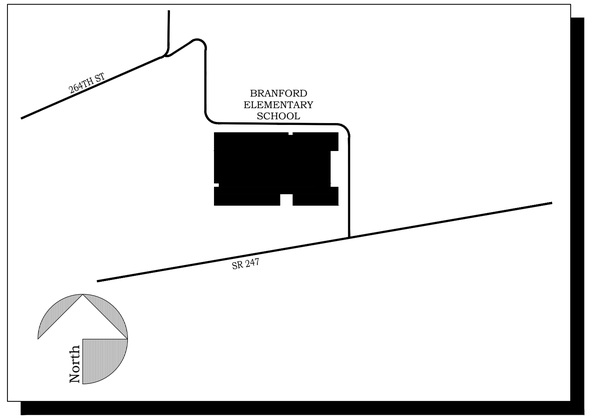
HVAC MODIFICATIONS
AT
BRANFORD ELEMENTARY SCHOOL
FOR THE
SUWANNEE COUNTY SCHOOL BOARD

LOCATION MAP



MECHANICAL AND ELECTRICAL ENGINEERS

ddc engineering inc

4083 South U.S. Highway 1, Ste. 101
Rockledge, Florida 32955
Phone 321.633.4522 Fax 321.633.4528
www.ddc-engineers.com
dasilva.david@ddc-engineers.com

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4083 South U.S. Highway 1, Ste. 101
Rockledge, Florida 32955
Phone 321.633.4522 Fax 321.633.4528
www.ddc-engineers.com
dasilva.david@ddc-engineers.com
C.O.A.: 25988
DDC PROJECT NO.: 19017.02

CONSULTANTS:

DATE
MARCH 29, 2019

REVIEW SET ☐
PERMIT SET ☐
BID SET ☒
CONSTRUCTION SET ☐
AS BUILT ☐

REVISIONS

NO.	DATE	DESCRIPTION

HVAC MODIFICATIONS AT BRANFORD ELEMENTARY SCHOOL
26801 FL-247
BRANFORD, FL 32008

MECHANICAL LEGEND AND SPECIFICATIONS

SHEET NO.:
G-1

DRAWN: LH
CHECKED: JMF
APPROVED: DAD

David A. DaSilva
54739

BID SET

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HVAC LEGEND

- 20x12 — NEW DUCTWORK. FIRST DIMENSION IS SIDE SHOWN
- ITEMS TO BE REMOVED
- EDH-# — ELECTRIC DUCT HEATER
- FLEX DUCTWORK
- ROOF EXHAUST FAN
- OAL — OUTSIDE AIR LOUVER
- OUTSIDE AIR INTAKE
- CEILING DIFFUSER, ROUND NECK (CEILING DIFFUSERS ARE 4-WAY THROW UNO)
- ROUND DIFFUSER
- CEILING RETURN
- CEILING EXHAUST
- EXHAUST FAN
- SWR — SIDE WALL RETURN
- SWD — SIDE WALL DIFFUSER
- T — THERMOSTAT/TEMPERATURE SENSOR
- DUCT SMOKE DETECTOR
- M — MOTORIZED CONTROL DAMPER
- TS — TEMPERATURE SENSOR
- P — PRESSURE SENSOR
- BD — BACKDRAFT DAMPER
- # — SHEET NOTE CALLOUT
- CEILING MOUNTED ACCESS DOOR
- 90° ELBOW W/TURNING VANES
- RADIUS ELBOW W/O TURNING VANES
- BD — BACKDRAFT DAMPER
- FIRE DAMPER (WITH ACCESS PANEL)
- FIRE & SMOKE DAMPER (WITH ACCESS PANEL)
- MANUAL BALANCING DAMPER
- 20"Ø — ROUND SPIRAL
- CHS — CHILLED WATER SUPPLY
- CHR — CHILLED WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- CD — CONDENSATE
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- FLOW DIRECTION
- GATE VALVE OR BALL VALVE
- CALIBRATING BALANCING VALVE
- BUTTERFLY VALVE
- STRAINER
- CONTROL VALVE
- UNION
- CHECK VALVE
- THERMOMETER
- CONNECTION, BOTTOM
- CONNECTION, TOP
- # — REVISION REFERENCE
- # — OCCUPANCY NUMBER
- POINT OF CONNECTION
- PUMP
- (150) NEW CFM / 100 EXISTING CFM — EXISTING DIFFUSER WITH CFM'S
- LIGHT DASHED INDICATES EXISTING EQUIPMENT
- DARK DASHED INDICATES EXISTING EQUIPMENT RELOCATED
- DARK SOLID INDICATES NEW EQUIPMENT
- HATCHED ITEMS INDICATES EQUIPMENT TO BE REMOVED & RELOCATED
- DEMO
- NOT IN CONTRACT (N.I.C.)
- VARIABLE AIR VOLUME (VAV) BOX
- R / S — PHOTOELECTRIC DUCT SMOKE DETECTOR R=RETURN S=SUPPLY

ABBREVIATIONS

ABV	- ABBREVIATION
AC	- AIR CONDITIONER
AFF	- ABOVE FINISHED FLOOR
AFG	- ABOVE FINISHED GRADE
AHU	- AIR HANDLING UNIT
AP	- ACCESS PANEL
AS	- AIR SEPERATOR
BD	- BYPASS DAMPER
BOP	- BOTTOM OF PIPE
BHP	- BRAKE HORSE POWER
BTH	- BRITISH THERMAL UNIT
CAP	- CAPACITY
CD	- CONDENSATE DRAIN
CFM	- CUBIC FEET PER MINUTE
CH	- CHILLER
CHP	- CHILLED WATER PUMP
CHR	- CHILLED WATER RETURN
CHS	- CHILLED WATER SUPPLY
COMB	- COMBINATION
CONN	- CONNECTION
CONT	- CONTINUE
CT	- COOLING TOWER
CW	- COLD WATER
CWP	- CONDENSER WATER PUMP
CWS	- CONDENSER WATER SUPPLY
CWR	- CONDENSER WATER RETURN
CU	- CONDENSING UNIT
DB	- DRY BULB
DIA	- DIAMETER
DG	- DOOR GRILLE
DL	- DOOR LOUVER
DN	- DOWN
DP	- DIFFERENTIAL PRESSURE
DWG	- DRAWING
EA	- EXHAUST AIR
EAT	- ENTERING AIR TEMPERATURE
EDH	- ELECTRIC DUCT HEATER
EER	- ENERGY EFFICIENCY RATIO
EF	- EXHAUST FAN
EFF	- EFFICIENCY
EG	- EXHAUST GRILLE
ENT	- ENTERING
ESP	- EXTERNAL STATIC PRESSURE
ET	- EXPANSION TANK
EWT	- ENTERING WATER TEMPERATURE
EXP	- EXPANSION
FA	- FACE AREA
FCU	- FAN COIL UNIT
FD	- FIRE DAMPER
FLA	- FULL LOAD AMPS
FLEX	- FLEXIBLE
FPM	- FEET PER MINUTE
FS	- FLOOR SINK
FT	- FEET
FV	- FACE VELOCITY
GA	- GAUGE
GPM	- GALLONS PER MINUTE
HP	- HORSE POWER
HB	- HOSE BIBB
HR	- HOUR
HW	- HOT WATER
HWR	- HOT WATER RETURN
HWS	- HOT WATER SUPPLY
HZ	- HERTZ
IN	- INCHES
IW	- INDIRECT WASTE
KW	- KILOWATT
LAT	- LEAVING AIR TEMPERATURE
LF	- LINEAR FOOT
LWT	- LEAVING WATER TEMPERATURE
LD	- LINEAR DIFFUSER
LIQ	- LIQUID
LP	- LOOP PUMPS
MAX	- MAXIMUM
MBH	- THOUSAND BTU PER HOUR
MCA	- MINIMUM CIRCUIT AMPACITY
MECH	- MECHANICAL
MIN	- MINIMUM
MD	- MOTORIZED DAMPER
NC	- NORMALLY CLOSED
NFPA	- NATIONAL FIRE PROTECTION ASSOCIATION
NO	- NORMALLY OPEN
NOM	- NOMINAL
NTS	- NOT TO SCALE
OA	- OUTSIDE AIR
OAU	- OUTSIDE AIR UNIT
OC	- ON CENTER
PD	- PRESSURE DROP
PH	- PHASE
PRV	- PRESSURE REDUCING VALVE
PSI	- POUNDS PER SQUARE INCH
PSIG	- PSI GAUGE
PTAC	- PACKAGED TERMINAL AIR CONDENSER
PVC	- POLYVINYL CHLORIDE PIPE
QTY	- QUANTITY
RA	- RETURN AIR
REF	- REFRIGERANT
RG	- RETURN GRILLE
RPM	- REVOLUTIONS PER MINUTE
RLA	- RATED LOAD AMPS
RTU	- ROOF TOP UNIT
SA	- SUPPLY AIR
SCR	- SILICON CONTROLLED RECTIFIER
SEER	- SEASONAL ENERGY EFFICIENCY RATING
SEN	- SENSIBLE
SD	- SMOKE DAMPER
SP	- STATIC PRESSURE
T	- THERMOSTAT
TEMP	- TEMPERATURE
TG	- TRANSFER GRILLE
TSH	- TOTAL SENSIBLE HEAT
TSP	- TOTAL STATIC PRESSURE
TYP	- TYPICAL
UC	- UNDER CUT
UG	- UNDER GROUND
VAV	- VARIABLE AIR VOLUME
VLV	- VALVE
VSD	- VARIABLE SPEED DRIVE
WB	- WET BULB
ZD	- ZONE DAMPER
ΔT	- CHANGE IN TEMPERATURE
ΔP	- CHANGE IN PRESSURE

GENERAL NOTES:

1. VERIFY THAT ALL EQUIPMENT, AS SHOWN ON THESE DRAWINGS, WILL NOT CONFLICT WITH ANY DRAINS, SCUTTLES, JOINTS, VENTS, PIPING OR OTHER EQUIPMENT PRIOR TO INSTALLATION.
2. EQUIPMENT SUPPLIER SHALL PROVIDE COMPLETE INFORMATION AND COOPERATE WITH THE OWNER'S REPRESENTATIVE AS REQUIRED FOR PROJECT COMPLETION AND COORDINATION.
3. CONTRACTOR SHALL ADMINISTER AND SUBMIT ALL DRAWINGS FOR PERMITTING.
4. PROVIDE VIBRATION ISOLATION DEVICES AND FLEXIBLE CONNECTIONS TO ALL MOVING MACHINERY.
5. ALL PIPE DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS.
6. PROVIDE SHOP DRAWINGS FOR ALL HVAC EQUIPMENT AND MATERIALS.
7. FURNISH AND INSTALL 4" HIGH BLACK NAMEPLATES FOR ALL EQUIPMENT.
8. FIELD VERIFY ALL EXISTING SERVICES PRIOR TO START OF CONSTRUCTION.
9. TEST AND BALANCE ALL NEW HVAC EQUIPMENT. SEE SPECIFICATIONS.

PROJECT SCOPE OF WORK

BASE BID:
-MODIFY EXISTING DUCTWORK TO AHU-5 AS INDICATED.
-ADD NEW VAV BOX AND RELOCATE EXISTING VAV BOX AS INDICATED.

ALTERNATE BID:
-ADD CONTROL WORK.

DESIGN CRITERIA

DESIGN TEMPERATURES

OUTSIDE AIR		
	SUMMER	94.8°F DB 76.7°F WB
	WINTER	36.7°F DB
INSIDE AIR		
	SUMMER	75°F DB
	WINTER	72°F DB

CODE COMPLIANCE REQUIREMENTS

ALL WORK SHALL BE IN COMPLIANCE WITH THE FOLLOWING CODES, BUT NOT LIMITED TO:
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - BUILDING (FBCB)
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - EXISTING BUILDING (FBCEB)
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - ACCESSIBILITY (FBCA)
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - ENERGY CONSERVATION (FBCEC)
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - MECHANICAL (FBCM)
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - PLUMBING (FBCP)
6TH EDITION OF THE 2017 FLORIDA BUILDING CODE - FUEL GAS (FBCFG)
6TH EDITION OF THE 2017 FLORIDA FIRE PREVENTION CODE (FFPC)
NFPA 70 - 2014 NATIONAL ELECTRICAL CODE (NEC)
2014 STATE REQUIREMENTS FOR EDUCATIONAL FACILITIES (SREF)

Jessica Lunsford Requirement
If Vendor will have any employees on any school site on school days when students may be present then Vendor will comply with all requirements of Fla. Stat. 1012.32 and 1012.465 by completing the fingerprint screening required of Vendor and all of its employees who provide services under this contract. Vendor shall contact the District's Personnel Departmentin to schedule an appointment for the screening. The fingerprint screening must be completed in advance of the Vendor providing any services. Vendor will bear the cost of acquiring the background screening required by Fla. Stat. 1012.32, and any fee imposed by the Florida Department of Law Enforcement to maintain the fingerprints provided with respect to Vendor and its employees. Vendor will provide District a list of its employees. Vendor will update these lists in the event that any new employees are added and Vendor agrees that new employees shall be fingerprinted. Vendor agrees that in the event any employee is convicted of a criminal offense, the Vendor will notify the District within forty-eight (48) hours.

The parties agree in the event that Vendor fails to perform any of the duties described in the above paragraph, this will constitute a breach of the contract entitling the District to terminate immediately with no further responsibility to make payment or perform any other duties under this contract. Vendor agrees to indemnify and hold harmless the District, its officers and employees from any liability whatsoever resulting from Vendor failure to comply with the requirements of this paragraph or Fla. Stat. 1012.32 and 1012.465.

NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF EXISTING CEILING, WALLS, CONCRETE SLABS, ETC. TO INSTALL NEW SYSTEM. MINIMIZE SAW CUTTING OF WALLS, SLABS, ETC. PATCH AND REPAIR ALL SURFACES IMPACTED BY CONSTRUCTION. PAINT ALL SURFACE TO MATCH EXISTING FINISH.

DEMOLITION SPECIFICATIONS:

SECTION 01732 - SELECTIVE DEMOLITION
PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT APPLY TO THIS SECTION.
1.2 SUMMARY
A. THIS SECTION INCLUDES THE FOLLOWING:
1. DEMOLITION AND REMOVAL OF SELECTED PORTIONS EQUIPMENT AS IDENTIFIED.
2. DEMOLITION AND REMOVAL OF SELECTED SITE ELEMENTS.
3. REPAIR PROCEDURES FOR SELECTIVE DEMOLITION OPERATIONS.
1.3 SUBMITTALS
A. SCHEDULE OF SELECTIVE DEMOLITION ACTIVITIES: INDICATE THE FOLLOWING:
1. DETAILED SEQUENCE OF SELECTIVE DEMOLITION AND REMOVAL WORK, WITH STARTING AND ENDING DATES FOR EACH ACTIVITY. ENSURE OWNER'S ON-SITE OPERATIONS ARE UNINTERRUPTED.
2. INTERRUPTION OF UTILITY SERVICES.
3. COORDINATION FOR SHUTOFF, CAPPING, AND CONTINUATION OF UTILITY SERVICES.
4. COORDINATION OF OWNER'S CONTINUING OCCUPANCY OF PORTIONS OF EXISTING BUILDING AND OF OWNER'S PARTIAL OCCUPANCY OF COMPLETED WORK.
A. PREDEMOLITION PHOTOGRAPHS OR VIDEOTAPE: SHOW EXISTING CONDITIONS OF ADJOINING CONSTRUCTION AND SITE IMPROVEMENTS, INCLUDING FINISH SURFACES, THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY SELECTIVE DEMOLITION OPERATIONS. SUBMIT BEFORE WORK BEGINS.
1.4 PROJECT CONDITIONS
A. OWNER WILL OCCUPY PORTIONS OF BUILDING IMMEDIATELY ADJACENT TO SELECTIVE DEMOLITION AREA. CONDUCT SELECTIVE DEMOLITION SO OWNER'S OPERATIONS WILL NOT BE DISRUPTED. PROVIDE NOT LESS THAN 36 HOURS' NOTICE TO OWNER OF ACTIVITIES THAT WILL AFFECT OWNER'S OPERATIONS.
B. MAINTAIN ACCESS TO EXISTING WALKWAYS, CORRIDORS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES.
1. DO NOT CLOSE OR OBSTRUCT WALKWAYS, CORRIDORS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT WRITTEN PERMISSION FROM AUTHORITIES HAVING JURISDICTION.
C. OWNER ASSUMES NO RESPONSIBILITY FOR CONDITION OF AREAS TO BE SELECTIVELY DEMOLISHED.
1. CONDITIONS EXISTING AT TIME OF INSPECTION FOR BIDDING PURPOSE WILL BE MAINTAINED BY OWNER AS FAR AS PRACTICAL.
2. BEFORE SELECTIVE DEMOLITION, CONSULT WITH OWNER ON ITEMS TO BE KEPT.
D. HAZARDOUS MATERIALS: IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK.
1. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER BEFORE START OF THE WORK.
2. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; IMMEDIATELY NOTIFY ENGINEER AND OWNER. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER UNDER A SEPARATE CONTRACT.
E. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE WILL NOT BE PERMITTED.
F. UTILITY SERVICE: MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS.
1. MAINTAIN FIRE-PROTECTION FACILITIES IN SERVICE DURING SELECTIVE DEMOLITION OPERATIONS.

PART 2 - PRODUCTS
2.1 REPAIR MATERIALS
A. USE REPAIR MATERIALS IDENTICAL TO EXISTING MATERIALS.
1. IF IDENTICAL MATERIALS ARE UNAVAILABLE OR CANNOT BE USED FOR EXPOSED SURFACES, USE MATERIALS THAT VISUALLY MATCH EXISTING ADJACENT SURFACES TO THE FULLEST EXTENT POSSIBLE.
2. USE MATERIALS WHOSE INSTALLED PERFORMANCE EQUALS OR SURPASSES THAT OF EXISTING MATERIALS (I.E. CEILING GRID AND TILES).

PART 3 - EXECUTION
3.1 EXAMINATION
A. VERIFY THAT UTILITIES HAVE BEEN DISCONNECTED AND CAPPED.
B. SURVEY EXISTING CONDITIONS AND CORRELATE WITH REQUIREMENTS INDICATED TO DETERMINE EXTENT OF SELECTIVE DEMOLITION REQUIRED.
C. INVENTORY AND RECORD THE CONDITION OF ITEMS TO BE REMOVED AND REINSTALLED AND ITEMS TO BE REMOVED AND SALVAGED.
D. WHEN UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OR DESIGN ARE ENCOUNTERED, INVESTIGATE AND MEASURE THE NATURE AND EXTENT OF CONFLICT. PROMPTLY SUBMIT A WRITTEN REPORT TO ENGINEER.
E. PERFORM SURVEYS AS THE WORK PROGRESSES TO DETECT HAZARDS RESULTING FROM SELECTIVE DEMOLITION ACTIVITIES.
3.2 UTILITY SERVICES
A. EXISTING UTILITIES: MAINTAIN SERVICES INDICATED TO REMAIN AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS.
B. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR OPERATING FACILITIES UNLESS AUTHORIZED IN WRITING BY OWNER AND AUTHORITIES HAVING JURISDICTION. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING UTILITIES, AS ACCEPTABLE TO OWNER AND TO AUTHORITIES HAVING JURISDICTION. PROVIDE TEMPORARY MEANS OF COOLING (AIR-COOLED CHILLER).
C. UTILITY REQUIREMENTS: DO NOT START SELECTIVE DEMOLITION WORK UNTIL UTILITY DISCONNECTING AND SEALING HAVE BEEN COMPLETED AND VERIFIED IN WRITING.
3.3 PREPARATION
A. DANGEROUS MATERIALS: DRAIN, PURGE, OR OTHERWISE REMOVE, COLLECT, AND DISPOSE OF CHEMICALS, GASES, EXPLOSIVES, ACIDS, FLAMMABLES, OR OTHER DANGEROUS MATERIALS BEFORE PROCEEDING WITH SELECTIVE DEMOLITION OPERATIONS.
B. SITE ACCESS AND TEMPORARY CONTROLS: CONDUCT SELECTIVE DEMOLITION AND DEBRIS-REMOVAL OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS, WALKWAYS, AND OTHER ADJACENT OCCUPIED AND USED FACILITIES.
C. TEMPORARY FACILITIES: PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND FACILITIES TO REMAIN.
D. TEMPORARY PARTITIONS: ERECT AND MAINTAIN DUSTPROOF PARTITIONS AND TEMPORARY ENCLOSURES TO LIMIT DUST AND DIRT MIGRATION AND TO SEPARATE AREAS FROM FUMES AND NOISE.
E. TEMPORARY SHORING: PROVIDE AND MAINTAIN SHORING, BRACING, OR STRUCTURAL SUPPORT TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF CONSTRUCTION TO REMAIN, AND TO PREVENT UNEXPECTED OR UNCONTROLLED MOVEMENT OR COLLAPSE OF CONSTRUCTION BEING DEMOLISHED.
1. STRENGTHEN OR ADD NEW SUPPORTS WHEN REQUIRED DURING PROGRESS OF SELECTIVE DEMOLITION.
3.4 POLLUTION CONTROLS
A. DUST CONTROL: USE WATER MIST, TEMPORARY ENCLOSURES, AND OTHER SUITABLE METHODS TO LIMIT SPREAD OF DUST AND DIRT. COMPLY WITH GOVERNING ENVIRONMENTAL-PROTECTION REGULATIONS.
B. DISPOSAL: REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
C. CLEANING: CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE SELECTIVE DEMOLITION OPERATIONS BEGAN.
3.5 SELECTIVE DEMOLITION
A. GENERAL: DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS AND AS FOLLOWS:
B. EXISTING FACILITIES: COMPLY WITH BUILDING MANAGER'S REQUIREMENTS FOR USING AND PROTECTING WALKWAYS, LOADING DOCKS, BUILDING ENTRIES, AND OTHER BUILDING FACILITIES DURING SELECTIVE DEMOLITION OPERATIONS.
C. REMOVED AND REINSTALLED ITEMS: COMPLY WITH THE FOLLOWING:
1. CLEAN AND REPAIR ITEMS TO FUNCTIONAL CONDITION ADEQUATE FOR INTENDED REUSE. PAINT EQUIPMENT TO MATCH NEW EQUIPMENT.
2. REINSTALL ITEMS IN LOCATIONS INDICATED. COMPLY WITH INSTALLATION REQUIREMENTS FOR NEW MATERIALS AND EQUIPMENT. PROVIDE CONNECTIONS, SUPPORTS, AND MISCELLANEOUS MATERIALS NECESSARY TO MAKE ITEM FUNCTIONAL FOR USE INDICATED.
D. EXISTING ITEMS TO REMAIN: PROTECT CONSTRUCTION INDICATED TO REMAIN AGAINST DAMAGE AND SOILING DURING SELECTIVE DEMOLITION. WHEN PERMITTED BY ENGINEER, ITEMS MAY BE REMOVED TO A SUITABLE, PROTECTED STORAGE LOCATION DURING SELECTIVE DEMOLITION AND CLEANED AND REINSTALLED IN THEIR ORIGINAL LOCATIONS AFTER SELECTIVE DEMOLITION OPERATIONS ARE COMPLETE.
E. CONCRETE: DEMOLISH IN SMALL SECTIONS. CUT CONCRETE TO A DEPTH OF AT LEAST 3/4 INCH AT JUNCTURES WITH CONSTRUCTION TO REMAIN, USING POWER-DRIVEN SAW. DISLODGE CONCRETE FROM REINFORCEMENT AT PERIMETER OF AREAS BEING DEMOLISHED, CUT REINFORCEMENT, AND THEN REMOVE REMAINDER OF CONCRETE INDICATED FOR SELECTIVE DEMOLITION. NEATLY TRIM OPENINGS TO DIMENSIONS INDICATED.
F. AIR-CONDITIONING EQUIPMENT: REMOVE EQUIPMENT WITHOUT RELEASING REFRIGERANTS.
3.6 PATCHING AND REPAIRS
A. GENERAL: PROMPTLY REPAIR DAMAGE TO ADJACENT CONSTRUCTION CAUSED BY SELECTIVE DEMOLITION OPERATIONS.
B. REPAIRS: WHERE REPAIRS TO EXISTING SURFACES ARE REQUIRED, PATCH TO PRODUCE SURFACES SUITABLE FOR NEW MATERIALS.
C. FINISHES: RESTORE EXPOSED FINISHES OF PATCHED AREAS AND EXTEND RESTORATION INTO ADJOINING CONSTRUCTION IN A MANNER THAT ELIMINATES EVIDENCE OF PATCHING AND REFINISHING.
D. FLOORS AND WALLS: WHERE WALLS OR PARTITIONS THAT ARE DEMOLISHED EXTEND ONE FINISHED AREA INTO ANOTHER, PATCH AND REPAIR FLOOR AND WALL SURFACES IN THE NEW SPACE. PROVIDE AN EVEN SURFACE OF UNIFORM FINISH COLOR, TEXTURE, AND APPEARANCE. REMOVE EXISTING FLOOR AND WALL COVERINGS AND REPLACE WITH NEW MATERIALS, IF NECESSARY, TO ACHIEVE UNIFORM COLOR AND APPEARANCE.
E. CEILINGS: PATCH, REPAIR, OR REHANG EXISTING CEILINGS AS NECESSARY TO PROVIDE AN EVEN-PLANE SURFACE OF UNIFORM APPEARANCE.
3.7 DISPOSAL OF DEMOLISHED MATERIALS
A. GENERAL: PROMPTLY DISPOSE OF DEMOLISHED MATERIALS. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE.

END OF SECTION 01732

NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF EXISTING CEILING, WALLS, CONCRETE SLABS, ETC. TO INSTALL NEW SYSTEM. MINIMIZE SAW CUTTING OF WALLS, SLABS, ETC. PATCH AND REPAIR ALL SURFACES IMPACTED BY CONSTRUCTION. PAINT ALL SURFACE TO MATCH EXISTING FINISH.

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HVAC MODIFICATIONS AT BRANFORD ELEMENTARY SCHOOL
26801 FL-247
BRANFORD, FL 32008

MECHANICAL LEGEND AND SPECIFICATIONS

SHEET NO.:
M-1

DRAWN: LH
CHECKED: JMF
APPROVED: DAD

David A. DaSilva
54739

BID SET

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EXISTING AHU-5
MEZZANINE N.T.S.

EXISTING AHU-5
MEZZANINE N.T.S.

EXISTING AHU-5 OA DUCT
MEZZANINE N.T.S.

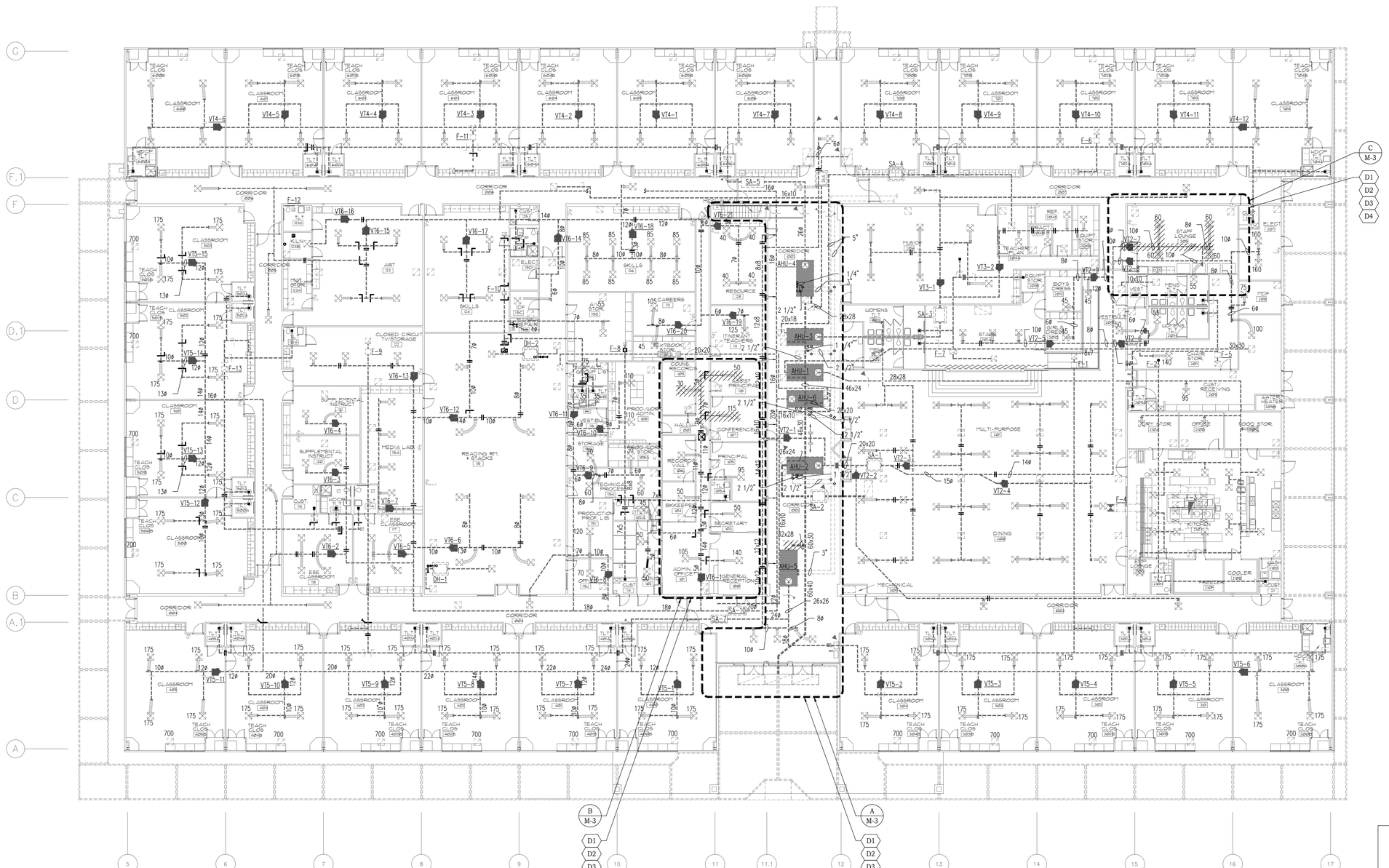
DEMOLITION NOTES

D1. SEE MECHANICAL DRAWING M-3 FOR ENLARGED PLANS.

D2. REMOVE EXISTING HVAC SYSTEMS AS INDICATED.

D3. CAP AND REPAIR ALL DUCTWORK AND INSULATE WHERE MODIFIED.

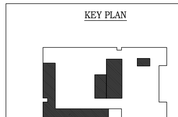
D4. DISCONNECT EXISTING FEEDERS FROM EXISTING VAV AND PRESSURE TO FEED NEW VAV BOX.



MECHANICAL DEMOLITION PLAN

1/16" = 1'-0"

KEY PLAN



DENOTES AREA OF WORK

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REVISIONS

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HVAC MODIFICATIONS AT BRANFORD ELEMENTARY SCHOOL

26801 FL-247
BRANFORD, FL 32008

MECHANICAL DEMOLITION PLAN

SHEET NO.:
M-2

DRAWN: LH
CHECKED: JMF
APPROVED: DAD

David A. DaSilva
54739

BID SET

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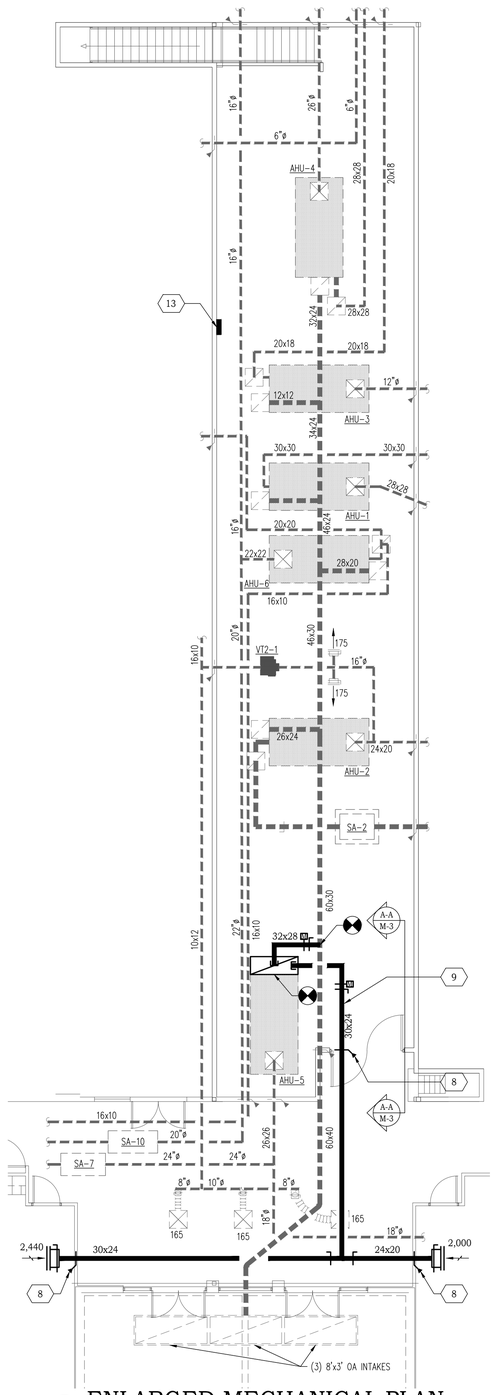
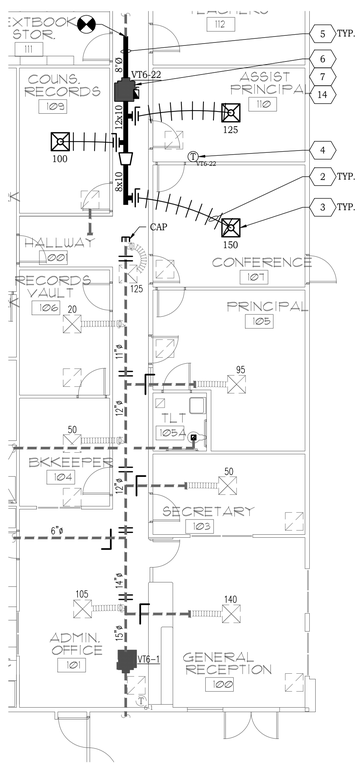
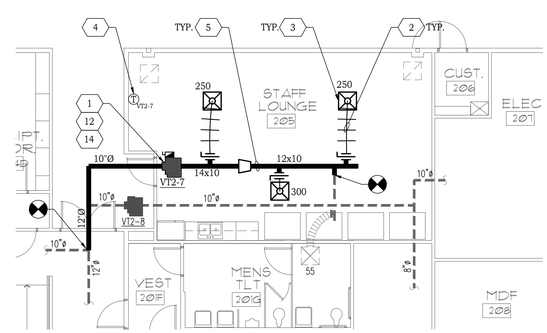


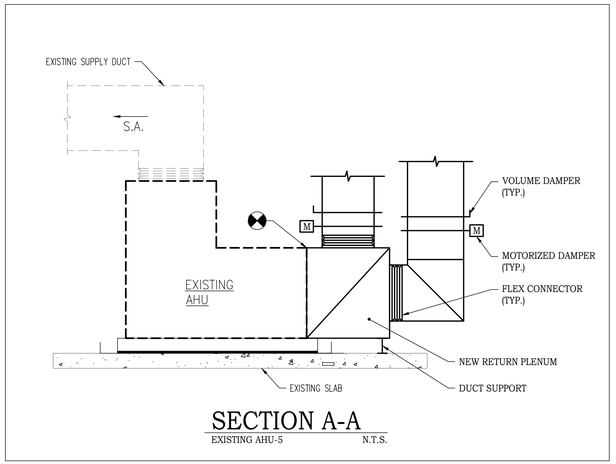
A ENLARGED MECHANICAL PLAN
MEZZANINE 1/8" = 1'-0"



B ENLARGED MECHANICAL PLAN
ADMIN. AREA 1/8" = 1'-0"



C ENLARGED MECHANICAL PLAN
STAFF LOUNGE 205 1/8" = 1'-0"



SECTION A-A
EXISTING AHU-5 N.T.S.

NOTES

1. INSTALL VAV BOX. SEE DETAIL.
2. SIZE FLEX DUCT BASED ON SCHEDULE PROVIDED.
3. INSULATE BACK OF ALL DIFFUSERS.
4. MOUNT THERMOSTAT AT 48" ABOVE FINISHED FLOOR.
5. PROVIDE NEW DUCTWORK AS INDICATED AND CONNECT TO EXISTING SYSTEM.
6. RELOCATE EXISTING VAV BOX SERVING STAFF LOUNGE AND CONNECT TO EXISTING MAIN TRUNK.
7. RE-LABEL VAV BOX AS INDICATED ON THIS DRAWING.
8. PROVIDE NEW FIRE DAMPER IN WALL. SEAL AND REPAIR WALL.
9. MOUNT DUCT HIGH ABOVE MEZZANINE FLOOR. COORDINATE DUCT LOCATION WITH EXISTING ARCHITECTURAL/STRUCTURAL FEATURES.
10. PROVIDE NEW ALC CONTROLS FOR VAV BOX AND INTEGRATE INTO CONTROL SYSTEM SERVING AHU-2.
11. EXISTING VAV CONTROLLER SERVING VT-6-22 SHALL BE INTEGRATED INTO CONTROL SEQUENCE SERVING AHU-6.
12. CONNECT EXISTING CONDUIT AND FEEDER TO NEW VAV BOX. EXTEND CONDUIT AND WIRING AS REQUIRED.
13. PROVIDE AND INSTALL NEW 20 AMP 1-POLE PANEL MATCHING CIRCUIT BREAKER WITHIN EXISTING 480/277V, 30 PANEL SPACE, LOCATED ON MEZZANINE, TO SERVE NEW VT6-22. CONNECT USING (2) #12 AWG, (1) #12 AWG CU G, 3/4"C. (NOTE: INSTALL BREAKER WITHING EXISTING PANEL THAT SERVES ALL OTHER VT6-#).
14. PROVIDE AND INSTALL NEW FUSED DISCONNECT TO SERVE NEW VAV'S.

ddc engineering inc.
4083 South U.S. Highway 1, Ste. 101
Rockledge, Florida 32955
Phone 321.633.4522 Fax 321.633.4528
www.ddc-engineers.com
dasilva.david@ddc-engineers.com
C.O.A.: 25988
DDC PROJECT NO.: 19017.02

CONSULTANTS:

DATE
MARCH 29, 2019

- REVIEW SET ☐
- PERMIT SET ☐
- BID SET ☒
- CONSTRUCTION SET ☐
- AS BUILT ☐

REVISIONS

NO.	DATE	DESCRIPTION

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26801 FL-247
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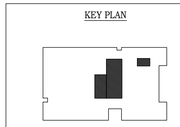
BID SET

KEY PLAN



DENOTES AREA OF WORK

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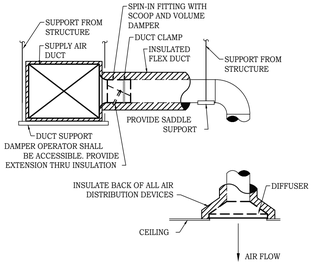
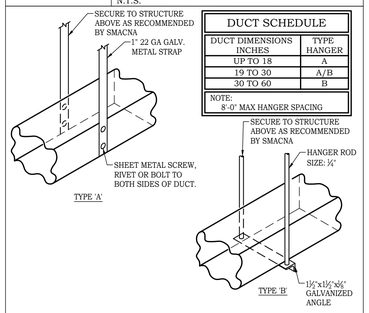


M1 TYPICAL DUCT / DIFFUSER DETAIL

N.T.S.

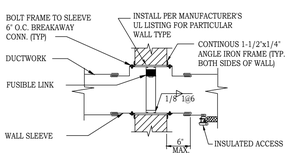


DUCT SCHEDULE	
DUCT DIMENSIONS INCHES	TYPE HANGER
UP TO 18	A
19 TO 30	A/B
30 TO 60	B

NOTE:
8'-0" MAX HANGER SPACING

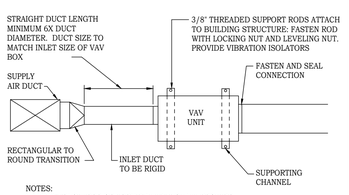
M2 DUCT SUPPORT DETAIL

N.T.S.



M3 FIRE DAMPER DETAIL HORIZONTAL DUCT

N.T.S.



NOTES:
1. MANUFACTURER OF TERMINAL UNIT SHALL PROVIDE CONTROLS ON LEFT OR RIGHT SIDE AS REQUIRED BY FIELD CONDITIONS.
2. ARRANGE ACCESS TO PERMIT EASY FIELD BALANCE AND MAINTENANCE OF TERMINAL UNIT. COORDINATE LOCATION OF VAV BOXES WITH LIGHTING.
3. FIXTURES TO ASSURE PROPER ACCESS.

M4 TYPICAL VAV UNIT INSTALLATION

N.T.S.

AIR HANDLING UNIT SCHEDULE (EXISTING)

PLAN MARK	MODEL NUMBER	UNIT TYPE	UNIT COMPONENTS IN DIRECTION OF AIR FLOW SEE LEGEND BELOW	AIR FLOWS RECIRC. CFM	AIR FLOWS O. A. CFM	FAN DATA	FAN DATA EXT. SP	FAN DATA TOTAL SP	FAN DATA WHEEL TYPE	FAN DATA RPM	FAN DATA MOTOR HP	COOLING COIL CAPACITY SEN. MBH	COOLING COIL CAPACITY TOTAL MBH	COOLING COIL AIR DATA ENT. TEMP. DB/WB	COOLING COIL AIR DATA LVG. TEMP. DB/WB	COOLING COIL AIR DATA VEL. FPM	COOLING COIL AIR DATA ROW/FIN. PER FT.	COOLING COIL AIR DATA P.D. IN.W.G.	COOLING COIL WATER DATA TEMP. F ENT.	COOLING COIL WATER DATA TEMP. F LVG.	COOLING COIL WATER DATA FLOW GPM	COOLING COIL WATER DATA P.D. FT.W.G.	HEATING COIL AIR DATA TEMP. F ENT.	HEATING COIL AIR DATA TEMP. F LVG.	HEATING COIL AIR DATA P.D. IN W.G.	HEATING COIL ELECTRICAL DATA KW	HEATING COIL ELECTRICAL DATA NO. STEPS	HEATING COIL ELECTRICAL DATA VOLT/ PHASE	PREFILTERS FACE VEL. FPM	PREFILTERS AIR PD LOADED IN. W.G.	PREFILTERS TYPE	PREFILTERS EFF. %
AHU-5	5WC-10-339x62x8-10AL	HORIZ. DRAW-THRU	PLN-CF-BS-CC-BS-FAN-DHC	10500	6060		3.35	6.0	FC	1168	15	350.0	725.0	93/78	43/42.5	239	8/120	1.0	36	52	135	17.0	55.6	73	0.05	82	6	480/3	278	0.80	12 IN.	65 & 30

NOTES:
MODIFY EXISTING UNITS TO HANDLE NEW RETURN AND O.A. DUCT. SEE DETAIL.
SET NEW O.A. CFM BASED ON SCHEDULE PROVIDED.

TERMINAL UNIT SCHEDULE

PLAN MARK	UNIT SIZE	MAX. PD IN. W.G.	PRIMARY AIR MAXIMUM CLG CFM	PRIMARY AIR MINIMUM CLG CFM	PRIMARY AIR HEATING CFM	ELECTRIC HEATING COIL DATA TEMP. F ENT.	ELECTRIC HEATING COIL DATA TEMP. F LVG.	ELECTRIC HEATING COIL DATA KW	ELECTRIC HEATING COIL DATA NO. STEPS	ELECTRIC HEATING COIL DATA VOLT/ PHASE
NEW VT2-7	11	0.07	900	200	500	70	92	3.0	2	277/1
*VT6-22	06	0.13	375	270	300	65	79	3.0	2	277/1

NOTES:
1. BASIS OF DESIGN: TRANE MODEL VCEE (UNITS W/ HEATERS) .
2. UNITS SHALL BE VAV FOR COOLING AND CONSTANT VOLUME FOR HEATING.
3. UNITS SHALL BE PRESSURE INDEPENDENT, NORMALLY OPEN.
4. UNITS SHALL HAVE ELECTRICALLY POWERED OPERATORS.
* RELOCATE VAV BOX (ORIGINALLY VT2-7).

AIR DISTRIBUTION DEVICE SCHEDULE

MARK	TYPE	CFM RANGE	MAX NC	NECK SIZE (IN.)	FLEX DIAM. (IN.)	MANUFACTURER / MODEL	REMARKS
12x12	SUPPLY DIFFUSERS	0-100	25	6"Ø	6	TITUS TDC-AA	1,2,3
		101-200	25	8"Ø	8		
		201-300	25	10"Ø	10		
		301-400	25	12"Ø	12		
		401-600	25	14"Ø	14		
		601-1000	25	16"Ø	16		
24x24		1001-1500	25	18"Ø	18		
	RETURN GRILLE	0-800	25	20x20	-	TITUS 350-FLF1	1,2,3
		801-3000	25	48x24	-		
SWD	SIDEWALL DIFFUSER	-	25	SEE DWGS	-	TITUS 272-FS	1,2,3
SWR	SIDEWALL RETURN	-	25	SEE DWGS	-	TITUS 4FL	1,2,3
DG	DOOR GRILLE	0-400	25	12x12	-	TITUS	3
		401-750	25	18x18	-		

REMARKS:
1. PROVIDE OPPOSED BLADE VOLUME DAMPERS.
2. CONTRACTOR SHALL COORDINATE GRILLES, DIFFUSERS AND REGISTER'S BORDER TYPES WITH CEILING, WALLS, EQUIPMENT ETC.
3. PROVIDE ALL ALUMINUM CONSTRUCTION.

NOTES:
1. ALL GRILLES SHALL BE FULL FACE OF MODULE. ALL LAY-IN CEILING RETURN MODULES SHALL BE 24"x24" WITH 20"x20"x1" FILTER
2. INSULATE THE BACK OF ALL SUPPLY AND RETURN AIR DEVICES.
3. PROVIDE BORDER TYPE 1 FOR LAY-IN CEILINGS, AND BORDER TYPE 3 FOR GYPSUM BOARD CEILINGS.
4. PROVIDE 1" PLEATED FILTER.
5. THE NUMBER ADJACENT TO THE FIXTURE INDICATES AIR FLOW (CFM).

DESIGN CRITERIA

DESIGN TEMPERATURES			
OUTSIDE AIR		INSIDE AIR	
SUMMER	WINTER	SUMMER	WINTER
95°F DB/80°F WB	30°F DB	75°F DB/60% RH	72°F DB

NOTES

THE DESIGN CRITERIA ABOVE IS BASED ON ASHRAE STANDARD 62.1. ANY CHANGES TO THIS OCCUPANCY OR FLOOR PLAN WILL REQUIRE FURTHER REVIEW AND MODIFICATIONS TO THIS VENTILATION SYSTEM.

FLEX DUCT SCHEDULE

CFM	DUCT SIZE
0-100	6"Ø
101-200	8"Ø
201-300	10"Ø
301-400	12"Ø
401-600	14"Ø
601-1000	16"Ø
1001-1500	18"Ø
1501-2000	20"Ø

SIZE BOTH SUPPLY AND RETURN BASED UPON AIRFLOWS ABOVE.

AIR BALANCE SCHEDULE

OUTSIDE AIR CFM		
UNIT TAG	ZONE USE	OUTSIDE AIR CFM
AHU-1	OFFICES/KITCHEN	2,595
AHU-2	CAFETERIA/STAFF LOUNGE	4,330
AHU-3	MUSIC/STORAGE	600
AHU-4	CLASSROOM	5,400
AHU-5	CLASSROOM	6060
AHU-6	MEDIA/CLASSROOM	3,750
F-4	KITCHEN HOOD MAKEUP	5,460
	TOTAL OUTSIDE AIR	28195

EXHAUST AIR SCHEDULE		
UNIT TAG	ZONE USE	OUTSIDE AIR CFM
F-1	CLASSROOM/TOILET	2,000
F-2	TOILET/JANITOR	135
F-3	KITCHEN HOOD	7,840
F-5	TOILET/JANITOR	905
F-6	CLASSROOM/TOILET	2,085
F-7	TOILET/GENERAL	4,520
F-8	TOILET/JANITOR	270
F-9	CLASSROOM/TOILETS	2,400
F-10	TOILET/JAN./GEN'L.	2,025
F-11	CLASSROOM/TOILET	2,800
F-12	TOILET/GENERAL	490
F-13	CLASSROOM/TOILET	2,725
	TOTAL EXHAUST AIR	28,195
TOTAL BUILDING PRESSURE IS NEUTRAL		

ddc engineering inc.
4083 South U.S. Highway 1, Ste. 101
Rockledge, Florida 32955
Phone 321.633.4522 Fax 321.633.4528
www.ddc-engineers.com
dasilva.david@ddc-engineers.com
C.O.A.: 25988
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15319 - DUCTWORK, LOW PRESSURE, FLEXIBLE
15450 - AIR DISTRIBUTION EQUIPMENT
15750 - AIR HANDLING EQUIPMENT
15802 - HVAC INSULATION GENERAL
15841 - INSULATION, LOW PRESSURE DUCTWORK
15870 - VARIABLE AIR VOLUME BOX
15890 - TESTING, ADJUSTING AND BALANCING
15950 - TEMPERATURE CONTROLS
15992 - HVAC COMMISSIONING

SECTION 15000
HEATING, VENTILATING, AND AIR CONDITIONING, GENERAL

PART 1 - GENERAL

1.01 DESCRIPTION
A. SECTIONS 15000 THROUGH 15890 PERTAIN TO HEATING, VENTILATING AND AIR CONDITIONING (HVAC) WORK. THIS SECTION APPLIES TO AND GOVERNS ALL HVAC SECTIONS.
B. REFER TO OTHER DIVISIONS FOR CONTINUATION OF EXTERIOR AND ALLIED WORK.
C. FIELD PAINTING SHALL BE PROVIDED BY THIS CONTRACTOR. PAINT ALL EXPOSED CONDUITS, PIPING, SUPPORTS ETC. FIELD PAINT SHALL MATCH SIMILAR EXISTING TRADES.

1.02 PERMITS, FEES, CODES, ORDINANCES AND REGULATIONS.
A. OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS AND CONNECTION FEES REQUIRED BY GOVERNING BODIES IN CONNECTION WITH THE WORK. DELIVER CERTIFICATES OF INSPECTION TO THE OWNER.
B. ALL WORK SHALL COMPLY WITH THE FLORIDA BUILDING CODE, 2017 EDITION AND ALL OTHER GOVERNING CODES, ORDINANCES AND REGULATIONS, THE NATIONAL ELECTRICAL CODE, AND THE FLORIDA MECHANICAL CODE.

1.03 QUALITY ASSURANCE
A. INDUSTRY STANDARDS AND CODES: UNLESS MODIFIED BY THESE SPECIFICATIONS, THE DESIGN, MANUFACTURE, TESTING AND METHOD OF INSTALLING ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL CONFORM TO THE FOLLOWING:
1. ARI CODE FOR REFRIGERATION APPARATUS
2. ANSI B9.1 SAFETY CODE FOR MECHANICAL REFRIGERATION
3. STANDARDS OF NATIONAL FIRE PROTECTION ASSOCIATION
4. SMACNA
5. ASHRAE
B. SUBSTITUTIONS: SEE GENERAL CONDITIONS.

1.04 JOB CONDITIONS
A. PROTECT MATERIALS, APPARATUS AND EQUIPMENT FROM DAMAGE, MOISTURE, DIRT, DEBRIS AND WORK OF OTHER TRADES.
B. USE OF PAPER. CARDBOARD OR OTHER FLIMSY MATERIAL WILL NOT BE PERMITTED. REPLACE DAMAGED PROTECTIVE MATERIALS IMMEDIATELY. DO NOT INSTALL DAMAGED MATERIALS AND EQUIPMENT; REMOVE FROM THE SITE.

PART 2 - PRODUCTS

2.01 GENERAL
A. ALL MATERIALS AND EQUIPMENT SHALL BE NEW. SYSTEMS SHALL BE PROVIDED COMPLETE AND OPERATIONAL TO MAINTAIN THE SPECIFIED DESIGN CAPACITY. SHOULD A SYSTEM, OR ANY PART THEREOF FAIL TO MEET PERFORMANCE REQUIREMENTS THIS CONTRACTOR SHALL BE RESPONSIBLE FOR NECESSARY REPLACEMENTS, ALTERATIONS OR REPAIRS, AS REQUIRED BY THE ENGINEER, TO BRING PERFORMANCE UP TO SPECIFIED REQUIREMENTS. BUILDING CONSTRUCTION OR EQUIPMENT DAMAGED OR MARRED DURING THIS PROJECT SHALL BE RESTORED TO PRIOR CONDITIONS, AT NO ADDITIONAL COST TO THE OWNER.
B. WHERE MULTIPLE ITEMS OF EQUIPMENT OF MATERIALS ARE REQUIRED, THEY SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER.
C. BEFORE ORDERING ANY EQUIPMENT, THE SIZE OF ALL EQUIPMENT SHALL BE CHECKED TO EASILY FIT SPACES ALLOTTED ON THE DRAWINGS.
D. INSERTS PIPE SLEEVES, SUPPORTS AND ANCHORAGE OF AIR CONDITIONING EQUIPMENT SHALL BE PROVIDED AS SPECIFIED HEREIN. WHERE SUCH ITEMS ARE TO SET OR EMBEDDED IN CONCRETE MASONRY OR SIMILAR WORK, THE ITEMS SHALL BE FURNISHED AND LAYOUT MADE AT THE PROPER TIME FOR THE SETTING OR EMBEDMENT THEREOF SO AS TO CAUSE NO DELAY IN THE WORK.
E. PIPING ASSEMBLIES OF EQUIPMENT SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC. ALL PIPING AND APPURTENANCES REQUIRED FOR THE PROPER OPERATION OF ALL EQUIPMENT SHALL BE PROVIDED.

2.02 MANUFACTURER'S NAMES AND CATALOG NUMBERS
A. SPECIFIC REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURER'S NAMES AND MODEL OR CATALOG NUMBERS.
B. THIS DOES NOT INDICATE THAT THE MATERIAL AND EQUIPMENT SPECIFIED IS NECESSARILY AN "OFF THE SHELF" ITEM; REQUIREMENTS FOR SPECIFIC FINISHES, MATERIALS OR OTHER MODIFICATIONS MAY INTRODUCE VARIANCES FROM MANUFACTURER'S STANDARDS. CONTRACTOR SHALL ASCERTAIN THAT SUCH MODIFICATIONS ARE FULLY CONSIDERED AND APPROVED PRIOR TO INSTALLATION.

2.03 EQUIPMENT IDENTIFICATION
A. EACH MAJOR COMPONENT OF EQUIPMENT SHALL HAVE THE MANUFACTURER'S NAME, ADDRESS AND CATALOG NUMBER ON A PLATE SECURELY AFFIXED IN A CONSPICUOUS PLACE. THE NAMEPLATE OF A DISTRIBUTING AGENT WILL NOT BE ACCEPTED.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP
A. THE WORK SHALL BE PERFORMED BY QUALIFIED CLASS A MECHANICAL CONTRACTOR AND INSTALL ALL MATERIALS, APPARATUS AND EQUIPMENT IN A NEAT, WORKMANLIKE MANNER. ANY MATERIAL, APPARATUS OR EQUIPMENT WHICH, IN THE OPINION OF THE PROJECT ENGINEER, IS IMPROPERLY INSTALLED SHALL BE REMOVED AND REINSTALLED IN AN APPROVED MANNER AT NO ADDITIONAL COST TO THE OWNER.
B. COORDINATE ALL WORK WITH OTHER TRADES. WHERE THE WORK IS DEPENDENT UPON WORK OF OTHER TRADES OR WORK ALREADY IN PLACE, SUCH OTHER WORK AND WORK IN PLACE SHALL BE EXAMINED AND SHALL BE IN PROPER CONDITION AND STATE OF COMPLETION BEFORE CONTINUING THE INSTALLATION.
C. THE INSTALLATION OF THE SYSTEM SHALL, IN GENERAL, BE IN ACCORDANCE WITH THE DRAWINGS WITH REGARDS TO LOCATION OF EQUIPMENT, DUCTS, PIPES, AND THE LIKE. PIPING INDICATED SHALL BE FOLLOWED AS ACCURATELY AS ACTUAL CONSTRUCTION WILL PERMIT AND ANY DEVIATIONS THEREFROM SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER. WHERE NECESSARY, AS DETERMINED BY THE ENGINEER, CONTRACTOR SHALL FURNISH DRAWINGS SHOWING PROPOSED CHANGES.

3.02 EARTHWORK AND DEWATERING
A. NOT APPLICABLE.

3.03 CUTTING AND PATCHING
A. LAYOUT OPENINGS FOR CUTTING BY OTHER TRADES AS REQUIRED.
B. CUTTING OF STEEL, CONCRETE OR ANY OTHER STRUCTURAL PART MUST BE APPROVED IN WRITING BY ENGINEER PRIOR TO CUTTING.

3.04 WATERPROOFING
A. DO NOT CUT OR PENETRATE WATERPROOFED SURFACES, OR WATERPROOFING MEMBRANES, WITHOUT FIRST MAKING ARRANGEMENTS FOR REPAIR BY A METHOD APPROVED BY PROJECT ENGINEER.

3.05 ELECTRICAL WORK
A. POWER WIRING FROM PANELS TO MOTOR CONTROLLERS AND FROM CONTROLLERS TO MOTORS IS SPECIFIED IN DIVISION 16.
B. PROVIDE MOTOR STARTERS WITH THE MOTORS AT THE FACTORY.
C. SUBMIT WIRING DIAGRAMS FOR APPROVAL AND PROVIDE APPROVED DIAGRAMS SO THAT THE ELECTRICAL WORK MAY BE PROPERLY ACCOMPLISHED.
D. ELECTRICAL CONTROL WIRING FOR CONNECTION OF TEMPERATURE CONTROLLERS, PUSH BUTTONS, INTERLOCKS IN MOTOR CONTROLLERS, AND LIKE ITEMS IS SPECIFIED IN THE CONTROL SECTION(S) IN THIS DIVISION. FURNISH ALL EQUIPMENT WITH COMPLETE INTERNAL CONTROL WIRING.
E. ELECTRICAL WORK SPECIFIED IN THIS DIVISION SHALL CONFORM TO APPLICABLE PROVISIONS OF DIVISION 16. ALL CONTROL WIRING SHALL BE IN CONDUIT.
F. PROVIDE MOTORS CONFORMING TO CHARACTERISTICS SHOWN ON ELECTRICAL DRAWINGS.

3.06 SUPPORTS FOR PIPING AND EQUIPMENT
A. SUPPORT FOR PIPING AND EQUIPMENT SHALL BE SUPPORTED FROM STRUCTURAL MEMBERS AND NOT FROM METAL DECK AND SLAB ASSEMBLIES.

3.07 ACCESS DOORS (ACCESS PANELS)
A. PROVIDE ACCESS REQUIRED FOR MAINTENANCE, ADJUSTMENT, REMOVAL AND REPAIR OF VALVES, CONTROLS, DAMPERS, EQUIPMENT AND LIKE ITEMS FURNISHED HERE-UNDER.

3.08 CLEAN UP
A. REFER TO GENERAL CONDITIONS FOR CLEANING-UP.
B. CLEAN ALL MATERIALS AND EQUIPMENT OF DIRT, DUST, PAINT, SPOTS, AND STAINS, SOIL MARKS AND OTHER FOREIGN MATTER.

3.09 FINAL INSPECTION
A. NOTICE TO THE PROJECT ENGINEER THAT THE WORK IS READY FOR FINAL INSPECTION THE CONTRACTOR SHALL:
1. SUBMIT TEST AND BALANCE REPORT AND COMPLETE REQUIREMENTS AS NOTED.
2. SUBMIT LETTER FROM CONTROL MANUFACTURER CERTIFYING THAT CONTROLS HAVE BEEN CHECKED FOR OPERATION AND CALIBRATION, AND THAT SYSTEM IS OPERATING AS INTENDED.
B. CONTRACTOR SHALL FURNISH NECESSARY MECHANICS TO OPERATE SYSTEM, MAKE NECESSARY ADJUSTMENTS AND ASSIST WITH FINAL INSPECTION.

3.10 INSTRUCTION OF OWNER'S OPERATING PERSONNEL
A. THE CONTRACTOR SHALL INCLUDE THE COST OF THE SERVICES OF QUALIFIED INSTRUCTOR(S) TO INSTRUCT THE OWNER'S OPERATING PERSONNEL IN THE OPERATION, ADJUSTMENT, CARE AND MAINTENANCE OF ALL HVAC EQUIPMENT AND SYSTEMS.
B. INSTRUCTION SHALL BE PERFORMED AT A TIME APPROVED BY THE OWNER AND AFTER ALL HVAC EQUIPMENT AND SYSTEMS ARE INSTALLED, COMPLETE, ADJUSTED AND OPERATING TO SPECIFIED REQUIREMENTS. CONTRACTOR SHALL NOTIFY THE OWNER WHEN INSTRUCTIONS WILL BE GIVEN.
C. QUALIFICATIONS OF INSTRUCTORS SHALL BE SUBJECT TO APPROVAL OF THE OWNER AND EQUIPMENT MANUFACTURER.
D. ADDITIONAL REQUIREMENTS CONCERNING OPERATION AND MAINTENANCE OF MECHANICAL EQUIPMENT AND SYSTEMS MAY BE SPECIFIED IN OTHER SECTIONS.

END OF SECTION

SECTION 15100
OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.01 DESCRIPTION
A. FURNISH THREE COPIES OF COMPLETE OPERATION AND MAINTENANCE MANUALS TO THE ENGINEER, FOR APPROVAL AND FOR THE OWNER, ON ALL EQUIPMENT AND SYSTEMS. THE MANUALS SHALL BE BOUND IN HARD-BACK, THREE RING LOOSE-LEAF BINDERS.

PART 2 - PRODUCTS

2.01 MANUAL CONTENTS
A. TITLE SHEET WITH JOB NAME, AND THE NAMES, ADDRESSES AND PHONE NUMBERS OF THE CONTRACTOR, SUBCONTRACTOR, CONTROL SUBCONTRACTOR, RELATED CONTRACTORS AND MATERIAL AND EQUIPMENT SUPPLIERS.
B. TABLE OF CONTENTS.
C. A COPY OF ACKNOWLEDGMENT OF INSTRUCTION TO THE OWNER'S OPERATING PERSONNEL IN THE OPERATION OF ALL MECHANICAL EQUIPMENT AND SYSTEMS, SIGNED BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE.
D. TYPEWRITTEN OPERATING INSTRUCTIONS FOR THE OWNER'S PERSONNEL DESCRIBING HOW TO STOP AND START EACH PIECE OF EQUIPMENT, HOW TO SET THE TEMPERATURE CONTROL SYSTEM FOR NORMAL OPERATION AND NORMAL RESTARTING PROCEDURES, CAUTION AND WARNING NOTICES.
E. APPROVED SHOP DRAWINGS, PRODUCT DATA AND PARTS AND MAINTENANCE BOOKLET FOR EACH ITEM OF MATERIAL AND EQUIPMENT FURNISHED UNDER DIVISION 15.
F. RECORD DRAWINGS OF ALL SYSTEMS INCLUDING ELECTRICAL AND CONTROL DIAGRAMS.
G. TEST AND BALANCE REPORT.
H. COPIES OF CERTIFICATES OF INSPECTION.
I. GUARANTEES, INCLUDING EXTENDED GUARANTEES.

PART 3 - EXECUTION

3.01 DELIVERY
A. DELIVER THE MANUALS TO THE OWNER PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT.

3.02 OPERATION AND MAINTENANCE MANUALS

END OF SECTION

SECTION 15305
DUCTWORK, LOW PRESSURE, GALVANIZED STEEL

PART 1 - GENERAL

1.01 QUALITY ASSURANCE
A. DUCTS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH "HVAC DUCT CONSTRUCTION STANDARDS" PUBLISHED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA) AND THE CURRENT ADOPTED MODEL CODE.
B. SEE NOTES ON DRAWINGS FOR ADDITIONAL DUCTWORK SPECIFICATIONS.

C. DUCT WORK SHALL BE G90 GALVANIZED STEEL, 26 GAUGE MIN OF LOCK FORMING QUALITY.

1.02 JOB CONDITIONS
A. INSPECT THE DRAWINGS AND VERIFY ALL CONDITIONS IN THE FIELD. REPORT CONFLICTS BEFORE STARTING FABRICATION.

PART 2 - PRODUCTS

2.01 DUCT MATERIAL
A. WEIGHTS AND GAUGES SHALL BE IN ACCORDANCE WITH TABLE I OF "HVAC DUCT CONSTRUCTION STANDARDS" PUBLISH BY SMACNA AND THE CURRENT ADOPTED MODEL CODE. DUCT MATERIAL SHALL BE GALVANIZED STEEL.

2.02 SPLITTERS
A. SPLITTERS SHALL BE 18 GAUGE GALVANIZED STEEL WITH HORIZONTAL AND VERTICAL DIMENSIONS SUFFICIENT TO CLOSE OFF AIR TO BRANCH.

2.03 VOLUME DAMPERS
A. VOLUME DAMPERS SHALL BE 18 GAUGE STEEL; SINGLE BLADE UP TO 8"x8", OPPOSED BLADE ON ALL DUCTS OVER 8"x8".
B. PROVIDE DAMPERS WITH INDICATING QUADRANT REGULATORS (SELF-LOCKING REGULATOR).
C. DAMPER RODS SHALL BE 1/2" SQUARE BARS WITH BLADES SECURELY RIVETED TO BAR.
D. PROVIDE DAMPER WITH LOCKING QUADRANT AND 2" STAND OFF.

2.04 TURNING VANES
A. ALL SQUARE AND RECTANGULAR ELBOWS SHALL CONTAIN DOUBLE WALL VANES.

2.05 HANGERS
A. PROVIDE IN ACCORDANCE WITH CHAPTER IV OF SMACNA.
B. PROVIDE GALVANIZED STEEL, PAINTED WITH INORGANIC ZINC.

2.06 FLEXIBLE CONNECTIONS.
A. FLEXIBLE CONNECTIONS SHALL BE PROVIDED FOR EACH AIR HANDLING DEVICE TO PREVENT TRANSMISSION OF VIBRATIONS.
B. MAKE FLEXIBLE CONNECTION A MINIMUM OF 4 INCHES WIDE, FIRE RETARDANT, AIRTIGHT WOVEN FIBROUS GLASS CLOTH.
C. INSTALL BRAIDED COPPER BRIDGE STRAP FOR INSTALLATION ACROSS FLEXIBLE CONNECTIONS.

PART 3 - EXECUTION

3.01 INSTALLATION
A. GENERAL: SLIT, DIVIDE OR TURN DUCTS AS NECESSARY TO AVOID OBSTRUCTIONS AND, IN SUCH CASES, PROVIDE AIR STREAM DEFLECTORS AND INCREASE SIZE OF DUCT TO AN EQUIVALENT AREA.
B. SPLITTERS: RIGIDLY ATTACH SPLITTERS TO PIVOT ROD AND OPERATING LINKAGE. SET DAMPER ASSEMBLY ON RAISED INSULATED BASE ON INSULATED DUCTWORK.
C. VOLUME DAMPERS: SUPPLY AND MAKE-UP AIR DUCTWORK IN CONCEALED SPACES. SET REGULATOR ON RAISED BASE ON INSULATED DUCTWORK. MARK END OF DAMPER ROD TO SHOW DAMPER POSITION.
D. FLEXIBLE CONNECTION: SECURE FLEXIBLE CONNECTIONS TO DUCT AND UNIT WITH GALVANIZED STEEL STRAPS HOLDING THE MATERIAL IN FORMED GALVANIZED STEEL CHANNELS. INSTALL BRAIDED COPPER BRIDGE STRAP ACROSS ALL FLEXIBLE CONNECTIONS.
E. TEST PLUGS: PROVIDE SQUARE HEAD TYPE TEST PLUGS AS REQUIRED FOR INSERTION OF TEST APPARATUS. PROVIDE A RING AND A REMOVABLE INSULATION PLUG WHERE DUCTS ARE INSULATED.
F. PAINTING: PAINT INTERIOR OF DUCTWORK FLAT BLACK WHERE VISIBLE THROUGH GRILLES AND REGISTERS.
G. SEALING: DUCTWORK SHALL BE SEALED IN ACCORDANCE WITH TABLE 1-2 FOR "SEAL CLASS B" OF SMACNA.

3.02 CORRECTIONS
A. REMOVE ALL DUCTWORK FOUND TO VIBRATE, CHATTER OR PULSATE AND REPLACE WITH NEW DUCTWORK.

END OF SECTION

SECTION 15319
DUCTWORK, LOW PRESSURE, FLEXIBLE

PART 1 - GENERAL

1.01 DESCRIPTION
A. PROVIDE WHERE INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN, FACTORY FABRICATED AND PREINSULATED FLEXIBLE DUCTS.

1.02 QUALITY ASSURANCE
A. FLEXIBLE DUCTS, INCLUDING INSULATION AND SEALANTS, SHALL CONFORM TO THE REQUIREMENTS OF NFPA 90A AND UL STANDARD 181 FOR CLASS 1 DUCTS.
B. PERFORMANCE DATA SHALL BE BASED ON TEST PERFORMED IN ACCORDANCE WITH AIR DIFFUSION COUNCIL FLEXIBLE AIR DUCT TEST CODE FD72.

PART 2 - PRODUCTS

2.01 LOW PRESSURE FLEXIBLE DUCTWORK
A. LOW PRESSURE FLEXIBLE DUCTWORK SHALL CONSIST OF CORROSION RESISTANT SPRING STEEL HELIX BONDED TO A GLASS REINFORCED NEOPRENE SLEEVE INSULATED WITH A MINIMUM OF 1 INCH THICK, 1 POUND DENSITY FIBERGLASS INSULATION WHICH IS IN TURN COVERED WITH AN OUTER VAPOR BARRIER OF FIBER REINFORCED FOIL-SCRIM-KRAFT LAMINATE.
B. INSULATION SHALL HAVE A THERMAL CONDUCTIVITY (K) OF NO GRATER THAN 0.25 AT 75°F. (MIN R VALUE OF 6)
C. DUCT FOR LOW VELOCITY SYSTEM CONNECTORS SHALL HAVE A WORKING PRESSURE OF NOT LESS THAN $1\frac{1}{2}$ INCHES OF WATER GAUGE AND A MAXIMUM OPERATING TEMPERATURE OF NOT LESS THAN 250°F.

2.02 DUCT CONNECTORS
A. WHERE FLEXIBLE DUCTS CONNECT TO LOW PRESSURE DUCTS TO FORM RUNOUTS TO INDIVIDUAL OUTLETS, PLENUMS OR LOW PRESSURE TERMINALS, PROVIDE FACTORY FABRICATED FITTINGS COMPLETE WITH MANUAL BALANCING DAMPERS HAVING LOCKING QUADRANTS WITH 2" STAND OFF. WHERE LOW PRESSURE DUCTS ARE INTERNALLY INSULATED THE CONNECTOR SHALL BE FURNISHED WITH AIR EXTENSION TO PROJECT THROUGH AND PROTECT THE INSULATION. FOR CONNECTION TO EQUIPMENT, AUXILIARY SLEEVES SHALL BE PROVIDED TO ALLOW AT LEAST 2 INCHES OF SURFACE FOR CLAMPING OF FLEXIBLE DUCTWORK. SLEEVES SHALL BE SCREWED OR BOLTED TO EQUIPMENT LIP FRAME.

2.03 CLAMPS
A. PROVIDE STAINLESS STEEL BAND, CADMIUM PLATED HEXBOLT ATTACHED TO METAL FITTINGS.

PART 3 - EXECUTION

3.01 INSTALLATION
A. INSTALL DUCT CONNECTORS TO LOW PRESSURE DUCTS USING MANUFACTURER'S TEMPLATE FOR ALL HOLES AND SECURE THE CONNECTOR WITH SHEET METAL SCREWS HAVING FIST APPLIED FOSTER'S 30-02 DUCT SEALANT TO THE ADJOINING SURFACES. DO NOT PRESSURIZE THE SYSTEM FOR 48 HOURS.
B. STRETCH NEW DUCT WHEN REMOVING IT FROM CARTONS WHERE IT MAY HAVE BEEN SHIPPED IN A COMPRESSED STATE.
C. USE THE MINIMUM LENGTH OF FLEXIBLE DUCT REQUIRED TO MAKE THE SPECIFIC CONNECTION UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. THE MAXIMUM DEVELOP LENGTH OF FLEX DUCT IS 12'-0".
D. AVOID SHARP BENDS. USE A MINIMUM INSIDE BEND RADIUS EQUAL TO (1) TIMES THE INSIDE DIAMETER OF THE DUCT.
E. SUPPORT HORIZONTAL DUCT RUNS AS DETAILED IN THE CONSTRUCTION DOCUMENTS.
F. ALLOW THE FLEXIBLE DUCT TO EXTEND STRAIGHT AWAY FROM CONNECTORS FOR A FEW INCHES PRIOR TO INITIATING ALL BENDS.
G. MAKE ALL CONNECTIONS OF FLEXIBLE DUCT TO RIGID DUCT OR TERMINALS AS FOLLOWS:
1. APPLY FOSTER'S 30-02 SEALANT TO THE INSIDE OF THE FLEXIBLE DUCT TO DEPTH OF 3 INCHES.
2. SLIDE THE FLEXIBLE DUCT OVER THE CONNECTOR AND WRAP WITH MINIMUM OF TWO REVOLUTIONS OF REINFORCED FOIL DUCT TAPE STARTING ABOUT 2 INCHES BACK FROM END OF FLEXIBLE DUCT AND SEALING OVERLAP WITH LAST WRAP.
3. PLACE A CLAMP OR STRAP OVER THE TAPED END AND SECURE FIRMLY.
4. REPAIR ALL DAMAGE TO VAPOR BARRIER WITH FOSTER'S 35-00 REINFORCED WITH 4 INCH WIDE GLASS FABRIC AND A SECOND COAT OF FOSTER'S 35-00.

END OF SECTION

SECTION 15450
AIR DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION AIR DISTRIBUTION DEVICES SHALL BE PROVIDED TO DELIVER THE INDICATED VOLUME OF SUPPLY AIR WITHOUT EXCEEDING THE AVAILABLE THROW AND WITH NC RATING AS FOLLOWS: OFFICES: NC-25 CORRIDORS AND COMPUTER ROOM: NC-30.

PART 2 - PRODUCTS

2.01 DIFFUSERS. GRILLES AND REGISTERS: DIFFUSERS, GRILLES AND REGISTERS SHALL BE AS MANUFACTURED BY METALAIRE OR TITUS, UNLESS NOTED OTHERWISE. FOR MODEL NUMBERS AND TYPES SEE AIR DISTRIBUTION SCHEDULE ON DRAWING. DIFFUSERS, GRILLES, AND REGISTERS SHALL BE OF THE SURFACE, FLUSH OR LAY-IN TYPE, COLOR CORRESPONDING TO THE CEILING IN WHICH THEY ARE LOCATED THE FINISH OF THE DIFFUSERS, GRILLE, OR REGISTER FACE PANEL SHALL BE BAKED ENAMEL, BRIGHT WHITE COLOR.

2.02 MOUNTING SCREWS: WHERE MOUNTING SCREWS ARE REQUIRED IN AIR DISTRIBUTION DEVICES, THEY SHALL BE FINISHED TO MATCH THE ADJACENT SURFACE OF THE DEVICES.

2.03 GASKETS: SUPPLY AND RETURN GRILLES AND REGISTERS WHICH ARE SURFACE MOUNTED SHALL BE PROVIDED WITH SPONGE RUBBER GASKETED FRAMES TO PREVENT SMUDGING.

PART 3 - PRODUCTS

3.01 INSTALLATION: INSTALL WHERE SHOWN ON DRAWINGS. DIFFUSERS, REGISTERS AND FITTINGS SHALL BE SECURELY ATTACHED TO FINISH SURFACES, OR STRUCTURAL MEMBERS BEHIND FINISH SURFACES. LAY-IN DIFFUSERS MOUNTED IN ACOUSTICAL TILE CEILINGS SHALL BE RIGIDLY MOUNTED, ABOVE THE FACE PANEL, TO THE CEILING SUSPENSION SYSTEM.

END OF SECTION

SECTION 15750
AIR HANDLING EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION
A. AIR DISTRIBUTION UNITS SHALL BE PROVIDED TO DELIVER THE INDICATED VOLUME OF SUPPLY AIR AND WITH COOLING CAPACITIES AS INDICATED ON THE SCHEDULE.

PART 2 - PRODUCTS

2.01 AIR HANDLING UNITS
A. UNITS SHALL BE AS MANUFACTURED BY CARRIER, TRANE, YORK OR EQUAL. FOR MODEL NUMBERS AND TYPES SEE AIR SCHEDULE ON DRAWING. NOTE: UNIT SHALL BE MADE FOR OUTDOOR USAGE.

2.02 CASING
A. FABRICATE UNIT CASING OF NOMINAL 16 GAUGE CHANNEL POST AND GALVANIZED STEEL. UNIT SHALL HAVE DOUBLE WALL WITH 2" THICK, POLYETHYLENE FOAM INSULATION. ALL PANELS TO BE GASKETED.

2.03 ACCESS DOORS
A. GALV. STEEL WITH TWO 6" LONG STAINLESS STEEL PIANO-TYPE HINGES, LATCH AND FULL SIZE HANDLE ASSEMBLY. DOOR TO SWING OUTWARD.

2.04 DRAIN PAN
A. SOLID STAINLESS STEEL INSULATED WITH CROSS BREAK AND DOUBLE SLOPING PITCH TO DRAIN CONNECTION.

2.05 FANS
A. PROVIDE FORWARD CURVED SUPPLY FANS. ALL FANS, MOTORS AND SHEAVES SHALL BE DYNAMICALLY BALANCED.

2.06 COOLING COILS
A. PROVIDE 5/8" COIL TUBES SEAMLESS COPPER WITH COPPER FINS.
B. CERTIFY AIR COIL CAPACITIES & PRESSURE DROPS IN ACCORDANCE WITH ARI 410.

2.07 FILTERS
A. PROVIDE 2" FLAT FILTER SECTION WITH 2" PLEATED PANEL FILTERS. MEDIA-TYPE FILTERS SHALL BE UL 900 LISTED.

PART 3 - PRODUCTS

3.01 INSTALLATION
A. INSTALL WHERE SHOWN ON DRAWINGS AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

END OF SECTION

SECTION 15802
HVAC INSULATION, GENERAL

PART 1 - GENERAL

1.01 DESCRIPTION
A. THIS SECTION GOVERNS ALL HVAC INSULATION.

PART 2 - EXECUTION

2.01 INSTALLATION
A. INSULATION SHALL NOT BE INSTALLED UNTIL TESTING PROCEDURES HAVE BEEN COMPLIED WITH ALL SURFACES AND HAVE BEEN CLEANED FREE OF DIRT AND GREASE AND ARE COMPLETELY DRIED.
B. PROTECT ADJACENT SURFACES, EQUIPMENT AND PREMISES FROM DROPPING OF COATINGS ADHESIVES AND FINISHES.
C. REMOVE ALL EXCESS MATERIALS AND DEBRIS FROM BOTH EXPOSED AND CONCEALED AREAS SO THAT THESE AREAS ARE COMPLETELY CLEAN.

PART 3- EXECUTION

NOT USED

END OF SECTION

SECTION 15841
INSULATION, LOW PRESSURE DUCTWORK

PART 1 - GENERAL

1.01 DESCRIPTION
A. ALL LOW PRESSURE CONCEALED DUCT SYSTEMS, 2 INCHES WATER GAUGE OR LESS, SHALL BE INSULATED.
B. ALL APPLICABLE REQUIREMENTS OF THE SECTION, HVAC INSULATION, GENERAL, SHALL APPLY TO THIS SECTION.
C. ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL INTERNALLY INSULATED WITH 1 INCH DUCT LINER BY SCHULLER. DUCT LINER SHALL BE COATED WITH AN IMMOBILIZED EPA-REGISTERED ANTI-MICROBIAL AGENT TO RESIST THE GROWING OF FUNGUS AND BACTERIA. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND CLEANING. ALL JOINTS AND FIELD CUTS SHALL BE PROPERLY SEALED WITH MANUFACTURER'S SEALANT/ADHESIVE.

1.02 EQUIVALENT MATERIALS
A. MATERIALS OTHER THAN THOSE SPECIFIED WILL BE CONSIDERED FOR APPROVAL EQUAL.

PART 2 - PRODUCTS

2.01 INSULATION
A. EXTERNAL INSULATION SHALL BE 2 INCH THICK, 1 POUND DENSITY, SCHULLER TYPE SMALLITE, FSK SPIN GLAS OR APPROVED EQUAL WITH AN EMBOSSED ALUMINUM FOIL FACING. (MIN. R VALUE OF 6).

2.02 ADHESIVES, MASTIC, SEALANTS
A. ADHESIVES SHALL BE FOSTER'S 85-20. STUDWELD PINS SHALL BE SEALED WITH FOSTER'S 30-36 ADHESIVE.
B. ALL JOINTS, SEAMS AND BREAKS IN THE VAPOR BARRIER SHALL BE SEALED WITH FOSTER'S 35-00, REINFORCED WITH 4 INCH WIDE GLASS FABRIC.

PART 3 - EXECUTION

3.01 INSTALLATION
A. ALL CONCEALED SUPPLY AND RETURN AIR DUCTWORK SHALL BE INSULATED AND INSTALLED PER SMACNA STANDARDS.
B. AIR SUPPLY DIFFUSER BACKS AND NECKS:
1. ALL AIR SUPPLY DIFFUSERS BACKS AND NECKS, SHALL BE INSULATED WITH $1\frac{1}{2}$ INCH THICK, $\frac{3}{4}$ POUND DENSITY, MANVILLE R-SERIES SMALLITE, OR APPROVED EQUAL FIBERGLASS BLANKET INSULATION, HAVING A CONDUCTANCE (K) NO GREATER THAN .31.

END OF SECTION

SECTION 15870
VARIABLE AIR VOLUME BOX

PART 1 - GENERAL

1.01 DESCRIPTION
A. THE WORK CONSISTS OF INSTALLING VAV BOXES WALL CONTROLS FOR THE HVAC SYSTEM AS ON THE DRAWINGS.

1.02 ELECTRICAL
A. ELECTRICAL WORK AND MATERIALS ASSOCIATED WITH THE VAV BOX SYSTEM SHALL BE INSTALLED AS WORK OF THIS SECTION BUT IN ACCORDANCE WITH INDUSTRY STANDARD AND THE NATIONAL ELECTRICAL CODE.
B. POWER WIRING PROVIDED BY CONTRACTORS.
C. ELECTRICAL CONTROL WIRING CONDUIT AND FITTINGS ASSOCIATED WITH THE SPACE TEMPERATURE AND HUMIDITY CONTROL INCLUDING INTERLOCKING WITH MOTOR CONTROLLERS, CONTROL ACCESSORIES AND APPURTENANCES ARE TO BE PROVIDED UNDER THIS SECTION. CONTROL WIRING SHALL BE IN CONDUIT.

1.03 GENERAL
A. PROVIDE VARIABLE AIR VOLUME BOXES AS SPECIFIED ON DRAWINGS.

PART 2 - PRODUCTS

2.01 CONSTRUCTION
A. TERMINALS SHALL BE CONSTRUCTED OF NOT LESS THAN 22 GAUGE GALVANIZED STEEL WITH A MINIMUM G60 ZINC COATING.
B. CASING SHALL BE INTERNALLY LINED WITH $\frac{3}{4}$" THICK, 4 POUND PER CF SKIN, DUAL DENSITY FIBERGLASS INSULATION, WITH 22 GAUGE GALV. INNER LINER.

2.02 PRIMARY AIR VALVE
A. THE PRIMARY AIR VALVE SHALL CONSIST OF A MINIMUM 22 GAUGE CYLINDRICAL BODY THAT INCLUDES EMBOSSMENT RINGS FOR RIGIDITY. THE AIR VALVE LEAKAGE SHALL NOT EXCEED 1% OF MAXIMUM INLET RATED AIRFLOW AT 3" W.G. INLET PRESSURE.

2.03 PRIMARY AIRFLOW SENSOR.
A. DIFFERENTIAL PRESSURE AIRFLOW SENSOR SHALL TRAVERSE THE DUCT USING THE EQUAL CROSS SECTIONAL AREA OR LOGLINEAR TRAVERSE METHOD ALONG TWO PERPENDICULAR DIAMERTERS. A MINIMUM OF 12 TOTAL PRESSURE SENSING POINTS SHALL BE UTILIZED.

PART 3 - EXECUTION

3.01 GENERAL
A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH INDUSTRY STANDARDS.

END OF SECTION

SECTION 15890
TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.10 SPECIAL NOTICE
A. EACH CONTRACTOR SHALL READ ALL RELEVANT DOCUMENTS, BECOME FAMILIAR WITH THE JOB, SCOPE OF WORK.

1.20 STARTUP TEST AND ADJUSTMENT
A. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE HVAC TEST & BALANCE, WHICH MUST BE PERFORMED BY AN INDEPENDENT BALANCING CONTRACTOR NOT ASSOCIATED WITH THE MECHANICAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL SCHEDULE A TENTATIVE T & B DATE A MINIMUM OF 4 WEEKS IN ADVANCE AND CALL IN A CONFIRMED DATE A MINIMUM OF 2 WEEKS IN ADVANCE. THIS WILL BE NECESSARY TO GUARANTEE THE T & B WORK ON THE REQUESTED DATE. THIS WORK SHALL BE PERFORMED AFTER THE HVAC SYSTEM START-UP IS COMPLETED. ALSO GAS AND ELECTRIC POWER MUST BE TURNED ON, EQUIPMENT OPERATIONAL, ALL ITEMS INSTALLED, AND CEILING TILES IN PLACE - PRIOR TO THE TEST AND BALANCE.
B. THE T & B COVERS ALL HEATING AND AIR-CONDITIONING, AND EXHAUST VENTILATION SYSTEMS. A CERTIFIED REPORT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

1.30 GENERAL
A. INQUIRE ABOUT ANY PROBLEMS OR COMPLAINTS.
B. COMPARE MECHANICAL PLANS TO INSTALLED SYSTEM.
C. DOCUMENT DESIGN SPECIFICATIONS FOR REPORT.
D. ENSURE ALL FANS ARE RUNNING FOR BALANCE.
E. MEASURE INITIAL BUILDING PRESSURE.

1.40 INSPECT AHU EQUIPMENT
A. INSPECT UNITS AND NOTE ANY DEFICIENCIES.
B. RECORD UNIT NAMEPLATE DATA.
C. CHECK THERMOSTATS FOR PROPER SETTINGS.
D. CHECK FOR CORRECT FAN ROTATION.
E. CHECK CONDITIONS OF FILTERS AND COILS.
F. CHECK POSITION OF OUTSIDE AIR DAMPERS.
G. CHECK AND CONDENSATE LINES.
H. CHECK BELT TENSION AND PULLEY ALIGNMENT.
I. CHECK DISCONNECT SWITCHES AND COVERS.
J. CHECK ANY FAN NOISE & VIBRATION.

1.50 TEST AND BALANCE/ KITCHEN HOOD SYSTEM
A. MEASURE SUPPLY AND EXHAUST AIR QUANTITIES.
B. MEASURE AHU - SUPPLY/RETURN/OUTSIDE AIRE TEMPERATURES.
C. MEASURE ALL WATER FLOW RATES AT COILS ECT.
D. MEASURE ALL PRESSURE DROPS AT COILS, CHILLERS, EXC.
E. MEASURE FINAL RPM'S.
F. EVALUATE DUCT SYSTEM DESIGN AND INSTALLATION.
G. ENSURE THAT FINAL SYSTEM DESIGN AND INSTALLATION.
H. RECORD ALL FANS, VERIFY KW, AMPS, FLOW RATES ECT.
I. VERIFY SEQUENCE OF OPERATION.

1.60 TEST AND BALANCE HEATING/COOLING SYSTEM
A. MEASURE AHU SUPPLY AND RETURN AIRFLOWS.
B. CHECK FOR DRAFTS, HOT/COLD SPOTS.
C. ADJUST RPM AS NECESSARY TO ACHIEVE DESIGN.
D. CHECK ACTUAL AMPS VERSUS MOTOR FLA.
E. NOTE ADJUSTMENTS MADE ON PULLEY'S.
F. MEASURE FINAL RPM'S
G. DAMPER AT BRANCH TAKE OFF'S FIRST AND AT DIFFUSERS SECOND.
H. EVALUATE DUCT SYSTEM DESIGN AND INSTALLATION.
I. ENSURE SLIGHTLY POSITIVE BUILDING PRESSURE.
J. FINE TUNE POSITION OF OA DAMPER.
K. MEASURE FINAL BUILDING PRESSURE.

1.70 FINAL REVIEW
A. AIR AND WATER QUANTITIES SHALL BE BALANCED TO WITHIN +10% OF DESIGN AS A GENERAL RULE. HOWEVER, IN SOME CASES, THE AIR QUANTITIES MAY NEED TO BE ADJUSTED DIFFERENTLY IN ORDER TO ENSURE ACCEPTABLE COMFORT LEVELS, POSITIVE BUILDING PRESSURE, ETC. BALANCING CONTRACTOR SHALL NOTIFY THE SUPERINTENDENT OF ANY DEFICIENCIES NEEDING IMMEDIATE ATTENTION, THE G.C. SHALL HAVE THE MECHANICAL AND ELECTRICAL CONTRACTORS ON CALL TO PROMPTLY CORRECT ANY SUCH PROBLEMS (I.E. REPLACE BURNED OUT MOTORS, FAILED THERMOSTATS, INCORRECT WIRING, BAD CIRCUIT BREAKERS AND STARTERS, DIRTY FILERS) IN THE EVENT BALANCING CONTRACTOR TO RESCHEDULE A FOLLOW UP VISIT TO TEST AND BALANCE EQUIPMENT NOT READY ON THE ORIGINALLY SCHEDULED T&B DATE, THE G.C. SHALL PAY FOR THE ACCIDENTAL COST INVOLVED, INCLUDING TRAVEL.
B. ALL DATA REQUIRED BY THESE SPECIFICATIONS SHALL BE TYPED ON WHITE BOND PAPER IN TRIPLICATE AND SUBMITTED TO OWNERS REPRESENTATIVE FOR APPROVAL. COMPLETE APPROVAL WILL BE NECESSARY BEFORE FINAL PAYMENT CAN BE MADE. THE CONTRACTOR SHALL THEN MAKE AVAILABLE SUCH INSTRUMENTS AS ARE REQUIRED FOR SPOT CHECKS ON THE SYSTEM.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

ddc engineering inc.
4083 South U.S. Highway 1, Ste. 101
Rockledge, Florida 32955
Phone 321.633.4522 Fax 321.633.4528
www.ddc-engineers.com
dasilva.david@ddc-engineers.com
C.O.A.: 25988

DDC PROJECT NO.: 19017.02

CONSULTANTS:

DATE
MARCH 29, 2019

REVIEW SET ☐
PERMIT SET ☐
BID SET ☒
CONSTRUCTION SET ☐
AS BUILT ☐

REVISIONS

NO. DATE DESCRIPTION

HVAC MODIFICATIONS AT BRANFORD ELEMENTARY SCHOOL
26801 FL-247
BRANFORD, FL 32008

MECHANICAL SPECIFICATIONS

SHEET NO.:
MS-1

DRAWN: JS
CHECKED: JMF
APPROVED: DAD

David A. DaSilva
54739

BID SET

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SECTION 15950
TEMPERATURE CONTROLS

PART 1 - GENERAL

1.01 CONTROLS INTENT
A. TO MAINTAIN COMPLETE COMPATIBILITY WITH OWNER'S EXISTING ENERGY MANAGEMENT SYSTEM (EMS) - AUTOMATED LOGIC CONTROL (ALC).
B. INSTALLING FACTORY FURNISHED CONTROL COMPONENTS, ROUTING CONDUIT AND WIRE, INSTALLING CONTROL DEVICES IS THE RESPONSIBILITY OF THIS CONTRACTOR.
C. PROGRAMMING, START-UP, MODULE INSTALLATIONS WITHIN THE CONTROL PANELS, WIRE TERMINATIONS IS THE RESPONSIBILITY OF THE CONTRACTOR.
D. ALL CONTROL ITEMS AND CONNECTIONS ARE TO BE FURNISHED AND INSTALLED BY THIS CONTRACTOR.

1.02 SECTION INCLUDES
A. TEMPERATURE CONTROLS INCLUDING, BUT NOT NECESSARILY LIMITED TO:
1. INSTALLATION OF CONTROL PANEL ENCLOSURES OR MODULES.
2. COMPLETE ELECTRONIC SENSING AND ACTUATION SYSTEM, INCLUDING:
- CONDUIT AND WIRE.
- TEMPERATURE SENSORS.

1.03 TAGS, CHARTS, AND IDENTIFICATION
A. TAG AUTOMATIC, DAMPERS, VALVES, AND DEVICES IN AN APPROVED FASHION.
B. PROVIDE SCREW-FASTENED, TYPE-ENGRAVED PHENOLIC NAMEPLATE WITH 1/4 IN. HIGH WHITE LETTERING ON BLACK BACKGROUND, AND CLEARLY INDICATE FUNCTION, DESIGNATION, OR EQUIPMENT CONTROLLED, FOR ALL CONTROL ITEMS.
C. LABELING:
1. LABEL CONTROL CABINETS AND DEVICES. OUTSIDE LABELS SHALL BE STAMPED BRASS PLATES.

1.04 COORDINATION
A. VERIFY FINAL LOCATION(S) WITH OWNER BEFORE MOUNTING ENCLOSURES.
B. VERIFY THREAD-O-LET OR TEE LOCATIONS FOR PIPE-MOUNTED SENSORS.
C. VERIFY FINAL LOCATION OF CABINET, AND STAND-ALONE STARTERS.
D. COORDINATE VALVE PLACEMENT TO ENSURE ACTUATOR ACCESSIBILITY.

PART 2 - PRODUCTS

2.01 CONTROL; DEVICES
A. FOR CONTROL DEVICES, SEE CONTROL DRAWINGS.
B. CONTRACTOR SHALL REUSE ALL EXISTING CONTROL PANELS WHERE POSSIBLE.

2.02 ELECTRICAL
A. ALL ENCLOSURES CONTAINING CONTROL DEVICES AND ALL TERMINAL BOXES SHALL HAVE LATCHING HINGED COVERS AND SHALL BE WEATHER PROOF.
B. ALL WIRING SHALL BE PLACED IN CONDUIT.

2.03 HIGH PRESSURE ACTUATORS FOR TEMPERATURE CONTROLS
A. EACH ELECTRONIC ACTUATOR SHALL BE CONNECTED TO THE UCP USING A FOUR-CONDUCTOR, 18-GAUGE CABLE, BELDEN 8489 OR OWNER-APPROVED EQUIVALENT. ISOLATED POWER FOR EACH ACTUATOR SHALL BE PROVIDED AT THE UCP, AND BRANCHING OF COMMON SIGNALS SHALL BE DONE IN THE UCP.
B. FIELD TERMINATION OF ELECTRONIC ACTUATORS SHALL BE ACCOMPLISHED WITH MATING QUICK-CONNECT PLUGS HAVING SCREW TERMINAL CONNECTIONS, PHOENIX CONTACT MSTB2.5/4-ST5,08 AND IC2.5/4-ST-5,08, OR OWNER-APPROVED EQUIVALENT.

PART 3 - EXECUTION

3.01 INSTALLATION
A. UNIT CONTROLLERS: INSTALL CONTROL COMPONENTS AND PULL AND CONNECT ALL WIRING TO THE DEVICES.
B. ALL CABLES ENTERING CONTROL PANEL SHALL HAVE MINIMUM 10 FT. OF SLACK TO ALLOW FOR CONTROLS TERMINATION. LEAVE MINIMUM 10 FT. OF SLACK ON ALL EMS CABLES AT RACKS. LEAVE 4 FT. OF COILED SLACK AT ALL EMS REMOTE COMMUNICATIONS BOXES.
C. TERMINATE CONTROL CABLES AT SENSORS AND ACTUATORS IN ACCORD WITH MANUFACTURER'S INSTRUCTIONS PROVIDED WITH THE DEVICE. TURN ALL INSTRUCTION SHEETS OVER TO OWNER AS PART OF THE O&M MANUAL.
D. INSTALL ALL ACTUATORS SO THAT THEY ARE ACCESSIBLE, AND MAY BE REMOVED WITHOUT REMOVING OTHER PIPING, CONDUIT, EQUIPMENT, OR COMPONENTS.
E. SENSORS:
1. INSTALL WATER TEMPERATURE SENSORS IN THERMOWELLS FULLY INSERTED INTO THE FLOW. FOR PIPES UNDER 2 IN., INSTALL THE WELL AXIALLY INTO THE PIPE ON AN ELBOW. FILL AIR GAP BETWEEN WELL AND SENSOR WITH HEAT-TRANSFER GREASE.

3.02 WIRING
A. CONTRACTOR SHALL INSTALL, CONNECT, AND WIRE THE ITEMS INCLUDED UNDER THIS SECTION. THIS WORK INCLUDES PROVIDING REQUIRED CONDUIT, WIRE, FITTINGS, AND RELATED WIRING ACCESSORIES. INSTALL ALL WIRING IN CONDUIT.
B. CONTRACTOR SHALL SIZE, ROUTE, AND INSTALL ALL CONDUITS REQUIRED FOR ITEMS INCLUDED IN THIS SECTION. DO NOT EXCEED THE FOLLOWING EMS CABLE QUANTITIES FOR EACH CONDUIT SIZE:

CONDUIT SIZE	QUANTITY SENSOR CABLES
1/2 IN.	3
3/4 IN.	6
1 IN.	10

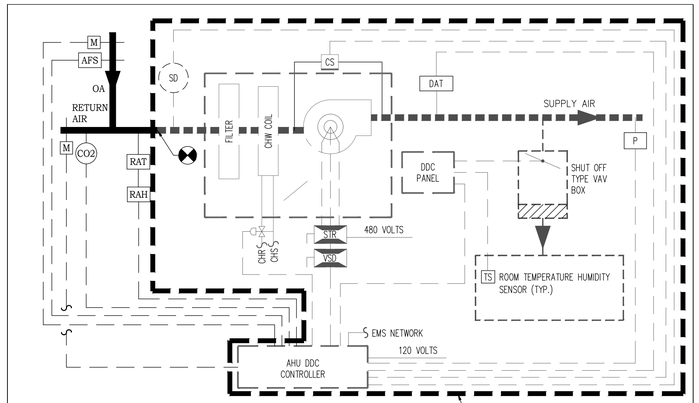
3.03 START-UP AND SUPPORT
A. INSTALLATION OF CONTROL PANEL COMPONENTS WITHIN THE ENCLOSURE, TERMINATION OF CABLES AND TUBING WITHIN THE ENCLOSURE, AND REQUIRED START-UP OF THESE COMPONENTS WILL BE PERFORMED BY CONTRACTOR.
B. SUPPORT THIS START-UP EFFORT TO QUICKLY TROUBLESHOOT AND CORRECT MALFUNCTIONS IN ALL PORTIONS OF THE SYSTEM.

3.04 TEMPERATURE CONTROL SYSTEM TEST PROCEDURE
A. TEST AND VERIFY ALL EMS CABLES, SENSORS, AND CONNECTIONS TO THE SATISFACTION OF OWNER.
B. ADJUST ALL VALVES FOR SMOOTH OPERATION. ADJUST ACTUATORS TO PROVIDE PROPER SYSTEM SEQUENCING.

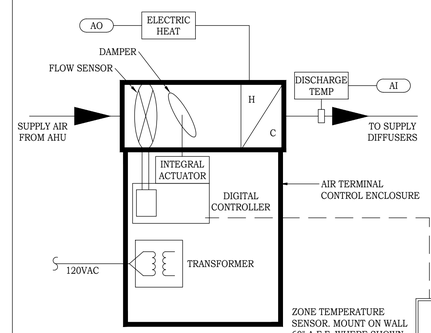
END OF SECTION

NOTE

OWNER MAY ELECT TO PERFORM CONTROL WORK. PROVIDE ALTERNATE BID FOR ALL CONTROL WORK.

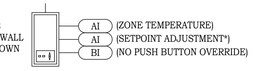


C1 TYPICAL AHU w/ VAV CONTROL
SCALE: N.T.S.



CONTROL POINTS

MARK	TYPE	DESCRIPTION
ZN-T	AI-01	ZONE TEMPERATURE
SP-ADJ	AI-02	PUSHBUTTON OVERRIDE
DA-T	AI-03	DISCHARGE AIR TEMP
SA-CFM	AI-04	SUPPLY AIRFLOW (CFM)
PBO	BI-01	PUSHBUTTON OVERRIDE
DMPR-O	BO-1	AIR DAMPER OPEN
DMPR-C	BO-2	AIR DAMPER CLOSED
HEATER	AO-01	ELECTRIC HEAT
CLG-SP	AD-1	COOLING SETPOINT
HTG-SP	AD-2	HEATING SETPOINT
AF-SP-MIN	AD-3	AIRFLOW SETPOINT MIN.
AF-SP-MAX	AD-4	AIRFLOW SETPOINT MAX.



ZONE TEMPERATURE SENSOR. MOUNT ON WALL 60" A.F.F. WHERE SHOWN ON PLANS.

SEQUENCE OF OPERATION

1. PRIMARY AIRFLOW IS MAINTAINED WITHIN MINIMUM LIMITS BASED UPON THE READING OF AN AIRFLOW SENSOR TO GIVE PRESSURE INDEPENDENT CONTROL OF THE VARIABLE AIR VOLUME TERMINAL UNIT. THE DIRECT DIGITAL CONTROLLER DETERMINES THE CONTROL MODE (HEATING, COOLING OR DEADBAND) BY COMPARING THE ZONE TEMPERATURE TO THE ACTIVE HEATING TEMPERATURE SETPOINT AND ACTIVE COOLING TEMPERATURE SETPOINT.

2. IN THE COOLING MODE, THE PRIMARY AIRFLOW MODULATES BETWEEN THE ACTIVE COOLING MINIMUM AND MAXIMUM AIRFLOW SETPOINTS AS THE COOLING REQUIREMENTS GOES FROM 0 TO 100%. IN THE DEADBAND MODE, THE PRIMARY AIRFLOW IS AT THE ACTIVE COOLING MINIMUM AIRFLOW SETPOINT. IN THE HEATING MODE, THE PRIMARY AIRFLOW IS AT THE ACTIVE HEATING MINIMUM AIRFLOW SETPOINT AND THE ELECTRIC HEATING COIL IS ENERGIZED (0-10 VDC) TO MAINTAIN THE ACTIVE HEATING TEMPERATURE SETPOINT.

COOLING SETPOINT - 76° w/ 2° PLUS OR MINUS ADJUSTMENT
HEATING SETPOINT - 70°
ALL SETPOINTS ARE ADJUSTABLE

CONTROL POINTS SHALL INDICATE DAMPER POSITION AND INLET PRESSURE OF ALL VAV BOXES.

C2 **VAV BOX CONTROL DIAGRAM (VT2-7)**
SCALE: NO SCALE

SEQUENCE OF OPERATION - AIR SIDE

GENERAL

1. AIR HANDLER FAN WILL START AND STOP ON COMMAND FROM ENERGY MANAGEMENT SYSTEM BASED ON TIME OF DAY SCHEDULE. THE EMS SHALL SOFT START ALL AIR HANDLERS WITH THE VARIABLE SPEED DRIVE, SLOWLY INCREASING FAN SPEED BASED ON VAV BOX POSITIONS (FOR VARIABLE VOLUME SYSTEMS).
2. CHILLED WATER VALVE SHALL OPEN BY THE EMS DURING THE OCCUPIED PERIOD AND WILL BE COMMANDED CLOSED WHEN FAN IS NOT OPERATING. VALVES SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE.
3. OWNER WILL REVIEW ALL PROPOSALS PRIOR TO FINAL ACCEPTANCE.
4. ON A RISE OR FALL OF RETURN OR SPACE AIR TEMPERATURE FROM 76°F SETPOINT, THE CHILLED WATER VALVE WILL MODULATE OPEN OR CLOSED RESPECTIVELY.
5. SPACE AIR TEMPERATURE SETPOINT SHALL BE SET BY THE EMS AND SHALL BE ADJUSTABLE.
6. WHEN ANY AIR HANDLER IS OFF, THE OUTSIDE DAMPER WILL BE COMMANDED CLOSED (WHERE APPLICABLE).

AIR HANDLING UNIT (VAV) (AHU-5)

1. AHU WILL BE STARTED AND STOPPED ON COMMAND FROM THE EMS RUN TIME WILL BE PREDETERMINED BY USER AND SHALL BE SCHEDULED BY SOFTWARE.
2. WHEN AHU FAN IS STARTED, FAN SHALL BE AT MINIMUM POSITION. OA DAMPER TO OPEN ONLY DURING THE OCCUPIED PERIODS (WHERE APPLICABLE). THE CHILLED WATER COIL SHALL BE ENERGIZED AND THE LEAVING AIR TEMPERATURE SET FOR 52°F (ADJUSTABLE). THE O.A. DAMPER SHALL MODULATE OPEN OR CLOSED BASED ON THE AIR FLOW READING AT AIR FLOW STATION.
3. WHEN TEMPERATURE IN ANY ROOM RISES OR FALLS FROM THE SETPOINT, THE LOCAL ROOM THERMOSTAT WILL SIGNAL THE CHILLED WATER VALVE TO MODULATE OPEN OR CLOSE MAINTAINING LEAVING AHU SET POINT TEMPERATURE OF 52°F (ADJUSTABLE) AND THE VAV BOXES SHALL MODULATE TO MAINTAIN ROOM TEMPERATURE.
4. THE AIR HANDLER'S VFD SHALL MODULATE AIRFLOW TO MAINTAIN DUCT PRESSURE. PRESSURE SENSOR TO BE LOCATED IN MAINDUCT (2/3 LENGTH OF DUCT). EMS SHALL ALSO MONITOR POSITION OF ALL VAV BOX VALVES. (LOCATE SENSOR ON AS BUILTS)
5. VAV DUCT HEATER TO BE ENERGIZED TO MAINTAIN WINTER INDOOR TEMPERATURE OF 70°F (ADJUSTABLE).
6. DURING THE UNOCCUPIED PERIOD, THE TEMPERATURE SET POINTS WITHIN THE SPACE SHALL BE INCREASED TO 78°F (ADJUSTABLE). OA UNITS AND FANS SHALL BE IN ITS OFF POSITION. IF HUMIDITY INCREASES ABOVE 60% RH DURING THIS PERIOD, THE SYSTEM SHALL BE ENERGIZED TO MAINTAIN AN ACCEPTABLE HUMIDITY READING.
7. NOTE: MOTORIZED DAMPERS SHALL MODULATE TO MAINTAIN OUTSIDE AIR FLOW BASED ON AIR FLOW SENSOR.

ddc engineering inc.
4083 South U.S. Highway 1, Ste. 101
Rockledge, Florida 32955
Phone 321.633.4522 Fax 321.633.4528
www.ddc-engineers.com
dasilva.david@ddc-engineers.com
C.O.A.: 25988

DDC PROJECT NO.: 19017.02

CONSULTANTS:

DATE
MARCH 29, 2019

REVIEW SET
PERMIT SET
BID SET
CONSTRUCTION SET
AS BUILT

REVISIONS

NO.	DATE	DESCRIPTION

HVAC MODIFICATIONS AT BRANFORD ELEMENTARY SCHOOL
26801 FL-247
BRANFORD, FL 32008

MECHANICAL SPECIFICATIONS

SHEET NO.:
MS-2

DRAWN: JS
CHECKED: JMF
APPROVED: DAD

David A. DaSilva
54739

BID SET

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