



- 1 DEMOLISH EXISTING CEILING AS INDICATED
PREPARE FOR NEW CEILING SYSTEM
- 2 REMOVE AND SALVAGE ANY MECH. EQUIPMENT TO BE
REUSED IN RENOVATION, SEE MECH.

1. DEMOLITION DRAWINGS ILLUSTRATE THE GENERAL SCOPE OF DEMOLITION WORK TO BE PERFORMED, AND ARE NOT INTENDED TO BE COMPREHENSIVE OR ALL-INCLUSIVE. THE GENERAL CONTRACTOR SHALL INCLUDE THE DEMOLITION WORK INCLUDED IN DEMOLITION PLANS, ALONG WITH DEMOLITION REQUIRED FOR SUCCESSFUL COMPLETION OF THE CONSTRUCTION WORK TO BE PERFORMED.
2. THE GENERAL CONTRACTOR SHALL PRIOR TO REMOVAL OF EXISTING ELEMENTS TEMPORARILY SHORE AND OR BRACE EXISTING CONSTRUCTION TO REMAIN AS REQUIRED TO SUPPORT EXISTING LOADS AND OR LOADS IMPOSED DURING CONSTRUCTION
3. CONTRACTOR SHALL FIELD VERIFY AND NOTIFY ARCHITECT OF ANY CONFLICTS WITH THE NEW SCHEDULED WORK PRIOR TO BID FOR CLARIFICATION. THE CONTRACTOR SHALL FIELD VERIFY AND NOTIFY OF ANY CONCEALED CONDITIONS EFFECTING THE WORK AND ANY DISCREPANCIES ENCOUNTERED DURING CONSTRUCTION PRIOR TO PROCEEDING WITH WORK.
4. CONTRACTOR IS RESPONSIBLE FOR BARRICADES OF AREAS OF WORK AND TO PROVIDE PROTECTED ENTRANCES AND EXITS TO AND FROM THE BUILDING.
5. THE CONTRACTOR SHALL PROVIDE PROTECTIVE BARRIERS TO DUST AND WEATHER DURING DEMOLITION SO AS NOT TO DAMAGE EXISTING CONSTRUCTION TO REMAIN.
6. CONTRACTOR TO PATCH, REPAIR, AND REPLACE ANY EXISTING STRUCTURAL, WALLS, FINISHES, AND EQUIPMENT DAMAGED BY REMOVAL OF ITEMS SUBJECT TO DEMOLITION. ALL ADJACENT WALLS, CEILINGS, FLOORS, FINISHES, ETC. SHALL BE PREPARED AS REQUIRED TO RECEIVE NEW WORK.
7. ALL SALVAGED ITEMS TO BE REMOVED, PROTECTED, STORED, AND DELIVERED TO AREA IN BUILDING DESIGNATED BY THE OWNER.
8. DAMAGED EXISTING CEILING TILES SHALL BE REPLACED
9. CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO DEMOLITION AND VERIFY ALL DIMENSIONS IN FIELD
10. SEE MEP DOCUMENTS FOR FULL SCOPE OF WORK
11. CONTRACTOR WILL ENSURE THAT ALL EXISTING CARPET IS PROTECTED FROM ANY DAMAGE.

GENERAL NOTES

1. INTERIOR CEILING HEIGHTS AS INDICATED ON THE REFLECTED CEILING PLANS.
2. REFER TO CONSTRUCTION FLOOR PLANS FOR REQUIRED COMPOSITION OF WALL CONSTRUCTION.
3. LOCATION OF LIGHTS, DIFFUSERS, AND RETURN AIR GRILLES TO BE COORDINATED BETWEEN REFLECTED CEILING PLANS, LIGHTING PLANS, AND HVAC PLANS. FINAL LOCATION TO BE APPROVED BY ARCHITECT.
4. SEE SPECIFICATIONS FOR ADDITIONAL CEILING FINISH INFORMATION AND REQUIREMENTS. NOTIFY ARCHITECT WITH ANY DISCREPANCIES BETWEEN SPECIFICATION AND DRAWINGS.
5. WHERE EXIT SIGNS ARE LOCATED ABOVE DOORWAYS, CENTER ABOVE DOOR.

CEILING FINISHES:

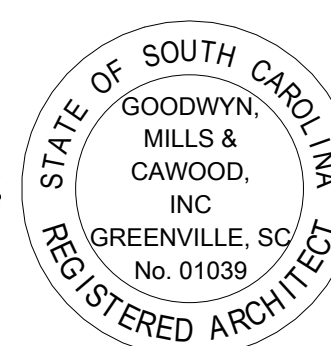
CEILING FINISHES:
 2'X2' LAY-IN ACOUSTICAL
 CEILING & GRID SYSTEM

LIGHTING:
 2X4 LIGHT FIXTURE

MECHANICAL:

— SLOT SUPPLY DIFFUSER

☒ SQUARE SUPPLY DIFFUSER
☒ RETURN AIR GRILL



10/31/2016 8:27:36 AM

FLOOR & CEILING PLANS

USC Aiken - Student Success Center

USC Aikell - Student
Office Addition

152 Scholar Loop

Aiken, SC 29801

GMC # AGRE160041

OSE# H27-D232-PD

ISSUE FOR BID

ISSUE FOR BID

ISSUE | DATE

ISSUE	DATE
ISSUE FOR BID	10/28/16

ISSUE FOR BID	10/28/18

drawn by:	JCB
checked by:	WAS

GOODWYN | MILLS | CAWOOD

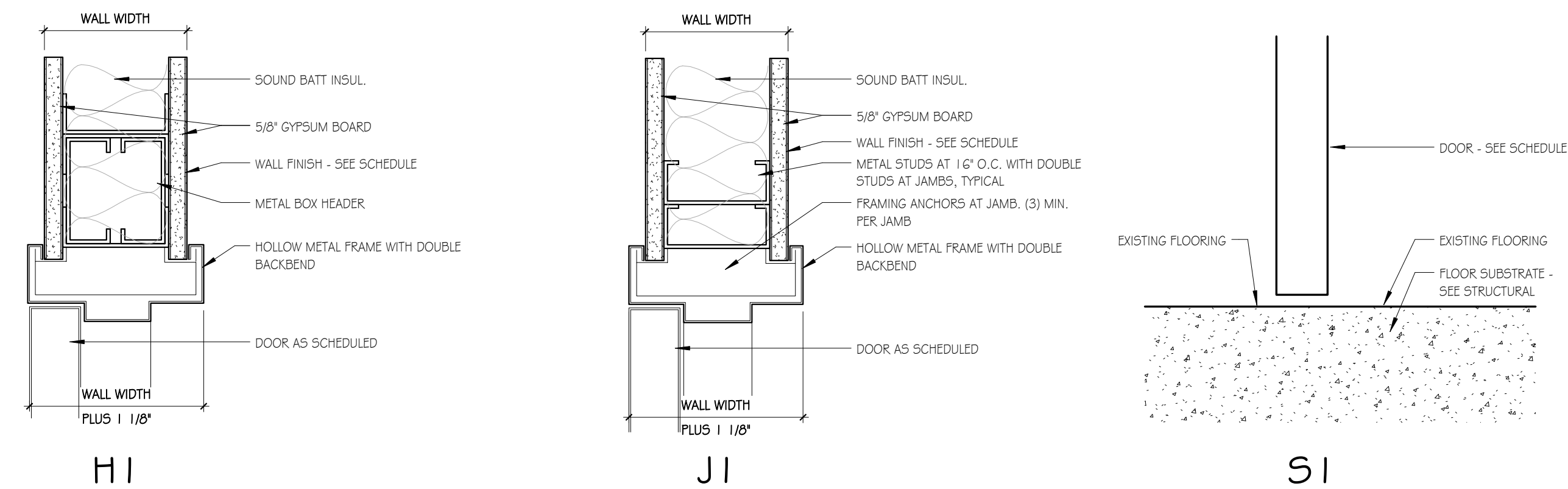
101 East Washington Street, Suite 200 | Greenville, SC 29601

at Washington Street, Suite 200 | Greenville, SC
Tel 864.527.0460 | GMCNETWORK.COM

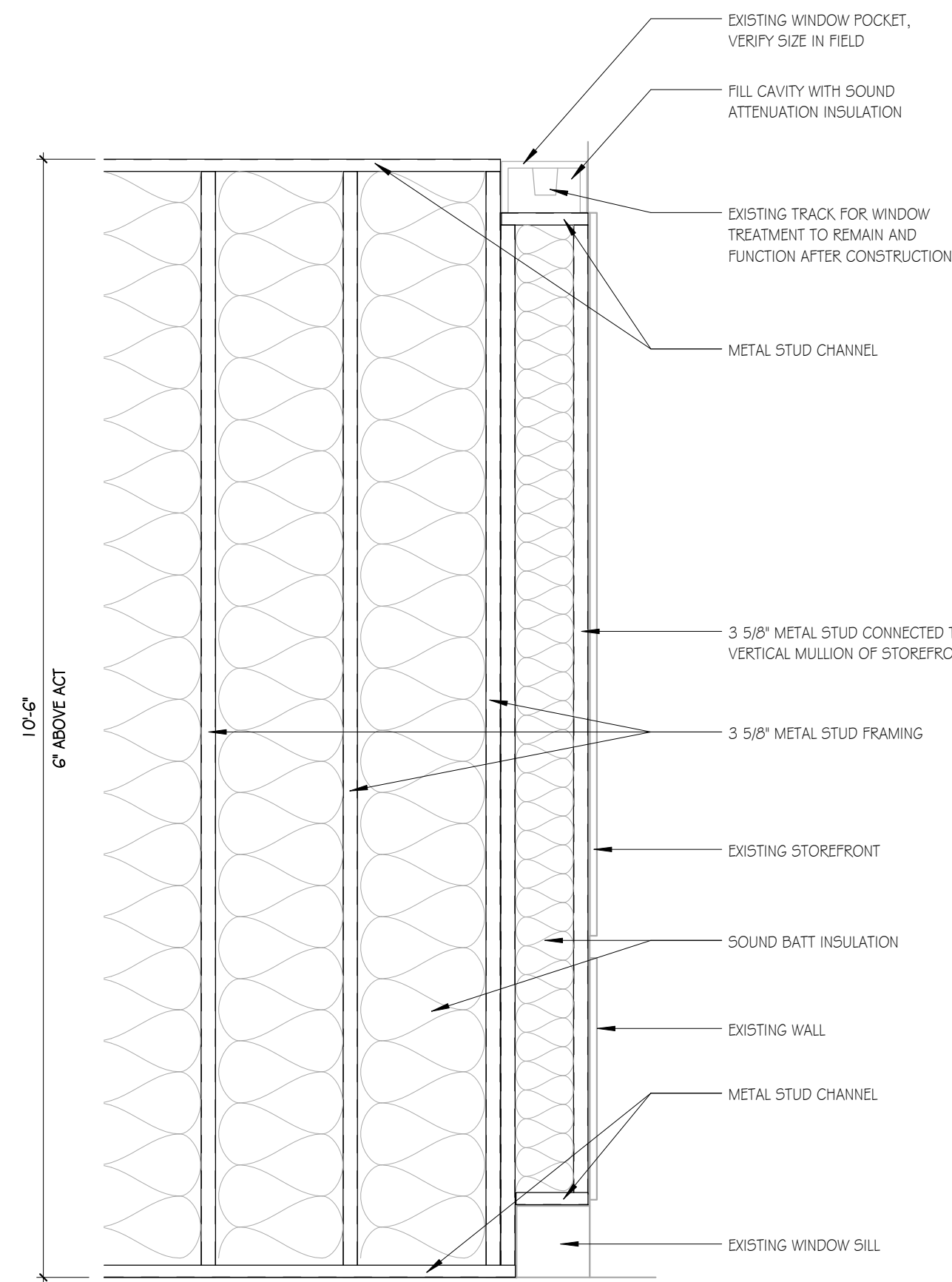
A1.00
sheet of

DOOR TYPE	FRAME TYPE	DOOR LITE KIT
<p>SCALE: 1/4" = 1'-0"</p> <p>WD-I</p> <p>FLUSH SOLID CORE WOOD DOOR, DOOR FINISH TO MATCH EXISTING</p>	<p>SCALE: 1/4" = 1'-0"</p> <p>F-I</p> <p>NEW HOLLOW METAL FRAME TO MATCH EXISTING</p>	<p>SCALE: 1/4" = 1'-0"</p> <p>LK-I</p> <p>NEW 24x32 LITE KIT IN EXISTING DOOR 106</p>

SCALE: 3" = 1'-0"

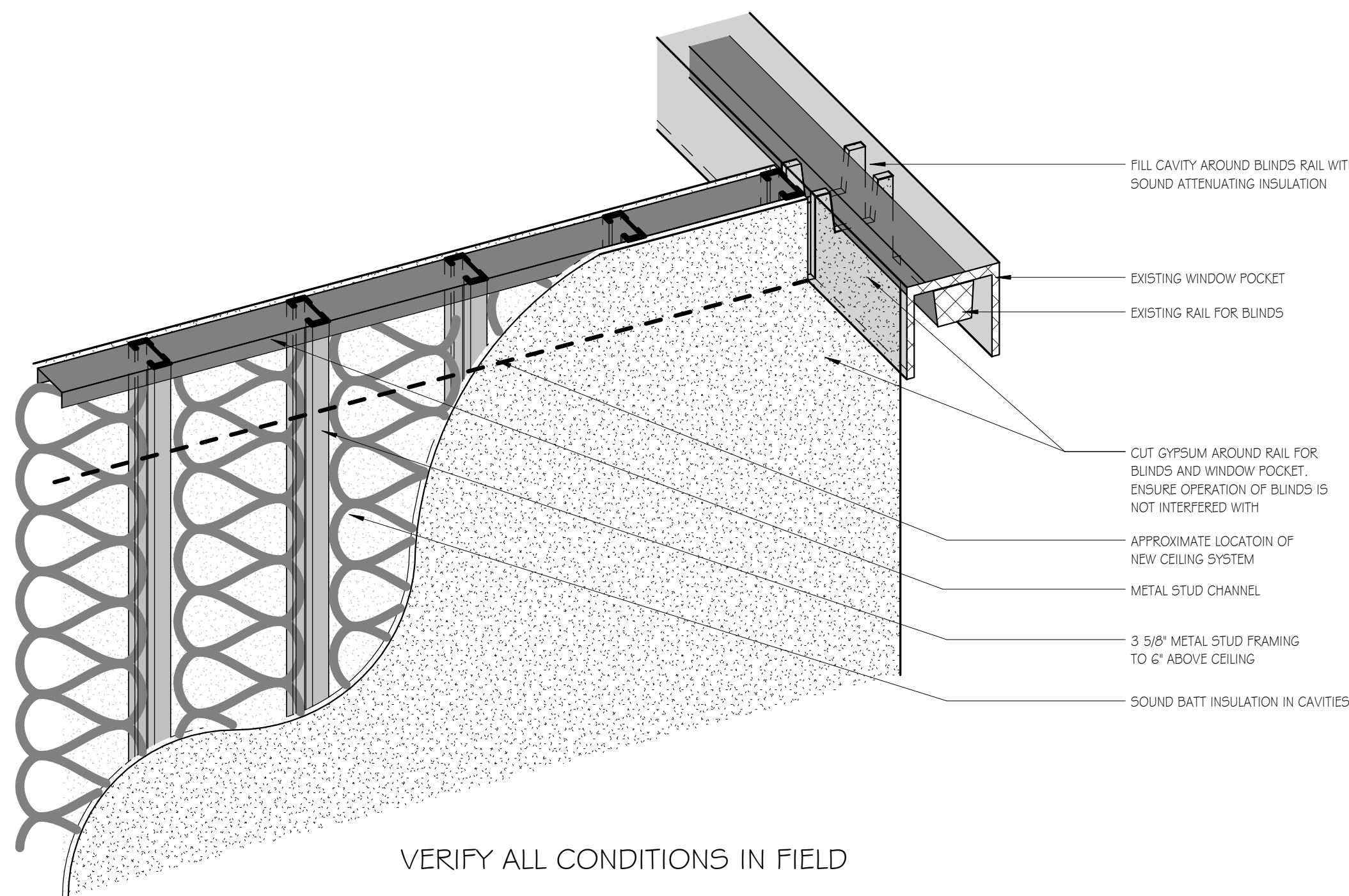


FINISH LEGEND								
BASE			WALL			CEILING		
NUMBER	TYPE	DETAIL DESCRIPTION	NUMBER	TYPE	DETAIL DESCRIPTION	NUMBER	TYPE	DETAIL DESCRIPTION
KB	RUBBER BASE	BLACK MATCH EXISTING	PNT - 1	MAIN WALL PAINT	Manufacturer: SHERWIN WILLIAMS Name: CUSTOM Color: MATCH EXISTING	ACT	ACOUSTICAL CEILING TILE SYSTEM	Manufacturer: ARMSTRONG Name: FINE FINISHED Style: SQUARE LAY-IN Color: WHITE Size: 24"x24"



DRYWALL NOT SHOWN FOR CLARITY.
VERIFY ALL CONDITIONS IN FIELD.

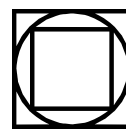
1 WALL SECTION



VERIFY ALL CONDITIONS IN FIELD

2 ENLARGED ISOMETRIC VIEW OF WALL CORNER

GOODWYN | MILLS | CAWOOD



101 East Washington Street, Suite 200 | Greenville, SC 29601
Tel 864.527.0460 | GMCNETWORK.COM

ISSUE	DATE
ISSUE FOR BID	10/28/16
drawn by:	JCB
checked by:	WAS

USC Aiken - Student Success Center
Office Addition
152 Scholar Loop
Aiken, SC 29801
GMC # AGRE160041
OSE # H27-D232-PD
ISSUE FOR BID

DETAILS AND SCHEDULES

A2.00
sheet of



10/31/2016 8:27:39 AM

MECHANICAL SPECIFICATIONS:

1. BASIC MECHANICAL MATERIALS AND METHODS

- 11 COORDINATION
- A. ARRANGE FOR DUCT SIZES, PHASES, SLOTS, AND OPENINGS IN BUILDING STRUCTURE DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR MECHANICAL INSTALLATIONS.
- 12 HVAC DEMOLITION
- A. COORDINATE WITH ARCHITECTURAL PHASING PLAN & SPECIFICATIONS TO DISCONNECT, DEMOLISH, AND REMOVE HVAC SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED. PLAN DEMO WORK ACCORDINGLY AND PROVIDE TEMPORARY RECONNECTION OF SERVICE TO MINIMIZE OUTAGES TO OCCUPIED AREAS.
- B. DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED.
- C. IF INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.
- D. INSPECT AND DISCUSS CONDITION OF CONSTRUCTION TO BE SELECTIVELY DEMOLISHED.
- E. REVIEW AND FINALIZE SELECTIVE DEMOLITION SCHEDULE AND VERIFY AVAILABILITY OF MATERIALS, DEMOLITION PERSONNEL, EQUIPMENT, AND FACILITIES NEEDED TO MAKE PROGRESS AND AVOID DELAYS.
- F. REVIEW REQUIREMENTS OF WORK PERFORMED BY OTHER TRADES THAT RELY ON SUBSTRATES EXPOSED BY SELECTIVE DEMOLITION OPERATIONS.
- G. REVIEW AREAS WHERE EXISTING CONSTRUCTION IS TO REMAIN AND REQUIRES PROTECTION.
- D. OWNER WILL OCCUPY PORTIONS OF BUILDING IMMEDIATELY ADJACENT TO SELECTIVE DEMOLITION AREA. CONDUCT SELECTIVE DEMOLITION SO OWNER'S OPERATIONS WILL NOT BE DISRUPTED.
- E. CONDITIONS EXISTING AT TIME OF INSPECTION FOR BIDDING PURPOSE WILL BE MAINTAINED BY OWNER AS FAR AS PRACTICAL.
- F. NOTIFY ARCHITECT OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS BEFORE PROCEEDING WITH SELECTIVE DEMOLITION.
- G. HAZARDOUS MATERIALS: IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK.
- H. IF SUSPECTED HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB. IMMEDIATELY NOTIFY ARCHITECT AND OWNER. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER UNDER A SEPARATE CONTRACT.
- H. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE IS NOT PERMITTED.
- I. UTILITY SERVICE: MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS.
- J. MAINTAIN FIRE-PROTECTION FACILITIES IN SERVICE DURING SELECTIVE DEMOLITION OPERATIONS.
- K. MECHANICAL SYSTEMS
1. EXISTING SERVICES/SYSTEMS TO REMAIN: MAINTAIN SERVICES/SYSTEMS INDICATED TO REMAIN AND PROTECT THEM AGAINST DAMAGE.
2. COMPLY WITH REQUIREMENTS FOR EXISTING SERVICES/SYSTEMS INTERRUPTIONS SPECIFIED.
3. EXISTING SERVICES/SYSTEMS TO BE REMOVED, RELOCATED, OR ABANDONED: LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF INDICATED UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS SERVING AREAS TO BE SELECTIVELY DEMOLISHED.
4. CONTRACTOR SHALL CONTACT OWNER TO ARRANGE FOR SHUT OFF INDICATED SERVICES/SYSTEMS WHEN REQUESTED BY CONTRACTOR.
5. ARRANGE TO SHUT OFF INDICATED UTILITIES WITH UTILITY COMPANIES.
6. IF SERVICES/SYSTEMS ARE REQUIRED TO BE REMOVED, RELOCATED, OR ABANDONED, PROVIDE TEMPORARY SERVICES/SYSTEMS THAT BYPASS AREA OF SELECTIVE DEMOLITION AND THAT MAINTAIN CONTINUITY OF SERVICES/SYSTEMS TO OTHER PARTS OF BUILDING.
7. DISCONNECT, DEMOLISH, AND REMOVE FIRE-SUPPRESSION SYSTEMS, PLUMBING, AND HVAC SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED.
8. PIPING TO BE REMOVED: REMOVE PORTION OF PIPING INDICATED TO BE REMOVED AND CAP OR PLUG REMAINING PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
9. PIPING TO BE ABANDONED IN PLACE: DRAIN PIPING AND CAP OR PLUG PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
10. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT.
11. EQUIPMENT TO BE REMOVED AND REINSTALLED: DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN, AND STORE EQUIPMENT; WHEN APPROPRIATE, REINSTALL, RECONNECT, AND MAKE EQUIPMENT OPERATIONAL.
12. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER.
13. DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND PLUG REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL.
14. DUCTS TO BE ABANDONED IN PLACE: CAP OR PLUG DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL.
- 13 ALL WORK SHALL COMPLY WITH 2017 INTERNATIONAL MECHANICAL CODE, BUILDING CODE AND FIRE CODE; LATEST AMENDMENTS AS ADOPTED BY THE STATE

2. HANGERS AND SUPPORTS

- 2.1 QUALITY ASSURANCE
- A. WELDING: QUALIFY PROCEDURES AND PERSONNEL ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX.
- 2.2 STEEL PIPE HANGERS AND SUPPORTS
- A. DESCRIPTION: MSS SP-58, TYPES 1 THRU 58, FACTORY-FABRICATED COMPONENTS. REFER TO "HANGER AND SUPPORT APPLICATIONS" ARTICLE FOR WHERE TO USE SPECIFIC HANGER AND SUPPORT TYPES.
- B. GALVANIZED, METALLIC COATINGS: PREGALVANIZED OR HOT DIPPED.
- C. NONMETALLIC COATINGS: PLASTIC COATING, JACKET, OR LINER.
- 2.3 EQUIPMENT SUPPORTS
- A. DESCRIPTION: WELDED, SHOP- OR FIELD-FABRICATED EQUIPMENT SUPPORT MADE FROM STRUCTURAL-STEEL SHAPES.
- 2.4 MISCELLANEOUS MATERIALS
- A. STRUCTURAL STEEL: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.
- 2.5 HANGER AND SUPPORT APPLICATIONS
- A. USE HANGERS AND SUPPORTS WITH GALVANIZED, METALLIC COATINGS FOR EQUIPMENT THAT WILL NOT HAVE FIELD-APPLIED FINISH.
- B. HANGER-ROD ATTACHMENTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN OTHER SECTIONS, INSTALL THE FOLLOWING TYPES:
- 1) STEEL TURNBUCKLES (MSS TYPE 13): FOR ADJUSTMENT UP TO 6" FOR HEAVY LOADS.
- C. BUILDING ATTACHMENTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN OTHER SECTIONS, INSTALL THE FOLLOWING TYPES:
- 1) TOP-BEAM C-CLAMPS (MSS TYPE 19): FOR USE UNDER ROD INSTALLATIONS WITH BAR-JOIST CONSTRUCTION TO ATTACH TO TOP FLANGE OF STRUCTURAL SHAPE.
- 2) SIDE-BEAM OR CHANNEL CLAMPS (MSS TYPE 20): FOR ATTACHING TO BOTTOM FLANGE OF BEAMS, CHANNELS, OR ANGLES.
- 3) CENTER-BEAM CLAMPS (MSS TYPE 21): FOR ATTACHING TO CENTER OF BOTTOM FLANGE OF BEAMS.
- 4) C-CLAMPS (MSS TYPE 23): FOR STRUCTURAL SHAPES.
- 5) SIDE-BEAM BRACKETS (MSS TYPE 34): FOR SIDES OF STEEL BEAMS.
- D. COMPLY WITH MSS SP-69 FOR TRAPEZE HANGER SELECTIONS AND APPLICATIONS THAT ARE NOT SPECIFIED IN OTHER SECTIONS.
- E. COMPLY WITH MFMA-102 FOR METAL FRAMING SYSTEM SELECTIONS AND APPLICATIONS THAT ARE NOT SPECIFIED IN OTHER SECTIONS.
- F. USE MECHANICAL-EXPANSION ANCHORS INSTEAD OF BUILDING ATTACHMENTS WHERE REQUIRED IN CONCRETE CONSTRUCTION.
- 2.6 EQUIPMENT SUPPORTS
- A. FABRICATE STRUCTURAL-STEEL STANDS TO SUSPEND EQUIPMENT FROM STRUCTURE OVERHEAD.
- B. PROVIDE LATERAL BRACING, TO PREVENT SWAYING, FOR EQUIPMENT SUPPORTS.
- C. PROVIDE ALL THREAD ROD FASTEN TO CONCRETE STRUCTURE WITH ROD & ROD INSERTS SIZED FOR CORNER WEIGHT LOADS OF EQUIPMENT.
- D. PROVIDE ALL THREAD RODS FASTEN TO BEAMS WITH ROD & BEAM CLAMPS SIZED FOR CORNER WEIGHT LOADS OF EQUIPMENT.
- E. PROVIDE SPRING ISOLATORS, SIZED FOR CORNER WEIGHTS, AT EACH CORNER OF HORIZONTAL FAN COIL UNITS WITH 0.5" TO 1" MAX DEFLECTION.
- 2.7 METAL FABRICATIONS
- A. SHOP WELDING: COMPLY WITH AWS D11 PROCEDURES FOR SHIELDED METAL ARC WELDING, APPEARANCE AND QUALITY OF WELDS, AND METHODS USED IN CORRECTING WELDING WORK, AND WITH THE FOLLOWING:
- 1) USE MATERIALS AND METHODS THAT MINIMIZE DISTORTION AND DEVELOP STRENGTH AND CORROSION RESISTANCE OF BASE METALS.
- 2) OBTAIN FUSION WITHOUT UNDERCUT OR OVERLAP.
- 3) REMOVE WELDING FLUX IMMEDIATELY.
- 4) FINISH WELDS AT EXPOSED CONNECTIONS SO NO ROUGHNESS SHOWS AFTER FINISHING AND CONTOURS OF WELDED SURFACES MATCH ADJACENT CONTOURS.
3. MECHANICAL IDENTIFICATION
- 3.1 QUALITY ASSURANCE

- A. ASME COMPLIANCE: COMPLY WITH ASME A13.1, "SCHEME FOR THE IDENTIFICATION OF HVAC SYSTEMS," FOR LETTER SIZE, LENGTH OF COLOR FIELD, COLORS, AND VIEWING ANGLES OF IDENTIFICATION DEVICES.
- 3.2 EQUIPMENT IDENTIFICATION DEVICES
- A. EQUIPMENT MARKERS: ENGRAVED, COLOR-CODED LAMINATED PLASTIC. INCLUDE CONTACT-TYPE, PERMANENT ADHESIVE.
- 1) TERMINOLOGY: MATCH SCHEDULES AS CLOSELY AS POSSIBLE.
- 2) DATA:
- a) NAME AND PLAN NUMBER.
- b) EQUIPMENT SERVICE.
- c) DESIGN CAPACITY.
- 3) SIZE: 2-1/2" BY 4" FOR CONTROL DEVICES AND DAMPERS, 4-1/2" BY 6" FOR EQUIPMENT.
- 3.3 DUCT IDENTIFICATION DEVICES
- A. DUCT MARKERS: PLASTIC WITH PRESSURE-SENSITIVE, PERMANENT-TYPE, SELF-ADHESIVE BACK.
- B. INCLUDE DIRECTION OF AIRFLOW AND DUCT SERVICE (SUCH AS SUPPLY AND EXHAUST).
4. HVAC INSULATION
- 4.1 QUALITY ASSURANCE
- A. FIRE-TEST-RESPONSE CHARACTERISTICS: INSULATION AND RELATED MATERIALS SHALL HAVE FIRE-TEST-RESPONSE CHARACTERISTICS INDICATED, AS DETERMINED BY TESTING IDENTICAL PRODUCTS PER ASTM E 84, BY A TESTING AND INSPECTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION. FACTORY LABEL INSULATION AND JACKET MATERIALS AND ADHESIVE, MASTIC, TAPES, AND CEMENT MATERIAL CONTAINERS, WITH APPROPRIATE MARKINGS OF APPLICABLE TESTING AND INSPECTING AGENCY.
- 1) INSULATION INSTALLED INDOORS: FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS.
- 4.2 SCHEDULING
- A. SCHEDULE INSULATION APPLICATION AFTER PRESSURE AND/OR LEAK TESTING SYSTEMS. INSULATION APPLICATION MAY BEGIN ON SEGMENTS THAT HAVE SATISFACTORY TEST RESULTS.
- 4.3 INSULATION MATERIALS
- A. PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY, OR MERCURY COMPOUNDS.
- B. MINERAL-FIBER BLANKET INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE III WITH FACTORY-APPLIED FSK JACKET. FACTORY-APPLIED JACKET REQUIREMENTS ARE SPECIFIED IN "FACTORY-APPLIED JACKETS" ARTICLE.
- 4.4 INSULATING CEMENTS
- A. MINERAL-FIBER INSULATING CEMENT: COMPLY WITH ASTM C 195.
- 4.5 ADHESIVES
- A. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES AND FOR BONDING INSULATION TO ITSELF AND TO SURFACES TO BE INSULATED, UNLESS OTHERWISE INDICATED.
- B. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-336C, CLASS 2, GRADE A.
- C. ASJ ADHESIVE, AND FSK AND PVDJ JACKET ADHESIVE: COMPLY WITH MIL-A-336C, CLASS 2, GRADE A FOR BONDING INSULATION JACKET LAP SEAMS AND JOINTS.
- 4.6 MASTICS
- A. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES; COMPLY WITH MIL-C-1956S, TYPE II.
- B. VAPOR-BARRIER MASTIC: WATER BASED, SUITABLE FOR INDOOR AND OUTDOOR USE ON BELOW AMBIENT SERVICES.
- 1) WATER-VAPOR PERMEANCE: ASTM E 96, PROCEDURE B, 0.013 PERM AT 43-MIL DRY FILM THICKNESS.
- 4.7 FACTORY-APPLIED JACKETS
- A. INSULATION SYSTEM SCHEDULES INDICATE FACTORY- APPLIED JACKETS ON VARIOUS APPLICATIONS. WHEN FACTORY-APPLIED JACKETS ARE INDICATED, COMPLY WITH THE FOLLOWING:
- 1) FSK JACKET: ALUMINUM-FOIL, FIBERGLASS- REINFORCED SCRM WITH KRAFT-PAPER BACKING, COMPLYING WITH ASTM C 1136, TYPE II.
- 4.8 SECUREMENTS
- A. INSULATION PINS AND HANGERS:
- 1) METAL, ADHESIVELY ATTACHED, PERFORATED-BASE INSULATION HANGERS: BASEPLATE WELDED TO PROJECTING SPINDLE THAT IS CAPABLE OF HOLDING INSULATION, OF THICKNESS INDICATED, SECURELY IN POSITION INDICATED WHEN SELF-LOCKING WASHER IS IN PLACE.
- 4.9 EXAMINATION
- A. EXAMINE SUBSTRATES AND CONDITIONS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION AND OTHER CONDITIONS AFFECTING PERFORMANCE OF INSULATION APPLICATION.
- 1) VERIFY THAT SYSTEMS AND EQUIPMENT TO BE INSULATED HAVE BEEN TESTED AND ARE FREE OF DEFECTS.
- 2) VERIFY THAT SURFACES TO BE INSULATED ARE CLEAN AND DRY.
- 3) PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- 4.10 GENERAL INSTALLATION REQUIREMENTS
- A. INSTALL INSULATION MATERIALS, ACCESSORIES, AND FINISHES WITH SMOOTH, STRAIGHT, AND EVEN SURFACES; FREE OF VOIDS THROUGHOUT THE LENGTH OF EQUIPMENT, DUCTS AND FITTINGS, AND PIPING INCLUDING FITTINGS, VALVES, AND SPECIALTIES.
- B. INSTALL INSULATION MATERIALS, FORMS, VAPOR BARRIERS OR RETARDERS, JACKETS, AND THICKNESSES REQUIRED FOR EACH ITEM OF EQUIPMENT AND DUCT SYSTEM, AS SPECIFIED IN INSULATION SYSTEM SCHEDULES.
- C. INSTALL ACCESSORIES COMPATIBLE WITH INSULATION MATERIALS AND SUITABLE FOR THE SERVICE. INSTALL ACCESSORIES THAT DO NOT CORRODE, SOFTEN, OR OTHERWISE ATTACK INSULATION OR JACKET IN EITHER WET OR DRY STATE.
- D. INSTALL INSULATION WITH LONGITUDINAL SEAMS AT TOP AND BOTTOM OF HORIZONTAL RUNS.
- 4.11 MINERAL-FIBER INSULATION INSTALLATION
- A. BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION PINS.
- 1) APPLY ADHESIVES ACCORDING TO MANUFACTURER'S RECOMMENDED COVERAGE RATES PER UNIT AREA, FOR 100% COVERAGE OF DUCT AND PLENUM SURFACES.
- 2) APPLY ADHESIVE TO ENTIRE CIRCUMFERENCE OF DUCTS AND TO ALL SURFACES OF FITTINGS AND TRANSITIONS.
- 3) INSTALL CAPACITOR-DISCHARGE WELD PINS AND SPEED WASHERS ON SIDES AND BOTTOM OF HORIZONTAL DUCTS AND SIDES OF VERTICAL DUCTS LARGER THAN 18".
- 4) AFTER INSULATION IS IN PLACE, JOINTS, SEAMS, AND FASTENERS SHALL BE POINTED UP WITH VAPOR BARRIER ADHESIVE, REINFORCED WITH GLASSFAB MEMBRANE FABRIC. WHERE VAPOR BARRIERS ARE INDICATED, APPLY VAPOR-BARRIER MASTIC ON SEAMS AND JOINTS AND AT ENDS ADJACENT TO DUCT AND FITTINGS.
- 5) REPAIR PUNCTURES, TEARS, AND PENETRATIONS WITH MASTIC AND GLASSFAB MEMBRANE FABRIC TO MAINTAIN VAPOR-BARRIER SEAL.
- 6) INSTALL INSULATION ON RECTANGULAR DUCT ELBOWS AND TRANSITIONS WITH A FULL INSULATION SECTION FOR EACH SURFACE. INSTALL INSULATION ON ROUND AND FLAT-OVAL DUCT ELBOWS WITH INDIVIDUALLY MITERED GORES CUT TO FIT THE ELBOW.
- 7) INSULATE DUCT STIFFENERS, HANGERS, AND FLANGES THAT PROTRUDE BEYOND INSULATION SURFACE WITH 6" WIDE STRIPS OF SAME MATERIAL USED TO INSULATE DUCT. SECURE ON ALTERNATING SIDES OF STIFFENER, HANGER, AND FLANGE WITH PINS SPACED 6" O.C.
- 4.12 DUCT INSULATION SCHEDULE, GENERAL
- A. DUCTS REQUIRING INSULATION:
- 1) INDOOR, SUPPLY AIR & RETURN
- 4.13 INDOOR DUCT AND PLENUM INSULATION SCHEDULE
- A. AIR DUCT INSULATION SHALL BE THE FOLLOWING:
- 1) MINERAL-FIBER BLANKET: 2" THICK AND 0.75-LB/CU. FT. NOMINAL DENSITY.
5. METAL DUCTS
- 5.1 SYSTEM DESCRIPTION
- A. DUCT SYSTEM DESIGN, AS INDICATED, HAS BEEN USED TO SELECT SIZE AND TYPE OF AIR-MOVING AND -DISTRIBUTION EQUIPMENT AND OTHER AIR SYSTEM COMPONENTS. CHANGES TO LAYOUT OR CONFIGURATION OF DUCT SYSTEM MUST BE SPECIFICALLY APPROVED IN WRITING BY ARCHITECT/ENGINEER. ACCOMPANY REQUESTS FOR LAYOUT MODIFICATIONS WITH CALCULATIONS SHOWING THAT PROPOSED LAYOUT WILL PROVIDE ORIGINAL DESIGN RESULTS WITHOUT INCREASING SYSTEM TOTAL PRESSURE.
- 5.2 SHEET METAL MATERIALS
- A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS, UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.
- B. GALVANIZED SHEET STEEL: LOCK-FORMING QUALITY; COMPLYING WITH ASTM A 653 AND HAVING G90 COATING DESIGNATION; DUCTS SHALL HAVE MILL-PHOSPHATIZED FINISH FOR SURFACES EXPOSED TO VIEW.
- C. REINFORCEMENT SHAPES AND PLATES: GALVANIZED-STEEL REINFORCEMENT WHERE INSTALLED ON GALVANIZED SHEET METAL DUCTS.
- D. THE KIDS: GALVANIZED STEEL, 1/4" MINIMUM FOR LENGTHS 36" OR LESS; 3/8" MINIMUM FOR LENGTHS LONGER THAN 36".
- 5.3 SEALANT MATERIALS
- A. JOINT AND SEAM SEALANTS, GENERAL: THE TERM "SEALANT" IS NOT LIMITED TO MATERIALS OF ADHESIVE OR MASTIC NATURE BUT INCLUDES TAPES AND COMBINATIONS OF OPEN-WEAVE FABRIC STRIPS AND MASTICS.

- B. WATER-BASED JOINT AND SEAM SEALANT: FLEXIBLE, ADHESIVE SEALANT, RESISTANT TO UV LIGHT WHEN CURED, UL 723 LISTED, AND COMPLYING WITH NFPA REQUIREMENTS FOR CLASS 1 DUCTS.
- 5.4 HANGERS AND SUPPORTS
- A. BUILDING ATTACHMENTS: CONCRETE INSERTS OR STRUCTURAL STEEL FASTENERS APPROPRIATE FOR CONSTRUCTION MATERIALS TO WHICH HANGERS ARE BEING ATTACHED.
- B. HANGER MATERIALS: GALVANIZED SHEET STEEL OR THREADED STEEL ROD.
- 1) STRAP AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR STEEL SHEET WIDTH AND THICKNESS AND FOR STEEL ROD DIAMETERS.
- C. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS; COMPATIBLE WITH DUCT MATERIALS.
- D. TRAPEZE AND RISER SUPPORTS: STEEL SHAPES COMPLYING WITH ASTM A 36.
- 1) SUPPORTS FOR GALVANIZED-STEEL DUCTS: GALVANIZED-STEEL SHAPES AND PLATES.
- 5.5 SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS
- A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE," CHAPTER 3, "ROUND, OVAL, AND FLEXIBLE DUCT," BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
- B. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE."
- C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE."
- D. TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE," FIGURE 3-5, "90° TEES AND LATERALS," AND FIGURE 3-6, "CONICAL TEES," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS --METAL AND FLEXIBLE."
- 5.6 RECTANGULAR DUCT FABRICATION
- ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" AND COMPLYING WITH REQUIREMENTS FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, TIE-ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.
- 1) LENGTHS: FABRICATE RECTANGULAR DUCTS IN LENGTHS APPROPRIATE TO REINFORCEMENT AND RIGIDITY CLASSES REQUIRED FOR PRESSURE CLASS.
- 2) DEFLECTION DUCT SYSTEMS SHALL NOT EXCEED DEFLECTION LIMITS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE."
- B. TRANSVERSE JOINTS: PREFABRICATED SLIDE-ON JOINTS AND COMPONENTS CONSTRUCTED USING MANUFACTURER'S GUIDELINES FOR MATERIAL THICKNESS, REINFORCEMENT SIZE AND SPACING, AND JOINT REINFORCEMENT.
- C. FORMED-ON FLANGES: CONSTRUCT ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS- METAL AND FLEXIBLE," FIGURE 1-4, USING CORNER, BOLT, CLEAT, AND GASKET DETAILS.
- 1) DUCT SIZE: MAXIMUM 30" WIDE AND UP TO 2" W.G. PRESSURE CLASS.
- 2) LONGITUDINAL SEAMS: PITTSBURGH LOCK SEALED WITH NONCURING POLYMER SEALANT.
- D. CROSS BREAKING OR CROSS BEADING: CROSS BREAK OR CROSS BEAD DUCT SIDES 19" AND LARGER AND 0.0359" THICK OR LESS, WITH MORE THAN 10 SQ. FT. OF NONBRACED PANEL AREA UNLESS DUCTS ARE LINED.
- 5.7 ROUND DUCT AND FITTING FABRICATION
- A. ROUND, LONGITUDINAL-SEAM DUCTS: FABRICATE SUPPLY DUCTS OF GALVANIZED STEEL ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE."
- B. DUCT JOINTS: DUCTS UP TO 20"Ø: INTERIOR, CENTER- BEADED SLP COUPLING, SEALED BEFORE AND AFTER FASTENING, ATTACHED WITH SHEET METAL SCREWS.
- C. 90° TEES AND LATERALS AND CONICAL TEES: FABRICATE TO COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE," WITH METAL THICKNESSES SPECIFIED FOR LONGITUDINAL-SEAM STRAIGHT DUCTS.
- D. DIVERGING-FLOW FITTINGS: FABRICATE WITH REDUCED ENTRANCE TO BRANCH TAPS AND WITH NO EXCESS MATERIAL PROJECTING FROM FITTING ONTO BRANCH TAP ENTRANCE.
- E. FABRICATE ELBOWS USING DIE-FORMED, GORED, PLEATED, OR MITERED CONSTRUCTION. BEND RADIUS OF DIE-FORMED, GORED, AND PLEATED ELBOWS SHALL BE 1-1/2 TIMES DUCT DIAMETER. UNLESS ELBOW CONSTRUCTION TYPE IS INDICATED, FABRICATE ELBOWS AS FOLLOWS:
- 1) ROUND ELBOWS 8"Ø AND LESS: FABRICATE DIE- FORMED ELBOWS FOR 45° AND 90° ELBOWS AND PLEATED ELBOWS FOR 30° & 60° ONLY. FABRICATE NONSTANDARD BEND-ANGLE CONFIGURATIONS OR NONSTANDARD DIAMETER ELBOWS WITH GORED CONSTRUCTION.
- 2) ROUND ELBOWS 9"Ø THRU 14"Ø: FABRICATE GORED OR PLEATED ELBOWS FOR 30°, 45°, 60°, AND 90°. FABRICATE NONSTANDARD BEND-ANGLE CONFIGURATIONS OR NONSTANDARD DIAMETER ELBOWS WITH GORED CONSTRUCTION.
- 3) ROUND ELBOWS LARGER THAN 14"Ø AND ALL FLAT-OVAL ELBOWS: FABRICATE GORED ELBOWS.
- 4) DIE-FORMED ELBOWS FOR SIZES THRU 8"Ø AND ALL PRESSURES 0.040" THICK WITH 2-PIECE WELDED CONSTRUCTION.
- 5) ROUND GORED-ELBOW METAL THICKNESS: SAME AS NON-ELBOW FITTINGS SPECIFIED ABOVE.
- 6) PLEATED ELBOWS FOR SIZES THRU 14"Ø AND PRESSURES THRU 10" W.G. 0.022".
- 5.8 DUCT APPLICATIONS
- A. STATIC-PRESSURE CLASSES: UNLESS OTHERWISE INDICATED, CONSTRUCT DUCTS ACCORDING TO THE FOLLOWING:
- 1) SUPPLY DUCTS (BEFORE AIR TERMINAL UNITS): 3" W.G.
- 2) SUPPLY DUCTS (AFTER AIR TERMINAL UNITS): 1" W.G.
- 3) RETURN DUCTS (NEGATIVE PRESSURE): 1" W.G.
- 4) EXHAUST DUCTS (NEGATIVE PRESSURE): 1" W.G.
- 5.9 DUCT INSTALLATION
- A. CONSTRUCT AND INSTALL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE," UNLESS OTHERWISE INDICATED.
- B. INSTALL DUCTS WITH FEWEST POSSIBLE JOINTS.
- C. INSTALL FABRICATED FITTINGS FOR CHANGES IN DIRECTIONS, SIZE, AND SHAPE AND FOR CONNECTIONS.
- D. INSTALL COUPLINGS TIGHT TO DUCT WALL SURFACE WITH A MINIMUM OF PROJECTIONS INTO DUCT. SECURE COUPLINGS WITH SHEET METAL SCREWS. INSTALL SCREWS AT INTERVALS OF 12", WITH A MINIMUM OF 3 SCREWS IN EACH COUPLING.
- E. INSTALL DUCTS, UNLESS OTHERWISE INDICATED, VERTICALLY AND HORIZONTALLY AND PARALLEL AND PERPENDICULAR TO CLOSEST COLUMN LINES, AVOID DIAGONAL RUNS, EXCEPT WHERE SHOWN ON DRAWINGS, OR REQUIRED TO MATE UP WITH EXISTING DUCT WORK.
- F. INSTALL DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING. COORDINATE DUCT LOCATIONS WITH EXISTING OPENINGS IN STRUCTURAL STEEL, WHERE REQUIRED. UNDER NO CIRCUMSTANCES ARE ANY NEW OPENINGS TO BE CUT INTO, NOR ARE ANY EXISTING OPENINGS TO BE ENLARGED IN, STRUCTURAL STEEL.
- G. INSTALL DUCTS WITH A CLEARANCE OF 1", PLUS ALLOWANCE FOR INSULATION THICKNESS, WHERE POSSIBLE IN ACCORDANCE WITH BUILDING CONDITIONS.
- H. CONCEAL DUCTS FROM VIEW IN FINISHED SPACES. DO NOT ENCASE HORIZONTAL RUNS IN SOLID PARTITIONS UNLESS SPECIFICALLY INDICATED.
- I. COORDINATE LAYOUT WITH SUSPENDED CEILING, LIGHTING LAYOUTS, AND SIMILAR FINISHED WORK.
- J. SEAL ALL JOINTS AND SEAMS. APPLY SEALANT TO MALE END CONNECTORS BEFORE INSERTION, AND AFTERWARD TO COVER ENTIRE JOINT AND SHEET METAL SCREWS.
- K. PAINT INTERIORS OF METAL DUCTS, THAT DO NOT HAVE DUCT LINER, FOR 24" UPSTREAM OF REGISTERS AND GRILLES. APPLY ONE COAT OF FLAT, BLACK, LATEX FINISH COAT OVER A COMPATIBLE GALVANIZED-STEEL PRIMER.
- 5.10 SEAM AND JOINT SEALING
- A. SEAL DUCT SEAMS AND JOINTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR DUCT PRESSURE CLASS INDICATED.
- 1) SUPPLY-AIR DUCTS IN PRESSURE CLASSES 2" W.G. AND GREATER: SEAL CLASS A.
- 2) SUPPLY-AIR DUCTS IN PRESSURE CLASSES 1" W.G. AND LOWER: SEAL CLASS C.
- 3) EXHAUST DUCTS: SEAL CLASS B. U.N.O.
- B. SEAL DUCTS BEFORE EXTERNAL INSULATION IS APPLIED.
- 5.11 HANGING AND SUPPORTING
- A. SUPPORT HORIZONTAL DUCTS WITHIN 24" OF EACH ELBOW AND WITHIN 48" OF EACH BRANCH INTERSECTION.
- B. ENSURE THAT ALL DUCTWORK IS ISOLATED FROM BUILDING INTERIOR WALL MEMBERS. THE USE OF WALL STRUCTURE TO SUPPORT DUCTWORK IS PROHIBITED.
- 5.12 CONNECTIONS
- A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR BRANCH, OUTLET, INLET, AND TERMINAL UNIT CONNECTIONS.

6. DUCT ACCESSORIES

- 6.1 VOLUME DAMPERS
- A. GENERAL DESCRIPTION: FACTORY FABRICATED, WITH REQUIRED HARDWARE AND ACCESSORIES: STIFFEN DAMPER BLADES FOR STABILITY. INCLUDE LOCKING DEVICE TO HOLD SINGLE-BLADE DAMPERS IN A FIXED POSITION WITHOUT VIBRATION. CLOSE DUCT PENETRATIONS FOR DAMPER COMPONENTS TO SEAL DUCT CONSISTENT WITH PRESSURE CLASS.
- B. STANDARD VOLUME DAMPERS: MULTIPLE- OR SINGLE-BLADE (SINGLE IF NOT INDICATED), PARALLEL- OR OPPOSED-BLADE (PARALLEL IF NOT INDICATED) DESIGN AS INDICATED, STANDARD LEAKAGE RATING, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.
- 1) STEEL FRAMES: HAT-SHAPED, GALVANIZED SHEET STEEL CHANNELS, MINIMUM OF 0.064" THICK, WITH MITERED AND WELDED CORNERS, FRAMES WITH FLANGES WHERE INDICATED FOR ATTACHING TO WALLS AND FLANGELESS FRAMES WHERE INDICATED FOR INSTALLING IN DUCTS.
- 2) ROLL-FORMED STEEL BLADES: 0.064" THICK, GALVANIZED SHEET STEEL.
- 3) BLADE AXLES: GALVANIZED STEEL.
- 4) BEARINGS: OIL-IMPREGNATED BRONZE.
- 5) TIE BARS AND BRACKETS: GALVANIZED STEEL.
- C. DAMPER HARDWARE: ZINC-PLATED, DIE-CAST CORE WITH DIAL AND HANDLE MADE OF 3/32" THICK ZINC-PLATED STEEL, AND A HEXAGON LOCKING NUT. INCLUDE CENTER HOLE TO SUIT DAMPER OPERATING-ROD SIZE. INCLUDE ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.
- 6.2 FLEXIBLE DUCTS
- A. INSULATED-DUCT CONNECTORS: UL 181, CLASS 1, 2-PLY VINYL FILM SUPPORTED BY HELICALLY WOUND, SPRING-STEEL WIRE, FIBROUS-GLASS INSULATION, ALUMINIZED VAPOR BARRIER FILM.
- 1) PRESSURE RATING: 10" W.G. POSITIVE AND 1.0" W.G. NEGATIVE.
- 2) MAXIMUM AIR VELOCITY: 4000 FPM.
- 3) TEMPERATURE RANGE: -10° TO +160 °F.
- B. INSULATED-DUCT CONNECTORS: UL 181, CLASS 1, MULTIPLE LAYERS OF ALUMINUM LAMINATE SUPPORTED BY HELICALLY WOUND, SPRING-STEEL WIRE, FIBROUS-GLASS INSULATION, ALUMINIZED VAPOR BARRIER FILM.
- 1) PRESSURE RATING: 10" W.G. POSITIVE AND 1.0" W.G. NEGATIVE.
- 2) MAXIMUM AIR VELOCITY: 4000 FPM.
- 3) TEMPERATURE RANGE: -20° TO +210 °F.
- 6.3 DUCT ACCESSORY HARDWARE
- A. INSTRUMENT DUCTS, ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER CONSTRUCTION ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" AND COMPLYING WITH REQUIREMENTS FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, TIE-ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.
- B. ADHESIVES: HIGH STRENGTH, QUICK SETTING, NEOPRENE BASED, WATERPROOF, AND RESISTANT TO GASOLINE AND GREASE.
- 6.4 APPLICATION AND INSTALLATION
- A. INSTALL DUCT ACCESSORIES ACCORDING TO APPLICABLE DETAILS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" FOR METAL DUCTS.
- B. PROVIDE DUCT ACCESSORIES OF MATERIALS SUITED TO DUCT MATERIALS; USE GALVANIZED-STEEL ACCESSORIES IN GALVANIZED-STEEL DUCTS.
- C. PROVIDE BALANCING DAMPERS AT POINTS ON SUPPLY AND EXHAUST SYSTEMS WHERE BRANCHES LEAD FROM LARGER DUCTS AS REQUIRED FOR AIR BALANCING. INSTALL AT A MINIMUM OF TWO DUCT WIDTHS FROM BRANCH TAKEOFF.
- D. CONNECT DIFFUSERS TO LOW PRESSURE DUCTS DIRECTLY OR WITH RIGID 45°-90° ELBOW & MAXIMUM 48" LENGTHS OF FLEXIBLE DUCT CLAMPED OR STRAPPED IN PLACE.
- E. CONNECT FLEXIBLE DUCTS TO METAL DUCTS WITH DRAW BANDS.
- F. INSTALL DUCT TEST HOLES WHERE REQUIRED FOR TESTING AND BALANCING PURPOSES.
- 6.5 ADJUSTING
- A. ADJUST DUCT ACCESSORIES FOR PROPER SETTINGS.
- B. FINAL POSITIONING OF MANUAL-VOLUME DAMPERS IS SPECIFIED IN "TESTING, ADJUSTING, AND BALANCING."
7. TESTING, ADJUSTING, AND BALANCING
- 7.1 QUALITY ASSURANCE
- A. AABC CERTIFIED CONTRACTOR REQUIRED
- B. TAB REPORT FORMS: USE STANDARD FORMS FROM AABC STANDARDS FOR TESTING, ADJUSTING, AND BALANCING.
- C. INSTRUMENTATION CALIBRATION: CALIBRATE INSTRUMENTS AT LEAST EVERY SIX MONTHS OR MORE FREQUENTLY IF REQUIRED BY INSTRUMENT MANUFACTURER.
- 7.2 PROJECT CONDITIONS
- A. PARTIAL OWNER OCCUPANCY: OWNER WILL OCCUPY OTHER AREAS OF THE BUILDING DURING PROJECT CONSTRUCTION. COOPERATE WITH OWNER DURING TAB OPERATIONS TO MINIMIZE CONFLICTS WITH OWNER'S OPERATIONS.
- 7.3 COORDINATION
- A. NOTICE: PROVIDE SEVEN DAYS' ADVANCE NOTICE TO ARCHITECT/ENGINEER AND OWNER FOR EACH TEST. INCLUDE SCHEDULED TEST DATES AND TIMES.
- 7.4 EXAMINATION
- A. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TAB OF SYSTEMS AND EQUIPMENT.
- 1) VERIFY THAT BALANCING DEVICES, SUCH AS MANUAL VOLUME DAMPERS, ARE REQUIRED BY THE CONTRACT DOCUMENTS. VERIFY THAT QUANTITIES AND LOCATIONS OF THESE BALANCING DEVICES ARE ACCESSIBLE AND APPROPRIATE FOR EFFECTIVE BALANCING AND FOR EFFICIENT SYSTEM AND EQUIPMENT OPERATION.
- B. EXAMINE APPROVED SUBMITTAL DATA OF HVAC SYSTEMS AND EQUIPMENT.
- C. EXAMINE EQUIPMENT PERFORMANCE DATA INCLUDING FAN CURVES. RELATE PERFORMANCE DATA TO PROJECT CONDITIONS AND REQUIREMENTS, INCLUDING SYSTEM EFFECTS THAT CAN CREATE UNDESIRED OR UNPREDICTED CONDITIONS THAT CAUSE REDUCED CAPACITIES IN ALL OR PART OF A SYSTEM.
- D. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS TO VERIFY THAT THEY ARE COMPLETE AND THAT TESTING, ADJUSTING, AND COMMISSIONING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.
- E. EXAMINE SYSTEMS FOR FUNCTIONAL DEFICIENCIES THAT CANNOT BE CORRECTED BY ADJUSTING AND BALANCING.
- F. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:
- 1) DAMPERS, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
- 2) DAMPERS ARE IN THE POSITION INDICATED BY THE CONTROLLER.
- 3) INTEGRITY OF DAMPERS FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITION.
- 4) THERMOSTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DRAFTS, AND COLD WALLS.
- 5) SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
- 6) CONTROLLER SETPOINTS ARE SET AT INDICATED VALUES.
- 7) INTERLOCKED SYSTEMS ARE OPERATING.
- 8) CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATED VALUES.
- G. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TAB PROCEDURES. OBSERVE AND RECORD SYSTEM REACTIONS TO CHANGES IN CONDITIONS. RECORD DEFAULT SETPOINTS IF DIFFERENT FROM INDICATED VALUES.
- 7.5 TEMPERATURE-CONTROL VERIFICATION
- A. VERIFY THAT EXISTING CONTROLLERS ARE CALIBRATED AND COMMISSIONED. CALIBRATE AND COMMISSION THE EXISTING CONTROLLERS THAT ARE NOT AND THE NEW CONTROLLER.
- B. CHECK TRANSMITTER AND CONTROLLER LOCATIONS AND NOTE CONDITIONS THAT WOULD ADVERSELY AFFECT CONTROL FUNCTIONS.
- C. RECORD CONTROLLER SETTINGS AND NOTE VARIANCES BETWEEN SETPOINTS AND ACTUAL MEASUREMENTS.
- D. CHECK FREE TRAVEL AND PROPER OPERATION OF CONTROL DEVICES.
- E. NOTE OPERATION OF ELECTRIC ACTUATORS USING SPRING RETURN FOR PROPER FAIL-SAFE OPERATIONS.
- 7.6 TOLERANCES
- A. SET HVAC SYSTEM AIRFLOW RATES WITHIN THE FOLLOWING TOLERANCES:
- 1) AIR OUTLETS: +0 TO -5 %.
- 7.7 FINAL REPORT
- A. GENERAL: COMPUTER PRINTOUT IN LETTER-QUALITY FONT, ON STANDARD BOND PAPER, IN THREE-RING BINDER.
- B. FINAL REPORT CONTENTS: IN ADDITION TO CERTIFIED FIELD REPORT DATA, INCLUDE THE FOLLOWING:
- 1) INFORMATION RELATIVE TO EQUIPMENT PERFORMANCE, BUT DO NOT INCLUDE SHOP DRAWINGS AND PRODUCT DATA.
- C. GENERAL REPORT DATA: IN ADDITION TO FORM TITLES AND ENTRIES, INCLUDE THE FOLLOWING DATA IN THE FINAL REPORT, AS APPLICABLE:
- 1) ON TEST PAGE:
- a) NAME AND ADDRESS OF TAB FIRM OR CONTRACTOR.
- b) PROJECT NAME.
- c) PROJECT LOCATION.
- d) ENGINEER'S NAME AND ADDRESS.
- e) REPORT DATE.
- 2) TABLE OF CONTENTS: NUMBER EACH PAGE IN THE REPORT.

- 3) DATA FOR ROOF TOP UNITS, DEDICATED OUTDOOR AIR UNITS, ENERGY RECOVERY VENTILATION UNITS, DUCTLESS HEAT PUMPS AND FAN COILS, AND EXHAUST FANS INCLUDING MANUFACTURER, TYPE SIZE, AND FITTINGS.
- 4) NOTES TO EXPLAIN WHY CERTAIN FINAL DATA IN THE BODY OF REPORTS VARIES FROM INDICATED VALUES.
- D. SYSTEM DIAGRAMS WHERE VARIATIONS OCCUR BETWEEN FINAL SYSTEMS AND CONTRACT DOCUMENTS: INCLUDE SCHEMATIC LAYOUTS OF AIR DISTRIBUTION SYSTEMS. PRESENT EACH SYSTEM WITH SINGLE-LINE DIAGRAM AND INCLUDE THE FOLLOWING:
- 1) QUANTITIES OF SUPPLY AIRFLOW (CFM).
- 2) ELECTRIC HEAT KW.
- 3) DUCT SIZES (INCH).
- 4) TERMINAL UNITS.
- E. AIR-DEVICE REPORTS:
- 1) UNIT DATA:
- a) AIR-DEVICE MANUFACTURER, TYPE, SIZE, AND MODEL NUMBER.
- 2) TEST DATA (INDICATED AND ACTUAL VALUES):
- a) AIRFLOW RATE (CFM).
- b) PRELIMINARY AIRFLOW RATE, AS NEEDED, (CFM).
- c) FINAL AIRFLOW RATE (CFM).
- d) SPACE TEMPERATURE (°F).
- F. SYSTEM HEATING OR COOLING COIL REPORTS: INCLUDE THE FOLLOWING:
- 1) UNIT DATA:
- 2) TEST DATA (INDICATED AND ACTUAL VALUES):
- a) AIRFLOW RATE (CFM).
- b) ENTERING- AND LEAVING-AIR TEMPERATURE (°F).

8. SUBMITTALS

- 8.1 PROVIDE SUBMITTALS FOR THE FOLLOWING:

- A. DIFFUSERS & GRILLES
- B. DUCT SEALER
- C. INSULATIONS & MASTICS
- D. DAMPERS & TAKE-OFFS
- E. FLEX DUCT
- F. DUCTWORK
- G. AABC CONTRACTOR QUALIFICATIONS
- H. AIR TEST AND BALANCE REPORT

USC Aiken - Student Success Center
Office Addition

152 Scholar Loop

Aiken, SC 29801

GMC # AGRE160041

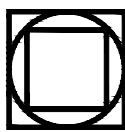
OSE# H27-D232-PD

OWNER REVIEW

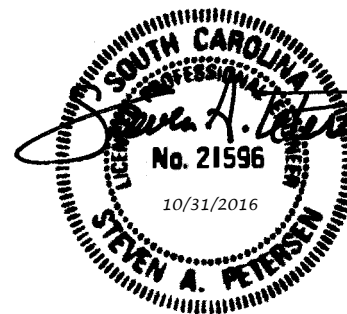
MECHANICAL
SPECIFICATIONS

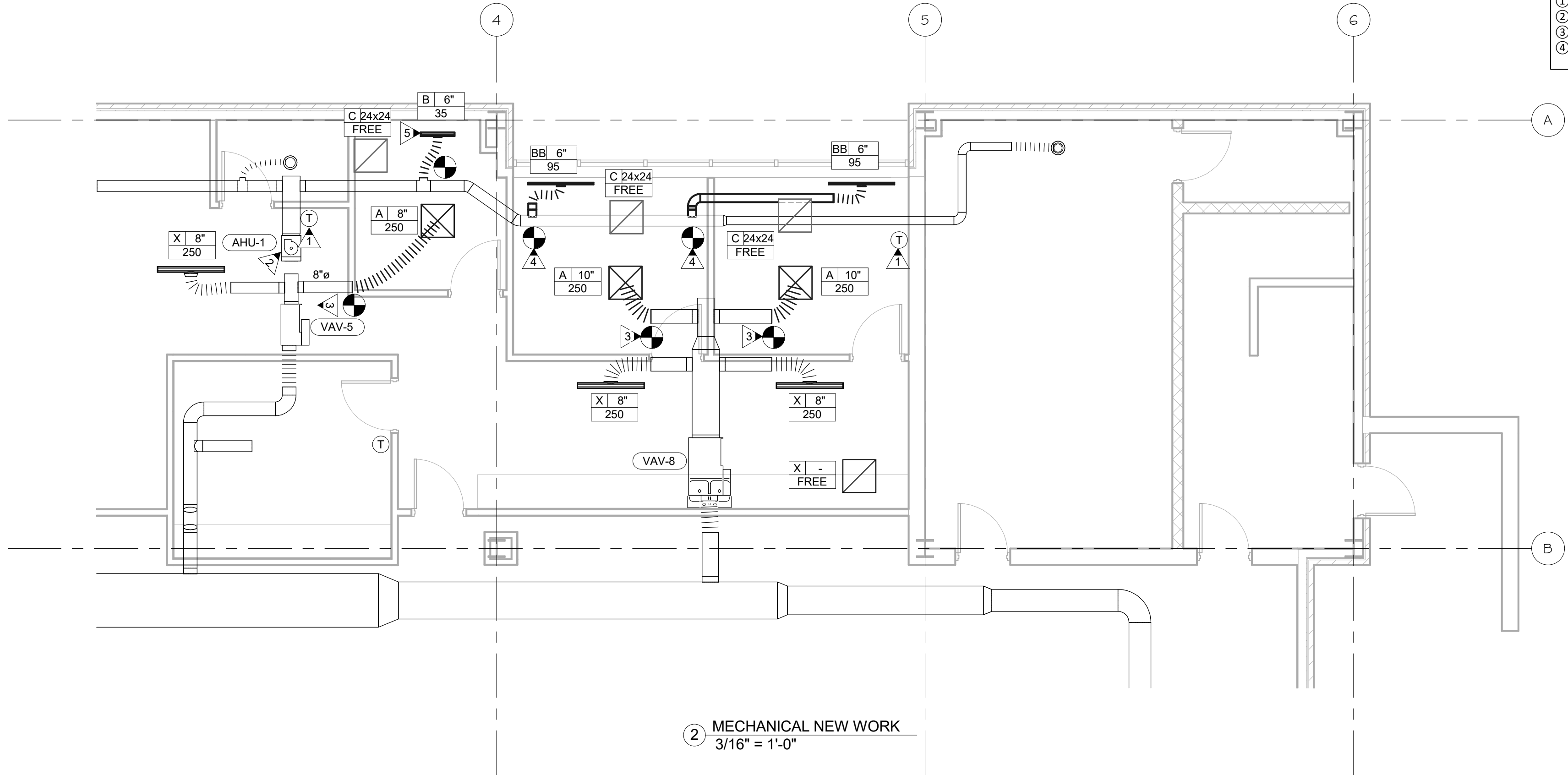
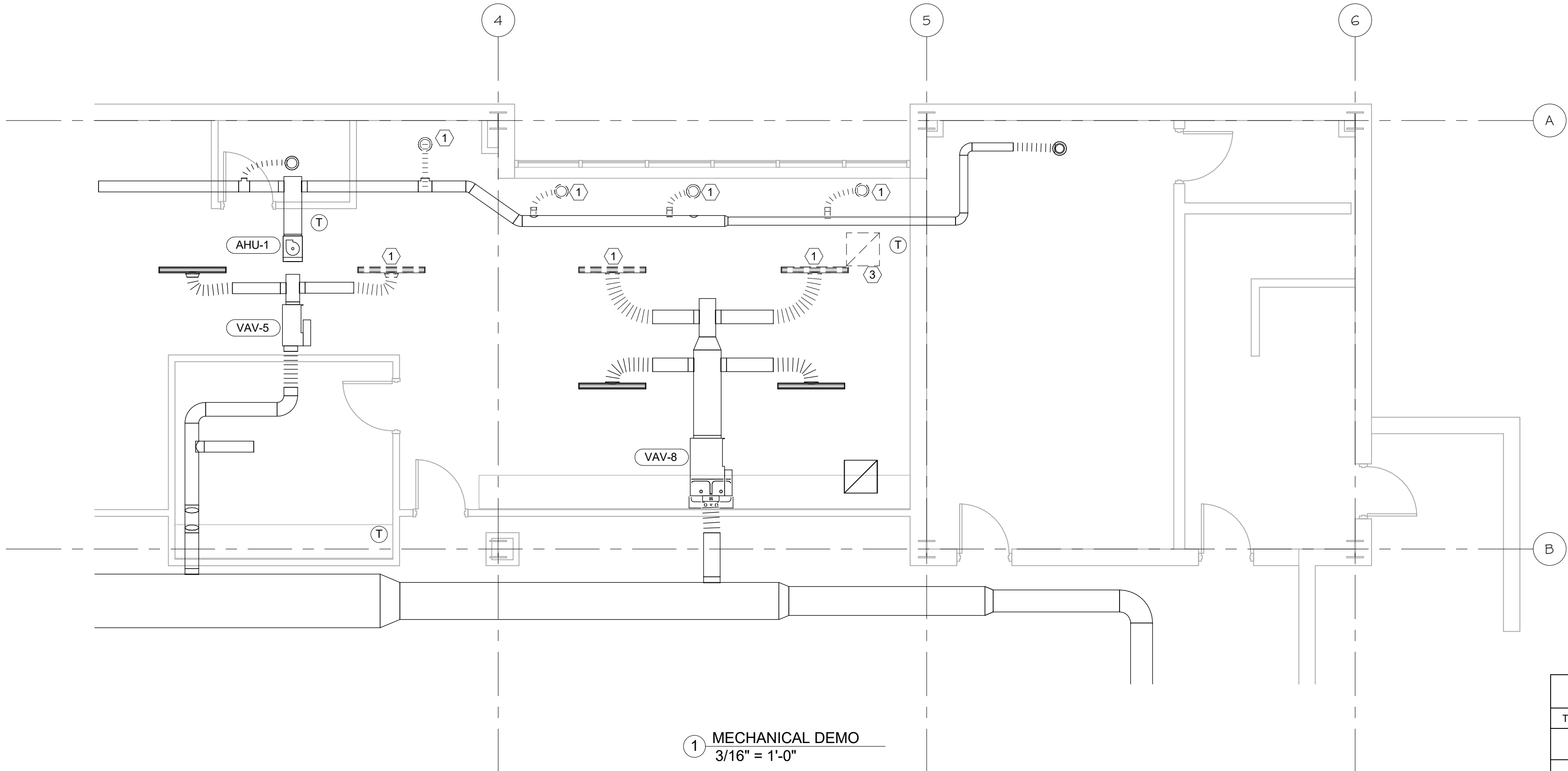
M001
Sheet of

GOODWYN MILLS CAWOOD



101 East Washington Street, Suite 200 | Greenville, SC 29601
Tel 64.527 GMCNETWORK.COM





DEMOLITION KEYNOTES

- 1 DEMO AND REMOVE SUPPLY DIFFUSER, FLEX DUCT AND ALL ASSOCIATED ACCESSORIES. PREPARE DUCT FOR NEW WORK.
- 2 DEMO AND REMOVE SUPPLY DIFFUSER, FLEX DUCT AND ALL ASSOCIATED ACCESSORIES. CAP AND SEAL WITH LIKE MATERIALS AND METHODS.
- 3 DEMO AND REMOVE RETURN GRILL AND ALL ASSOCIATED ACCESSORIES.

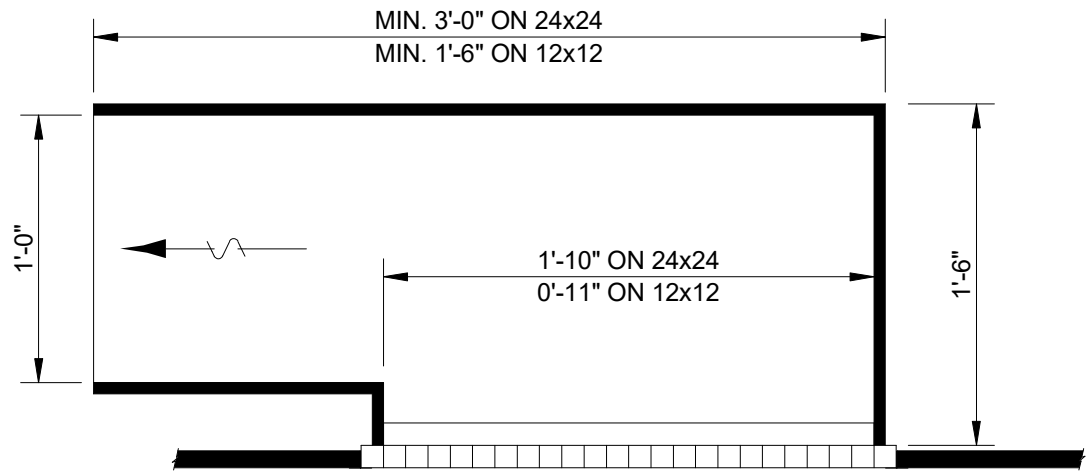
NEW WORK KEYNOTES

- 1 EXISTING THERMOSTAT TO REMAIN.
- 2 EXISTING PERIMETER AIR HANDLING UNIT TO BE CLEANED AND SERVICED ACCORDING TO MANUFACTURE SPECIFICATIONS.
- 3 INSTALL NEW FLEX DUCT TO NEW SUPPLY DIFFUSER.
- 4 REMOVE EXISTING 4" TAP AND INSTALL NEW 6" TAP. PROVIDE NEW FLEX DUCT TO NEW LINEAR SLOT DIFFUSER.
- 5 PROVIDE NEW 4" FLEX DUCT TO NEW SLOT DIFFUSER. PROVIDE TRANSITION AT SLOT DIFFUSER CONNECTION TO 6".

AIR DEVICE SCHEDULE

TAG	MANUFACTURER	MODEL	DESCRIPTION	SERVICE	MOUNTING	DEFLECTION	MAX NC	FACE SIZE	FINISH	OPTIONS:
A	TITUS	OMNI	SQUARE PLAQUE	SUPPLY	LAY-IN	4-WAY	<20	24"x24"	WHITE	1 2
B	TITUS	TBD-30	LINEAR SLOT DIFFUSER 1 SLOT, 1" SLOT WIDTH	SUPPLY	LAY-IN	-	<20	24"	WHITE	1 2 3
BB	TITUS	TBD-30	LINEAR SLOT DIFFUSER 1 SLOT, 1" SLOT WIDTH	SUPPLY	LAY-IN	-	<20	48"	WHITE	1 2 3
C	TITUS	50F	EGGCRATE RETURN	RETURN	LAY-IN	-	<20	24"x24" 24"x12"	WHITE	1 2 4
X	EXISTING			-	-	-	-	-	-	-

OPTIONS & COMMENTS:
1 SUBMITTALS SHALL INCLUDE PERFORMANCE CHARACTERISTICS AT LISTED CFM IN TABULAR FORMAT.
2 COLOR SHALL BE MANUFACTURER'S STANDARD WHITE.
3 INSTALL DEVICE WITH PROPER SUPPORT FROM THE GRID, NOT THE CEILING TILE.
4 PROVIDE LOW PROFILE 24/12 SOUND BOOT ON DEVICE.

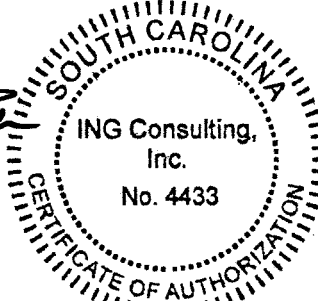
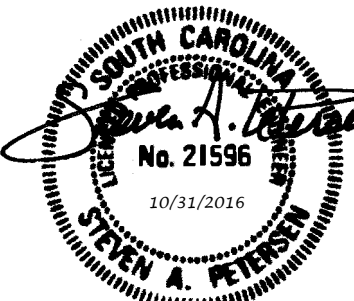


1" THICK FIBERGLASS DUCTBOARD EQUAL TO CERTAINTEEED "TOUGHGARD".

24x24 OR 24x12 LAY-IN EGGCRATE WITH 22x22 NECK. FIELD MODIFY SIZE OF GRILLE PANEL AND PLENUM BOOT AS REQUIRED FOR TO FIT A/T GRID LOCATION. MAX TRIM OF GRILLE 6" FOR FIT BEFORE RELOCATING

DETAIL - 24"x24" RETURN PLENUM BOOT

M101 SCALE: NONE



10/31/2016 3:14:21 PM

USC Aiken - Student Success Center
Office Addition

152 Scholar Loop

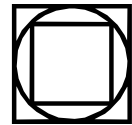
Aiken, SC 29801

GMC # AGRE160041

OSE# H27-D232-PD

ISSUE FOR BID

GOODWYN | MILLS | CAWOOD



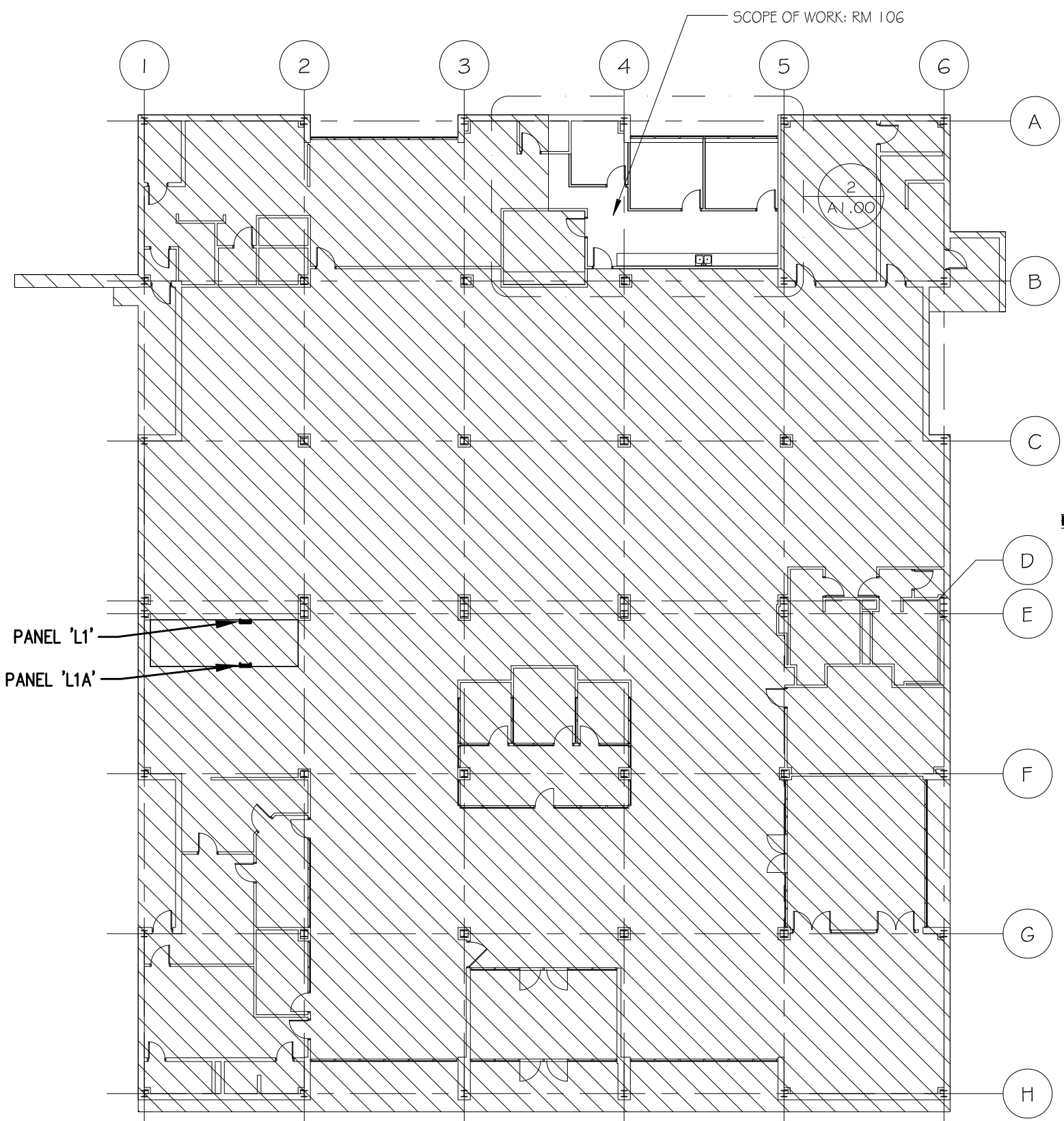
101 East Washington Street, Suite 200 | Greenville, SC 29601
Tel864.527.0460 GMCNETWORK.COM

drawn by: RGS
checked by: ISAP

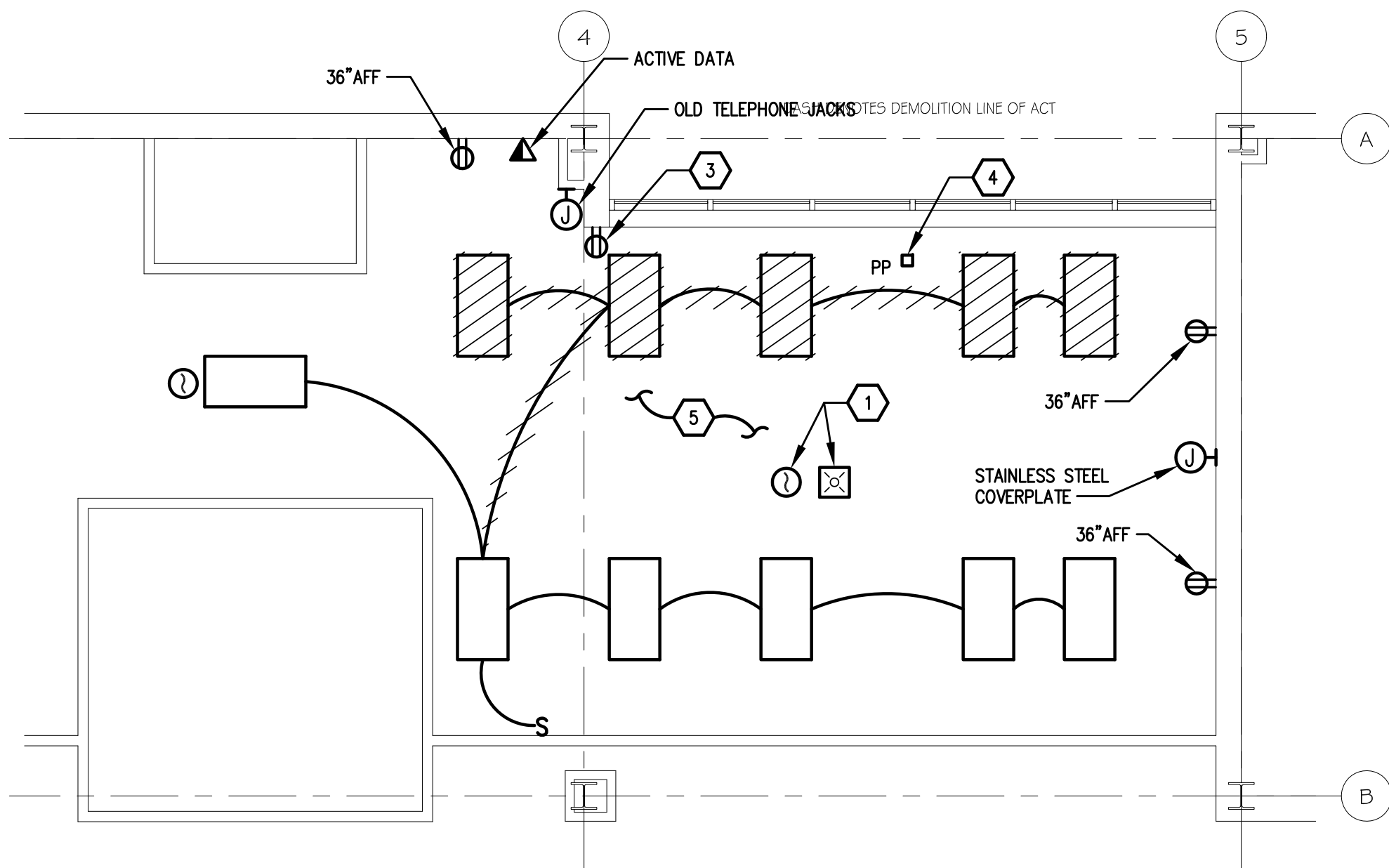
MECHANICAL PLANS,
SCHEDULES & DETAILS

M101
sheet of

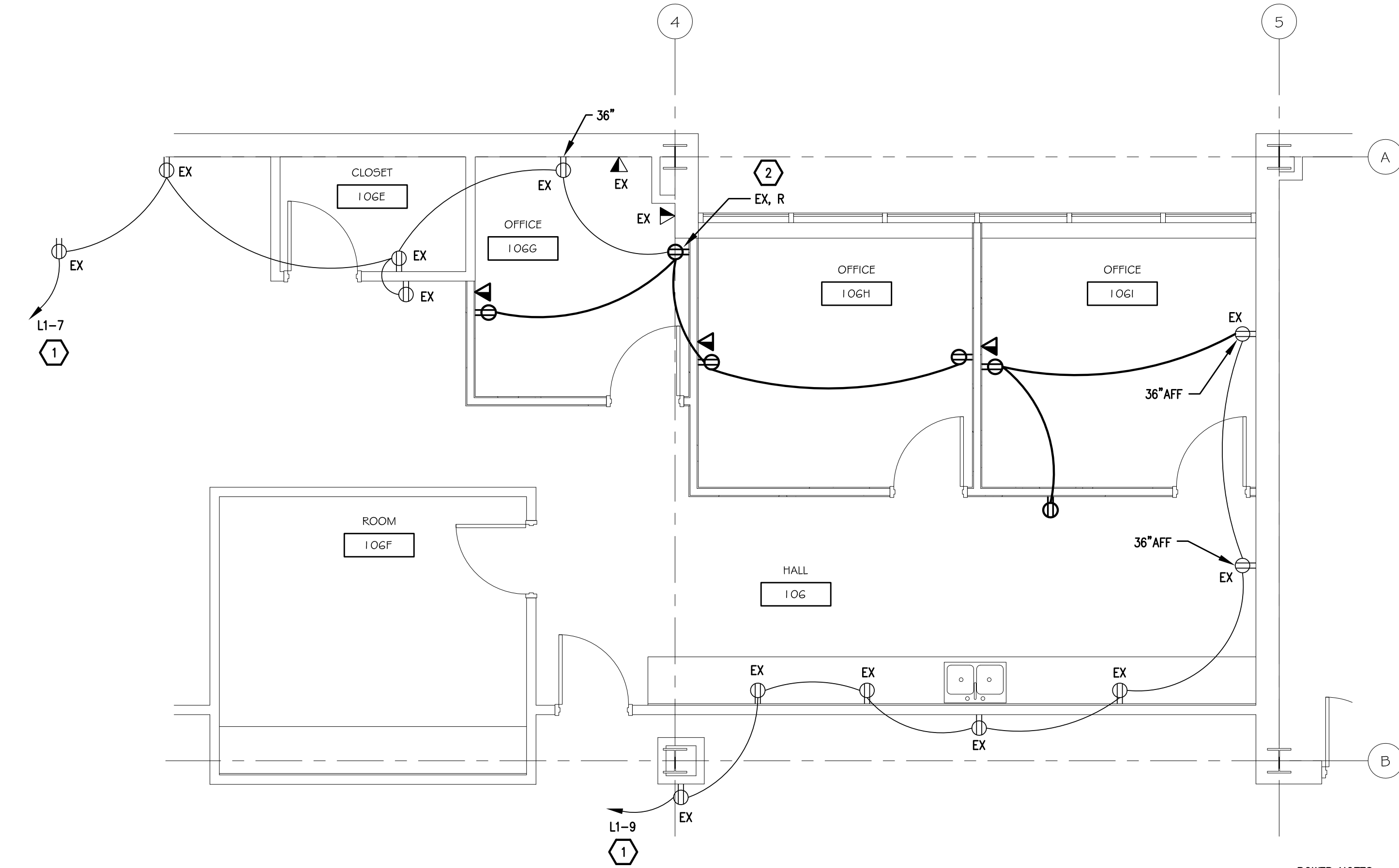
P:\P\AD\16845 USC Aiken (GOODWYN MILLS CAWOOD)\16845A\E101.dwg, 10/28/2016 11:42:36 AM, Adobe PDF



A ELECTRICAL KEY PLAN
E1.01 SCALE: 3/64" = 1'-0"
3/64" = 1'-0"



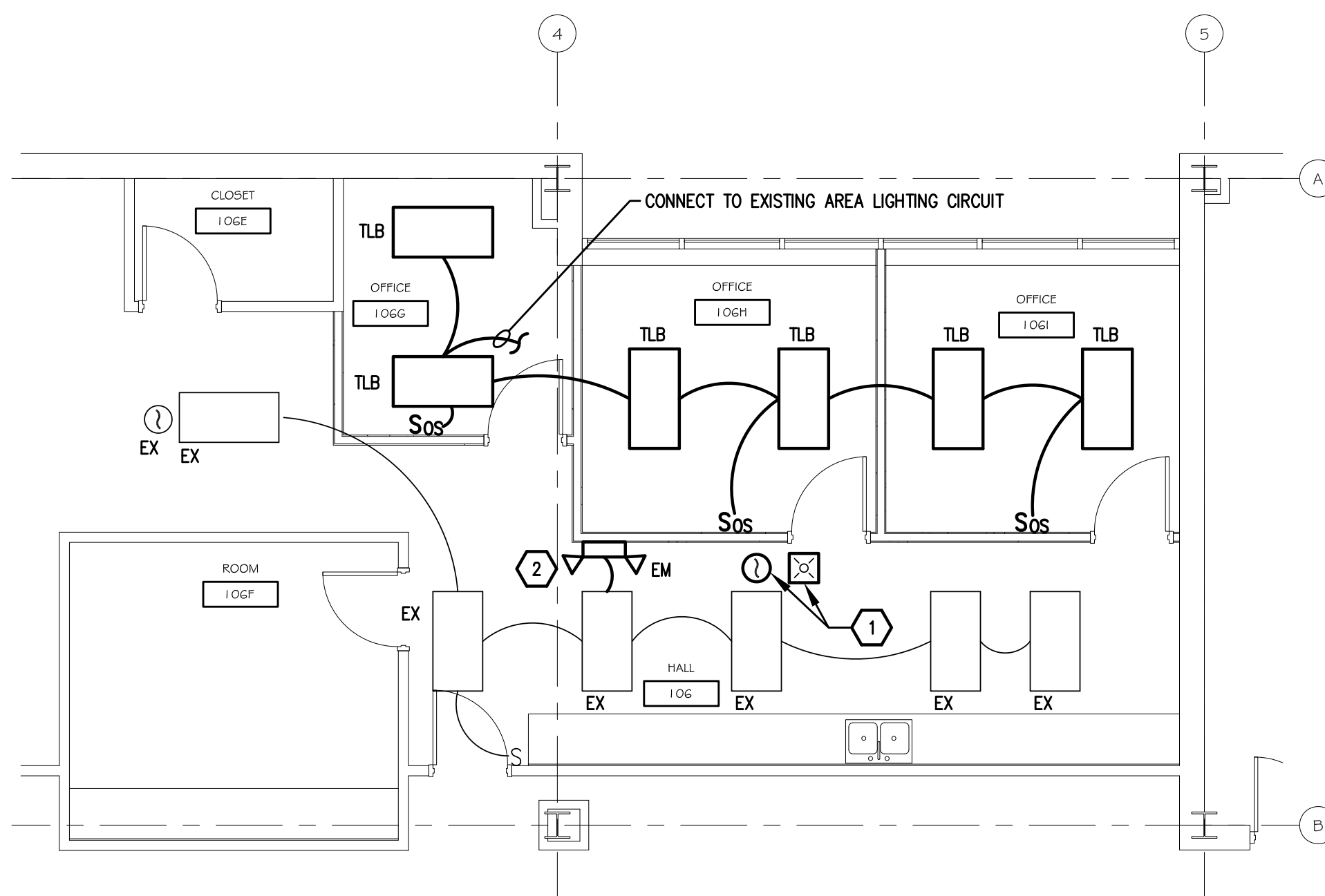
C ELECTRICAL DEMOLITION PLAN
E1.01 SCALE: 3/16" = 1'-0"
3/16" = 1'-0"



B ELECTRICAL POWER PLAN
E1.01 SCALE: 1/4" = 1'-0"
3/64" = 1'-0"

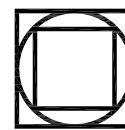
- POWER NOTES:**
- EXISTING CIRCUITS SHOWN ARE TAKEN FROM EXISTING PLANS. CONTRACTOR TO VERIFY EXISTING QUANTITY OF OUTLETS, VERIFY PANEL CIRCUIT NUMBER AND BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ENGINEER. RELABEL PANEL CIRCUITS TO REFLECT CONDITIONS.
 - REWORK EXISTING WALL MOUNTED OUTLET AS SHOWN TO ALLOW CONSTRUCTION OF NEW PARTITION WALL.
 - ALL NEW DEVICES AND COVERPLATES SHALL BE IVORY TO MATCH EXISTING.

- DEMOLITION NOTES:**
- REMOVE CEILING MOUNTED SMOKE DETECTOR AND STROBE AND RELOCATE AS SHOWN ON LIGHTING PLAN.
 - REMOVE EXISTING LIGHTING SHOWN HATCHED, LEAVING REST OF FIXTURES TO REMAIN OPERATIONAL AND SWITCHED AS EXISTING.
 - RELOCATE EXISTING OUTLET ALL REQUIRED TO ALLOW NEW WALL. REINSTALL IN NEW WALL.
 - REMOVE EXISTING POWER POLE AND ASSOCIATED WIRING BACK TO NEAREST JUNCTION BOX.
 - REPLACE ALL EXISTING COVERS AND INSTALL PLUGS IN OPEN HOLES OF JUNCTION BOXES ABOVE CEILING IN AREA OF WORK.



D ELECTRICAL LIGHTING PLAN
E1.01 SCALE: 3/16" = 1'-0"
3/16" = 1'-0"

- LIGHTING NOTES:**
- RELOCATE EXISTING SMOKE DETECTOR AND STROBE. TEST SMOKE DETECTOR AND STROBE OPERATION.
 - CONNECT EMERGENCY LIGHT TO EXISTING NON SWITCHED AREA LIGHTING CIRCUIT.



USC Aiken - Student Success Center Office

Addition

GMC # AGRE160041

OSE#

OWNER REVIEW



ELECTRICAL LIGHTING AND
POWER PLANS

E1.01
sheet of