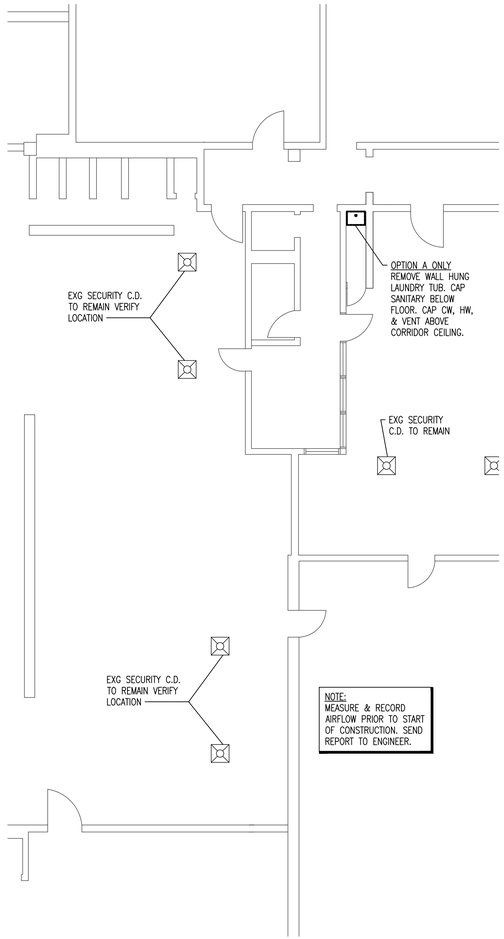
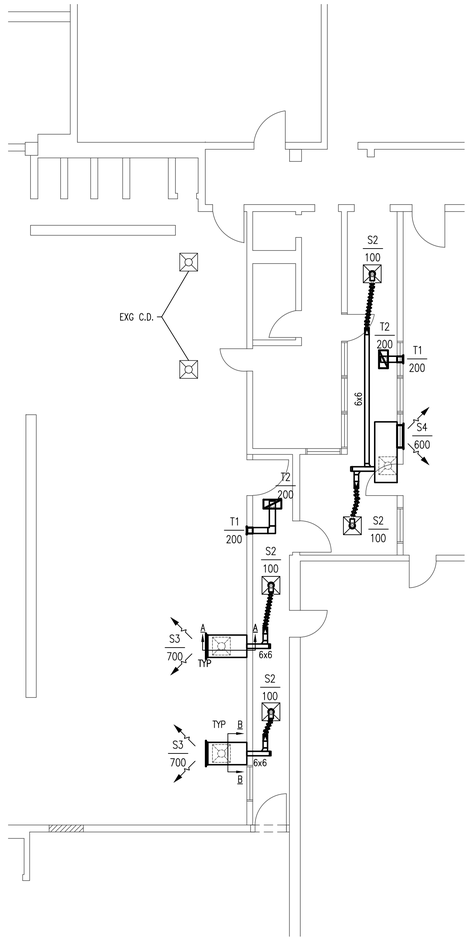


NORTH

HOLDING AREA
PARTIAL MECHANICAL PLAN - EXISTING

SCALE 1/8" = 1'-0"



NORTH

HOLDING AREA
PARTIAL MECHANICAL PLAN - OPTION A

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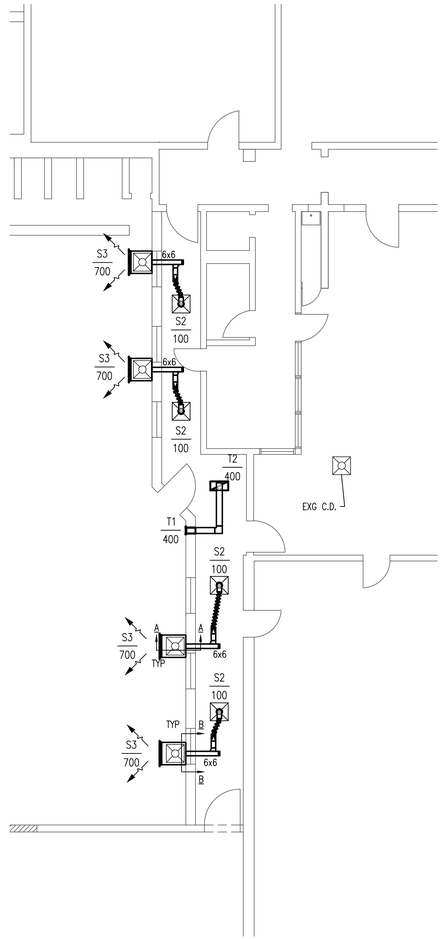

NORTH

HOLDING AREA
PARTIAL MECHANICAL PLAN - OPTION B

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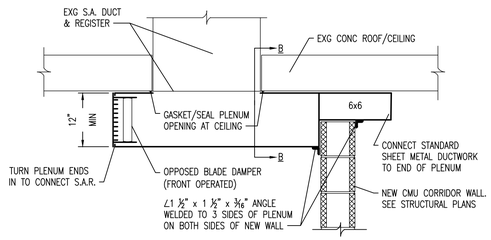
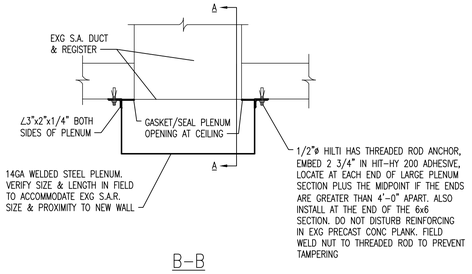
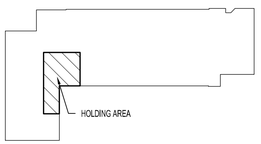


A–A



B–B

1 M101 **HOLDING AREA SUPPLY AIR PLENUM**
NO SCALE



NORTH

KEY PLAN

SCALE: N.T.S.

SNYDER & STALEY ENGINEERING, P.L.C.
CONSULTING ENGINEERS
3085 BAY ROAD, SUITE 6
SAGINAW, MI 48603
PH: (989) 797-1710 FX: (989) 797-1715

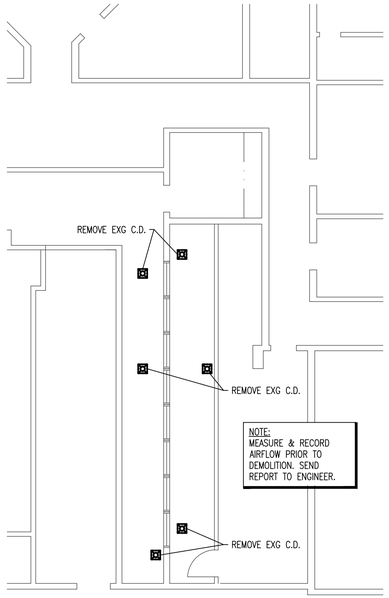
PROJECT TITLE:
CLARE COUNTY JAIL MODIFICATIONS
KLM BUILDING DESIGNS
HARRISON, MI

SHEET TITLE:
HOLDING AREA PARTIAL
MECHANICAL PLANS

ISSUED FOR

10/23/17	CONSTRUCTION

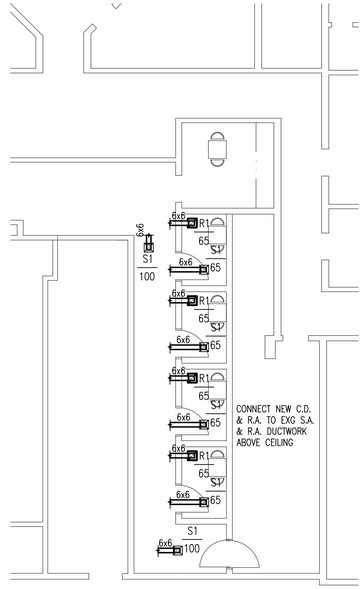
PROJECT NUMBER: 17-797-199
DATE: 10/19/2017
DRAWN BY: CAM
CHK'D BY: SSC
SHEET NUMBER: M101
SHT 1 OF 3



NORTH

CONSULTATION AREA
PARTIAL MECHANICAL PLAN - EXIST

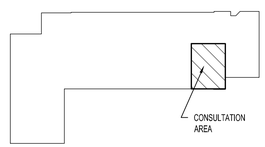
SCALE 1/8" = 1'-0"



NORTH

CONSULTATION AREA
PARTIAL MECHANICAL PLAN

SCALE 1/8" = 1'-0"



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SHEET TITLE:
CONSULTATION AREA
PARTIAL MECHANICAL PLANS

ISSUED FOR

10/23/17	CONSTRUCTION

PROJECT NUMBER: 17-797-199
DATE: 10/19/2017
DRAWN BY: CAM
CHK'D BY: SSC
SHEET NUMBER: M102
SHT 2 OF 3

MECHANICAL SPECIFICATIONS

1. MECHANICAL DRAWINGS
   - 1.1. DRAWINGS SHOW ARRANGEMENT, GENERAL DESIGN, EXTENT OF WORK, ARE MORE OR LESS DIAGRAMMATIC WITH EQUIPMENT IN ITS GENERAL LOCATION. CONTRACTOR IS REQUIRED TO PROVIDE INSTALLATION THAT CONFORMS TO CODES, LAWS, RULES AND OR REGULATIONS WHETHER SPECIFICALLY DETAILED OR NOT.
   - 1.2. THE CONTRACTOR SHALL INSTALL/RELOCATE PIPING, DUCTWORK, ETC. TO ALLOW MAXIMUM CEILING HEIGHTS AS SHOWN ON THE ARCHITECTURAL DRAWINGS. CONTRACTORS OF ALL TRADES SHALL COORDINATE INSTALLATION OF THEIR RESPECTIVE EQUIPMENT/MATERIALS WITH EACH OTHER IN ORDER TO PROVIDE MAXIMUM SPACE TO MEET THE INTENT OF THE DESIGN.

2. PERMITS
   - 2.1. THE CONTRACTOR IS TO SECURE PERMITS FOR ALL INSPECTION AND PERFORM ALL TESTS REQUIRED IN CONNECTION WITH THIS WORK. UPON COMPLETION OF WORK, THE CONTRACTOR MUST SECURE AND PRESENT TO THE OWNER CERTIFICATES OF INSPECTION AND APPROVAL FROM THE DEPARTMENT HAVING JURISDICTION OVER HIS WORK, IF SUCH BE ISSUED.

3. EXAMINATION OF PREMISES
   - 3.1. BEFORE SUBMITTING PROPOSALS FOR WORK, EACH BIDDER MUST EXAMINE THE PREMISES AND VERIFY EXISTING CONDITIONS UNDER WHICH HE WILL BE OBLIGED TO OPERATE IN PERFORMING HIS PART OF THE WORK. NO EXTRAS WILL BE ALLOWED ON ACCOUNT OF HIS FAILURE TO MAKE THE ABOVE EXAMINATION OR NEGLECT TO INCLUDE ALL MATERIAL AND LABOR REQUIRED TO COMPLETE WORK.

4. GUARANTEE
   - 4.1. THE CONTRACTOR SHALL FURNISH, OVER AND ABOVE MANUFACTURERS' GUARANTEES, WRITTEN GUARANTEE COVERING ALL MATERIALS AND WORKMANSHIP UNDER HIS CONTRACT FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. UNDER THE ABOVE GUARANTEE, THE CONTRACTOR AGREES TO REMEDY ANY DEFECTS IN MATERIALS AND WORKMANSHIP APPEARING DURING THE GUARANTEE PERIOD AND TO PAY FOR ANY DAMAGE TO OTHER WORK RESULTING THEREFROM.

5. SHOP DRAWINGS
   - 5.1. SUBMIT SHOP DRAWINGS AND OBTAIN WRITTEN APPROVAL OF SAME FROM THE ENGINEER BEFORE ORDERING EQUIPMENT FOR INSTALLATION OF SAME. EQUIPMENT ORDERED OR INSTALLED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER WILL BE SUBJECT TO NON-ACCEPTANCE. SHOP DRAWING SHALL CONSIST OF MANUFACTURERS CUTS, SCALE DRAWINGS, OR CATALOGS, INCLUDING DIMENSIONS, DESCRIPTION, LITERATURE, AND COMPLETE CHARACTERISTICS OF THE EQUIPMENT. A SET OF SHOP DRAWINGS SHALL BE SUPPLIED TO THE OWNER UPON COMPLETION OF THE JOB.

6. RECORD DOCUMENTS
   - 6.1. SUBMIT TWO SETS OF CLEAN, READABLE, MARKED-UP RECORD PRINTS.
   - 6.2. RECORD DRAWINGS
     - 6.2.1. RECORD PRINTS: MAINTAIN ONE SET OF BLACK-LINE WHITE PRINTS OF THE CONTRACT DRAWINGS AND SHOP DRAWINGS.
     - 6.2.2. PREPARATION: MARK RECORD PRINTS TO SHOW THE ACTUAL INSTALLATION WHERE INSTALLATION VARIES FROM THAT SHOWN ORIGINALLY. REQUIRE INDIVIDUAL OR ENTITY WHO OBTAINED RECORD DATA, WHETHER INDIVIDUAL OR ENTITY IS INSTALLER, SUBCONTRACTOR, OR SIMILAR ENTITY, TO PREPARE THE MARKED-UP RECORD PRINTS. GIVE PARTICULAR ATTENTION TO INFORMATION ON CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO IDENTIFY OR MEASURE AND RECORD LATER. RECORD DATA AS SOON AS POSSIBLE AFTER OBTAINING IT. RECORD AND CHECK THE MARKUP BEFORE ENCLOSING CONCEALED INSTALLATIONS.
     - 6.2.3. MARK RECORD SETS WITH ERASABLE, RED-COLORED PENCIL. USE OTHER COLORS TO DISTINGUISH BETWEEN CHANGES FOR DIFFERENT CATEGORIES OF THE WORK AT SAME LOCATION.
     - 6.2.4. NOTE CONSTRUCTION CHANGE DIRECTIVE NUMBERS, ALTERNATE NUMBERS, CHANGE ORDER NUMBERS, AND SIMILAR IDENTIFICATION, WHERE APPLICABLE.
     - 6.2.5. FORMAT: IDENTIFY AND DATE EACH RECORD DRAWING; INCLUDE THE DESIGNATION "PROJECT RECORD DRAWING" IN A PROMINENT LOCATION. ORGANIZE RECORD PRINTS AND NEWLY PREPARED RECORD DRAWINGS INTO MANAGEABLE SETS. BIND EACH SET WITH DURABLE PAPER COVER SHEETS. INCLUDE IDENTIFICATION ON COVER SHEETS INCLUDING: PROJECT NAME, DATE, DESIGNATION "PROJECT RECORD DRAWINGS," NAME OF ENGINEER AND ARCHITECT (IF APPLICABLE), NAME OF CONTRACTOR.
   - 6.3. RECORDING: MAINTAIN ONE COPY OF EACH SUBMITTAL DURING THE CONSTRUCTION PERIOD FOR PROJECT RECORD DOCUMENT PURPOSES. POST CHANGES AND MODIFICATIONS TO PROJECT RECORD DOCUMENTS AS THEY OCCUR; DO NOT WAIT UNTIL THE END OF PROJECT.
   - 6.4. MAINTENANCE OF RECORD DOCUMENTS: STORE RECORD DOCUMENTS IN THE FIELD OFFICE APART FROM THE CONTRACT DOCUMENTS USED FOR CONSTRUCTION. DO NOT USE PROJECT RECORD DOCUMENTS FOR CONSTRUCTION PURPOSES. MAINTAIN RECORD DOCUMENTS IN GOOD ORDER AND IN A CLEAN, DRY, LEGIBLE CONDITION, PROTECTED FROM DETERIORATION AND LOSS.

7. SLEEVES AND FLASHING
   - 7.1. THE CONTRACTOR SHALL FURNISH AND SET ALL SLEEVES AND FLASHING FOR HIS WORK AS REQUIRED FOR PIPING, ETC. WHERE PASSING THRU FLOORS OR WALLS.

8. CUTTING AND PATCHING
   - 8.1. ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THE SYSTEMS SPECIFIED SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ACCOMPLISHED UNDER THE DIRECTION OF AND TO THE SATISFACTION OF THE ARCHITECT. COORDINATE WITH ALL OTHER TRADES. NO CUTTING OF STRUCTURAL WORK SHALL BE PERMITTED UNTIL THE ENGINEER GIVES APPROVAL.

9. DAMAGE TO OTHER WORK
   - 9.1. EACH CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE CAUSED BY HIS WORK OR THRU NEGLECT OF HIS WORKMAN. ALL PATCHING AND REPAIRING OF DAMAGED WORK WILL BE DONE BY THE CONTRACTOR WHO INSTALLED THE WORK, AS DIRECTED BY THE ARCHITECT OR ENGINEER, BUT COST OF SAME SHALL BE PAID BY CONTRACTOR CREATING DAMAGE.

10. CLEANING UP
    - 10.1. THE CONTRACTOR SHALL, AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH CAUSED WHILE PERFORMING WORK. AND AT COMPLETION OF WORK, HE SHALL REMOVE ALL RUBBISH, TOOLS, AND SURPLUS MATERIALS FROM AND ABOUT THE BUILDING. THE CONTRACTOR SHALL LEAVE THE AREA "BROOM CLEAN."
    - 10.2. COMPLY WITH THE OWNER'S REQUIREMENTS FOR SECURITY OF TOOLS AND EQUIPMENT AS WELL AS ANY PERSONNEL RESTRICTIONS.

11. EQUIPMENT AND MATERIAL INSTALLATION
    - 11.1. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS AND REQUIREMENTS.

12. EQUIPMENT AND PIPE IDENTIFICATION
    - 12.1. LABEL EACH DUCT INDICATING ITS RESPECTIVE SERVICE (S.A., R.A., OR O.A.) W/ ARROWS SHOWING DIRECTION OF FLOW ADJACENT TO EACH LABEL. APPLY IDENTIFICATION AT FIFTY FEET MAXIMUM INTERVALS IN STRAIGHT RUNS, AT EACH WALL SLEEVE, AT EACH DIRECTION CHANGE, AT SHUT-OFF VALVES, AND IN ACCESS PANELS.
    - 12.2. IDENTIFY EQUIPMENT WITH PAINTED STENCIL OR BLACK MICARTA PLATES WITH WHITE ENGRAVED LETTERING AFTER COVERING OR FINISH PAINTING. STENCILING FOR EQUIPMENT SHALL BE 1-1/8" HIGH. EQUIPMENT NUMBERS SHALL CORRESPOND TO THOSE INDICATED ON THE DRAWINGS.

13. INSULATION
    - 13.1. SCHEDULE OF REQUIRED INSULATION:
      - 13.1.1. DUCTWORK
        - 13.1.1.1. REFER TO DUCT INSULATION SCHEDULE
      - 13.1.2. INTERNAL DUCT SOUND LINING (SUPPLY AND RETURN):
        - 13.1.2.1. 1" THICK IN BRANCH DUCT FROM RETURN AIR REGISTER TO TRUNK DUCT.
        - 13.1.2.2. CONFORMING TO ASTM C 1071 TYPE I AND NFPA 90A & 90B; GREENGUARD COMPLIANT, OR RIGID PLENUM LINER COMPLYING WITH ASTM C 1071 TYPE II AND NFPA 90A & 90B.
        - 13.1.2.3. 'K' VALUE: ASTM C 177, 0.24 AT 75°F MEAN TEMPERATURE.
        - 13.1.2.4. NOISE REDUCTION COEFFICIENT (NRC): ASTM C 423 TYPE A MOUNTING, 0.45 OR HIGHER FOR ½" PRODUCT, 0.70 OR HIGHER FOR 1" PRODUCT.

14. DUCTWORK
    - 14.1. DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESSES, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, AND HANGERS AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED IN "DUCT SCHEDULE."
    - 14.2. AIRSTREAM SURFACES: SURFACES IN CONTACT WITH THE AIRSTREAM SHALL COMPLY WITH REQUIREMENTS IN ASHRAE 62.1.
    - 14.3. RECTANGULAR DUCTS AND FITTINGS GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
    - 14.4. ROUND DUCTS AND FITTINGS 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.
    - 14.5. SHEET METAL MATERIALS
      - 14.5.1. GENERAL MATERIAL REQUIREMENTS: 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.
      - 14.5.2. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.
      - 14.5.3. GALVANIZED COATING DESIGNATION: G60.
      - 14.5.4. FINISHES FOR SURFACES EXPOSED TO VIEW: MILL PHOSPHATIZED.
      - 14.5.5. REINFORCEMENT SHAPES AND PLATES: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.
      - 14.5.6. WHERE BLACK- AND GALVANIZED-STEEL SHAPES AND PLATES ARE USED TO REINFORCE ALUMINUM DUCTS, ISOLATE THE DIFFERENT METALS WITH BUTYL RUBBER, NEOPRENE, OR EPDM GASKET MATERIALS.
    - 14.6. SEALANT AND GASKETS
      - 14.6.1. GENERAL SEALANT AND GASKET REQUIREMENTS: SURFACE-BURNING CHARACTERISTICS FOR SEALANTS AND GASKETS SHALL BE A MAXIMUM FLAME-SPREAD INDEX OF 25 AND A MAXIMUM SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO UL 723; CERTIFIED BY AN NRTL.
      - 14.6.2. WATER-BASED JOINT AND SEAM SEALANT: BRUSH ON; MINIMUM 65 PERCENT SOLIDS CONTENT; MINIMUM 20 SHORE A HARDNESS; WATER RESISTANT; MOLD AND MILDEW RESISTANT; MAXIMUM 75 G/L (LESS WATER) VOC CONTENT; 10-INCH WG, POSITIVE AND NEGATIVE MAXIMUM STATIC-PRESSURE CLASS; INDOOR OR OUTDOOR SERVICE; SUBSTRATE COMPATIBLE WITH GALVANIZED SHEET STEEL (BOTH PVC COATED AND BARE), STAINLESS STEEL, OR ALUMINUM SHEETS.
      - 14.6.3. FLANGED JOINT SEALANT: COMPLY WITH ASTM C 920. SINGLE-COMPONENT, ACID-CURING, SILICONE, ELASTOMERIC. TYPE S. GRADE NS. CLASS 25. USE O.
      - 14.6.4. FLANGE GASKETS: BUTYL RUBBER, NEOPRENE, OR EPDM POLYMER WITH POLYISOBUTYLENE PLASTICIZER.
      - 14.6.5. SEAL DUCTS FOR DUCT STATIC-PRESSURE, SEAL CLASSES, AND LEAKAGE CLASSES SPECIFIED IN "DUCT SCHEDULE" ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE."
    - 14.7. HANGERS AND SUPPORTS
      - 14.7.1. HANGER RODS FOR NONCORROSIVE ENVIRONMENTS: CADMIUM-PLATED STEEL RODS AND NUTS.
      - 14.7.2. STRAP AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," TABLE 5-1, "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT."
      - 14.7.3. CABLES, STRAPS, SUPPORTS, AND DUCT ATTACHMENTS (SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS): COMPATIBLE WITH DUCT MATERIALS.
    - 14.8. DUCT INSTALLATION
      - 14.8.1. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DUCT SYSTEM. INDICATED DUCT LOCATIONS, CONFIGURATIONS, AND ARRANGEMENTS WERE USED TO SIZE DUCTS AND CALCULATE FRICTION LOSS FOR AIR-HANDLING EQUIPMENT SIZING AND FOR OTHER DESIGN CONSIDERATIONS. INSTALL DUCT SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON SHOP DRAWINGS AND COORDINATION DRAWINGS.
      - 14.8.2. INSTALL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
      - 14.8.3. INSTALL DUCTS WITH FEWEST POSSIBLE JOINTS.
      - 14.8.4. INSTALL FACTORY- OR SHOP-FABRICATED FITTINGS FOR CHANGES IN DIRECTION, SIZE, AND SHAPE AND FOR BRANCH CONNECTIONS.
      - 14.8.5. UNLESS OTHERWISE INDICATED, INSTALL DUCTS VERTICALLY AND HORIZONTALLY, AND PARALLEL AND PERPENDICULAR TO BUILDING LINES.
      - 14.8.6. INSTALL DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING.
      - 14.8.7. WHERE DUCTS PASS THROUGH NON-FIRE-RATED INTERIOR PARTITIONS AND EXTERIOR WALLS AND ARE EXPOSED TO VIEW, COVER THE OPENING BETWEEN THE PARTITION AND DUCT OR DUCT INSULATION WITH SHEET METAL FLANGES OF SAME METAL THICKNESS AS THE DUCT. OVERLAP OPENINGS ON FOUR SIDES BY AT LEAST 1-1/2 INCHES.
      - 14.8.8. PROTECT DUCT INTERIORS FROM MOISTURE, CONSTRUCTION DEBRIS AND DUST, AND OTHER FOREIGN MATERIALS. COMPLY WITH SMACNA'S "IAQ GUIDELINES FOR OCCUPIED BUILDINGS UNDER CONSTRUCTION," APPENDIX G, "DUCT CLEANLINESS FOR NEW CONSTRUCTION GUIDELINES."
    - 14.9. INSTALLATION OF EXPOSED DUCTWORK
      - 14.9.1. PROTECT DUCTS EXPOSED IN FINISHED SPACES FROM BEING DENTED, SCRATCHED, OR DAMAGED.
      - 14.9.2. TRIM DUCT SEALANTS FLUSH WITH METAL. CREATE A SMOOTH AND UNIFORM EXPOSED BEAD. DO NOT USE TWO-PART TAPE SEALING SYSTEM.
      - 14.9.3. GRIND WELDS TO PROVIDE SMOOTH SURFACE FREE OF BURRS, SHARP EDGES, AND WELD SPLATTER. WHEN WELDING STAINLESS STEEL WITH A NO. 3 OR 4 FINISH, GRIND THE WELDS FLUSH, POLISH THE EXPOSED WELDS, AND TREAT THE WELDS TO REMOVE DISCOLORATION CAUSED BY WELDING.
      - 14.9.4. MAINTAIN CONSISTENCY, SYMMETRY, AND UNIFORMITY IN THE ARRANGEMENT AND FABRICATION OF FITTINGS, HANGERS AND SUPPORTS, DUCT ACCESSORIES, AND AIR OUTLETS.
      - 14.9.5. REPAIR OR REPLACE DAMAGED SECTIONS AND FINISHED WORK THAT DOES NOT COMPLY WITH THESE REQUIREMENTS.
      - 14.9.6. EXPOSED DUCTWORK INSTALLED IN INMATE AREAS SHALL BE INSTALLED TIGHT TO ROOF DECK WITH NO SHARP EDGES EXPOSED.
    - 14.10. HANGER AND SUPPORT INSTALLATION
      - 14.10.1. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," CHAPTER 5, "HANGERS AND SUPPORTS."
      - 14.10.2. BUILDING ATTACHMENTS: CONCRETE INSERTS, POWDER-ACTUATED FASTENERS, OR STRUCTURAL-STEEL FASTENERS APPROPRIATE FOR CONSTRUCTION MATERIALS TO WHICH HANGERS ARE BEING ATTACHED.
      - 14.10.3. HANGER SPACING: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," TABLE 5-1, "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT," FOR MAXIMUM HANGER SPACING; INSTALL HANGERS AND SUPPORTS WITHIN 24 INCHES OF EACH ELBOW AND WITHIN 48 INCHES OF EACH BRANCH INTERSECTION.
      - 14.10.4. HANGERS EXPOSED TO VIEW: THREADED ROD AND ANGLE OR CHANNEL SUPPORTS.
      - 14.10.5. INSTALL UPPER ATTACHMENTS TO STRUCTURES. SELECT AND SIZE UPPER ATTACHMENTS WITH PULL-OUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.
    - 14.11. CONNECTIONS
      - 14.11.1. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" FOR BRANCH, OUTLET AND INLET, AND TERMINAL UNIT CONNECTIONS.

15. BALANCING
    - 15.1. TAB CONTRACTOR QUALIFICATIONS: ENGAGE AN INDEPENDENT TAB ENTITY CERTIFIED BY ASSOCIATED AIR BALANCE COUNCIL (AABC); NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB); OR TESTING, ADJUSTING, AND BALANCING BUREAU (TABB).
    - 15.2. CERTIFY TAB FIELD DATA REPORTS AND PERFORM THE FOLLOWING:
      - 15.2.1. REVIEW FIELD DATA REPORTS TO VALIDATE ACCURACY OF DATA AND TO PREPARE CERTIFIED TAB REPORTS.
      - 15.2.2. CERTIFY THAT THE TAB TEAM COMPLIED WITH THE APPROVED TAB PLAN AND THE PROCEDURES.
    - 15.3. INSTRUMENTATION TYPE, QUANTITY, ACCURACY, AND CALIBRATION: AS DESCRIBED IN ASHRAE 111, SECTION 5, "INSTRUMENTATION."
    - 15.4. GENERAL PROCEDURES FOR TESTING AND BALANCING
      - 15.4.1. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN ASHRAE 111, NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS", OR SMACNA'S "HVAC SYSTEMS – TESTING, ADJUSTING, AND BALANCING."
      - 15.4.2. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES. AFTER TESTING AND BALANCING, PATCH PROBE HOLES IN DUCTS WITH SAME MATERIAL AND THICKNESS AS USED TO CONSTRUCT DUCTS. INSTALL AND JOIN NEW INSULATION THAT MATCHES REMOVED MATERIALS. RESTORE INSULATION, COVERINGS, VAPOR BARRIER, AND FINISH.
      - 15.4.3. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS.
      - 15.4.4. TAKE AND REPORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP) UNITS.
    - 15.5. PRE-CONSTRUCTION BALANCE REPORT
      - 15.5.1. PRIOR TO THE START OF DEMOLITION AND CONSTRUCTION OF THE PROJECT, VERIFY THE PERFORMANCE OF THE EXISTING SYSTEMS. THIS INFORMATION WILL BE USED TO BALANCE THE NEW EQUIPMENT.
      - 15.5.2. EVALUATE THE CONDITION OF THE EQUIPMENT AND NOTE DEFICIENCIES THAT WILL EFFECT THE MEASUREMENTS.
      - 15.5.3. MEASURE THE AIR FLOW RATES AND PRESSURES FOR SUPPLY, RETURN, AND OUTSIDE AIR OF THE AIR HANDLING UNIT.
      - 15.5.4. MEASURE AIR FLOW RATES AND PRESSURES AT LOCATIONS IN THE DUCTWORK WHERE NEW DUCTWORK WILL BE CONNECTED.
      - 15.5.5. MEASURE CURRENT DRAW OF AIR HANDLING UNIT FAN.
      - 15.5.6. INCLUDE ANY OTHER MEASUREMENTS NEEDED TO PUT THE NEW EQUIPMENT INTO SERVICE WITH THE EXISTING BUILDING EQUIPMENT TO REMAIN.
      - 15.5.7. TABULATE BALANCE INFORMATION SIMILAR TO THE FINAL REPORT SPECIFIED BELOW. SUBMIT A COPY OF THIS REPORT TO THE ENGINEER BEFORE DEMOLITION BEGINS.
    - 15.6. GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS
      - 15.6.1. PREPARE TEST REPORTS FAN. OBTAIN MANUFACTURER'S OUTLET FACTORS AND RECOMMENDED TESTING PROCEDURES. CROSSCHECK THE SUMMATION OF REQUIRED OUTLET VOLUMES WITH REQUIRED FAN VOLUMES.
      - 15.6.2. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT-AIRFLOW MEASUREMENTS.
      - 15.6.3. CHECK AIRFLOW PATTERNS FROM THE OUTDOOR-AIR LOUVERS AND DAMPERS AND THE RETURN-AIR DAMPERS THROUGH THE SUPPLY-FAN DISCHARGE AND MIXING DAMPERS.
      - 15.6.4. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
      - 15.6.5. CHECK DAMPERS FOR PROPER POSITION TO ACHIEVE DESIRED AIRFLOW PATH.
      - 15.6.6. CHECK FOR AIRFLOW BLOCKAGES.
      - 15.6.7. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
      - 15.6.8. CHECK FOR PROPER SEALING OF AIR-HANDLING-UNIT COMPONENTS.
      - 15.6.9. VERIFY THAT AIR DUCT SYSTEM IS SEALED.
      - 15.7.10. ADJUST AIR SYSTEMS TO +/-10% OF DESIGN CONDITIONS.
    - 15.8. FINAL REPORT
      - 15.8.1. GENERAL: PREPARE A CERTIFIED WRITTEN REPORT; TABULATE AND DIVIDE THE REPORT INTO SEPARATE SECTIONS FOR TESTED SYSTEMS AND BALANCED SYSTEMS.
      - 15.8.2. INCLUDE A CERTIFICATION SHEET AT THE FRONT OF THE REPORT'S BINDER, SIGNED AND SEALED BY THE CERTIFIED TESTING AND BALANCING ENGINEER.
      - 15.8.3. INCLUDE A LIST OF INSTRUMENTS USED FOR PROCEDURES, ALONG WITH PROOF OF CALIBRATION.
      - 15.8.4. INCLUDE PRE-CONSTRUCTION BALANCE INFORMATION.
      - 15.8.5. FINAL REPORT CONTENTS: IN ADDITION TO CERTIFIED FIELD-REPORT DATA, INCLUDE THE FOLLOWING: FAN CURVES, MANUFACTURERS' TEST DATA, FIELD TEST REPORTS PREPARED BY SYSTEM AND EQUIPMENT INSTALLERS, OTHER INFORMATION RELATIVE TO EQUIPMENT PERFORMANCE; DO NOT INCLUDE SHOP DRAWINGS AND PRODUCT DATA.

DIFFUSER & REGISTER SCHEDULE

TAG	SYSTEM	NOMINAL FACE SIZE	NECK SIZE	STYLE	MODEL	BORDER/FRAME TYPE	NOTES
S1	SUPPLY	12x12	6x6	MIN. SECURITY LATTICE FACE DIFFUSER	MSD	SURFACE MOUNT	1,2,3
S2	SUPPLY	24x24	6ø	SQUARE CONE DIFFUSER	SCD	31: LAY-IN	1,2,3
S3	SUPPLY	24x12	22x10	MEDIUM SECURITY STRAIGHT LOUVER GRILLE	MSSL	MF1, CS8, 3BF	2,3,4
S4	SUPPLY	26x10	24x8	MEDIUM SECURITY STRAIGHT LOUVER GRILLE	MSSL	MF2, 3BF	2,3,4
R1	RETURN	12x12	6x6	MIN. SECURITY LATTICE FACE DIFFUSER	MSD	SURFACE MOUNT	3
T1	TRANSFER	18x10	16x8	MEDIUM SECURITY STRAIGHT LOUVER GRILLE	MSSL	MF2, CS8	3
T2	TRANSFER	24x12	22x10	PERFORATED	PDDR	3: LAY-IN	3

BASED ON PRICE (ACCEPTABLE: PRICE, TITUS)

TAG KEY: TAG — S1; CFM — 150

NOTES:
CONTRACTOR TO VERIFY QUANTITY, SIZES, AND INSTALLATION TYPE.
1. 4-WAY THROW UNLESS NOTED OTHERWISE.
2. PROVIDE W/ BALANCE DAMPER.
3. PROVIDE W/ WHITE POWDER COAT FINISH.
4. 2-WAY THROW.

SPECIFICATIONS:
1. MINIMUM SECURITY LATTICE FACE DIFFUSERS
   - 1.1. FURNISH AND INSTALL STEEL MINIMUM SECURITY SUPPLY DIFFUSER OF THE SIZES AND MOUNTING TYPES INDICATED ON THE PLANS AND THIS SCHEDULE. THE FACEPLATE SHALL CONSIST OF 12 GAUGE HOT ROLLED STEEL WITH 13/16 IN. X 13/16 IN. SQUARE HOLES AND 3/16 IN. FRETS. THE FACEPLATE IS TO BE ATTACHED WITH TAMPERPROOF SCREWS IN COUNTERSUNK SCREW HOLES AT A MAXIMUM DISTANCE OF 10 IN. . DIFFUSERS SHALL CONSIST OF AN OUTER FRAME ASSEMBLY, WHICH FACILITATES MOUNTING IN THE APPLICATION SHOWN. A COLLAR THAT ALLOWS CONNECTION TO THE SQUARE (OR RECTANGULAR) DUCT SIZE INDICATED SHALL BE AN INTEGRAL PART OF THE FRAME ASSEMBLY. AN INNER CORE ASSEMBLY CONSISTING OF FIXED LOUVERS CAPABLE OF PRODUCING THE AIR FLOW DISCHARGE PATTERN INDICATED ON THE PLANS SHALL BE FULLY REMOVABLE FROM THE INSTALLED DIFFUSER FRAME FOR ACCESS TO ANY DAMPERS OR OTHER DUCTWORK COMPONENTS LOCATED IN OR NEAR THE DIFFUSER NECK. THE INNER CORE ASSEMBLIES SHALL BE IDENTICALLY CONSTRUCTED SO THAT DIRECTIONAL CORE ASSEMBLIES PROVIDING DIFFERENT AIR FLOW DISCHARGE PATTERNS MAY BE INTERCHANGED BETWEEN FRAMES, PROVIDED THE FRAME DUCT CONNECTIONS ARE OF THE SAME SIZE. THE GRILLE SHALL BE PAINTED WITH A POWDER COAT PROCESS AND BE FINISHED IN WHITE. PAINT FINISH SHALL PASS 500 HOURS OF SALT SPRAY EXPOSURE WITH NO MEASURABLE CREEP IN ACCORDANCE WITH ASTM D1654 AND 1000 HOURS WITH NO RUSTING OR BLISTERING AS PER ASTM D610 AND ASTM D714. OPTIONAL INTEGRAL VOLUME CONTROL DAMPER SHALL BE OF THE OPPOSED BLADE TYPE AND SHALL BE CONSTRUCTED OF COLD ROLLED STEEL. 304 STAINLESS STEEL AND ALUMINUM GRILLES TO USE DAMPERS OF THE SAME CONSTRUCTION MATERIAL.
   - 1.2. THE DIFFUSER SHALL BE PRICE MODEL SMD STEEL DIRECTIONAL LOUVERED FACE DIFFUSER OR APPROVED EQUAL BY TITUS.
2. SQUARE CONE DIFFUSER
   - 2.1. THE SQUARE CONE DIFFUSER SHALL BE SUPPLIED TO DELIVER A 360 DEGREE RADIAL, HORIZONTAL AIRFLOW PATTERN. THE CONES AND BACKPAN SHALL BE ON-PIECE DIE-FORMED WITH SMOOTH, AERODYNAMICALLY DESIGNED SURFACES AND NO CORNER JOINTS. THIS CONTOURED DESIGN SHALL PROTECT THE CEILING AND HELP TO PREVENT SMUDGING AND STREAKING.
   - 2.2. FURNISH AND INSTALL STEEL CEILING DIFFUSERS OF SIZES AND MOUNTING TYPES DESIGNATED BY THE PLANS AND THIS SCHEDULE. DIFFUSERS SHALL CONSIST OF A PRECISION FORMED BACK CONE OF ONE-PIECE SEAMLESS CONSTRUCTION THAT INCORPORATES A ROUND INLET COLLAR OF SUFFICIENT LENGTH FOR CONNECTING RIGID OR FLEXIBLE DUCT. THE DIFFUSER SHALL INTEGRATE WITH ALL DUCT SIZES SHOWN ON THE PLANS WITHOUT AFFECTING THE FACE SIZE AND APPEARANCE OF THE UNIT. AN INNER CONE ASSEMBLY SHALL CONSIST OF 3 CONES WHICH DROP BELOW THE CEILING PLANE TO ASSURE OPTIMAL VAV AIR DIFFUSION PERFORMANCE. THE INNER CONE ASSEMBLY SHALL BE COMPLETELY REMOVABLE FROM THE DIFFUSER FACE TO ALLOW FOR FULL ACCESS TO ANY DAMPERS OR OTHER DUCTWORK COMPONENTS LOCATED NEAR THE DIFFUSER NECK. FINISH SHALL BE B12 WHITE POWDER COAT. PAINT FINISH SHALL PASS 500 HOURS OF SALT SPRAY EXPOSURE WITH NO MEASURABLE CREEP IN ACCORDANCE WITH ASTM D1654 AND 1000 HOURS WITH NOW RUSTING OR BLISTERING AS PER ASTM D610 AND ASTM D714.
   - 2.3. THE DIFFUSER SHALL BE PRICE MODEL SCD SQUARE CONE DIFFUSER OR APPROVED EQUAL BY TITUS.
3. MEDIUM SECURITY STRAIGHT LOUVER GRILLE
   - 3.1. FURNISH AND INSTALL PRICE MODEL MSSL STEEL MEDIUM SECURITY (SUPPLY/RETURN) STRAIGHT FIXED LOUVER GRILLES OF THE SIZES AND MOUNTING TYPES INDICATED ON THE PLANS AND OUTLET SCHEDULE. GRILLES SHALL BE 0 DEGREE DEFLECTION FIXED LOUVER TYPE WITH BLADES SPACED 1/2 IN. ON CENTER SUPPORTED BY 14 GAUGE VERTICAL SUPPORT MULLIONS LOCATED ON 6 IN. CENTERS WITH A 10 GAUGE WIRE MESH (2.5 MESH/INCH – 44% FREE AREA). THE FACEPLATE SHALL BE 14 GAUGE HOT ROLLED STEEL. BLADES SHALL RUN PARALLEL TO THE LONG DIMENSION OF THE GRILLE. THE GRILLE IS TO BE ATTACHED TO A STEEL WALL SLEEVE WITH A REAR MOUNTING FRAME FOR A CONCEALED AND SECURE FASTENING. THE GRILLE SHALL BE PAINTED WITH A POWDER COAT PROCESS AND BE FINISHED IN WHITE. PAINT FINISH SHALL PASS 500 HOURS OF SALT SPRAY EXPOSURE WITH NO MEASURABLE CREEP IN ACCORDANCE WITH ASTM D1654 AND 1000 HOURS WITH NO RUSTING OR BLISTERING AS PER ASTM D610 AND ASTM D714. OPTIONAL INTEGRAL VOLUME CONTROL DAMPER SHALL BE OF THE OPPOSED BLADE TYPE AND SHALL BE CONSTRUCTED OF COLD ROLLED STEEL. THE DAMPER SHALL BE MOUNTED IN THE WALL SLEEVE AND BE OPERABLE FROM THE FRONT OF THE REGISTER.
   - 3.2. FOR SUPPLY GRILLE (S3): PROVIDE WITH 4-SIDED MOUNTING FRAME TYPE MF1 – 1"x1"x 3⁄16" HOT ROLLED STEEL LOOSE ANGLE FRAME FOR FIELD WELDING. PROVIDE WITH FASTENING METHOD CS8 – REAR ANGLE FRAME OR REAR PLATE WITH WELDNUTS AND TAMPERPROOF BOLTS.
   - 3.2. FOR SUPPLY GRILLE (S4): PROVIDE WITH 4-SIDED MOUNTING FRAME TYPE MF2 – 1 ½" x 1 ½" x 3⁄16" HOT ROLLED STEEL LOOSE ANGLE FRAME FOR FIELD BOLTING.
   - 3.3. FOR TRANSFER GRILLE: PROVIDE WITH 4-SIDED MOUNTING FRAME TYPE MF2 – 1 ½" x 1 ½" x 3⁄16" HOT ROLLED STEEL LOOSE ANGLE FRAME FOR FIELD BOLTING.
   - 3.4. THE GRILLE SHALL BE PRICE MODEL MSSL OR APPROVED EQUAL BY TITUS.
4. PERFORATED RETURN/EXHAUST – FLUSH FACE:
   - 4.1. FURNISH AND INSTALL PERFORATED FACE RETURN DIFFUSERS AS DESCRIBED ON PLANS AND THIS SCHEDULE. DIFFUSER SHALL CONSIST OF A PERFORATED AIR DISTRIBUTION FACE OF NO LESS THAN 51% FREE AREA, A HEAVY GAUGE STEEL BACKPAN WITH ROUND OR SQUARE INLET COLLARS AS NOTED ON PLANS. THE PERFORATED FACE SHALL BE REMOVABLE FROM THE DIFFUSER FACE AND SHALL BE FITTED WITH HINGES TO FACILITATE THE REMOVAL OF FACE SCREEN FOR CLEANING PURPOSES. THE PERFORATED FACE SCREEN SHALL BE STEEL OR ALUMINUM AS NOTED ABOVE. THE FINISH OF THE DIFFUSER SHALL BE WHITE POWDER COAT. PAINT FINISH SHALL PASS 500 HOURS OF SALT SPRAY EXPOSURE WITH NO MEASURABLE CREEP IN ACCORDANCE WITH ASTM D1654 AND 1000 HOURS WITH NO RUSTING OR BLISTERING AS PER ASTM D610 AND ASTM D714.

MECHANICAL SYMBOLS LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A.F.F.	ABOVE FINISHED FLOOR	M.C.	MECHANICAL CONTRACTOR
AHU	AIR HANDLING UNIT	N.A.	NOT APPLICABLE
A.S.M.E.	AMERICAN SOCIETY OF MECH. ENGINEERS	O.A.	OUTSIDE AIR
CD	CEILING DIFFUSER	PSI	POUNDS PER SQUARE INCH
CFM	CUBIC FEET PER MINUTE	R.A.	RETURN AIR
℄	CENTER LINE	RAR	RETURN AIR REGISTER
CW	DOMESTIC COLD WATER	SA	SUPPLY AIR
E.C.	ELECTRICAL CONTRACTOR	SAN	SANITARY
EXG	EXISTING	SAR	SUPPLY AIR REGISTER
G.C.	GENERAL CONTRACTOR	S.P.	STATIC PRESSURE
HP	HORSEPOWER	U.N.O.	UNLESS NOTED OTHERWISE
HW	DOMESTIC HOT WATER	V	VENT
HWR	DOMESTIC HOT WATER RETURN	V/ø	VOLTAGE/PHASE (ELECTRICAL)

MECHANICAL DEMOLITION GENERAL NOTES

1. REMOVAL OF ALL PLUMBING FIXTURES TO INCLUDE REMOVAL AND CAPPING OF ALL ASSOCIATED PIPING.
2. DISCONTINUED SANITARY SEWER UNDER CONCRETE SLAB TO BE CAPPED AND ABANDONED UNDER SLAB.
3. ALL SURFACES DISTURBED OR HOLES CREATED DUE TO DEMOLITION TO BE PATCHED TO MATCH SURROUNDING SURFACE.
4. ALL MATERIALS RESULTING FROM DEMOLITION OPERATION SHALL BE PROMPTLY REMOVED FROM PREMISES AND LEGALLY DISPOSED. CONTRACTOR TO CONTACT OWNER PRIOR TO REMOVAL AND TURN OVER TO OWNER ANY EQUIPMENT OR MATERIALS REQUESTED.
5. PIPE CAPPING TO BE DONE WITH MATERIALS TO MATCH EXISTING PIPING.

MECHANICAL GENERAL NOTES

1. ALL WORK TO COMPLY WITH ALL APPLICABLE STATE, FEDERAL, AND LOCAL CODES AND ORDINANCES.
2. FIELD VERIFY EXISTING CONDITIONS PRIOR TO BIDDING.
3. SEAL ALL DUCT JOINTS.
4. COORDINATE LOCATION OF ALL CEILING DIFFUSERS, REGISTERS, AND CEILING MOUNTED EQUIPMENT WITH THE REFLECTED CEILING PLAN AND/OR LIGHTING PLAN.
5. DUCT SIZES NOTED REPRESENT NET FREE INTERIOR DIMENSIONS.
6. PROVIDE BALANCE DAMPERS IN EACH SUPPLY, RETURN, AND EXHAUST DUCT BRANCH.
7. ALL ROUND DUCTWORK SHALL BE SPIRAL TYPE UNLESS NOTED OTHERWISE.
8. SUPPLY AIR DIFFUSERS MAY BE CONNECTED WITH A MAXIMUM 5 FEET OF INSULATED FLEXIBLE DUCT. ALL RETURN AIR REGISTERS AND EXHAUST AIR REGISTERS SHALL BE DUCTED WITH SHEET METAL.

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PROJECT TITLE: CLARE COUNTY JAIL MODIFICATIONS KLM BUILDING DESIGNS HARRISON, MI

SHEET TITLE: MECHANICAL SPECIFICATIONS AND SCHEDULES

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