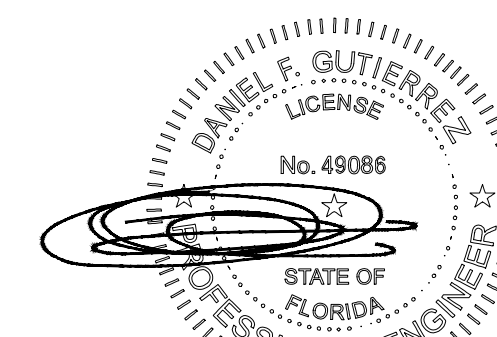


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ELECTRICAL ENGINEER

LIC. #04908

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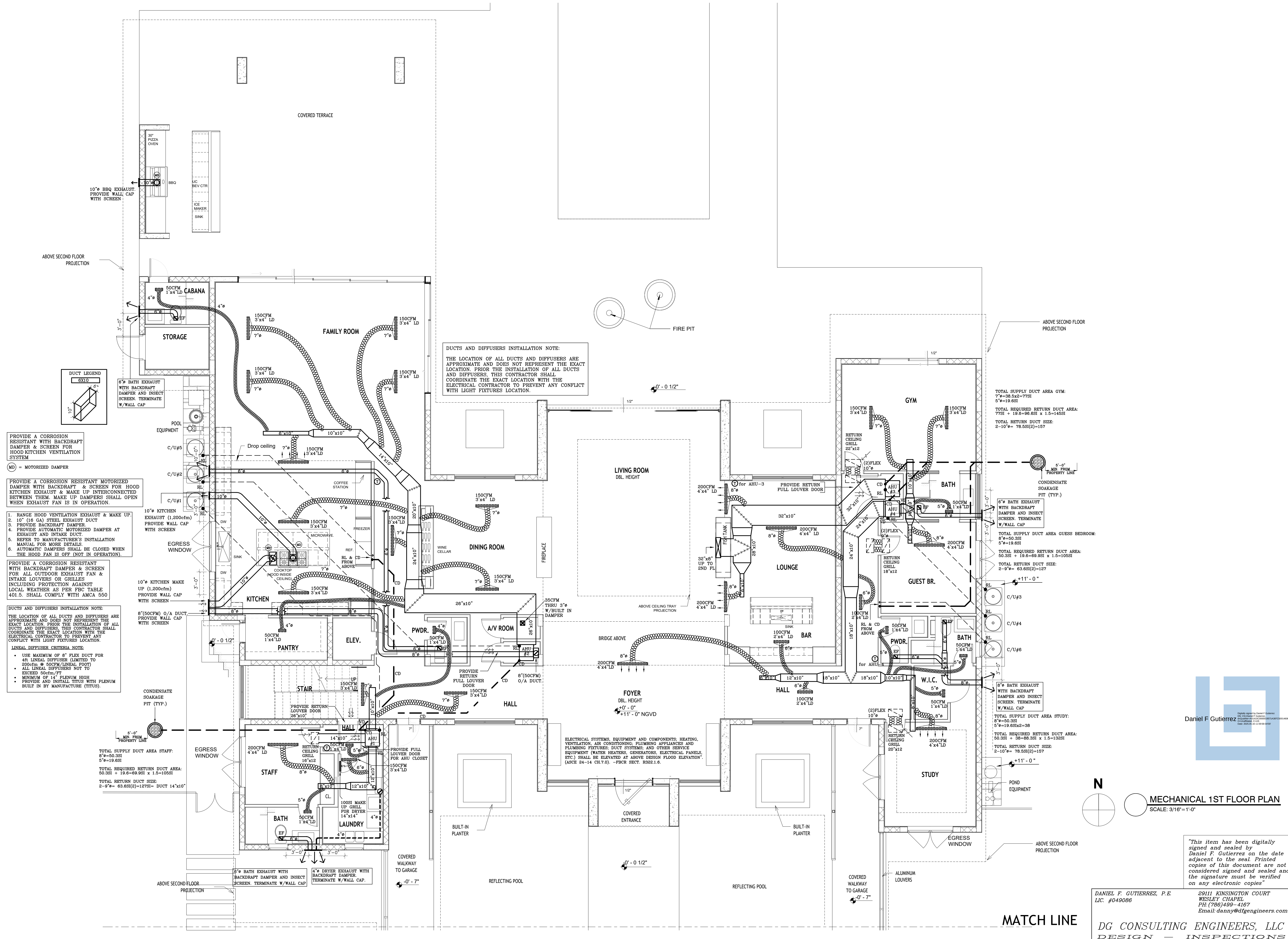
BALLI - TRAUTMAN
 ARCHITECTURE INTERIORS CONSTRUCTION

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ISSUE DATE:	04/25/2025
SCALE:	AS NOTED

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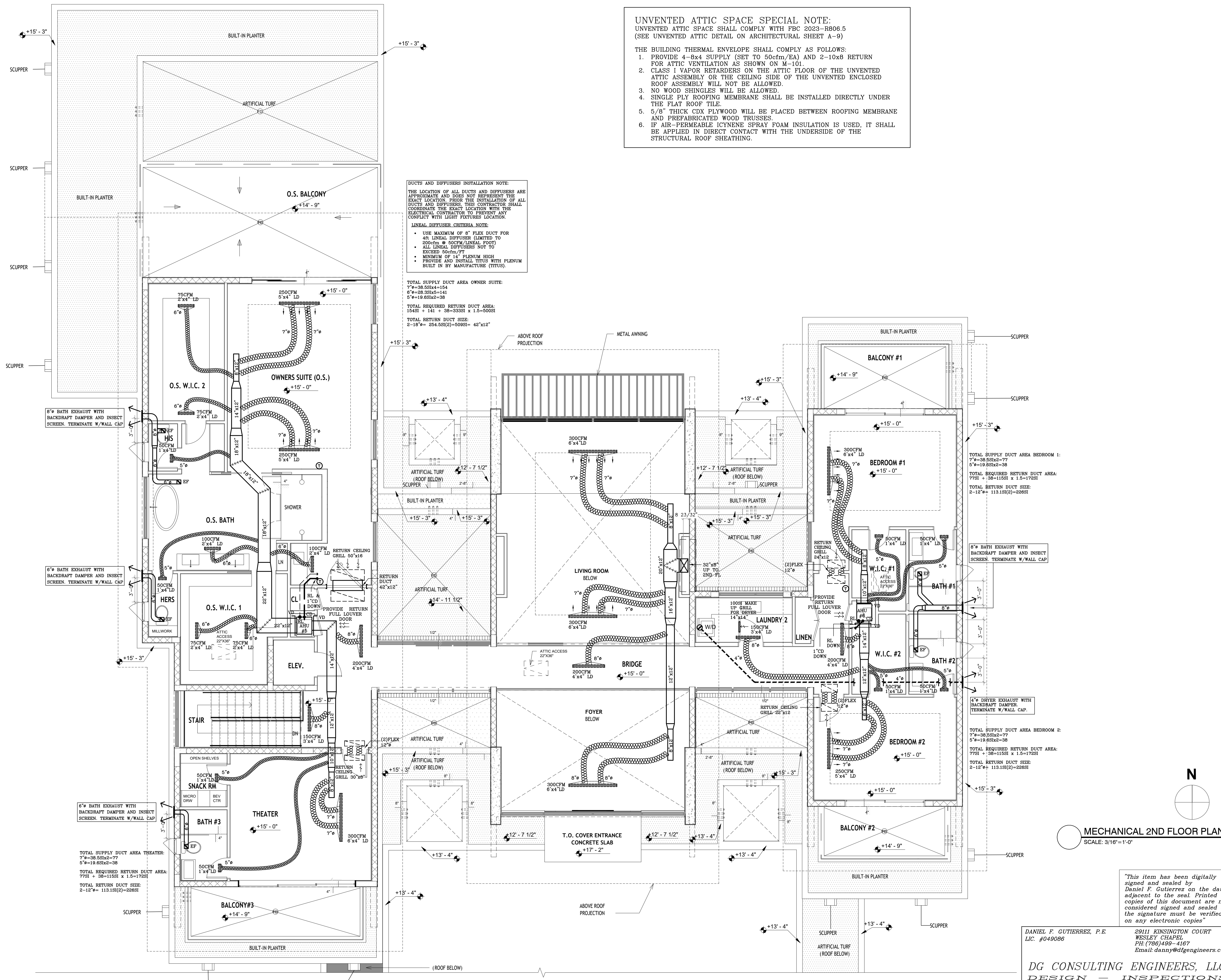
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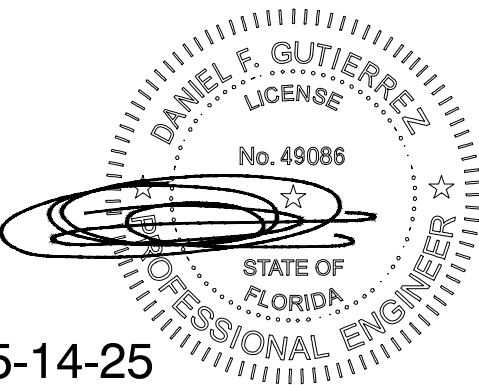
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ELECTRICAL ENGINEER LIC. #049086

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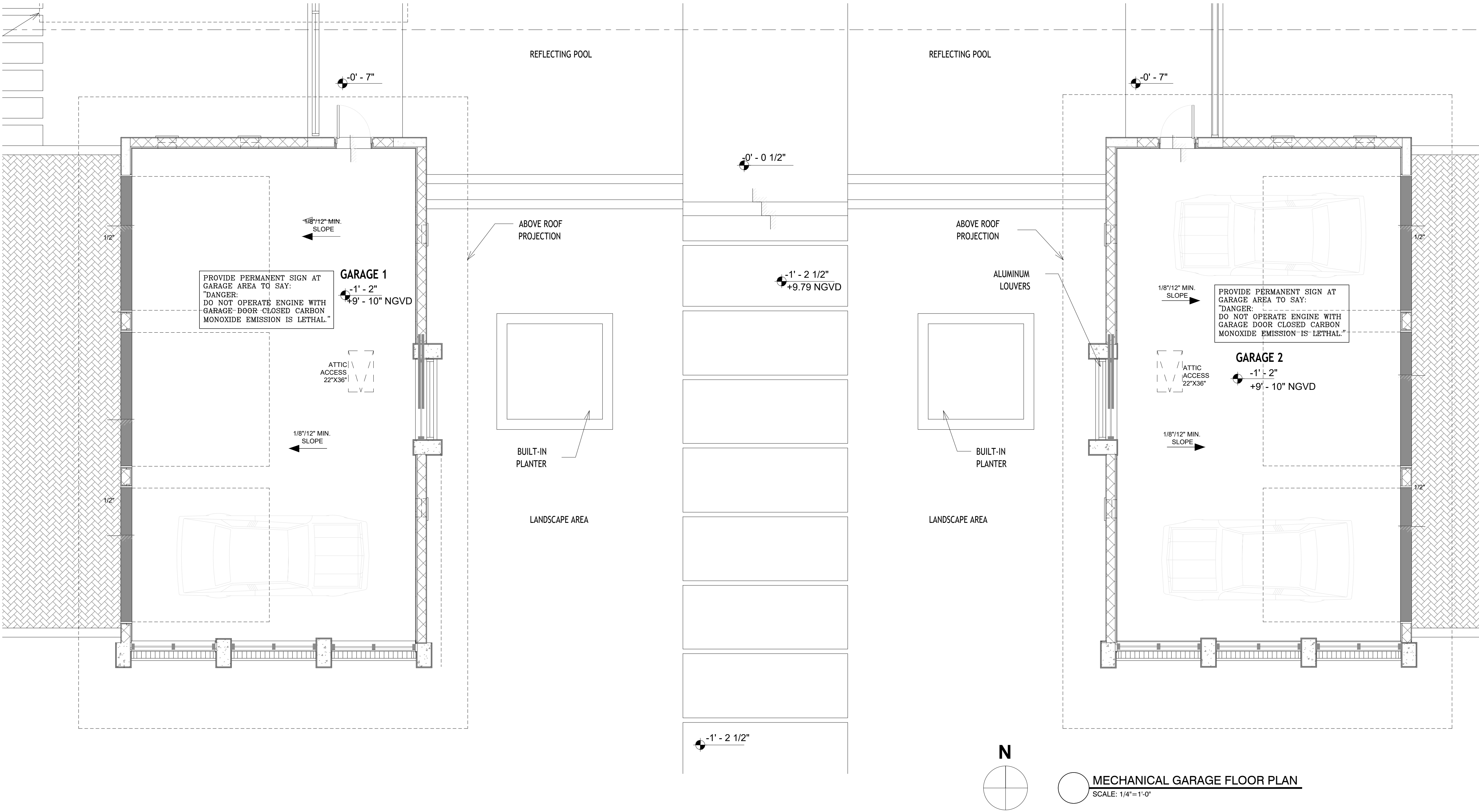
SHEET TITLE

MECHANICAL
GARAGE FLOOR
PLAN

SHEET NUMBER

M-103

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MECHANICAL GARAGE FLOOR PLAN
SCALE: 1/4"=1'-0"

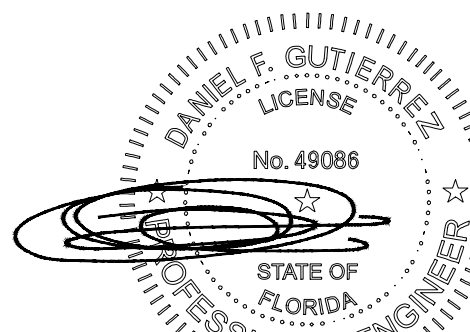
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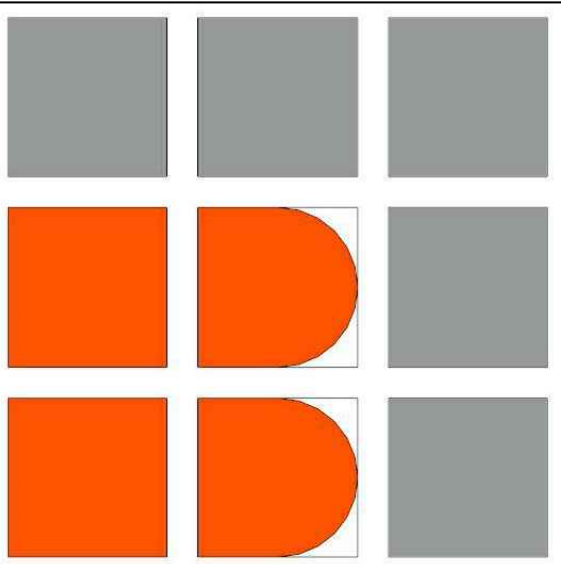
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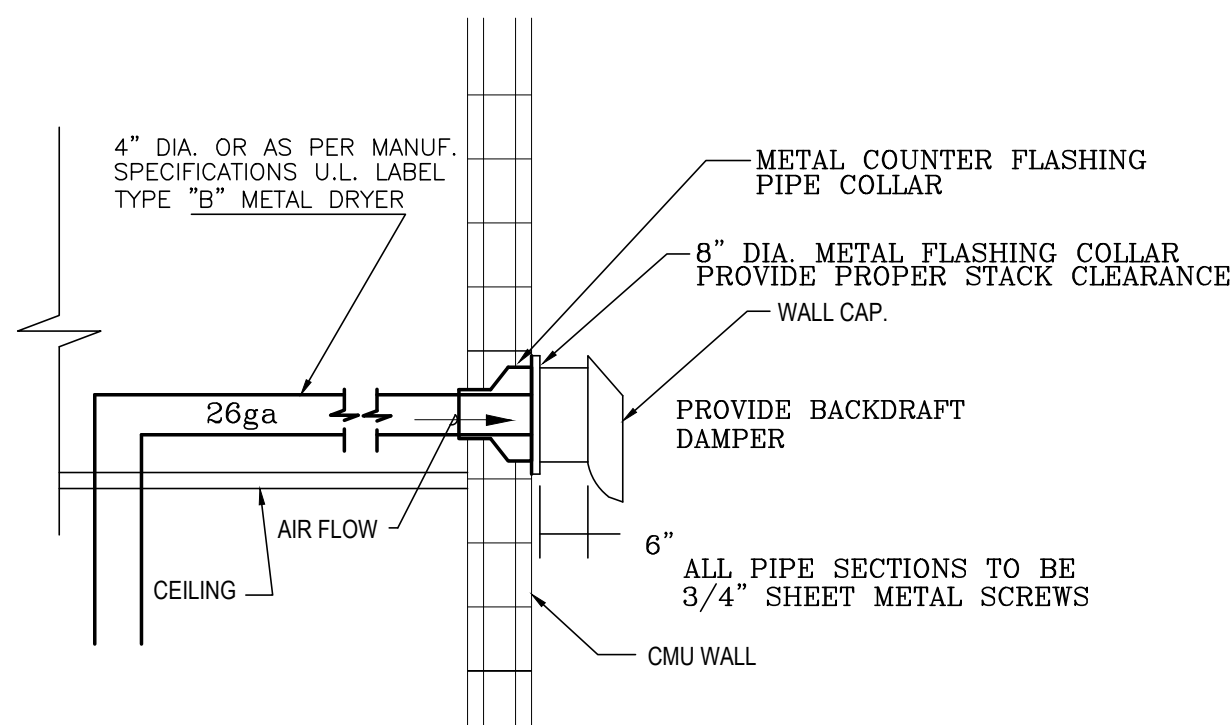
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MECHANICAL POOL HOUSE FLOOR PLAN

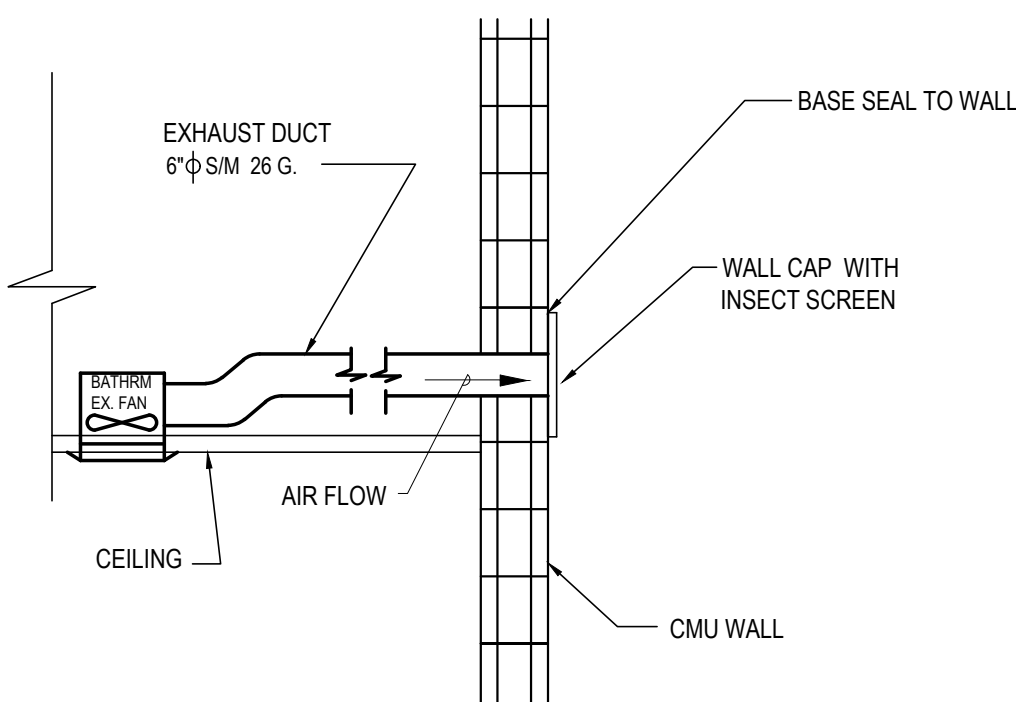
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M-104

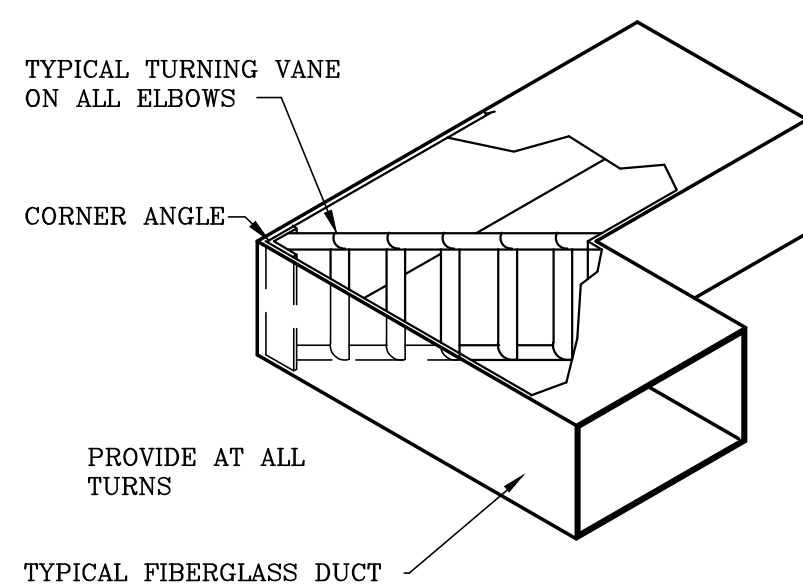
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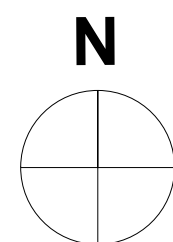
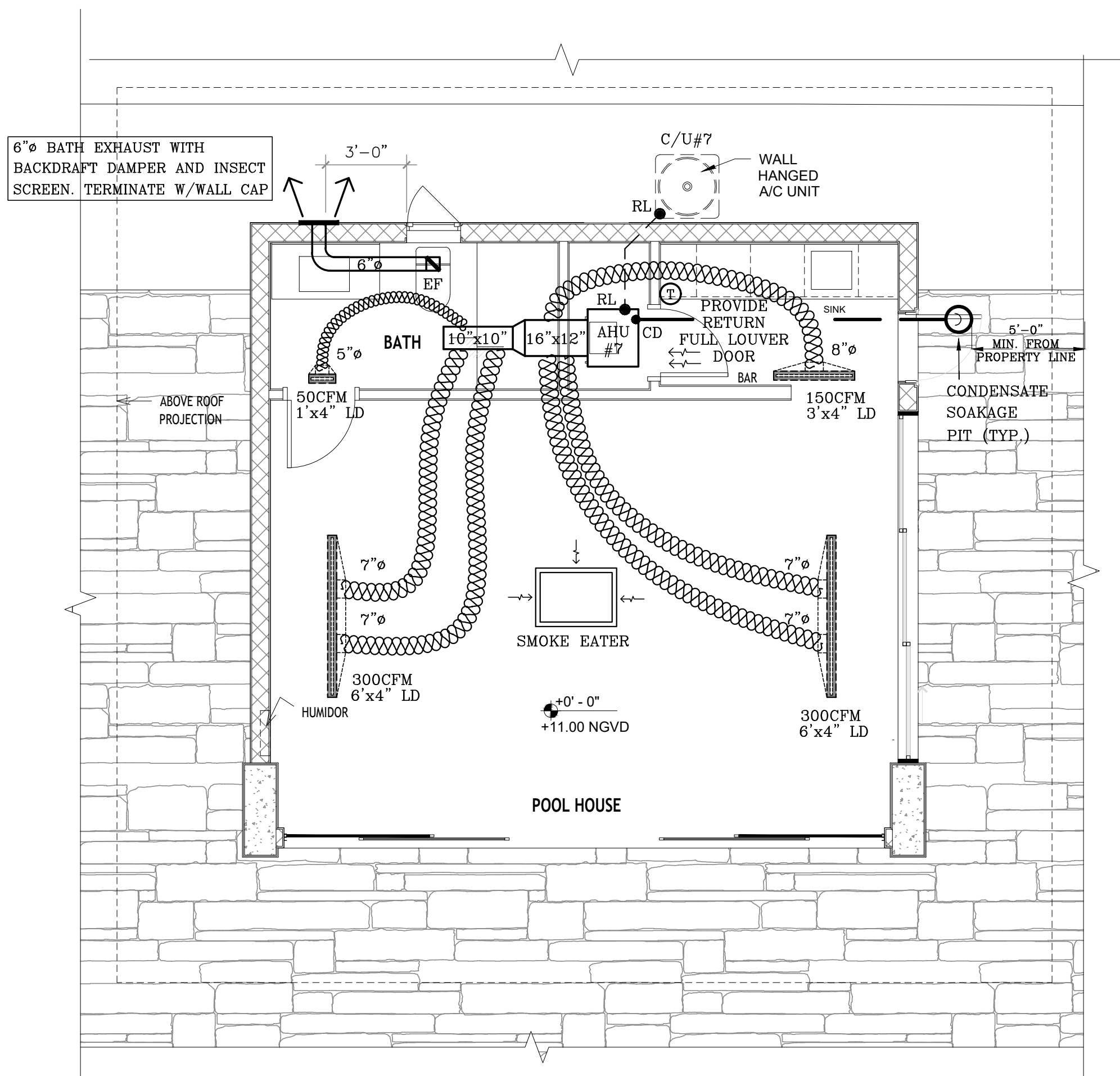
DRYER WALL EXHAUST DETAIL



EXHAUST FAN DETAIL
N.T.S.



ELBOW TURNING VANE DETAIL
N.T.S.



MECHANICAL POOL HOUSE FLOOR PLAN
SCALE: 1/4"=1'-0"

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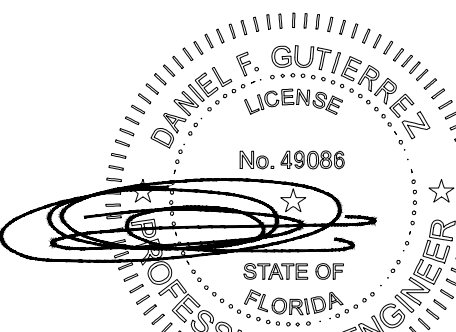
RECOMMENDED SCHEDULE NOTES:

- A. REFRIGERANT LINE SIZES FOR TUBE SETS UP TO 50' LINEAR LENGTH
- B. UNITS SHALL CONFORM TO FLORIDA BUILDING CODE LATEST EDITION FOR HVHZ INSTALL
- C. INFINITY TOUCH CONTROL REQUIRED
- D. CARRIER REMOTE ACCESS MODULE FOR CRESTRON CONTROLS IS REQUIRED

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AC SPECS & AHRI

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HEATING-VENTILATING & AIR CONDITIONING
NOTES AND SPECIFICATIONS

1- PROVIDE AND INSTALL A COMPLETE AIR CONDITIONING SYSTEM AS SHOW ON PLANS WITH WORKMANSHIP TO MEET OR EXCEED ALL LOCAL CITY CODES. OR 2023 FBC (8TH EDITION) CODES WHICHEVER APPLIES, AND INCLUDING THE LATEST EDITION OF THE FLORIDA STATE ENERGY CODE REQUIREMENTS SUPERSEDE ALL OF THE FOLLOWING.

2- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST ISSUE OF 2012 NFPA 90A, 90B, 2011 NFPA 70 SMACNA MANUALS.

3- IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY DETAILS OF CONSTRUCTION. CONTRACTOR IS EXPECTED TO PROVIDE ALL ITEMS THAT ARE REQUIRED FOR A COMPLETE AND WORKABLE HVAC SYSTEM TO THE EXTEND TO WHICH THE PLANS INDICATE. IT IS THE CONTRACTOR RESPONSIBILITY TO FURNISH ALL NECESSARY LABOR, MATERIALS AND MISCELLANEOUS ITEMS TO PLACE ALL EQUIPMENT IN PROPER WORKING ORDER.

4- CONTRACTOR SHALL EXAM THE PLANS AND SPECIFICATIONS OF ALL TRADES FOR PARTS OF WORK. IF ANY DISCREPANCIES EXIST BETWEEN DRAWINGS FOR HIS WORK AND OR WORK OF OTHER TRADES, HE SHALL REPORT SUCH DISCREPANCIES TO THE ENGINEER AND OBTAIN WRITTEN INSTRUCTION FOR ANY CHANGES IN WORK COVERED BY THESE PLANS AND SPECIFICATIONS. NEGLECT OR FAILURE OF CONTRACTOR TO REPORT SUCH DISCREPANCIES TO THE ENGINEER PRIOR TO BIDDING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

5- CONTRACTOR SHALL PROVIDE ALL FEES, PERMITS AND INSURANCE AND SUBMIT TO THE OWNER AN UNCONDITIONAL WRITTEN GUARANTEE FOR THE REPAIR OR REPLACEMENT OF DEFECTIVE WORKMANSHIP AND MATERIALS PROVIDED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR AFTER THE DATE OF ACCEPTANCE BY THE OWNER.

6- CONTRACTOR SHALL SUBMIT TO THE OWNER THE FOLLOWING SHOP DRAWINGS AND PRODUCT DATA PRIOR TO ORDERING OR COMMENCING WITH THE WORK:
A- DUCT MATERIALS AND ACCESSORIES
B- DIFFUSERS, GRILLS AND REGISTERS.
C- FIRE DAMPERS.
D- ALL EQUIPMENT SUCH AS A.H.U., C.U., FANS, VAV'S, THERMOSTATS ETC.

7- THE FIVE YEAR FACTORY WARRANTY OF THE COMPRESSOR MOTORS SHALL BE FILLED OUT IN THE NAME OF THE OWNER. THIS CONTRACTOR SHALL ALSO FURNISH TO THE OWNER ALL CERTIFICATES OF FINAL INSPECTIONS AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION. THE INSTALLATION ACCEPTANCE FORMAT WHICH ACCOMPANIES THE EQUIPMENT FROM THE FACTORY SHALL BE FILLED OUT AND FURNISHED TO THE OWNER.

8- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING THE NECESSARY CONDENSATE DRAIN LINE FROM THE APPARATUS TO THE EXTERIOR OF THE BUILDING WHETHER SHOWN ON PLANS UTILIZE PVC OR COPPER MATERIAL DEPENDING THE CEILING FIRE RATING OR THE USE OF A RETURN AIR PLENUM. CONSULT LOCAL CODE REQUIREMENTS. CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH FIRE RESISTIVE 3/4" THICK FOAM PLASTIC INSULATION.

9- WHERE CALLED FOR ON PLANS OR THE USE OF FIBERGLASS IS APPROVED BY LOCAL CODE REQUIREMENTS, FIBERGLASS DUCT SHALL BE 1 1/2 THICK RIGID FIBROUS GLASS WITH ALUMINUM FOIL. GLASS SCRM AND DRAFT OR PLASTIC JACKET VAPOR BARRIER. THE "k" VALUE OF THE DUCT SHALL BE 0.23 BTU/IN/SQ. FT./DEG F/HR. MINIMUM RATING AT 75 DEGREES. R-6 MIN.

10- FLEXIBLE DUCTWORK, WHERE SHOWN ON THE DRAWINGS SHALL BE EQUAL TO FLEXAIRE WITH WIRE HELIX FRAME, POLYESTER LINER, HIGH DENSITY FIBERGLASS (*) INSULATION AND METALIZED REINFORCED VAPOR BARRIER EXTERIOR COVER. PROVIDE SPIN-IN FITTINGS WITH SCOOP OR BELLMOUTH TYPE FITTINGS WITH ADJUSTABLE DAMPERS FOR ALL BRANCH TAKE OFFS. (*) ALL DUCTWORK, INSTALLATION AND EQUIPMENT MUST MEET STATE OF FLORIDA ENERGY CODE REQUIREMENTS FOR 2023.

11- EXHAUST DUCTS SHALL BE GALVANIZED WITH SMOOTH INTERIOR FINISH AND BE CONSTRUCTED OF METAL STEEL LOCK FORMING QUALITY, HAVING ZINC COATING OF 1.25 OUNCES PER SQUARE FOOT FOR EACH SIDE AND MINIMUM THICKNESS OF 0.0157 INCHES (NO. 28 GAGE) FBC R-M1502.4.1
12- REFRIGERANT LIQUID LINES BELOW 5/8" O.D. SIZE TO BE ACR TYPE L. SOFT COPPER LIQUID LINES 5/8" O.D. AND LARGER AND ALL SUCTION LINES SHALL BE ACR TYPE L HARD COPPER, 15% SILFLOS TO BE USE FOR WELDING OF REFRIGERANT PIPING ALL SUCTION LINES TO BE INSULATED WITH A MINIMUM 1/2 THICK ARMAFLEX (R-4) OR EQUAL ROUGH-IN AND PRESSURE TEST ALL REFRIGERANT LINES WITH A 75 PSI PRESSURE, PRIOR TO CLOSING OFF THE REFRIGERANT LINES TO HOLD CHARGE FOR A MINIMUM OF 24 HOURS. SIZE OF REFRIGERANT LINES TO BE AS PER MANUFACTURER RECOMMENDATIONS FOR THE ACTUAL LENGTH OF PIPE. EXTERNAL SURFACE PERMEANCE NOT EXCEEDING 0.05 PERM WHEN TESTED IN ACCORDANCE WITH ASTM E 96. 2023FBC (8th edition) R-M1411.6.

13- CONTRACTOR TO VERIFY EXISTING FIELD CONDITIONS AND ANY INTERFERENCE WITH OTHER DISCIPLINES (ELECTRICAL, SPRINKLERS) BEFORE BIDDING THE PROJECT. FAILURE TO DO WILL RESULT THAT NECESSARY FIELD MODIFICATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

14- ALL EQUIPMENT SUPPORTS SHOWN ON PLANS ARE DIAGRAMMATIC AND REQUIRE APPROVAL OF ARCHITECTS, STRUCTURAL ENGINEER AND EQUIPMENT MANUFACTURER PRIOR TO HANGING.

15- CONTRACTOR TO VERIFY WITH THE ARCHITECT OF RECORD THE CEILING/FLOOR FIRE RATING TO DETERMINE REQUIREMENTS FOR FIRE DAMPERS, BEFORE BEGINNING WORK.

16- THERMOSTAT TO BE MANUFACTURED BY HONEYWELL OR EQ. THERMOSTAT LOCATION TO BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION.

17- A/C CONTRACTOR TO VERIFY WITH ARCHITECT THE UNITS EER RATING REQUIRED BASED ON FLORIDA ENERGY CODE COMPLIANCE

18- EXISTING CONDITION: CONTRACTOR SHALL VISIT THE JOB SITE AND ASCERTAIN ALL EXISTING CONDITIONS, WHICH WILL AFFECT HIS WORK. FAILURE TO DO SO WILL NOT BE ACCEPTED AS A REASON FOR REQUESTING EXTRA PAY WHERE THE EXISTING CONDITIONS RESULT IN EXTRA MATERIAL OR LABOR. ANY EXISTING CONDITION FOUND BY THE CONTRACTOR WHICH WILL ADVERSELY AFFECT THE WORK SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER. CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE AND SHALL INCLUDE REPLACEMENTS OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED THEREBY.

19- IN THE EVENT OF DISCREPANCIES ON THESE DRAWINGS, THIS CONTRACTOR SHALL NOTIFY THIS ENGINEER IN ORDER TO HAVE DIRECTIONS TO COMPLETE WORKS ON THIS JOB.

20- PROVIDE VOLUME DAMPERS AT ALL SUPPLY DIFFUSERS.

21- THIS CONTRACTOR SHALL EXAMINE THESE PLANS (CONSTRUCTION DOCUMENTS) TO UNDERSTAND THE SCOPE. IN THE EVENT OF ANY DISCREPANCIES, CONTRADICTION INFORMATION NOT PROVIDED ON THIS CONSTRUCTION DOCUMENTS, THIS CONTRACTOR SHALL STOP WORKS AND NOTIFY THIS OFFICE FOR CLARIFICATION AND PROCEED WORKS AFTER THIS OFFICE HAVE CLARIFIED THOSE DISCREPANCIES.

GENERAL NOTES

- TEMPERTURE SENSORS SHALL BE LOCATED 4'-6" ABOVE FINISHED FLOOR. TEMPERATURE SENSORS SHALL BE TRANE MODEL VASNSRSTAT2 (SENSOR ONLY) OR EQUAL. IVORY FINISH.
- ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTION SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
- CONCRETE PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY MECHANICAL CONTRACTOR. COORDINATE WITH OTHER TRADE.
- FLEXIBLE DUCT CONNECTING MAIN DUCT TO SUPPLY DIFFUSER OR AIR BOOT SHALL NOT EXCEED 8 FEET IN LENGTH. IF THE DISTANCE EXCEEDS THIS LIMIT, AN INSULATED METAL DUCT OF REQUIRED LENGTH AND EQUAL DIAMETER SHALL BE INSTALLED WITH AIR SCOOP AND DAMPER AT MAIN DUCT TO REDUCE FLEXIBLE DUCT TO A MAXIMUM LENGTH OF 8 FEET.
- ALL DUCTS TO BE GROUNDED ACROSS FLEXIBLE CONNECTION WITH FLEXIBLE COPPER GROUNDING STRAPS
- PROVIDE FLEXIBLE DUCT CONNECTIONS ON ALL DUCTS CONNECTING TO EXHAUST FANS AND AIR HANDLING UNITS.
- THE INSIDE OF ALL DUCTWORK VISIBLE THROUGH A GRILLE OR DIFFUSER SHALL BE PAINTED FLAT BLACK.
- ALL DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.
- CONDENSATE DRAIN LINE FROM AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, TO FLOOR DRAIN
- SMOKE DETECTORS SHALL BE FURNISHED AND WIRED UNDER DIVISION 16. MOUNTING OF SMOKE DETECTORS IN DUCTWORK SHALL BE WORK OF DIVISION 15. MOUNT IN SUPPLY DUCT PER SECTION A/M-2.
- ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH N.E.C. AND DIVISION 16 OF SPECIFICATIONS.
- CEILING SPACE IS USED AS A RETURN AIR PLENUM. ALL WIRING, CONDUIT, PIPING, ETC. LOCATED IN THIS AREA SHALL BE PLENUM RATED.
- TEST AND BALANCE AGENCY SHALL INCREASE FAN SPEED AS REQUIRED TO BALANCE ZONE DAMPERS AND THEN REDUCE FAN SPEED AS REQUIRED FOR SPECIFIED AHU CFM.

HVAC SYMBOLS



A/C SUPPLY DIFFUSER WITH DAMPER.
SEE AIR DEVICE SCHEDULE.

8X6

A/C DUCT.



FLEXIBLE A/C DUCT. LETTER "E" MEANS EXISTING.
LETTER "ER" MEANS EXISTING TO BE RELOCATED.

EF

EXHAUST FAN



PROGRAMMABLE THERMOSTAT, INSTALL 48" A.P.F.

1VD

MANUAL VOLUME DAMPER

TEST AND BALANCE NOTE:

- THIS CONTRACTOR SHALL PROVIDE A INDEPENDENT TEST AND BALANCE WHERE INDICATED ON THIS DRAWING TO ASSURE THE REQUIRED AMOUNT OF "CFM" ARE PROVIDED AND NOTIFY OF ANY CONFLICT TO REACH THE AMOUNT OF "CFM" REQUIRED.

FAN SCHEDULE

MARK	MODEL NUMBER	CFM	ESP	AMPS	ELECTRICAL VOLTS-PH-HZ	DRIVE	RPM	SONES	REMARKS
EF	GREENHECK SF-A90	90	0.10	0.80 A	120-1-60	DIRECT	1,500	1.1	2,3,4,5

- PROVIDE FACTORY PRE-FABRICATED SOUND ATTENUATION ROOF CURB
- PROVIDE DISCONNECT SWITCH
- PROVIDE FAN SPEED CONTROLLER MOUNTED ON UNIT CASING
- BACKDRAFT DAMPER
- USE 6" DUCT

WHERE THE AIR INFILTRATION RATE IN A DWELLING UNIT IS LESS THAN 3 AIR CHANGES PER HOUR WHEN TESTED WITH A BLOWER DOOR AT A PRESSURE OF 0.2 INCH WATER COLUMN (50PA) IN ACCORDANCE WITH SECTION 402.4.1.2 OF THE FLORIDA BUILDING CODE, ENERGY CONSERVATION, THE DWELLING UNIT SHALL BE VENTILATED BY MECHANICAL MEANS IN ACCORDANCE WITH SECTION 403. FBC R-303.4

THIS CONTRACTOR MUST PROTECT DUCTWORK NOT TO BE IN CONTACT WITH FOAM INSULATION DURING APPLICATION AND AFTER FOAM IS DIERED TO PREVENT A VOIDED LISTING ON THE DUCTWORK. APPLICABLE TO FIBERGLASS AND FLEX DUCTWORK.

AIR DISTRIBUTION SCHEDULE

MARK	DESCRIPTION			
A	CEILING DIFFUSER 24x24 MODULE WITH SQUARE TO ROUD ADAPTOR. 9x9 FROM 0 TO 120 CFM 8" ROUND 12x12 FROM 125 TO 450 CFM 10" ROUND			
	NECK SIZE	MATERIAL	FINISH	BASIS OF DESIGN
	SEE ABOVE	ALUMINIUM	OFF-WHITE	TITUS
B	EXHAUST OR RETURN GRILL, EGGCRATE WITH 1/4"x1" GRID 6x6 FROM 0 TO 120 CFM 8x8 FROM 125 TO 250 CFM 10x10 FROM 255 TO 400 CFM 12x12 FROM 405 TO 520 CFM 14x14 FROM 525 TO 730 CFM 16x16 FROM 735 TO 950 CFM 18x18 FROM 955 TO 1200 CFM			
	SIZE	MATERIAL	FINISH	BASIS OF DESIGN
	SEE ABOVE	ALUMINIUM	OFF-WHITE	TITUS
C	SIDEWALL SUPPLY REGISTER: DOBLE DEFLECTION SURFACE MOUNTED BORDER W/OPPOSED BLADE DAMPERS 12x6 FROM 0 TO 300 CFM 20x6 FROM 305 TO 500 CFM			
	SIZE	MATERIAL	FINISH	BASIS OF DESIGN
	SEE ABOVE	ALUMINIUM	OFF-WHITE	TITUS
NOTE: 1. AIR DISTRIBUTION DEVICES LOCATED WITHIN ACOUSTICAL TILE CEILING SHALL BE PROVIDED WITH A 24"x24" FACE & A BORDER FOR LAY-IN MOUNTING. AIR DISTRIBUTION DEVICES LOCATED WITHIN GYPSUM BOARD CEILINGS OR WALLS SHALL BE PROVIDED WITH BORDER FOR SURFACE MOUNTING. REFER TO ARCHITECTURAL DOCUMENTS FOR CEILING TYPES.				

TEST AND BALANCE NOTE:

- THIS CONTRACTOR SHALL PROVIDE A INDEPENDENT TEST AND BALANCE WHERE INDICATED ON THIS DRAWING TO ASSURE THE REQUIRED AMOUNT OF "CFM" ARE PROVIDED AND NOTIFY OF ANY CONFLICT TO REACH THE AMOUNT OF "CFM" REQUIRED INCLUDING THE O/A CFM.

NOTES:

- PROVIDE PROGRAMMABLE THERMOSTAT WITH SUB-BASE.
- PROVIDE SOLENOID VALVES, ACCUMULATORS AND OTHER ACCESSORIES RECOMMENDED BY MFGR. FOR PROPER OPERATION.
- APPROVED EQUAL MANUFACTURERS ARE ACCEPTABLE.
- PROVIDE ACRYLIC COATING ON ALL PARTS OF AHU'S AND CU'S INCLUDING COILS AND FINS.

HVAC DESIGN REQUIREMENTS	YES	NO
DUCT SMOKE DETECTORS		X
FIRE DAMPERS		X
SMOKE DAMPERS		X
FIRE RATED ENCLOSURE		X
CEILING ASSEMBLY		X
FIRE STOPPING		X
SMOKE CONTROL		X

ALL RETURN GRILLS SIZE ARE "FREE AREA". THIS CONTRACTOR SHALL PROVIDE RETURN GRILL WITH FREE AREA TO MATCH THE SIZE SHOWN.

THIS CONTRACTOR SHALL VERIFY WITH TRUSSES CONTRACTOR FOR OPENING BETWEEN TRUSSES PRIOR ORDERING SUPPLY & RETURN GRILL AND CHANGE SIZE ACCORDINGLY

THIS CONTRACTOR SHALL PROVIDE AND INSTALL TURNING VANES AT ALL DUCTS TURNS.

DUCTS AND DIFFUSERS INSTALLATION NOTE:

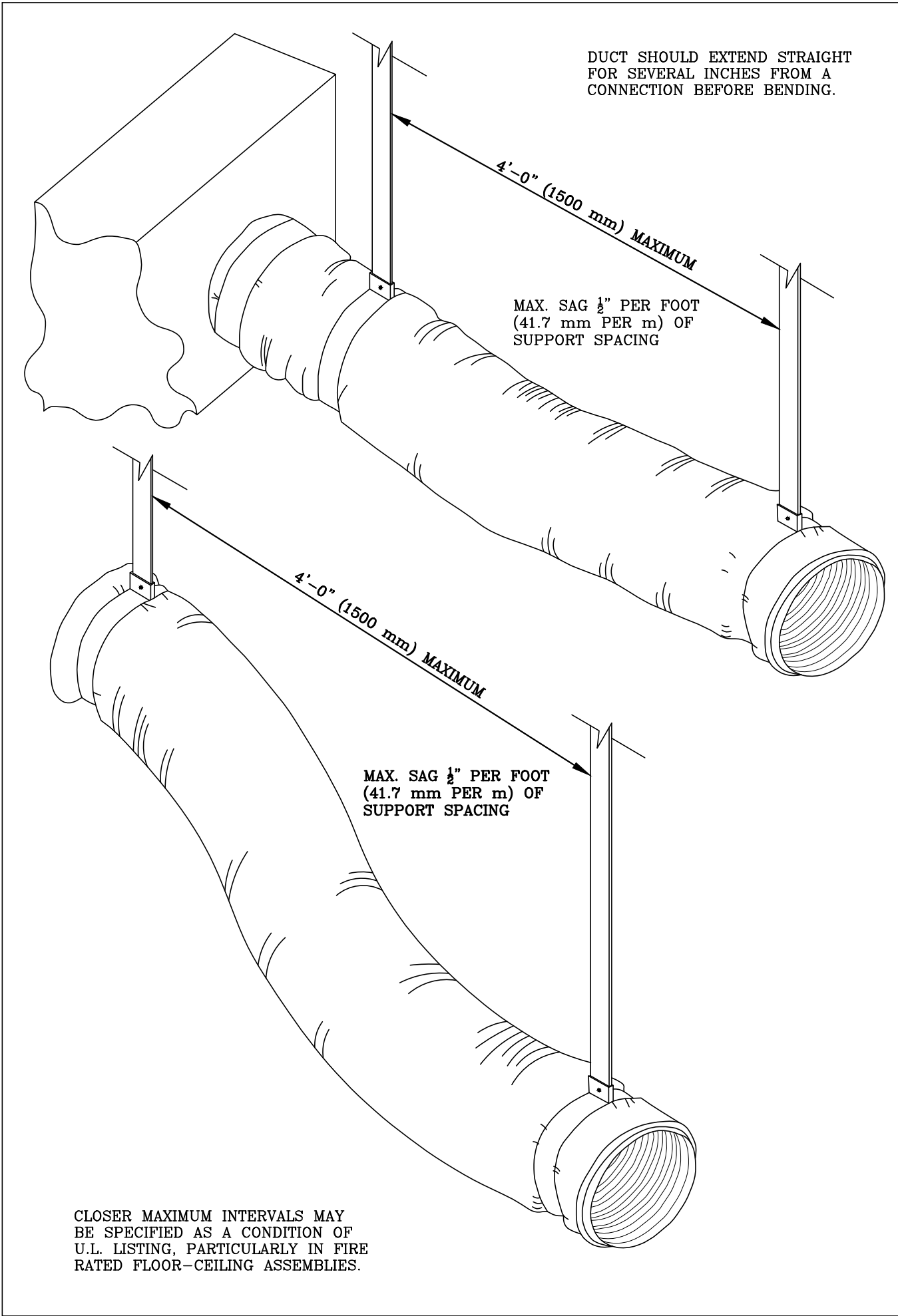
THE LOCATION OF ALL DUCTS AND DIFFUSERS ARE APPROXIMATE AND DOES NOT REPRESENT THE EXACT LOCATION. PRIOR THE INSTALLATION OF ALL DUCTS AND DIFFUSERS, THIS CONTRACTOR SHALL COORDINATE THE EXACT LOCATION WITH THE ELECTRICAL CONTRACTOR TO PREVENT ANY CONFLICT WITH LIGHT FIXTURES LOCATION.

LINEAL DIFFUSER CRITERIA NOTE:

- USE MAXIMUM OF 8" FLEX DUCT FOR 4ft LINEAL DIFFUSER (LIMITED TO 200cfm @ 50CFM/LINEAL FOOT)
- ALL LINEAL DIFFUSERS NOT TO EXCEED 50cfm/FT
- MINIMUM OF 14" PLENUM HIGH
- PROVIDE AND INSTALL TITUS WITH PLENUM BUILT IN BY MANUFACTURE (TITUS).

REFRIGERANT LIQUID LINES BELOW 5/8" O.D. SIZE TO BE ACR TYPE L. SOFT COPPER LIQUID LINES 5/8" O.D. AND LARGER AND ALL SUCTION LINES SHALL BE ACR TYPE L HARD COPPER, 15% SILFLOS TO BE USE FOR WELDING OF REFRIGERANT PIPING ALL SUCTION LINES TO BE INSULATED WITH A MINIMUM 1/2 THICK ARMAFLEX (R-4) OR EQUAL ROUGH-IN AND PRESSURE TEST ALL REFRIGERANT LINES WITH A 75 PSI PRESSURE, PRIOR TO CLOSING OFF THE REFRIGERANT LINES TO HOLD CHARGE FOR A MINIMUM OF 24 HOURS SIZE OF REFRIGERANT LINES TO BE AS PER MANUFACTURER RECOMMENDATIONS FOR THE ACTUAL LENGTH OF PIPE. EXTERNAL SURFACE PERMEANCE NOT EXCEEDING 0.05 PERM WHEN TESTED IN ACCORDANCE WITH ASTM E 96. FBC R-M1411.6.

PROVIDE REFRIGERANT CIRCUIT ACCESS PORTS AS PER 2023FBC (8th edition). R SECTION M1411.6 LOCATED OUTDOOR AND SHALL BE FITTED WITH LOCKING TYPE TAMPER RESISTANT CAPS OR SHALL BE OTHERWISE SECURED TO PREVENT UNAUTHORIZED ACCESS.



FLEXIBLE DUCT SUPPORTS

FLEXIBLE DUCT INSTALLATION STANDARDS

- UNLESS OTHERWISE DESIGNATED, THE TERM "FLEXIBLE AIR DUCT" IS USED FOR ALL DUCTS CLASSIFIED BY UL AS EITHER FLEXIBLE AIR DUCTS OR FLEXIBLE CONNECTORS.
- THESE PROVISIONS APPLY TO DUCTS USED FOR INDOOR COMFORT HEATING, VENTILATING, AND AIR CONDITIONING SERVICE. THEY DO NOT APPLY TO SERVICE FOR CONVEYING PARTICULATES, CORROSIVE FUMES AND VAPORS, HIGH TEMPERATURE AIR, CORROSIVE OR CONTAMINATED ATMOSPHERE, ETC.
- IT IS PRESUMED THAT PROJECT SPECIFICATIONS DEFINE THE SPECIFIC MATERIALS, PRESSURE LIMITS, VELOCITY LIMITS, FRICTION RATE, THERMAL CONDUCTIVITY, ACOUSTICAL RATINGS, AND OTHER ATTRIBUTES.
- WHEN DUCTS MUST CONFORM TO NFPA STANDARD 90A OR 90B, FLEXIBLE DUCTS MUST BE TESTED IN ACCORDANCE WITH UNDERWRITERS LABORATORY'S STANDARD FOR FACTORY MADE DUCT MATERIALS, UL-184, AND MUST BE INSTALLED IN ACCORDANCE WITH THE CONDITIONS OF THEIR UL LISTING. SEPARATE INSTALLATION LIMITATIONS FOR FLEXIBLE CONNECTORS AND FLEXIBLE DUCTS ARE IDENTIFIED IN NFPA STANDARD 90A. BY UL STANDARD 181, A FLEXIBLE CONNECTOR IS DEFINED AS: A FLEXIBLE AIR DUCT NOT HAVING CERTAIN FLAME PENETRATION, PUNCTURE, AND IMPACT TESTS.
- THE MINIMUM LENGTH OF FLEXIBLE DUCT SHOULD BE USED.
- BENDS SHALL BE MADE WITH NOT LESS THAN 1 DUCT DIAMETER CENTERLINE RADIUS. DUCTS SHOULD EXTEND A FEW INCHES BEYOND THE END OF A SHEET METAL CONNECTION BEFORE BENDING. DUCTS SHOULD NOT BE COMPRESSED.
- DUCTS SHALL BE LOCATED AWAY FROM HOT EQUIPMENT SUCH AS FURNACES AND STEAM PIPES TO AVOID EXCESS TEMPERATURE EXPOSURE.
- ILLUSTRATIONS OF ACCESSORIES, SLEEVES, AND COLLARS ARE REPRESENTATIVE OF CLASSES OF ITEMS. THE USE OF COMPONENTS NOT PRECISELY IDENTICAL TO THESE IS ACCEPTABLE.
- IF THE APPLICATION GUIDELINES DICTATED BY THE FLEXIBLE DUCT MANUFACTURER ARE MORE STRINGENT THAN THE SPECIFICATIONS IN THIS MANUAL, THOSE OF THE MANUFACTURER SHALL GOVERN.

SPECIFICATION FOR SUPPORTING FLEXIBLE DUCT

- FLEXIBLE DUCT SHALL BE SUPPORTED AT THE MANUFACTURER'S RECOMMENDED INTERVALS BUT AT LEAST EVERY 4' (1.5M). MAXIMUM PERMISSIBLE SAG IS A 1/2 INCH PER FOOT (41.7 MML) OF SPACING BETWEEN SUPPORTS. A CONNECTION TO ANOTHER DUCT OR TO EQUIPMENT IS CONSIDERED A SUPPORT POINT.
- HANGER OR SADDLE MATERIAL IN CONTACT WITH THE FLEXIBLE DUCT SHALL BE WIDE ENOUGH SO THAT IT DOES NOT REDUCE THE INTERNAL DIAMETER OF THE DUCT WHEN THE SUPPORTED SECTION RESTS ON THE HANGER OR SADDLE MATERIAL. IN NO CASE WILL THE MATERIAL CONTACTING THE FLEXIBLE DUCT BE LESS THAN 1" WIDE. NARROWER HANGER MATERIAL MAY BE USED IN CONJUNCTION WITH A SHEET METAL SADDLE THAT MEETS THIS SPECIFICATION. THIS SADDLE MUST COVER ONE-HALF THE CIRCUMFERENCE OF THE OUTSIDE DIAMETER OF THE FLEXIBLE DUCT AND FIT NEATLY AROUND THE LOWER HALF OF THE DUCT'S OUTER CIRCUMFERENCE.
- FACTORY-INSTALLED SUSPENSION SYSTEMS THAT ARE INTEGRAL TO THE FLEXIBLE DUCT ARE ACCEPTABLE FOR HANGING WHEN THE MANUFACTURER'S RECOMMENDED PROCEDURES ARE FOLLOWED.
- HANGERS SHALL BE ADEQUATELY ATTACHED TO THE BUILDING STRUCTURE.
- TO AVOID TEARING THE VAPOR BARRIER, DO NOT SUPPORT THE ENTIRE WEIGHT OF THE FLEXIBLE DUCT ON ANYONE HANGER DURING INSTALLATION. AVOID CONTACTING THE FLEXIBLE DUCT WITH SHARP EDGES OF THE HANGER MATERIAL. DAMAGE TO THE VAPOR BARRIER MAY BE REPAIRED WITH APPROVED TAPE. IF THE INTERNAL CORE IS PENETRATED, REPLACE THE FLEXIBLE DUCT OR TREAT THE TEAR AS A CONNECTION.
- TERMINAL DEVICES CONNECTED BY FLEXIBLE DUCT SHALL BE SUPPORTED INDEPENDENTLY OF THE FLEXIBLE DUCT.

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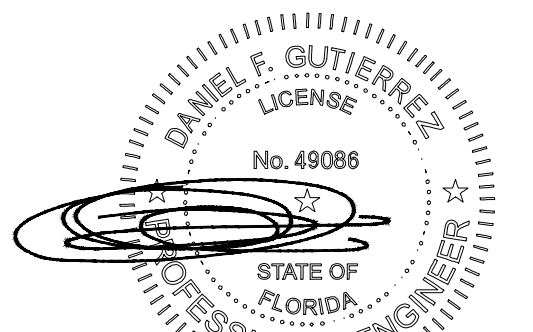
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DG CONSULTING ENGINEERS, LLC
DESIGN — INSPECTIONS

HERRERA
RESIDENCE

6825 SW 132nd St,
Pinecrest, FL 33156.

SEAL



05-14-25

DANIEL F. GUTIERREZ, P.E.

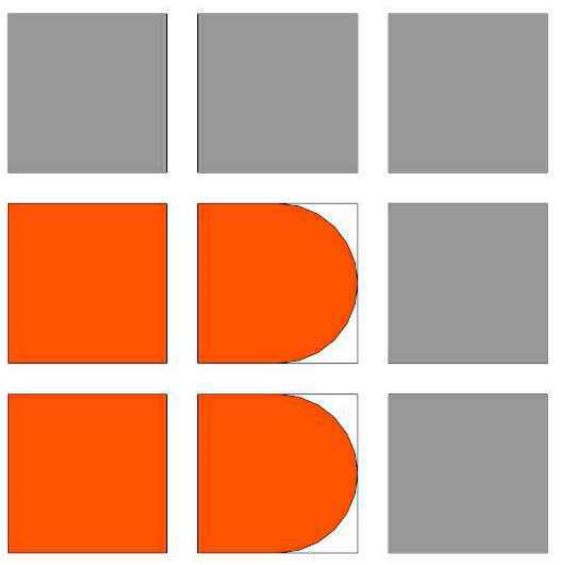
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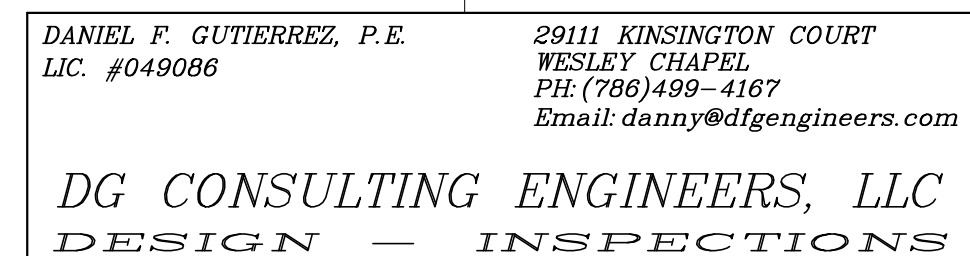
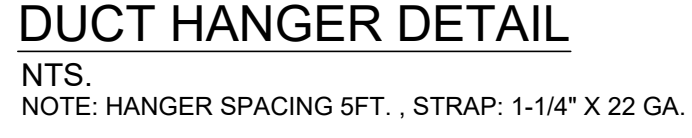
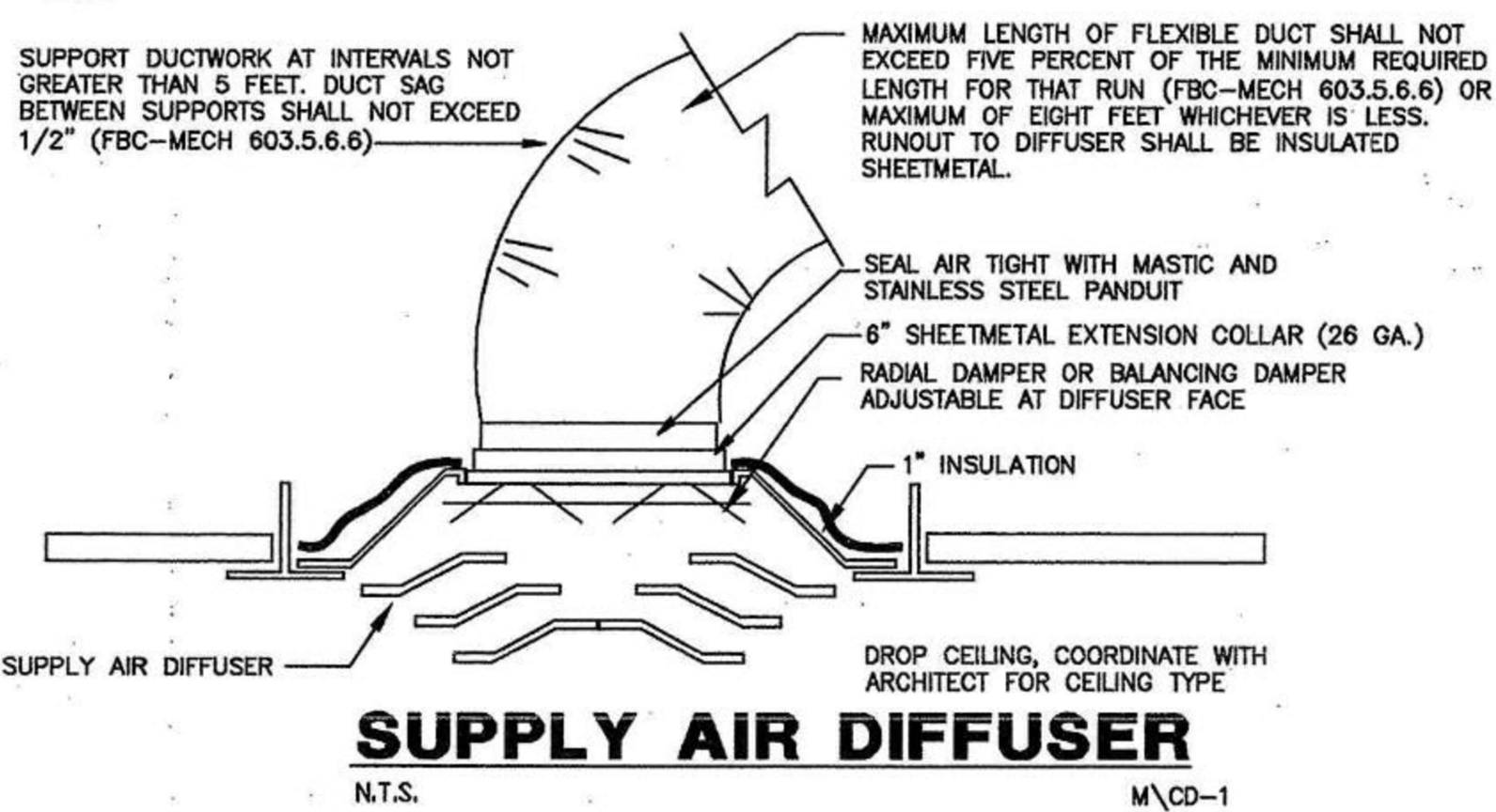
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Diagram illustrating a heavy-duty concrete steel insert with an elongated strap. The insert is shown embedded in a concrete structure. Labels include: HEAVY DUTY CONCRETE STEEL INSERT WITH ELONGATED STRAP, INSERT NUT, and HANGER ROD.



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