A/C EQUIPMENT SCHEDULE (BASED ON JCI/YORK; EQUAL BY LENNOX, CARRIER, OR TRANE IS ACCEPTABLE)																					
Unit Size		EFFICIENCY	ELECTRICAL	1		EVAPOR	ATOR I	FAN	Ö	OLIN	3					HEATING	(TOM ETE	CTRIC)		DIMENSIONS &	WEIGHTS
Ì	MODEL NUMBER	EER / SEER	V-Ph-Hz	MCA	MAX	CFM	HP	ESP	TE	MP.	(F)			CAPACIT	MBH	TEMP. (F	)	CAPACITY	•	DIMENSIONS	WEIGHT
}					FUSE			(IN)	ENT.	AIR	0/A	LVG.	AIR	тот.	SEN.	ENT. AIR	LVG. AIR	KW	MBH	LxWxH (IN)	(LBS)
									DB	WB	AMB	DB	WB			DB	DB	IN	OUT	("")	
6.5 Ton	J06 ZF	11.2	460-3-60	17.8	20	2600	2	1.0	80	67	105	60.0	58.1	73.9	56.2	60	70.9	9	30.7	89 x 59 x 42	975
RTU-1	1							<u> </u>				<u> </u>				<u> </u>			<u> </u>		

SUPPLY 24"X24" LAY-IN GRID FULL SIZE 24"X24" ALUMINUM, STAMPED LOUVERED FACE DIFFUSER ADJUSTABLE AIR DIRECTION

RETURN 24"X24" LAY-IN GRID ALUMINUM, FIXED BLADE BAR TYPE RETURN AIR GRILLE. NECK SIZE PER PLAN

VERIFY, MATCH EXISTING.

NAILOR INDUSTRIES ARNSA

NAILOR INDUSTRIES 5145H

C NAILOR INDUSTRIES 51DV-0

16" DIA.

A	AIR DEVIC	E SCHE	DUL	E	
YPE	MFG.	MODEL	APPL.	MOUNTING	DESCRIPTION

SUPPLY SIDE WALL DUCT MTD. SIDEWALL DIFFUSER, ADJUSTABLE DOUBLE DEFLEXION, WITH OPPOSED BLADE DAMPER (OBD) NOTES: \*\* NECK SIZE AND CFM AS NOTED ON FLOOR PLAN DRAWINGS \*\* ALL GRILLES TO BE PAINTED TO MATCH ARCHITECTURAL SPECIFICATIONS. PROVIDE GRILLE WITH FINISH TO ACCEPT ENAMAL PAINT.

#### CEILING DIFFUSER NECK CHART 6" DIA. 0 - 80 CFM 8" DIA. 85 - 175 CFM 10" DIA. 180 - 320 CFM 12" DIA. 325 - 550 CFM 555 - 825 CFM

MECHANICAL SCHEDULES

830 - 1200 CFM

BRANCH DUCT SIZE CHART						
DUCT SIZE	CFM RANGE					
6" DIA.	0 - 80 CFM					
8" DIA.	85 - 175 CFM					
10" DIA.	- 180 - 320 CFM					
12" DIA.	325 - 550 CFM					
14" DIA.	555 - 825 CFM					
408 014	070 4000 0514					

RANCH D	OUCT SIZE CHART	OPEN VENT
DUCT SIZE	CFM RANGE	
6" DIA.	0 - 80 CFM	UNION———— A     B
8" DIA.	85 — 175 CFM	COIL UNIT—
10" DIA.	- 180 - 320 CFM	
12" DIA.	325 - 550 CFM	
14" DIA.	555 — 825 CFM	P-TRAP
16" DIA.	830 1200 CFM	
		A B
		DRAW THRU: FAN TOTAL STATIC 3" PRESSURE PLUS 1"

LAVATORY

1-1/2" TAILPIECE-

1-1/2"X1-1/2"X1"

1-1/2" TRAP ARM-

## HVAC UNIT CONDENSATE DRAIN

8 CD INTO LAV TAIL PEICE DETAIL

SCREWED TEE

SUPPLEMENTARY NOTES RELATIVE TO HVAC COMPLIANCE WITH THE CURRENT ENERGY CODE

FAN TOTAL STATIC PRESSURE PLUS 4"

(1) EACH COOLING & HEATING SYSTEM SHALL HAVE AT LEAST ONE SOLID-STATE PROGRAMMABLE THERMOSTAT THAT CAN START AND STOP THE SYSTEM UNDER DIFFERENT TIME SCHEDULES FOR SEVEN DIFFERENT DAY TYPES PER WEEK, ARE CAPABLE OF RETAINING PROGRAMMING AND TIME SETTING DURING LOSS OF POWER FOR A PERIOD OF AT LEAST 10 HOURS AND INCLUDE AN ACCESSIBLE MANUAL OVERRIDE OR EQUIVALENT FUNCTION THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO TWO HOURS, HVAC CONTROL SYSTEMS SHALL BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION, HVAC SYSTEMS SHALL HAVE THE OFF-HOUR CONTROLS REQUIRED BY THE CURRENT LOCAL ENERGY COMPLIANCE CODE, HEATING SYSTEMS SHALL BE EQUIPPED WITH CONTROLS THAT HAVE THE CAPABILITY TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES ABOVE A HEATING SET POINT ADJUSTABLE DOWN TO 55F OR LOWER, COOLING SYSTEMS SHALL BE EQUIPPED WITH CONTROLS THAT HAVE THE CAPABILITY TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES BELOW A COOLING SET POINT ADJUSTABLE UP TO 85F OR HIGHER OR TO PREVENT HIGH SPACE HUMIDITY

(2) EACH SYSTEM SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS PER THE CURRENT ENERGY CONSERVATION CODE.

(3) EACH AIR DEVICE OR THE BRANCH DUCT TO THAT AIR DEVICE SHALL BE EQUIPPED WITH A MANUAL DAMPER TO FACILITATE AIR BALANCING. (4) CONDENSATE SHALL BE DISCHARGED TO AN APPROVED PLUMBING FIXTURE OR

(5) THERMAL INSULATION FOR BOTH REFRIGERANT AND CHILLED WATER PIPING AND DUCTWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT ENERGY

(6) IF AREA OF CONSTRUCTION IS 5,000 SF OR MORE, CONDITIONED SPACES ARE TO BE AIR BALANCED PER AABC OR NEBB STDS.

(7) IF THE CONDITIONED AREA IS 50,000 SF OR MORE, AFTER CONSTRUCTION, THE HVAC IS TO BE COMMISSIONED, AND A COMMISSIONING STATEMENT IS TO BE ISSUED AND SIGNED BY EITHER THE ARCHITECT OR ENGINEER OF RECORD.

(8) WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED TO THE BUILDING OWNER OR A DESIGNATED REPRESENTATIVE, RECORD DRAWINGS SHALL INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF THE DUCT AND PIPE DISTRIBUTION SYSTEM, INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES. ALSO TO BE PROVIDED WITHIN 90 DAYS ARE OPERATING AND MAINTENANCE MANUALS INCLUDING AT A MINIMUM SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, OPERATION MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, OPERATION MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. ALSO INCLUDED SHALL BE NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY, HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD— DETERMINED SET POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS, AT CONTROL DEVICES, OR FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS. ALSO TO BE INCLUDED IS A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET POINTS.

(9) BOTH DUTDOOR AIR SUPPLY AND EXHAUST SYSTEMS SHALL BE EQUIPPED WITH MOTORIZED DAMPERS THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEMS OR SPACES SERVED ARE NOT IN USE, SUCH DAMPERS SHALL HAVE A MINIMUM LEAKAGE RATE OF 0.3 CFM PER SQ. FT. VENTILATION DUTDOOR AIR DAMPERS SHALL BE CAPABLE OF AUTOMATICALLY SHUTTING OFF DURING PREDCCUPANCY BUILDING WARM-UP, CODL-DOWN, AND SETBACK, EXCEPT WHEN VENTILATION MUST BE SUPPLIED TO MEET CODE REQUIREMENTS (EXCEPTIONS) GRAVITY DAMPERS ARE ACCEPTABLE IN EXHAUST SYSTEMS FOR BLDGS. LESS THAN 3-STORIES AND FOR ANY HEIGHT, GRAVITY DAMPERS ARE ACCEPTABLE FOR D/A OR EXHAUST OF 300 CFM OR LESS, AND WHERE PROHIBITED BY CODE)

(10) EACH SYSTEM SHALL EPERATE WITH THE SET POINTS BETWEEN 70 AND 90 DEGREES, PROGRAMMABLE THERMOSTATS TO PROVIDE OWNERS PRESET TIMES AND TEMPERATURE OF OPERATION FOR COOLING AND HEATING SYSTEMS

# AIR DIFFUSER CONNECTION

DIFFUSER NECK SIZE.

SUPPLY AIR DUCT. SEE PLANS FOR

DUCT TAPE OUTER

JACKET OF INSULATION

TO DUCTWORK ----

PROVIDE RIGID DUCT EXTENSION

AS REQUIRED, THE SAME SIZE AS THE AIR DEVICE NECK ----

FLEXIBLE DUCT MAXIMUM

SIZE. REFER TO SPECIFICATIONS

FOR INSULATION. ---

FROM EQUIPMENT

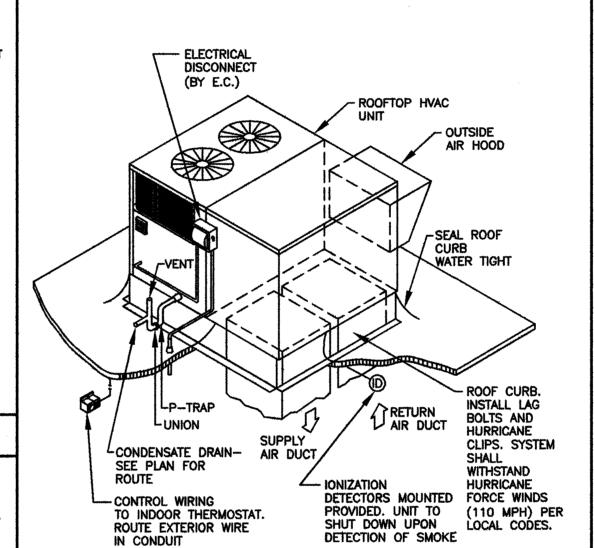
-COPPER COUPLING

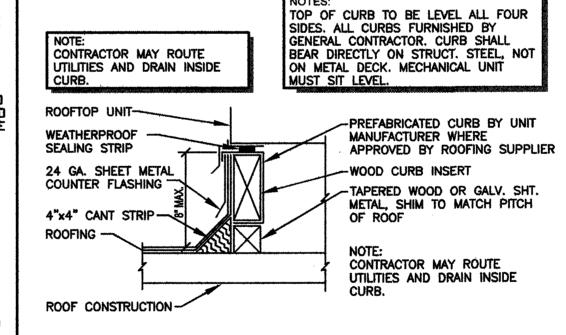
-COPPER ELBOW COPPER TO INCH PIPE SIZE

CHROME PLATED

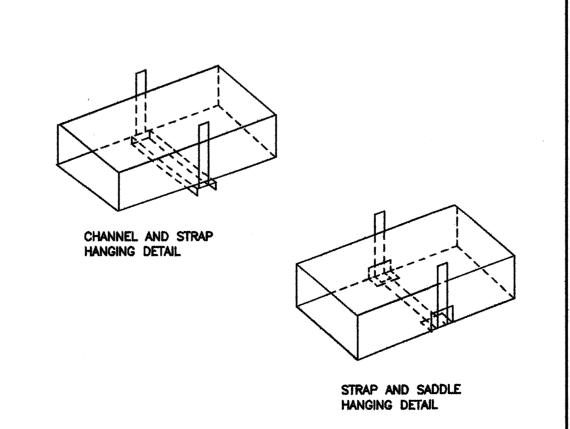
ESCUTCHEON

FOR SIZE





# ROOF TOP UNIT DETAIL



1. ALL WORK TO MEET WITH THE LOCAL CITY CODES AMENDMENTS AND INTERNATIONAL MECHANICAL BUILDING CODE REQUIREMENTS.

2. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

3. VERIFY ALL EQUIPMENT DIMENSIONS AND LOCATIONS WITH

ARCHITECTURAL PLANS. 4. MECHANICAL CONTRACTOR TO VERIFY EXACT PLACEMENT OF SUPPLY & RETURN AIR DEVICES WITH REFLECTED CEILING LIGHTING LOCATIONS AND ARCHITECTURAL DRAWINGS FOR STRUCTURE TYPE.

5. DO NOT SCALE THESE DRAWINGS FOR DIMENSIONAL INFORMATION. IF THERE IS A CONFLICT WITH THE PLAN DIMENSIONS OR AN EXISTING FIELD CONTRACT ARCHITECT.

6. COORDINATE ALL WORK WITH EACH SUB CONTRACTOR AND GENERAL CONTRACTOR AND GENERAL CONTRACTOR CONTRACTOR (STRUCTURAL, ELECTRICAL, MECHANICAL, AND PLUMBING) PRIOR TO INSTALLATION AND CONNECTION OF EQUIPMENT.

7. VERIFY EXISTING ROOF TOP UNIT CLEAN & SERVICE ROOF TOP UNITS TO ORIGINAL CONDITIONS AS POSSIBLE.

### GENERAL NOTES

#### GENERAL

-SPIN-IN FITTINGS 26 GAUGE

-VOLUME DAMPER WITH LOCKING

GALVANIZED STEEL.

- STAINLESS STEEL CLAMP

--- INSULATED FLEX DUCT

QUADRANT

SCHEDULED AIR DEVICE-

NOTE: 1. SUPPORT FLEX DUCT FROM STRUCTURE SO THAT IT DOES

2. SEE PLAN FOR DUCT SIZE. PROVIDE SAME SIZE AS

NOT KINK, SAG OR REST ON LIGHT FIXTURES, CEILING

Furnish and install a complete and workable HVAC system per the plans and specifications. Comply with the latest edition of the Uniform Mechanical Code and the Uniform Building Code as it applies with modifications by the governing city to obtain all permits and pay all fees. Materials shall be new and undamaged. Equipment shall be UL LIST & APPROVED by the authority having jurisdiction over such equipment and shall be warranted for a period of one year from the date of finial acceptance. Guarntee HVAC compressors in air conditioning equipment for a period of five years from the date of final acceptance.

Coordinate work with other trades and with job site conditions before installing and/or fabricating mechanical equipment. Visit the job site prior to bid date and becoming aquatinted with existing conditions to determine the extent of mechanical work which shall be required to complete the job. No allowance and/or compensation will be made for failure to understand the scope of work

3. The plans attempt to show the desired locations of mechanical equipment and materials and to coordinate them with other trades; however, reasonable revisions and/or changes to the location of equipment and/or materials may be required and shall be made to avoid conflicts with other building trades and existing job site conditions at no additional cost.

Supply and return air ducts shall be rigid fiberglass high density duct board, fabricated and installed by SMACNA & ASHRAE Standards.

Mount all equipment for wind loads and mounting heights per local codes. This shall be verified with structural engineer by HVAC contractor and to be a part of mechanical contractor's bid. Wind load to be min. 90 MPH

6. Furnish and install fire dampers in supply & return air ducts penetrating the space at the rated ceiling and or wall.

Verify the finial locations of thermostats with the Architect and/or owner prior to installation.

Mount to meet A.D.A. mounting requirements. Should conflicts exist between HVAC and Architectural documents, the Architectural documents shall govern.

8. Furnish and install the equipment as shown. Coordinate the size and location for new openings and/or penetrations required. Secure necessary rough—in data, templates, roofjacks, roof curbs, etc. required to complete the work in a timely fashion to facilitate proper installations. Cut required openings or penetrations, install the appropriate framing devices and restore the existing construction to its original condition.

Install full line size primary condensate drain lines from air handling unit/equipment to approved receptor. (Soil stack, or floor drain, hud drain, or floor sink). Install full size auxiliary drain pans (galvanized metal pans) below each air handling unit/equipment and route full size auxiliary drain line to discharge over the plumbing fixture as indicated on plans.

Furnish and install all control devices including (but not limited to thermostats, relays, interlocking devices and other necessary cantrol items required to provide a complete and workable system. Control wiring exposed outside the building shall be installed in emt conduit.

ALL SUPPLY DUCTWORK TO BE R-8 RATED ALL RETURN DUCTWORK TO BE R-8 RATED ALL RETURN DUCIWORK TO BE R-8 RATED

1. Flexible duct shall be class 1 and U.L. #181 listed; with 2" fiberglass blanket, 0.1 perm rated polyethylene inner jacket, and 0.1 perm rated reinforced metalized film outer jacket, duct shall be flexmaster type #131 or "approved equal, secure duct to rigid collars with adjustable stainless steel clamping bands. Tape and sealed joint airtight with UL listed duct tape with acrylic based adhesive (latex based adhesive is not acceptable) per the manufacturer's recommendations. Suspend ductwork from structure above using minimum 18 GA., 1" wide galvanized sheet metal hanger straps (not to exceed 4'--0") or hangers as allowed by SMACNA standard (whichever is more stringent). Provide sheet metal saddles at hanger straps.

Rigid round ductwork shall be galvanized sheet metal, externally insulated with 2" density fiberglass, fabricated and installed per SMACNA standards. Tape and seal joints airtight with Ut. listed duct tape with acrylic based adhesive (latex based adhesive is not acceptable) per the manufacture's recommendations. Suspend ductwork from stricture using minimum 18 GA. 1" wide galvanized sheet metal hanger straps (not to exceed 4'-0"

Rectangular supply and return ductwork shall be 2" fiberglass ductboard, Toughgguard manufactured by CERTAINTEED fiberglass or "approved equal". All ductwork, and the installation thereof, shall adhere to the latest edition of SMACNA requirements. DuctBoard shall UL 181 listed class 1 and shall be sealed and supported in the following manner.

a. All longitudinal and circumferential joints must be stable with outward flaring, 1/2" (minimum) staples 2" O.C.

 Wipe surface where tape is to be applied with a clean cloth. (If surface has grease or oil saturate cloth with approved solvent prior to wiping). c. Rub tape (hard cast typ #AM-401, no exceptions) firmly in place immediately after application, using a "squeegee" or similar tool.

d. Ductwork shall be suspended for the structure above using 20 gauge (minimum) galvanized stell hanger straps and saddles, spaced not to exceed 4—0" O.C. Duct dimensions shown on the drawings are net clear internal dimensions and allowance must be made for duct insulation.

Refer to floor plan drawings for round insulated duct locations. All duct above suspended and/or gypboard (furrdown) ceiling to be duct board, verify with owner for ALTERNATE pricing for external insulated metal duct.

The balance of the supply air and return duct shall be E1 475 fiberglass in accordance with SMACNA. SMACNA approved tape shall be provided for the closure systems.

Spin—in fittings shall be factory fabricated, and include an extractor scoop and a balancing damper with locking quadrant and handle. Note that balancing for the type "A" ceiling diffusers shall be at the spin—in fitting.

Condensate drain lines shall be schedule 40, galvanized steel, or type "L" copper pipe.
 Provide unistrut pipe clamps at pipe supports as required (not to exceed 6 feet 0.C.).
 Provide dielectric separation between all dissimilar materials.

1. Air Devices: REFER TO SCHEDULE. Coordinate air device requirements with project owner.

Insulate refrigerant suction piping with 1" armaflex "AP-2000" insulation. Seal all joints airtight with armstrong #520 vapor barrier adhesive and two coats of armstrong finish (each coat shall be a different color to insure 100% coverage) per the manufacturer's recomm recommendations. Provide 16 gauge galvanized sheetmetal support saddle at each hanger or support. In addition, all lines exposed outside the building shall have a 16 mil aluminum jacket, sealed watertight with GE silicon sealer.

Insulate condensate drain lines with 1/2" armaflex "AP-2000" insulation. Seal joints airtight with armstrong #520 vapor barrier adhesive and two coats of armstong finish as per the manufacturer's recommendations. Provide 16 gauge galvanized sheet metal support saddle at each hanger or support.

Fire dampers: Rusking type IBD2, style "B", UL labeled with 165 degree fusible link, rated for 1-1/2 hours per UL standard 555 with blades entirely out of the airstream. Install

2. Filters shall be provide din the air handling units. The factory filters shall be used during construction and a new set of 1" min. replaceable media. Metal filler frame filters shall be provided in the units just prior to est and balance.

The air handling units shall be provided with smoke detectors in accordance with applicable codes. (in supply and return air plenums)

Contractor shall furnish shop drawings for NEW exhaust fans, and air devices and air handlers, and hvac condensing units, and controls.

HVAC contractor shall verify and coordinate with the electrical contractor HVAC unit voltage requirements and confirm it with the equipment mfr.

### CONTROLS

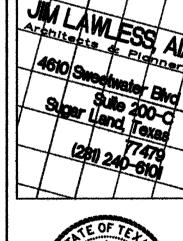
ROOM THERMOSTATS SHALL BE PROVIDED FOR EACH NEW UNIT & EXISTING UNIT. THERMOSTATS SHALL BE MOUNTED TO A.D.A. HEIGHT REQUIREMENTS. WITH THE CONTROL WIRES CONCEALED IN WALL, THERMOSTATS SHALL BE PROGRAMMABLE (SELECT MODEL # TO SUITE APPLICATION)
OR EQUAL AS FURNISHED BY THE A/C UNIT MANUFACTURER. PROVIDE WITH HONEYWELL LOCKING GUARD # TGS86 (2) KEYS. THE KEYS SHALL BE ENGRAVED BAKELITE TAG ATTACHED, WITH "THERMOSTATS" NOTED ON THE TAG, AND BE TURNED OVER TO THE TENANT/MANAGER AT START-UP.

THE HVAC UNITS SHALL BE PROVIDED WITH SMOKE DETECTORS IN ACCORDANCE WITH APPLICABLE CODES. (IN SUPPLY AND RETURN AIR PLENUMS)

MECHANICAL SYMBOLS

DATE: 09/08/11 **REVISIONS:** 

0 Ш





THIS SEAL WAS AUTHORIZED THIS DATE 9/08/11 PROJECT #11-210 H.M. McLEOD, P.E. 4727 MERWIN ST. SUITE B HOUSTON, TEXAS 77027 OFFICE: (713) 961-2699 FAX: (713) 961-5691 CELL: (713) 806-1646 Firm Registration: H. M. McLeod, P.E. #F-3679 © 2011 H.M. McLeod, P.E. Drawings, written material, and design

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**MECHANICAL DETAILS** 

TYP. MANUAL VOLUME DAMPER, WHERE SHOWN ON DRAWINGS. BRACKET (TYP)

FOUAL SPLIT SQUARE TEE

EXPANDED DUCT TAP

TYPICAL DUCT FITTINGS DETAIL

EXTRACTOR DUCT TAP

SQUARE ELBOW

TYP. SPLITTER

DAMPER, WHERE

SHOWN ON DWGS.

SPLIT DUCT TAP

CONTROL ROD TO LIMIT

AIR EXTRACTOR

THIS DIMENSION TO

20% OF DUCT WIDTH

UNEQUAL SPLIT SQUARE TEE

DETAIL OF TURNING VANE

2" O.C.

RADUIS ELBOW

6 ENERGY CODE COMPLIANCE

DUCT SUSPENSION DETAIL