ABBREVIATIONS

AC	AIR CONDITIONING	PRESS	PRESSURE
ACH	AIR CHANGES PER HOUR	PVC	POLYVINYLCHLORIDE
AD	ACCESS DOOR	RA	RETURN AIR
AFF	ABOVE FINISHED FLOOR	RD	ROOF DRAIN
AG	ABOVE GRADE	REF	REFRIGERANT
AHU	AIR HANDLING UNIT	RG	RETURN GRILLE
AI	ANALOG INPUT	RL	RAIN LEADER
AO	ANALOG OUTPUT	RLA	RUNNING LOAD AMPS
AP	ACCESS PANEL	RPM	REVOLUTIONS PER MINUTE
APPROX	APPROXIMATELY	RS	REFRIGERANT SENSOR
BAS	BUILDING AUTOMATION SYSTEM	RTU	ROOFTOP A/C UNIT
BDD	BACK DRAFT DAMPER	RTU	ROOF TOP UNIT
BFF	BELOW FINISHED FLOOR	SA	SUPPLY AIR
BHP	BRAKE HORSE POWER	SD	SUPPLY DIFFUSER
BOD	BOTTOM OF DUCT	SD	FIRE STAT
BOT	BOTTOM	SD	SMOKE DETECTOR
BTU	BRITISH THERMAL UNIT	SEN	SENSIBLE
CAP	CAPACITY	SG	SUPPLY GRILLE
CC	COOLING COIL	SP	STATIC PRESSURE
CD	CONDENSATE DRAIN	STRUCT	STRUCTURAL
CFM	CUBIC FEET PER MINUTE	SYS	SYSTEM
CHWR	CHILLED WATER RETURN	T	TEMPERATURE
CHWS	CHILLED WATER SUPPLY	TSP	TOTAL STATIC PRESSURE
CLG	CEILING	TYP	TYPICAL
CMU	CONCRETE MASONRY UNIT	UC	UNDERCUT
CONN	CONNECTION	UG	UNDERGROUND
CT	COOLING TOWER	UL	UNDERWRITERS LABORATORY
CU	CONDENSING UNIT	UON	UNLESS OTHERWISE NOTED
DB	DRY BULB	UV	UNIT VENTILATOR
DDC	DIRECT DIGITAL CONTROL	VAV	VARIABLE AIR VOLUME
DG	DOOR GRILLE	VD	VOLUME DAMPER
DI	DIGITAL INPUT	VFD	VARIABLE FREQUENCY DRIVE
DN	DOWN	WB	WET BULB
DO	DIGITAL OUTPUT		
DP	DEW POINT		
DX	DIRECT EXPANSION		
EA	EXHAUST AIR		
EAT	ENTERING AIR TEMPERATURE		
EA	EXHAUST AIR		
EER	ENERGY EFFICIENCY RATIO		
EF	EXHAUST FAN		
EG	EXHAUST GRILLE		
EL	ELEVATION		
ELEC	ELECTRICAL		
ENT	ENTERING		
EQUIP	EQUIPMENT		
ESP	EXTERNAL STATIC PRESSURE		
ET	EXPANSION TANK		
EXH	EXHAUST		
EXIST	EXISTING		
F	FAHRENHEIT		
FA	FILTER ACCESS		
FACP	FIRE ALARM CONTROL PANEL		
FCD	FLOW CONTROL DAMPER		
FCU	FAN COIL UNIT		
FD	FIRE DAMPER		
FSD	FIRE SMOKE DAMPER		
FL	FLOOR		
FLA	FULL LOAD AMPACITY		
FPF	FINS PER FOOT		
FPI	FINS PER INCH		
FPM	FEET PER MINUTE		
FPM	FINS PER MINUTE		
FSD	FIRE/SMOKE DAMPER		
GPH	GALLONS PER HOUR		
GPM	GALLONS PER MINUTE		
H	HUMIDITY		
HC	HEATING COIL		
HP	HORSEPOWER		
HHWR	HEATING HOT WATER RETURN		
HHWS	HEATING HOT WATER SUPPLY		
HZ	HERTZ		
IN-H2O	INCHES OF WATER		
KW	KILOWATT		
LAT	LEAVING AIR TEMPERATURE		
LAT	LATENT		
LD	LOUVERED DOOR		
LPC	LOW PRESSURE CONDENSATE		
LPS	LOW PRESSURE STEAM		
LRA	LOCKED ROTOR AMPS		
LVG	LEAVING		
LWT	LEAVING WATER TEMPERATURE		
MAX	MAXIMUM		
MBH	1000xBTU		
MCA	MINIMUM CIRCUIT AMPACITY		
MEZZ	MEZZANINE		
MIN	MINIMUM		
MISC	MISCELLANEOUS		
NC	NORMALLY CLOSED		
NIC	NOT IN CONTRACT		
NO	NORMALLY OPEN		
NTS	NOT TO SCALE		
OA	OUTSIDE AIR		
OAI	OUTSIDE AIR INTAKE		
OAL	OUTSIDE AIR LOUVER		
OC	ON CENTER		
PD	PRESSURE DROP		
PKU	PACKAGE UNIT		
PH	PHASE		
POC	POINT OF CONNECTION		

THIS IS A GENERAL LIST OF ABBREVIATIONS AND MAY NOT BE USED ON A SPECIFIC PROJECT. IF AN ABBREVIATION IS USED ON A PROJECT AND IS NOT REPRESENTED IN THIS LIST, CONTRACTOR SHALL SUBMIT A REQUEST FOR INFORMATION.

MECHANICAL GENERAL NOTES

1 APPLICABLE CODES: FLORIDA BUILDING CODE SEVENTH EDITION INCLUDING MECHANICAL, PLUMBING, FUEL GAS. NEC 2011, SMACNA, ASHRAE, NFPA

2 THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE SYSTEM IN ACCORDANCE WITH THESE DRAWINGS. THE APPLICABLE BUILDING CODE AND ALL OTHER APPLICABLE STATE, COUNTY, AND LOCAL ORDINANCES AND THE LATEST ADDITION OF THE FOLLOWING PUBLICATIONS; SMACNA, ASHRAE, NFPA 90A, 90B, 91, AND ANSI B-9.1 MECHANICAL REFRIGERATION.

3 THE CONTRACTOR SHALL PAY ALL COSTS OF PERMIT, INSPECTIONS, AND ALL OTHER COSTS INCIDENTAL TO THE COMPLETION AND TESTING OF THIS WORK.

4 THE CONTRACTOR SHALL VISIT THE SITE AND COORDINATE WITH ALL OTHER TRADES.

5 THE CONTRACTOR SHALL SUPPLY THE ARCHITECT WITH "AS-BUILT" DRAWINGS. IF FIELD CHANGES ARE MADE, CONTRACTOR NEEDING DRAWINGS CHANGES FOR INSPECTION, SHALL SUBMIT CHANGES WITH SUFFICIENT TIME TO MAKE DRAWINGS CHANGES. THE CONTRACTOR WILL BE BILLED HOURLY FOR CAD CHANGES IF THE CHANGES WERE NOT PRE-APPROVED BY THE ENGINEER AND OWNER.

6 THE CONTRACTOR SHALL SUBMIT FOR APPROVAL FIVE (5) COPIES OF MANUFACTURER'S DRAWINGS FOR EACH PIECE OF EQUIPMENT AND CONTROLS INCLUDED IN CONTRACT. CONTRACTOR SHALL ALSO SUBMIT OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT TO THE OWNER. CONTRACTOR SHALL ALSO SUBMIT WITH MANUFACTURER SUBMITTALS A NOTICE TO OWNER FOR TRAINING. TRAINING SHALL BE PROVIDED BY THE CONTRACTOR FOR ALL EQUIPMENT AND CONTROLS WITH NECESSARY TIME TO ENSURE THE OWNER HAS UNDERSTOOD SYSTEM. MINIMUM TRAINING HOURS SHALL BE SCHEDULE AT 4-HOURS. ALL COSTS AND TIME OF TRAINING SHALL BE INCLUDED IN THE BID.

7 ALL MATERIAL SHALL BE NEW OF U.S. MANUFACTURER OF GOOD QUALITY. ALL WORK SHALL BE PERFORMED AT INDUSTRY STANDARD QUALITY LEVEL BY CERTIFIED PROFESSIONALS. ALL EQUIPMENT SHALL BE UL OR ETL LISTED.

8 DUCT SIZES SHOWN ARE INSIDE AIRFLOW DIMENSIONS. WHERE INTERNAL LINERS ARE USED, INSIDE DIAMETER OF DUCT SHALL COMPENSATE FOR INSULATION THICKNESS.

9 ALL SUPPLY AND RETURN BRANCH TAKE-OFFS TO BE PROVIDED WITH MANUAL VOLUME DAMPERS. ALL ELBOWS AND TEE'S MUST BE FURNISHED IN TURNING VANES. PROVIDE MANUAL VOLUME DAMPERS AND EXTRACTOR AT ALL FLEX TAKE OFFS.

10 PROVIDE "CONSTRUCTION" AIR FILTERS IN ALL AIR MOVING EQUIPMENT AND ROUGHED IN AIR DEVICE BOOTS. FOR ALL ROUGHED IN FLEX RUN-OUTS PULL AND TWIST THE END SECTION OF THE OUTER FOIL FACE ONLY, SPIN SO THE FOIL CLOSES, SECURE WEATHER TIGHT WITH ZIP TIE TO PREVENT MOISTURE INTRUSION. PROVIDE NEW FILTERS FOR ALL AIR MOVING EQUIPMENT PRIOR TO START-UP. REPLACE ALL FILTERS PRIOR TO FINAL ACCEPTANCE BY OWNER. SUBMIT A NOTICE TO THE OWNER OF FILTER QUANTITIES, SIZES AND LOCATIONS OF ALL FILTERS CHANGED.

11 PROVIDE SMOKE DETECTORS WITH SERVICEABLE ACCESS DOORS IN ALL SUPPLY AIR DUCTS FROM ALL AIR HANDLERS WHERE NOTED. ALL SMOKE DETECTORS SHALL BE BY SAME MANUFACTURER, COORDINATE VOLTAGE, ETC. WITH ELECTRICAL CONTRACTOR AND FIRE ALARM SYSTEM, BEFORE ORDER. UPON DETECTION, SMOKE DETECTORS SHUT DOWN ASSOCIATED AIR MOVING EQUIPMENT AND ALL AIR MOVING EQUIPMENT SERVICING THAT AREA. WHERE NO FIRE ALARM SYSTEM IS INDICATED, MECHANICAL CONTRACTOR SHALL ALSO PROVIDE AND INSTALL REMOTE KEY SWITCH WITH AUDIBLE/VISUAL ALARM PER CODE.

12 PROVIDE TYPE "B" STATIC FIRE DAMPERS WITH CURTAIN TOTALLY OUT OF AIR STREAM IN ALL DUCTS OR OPENINGS PENETRATING RATED WALLS AND FLOORS PER ARCHITECTURAL LIFE SAFETY PLANS AND MECHANICAL PLANS.PROVIDE TYPE "A" STATIC FIRE DAMPERS WITH CURTAIN IN AIR STREAM FOR ALL FIRE DAMPERS USED IN CONJUNCTION WITH GRILLES/REGISTERS PENETRATING RATED WALLS AND FLOORS PER ARCHITECTURAL LIFE SAFETY PLANS AND MECHANICAL PLANS.

13 THERMOSTAT LOCATION SHALL BE APPROVED BY THE OWNER AND ENGINEERS BEFORE INSTALLATION. INSTALL 48" A.F.F. PER A.D.A. REQUIREMENTS. INCLUDE ADD ALTERNATE TO PROVIDE ALL THERMOSTATS WITH LOCKING COVERS AND COORDINATE REQUIREMENTS WITH OWNER. PROVIDE A KEYMAP AT EACH THERMOSTAT WHICH SHOWS A FLOOR PLAN OF AREA BEING SERVED BY THE THERMOSTAT. INSTALL KEYMAP WITHIN A GLASS PICTURE FRAME AND MOUNT ON WALL. LABEL THERMOSTAT FOR AIR UNIT BEING SERVED.

14 ALL INSULATION SHALL HAVE FIRE/SMOKE RATING LESS THAN 25/50.

15 PROVIDE MINIMUM OF 3' CLEARANCE IN FRONT OF ALL 120-240 VOLT PANELS AND 4' CLEARANCE IN FRONT OF ANY 480 VOLT PANEL. PROVIDE ADEQUATE SIDE CLEARANCE PER NEC.

16 MECHANICAL PLANS IN GENERAL, ARE DIAGRAMMATIC IN NATURE, AND ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, PLUMBING, ELECTRICAL, AND STRUCTURAL PLANS AND SHALL BE CONSIDERED AS ONE SET OF DOCUMENTS. DUCT AND PIPING OFFSETS, BENDS AND TRANSITIONS WILL BE REQUIRED TO PROVIDE AND INSTALL A COMPLETE FUNCTIONAL SYSTEM AND SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

17 THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BIDDING, ORDERING, FABRICATING OR INSTALLATION OF MATERIALS OR EQUIPMENT.

18 ALL WORK SHALL BE DONE IN ACCORDANCE WITH FLORIDA BUILDING CODE SEVENTH EDITION, NFPA, ASHRAE, AND SMACNA DUCT CONSTRUCTION STANDARDS.

19 ROUTE ALL DUCTWORK, PIPING AND ACCESSORIES IN A MANNER TO AVOID BUILDING COMPONENTS STRUCTURE, AND LIGHTING. COORDINATE TRANSITIONS MADE TO MAXIMUM PRESSURE DROPS PER FAN AND PUMP MANUFACTURERS CURVES.

20 WHERE REFRIGERANT LINES ARE INSTALLED, SIZE PER MANUFACTURER'S INSTRUCTIONS WITH RESPECT TO LENGTH AND FITTINGS TO BE INSTALLED IN PIPING.

21 ALL DEBRIS SHALL BE PROPERLY DISPOSED OFF SITE. CLEAN UP SITE DAILY AFTER WORK IS COMPLETE. IF CLEAN UP PERFORMED BY OWNER'S REPRESENTATIVE AS A RESULT OF SUBCONTRACTOR NOT PERFORMING CLEAN UP OPERATIONS, OWNER WILL HAVE THE RIGHT TO CHARGE SUBCONTRACTOR FOR CLEAN UP LABOR.

22 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY SUPPORTING DEVICES FOR ALL ACCESSORIES INCLUDED WITHIN THIS CONTRACT.

DUCTWORK LEGEND

SYMBOL DOUBLE LINE	DESCRIPTION
	FLEXIBLE DUCTWORK
	EXISTING EQUIPMENT OR DUCTWORK TO BE REMOVED.
	EXISTING DUCTWORK TO REMAIN NEW DUCTWORK
	MANUAL VOLUME DAMPER (MVD) MOTOR OPERATED DAMPER (MOD)
AD / AD	ACCESS DOOR
	RADIUS ELBOW (R=1.5)
	VANED ELBOW
	BRANCH DUCT TAKE-OFF
DN UP	RISE OR DROP DIRECTION OF AIR FLOW
	CHANGE FROM RECTANGULAR TO ROUND DUCT ON SINGLE LINE DUCT
	CHANGE IN SIZE OF DUCTWORK (CONCENTRIC)
	CHANGE IN SIZE OF DUCTWORK (ECCENTRIC)
	SPIN IN FITTING WITH MANUAL VOLUME DAMPER
	OPPOSED BLADE CONTROL DAMPER WITH ACTUATOR
	PARALLEL BLADE CONTROL DAMPER WITH ACTUATOR

THIS IS A GENERAL LIST OF SYMBOLS. ALL SYMBOLS MAY NOT BE USED ON A SPECIFIC PROJECT

PIPING LEGEND

SYMBOL	DESCRIPTION
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CD	CONDENSATE LINE
	REFRIGERANT PIPNG
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
	PIPE REDUCER
	PIPE UNION
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	BALL VALVE
	PLUG VALVE
	BUTTERFLY VALVE
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	SAFETY OR PRESSURE RELIEF VALVE
	VALVE IN RISER
	DIRECTION OF FLOW
	TOP CONNECTION, 45 OR 90 DEGREES
	BOTTOM CONNECTION, 45 OR 90 DEGREES
	SIDE CONNECTION
	CAPPED OUTLET
	DROP IN PIPING
	RISE IN PIPING
	SOLENOID VALVE
	OUTSIDE SCREW AND YOKE
	WATER FLOW MEASURING DEVICE
	ANGLE GLOBE VALVE
	PRESSURE GAUGE
	STRAINER WITH BALL VALVE
	EXPANSION JOINT
M	BTU FLOW METER

LEGEND

SYMBOL	DESCRIPTION
	INDICATES DIRECTION OF AIRFLOW
TYPE A 6"Ø CONNECTION SIZE / AIRFLOW 100	USE TO IDENTIFY SUPPLY, RETURN OR EXHAUST GRILLE VALUES AND TYPE
T	THERMOSTAT
SD	SMOKE DETECTOR
TS (X)	TEMPERATURE SENSOR X= ZONE CONTROLLED
H	HUMIDISTAT (DIGITAL)
OC	OCCUPANCY SENSOR (DUAL TECHNOLOGY - IR/MOTION) CEILING MOUNTED.
CO	COMBINATION CARBON MONOXIDE SENSOR (MSA - Z-GARD DS)
FD	GREENHECK STATIC FIRE DAMPER WITH ACCESS DOOR SEE ARCHITECTURAL LIFE SAFETY PLANS FOR FIRE RATED WALL LOCATIONS
FSD	GREENHECK FIRE-SMOKE DAMPER WITH ACCESS DOOR (24V ACTUATOR) SEE ARCHITECTURAL LIFE SAFETY PLANS FOR FIRE RATED WALL LOCATIONS
	CEILING SUPPLY DIFFUSER
	RETURN GRILLE OR DUCT DOWN/UP
	EXHAUST GRILLE OR DUCT DOWN/UP
CDP	CONDENSATE PUMP WITH SAFETY FLOAT SWITCH TO DE-ENERGIZE MAIN AC IN CASE OF OVERFLOW MODEL: LITTLE GIANT VCMA-15 OR EQUAL
(TAG SERVING)	REMOTE SMOKE ALARM INDICATION STATION WITH LIGHT
	INILINE DRYER BOOSTER FAN (FANTECH DBF-110)
	SIDEWALL SUPPLY DIFFUSER
	TERMINAL UNIT VARIABLE/CONSTANT AIR VOLUME
	TERMINAL UNIT VARIABLE/CONSTANT AIR VOLUME WITH HOT WATER HEAT

THIS IS A GENERAL LIST OF SYMBOLS. ALL SYMBOLS MAY NOT BE USED ON A SPECIFIC PROJECT

MECHANICAL SHEET INDEX

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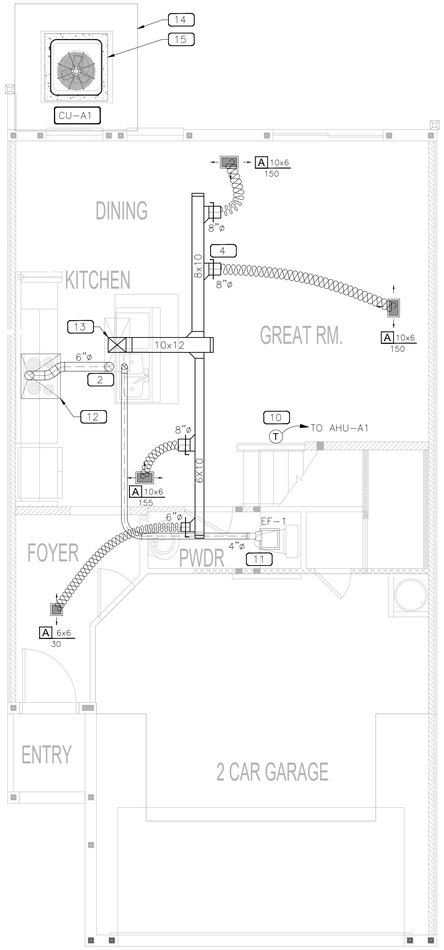
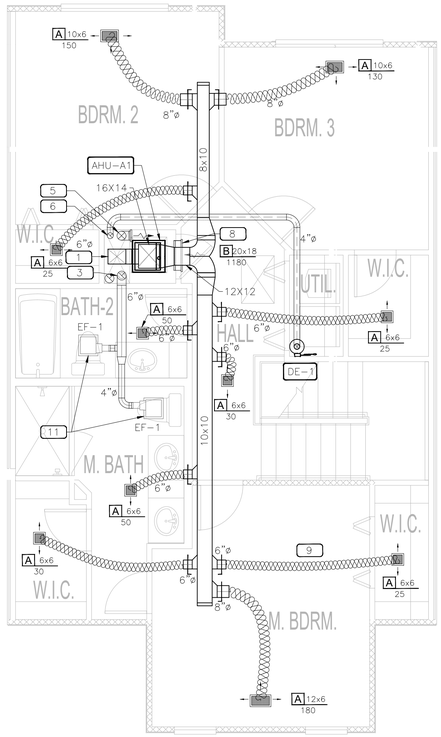
M-01



1 FIRST FLOOR UNIT PLAN "A1" - HVAC DUCT

0 2' 4' 8' 12'

1/4" = 1'–0"

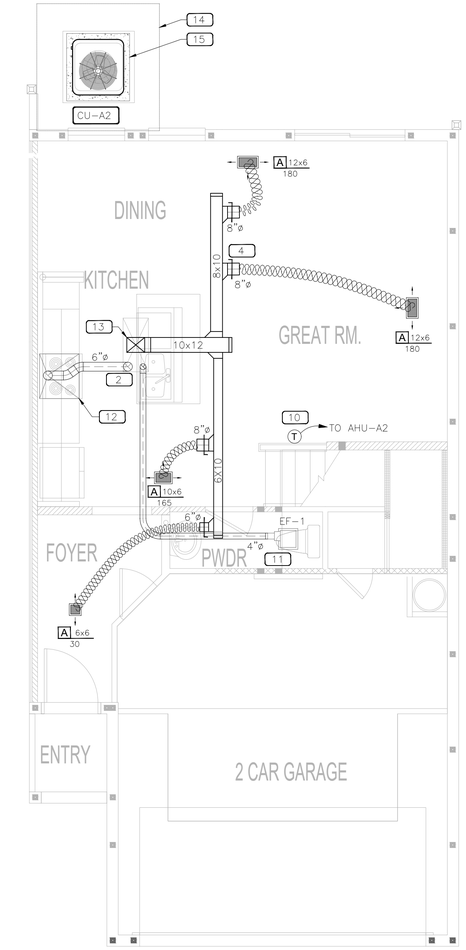


DRYER DUCT = 30 FT + 20 FT FOR 3–90° ELBOW
= 50 FT EQUIVALENT DRYER DUCT LENGTH

2 SECOND FLOOR UNIT PLAN "A1" - HVAC DUCT

0 2' 4' 8' 12'

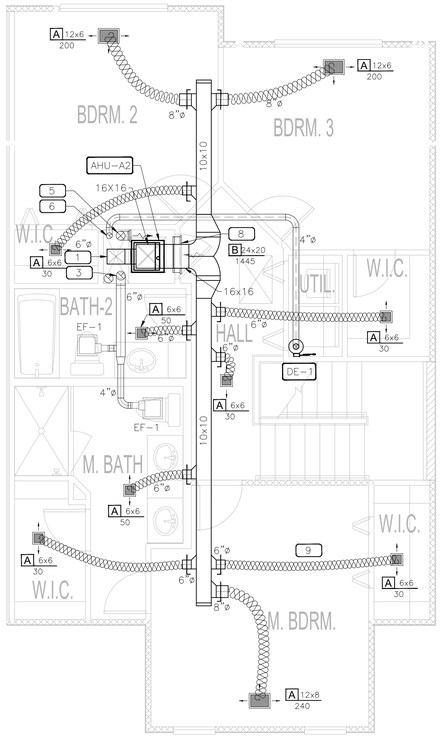
1/4" = 1'–0"



3 FIRST FLOOR UNIT PLAN "A2" - HVAC DUCT

0 2' 4' 8' 12'

1/4" = 1'–0"



DRYER DUCT = 30 FT + 20 FT FOR 3–90° ELBOW
= 50 FT EQUIVALENT DRYER DUCT LENGTH

4 SECOND FLOOR UNIT PLAN "A2" - HVAC DUCT

0 2' 4' 8' 12'

1/4" = 1'–0"

KEYNOTES

1. 10x12 SUPPLY AIR DUCT DOWN TO FIRST FLOOR.
2. 6" KITCHEN HOOD AND EXHAUST AIR DUCT UP TO ROOF.
3. 4" EA DUCT FROM FIRST FLOOR CONNECT TO 6" EA DUCT FROM SECOND FLOOR IN CHASE.
4. MANUAL DAMPER (TYPICAL).
5. 6" FRESH AIR DN TO SECOND FLOOR.
6. 4" DRYER VENT DUCT UP TO ROOF.
7. 20x18 RETURN AIR GRILLE.
8. 24X20 RETURN AIR GRILLE.
9. TYPICAL FLEX DUCT.
10. THERMOSTAT SHALL MOUNT AT 4'–0" A.F.F.
11. TYPICAL CEILING MOUNTED BATHROOM EXHAUST FAN, SEE M–601 FOR INFORMATION.
12. KITCHEN EXHAUST HOOD (PROVIDED BY OWNER).
13. 10x12 SUPPLY AIR DUCT UP TO SECOND FLOOR.
14. UNIT ACCESS CLEARANCE.
15. 4" HOUSEKEEPING/HURRICANE PAD.

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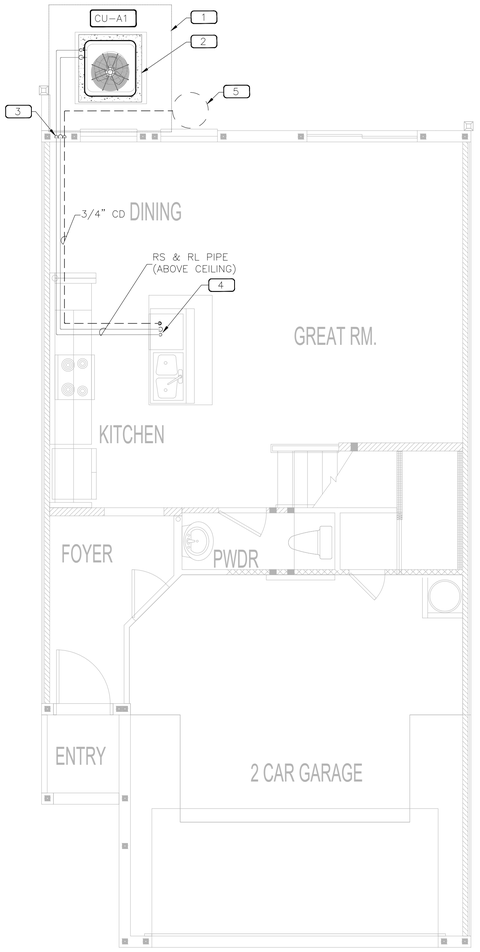
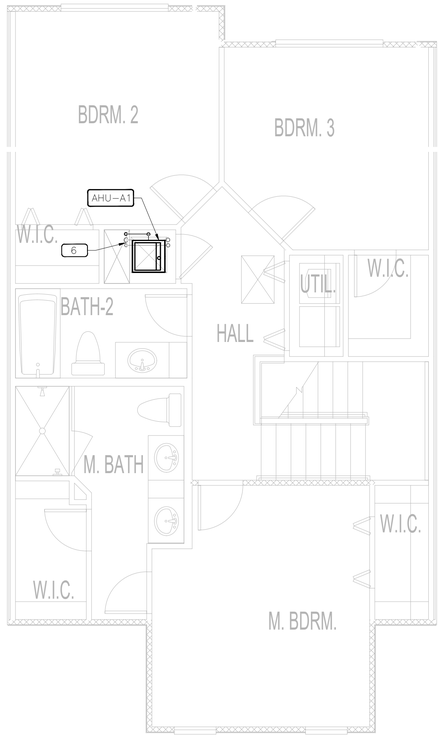


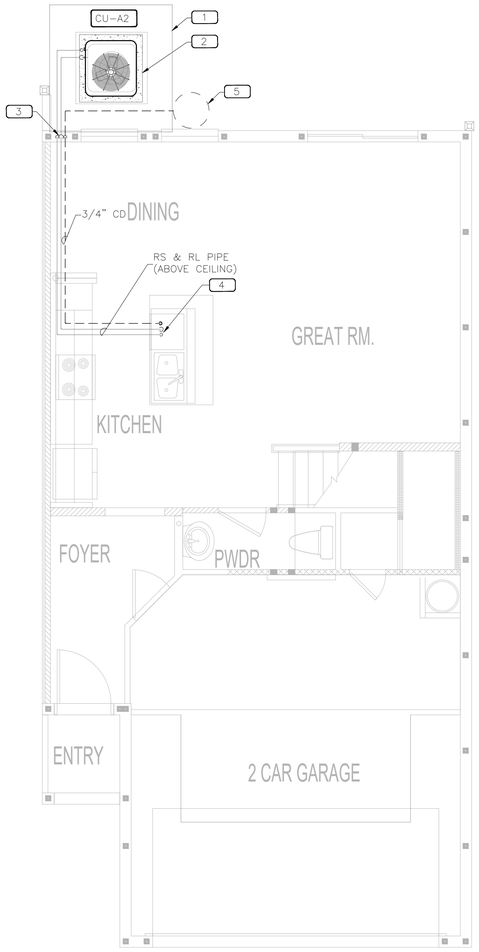
1 FIRST FLOOR UNIT PLAN "A1" - HVAC PIPING

0 2' 4' 8' 12'
1/4" = 1'-0"



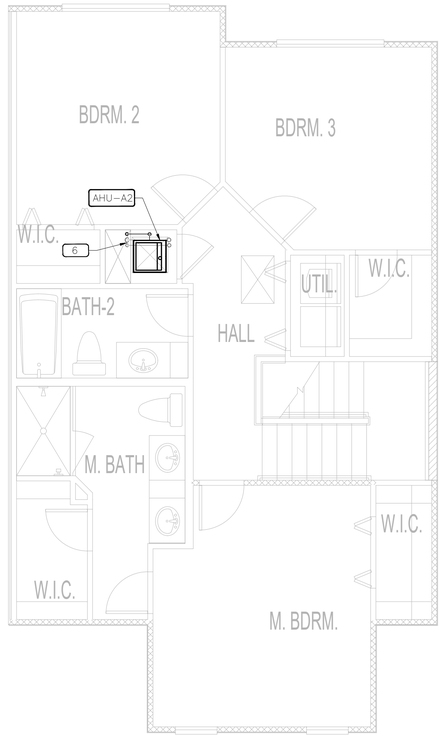
2 SECOND FLOOR UNIT PLAN "A1" - HVAC PIPING

0 2' 4' 8' 12'
1/4" = 1'-0"



3 FIRST FLOOR UNIT PLAN "A2" - HVAC PIPING

0 2' 4' 8' 12'
1/4" = 1'-0"



4 SECOND FLOOR UNIT PLAN "A2" - HVAC PIPING

0 2' 4' 8' 12'
1/4" = 1'-0"

KEYNOTES

1. UNIT ACCESS CLEARANCE.
2. 4" HOUSEKEEPING/HURRICANE PAD.
3. RS & RL PIPE UP/DN TO CU-A1/A2.
4. RS & RL PIPE UP/DN FROM AHU-A1/A-2 TO SECOND FLOOR THRU CHASE.
5. PROPOSED DRYWELL LOCATION. 3/4" CONDENSATE DRAIN PIPE TERMINATED TO DRYWELL.
6. RS & RL PIPE UP/DN FROM AHU-A1/A2 THRU CHASE AND CONNECT WITH CU-A1.

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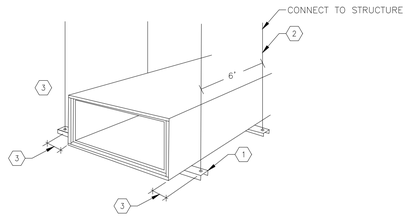


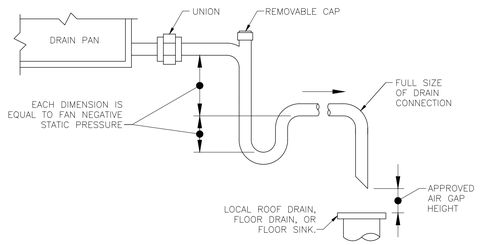
1 PROVIDE MIN. 24 GUAGE CHANNEL 3"x1-1/2".

2 PROVIDE 12 GAUGE HANGER WIRE AND SPACE NO GREATER THAN 6 FEET.

3 3" MAX DISTANCE BETWEEN DUCT AND HANGER WIRE.

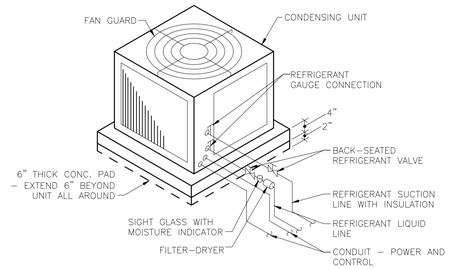
DUCT SUPPORT DETAIL

NOT TO SCALE



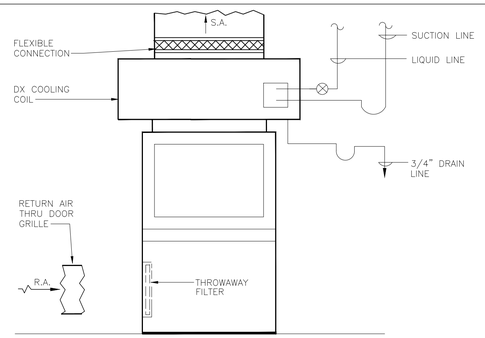
CONDENSATE DRAIN DETAIL

NOT TO SCALE



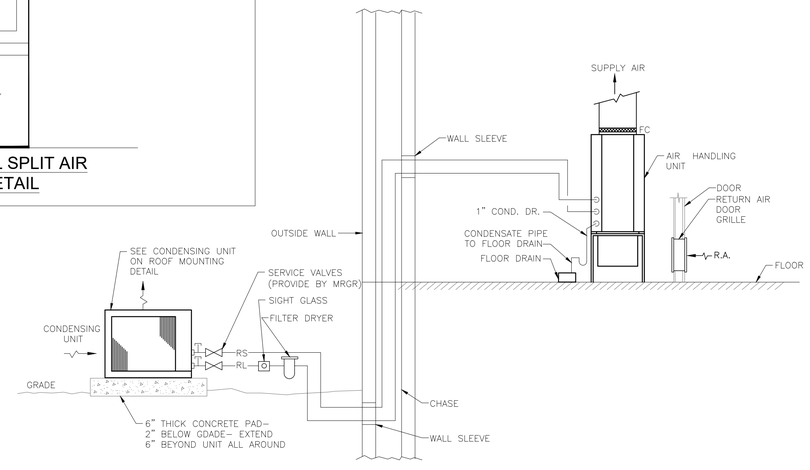
AIR-COOLED CONDENSING UNIT - SLAB MOUNTED AT GRADE

NOT TO SCALE



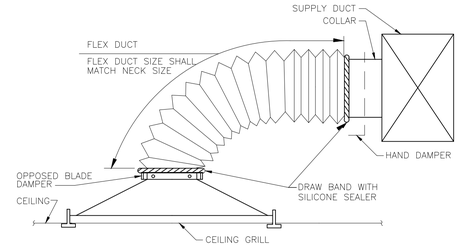
TYPICAL VERTICAL SPLIT AIR HANDLING UNIT DETAIL

NOT TO SCALE



AIR CONDITIONING SYSTEM DETAIL WITH VERTICAL AIR HANDLING UNIT & CONDENSING UNIT MOUNTED AT GRADE

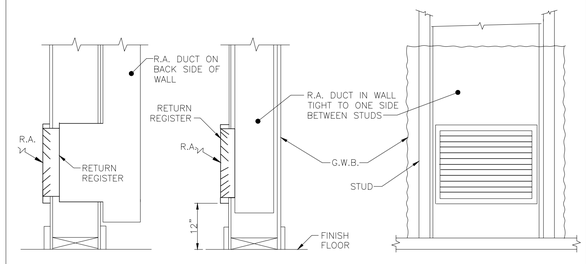
N.T.S.



TYPICAL GRILL CONNECTION

(SIDE OF DUCT CONNECTION)

NOT TO SCALE



WALL MOUNTED RETURN AIR GRILLE DETAIL

NOT TO SCALE

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Townhomes
Thompkins Dr, Osceola County, FL 34771

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NOT FOR CONSTRUCTION

HACKENBERG ENGINEERING
Hackenberg Engineering
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Winter Park, FL 32790
FBPE Lic: CA 31660

M-05

INDOOR UNIT SCHEDULE

MARK	LOCATION	SYSTEM TYPE	CONNECTED OUTDOOR SYSTEM	TONNAGE CAPACITY	SUPPLY FAN DATA							COOLING COIL DATA						HEATING COIL DATA				ELECTRICAL DATA					FILTER DATA			GENERAL INFORMATION									REMARKS
					SUPPLY FAN AIRFLOW	OUTSIDE AIR	E.S.P.	NO. USED	FLA	FAN MOTOR		NET COOLING CAPACITY	NET SENSIBLE CAPACITY	EDB	EWB	LDB	LWB	ELECTRIC HEAT CAPACITY	CONTROL STAGES	ENTERING DB	LEAVING DB	SYSTEM VOLTAGE	EER @ AHRI	SEER	MCA	MOP	TYPE	FURNISHED	NO. SIZE RECOMMENDED	REFRIGERANT	GAS LINE O.D.	LIQUID LINE O.D.	DIMENSIONS (INCH)			OPERATING WEIGHT	MANUFACTURER	MODEL NO.	
					MAX. AIRFLOW CFM	DESIGN CFM	IN. H20	–	–	RPM	HP	MBH	MBH	°F	°F	°F	°F	KW	–	°F	°F	V/PH/HZ	–	–	A	A	–	–	INCH	TYPE	INCH	INCH	HEIGHT	WIDTH	LENGTH	LBS	–	–	
AHU–A1	SEE PLAN	A/C WITH AIR HANDLER	CU–A1	2.5	1180	90	–	1	3.9	–	1/2	30.0	27.17	77.40	64.00	55.80	54.00	5.0	–	67.4	71.6	230/1/60	12.5	15	29.9	30	–	NO	18x20x1	R410	3/4"	3/8"	36	24	21	110	GOODMAN	AWUF310516	–
AHU–A2	SEE PLAN	A/C WITH AIR HANDLER	CU–A2	3.0	1445	90	–	1	3.9	–	1/2	36.0	34.164	76.90	63.00	54.80	53.40	5.0	–	67.7	72.7	230/1/60	12.5	15	29.9	30	–	NO	18x20x1	R410	3/4"	3/8"	36	24	21	96	GOODMAN	AWUF370516	–

NOTES:

1. DIRECT DRIVE, MULTI–SPEED MOTOR.
2. THERMOPLASTIC DRAIN PAN WITH BOTTOM PRIMARY AND SECONDARY DRAIN CONNECTIONS.
3. ELECTRICAL (V/PH/HZ) – 230/1/60

AIR DISTRIBUTION SCHEDULE

NOTES:

1. COORDINATE FRAME & BORDER TYPE WITH CEILING TYPE. REFER TO ARCHITECTURAL PLANS.
2. COORDINATE WITH BLDG MGT FOR BLDG STANDARDS.

MARK	CFM	NECK SIZE	DESCRIPTION
A	000–090	6x6	MANUFACTURER: PRICE MODEL: 640/640S CEILING SUPPLY GRILLE
	091–170	10x6	
	171–195	12x6	
	196–300	12x8	
B	000–1220	20x18	MANUFACTURER: PRICE MODEL: 510Z/610Z/710Z RETURN WITH 0° DEFLECTION AND 3/4" BLADE SPACING
	1221–1560	24x20	

OUTDOOR UNIT SCHEDULE

MARK	LOCATION	CONNECTED INDOOR SYSTEM	RATED COOLING CAPACITY (MBH)	CONDENSER FAN DATA				COMPRESSOR DATA					ELECTRICAL DATA				GENERAL INFORMATION										
				NO.	MOTOR POWER	MOTOR SPEED	FLA	NO.	TYPE	RLA	LRA	SYSTEM KW	SYSTEM VOLTAGE	SEER	MCA	MOP	REFRIGERANT	SUCTION LINE O.D.	LIQUID LINE O.D.	SYSTEM TONNAGE	DIMENSIONS (INCH)			EQUIPMENT WEIGHT	MANUFACTURER	MODEL NO.
				–	HP	RPM	A	–	–	A	A	KW	V/PH/HZ	–	A	A	TYPE	INCH	INCH	TON	HEIGHT	WIDTH	LENGTH	LB	–	–
CU–A1	SEE PLAN	AHU–A1	28.6	1	1/6	–	0.95	1	SCROLL	12.8	64	–	230/1/60	14.5	17.0	25.0	R–410	7/8"	3/8"	2.5	38–1/4	29	29	161	DAIKIN	DX16SA0311
CU–A2	SEE PLAN	AHU–A2	36.0	1	1/6	–	0.95	1	SCROLL	15.4	83.9	–	230/1/60	–	22.0	35.0	R–410	7/8"	3/8"	3	29–1/8	37–1/4	34–1/4	182	DAIKIN	DX16SA0371

NOTES:

1. HIGH–EFFICIENCY SCROLL COMPRESSOR.
2. SINGLE SPEED ECM CONDENSER FAN MOTOR.
3. FACTORY INSTALLED FILTER DRIER.

EXHAUST FAN SCHEDULE

MARK	LOCATION	MANUFACTURER	MODEL NUMBER	TYPE	DIMENSIONAL		PERFORMANCE					MOTOR					
					WEIGHT W/ACC'S (LB)	DIMENSION LxWxH(IN.)	ACTUAL VOLUME (CFM)	TOTAL EXTERNAL SP (IN.WG)	FAN (RPM)	OPERATING POWER (HP)	SONES (INLET)	MOTOR MOUNTED	SIZE (HP)	VOLTAGE/CYCLE/PHASE	INPUT WATTS	MOTOR (RPM)	FLA (AMPS)
EF–1	SEES PLAN	GREENHECK	SP–80–VG	CEILING EXHAUST FAN	12	11x11x8	70	0.32	935	–	25	YES	–	115/60/1	6	–	0.1

NOTE :

1. INCLUDE STARTERS FOR ALL EXHAUST FANS.

HVAC DUCT & EQUIPMENT CONSTRUCTION & INSULATION SCHEDULE

SERVICE	STATIC PRESSURE CLASS	LOCATION(S)	DUCT MATERIAL/ CONSTRUCTION	INSULATION TYPE/DESCRIPTION/PROPERTIES
SUPPLY AIR DUCTS				
LOW PRESSURE, DOWNSTREAM OF BLOWER COILS AND COILS SUPPLYING LESS THAN 2000 CFM	+1" SMACNA SEAL CLASS A	INDOOR CONCEALED LOCATIONS	SINGLE WALL, RECTANGULAR, ROUND AND FLAT OVAL.	0.75 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.
		INDOOR EXPOSED LOCATIONS, WHERE SHOWN OR NOTED ON THE PLANS	FLANGED TRANSVERSE JOINTS, DOUBLE WALL, SOIL INNER WALL. RECTANGULAR, ROUND AND FLAT OVAL.	INTERSTITIAL INSULATION: 2" THICKNESS, FIBROUS–GLASS LINER COMPLYING WITH ASTM C 1071, NFPA 90A, OR NFPA 90B; AND WITH NAIMA AH124, "FIBEROUS GLASS DUCT LINER STANDARD."
		INDOOR EXPOSED LOCATIONS	SINGLE WALL. RECTANGULAR ONLY.	2.0 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.
LOW PRESSURE, DOWNSTREAM OF AHUS SUPPLYING 2000 CFM AND GREATER	+3" SMACNA SEAL CLASS A	INDOOR CONCEALED LOCATIONS	SINGLE WALL, RECTANGULAR, ROUND AND FLAT OVAL.	0.75 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.
		INDOOR EXPOSED LOCATIONS, WHERE SHOWN OR NOTED ON THE PLANS	FLANGED TRANSVERSE JOINTS, DOUBLE WALL, SOLID INNER WALL. RECTANGULAR, ROUND AND FLAT OVAL.	INTERSTITIAL INSULATION: 2" THICKNESS, FIBROUS–GLASS LINER COMPLYING WITH ASTM C 1071, NFPA 90A, OR NFPA 90B; AND WITH NAIMA AH124, "FIBEROUS GLASS DUCT LINER STANDARD."
		INDOOR EXPOSED LOCATIONS	SINGLE WALL. RECTANGULAR ONLY.	2.0 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.
RETURN AIR DUCTS				
LOW PRESSURE, DOWNSTREAM OF AHUS SUPPLYING 2000 CFM AND GREATER	–2" SMACNA SEAL CLASS A	INDOOR CONCEALED LOCATIONS (UNCONDITIONED SPACE)	SINGLE WALL, RECTANGULAR, ROUND AND FLAT OVAL.	0.75 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.
		INDOOR EXPOSED LOCATIONS (CONDITIONED SPACE)	SINGLE WALL, RECTANGULAR, ROUND AND FLAT OVAL.	INSULATION NOT REQUIRED FOR RA DUCTS LOCATED IN CONDITIONED SPACE.
OUTSIDE AIR DUCTS				
UNCONDITIONED OA DUCTS, UPSTREAM OR DOWNSTREAM OF FANS	+ OR – 2" SMACNA SEAL CLASS A	INDOOR	SINGLE WALL, RECTANGULAR, ROUND AND FLAT OVAL.	0.75 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.
OUTSIDE AIR PLENUM AT WALL LOUVER OF GRAVITY INTAKE	+ OR – 2" SMACNA SEAL CLASS A	INDOOR	SINGLE WALL, RECTANGULAR, ROUND AND FLAT OVAL.	2.0 PCF NOMINAL DENSITY, EXTERNAL FIBERGLASS DUCT WRAP MINIMUM 2" NOMINAL THICKNESS.

NOTES:

1. REFER TO SPECIFICATION SECTION 23 07 00 FOR ADDITIONAL INSULATION DETAILS AND REQUIREMENTS.
2. DUCT AND PLENUM INSULATION, CONSTRUCTION & SEALING SHALL MEET THE REQUIREMENTS OF THE 6TH EDITION OF THE FBC 2017– ENERGY CONSERVATION CODE, SECTION C403.2.10, PLUS THE ABOVE REQUIREMENTS WHERE MORE STRINGENT.
3. DUCT CONSTRUCTION AND INSULATION SHALL MEET THE REQUIREMENTS OF THE 6TH EDITION OF THE FBC 2017–MECHANICAL CODE, CHAPTER 6, PLUS THE ABOVE REQUIREMENTS WHERE MORE STRINGENT.
4. ALL DUCT INSULATION SHALL MEET THE REQUIREMENTS OF ASHRAE 90.1–2013, TABLES 6.8.2–1 AND 6.8.2–2,PLUS THE ABOVE REQUIREMENTS WHERE MORE STRINGENT.
5. AS A MINIMUM, ALL DUCT SHALL BE CONSTRUCTED AND SUPPORTED AS SPECIFIED IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS –METAL AND FLEXIBLE", LATEST EDITION. HOWEVER, ANY MORE STRINGENT REQUIREMENT INDICATED IN THESE DRAWINGS AND/OR IN THE SPECIFICATIONS SHALL PREVAIL OVER THE SMACNA MANUAL.
6. ALL SHEET METAL DUCTWORK SHALL BE CONSTRUCTED OG G90 GALVANIZED STEEL UNLESS NOTED OTHERWISE.
7. THE DUCT SEALING MATERIAL SHALL BE OF LIQUID,MASTIC AND GASKET TYPE AND APPLIED PER MANUFACTURER'S WRITTEN RECOMMENDATIONS. HEAT AND PRESSURE SENSITIVE TAPES ARE NOT ACCEPTABLE AS A FINAL CLOSURE.
8. FLEXIBLE DUCT SHALL BE PROVIDED WHERE INDICATED ON DRAWINGS. ALL FLEXIBLE SHALL BE SUITABLE FOR THE SERVICE INTENDED. NO LENGTH OF FLEXIBLE DUCT SHALL TURN MORE THAN A TOTAL OF 180 DEGREES, FLEXIBLE DUCT SHALL ONLY BE USED IN CONCEALED SPACES (ABOVE CEILINGS) AND NOT PASS THROUGH ANY WALL, FLOOR OR CEILING. FLEXIBLE DUCT SHALL BE NO LONGER THAN SIX (6) FEET.
9. ALL DUCTWORK REQUIRING INSULATION SHALL BE EXTERNALLY INSULATED UNLESS OTHERWISE NOTED.
10. ALL EXTERNAL FIBROUS GLASS INSULATIONS (RIGID BOARD INSULATIONS OR DUCT WRAP INSULATION) JOINTS, SEAMS AND CONNECTIONS SHALL BE CONSTRUCTED WITH FAB AND STAPLES AND THEN SEALED WITH MASTIC. HEAT AND PRESSURE SENSITIVE TAPES ARE NOT ACCEPTABLE AS FINAL CLOSURE.
11. INSULATION MATERIAL SHALL MEET NFPA 90A REQUIREMENTS AND SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATING AS TESTED IN ACCORDANCE WITH NFPA 225 OR UL 723 NOT EXCEEDING FLAME SPREAD OF MORE THAN 25 AND SMOKE DEVELOPED 50.
12. ALL PLENUMS AT AIR HANDLING UNITS SHALL MATCH THE AHU CONSTRUCTION PARAMETERS. PLENUMS AT DOUBLE–WALL AHUS SHALL BE DOUBLE–WALL FABRICATED BY THE AHU MANUFACTURER TO MATH AHU CONSTRUCTIONS. REFER TO SPECIFICATIONS SECTION 23 73 00 FOR AHU PLENUM REQUIREMENTS.
13. MINIMUM INSULATION R–VALUES FOR SUPPLY, RETURN AND TRANSFER AIR SYSTEMS CONVEYING CONDITIONED ATE: OUTDOORS R–8; VENTILATED ATTIC R–8: UNVENTED ATTIC ABOVE INSULATED CEILING R–8: UNVENTED ATTIC WITH ROOF INSULATIONS R–4.2: UNCONDITIONED R–4.2: INDIRECTLY CONDITIONED R–4.2: CONDITIONED R–4.2 (SUPPLY AIR).

DRYER VENT BOOSTER FAN SCHEDULE

MARK	LOCATION	MANUFACTURER	MODEL NUMBER	TYPE	NOMINAL DATA							DIMENSIONS (INCH)		DUCT DIMENSION (INLET)	DUCT DIMENSION (OUTLET)	WEIGHT (LBS)
					MAX AIRFLOW (CFM)	ESP (IN WG)	V	PH	HZ	INPUT POWER (W)	INPUT CURRENT (A)	IMPELLER SPEED (RPM)	DIAMETER	HEIGHT			
DE–1	UTILITY RM	FANTECH	DEDPV–705	INLINE DRYER VENT DUCT POWER VENTILATOR	161	0.5	120	1	60	70	0.75	2,600	9–11/16	28–9/16	4"	4"	13.3

HVAC PIPE & EQUIPMENT CONSTRUCTION & INSULATION SCHEDULE

SERVICE	LOCATION(S)	PIPING MATERIAL / CONSTRUCTION	INSULATION TYPE / DESCRIPTION/ PROPERTIES	NOTES
EQUIPMENT & MISC INSULATION REQUIREMENTS				
A/C COIL CONDENSATE	INDOORS CONDITIONED OR UNCONDITIONED	TYPE–L OR DWV COPPER W/ SOLDERED JOINTS	3/4" CLOSED CELL ELASTOMETRIC	–
REFRIGERANT SUCTION & LIQUID PIPING	INDOORS CONDITIONED OR UNCONDITIONED	TYPE–L OR DWV COPPER W/ SOLDERED JOINTS	CONDUCTIVITY RANGE 0.21–0.27 FOR 40°F TO 60°F TEMPERATURE RANGE. FIBERGLASS PIPE INSULATION OF 0.5" UPTO 1 1/2" PIPE AND 1" INSULATION FOR LARGER THAN 1 1/2" PIPES.	COVER ALL OUTDOORS WITH FITTED ALUMINUM JACKET.

NOTES:

1. REFER TO SPECIFICATION SECTION 23 07 00 FOR ADDITIONAL DETAILS AND REQUIREMENTS.
2. ALL PIPE INSULATION SHALL MEET THE REQUIREMENTS OF THE 6TH EDITION OF THE FBC 2017 – ENERGY CONSERVATION CODE. TABLE C403.2.10, PLUS THE ABOVE REQUIREMENTS WHERE MORE STRINGENT.
3. HYDRONIC PIPING CONSTRUCTION AND INSULATION SHALL MEET THE REQUIREMENTS OF THE 6TH EDITION OF THE FBC 2017 – MECHANICAL CODE, CHAPTER 12, PLUS THE ABOVE REQUIREMENTS WHERE MORE STRINGENT.
4. ALL PIPE INSULATION SHALL MEET THE REQUIREMENTS OF ASHRAE 90.1–2013. TABLES 6.8.3–1 (HOT) AND 6.8.3–2 (COLD). PLUS THE ABOVE REQUIREMENTS WHERE MORE STRINGENT.
5. ALL NEW CHW AND HEATING KW PIPING SHALL BE SCH. 40 STEEL OR TYPE–L COPPER (MATCH EXISTING). PROVIDE DIELECTRIC UNIONS AT CONNECTIONS TO DISSIMILAR METALS.
6. PROVIDE MANUAL AIR VENTS AT ALL HIGH POINTS AND DRAINS AT ALL LOW POINTS OF HYDRONIC PIPING.
7. VALVES: SHUT–OFF VALVES 2" AND SMALLER SHALL BE 2–PIECE, LULL–PORT BRONZE BALL VALVES WITH STAINLESS STEEL TRIM EQUAL TO NLBCO 1585–70–66. SHUT–OFF VALVES LARGER THAN 2" SHALL BE LUG–TYPE IRON BODY BUTTERFLY VALVES SUITABLE FOR BIDIRECTIONAL DEAD–END SERVICE, WITH EPDM SEAT, STAINLESS STEEL STEM, ALUMINUM BRONZE OR STAINLESS STEEL DISC, AND MEMORY STOP HANDLE.
8. HYDRONIC STRAINERS: Y–PATTERN, IRON BODY, STAINLESS STEEL MESH WITH 0.045" PERFORATIONS: COMPLETE WITH BLOW DOWN WITH BALL SHUT–OFF VALVE, HOSE–END FINING AND CAP. EQUAL TO MUELLER STEAM SPECIALTY.
9. PRESSURE GAUGES: TWICE, WEISS INSTRUMENTS, OR WEKSIER; ASME B40.100; 4.5" DIAMETER METAL CASE; LIQUID–FILLED; STAINLESS STEEL BOURDON TUB.; MECHANICAL MOVEMENT, STAINLESS STEEL, WITH LINK TO PRESSURE ELEMENT AND CONNECTION TO POINTER; NON–REFLECTIVE ALUMINUM DIAL WITH PERMANENTLY ETCHED SCALE MARKINGS IN PSI; DARK–COLORED METAL POINTER; PLASTIC WINDOW; METAL RING; GRADE A ACCURACY + OR – 1/2% OF MIDDLE HALF OF SCALE RANGE. PROVIDE WITH SNUBBER AND BALL SHUT–OFF VALVE. SELECT SCALE AS REQUIRED SO THAT NORMAL OPERATING POINT FALLS WITHIN MIDDLE ONE–THIRD OF GAUGE RANGE, WITH GAUGE RANGE APPROXIMATELY OF 2X NORMAL OPERATING PRESSURE. NOTE DIFFERENT RANGE MAY BE REQUIRED AT VARIOUS LOCATIONS IN THE BUILDING.
10. THERMOMETER: TRERICE, WEISS INSTRUMENTS, OR WEKSLER; ASME B40.200; ALUM. 9" LONG CASE; ADJUSTABLE ANGLE; GLASS TUBE WITH MAGNIFYING LENS AND BLUE OR RED ORGANIC LIQUID; NON–REFLECTIVE ALUMINUM BACKGROUND WITH PERMANENTLY ETCHED SCALE MARKINGS IN DEGREES F; PLASTIC WINDOW; ALUMINUM OR BRASS STEM OF LENGTH SUITABLE FOR APPLICABLE; ACCURACY + OR – 1% OF SCALE. 0–100°F RANGE FOR CHW AND 30°F–240°F FOR HEATING HW.
11. THERMOWELLS: ASME B40.200; PRESSURE–TIGHT, SOCKET–TYPE FITTING MADE FOR INSERTION INTO PIPING TEE FITTING; LAGGING EXTENSION ON THERMOWELLS FOR INSULATED PIPING; INCLUDE HEAT–TRANSFER MEDIUM MADE OF GRAPHITE AND GLYCERIN.
12. P–T PORTS: TEST–STATION FITTING MADE FOR INSERTION INTO PIPING TEE FITTING; BRASS OR STAINLESS STOOL BODY WITH CORE INSERTS AND GASKOTED AND THREADED CAP; EXTENDED STEM ON UNITS TO BE INSTALLED IN INSULATED PIPING; MINIMUM RATING OF 500 PSIG AT 200 DEG F; EPDM SELF–SEALING RUBBER CORE INSERTS.
13. PROVIDE PRESSURE GAUGE, THERMOMETER AND P–T PORT AT INLET AND OUTLET OF EACH COIL AND ELSEWHERE WHERE SHOWN ON NOTED ON THE DRAWINGS.

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PLAN REVISION DATES:

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