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CONSTRUCTION MANAGEMENT DIV.
ARLINGTON, TEXAS



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ARLINGTON, TEXAS 76013

REVISIONS:

FILE:

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DWG BY: KGP

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SHEET M2 OF 10

M2

HVAC LEGEND	
	SHEET METAL DUCTWORK AND TRANSITION. 1ST DIMENSION NOTED IS SIDE SHOWN.
	EXISTING DUCTWORK.
	HIDDEN DUCTWORK.
	BRANCH TAKEOFF FROM DUCT W/ VOLUME DAMPER AT EA TAKEOFF, EVEN IF VOLUME DAMPER IS NOT SHOWN.
	DUCTWORK: CEILING S/A DIFFUSERS. THROW IS FOUR-WAY DOWN.
	DUCTWORK ELBOW UP.
	DUCTWORK ELBOW DOWN.
	CONTRACTOR FURNISHED HVAC EQUIPMENT.
	WALL SUPPLY AIR REGISTER
	WALL RETURN AIR GRILLE
	CEILING SUPPLY AIR DIFFUSER.
	CEILING RETURN OR EXHAUST AIR DEVICE.
	SUPPLY OR OUTSIDE AIR DUCTWORK SECTION.
	RETURN AIR DUCTWORK SECTION.
	EXHAUST AIR DUCTWORK SECTION.
	FIRE DAMPER
	SMOKE DAMPER
	COMB. FIRE/SMOKE DAMPER
	MOTORIZED DAMPER.
	FLEXIBLE DUCTWORK
	THERMOSTAT
	HUMIDITY SENSOR
	DUCT MOUNTED SMOKE DETECTOR. FURNISHED BY DIV. 16, INSTALLED BY MECHANICAL CONTRACTOR.
	TOP ROW - AIR DEVICE TYPE
	BOTTOM ROW - AIRFLOW CFM
	TOP ROW - AIR DEVICE TYPE, NECK SIZE (OPTIONAL) BOTTOM ROW - CFM, LENGTH X WIDTH, SEE SCHEDULE.
	POINT OF CONNECTION, NEW TO EXISTING DUCT OR PIPE.
ABBREVIATIONS	
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AMB	AMBIENT
AMP	AMPERES
ARCH	ARCHITECT, ARCHITECTURAL
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BFF	BELOW FINISHED FLOOR
BFP	BACK FLOW PREVENTER
BFV	BUTTERFLY VALVE
BTUH	BRITISH THERMAL UNITS / HR.
BY	BY PASS
BYP	BYPASS
CFM	CUBIC FEET PER MINUTE
CHWR/CHWS	CHILLED WATER RETURN / SUPPLY
CO2	CARBON DIOXIDE SENSOR
CONT	CONTINUATION
COORD	COORDINATE
CWR/CWS	CONDENSER WATER RETURN / SUPPLY
D	HVAC CONDENSATE DRAIN LINE, EQUIP. DRAIN
DB	DEGREE(S)
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEG F	DEGREE FAHRENHEIT
DIA	DIAMETER
DN	DOWN
(E)	EXISTING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENT
EL	ELEVATION
ELEC	ELECTRICAL
EWB	ENTERING WET BULB TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
EXH	EXHAUST
FBI	FURNISH AND INSTALL
FLEX	FLEXIBLE DUCT
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
GC	GENERAL CONTRACTOR
GPM	GALLON PER MINUTE
HP	HORSE POWER
HR	HOUR
HSTAT	HUMIDISTAT
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HW	HEATING WATER
HWR	HEATING WATER RETURN
IAQ	INDOOR AIR QUALITY
IN	INCHES
KEC	KITCHEN EQUIPMENT CONTRACTOR
KW	KILOWATT
KWH	KILOWATT HOUR
LES	LEAVING
LDBT	LEAVING DRY BULB TEMPERATURE
LEWB	LEAVING WET BULB TEMPERATURE
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	BTU/HR X 1,000
MECH	MECHANICAL
MVD	MOTORIZED VOLUME DAMPER
NA	NOT APPLICABLE
NC	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OH	PHASE (ELECTRIC)
POC	POINT OF CONNECTION
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RM	ROOM
REV	REVISION
RZ	RELIEF PRESSURE ZONE BACKFLOW PREVENTER
SA	SUPPLY AIR
TYP	TYPICAL
UG	UNDERGROUND
UF	UNDER FLOOR
UN	UNLESS OTHERWISE NOTED
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL)
W	WITH
W/O	WITHOUT
WCO	WALL CLEANOUT
X	EXISTING TO REMAIN

(NOTE: ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON DRAWINGS)

GENERAL MECHANICAL SPECIFICATIONS

- THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, ETC. FOR THE COMPLETE INSTALLATION OF THE HVAC, AND RELATED WORK AS INDICATED ON THE CONTRACT DRAWINGS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL CHECK, VERIFY, AND COORDINATE WORK WITH OTHER TRADES. INCLUDE MODIFICATIONS, RELOCATIONS OR ADJUSTMENTS NECESSARY TO COMPLETE WORK OR TO AVOID INTERFERENCE WITH OTHER TRADES. COORDINATE WITH EXISTING STRUCTURE TO AVOID CONFLICTS WITH BEAMS AND JOISTS.
- THE CONTRACT DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE TO BE USED TO DETERMINE PROJECT SCOPE AND A MINIMUM LEVEL OF QUALITY. THE CONTRACTOR'S APPROVED SUBMITTED SHOP DRAWINGS, COORDINATED WITH OTHER TRADES, SHALL BE USED FOR ACTUAL SYSTEM INSTALLATION.
- CONTRACTOR SHALL PERFORM CUTTING AND PATCHING REQUIRED FOR COMPLETE INSTALLATION OF SYSTEMS. PATCH AND RESTORE ALL WORK CUT OR DAMAGED TO ORIGINAL CONDITION. ROOF PENETRATIONS SHALL BE SEALED WATERTIGHT.
- CONTRACTOR SHALL CONFORM TO THE ALL APPLICABLE RULES AND REGULATIONS, INCLUDING:
 - INTERNATIONAL BUILDING CODE 2003.
 - INTERNATIONAL MECHANICAL CODE 2003.
 - INTERNATIONAL PLUMBING CODE 2003.
 - INTERNATIONAL ENERGY CONSERVATION CODE 2003.
 - REQUIREMENTS AND CODE AMENDMENTS OF LOCAL BUILDING DEPARTMENT, FIRE DEPARTMENT, UTILITY COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.
 - NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS.
- CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION, CONNECTION SIZE, AND ELEVATION OF ALL EXISTING SYSTEMS AND UTILITIES.
- CONTRACTOR SHALL MAINTAIN ALL CODE REQUIRED CLEARANCES TO COMBUSTIBLES, EQUIPMENT AND MAINTAIN MANUFACTURER'S RECOMMENDED SPACE FOR ACCESS.
- CONTRACTOR SHALL SUBMIT A MINIMUM SIX (6) COPIES TO THE ARCHITECT AND ENGINEER FOR REVIEW AND APPROVAL ALL MANUFACTURER'S PRODUCT DATA SHEETS AND CONSTRUCTION SHOP DRAWINGS.
- CONTRACTOR SHALL GUARANTEE FOR ONE (1) YEAR AFTER ACCEPTANCE BY OWNER ALL EQUIPMENT, MATERIALS, AND WORKMANSHIP TO BE FREE FROM DEFECT. CONTRACTOR SHALL REPAIR, REPLACE OR ALTER SYSTEMS OR PARTS OF SYSTEMS FOUND DEFECTIVE AT NO EXTRA COST TO OWNER.
- FROM FIELD MARKED CONSTRUCTION DRAWINGS, CONTRACTOR SHALL NEATLY PRODUCE A FINAL SET OF "AS-BUILT" DRAWINGS TO BE PROVIDED TO OWNER.
- LABEL ALL EQUIPMENT WITH IDENTIFICATION TAGS AND LABEL ALL PIPING WITH FLUID AND FLOW DIRECTIONAL ARROWS.
- SUPPORT ALL PIPE WITH HANGERS AND SUPPORTS PER MECHANICAL CODE AND MSS-SP89 STANDARDS.
- ALL MOTORIZED EQUIPMENT SHALL HAVE VIBRATION ISOLATORS TO REDUCE VIBRATION AND SOUND TRANSMISSION TO STRUCTURE.
- INSTALL ALL DUCTWORK AND PIPING IN A NEAT MANNER. INSTALL AS HIGH AS POSSIBLE AND ROUTE PARALLEL AND PERPENDICULAR TO WALLS UNLESS OTHERWISE SHOWN.
- MAINTAIN ALL REQUIRED DUCTWORK AND PIPING CLEARANCES TO ELECTRICAL EQUIPMENT PER THE NATIONAL ELECTRIC CODE.
- MOTOR DISCONNECTS AND STARTERS SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR.

HVAC SPECIFICATIONS

- DUCTWORK:
 - DUCTWORK SHALL BE GALVANIZED SHEET METAL WITH WEIGHT, THICKNESS, GAGE, CONSTRUCTION AND INSTALLATION METHODS PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS. DUCTWORK SHALL BE MINIMUM 26 GAGE GALVANIZED STEEL.
 - FIBERGLASS DUCT BOARD IS NOT PERMITTED.
 - INSTALL FLEXIBLE DUCT CONNECTIONS AT MOTORIZED EQUIPMENT.
 - INSTALL TURNING VANES AT 90 DEGREE ELBOWS PER SMACNA INSTALLATION GUIDELINES.
 - INSTALL VOLUME BALANCING DAMPER IN BRANCH DUCT SERVING EVERY SUPPLY AND RETURN AIR DEVICE. PROVIDE REMOTE BALANCING DEVICE AT INACCESSIBLE LOCATIONS.
 - FLEX DUCT SHALL BE A MAXIMUM 6 FEET IN LENGTH.
 - ALL DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
- DUCT INSULATION:
 - ALL SUPPLY AND RETURN DUCTWORK SHALL BE INSULATED AND COMPLY WITH INTERNATIONAL ENERGY CONSERVATION CODE REQUIREMENTS.
 - INSULATION SHALL BE FLEXIBLE GLASS FIBER DUCT WRAP, 2 INCH THICK, MINIMUM R5 INSULATING VALUE, WITH K-VALUE 0.29 AT 75F MEAN TEMPERATURE, FKS OR PSK VAPOR RETARDER JACKET. DENSITY SHALL BE MINIMUM 0.75 PCF.
 - DUCTWORK OUTSIDE THE BUILDING'S INSULATION ENVELOPE SHALL HAVE 3 INCH THICK EXTERNAL DUCT WRAP WITH MINIMUM R8 INSULATING VALUE.
- REFER TO ARCHITECTURAL CEILING PLAN FOR CEILING HEIGHTS AND EXACT LOCATION OF CEILING AIR DEVICES.
- MOTOR DISCONNECTS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED ON DRAWINGS.
- HVAC CONDENSATE PIPE SHALL BE TYPE "M" COPPER AND SHALL BE SLOPED MINIMUM 1/8 INCH PER FOOT. INTERIOR CONDENSATE PIPE SHALL BE INSULATED WITH 3/4 INCH CLOSED CELL INSULATION.
- OUTSIDE AIR INTAKES SHALL BE INSTALLED A MINIMUM 10 FEET FROM EXHAUST SOURCES AND PLUMBING VENTS.
- A SMOKE DETECTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR IN THE RETURN AIR DUCT OF ALL AIR HANDLING SYSTEMS GREATER THAN 2,000 CFM. COORDINATE WITH ELECTRICAL CONTRACTOR. DETECTION SHALL SHUT DOWN UNIT.
- THE BACKS OF ALL SUPPLY AIRFLOW DEVICES SHALL BE INSULATED. PROVIDE TRIM KIT FOR DEVICES INSTALLED IN HARD SURFACES.
- PROVIDE BIRD SCREEN ON ALL INTAKES, VENTS AND FANS.
- PROVIDE 24 HOUR/7 DAY FULLY PROGRAMMABLE THERMOSTAT ON ALL HVAC SYSTEMS.
- ALL CONTROL WIRING AND DEVICES SHALL BE BY MECHANICAL CONTRACTOR.
- HVAC EQUIPMENT SHALL BE MANUFACTURED BY TRANE, CARRIER, LENOX, OR AON.
- TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED ON ALL HVAC SYSTEMS. TAB WORK MAY BE PERFORMED BY THE MECHANICAL CONTRACTOR. A FINAL TAB REPORT, IN NEBB FORMAT, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

DX HEAT PUMP SPLIT SYSTEM SCHEDULE

GENERAL	
SERVES	AHU-1/HP-1
DESIGN BASIS MANUFACTURER	OFFICES
MIN. SEER	CARRIER
	13.0
AIR HANDLER	
MODEL	AHU-1
DISCHARGE	FY4ANF018
SUPPLY AIR (CFM)	HORZ.
OUTSIDE AIR (CFM)	600
MOTOR HORSEPOWER	40
EXTERNAL SP (IN WC)	1/6
SPEED	0.3
FILTER	HIGH
	MERV 7
AUXILIARY HEATING PERFORMANCE	
MODEL	KFCEH0401N03
FUEL TYPE	ELECTRIC
INPUT (KW @240/1)	3
OUTPUT (BTUH)	10,200
INDOOR ELECTRICAL SINGLE POINT CONNECTION	
VOLTAGE/PHASE	240/1
EVAP. FAN FLA	1.8
HEATER AMPS	12.5
MCA	17.9
MOCF	20
OUTDOOR HEAT PUMP UNIT	
MODEL	HP-1
TOTAL COOLING CAPACITY (BTUH)	26HPA3
SENSIBLE COOLING CAPACITY (BTUH)	18,000
ENTERING AIR DB/WB (F)	17,000
AMBIENT TEMP (F)	80/67
REFRIGERANT	105
WEIGHT (LBS.)	R-410A
	210
OUTDOOR ELECTRICAL	
VOLTAGE/PHASE	240/1
COMPRESSOR RLA	9.0
COND. FAN FLA	0.7
MCA	11.9
MOCF	20

NOTES:

- VERIFY UNITS HORIZONTAL ACCESS SIDE PRIOR TO ORDERING.
- MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCE.
- INSTALL AUXILIARY DRAIN PAN BELOW COOLING COIL OF AIR HANDLER. ROUTE OVERFLOW TO CORRIDOR.
- REFRIGERANT LINES SHALL BE SIZED AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- UNITS SHALL HAVE TXV EXPANSION VALVES, CRANKCASE HEATER,
- PROVIDE PROGRAMMABLE 24/7 THERMOSTAT.
- INCLUDE HAIL GUARDS.

AIR DEVICE SCHEDULE

TAG	MANUFACTURE	MODEL	MATERIAL	NC RATING	DESCRIPTION
'A'	TITUS	TMS	STEEL	30	LOUVERED FACE, SQUARE CEILING SUPPLY DIFFUSER
'B'	TITUS	50F	ALUM.	30	1/2"X1/2"X1" EGGCRATE CEILING RETURN GRILLE.
NECK SIZE	CFM RANGE	NOTES:			
6" DIA.	0-100	1. INSTALL INSULATION ON BACKS OR PLENUMS OF ALL SUPPLY AND RETURN DEVICES.			
8" DIA.	101-249	2. BRANCH DUCT SIZE SHALL MATCH DEVICE NECK SIZE.			
10" DIA.	250-400	3. PROVIDE TRIM KIT AT HARD SURFACE INSTALLATIONS.			
12" DIA.	401-650	4. INSTALL REMOTE BALANCING DEVICE AT INACCESSIBLE LOCATIONS.			