OUTSIDE AIR CALCULATION

ENTRY #01: 1,040 SQ. FT.
OUTSIDE AIR REQUIRED: 0.06 CFM/SQ. FT. x 1040 SQ. FT. = 63 CFM
5 CFM/PERSON x 11 PEOPLE = 55 CFM
118 CFM
ENTRY #01 IS SERVED BY RTU-13 WITH 200 CFM
OUTSIDE AIR PROVIDED

CLASSROOM #100: 527 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 527 SQ. FT. = 95 CFM
10 CFM/PERSON x 13 PEOPLE = 130 CFM
225 CFM
CLASSROOM #100 IS SERVED BY RTU-1 WITH 240 CFM OUTSIDE AIR PROVIDED

CLASSROOM #150: 527 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 527 SQ. FT. = 95 CFM
10 CFM/PERSON x 13 PEOPLE = 130 CFM
225 CFM
CLASSROOM #150 IS SERVED BY RTU-2 WITH 240 CFM OUTSIDE AIR PROVIDED

CLASSROOM #200: 557 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 557 SQ. FT. = 101 CFM
10 CFM/PERSON x 14 PEOPLE = 140 CFM
241 CFM
CLASSROOM #200 IS SERVED BY RTU-3 WITH 240 CFM OUTSIDE AIR PROVIDED

CLASSROOM #250: 870 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 870 SQ. FT. = 157 CFM
10 CFM/PERSON x 22 PEOPLE = 220 CFM
377 CFM
CLASSROOM #250 IS SERVED BY RTU-4 WITH 400 CFM OUTSIDE AIR PROVIDED

CLASSROOM #300: 759 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 759 SQ. FT. = 137 CFM
10 CFM/PERSON x 19 PEOPLE = 190 CFM
327 CFM
CLASSROOM #300 IS SERVED BY RTU-5 WITH 350 CFM OUTSIDE AIR PROVIDED

CLASSROOM #350: 715 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 715 SQ. FT. = 129 CFM
10 CFM/PERSON x 18 PEOPLE = 180 CFM
309 CFM
CLASSROOM #250 IS SERVED BY RTU-6 WITH 350 CFM OUTSIDE AIR PROVIDED

CLASSROOM #400: 831 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 831 SQ. FT. = 150 CFM
10 CFM/PERSON x 22 PEOPLE = 220 CFM
370 CFM
CLASSROOM #400 IS SERVED BY RTU-7 WITH 400 CFM OUTSIDE AIR PROVIDED

CLASSROOM #450: 784 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 784 SQ. FT. = 142 CFM
10 CFM/PERSON x 20 PEOPLE = 200 CFM
342 CFM
CLASSROOM #450 IS SERVED BY RTU-8 WITH 350 CFM OUTSIDE AIR PROVIDED

CLASSROOM #500: 747 SQ. FT.
OUTSIDE AIR REQUIRED: 0.12 CFM/SQ. FT. x 747 SQ. FT. = 90 CFM
10 CFM/PERSON x 19 PEOPLE = 190 CFM
280 CFM
CLASSROOM #500 IS SERVED BY RTU-9 WITH 300 CFM OUTSIDE AIR PROVIDED

CLASSROOM #550: 799 SQ. FT.
OUTSIDE AIR REQUIRED: 0.12 CFM/SQ. FT. x 799 SQ. FT. = 96 CFM
10 CFM/PERSON x 20 PEOPLE = 200 CFM
296 CFM
CLASSROOM #500 IS SERVED BY RTU-10 WITH 300 CFMOUTSIDE AIR PROVIDED

ACTIVITY ROOM #600: 2042 SQ. FT.
OUTSIDE AIR REQUIRED: 0.12 CFM/SQ. FT. x 2042 SQ. FT. = 245 CFM
10 CFM/PERSON x 51 PEOPLE = 510 CFM
755 CFM
CLASSROOM #500 IS SERVED BY RTU-11 & 12 WITH 800 CFM OUTSIDE AIR PROVIDED

LUNCH ROOM #08: 800 SQ. FT.
OUTSIDE AIR REQUIRED: 0.18 CFM/SQ. FT. x 800 SQ. FT. = 144 CFM
7.5 CFM/PERSON x 53 PEOPLE = 398 CFM
KITCHEN #05: 200 SQ. FT.
OUTSIDE AIR REQUIRED: 0.12 CFM/SQ. FT. x 200 SQ. FT. = 24 CFM
7.5 CFM/PERSON x 4 PEOPLE = 30 CFM
596 CFM
CLASSROOM #500 IS SERVED BY RTU-14 WITH 600 CFM OUTSIDE AIR PROVIDED

LEARNING #21: 300 SQ. FT.
OUTSIDE AIR REQUIRED: 0.12 CFM/SQ. FT. x 300 SQ. FT. = 36 CFM
10 CFM/PERSON x 10 PEOPLE = 100 CFM
CORRIDORS: 600 SQ. FT.
OUTSIDE AIR REQUIRED: 0.06 CFM/SQ. FT. x 600 SQ. FT. = 36 CFM
0 CFM/PERSON x – PEOPLE = 0 CFM
172 CFM
CLASSROOM #500 IS SERVED BY RTU-15 WITH 200 CFM OUTSIDE AIR PROVIDED

MECHANICAL NOTES:

1. VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND FROM ARCHITECTURAL PLANS.
2. CONTRACTOR AND SUB-CONTRACTOR SHALL PAY FOR ALL PERMITS AND CHARGES REQUIRED AND COMPLY WITH ALL GOVERNING CODES AND ORDINANCES.
3. VISITING THE SITE: EACH BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND SHALL FULLY INFORM HIMSELF REGARDING THE FACILITES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WORK OR MATERIALS OMITTED FROM BIDDER'S CONTRACT PROPOSAL DUE TO HIS FAILURE TO SO INFORM HIMSELF BY SUCH INVESTIGATION.
4. CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT AND STRUCTURE ENGINEER PRIOR TO THE PLACEMENT OF EQUIPMENT ON THE ROOF AND THE CUTTING OF THE ROOF OPENINGS.
5. REFER TO REFLECTIVE CEILING PLAN FOR THE EXACT LOCATIONS OF ALL CEILING AIR DEVICES.
6. FURNISH AND INSTALL COMPLETE AND OPERATIONAL MECHANICAL SYSTEMS AS SHOWN ON PLANS AND SPECIFIED HEREIN.
7. DUCKWORK SHALL BE AS FOLLOWS:
   A. GALVANIZED SHEETMETAL CONSTRUCTED AND INSTALLED ACCORDING TO SMACNA STANDARD FOR LOW VELOCITY DUCTWORK.
   B. FURNISH AND INSTALL AIR SCOOPS. EXTRACTORS, SPIN-IN FITTINGS WITH VOLUME DAMPERS AND SPLIT DAMPERS WITH OPERATORS AND LOCKING QUADRANTS AT ALL SPLITS, BRANCH CONNECTIONS AND REGISTER OR DIFFUSER CONNECTIONS TO DUCKWORK AND AS OTHERWISE INDICATED ON PLANS.
   C. INSULATE ALL GALVANIZED SHEETMETAL SUPPLY, RETURN AIR DUCTS WITH 1.5" (R-6) OR 2" (R-8) DUCT LINER.
   D. DIMENSIONS SHOWN ON PLANS SHALL BE FREE AIR FLOW AREA.
   E. FLEXIBLE DUCT SHALL BE INSULATED AND MAX. LENGTH 6'- 0". WHERE LONGER RUNS ARE REQUIRED COMBINE FLEX. DUCT WITH RIGID ROUND DUCT (INSULATED).
   F. SEAL ALL TRANSVERSE JOINTS, SEAMS AND FITTINGS WITH FOSTER "32-50" WATER BASE HIGH VELOCITY DUCT SEALANT IN ACCORDANCE WITH SMACNA STANDARD.
8. CONDENSATE LINES SHALL BE COPPER.
9. PROVIDE COMPLETE HVAC CONTROL SYSTEMS INCLUDING ELECTRONIC PROGRAMMABLE THERMOSTAT WITH TAMPER-PROOF LOCKING COVER, CONTROL WIRING CONDUITS, INTERLOCK WIRING AND CONTROL DEVICES. PROGRAMMABLE THERMOSTATS SHALL COMPLY WITH IECC 803.2.3.1 & 803.3.3.2 FOR SET BACK, TIME OF DAY, START/STOP, MANUAL OVERRIDE, AND MINIMUM 5° FDEADBAND CONTROL.
10. SUPPLY AIR DIFFUSER SHALL BE TITUS MODEL TDC,UNLESS OTHERWISE NOTED, 24"X24" FACE, ROUND OR SQUARE NECK WITH VOLUME DAMPER.
11. CEILING RETURN AIR GRILLES SHALL BE TITUS MODEL PAR OR EQUAL.
12. SUPPLY AIR REGISTERS SHALL BE TITUS MODEL 272FL OR EQUAL WITH OPPOSED BALDE DAMPERS.
13. CONTRACTOR SHALL INSTALL ALL MECHANICAL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
14. CONTRACTOR SHALL PROVIDE U.L. LISTED FIRE DAMPERS FOR AIR DISTRIBUTION SYSTEMS AT FIRE RATED WALLS AND CEILING PENETRATIONS IN ACCORDANCE WITH LOCAL CODES.
15. BALANCE AIR DISTRIBUTION SYSTEMS PER AABC STANDARDS. CONTRACTOR SHALL SUBMIT FINAL BALANCING REPORT SIGNED BY AABC CERTIFIED ENGINEER.
16. FURNISH AND INSTALL KITCHEN HOOD VENTILATION SYSTEM PER NFPA 96. HOOD EXHAUST DUCTS SHALL BE CONSTRUCTED OF 18 GAGE TYPE 316 STAINLESS STEEL WITH WELDED SEAMS & JOINTS.
17. BALANCE KITCHEN HOOD VENTILATION SYSTEMS PER AABC OR NEBB STANDARDS.
18. KITCHEN HOOD SHALL BE UL LISTED WITH ANSUL R-102 FIRE SUPPRESSION SYSTEM AND MECHANICAL GAS VALVE.
19. PERFERRED MOUNTING HEIGHT FOR REMOTE TEMPERATURE SENSORS TO BE AT 72" ABOVE FINISH FLOOR. IF THE REMOTE TEMPERATURE SENSOR LOCATION CONFLICTS WITH OTHER TRADES, CONSULT PROJECT ARCHITECT FOR THE FINAL LOCATION. FIELD VERIFY.

PACKAGED ROOFTOP UNIT SCHEDULE

MARK		RTU-1	RTU-2	RTU-3	RTU-4	RTU-5	RTU-6	RTU-7	RTU-8	RTU-9	RTU-10	RTU-11	RTU-12	RTU-13	RTU-14	RTU-15
EVAPORATOR	DISCHARGE (HORIZONTAL OR VERTICAL)	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
	SUPPLY AIRFLOW (CFM)	1,080	1,080	1,080	1,440	1,440	1,440	1,440	1,440	1,440	1,800	1,800	1,800	1,440	1,800	1,440
	OUTSIDE AIRFLOW (CFM)	240	240	240	400	350	350	400	350	300	300	400	400	200	600	200
	EXTERNAL STATIC PRESSURE (IN. W.G.)*	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	SUPPLY FAN MOTOR SIZE (HP)	1.2	1.2	1.2	1.7	1.7	1.7	1.7	1.7	1.7	2.4	2.4	2.4	1.7	2.4	1.7
	ENTERING AIR TEMP. - DB/WB (°F)	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67
CONDENSING	MIN. TOTAL CAPACITY (BTUH)**	34,500	34,500	34,500	46,700	46,700	46,700	46,700	46,700	46,700	55,900	55,900	55,900	46,700	55,900	46,700
	MIN. SENSIBLE CAPACITY (BTUH)**	25,700	25,700	25,700	34,500	34,500	34,500	34,500	34,500	34,500	43,300	43,300	43,300	34,500	43,300	34,500
	MINIMUM STAGES OF COOLING	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAXIMUM TOTAL POWER INPUT AT RATED CAPACITY (KW)	2.9	2.9	2.9	3.7	3.7	3.7	3.7	3.7	3.7	4.6	4.6	4.6	3.7	4.6	3.7
	MINIMUM SEER / EER	15.0/-	15.0/-	15.0/-	15.6/-	15.6/-	15.6/-	15.6/-	15.6/-	15.6/-	15.2/-	15.2/-	15.2/-	15.6/-	15.2/-	15.6/-
	DESIGN AMBIENT AIR TEMP. (°F)	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
HEATING	TYPE	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS
	MIN. HEATING CAPACITY (MBH)	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
	MAX. INPUT (MBH)	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
	MIN. NUMBER OF STAGES	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
MCA / MOCP (AMPS)		9.9 / 15	9.9 / 15	9.9 / 15	10.8 / 15	10.8 / 15	10.8 / 15	10.8 / 15	10.8 / 15	10.8 / 15	12.3 / 15	12.3 / 15	12.3 / 15	10.8 / 15	12.3 / 15	10.8 / 15
VOLTS / PHASE		460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3	460/3
APPROX. WEIGHT (LBS)		700	700	700	800	800	800	800	800	800	800	800	800	800	800	800
BASIS OF DESIGN		CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER
MODEL		48HC A04	48HC A04	48HC A04	48HC A05	48HC A05	48HC A05	48HC A05	48HC A05	48HC A05	48HC A06	48HC A06	48HC A06	48HC A05	48HC A06	48HC A05
NOTES		1	1	1	1	1	1	1	1	1	2	2	2	1	2	1

1- PROVIDE UNIT WITH BELT DRIVE BLOWER, 14" HIGH ROOF CURB, PROGRAMMABLE THERMOSTAT WITH REMOTE TEMPERATURE SENSOR AND LOW-AMBIENT KIT.

2- PROVIDE UNIT WITH BELT DRIVE BLOWER, 14" HIGH ROOF CURB, PROGRAMMABLE THERMOSTAT WITH REMOTE TEMPERATURE SENSOR, LOW-AMBIENT KIT AND DRY-BULB ECONOMIZER.

* INCLUDES DUCTWORK, AIR DEVICES, AND FILTER LOADING; DOES NOT INCLUDE COIL, CASING OR OTHER UNIT LOSSES.

** AT SCHEDULED AMBIENT AIR TEMPERATURE.

KITCHEN AIR BALANCE SCHEDULE

UNIT	MAKE-UP AIR	EXHAUST AIR
RTU-14	600	----
EF-C	----	1000
MAKE-UP AIR FROM CORRIDOR	400	----
TOTAL	1,000	1,000

UNIT HEATER SCHEDULE

PLAN DESIGNATION	TYPE	SERVICE	INPUT(KW)	VOLTS / PHASE	BASIS OF DESIGN	MODEL	NOTES
UH-1	ELECTRIC	SPRINKLER ROOM	3.0	277/ 1	Q-MARK	MUH0371	1
UH-2, 3, 4 5	ELECTRIC	CEILING PLENUM FREEZE PROTECTION	5.0	277/ 1	Q-MARK	MUH0571	1

NOTES:

1. PROVIDE ELECTRIC UNIT HEATERS WITH MOUNTING KIT AND UNIT-MOUNT THERMOSTAT.

FAN SCHEDULE

MARK	EF-A	EF-B	EF-C	EF-D	EF-E
SERVICE	TOILET EXHAUST	TOILET EXHAUST	KITCHEN HOOD EXHAUST	ELECTRICAL ROOM EXHAUST	TOILET EXHAUST
UNIT TYPE	CENTRIFUGAL	CENTRIFUGAL	CENTRIFUGAL	CENTRIFUGAL	CENTRIFUGAL
DRIVE TYPE	DIRECT	DIRECT	BELT	DIRECT	DIRECT
TOTAL AIRFLOW (CFM)	60	120	1,000	400	50
EXTERNAL STATIC PRESSURE (IN. W.G.)	0.25	0.125	1.25	0.125	0.25
MAXIMUM ACCEPTABLE SONES	1.1	1.4	-	4.1	1.1
MOTOR SIZE (HP)	29-WATT	53-WATT	1/2	121-WATT	29-WATT
VOLTS / PHASE	120/1	120/1	120/1	120/1	120/1
BASIS OF DESIGN	GREENHECK	GREENHECK	COOK	GREENHECK	GREENHECK
MODEL	SP-A90	SP-A125	120-CPS-A	SP-A410	SP-A90
ACCESSORIES	DS,BD,SC,RCP	DS,BD,SC,RCP	AD,IOF,DS,GT,BG	DS,BD,SC,RCP	DS,BD,SC,RCP
NOTES	1	1	3	2	1

NOTES
1. CONTROLLED BY WALL-MOUNT SWITCH.
2. FAN SHALL BE CONTROLLED BY WALL-MOUNT THERMOSTAT.
3. FAN SHALL BE UL LISTED FOR KITCHEN HOOD EXHAUST.

* EXTERNAL STATIC PRESSURE CONSISTS OF DUCTWORK, AIR DEVICES, AND FILTERS.

ACCESSORIES:
BD-BACKDRAFT DAMPER; AD-ACCESS DOOR
DS-DISCONNECT SWITCH; RCP-ROOF CAP
IOF-INLET/OUTLET FLANGE; BG-BELT GUARD
GT-GREASE TROUGH WITH DRAIN CONNECTION
SC-SPEED CONTROLLER; WCP-WALL CAP

REVISIONS AND ISSUANCE

NO.	DATE	DESCRIPTION
	04/17/2019	PRICING ONLY
	06/07/2019	ISSUE FOR PERMIT

IVY KIDS EARLY LEARNING CENTER
LOT COM2I
CROSS CREEK RANCH
6407 CROSS CREEK BEND LANE
FULSHEAR, Tx 77441

MEP Consultants
BLK Engineering & Consulting Co.
3423 Spring Arbor Ln.
Sugar Land, TX 77479
(t) 832 563 3127
TBPE Firm #12672

STATE OF TEXAS
CHIH-TAI KENG
79201
REGISTERED
PROFESSIONAL ENGINEER
6-7-2019

DRAWING TITLE
MECHANICAL SCHEDULES

DRAWN BY	CHECKED BY
FK	CK
DATE	JOB NO.
04/10/2019	FULSHEAR

DRAWING NO.
M-2.0