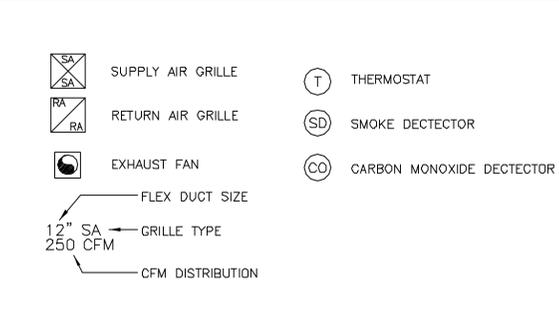


1 1st LEVEL HVAC MECHANICAL PLAN

SCALE: 3/16" = 1'-0"

- CONTRACTOR IS TO INSTALL DUCTWORK WITH CAREFUL CONSIDERATION OF LIGHTING, PLUMBING PIPING, CONDUITS, ETC. COORDINATE WITH GENERAL CONTRACTOR AND OTHER SUBCONTRACTORS PRIOR TO INSTALLATION. INSTALL ALL DUCTWORK TIGHT AGAINST BOTTOM OF STRUCTURE UNLESS OTHERWISE INSTRUCTED BY ENGINEER.
- CLEARANCES ARE VERY CRITICAL. CONTRACTOR TO VERIFY CLEARANCES WITH ALL TRADES PRIOR TO DUCT ROUTING. ALL DUCTWORK SHALL BE MOUNTED DIRECTLY BENEATH THE STRUCTURAL MEMBERS, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- CONTRACTOR TO COORDINATE ALL DIFFUSER LOCATIONS WITH REFLECTED CEILING PLANS AND ELECTRICAL DRAWINGS PRIOR TO INSTALLATION.
- CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL CODES AND AUTHORITIES HAVING JURISDICTION OVER THE PROJECT.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS, MOUNTING HEIGHTS AND SPECIFICATIONS OF ALL EXTERIOR LOUVERS, PROVIDE CORROSION RESISTANT SCREEN OF NOT LESS THAN 1/4" MESH. COORDINATE WITH GENERAL CONTRACTOR PRIOR TO ORDER.
- VERIFY THERMOSTAT LOCATIONS WITH GENERAL CONTRACTOR PRIOR TO INSTALLATION. (MOUNTING HEIGHT TO BE 48" ABOVE FLOOR LEVEL UNLESS OTHERWISE NOTED). ALL THERMOSTATS TO BE 7-DAY PROGRAMABLE.
- PRIOR TO SUBMITTING BID PRICE, MECHANICAL CONTRACTOR SHALL VERIFY ACCESSIBILITY AND CLEARANCES REQUIRED FOR FILTER AND COIL CONNECTION/REMOVAL BASED ON ROOM SIZE AND UNIT ORIENTATION. MODIFICATIONS TO EQUIPMENT TO ENSURE ACCESSIBILITY AND CLEARANCE TO BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY.
- DUCT SIZES INDICATED ON PLANS ARE INSIDE FREE AREA. ALL MAIN DUCTS SHALL BE OF SHEETMETAL CONSTRUCTION MEETING SMACNA.
- PROVIDE A MINIMUM OF 2" THICK INSULATION AROUND SUPPLY AIR NECK AND OVER SUPPLY AIR DIFFUSERS TO MINIMIZE CONDENSATION.
- ALL SUPPLY AND RETURN AIR DUCTS SHALL HAVE A MINIMUM OF 2" THICK EXTERNAL INSULATION. (SEE SPECIFICATIONS FOR TYPE OF DUCTWORK INSULATION.)
- PROVIDE ROUND FLEXIBLE DUCT, 12'-0" (MAX. LENGTH), SAME SIZE AS DIFFUSER NECK AT FINAL DROPS ONLY.
- PROVIDE CONTROL DAMPERS AT SUPPLY BRANCHES AND INDIVIDUAL AIR SUPPLY OUTLETS FOR COMPLETE CONTROL OF AIR FLOW.
- PROVIDE TURNING VANES AT EACH CHANGE IN DIRECTION TO MINIMIZE FRICTION LOSS.

- ALL ROOF PENETRATIONS, FLASHING, AND MOUNTING SHALL BE COORDINATED WITH ROOFING CONTRACTOR AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- ALL FLOOR PENETRATIONS SHALL BE COORDINATED WITH CONTRACTOR AND INSTALLED PER MANUFACTURER'S RECOMMENDATION.
- PROVIDE INSULATION ON FIRST 12'-0" OF CONDENSATE DRAIN PIPING EXTENDING FROM UNIT. DRAIN LINE TO HAVE SLOPE OF 1/8" PER FOOT IN THE DIRECTION OF FLOW AND DISCHARGE AT CODE APPROVED LOCATIONS.
- CONDENSATE DRAIN PIPING SHALL BE SCH-40 PVC IN DUCTED RETURN INSTALLATIONS AND COPPER TYPE 'L' IN RETURN AIR PLENUM INSTALLATIONS.
- PROVIDE AUXILIARY DRAIN FOR ALL UNITS LOCATED ABOVE THE CEILING. DRAIN PAN SHALL BE CONSTRUCTED OF 12ga. SHEET METAL WITH A 1" DIAMETER DRAIN AND SHALL BE LARGE ENOUGH TO COVER THE ENTIRE UNIT.
- ROUTE AUXILIARY DRAIN PIPE TO OUTSIDE OF BUILDING IN AN AREA WHERE IT CAN BE OBSERVED.
- INSULATE ALL REFRIGERATION SUCTION LINES WITH ARMSTRONG ARMAFLEX AP, 1" WALL THICKNESS. INSULATION SHALL BE FINISHED WITH TWO COATS OF VINYL LACQUER PER MANUFACTURER'S PUBLISHED PROCEDURES.
- UNITS LOCATED ABOVE THE CEILING SHALL BE SUPPORTED WITH UNISTRUT AND ALL-THREAD IN A MANNER TO ALLOW EASY ACCESS TO MAINTENANCE PANELS.
- CONCRETE PAD FOR HVAC EQUIPMENT SHALL BE A MINIMUM OF 6" LARGER THAN FOOTPRINT OF EQUIPMENT. EQUIPMENT PAD SHALL BE PROVIDED BY GENERAL CONTRACTOR, BUT SIZED BY HVAC CONTRACTOR. PROVIDE ISOLATION PADS PER MANUFACTURER'S RECOMMENDATIONS.
- HVAC CONTRACTOR SHALL PROVIDE, AT HIS EXPENSE, THE SERVICES OF AN INDEPENDENT TESTING AND AIR BALANCING CONTRACTOR (TAB) AND SUBMIT A WRITTEN 'TAB' BALANCE REPORT. ALL ADJUSTMENTS IN SHEAVES, BELTS, DAMPERS, VALVES, ETC., REQUIRED BY 'TAB' REPORT SHALL BE THE RESPONSIBILITY OF THE HVAC CONTRACTOR.



3 MECHANICAL LEGEND

UNIT No.	EF-1	EF-2	EF-3	-	-
AREA SERVED	APPARATUS	UNISEX R.R.	CHIEF'S R.R.	-	-
TYPE	CENT/BELT	CEILING	CEILING	-	-
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK	-	-
MODEL No.	BSD-200-10	SP-B70	SP-B70	-	-
GENERAL DATA					
MOTOR ELECTRICAL	208/3/60	120/1/60	120/1/60	-	-
CFM	4,500	50	50	-	-
S.P.	0.30	0.25	0.25	-	-
NOTES	1,2,3,6,7	4,5	4,5	-	-

NOTES:
 1. INSECT SCREEN
 2. DISCONNECT SWITCH (BY ELECTRICAL CONTRACTOR)
 3. WEATHERPROOF WALL LOUVER
 4. FAN TO BE OPERATED BY SAME SWITCH AS LIGHTS.
 5. INTERLOCK FAN WITH ASSOCIATED AIR HANDLING UNIT.
 6. PROVIDE CARBON MONOXIDE DETECTOR TO TURN ON FAN WHEN CARBON MONOXIDE REACHES A LEVEL OF 50 PARTS PER MILLION.
 7. PROVIDE WITH BACKDRAFT DAMPER AND FAN-MOUNTED SPEED CONTROL.

4 EXHAUST FAN SCHEDULE

2 HVAC GENERAL NOTES

UNIT No.	UH-1	UH-2		
AREA SERVED	APPARATUS BAY	APPARATUS BAY		
MANUFACTURER	DAYTON	DAYTON		
MODEL No.	3E133	3E133		
GENERAL DATA				
GAS CONNECTION (IN)	1/2	1/2		
GAS INPUT (BTUH)	60,000	60,000		
WEIGHT (LBS)		35		
STAGES	2	2		
GAS TYPE	NATURAL GAS	NATURAL GAS		
MOTOR ELECTRICAL	120/1/60	120/1/60		
NOTES	1,2,3,4	1,2,3,4		

NOTES:
 1. INSTALL PER MANUFACTURERS SPECIFICATIONS
 2. PROVIDE WITH UNIT MOUNTED TEMPERATURE SENSOR. HEATER SHALL BE ENERGIZED WHEN TEMPERATURE DROPS BELOW 50°F.
 3. PROVIDE PRESSURE REDUCING VALVE (PRV) AND CUT-OFF VALVE AT EA. UNIT.

5 GAS UNIT HEATER SCHEDULE

ITEM NUMBER	TYPE	MATERIAL	NECK SIZE	AIR VOLUME MIN-MAX	VOLUME DAMPER	FIRE DAMPER	MAXIMUM NC	MAXIMUM VELOCITY	MANUFACTURER	MODEL NUMBER	COMMENTS
6-SAD	LAY-IN CLG	STEEL	6 IN DIA	25 - 90	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
8-SAD	LAY-IN CLG	STEEL	8 IN DIA	95 - 200	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
10-SAD	LAY-IN CLG	STEEL	10 IN DIA	205 - 300	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
12-SAD	LAY-IN CLG	STEEL	12 IN DIA	305 - 400	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
14-SAD	LAY-IN CLG	STEEL	14 IN DIA	405 - 550	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
10-RAGR	LAY-IN CLG	ALUMINUM	10 IN DIA	165 - 245	YES	NO	30	450 FPM	METAL*AIR	RHF-TB	SEE NOTES
12-RAGR	LAY-IN CLG	ALUMINUM	12 IN DIA	250 - 345	YES	NO	30	450 FPM	METAL*AIR	RHF-TB	SEE NOTES
SIDE-GRILL	WALL MTD.	ALUMINUM	12 IN DIA	320 - 450	YES	NO	30	500 FPM	METAL*AIR		

NOTES:
 1. ALL AIR TERMINALS TO HAVE OFF-WHITE FINISH UNLESS NOTED OTHERWISE
 2. ALL DIFFUSER PATTERNS TO BE FOUR WAY BLOW UNLESS NOTED OTHERWISE (FULL CONE UNIT REQUIRED)

6 O/A CALCULATIONS FOR AHU 1, 2 & EF-1

INDOOR UNIT	MARK	AHU-4	AHU-5
GENERAL		EAST ZONE	WEST ZONE
AREA SERVED		1200	1200
SUPPLY AIR (CFM)		200	200
OUTSIDE AIR (CFM)		1.5	1.5
FAN MOTOR HORSEPOWER		BELT	BELT
BELT/DIRECT DRIVE		10	10
TOTAL HEATING kW		208/3/60	208/3/60
VOLTS/PHASE/HERTZ			
MANUFACTURE		TRANE	TRANE
MODEL		BCV036	BCV036
WEIGHT (LBS)		-	-
CONDENSING UNIT			
GENERAL		ACCU-4	ACCU-5
MARK		1	1
STEPS OF CAPACITY		13	13
EER		100	100
AMBIENT AIR		208/3/60	208/3/60
VOLTS/PHASE/HERTZ		15	15
MCA		25	25
MOCP		TRANE	TRANE
MANUFACTURE		4TTA3036A3	4TTA3036A3
MODEL		3	3
NOMINAL TONS		R-410A	R-410A
REFRIGERANT		1,2,3,4,5	1,2,3,4,5

COMMENTS:
 1. PROVIDE CONDENSER COIL HAIL GUARDS.
 2. PROVIDE LOW AMBIENT CONTROL.
 3. PROVIDE REFRIGERANT PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 4. PROVIDE SINGLE POINT ELECTRICAL CONNECTION.
 5. PROVIDE PROGRAMMABLE THERMOSTAT.
 6. UNITS SHALL BE PROVIDED WITH HOT GAS BYPASS.
 7. PROVIDE UNIT WITH ELECTRIC HEATING.
 8. PROVIDE UNITS WITH A SINGLE POINT ELECTRICAL CONNECTION.
 9. ALL RETURN OPENING SHALL BE PROVIDED WITH 1 1/2" AIR FILTER.
 10. ELECTRICAL CONTRACTOR TO PROVIDE DISCONNECT, WIRING FROM ELECTRICAL PANEL TO SINGLE HOOK-UP CONNECTION AND BREAKER (REFER TO MANUFACTURER FOR REQUIRED BREAKER SIZE).
 11. AHU SHALL BE CONNECTED TO SMOKE DETECTORS LOCATED IN MIXING PLENUM, UPON ACTIVATION, THE SMOKE DETECTORS SHALL SHUT DOWN THE AIR DISTRIBUTION SYSTEM. HVAC CONTRACTOR SHALL INCLUDE WIRING (24 VOLT) AND INSTALLATION FROM SMOKE DETECTOR TO AHU.

8 AIR HANDLING UNIT SCHEDULE

INDOOR UNIT	MARK	AHU-4	AHU-5
GENERAL		EAST ZONE	WEST ZONE
AREA SERVED		1200	1200
SUPPLY AIR (CFM)		200	200
OUTSIDE AIR (CFM)		1.5	1.5
FAN MOTOR HORSEPOWER		BELT	BELT
BELT/DIRECT DRIVE		10	10
TOTAL HEATING kW		208/3/60	208/3/60
VOLTS/PHASE/HERTZ			
MANUFACTURE		TRANE	TRANE
MODEL		BCV036	BCV036
WEIGHT (LBS)		-	-
CONDENSING UNIT			
GENERAL		ACCU-4	ACCU-5
MARK		1	1
STEPS OF CAPACITY		13	13
EER		100	100
AMBIENT AIR		208/3/60	208/3/60
VOLTS/PHASE/HERTZ		15	15
MCA		25	25
MOCP		TRANE	TRANE
MANUFACTURE		4TTA3036A3	4TTA3036A3
MODEL		3	3
NOMINAL TONS		R-410A	R-410A
REFRIGERANT		1,2,3,4,5	1,2,3,4,5

8 AIR HANDLING UNIT SCHEDULE

OCCUPANCY CLASSIFICATION	
BATHROOMS	= 1 x 35 cfm = 35 cfm
DORMITORY	= 1 x 15 cfm = 15 cfm
OFFICE SPACE	= 1 x 20 cfm = 20 cfm
LOUNGE AREA	= 1 x 30 cfm = 30 cfm
EXERCISE AREA	= 15 cfm of O/A per person
LOUNGE AREA	= 30 cfm of O/A per person
EXERCISE AREA	= 15 cfm of O/A per person
OFFICE SPACES	= 20 cfm of O/A per person
APPARATUS AREA	= 1.5 cfm per square foot of floor area (PER CHAPTER 4 OF THE MECHANICAL CODE TABLE 403.3)
TOTAL O/A REQUIRED = 155 cfm	
TOTAL O/A PROVIDED = 200 cfm > 155 cfm O.K.	
O/A REQUIRED FOR AHU-4	
BATHROOMS	= 1 x 35 cfm = 35 cfm
DORMITORY	= 1 x 15 cfm = 15 cfm
OFFICE SPACE	= 1 x 20 cfm = 20 cfm
LOUNGE AREA	= 1 x 30 cfm = 30 cfm
TOTAL O/A REQUIRED = 100 cfm	
TOTAL O/A PROVIDED = 200 cfm > 100 cfm O.K.	
O/A REQUIRED FOR EF-1	
APPARATUS AREA	= 1,900SF x 1.5 cfm = 2,850 cfm
TOTAL O/A PROVIDED = 4,500 cfm > 2,850 cfm O.K.	

6 O/A CALCULATIONS FOR AHU 1, 2 & EF-1

GRILLES AND REGISTERS											
ITEM NUMBER	TYPE	MATERIAL	NECK SIZE	AIR VOLUME MIN-MAX	VOLUME DAMPER	FIRE DAMPER	MAXIMUM NC	MAXIMUM VELOCITY	MANUFACTURER	MODEL NUMBER	COMMENTS
6-SAD	LAY-IN CLG	STEEL	6 IN DIA	25 - 90	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
8-SAD	LAY-IN CLG	STEEL	8 IN DIA	95 - 200	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
10-SAD	LAY-IN CLG	STEEL	10 IN DIA	205 - 300	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
12-SAD	LAY-IN CLG	STEEL	12 IN DIA	305 - 400	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
14-SAD	LAY-IN CLG	STEEL	14 IN DIA	405 - 550	YES	NO	30	450 FPM	METAL*AIR	5800-6	SEE NOTES
10-RAGR	LAY-IN CLG	ALUMINUM	10 IN DIA	165 - 245	YES	NO	30	450 FPM	METAL*AIR	RHF-TB	SEE NOTES
12-RAGR	LAY-IN CLG	ALUMINUM	12 IN DIA	250 - 345	YES	NO	30	450 FPM	METAL*AIR	RHF-TB	SEE NOTES
SIDE-GRILL	WALL MTD.	ALUMINUM	12 IN DIA	320 - 450	YES	NO	30	500 FPM	METAL*AIR		

NOTES:
 1. ALL AIR TERMINALS TO HAVE OFF-WHITE FINISH UNLESS NOTED OTHERWISE
 2. ALL DIFFUSER PATTERNS TO BE FOUR WAY BLOW UNLESS NOTED OTHERWISE (FULL CONE UNIT REQUIRED)

7 GRILLES AND REGISTERS FOR SUSPENDED ACOUSTICAL CEILINGS

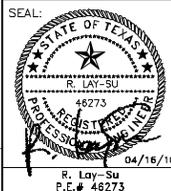
DX SPLIT SYSTEM SCHEDULE			
INDOOR UNIT	HEAT	MARK	ACCU-4
		AREA SERVED	EAST ZONE
		SUPPLY AIR (CFM)	1200
		OUTSIDE AIR (CFM)	200
		FAN MOTOR HORSEPOWER	1.5
		BELT/DIRECT DRIVE	BELT
		TOTAL HEATING kW	10
		VOLTS/PHASE/HERTZ	208/3/60
		MANUFACTURE	TRANE
		MODEL	BCV036
CONDENSING UNIT	ELECTRIC	MARK	ACCU-4
		STEPS OF CAPACITY	1
		EER	13
		AMBIENT AIR	100
		VOLTS/PHASE/HERTZ	208/3/60
		MCA	15
		MOCP	25
		MANUFACTURE	TRANE
		MODEL	4TTA3036A3
		NOMINAL TONS	3
REFRIGERANT	R-410A		
COMMENTS		1,2,3,4,5	1,2,3,4,5

3 MECHANICAL LEGEND

UNIT No.	EF-1	EF-2	EF-3	-	-
AREA SERVED	APPARATUS	UNISEX R.R.	CHIEF'S R.R.	-	-
TYPE	CENT/BELT	CEILING	CEILING	-	-
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK	-	-
MODEL No.	BSD-200-10	SP-B70	SP-B70	-	-
GENERAL DATA					
MOTOR ELECTRICAL	208/3/60	120/1/60	120/1/60	-	-
CFM	4,500	50	50	-	-
S.P.	0.30	0.25	0.25	-	-
NOTES	1,2,3,6,7	4,5	4,5	-	-

NOTES:
 1. INSECT SCREEN
 2. DISCONNECT SWITCH (BY ELECTRICAL CONTRACTOR)
 3. WEATHERPROOF WALL LOUVER
 4. FAN TO BE OPERATED BY SAME SWITCH AS LIGHTS.
 5. INTERLOCK FAN WITH ASSOCIATED AIR HANDLING UNIT.
 6. PROVIDE CARBON MONOXIDE DETECTOR TO TURN ON FAN WHEN CARBON MONOXIDE REACHES A LEVEL OF 50 PARTS PER MILLION.
 7. PROVIDE WITH BACKDRAFT DAMPER AND FAN-MOUNTED SPEED CONTROL.

4 EXHAUST FAN SCHEDULE



LAY-SU Architects & Engineers
 Houston, Texas 77031
 TEXAS ENGINEERING FIRM #F-5215

0 WARNING 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

ISSUED FOR BLD DATE: 04/16/10

DESIGNED BY: RLS
 DRAWN BY: RAY
 SCALE: AS SHOWN
 DATE: SEPTEMBER 2009

REVISIONS:

REV.	DATE	REMARKS
-	04/16/10	Issued for Bld

DRAWING NAME: 1st LEVEL MECHANICAL PLAN & SCHEDULES

SHEET: M1.0

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FIRE STATION #20 - ADDITION
 6902 NAVIGATION BLVD., HOUSTON, TEXAS