

Sheet Template ID: CFE-F-07-B
 File: Z:\Projects\4802_South Charlotte Hyundai Redesign\4802M2 PARTIAL MECHANICAL FLOOR PLAN SALES; Rev: 3/14/2020 4:27 PM by ALEX E. LEIKER; Sheet: 3/14/2020 4:28 PM by ALEX E. LEIKER

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-1)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
SERV DRIVE 101	3744	-	-	-	0.06	224.6	0.8	280.8
TOTAL OA REQUIRED (RTU-1)								280.8
TOTAL OA PROVIDED (RTU-1)								280

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-4)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
NEW CAR DELI 137	706	7.5	15	13	0.02	175.8	0.8	284.4
TOTAL OA REQUIRED (RTU-4)								284.4
TOTAL OA PROVIDED (RTU-4)								225

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-2)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
ACCOUNTING 144	904	5	5	30	0.06	91.5	0.8	94.3
FILES 150	368	-	-	-	0.02	30.3	0.8	35.3
OFFICE 148	104	5	5	0.8	0.06	8.0	0.8	13
TOTAL OA REQUIRED (RTU-2)								100.7
TOTAL OA PROVIDED (RTU-2)								100

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-3)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
BREAK 153	400	7.5	30	12.0	0.06	144.0	0.8	141.8
TRAINING 117	666	5	50	28.5	0.06	176.4	0.8	220.6
TOTAL OA REQUIRED (RTU-3)								362.0
TOTAL OA PROVIDED (RTU-3)								370

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-5)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
CASHIER 113	78	5	5	0.06	0.06	0.7	0.8	0.4
CORRIDOR 116	221	-	-	-	0.06	13.3	0.8	16.6
CORRIDOR 142	272	-	-	-	0.06	16.3	0.8	20.4
FILES 153	364	-	-	-	0.02	30.3	0.8	35.3
FI 158	10	5	5	0.06	0.06	0.6	0.8	10.0
FI 159	10	5	5	0.06	0.06	0.6	0.8	10.0
FI 161	10	5	5	0.06	0.06	0.6	0.8	10.0
GEN MER 151	214	-	-	-	0.06	12.8	0.8	12.7
INTERNET 123	492	-	-	-	0.06	29.5	0.8	40.0
124	53	-	-	-	0.06	5.4	0.8	8.0
125	11	5	5	0.06	0.06	0.4	0.8	1.8
127	106	5	5	0.06	0.06	8.2	0.8	10.5
128	106	5	5	0.06	0.06	8.2	0.8	10.5
130	11	5	5	0.06	0.06	0.4	0.8	1.8
SALES MER 158	288	5	15	0.06	0.06	22.9	0.8	28.8
STOR 152	48	-	-	-	0.06	0.8	0.8	7.2
WORK 147	90	-	-	-	0.06	5.4	0.8	6.6
TOTAL OA REQUIRED (RTU-5)								279.8
TOTAL OA PROVIDED (RTU-5)								279

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-6)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
CAPE 154	110	5	30	3.3	0.06	23.1	0.8	28.8
CURT. LOUNGE 118	118	5	30	35.4	0.06	335.6	0.8	291.8
TOTAL OA REQUIRED (RTU-6)								308.8
TOTAL OA PROVIDED (RTU-6)								308

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

TABLE 403.3.1.1 OA REQUIREMENTS (RTU-7, RTU-8)

ZONE	AREA (sq ft)	PEOPLE OA RATE (sq ft / person)	OCCUPANT DENSITY (sq ft / person)	ZONE POP. (sq ft)	AREA OA RATE (sq ft / min)	OA FLOWRATE (cfm)	ZONE AIR DIST. EFFECTIVENESS (%)	ZONE OA FLOWRATE (cfm)
RECEPTION 156	820	5	10	0.06	0.06	80.2	0.8	112.8
SHOWROOM 1443	7.5	15	272	0.06	0.06	428.8	0.8	558.8
OFFICE AREA 1443	5	7.7	0.06	0.06	0.06	30.3	0.8	35.8
VESTIBULE 155	13	-	-	-	0.06	7.4	0.8	8.2
TOTAL OA REQUIRED (RTU-7, RTU-8)								602.8
TOTAL OA PROVIDED (RTU-7, RTU-8)								600

VENTILATION RATE PROCEDURE NOTES

1. ZONE POPULATION BASED ON THE ZONE FLOOR AREA AND THE DEFAULT OCCUPANT DENSITY (TABLE 6-4)
2. ZONE POPULATION: $P_o = A_o \times \text{Occupant Density (IP/1000ft}^2)$
3. OUTDOOR AIRFLOW: $\text{Vol} = P_o \times P_o + P_o \times A_o$
4. ZONE OUTDOOR AIRFLOW: $\text{Vol} = \text{Vol} / E_o$

SERVICE DRIVE HVAC AND EMERGENCY VENTILATION OPERATION SEQUENCE

NORMAL OPERATION:

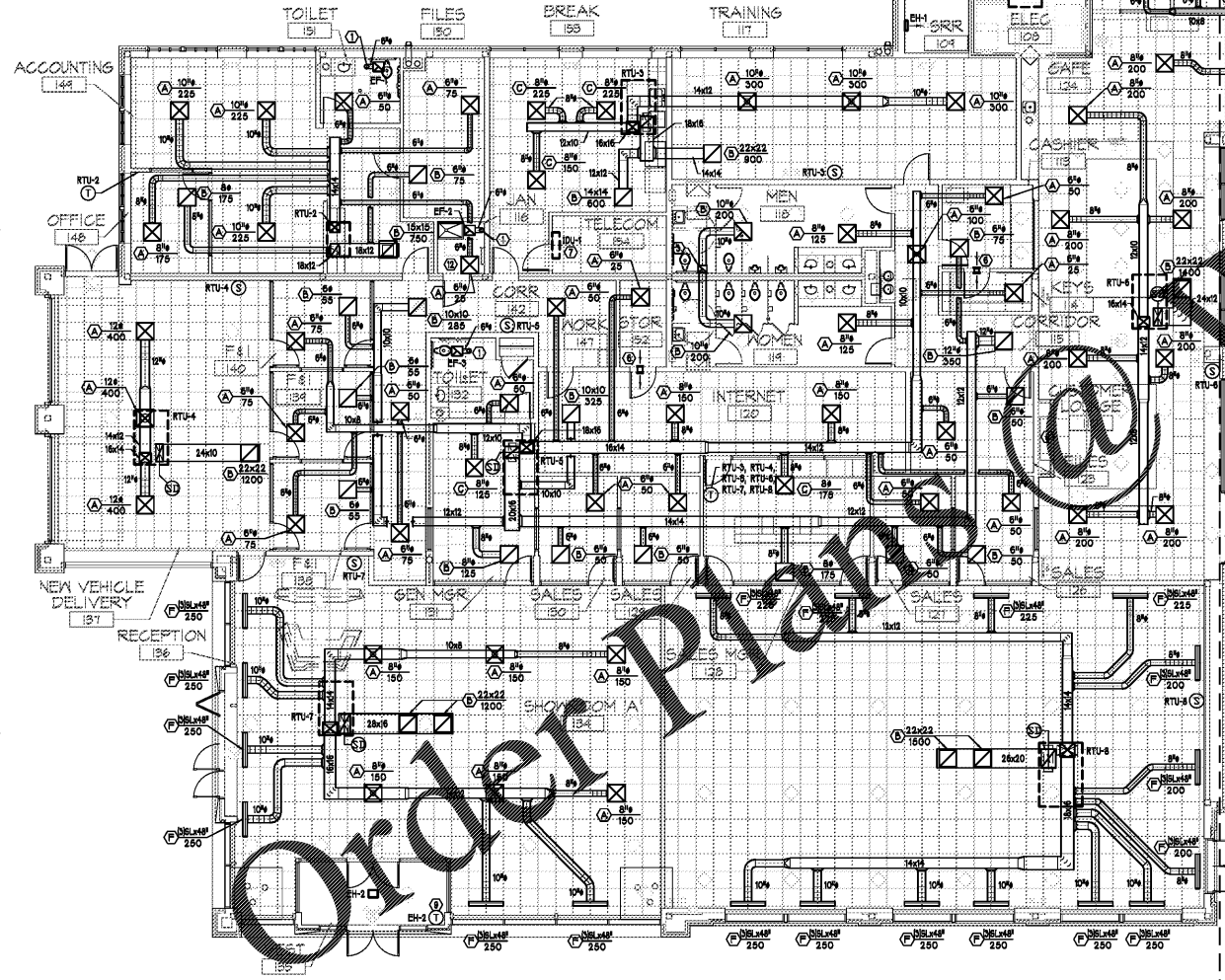
1. EXHAUST FAN (EF-1) OFF.
2. ROOF TOP UNIT (RTU-4) ON WITH OUTDOOR AIR DAMPER OPEN TO ALLOW FOR REQUIRED FRESH AIR.

EMERGENCY OPERATION:

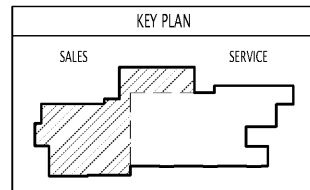
1. WALL MOUNTED CO AND/OR NO₂ SENSORS TRIGGERED DUE TO HIGH CO/NO₂ CONCENTRATION.
2. ROOF TOP UNIT (RTU-4) STOP.
3. GARAGE DOORS FULLY OPEN. EXHAUST FAN (EF-1) START FOR FULL VENTILATION OPERATION CONTINUES UNTIL CO AND/OR NO₂ SENSORS RETURN TO NORMAL SETPOINT. EMERGENCY VENTILATION CONTINUES FOR 15 MIN BEFORE RESET TO NORMAL OPERATION.

WORK NOTES

1. ROUTE 6" EXHAUST DUCT THROUGH ROOF AND TERMINATE W/ HOODED ROOF CAP. ROOF CAP TO BE GREENHECK MODEL RSC-4, OR APPROVED EQUAL. PROVIDE W/ RISE SCREEN & BACKDRAFT DAMPER. COORDINATE FINISH AND ROOF PITCH W/ ARCHITECT. FIELD COORDINATE EXACT LOCATION. MAINTAIN 10'-0" MIN. AWAY FROM G.A. INTAKES. MAINTAIN 3'-0" MIN. AWAY FROM BUILDING OPENINGS.
2. ROUTE 18x18 OPEN ENDED EXHAUST AIR DUCT BELOW ROOF AND TERMINATE FLUSH W/ BOTTOM OF STRUCTURE. COVER OPENING WITH 1/2" x 1/2" GALVANIZED SCREEN.
3. ROUTE 12x10 EXHAUST DUCT UP THROUGH ROOF TO EF-4. MAINTAIN 10'-0" FROM BUILDING INTAKES. FIELD COORDINATE EXACT LOCATION.
4. ROUTE ALL DUCTWORK IN SERVICE DRIVE 10' WITHIN BAR JOISTS. COORDINATE W/ STRUCTURAL.
5. COVER OPENING WITH 1/2" x 1/2" GALVANIZED SCREEN.
6. TWO 7x4 TRANSFER GRILLES (TAG E TYPE GRILLES), ONE ON EACH SIDE OF WALL. INSTALLED AT A MIN 2' ABOVE DOOR FRAME. COORDINATE W/ STRUCTURAL.
7. MOUNT 100 MIN. 2" ABOVE DOOR FRAME. ROOM AIR CONTROLS. DAYLIGHT AND TERMINATE W/ SPLASH PLATE. PROVIDE W/ CONCRETE PUMP IF UNABLE TO GRAVITY DRAIN.
8. VENTLESS GAS FIREPLACES (EF-4) SUPPLY FIRE-RESISTANT VLV4545, 38.0 MBH. SEE PLUMBING PLANS FOR GAS PIPING AND ARCHITECTURAL PLANS FOR SPECIFICATIONS.
9. PROVIDE 1" DIA. CLEAR LOCKER BOX.
10. PROVIDE HEAT, CARBON MONOXIDE (CO) & NITROGEN DIOXIDE (NO₂) DETECTOR CONTROLS. HONEYWELL 2-POINT NETWORK MODEL NUMBER E53M, 2-POINT SENSORS. INTERLOG MODEL NUMBER E53CO (CO) & E53M (NO₂). INTERLOCK DETECTOR FOR EXHAUST FAN (EF-4) TO AUTOMATICALLY ENERGIZE FAN WHEN CO SENSORS REACHES 25 PPM OR NO₂ LEVEL REACHES 0.7 PPM. MOUNT CO DETECTOR ON COLUMN/WALL AT 6' AFF. AND MOUNT NO₂ DETECTOR 24" BELOW JOCK. MEASUREMENT IS FROM THE TOP OF THE DEVICE EACH CO & NO₂ SENSOR WILL MONITOR UP TO 7000 SQ FT OR 50 FOOT RADIUS PER MANUFACTURERS SPECS. G.C. TO COORDINATE SENSOR LOCATION W/ OWNER & OWNER VENDOR PRIOR TO ROUGH INSTALL. INSTALL PER MANUFACTURERS REQUIREMENTS.
11. CO/NO₂ SENSOR CONTROL PANEL EQUAL TO HONEYWELL MODEL NUMBER 300-0LC, 24V POWER SUPPLY. TOTAL OF 4 SENSORS (2 CO + 2 NO₂). INSTALL PER MANUFACTURERS RECOMMENDATIONS. G.C. TO COORDINATE LOCATION W/ OWNER & OWNER VENDOR PRIOR TO ROUGH INSTALL.
12. ROOF ACCESS LADDER AND HATCH. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.



1 PARTIAL MECHANICAL FLOOR PLAN - SALES
 1/8" = 1'-0"



AIR BALANCE SCHEDULE

HVAC EQUIPMENT	SERVICE DRIVE				CUSTOMER LOUNGE & SERVICE OFFICES			
	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1	+3,000 CFM	+280 CFM	-3,000 CFM					
RTU-5					+1,200 CFM	+250 CFM	-1,200 CFM	
RTU-9					+1,400 CFM	+325 CFM	-1,400 CFM	
TOTAL	+3,000 CFM	+280 CFM	-3,000 CFM		+2,600 CFM	+575 CFM	-2,600 CFM	

SERVICE DRIVE PRESSURIZATION: OUTSIDE AIR - EXHAUST AIR = +280 CFM
 LOUNGE & SERVICE OFFICES PRESSURIZATION: OUTSIDE AIR - EXHAUST AIR = +575 CFM
 NET AREA PRESSURIZATION LOUNGE & SERVICE OFFICES = +280 CFM

AIR BALANCE SCHEDULE

HVAC EQUIPMENT	NEW CAR DELI				OFFICES & SHOWROOM			
	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-4	+1,200 CFM	+225 CFM	-1,200 CFM					
RTU-5					+1,750 CFM	+275 CFM	-1,750 CFM	
RTU-7					+2,400 CFM	+360 CFM	-2,400 CFM	
RTU-8					+3,000 CFM	+465 CFM	-3,000 CFM	
EF-1								-70 CFM
EF-3								-70 CFM
TOTAL	+1,200 CFM	+225 CFM	-1,200 CFM		+7,850 CFM	+1,100 CFM	-7,850 CFM	-140 CFM

NEW CAR DELI PRESSURIZATION: OUTSIDE AIR - EXHAUST AIR = +225 CFM
 OFFICES & SHOWROOM PRESSURIZATION: OUTSIDE AIR - EXHAUST AIR = +860 CFM
 NET AREA PRESSURIZATION OFFICES & SHOWROOM = +735 CFM

NOTES:

1. MAINTAIN A MINIMUM 10'-0" BETWEEN OUTDOOR AIR INTAKES AND EXHAUST FAN DISCHARGE AND PLUMBING VENTS, ETC. FIELD COORDINATE.
2. MAINTAIN MFRS RECOMMENDED CLEARANCES, TYPICAL.
3. COORDINATE ALL TERMINATION POINTS WITH THE ARCHITECT PRIOR TO PRICING AND INSTALLATION.

in+EGRA
 an Ingra Architecture, PLLC DBA
 110 East Kingston Avenue, Ste. 20
 Charlotte, NC 28203
 704.372.0001
 www.ingraplus.com

THE DRAWINGS & WRITTEN MATERIAL HEREIN CONSTITUTE ORIGINAL WORK OF THE ARCHITECT. ALL INTELLECTUAL PROPERTY & TRADEMARKS OF SERVICE ARE SUBJECT TO COPYRIGHT & MAY NOT BE REPRODUCED, TRANSMITTED, REPRODUCED, OR USED IN ANY WAY WITHOUT EXPRESS WRITTEN CONSENT OF THE ARCHITECT.
 © 2020 in+EGRA

VP ENGINEERING
 CONSULTING ENGINEERS, P.A.
 10000 N. CENTRAL
 2915 Lakewood Drive, Suite 180
 Charlotte, NC 28217
 704.372.1785
 www.vpe.com
 CORPORATE NC LICENSE #C-2409

Revisions:
 Number Date Description

Project Title:
SOUTH CHARLOTTE HYUNDAI

Project No: **4802.00**

Drawing Title:
PARTIAL MECHANICAL FLOOR PLAN - SALES

SET ISSUE DATE
 MAR 4, 2020

Sheet:
M2