EXISTING AIR HANDLING UNITS SCHEDULE																											
	AIRFLOW			FAN					HEATING COIL							COOLING COIL							FILTERS		
UNIT #	MAX CFM	MIN CFM	MIN OA CFM	EXTERNAL STATIC IN WC	FAN TYPE	FAN HP	ELEC V/PH	INTEGRAL VFD W/ BYPASS	DISCONNECT FOR EACH FAN	EAT	LAT	EWT	LWT	FLOW RATE GPM	AIRSIDE PD IN WC	MBH	WATERSIDE PD FT	EAT db/wb F	LAT db/wb F	EWT	LWT	FLOW RATE GPM	AIRSIDE PD IN WC	WATERSIDE PD FT	PRE	FINAL	PRESSURE DROP IN WC
AC-50	6000	3500	1350	3.00	PLENUM	15	230/3	Y	N	43.8	55.0	180	160	11.0	0.063	22.0	0.43	79/63	55/52	45	55	23.2	0.402	1.43	MERV 8	MERV 14	1.78

RETURN EXHAUST FAN SCHEDULE								
UNIT #	FAN							BASIS OF DESIGN
	CFM	EXTERNAL STATIC IN WC	FAN TYPE	FAN BHP	FAN HP	ELEC V/PH	INTEGRAL VFD W/ BYPASS	DISCONNECT FOR EACH FAN	
RF-50	5250	1.75	INLINE	2.8	5.0	230/3	Y	N	PENNBARRY SX225BC

EXISTING AHU SCHEDULE NOTES:

1. MODIFY EXISTING SUPPLY FAN. REMOVE EXISTING AND PROVIDE NEW MOTOR, VFD, SHEAVES AND BELTS. RE-BALANCE TO INCREASE CFM FROM 4,400 TO 6,000.
2. PROVIDE OPPOSED BLADE BALANCING DAMPER ADJUSTED TO MAINTAIN A MAXIMUM OF 500 PPM ACROSS THE EXISTING COOLING COIL AT 100% FLOW.

ULTRAVIOLET LIGHT COIL DISINFECTION SCHEDULE						
UNIT #	SYSTEM SERVED	CFM	APPROX. CC DIMS. (HxW)	ELECT. VOLTAGE	ELECT. AMPS	REMARKS
UV-1	AC-50 BYPASS	1600	50x10	120	1.5	1,2,3,4,5

NOTE:
1. PROVIDE ELEC. INTERLOCK TO DE-ENERGIZE LIGHTS WHEN ACCESS DOOR IS OPEN.
2. PROVIDE PILOT LIGHT TO VERIFY LAMP OPERATION.
3. PROVIDE SIGNAGE ON ACCESS DOOR W/ UV WARNING INFORMATION.
4. DESIGN BASIS: AMERICAN AIR & WATER CC SERIES.
5. LAMPS ARE MOUNTED HORIZONTALLY 18" FROM LEAVING FACE OF COIL. SUPPORT AS RECOMMENDED BY MANUFACTURER.

CASED COOLING COIL SCHEDULE - CHILLED WATER 44 DEG F EWT														
UNIT NO.	LOCATION	SERVICE	AIRFLOW (CFM)	FACE VEL FPM	GPM	TEMP RISE DEG F	ROWS	P.D. IN FT HD	E.A.T.		L.A.T.		P.D. IN W.G.	TOTAL MBH	DIMENSIONS (LxWxH)	REMARKS
									DB	WB	DB	WB				
CC-50A	DUCT	AC-50	1600	527	10	10	5	9.5	79	63	54	52	.5	49.9	50x10x10	1,2,3

NOTES:
1. COIL SHALL BE FLANGE MOUNTED AND SUPPORTED FROM EXISTING BUILDING STRUCTURE.
2. COIL TO BEINSTALLED IN PARALLEL TO EXISTING AC-50 COOLING COIL AND BALANCED TO 1600 CFM MAX.
3. PROVIDE CONDENSATE DRAIN PAN AND PIPE TO NEAREST FLOOR DRAIN.

RADIANT CEILING PANEL SCHEDULE (HYDRONIC)						
TAG	PANEL SIZE	HEATING				REMARKS
		HEATING CAPACITY	EWT	LWT	BASIS OF DESIGN MFR / MODEL	
	IN	BTUH/FT	°F	°F		
RAD-1	24x48	190	170	70	AIRTITE / AR-D	1
RAD-2	24x24	190	170	70	AREO TECH / METAL LAY-IN	2

REMARKS:
1. RE-INSTALLED RADIANT PANEL WITH INTEGRAL SLOTTED AIR DIFFUSER (SD-1)
2. NEW RADIANT HEATING PANEL TO MATCH EXISTING.

GRILLE, REGISTER & DIFFUSER SCHEDULE								
TAG	BASIS OF DESIGN	DESCRIPTION	MOUNTING TYPE	MODEL	BLOW PATTERN	SLOTS (NO. / SIZE)	FACE SIZE (IN)	REMARKS
SD-1	AIRTITE / AR-D	LINEAR BAR	- -	- -	2-WAY	1 / 1.5"	48"	3
SD-2	PRICE	LOUVERED FACE	T-BAR	SMDA	4-WAY	- -	24x24	1,2,4
SD-3	PRICE	FILTER/DUCTED	T-BAR	LFDCSS	- -	- -	24x48	1,2,5
SD-4	PRICE	FILTER/DUCTED	T-BAR	LFDCSS	- -	- -	24x24	1,2,5
RD-1	PRICE	PERFORATED FACE	T-BAR	PDDR	- -	- -	24x24	1,2,4
EG-1	PRICE	PERFORATED FACE	T-BAR	PDDR	- -	- -	12x12	1,2

REMARKS:
1. COORDINATE FRAME AND MOUNTING TYPE WITH INDIVIDUAL APPLICATION AND LOCATION.
2. UNIT SHALL BE CONSTRUCTED OF STEEL; COLOR SHALL BE WHITE.
3. RE-INSTALLED SUPPLY DIFFUSER INTEGRAL WITH RADIANT PANEL (RAD-1)
4. RE-INSTALLED SUPPLY/RETURN DIFFUSER.
5. PROVIDE WITH HIGH EFFICIENCY MERV 14 FILTERS. FILTERS SHALL BE ROOMSIDE REPLACEABLE.

EXHAUST FAN (EF) SCHEDULE									
ITEM	DESCRIPTION	LOCATION	CFM	E.S.P. (IN W.G.)	DRIVE	RPM	MOTOR		BASIS OF DESIGN	REMARKS
							HP	VOLTS / PHASE / HZ		
EF-1	GENERAL EXHAUST	ROOF	750	0.5	BELT	1150	1/6	120/1/60	LOREN COOK 120 ACEB	1,2

REMARKS:
1. FURNISH AND INSTALL DISCONNECT WITH THERMAL OVERLOAD PROTECTION.
2. FURNISH 12-INCH PRE-FABRICATED ROOF CURB, FACTORY INSTALLED BACK DRAFT DAMPER AND ALUMINUM BIRD SCREEN.

INSULATION SCHEDULE (c)												
TYPE	EQUIPMENT OR SYSTEM SERVED	INSULATION CLASS (a)			JACKETING CLASS (b)			THICKNESS (IN)				
								NOMINAL PIPE SIZE (IN)				DUCTWORK
		INTERIOR CONCEALED	INTERIOR EXPOSED	EXTERIOR	INTERIOR GENERAL	EQUIPMENT ROOMS	EXTERIOR	.5 - 1.5	2 - 4	5 - 6	8 & UP	(d)
A	HWS, HWR	FG	- -	- -	1	- -	- -	1	2	2.5	3	
		- -	FG	- -	1	1 & 3	- -	1	2	2.5	3	
		- -	- -	UR	- -	- -	6	1.5	2	3	4	
B	DUCTWORK	FG (e)	- -	- -	2	- -	- -	- -	- -	- -	- -	1.5
		- -	FG (f)	- -	2	2 & 3	- -	- -	- -	- -	- -	2 (g)
		- -	- -	CS (f)	- -	- -	7	- -	- -	- -	- -	2 (h)

(a) FG - - FIBROUS GLASS
FE - - FLEXIBLE ELASTOMERIC
UR - - URETHANE
CS - - CALCIUM SILICATE
CF - - CERAMIC FIBER

(b) 0 - - NONE
1 - - ALL SERVICE
2 - - ALUMINUM FOIL
3 - - CANVAS
4 - - POLYVINYL CHLOIRDE
5 - - STAINLESS STEEL
6 - - ALUMINUM
7 - - EPDM

(c) INSULATION TYPE, JACKETING & THICKNESS FOR EQUIPMENT SHALL MATCH THE CORRESPONDING PIPING SYSTEM'S PARAMETERS LISTED FOR: EQUIPMENT ROOMS, NOMINAL PIPE SIZE 8" AND LARGER

(d) SUPPLY AIR
OUTSIDE AIR
MIXED AIR

(e) BLANKET

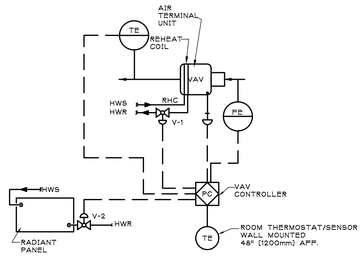
(f) RIGID BOARD

(g) EXCEPT SUPPLY AIR WITHIN CONDITIONED SPACE

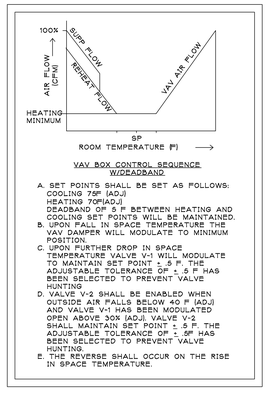
(h) RETURN AIR AND / OR EXHAUST AIR AS SHOWN

SINGLE DUCT AIR TERMINAL UNIT SCHEDULE											
TAG	EXIST TAG	AREA SERVED	SIZE	AIR FLOW		HEATING COIL					REMARKS
				MAX CFM	MIN CFM	EAT (F)	LAT (F)	MBH	EWT (F)	LWT (F)	FLOW RATE (GPM)	PD (FT)	
VAV-1	VAV-1	MANAGER OFFICE	04	120	95	55	108	5.5	180	160	0.6	.3	1
VAV-2	VAV-2	WAITING ROOM	8	620	300	55	100	9.0	180	160	1.0	.9	1
VAV-3	VAV-11	RECEPTION	4	150	95	55	100	5.8	180	160	0.6	.4	1
VAV-4	VAV-3	DOCUMENTATION ROOM	5	300	130	55	107	5.6	180	160	0.6	.3	1
VAV-5	VAV-4	EQUIPMENT ALCOVE	5	300	100	55	107	5.6	180	160	0.6	.3	1
VAV-6	VAV-7	MENTAL HEALTH / PHARMACY	4	225	90	55	100	5.3	180	160	0.5	.3	1
VAV-7	VAV-6	EXAM ROOM #4	5	300	100	55	107	5.6	180	160	0.6	.3	1
VAV-8	VAV-10	EXAM ROOM #5	5	300	100	55	107	5.6	180	160	0.6	.3	1
VAV-9	VAV-8	MULTI PURPOSE ROOM	6	360	160	55	98	7.5	180	160	0.8	.6	1
VAV-10	VAV-9	CORRIDOR & CLEAN UTILITY	4	200	110	55	90	7.6	180	160	0.6	.4	1
VAV-11	- -	PROCEDURE ROOM #2	5	350	350	55	107	5.6	180	160	0.6	.3	2
VAV-12	- -	PROCEDURE ROOM #1	5	310	310	55	107	5.6	180	160	0.6	.3	2
VAV-13	VAV-12	EXAM ROOM #3	5	240	100	55	109	5.3	180	160	0.5	.3	1
VAV-14	VAV-13	EXAM ROOM #2	4	220	100	55	100	4.3	180	160	0.5	.3	1
VAV-15	VAV-14	DR. GREWALL OFFICE	4	220	100	55	100	4.3	180	160	0.5	.3	1
VAV-16	VAV-16	EXISTING OFFICE	4	205	100	55	90	3.8	180	160	0.5	.3	1
VAV-17	VAV-17	EXISTING OFFICE	5	270	100	55	90	3.8	180	160	0.5	.3	1
VAV-18	VAV-18	EXISTING OFFICE	10	570	250	55	90	9.5	180	160	1.2	1.5	1
VAV-19	VAV-19	EXISTING OFFICE	4	130	75	55	90	2.8	180	160	0.5	.2	1
VAV-20	VAV-20	CORRIDOR	6	475	200	55	90	7.6	180	160	0.8	.4	1
VAV-21	VAV-15	EXAM ROOM #1	4	220	100	55	113	4.5	180	160	0.5	.2	1

REMARKS:
1. RELOCATE AND REBALANCE EXISTING VAV BOX AND ASSOCIATED VALVES TO NEW AIRFLOW AND GPM INDICATED.
2. PROVIDE NEW VAV BOX WITH ASSOCIATED 2-WAY CONTROL VALVE AND WIRE-LESS T-STAT.



WITH SUPPLEMENTAL HEATING

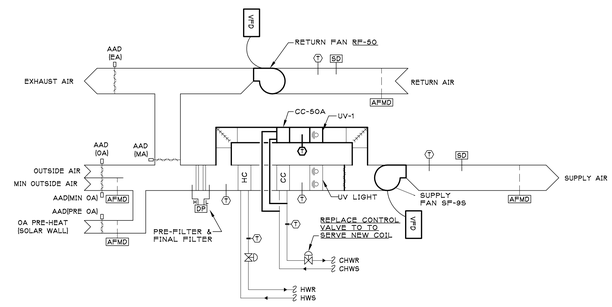


VAV BOX CONTROL SEQUENCE W/DEADBAND

A. SET POINTS SHALL BE SET AS FOLLOWS:
COOLING 75F (ADJ)
HEATING 70F(ADJ)
DEADBAND OF 5 F BETWEEN HEATING AND COOLING SET POINTS WILL BE MAINTAINED.
B. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
C. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT - .5 F. THE ADJUSTABLE TOLERANCE OF + .5 F HAS BEEN SELECTED TO PREVENT VALVE HUNTING
D. VALVE V-2 SHALL BE ENABLED WHEN OUTSIDE AIR FALLS BELOW 40 F (ADJ) AND VALVE V-1 HAS BEEN MODULATED OPEN ABOVE 30% (ADJ). VALVE V-2 SHALL MAINTAIN SET POINT - .5 F. THE ADJUSTABLE TOLERANCE OF + .5F HAS BEEN SELECTED TO PREVENT VALVE HUNTING.
E. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.

VARIABLE AIR VOLUME (VAV) TERMINAL UNIT CONTROL DIAGRAM

SCALE: NONE



SEQUENCE OF OPERATIONS FOR AC-50 AND REF-50

MODIFY EXISTING CONTROLS, USING EXISTING POINTS AND DEVICES TO THER MAXIMUM EXTENT POSSIBLE TO PROVIDE A COMPLETE AND OPERABLE CONTROL SYSTEM TO PERFORM THE FOLLOWING FUNCTIONS FOR THE VARIABLE AIR VOLUME AIR HANDLING SYSTEM:

A. OCCUPIED MODE:
1. OPEN AND SET OA, RA, AND EXHAUST AIR DAMPERS TO THE MINIMUM OA OPERATING POSITIONS. MONITOR OUTSIDE AIRFLOW AND ADJUST DAMPERS TO MAINTAIN MINIMUM SETTING SUBJECT TO ECONOMIZER OVERRIDE.
2. SUPPLY AND RETURN FANS RUN CONTINUOUSLY
3. MODULATE SUPPLY FAN TO MAINTAIN DUCT STATIC PRESSURE SET POINT. MINIMUM FAN SPEED IS 20% (ADJ) OR 5% ABOVE STALL SPEED AS DETERMINED BY BALANCING.
4. RESET SUPPLY STATIC PRESSURE SET POINT BASED ON REQUIRED AIRFLOW TO CRITICAL ZONE. CRITICAL ZONE IS DEFINED AS THE VAV ZONE 100% OPEN AND NOT SATISFYING COOLING SET POINT OR 85% OF MAX SCHEDULE VAV AIR FLOW AIR FLOW.
5. MODULATE RETURN FAN TO TRACK SUPPLY AIRFLOW MINUS AN ALLOWANCE FOR ANY DIRECT EXHAUST NOT RETURNING TO SYSTEM. MINIMUM FAN SPEED IS 20% (ADJ) OR 5% ABOVE STALL SPEED AS DETERMINED BY BALANCING.
6. MAINTAIN A LEAVING AIR TEMPERATURE (LAT) OF 55 DEGREES (ADJ) SUBJECT TO RESET AND ECONOMIZER MODES BY MODULATING EITHER THE HWS OR CHS VALVES.
7. IMPLEMENT A LAT RESET STRATEGY TO MINIMIZE REHEAT BY ANY VAV ZONES.

B. UNOCCUPIED MODE:
1. DE-ENERGIZE SUPPLY AND RETURN FANS
2. CLOSE OUTSIDE (OA) AND EXHAUST AIR (EA) DAMPERS
3. CLOSE CHILLED WATER VALVE
4. MODULATE HOT WATER CONTROL VALVE TO MAINTAIN 40F (ADJ) AS SENSED BY THE MIXED AIR TEMPERATURE SENSOR

C. WARM-UP/COOL DOWN W/OPTIMAL START.
1. PRIOR TO RETURNING TO OCCUPIED MODE, BASED ON AN ADJUSTABLE TIME PERIOD OPERATE SYSTEM CONTINUOUSLY TO BRING ALL SPACES BACK TO OCCUPIED SET POINTS.
2. DURING THIS START-UP PERIOD OUTSIDE (OA) AND EXHAUST AIR (EA) DAMPERS REMAIN CLOSED AND RETURN AIR (RA) DAMPER IS OPEN
3. OPTIMIZE TIME PERIOD BASED ON OA CONDITIONS, DELTA BETWEEN OCCUPIED SET POINTS AND ACTUAL SPACE CONDITIONS, AND LOGGED DATA

D. ECONOMIZER CYCLE:
1. ACTIVATE ECONOMIZER ON CALL FOR COOLING WHEN TEMPERATURE OF OUTSIDE AIR IS LESS THAN THE MIXED AIR TEMPERATURE. MODULATE OA DAMPER INCREASING VOLUME OF OUTSIDE AIR UP TO 100% TO PROVIDE FREE COOLING. ECONOMIZER FUNCTION IS LOCKED OUT WHEN OA ENTHALPY IS GREATER THAN RETURN AIR ENTHALPY.

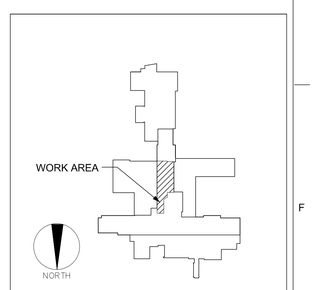
E. OUTSIDE AIR PRE-HEAT
1. WHEN OA TEMPERATURE IS LESS THAN 55F CLOSE MIN OA DAMPER AND OPEN SOLAR WALL DAMPER.
2. DISABLE OA PREHEAT OPTION ON CALL FOR COOLING.

F. MONITOR/ALARMS
1. PRE- FILTER DIFFERENTIAL PRESSURE
2. FINAL-FILTER DIFFERENTIAL PRESSURE
3. FAN STATUS/FAILURE
4. HIGH STATIC PRESSURE - SUPPLY
5. HIGH STATIC PRESSURE - RETURN

G. SAFETY SHUTDOWN
1. FREEZE STAT
2. SMOKE DETECTORS
3. FIRE ALARM

VARIABLE AIR VOLUME AIR HANDLING UNIT CONTROL DIAGRAM

SCALE: NONE



KEY PLAN

Scale: As Noted

Revisions:	Date

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Drawing Title: MECHANICAL SCHEDULES AND CONTROLS

Approved: Project Director

Project Title: RENOVATE FOR WOMEN'S CLINIC

Location: 800 IRVING AVENUE, SYRACUSE NY 13210

Date: 12.18.2012 | Checked: SBG | Drawn: NCB

Project Number: VA# 528A7-13-701 IPD# 11-7230

Building Number: 1

Drawing Number: M-601

Dwg. 33 of 41

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