Report By:
Double T Balancing Company
5910 S. University Blvd.
Greenwood Village, CO 80121

NATIONAL TAB
INTELLIGENCE

For:
National TAB
1126 Swift Street
North Kansas City, MO 64116

Report: TAB REPORT

Function: Test, Adjust, & Balance

Date: 01/17/2024

PROJECT

01-15-24 SWEETGREEN - DENVER, CO (TENNYSON) TAB, IAQ

3985 N TENNYSON ST

DENVER, CO 80212

Client

Snyder Building Construction

3535 SOUTH SHERMAN ST

ENGLEWOOD, CO 80113

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National TAB

Project Summary

The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report is further detail about your building performance including recommendations, asset data, and pictures. Our focus is to work with the trades to remedy any issues or deficiencies during the actual field balancing and not after the balancing has occurred to achieve a positive environment and outcome. The level of success is determined by the availability of the trades, possible parts needed, or time constraints.

RTU's (Roof Top Units) w/ Diffusers

Each of the RTU's were measured at their terminal devices or via traverse to establish a total flow for that unit. Each RTU was adjusted to within tolerance of the engineer's design flow. Each outlet was then adjusted to within tolerance of the design flow. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. The outside air damper was adjusted until the airflow was within the design requirements. Any equipment that fell outside of that tolerance is noted throughout the report.

General Exhaust Fans w/ Grilles

The general exhaust fans were measured by reading each air device with a flow hood. The total airflow for each fan is equivalent to the sum of these readings. Fan speed was then adjusted so that the airflow was within tolerance of design. Each terminal device was balanced to within tolerance of the design volume using the installed volume dampers. Any equipment that fell outside of this tolerance is noted throughout the report.

Final Building Tests

After completing the test and balance the final building pressure was measured. It was confirmed that the building pressure fell within acceptable tolerances of -0.02" wc to +0.02" wc and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report.

The hood capture was tested at the perimeter of the hood and the cook top level with the equipment heat on to ensure satisfactory hood capture and containment.

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AIR APPARATUS TEST REPORT

PROJECT NAME:		1301 - Sweetgreen						
EQUIPMENT / SYSTEM:		RTU-1						
UNIT INFORMATION								
		DESIGN			***ACTUAL***			
MANUFACTURER		Carrier			Carrier			
MODEL #		48HCFD08			48TCFM09A2A6			
SERIAL #					2922P34095			
LOCATION / SERVICE								
FAN INFORMATION								
		DESIGN			***ACTUAL***			
Total Airflow (CFM)		2,200			2,250			
Total of Terminals (CFM)		2,200			2,250			
Return Airflow (CFM)		1,530			1,570			
Outside Airflow (CFM)		670			680			
Total Static Pressure (in. w.g.)					1.09			
External Static Pressure (in. w.g.)		1.00			0.99			
Fan Speed (RPM / Setpoint)					768			
VFD Speed (Hz)					n/a			
OA Damper Postion (% Open)					30%			
MOTOR INFORMATION								
		DESIGN / NAMEPLATE			***ACTUAL***			
Manufacturer / Frame - Nameplate					Marathon / 56HZ			
Horse Power (HP)		3.70			n/g			
Brake Horse Power (BHP)					1.87			
Volts	Phase	460	3		477	474	474	
Full Load Amps		3.40			2.35	2.37	2.36	
Corrected Nameplate Amps		-			3.29			
Motor Speed (RPM / Setting)					1,725			
Service Factor		-			1.15			
Current Overload Size/Setting		-			n/a			
DRIVE INFORMATION								
		DESIGN			***ACTUAL***			
Motor Sheave OD					1VL44			
Motor Sheave Bore Size					0.625			
Motor Sheave Adjustment (PD)					4 TO			
Fan Sheave OD					AFD74			
Fan Sheave Bore Size					1			
Belt Size (Inches) and Quantity					(1) A48			
Center to Center Distance (Inches)					16.6			
FILTER INFORMATION								
DESIGN (MERV Rating)		***BANK #1 Style/Size(Qty)***			***BANK #2 Style/Size(Qty)***			
Merv 8		(4) 16x16x2						

AIR OUTLET TEST REPORT

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	

OUTLET SUMMARY

Area Served	FH / RVA / TRV	ATI #	Outlet Type	Size LxW /	AK	Design FPM	Design CFM	Initial FPM	Initial CFM	Final FPM	Final CFM	Final %	Notes
		1	sw	10x6	1.0	*275*	275		**304**		**277**	101%	
		2	sw	10x6	1.0	*275*	**275**		**296**		**293**	107%	
		3	sw	10x6	1.0	*275*	**275**		**300**		**286**	104%	
		4	sw	10"	1.0	*275*	**275**		**325**		**294**	107%	
		5	cd	10"	1.0	*275*	**275**		**134**		**274**	100%	
		6	cd	10"	1.0	*275*	**275**		**329**		**273**	99%	
		7	cd	10"	1.0	*275*	275		**355**		**279**	101%	
		8	cd	10"	1.0	*275*	**275**		**300**		**274**	100%	
							2200		**2343**		**2250**	102%	
												-	
												-	
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RVA = Rotating Vane Anemometer : FH = Flow Hood : TRV = Traverse

Comments: ______________________

RECTANGLE DUCT TRAVERSE TEST REPORT

PROJECT NAME:	1301 - Sweetgreen											
EQUIPMENT / SYSTEM:	RTU-1 - Outside Air											
DUCT TRAVERSE INFORMATION												
Duct Zone:	RTU-1				Required CFM:	670			Required FPM:	177		
Duct Size:	34	X	16	WxH"	Area:	3.78			Static Pressure:	-0.53 in.w.g.		
Instrument:	Velgrid		Corr Factor	1	Altitude:	5280 FT			Temperature:	n/a		
DUCT TRAVERSE MEASUREMENTS												
Velocity Total (FPM):	540		Velocity Average (FPM):	180			Actual Airflow (CFM):	**680**				

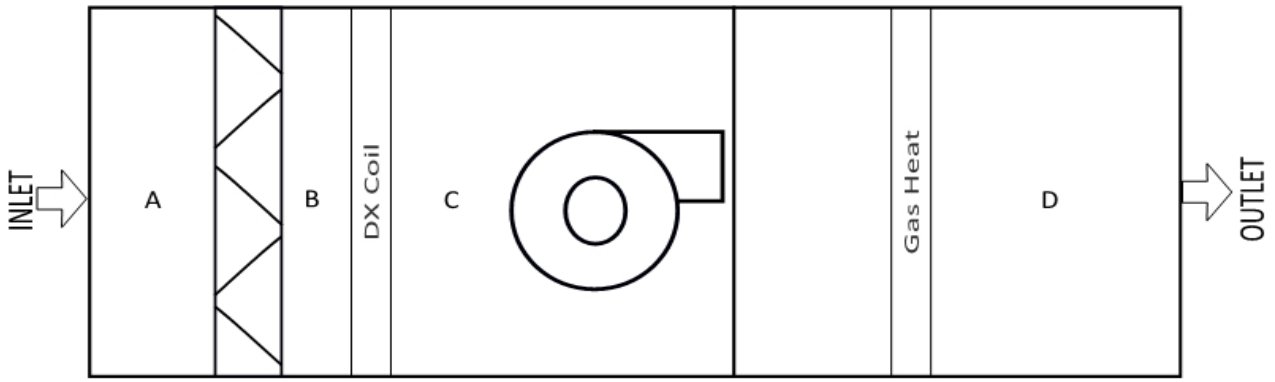
POS	1	2	3	4	5	6	7	8	9	10	11	Distance Height
1	186	181	173									8.0
2												24.0
3												40.0
4												56.0
5												72.0
6												88.0
7												104.0
8												120.0
9												136.0
10												152.0
11												168.0
Distance Width	5.7	17.0	28.3	39.7	51.0	62.3	73.7	85.0	96.3	107.7	119.0	Inches
Totals	186	181	173	0	0	0	0	0	0	0	0	

Comments: _____

STATIC PRESSURE PROFILE

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	RTU-1 - Static Pressure Profile

SYSTEM INFORMATION	
Static Pressure Profile Setup:	FilCoilFanDis
Design Airflow (CFM)	2200
Measured Airflow (CFM)	2250



	ESP:		**0.99**				**TSP:**		**1.09**		
STATIC PRESSURE READINGS (in. w.g.)											
Location	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Supply	0.53	-0.59	-0.63	0.46							

Comments: _____

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AIR APPARATUS TEST REPORT

PROJECT NAME:		1301 - Sweetgreen						
EQUIPMENT / SYSTEM:		RTU-2						
UNIT INFORMATION								
		DESIGN			***ACTUAL***			
MANUFACTURER		Carrier			Carrier			
MODEL #		48HCFD08			48HCFD08A2A6			
SERIAL #					2822P32719			
LOCATION / SERVICE								
FAN INFORMATION								
		DESIGN			***ACTUAL***			
Total Airflow (CFM)		3,400			3,173			
Total of Terminals (CFM)		3,400			3,173			
Return Airflow (CFM)		2,970			2,717			
Outside Airflow (CFM)		430			456			
Total Static Pressure (in. w.g.)					1.84			
External Static Pressure (in. w.g.)		1.00			1.48			
Fan Speed (RPM / Setpoint)					939			
VFD Speed (Hz)					n/a			
OA Damper Postion (% Open)					13%			
MOTOR INFORMATION								
		DESIGN / NAMEPLATE			***ACTUAL***			
Manufacturer / Frame - Nameplate					Marathon / 56HZ			
Horse Power (HP)		3.70			n/g			
Brake Horse Power (BHP)					2.26			
Volts	Phase	460	3		477	474	474	
Full Load Amps		3.40			2.76	2.93	2.85	
Corrected Nameplate Amps		-			3.29			
Motor Speed (RPM / Setting)					1,725			
Service Factor		-			1.15			
Current Overload Size/Setting		-			n/a			
DRIVE INFORMATION								
		DESIGN			***ACTUAL***			
Motor Sheave OD					1VL44			
Motor Sheave Bore Size					0.625			
Motor Sheave Adjustment (PD)					1 TO			
Fan Sheave OD					AFD74			
Fan Sheave Bore Size					1			
Belt Size (Inches) and Quantity					(1) A48			
Center to Center Distance (Inches)					16.3			
FILTER INFORMATION								
DESIGN (MERV Rating)		***BANK #1 Style/Size(Qty)***			***BANK #2 Style/Size(Qty)***			
Merv 8		(4) 16x16x2						

AIR OUTLET TEST REPORT

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	RTU-2 - Supply

OUTLET SUMMARY

Area Served	FH / RVA / TRV	ATI #	Outlet Type	Size LxW /	AK	Design FPM	Design CFM	Initial FPM	Initial CFM	Final FPM	Final CFM	Final %	Notes
		1	cd	10"	1.0	*300*	300		**335**		**297**	99%	
		2	cd	10"	1.0	*300*	**300**		**365**		**293**	98%	
		3	cd	8"	1.0	*300*	**300**		**190**		**276**	92%	
		4	cd	8"	1.0	*300*	**300**		**168**		**270**	90%	
		5	cd	8"	1.0	*300*	**300**		**154**		**272**	91%	
		6	cd	8"	1.0	*300*	**300**		**143**		**270**	90%	
		7	cd	8"	1.0	*300*	300		**174**		**272**	91%	
		8	cd	8"	1.0	*300*	**300**		**165**		**270**	90%	
		9	cd	8"	1.0	*300*	**300**		**148**		**276**	92%	
		10	cd	10"	1.0	*320*	**320**		**364**		**311**	97%	
		11	cd	8"	1.0	*105*	**105**		**229**		**99**	94%	
		12	cd	6"	1.0	*75*	**75**		**10**		**71**	95%	
		13	cd	8"	1.0	*200*	200		**205**		**196**	98%	
							3400		**2650**		**3173**	93%	
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RVA = Rotating Vane Anemometer : FH = Flow Hood : TRV = Traverse

Comments: ____________________

RECTANGLE DUCT TRAVERSE TEST REPORT

PROJECT NAME:	1301 - Sweetgreen											
EQUIPMENT / SYSTEM:	RTU-2 - Outside Air											
DUCT TRAVERSE INFORMATION												
Duct Zone:	RTU-2				Required CFM:	430			Required FPM:	114		
Duct Size:	34	X	16	WxH"	Area:	3.78			Static Pressure:	-0.48 in.w.g.		
Instrument:	Velgrid		Corr Factor	1	Altitude:	5280 FT			Temperature:	n/a		
DUCT TRAVERSE MEASUREMENTS												
Velocity Total (FPM):	362		Velocity Average (FPM):	121			Actual Airflow (CFM):	**456**				

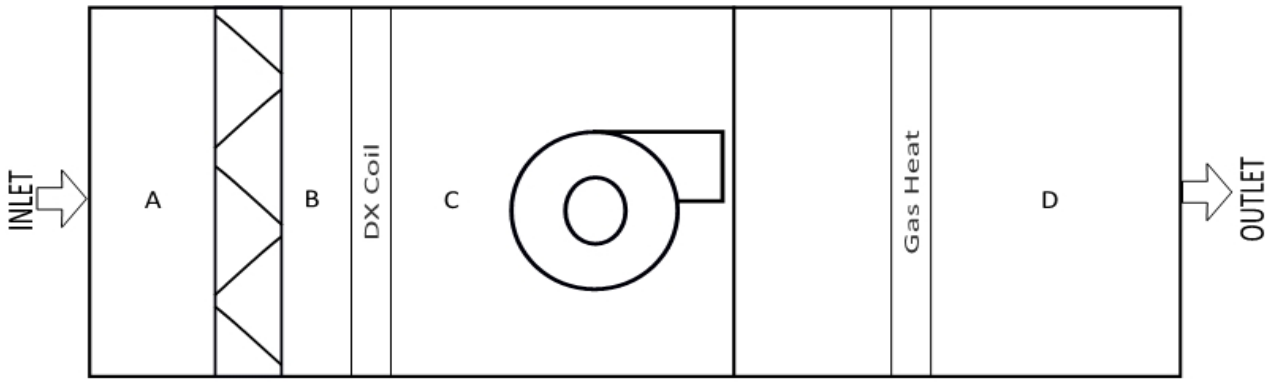
POS	1	2	3	4	5	6	7	8	9	10	11	Distance Height
1	125	120	117									8.0
2												24.0
3												40.0
4												56.0
5												72.0
6												88.0
7												104.0
8												120.0
9												136.0
10												152.0
11												168.0
Distance Width	5.7	17.0	28.3	39.7	51.0	62.3	73.7	85.0	96.3	107.7	119.0	Inches
Totals	125	120	117	0	0	0	0	0	0	0	0	

Comments: _____

STATIC PRESSURE PROFILE

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	RTU-2 - Static Pressure Profile

SYSTEM INFORMATION	
Static Pressure Profile Setup:	FilCoilFanDis
Design Airflow (CFM)	3400
Measured Airflow (CFM)	3173



	ESP:		**1.48**				**TSP:**		**1.84**		
STATIC PRESSURE READINGS (in. w.g.)											
Location	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Supply	-0.48	-0.69	-0.84	1.00							

Comments: _____

FAN TEST REPORT

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	EF-1

UNIT INFORMATION		
	DESIGN	***ACTUAL***
MANUFACTURER	Captive Aire	Captive Aire
MODEL #	SIF11DD	SIF11DD
SERIAL #		6103722
LOCATION / SERVICE		Hood

FAN INFORMATION		
	DESIGN	***ACTUAL***
Total Airflow (CFM)	750	724
Total of Terminal Airflows (CFM)	750	724
External Static Pressure	1. in.w.g.	-1.17 in.w.g.
SP Reading - Intake		-0.06 in.w.g.
SP Reading - Discharge		1.11 in.w.g.
Fan Speed (RPM / Setpoint)		D.D. / Speed Setting 99P

MOTOR INFORMATION				
		DESIGN / NAMEPLATE		***ACTUAL***
Manufacturer / Frame - Nameplate				nac
Horse Power (HP)		0.75		0.75
Brake Horse Power (BHP)				0.56
Volts	Phase	120	1	121
Full Load Amps		8.90		4.83
Corrected Nameplate Amps		-		8.83
Motor Speed (RPM / Setting)				nac
Service Factor		-		nac
Current Overload Size/Setting		-		Speed setting 99P

Comments: ***Individual grille read with Flowhood***

FAN TEST REPORT

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	

UNIT INFORMATION		
	DESIGN	***ACTUAL***
MANUFACTURER	Greenheck	Captive Aire
MODEL #	SP-97-VG	SIF10DD
SERIAL #		6103722
LOCATION / SERVICE		Restrooms

FAN INFORMATION		
	DESIGN	***ACTUAL***
Total Airflow (CFM)	225	238
Total of Terminal Airflows (CFM)	225	238
External Static Pressure	0.5 in.w.g.	0.3 in.w.g.
SP Reading - Intake		-0.18 in.w.g.
SP Reading - Discharge		0.12 in.w.g.
Fan Speed (RPM / Setpoint)		D.D. / Speed Setting 42P

MOTOR INFORMATION				
		DESIGN / NAMEPLATE		***ACTUAL***
Manufacturer / Frame - Nameplate				nac
Horse Power (HP)		0.25		0.25
Brake Horse Power (BHP)				0.14
Volts	Phase	120	1	121
Full Load Amps		2.90		1.24
Corrected Nameplate Amps		-		2.88
Motor Speed (RPM / Setting)				nac
Service Factor		-		nac
Current Overload Size/Setting		-		Speed Setting 42P

Comments: _____

AIR INLET TEST REPORT

PROJECT NAME:	1301 - Sweetgreen
EQUIPMENT / SYSTEM:	EF-2

INLET SUMMARY

Area Served	FH / RVA / TRV	ATI #	Outlet Type	Size LxW /	AK	Design FPM	Design CFM	Initial FPM	Initial CFM	Final FPM	Final CFM	Final %	Notes
		1	eg	6"	1.0	*75*	75		157		80	107%	
		2	eg	6"	1.0	*75*	75		168		81	108%	
		3	eg	6"	1.0	*75*	75		113		77	103%	
							225		438		238	106%	

RVA = Rotating Vane Anemometer : FH = Flow Hood : TRV = Traverse

Comments: _____

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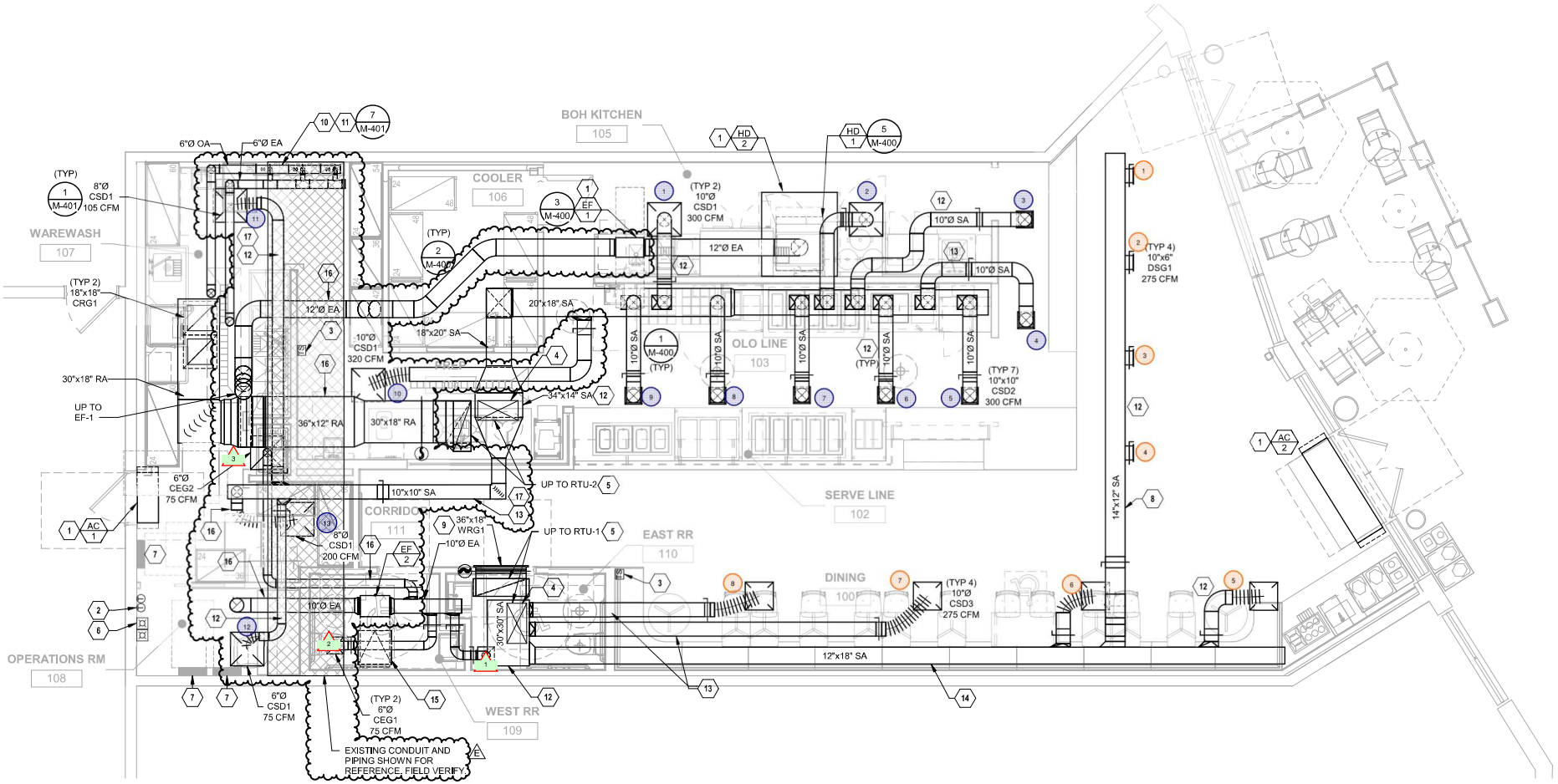

1 HVAC FLOOR PLAN
1/4" = 1'-0"

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AND EN
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15 PROVID
EQUIPM
16 ROUTE
17 ROUTE