

Report By:

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NATIONAL

TAB

Comfort. Under control.

Report: TAB Report
Function: Test, Adjust, & Balance
Date: 5/25/2022

PROJECT
WENDY'S - BROKEN ARROW, OK

500 W STONEWOOD DRIVE

BROKEN ARROW, OK

Client

AIR COMFORT HEAT & AIR (OK)
517 WEST H STREET
JENKS, OK 74037

National TAB

Project: WENDY'S - BROKEN ARROW, OK

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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.

Kitchen Exhaust Hood & Associated Fans (Halton)

Each kitchen exhaust fan was measured by taking static pressure at the exhaust plenum and comparing to OEM performance data. The total flow of the exhaust was then adjusted to tolerance of the engineer's design flow.

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 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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WENDY'S - BROKEN ARROW, OK

Project Issue Information

Issue Name : RTU-1 and 2 economizers

Description : Economizers do not function as intended and cannot currently be set at the thermostat. Manually set outside air and physically marked damper position. Once repaired recommend setting to the permanently marked position.

Created By : National TAB

Assigned To : National TAB - Will Turnbough

Status : Open

Project Issue File Details



Screenshot_2022_06_24_16210
3.png



Screenshot_2022_06_24_16205
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AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HVAC SUPPLY		HVAC RETURN		HVAC OUTDOOR		OA %		HOOD MAKE-UP		HOOD EXHAUST		GENERAL EXH.	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
RTU-1	KITCHEN	4500	4295	2900	2635	1600	1660	35.6%	38.6%						
RTU-2	DINING	4500	4227	2900	2590	1600	1637	35.6%	38.7%						
EF-1	HD1 GRILL											1200	1201		
EF-2	HD2 FRYER											1500	1425		
EF-3	RESTROOM													300	285
TOTALS		9000	8522	5800	5225	3200	3297			0	0	2700	2626	300	285

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	3200	3297
TOTAL EXHAUST	3000	2911
NET AIRFLOW	200	386

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H2O)
FRONT	0.0059
SIDE	0.0087
REAR	-0.0024
AVERAGE	0.0041

FINAL CHECKS

- ACTUAL NET AIRFLOW COINCIDES WITH DESIGN: ✔

- MEASURED PRESSURES COINCIDES WITH ACTUAL NET AIRFLOW: ✔

- PRESSURE FALLS WITHIN IMC TOLERANCE OF +/-0.02" W.C. ✔

NOTES:



STOREFRONT



RTU1 KITCHEN



RTU2 DINING



EF1 GRIDDLE



EF2 FRYER



EF3 RESTROOMS



ROOFTOP



HD2 GRIDDLE



HD1 FRYER



RTU1 MINIMUM DAMPER POSITION



RTU2 MINIMUM DAMPER POSITION



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WENDY'S - BROKEN ARROW, OK

CheckList Information

Name : TECH - STEP 1: INITIAL WALKTHROUGH **Status :** Submitted

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

CheckList Item Details

INITIAL SITE WALKTHROUGH

All diffusers and grilles are installed and match design?	YES
All hood filters installed and accounted for?	YES
Hoods are wired and have power?	YES
Hood is free of alarms?	YES
Thermostats have power?	YES
Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	N/A

Notes/Comments :



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WENDY'S - BROKEN ARROW, OK

CheckList Information

Name :	TECH - STEP 2: UNIT DATA AND EVAL	Status :	NotSubmitted
Assigned Organization :	National TAB	Asset :	
Requesting Organization :	National TAB		

CheckList Item Details

UNIT DATA AND EVALUATION WHILE GATHERING UNIT DATA CHECK THE FOLLOWING:

RTU's/AHU's

Economizers are assembled and functional?	ASSEMBLED, NOT FUNCTIONING PROPERLY
DCV Max damper opening position is set to minimum?	YES, MANUALLY SET
Free cooling enthalpy set point set for lowest setting (Typically "D")	N/A
Motors are all operating below the FLA rating?	YES
Are belts tight?	N/A
If direct drive unit is the speed controller working.	YES
Is gas piping installed and valves turned on?	YES
Unit free of noticeable noise and vibration	YES

EF's

Rotation is correct?	YES
Belts are tight?	N/A DD units
Grease cup installed on hood fan?	YES
Hinge kit installed installed on hood fan?	YES
Lean fan back. Is grease duct installation adequate and is duct ran all the way to the base of the fan?	YES

Flex conduit is long enough so that fan can be completely tilted back?	YES
There is no major leakage around base of fan?	YES, NO MAJOR LEAKAGE
Is the motor operating below the motor FLA rating?	YES
For restroom fan(s) is the back draft damper installed and can it fully open?	YES
Unit free of noticeable noise and vibration?	YES

HOODS

Kitchen equipment installed in proper places?	YES
Can kitchen equipment be turned on for final smoke test?	NO

DOCUMENTATION

Have trades/general contractor been notified about any issues and are they created on FaciliBuild?	YES
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Notes/Comments :



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CheckList Information

Name :	TECH - STEP 3: TEST, ADJUST AND BALANCE	Status :	NotSubmitted
Assigned Organization :	National TAB	Asset :	
Requesting Organization :	National TAB		

CheckList Item Details

TEST, ADJUST, AND BALANCE ALL EQUIPMENT:

DURING TESTING MAKE NOTE OF THE FOLLOWING:

Is space free of drafting?	YES
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Is space comfortable in all areas?	YES
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Is the space free of ventilation noise?	YES
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If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".

Notes/Comments :



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CheckList Information

Name :	TECH - STEP 4: FINAL TESTS	Status :	NotSubmitted
Assigned Organization :	National TAB	Asset :	
Requesting Organization :	National TAB		

CheckList Item Details

FINAL TESTS

HOOD CAPTURE TEST

List equipment turned on for testing	NONE, STARTUPS NOT DONE
List smoke candle type used	45 SECOND SMOKE EMITTER
Smoke test capture - Perimeter of hood	100%
Smoke test capture - Top of cooking surface	100%

WITNESS

Date test was completed	05/25/2022
TAB tech name / Firm	JACOB DAVIDSON/ NATIONAL TAB
Site super name / Firm	CHASE BOLIN / CRV CONSTRUCTION
Owner representative name / Firm (if Applicable)	
Building pressure at front & back doors (All Systems On)	FRONT 0.0059" BACK -0.0024

ADDITIONAL

Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)	YES
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Notes/Comments :



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Project: WENDY'S - BROKEN ARROW, OK

System/Unit: AHU/RTU

Asset: RTU1

AREA:KITCHEN

Unit Data		
	Design	Actual
MFG	AAON	AAON
Serial Num	-	202201-BNG96458
Model Num	RN-0148-0-GA	RN-0148-0-GA05-244
Type	-	RTU
Configuration	-	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	18.5x23.5
Num Final Filter 1	-	6
Final Filter Size 1	-	20X25X2

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR ELECTRIC CO
Frame	-	213T
Horsepower	2	3
Motor Rpm	-	1165
Phase	3	3
Rated Voltage	208	230/460
Rated Amperage	-	9/4.5

Drive Data		
	Design	Actual

Test Data		
	Design	Actual
SF CFM	4500	4295
SF RPM	-	1165
RA CFM	2900	2635
OA CFM	1600	1660
RL Voltage	-	189
RL Amperage	-	6.8
SF Rotation	-	CW
RA Damper Position	-	[1]
Min OA Damper Position	-	[1]
Min OA Damper Type	-	ECONOMIZER

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.53"
Fan Suction SP	-	-0.73"
Fan Discharge SP	-	0.18"
Total ESP	0.8"	0.71"
Fan Total SP	-	0.91"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Notes:[1] ECONOMIZER DID NOT RESPOND TO INPUT FROM CONTROL. MANUALLY SET MINIMUM. SEE PICTURE.



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Project: WENDY'S - BROKEN ARROW, OK

AHU/RTU

Diffuser Supply (GRD)

RTU1/KITCHEN

Asset	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)
SGRD1	BOH	SD3	12	400	1	820	484
	FINAL CFM	% to design					
	395	98.8					
SGRD2	FOOD BRAB	SD3	12	500	1	34	438
	FINAL CFM	% to design					
	457	91.4					
SGRD3	FOOD BRAB	SD2	10	350	1	56	328
	FINAL CFM	% to design					
	324	92.6					
SGRD4	FOOD RAB	SD2	10	350	1	46	315
	FINAL CFM	% to design					
	349	99.7					
SGRD5	DRIVE THRU	SD3	12	450	1	86	457
	FINAL CFM	% to design					
	424	94.2					
SGRD6	COOK LINE	SD2	10	300	1	56	270
	FINAL CFM	% to design					
	289	96.3					
SGRD7	COOK LINE	SD2	10	300	1	449	307
	FINAL CFM	% to design					
	323	107.7					
SGRD8	DRIVE THRU	SD3	12	450	1	754	520
	FINAL CFM	% to design					
	418	92.9					
SGRD9	FOOD BREB	SD2	10	300	1	349	235
	FINAL CFM	% to design					
	264	88.0					
SGRD10	FOOD BREB	SD2	10	300	1	391	263
	FINAL CFM	% to design					
	283	94.3					
SGRD11	FOOD BREB	SD2	10	300	1	367	248
	FINAL CFM	% to design					
	276	92.0					

SGRD12	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)
	FOOD BREB	SD3	12	500	1	676	451
	FINAL CFM	% to design					
	493	98.6					

Asset	Notes
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Project: WENDY'S - BROKEN ARROW, OK

System/Unit: AHU/RTU

Asset: RTU2

AREA:DINING

Unit Data		
	Design	Actual
MFG	AAON	AAON
Serial Num	-	202201-BNGB96459
Model Num	RN-014-8-0-GA	RN-014-8-0-GA05-244
Type	-	RTU
Configuration	-	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	18.5X23.5
Num Final Filter 1	-	6
Final Filter Size 1	-	20X25X2

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR ELECTRIC CO
Frame	-	213T
Horsepower	2	3
Motor Rpm	-	1165
Phase	3	3
Rated Voltage	208	230/460
Rated Amperage	-	9/4.5

Drive Data		
	Design	Actual

Test Data		
	Design	Actual
SF CFM	4500	4227
SF RPM	-	1165
RA CFM	2900	2590
OA CFM	1600	1637
RL Voltage	-	186
RL Amperage	-	6.8
SF Rotation	-	CW
RA Damper Position	-	[1]
Min OA Damper Position	-	[1]
Min OA Damper Type	-	ECONOMIZER

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.58"
Fan Suction SP	-	-0.83"
Fan Discharge SP	-	0.15"
Total ESP	0.8"	0.73"
Fan Total SP	-	0.98"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Notes:[1] ECONOMIZER DID NOT RESPOND TO INPUT FROM CONTROL. MANUALLY SET MINIMUM. SEE PICTURE.



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Project: WENDY'S - BROKEN ARROW, OK

AHU/RTU

Diffuser Supply (GRD)

RTU2/DINING

Asset	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)
SGRD1	DINING	SD1	12	525	1	592	493
	FINAL CFM	% to design					
	524	99.8					
SGRD2	DINING	SD2	12	525	1	539	461
	FINAL CFM	% to design					
	499	95.0					
SGRD3	DINING	SD1	12	525	1	357	443
	FINAL CFM	% to design					
	472	89.9					
SGRD4	DINING	SD1	12	525	1	387	485
	FINAL CFM	% to design					
	474	90.3					
SGRD5	DINING	SD1	12	525	1	435	450
	FINAL CFM	% to design					
	490	93.3					
SGRD6	DINING	SD1	12	525	1	615	487
	FINAL CFM	% to design					
	496	94.5					
SGRD7	DINING	SD1	12	525	1	497	452
	FINAL CFM	% to design					
	487	92.8					
SGRD8	DINING	SD1	12	525	1	96	453
	FINAL CFM	% to design					
	473	90.1					
SGRD9	OFFICE	SD3	8	100	1	223	239
	FINAL CFM	% to design					
	109	109.0					
SGRD10	RESTROOM	SD4	8	100	1	185	96
	FINAL CFM	% to design					
	108	108.0					
SGRD11	RESTROOM	SD4	8	100	1	191	101
	FINAL CFM	% to design					
	95	95.0					

Asset	Notes
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Project: WENDY'S - BROKEN ARROW, OK

System/Unit: FAN - Exhaust

Asset: EF1

AREA:HOOD 1 DRIDDLE

Unit Data		
	Design	Actual
MFG	CAPTIVEAIRE	FLOAIRE
Model Num	DUBSHFA	DU85H
Serial Num	-	5213182
Type	UPBLAST	UPBLAST
Configuration	VERTIZALE	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	0.750	3/4
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	208	208
Amperage (rated)	-	5.2
Service Factor	-	1

Test Data		
	Design	Actual
CFM	1200	1201
Fan RPM	1254	1260
Fan Rotation	-	CCW
Motor RPM	-	1260
System SetPt	-	66
RL Voltage	-	207
RL Amperage	-	NOT SAFE
Total ESP	1.250"	1.50"
Fan Inlet SP	-	-1.50"
Fan Discharge SP	-	ATM

Notes:

Asset	Notes



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Project: WENDY'S - BROKEN ARROW, OK
 System/Unit: FAN - Exhaust

Asset: EF2

AREA:HOOD 2 FRYER

Unit Data		
	Design	Actual
MFG	CAPTIVEAIRE	FLOAIRE
Model Num	DUBSHFA	DU85H
Serial Num	-	5213182
Type	UPBLAST	UPBLAST
Configuration	HORZANTIOL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NL
Horsepower	0.750	3/4
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	208	208
Amperage (rated)	-	5.2
Service Factor	-	1

Test Data		
	Design	Actual
CFM	1500	1425
Fan RPM	1332	1080
Fan Rotation	-	CCW
Motor RPM	-	1080
System SetPt	-	58p
RL Voltage	-	208
RL Amperage	-	NOT SAFE
Total ESP	1.250"	1.10"
Fan Inlet SP	-	-1.10"
Fan Discharge SP	-	ATM

Notes:

Asset	Notes



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Project: WENDY'S - BROKEN ARROW, OK
 System/Unit: FAN - Exhaust

Asset: EF3

AREA:RESTROOM

Unit Data		
	Design	Actual
MFG	CAPTIVEAIRE	FLOAIRE
Model Num	DR10HFA	DR12H
Serial Num	-	5213182
Type	CELLING	DOWNBLAST
Configuration	HORZANTIOL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	HSSA
Frame	-	42Y
Horsepower	0.166	1/6
Motor Rpm	-	1625
Phase	1	1
Voltage (rated)	115	115/230
Amperage (rated)	-	1.9/0.96
Service Factor	-	1

Test Data		
	Design	Actual
CFM	300	285
Fan RPM	1500	UTO
Fan Rotation	-	DD
Motor RPM	-	UTO
System SetPt	-	SEE PIC
RL Voltage	-	NOT SAFE
RL Amperage	-	NOT SAFE
Total ESP	0.340 "	-0.31"
Fan Inlet SP	-	-0.31"
Fan Discharge SP	-	ATM

Notes:



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Project: WENDY'S - BROKEN ARROW, OK

FAN - Exhaust

Diffuser Ret/Exh (GRD)

EF3/RESTROOM

Asset	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)
EGRD1	RESTROOM	RG2	8	150	1	191	180
	FINAL CFM	% to design					
	147	98.0					
EGRD2	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)
	RESTROOM	RG2	8	150	1	175	167
	FINAL CFM	% to design					
	138	92.0					

1

Asset	Notes
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Project: WENDY'S - BROKEN ARROW, OK

System/Unit: Kitchen Hood Type I

Asset: HD1

AREA:

Unit Data		
	Design	Actual
MFG	HALTON	HALTON
Model Num	KVE-L0806	KVE-L0806
Job / Serial Num	-	110030-461
Type	-	LOW PROXIMITY
Hood length	-	91"
Hood Width	-	64"

Test Data Exhaust		
	Design	Actual
Filter Size 1	-	10X20
Filter Qty 1	-	3
Plenum SP	-	-0.43"
CFM	-	1201

Cooking Equipment		
	Design	Actual
Item 1	-	GRIDDLE

Test Data Supply		
	Design	Actual
Plenum SP	-	0.25"

Performance Data		
	Design	Actual
Smoke Generation Type	-	45 SECOND SMOKE EMITTER
Hood Capture %	-	100%

General		
	Design	Actual
Third Party Witness	-	CHASE BOLIN
Third Party Company	-	CRV CONSTRUCTION
Tech Witness	-	JACOB DAVIDSON
Tech Company	-	NATIONAL TAB

Notes: CAPTURE JET PRESSURE 0.25"

Asset	Notes



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Project: WENDY'S - BROKEN ARROW, OK

System/Unit: Kitchen Hood Type I

Asset: HD2

AREA:

Unit Data		
	Design	Actual
MFG	HALTON	HALTON
Model Num	KVM-L0503	KVM-L0503
Job / Serial Num	-	110030-499
Type	-	TYPE I LOW PROXIMITY
Hood length	-	126"
Hood Width	-	48"

Test Data Exhaust		
	Design	Actual
Filter Size 1	-	10X20
Filter Qty 1	-	6
Plenum SP	-	-0.14"
CFM	-	1425

Cooking Equipment		
	Design	Actual
Item 1	-	FRYERS

Test Data Supply		
	Design	Actual
Plenum SP	-	0.23"

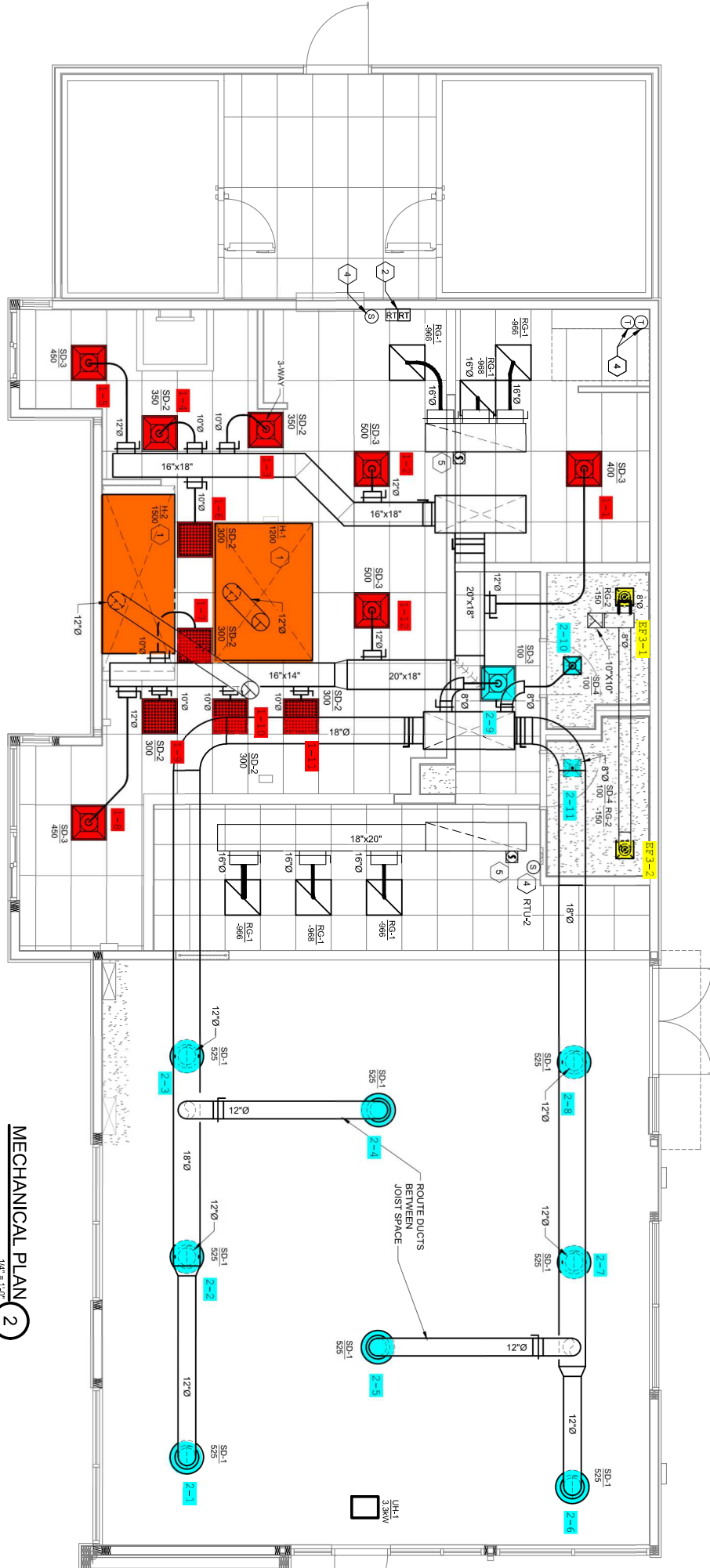
Performance Data		
	Design	Actual
Smoke Generation Type	-	45 SECOND SMOKE EMITTER
Hood Capture %	-	100%

General		
	Design	Actual
Third Party Witness	-	CHASE BOLIN
Third Party Company	-	CRV CONSTRUCTION
Tech Witness	-	JACOB DAVIDSON
Tech Company	-	NATIONAL TAB

Completed By: Wendy Biggs

Notes: CAPTURE JET PRESSURE 0.23"

Asset	Notes



MECHANICAL PLAN 2
1/4" = 1'-0"

