

Report By:

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Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 05/01/2024

PROJECT
Tractor Supply (Oroville, CA)

Feather River Blvd

Oroville, CA

Client

B&M Builders, Inc.
11330 Sunrise Park Drive
Suite C
Rancho Cordova, CA 95742

National TAB

Project: Tractor Supply (Oroville, CA)

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CERTIFICATION

PROJECT: Tractor Supply (Oroville, CA)

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB *Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems*. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.

The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB-Southeast

REGISTRATION NO: 3755

CERTIFIED BY: J. Scott Springer 23312

DATE: 4/30/2024

The hydronic distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB-Southeast

REGISTRATION NO: 3086

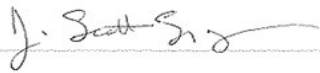
CERTIFIED BY: J. Scott Springer 23312

DATE:

Submitted and Certified by:

NEBB TAB FIRM: National TAB-Southeast

TAB PROFESSIONAL: J. Scott Springer

SIGNATURE: 

REGISTRATION NO: 3755 (NTAB) / 23312

CERTIFICATION EXP: 12/31/2024





National TAB

Testing, Adjusting, and Balancing Equipment



| Function | | Range | Minimum Accuracy | Instrument Information | Calibration Date | Date Due |
|-------------|-----------------------------------|---------------------------|------------------------------|--------------------------------------|------------------|------------|
| AIR | AIR PRESSURE | 0 in wg to 10 in wg | 2% +/- 0.001 in wg | Shortridge ADM-860C S/N M19547 | 10/17/2023 | 10/16/2024 |
| | AIR VELOCITY INSTRUMENT | 50 fpm to 3900 fpm | +/- 5 % +/- 7 fpm | Shortridge ADM-860C S/N M19548 | 10/17/2023 | 10/16/2024 |
| | DIRECT HOOD READING | 100 cfm to 2000 cfm | +/- 3 % +/- 7 cfm | Shortridge Flow Hood | 10/17/2023 | 10/16/2024 |
| TEMPERATURE | AIR METER | -20 F to 240 F | +/- .5 % 2 F | Cooper ATKINS - SRH77A S/N 081820093 | 10/20/2023 | 10/19/2024 |
| | AIR PROBE | -20 F to 240 F | +/- .5 % 2 F | Cooper ATKINS - PD1388 7-6 S/N 5028 | 10/20/2023 | 10/19/2024 |
| | IMMERSION METER | -20 F to 240 F | +/- .5 % 2 F | Cooper ATKINS - SRH77A S/N 081820093 | 10/20/2023 | 10/19/2024 |
| | IMMERSION PROBE | -20 F to 240 F | +/- .5 % 2 F | Cooper ATKINS - PD1388 7-6 S/N 1075 | 10/20/2023 | 10/19/2024 |
| | CONTACT METER | -20 F to 240 F | +/- .5 % 2 F | Cooper ATKINS - SRH77A S/N 081820093 | 10/20/2023 | 10/19/2024 |
| | CONTACT PROBE | -20 F to 240 F | +/- .5 % 2 F | Cooper ATKINS - PD1388 7-6 S/N 4011 | 10/20/2023 | 10/19/2024 |
| HUMIDITY | HUMIDITY PROBE | 10 % RH to 90 % RH | 3% of reading | Cooper ATKINS - SRH77A S/N 090315046 | 10/20/2023 | 10/19/2024 |
| ELECTRICAL | VOLTAGE MEASUREMENT | 0 VAC to 600 VAC | 2 % reading +/- 5 digits | Dwyer CM-1 - S/N 190800099 | 10/16/2023 | 10/15/2024 |
| | AMPERAGE MEASUREMENT | 0 Amperers to 100 Amperes | 2 % reading +/- 5 digits | Dwyer CM-1 - S/N 190800099 | 10/16/2023 | 10/15/2024 |
| ROTATION | ROTATION MEASUREMENT | 60 rpm to 5000 rpm | 2 % reading 2 rpm | Dwyer TAC-L - S/N S1100123 | 10/16/2023 | 10/15/2024 |
| HYDRONIC | PRESSURE MEASUREMENT | -30 in Hg to 200 psi | ±2% of reading +/- 1 psi | Dwyer 490W-6 - S/N 01L6NK | 6/21/2023 | 6/20/2024 |
| | DIFFERENTIAL PRESSURE MEASUREMENT | 0 psi - 80 psi | ±2% of reading +/- 1 psi | Dwyer 490W-6 - S/N 01L6NK | 6/21/2023 | 6/20/2024 |
| DALT | DUCT LEAKAGE | -10" - +10" wc | ±1% of reading +/- 0.004" wc | Kanomax DALT 6900 S/N: 080439 | 5/2023 | 5/2024 |

Abbreviation List

| | |
|--|---|
| A = Area (ft ²) | S.F. = Service Factor |
| AHU = Air Handling Unit | SF = Supply Fan |
| A _k = Effective Area | SP = Static Pressure |
| BHP = Brake Horsepower (IP) HP | SR = Supply Register |
| Btu = British Thermal Unit | T = Temperature |
| Btu/h = Btuh = BTUH = BTU/Hour | T _{ma} = Mixed Air Temperature |
| CL = Center Distance (used in belt formula) | T _{oa} = Outside Air Temperature |
| CD = Ceiling Diffuser | T _{ra} = Return Air Temperature |
| CF = Correction Factor | H = Head (in wc, ft wc, psi) |
| CFM = Volumetric Flow: Cubic Feet Per Minute | h = Enthalpy |
| CO ₂ = Carbon Dioxide | HP = Horsepower |
| CO = Carbon Monoxide | hr = Hour |
| C _v = Flow Constant | K _v = Flow constant (SI) |
| d = Diameter (in.) IP | kW = Kilowatt = 1000 Watts |
| Δ = Difference or Change (Final - Initial) | LAT = Leaving Air Temperature |
| DB = Dry Bulb | lb = Pounds |
| EA = Exhaust Air | LWT = Leaving Water Temperature |
| EAT = Entering Air Temperature | ma = Mixed Air |
| EF = Exhaust Fan | MIN = Minimum |
| Eff = Efficiency | MAX = Maximum |
| EG = Exhaust Grille | N/A = Not Applicable |
| ESP = External Static Pressure | NA = No Access |
| EWT = Entering Water Temperature | NL = Not Listed |
| °F = Degrees Fahrenheit, °F | NPSHA = Net Positive Suction Head Available |
| FPB = Fan Powered Box | NS = Not Specified |
| FLA = Full Load Amps | OA = Outside Air |
| fpm = Feet per Minute (fpm) | OAT = Outside Air Temperature |
| ft = Foot | PD = Sheave Pitch Diameter |
| gal = Gallons | P.D. = Pressure Drop |
| GPM = Gallons Per Minute (GPM) | PF = Power Factor |
| h = Enthalpy (BTU/lb dry air) | SG = Supply Grille |
| P = Pressure | SR = Supply Register |
| ppm = parts per million | TP = Total Pressure |
| psi = Pounds Per Square Inch | T _{ra} = Return Air Temperature |
| psid = PSI Differential | TS = Tip Speed (fpm) IP, (m/s) SI |
| r = Radius (in) | TSP = Total Static Pressure |
| % _{ra} = % of Return Air | V = Velocity |
| RA = Return Air | VAV = Variable Air Volume |
| RAT = Return Air Temperature | VD = Volume Damper |
| RF = Return Fan | VFD = Variable Frequency Drive |
| RG = Return Grille | W = Watt |
| RH = Relative Humidity | WB = Wet Bulb |
| RPM = Revolutions Per Minute | wg = wc = water gauge = water column |
| RTU = Roof Top Unit | WHP = Water Horsepower (IP) |
| SA = Supply Air | ω = Humidity Ratio |

National TAB

Project: Tractor Supply (Oroville, CA)
System/Unit: AHU/RTU



Asset: RTU-1

AREA:102

| Unit Data | | |
|------------------|----------|--------------------------|
| | Design | Actual |
| MFG | NA | TRANE |
| Serial Num | - | 234512778D |
| Model Num | NA | YSJ180A4S0L02M0EA2A000A1 |
| Configuration | VERTICAL | VERTICAL |
| Num OA Filters 1 | - | 1 |
| OA Filter Size 1 | - | 17X66 |
| Num PreFilter 1 | - | 8 |
| PreFilter Size 1 | - | 20X24X2 |

| Test Data | | |
|--------------------|--------|----------------|
| | Design | Actual |
| SF CFM | 5000 | 5195 |
| RA CFM | 3475 | 3599 |
| OA CFM | 1525 | 1596 |
| RL Voltage | 460 | 495/496/495 |
| RL Amperage | - | 1.16/1.14/1.16 |
| OA Damper Position | - | 20% |
| Brake Horse Power | - | 0.76 |

| Motor Data | | |
|----------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | NL |
| Frame | - | NL |
| Horsepower | 0.75 | 3.0 |
| Motor Rpm | - | 1850 |
| Phase | 3 | 3 |
| Rated Voltage | 460 | 460 |
| Rated Amperage | - | 4.6 |
| Service Factor | - | NL |

| Performance Data | | |
|------------------|--------|--------|
| | Design | Actual |
| MA Plenum SP | - | -0.21" |
| Fan Suction SP | - | -0.49" |
| Fan Discharge SP | - | 0.24" |
| Total ESP | 0.7 | 0.45" |
| Fan Total SP | - | 0.73" |

Completed By: Zack Eismin on 04/15/2024

National TAB

Project: Tractor Supply (Oroville, CA)

System/Unit: AHU/RTU



Asset: RTU-2

AREA:102

| Unit Data | | |
|------------------|----------|--------------------------|
| | Design | Actual |
| MFG | NA | TRANE |
| Serial Num | - | 234512777D |
| Model Num | NA | YSJ180A4S0L02M0EA2A000A1 |
| Configuration | VERTICAL | VERTICAL |
| Num OA Filters 1 | - | 1 |
| OA Filter Size 1 | - | 17X66 |
| Num PreFilter 1 | - | 8 |
| PreFilter Size 1 | - | 20X24X2 |

| Test Data | | |
|--------------------|--------|----------------|
| | Design | Actual |
| SF CFM | 5000 | 5027 |
| RA CFM | 3495 | 3498 |
| OA CFM | 1505 | 1529 |
| RL Voltage | 460 | 494/494/495 |
| RL Amperage | - | 1.07/1.08/1.07 |
| OA Damper Position | - | 20% |
| Brake Horse Power | - | 0.70 |

| Motor Data | | |
|----------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | NL |
| Frame | - | NL |
| Horsepower | 0.75 | 3.0 |
| Motor Rpm | - | 1850 |
| Phase | 3 | 3 |
| Rated Voltage | 460 | 460 |
| Rated Amperage | - | 4.6 |
| Service Factor | - | NL |

| Performance Data | | |
|------------------|--------|--------|
| | Design | Actual |
| MA Plenum SP | - | -0.21" |
| Fan Suction SP | - | -0.51" |
| Fan Discharge SP | - | 0.23" |
| Total ESP | 0.7 | 0.44" |
| Fan Total SP | - | 0.74" |

Completed By: Zack Eismin on 04/15/2024

National TAB

Project: Tractor Supply (Oroville, CA)
System/Unit: AHU/RTU



Asset: RTU-3

AREA:102

| Unit Data | | |
|------------------|----------|---------------------------|
| | Design | Actual |
| MFG | NA | TRANE |
| Serial Num | - | 234512776D |
| Model Num | NA | YSJ180A4S0L02M0E0A2A000A1 |
| Configuration | VERTICAL | VERTICAL |
| Num OA Filters 1 | - | 1 |
| OA Filter Size 1 | - | 17X66 |
| Num PreFilter 1 | - | 8 |
| PreFilter Size 1 | - | 20X24X2 |

| Motor Data | | |
|----------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | NL |
| Frame | - | NL |
| Horsepower | 0.75 | 3.0 |
| Motor Rpm | - | 1850 |
| Phase | 3 | 3 |
| Rated Voltage | 460 | 460 |
| Rated Amperage | - | 4.6 |
| Service Factor | - | NL |

| Test Data | | |
|--------------------|--------|----------------|
| | Design | Actual |
| SF CFM | 5000 | 4958 |
| RA CFM | 3495 | 3430 |
| OA CFM | 1505 | 1528 |
| RL Voltage | 460 | 497/497/496 |
| RL Amperage | - | 1.05/1.04/0.99 |
| OA Damper Position | - | 20% |
| Brake Horse Power | - | 0.68" |

| Performance Data | | |
|------------------|--------|--------|
| | Design | Actual |
| MA Plenum SP | - | -0.23" |
| Fan Suction SP | - | -0.46" |
| Fan Discharge SP | - | 0.22" |
| Total ESP | 0.7 | 0.45" |
| Fan Total SP | - | 0.68" |

Completed By: Zack Eismin on 04/15/2024

National TAB

Project: Tractor Supply (Oroville, CA)

System/Unit: AHU/RTU



Asset: RTU-4

AREA:102

| Unit Data | | |
|------------------|----------|---------------------------|
| | Design | Actual |
| MFG | NA | TRANE |
| Serial Num | - | 234512779D |
| Model Num | NA | YSJ180A4S0L02M0E0A2A000A1 |
| Configuration | VERTICAL | VERTICAL |
| Num OA Filters 1 | - | 1 |
| OA Filter Size 1 | - | 17X66 |
| Num PreFilter 1 | - | 8 |
| PreFilter Size 1 | - | 20X24X2 |

| Motor Data | | |
|----------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | NL |
| Frame | - | NL |
| Horsepower | 0.75 | 3.0 |
| Motor Rpm | - | 1850 |
| Phase | 3 | 3 |
| Rated Voltage | 460 | 460 |
| Rated Amperage | - | 4.6 |
| Service Factor | - | NL |

| Test Data | | |
|--------------------|--------|----------------|
| | Design | Actual |
| SF CFM | 5000 | 5077 |
| RA CFM | 3495 | 3578 |
| OA CFM | 1505 | 1499 |
| RL Voltage | 460 | 499/498/499 |
| RL Amperage | - | 0.95/0.97/0.97 |
| OA Damper Position | - | 20% |
| Brake Horse Power | - | 0.62 |

| Performance Data | | |
|------------------|--------|--------|
| | Design | Actual |
| MA Plenum SP | - | -0.25" |
| Fan Suction SP | - | -0.50" |
| Fan Discharge SP | - | 0.19" |
| Total ESP | 0.7 | 0.44" |
| Fan Total SP | - | 0.69" |

Completed By: Zack Eismin on 04/16/2024

National TAB

Project: Tractor Supply (Oroville, CA)
System/Unit: AHU/RTU



Asset: RTU-5

AREA:107

| Unit Data | | |
|------------------|----------|--------------------------|
| | Design | Actual |
| MFG | NA | TRANE |
| Serial Num | - | 234311472L |
| Model Num | NA | YHC037E4RXA2EM0E1A2A000A |
| Configuration | VERTICAL | VERTICAL |
| Num OA Filters 1 | - | 1 |
| OA Filter Size 1 | - | 15X27 |
| Num PreFilter 1 | - | 2 |
| PreFilter Size 1 | - | 20X30X2 |

| Test Data | | |
|--------------------|--------|--------|
| | Design | Actual |
| SF CFM | 1200 | 1095 |
| RA CFM | 1075 | 978 |
| OA CFM | 125 | 117 |
| RL Voltage | 460 | 495 |
| RL Amperage | 3.7 | 1.42 |
| OA Damper Position | - | 15% |
| Brake Horse Power | - | 0.38 |

| Motor Data | | |
|----------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | GENTEQ |
| Frame | - | NL |
| Horsepower | - | 0.75 |
| Motor Rpm | - | NL |
| Phase | 3 | 1 |
| Rated Voltage | 460 | 460 |
| Rated Amperage | 3.7 | 3.7 |
| Service Factor | - | NL |

| Performance Data | | |
|------------------|--------|--------|
| | Design | Actual |
| MA Plenum SP | - | -0.19" |
| Fan Suction SP | - | -0.28" |
| Fan Discharge SP | - | 0.17" |
| Total ESP | 0.7 | 0.36" |
| Fan Total SP | - | 0.45" |

Completed By: Zack Eismin on 04/16/2024

National TAB

Project: Tractor Supply (Oroville, CA)

AHU/RTU



Diffuser Supply (GRD)

RTU-5/107

| Asset | | | | | | | |
|------------|----------|------|------|------------|--------|-----------|-------------|
| Asset Name | Location | Type | Size | DESIGN CFM | CFM(1) | FINAL CFM | % to design |
| 5-1 | 106 | CS-1 | 10 | 275 | 122 | 252 | 91.6 |
| 5-2 | 108 | CS-1 | 12 | 450 | 338 | 409 | 90.9 |
| 5-3 | 110 | CS-2 | 6 | 50 | 65 | 47 | 94.0 |
| 5-4 | 109 | CS-2 | 6 | 50 | 40 | 48 | 96.0 |
| 5-5 | 111 | CS-3 | 8 | 175 | 0 | 158 | 90.3 |
| 5-6 | 107 | CS-1 | 8 | 200 | 180 | 181 | 90.5 |
| Total | | | | 1200 | 745 | 1095 | 91.25% |

Diffuser Ret/Exh (GRD)

RTU-5/107

| Asset | | | | | | | | |
|------------|------|------|------------|----|--------|--------|-----------|-------------|
| Asset Name | Type | Size | DESIGN CFM | AK | CFM(1) | CFM(2) | FINAL CFM | % to design |
| R5-1 | CR-1 | 8 | 200 | 1 | 182 | 182 | 182 | 91.0 |
| R5-2 | CR-2 | 8 | 175 | 1 | 159 | 159 | 159 | 90.9 |
| R5-3 | CR-1 | 10 | 250 | 1 | 227 | 227 | 227 | 90.8 |
| R5-4 | CR-1 | 12 | 450 | 1 | 410 | 410 | 410 | 91.1 |
| Total | | | 1075 | | 978 | 978 | 978 | 90.98% |

National TAB

Project: Tractor Supply (Oroville, CA)
System/Unit: FAN - Exhaust



Asset: EF-1

AREA:110

| Unit Data | | |
|------------|---------|-----------|
| | Design | Actual |
| MFG | NA | GREENHECK |
| Model Num | NA | SP-A110 |
| Serial Num | - | 23245970 |
| Type | CEILING | CEILING |

| Test Data | | |
|-------------|--------|--------|
| | Design | Actual |
| CFM | 100 | 92 |
| RL Voltage | - | 115 |
| RL Amperage | - | NA |
| Total ESP | 0.25 | NA |

| Motor Data | | |
|------------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | NL |
| Frame | - | NL |
| Horsepower | - | NL |
| Motor Rpm | 950 | NL |
| Phase | 1 | 1 |
| Voltage (rated) | 115 | 115 |
| Amperage (rated) | - | 0.19 |
| Service Factor | - | NL |

Completed By: Zack Eismin on 04/16/2024

National TAB

Project: Tractor Supply (Oroville, CA)
System/Unit: FAN - Exhaust



Asset: EF-2

AREA:109

| Unit Data | | |
|------------|---------|-----------|
| | Design | Actual |
| MFG | NA | GREENHECK |
| Model Num | NA | SP-A110 |
| Serial Num | - | SPA110 |
| Type | CEILING | CEILING |

| Test Data | | |
|-------------|--------|--------|
| | Design | Actual |
| CFM | 100 | 97 |
| RL Voltage | - | 115 |
| RL Amperage | - | NA |
| Total ESP | 0.25 | NA |

| Motor Data | | |
|------------------|--------|-----------|
| | Design | Actual |
| Motor MFG | - | GREENHECK |
| Frame | - | NL |
| Horsepower | - | NL |
| Motor Rpm | 950 | NL |
| Phase | 1 | 1 |
| Voltage (rated) | 115 | 115 |
| Amperage (rated) | - | 0.19 |
| Service Factor | - | NL |

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National TAB

Project: Tractor Supply (Oroville, CA)

System/Unit: FAN - Exhaust



Asset: EF-3

AREA:112

| Unit Data | | |
|------------|-------------------|-----------|
| | Design | Actual |
| MFG | NA | GREENHECK |
| Model Num | NA | CSP-A200 |
| Serial Num | - | 23245972 |
| Type | INLINE CABINET | INLINE |

| Test Data | | |
|-------------|--------|--------|
| | Design | Actual |
| CFM | 170 | 177 |
| RL Voltage | - | 115 |
| RL Amperage | - | NA |
| Total ESP | 0.3 | 0.32" |

| Motor Data | | |
|------------------|--------|--------|
| | Design | Actual |
| Motor MFG | - | NL |
| Frame | - | NL |
| Horsepower | - | NL |
| Motor Rpm | 1400 | NL |
| Phase | 1 | 1 |
| Voltage (rated) | 115 | 115 |
| Amperage (rated) | - | NL |
| Service Factor | - | NL |

Completed By: Zack Eismin on 04/16/2024

National TAB

Project: Tractor Supply (Oroville, CA)

FAN - Exhaust



Diffuser Ret/Exh (GRD)

EF-3/112

| Asset | | | | | | | | |
|------------|------|------|------------|----|--------|--------|-----------|-------------|
| Asset Name | Type | Size | DESIGN CFM | AK | CFM(1) | CFM(2) | FINAL CFM | % to design |
| E3-11 | WE-1 | 12X6 | 170 | 1 | 177 | 177 | 177 | 104.1 |
| Total | | | 170 | | 177 | 177 | 177 | 104.12% |