

ACCA MANUAL J 8TH EDITION LOAD CALCULATION + MANUAL S EQUIPMENT + MANUAL D DUCT SCHEDULE

ANSI/ACCA 2 Manual J (8th Ed., Ver. 2.50) & ANSI/ACCA 3 Manual S (2nd Ed.) | ANSI/ACCA 2 Manual J 8th Ed / Manual S 2nd Ed / Manual D 3rd Ed

✓ **COMPLIANT** — Selected 3.0-Ton Heat Pump is 109.4% of Manual J Cooling Load (Within 90%–130% Limit)

Total Heating Load: 24,860 BTUh | Sensible Cooling: 24,420 BTUh + Latent: 5,940 BTUh = Total Cooling: 30,360 BTUh (2.53 Tons, SHR 0.804) | AHRI #208941512

Project Title:	Shoal Creek Custom Residence — New Single-Family Dwelling	Weather Station:	Austin-Bergstrom Intl / Camp Mabry, TX (WMO #722540)
Site Address:	4812 Shoal Creek Blvd, Austin, TX 78756	Latitude / Elev.:	30.30° N Elevation 542 ft (ACF 0.981)
Jurisdiction:	City of Austin Development Services Dept. (Travis County, TX)	99% Winter Outdoor:	30°F DB -> Indoor Heating 70°F DB ($\Delta T = 40^\circ F$)
Owner / Builder:	Shoal Creek Homes LLC / Barton Springs Custom Builders	1% Summer Outdoor:	98°F DB / 74°F WB Daily Range: Medium (21°F)
Building Type:	New Single-Family Detached Residence (2-Story, 4 BR)	Indoor Cooling:	75°F DB / 50% RH ($\Delta T = 23^\circ F$, $\Delta Grains = 34$ gr/lb)
Conditioned Area:	2,450 sq ft Monolithic Post-Tensioned Slab-on-Grade	Infiltration / Vent:	2.60 ACH50 (Blower Door Verified) -> 0.14 ACH Natural Clg / 0.18 ACH Htg

1. SYSTEM THERMAL LOAD SUMMARY (ACCA MANUAL J 8TH EDITION WHOLE-HOUSE LOADS)

Load Component / Heat Transfer Pathway	Heating Load (BTUh)	Sensible Clg (BTUh)	Latent Clg (BTUh)	Total Cooling (BTUh)	% of Clg
Fenestration Solar Gain — North Orientation	0	1,240	0	1,240	4.1%
Fenestration Solar Gain — East Orientation	0	2,380	0	2,380	7.8%
Fenestration Solar Gain — South Orientation	0	2,960	0	2,960	9.7%
Fenestration Solar Gain — West Orientation	0	2,680	0	2,680	8.8%
Windows, Skylights & Glass Doors (Conductive ΔT)	6,180	2,740	0	2,740	9.0%
Above-Grade Exterior Walls & Opaque Doors (CLTD / Conductive)	6,840	3,120	0	3,120	10.3%
Roof & Ceiling Assemblies (Attic / Vaulted Rafter CLTD)	2,940	2,180	0	2,180	7.2%
Framed Floors & Slab-on-Grade Foundation Perimeter	3,120	640	0	640	2.1%
Envelope Air Infiltration (Blower Door Verified ACH50)	2,780	1,220	1,520	2,740	9.0%
ASHRAE 62.2 Mechanical Fresh Air Ventilation	1,620	1,340	2,180	3,520	11.6%
Internal Gains — Occupants (230S/200L) & Appliances (1,200 BTUh)	0 (Credit Omit)	2,120	1,600	3,720	12.3%
Supply & Return Distribution Duct Gain / Loss	1,380	1,320	640	1,960	6.5%
Adequate Exposure Diversity (AED) Peak Fenestration Excursion	0	480	0	480	1.6%
TOTAL SYSTEM DESIGN LOADS (SHR = 0.804 2.53 Nominal Tons)	24,860 BTUh	24,420 BTUh	5,940 BTUh	30,360 BTUh	100.0%

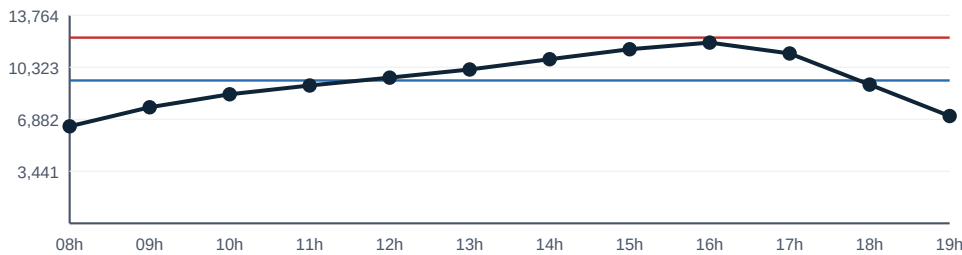
2. ROOM-BY-ROOM HEATING & COOLING LOAD AND AIRFLOW SCHEDULE (MANUAL J)

Room / Zone Name	Dimensions	Area (sf)	Exposed Wall/Glass (sf)	Htg BTUh	Htg CFM	Sens. Clg	Lat. Clg	Total Clg	Clg CFM
1. Great Room / Living	20' x 19' x 10'	380	S: 190W/54G, W: 100W/20G	3,920	160	4,180	980	5,160	185
2. Kitchen & Dining	20' x 17' x 10'	340	N: 170W/36G, E: 140W/24G	3,480	145	3,940	1,180	5,120	175
3. Primary Bedroom (1st Fl)	18' x 17.2' x 10'	310	S: 172W/42G, E: 160W/20G	3,240	135	3,160	760	3,920	140
4. Primary Bath & Walk-In	15' x 11' x 10'	165	E: 110W/16G, N: 80W/0G	1,760	75	1,580	420	2,000	70

Room / Zone Name	Dimensions	Area (sf)	Exposed Wall/Glass (sf)	Htg BTUh	Htg CFM	Sens. Clg	Lat. Clg	Total Clg	Clg CFM
5. Study / Home Office	13.5' x 13.7' x 10'	185	N: 135W/30G, W: 110W/15G	2,040	85	1,960	460	2,420	85
6. Bedroom 2 (Upstairs N)	16' x 15' x 9'	240	N: 144W/24G, E: 90W/20G	2,480	100	2,280	520	2,800	100
7. Bedroom 3 (Upstairs S)	15.3' x 15' x 9'	230	S: 138W/24G, E: 60W/0G	2,360	95	2,240	510	2,750	100
8. Bedroom 4 (Upstairs W)	14.7' x 15' x 9'	220	W: 132W/20G, N: 50W/0G	2,280	95	2,160	490	2,650	95
9. Upstairs Game Rm & Bath	20' x 19' x 9'	380	W: 108W/15G, Horiz Roof	3,300	135	2,920	620	3,540	130
TOTAL CONDITIONED ZONES (9 Rooms)	Whole House	2,450	All Orientations Verified	24,860	1,025	24,420	5,940	30,360	1,080

3. ADEQUATE EXPOSURE DIVERSITY (AED) HOURLY GLAZING CURVE & EXCURSION CHECK

ACCA MANUAL J SECTION 10 — ADEQUATE EXPOSURE DIVERSITY (AED) HOURLY FENESTRATION LOAD CURVE (08:00 - 19:00)



AED Excursion Check Summary

Avg Load Value (ALV): 9,453 BTUh

130% Diversity Limit: 12,289 BTUh

Peak Glazing (16:00): 11,960 BTUh

AED Excursion Added: 480 BTUh

Status: PASS — Fenestration Diversity Within Manual J Limits

Solar Hour	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
Glazing BTUh	6,420	7,680	8,540	9,120	9,640	10,180	10,860	11,520	11,960	11,240	9,180	7,100

4. ACCA MANUAL S EQUIPMENT SELECTION & OEM CAPACITY VERIFICATION

Selected HVAC System Type:	3.0-Ton Variable-Speed Inverter Central Split Heat Pump	AHRI Certified Ref #:	208941512 (SEER2 19.5 / EER2 12.5 / HSPF2 9.2)
Outdoor Unit Make/Model:	Carrier Infinity 25VNA436A003 (3.0-Ton Inverter HP)	Indoor Unit Make/Model:	Carrier Infinity FE4ANF003L00 Variable-Speed ECM Fan Coil
Design Cooling Airflow:	1,080 CFM (360 CFM/Ton)	Supplemental Heating:	5.0 kW Integrated Electric Auxiliary Heat Strip (KFAEH0501N05)

ACCA Manual S Sizing Parameter	Manual J Design Load	OEM Rated Capacity @ Design	Ratio (% of Load)	Manual S Permitted Limit	Verification
Total Cooling Capacity (Sensible + Latent)	30,360 BTUh	33,200 BTUh	109.4%	90% – 130% (Variable-Speed)	PASS
Sensible Cooling Capacity @ Design Conditions	24,420 BTUh	26,800 BTUh	109.7%	>= 100% Design Sensible	PASS
Latent Dehumidification Capacity @ 50% RH	5,940 BTUh	6,400 BTUh	107.7%	>= 100% Design Latent	PASS
Heating Output @ 30°F 99% Winter DB	24,860 BTUh	31,400 BTUh	126.3%	100% – 140% Heating Load	PASS

5. ACCA MANUAL D DUCT SYSTEM SIZING & FRICTION RATE SCHEDULE

Blower Rated ESP:	0.50 IWC	Total Device Losses:	0.37 IWC (4-inch MERV 11 Pleated Media Filter Cabinet (0.12) + Direct-Expansion Wet Evaporator Coil (FE4ANF003) (0.16) + Supply Registers & Opposed-Blade Balancing Dampers (0.05) + Return Air Filter Grilles & Backdraft Damper (0.04))
Available Static (ASP):	0.13 IWC (ESP - Devices)	Critical Path TEL & FR:	TEL = 148 ft (38 ft straight + 110 ft fittings) -> Design FR = 0.088 IWC/100ft

Run ID	Trunk / Room Runout Branch Served	Duct Material & Insul.	TEL (ft)	Design CFM	Duct Size	Velocity (FPM)	ACCA Limit
ST-1	Main Supply Plenum & Trunk A (1st Floor)	Rect. Galv. Sheet Metal R-8	120	635	18" x 10" Rect	508 FPM	<= 900 (PASS)

Run ID	Trunk / Room Runout Branch Served	Duct Material & Insul.	TEL (ft)	Design CFM	Duct Size	Velocity (FPM)	ACCA Limit
ST-2	Supply Trunk B (2nd Floor Riser)	Rect. Galv. Sheet Metal R-8	148	445	14" x 10" Rect	458 FPM	<= 900 (PASS)
RT-1	Central Return Trunk (1st & 2nd Fl Returns)	Rect. Sheet Metal / R-8 Flex	115	1,080	24" x 12" Rect	540 FPM	<= 700 (PASS)
S-01	1. Great Room / Living (2 Supply Drops)	R-8 Insulated Flex Duct	118	185	(2) 6" Dia Round	471 FPM	<= 700 (PASS)
S-02	2. Kitchen & Dining (2 Supply Drops)	R-8 Insulated Flex Duct	124	175	(2) 6" Dia Round	446 FPM	<= 700 (PASS)
S-03	3. Primary Bedroom (1st Fl)	R-8 Insulated Flex Duct	132	140	8" Dia Round	401 FPM	<= 700 (PASS)
S-04	4. Primary Bath & Walk-In Closet	R-8 Insulated Flex Duct	136	70	6" Dia Round	357 FPM	<= 700 (PASS)
S-05	5. Study / Home Office	R-8 Insulated Flex Duct	114	85	6" Dia Round	433 FPM	<= 700 (PASS)
S-06	6. Bedroom 2 (Upstairs N)	R-8 Insulated Flex Duct	142	100	7" Dia Round	374 FPM	<= 700 (PASS)
S-07	7. Bedroom 3 (Upstairs S)	R-8 Insulated Flex Duct	148	100	7" Dia Round	374 FPM	<= 700 (PASS)
S-08	8. Bedroom 4 (Upstairs W)	R-8 Insulated Flex Duct	140	95	7" Dia Round	355 FPM	<= 700 (PASS)
S-09	9. Upstairs Game Room & Hall Bath	R-8 Insulated Flex Duct	130	130	8" Dia Round	372 FPM	<= 700 (PASS)

PREPARER COMPLIANCE CERTIFICATION: I hereby certify that this **ACCA Manual J 8th Ed + Manual S + Manual D Engineering Report** for **4812 Shoal Creek Blvd, Austin, TX 78756** has been prepared in full accordance with the applicable provisions of the **2021 International Energy Conservation Code (IECC)** and/or **ACCA Manual J 8th Edition / Manual S 2nd Edition / Manual D 3rd Edition** standards, using construction documents (October 2026 — Permit Issue Rev. 2) provided by the applicant. The building thermal envelope and/or mechanical equipment selections meet or exceed code requirements.

Prepared & Signed By:	<i>/s/ Skyler Tran</i> Skyler Tran, Energy Code Specialist	Organization:	Energy Code Certificates Cert ID: www.energycodecerts.com +1 (917) 746-6116
Credentials:	IECC / IRC Residential Energy & Manual J8 Load Calculation Preparer	Date & Verification:	2026-10-21 Status: APPROVED FOR PERMIT