

QUOTE TO: WilCo Facilities
FOR THE PROJECT: WilCo Juvenile AAON Unit
ATTENTION: Toby Bonnet
EMAIL: tbonnet@wilco.org

DATE: August 23, 2018

WILCO JUVENILE AAON UNITS – HVAC QUOTE – R1

TIPS-180205

We offer the following proposal for your consideration for the HVAC scope of work on the above referenced project. Subject to the following scope narrative, exclusions & clarifications.

HVAC PRICING: \$ 34,760.00 + tax

INCLUDED IN HVAC PRICE:

1. Disconnect and remove (1) rooftop units from premises
2. Provide and install (1) new 5-ton AAON unit
 - a. Replacement unit is not exact match for existing unit. Customer requests new unit to be AAON RQ style unit per attached submittal.
3. Terminal units for mounting of field DDC controllers
4. Provide and install (1) new bi-polar ion unit
5. Equipment hoisting
6. Modify existing and provide new natural gas piping as required
7. Modify existing and provide new condensate piping as required
8. Curb adapters as required for scheduled equipment
9. Filters
10. Factory start-up
11. Test & balance
12. One-year standard warranty on parts and labor
13. 5-Year compressor warranty & 25-Year stainless steel heat exchanger warranty

NOT INCLUDED IN PRICE:

1. Permits
2. Controls. AAON units will come with space for new DDC controller by others
3. Electrical
4. Roofing work
5. Equipment service or maintenance, except for warranty purposes
6. Smoke detectors
7. Fire dampers or fire/smoke dampers (none shown)
8. Delays beyond Mtech's control
9. Structural engineering or structural supports / angle iron framing / structural steel
10. Allowances / alternates not specifically noted above

11. Engineering work of any kind
12. 3rd Party testing of any kind not specifically noted above
13. Duct cleaning
14. Taxes

Bart Hoover
Chief Estimator
512-908-1069
bart.hoover@csusa.us

PROPOSAL IS SUBJECT TO AND CONDITIONED UPON EACH OF THE FOLLOWING:

1. APPROVAL OF CONTRACTOR'S CREDIT BY MECHANICAL TECHNICAL SERVICES, L.P. AND/OR RECEIPT OF A CERTIFICATE SHOWING A PAYMENT BOND IS IN PLACE FOR THE BENEFIT OF ALL SUBCONTRACTORS.
2. THE EXECUTION BY BOTH PARTIES OF A DEFINITIVE WRITTEN CONTRACT.

NOTE: We may withdraw quote if not accepted within 30 days.

Regulated by the Texas Department of Licensing and Regulation, PO Box 12157, Austin, TX. 78711 1-800-803-9202, 512-463-6599



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.271 (SN: 6844464-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RQ-005-3-V-GA02-312:A000-E0D-QJD-B00-0DKAHB5-00-00000000B

Tag: 5 TON

Job Information

Job Name: WILLIAMSON COUNTY JUVENILE RTU
Job Number: Job #7292154
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

Approx. Op./Ship Weights: 973 / 973 lbs. (±5%)
Supply CFM/ESP: 1750 / 0.75 in. wg.
Final Filter FV / Qty: 315.00 fpm / 2
Outside CFM: 250
Ambient Temperature: 105 °F DB / 75 °F WB
Return Temperature: 75 °F DB / 62 °F WB

Static Pressure

External: 0.75 in. wg.
Evaporator: 0.27 in. wg.
Filters Clean: 0.12 in. wg.
Dirt Allowance: 0.35 in. wg.

Economizer: 0.11 in. wg.
Heating: 0.25 in. wg.
Cabinet: 0.07 in. wg.
Total: 1.97 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	53.70	50.50 MBH
Sensible Capacity:	46.85	43.64 MBH
Latent Capacity:	6.85 MBH	
Mixed Air Temp:	79.29 °F DB	64.09 °F WB
Entering Air Temp:	79.29 °F DB	64.09 °F WB
Lv Air Temp (Coil):	54.05 °F DB	53.35 °F WB
Lv Air Temp (Unit):	55.73 °F DB	54.05 °F WB
Supply Air Fan:	1 x RQ185-VFD @ 1.03 BHP	
SA Fan RPM / Width:	1532 / 3.000"	
Evaporator Coil:	5.3 ft ² / 4 Rows / 14 FPI	
Evaporator Face Velocity:	333.3 fpm	

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Nat. Gas Heat
Heating CFM: 1750
Total Capacity: 48.6 MBH
OA Temp: 10.0 DB / 9.0°F WB
RA Temp: 75.0 °F DB / 62.0 °F WB
Entering Air Temp: 65.7 °F DB / 56.8 °F WB
Leaving Air Temp: 91.4 °F DB / 65.9 °F WB
Input: 60.0 MBH
Heater Qty (Hi/Low): 1
Consumption: 60.0 MBH
Operation: N/A
Total Turndown Ratio: 1.4:1

Re-Heat Coil:

Capacity: 30 MBH
LA DB / WB: 70.00 °F / 59.59 °F
RH: 54%

Rating Information

Cooling Capacity (MBH): 57.0
Cooling SEER: 16.75
Cooling EER: 13.3
Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 9.3

Electrical Data

Rating: 460/3/60
Unit FLA: 12

Minimum Circuit Amp: 14
Maximum Overcurrent: 20

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			7.6
Condenser Fans:	1	0.333	230	1	1110	2.8	
Supply Fan:	1	2.00	460	3	1760	3.4	
Combustion:	1	0.09	460	1	3000	0.7	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	83	82	83	78	71	69	66	61
Return LW(dB):	79	77	74	65	63	61	55	48

*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.



18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.271 (SN: 6844464-)

JOB INFORMATION:

Job Name: WILLIAMSON COUNTY
Job Tag: JUVENILE RTU
Rep Firm: 5 TON
Date: 08/15/2018
08/15/2018

WHEEL SPECIFICATION:

Max RPM: 2,200
Diameter x Qty: 18.5 in. x 1
CFM: 1750
Tip Speed: 1750
Inertia: 7,420 FPM
7,420 FPM

OPERATING CONDITIONS:

Air Flow: 1,750 CFM
Static Pressure: 1.97 in. Wg.
Relief Dampers DP: 0.00 in. Wg.
TSP: 1.97 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 1.97 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 2 / No
Frame Size: 48
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Standard / 0.815
Enclosure Type: ODP
Max Inertial Load: 27 WR²

FAN PERFORMANCE:

RPM: 1532
BHP: 1.03
Efficiency: 52.9%
In/Out Velocity: / FPM
Plenum Out Velocity: 29 FPM

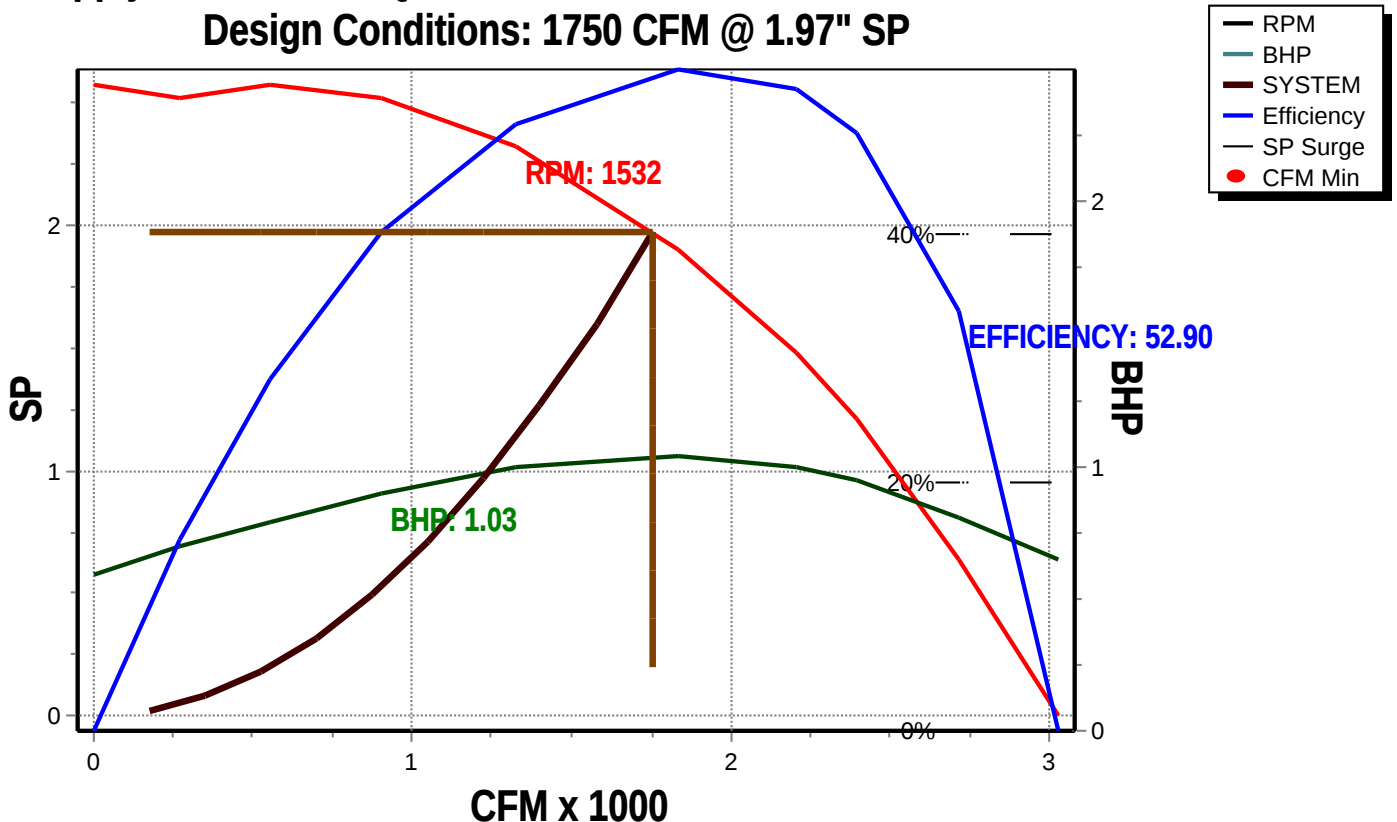
FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)					
1	2	3	4	5	6	7	8
83	82	83	80	74	72	70	65
83	82	83	80	74	72	70	65

SOUND POWER A-Weighted: 84 / 84 dB

Max Duct SP with Blocked Airway: 2.6 in. Wg. @ 1532 rpm

Supply Fan Model: RQ185-VFD @ 1532 RPM and 100% Width
Design Conditions: 1750 CFM @ 1.97" SP





Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.271 (SN: 6844464-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RQ-005-3-V-GA02-312:A000-E0D-QJD-B00-0DKAHB5-00-00000000B

Tag: 5 TON

Job Name:
Job Number:

WILLIAMSON COUNTY JUVENILE RTU
Job #7292154

Unit Submittal For:
Unit Submittal Date:

August 15, 2018

	Base Option	Description
R	Series	Roof Top Unit
Q	Generation	Tenth Generation
005	Unit Size	Five
3	Voltage	460V/3Ø/60Hz
V	Interior Protection	Vertical Discharge and Return
G	Refrigerant Style	R-410A Two-Step Compressor - High Efficiency
A	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
0	Coil Coating	Standard
2	Cooling/Heat Pump Staging	2 Stage
3	Heating Type	Natural Gas Stainless Steel
1	Heating Designation	Heat 1 - 60 MBtuh
2	Heating Staging	2 Stage

	Feature Option	Description
A	1A. RA/OA Section	Economizer
0	1B. RA/EA Blower Configuration	Standard - None
0	1C. RA/EA Blower	Standard - None
0	1D. RA/EA Blower Motor	Standard - None
E	2. OA Control	DDC Actuator
0	3. Heat Options	Standard
D	4. Maintenance Options	Remote Start/Stop Terminals - Low Voltage Terminal Block
Q	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
J	5B. SA Blower	19" Direct Drive Backward Curved Plenum
D	5C. SA Motor	2 HP 1760 rpm
B	6A. Pre Filter Type	Metal Mesh OA Pre Filter
0	6B. Unit Filter Type	2" Pleated - MERV 8
0	6C. Filter Options	Standard
0	7. Refrigeration Control	Standard - Fixed 55°F Comp. Cooling Lock Out
D	8. Refrigeration Options	Modulating Hot Gas Reheat
K	9. Refrigeration Accessories	ECM Condenser Fan - Head Pressure Control + Sight Glass
A	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
H	11. Safety Options	Remote Safety Shutdown Terminals
B	12. Controls	Phase & Brown Out Protection
5	13. Special Controls	Field Installed DDC Controls by Others + Isolation Relays
0	14A. Preheat Configuration	Standard - None
0	14B. Preheat Sizing	Standard - None
0	15. Glycol Percent	Water or No WSHP
0	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
0	17. Exterior Cabinet Options	Standard
0	18. Customer Code	Standard
0	19. Code Options	Standard - ETL U.S.A. Listing
0	20. Crating	Standard
0	21. Water-Cooled Cond.	Standard - None
0	22. Control Vendors	Standard
B	23. Type	Standard - Includes AAON Gray Paint



Control Terminals

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.271 (SN: 6844464-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RQ-005-3-V-GA02-312:A000-E0D-QJD-B00-0DKAHB5-00-00000000B

Tag: 5 TON

Job Name:

**WILLIAMSON COUNTY
JUVENILE RTU**

For:

Job Number:

Job #7292154

Date:

August 15, 2018

Terminals Available/Required for Controlling the Unit

Terminal	Description
[R]	24VAC Control Voltage
[E]	Common
[G]	Supply Fan Enable + Isolation Relay
[Y1]	Cooling Stage 1 Enable + Isolation Relay
[Y2]	Cooling Stage 2 Enable + Isolation Relay
[W1]	Heating Stage 1 Enable + Isolation Relay
[W2]	Heating Stage 2 Enable + Isolation Relay
[EC1-] & [EC2+]	Economizer Signal (2-10VDC)
[ST1] & [ST2]	Remote Start/Stop of the Unit
[S1-] & [S2+]	Supply Fan 1 - w/1 VFD: Signal (0-10VDC) <i>VFD frequency reference signal control point must handle a rated 20k ohm input impedance.</i>
[RH1]	Reheat Enable + Isolation Relay <i>Must enable and modulate the digital compressors during dehumidification mode. The control logic needs to set if cooling or dehumidification is priority.</i>
[AI1] & [COM]	Reheat Reset Signal (0-10VDC) <i>Resets the supply air setpoint</i>
[BI1] & [BI2]	Remote Safety Shutdown
[PBO1] & [PBO2]	Phase & Brown Out

Terminations Found On VFD

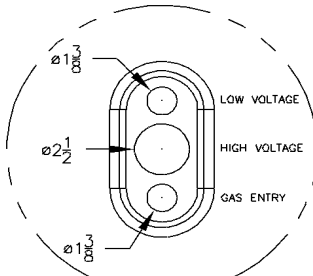
Supply Fan VFD	J1000:std 1-2HP VFD <i>Upgrade 1-5HP to V1000 by SPA for run status</i>
[AM] & [AC]	Current Feedback (0-10VDC = 0-100%)
[MA] & [MC]	Fault Status (NC, 250VAC/30VDC, 1A)

RQ CABINET ECONOMIZER VERTICAL ~ 1-6 TON

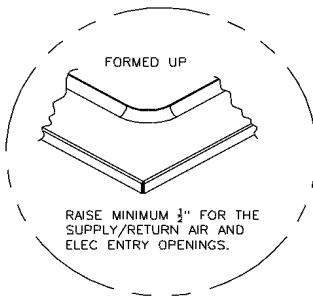
CLEARANCES

LOCATION	• UNIT SIZE •
	1 - 6 TON
OUTSIDE AIR (BACK)	36*
HXC (FRONT)	36
LEFT SIDE	24
RIGHT SIDE	48
TOP	UNOBSTRUCTED

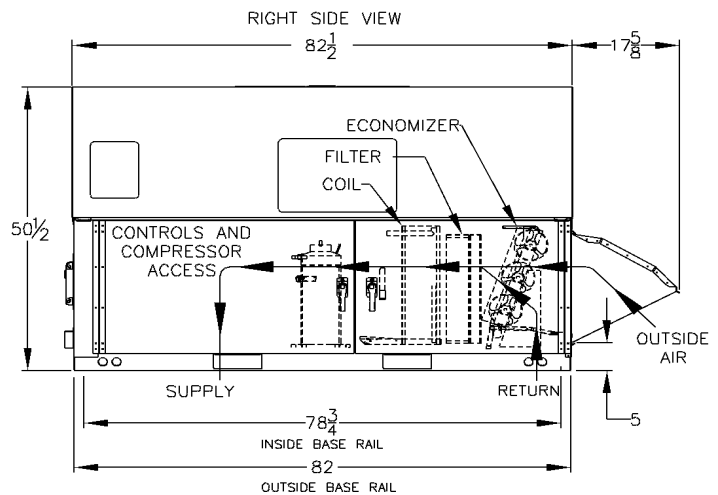
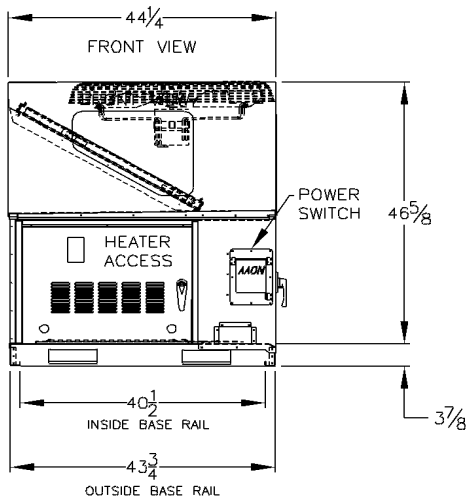
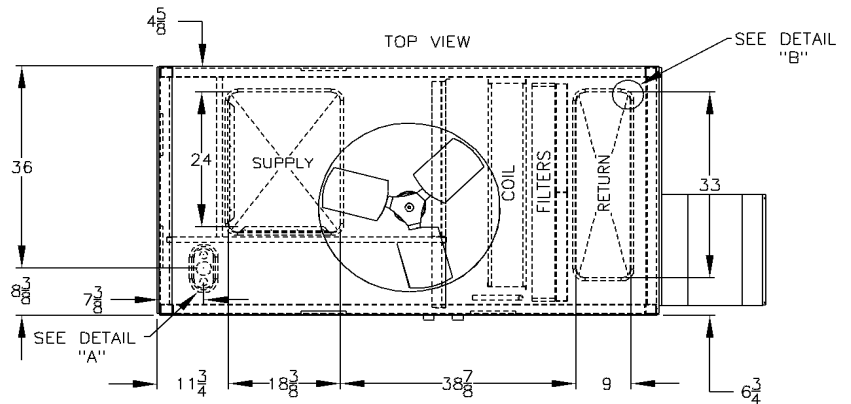
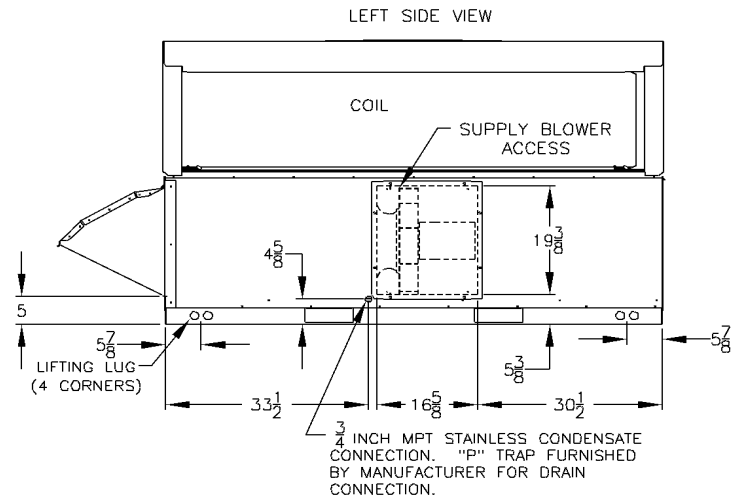
*CLEARANCE IS MEASURED FROM THE END OF THE OUTSIDE AIR RAIN HOOD



DETAIL A



DETAIL B



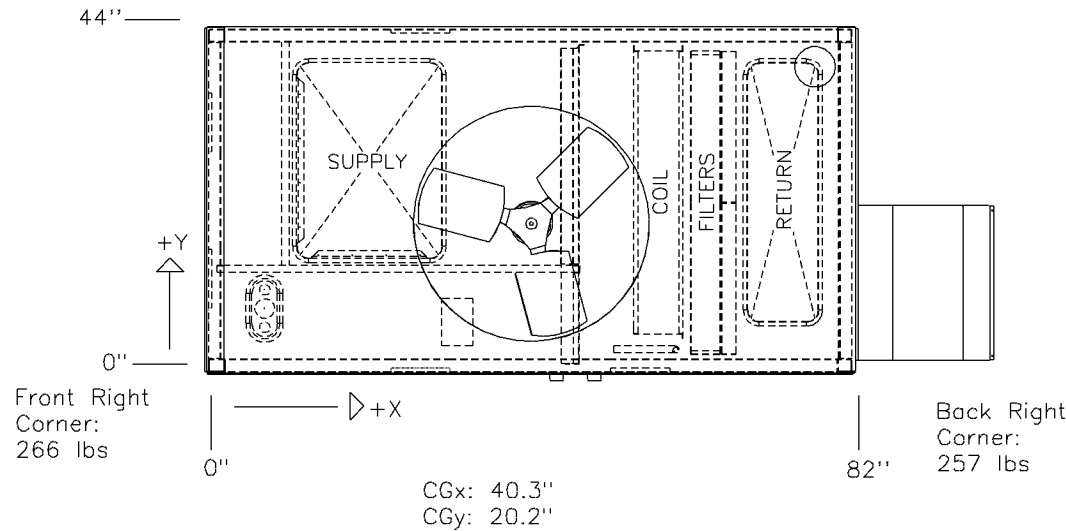
RQ CABINET VERTICAL AIR COOLED CONDENSING UNIT



RQ-005-3-V-GA02-312:A000-E0D-QJD-B00-0DKAHB5-00-00000000B

Front Left
Corner:
228 lbs

Back Left Corner:
221 lbs



Total Weight:
973 lbs ($\pm 5\%$)

Disclaimer:
This weight estimate does not account for any SPAs.