

Appendix C Air Conditioning Additional Information

Example of Product Data Sheet for Bryant 113A Legacy Line 13 SEER:

A-WEIGHTED SOUND POWER LEVEL								
UNIT SIZE - SERIES (VOLTAGE)	STANDARD RATING dBA	TYPICAL OCTAVE BAND SPECTRUM (dBA, without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18-G (N)	71	64.0	62.0	63.0	68.0	64.0	62.0	57.0
24-H (N)	74	50.9	60.6	66.4	71.0	65.5	61.1	59.2
30-G (N)	72	54.8	59.3	65.1	68.2	66.4	61.6	57.3
30-E (P)	74	55.0	63.5	68.5	68.5	65.5	61.0	54.0
36-I (N)	75	50.5	61.0	64.5	67.0	62.5	60.0	52.5
36-E (PE)	75	59.5	63.0	68.5	70.0	65.5	61.5	53.5
42-C (N,PE)	78	57.5	65.0	71.0	73.0	70.5	67.5	62.5
48-J (N)	76	55.5	62.9	69.6	71.2	69.5	66.3	59.1
48-E (PE)	80	58.5	67.5	73.5	75.0	70.5	67.5	64.5
60-H (N)	79	57.5	67.0	72.0	75.0	72.5	68.0	61.0
60-G (PE)	79	59.5	69.5	72.5	73.5	71.0	68.0	63.5

NOTE: Tested in accordance with AHRI Standard 270-2008 (not listed in AHRI).

A-WEIGHTED SOUND POWER LEVEL WITH SOUND SHIELD								
UNIT SIZE - SERIES (VOLTAGE)	STANDARD RATING dBA	TYPICAL OCTAVE BAND SPECTRUM (dBA, without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18-G (N)	70	66.0	64.0	64.0	67.0	63.0	60.0	54.0
24-H (N)	74	51.1	61.3	66.6	71.2	65.0	60.0	55.6
30-G (N)	72	51.9	59.3	64.8	67.3	65.2	61.1	54.8
30-E (P)	73	55.5	64.0	68.0	67.0	64.0	60.0	52.5
36-I (N)	75	51.0	62.0	64.5	65.5	62.0	59.5	51.5
36-E (PE)	74	59.5	63.0	68.0	69.5	65.0	60.5	50.5
42-C (N,PE)	77	57.5	65.0	70.5	72.0	70.0	67.0	62.0
48-J (N)	75	55.8	62.6	69.7	70.6	68.7	65.4	58.6
48-E (PE)	79	60.5	67.5	73.5	74.5	71.0	68.0	63.5
60-H (N)	79	57.5	68.0	72.5	74.5	72.5	68.0	60.5
60-G (PE)	78	60.5	69.5	72.5	73.0	71.0	67.5	61.5

NOTE: Tested in accordance with AHRI Standard 270-2008 (not listed in AHRI).

Example of Product Data Sheet for Bosch Heat Pump Inverter 18 SEER:

Model	Sound Power Level [dB(A)]	Full Octave Linear Sound Power Level dB -Center Frequency -Hz								Sound Power Level [dB(A)] with Sound Blanket
		100	125	250	500	1000	2000	4000	8000	
3 Ton	56 (Low)	26.1	28.9	37.5	44.4	48.1	42.5	47.1	40.7	Sound Blanket - Standard
	77 (High)	48.4	54.3	60.5	66.2	68.7	63.6	62.3	53.7	
5 Ton	60 (Low)	30.5	36.0	47.6	50.1	48.5	50.1	50.5	41.3	
	79 (High)	51.6	47.6	62.3	67.0	68.6	64.2	64.6	56.5	

Example of Product Data Sheet for Trane XR16 Side Discharge 16 SEER:

MODEL	A-Weighted Sound Power Level [dB(A)]	Full Octave Sound Power (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
4TWL6018A1	69	72	70	72	66	65	59	52	44
4TWL6024A1	69	72	72	71	66	65	59	53	43
4TWL6030A1	70	72	76	72	68	65	60	52	44
4TWL6036A1	71	72	77	74	68	65	59	53	46
4TWL6042A1	71	75	75	73	68	66	60	53	46
4TWL6048A1	74	75	80	77	70	68	62	54	48

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Sound Power Level Charts

Acceptable sound power level in decibels for proposed units when measured from middle of unit to property line during Daytime:

Sound Power Level	Minimum Distance to Meet the 55 dBA Limit without Mitigation	Minimum Distance to meet the 55 dBA Limit with Mitigation
Less than or equal to 70	5 feet	n/a
71-75	10 feet	5 feet
76-79	15 feet	10 feet
80-81	20 feet	15 feet
82-83	25 feet	15 feet
84-85	30 feet	20 feet
86	35 feet	20 feet

Acceptable sound power level in decibels for proposed units when measured from middle of unit to property line during Nighttime:

Sound Power Level	Minimum Distance to Meet the 45 dBA Limit without Mitigation	Minimum Distance to meet the 45 dBA Limit with Mitigation
Less than or equal to 60	5 feet	n/a
61-65	10 feet	5 feet
66-69	15 feet	10 feet
70-71	20 feet	15 feet
72-73	25 feet	15 feet
74-75	30 feet	20 feet
76	35 feet	20 feet

The purpose of this section is to maintain an acceptable level of noise from mechanical units. The intent is to align with Washington Administrative Code 173-60 Maximum Environmental Noise Levels. WAC Code 173-60 applies to residential properties adjacent to residential properties in which mechanical units are planned to be installed and must follow the below noise limit times:

- *Between the hours of 7:00 AM to 10:00 PM, noise at the adjacent residential property from the mechanical unit must not exceed 55 dBA*
- *Between the hours of 10:00 PM to 7:00 AM, noise at the adjacent residential property from the mechanical unit must not exceed 45 dBA*



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Sound Pressure Level Charts

The following sound level charts are based on sound pressure levels compared to sound power level, which is a less common sound level rating for outdoor air conditioning units and heat pumps. Typically, the manufacturers who publish these sound ratings are international, such as Mitsubishi.

Acceptable sound pressure level in decibels for proposed units when measured from middle of unit to property line during Daytime:

Sound Pressure Level dBA at 5 ft	Minimum Distance to Meet the 55 dBA Limit without Mitigation	Minimum Distance to meet the 55 dBA Limit with Mitigation
Less than or equal to 55	5 feet	n/a
56-60	10 feet	5 feet
61-64	15 feet	10 feet
65-67	20 feet	15 feet
68-69	25 feet	15 feet
70	30 feet	20 feet
71	35 feet	20 feet

Acceptable sound pressure level in decibels for proposed units when measured from middle of unit to property line during Night time:

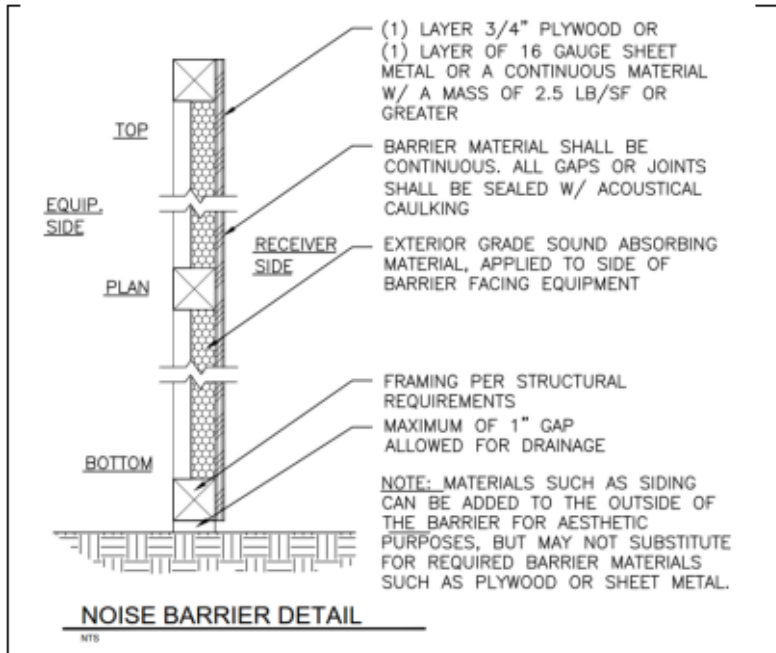
Sound Pressure Level dBA at 5 ft	Minimum Distance to Meet the 45 dBA Limit without Mitigation	Minimum Distance to meet the 45 dBA Limit with Mitigation
Less than or equal to 45	5 feet	n/a
46-50	10 feet	5 feet
51-54	15 feet	10 feet
55-57	20 feet	15 feet
58-59	25 feet	15 feet
60	30 feet	20 feet
61	35 feet	20 feet

Noise Mitigation

If the mechanical units are placed in the distance between the two columns of the applicable minimum distance tables above, they will need to have five (5) dBA of mitigation to meet the limit. To provide the necessary noise reduction, a noise barrier will need to be constructed as follows:

- Install a noise barrier between the mechanical unit and the nearest property line.
 - The noise barrier should be as close to the unit(s) while maintaining proper clearances outlined by the manufacturer for access and airflow.
 - The noise barrier should be constructed in a “U” shaped with the short sides extending from the main portion of the barrier to in line with the property line side of the mechanical unit. The house itself can be part of the noise barrier.
- The top of the noise barrier shall be six (6) feet above grade.
- Construct the noise barrier with a continuous solid material that has a surface area of at least two (2) lbs/sq ft. The following are common barrier materials that meet this requirement:
 - 3/4-inch exterior grade plywood
 - 16-gauge sheet metal
 - HardiPanel Vertical Siding or HardiBacker 1/2-inch
- Additional siding can be installed for aesthetic purposes but should not replace the required mass layer of the barrier material.
- Line the barrier around the equipment with sound absorbing material that has a minimum Noise Reduction Coefficient (NRC) of 0.70.
 - The extents of the barrier shall be fully lined on the equipment side.
 - Recommended products for this application include minimum 1” thick polyester absorption panels
 - F-Sorb polyester acoustical panels
 - PolySorb polyester acoustical panels
 - Pyrotek Sorberpoly 2D polyester acoustical panels

Noise Barrier Detail:



Example Site Plan to Noise Barrier:

