

Appendix I

Noise Supporting Information

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Appendix I1

RCNM Calculations

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Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 1/15/2021

Case Description: UCR LRDP General Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Residential	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	50	0
Excavator	No	40		80.7	50	0
Front End Loader	No	40		79.1	50	0

Results

Equipment	Calculated (dBA)	
	*Lmax	Leq
Dump Truck	76.5	72.5
Excavator	80.7	76.7
Front End Loader	79.1	75.1
Total	80.7	79.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/25/2021

Case Description: UCR LRDP General Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Residential	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	75	0
Excavator	No	40		80.7	75	0
Front End Loader	No	40		79.1	75	0

Results

Equipment		Calculated (dBA)	
		*Lmax	Leq
Dump Truck		72.9	68.9
Excavator		77.2	73.2
Front End Loader		75.6	71.6
Total		77.2	76.4

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/25/2021

Case Description: UCR LRDP General Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Residential	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	100	0
Excavator	No	40		80.7	100	0
Front End Loader	No	40		79.1	100	0

Results

Equipment	Calculated (dBA)	
	*Lmax	Leq
Dump Truck	70.4	66.5
Excavator	74.7	70.7
Front End Loader	73.1	69.1
Total	74.7	73.9

*Calculated Lmax is the Loudest value.

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Appendix I2

HVAC Analysis

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QuietCurb™

What is QuietCurb™ ?



An innovative "Quiet Comfort" option

The **QuietCurb™** is an acoustically-engineered roof curb product which further enhances the Trane IntelliPak by **reducing operating sound power levels**. In some sizes, the Trane rooftop, with the **QuietCurb** accessory, is as much as 18 NC lower than the equivalent size competitive model! Read on and COMPARE.



TRANE®

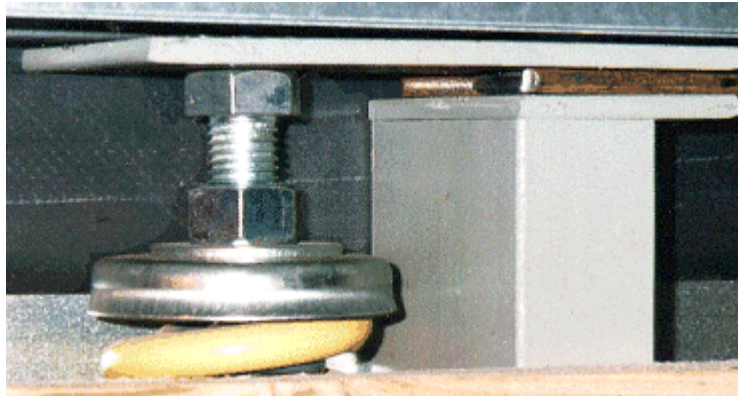
Unitary Products Group

QuietCurb™

How Does it Work?

Addresses the Three Major Components of Rooftop Generated Sound

The curb prevents regenerated noise (vibratory noise resulting from the transmission of sound from a turbulent fluid or mechanical source) through the use of an integral spring-vibration isolation rail. [Installer's Guide](#)



High frequency components of rooftop noise are absorbed by the High density insulation lining the interior of the curb.



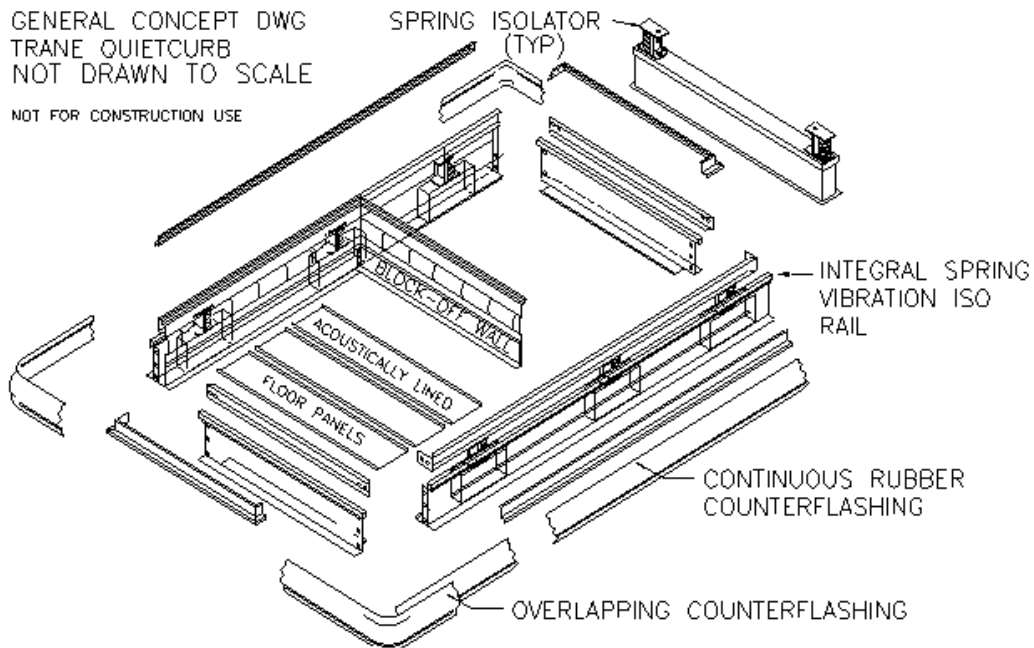


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QuietCurb™

Low frequency noise is reduced / eliminated through the use of a unique air flow path-plenum design which reduces air turbulence and permits the low frequency noise to "break out" above the roof line before entering the building.



What products can QuietCurb™ be applied to?

IntelliPak™ Packaged Rooftops

The entire line of 20 - 130 ton IntelliPak packaged rooftops and roof-mounted air handling products which have the extended ("X-casing") design, i.e. all SX (extended casing-cooling only), SF (cooling with gas heat), SS (cooling with steam heat), SL (cooling with hot water heat), and SE (cooling with electric heat) models. The curb is not available for SA models (this is because the SA model rooftops should never be chosen for applications where noise is a concern - they are typically up to 6 dB louder than the equivalent extended-casing model)



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QuietCurb™

Features & Benefits

Up to 18 NC quieter than competitive offerings.

Easy and quick to install curb ships fully assembled.

Spring isolated curb with special air flow plenum design addresses all major components of rooftop generated noise.

Seismic option available to meet seismic criteria in most regions of the U.S.

Applicable to IntelliPak packaged rooftops and air handlers and, C & E-style units which are design sequence "P" and "H" or higher respectively.

Quick production cycle curb cycle is 2 - 4 weeks.

Product Positioning

Sound Sensitive Applications - always apply QuietCurb.

Potentially Sound Sensitive Applications - QuietCurb is strongly recommended with extended casing models (SE, SF, SL, SS & SX) should be utilized.

Sound is Not a Concern - the lower cost SA model may be bid



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in lieu of an SX. Keep in mind that utilization of the SA usually results in about 6 dB sound penalty - versus an SX.

Selling Strategy

Actual Test Results - confirm that QuietCurb is a real solution producing real quiet comfort results.

Octave Band Sound Power Level Data - is provided to document the acoustical performance of QuietCurb.

Factory Assembly - minimizes field labor time and expense and assures the customer that he/she will get consistent, repeatable results each time QuietCurb is applied.

Patent Pending Design - QuietCurb is a unique development in quiet comfort technology which is easily differentiable from field-fabricated/other competitive solutions.



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How Do I Order the QuietCurb

QuietCurb model numbers and pricing are available through the LYNX™ Productivity Suite. The curbs are build-to-order and have a 2-4 week production cycle

WHEN ENTERING THE ORDER YOU MUST INCLUDE THE PRODUCT CODE (394), QUANTITY, AND ASSOCIATED SPECIFIC CURB MODEL NUMBER(S).

The QuietCurb model number nomenclature is shown on the following page.

Stock or Build-to-order (BTO)?

Note: Curbs are **build-to-order** items only, just as the large rooftop products are. However, the curbs will be available on a shorter 2-4 week production cycle.

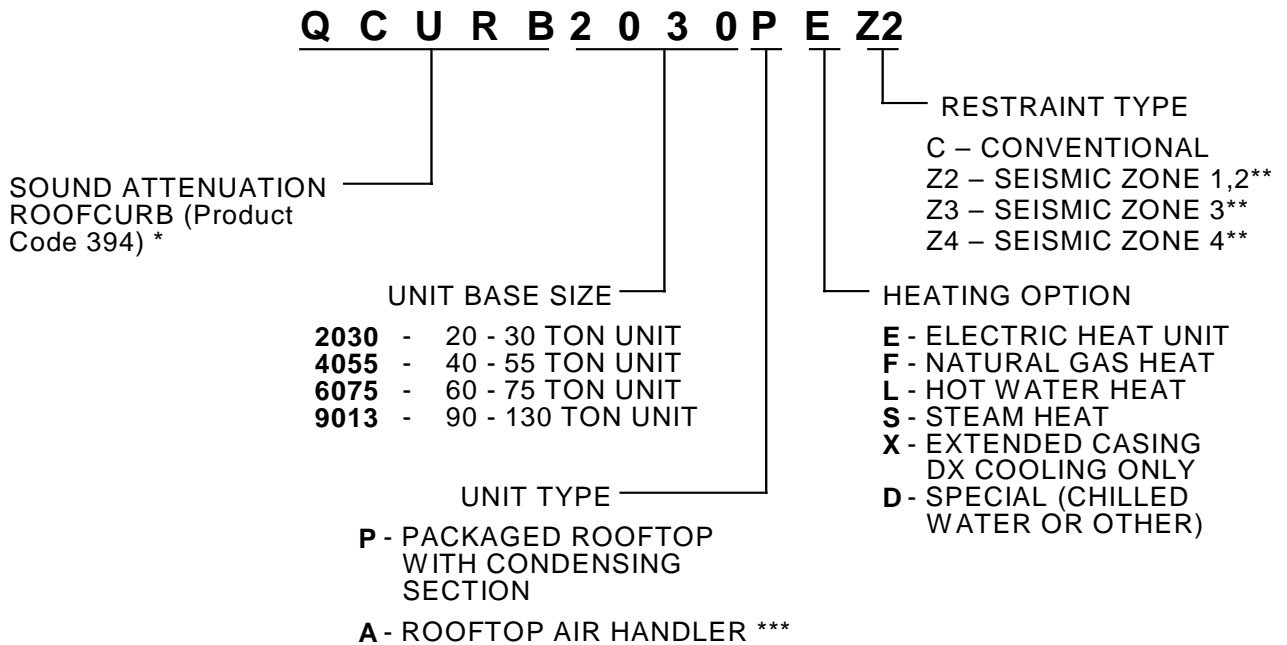
Call the Customer Service-Order Entry team at 1-800-235-9226 for assistance.



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** A full set of stamped calculations that are prepared by professional engineers for a specific project, in its specific seismic region, may be obtained by adding a "J" as the last digit of the ordering number. (Example: QCURB2030ADZ2J for a zone 2 seismic curb with job specific calculations). For more information, contact ThyBar Corp. at 1-800-666-CURB.

*** If a chilled water air handler is ordered the complete model number must be provided to identify coil type chosen / coordinate thru-the-curb piping locations.



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QuietCurb™ Applications

Frequency Inverters

Variable Frequency Drives (VFD) or frequency inverters are recommended for air flow modulation (versus inlet guide vanes or discharge dampers) where noise is a concern. Testing on the 40 ton unit has shown that inverters modulate air flow more quietly than damper controls. On the 40 ton unit, NC levels dropped as low as NC-26 - well below normal background noise when an inverter was applied.

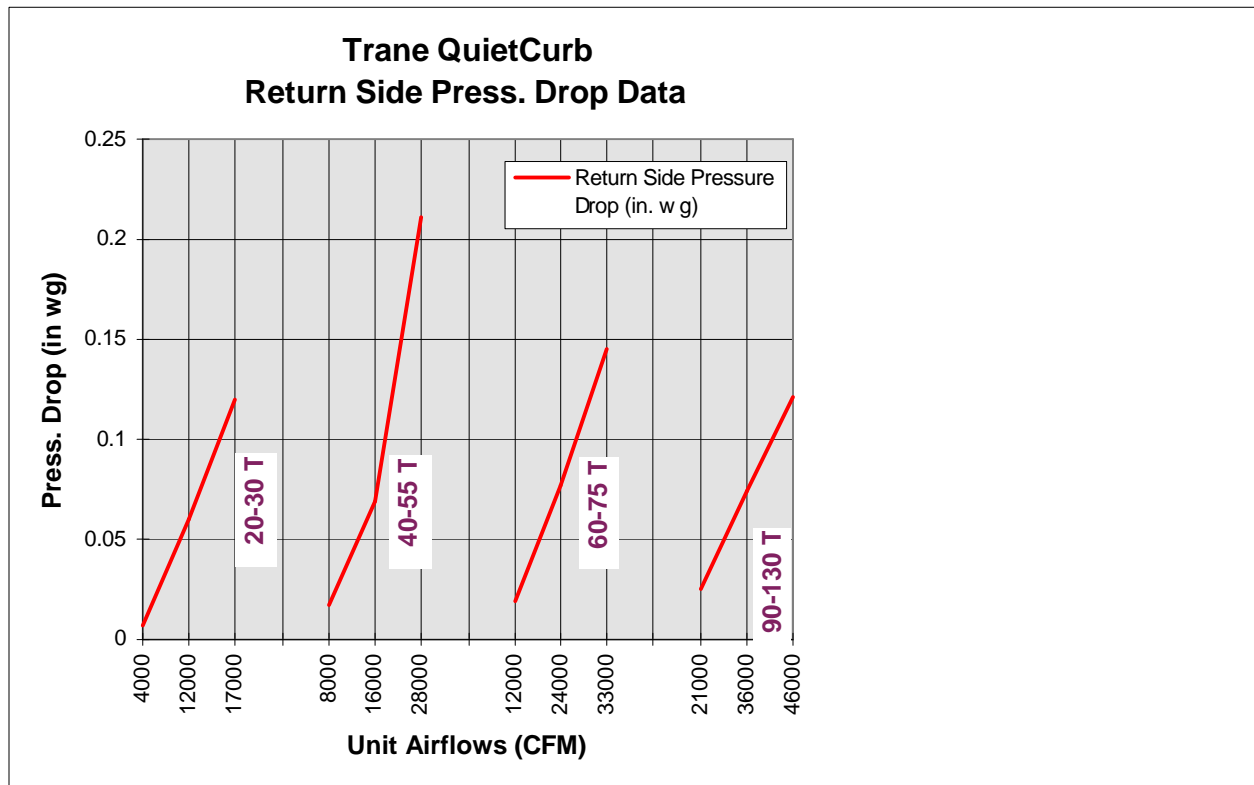
Flexible Connections

When applying the **QuietCurb™** it is of **utmost importance** that all rigid connections to the unit (i.e hot water piping, chilled water piping, steam piping, natural gas piping, electrical conduit...etc.) integrate a flexible loop or coupling connector to allow the spring isolators in the curb to "free float". Any rigid connections to the unit will negate the benefit of the spring curb causing it to "short circuit" transmitting vibration through the rigid connections to the building structure.

USE FLEXIBLE TRANSITIONS OR COUPLINGS AT THE ROOFTOP TO AVOID REGENERATED NOISE PROBLEMS.

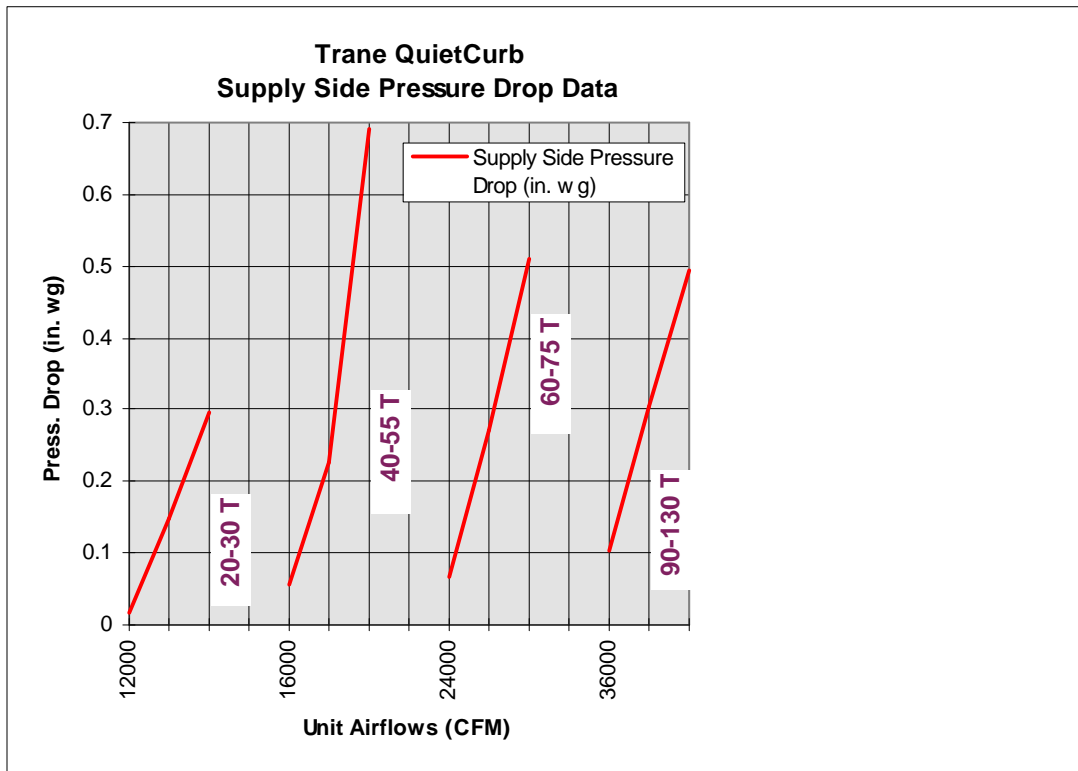
Trane Quiet Curb Return Side Pressure Drop Data

	Unit Airflow CFM	Return Side Pressure Drop (in. wg)	Supply Side Pressure Drop (in. wg)	Total Curb Pressure Drop (in. Wg)
20 - 25 - 30	4000	0.007	0.016	0.023
	12000	0.06	0.147	0.207
	17000	0.12	0.295	0.415
40 - 50 - 55	8000	0.017	0.057	0.074
	16000	0.069	0.226	0.295
	28000	0.211	0.693	0.904
60 - 70 - 75	12000	0.019	0.068	0.087
	24000	0.077	0.27	0.347
	33000	0.145	0.511	0.656
90 - 105 - 115 - 130	21000	0.025	0.103	0.128
	36000	0.074	0.303	0.377
	46000	0.121	0.494	0.616



Trane QuietCurb Supply Side Pressure Drop

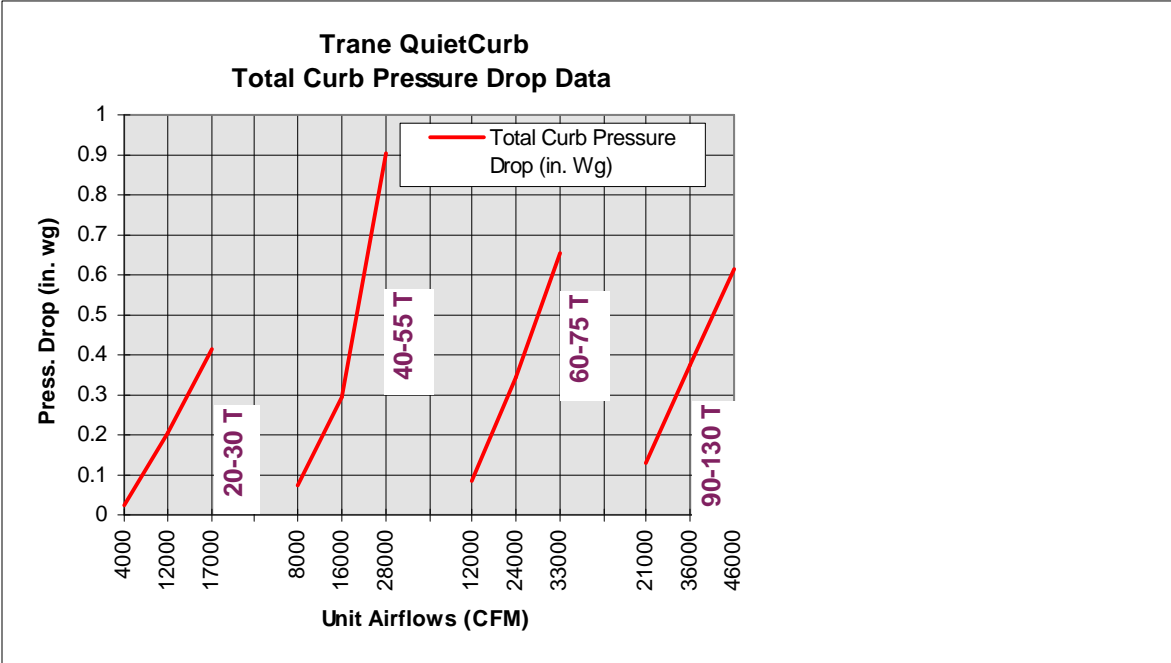
	Unit Airflow CFM	Supply Side Pressure Drop (in. wg)
20 - 25 - 30	4000	0.016
	12000	0.147
	17000	0.295
40 - 50 - 55	8000	0.057
	16000	0.226
	28000	0.693
60 - 70 - 75	12000	0.068
	24000	0.27
	33000	0.511
90 - 105 - 115 - 130	21000	0.103
	36000	0.303
	46000	0.494



Trane QuietCurb

Total Curb Pressure Drop

	Unit Airflow CFM	Total Curb Pressure Drop (in. Wg)
20 - 25 - 30	4000	0.023
	12000	0.207
	17000	0.415
40 - 50 - 55	8000	0.074
	16000	0.295
	28000	0.904
60 - 70 - 75	12000	0.087
	24000	0.347
	33000	0.656
90 - 105 - 115 - 130	21000	0.128
	36000	0.377
	46000	0.616



For standard curb sound data, see RT-EB-80.

**COMMERCIAL PACKAGED ROOFTOP WITH QUIETCURB
SX, SF, SE, SL, SS 20 & 25 Ton Supply Fan - Sound Power Levels**

Discharge Lw, dB

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K	63	125	250	500	1K	2K	4K	8K
5000	1.5	872	80	71	58	54	51	48	44	42	73	68	61	58	55	54	47	43
5000	2	1000	82	74	61	56	54	50	47	46	76	71	64	60	58	57	50	47
5000	2.5	1109	84	76	63	58	56	52	49	48	77	73	65	62	61	60	53	50
5000	3	1206	85	77	65	58	57	53	51	50	79	74	67	63	62	61	55	52
5000	3.5	1293	87	79	66	60	58	54	52	51	81	76	69	64	64	63	56	54
5000	4	1374	88	80	68	61	59	55	53	52	82	77	70	65	65	64	58	55
5000	4.5	1449	90	81	69	62	60	56	54	53	83	78	71	67	66	65	59	57
5000	5	1519	91	82	69	62	61	57	55	54	85	79	72	67	67	66	60	58
5000	5.5	1585	91	83	70	63	62	57	56	55	86	80	73	68	68	67	61	59
5000	6	1648	92	84	71	64	62	58	56	56	86	81	74	69	68	68	62	60
7000	1.5	892	80	72	59	55	53	49	46	43	73	68	62	59	57	56	47	43
7000	2	1018	82	75	62	57	55	52	49	47	75	71	64	61	60	59	50	47
7000	2.5	1131	84	77	64	58	57	53	51	49	77	73	66	63	62	61	53	50
7000	3	1233	86	79	66	60	59	54	53	51	79	75	68	64	64	63	55	52
7000	3.5	1327	87	80	67	61	60	56	54	52	81	76	69	66	65	64	57	54
7000	4	1413	89	81	69	62	61	57	55	54	82	78	71	67	66	65	58	55
7000	4.5	1493	90	82	70	63	62	58	56	55	84	79	72	68	67	66	59	56
7000	5	1567	91	83	71	64	63	59	57	56	85	80	73	69	68	67	60	58
7000	5.5	1638	92	84	72	65	64	60	58	57	86	81	74	70	69	68	61	59
9000	1.5	928	81	73	61	57	54	51	49	45	74	69	63	60	58	57	48	44
9000	2	1038	82	75	63	58	57	53	51	48	75	71	65	62	61	59	51	47
9000	2.5	1151	84	78	65	60	59	54	53	50	77	73	66	64	63	62	53	50
9000	3	1252	86	79	67	61	60	56	54	52	79	75	68	65	65	63	55	52
9000	3.5	1344	88	81	68	62	61	57	55	53	81	77	70	67	66	65	57	53
9000	4	1431	89	82	69	63	62	58	56	54	82	78	71	68	67	66	58	55
9000	4.5	1514	90	83	70	65	63	59	57	55	83	79	72	69	68	67	59	56
9000	5	1591	91	84	71	65	64	60	58	56	85	80	73	70	69	68	61	57
11000	2	1088	83	77	65	60	58	54	53	49	76	72	65	63	62	61	52	48
11000	2.5	1181	85	79	66	61	60	56	54	51	77	74	67	65	64	62	54	50
11000	3	1271	86	80	67	62	61	57	55	52	79	76	69	66	65	64	55	52
11000	3.5	1364	88	81	69	63	62	58	56	54	81	77	70	67	67	65	57	53
11000	4	1452	89	83	70	64	63	59	57	55	82	78	71	68	68	67	58	55
11000	4.5	1533	90	84	71	65	64	60	58	56	83	80	73	70	69	68	60	56
11000	5	1609	92	85	72	66	65	61	59	57	84	81	74	70	70	69	61	57

EXHAUST FAN ----- Sound Power Levels

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K
4000	0.5	538	71	63	59	54	51	45	42	38
4000	1	730	74	67	64	60	57	54	51	46
4000	1.5	882	76	70	67	63	61	60	57	51
6000	0.5	570	71	64	61	57	53	48	44	40
6000	1	765	74	68	66	62	60	56	53	48
6000	1.5	912	76	71	69	65	63	62	59	53
8000	0.5	619	72	65	63	59	56	51	48	43
8000	1	797	74	69	67	64	61	58	56	50
8000	1.5	947	77	72	70	68	65	63	61	55
10000	0.5	712	73	68	66	63	60	56	53	48
10000	1	837	75	70	68	66	63	60	58	52
10000	1.25	911	76	72	70	67	65	63	60	55

COMMERCIAL PACKAGED ROOFTOP WITH QUIET ROOFCURB
SX, SF, SE, SL, SS 30 Ton Supply Fan - Sound Power Levels

Discharge Lw, dB

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K		63	125	250	500	1K	2K	4K	8K
8000	1.5	744	82	73	60	56	53	51	47	44		76	70	64	61	57	56	49	45
8000	2	857	85	76	63	59	55	53	50	47		79	73	67	63	60	59	52	48
8000	2.5	955	87	78	66	60	58	55	52	50		81	75	68	65	63	62	55	51
8000	3	1041	88	80	68	61	59	56	54	52		82	77	70	66	65	64	57	54
8000	3.5	1117	90	82	69	63	61	57	55	54		84	78	71	67	66	65	59	56
8000	4	1186	91	83	70	64	62	58	56	55		85	79	72	68	67	66	60	57
8000	4.5	1251	92	84	71	65	63	59	57	56		86	81	73	69	68	67	61	59
8000	5	1311	93	85	72	66	64	60	58	57		87	82	74	70	69	68	62	60
8000	5.5	1368	94	86	73	66	65	61	59	58		88	83	75	71	70	69	63	61
12000	1.5	760	83	74	61	57	55	52	49	45		76	71	65	62	59	58	49	44
12000	2	866	85	77	64	60	57	54	51	48		78	73	67	64	62	60	52	48
12000	2.5	964	87	79	66	61	59	55	54	51		80	76	69	66	64	63	55	51
12000	3	1053	88	81	68	63	61	57	55	53		82	77	70	67	66	65	57	53
12000	3.5	1136	90	83	70	64	63	59	57	55		83	79	72	68	68	66	59	55
12000	4	1213	91	84	71	66	64	60	58	56		85	80	73	69	69	68	60	57
12000	4.5	1286	92	85	73	67	65	61	59	58		86	81	74	71	70	69	62	58
12000	5	1354	94	86	74	68	66	62	60	59		87	82	75	72	71	70	63	60
13500	1.5	779	83	75	62	59	55	53	50	46		76	71	65	63	60	58	49	45
13500	2	875	85	77	64	60	57	55	52	49		78	74	67	65	62	61	52	48
13500	2.5	969	87	79	67	61	59	56	54	51		80	76	69	66	64	63	55	51
13500	3	1057	88	81	69	63	61	58	56	53		81	77	70	67	66	65	57	53
13500	3.5	1138	90	83	70	65	63	59	57	55		83	79	72	69	68	67	59	55
13500	4	1215	91	84	72	66	65	60	59	57		84	80	73	70	69	68	60	57
13500	4.5	1288	92	85	73	67	66	61	60	58		86	81	74	71	70	69	62	58
13500	5	1357	94	86	74	68	67	62	61	59		87	83	75	72	71	70	63	59

EXHAUST FAN ----- Sound Power Levels

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K
6000	0.5	570	71	64	61	57	53	48	44	40
6000	1	765	74	68	66	62	60	56	53	48
6000	1.75	975	78	73	70	67	65	64	61	55
8000	0.5	619	72	65	63	59	56	51	48	43
8000	1	797	74	69	67	64	61	58	56	50
8000	1.75	1013	78	74	72	69	67	65	63	57
10000	0.5	712	73	68	66	63	60	56	53	48
10000	1	837	75	70	68	66	63	60	58	52
10000	1.75	1045	79	74	73	71	69	67	64	58
12000	0.5	806	74	70	68	66	63	61	58	53
12000	1	905	75	72	70	68	65	64	61	55
12000	1.25	956	76	73	71	69	67	65	62	57

**COMMERCIAL PACKAGED ROOFTOP WITH QUIETCURB
SX, SF, SE, SL, SS 40, 50, & 55 Ton Supply Fan - Sound Power Levels**

Discharge Lw, dB

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K	63	125	250	500	1K	2K	4K	8K
12000	2	787	86	77	64	60	56	54	50	48	81	75	68	64	60	59	54	50
12000	2.5	876	88	80	67	62	58	55	53	51	83	77	70	66	63	62	56	53
12000	3	956	89	81	69	63	60	57	54	53	84	79	71	67	65	64	59	55
12000	3.5	1030	91	83	71	64	62	58	56	55	85	80	72	68	66	65	60	57
12000	4	1098	92	84	72	66	62	59	57	56	87	81	73	69	67	67	62	59
12000	4.5	1160	93	85	73	67	63	60	58	57	88	82	75	71	68	68	63	60
18000	1.5	725	85	77	64	60	56	54	50	47	79	73	66	64	59	58	52	47
18000	2	812	87	79	66	62	58	55	52	50	81	75	68	66	62	61	54	50
18000	2.5	893	88	80	68	63	59	57	54	52	82	77	70	67	64	63	57	53
18000	3	969	89	82	70	64	61	58	56	54	84	79	71	68	66	64	59	55
18000	3.5	1042	91	84	71	65	62	59	57	55	85	80	73	69	67	66	60	57
18000	4	1110	92	85	72	67	63	60	58	57	86	82	74	70	68	67	62	59
20000	2	857	88	81	68	64	59	58	55	52	82	77	69	67	63	62	56	51
20000	2.5	929	89	82	69	65	61	58	56	53	83	78	71	68	65	64	58	53
20000	3	998	90	83	71	66	62	59	58	55	84	80	72	69	67	65	59	55
20000	3.5	1064	91	85	72	67	64	60	59	56	85	81	73	70	68	67	61	57
20000	4	1128	92	86	73	68	65	61	60	58	86	82	74	71	69	68	62	59
24000	2	926	89	83	71	67	62	60	58	55	84	78	70	69	65	63	58	53
24000	2.5	983	90	84	72	67	63	61	59	56	84	79	72	69	67	65	59	55
24000	3	1043	91	85	73	68	64	61	60	57	85	80	73	70	68	67	60	56
24000	3.5	1102	92	86	73	69	65	62	60	58	86	82	74	71	69	68	61	58
24000	4	1161	93	87	74	69	66	63	61	59	87	83	75	72	70	69	63	59

EXHAUST FAN ----- Sound Power Levels

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K
9000	0.5	499	76	67	63	61	57	51	47	43
9000	1	618	78	70	67	65	62	57	53	49
9000	1.75	812	80	75	72	70	67	65	62	57
12000	0.5	496	75	67	64	62	58	51	48	44
12000	1	628	78	71	68	66	63	58	55	50
12000	1.75	817	80	75	73	71	68	66	63	58
15000	0.5	567	76	70	67	65	62	56	53	49
15000	1	667	78	72	70	68	65	60	57	53
15000	1.75	824	80	75	73	72	69	66	64	58
18000	0.5	642	78	72	69	68	65	61	58	53
18000	1	724	79	74	71	70	67	63	61	56
18000	1.75	856	80	76	74	73	71	68	65	60

**COMMERCIAL PACKAGED ROOFTOP WITH QUIETCURE
SX, SF, SE, SL, SS 60, 70, & 75 Ton Supply Fan - Sound Power Levels**

Discharge Lw, dB

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K	63	125	250	500	1K	2K	4K	8K
18000	1.5	633	84	80	65	60	55	53	51	48	79	73	66	63	58	57	52	48
18000	2	718	87	82	67	62	56	54	53	50	82	76	69	65	60	59	55	51
18000	2.5	791	88	84	69	64	58	56	55	52	83	78	70	67	62	62	57	53
18000	3	855	90	85	71	65	59	57	56	54	84	79	72	68	64	63	59	56
18000	3.5	913	91	87	72	66	61	58	57	56	86	81	73	69	65	65	61	58
18000	4	966	92	88	73	67	62	59	58	57	86	82	74	70	67	66	62	59
18000	4.5	1016	92	89	74	67	63	59	59	58	87	83	75	71	68	67	63	61
18000	5	1063	93	90	75	68	64	60	60	59	88	84	76	72	69	68	64	62
18000	5.5	1107	94	90	76	69	64	61	61	60	89	85	77	72	69	69	65	63
24000	1.5	659	85	81	66	63	56	54	53	49	80	74	67	64	59	58	53	48
24000	2	746	87	84	69	64	57	56	55	52	82	77	69	67	62	61	55	51
24000	2.5	821	89	85	71	65	60	58	57	54	84	79	71	68	64	63	58	54
24000	3	889	90	87	72	67	62	59	58	56	85	80	72	69	65	65	60	56
24000	3.5	951	91	88	74	68	63	60	60	58	86	81	74	70	67	66	61	58
24000	4	1008	92	89	75	69	64	61	61	59	87	83	75	71	68	67	63	60
24000	4.5	1060	93	90	76	70	65	62	61	60	88	84	76	72	69	68	64	61
24000	5	1109	94	91	77	71	66	62	62	61	89	85	77	73	70	69	65	62
28000	2	763	88	84	70	65	59	58	56	53	82	77	70	67	62	61	56	51
28000	2.5	839	89	86	72	67	61	58	58	55	84	79	72	69	65	63	58	54
28000	3	907	90	88	73	68	62	60	59	57	85	81	73	70	66	65	60	56
28000	3.5	969	92	89	75	69	64	61	61	58	86	82	74	71	68	67	62	58
28000	4	1028	93	90	76	70	65	62	62	60	87	83	75	72	69	68	63	60
28000	4.5	1082	94	91	77	71	66	63	63	61	88	84	76	73	70	69	64	61
32000	2	802	89	86	72	67	61	59	58	55	84	78	71	69	64	62	57	52
32000	2.5	858	90	87	72	68	62	60	59	56	84	80	72	70	65	64	59	54
32000	3	924	91	89	74	69	63	61	61	58	85	81	73	71	67	66	60	57
32000	3.5	988	92	90	75	70	65	62	62	59	86	82	74	72	68	67	62	58
32000	4	1046	93	91	76	71	66	63	63	60	88	84	75	73	70	68	63	60
32000	4.5	1100	94	92	77	72	67	64	64	61	89	85	77	74	71	70	65	61

**EXHAUST FAN ----- Sound Power Levels
Return Lw, dB**

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K
12000	0.5	423	73	66	60	57	53	52	49	43
12000	1	572	79	73	67	65	61	60	57	51
12000	1.75	740	84	78	73	71	68	66	63	57
18000	0.5	516	78	72	66	64	60	59	57	51
18000	1	607	81	75	69	67	63	62	59	53
18000	1.75	766	85	80	74	72	69	67	64	58
21000	0.5	578	81	75	69	67	64	63	60	55
21000	1	647	82	77	71	69	65	64	61	55
21000	1.75	781	86	80	75	72	69	68	65	59
27000	0.5	711	86	81	75	73	70	69	67	62
27000	1	761	86	81	75	73	70	69	66	61
27000	1.75	844	88	83	77	74	71	70	67	62

**COMMERCIAL PACKAGED ROOFTOP WITH QUIETCURB
SX, SF, SE, SL, SS 90 Ton Supply Fan - Sound Power Levels**

Discharge Lw, dB

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K		63	125	250	500	1K	2K	4K	8K
27000	2.5	992	85	80	71	66	61	55	51	46		79	73	72	64	58	58	58	47
27000	3	1053	86	80	73	68	61	56	53	48		79	74	74	65	59	59	59	48
27000	3.5	1111	87	81	74	68	62	56	54	49		80	74	75	66	60	60	59	49
27000	4	1167	87	82	76	69	64	57	55	50		80	75	77	67	62	61	60	50
27000	4.5	1223	88	83	77	70	65	58	56	52		81	76	78	68	63	62	60	50
27000	5	1277	89	84	78	71	66	59	57	53		82	77	79	69	64	63	61	51
27000	5.5	1330	91	85	79	72	66	60	58	54		83	78	81	71	65	64	61	52
27000	6	1382	92	86	81	73	67	61	59	55		84	79	82	72	66	64	62	53
27000	6.5	1434	93	87	82	74	68	62	60	56		84	80	83	73	67	65	62	54
37000	2.5	1156	87	83	77	71	65	57	55	50		80	75	77	67	62	60	59	49
37000	3	1204	87	83	78	72	66	58	56	51		80	76	78	68	63	61	60	49
37000	3.5	1253	88	83	79	73	66	59	57	52		81	76	79	69	63	62	60	50
37000	4	1300	88	84	80	73	67	60	58	53		81	77	80	70	64	63	60	51
37000	4.5	1343	89	84	80	74	68	61	58	54		82	77	81	70	65	63	61	51
37000	5	1386	90	85	81	74	68	61	59	55		82	78	82	71	66	64	61	52
37000	5.5	1431	90	85	82	75	69	62	60	56		83	78	82	72	67	64	61	53
37000	6	1475	91	86	83	76	70	62	61	57		83	79	83	73	67	65	61	54
37000	6.5	1517	92	87	84	76	71	63	61	58		84	79	84	73	68	65	62	54
45000	2.5	1302	88	85	81	75	69	61	58	54		81	77	80	70	65	63	60	51
45000	3	1348	89	85	82	76	70	62	59	55		82	77	81	71	66	63	61	51
45000	3.5	1390	89	86	83	76	70	62	60	56		82	78	82	72	66	64	61	52
45000	4	1430	90	86	83	77	71	62	60	56		82	78	83	72	67	64	61	53
45000	4.5	1470	90	86	84	77	71	63	61	57		83	79	83	73	67	65	61	53
45000	5	1509	91	87	85	78	72	63	61	58		83	79	84	73	68	65	61	54
45000	5.5	1549	91	87	86	78	73	64	62	59		84	80	85	74	69	65	61	54
45000	6	1587	92	87	87	79	73	64	63	59		84	80	86	74	69	66	62	55

EXHAUST FAN ----- Sound Power Levels

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K
27900	0.25	520	83	76	73	70	68	71	68	61
27900	0.75	580	84	76	73	71	69	69	65	59
27900	1.5	690	87	79	76	74	72	70	65	59
27900	2.5	800	91	82	78	76	75	73	68	62
35100	0.25	630	88	81	78	77	75	75	71	63
35100	0.75	690	88	81	78	77	75	73	69	61
35100	1.5	770	91	82	79	78	77	74	69	62
35100	2.5	880	94	85	81	80	79	76	71	64
41400	0.25	745	93	85	83	82	80	80	76	67
41400	0.75	780	92	84	82	81	79	77	73	65
41400	1.5	860	94	85	83	82	81	78	73	66
41400	2.5	950	96	87	84	84	82	78	72	65

**COMMERCIAL PACKAGED ROOFTOP WITH QUIETCURB
SX, SF, SE, SL, SS 105, 115, & 130 Ton Supply Fan - Sound Power Levels**

Discharge Lw, dB

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K		63	125	250	500	1K	2K	4K	8K
31000	2.5	1054	85	81	74	69	63	57	53	48		79	74	74	65	60	59	59	48
31000	3	1109	86	82	75	70	64	58	54	49		80	74	75	66	61	60	59	48
31000	3.5	1160	87	82	76	70	64	58	55	50		80	75	77	67	61	61	60	49
31000	4	1213	88	82	77	71	65	59	56	52		81	76	78	68	62	62	60	50
31000	4.5	1265	89	83	78	72	66	60	57	53		81	76	79	69	63	62	60	51
31000	5	1314	89	84	79	72	67	60	58	54		82	77	80	70	64	63	61	51
31000	5.5	1362	90	85	80	73	68	60	58	55		82	78	81	71	65	64	61	52
31000	6	1410	91	86	81	74	68	61	59	56		83	78	82	72	66	64	62	53
31000	6.5	1457	92	86	82	75	69	62	60	57		84	79	83	72	67	65	62	54
39000	2.5	1192	88	84	78	72	67	59	56	51		80	76	78	68	63	61	60	49
39000	3	1239	88	84	79	73	67	60	57	52		81	76	79	69	63	62	60	50
39000	3.5	1284	89	84	80	74	68	60	57	53		81	76	80	70	64	62	60	50
39000	4	1330	89	84	80	74	68	61	58	54		81	77	80	70	65	63	61	51
39000	4.5	1374	89	85	81	75	69	61	59	55		82	77	81	71	66	64	61	52
39000	5	1416	90	85	82	75	69	62	60	56		82	78	82	72	66	64	61	52
39000	5.5	1456	90	86	83	76	70	63	60	57		83	78	83	72	67	65	61	53
39000	6	1499	91	86	84	76	71	63	61	58		83	79	84	73	68	65	61	54
39000	6.5	1541	92	87	85	77	71	64	62	58		84	80	85	74	68	66	62	55
46000	3	1366	89	86	82	76	70	62	59	55		82	77	81	71	66	63	61	52
46000	3.5	1408	90	86	83	77	71	63	60	56		82	78	82	72	66	64	61	52
46000	4	1448	90	86	84	77	71	64	61	57		83	78	83	73	67	64	61	53
46000	4.5	1487	91	86	85	78	72	64	61	57		83	79	84	73	68	65	61	53
46000	5	1525	91	87	86	78	72	64	62	58		84	79	85	74	68	65	61	54
46000	5.5	1564	92	87	87	79	73	64	62	59		84	80	86	74	69	66	61	55
46000	6	1602	92	88	88	79	73	65	63	60		85	80	86	75	70	66	62	55

EXHAUST FAN ----- Sound Power Levels

Return Lw, dB

CFM	TSP	RPM	63	125	250	500	1K	2K	4K	8K
24300	0.25	460	80	73	69	66	64	68	66	60
24300	0.75	540	82	74	71	68	66	67	64	58
24300	1.5	650	85	77	73	71	69	68	64	58
24300	2.5	800	90	81	77	75	74	73	68	62
33300	0.25	610	87	80	77	75	73	74	71	63
33300	0.75	660	87	80	77	75	73	72	67	60
33300	1.5	750	90	81	78	77	75	73	68	61
33300	2.5	865	93	84	81	79	78	76	71	64
40500	0.25	730	92	84	82	80	80	79	75	67
40500	0.75	770	92	84	81	81	79	77	72	65
40500	1.5	845	94	85	82	81	80	78	73	65
40500	2.5	940	96	86	84	83	82	78	72	65

2.01 MANUFACTURERS

A. Provide Trane QuietCurb™ or approved alternate by Custom Curb Inc. or Micro Metl. Alternates must include high density sheathing in the base of the curb, spring-vibration isolation rail, low velocity air flow patterning, and be lined internally with minimum 4" insulation containing a perforated liner backing. The curb must comply with the sound power level performance and features specified herein and as indicated on the contract documents.

OR

A. Manufacturer of rooftop units [rooftop air handlers] shall provide acoustical curbs to form a complete and matched rooftop system with documented octave band sound power performance.

OR

* A. Provide Trane QuietCurb™.

2.02 ROOFCURBS

A. Roofcurb shall be prefabricated, non-combustible construction with sealing gasket around perimeter members to insure air/water tight integrity. The curb shall be constructed of minimum 14 ga. galvanized steel structural members with minimum 20 ga. galvanized steel flashing with overlapping continuous rubber counterflashing. Curb shall be furnished with a 2" X 2" nailer strip for attaching roofing felts. The base of the curb shall contain acoustically non-conductive floor pans with the supply and return air openings framed for duct attachment (duct must be supported independent of curb and flex connected).

B. Curb shall incorporate integral spring-vibration isolation rail with adjustable 1" deflection isolators, properly sized and selected for unit point loading. Spring isolators shall have a minimum of 90% isolation efficiency.

C. Roofcurb shall be shipped [fully assembled from the manufacturing site] [and] seismically isolated with [vertically stabalized] spring isolators [incorporating vertical limit stops].

The following paragraph applies to packaged rooftops only - not roof mounted air handling units

- # D. The curb shall be designed to provide pedestal support for an open (no base pan constructed) condensing section. Full perimeter supported condensing sections shall not be permitted.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install the roofcurb in accordance with manufacturer's recommendations and as shown on the construction documents.
- B. Coordinate piping and power entry locations with other trades. Supporting structural framing shall be sized and installed as indicated on the construction documents. Submit shop drawings to the Architect, with point loadings and curb layout, for approval, prior to beginning work.

END OF SECTION

+++++ SPEC BRIEF +++++ >>>>>DELETE FROM DOCUMENT <<<<<<

1.03, B.

2.01, A.

Requiring published sound data to document performance of the roofcurb-rooftop "system" eliminates the guesswork involved to engineer a quiet job for the customer. Vendor products which cannot provide documentation for the real world performance of the combination curb-unit should not be allowed.

2.01, A.

"QuietCurb" is a proprietary feature THAT WORKS producing up to 18 NC reductions in sound power levels (depending on size). Let the OWNER make the buying decision based upon unprecedented performance in quiet comfort!

2.02, C.

QuietCurb™ is unique in that the product is shipped fully assembled from the manufacturing point directly to the job site. This feature is beneficial for jobs with tight schedules or replacement opportunities that have been plagued with poor acoustic performance.

2.02, D.

Manufacturer's which do not have open (no base pan constructed) condensing sections should not be allowed to bid. If allowed, the base pan in the condensing section can resonate, amplifying compressor noise. Designs without the base pan eliminate the "drum head" potential and allow compressor noise to break out above the roof line. Whereas, full perimeter base pan designs radiate and reflect the noise directly into the ceiling space below.

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Appendix I3

Construction Site Sound Blanket Model

Model CSSB-2 Construction Site Sound Blankets



129 Penn St, Westfield, IN 46074
Phone 888.213.4711 Fax 317-774-1911

Product Features:

- Weatherproof
- Outdoor use/Sheds water
- 2" thick, quilted exterior rated facing
- Grommets for easy attachment to a fence
- STC-21, estimated 10-20 decibel reduction
- In-stock option for quick ship



eNoise Control's Construction Site Sound Blankets are used to block noise on construction sites, drilling sites, compressor stations, and other outdoor noise sources. Our Model CSSB-2 consists of a UV resistant, heavy duty 10 ounce per square yard vinyl coated polyester (VCP) facing on both sides of a nominal 2" thick quilted fiberglass. Sound Blankets are constructed with grommets and sewn with Gore Tenara exterior grade thread for maximum longevity. The sound blankets can simply be zip-tied to your existing chain link perimeter fence, wood fence, jersey barrier fencing, or support framing.

Specification:

Supply weatherproof, exterior-rated quilted sound blankets for sound barrier and visual barrier at construction site perimeter. Material shall be nominal 2" thick, diamond stitched UV resistant 10 ounce per square yard vinyl coated polyester (VCP) faced both sides. Sewn using exterior-rated Gore Tenara thread. Grommets integrated into blankets for securing to job site fencing. Minimum STC-21 rating. Minimum NRC-0.75 rating. Secure blankets with no visual gaps at joints and tight to ground level, complying to manufacturers installation guidelines. Use Model CSSB-2, Construction Site Sound Blanket manufactured by eNoise Control, 129 Penn St, Westfield, IN 46074, 888.213.4711, info@enoisecontrol.com.



Technical Data:

Facing	UV resistant, weather proof VCP both sides
Thickness	Nominal 2.00" [1.5" post fabrication]
Standard Width	48"
Weight	0.50 lb-psf
Temperature Range	-40° to +180°F
Sound Data Summary	STC-21, NRC-0.75

SOUND ABSORPTION (ASTM C-423)						
125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
.46	.94	.85	.64	.47	.33	.75

SOUND TRANSMISSION LOSS (ASTM E-90 & E-413)						
125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	STC
9	14	19	21	27	34	21