

ARCHITECTURAL ACOUSTICS • INDUSTRIAL NOISE CONTROL

www.theproudfootcompany.com

Sound Absorbing Structural Masonry Units

www.soundblox.com

Soundblox projects:
Montgomery High School
Location: Montgomery, New Jersey
Architect: MRM Architecture
Mason Contractor: Thomas Carney
Philadelphia, PA
CMU Producer: Clayton Block Company

SOUNDBLOX®



SOUNDCELL®



Architectural Acoustical Masonry Units

www.soundcell.com

Green Bay West High School
Location: Green Bay, WI
Architect: Architectural Group, Ltd.
Mason Contractor: Hougard Construction
CMU Producer: County Materials Corp.

Acoustical Products

www.noisemaster.com

NOISEMASTER®



SOUNDBLOX®

Proudfoot Architectural Acoustics

The Proudfoot Company, Inc. is an industry leader in acoustical correction and noise control. Since 1965, Proudfoot has worked with architects and engineers to control noise levels on a wide variety of projects through the incorporation of its SOUNDBLOX products.

An Introduction to SOUNDBLOX

SOUNDBLOX units are the solution to acoustical correction and noise control problems in masonry construction. Attractive, economical, and efficient sound absorbing units, SOUNDBLOX are made locally near the jobsite by carefully selected quality concrete block producers. These producers employ exclusive Proudfoot molds designed to fit standard automatic block machines — thereby assuring uniform quality and acoustical efficiency of each SOUNDBLOX unit.

SOUNDBLOX Masonry Units are Structural and Load-bearing

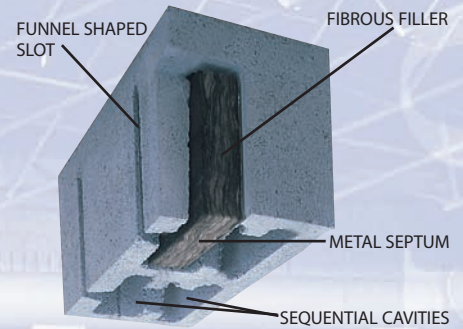
SOUNDBLOX have the same compressive strength as standard hollow concrete masonry units of similar composition. Installed conventionally with little or no added labor, the in-place cost of SOUNDBLOX is low by comparison to most other acoustical materials. Rugged and durable in construction, SOUNDBLOX masonry units are an excellent choice for industrial settings, gymnasiums, mechanical equipment rooms, and comparable installations.

A Close Up Look At SOUNDBLOX

SOUNDBLOX derive their excellent sound absorption from a unique cavity-slot resonator construction. The cavities are closed at the top and the slots allow the cavities to function as damped (Helmholtz) resonators — an excellent sound absorption tool at low frequencies. The slots of the RSR, RSC and Q Type units are funnel-shaped for superior acoustical performance.

The amount of sound absorbed by properly installed SOUNDBLOX is increased dramatically when units incorporating a metal septum (membrane or divider) and fibrous filler in the cavity are specified. Together with funnel-shaped slots, these units provide higher levels of sound absorption across a wider range of frequencies. In addition to sound absorption, SOUNDBLOX

BLOX walls have a superior sound transmission loss (STL) performance rating when compared to walls of ordinary hollow concrete blocks of similar composition.



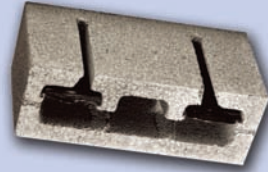
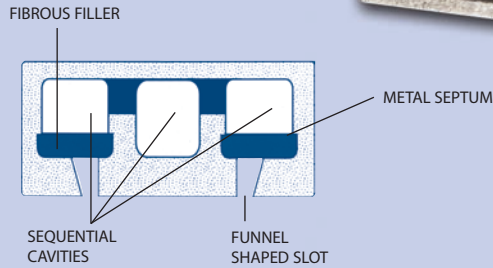
SOUND TRANSMISSION LOSS CHARACTERISTICS

		FREQUENCY – Hertz						
Size	Type	125	250	500	1000	2000	4000	STC
6"	A-1	38	38	44	51	58	58	49
8"	RSC	36	44	50	54	58	56	53
12"	RSC/RF	45	46	52	58	62	61	56
12"	RSC/RF*	44	48	57	65	67	67	60

The sound transmission loss values shown above were determined in accordance with ASTM methods by ETL Laboratories in Cortland, NY, and Riverbank Laboratories in Geneva, IL. The SOUNDBLOX® walls were sealed on the unslotted side using two coats of Thoroseal® before testing. * This wall was tested with the two rear cores filled with sand. See pages 3, 4 & 5 for NRC test results.

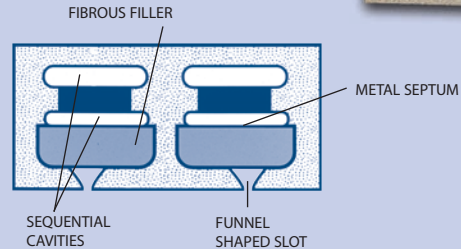
Type RSC 4" & 6" have three (3) sequential cavities, two (2) flared slots, metal foil septa and fibrous fillers, and an NRC rating of .80 and .85 respectively.

Type RSC (6")



Type RSC 8" & 12" have four (4) sequential cavities, two (2) flared slots, metal foil septa and fibrous fillers, and an NRC rating of .80 and .85 respectively.

Type RSC (12")



Sound Absorption Coefficients — Type RSC

Size	Type	Surface	Exposed Slots/ Cavities	FREQUENCY — Hertz																	NRC
				125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	
4"	RSC	PAINTED	2/3	.18	.22	.36	.64	1.12	1.16	1.02	.89	.76	.72	.76	.77	.80	.73	.68	.58	.65	.80
6"	RSC	PAINTED	2/3	.48	.70	.93	1.14	1.05	.97	.91	.84	.75	.76	.77	.70	.67	.68	.56	.51	.59	.85
8"	RSC	PAINTED	2/4	.48	.85	1.17	.99	.90	.88	.98	.79	.62	.58	.60	.61	.70	.69	.70	.64	.51	.80
12"	RSC	PAINTED	2/4	.57	*	*	.76	*	*	1.09	*	*	.94	*	*	.54	*	*	.59	*	.85

The above sound absorption data was determined by tests conducted at Geiger and Hamme Acoustical Laboratory in strict compliance with ASTM C423 specifications. Actual installed performance may vary.
* Measurements at these frequencies were not taken.

Architectural Finishes

SOUNDBLOX[®] can be painted and are available in a variety of colors and architectural finishes, including:

- Ground-Face
- Burnished
- Decro-Face[®]
- Spectra-Glaze[®]
- Split-Rib^{*}

Check your local SOUNDBLOX[®] producer for available architectural finishes in your area.

**Split-Rib (Type RSR) are available in 8" thickness only.
Decro-Face[®] is a trademark of E.P. Henry, Woodbury, NJ.
Spectra-Glaze[®] is a trademark of The Burns & Russell Co., Baltimore, MD.*



Onekama Elementary School
Location: Onekama, MI
CMU Producer: Michigan Certified Concrete

Reinforced Masonry



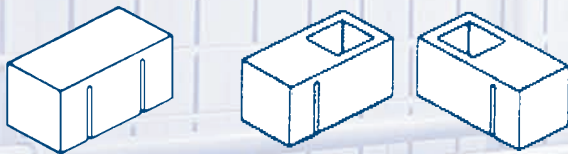
SOUND ABSORPTION COEFFICIENTS — TYPE RSC/RF

Size	Type	Surface	Exposed Slots / Cavities	FREQUENCY — Hertz																	
				125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	NRC
8"	RSC/RF	PAINTED	2/5	.18	.22	.36	.64	1.12	1.16	1.02	.89	.76	.72	.76	.77	.80	.73	.68	.58	.65	.80
10"	RSC/RF	PAINTED	2/5	.18	.22	.36	.64	1.12	1.16	1.02	.89	.76	.72	.76	.77	.80	.73	.68	.58	.65	.80
12"	RSC/RF	PAINTED	2/5	.48	.70	.93	1.14	1.05	.97	.91	.84	.75	.76	.77	.70	.67	.68	.56	.51	.59	.85
12"	RSC/RF4	PAINTED	2/5	.18	.22	.36	.64	1.12	1.16	1.02	.89	.76	.72	.76	.77	.80	.73	.68	.58	.65	.80

The above sound absorption data was determined by tests conducted at Geiger and Hamme Acoustical Laboratory in strict compliance with ASTM C423 specifications. Actual installed performance may vary. * Measurements at these frequencies were not taken.

Left-Hand and Right-Hand Units

For situations requiring a full core for vertical reinforcement, SOUNDBLOX units with open cavities on either the left- or right-hand side are available. When used in conjunction with standard SOUNDBLOX units, reinforcing bars and grout can be incorporated easily and efficiently. SOUNDBLOX left-hand and right-hand units have been approved for use in reinforced masonry construction and are allowed 90% of the shear value of ordinary hollow concrete block.



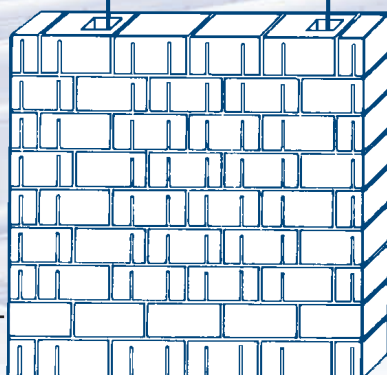
STANDARD UNIT

LEFT- AND RIGHT-HAND UNITS AVAILABLE IN 8" A-1, 8" Q AND 8" & 12" RSC

Open top, non-slotted cavities for reinforcing bars and grout.

Spacing of vertical reinforcing at multiples of 16" as required (i.e., 32", 48", etc.).

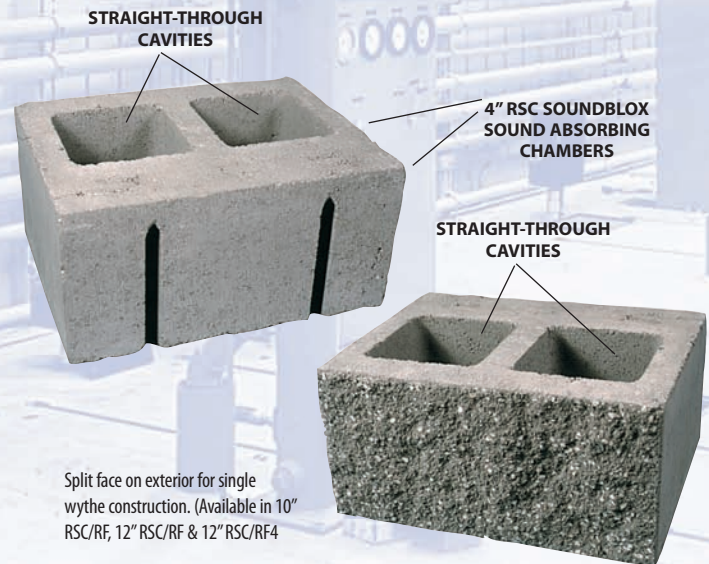
A course of standard bond beam used for horizontal reinforcement as needed.



Type RSC/RF

Special SOUNDBLOX unit providing the sound absorption of Type RSC units. Incorporates a metal septum and filler, and two additional large, straight-through cavities, allowing specification of this unit in applications requiring vertical reinforcing, thermal insulation or accommodations for vertical conduits and/or pipes. Available in 8", 10" and 12" thicknesses. For specific dimensions and structural property details of RSC/RF units, contact the Proudfoot Company, Inc.

Type 12" RSC/RF4 For additional groutable area



Split face on exterior for single wythe construction. (Available in 10" RSC/RF, 12" RSC/RF & 12" RSC/RF4)

Special Applications

SOUNDBLOX® Type A-1 and Q units have been specially designed for low frequency absorption. Optimum sound absorption is achieved in both of these units at 125 Hz.

Type A-1

Narrow slots, unfilled cavities.



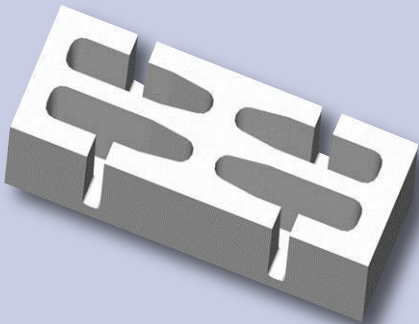
Type A-1-RF

Outstanding low frequency absorption combined with straight through cavities for vertical reinforcement.



6" A-1 Double Sided

This 6" A-1 Double Sided Acoustical Masonry Unit has the unique ability to absorb noise from both the front and rear face shells. With a Noise Reduction Coefficient of .65 - .75, the 6" A-1 Double Side can be the right choice for interior partitions where space is at a premium.



Sound Absorption Coefficients: Types A-1, A-1-RF, Q and RSR

Size	Type	Surface	Exposed Slots/ Cavities	FREQUENCY – Hertz						
				125	250	500	1000	2000	4000	NRC
4"	A-1	PAINTED	2/2	.12	.85	.36	.36	.42	.45	.50
6"	A-1	PAINTED	2/2	.62	.84	.36	.43	.27	.50	.50
8"	A-1	PAINTED	2/2	.97	.44	.38	.39	.50	.60	.45
8"	Q	PAINTED	2/2	1.07	.57	.61	.37	.56	.55	.55
8"	RSR	UNPAINTED	2/2	.61	.81	.57	.55	.66	.64	.65
8"	A-1/RF	PAINTED	2/4	.12	.85	.36	.36	.42	.45	.50
10"	A-1/RF	PAINTED	2/4	.12	.85	.36	.36	.42	.45	.50
12"	A-1/RF	PAINTED	2/4	.62	.84	.36	.43	.27	.50	.50
6"	A-1/DBL	PAINTED	4/4	.20	.95	.85	.49	.53	.50	.65-.75

The above sound absorption data was determined by tests conducted at Geiger and Hamme Acoustical Laboratory in strict compliance with ASTM C423 specifications. Actual installed performance may vary.



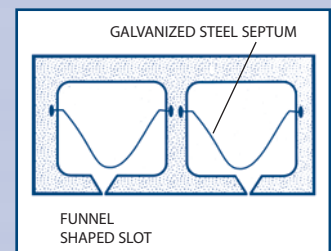
Type RSR

Split rib units; wider slots flaring inward, incombustible fibrous fillers with metal septa in cavities. Graffiti resistant and attractive, Type RSR SOUNDBLOX® units also offer sound diffusion properties. Available in 8" thickness only. Limited availability.



Type Q

Flared slots in the same width as Type A-1 units on the outer face. Galvanized steel septa placed in unfilled cavities. Available in 8" thickness only.



SOUNDCELL®

An Introduction to SOUNDCELL

With the introduction of SOUNDCELL acoustical masonry units, Proudfoot now offers architects and contractors even more noise control options with the added touch of grace and elegance.

Create an improved environment in architectural masonry acoustics. The SOUNDCELL unit's design innovation is your practical solution to effectively absorb problem noise, diffuse sound energy, and more thoroughly capture flutter echo, standing waves and sound intensity annoyances — with style.

Absorption, Diffusion, Style

SOUNDCELL® architectural acoustical concrete masonry units provide built-in sound control for areas of public access where noise pollution is a problem. Available in 8" or 12" thickness, SOUNDCELL units are load-bearing with compressive strengths comparable to standard CMUs of similar composition. Installed conventionally in stack bond with little or no added labor, the in-place cost of SOUNDCELL is low by comparison to most other acoustical materials.

Diffusion is the random reflection and dispersion of the sound path after striking irregular shaped surfaces and reliefs. Many rooms utilizing flat, exposed masonry promote sound "bounce" and problematic reflections. SOUNDCELL units improve the quality and nature of sound by providing desirable diffusion with their innovative grid and impressed form.

Ideal for schools, houses of worship, manufacturing plants, arenas, water treatment facilities and other structures where excessive noise can be generated, SOUNDCELL units are available throughout the United States through a network of licensed concrete block manufacturers that make the product locally to a series of strict specifications.



Sound Cell projects:
West Allis Animal Hospital
Location: West Allis, WI
Architect Firm: Chris Greene Architects
Mason Contractor: Craft Masonry
CMU Producer: County Materials Corp.

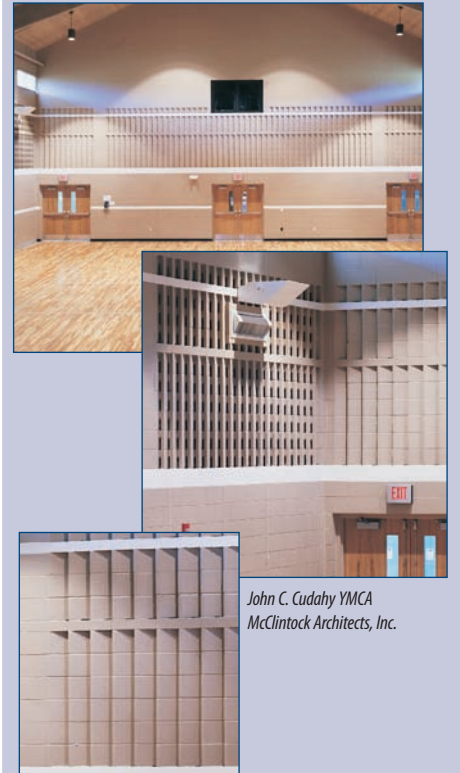


Green Bay West High School
Location: Green Bay, WI
Architect Firm: Architectural Group, Ltd.
Mason Contractor: Hougard Construction
CMU Producer: County Materials Corp.



Green Bay Community Church
Location: Green Bay, WI
Architect Firm: Valentine Architects
Mason Contractor: McGivern Masonry
CMU Producer: County Materials Corp.

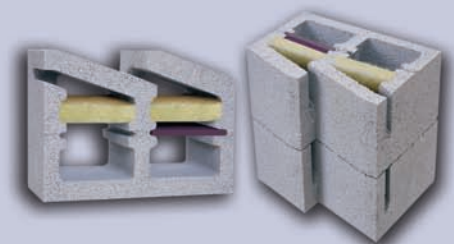
ACOUSTADE®



John C. Cudahy YMCA
McClintock Architects, Inc.

Now even more design options are available. SOUNDCELL Acoustade® masonry units offer the same noise control capabilities as regular SOUNDCELL units without the horizontal baseline.

This feature allows for continuous vertical lines and offers a reversible skew, enabling the architect to specify in which direction the slanted surface faces. For example a left-hand skew may be specified for a north wall with a right-hand skew specified for a south wall.

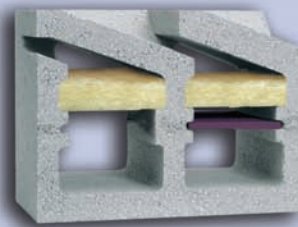
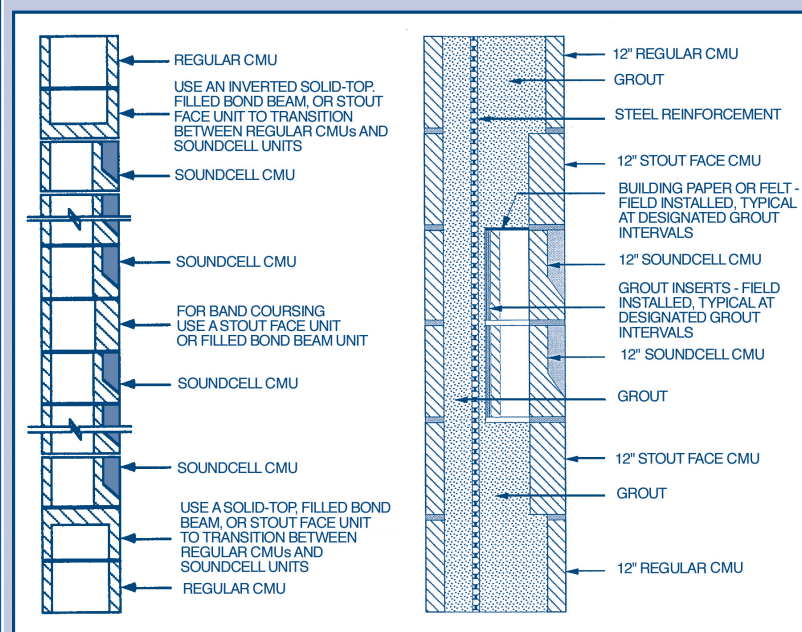


Available in 8" & 12" widths.
Optional grout shields only available
with 12" units, as shown.

Specifications

Provide SOUNDCELL acoustical masonry units conforming to ASTM C-90 or ASTM C-129, with factory-installed noise attenuating fillers.

STORAGE, HANDLING & INSTALLATION: SOUNDCELL units shall be kept dry and handled carefully to protect from chipping. Units shall be laid in stacked bond only with 3/8" mortar joints. Mortar joints shall be struck flush, filled and dressed on the face-side of the units, and shall be tooled, brushed, and finish-tooled on the backside of the units. Contractor shall keep units clean and dry during installation. Units shall be laid consistent with the best concrete masonry practices, including: full face shell mortar bedding, control joints and wire reinforcing (utilize 10" wire for 12" units; 6" wire for 8" units). Solid Tops, Bond Beams, or Thickened face-shell units shall be utilized as a course separating the SOUNDCELL units from the regular utility CMUs in order to ensure correct face-shell alignment. (See critical wall section detail and review with Engineer and Mason Contractor.)



Optional grout shields only available with 12" units, as shown.



FREQUENCY - HERTZ / SOUND ABSORPTION COEFFICIENTS

SIZE	SURFACE	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15k	4K	5K	NRC	SAA
8"	UNPAINTED	.50	.67	.94	1.16	.89	.68	.59	.51	.55	.66	.75	.78	.79	.77	.71	.68	.69	.69	.75	.74
8"	PAINTED	.51	.64	1.04	1.17	.95	.67	.57	.46	.48	.59	.68	.74	.73	.73	.67	.62	.58	.54	.70	.70
12"	UNPAINTED	1.20	.95	.96	.89	.64	.55	.54	.55	.60	.72	.70	.76	.79	.80	.75	.73	.70	.70	.70	.70
12"	PAINTED	.99	1.28	.93	.75	.61	.50	.48	.46	.54	.69	.70	.73	.73	.70	.61	.60	.60	.50	.65	.63

The above sound absorption data was determined by tests conducted at Riverbank Acoustical Laboratories in strict compliance with ASTM C423 and E795. Actual installed performance may vary.

Are SOUNDBLOX and SOUNDCELL units load-bearing?

YES, providing they are made of the same aggregate necessary to produce regular load-bearing units to conform to ASTM C90 or C129, and are installed with the closed top up in a full horizontal bed of mortar. And, because SOUNDBLOX and SOUNDCELL are load-bearing, noise control can be built right into the structure of the building! SOUNDBLOX units have also been allowed 90% of the shear value of ordinary hollow concrete masonry units of the same thickness. (See International Conference of Building Officials Research Recommendation No. 2539 and Los Angeles Department of Building and Safety Report No. RR 23609.) Please contact The Proudfoot Company, Inc. for the ICBO report, and other structural test reports, physical properties, and drawings.

Can SOUNDBLOX and SOUNDCELL units be vertically reinforced?

YES, both SOUNDBLOX and SOUNDCELL provide for vertical reinforcement. The 8", 10", and 12" SOUNDBLOX Type RSC/RF units have separate cavities to allow for vertical rebar, and grout. The 12" SOUNDCELL units can accommodate vertical reinforcement bars and grout with the use of a grout shield to separate the sound absorbing cavity from the reinforcing cavity. Dimension drawings, wall details, and structural properties are available on request.

Which type and thickness of SOUNDBLOX and SOUNDCELL units shall I use?

For outdoor noise problems, it is recommended that the Type A-1 or Type Q units be used. The Type RSC or RSR units have also been used outdoors with no ill effects. For structural reasons, an 8", 10", or 12" unit is generally required for outdoor applications. Sometimes, especially for partition walls, only a 4" thick unit can be used, in which case it is necessary to choose the 4" Type RSC or possibly, the 4" A-1. By far, the best way to select the most efficient unit for the job is to obtain, by measurement, a frequency characteristic of the noise from the source. If high sound levels are distributed over a wide frequency range, a Type RSC or RSC/RF unit would be a good choice since these units have excellent absorption at nearly all frequencies. If the noise level measurements indicate a pronounced peak at specific frequency the unit with the highest sound absorption coefficient at that frequency is usually the best choice, e.g. for a noise with a high peak at 125 Hz, the 8" Q unit would be a good choice since it has excellent absorption at 125 Hz. If the noise is concentrated at the very low frequencies (below 500 Hz) the Type A-1, Q, or RSC units can often be used to advantage.

Architectural finishes are optional on SOUNDBLOX and SOUNDCELL as well, such as: scoring, ground-face, split-face, and DECRO-FACE®.

How many SOUNDBLOX and SOUNDCELL units shall I use?

There are formulas to calculate how many blocks should be used to achieve a certain amount of absorption for gymnasiums, auditoriums, and natatoriums, etc. However, when understanding speech is critical, it is best to use the service of an acoustical consultant. When the problem is not too complex, we can often be of help. A rule of thumb for mechanical equipment rooms and noisy manufacturing areas is to construct a wall area equal to 30% to 40% of the total area of walls, floor and ceiling with SOUNDBLOX and SOUNDCELL units, if this amount of area is available. Note that as a room becomes larger by increasing the length and width while keeping the ceiling height constant, the wall area becomes a smaller part of the total area and in some cases even constructing 100% of the walls of SOUNDBLOX and SOUNDCELL units may not be sufficient. Some ceiling treatment should be used as well. For school classrooms and gymnasiums it is recommended that the SOUNDBLOX and SOUNDCELL treatment begin above door height.

How much noise reduction can I achieve using SOUNDBLOX and SOUNDCELL units?

The maximum practical reduction in sound level that can be achieved using sound absorption alone is 10 decibels, and generally the achieved reduction may be more like 6 to 8 decibels. However, most people perceive a drop of 10 decibels as resulting in a noise only half as loud, in effect, doubling the reduction, so even 6 to 8 decibels can be well worthwhile in providing increased comfort.

Can SOUNDBLOX and SOUNDCELL units be painted?

YES. For their sound absorption, SOUNDBLOX and SOUNDCELL units do not depend on the porosity of the material from which they are manufactured. SOUNDBLOX and SOUNDCELL units were both painted before sound absorption tests were performed. Most SOUNDBLOX and SOUNDCELL units (with exception of the split-rib units) are painted in the field. Therefore, published sound absorption values are achieved in the field no matter what type of aggregate is used in the manufacture of the blocks. However, it has been shown that when SOUNDBLOX and SOUNDCELL units manufactured out of a highly porous aggregate are left unpainted, they exhibit increased sound absorption, particularly at higher frequencies due to the porous absorption of the aggregate.

Can SOUNDBLOX and SOUNDCELL units be used outdoors?

YES. Millions of SOUNDBLOX units have been used for transformer and other types of outdoor noise screens and for highway noise barriers. For outdoor use the Type A-1, Type Q or Type RSR units are recommended, although the Type RSC units have also been used outdoors. Because the units are installed with the open side of cavities facing down, water

drains easily out of the open slots. In over forty years of use there have been no complaints about damage or deterioration to the fiberglass filler. SOUNDCELL and ACOUSTADE units are not suitable for outdoor use.

It is also recommended that water repellency be added to the aggregate prior to producing the units.

Can SOUNDBLOX and SOUNDCELL units be cleaned with water or steam?

YES. Type A-1 and Type Q units only can be hosed down with water or steam-cleaned. Units incorporating the fibrous filler insert should not be used in areas that are to be hosed or steam-cleaned due to the possibility of dislodging the filler from its precise placement in the unit. The optional Spectra-Glaze® finish is readily cleaned as well. Dust and dirt may be vacuumed from the cavities if necessary. In areas of constant high humidity, such as a natatorium, the use of fibrous fillers sealed in 2 mil polyethylene bags is an available option and is recommended.

What is the purpose of the SOUNDCELL grout shield?

When a 12" SOUNDCELL unit is being vertically reinforced, it becomes necessary to fill the rear chamber with grout. To prevent grout from encroaching on the sound-absorbing portion of the unit a grout shield must be used. The shield is inserted in the slot that separates the grout filled chamber from the sound-absorbing chamber.

Can SOUNDBLOX and SOUNDCELL be made in split face units?

A split face is available on the backs of 12" Type RSC/RF and Type RSC/RF4 SOUNDBLOX units. Please call customer service for availability. SOUNDCELL and ACOUSTADE units are not available in split face.

How much does a SOUNDBLOX or SOUNDCELL unit weigh?

The weight of any concrete masonry unit is dependent on the concrete mix design used to manufacture the unit. The most important component affecting a masonry units' weight is the type of aggregate used. Please consult the SOUNDBLOX or SOUNDCELL licensee on your particular project for the weight of the acoustical masonry units to be made.

How much does a SOUNDBLOX or SOUNDCELL unit cost?

It is not our policy to quote pricing. Pricing is available from your local SOUNDBLOX or SOUNDCELL licensee.

How do I locate SOUNDBLOX and SOUNDCELL licensees?

Call the Proudfoot Company customer service department at 1-800-445-0034 for the location of the licensee nearest your project.