

QRD[®] 734



*The First General Purpose QRD[®] Diffusor From
The Acoustical Industry's Leading Innovator*

The QRD[®] 734 has proven to be the most popular and versatile diffusor in the RPG[®] product line. It's wide bandwidth, low cost, and broad selection of finishes make it a logical choice for music education facilities, recording studios, worship spaces, auditoriums, theaters, and performing arts facilities. This one dimensional diffusor is a modular, computer designed phase grating which produces a directional hemidisc polar response that can be oriented in any direction. It also provides low frequency absorption below the design bandwidth due to the RPG[®] pressure gradient mechanism.



The Sound of Innovation

Problem and Solution

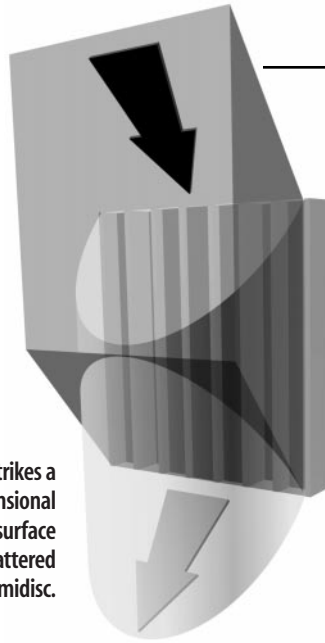
Problem

Interfering reflections that degrade speech intelligibility, gain before feedback, and music quality can be controlled by absorption and diffusion. Since commercial surfaces that provided uniform diffusion over a wide frequency range and for all angles of incidence were not available, absorption was used solely to control reflections. This treatment created "dead" spaces.

Solution

In 1983, RPG® introduced the first commercial QRD® Diffusor, based on mathematical number theory. Now a predictable diffusive surface treatment is readily available.

Sound strikes a one dimensional diffusing surface and is scattered into a hemidisc.



FEATURES

- QRD® sound diffusion
- Wood finish, paintable finish, or transparent plexiglass
- Custom Finishes are available
- Distinctive textured appearance
- Can be surface or flush mounted
- Can be oriented to provide two dimensional diffusion in the far field

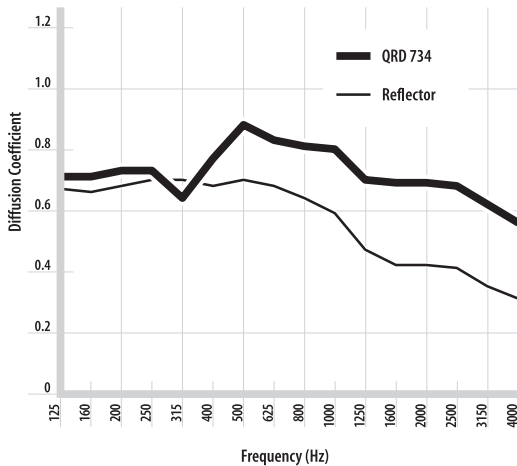
BENEFITS

- Attractive finish allows its use in a variety of decors
- Can be used to control unwanted reflections without adding additional absorption

APPLICATIONS

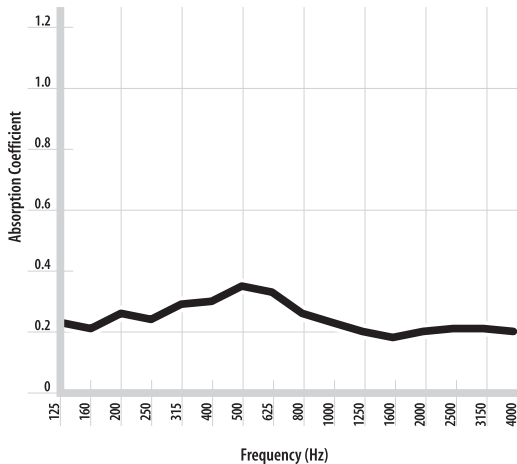
Music education facilities, Band rooms, Recording studios, Post production studios, Home theaters, Worship spaces, Auditoriums, Performing arts centers

Performance Specifications



Diffusion

Compared to a flat reflector panel, the QRD® 734 offers significant diffusion above the diffraction limit of 565Hz, which is equal to the speed of sound (1130ft/sec) divided by the 2' dimension of the panel. As the frequency increases above 565Hz, the graph indicates how the reference reflector becomes more and more specular, whereas the QRD® 734 provides a uniform diffusivity.

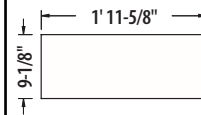


Absorption

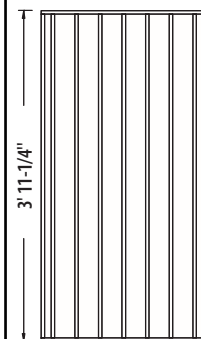
The wooden QRD® 734 or plexiglass Diviewisor™ contribute minimal absorption. The low cost Kydex® Formeddiffusor™ is designed to provide additional low frequency absorption.

SPECIFICATIONS

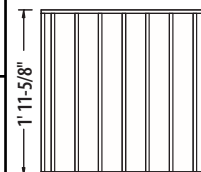
- Sizes and weights:
23-5/8" (H) x 23-5/8" (W) x 9-1/8" (D): 26 lbs.
47-1/4" (H) x 23-5/8" (W) x 9-1/8" (D): 50 lbs.
- Custom sizes available
- Standard finish: Uniform white birch clear coat
- Custom finishes available
- Class A fire rated



Top View



4' x 2' Unit



2' x 2' Unit

Installation

The QRD® 734 is typically mounted on a cleat and secured. For installations that require a flush mount the units are framed out much like an opening for a window.

Standard Unit Construction

Rotary Cut, Uniform White Birch
Clear Coat
4' height x 2' width nominal (3' 11-1/4" x 1' 11-5/8") x 9-1/8" deep
1/2" Class A Fire Rated Flake Core

Product Options*, **

Custom units can be supplied with contrasting well and divider species and finishes

Veneer Selection

Resin Filled particleboard (paint ready)
Uniform White Birch
White Maple
Red Oak
White Oak
White Ash
Honduran Mahogany
American Cherry
Custom wood species (based on availability)
Melamine wood grain or solid color (not Class A Fire Rated)

Finish Selection

Unfinished
Clear Coat only (satin lacquer finish)
Stained and unfinished
Stained and clear coat
Painted

Unit Size

Units can be made with any height up to 8'
Units can be made with widths between 19" and 26"
Units can be made with depths between 4" and 12"

End Conditions

End Well/End Well (EE)
End Well/Half Well (EH)
End Well/Joining Well (EJ)
Half Well/Half Well (HH)
Half Well/Joining Well (HJ)
Joining/Joining (JJ)

Option Sheet

Note:

All dimensions are allowed a tolerance of $\pm 1/16$ " due to material shrinkage and variations.

** Most options merit an increase or, in some cases, a decrease in pricing compared to the standard unit.*

*** Due to material availability, RPG[®] reserves the right to change options at any time. Therefore, any special options—whether listed or not—must be confirmed prior to submittal of P.O. and acceptance verified by RPG[®] Diffusor Systems, Inc.*



The Sound of Innovation

Quadratic Residue Diffusor

2' x 2' CSI Specifications

- A** The Quadratic Residue Diffusor shall be the model QRD[®] 734 2' x 2' as manufactured by RPG[®] Diffusor Systems, Inc., Upper Marlboro, MD 20774. Tel: 301-249-0044, Fax: 301-249-3912.
- B** The Quadratic Residue Diffusor shall be fabricated with a 1/2" Class A Duraflake core and veneered with a rotary cut uniform white birch.
- C** The Quadratic Residue Diffusor shall work on the one dimensional reflection phase grating principle, using an array of wells of equal width separated by thin dividers. The depths of the wells shall be based on the prime seven quadratic residue theory sequence.
- D** Sound diffusion in the horizontal plane shall be provided by wells in the vertical position while diffusion in the vertical plane shall be provided by wells in the horizontal position. The Quadratic Residue Diffusor may be rotated to achieve a variety of patterns that will provide a highly effective scattering surface.
- E** Absorption Coefficients and Noise Reduction Coefficient for the product shall be measured by an independent, accredited NVLAP facility according to the test methods as defined by ASTM C 423 and ASTM E 795. Random incidence Absorption Coefficients for the product in a Type A mounting shall be as follows:

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
0.23	0.24	0.35	0.23	0.20	0.20	0.25

- F** Diffusion Coefficients for the product shall be measured in accordance with the recommendations of the Audio Engineering Society Working Group SC-04-02 boundary measurement technique. The directional diffusion coefficient is given by the standard deviation of the 1/3-octave polar response, for a given angle of incidence, and normalized by the response of a flat panel of similar size. The average incidence diffusion coefficients determined at 5° intervals between ± 85° are listed below at octave-band centers. The mean and standard deviation (SD) of the 1/3 octave-band coefficients are also tabulated.

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Mean	SD
0.71	0.73	0.88	0.80	0.69	0.56	0.72	0.08

- G** Flame Spread and Smoke Developed shall be tested by an independent, accredited NVLAP facility according to the test methods as defined by ASTM E 84 and NFPA 255. The Quadratic Residue Diffusor shall have a composite Flame Spread Rating of less than 25 and a Smoke Development of less than 450.
- H** The Quadratic Residue Diffusor shall be supplied with a clear coat finish.
- I** The overall dimensions shall be 23-5/8"(H) x 23-5/8"(W) x 9-1/8"(D) and weigh no more than 32 pounds.



The Sound of Innovation

Quadratic Residue Diffusor

4' x 2' CSI Specifications

- A** The Quadratic Residue Diffusor shall be the model QRD[®] 734 4' x 2' as manufactured by RPG[®] Diffusor Systems, Inc., Upper Marlboro, MD 20774. Tel:301-249-0044, Fax: 301-249-3912.
- B** The Quadratic Residue Diffusor shall be fabricated with a 1/2" Class A Duraflake core and veneered with a rotary cut uniform white birch.
- C** The Quadratic Residue Diffusor shall work on the one dimensional reflection phase grating principle, using an array of wells of equal width separated by thin dividers. The depths of the wells shall be based on the prime seven quadratic residue theory sequence.
- D** Sound diffusion in the horizontal plane shall be provided by wells in the vertical position while diffusion in the vertical plane shall be provided by wells in the horizontal position. The Quadratic Residue Diffusor may be rotated to achieve a variety of patterns that will provide a highly effective scattering surface.
- E** Absorption Coefficients and Noise Reduction Coefficient for the product shall be measured by an independent, accredited NVLAP facility according to the test methods as defined by ASTM C 423 and ASTM E 795. Random incidence Absorption Coefficients for the product in an Type A mounting shall be as follows:

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
0.23	0.24	0.35	0.23	0.20	0.20	0.25

- F** Diffusion Coefficients for the product shall be measured in accordance with the recommendations of the Audio Engineering Society Working Group SC-04-02 boundary measurement technique. The directional diffusion coefficient is given by the standard deviation of the 1/3-octave polar response, for a given angle of incidence, and normalized by the response of a flat panel of similar size. The average incidence diffusion coefficients determined at 5° intervals between ± 85° are listed below at octave-band centers. The mean and standard deviation (SD) of the 1/3 octave-band coefficients are also tabulated.

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Mean	SD
0.71	0.73	0.88	0.80	0.69	0.56	0.72	0.08

- G** Flame Spread and Smoke Developed shall be tested by an independent, accredited NVLAP facility according to the test methods as defined by ASTM E 84 and NFPA 255. The Quadratic Residue Diffusor shall have a composite Flame Spread Rating of less than 25 and a Smoke Development of less than 450.
- H** The Quadratic Residue Diffusor shall be supplied with a clear coat finish.
- I** The overall dimensions shall be 47-1/4"(H) x 23-5/8"(W) x 9-1/8"(D) and weigh no than 58 pounds.



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Quadratic Residue Diffusor

- A** The Quadratic Residue Diffusor shall be the model QRD[®] 734 Custom as manufactured by RPG[®] Diffusor Systems, Inc., Upper Marlboro, MD 20774. Tel: 301-249-0044, Fax: 301-249-3912.
- B** The Quadratic Residue Diffusor shall be fabricated with a 1/2" Class A Duraflake core and veneered with a rotary cut _____ (specify suitable veneer).
- C** The Quadratic Residue Diffusor shall work on the one dimensional reflection phase grating principle, using an array of wells of equal width separated by thin dividers. The depths of the wells shall be based on the prime seven quadratic residue theory sequence.
- D** Sound diffusion in the horizontal plane shall be provided by wells in the vertical position while diffusion in the vertical plane shall be provided by wells in the horizontal position. The Quadratic Residue Diffusor may be rotated to achieve a variety of patterns that will provide a highly effective scattering surface.
- E** Absorption Coefficients and Noise Reduction Coefficient for the product shall be measured by an independent, accredited NVLAP facility according to the test methods as defined by ASTM C 423 and ASTM E 795. Random incidence Absorption Coefficients for the product in an Type A mounting shall be as follows:

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
0.23	0.24	0.35	0.23	0.20	0.20	0.25

- F** Diffusion Coefficients for the product shall be measured in accordance with the recommendations of the Audio Engineering Society Working Group SC-04-02 boundary measurement technique. The directional diffusion coefficient is given by the standard deviation of the 1/3-octave polar response, for a given angle of incidence, and normalized by the response of a flat panel of similar size. The average incidence diffusion coefficients determined at 5° intervals between ± 85° are listed below at octave-band centers. The mean and standard deviation (SD) of the 1/3 octave-band coefficients are also tabulated.

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Mean	SD
0.71	0.73	0.88	0.80	0.69	0.56	0.72	0.08

- G** Flame Spread and Smoke Developed shall be tested by an independent, accredited NVLAP facility according to the test methods as defined by ASTM E 84 and NFPA 255. The Quadratic Residue Diffusor shall have a composite Flame Spread Rating of less than 25 and a Smoke Development of less than 450.
- H** The Quadratic Residue Diffusor shall be supplied with a _____ finish (specify suitable finish).
- I** The overall dimensions shall be ____ (H) x ____ (W) x ____ (D) and weigh no more than ____ pounds.



The Sound of Innovation

QRD[®] 734

Standard Unit Construction

Plexiglass

4' height x 2' width nominal (3' 11-1/4" x 1' 11-5/8") x 9-1/8" deep

Product Options*, **

Plexiglass

Unit Size

Units can be made with any height up to 8'

Units can be made with widths between 19" and 26"

Units can be made with depths between 4" and 12"

End Conditions

End Well/End Well (EE)

Divisors™ Option Sheet

Note:

All dimensions are allowed a tolerance of $\pm 1/16$ " due to material shrinkage and variations.

** Most options merit an increase or, in some cases, a decrease in pricing compared to the standard unit.*

*** Due to material availability, RPG[®] reserves the right to change options at any time. Therefore, any special options—whether listed or not—must be confirmed prior to submittal of P.O. and acceptance verified by RPG[®] Diffusor Systems, Inc.*



The Sound of Innovation

Transparent One Dimensional Quadratic Residue Diffusor

- A** The Transparent One Dimensional Quadratic Residue Diffusor shall be the model Diviewor™ 2' x 2' as manufactured by RPG® Diffusor Systems, Inc., Upper Marlboro, MD 20774. Tel: 301-249-0044, Fax: 301-249-3912.
- B** The Transparent One Dimensional Quadratic Residue Diffusor shall be fabricated from 1/2" plexiglass.
- C** The Transparent One Dimensional Quadratic Residue Diffusor shall work on the one dimensional reflection phase grating principle, using an array of wells of equal width separated by thin dividers. The depths of the wells shall be based on the prime seven quadratic residue theory sequence.
- D** Sound diffusion in the horizontal plane shall be provided by wells in the vertical position while diffusion in the vertical plane shall be provided by wells in the horizontal position. The Transparent One Dimensional Quadratic Residue Diffusor may be rotated to achieve a variety of patterns that will provide a highly effective scattering surface.
- E** Absorption Coefficients and Noise Reduction Coefficient for the product shall be measured by an independent, accredited NVLAP facility according to the test methods as defined by ASTM C 423 and ASTM E 795. Random incidence Absorption Coefficients for the product in a Type A mounting shall be as follows:

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
0.23	0.24	0.35	0.23	0.20	0.20	0.25

- F** Diffusion Coefficients for the product shall be measured in accordance with the recommendations of the Audio Engineering Society Working Group SC-04-02 boundary measurement technique. The directional diffusion coefficient is given by the standard deviation of the 1/3-octave polar response, for a given angle of incidence, and normalized by the response of a flat panel of similar size. The average incidence diffusion coefficients determined at 5° intervals between ± 85° are listed below at octave-band centers. The mean and standard deviation (SD) of the 1/3 octave-band coefficients are also tabulated.

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Mean	SD
0.71	0.73	0.88	0.80	0.69	0.56	0.72	0.08

- G** Flame Spread and Smoke Developed shall be tested by an independent, accredited NVLAP facility according to the test methods as defined by ASTM E 84 and NFPA 255. The Quadratic Residue Diffusor shall have a composite Flame Spread Rating of less than 25 and a Smoke Development of less than 450.
- H** The overall dimensions shall be 23-5/8"(H) x 23-5/8"(W) x 9-1/8"(D) and weigh no more than 50 pounds.



The Sound of Innovation

Transparent One Dimensional Quadratic Residue Diffusor

- A** The Transparent One Dimensional Quadratic Residue Diffusor shall be the model Diviewisor™ 4' x 2' as manufactured by RPG® Diffusor Systems, Inc., Upper Marlboro, MD 20774. Tel: 301-249-0044, Fax: 301-249-3912.
- B** The Transparent One Dimensional Quadratic Residue Diffusor shall be fabricated from 1/2" plexiglass.
- C** The Transparent One Dimensional Quadratic Residue Diffusor shall work on the one dimensional reflection phase grating principle, using an array of wells of equal width separated by thin dividers. The depths of the wells shall be based on the prime seven quadratic residue theory sequence.
- D** Sound diffusion in the horizontal plane shall be provided by wells in the vertical position while diffusion in the vertical plane shall be provided by wells in the horizontal position. The Transparent One Dimensional Quadratic Residue Diffusor may be rotated to achieve a variety of patterns that will provide a highly effective scattering surface.
- E** Absorption Coefficients and Noise Reduction Coefficient for the product shall be measured by an independent, accredited NVLAP facility according to the test methods as defined by ASTM C 423 and ASTM E 795. Random incidence Absorption Coefficients for the product in a Type A mounting shall be as follows:

125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
0.23	0.24	0.35	0.23	0.20	0.20	0.25

- F** Diffusion Coefficients for the product shall be measured in accordance with the recommendations of the Audio Engineering Society Working Group SC-04-02 boundary measurement technique. The directional diffusion coefficient is given by the standard deviation of the 1/3-octave polar response, for a given angle of incidence, and normalized by the response of a flat panel of similar size. The average incidence diffusion coefficients determined at 5° intervals between ± 85° are listed below at octave-band centers. The mean and standard deviation (SD) of the 1/3 octave-band coefficients are also tabulated.

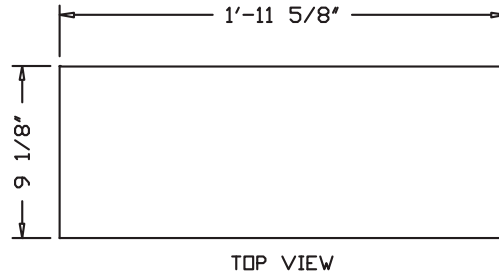
125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Mean	SD
0.71	0.73	0.88	0.80	0.69	0.56	0.72	0.08

- G** Flame Spread and Smoke Developed shall be tested by an independent, accredited NVLAP facility according to the test methods as defined by ASTM E 84 and NFPA 255. The Quadratic Residue Diffusor shall have a composite Flame Spread Rating of less than 25 and a Smoke Development of less than 450.
- H** The overall dimensions shall be 47-1/4"(H) x 23-5/8"(W) x 9-1/8"(D) and weigh no more than 50 pounds.

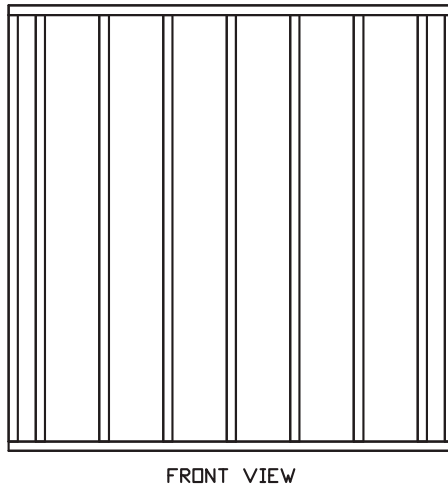
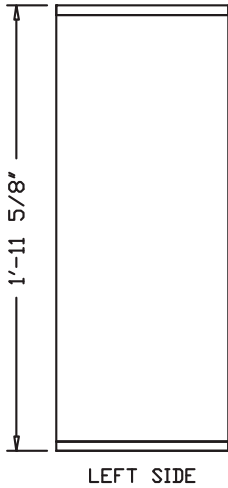
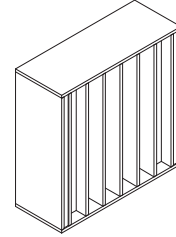


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QRD[®] 734



2' x 2' EE Cutsheet



Project:

Specifier:

Drawing Number:

Date:

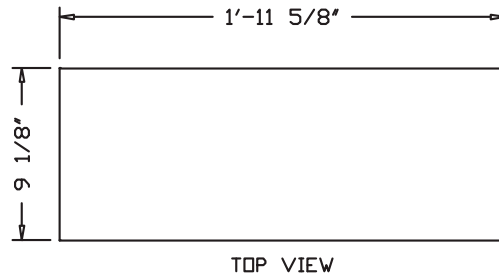
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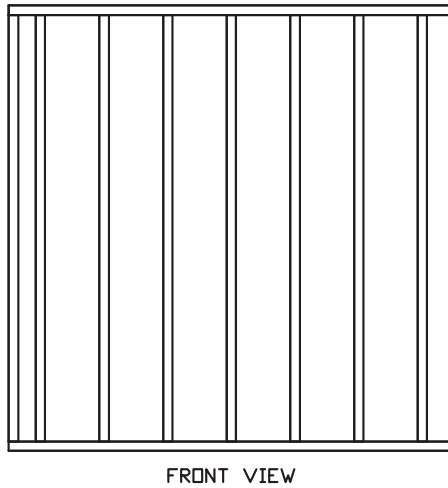
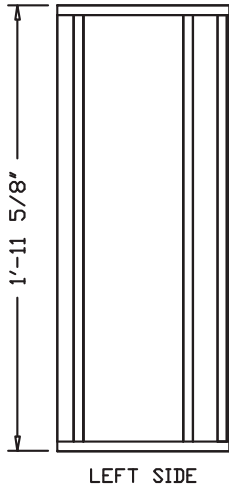
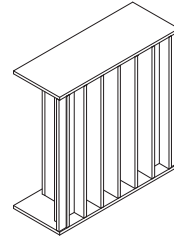
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QRD[®] 734



2' x 2' EH Cutsheet



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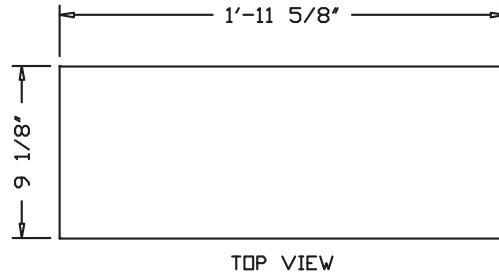
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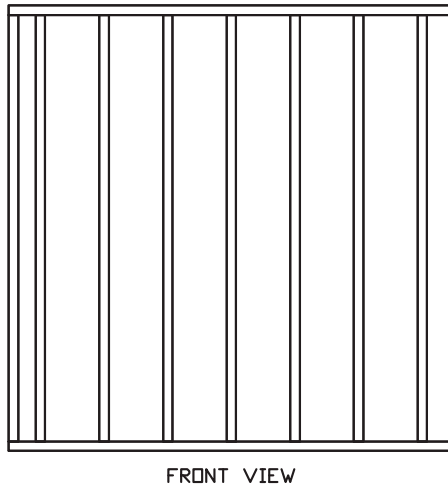
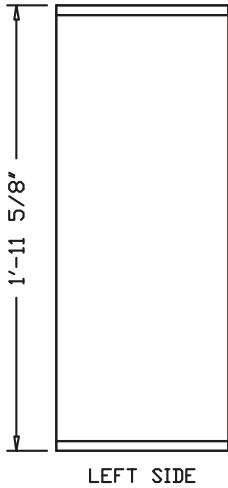
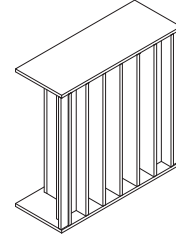
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QRD[®] 734



2' x 2' EJ Cutsheet



Project:

Specifier:

Drawing Number:

Date:

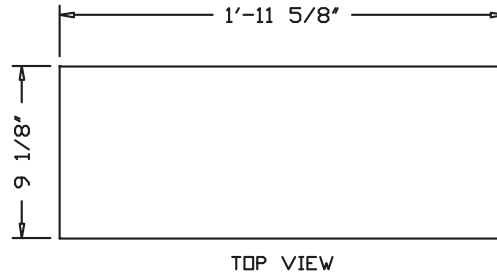
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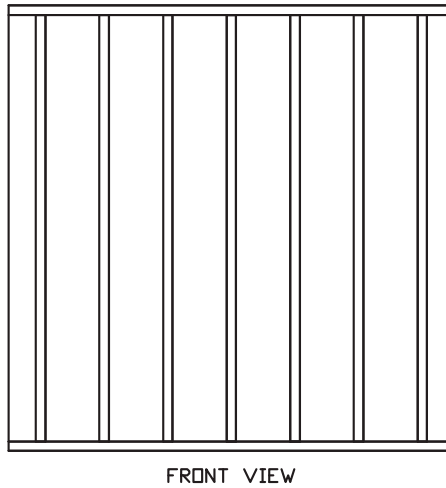
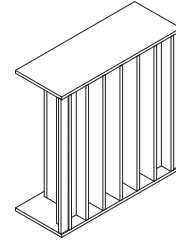
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QRD[®] 734



2' x 2' HH Cutsheet



Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

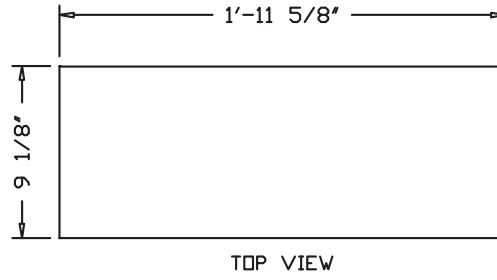
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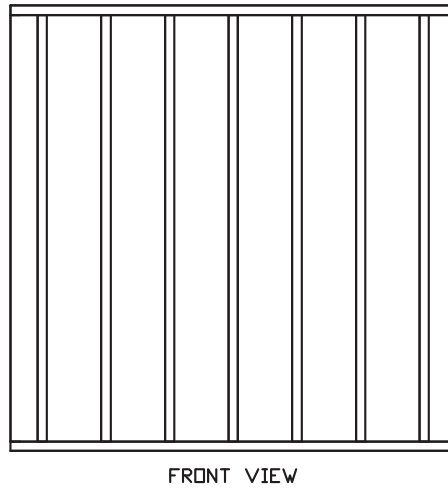
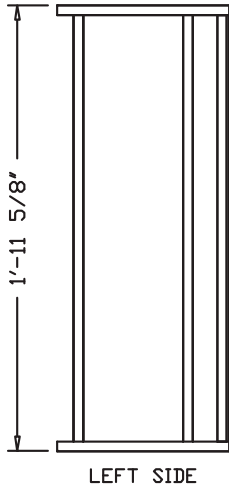
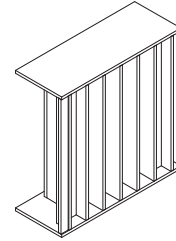
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QRD[®] 734



2' x 2' HJ Cutsheet



Project:

Specifier:

Drawing Number:

Date:

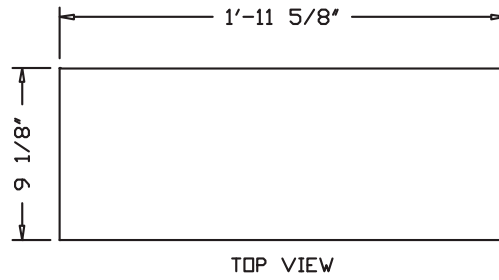
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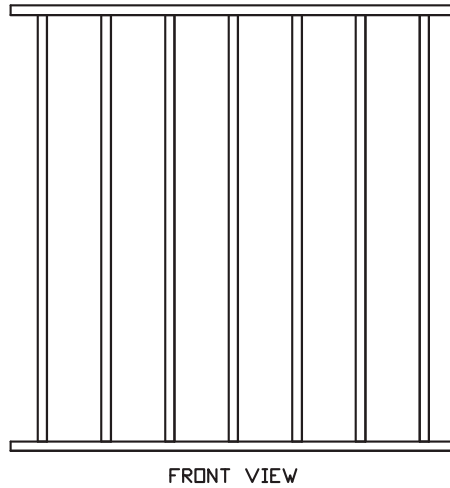
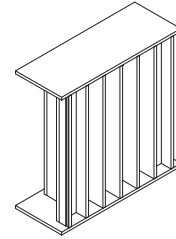
The Sound of Innovation



QRD[®] 734



2' x 2' JJ Cutsheet



Project:

Specifier:

Drawing Number:

Date:

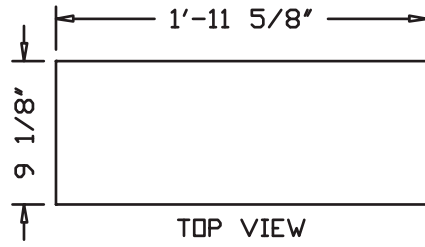
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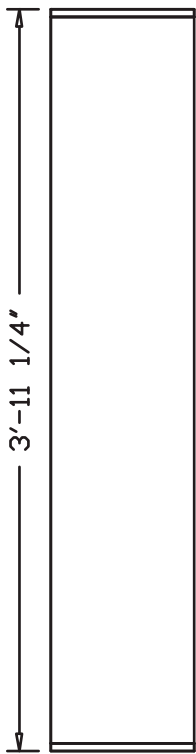
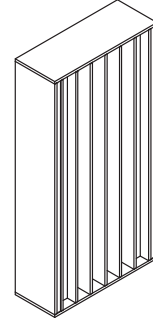
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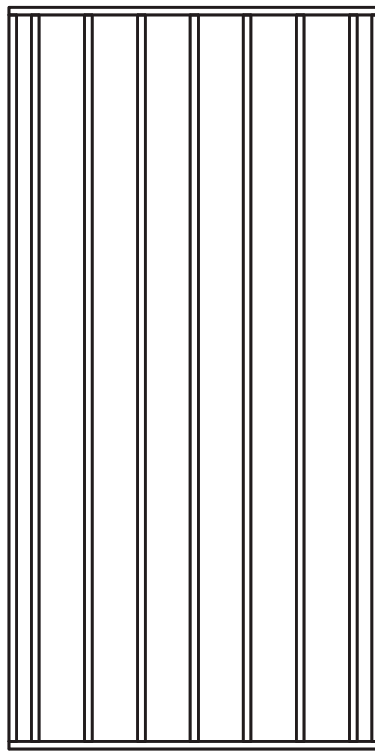
QRD[®] 734



4' x 2' EE Cutsheet



LEFT SIDE



FRONT VIEW

Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

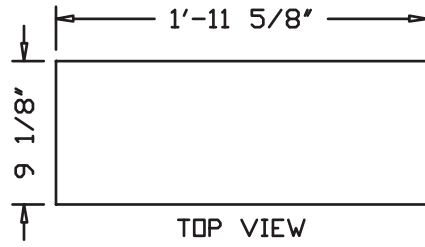
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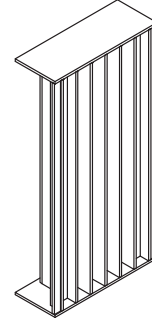
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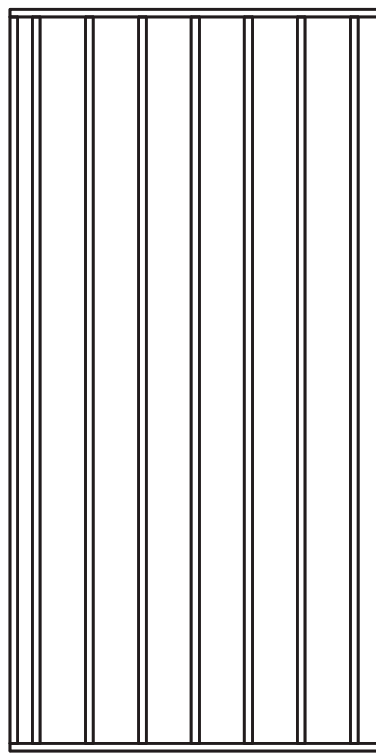
QRD[®] 734



4' x 2' EH Cutsheet



LEFT SIDE



FRONT VIEW

Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

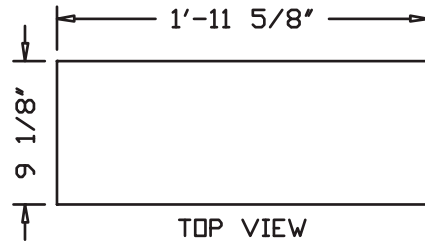
Tolerance: $\pm 1/16"$



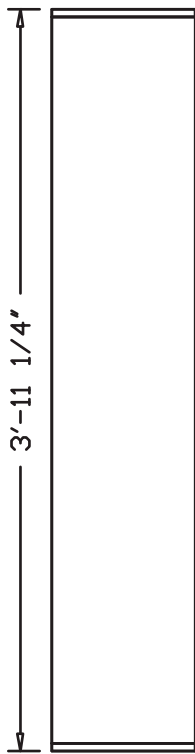
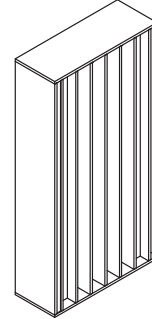
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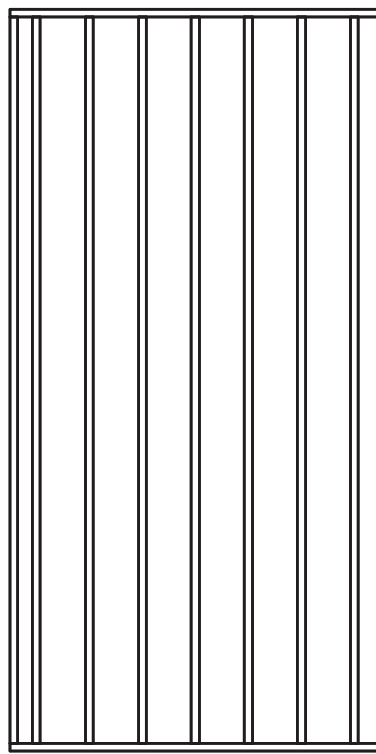
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4' x 2' EJ Cutsheet



LEFT SIDE



FRONT VIEW

Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

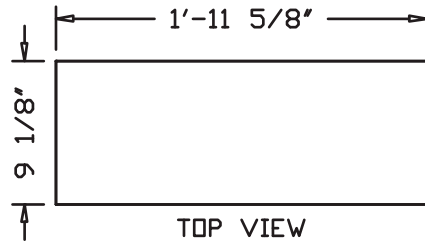
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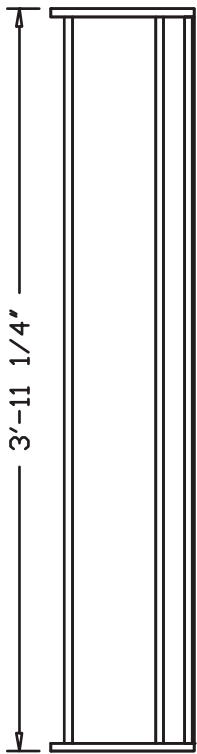
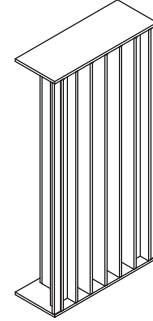
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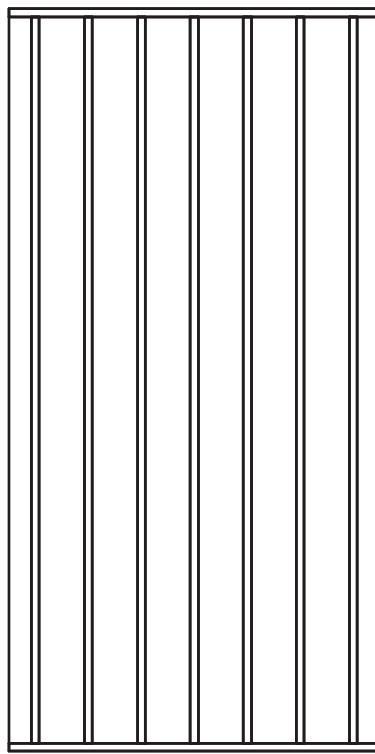
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4' x 2' HH Cutsheet



LEFT SIDE



FRONT VIEW

Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

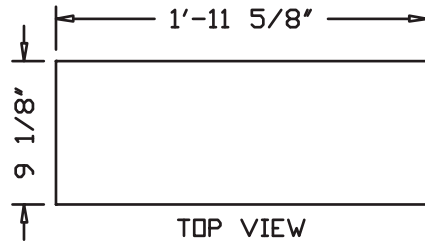
Tolerance: $\pm 1/16"$



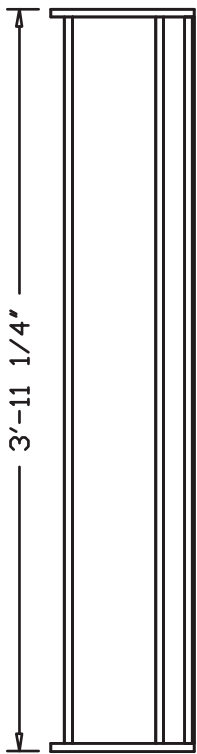
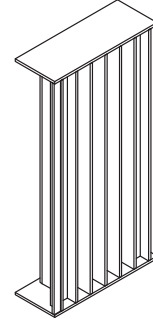
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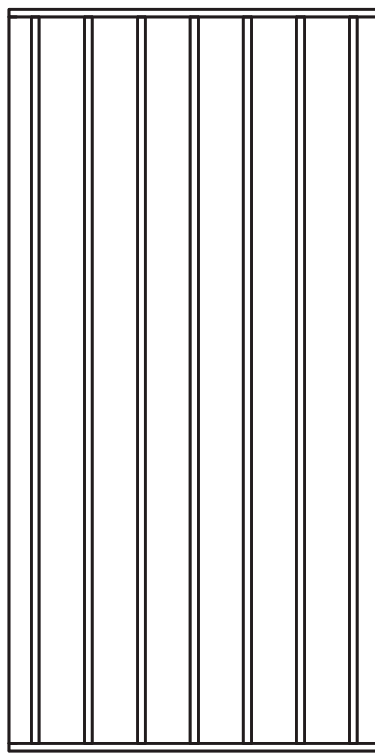
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4' x 2' HJ Cutsheet



LEFT SIDE



FRONT VIEW

Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

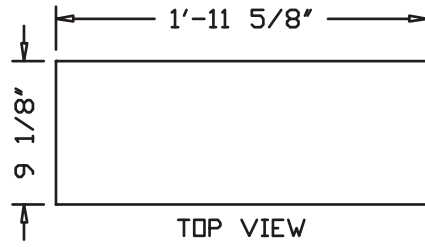
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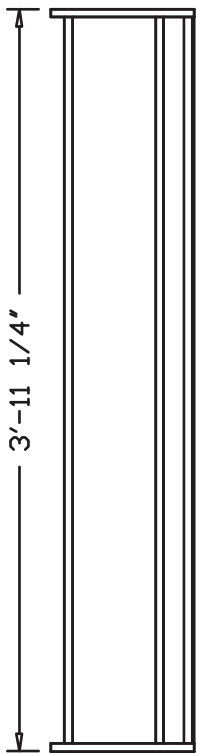
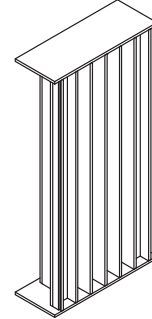
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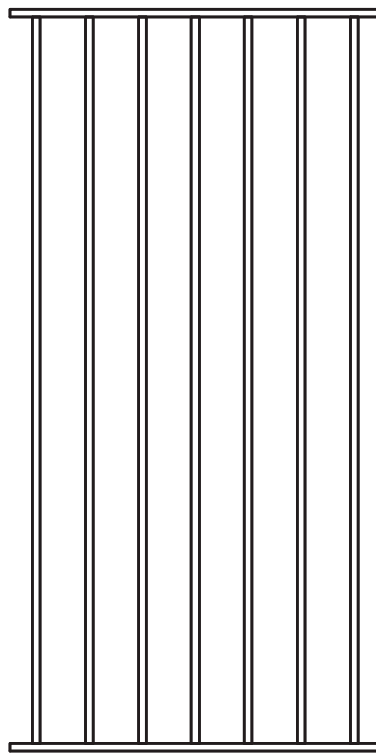
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4' x 2' JJ Cutsheet



LEFT SIDE



FRONT VIEW

Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

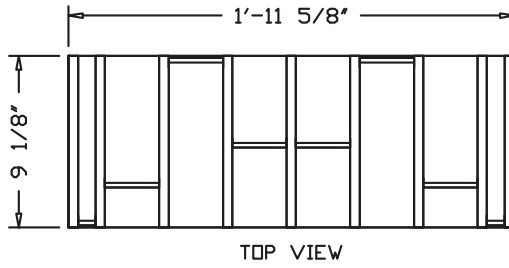
Tolerance: $\pm 1/16''$



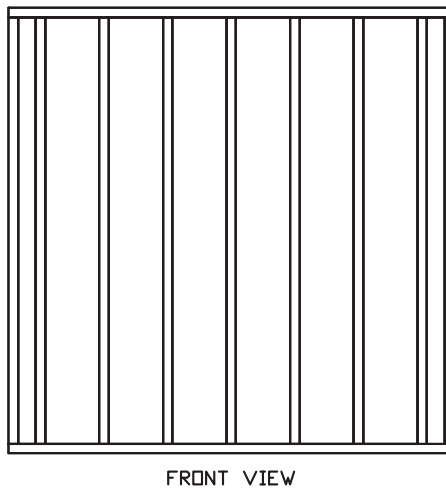
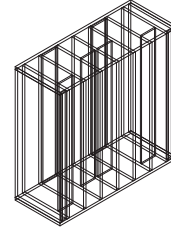
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Divisor™ 2' x 2' Cutsheet



Project:

Specifier:

Drawing Number:

Date:

Tolerance: ± 1/16"

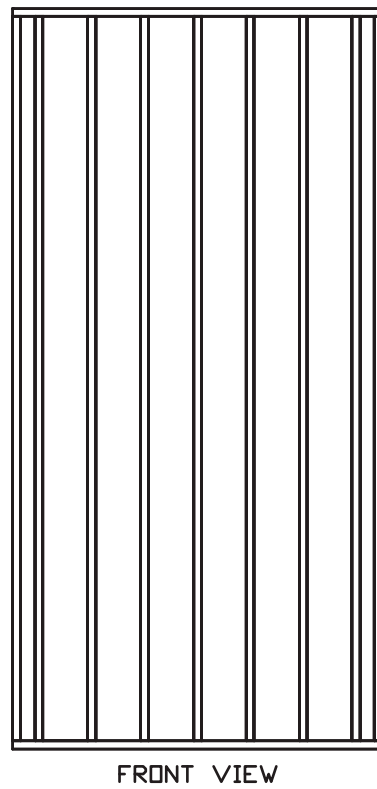
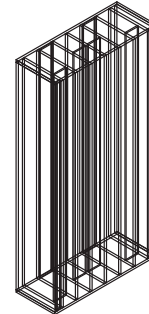
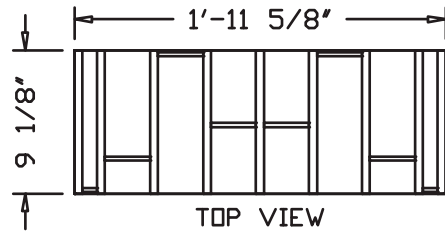


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Divisors™ 4' x 2' Cutsheet



Project: _____

Specifier: _____

Drawing Number: _____

Date: _____

Tolerance: $\pm 1/16"$

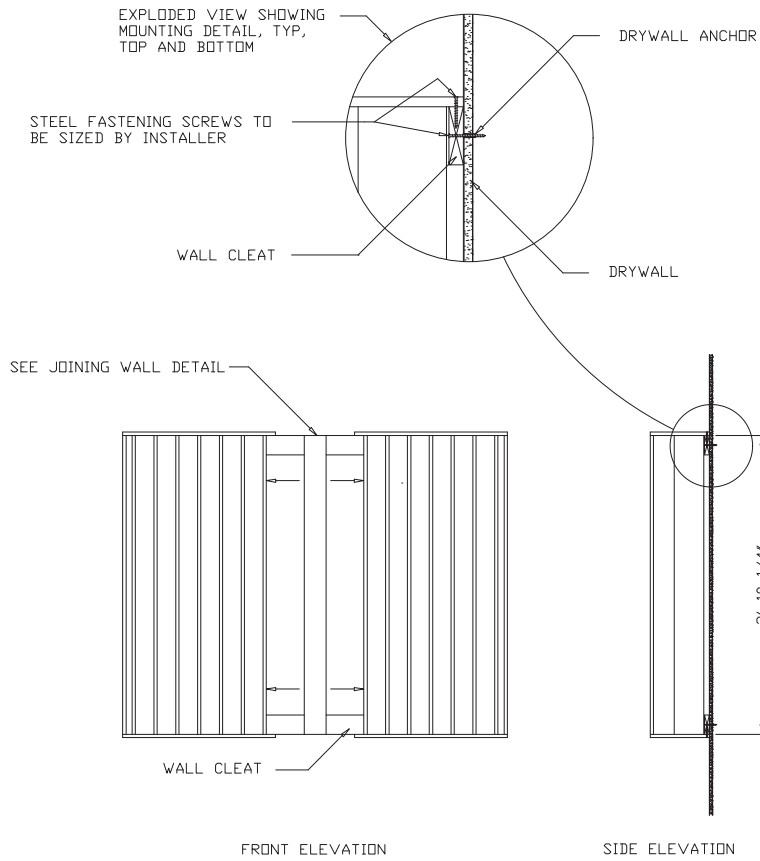


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Surface Mount



Project:

Specifier:

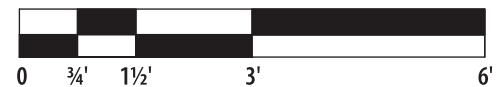
Drawing Number:

Date:

All dimensions should be field verified prior to installation.

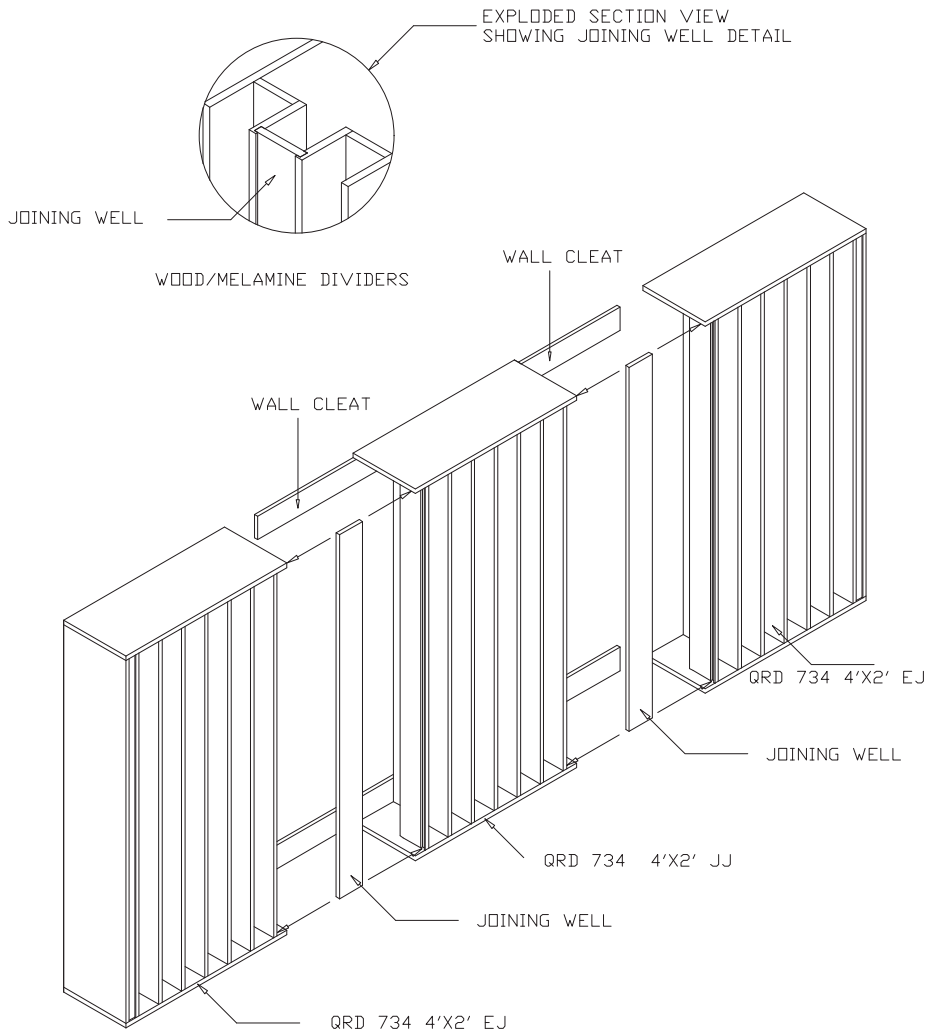


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Joining Well Mount



Project:

Specifier:

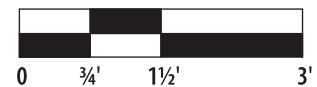
Drawing Number:

Date:

All dimensions should be field verified prior to installation.

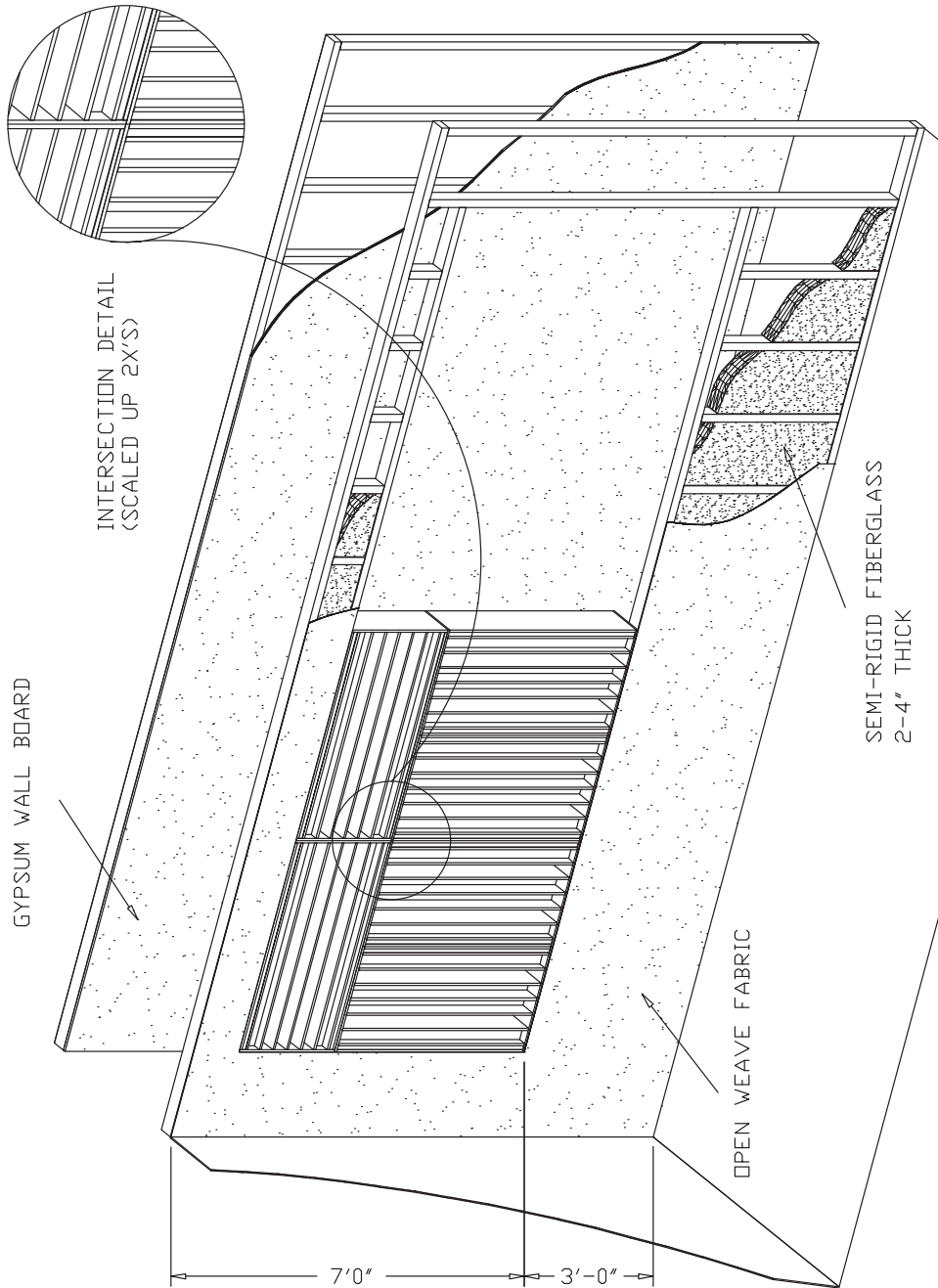


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4' x 2' Flush Mount



Project:

Specifier:

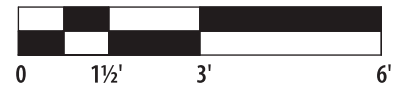
Drawing Number:

Date:

All dimensions should be field verified prior to installation.

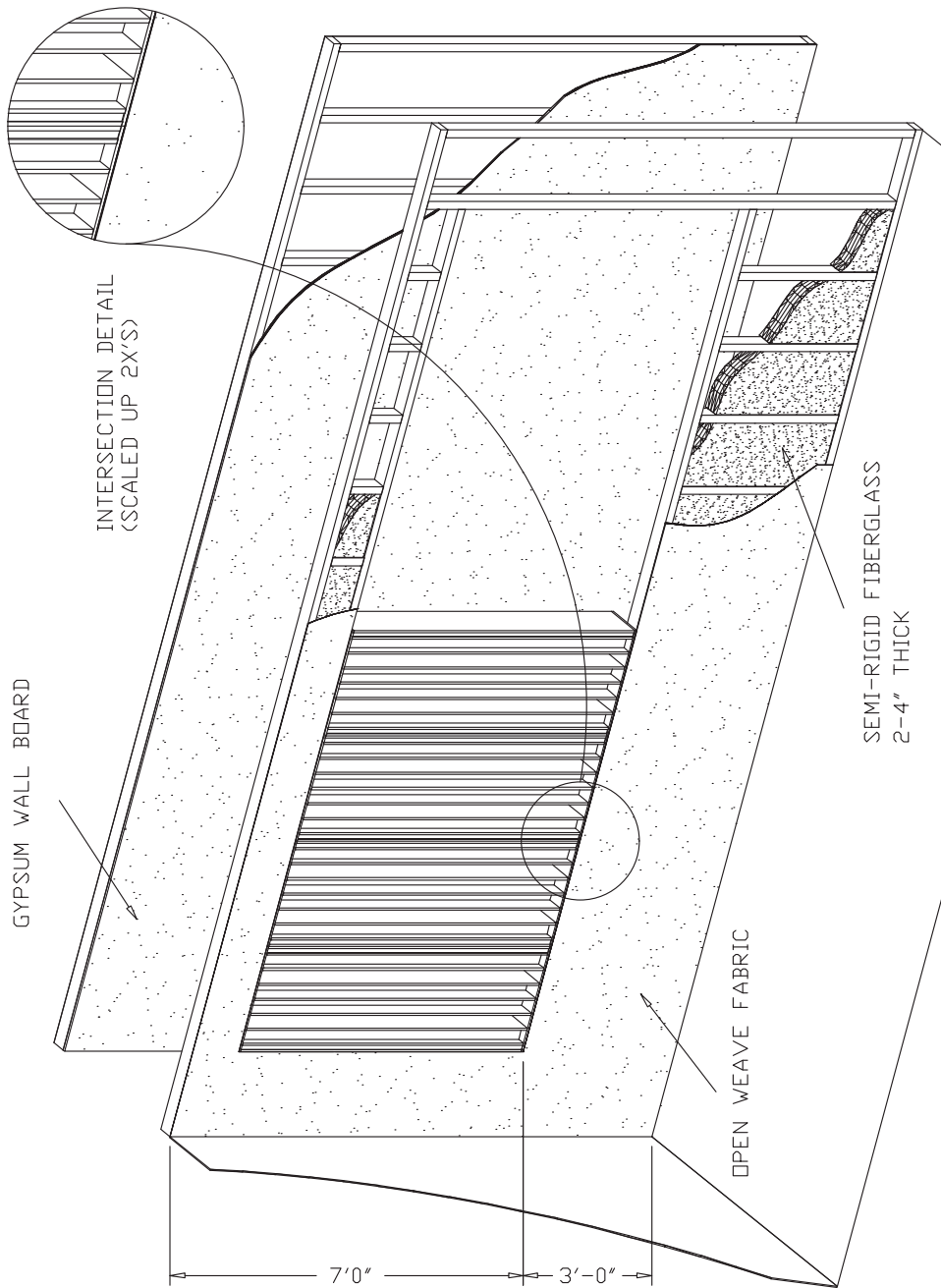


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Custom Height Flush Mount



Project: _____

Specifier: _____

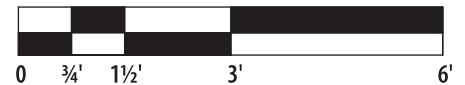
Drawing Number: _____

Date: _____

All dimensions should be field verified prior to installation.



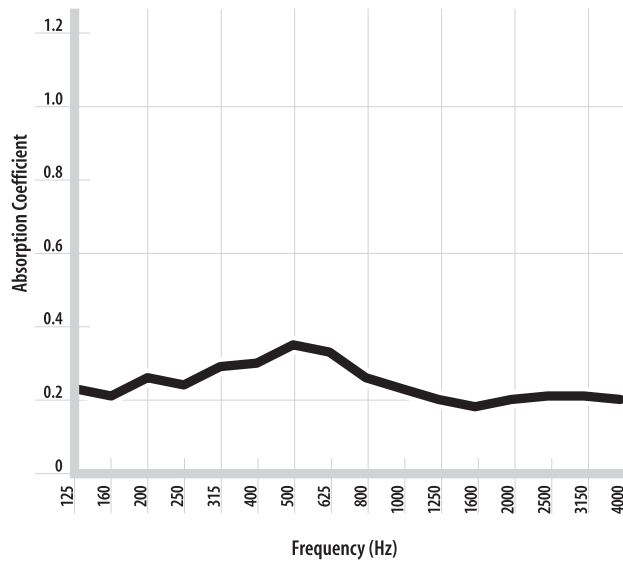
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Absorption Coefficients

Measured According to ASTM C423 at Riverbank
Acoustical Laboratories (RAL-A86-126).



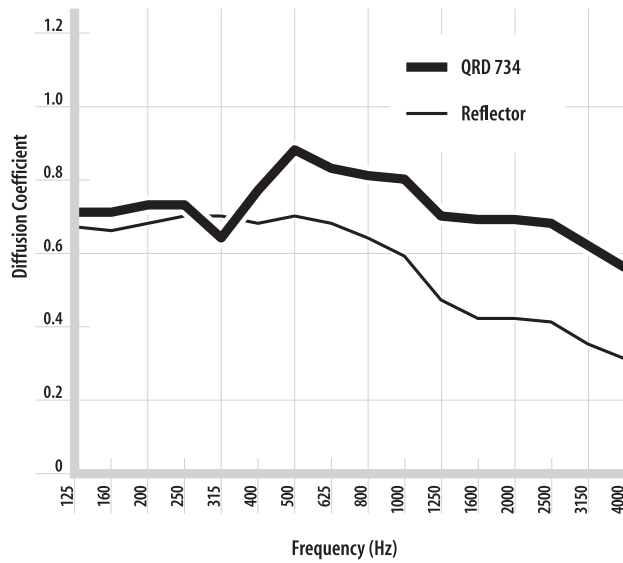
Hz	Absorption Coefficient
125	0.23
160	0.21
200	0.26
250	0.24
315	0.29
400	0.30
500	0.35
630	0.33
800	0.26
1000	0.23
1250	0.20
1600	0.18
2000	0.20
2500	0.21
3150	0.21
4000	0.20



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Diffusion Coefficients



Hz	QRD [®] 734	Reflector
125	0.71	0.67
160	0.71	0.66
200	0.73	0.68
250	0.73	0.70
315	0.64	0.70
400	0.77	0.68
500	0.88	0.70
625	0.83	0.68
800	0.81	0.64
1000	0.80	0.59
1250	0.70	0.47
1600	0.69	0.42
2000	0.69	0.42
2500	0.68	0.41
3150	0.62	0.35
4000	0.56	0.31



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