



## RE: Estimation of Taper Systems

The purpose of this document is to provide clarification regarding the process C3 Group estimates for taper systems through Xactimate. Currently, Xactimate does not have taper options, which means a user must estimate for these materials based solely off of discretion, often times leading to inaccurate estimation.

Common throughout the industry, taper systems are priced through volume, in this case- board feet (BF). Taper systems can be designed to cater to specific roof designs, a majority with a common goal of providing positive roof drainage. In order to receive accurate material proposals for various taper needs, a contractor will typically submit roof drawings to a local distributor showing the location of roof drains and curbs- which may indicate the need for additional crickets, etc. Once this information is submitted, a proposal is given that offers multiple options. All taper systems are dependent upon materials used, slope, among other factors.

Once this proposal is received, contractors will provide an installation price, and add on other material needs, such as roof fasteners or adhesives needed to bond the boards to the roof substrate. Conveniently, Xactimate provides excellent data for estimating these costs. The issue is how a user can accurately represent taper system material and labor costs that are in-line with local market costs.

The below information includes a comparison between real market costs and Xactware pricing in regard to tapered insulation systems. This information will assist an estimator with accurately pricing tapered systems, and also guide a user through the estimating process within Xactimate.

## Example

In order to provide verification for material costs associated with tapered insulation, C3 Group contacted a local distributor, Gulfeagle Supply, to acquire true-market costs associated with a material order. C3 Group then compared this figure to a Xactimate estimate, with identical design (volume) and materials.

The following are roof specifications for the comparison:

Roof Size: 16' x 16'  
 Material: Expanded Polystyrene (EPS)  
 Tapered Area: 2.56 SQ  
 Minimum Start: 0.00"  
 Maximum Height: 4.00"  
 Slope: 1/4":12"

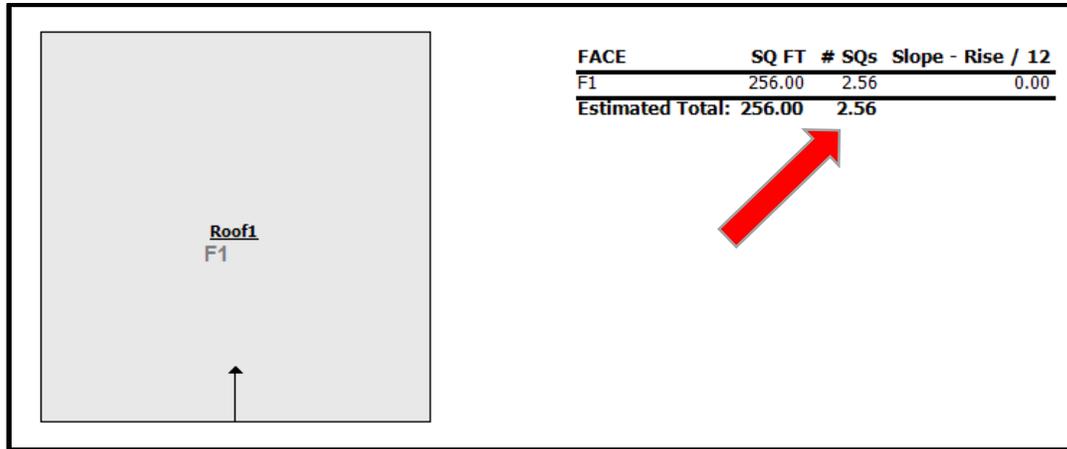
## Distributor Proposal

		<b>Tapered System Quote-Form</b>	
1565 Northgate Blvd / Sarasota, FL 34234 Tel: 941.358.5682 Fax: 941.351.4207		Fax to:	<b>Scott</b>
		Company:	<b>GULFEAGLE SUPPLY</b> 4747 S Windemere Street Englewood, Co 80110
		Phone:	<b>303-346-3706</b>
		Fax:	<b>303-346-3704</b>
		Copy to:	<b>0</b>
<b>Tapered System Specifications:</b>			
Project:	<b>16' X 16'</b>	Job Number:	<b>17-2226</b>
Location:	<b>Englewood, Co</b>	Quote Date:	<b>9/14/2017</b>
Tapered System:	<b>E.P.S.</b>	Minimum Start:	<b>0.0"</b>
Tapered Area:	<b>2.56</b> Squares	Maximum Height:	<b>4.0"</b>
Cricket Area:	<b>0.00</b> Squares	Fill Insulation:	<b>N/A</b>
Slope(s):	<b>1/4"</b> /ft	Base Layer:	<b>N/A</b>
Cricket Slope:	<b>N/A</b> /ft	Overlay:	<b>N/A</b>
		Thermal:	<b>N/A</b>
<b>Price: \$</b>		<b>205</b>	
		Labor Information	
		Total Squares of Material:	<b>2.56</b>
		Total Squares Applied:	<b>2.56</b>
		Average R-Value:	<b>8.34</b>
		Quote expires:	<b>12/13/2017</b>
		Project Estimator:	Keith Krug
		E-Mail:	kkrug@gulfeaglesupply.com

As listed above, the material cost for this taper system is \$205.00. This includes only the tapered expanded polystyrene boards, exclusive of labor, fasteners and adhesive.

### Xactimate Proposal

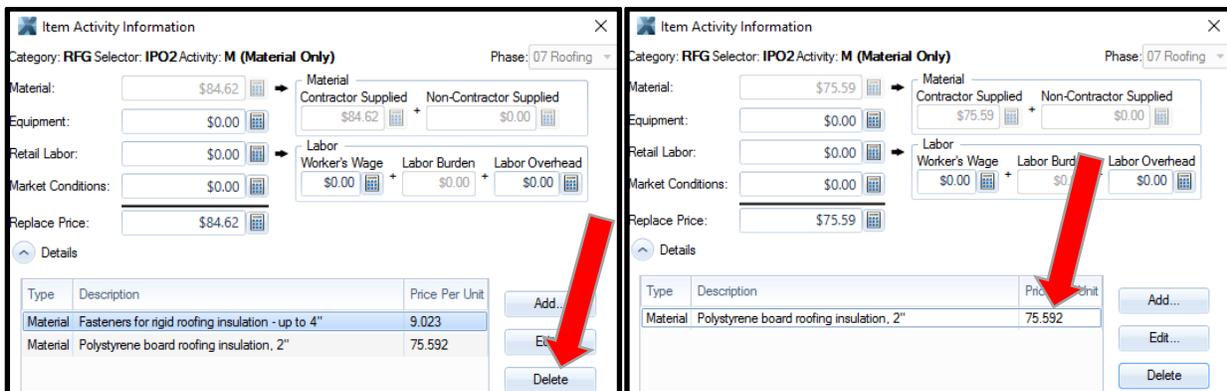
C3 Group then provided a like-kind and quality estimate through Xactimate using a price list on or near the date the proposal was received (CODEN\_SEP17).



C3 Group selected (2) 2" expanded polystyrene boards (EPS) 'RFGIPO2', and changed the action to account for Materials Only 'M' in order to compare to the material only distributor proposal.

#	Cat	Sel	Act	Notes	Description	Coverag	Calc	Quantity
4	RFG	IPO2	M		Insulation - polystyrene board, 2"	Dwelling	SQ	2.56
7	RFG	IPO2	M		Insulation - polystyrene board, 2"	Dwelling	SQ	2.56

C3 Group modified the material components to include only the polystyrene boards. This required the deletion of the fasteners that are included within the line item components.



C3 Group reduced the material amount by 50%. This was completed by subtracting 50% of the listed Material component within the Market Conditions field. This accurately accounts for the volume of a 0"-4" taper.

The screenshot shows the 'Item Activity Information' window for 'Polystyrene board roofing insulation, 2"'. The 'Market Condition' field is highlighted with a red arrow and contains the value '(\$37.79)'. The 'Replace Price' field shows '\$37.80'. The 'Material' section shows a price of '\$75.59' for 'Contractor Supplied' and '\$0.00' for 'Non-Contractor Supplied'. The 'Labor' section shows '\$0.00' for 'Worker's Wage', '\$0.00' for 'Labor Burden', and '\$0.00' for 'Labor Overhead'. Below the form is a table with columns: Type, Description, Price Per Unit, Add..., Edit..., and Delete.

Type	Description	Price Per Unit	Add...	Edit...	Delete
Material	Polystyrene board roofing insulation, 2"	75.592			

After settings were saved, the quantities fields were entered as the square count of the roof, in this case '2.56 SQ' for each line item.

#	Cat	Sel	Act	Notes	Description	Coverag	Calc	Quantity	Unit	Unit Price	Sales Tax	RCV
4	RFG	IPO2	M		Insulation - polystyrene board, 2"	Dwelling	SQ	2.56	SQ	\$37.80	\$7.74	\$104.51
8	RFG	IPO2	M		Insulation - polystyrene board, 2"	Dwelling	SQ	2.56	SQ	\$37.80	\$7.74	\$104.51

As seen above, the replacement costs value (RCV) is listed at \$104.51 for each line item, coming to a total of \$209.02.

Material Only Pricing for 0"-4" Expanded Polystyrene Taper System	
Gulfeagle Supply:	\$205.00
Xactimate:	\$209.02
<b>Variation:</b>	<b>&lt;2%</b>

## Estimation of Taper Systems Including Labor and Materials

The method in which C3 Group estimates taper systems is as follows:

- The user determines taper material, along with taper depth based on slope requirements and roof span, or based on like-kind and quality. In this case we will assume a 0"-4" taper is required and/or existing.
- Assuming the use of expanded polystyrene (EPS) material, the user will select (2) 2" polystyrene boards (RFGIPO2).
- The user will enter the square count of the area, or 'SQ', plus any necessary waste factor.
- The user, understanding that taper systems are based on volume, deducts 50% of the material component of the polystyrene boards for both line items, which is completed within Market Conditions. This accommodates the accurate volume (0"-4" taper = 50% of the volume of full-thickness 4" layer).

The image shows two screenshots of the 'Item Activity Information' window in a software application, illustrating the process of adjusting market conditions for tapered polystyrene board roofing insulation.

**Top Screenshot:** The 'Market Conditions' field is set to \$0.00. The 'Replace Price' is \$84.62. The 'Details' table shows two material items:

Type	Description	Price Per Unit
Material	Fasteners for rigid roofing insulation - up to 4"	9.023
Material	Polystyrene board roofing insulation, 4"	75.592

**Bottom Screenshot:** The 'Market Conditions' field is adjusted to (\$37.79), indicated by a red arrow. The 'Replace Price' is now \$46.83. The 'Details' table shows the same two material items, but the description for the second item is now 'Polystyrene board roofing insulation, 2"':

Type	Description	Price Per Unit
Material	Fasteners for rigid roofing insulation - up to 4"	9.023
Material	Polystyrene board roofing insulation, 2"	75.592

As seen above, the user deducts 50% of the material component of "Polystyrene board roofing insulation, 2"" from Materials Conditions field (\$37.79) to compensate for adequate volume.

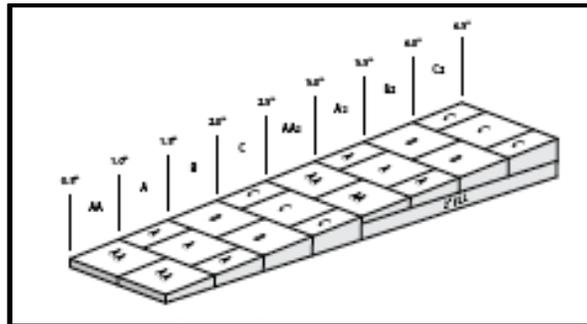
## Common Questions

### “What about the labor costs?”

- The labor costs associated with the installation are left as-is. This is due to the fact that labor costs are primarily dependent upon the area of installation, and not the thickness of the board. For instance, each board may be 50% less volume than a full thickness board, but multiple taper system layers are being installed along the entire area of the roof system. Reducing the labor costs by 50% would inaccurately represent installation of only half the roof area.

### “Why use two boards and not just one?”

- Taper systems are very rarely one solid board, but rather made up of boards with varying size and thickness. Because of this, additional labor is required to manipulate, place and install up to several layers of boards in order to achieve the needed taper design. A side view of common taper design can be seen below. Because of this, C3 Group prices tapers by including two or more layers of insulation to accommodate the total taper needed, e.g. (2) 2” layers for a 4” taper; (1) 2”, (1) 3” layers for a 5” taper, etc. This is ultimately dependent upon the span of the roof section and slope required.



## Conclusions

Based on the information presented above, C3 Group has determined that this process is an accurate means to determining the true costs of a tapered system. This information is based on a like-kind and quality comparison between cost data provided by Xactware, and proposals offered by a local market distributor.