Composite Decking: a helpful primer

Summary
Composite decking, made out of recycled plastic, is becoming a viable alternative to replace traditional redwood and hardwood decks. Typical cost of building a new deck with handrails (see below) is about $35/sq ft for composites, compared to about $24/sq ft for Redwood, i.e. about 30-40% more. It is seldom worthwhile to retrofit an existing deck with composite deck planks. We discuss comparative costs of composite decks with redwood decks in some detail below. A typical small mountain deck of 800 sq ft with 80 lineal ft of handrail will cost $20-30k, with big decks running to $80k.

Advantages of composite Decking
There are several reasons for composite decking's recent popularity:
1. They do not require staining to protect them from sunshine, damp rot and termites. So they last longer, and do not have the typical problems of redwood decks of graying, cracking, warping and nails/screws popping out.
2. Often made out of recycled consumer plastic, you can feel good using this material.

Disadvantages of composite decking
Composite decking does have some drawbacks, however, which make it more suitable for some applications than others. These are:
1. Real wood really does look spectacular. Composites can have some rather fake-looking grain.
2. Composite decking is heavier and much less rigid than redwood in general, which means much more under-structure is required. Code for redwood is 30" spacing of joists and beams (though many contractors use 24" to reduce bounce), whereas code for composite decking is 16". This often makes it uneconomical to retrofit composite decking to an existing deck, because you have to put an additional joists in between every existing one, and the joists are probably in bad shape if the deck boards need replacing.
3. Water markings, action of lichen and differential sun shading effects on a composite deck surface can be hard to eliminate and not painting or staining the deck is one of the reasons you went for composites in the first place! Cheap composites are very prone to nonremovable lichen stains which can look awful after a few years.
4. It is rare to find handrails in composite products, probably because composite does not yet have the strength required. This may mean

you have to use redwood for the handrails. In which case you might want to consider cable rail systems on new decks.
5. Environmentally, of course, redwood trees produce oxygen for the atmosphere, and employment in forested areas.

Brands of composite decking

There are several brands you should consider. Many of these also have several variants, so you need to do your research.

1. Trex
2. Timbertech
3. Weatherbest
4. Evergreen
5. Amerideck
6. Luxray
7. Fiberon

Comparative costs

A. Costs of decking planks

Most planks are 5 1/2" wide. Redwood comes in 1 1/2" thickness. (This is known as a 2x6"). Composite products tend to come in 5/4" thicknesses and are mostly also 5 1/2" widths. We compare the cost of redwood and composite deck planks:

Heart Redwood	$1.60/lin ft
Trex	$1.97-2.43/lin ft, typically $2.20/lin ft
Fiberon	$3.10/lin ft

Notes:

- From this you can see that composites are typically 30% more expensive than Redwood.
- Redwood comes in at least 4 grades. The most commonly used grade is Heart Redwood (sometimes known as 'Con Heart Redwood'), which is what you will find at every lumber store. There is a cheaper grade called 'Con Common' which has more mixed rain and prone to warpage, which I advise against. We

have used Heart Redwood as a comparator in this cost discussion.

- The costs are costs per lineal foot. You can typically double them to get costs per square foot, allowing for a ¼" gap between boards. These prices are before sales tax.
- You also want to allow 10% for wastage, and allow an additional 15% if you go with diagonal boards (they require more supports, have more wastage, and are harder to cut).
- You may also want to consider hardwoods, such as Ipé/Ironwood. These however are very difficult to make decks with, because of their hardness and the need to predrilled screw holes. They also fade quickly and need to be stained every 6 months
- The prices for composite material are as of November 2007. they vary by variant of composite offered by the manufacturer, and also by retailer.

B. Comparative costs of decks

We have pulled together some estimates of labor and material costs to help you estimate the cost of a new deck, comparing redwood and composite material. We have assumed $1.60/linear ft for redwood planking, and $2.20/linear ft for composite planking as being representative figures. We have tried to express these figures in sq ft and lin ft so that you can quickly use them for your own deck situation. Note that deck surface costs are per square foot but handrail costs are per lineal foot. Don't get confused!

We have assumed in these examples a deck placed a few feet above the ground; higher elevations on more difficult ground will cost more in labor and materials, maybe an additional 25%.

Handrails are required by California code when decks are above 4' off the ground, and are very labor-intensive to make. Handrails tend to be of the redwood picket type or the cablerail type. We examine both options.

Here are some representative costings:

1. Deck surface and understructure:

$/sq ft	Redwood	Composite
Materials	5.6	8.3
Labor	15	20
Total cost/sq ft	**$21/sq ft**	**$29/sq ft**

2. Redwood handrails

We have assumed a typical handrail of an inverted L-shaped cap rail, and pickets/spindles of 2x2 redwood placed at 4" centers.

$/lineal ft	Redwood handrails
Materials	20
Labor	43
Total cost/lin ft	**$63/lin ft**

3. Cablerail Handrails

We have assumed redwood posts, a flat cap rail and horizontal cables at 4" spacing, with some tensioning device, and not too many corners (i.e. essentially a rectangular shaped deck).

$/lineal ft	Cablerail Handrails
Materials	15
Labor	60
Total cost/lin ft	**$75/lin ft**

4. Typical deck

Let us assume a typical mountain deck of 800 sq ft and 80 lineal ft of handrail. Rectangular decks tend to have this "10:1" ratio, so this should be a useful example for you to use for your case.

5. Starting with redwood deck surface first:

$	Redwood deck and Redwood handrails	Redwood deck and cablerail handrails
Deck	$21/sq ft x 800=$17,000	$21/sq ft x 800=$17,000
Handrails	$63/lin ft x 80=$5,000	$75/lin ft x 80=$6,000
Total	$19,000	$23,000
Cost/sq ft	**$24/sq ft**	**$29/sq ft**

6. Now estimating for composite decking:

$	Composite deck and Redwood handrails	Composite deck and cablerail handrails
Deck	$29/sq ft x 800=$23,000	$29/sq ft x 800=$23,000
Handrails	$63/lin ft x 80=$5,000	$75/lin ft x 80=$6,000
Total	$28,000	$29,000
Cost/sq ft	**$35/sq ft**	**$36/sq ft**

6. And now comparing directly we have:

$/sq ft	Redwood handrails	Cable rail handrails
Redwood Deck	**$24/sq ft**	**$29/sq ft**
Composite Deck	**$35/sq ft**	**$36/sq ft**

8. Or, in percentage terms:

the cost per sq ft compared to our base case of Redwood deck and redwood handrails.

	Redwood handrails	Cable rail handrails
Composite Deck	**+46%**	**+24%**

As a rule then, this shows that, because cablerail handrails have so much more labor in them, that the additional labor cost of the cablerail handrails is lost in the higher costs of the composite decking. This explains why, if you are going to fit a new composite deck, you might as well go for cablerail handrails at the same time.

Conclusion

Composite Decks are increasingly viable options for new decks. They are often combined with cablerail handrails. Costs are about $35/sq ft, about 30-40% more than redwood, as a rule of thumb.

Useful sources of information and displays in the South Bay:

- San Jose Forest Products/the Decking Superstore, Campbell 408 371 3321. (they have a big display of composite decking).
- Economy Lumber, Campbell 408 378 5231
- Southern Lumber, San Jose 408 294 1487
- Lumbermen's, Santa Cruz 831 475 6100

Attachments

- Trex Usage Guidelines

Disclaimer

This information is provided in the spirit of helpfulness. These are indicative figures only, and based on rough estimates based on my experience and information provide to me by manufacturers. You should take the responsibility to get more detailed information from decking contractors and retailers. Check the Building code in your region. We accept no liability for any errors omissions, or inaccuracies in this information.

Trex® Usage Guidelines

Trex® Wood Polymer™ lumber is suitable for a wide range of uses such as decking and landscaping. *Trex® Wood-Polymer™ lumber is not intended for primary structural members such as load bearing columns, joists, stringers and beams.* In most installations, a span of 16" on center using a minimum of 3 joists will provide excellent results. Please refer to the *Trex* Decking Span Chart on the back of these guidelines for specific requirements or consult the *Trex Wood-Polymer* lumber building code listings (National Evaluation Service - NER-508 or ICBO ES ER-5747).

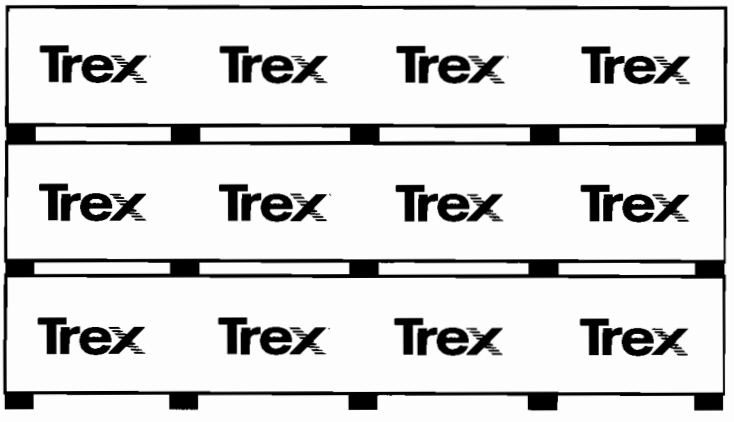
IMPORTANT: *Trex* decking must always be installed properly gapped and directly on joists. Do not attach *Trex* decking to any solid surface or water tight system such as sheathing, waterproof membranes, concrete, roof systems, or patios.

Getting Started

- As with any woodworking project, protective clothing and safety glasses should be worn.

Handling *Trex Wood-Polymer* Lumber

- *Trex Wood-Polymer* lumber weighs more than wood and it's more flexible. Special care should be taken when handling. Do not attempt to lift similar volumes of *Trex* lumber as you do wood.
- When storing *Trex Wood-Polymer* lumber at the job site, be sure to place on a flat surface.
- When stacking units, supports should start at each end and be spaced 24" on center. Supports should line up vertically.



Units of 8' *Trex* lumber

Cutting and Drilling *Trex Wood-Polymer* Lumber

- For best results, use carbide tipped blades and router bits.

  Trex Tip: Blades with fewer teeth (18-24 for $7^1/4$" circular sawblade) work best.

- *Trex Wood-Polymer* lumber's workability is outstanding. Unlike wood, with *Trex Wood-Polymer* lumber you won't need to be concerned about grain direction or knots.
- When drilling large or deep holes, periodically lift the drill out of the hole to draw the shavings out.

Nailing and Fastening *Trex Wood-Polymer* Lumber

- Hot-dipped galvanized or stainless steel nails or screws are highly recommended to take full advantage of the durability of *Trex Wood-Polymer* lumber.
- More force is required to drive a nail into *Trex Wood-Polymer* lumber than regular wood. Hold nail while hammering until it is driven $^1/2$" to $^3/4$". Hitting a nail with full force when it is not driven in may cause it to fly out. Nail guns work very well with *Trex Wood-Polymer* lumber. For cold weather installations or when using wood screws or lag bolts, pre-drilling may be necessary. Do not drill holes any larger than $^3/4$ of the screw/bolt diameter. Pre-drilling is generally not required for self-tapping or deck screws.

  Trex Tip: Most screws will cause *Trex Wood-Polymer* lumber to "mushroom" up over the screw head. Simply tap down with a hammer to hide the fastener or pre-drill to reduce the "mushroom" effect. Screws that minimize the "mushroom" effect are also commercially available.

Trex®

NOTE: See back side of Usage Guidelines for important gapping, spanning and cleaning information.

Trex® Usage Guidelines (cont'd.)

Trex Decking Span Chart

Maximum Recommended Center-to-Center Decking Spans (*Trex* decking fastened to a minimum of 3 joists)

Profile	Residential Decks & Light Duty Docks	Commercial Decks, Boardwalks & Marinas	Playground Equipment
5/4 x 6	16"	12"	16" Residential / Day Care Only
2 x 4, 6, 8	20"	16"	16" Commercial Uses

Note: When installing *Trex* decking at a 45° angle to the joists, be sure to reduce the joist spacing by a minimum of 4".

Gapping *Trex Wood-Polymer*™ Lumber

- Width-to-width board gapping is *essential* for drainage as well as changes in dimension due to temperature. **The width to width gap should be a minimum of 1/4". For cold weather installations, a gap of 3/8" is recommended.**

- When joining *Trex Wood-Polymer* lumber end-to-end, gapping is also required. The size of the gap required will depend on the length of the boards, the temperature at the time of installation and the highest anticipated temperature in the local area.

  End-to-End Gap Rule of Thumb:
  For 16' boards and smaller, allow 1/16" end gap for every 20°F difference between installation temperature and the highest temperature expected during the year. For 20' boards, add an additional 1/16" to the rule of thumb calculated above.

Trex Wood-Polymer Lumber Colors & Weathering Process

Trex Wood-Polymer lumber is available in five colors:

- Natural starts out in varying shades of brown and weathers to driftwood grey hues when exposed to sunlight and water.
- Winchester Grey starts out in varying shades of brown and weathers to deep rich grey hues when exposed to sunlight and water.
- Madeira is a reddish brown and weathers slightly while maintaining its reddish brown hue.
- Woodland Brown is a dark brown and weathers very slightly.
- Saddle is a deep tan and weathers slightly while maintaining its rich tones.

This weathering process is normal and does not harm the product.

Cleaning *Trex Wood-Polymer* Lumber

- For stains caused by mold, mildew, berries and leaves, conventional deck washes containing detergent and sodium hypochlorite work well.

- For rust stains, ground-in dirt and grime, use cleaners containing phosphoric acid which are commonly available in home centers and hardware stores.

- For tougher stains, such as oil or grease, scrub with a detergent containing a degreasing agent as soon as the stain occurs.

  Trex Tip: A light sanding with a medium grit sandpaper works well in removing grease stains that have been allowed to set. This area will weather again as it did after installation.

- Periodically clean out expansion gaps between *Trex* boards with a flat tool to ensure proper drainage.

- Refer to *Trex Wood-Polymer* lumber Care and Cleaning Guide for more information.

General Construction Facts

- *Trex Wood-Polymer* lumber is the only wood-plastic lumber to receive a listing with the nation's three largest building code agencies - BOCA, SBCCI, and ICBO. (NER-508 (National Evaluation Service) and ICBO ES ER-5747).

- Reports NER-508 and ICBO ES ER-5747 are available at your authorized *Trex* dealer.

- *Trex Wood-Polymer* lumber is not intended for use as columns, beams, joists, stringers, and other primary load bearing members.

- Refer to the decking span chart above or NER-508 or ICBO ES ER-5747 for maximum allowable spans.

Trex