Architectural and Design Uses of Reclaimed Wood ~ *Rare and beautiful*

Your Reclaimed Wood Partner

From Specification to Technical Expertise

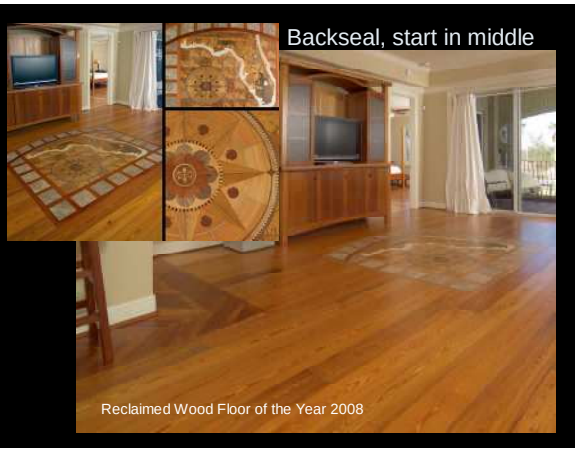
- Pioneered environmental permit for river recovery
- George personally oversees every aspect of your wood from Goodwin

Goodwin was the first reclaimed wood company to manufacture an engineered floor at home in America

Learning Objectives

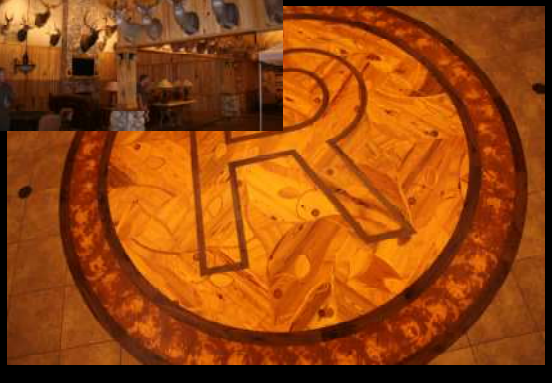
- **Wood… a Wonderful Building Material**
- **America's Rich Virgin Forest History**
- **Grades, Uses and Comparisons**
- **Wood Science Install Advice**
- **Finish Specifications**
- **Case Studies – Avoiding Problems**

Backseal, start in middle



Reclaimed Wood Floor of the Year 2008

Engineered, seal concrete



Measure MC w/ proper meter, vapor retarder

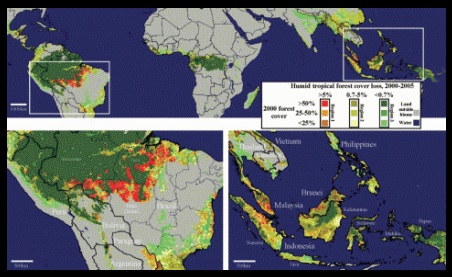
Use enough fasteners - level the subfloor

Wood — The Only Renewable Resource

- Manufacturing is cleaner
- Maintenance is easier
- Requires less energy

Tropical Deforestation

61% of deforestation occurred in 6% of the world's forests
www.pnas.org



Wood Terminology

- Hardwoods
  Softwoods
- Species
  - Red Oak
  - So. Pine
  - Tropical
- Heartwood
  Sapwood

Wood Floor Trends

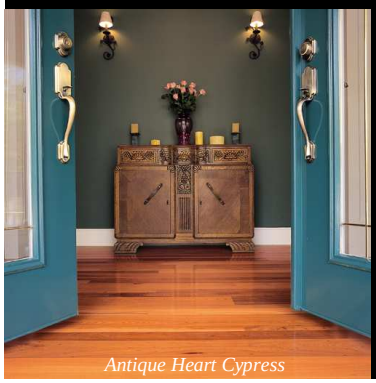
Woods

- Wide range of species
  - Environmental
  - Engineered
- Expanding usage

Finishes

- Improvements
- Distressing

Health and Happiness…



- Indoor air quality
- Finishes and Maintenance
- Engineered Glue Compliance

Reclaimed Wood is Recyling

- River-Recovered® logs
- Old warehouse beams
- Not cut from standing trees

Reclaimed Wood Manufacturing

- Carefully sawn & kiln dried
- Precisely milled
- Graded to established standards
- Solid vs. Engineered

Diversity Available

- Species
- Grains, grades
- Stains, finishes

Antique Heart Pine

The Wood That Built America

– Brooklyn Bridge to Monticello

– Most frequently specified…

– Standards can be confusing

George Goodwin on river recovery…

…an American story to tell

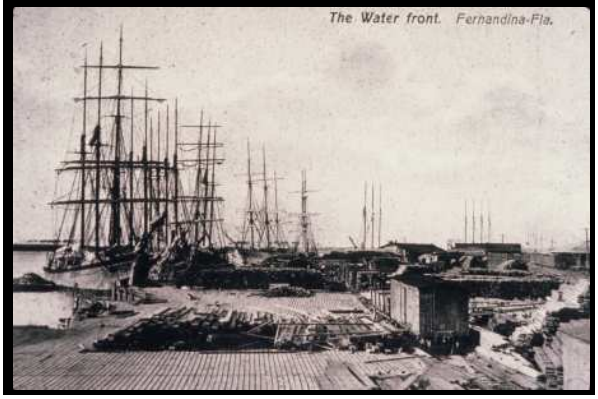
Turpentine from the longleaf pine...

Dragging logs to the river…

As demand grew…

Cool waters perfectly preserved the wood…

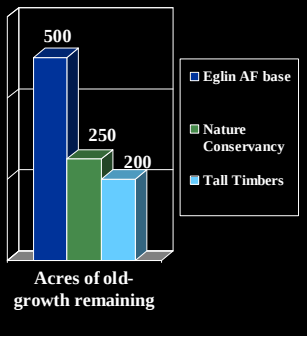
Heart Pine… harder than other woods…



Antique Heart Pine

Then and Now

- Once the largest forest on the continent
- Less than 5,000 acres remain



Original-growth longleaf ecosystem

What does ‘antique’ mean?

Recovering each log by hand…

Grain Patterns

Vertical
(floor)

Select
(doors)

Curly
(crown)

Vertical Heart Pine

Pin-Stripes

The best of quartersawn

Select Heart Pine

Arches and Stripes

Also known as plainsawn

Curly
Heart Pine
(with pegs)

The rarest of all

Rosemary
or
Burl wood

Fine Furnishings…

Craftsman
Style

Country

Historic

Contemporary

Southwestern

Stairparts

traditional
or
custom

George Goodwin with a load of salvage beams

Salvage

a few
nail
holes

Character
Grade

many nail
holes
and
stains

Is It Really Antique?

The older the logs, the harder and more durable

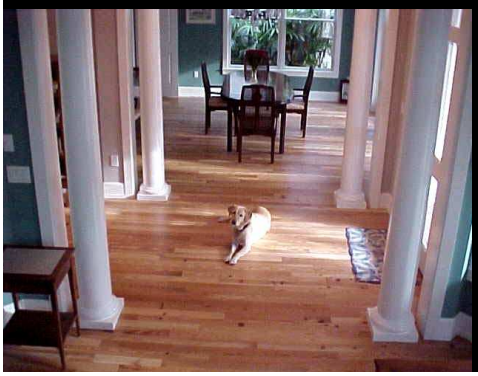
At least 200 years old

Original Growth

Old growth– not the same thing

Heartwood is photoreactive…

Yellow when first sawn — turns red with oxidation



- Antique Longleaf
- One-third heart wood
- Lighter color

Comparison shopping can be confusing

- Quartersawn is not all vertical
- Wide plank can be 75%-85% vertical
- Kiln drying is essential
- Quality grading = 100% useable wood

Comparison shopping (con't):

- Knots are infrequent
- Slight checks — no shake
- Pitch (resin) pockets, up to 1/8"
- Nail holes up to ¼"

Comparison shopping (con't):

- Growth rings, at least 6 per inch
- 1/3rd of the wood in the dark ring
- Not to be confused with old growth or non-native woods
- Graded to established standards, backed by technical expertise

Expect to use more sandpaper

- Cleats vs. staples
- Tighter nail schedule
- Start on a diagonal

Total life cycle cost

Often less over the life of the building

Prices vary widely

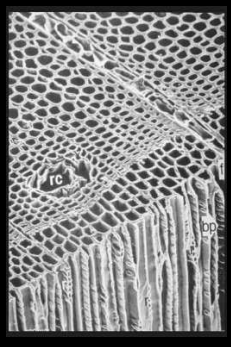
- < $5.00/square foot
  Character Heart Pine
- > $20.00
  Clear Wide 100% Heart

Why Talk About Wood Science?

- How to avoid:
  - Cupping, moisture gradient
  - Buckling, excessive water
  - Cracks, improper acclimation, over drying

Wood Science

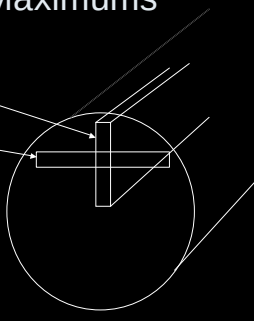
- Porous
  - Finish
- Hygroscopic
  - vapor retarders
- Anisotropic
  - Width versus length



Shrink / Swell Maximums

- Radial (vertical or quartersawn), 4%

- Tangential (plainsawn or select), 8%



- Longitudinal, .1%
- Engineered wood, .5%

Moisture Content for Proper Installation

Temperature (Fahrenheit)

40	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5
50	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5
60	4.6	5.4	6.2	7.0	7.8	8.6	9.4	10.2	11.1	12.1	13.3	14.6	16.2
70	4.5	5.4	6.2	6.9	7.7	8.5	9.2	10.1	11.0	12.	13.1	14.4	16.0
80	4.4	5.3	6.1	6.8	7.6	8.3	9.1	9.9	10.8	11.7	12.9	14.2	15.7
90	4.3	5.1	5.9	6.7	7.4	8.1	8.9	9.7	10.5	11.5	12.6	13.9	15.4
100	4.2	5.0	5.8	6.5	7.2	7.9	8.7	9.5	10.3	11.2	12.3	13.6	15.1
	20	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**

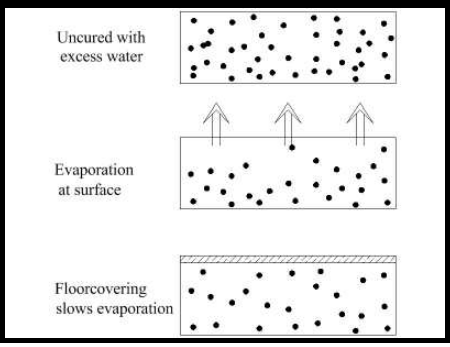
Relative Humidity (percent)

Wood Handbook (Agriculture Handbook 72), Forest Products Laboratory, USDA

Site Preparation & Acclimation

- Dry site before delivery
- Vapor barriers as needed
- Seal wood or concrete as needed
- HVAC w/ appropriate humidification options

Concrete Curing



Concrete Curing Tests

- Qualitative
  - Mats and meters
    - Electrical resistance, ¾"
    - Electrical impedence, 2"
- Quantitative
  - CaCl, CaCarbide
  - ASTM 2170-11
    - The only test that actually measures RH

Over Concrete

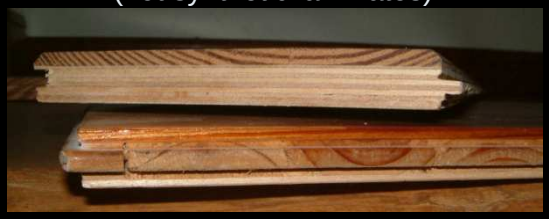
5-1/4" heart pine glue down

- STC and IIC
- Construction systems
  - Floating floor mat or foam
  - Glue down
    - Cork, Sika Acoubond, Rubber, rebonded, Bostik's MVP4…
    - Seal perimeters
    - No through fasteners
  - Sleeper system with pads
  - Track systems

Some Subfloor Options

- Plywood
  - Floating versus attached
  - ¾", C-D grade or 2 layers of ½", perpendicular
- Advantech, OSB types
  - Nail holding strength
  - Consider staples, pressure
- Glue down to concrete
  - No crooked boards, most say not over 5-1/4"
  - Bostik's BEST, Sika Acoubond

Engineered Wood Floors
(not synthetic laminates)



- Often easier on a slab Construction
  - Use balanced layers
  - Fillets vs. plys
  - Micro bevel
  - Sawn vs. rotary cut
- Concerns
  - Delamination
  - Cupping
  - Wear layer
  - Shorter lengths
  - Finishes and repairs

Finish Reasons & Properties

- Protection
  - Abrasion & moisture resistance
  - Ease of care
- Change natural appearance
  - Shade: patina, gloss level
  - Change or stabilize color
  - Age, blend, simulate another wood

A Penetrating Oil for a Richer Color

Finish Choices Per site use

Commercial Application

BUILD A BRANDED CULTURE WORKSHOP

Zappos CEO Tony Hsieh said it best: "Your culture is your brand." And he ought to know – he helped build Zappos into a billion dollar company by focusing on the company's most powerful asset: its culture. Come learn how brand leaders like Zappos consistently outperform competitors by building branded cultures that turn ordinary customers into devoted followers that do the marketing for you. Our workshop is in the planning stages – so email info@walkerbrands.com to be the first on our list to receive more information.

- Sound transmission
- Long lengths glued down
- Staining to match cabinetry

Distressed floors…

National Wood Flooring Association
Floor of the Year 1998

Historic Restoration

- Explore Specifications
- Project Team
- Time Frame

Water Damage Restoration

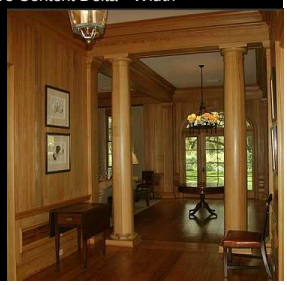
- Is the site dry?
- Contractor responsibilities
- Floor in at right Moisture Content
- Multiple issues in older homes

Case Study on Shrink / Swell

OD / FSP * MC change * Face width

Maximum shrink/swell (Oven dry to Fiber Saturation Point) / Fiber Saturation Point * Moisture Content Delta * Width

- 7" wide Heart Pine
  7.5% (9.6% for oak) /
  25.5% *
  2.5% * 7"
  = .051"



Why Antique Reclaimed Wood?

- Durable
- 'Green'
- Versatile
- Beautiful

An environmental architect on reclaimed wood

Gail Lindsey, FAIA, Harmony Design
Founder, AIA Committee on the Environment

References

- Wood Engineering Handbook, USDA Forest Products Research Lab
- The Beauty of Engineered Wood Floors, Andrew St. James, Wood Source Magazine, Winter 2009
- Kanare, Howard M., Construction Technologies Laboratories, *Concrete Floors and Moisture*. Engineering Bulletin 119. Portland Cement Association
- www.nwfa.org, National Wood Floor Association, Wood Floor Problems: Causes and Cures
- Brickman, Howard, *Advanced Wood Floor Inspection*. Inspector Training Services for Floor Coverings, 2003

The Goodwin Story

~

River Recovered® Pioneer
Only Goodwin… Always Green
First Reclaimed Engineered Made in America

Waiting to Happen

1976, George recovers river logs, sells his antique business and builds the first Goodwin Sawmill

The Company's First Sawmill, drawn by a student working at the mill part-time

Learning to Saw, 1980's

Learning to Mill, 1990's

- George starts out with 1926 planer mill
- 1995, George buys modern high-tech molder to precisely mill the dense, hard River Recovered® & reclaimed wood

Goodwin River Recovered® Permit and Trademark

- Permit became law in 1998
- Environmental Permit Program Requires:
  - Archaeological Survey
  - Proper Equipment to protect the river habitat
  - Master Log Recovery Certification Course
  - Private Landings

Goodwin wins NWFA Floor of the Year 10 Times Since 1997

Floor of the Year 1998

Floor of the Year 2000

Floor of the Year 2008

Wood Floor of the Year 2010

Recent Prominent Projects

2012

- The Texas Governor's Mansion Restoration to match an 1856 floor spec
- Brownwood – The Villages, World's largest retirement community

2013

- Charnley-Norwood Cottage Restoration, birth of modern architecture
- Old Gainesville Depot – won 'green building' and preservation awards

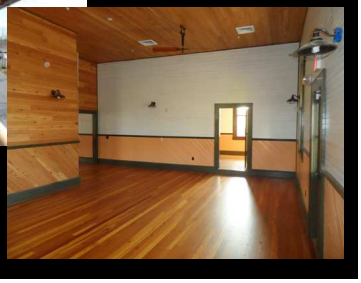
Texas Governor's Mansion

Brownwood at The Villages

Charnley-Norwood Cottage

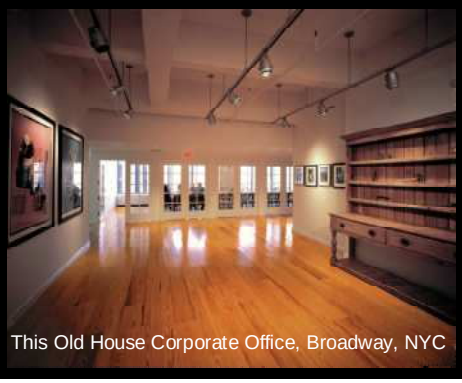
Old Gainesville Depot

- Floor left from Texas Governor's Mansion.
- Old-Growth Plantation Longleaf.



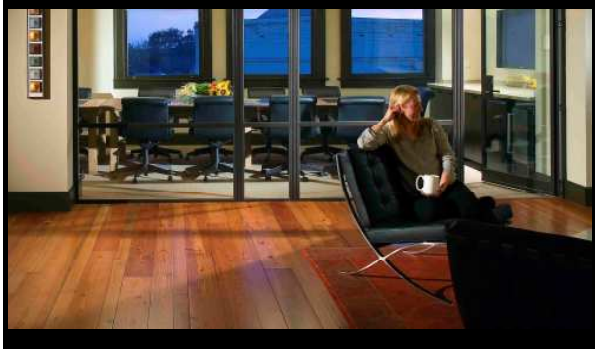
- Saved Community money on wood to be painted.
- Kept history at the forefront.
- LEED and Florida Trust for Historic Preservation Awards.

River Heart Pine Select Clear



This Old House Corporate Office, Broadway, NYC

River Heart Pine Select



River Heart Pine Vertical Clear

River Heart Pine Vertical

River Heart Pine Curly

River Heart Pine Midnight

River Heart Pine Character

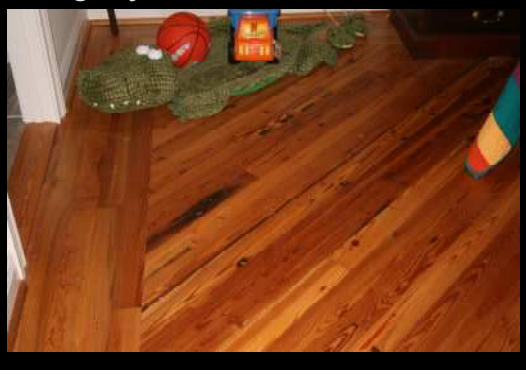
River Antique Longleaf

Legacy Heart Pine Select

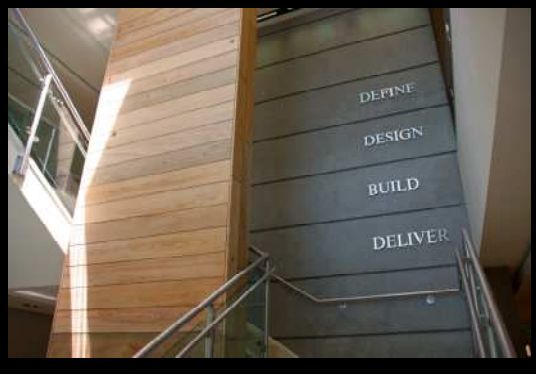
Legacy Heart Pine Vertical

Legacy Heart Pine Naily

Legacy Heart Pine Character



River Heart Cypress Select Clear



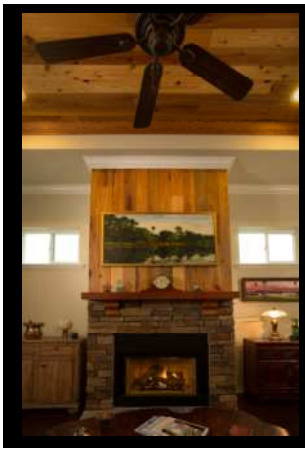
River Heart Cypress Select

River Heart Cypress Vertical Clear

River Heart Cypress Vertical

River Heart Cypress Pecky

River Heart Cypress Midnight



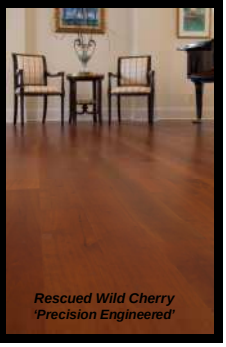
River Heart Cypress Character

Old Florida Heart Pine

Wild Black Cherry

First Reclaimed Engineered Made in America

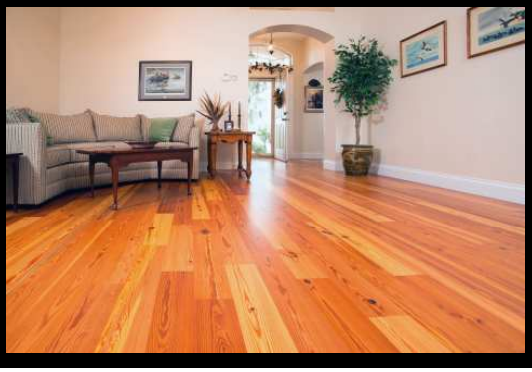
- **2014… primed to grow!**
  - We listen… Educate… Help make well-informed decisions
- **2007… George makes first** reclaimed engineered at Goodwin instead of outsourcing
- **2000… George begins R&D** on engineered to conserve rare wood



Rescued Wild Cherry 'Precision Engineered'

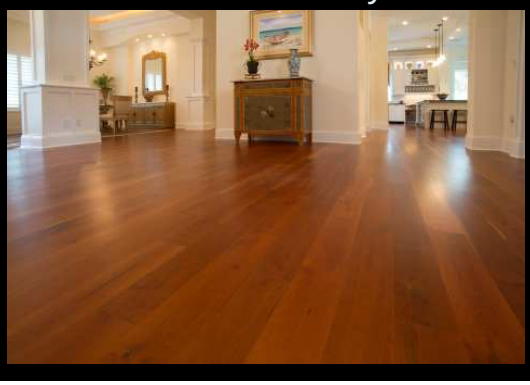
River Classic Heart Pine PE

Legacy Vintage Heart Pine PE



River Heart Pine Vertical PE

Wild Black Cherry PE



We define Goodwin Company with three simple words:
Heritage. Heart. Home.

Preserving Our Rich *Heritage* ~ One-of-a-Kind Works of *Heart*
Custom Handcrafted Specifically for Your Office or *Home*

GOODWIN COMPANY

Fine Antique Wood Flooring Since 1976

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