Surface Degradation of Wood

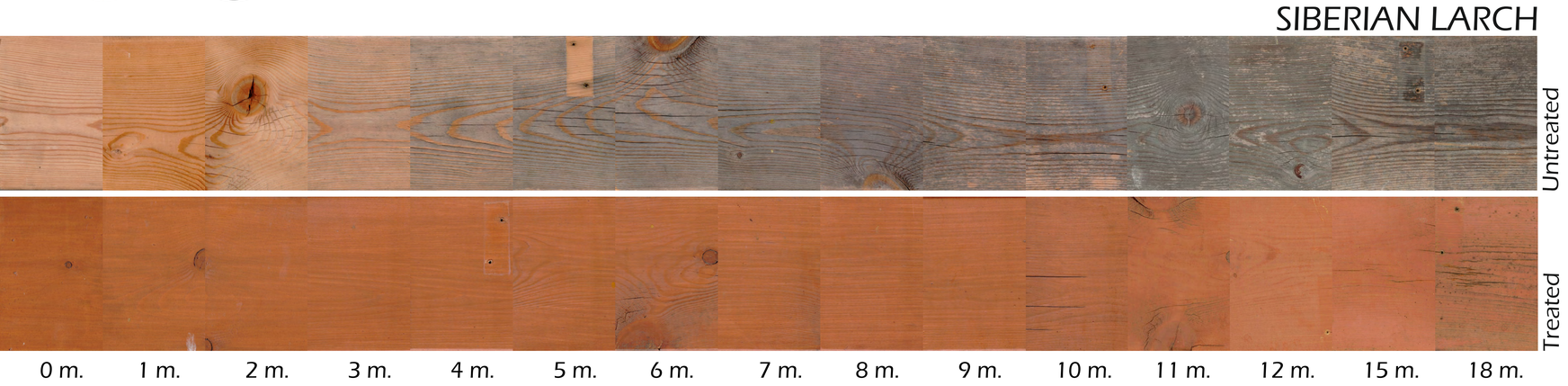
Exposed to External Conditions in South Africa

Hout Bay House research project in cooperation with the Czech University of Life Sciences in Prague

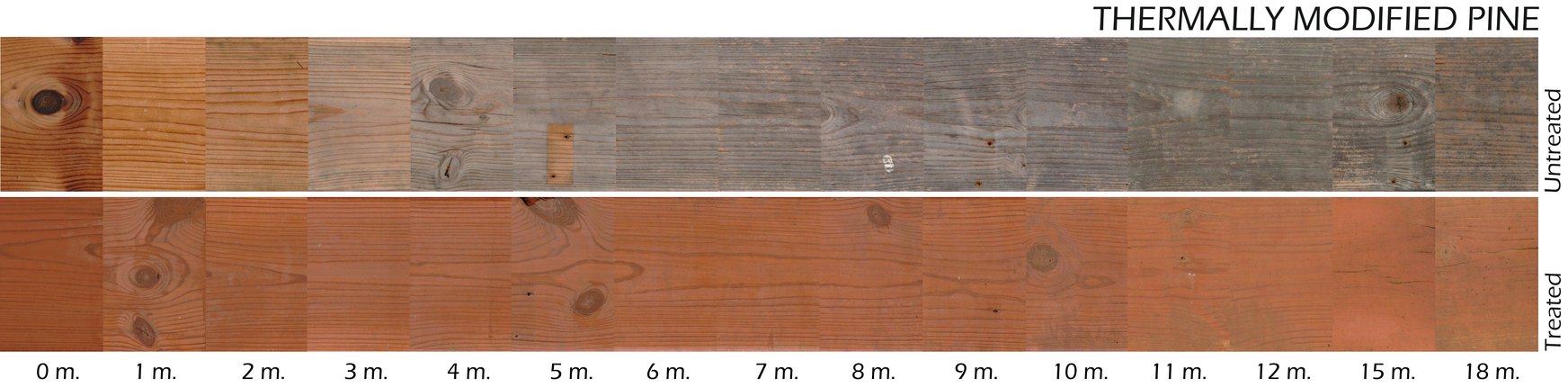
> testing and evaluating the performance of treated and untreated wood species under local coastal climate

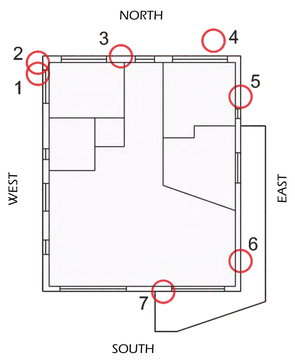
HOUT BAY HOUSE

SIBERIAN LARCH



THERMALLY MODIFIED PINE



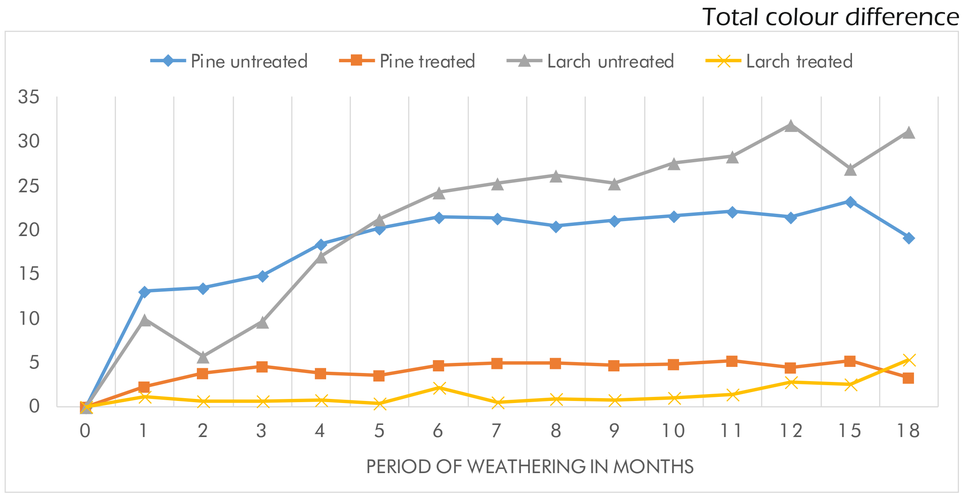


1. Thermally modified pine UNTREATED
2. Siberian larch UNTREATED
3. Thermally modified pine TREATED (2 layers)
4. Siberian larch UNTREATED
5. CEMBRIT
6. Thermally modified pine TREATED (2 layers)
7. Thermally modified pine TREATED (1 layer)

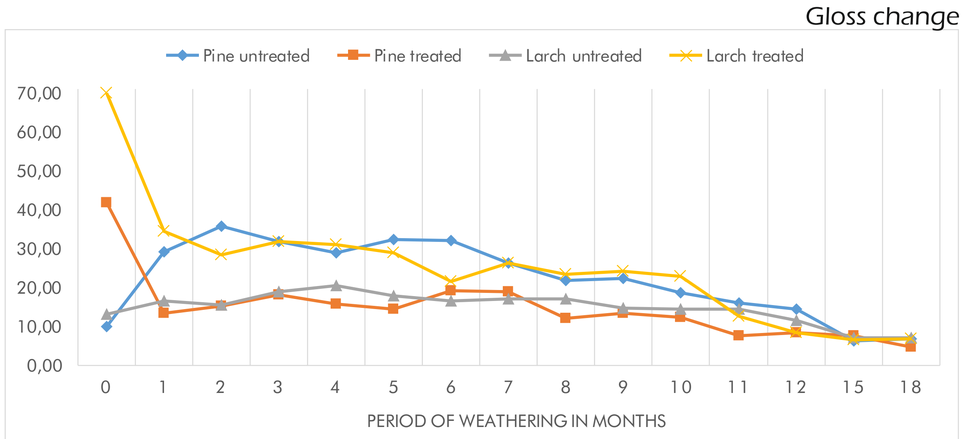
> Cladding x decking
> Different wood species
> Different profiles
> Different surface treatment

Change of properties during weathering

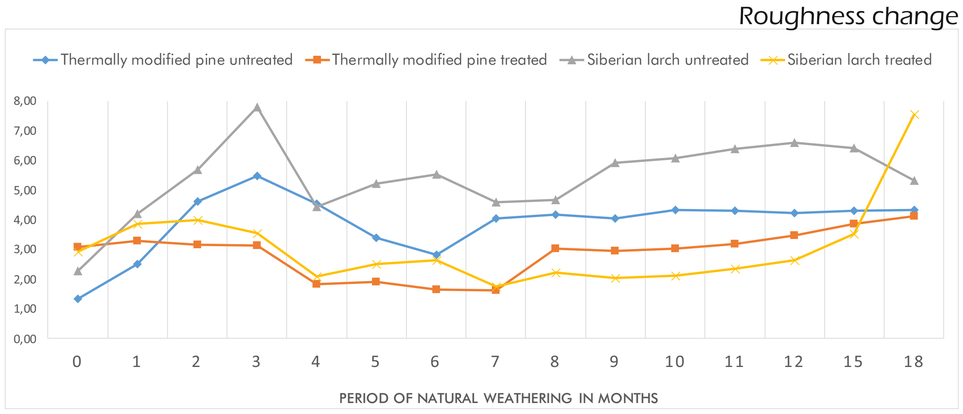
Total colour difference



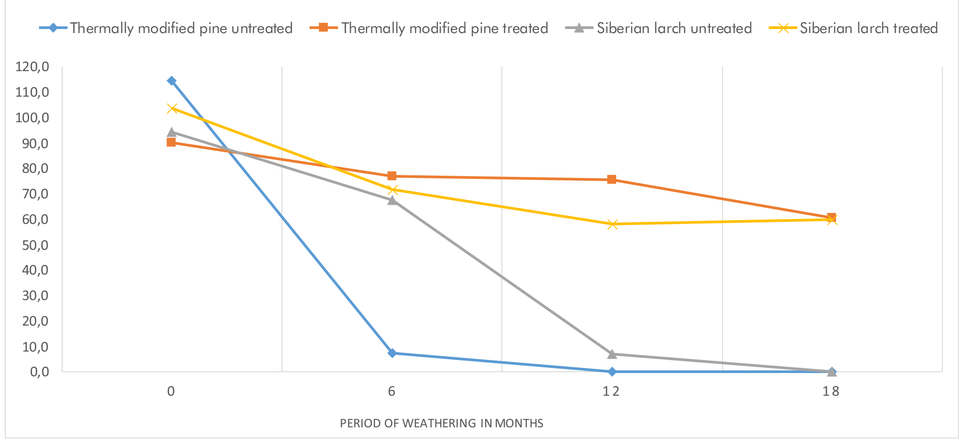
Gloss change

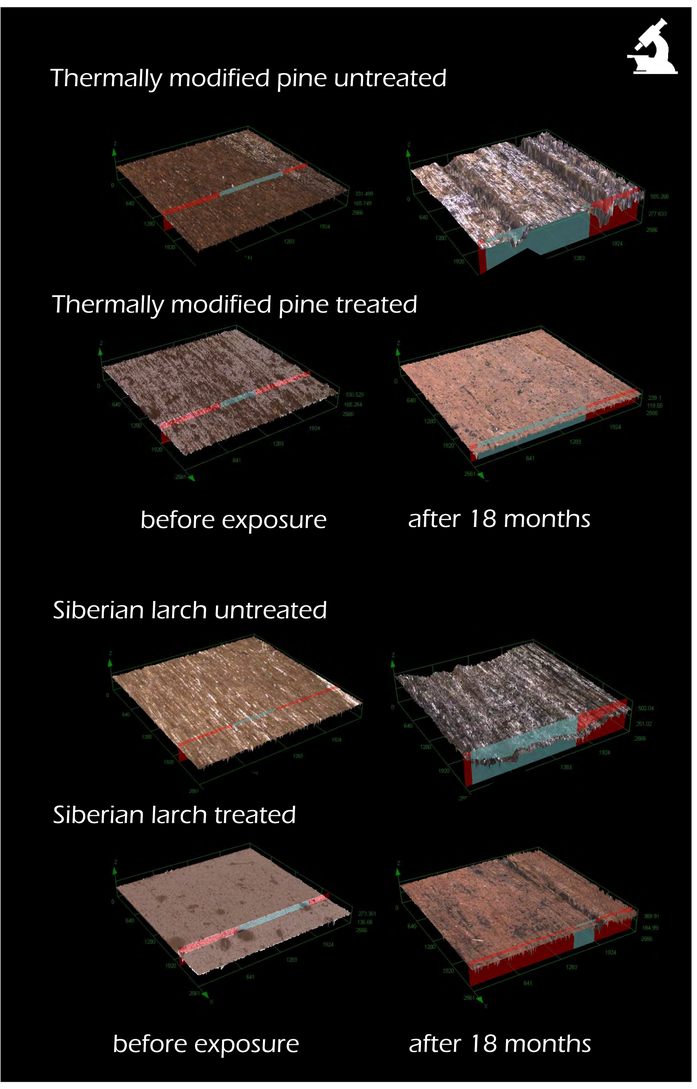


Roughness change



Contact angle change



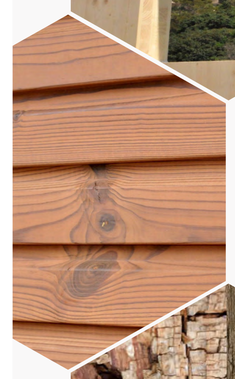


> More stable results in the case of treated samples
> Increasing change of colour and surface roughness
> Graying already after 4 months of weathering of untreated samples
> Starting degradation of treated samples after 1 year of exposure

The trend of using treated or untreated wood elements in the exterior is becoming more progressive. Wood is a natural material and it behaves accordingly - we can either accept the fact that untreated wood turns grey and gets typical plastic structure or use suitable surface treatment which preserves the colour but has to be renewed after several years.

Hout Bay House

> Location
> Weather
> Construction
> Materials used
> Wall composition



Weathering

> Factors
> Change of properties
> Degradation of lignin
> Erosion of wood surface

Structural degradation
> Mechanical changes

Surface degradation
> Only aesthetic changes

Material selection

Construction solution

Surface treatment

1. Material selection

> Use of wood species with higher natural durability

2. Construction solution

> Ventilated air gaps
> Roof overhangs
> Avoiding the ground contact
> Covering the top ends of wood
> Use of steinless fasteners

3. Surface treatment

> Transparent vs. opaque

Regular evaluation

> colour change
> gloss change
> roughness change
> wettability change
> visual appearance