

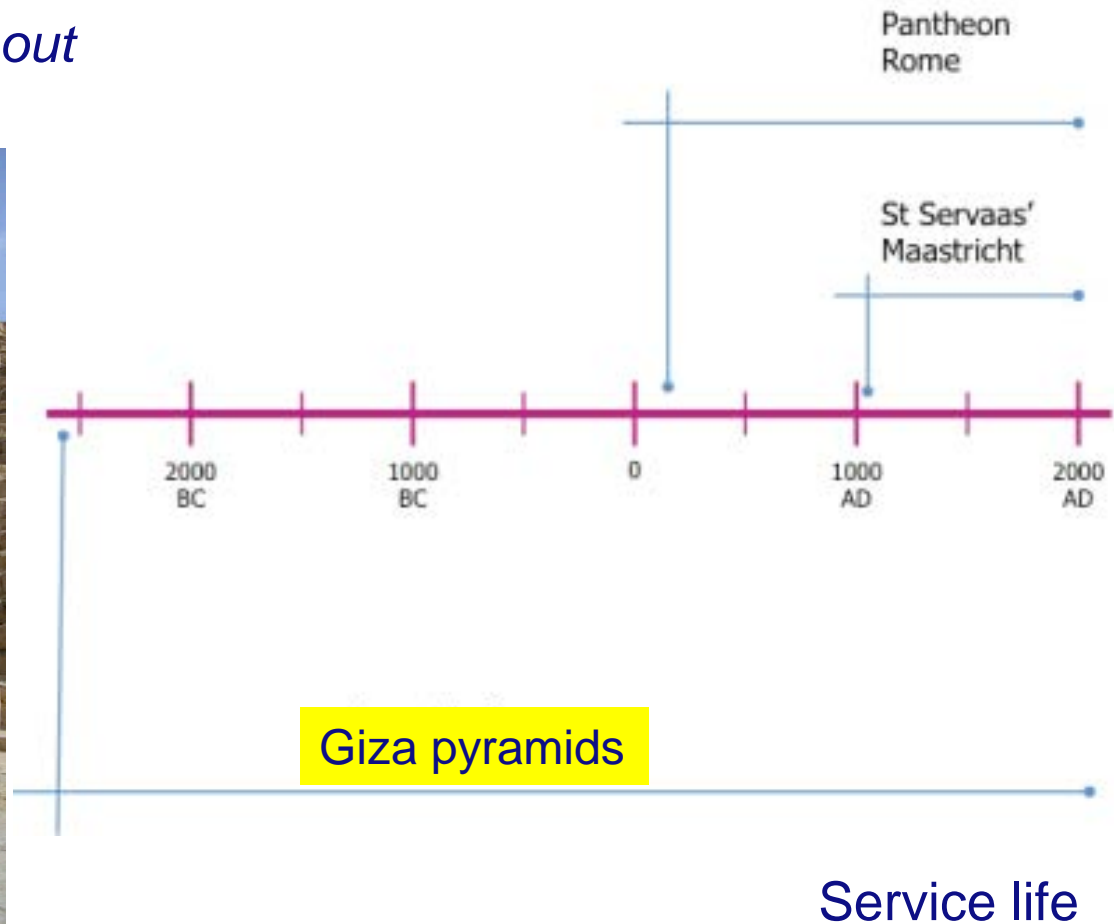
Sustainable use of materials in past and future: the example of Curaçao

Rob van Hees



Durability & sustainability

Durable stands for able to exist for a long time without significant deterioration



Durability & *sustainability*

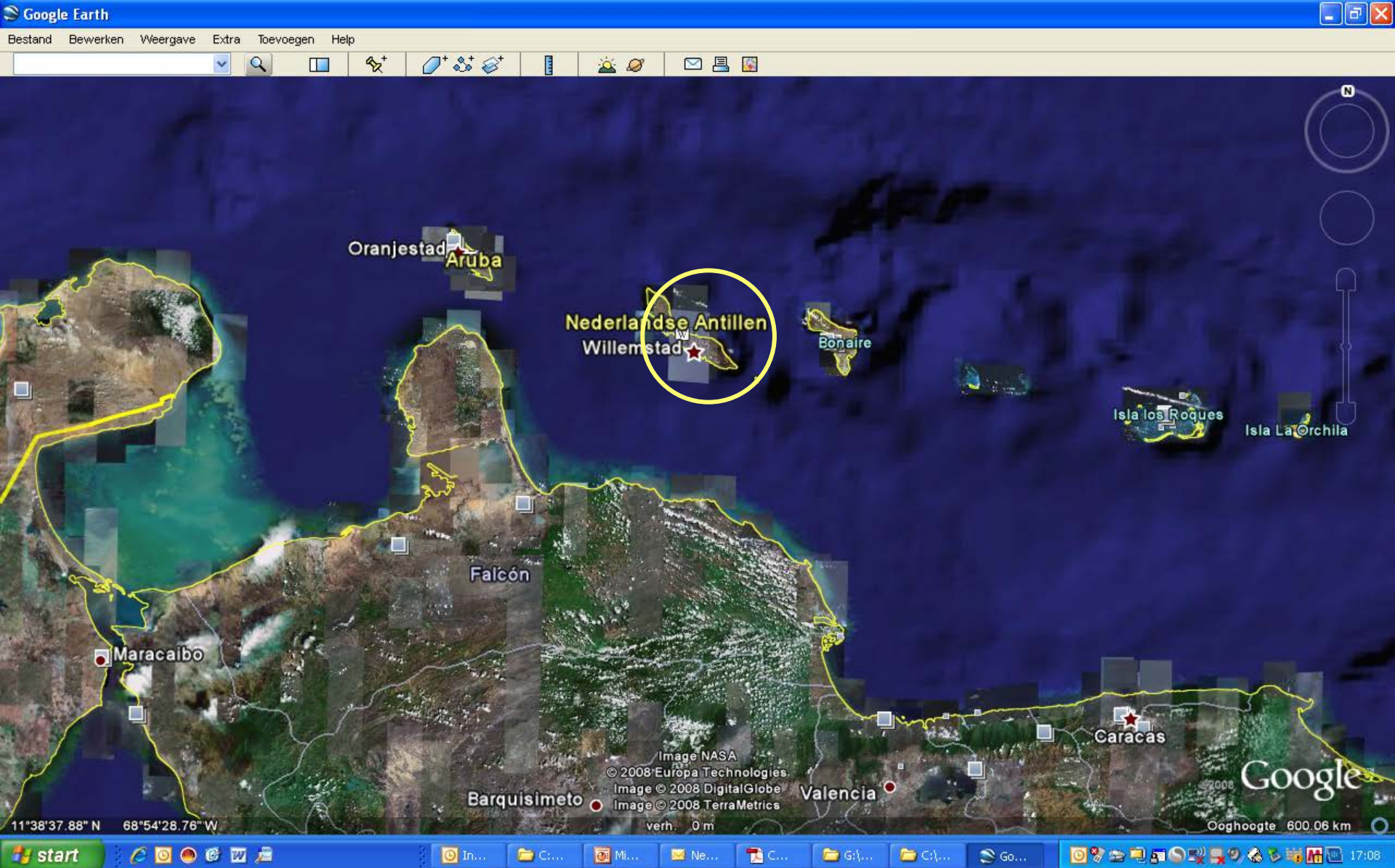
Sustainable means relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged

Sustainable is more than energy: also,

- materials & technology
- culture & history
- design

Vernacular architecture:
Source of inspiration





Curaçao: some data

- Climate
 - Average T: 27.5 ° C
 - Average RH: 77%
 - Rain: 600 mm/yr in Oct. – Dec.
 - Tradewind: average 7 m/s
- Ca. 150.000 inhabitants
- Size ca. 450 km²
- Dutch colony 1634 – 1954
 - Plantations
 - Salt trade
 - Slave trade
 - Natural harbour: merchant ships

Salt production (salt pans)



Salt water ponds
bad for irrigation
(plantations)

Valuable for salt
trade

<http://curacao.memento-vivi.com/images/curacao-zoutpannen.jpg>

Architecture and construction technology

- Monuments in Dutch style from 17th, 18th, 19th century, local influences (climate and material)
- Materials used:
 - Coral stone
 - Lime mortar
 - Brick (very limited)
 - Cliff stone (limited)
 - Plaster and paint

Architectural style



Adaptation to local resources and climate: planters' mansions (Landhuizen')



High position (wind)
Optimal ventilation
Veranda's

Construction technology and materials



Construction technology and materials



Local resources

Aquaduct and cistern ('waterbak'): dealing with local climate (lack of water) – nb use of materials

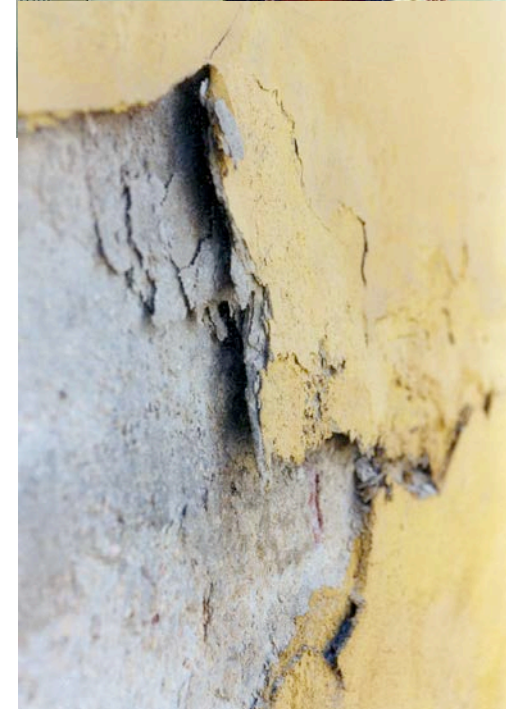


From 1900: durable materials

Damage

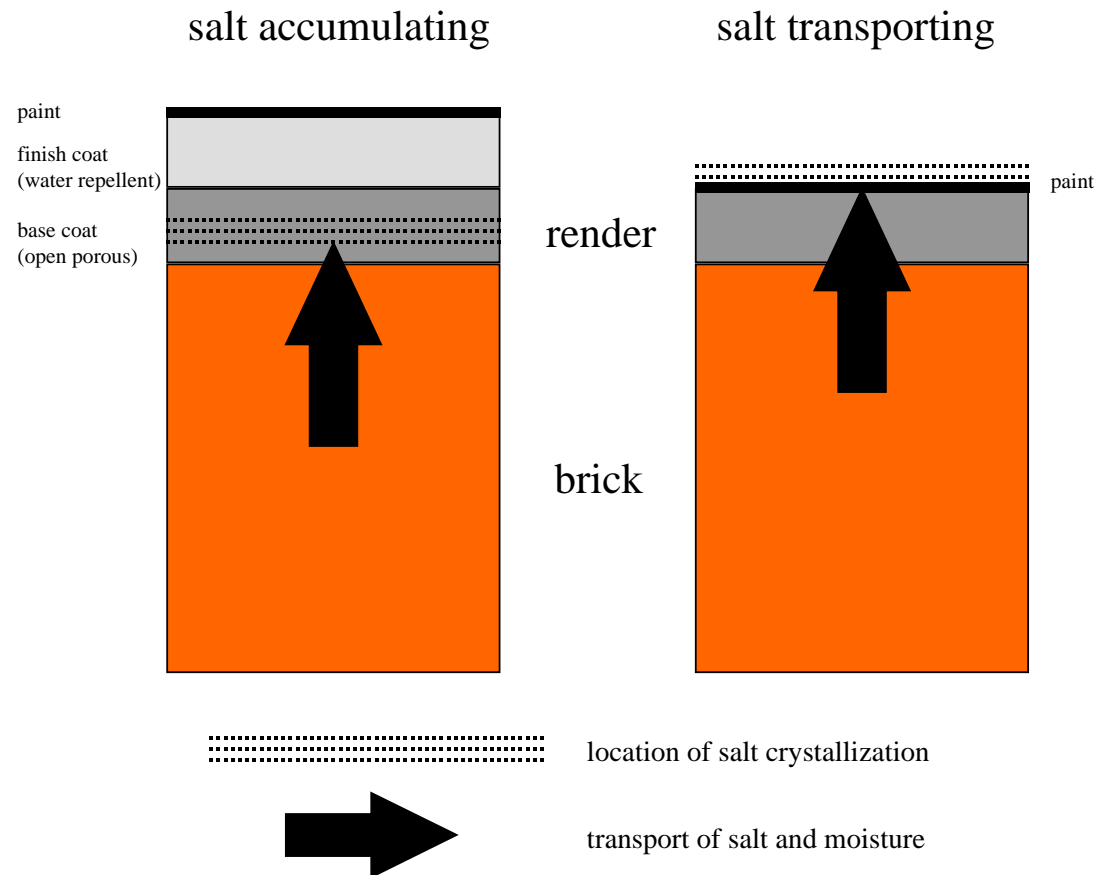


Cement plasters

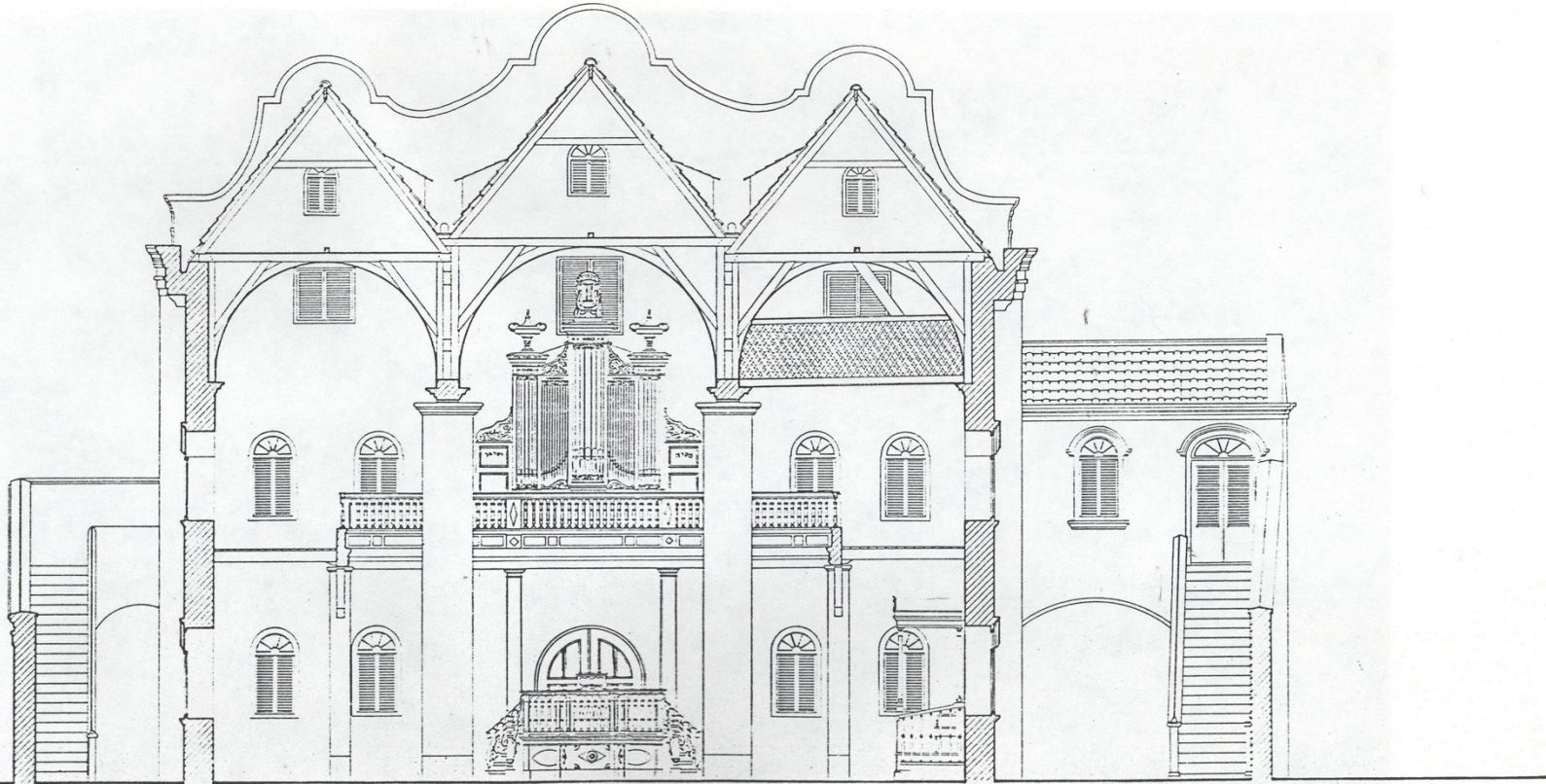


Latex paint

1990 - 2000: better salt resistant plasters



Example project: Curaçao Synagogue



SYNAGOGUE MIKVÉ ISRAEL-EMANUEL, CURAÇAO, N.A.

CROSS SECTION

0 5m

Synagogue



Restoration works Synagogue



After restoration

Is restoration plaster a miracle?





Scharlooweg 105: Within one year.....

Towards a Curaçao plaster?

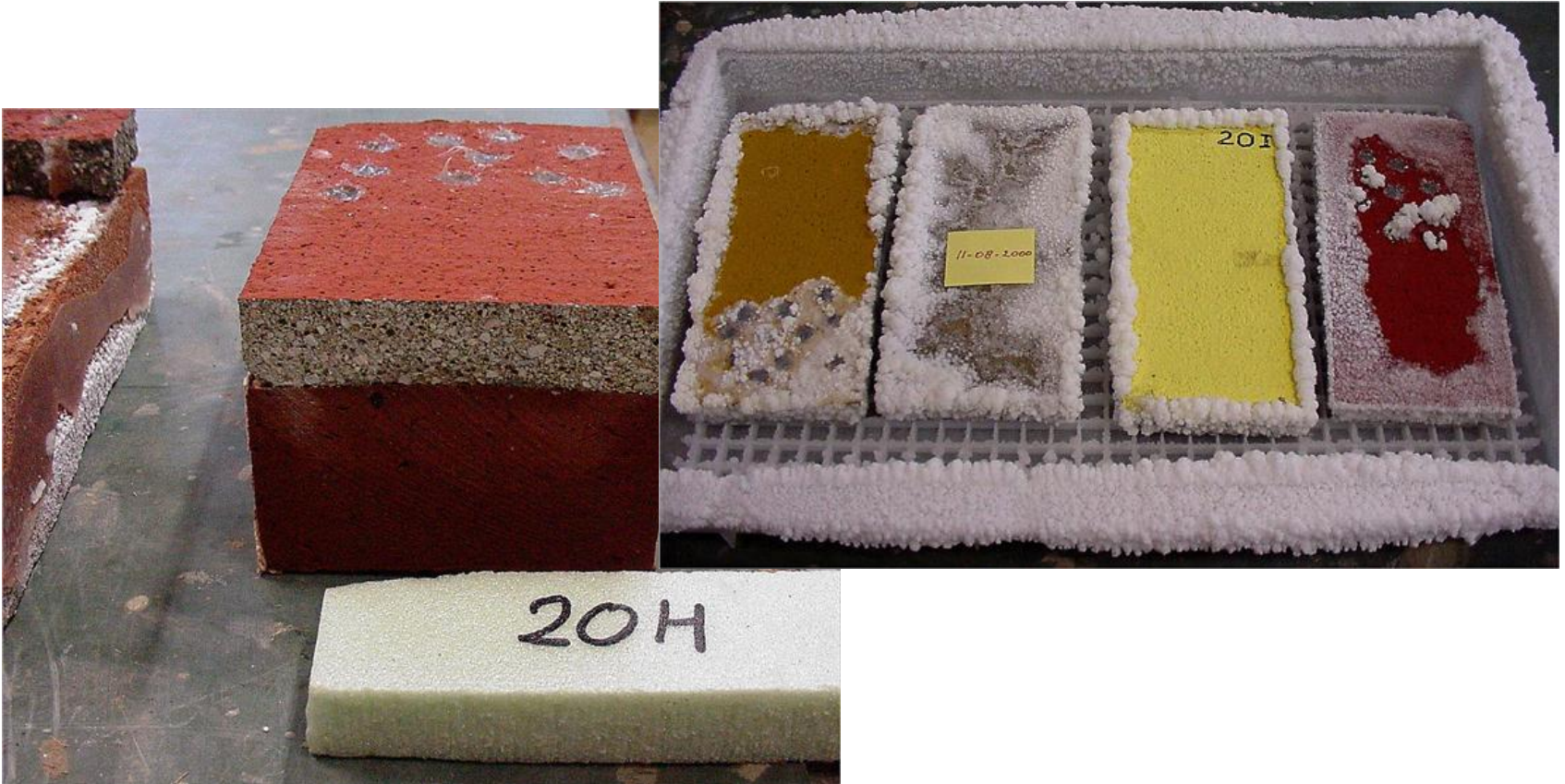


Local product development: use of sand from mining company (avoid transatlantic transport)

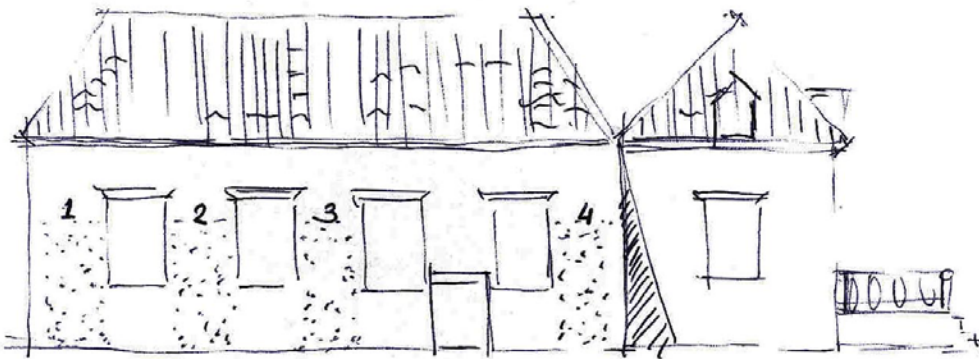
Selection sand



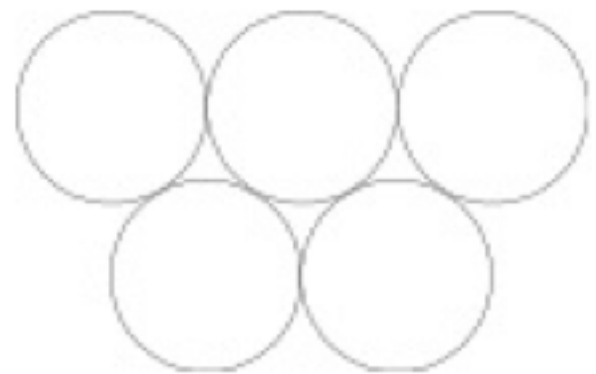
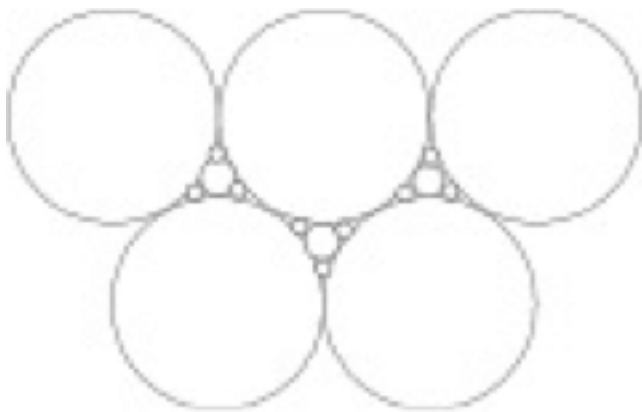
Tests in lab



Test panels on site: Scharlooweg 51



'Better' sand



Execution in practice



Execution – good workability is essential !



Mortar based on lime

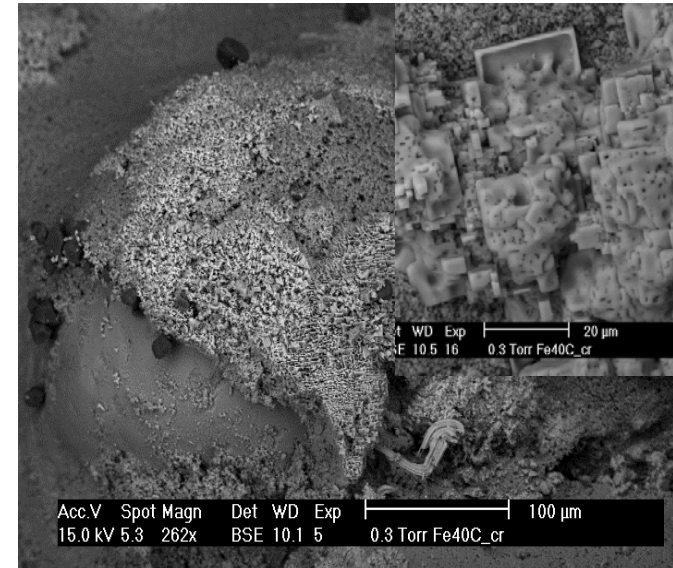
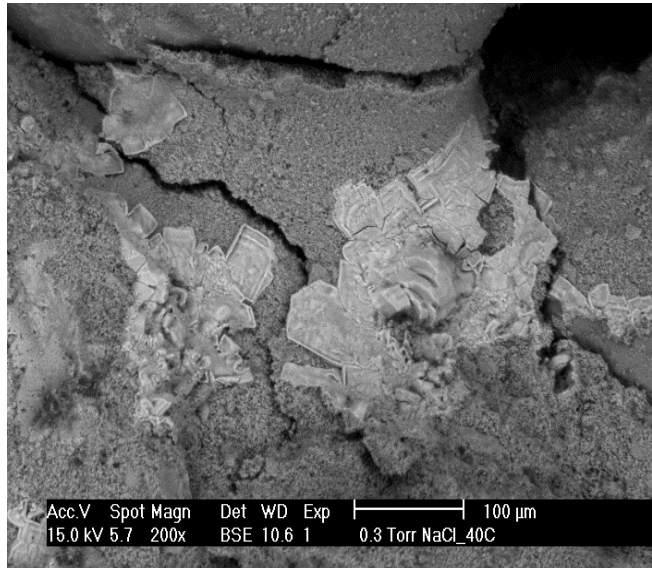


Local product development



Future: better sustainability of materials and monuments through:

- Use of local materials
- Adapted design
&
- *Innovation*



Crystallisation pattern changes drastically when inhibitor is used (R)

Conclusions

Vernacular and traditional architecture and construction technology of Curacao

Strongly connected to landscape and available materials

Very functional and sustainable

Inspiration for sustainable and durable interventions

Can go together with innovative materials and techniques



Durable past – sustainable future

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