Ruin Prosthesis
Using new crafts to rehabilitate the ruin of castle Schaesberg
PRESENTATION
STRUCTURE

Introduction

Research
technical | thematic

Design

Reflection
Using only digital information to build, transform or cut physical things.

Digital Fabrication
Using only digital information to build, transform or cut physical things.

Physical

Digital

Physical

Reality capture

Digital Fabrication

Object prosthesis
RESEARCH
Thematic Research
ruin value, strategies for restoration

Technical Research
digital capture and fabrication as a building method for ruined structures
Ruin value

restoration means a destruction out of which no remnants can be gathered; a destruction accompanied with false description of the thing destroyed (...) It is impossible, as impossible as to raise the dead, to restore anything that has ever been great or beautiful in architecture.

restoration is a “means to re-establish [a building] to a finished state, which may in fact never have actually existed at any given time.”

the ruin is a symbol for persistence and continuation ‘...we should be able to build structures which even in a state of decay... would more or less resemble roman models’

the ruin is a metaphor for trancience and decay ‘in the Ruin, history has physically merged into the setting’

John Ruskin 1819 - 1900
Eugène Emmanuel Viollet-le-Duc 1814 - 1879
Albert Speer 1905 – 1981
Walter Benjamin 1892 – 1940
Case studies
Ruin renovation
strategies for ruin renovation

Kolumba Kunst museum
Kolumba Kunst Museum
by Peter Zumthor
Berlin Physics Museum east wing
Diener & Diener architecten
Neues Museum Berlin
David Chipperfield

the original structure should be emphasized in its spatial context and original materiality – the new reflects the lost without imitating it.”

David Chipperfield, design approach for the neues museum.
TECHNIQUE
How can digital capture and digital fabrication be used to build a ‘prosthetic’ extension to a monumental ruined structure?

**Research Methods**

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**Hypothesis**

**Conclusions**

**Further Research**

- What building methods could be compatible?
- What might a connection look like?
- How are they produced?
- How to assemble the elements?

Research methods: Literature, research by design
Technical Research
digital capture to fabrication experiments

Cup Prosthesis 1  Cup Prosthesis 2  Cup Prosthesis 3  Prosthetic shelf
Ruin of Castle Schaesberg, Heerlen
'The region should be more adaptable to future changes … Flexibility, creativity and innovation are necessary to give the region new elan.'
INTRODUCTION

Problem Statement

Objective

Thematic research question

Overall design question

Subquestions

RESEARCH

I - Durability and efficiency

II - Movements in nature

III - Healing Environment

Guidelines

IV - Program care-hotel

PRELIMINARY DESIGN

Masterplan Anna

Building concept

Kinetic facade

Climate Principle

First design impression

Questions?

MASTERPLAN ANNA

Gardencity 2.0 ANNa
Construction of Renaissance Castle Schaesberg

1571 1616 1650

Expansion with east wing and tower

Court yard Colonade and castle manor

1733 1968 2015

Castle becomes uninhabited and falls into decay

The manor is demolished entirely, some parts of the castle build up further progression into decay
DESIGN STRATEGY

concept
DESIGN STRATEGY
planning
entrance hall & exposition space
KASTEEL SCHAESBERG.

Schoorsteen in Lokaal gemerkt 2.

Opstand en Profil op een tiende de Details op de helft der grootte.
KASTEEL SCHAESBERG.

Schoorsteen in Lokaal Gemerkt 2.

Opstand en Profil op een tiende deel Details op de helft der grootte.
Insulating Concrete
DETAIL A
cross section wall

existing brick wall
reinforced with cintec anchors

CNC cut window frame

liapor insulating concrete

DETAILED ANALYSIS

 triple insulated glazing

Oak window

CNC cut window frame

 existing brick wall

reinforced with cintec anchors

liapor insulating concrete

waterproofing foil

rigid insulation

plaster ceiling

finishing layer concrete

concrete floor

waterproofing foil

rigid insulation

waterproofing foil

finishing layer concrete

concrete floor

waterproofing foil

rigid insulation

waterproofing foil

finishing layer concrete

concrete floor
existing ruin wall

5

cleaning repointing and reinforcement by cintec drilling

6

3d scanning of the wall

7

modeling and CNC cutting of the formwork

8

carefull placement of the formwork

applying formwork backing structure and sealing.

pour of the lightweight concrete

continue building with standard method
Elevation of facade fragment
scale 1:20
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8-12-2015