River Team Contract

General Rules

Rule #1: be polite, words like thanks and please will make the work easier
Rule #2: be transparent, how do you feel, what plans do you have for the next months
Rule #3: be available, it's just as good to show that you are on the same step as your team members (give messages likes or comments)
Rule #4: Say AND, not BUT! (Give every idea a chance!)
Rule #5: work and decide together
Rule #6: Decisions should come from the whole group and send on owner/renate
Rule #7: 24 hours before our official meeting the agenda should be fix so we can discuss all issues between the group before our official owner meeting starts. TRY to upload the files not too late. That everyone have a early access to the files to be prepared.
Rule #8: Please mute yourself if there is anybody else talking

Technology Implementation Plan

File sharing: We will use Box. Please download the “Box Sync” extension. You will have...
<table>
<thead>
<tr>
<th>Meeting Leader</th>
<th>Week #</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Danny</td>
<td>2</td>
<td>January 29, 2013</td>
</tr>
<tr>
<td>Charles</td>
<td>3</td>
<td>February 5, 2013</td>
</tr>
<tr>
<td>Danielle</td>
<td>4</td>
<td>February 12, 2013</td>
</tr>
<tr>
<td>Ronnie</td>
<td>5</td>
<td>February 19, 2013</td>
</tr>
<tr>
<td>Sijie</td>
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<td>February 26, 2013</td>
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<tr>
<td>Joanna</td>
<td>7</td>
<td>March 5, 2013</td>
</tr>
<tr>
<td>Mareike</td>
<td>7</td>
<td>March 8, 2013 (No Class)</td>
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<tr>
<td>Danny</td>
<td>8</td>
<td>March 11-14 (Dry Run #1)</td>
</tr>
<tr>
<td>Charles</td>
<td>8</td>
<td>March 11-14 (Dry Run #2)</td>
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</table>
“I wish, I like, How to…”

<table>
<thead>
<tr>
<th>Description</th>
<th>Danny</th>
<th>Sijie</th>
<th>Danielle</th>
<th>Mareike</th>
<th>Joanna</th>
<th>Ronnie</th>
<th>Charles</th>
<th>Votes</th>
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<tbody>
<tr>
<td>Wish: More subgroup meeting</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>8</td>
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<tr>
<td>Wish: have a party!</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>Howto: More productive but how?</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Wish: This is the only class!</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>7</td>
</tr>
<tr>
<td>Like: Owners/Profs are very present. Available</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>7</td>
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<tr>
<td>Like: Great team spirit</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>6</td>
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<tr>
<td>Wish: more construction/industry experience with IPD and etc.</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Wish: difference between team updates/presentation vs. discussion. Two type of meetings.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Wish: to integrate technology without being distraction</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Wish: More quality time</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Wish: leap frog idea for movable space</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>Howto: make concept clear for winter presentation</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Wish: general team concept understanding. what is important?</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>How to make all of our work shown? how to integrate our the work clearly?</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>5</td>
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<tr>
<td>Like: big idea for the project</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>4</td>
</tr>
<tr>
<td>Like: understand everyone's workload</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>4</td>
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<tr>
<td>Like: presentation feedback from the crit, lesson learned.</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Wish: could manage time better</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>Wish: more group meeting time</td>
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<td>Wish: Less time difference</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>3</td>
</tr>
<tr>
<td>Wish/Howto: rsmeans, vico, revit model, a in bewteen method</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Howto: work more efficiently with different concept</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Solution</td>
<td>Before</td>
<td>After</td>
<td></td>
<td></td>
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<td>Communication</td>
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<td><img src="image2.png" alt="Facebook" /> <img src="image3.png" alt="GroupMe" /></td>
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<td>Collaborate</td>
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<td><img src="image8.png" alt="Basecamp" /></td>
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</tbody>
</table>

** TEAM PROCESS **
Here’s what’s been happening in your projects.

AEC River Project

Ronnie H. commented on *What’s the BIG idea for our project?*
I have tried to elaborate on the big idea of "Connection" and what we have so far. I have tried narrow a lot of our work down to four con...

Feb 22

AEC River Project

Joanna P. forwarded an email: *AEC class - possible coaching session?*

Feb 21

AEC River Project

Sijie Z. completed a to-do: *Both CM Discuss risk list with LCFM*

Sijie Z. completed a to-do: *Both CM Update site access #1 to make to feasible and verify with M...*
SITE INFORMATION
WEIMAR, Germany
WEIMAR, Germany
CASTLE

WEIMAR, Germany

CONCENTRATION OF PEDESTRIAN TRAFFIC
SITE HAZARDS & CHALLENGES

- Castle proximity
- Floods
- Many trees
- Park protected by UNESCO

Many trees

A
MEP
SE
CM
LCFM
FLOOD DATA

+ 3.3 m  \[ 2^{\text{ND}} \text{ FLOOR} \]

+ 0.3 m  \[ 1^{\text{ST}} \text{ FLOOR} \]

0 m  \[ \text{RIVER} \]
FLOOD DATA

+ 3.3 m 2nd FLOOR

+ .7 m AVG. YEARLY FLOOD

+ .3 m 1st FLOOR

0 m RIVER

1ST FLOOR

2ND FLOOR

RIVER

AVG. YEARLY FLOOD

+ .7 m

+ 3.3 m
FLOOD DATA

+ 3.3 m 2ND FLOOR

+ 2.5 m 1994 FLOOD LEVEL

+ .3 m 1ST FLOOR

0 m RIVER

1994 FLOOD LEVEL
ARCHITECTURE + DESIGN + STRUCTURE
CHALLENGE:

SOLUTIONS:

LET WATER IN

KEEP WATER OUT
circulation
entrance hall
auditorium
large classroom
small classroom
restrooms
lounge
instructional lab
server room
student offices
seminar room
faculty office
department’s chair office
senior administration office
administrative assistants
storage
SECOND FLOOR

circulation
entrance hall
auditorium
large classroom
small classroom
restrooms
lounge
instructional lab
server room
student offices
seminar room
faculty office
department’s chair office
senior administration office
administrative assistants
storage

A
MEP
SE
CM
LCFM
SECTION 27

- Large Classroom
- Small Class
- Faculty Offices
- Student Offices
- Faculty Offices
- Auditorium
ALTERNATE LAYOUT
<table>
<thead>
<tr>
<th>Audition Ventilation</th>
<th>Installation Cost</th>
<th>Annual Energy Cost</th>
<th>25 Years Cost</th>
<th>STV Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$37.8k</td>
<td>$2.0k</td>
<td>$162.7k</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$30.6k</td>
<td>$1.3k</td>
<td>$121.6k</td>
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</table>

<table>
<thead>
<tr>
<th># of AHUs</th>
<th>Installation Cost</th>
<th>Annual Energy Cost</th>
<th>25 Years Cost</th>
<th>STV Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$49.0k</td>
<td>$2.8k</td>
<td>$217.5k</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$60.0k</td>
<td>$3.0k</td>
<td>$253.1k</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heating System</th>
<th>Installation Cost</th>
<th>Annual Energy Cost</th>
<th>25 Years Cost</th>
<th>STV Delta</th>
</tr>
</thead>
<tbody>
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<td>$56.9k</td>
<td>$2.6k</td>
<td>$216.8k</td>
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</tr>
<tr>
<td></td>
<td>$22.9k</td>
<td>$4.8k</td>
<td>$211.2k</td>
<td>- 1 % points</td>
</tr>
</tbody>
</table>
2ND FLOOR

COLUMNS                  320x320 mm
BANDED SLAB              600x400 mm
SLAB THICKNESS           250 mm
SHEAR WALL THICKNESS     220 mm
CONCRETE FRAMING PLAN

3RD FLOOR

COLUMNS 260x260 mm
BANDED SLAB 600x400 mm
SLAB THICKNESS 210 mm
SHEAR WALL THICKNESS 220 mm
CONCRETE FRAMING PLAN

ROOF

COLUMNS 180x180 mm
BANDED SLAB 600x400 mm
SLAB THICKNESS 250 mm
SHEAR WALL THICKNESS 200 mm
STEEL SUPERSTRUCTURE MODEL

MOMENT FRAME
2ND Floor

Columns:

Interior  W12x96
Exterior  W12x58

Typical Member Sizes:

Ext. FB  W8x58
Int. FB  W14x61
Ext. FG  W24x55
Int. FG  W33x130

Auditorium Members:

Ext. FB  W10x33
Int. FB  W10x39
Ext. FG  W16x40
Int. FG  W44x262
3RD Floor

Typical Member Sizes:

**Ext. FB**  W8x58
**Int. FB**  W14x61
**Ext. FG**  W24x55
**Int. FG**  W33x130

Auditorium Members:

**Ext. FB**  W10x33
**Int. FB**  W10x39
**Ext. FG**  W16x40
**Int. FG**  W44x262
Roof

Typical Member Sizes:

- **Ext. RB**: W8x58
- **Int. RB**: W8x58
- **Ext. RG**: W21x44
- **Int. RG**: W30x108

Auditorium Members:

- **Ext. RB**: W10x33
- **Int. RB**: W10x33
- **Ext. RG**: W14x34
- **Int. RG**: W40x215
SITE ACCESS

Construction Site

Ilm river

Building
Concrete washout

Fence

Materials laydown

Onsite assembly yard

Stone socket

Trailers
Toilets
20 parking lots
Waste/recycling containers
HESCO Container Units

- **Length**: 125m
- **Height**: 2.44 m
- **4 hour to install**

**Store in basement**

**Sand fill**

**With flood**
• Concrete - thomas-gruppe 2.6km
• Precast concrete - Betonwerk Streichardt 2.9km
• Steel – Stahlwerke Thüringen 54km
• Construction equipment - zeppelin-rental 19km
• Stone socket - Hauschild Michael 3.2km
light

float

flower stem

inner core
inspiration

Buoyant Foundation Project
New Orleans, LA, USA
Dr. Elizabeth English
Univ. of Waterloo

FLOAT house
New Orleans, LA, USA
Make It Right Foundation
Morphosis Architects
UCLA School of Architecture

Amphibious Houses
Maasbommel, NL
DuraVermeer

UK Amphibious home
London, UK
BACA Architects
AMPHIBIOUS DEFENSE SYSTEM

buoyant force up

gravitational force down

buoyant force up

gravitational force down
AMPHIBIOUS DEFENSE SYSTEM

Resting Position

Flood Position

2 m
Third Floor

circulation
entrance hall
auditorium
large classroom
small classroom
restrooms
lounge
instructional lab
server room
student offices
seminar room
faculty office
department’s chair office
senior administration office
administrative assistants
storage

4740 6000 4400 4400 5740 5200
First and second floor

Outline of UFAD plenum
Supply diffuser
Ceiling return diffuser
Return grill
Supply ducting
Return ducting
Supply ducting (vertical)
Return ducting (vertical)
Ceiling level return ducting
Inlet ducting (vertical)
Outlet ducting (vertical)
Ceiling level supply ducting
Utility pipes
Third floor and 3D network

Outline of UFAD plenum
Supply diffuser
Ceiling return diffuser
Return grill
Supply ducting
Return ducting
Supply ducting (vertical)
Return ducting (vertical)
Ceiling level return ducting
Ceiling level supply ducting
Inlet ducting (vertical)
Outlet ducting (vertical)
Utility pipes
Option concept

- Outline of UFAD plenum
- Supply diffuser
- Ceiling return diffuser
- Return grill
- Supply ducting (horizontal)
- Return ducting (horizontal)
- Ceiling level supply ducting
- Ceiling level return ducting
- Inlet ducting (vertical)
- Outlet ducting (vertical)
- Utility pipes
<table>
<thead>
<tr>
<th><strong>MEP EVALUATION</strong></th>
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</table>

<table>
<thead>
<tr>
<th><strong>AUDITORIUM VENTILATION</strong></th>
<th><strong>INSTALLATION COST</strong></th>
<th><strong>ANNUAL ENERGY COST</strong></th>
<th><strong>25 YEARS COST</strong></th>
<th><strong>STV DELTA</strong></th>
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<tbody>
<tr>
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<td>$37.8k</td>
<td>$2.1k</td>
<td>$168.1k</td>
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<td>$30.7k</td>
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<td>$143.7k</td>
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<th><strong># OF AHUS</strong></th>
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<th><strong>ANNUAL ENERGY COST</strong></th>
<th><strong>25 YEARS COST</strong></th>
<th><strong>STV DELTA</strong></th>
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<tr>
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<td>$210.3k</td>
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<th><strong>ANNUAL ENERGY COST</strong></th>
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<td>- 2% points</td>
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<tr>
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<td>$141.0k</td>
<td>$4.1k</td>
<td>$500.3k</td>
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</table>
FOUNDATION

GUIDEPOSTS  600x600 mm

SLAB THICKNESS  180 mm

RETAINING WALL THICK.  500 mm
FOUNDATION

COLUMNS
600x600 mm

BANDED SLAB
600x400 mm

SLAB THICKNESS
180 mm

SHEAR WALL THICKNESS
500 mm

1ST / 2ND FLOOR

320x320 mm

600x400 mm

180 mm

200 mm
### 3rd Floor

**Columns**
- 250x250 mm

**Banded Slab**
- 600x400 mm

**Slab Thickness**
- 180 mm

**Shear Wall Thickness**
- 200 mm

### Roof

**Columns**
- 180x180 mm

**Banded Slab**
- 600x400 mm

**Slab Thickness**
- 150 mm

**Shear Wall Thickness**
- 150 mm
2ND Floor

Columns:
- Interior W12x96
- Exterior W10x45

Typical Member Sizes:
- Ext. FB W18x21
- Int. FB W10x30
- Ext. FG W12x26
- Int. FG W24x55

Auditorium Members:
- Ext. FB W8x21
- Int. FB W10x30
- Ext. FG W24x68
- Int. FG W36x160
3RD Floor

Typical Member Sizes:

External Framing Beams (FB):
- Ext. FB W18x21
- Ext. FB W8x21

Internal Framing Beams (FG):
- Int. FB W10x30
- Int. FB W10x30
- Int. FB W24x68
- Int. FG W24x55
- Int. FG W36x160
ROOF

Typical Member Sizes:

Ext. RB  W8x18
Int. RB  W8x24
Ext. RG  W10x22
Int. RG  W18x50

Ext. RB  W8x18
Int. RB  W10x26
Ext. RG  W24x62
Int. RG  W36x135
HESCO Concertainer Units

Length: 160m
Height: 2.44m
5 hour to install

With flood
SUPPLIERS

- **Concrete - Thomas-Gruppe** 2.6km
- **Precast Concrete - Betonwerk Streichardt** 2.9km
- **Steel – Stahlwerke Thüringen** 54km
- **Construction Equipment - Zeppelin Rental** 19km
TARGET SET BASED ON:

- Owners input
- Previous projects
- First cost estimate
TARGET VALUE COST COMPARISON

Target Value

STEEL

CONCRETE

STEEL

CONCRETE

<table>
<thead>
<tr>
<th>A Substructure</th>
<th>B Shell</th>
<th>C Interiors</th>
<th>D Services</th>
<th>Equipment &amp; Furnishings</th>
<th>Special Construction</th>
<th>Building Sitework</th>
<th>Indirect Cost</th>
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<tr>
<td>$-</td>
<td>$2</td>
<td>$4</td>
<td>$6</td>
<td>$8</td>
<td>$10</td>
<td>$12</td>
<td>$10</td>
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</tbody>
</table>

Erosion (Concrete)
Water Lily (Concrete)
Erosion (Steel)
Water Lily (Steel)
Transplant Trees
Flood Protection
Earthwork
Mobilize on Site
Substructure
Superstructure
Exterior Enclosure
Interior Wall Framing
Services
Interior Finishes
Building Sitework
Commissioning

CONCRETE

Start 01/09/15
Finish 22/08/16

<table>
<thead>
<tr>
<th>Qtr 4, 2015</th>
<th>Qtr 1, 2016</th>
<th>Qtr 2, 2016</th>
<th>Qtr 3, 2016</th>
</tr>
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<tr>
<td>NTP</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td>Computer System Manager Moves In</td>
</tr>
</tbody>
</table>

Transplant Trees
Flood Protection
Earthwork
Mobilize on Site
Substructure
Superstructure
Exterior Enclosure
Interior Wall Framing
Services
Interior Finishes
Building Sitework
Commissioning

Start 01/09/15
Finish 22/08/16

<table>
<thead>
<tr>
<th>Qtr 4, 2015</th>
<th>Qtr 1, 2016</th>
<th>Qtr 2, 2016</th>
<th>Qtr 3, 2016</th>
</tr>
</thead>
<tbody>
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Start 01/09/15
Finish 22/08/16

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<td></td>
<td></td>
<td>Computer System Manager Moves In</td>
</tr>
</tbody>
</table>
STEEL

Start: 01/09/15
Finish: 08/08/16

- Qtr 1, 2015
- Qtr 2, 2015
- Qtr 3, 2015
- Qtr 4, 2015

Tasks:
- Transplant Trees
- Flood Protection
- Earthwork
- Mobilize on Site
- Substructure
- Superstructure
- Exterior Enclosure
- Interior Wall Framing
- Services
- Interior Finishes
- Building Sitework
- Commissioning

Events:
- NTP
- Ground Freezing
- Underground Work Complete
- Building Envelope Complete
- Computer System Manager Moves In
Start 01/09/15
Finish 18/08/16

- Transplant Trees
- Flood Protection
- Earthwork
- Mobilize on Site
- Substructure
- Superstructure
- Exterior Enclosure
- Interior Wall Framing
- Services
- Interior Finishes
- Building Sitework
- Commissioning

NTP  | Ground Freezing  | Underground Work Complete  | Building Envelope Complete  | Computer System Manager Moves In
<table>
<thead>
<tr>
<th>Material</th>
<th>Impact (tonsCO₂eq)</th>
<th>% of Target</th>
<th>% of Target</th>
<th>Impact (tonsCO₂eq)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>3131</td>
<td>56 %</td>
<td>50 %</td>
<td>2798</td>
</tr>
<tr>
<td>Steel</td>
<td>3490</td>
<td>62 %</td>
<td>54 %</td>
<td>3036</td>
</tr>
</tbody>
</table>

**Target Impact:** 5615 (tonsCO₂eq)
Plan: 45%
Development: 34%
Operation: 21%
## Risk Identification

### Risk Name: Erosion

<table>
<thead>
<tr>
<th>Risk name</th>
<th>Description</th>
<th>Consequences</th>
<th>Probability</th>
<th>Consequences</th>
<th>Probability</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Risks</strong></td>
<td>problems with innovative construction</td>
<td>loss money</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>External Risks</strong></td>
<td>flood</td>
<td>flood will disturb the ground floor</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

### Risk Name: Water Lily

<table>
<thead>
<tr>
<th>Risk name</th>
<th>Description</th>
<th>Consequences</th>
<th>Probability</th>
<th>Consequences</th>
<th>Probability</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Risks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External Risks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**
- **EROSION** section highlights internal and external risks related to erosion.
- **WATER LILY** section shows potential impacts on water lily gardens.

---

**Legend:**
- **3** indicates moderate probability and consequences.
- **4** indicates high probability and consequences.

---

**Risk Management Strategies:**
- Addressing erosion through sustainable landscaping practices.
- Enhancing flood protection measures in critical areas.

---

**Conclusion:**
- Effective planning is crucial to mitigate risks associated with both erosion and water lilies.

---

**References:**
- Environmental management guidelines for sensitive ecosystems.
- Case studies on regional climate change impacts.

---

**Author:**
- [Name]

---

**Date:**
- [Date]

---

**Footnotes:**
- Additional data sources include local environmental agencies and academic research institutions.
**RISK COMPARISON**

![Risk Comparison Diagram]

- **CONSEQUENCES**
  - Innovation
  - Flood risk
- **PROBABILITY**
  - Innovation
  - Flood Risk
<table>
<thead>
<tr>
<th>RISK ALLOCATION</th>
<th>RISK MANAGEMENT</th>
<th>LIFE CYCLE OCCURANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>PC</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>100%</td>
<td>good cooperation with the producer/profession</td>
</tr>
<tr>
<td>0%</td>
<td>100%</td>
<td>insurance</td>
</tr>
</tbody>
</table>
FLOOD RISK

- **Development**
  - FIRE INSURANCE
  - PERFORMANCE INSURANCE

- **Operation**
  - BUILDING INSURANCE
  - LIABILITY INSURANCE

> BASE: 3,000,000 $ per annum

**Erosion:** 120,000 $  
**Waterlily:** 000,000 $ per annum
LIFE CYCLE COST

- Risk Management
- O&M Costs
- Construction Costs

$0
$2,000,000
$4,000,000
$6,000,000
$8,000,000
$10,000,000
$12,000,000
$14,000,000
$16,000,000
$18,000,000

Erosion
Waterlily
## Decision Matrix

### Erosion

- **Sustainability**: Best = 3 Points
- **Big Idea**: Better = 2 Points
- **Innovation**: Good = 1 Point
- **Connection with Environment**: Good = 1 Point
- **Collaborative Space**: Better = 2 Points
- **Aesthetic Value**: Best = 3 Points
- **Risk Factor**: Good = 1 Point
- **Comfort**: Better = 2 Points
- **Efficiency**: Good = 1 Point
- **Constructability / Phasing**: Best = 3 Points

<table>
<thead>
<tr>
<th>Feature</th>
<th>Erosion Points</th>
<th>Water Lily Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability</td>
<td>Best = 3 Points</td>
<td></td>
</tr>
<tr>
<td>Big Idea</td>
<td>Better = 2 Points</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Constructability / Phasing</td>
<td>Best = 3 Points</td>
<td></td>
</tr>
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### Total Value

- **Erosion Total Value**: 24 points
- **Water Lily Total Value**: 26 points

- **Erosion Cost**: $6.51M
- **Water Lily Cost**: $7.03M

### Value for Cost

- **Erosion Value for Cost**: 3.69
- **Water Lily Value for Cost**: 3.70
RIVER TEAM 2013 PRESENTS...

WATER LILY (CONCRETE)
Thank you!

**AEC MENTORS:**
Willem Kymmell
Humberto Cavallin
Jan Styk
Björn Wündsch
Sarah Russell-Smith
John Nelson
Arsen Melikov
Jochen Teizer
Paul T. Eickenberg
and
Renate Fruchter

**AMPHIBIOUS DEFENSE SYSTEM:**
Elizabeth English
Questions?