AEC KICKOFF WEEKEND

1/11: AEC KICKOFF
1/14: SITE VISIT
1/14: TEAM PROCESS
1/28: BRAIN CIRCLE
2/9: PEER REVIEW
2/11: VPS
2/16: MENTOR CRIT
2/17: BREEZE
2/23: SLACK SWITCH
3/2: PROJECT VALUES
3/3: BRAIN 2.0
3/10: DECISION MATRIX
3/16: WINTER PRES
Where we were
Our Team

Alicja
ARCH
Poland

Michal
ARCH
Poland

Jimena
SE
Costa Rica

Kate
SE
United States

Adam
MEP
United States

Jue
CM
China

Eeshan
CM
India

1/11 AEC KICKOFF
1/14 SITE VISIT
1/14 TEAM PROCESS
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2/9 PEER REVIEW
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2/23 SLACK SWITCH
3/2 PROJECT VALUES
3/3 BRAIN 2.0
3/10 DECISION MATRIX
3/16 WINTER PRES

Poland

Costa Rica

United States

United States

China

India
Our Client

Elias
Karolina
Nick
Mikki
SITE VISIT
Site Context
Site Sectors

- Nature
- SF University
- High School
- Shopping
Site Features
Site Hazards

Lateral Loads

Seismic will govern!
TEAM PROCESS

- Coordination
- Communication
- Collaboration
Communication
Confusion

ASANA
GOOGLE CALENDAR
BOX DRIVE
WHATSAPP
ZOOM VC
FACEBOOK

4 tasks due today!!
200 new messages
8 new notifications

AEC KICKOFF SITE VISIT TEAM PROCESS BRAIN CIRCLE PEER REVIEW VPS MENTOR CRIT BREEZE SLACK SWITCH PROJECT VALUES BRAIN 2.0 DECISION MATRIX WINTER PRES
BRAIN 1.0
Big Idea – Brain 1.0
Driving Value - Connections
Brain 1.0
Atrium Space
PEER REVIEW
Peer Review

ARCH

SE

MEP

CM

AEC KICKOFF

SITE VISIT

TEAM PROCESS

BRAIN CIRCLE

PEER REVIEW

VPS

MENTOR CRIT

BREEZE

SLACK SWITCH

PROJECT VALUES

BRAIN 2.0

DECISION MATRIX

WINTER PRES

1/11

1/14

1/14

1/28

2/9

2/11

2/16

2/17

2/23

3/2

3/3

3/10

3/16

ARCH

SE

MEP

CM

Structural Grid Lines
VISUAL PREFERENCE SURVEY (VPS)

- Visual Preferences
- Predict occupant space usage
- Understand functional inclinations
Quantifying Preferences
MENTOR CRIT

- Establish Goals/Values
- Rethink Co3
- Design from Inside Out

• Establish Goals/Values
• Rethink Co3
• Design from Inside Out
Lessons Learned

ARCH

SE

 MEP

CM

AEC KICKOFF

SITE VISIT

TEAM PROCESS

BRAIN CIRCLE

1/11

1/14

1/14

1/28

2/9

2/11

2/16

2/17

MENTOR CRIT

BREEZE

BRAIN 2.0

PROJECT VALUES

SLACK SWITCH

DECISION MATRIX

WINTER PRES

ARCH MEPCM
Breeze – Big Idea
Architect - Breeze

- Small classroom
- Instructional Labs
- Seminar room
- Toilets
- Storage
- Elevator
- Students open space
Breeze interior
Architect - Breeze
Conventional Concrete Alternative

- **Poured in place**
- **Shear Walls reduce window space**
- **Fly Ash**
- **Recycled Formwork**
- **Durable – longer building life span**
- **Locally Available**
- **Larger # of skilled workers**
- **Known for being more dangerous**
ConXTech Alternative

- No field welding
- Factory Labor instead of field labor
- Lighter & Greener - Up to 30% less steel
- 2 to 5X faster than conventional steel
- No braces/walls
- Limited Sizes available (HSS16x16 Columns)
- Non-orthogonal connections not supported
# Dead Load Takeoff

## Conventional Concrete Option

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab</td>
<td>100</td>
</tr>
<tr>
<td>Insulation</td>
<td>3</td>
</tr>
<tr>
<td>MEP &amp; Misc</td>
<td>8</td>
</tr>
<tr>
<td>Suspended Ceiling System</td>
<td>2</td>
</tr>
<tr>
<td><strong>Slabs</strong></td>
<td><strong>113</strong></td>
</tr>
<tr>
<td>Beams</td>
<td>19</td>
</tr>
<tr>
<td><strong>12&quot;x18&quot; @ 12' o.c.</strong></td>
<td><strong>132</strong></td>
</tr>
<tr>
<td>Girders</td>
<td>10</td>
</tr>
<tr>
<td><strong>16&quot;x24&quot; @ 12' o.c.</strong></td>
<td><strong>142</strong></td>
</tr>
<tr>
<td>Columns</td>
<td>2</td>
</tr>
<tr>
<td><strong>16&quot;x16&quot;</strong></td>
<td><strong>144</strong></td>
</tr>
</tbody>
</table>

## ConXTech Option

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<th>Material</th>
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<tbody>
<tr>
<td>3&quot; Rigid Insulation</td>
<td>0.6</td>
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<td>Lightweight Concrete</td>
<td>38</td>
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<td>2&quot; Steel Decking (18 gauge)</td>
<td>2.4</td>
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<td>2</td>
</tr>
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<td><strong>Slabs</strong></td>
<td><strong>53</strong></td>
</tr>
<tr>
<td>Beams</td>
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<td><strong>W14x48 @ 12' o.c.</strong></td>
<td><strong>57</strong></td>
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<td>Girders</td>
<td>5</td>
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<td><strong>W21x93 @ 20' o.c.</strong></td>
<td><strong>62</strong></td>
</tr>
<tr>
<td>Columns</td>
<td>2</td>
</tr>
<tr>
<td><strong>HSS 16x16x5/16</strong></td>
<td><strong>63</strong></td>
</tr>
</tbody>
</table>

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**Timeline:**

- **1/11**: AEC KICKOFF
- **1/14**: SITE VISIT
- **1/14**: TEAM PROCESS
- **1/28**: BRAIN CIRCLE
- **2/9**: PEER REVIEW
- **2/11**: VPS
- **2/16**: MENTOR CRIT
- **2/17**: BREEZE
- **2/23**: SLACK SWITCH
- **3/2**: PROJECT VALUES
- **3/3**: BRAIN 2.0
- **3/10**: DECISION MATRIX
- **3/16**: WINTER PRES
Live Load Diagram

- Classroom/Office: 50 psf
- Corridor: 80 psf
- Stairwell/Elevator: 100 psf
- Storage: 125 psf
- Deck: 60 psf

Level 1
Live Load Determination

Level 1

Live Load Diagram

- Classroom/Office: 50 psf
- Corridor: 80 psf
- Stairwell/Elevator: 100 psf
- Storage: 125 psf
- Deck: 60 psf

Dimensions:

- 7' 28' 11'6" 28' 16' 17'6" 15'6" 12'
- 6' 8' 12' 13' 13' 11' 21' 19' 15' 24'
Breeze Structural System

Option #1
• Material:
  • Conventional Concrete
• Lateral System Elements:
  • Shear walls
• Foundation:
  • Pad/Wall Footings

Option #2
• Material:
  • ConXtech (Steel)
• Lateral System Elements:
  • Moment Frames
Structural Challenges

- Asymmetry

• Lateral System Placement
• ‘L’ Shape
• Symmetry
Structural Challenges

• Asymmetry

- Lateral System Placement
- ‘L’ Shape
- Symmetry
Structural Challenges

- Coordination with others
Structural Challenges

• Coordination with others
Structural Challenges

- Cantilevers
Structural - Breeze

- Loads
Structural - Breeze

• Loads
Structural - Breeze

- Loads
Structural - Breeze

- Loads

- MEP Integration
Climatic Conditions

- **Comfort Zone**
- **Natural Ventilation**
- **Internal Heat Gain**
East Elevation 12:00

West Elevation 17:00
Breeze – Hybrid Ventilation

- Natural Wind Path
- Hybrid Stack Vent Path
- Mechanically Ventilated
Breeze – L0

Natural Wind Path

Hybrid Stack Vent Path

Mechanically Ventilated
Breeze – L1

- Natural Wind Path
- Hybrid Stack Vent Path
- Mechanically Ventilated
Breeze – L2

- Natural Wind Path
- Hybrid Stack Vent Path
- Mechanically Ventilated
Breeze: Floor Sandwiches

9'10"

1'5"

6'10"

1'5"

8'
Breeze – L0

- Fresh Air Horizontal
- Return Air Horizontal
- Mixed Use Vertical Shaft
- Water Closets

Dimensions:
- 74’
- 61’
- 113’
Breeze – L1

- Fresh Air Horizontal
- Return Air Horizontal
- Mixed Use Vertical Shaft
- Water Closets
Breeze – L2

- 74’
- 61’
- 113’

- Fresh Air Horizontal
- Return Air Horizontal
- Mixed Use Vertical Shaft
- Water Closets
Primary Air System Options

- Dedicated Outdoor Air System (DOAS)
- Enthalpy Wheel
- Rooftop Air Handler
- Economizer
# System Option Comparison

<table>
<thead>
<tr>
<th>OPTION 01</th>
<th>OPTION 02</th>
<th>OPTION 03</th>
</tr>
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<tbody>
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<td>Variable Air Volume w/ Central Preheat</td>
<td>Passive Hydronic w/ Displacement Ventilation</td>
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</tr>
<tr>
<td>![icon] 12”</td>
<td>![icon] 8”</td>
<td>![icon] 10”</td>
</tr>
<tr>
<td>![icon] ![icon]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sustainable Target Value

- Breeze Option 01
  - Concrete Framing System
  - Wood Studs
  - EFIS Exterior

- Breeze Option 02
  - Steel Framing System
  - Steel Studs
  - Recycled Brick
The Process and Current Stage

Current Stage

- Design phase has the highest impact on sustainability goals.

[Image of RIBA Plan of Work 2013 diagram showing stages of project planning and execution, with dates and key events listed along the timeline.]
Focus on Sustainability Targets

To Create a Zero Energy Building...

**STEP 1** Increase energy efficiency
- Efficient building construction
- Efficient systems and appliances
- Operations and maintenance
- Change in user behavior

**STEP 2** Address remaining needs with on-site renewable energy generation
- Wind
- Solar
- Hydro Energy

Logos: USGBC, WELL, BREEAM
CM - Breeze

• Schedule Comparison

ConXtech

- 30 Weeks
- General: 4 w
- Found.: 2 w
- Structure: 4 w
- MEP: 2 w
- Exterior: 8 w
- Interior: 12 w
- Close Out: 2 w

Conventional Concrete

- 36 Weeks
- General: 4 w
- Found.: 2 w
- Structure: 10 w
- MEP: 2 w
- Exterior: 8 w
- Interior: 12 w
- Close Out: 2 w
Equipment

Capacity: 90t
Radius: 164 ft.
Max Height: 354 ft.

Capacity: 50t
Radius: 131 ft.
Max Height: 157 ft.
Payload Capacity = 30,000 Kg
Zero emissions & Silent (E-truck)

Bucket Capacity: 68 c.ft.
Bucket Weight: 1277 kg

Telehandler Capacity: 4000 kg
Max. Height: 43 ft.

Hanson 6m3 RMC Truck

Crown Electric Forklift
Capacity: 2000 kg
Site Layout - Breeze
Excavation & Retaining Wall
Site Layout - Breeze

Conventional Concrete
Site Layout - Breeze

ConXtech Steel
Site Layout - Breeze
CM Breeze

- Cost Distribution Comparison -10 M Total

**ConXtech XL**

- G. Building Sitework: 5% $510,000
- H. General Conditions: 5% $530,000
- F. Specialty Construction: 7% $700,000
- E. Equipment and Furnishings: 6% $640,000
- D. Services: 29% $2,900,000
- C. Interiors: 12% $1,200,000
- A. Substructure: 10% $980,000
- B. Shell: 26% $2,600,000

**Conventional Concrete**

- G. Building Sitework: 5% $510,000
- H. General Conditions: 5% $530,000
- F. Specialty Construction: 7% $700,000
- E. Equipment and Furnishings: 6% $640,000
- D. Services: 29% $2,900,000
- C. Interiors: 11% $1,100,000
- A. Substructure: 10% $990,000
- B. Shell: 29% $2,900,000
Information Flow & Integration

Revit ➔ Dynamo ➔ Excel ➔ Quantity ➔ Schedule
RETHINKING CO$_3$
@Alicja how do you feel about exposed columns like this (the blue highlighted ones)? They lie within the L-shaped footprint, so ideally we would be able to have these... do you have a material preference? steel vs. concrete? also if they are exposed columns... which type of shape would you prefer?
### Team Values

Just to get a sense of what our team values are! Please rank your values on a scale of 1 to 5 (where 5 = Very Important to Me, and 1 = Don't care about this at all)

* Required

<table>
<thead>
<tr>
<th></th>
<th>1 - Don't care about this</th>
<th>2 - Somewhat Unimportant</th>
<th>3 - Neutral</th>
<th>4 - Somewhat Important</th>
<th>5 - Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Impact/Carbon Footprint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainability/Net Zero</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managing Fog &amp; Wind (Air &amp; Water)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Cross Paths</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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**Dates:**
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- 3/3: BRAIN 2.0
- 3/10: DECISION MATRIX
- 3/16: WINTER PRES
Project Values
Project Values

- Environmental Impact: 20.6%
- Zero Accident Concern: 19.4%
- Flexibility & Flexibility: 20.0%
- Sustainability/Net: 20.0%
- Adaptiveness: 20.0%
Project Values

- Zero Accident Con...: 19.4%
- Sustainability/Net...: 40.6%
- AdaptivenessFlexi...: 40.0%
BRAIN 2.0
Brain 2.0
BRAIN 2.0 – BIG IDEA

Integrated with body

Divided into two Hemispheres

Neuronal Connections
BRAIN 2.0 – Integration with "body"
BRAIN 2.0 – Two Hemispheres
BRAIN 2.0 – Two Hemispheres
BRAIN 2.0 – Two Hemispheres
BRAIN 2.0 – Two Hemispheres
BRAIN 2.0 – Sections
BRAIN 2.0 – Sections
BRAIN – BASEMENT

Instructional Labs
Cafe / Kitchen
Auditorium
Storage

WCs, Elevators

Main Entrance

112’
BRAIN – GROUND LEVEL

Classrooms, Seminar Rooms, Student Offices

WCs, Elevator

Storage, Technical Support

Second Entrance
BRAIN – Neuronal Connections
BRAIN - GROUND LEVEL + 1/2

- WCs
- Student Offices
- Technical Support, Storage
BRAIN – LEVEL 1

- Faculty Offices
- WCs, Elevators
- Classrooms, Seminar Rooms
- Storage
BRAIN – LEVEL 2

112’

- Faculty Offices
- Heads Dep. Office, Senior Offices, Admin. Offices
- Storage, Faculty Longue
- WCs, Elevators
BRAIN – Elevations

North

West

South

East
Double Cantilevers

- Double Cantilever
- ‘Double Diamond’ Shape
- Lateral System Placement
Façade

- Lateral System
- Facade
- Lateral System Elements:
  - Bracing
- 36' Cantilever
- Cantilever:
  - Bracing
5th Facade

TWO OPTIONS:
• Steel
• PT Concrete

Foundations:
• Isolated Pad Footings

• Atrium
  • Seismic masses
# Dead Load Takeoff

## PT Concrete Option

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (psf)</th>
</tr>
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<tbody>
<tr>
<td>Slab</td>
<td>77</td>
</tr>
<tr>
<td>Insulation</td>
<td>3</td>
</tr>
<tr>
<td>MEP &amp; Misc</td>
<td>8</td>
</tr>
<tr>
<td>Suspended Ceiling System</td>
<td>2</td>
</tr>
<tr>
<td><strong>Slabs</strong></td>
<td><strong>90</strong> psf (SLAB DESIGN)</td>
</tr>
<tr>
<td>Beams</td>
<td>0</td>
</tr>
<tr>
<td>No Beams</td>
<td>90           psf (BEAMS)</td>
</tr>
<tr>
<td>Girders</td>
<td>10</td>
</tr>
<tr>
<td>16&quot;x24&quot; @ 12' o.c.</td>
<td><strong>100</strong> psf (GIRDERS)</td>
</tr>
<tr>
<td>Columns</td>
<td>2</td>
</tr>
<tr>
<td>16&quot;x16&quot;</td>
<td><strong>102</strong> psf (Columns/Footings/Seismic)</td>
</tr>
</tbody>
</table>

## ConXTech Option

<table>
<thead>
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<td><strong>Slabs</strong></td>
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<td>Columns</td>
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</tr>
<tr>
<td>HSS 16x16x5/16</td>
<td><strong>63</strong> psf (Columns/Footings/Seismic)</td>
</tr>
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**Dates:**
- 1/11: AEC KICKOFF
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- 2/16: Mentor CRIT
- 2/17: BREEZE
- 2/23: Slack Switch
- 3/2: Project Values
- 3/3: Brain 2.0
- 3/10: Decision Matrix
- 3/16: Winter Pres
Live Load Diagram

- Classroom/Office: 50 psf
- Corridor: 80 psf
- Stairwell/Elevator: 100 psf
- Storage: 125 psf

Live Load Determination

Level 1.5
Live Load Diagram

- Classroom/Office: 50 psf
- Corridor: 80 psf
- Stairwell/Elevator: 100 psf
- Storage: 125 psf

Live Load Determination
Level 2
Live Load Determination
Level 3

- Classroom/Office: 50 psf
- Corridor: 80 psf
- Stairwell/Elevator: 100 psf
- Storage: 125 psf
Load Path

- Loads
Structural - Brain

- Coordination
Structural - Brain

• Coordination
Structural - Brain

- Coordination
West Elevation 02:00

West Elevation 13:00
Brain 2.0

Natural Wind Path

Hybrid Stack Vent Path
Brain 2.0

Natural Wind Path

Hybrid Stack Vent Path

Mechanically Ventilated
Brain 2.0

Natural Wind Path
Hybrid Stack Vent Path
Mechanically Ventilated
Brain 2.0

- Natural Wind Path
- Hybrid Stack Vent Path
- Mechanically Ventilated
Brain 2.0

- Natural Wind Path
- Hybrid Stack Vent Path
- Mechanically Ventilated
Brain 2.0: Floor Sandwiches
Brain 2.0 – L0

- Fresh Air Horizontal
- Return Air Horizontal
- Mixed Use Vertical Shaft
- Water Closets
Brain 2.0 – L1

- Fresh Air Horizontal
- Return Air Horizontal
- Mixed Use Vertical Shaft
- Water Closets
Brain 2.0 – L3

- Mixed Use Vertical Shaft
- Return Air Horizontal
- Fresh Air Horizontal
- Water Closets
Primary Air System Options

• Dedicated Outdoor Air System (DOAS)
• Enthalpy Wheel
• Rooftop Air Handler
• Economizer
# System Option Comparison

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<tr>
<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
<td><img src="image3.png" alt="Diagram" /></td>
</tr>
<tr>
<td>12”</td>
<td>8”</td>
<td>10”</td>
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</tbody>
</table>
Sustainable Target Value

• BRAIN 1.0
  • Concrete Framing
  • PT Slab System
  • EFIS Facade

• BRAIN 2.0
  • Steel Framing
  • PT Slab System
  • Glass/Wood Facade
Equipment

Capacity: 90t
Radius: 164 ft.
Max Height: 354 ft.

Capacity: 50t
Radius: 131 ft.
Max Height: 157 ft.
Payload Capacity = 30,000 Kg
Zero emissions & Silent (E-truck)

Bucket Capacity: 68 c.ft.
Bucket Weight: 1277 kg

Telehandler Capacity: 4000 kg
Max. Height: 43 ft.

Hanson 6m3 RMC Truck

Crown Electric Forklift
Capacity: 2000 kg
On-site Facilities

Capacity: Up to 40 people

- Easily add and subtract space as you need it
- Not dependent on shore power
- Small footprint with no ancillary tie downs required
- No special foundation required
Interactive Hoardings

1. Interaction, Communication, Transparency about the project.

2. Telling the story of the project

3. Telling the Story of the Community
**Vehicle Tracking**

1. For Vehicles Coming from the South of the Site.
2. For Vehicles coming from North, nearest roundabout 431m from site.
3. Temporary road and ramp to be set up for this movement.
4. Vehicle Details: USA - WB 40 Semi-truck: w= 8’, l=46’
5. 18’ wide opening for temp. road access and exit
Site Layout - Brain
PT Concrete Option
Site Layout - Brain
Steel Option
Site Layout - Brain
Supply Chain

LEED v4 EPD & HPD recognized
Low CO2 Concrete

Address: 450 Amador St.
San Francisco, CA 94124,
USA

9 Miles from Site

Address: 6701 Koll Centre
Pkwy 150, Pleasanton, CA
94566, USA

35 Miles from Site
Address: Pier 96
gatehouse, San Francisco,
CA 94124, USA
Phone: +1 415-282-8710
8 Miles from Site

Address: 1464 Davidson Ave,
San Francisco, CA 94124, USA
Phone: +1 415-821-3888
9 Miles from Site
Address: 3786 Valley Ave, Pleasanton, CA 94566, USA
52 Miles from Site

Address: 701 De Long Ave, Novato, CA 94945, USA
30 Miles from Site
CM - Brain

• Schedule Comparison

ConXtech

<table>
<thead>
<tr>
<th>General</th>
<th>Found.</th>
<th>Structure</th>
<th>MEP</th>
<th>Exterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 w</td>
<td>2 w</td>
<td>4 w</td>
<td>2 w</td>
<td>11 w</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conventional Concrete

<table>
<thead>
<tr>
<th>General</th>
<th>Found.</th>
<th>Structure</th>
<th>MEP</th>
<th>Exterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 w</td>
<td>2 w</td>
<td>10 w</td>
<td>2 w</td>
<td>11 w</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37 Weeks

11 w

12 w

2 w

43 Weeks

11 w

12 w

2 w
CM Brain

• TVD Tracking
CM - Brain

- Cost Distribution Comparison – 10.6 M Total

ConXtech XL

PT Concrete
# Health & Safety

## Risk Matrix For Foundation Works

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hazard</th>
<th>Associated Risk</th>
<th>Risk Analysis</th>
<th>Control Measures</th>
<th>Adjusted Risk Analysis</th>
<th>PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Falls and falling objects into the excavation</td>
<td>Serious/fatal injuries to workers/public/students on/passing the site.</td>
<td>M H H</td>
<td>Machinery parked away from excavation&lt;br&gt;Use of temporary barriers&lt;br&gt;Avoid manual excavation&lt;br&gt;Install warning signs</td>
<td>L H L</td>
<td>Helmets</td>
</tr>
<tr>
<td></td>
<td>Soil collapse</td>
<td>Serious/fatal injuries could occur if soil collapses Bodily injuries/potential asphyxia to the workers.</td>
<td>L L M</td>
<td>Geotextile reinforcement&lt;br&gt;Shoring excavation&lt;br&gt;No entry in excavation zone when deeper than 1.5 metres&lt;br&gt;Examine soil conditions and soil bearing capacity</td>
<td>L L L</td>
<td>helmets, ear defenders, Face masks</td>
</tr>
<tr>
<td>Excavation Works</td>
<td>Plant falling into the excavations or plant overturn</td>
<td>Serious/fatal injuries to those working on excavations.</td>
<td>M H H</td>
<td>Plan vehicle routes.&lt;br&gt;Mark routes with timber&lt;br&gt;Edge protection&lt;br&gt;Experienced machine operators and effective use of banksmen</td>
<td>L H L</td>
<td>High visibility vest</td>
</tr>
<tr>
<td></td>
<td>Buried Existing Services</td>
<td>Burns or electric shocks to the workers/plant operators caused by damaged services.</td>
<td>H M M</td>
<td>Use CAT equipment before excavation.&lt;br&gt;Use insulated tools where necessary&lt;br&gt;Operators of the locators are to be suitably trained.</td>
<td>L M L</td>
<td>Hat, Gloves, Boots, High Visibility vest</td>
</tr>
<tr>
<td></td>
<td>Abuse of Overtime</td>
<td>To speed the construction, process up overtime hours will become available to workers. It is important that labour do not abuse this and become overtired as this will be hazardous to the individual and the project</td>
<td>L H L</td>
<td>Strict monitoring of labour overtime to ensure no one completes more than 60 hours per working week (includes normal working hours)&lt;br&gt;Provide regularly breaks for labour</td>
<td>L H L</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Poor Leadership</td>
<td>Poor leadership can result in a lack of understanding and direction for labour</td>
<td>L H L</td>
<td>Ensure leaders are efficiently trained&lt;br&gt;Ensure there are enough leaders per number of workers 0.1:3&lt;br&gt;Ensure team is organised</td>
<td>L H L</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*HSE Health & Safety Executive<br>CDM 2015<br>ARE YOU PROTECTED? OSHA® Occupational Safety and Health Administration*
Action Plan – Earthquake & Hazards Mitigation

- Earthquake a major hazard
- Evacuation area provided for Earthquakes, Fire, etc off-site

How stupid can they be
NEITHER OF THEM ARE WEARING GOGGLES

Take the right preventive measures for the right activity. Not just for the sake of safety regulations.
Better knowledge of sub-contractor practices, better overall site H & S

SiteWise is a prequalification system that grades a contractor's health & safety capability and publishes that grade in a database that can be viewed by main contractor's and principal organisations. This allows for better contractor selection and an easier tendering process for everyone involved.
Statement of general policy

• Site method statement revised weekly by H&S experts,

• Clear process diagram for daily work and special construction,

• Daily brief meetings and induction programme,

• Substantial and suitable training.

• Monthly inspections by H&S regulator.
DECISION MATRIX
Decision Matrix

Decision Criteria

1) Integration Level
2) Big Idea and Concept Affinity
3) Sustainability
4) Construction
5) Life Cycle Assessment
6) Aesthetics
7) User Interface
8) Functionality & Adaptability

0 5 10 15 20 25 30 35 40 45 50 55 60

BREEZE CONC  BREEZE STEEL  BRAIN CONC  BRAIN STEEL

TOTAL

29%  25%  21%  25%
WINTER PRESENTATION