Delta Interventions Studio
MSc 3/4 Urbanism & Architecture
Department of Urbanism
2016 — 2017
San Francisco Bay: Resilience by Design
Designing for uncertain delta-landscape futures
Delta Center Design
Location: Pier 70, San Francisco
Licheng Wang
Student Number: 4463633

1. Nature Introduced
2. Courtyard opened for ventilation and circulation
3. Flow of water follows the flow of people
4. Individual structures input for specific programs

Flow of People
Flow of Water

Ground Floor Plan 1:500
First Floor Plan 1:500
Section 1-1 1:500

1 Study Center
2 Library
3 Exhibition Hall
4 Research Lab
5 Storage
6 Archive
7 Performance Stage

1 Study Center
2 Library
3 Cafe

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North Facade 1:200
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Derbigum membrane
20mm Fire retardant treated plywood
50mm expanded cork insulation
Vapor proof sheets
50mm Cross-laminated Timer
Operable Skylights with remotely controlled actuator
Steel Truss
Silane-Siloxane Masonry Sealer
600mm Brick Masonry Wall
Glass Curtain Wall
Roof Drainage Pipe
Concrete Wall
Drainage Pipe
Sand & Gravels
Stainless Steel Gutter
Single Glazing
Condensation
Double Glazing
Skylight Detail 1:5
Roof Detail 1:5
Window Detail 1:5
Courtyard Section 1:50
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### Water and Energy Management

- **Rainwater Harvesting and Storage:**
  - **Summer Scenario:**
    - Rainwater harvesting from roofs and rain gardens.
    - Water storage in underground tanks.
    - Water used for flushing toilets, irrigation, and water features.
  - **Winter Scenario:**
    - Water used for flushing toilets and irrigation.
    - Additional water supply from urban runoff and rainwater harvesting during dry seasons.

- **Solar Power Generation:**
  - Solar panels on the roof.
  - Power stored in batteries for use during grid outages.

- **Condensation and Moisture Management:**
  - Condensation from indoor spaces.
  - Moisture sensor in the building.

### Water Usage Breakdown

- **Toilet Flushing:**
  - 25.5 m³ per month
  - 8.5 m³ per day

- **Irrigation:**
  - 26.3 m³ per month
  - 3.34 m³ per day

- **Water Feature:**
  - 204 m³ per month
  - 13.6 m³ water change per 2 days

### Water Tank Capacity

- **Underground Water Tank Units:**
  - 250 m³
  - 150 m³
  - 400 m³

- **Cover for 3 Months of Water Usage during Dry Season:**
  - 255.7 m³ per month

- **Additional Supply:**
  - 1062 m³ Rainwater received per month during raining season
  - 100 m³ Rainwater received per month during dry season

### Precipitation and Rainwater Harvesting

- **Average Monthly Precipitation:** 50 mm
- **Area of Receiving Rainfall (without urban runoff):** 300 m x 65 m = 19,500 m²
- **Mount of Rainwater (without urban runoff) received every month:** 1062 m³

### Water Management

- **Summer and Winter Scenarios:**
  - Adjustments in water usage based on seasonal changes.

- **Raining Season vs. Dry Season:**
  - More than 1062 m³ in rainy season.
  - More than 100 m³ in dry season.

- **Additional Considerations:**
  - Water usage during different seasons.
  - Strategies for water conservation.

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