

Burj Al Fanteer

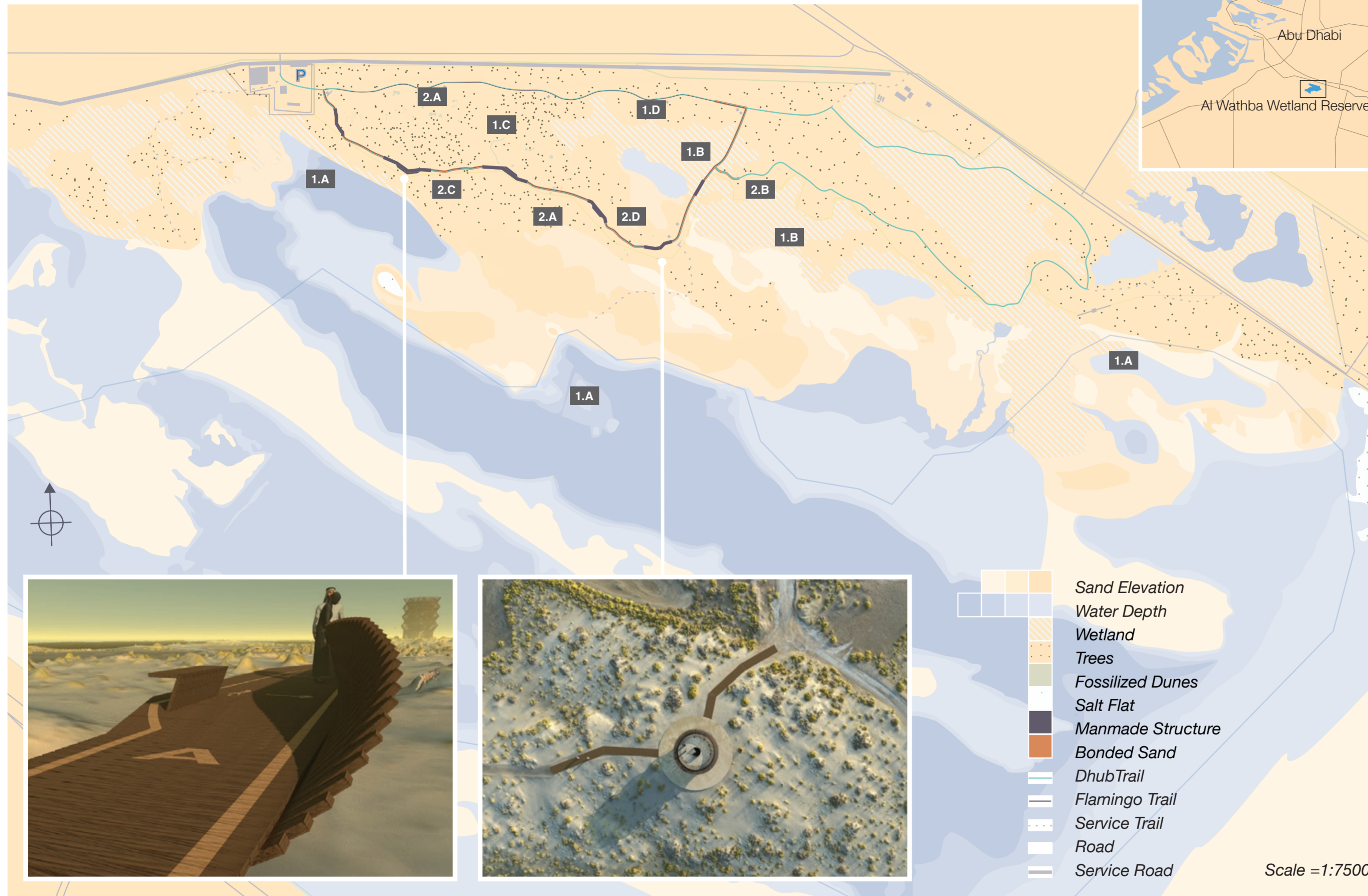
Watch Tower and Modular Boardwalk System for the Environment Agency Abu Dhabi

June 2019



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Al Wathba Wetland Reserve | Concept and Site Analysis



A Uniquely Diverse Ecosystem Highlighting Flora, Fauna, and Geology

Al Wathba Wetland reserve is a beautiful habitat, hosting over 600 species of mammals, birds, invertebrates, plants, and reptiles. The reserve serves as breeding grounds for many migratory birds such as the greater flamingo and the black winged stilt. Between the sabkhas, fossil dunes, and wetlands, Al Wathba's geologic variety serves as a home for a diverse variety of species. Here are examples of the diverse species and features in the reserve.

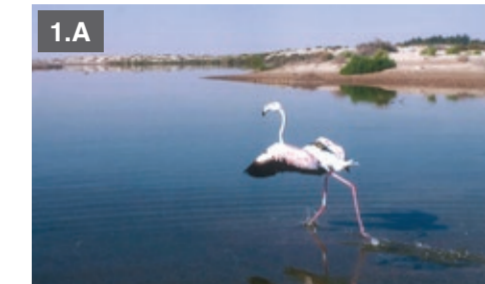


Figure 1.A: Greater Flamingo



Figure 1.B: Black-winged Stilt



Figure 1.C: Spiny-tailed Lizard



Figure 1.D: Fat-tailed Scorpion



Figure 2.A: Toothbrush Bush



Figure 2.B: Red Thumb



Figure 2.C: Common Reed



Figure 2.D: Halophytes



Figure 3.A: Wetland



Figure 3.B: Fossilized Dunes



Figure 3.C: Saltflats (Sabkhas)



Figure 3.D: Dry land with shrubs.

Creating an Experience

An Introduction

Often reserves are boiled down to visuals and aesthetics. This project, however, hopes to create an educational experience that complements the preservation of the site. For example, binoculars will be handed out to aid visitors in exploring the different species and geologic features around the reserve alongside **detailed information panels**. Al Wathba Wetland Reserve was founded in 1998 when the late Sheikh Zayed Bin Sultan Al Nahyan desig-

nated it as a protected area. There is a blossoming floral and faunal ecosystem containing 260 bird species, 35 plant species, 16 reptile species, and 10 mammal species. Placed on the IUCN Green List of Protected and Conserved Areas, the area covers 5 square kilometers and has wetlands, salt flats (sabkhas), and fossilized dunes. Primarily, the park hosts as many as 4000 Greater Flamingos. The project outlines a **modular boardwalk system** oriented around an educational and contextual

experience of the wetlands concluding at a **watchtower**. The watchtower stands at 12 meters tall over a 700 meter boardwalk, built for variable accessibility needs. The structure and construction process are also meant to have minimal impact on the environment and ecological composition of the site. For instance, the boardwalk is a raised platform with minimal intrusive foundations, allowing water flow, nutrient circulation, and open pathways for animals to cross.

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Al Wathba Wetland Reserve | Tower View and Diagrams



1.A 2.A 1.C 3.B 1.D 3.A 1.B 2.B 3.D



Visitor perspective: A 360 view from the platform of the watchtower.

Angle-adjusting smart mirrors “blink” to highlight significant landscape locations throughout the reserve. These are activated when visitors on the viewing platform of the watchtower press location-specific buttons (1) on available information interfaces (See Figure 4). Oscillation motors move a small mirror (2) that will reflect sunlight towards the tower. These blink for a few seconds.



3.C Labels (1.B, 2.A, ...) refer to Figures 1-3.

1.A

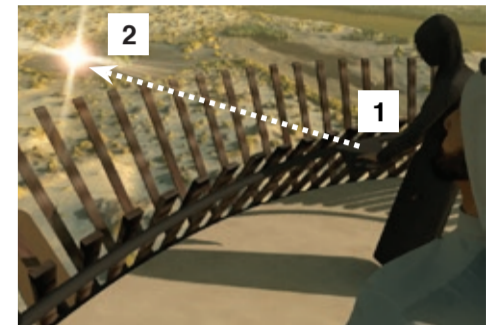
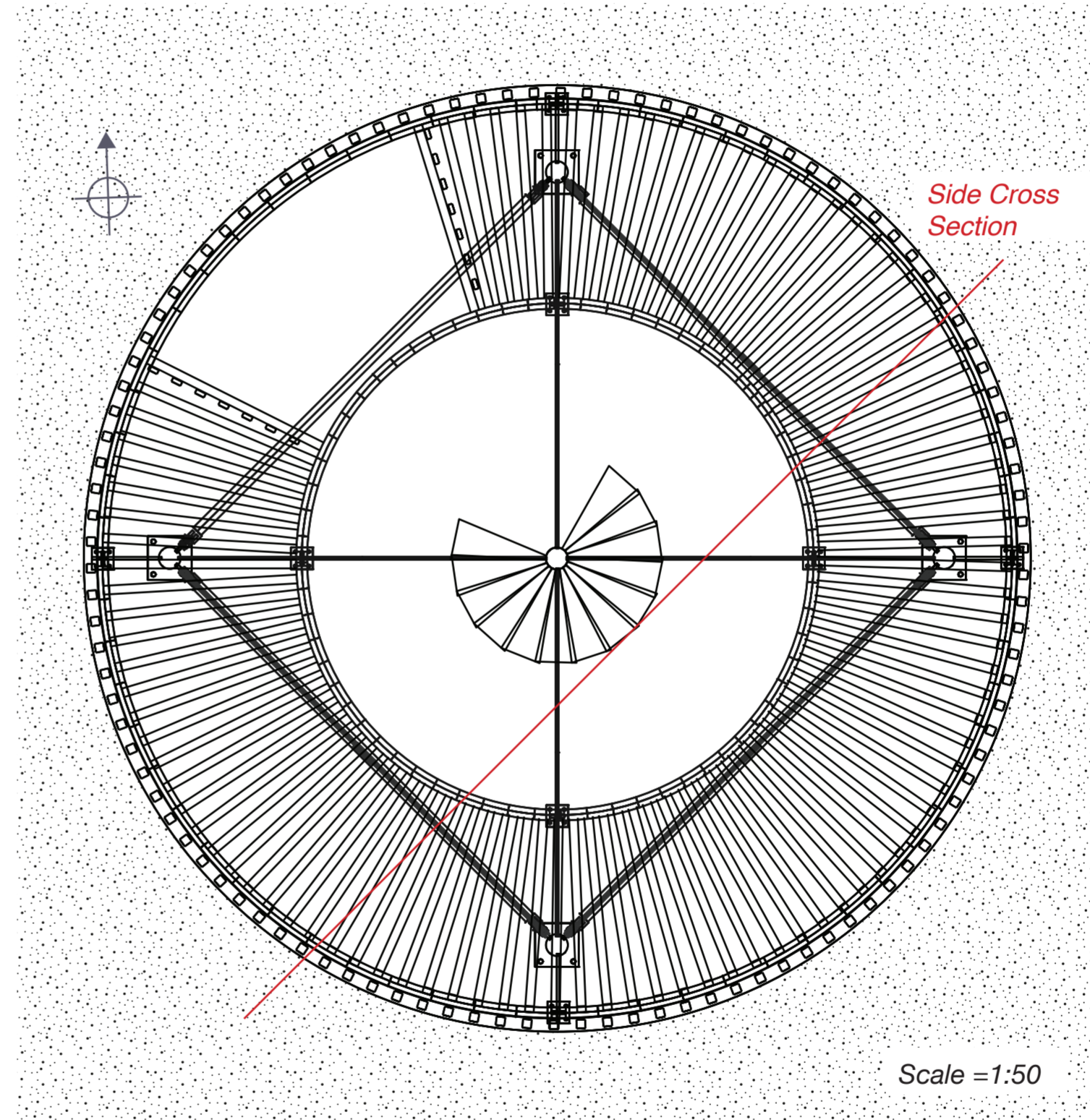
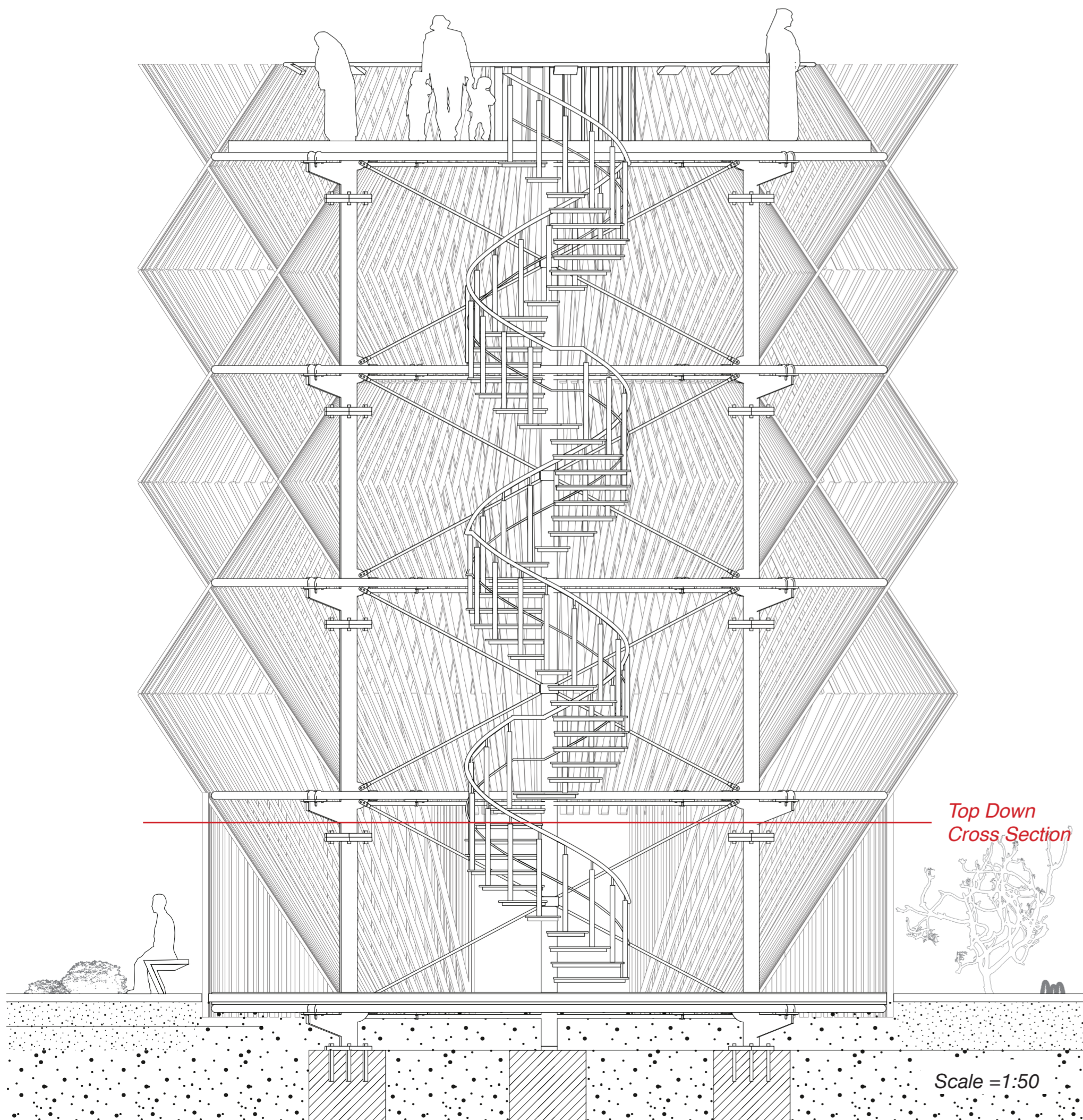


Figure 4: Smart Mirror Interaction

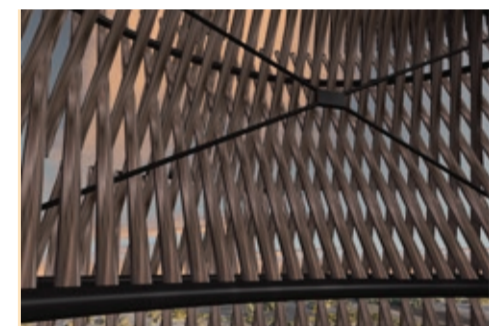


Figure 5: Interlocked Wood Planks

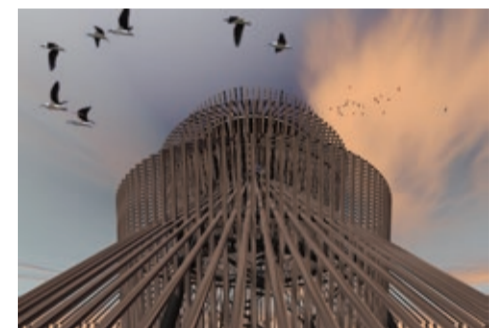


Figure 6: Worm's Eye View



Figure 7: Entrance Walkthrough

Climbing the Tower

An Illuminating Experience

The watchtower is a 12 meter-tall structure with a total diameter of 18 meters at the viewing platform. It is made of prefabricated steel and wood elements. The tower has a steel spiral staircase on the inside that leads up to a viewing platform at the top. The tower's exterior is made of interlocked wooden planks that provide a curated view of the surrounding wetlands.

Visitors experience a complex light structure culminating with a 'WOW' at the pinnacle of the tower. **Palm trees**, which are native to the region and are central to the UAE culture, inspire the outer structure's zig-zag-like pattern. The boardwalk and tower use the same design language, (ie. angles, materials and concept). Visitors will find an array of buttons at the top of the tower. These activate smart mirrors which “blink” reflecting sunlight to the top of the tower and highlight various locations around the reserve.

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Al Wathba Wetland Reserve | Modular Boardwalk

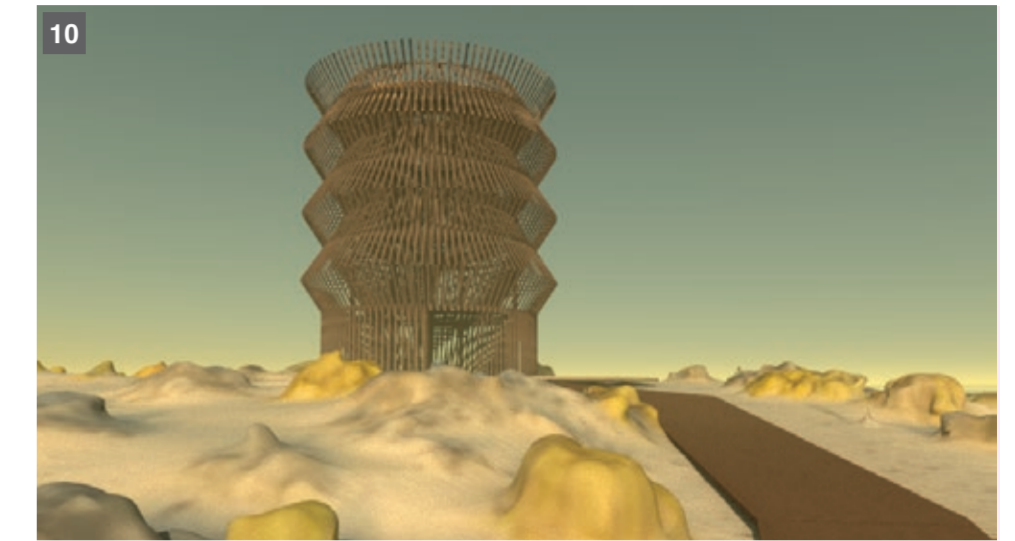


Figure 10: Ramp leading to Tower

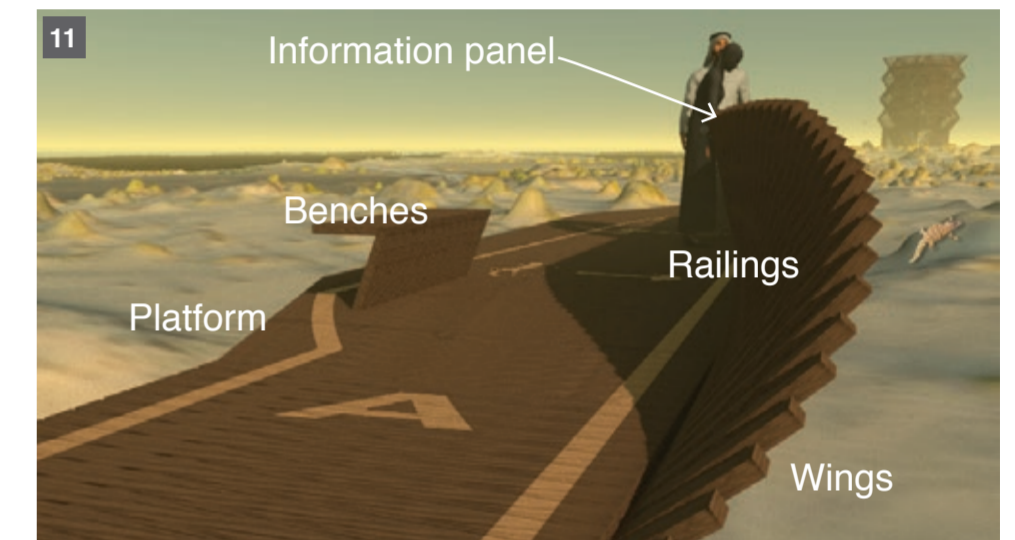


Figure 11: Boardwalk Components

An Educational Walk

The modular boardwalk is designed to be accessible to people of varying ages and abilities. Not only is it wheelchair friendly, but it also integrates benches for visitors who need to take a break. **The boardwalk is made of several modules.** One is comprised of a platform, wings, a railing and benches (Figure 11). The length, placement and order of suggested boardwalk modules are adjustable. This flexibility allows us to build in phases, according to available budgets. As an educational tool, milled animal footprints are embedded into various locations throughout the wooden floors and railing. Children can search for and collect these footprints which provides a curated journey alongside information panels.



Figure 8: Person transferring milled footprint to paper with pencil

Landscaping

Phase 1 of the boardwalk, the one proposed for this project, extends from the visitor center to the watchtower, then goes north along the rest of the Dhub trail. Phase 1 of the boardwalk ends with a turn left back to the beginning. Though, the existing trail is currently usable. Phase 2 extends the boardwalk from the watchtower to the rest of the flamingo trail, and back to the visitor center. The boardwalk is a modular design alternating between wooden and bonded sand areas. Phase 2 is proposed to be realized at a later time.

Materiality

The platform of the boardwalk is proposed to be built out of wooden planks. Wood as a material is both durable and cost effective, increasing the life of the boardwalk and reducing the cost of maintenance. Wood is also an environmentally friendly material that is inert, thus not affecting the composition of the soil. *Cleartech* acts as transparent binder creating a natural looking path out of existing sand and gravel (Figure 13). Highly durable, once dry this material is creates a solid foundation for wheelchair access.

Lifecycle and Cost

The materials proposed for the boardwalk are very durable, only needing replacement every 15 years. They are cost effective and low-maintenance. Both the wood and Cleartech Bonded Sand are very strong, being able to carry massive amounts of weight. Their strength also makes them resistant to vandalism and damage. This building process also does not require any heavy construction machines.

In case of project realization, the expected costs cover project management, materials, footing and anchors, sorting and distributing, erection, and fit-out.

- Phase 1
- Phase 2

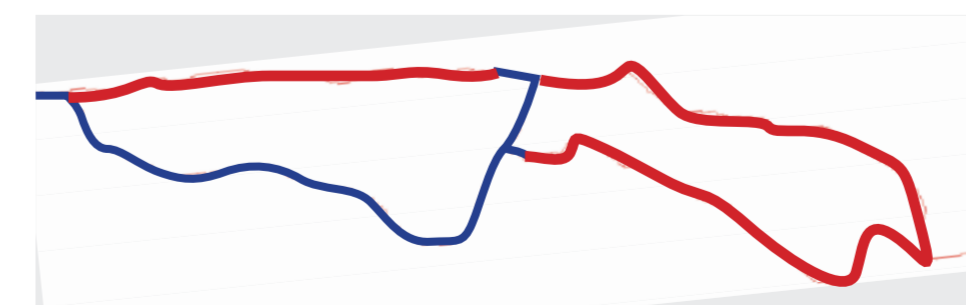


Figure 9: Flora of Al Wathba Wetlands

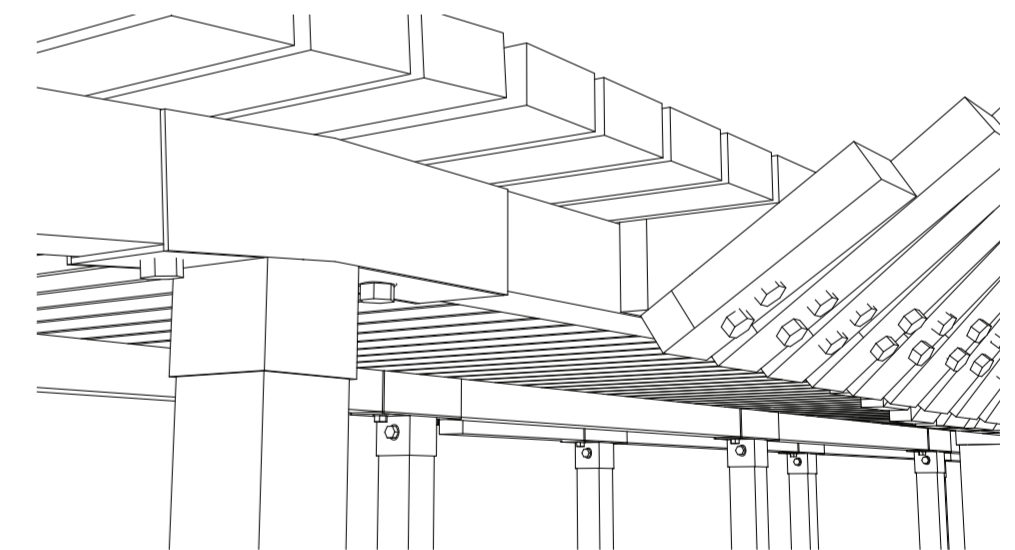


Figure 12: Bracket and Footing of Boardwalk

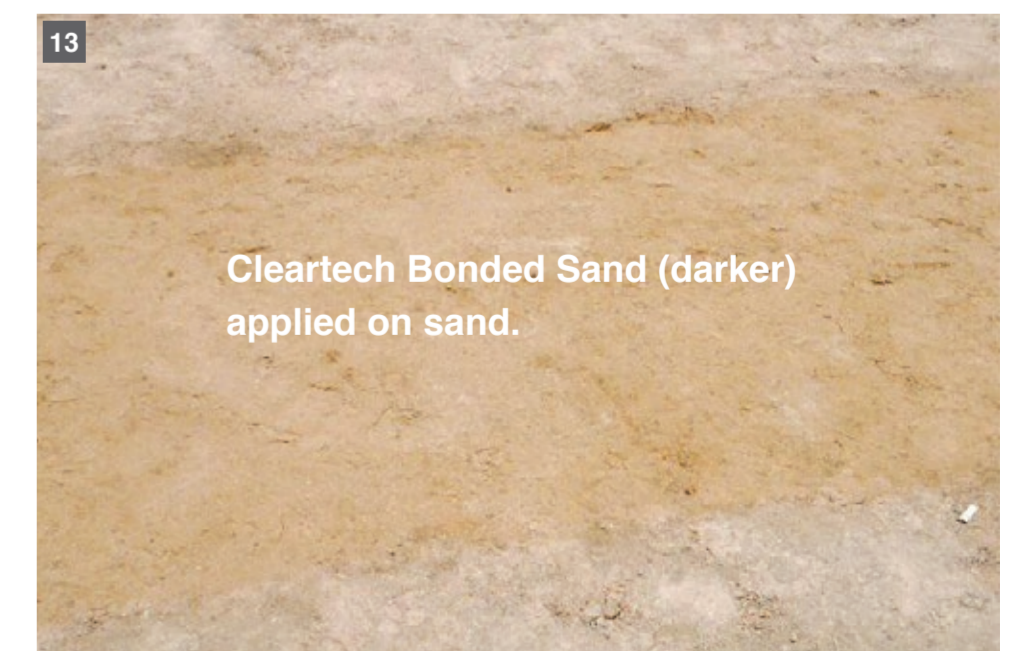


Figure 13: Bonded Sand