

CARVING WAVE

Amin Yazdi | ARCH 486 | Spring 2016 | Nancy Cheng



Cascades Forma-
66 million years ago

Missoula Floods
20,000 years ago

Portland
1800s

The Site

Before inhabiting the land, we must understand the history of the place. But how far back should we study? Events unfold so gradually that one might have to go back to the beginning of the planet to fully comprehend a given site. Some of the inspirations traces as far back as sixty million years ago.

The Hull

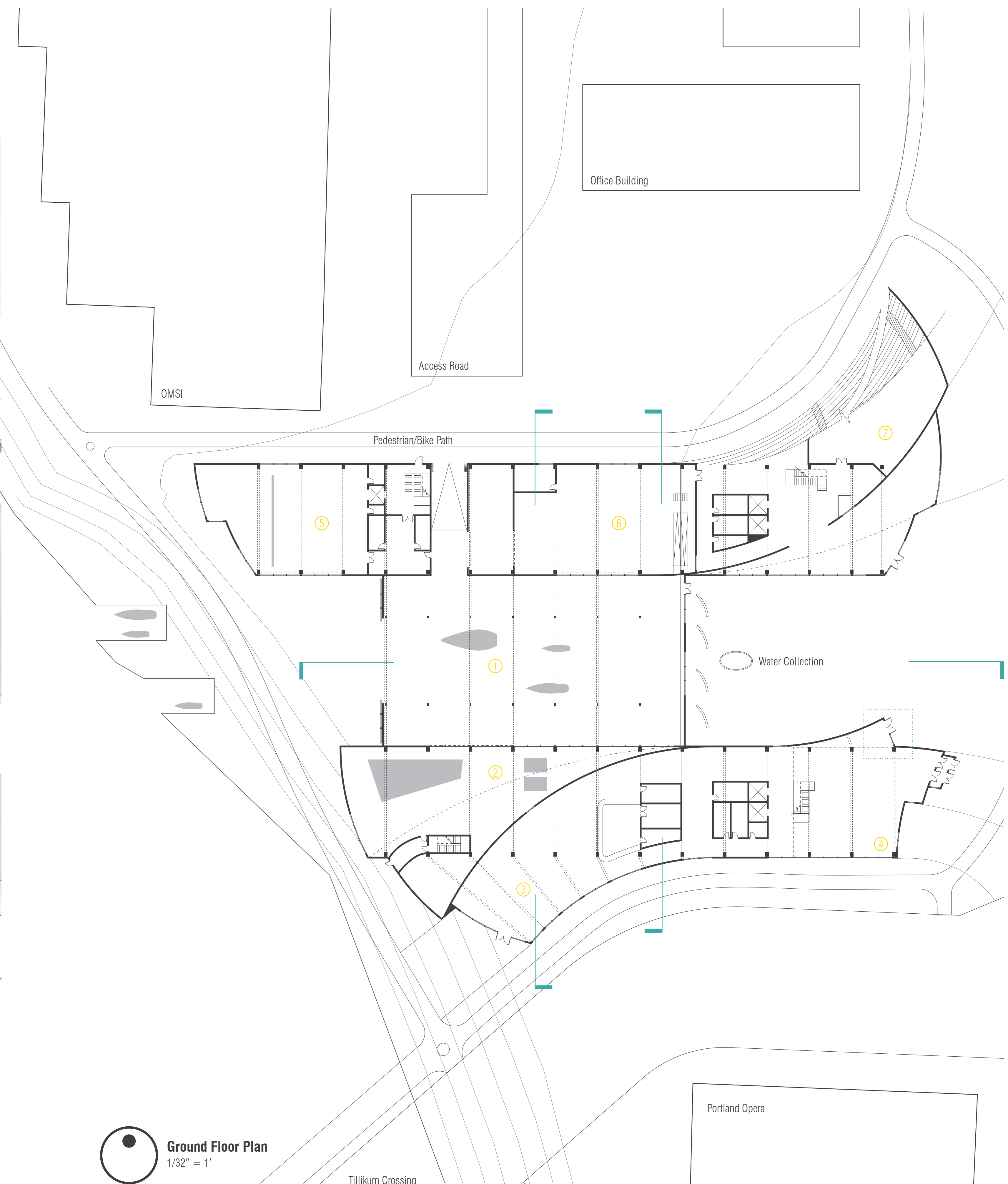
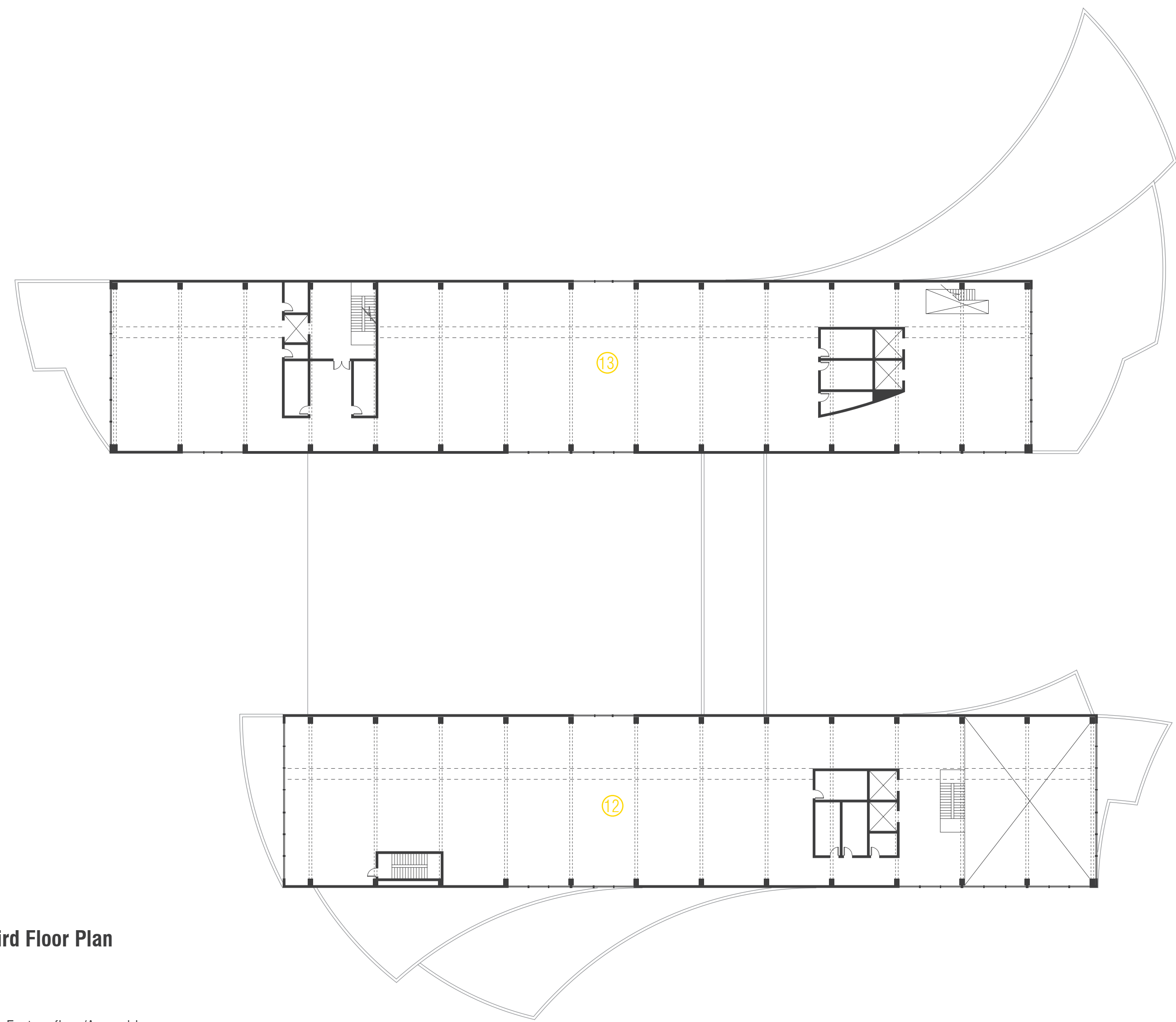
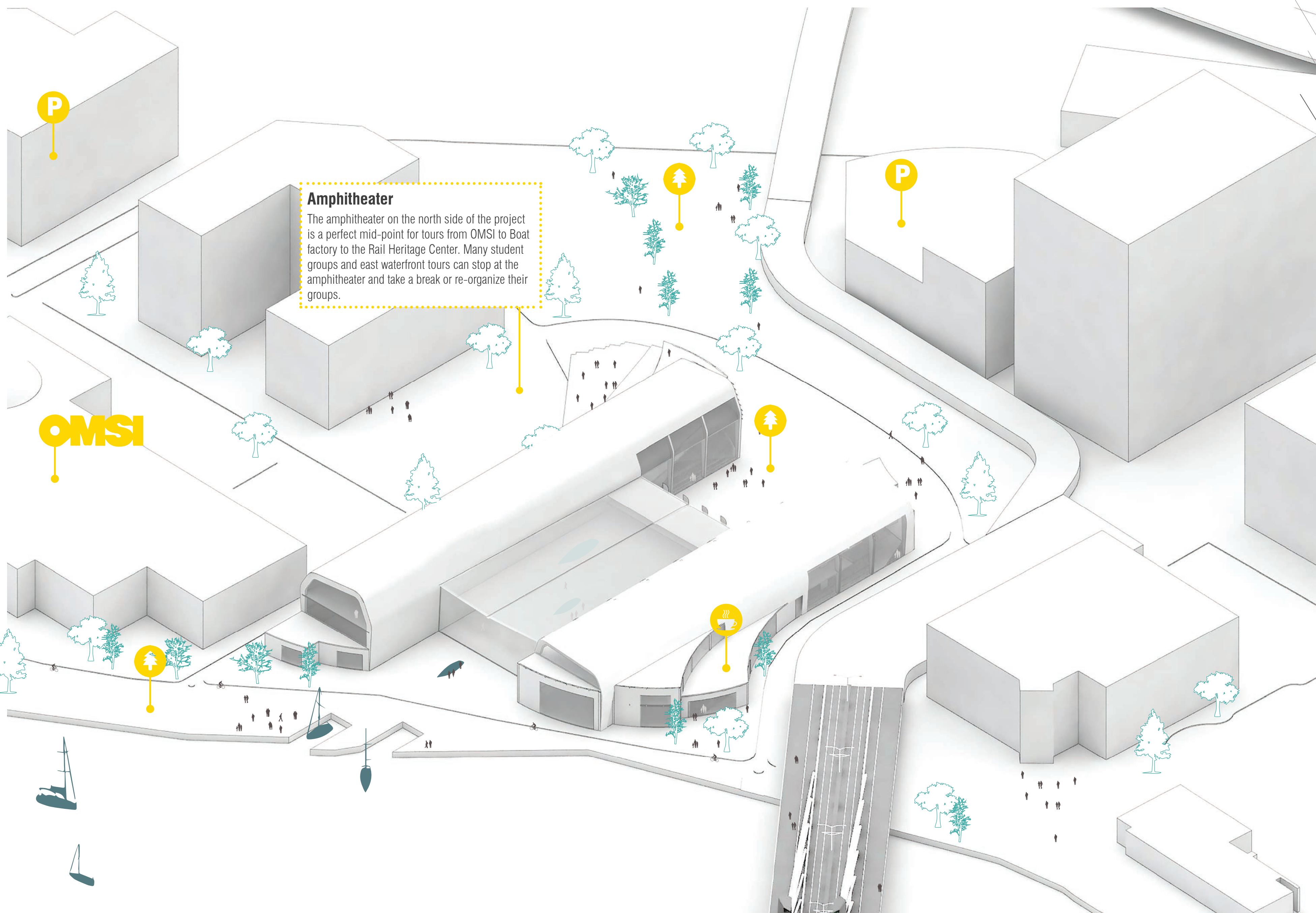
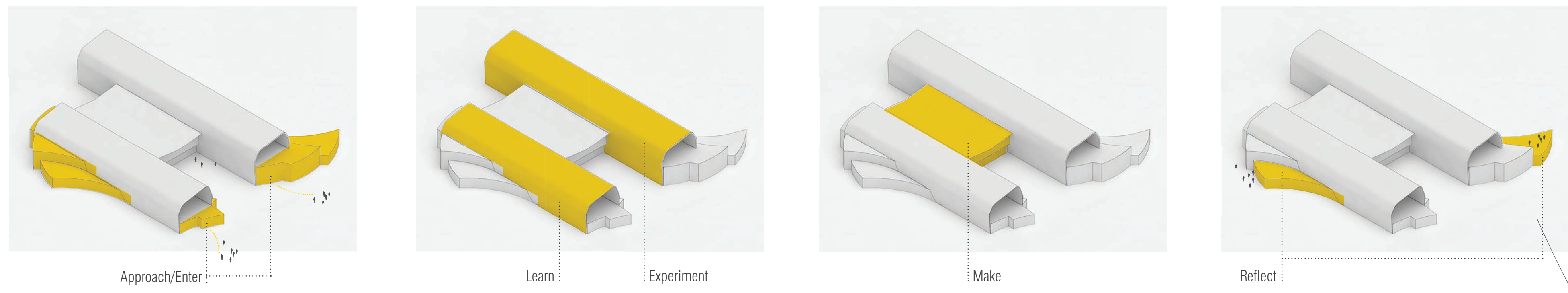
The first few steps of making a sailboat is to create the frame and ribs. Once the ribs are in place, thin layers of wood laminates will be carved and put in place to form the boat hull.

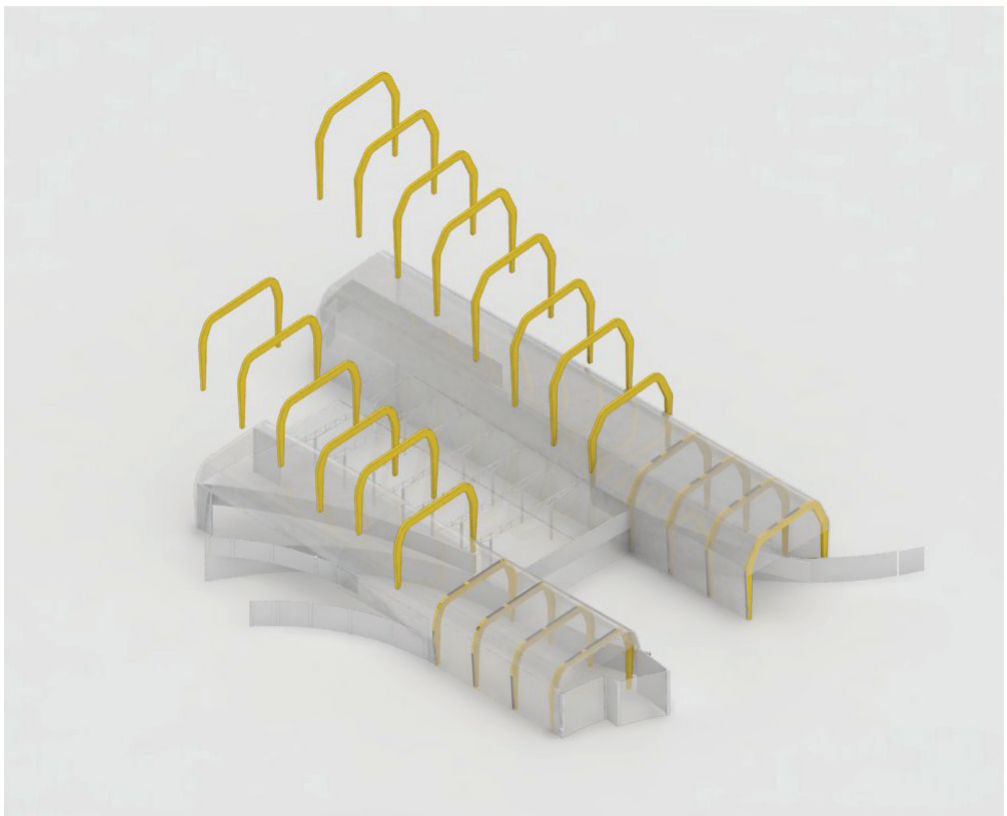
Assembly

Mast and Launch

Carving Wave

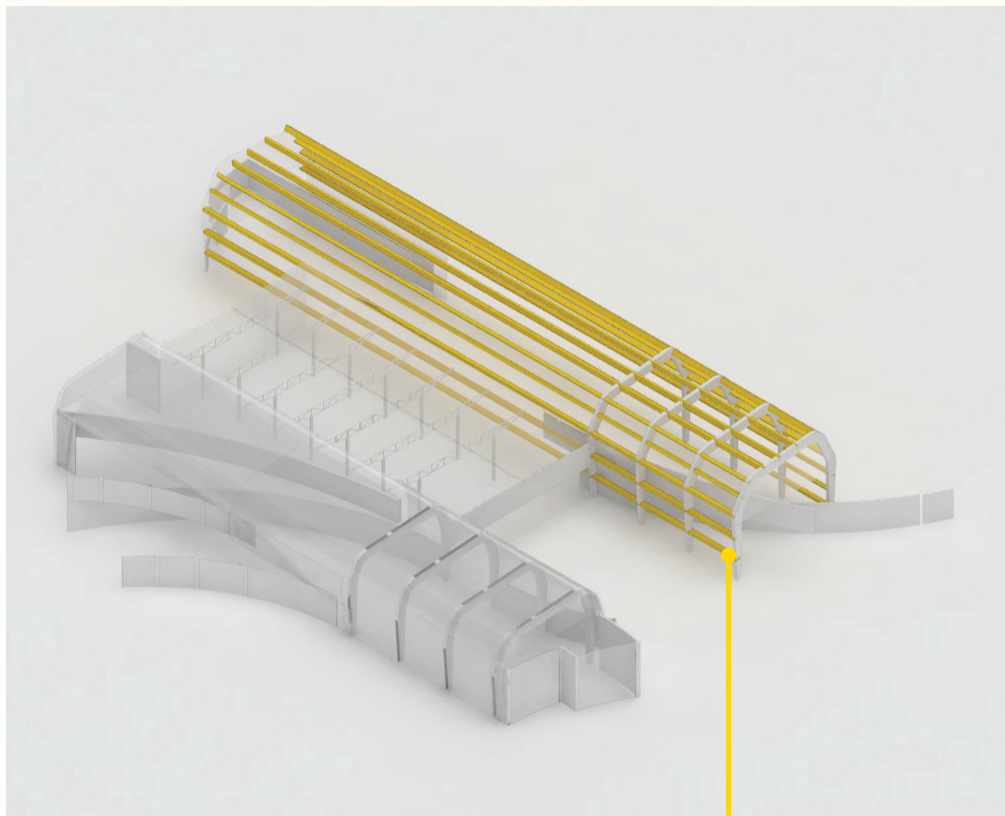
A sailboat hull is designed such that it performs very efficient under different points of sail. The hull doesn't change its shape as the force vectors change, but all the variations of forcefields have been calculated in the design of the hull. Can we design and make forms considering all the forces that will influence it: the program, urban strength and weaknesses, and physical conditions?





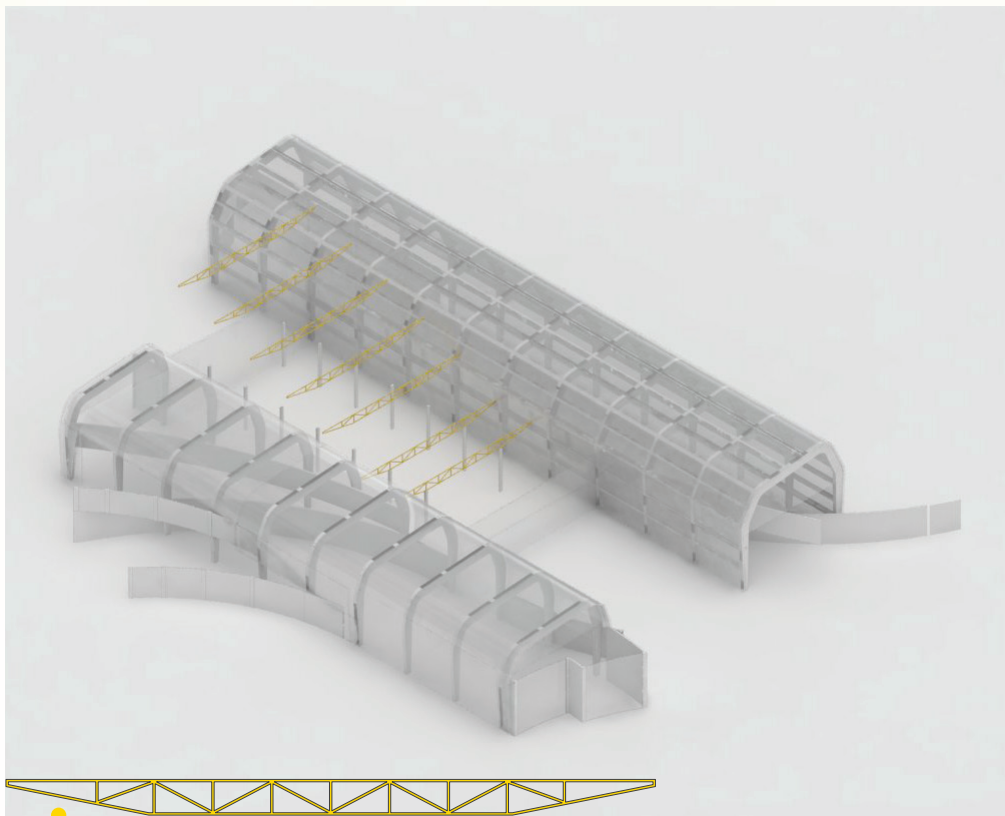
The Ribs

The huge glulamated structure is a three-point arch spanning almost 60 feet. Each of the glulams are 5-foot deep at the deepest part. The ribs accommodate the large open floor needed for boat building program and is, itself, inspired from wooden boat hull design and construction.



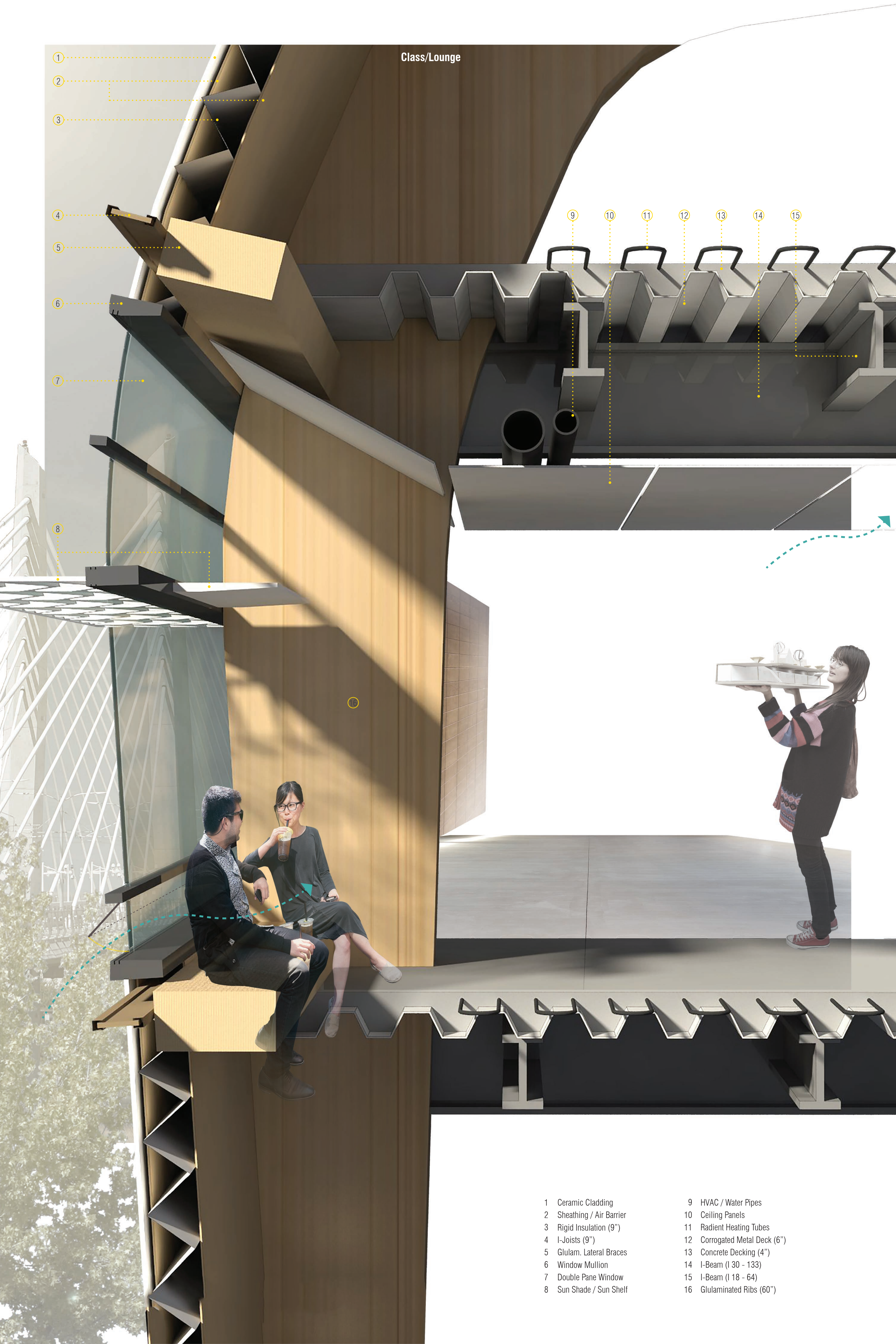
Lateral Support

Besides the cross-bracings (that happen and are visible throughout the building) and structural cores (two on each wing), the glulamated wood beams run horizontally covering all the ribs for more structural support.

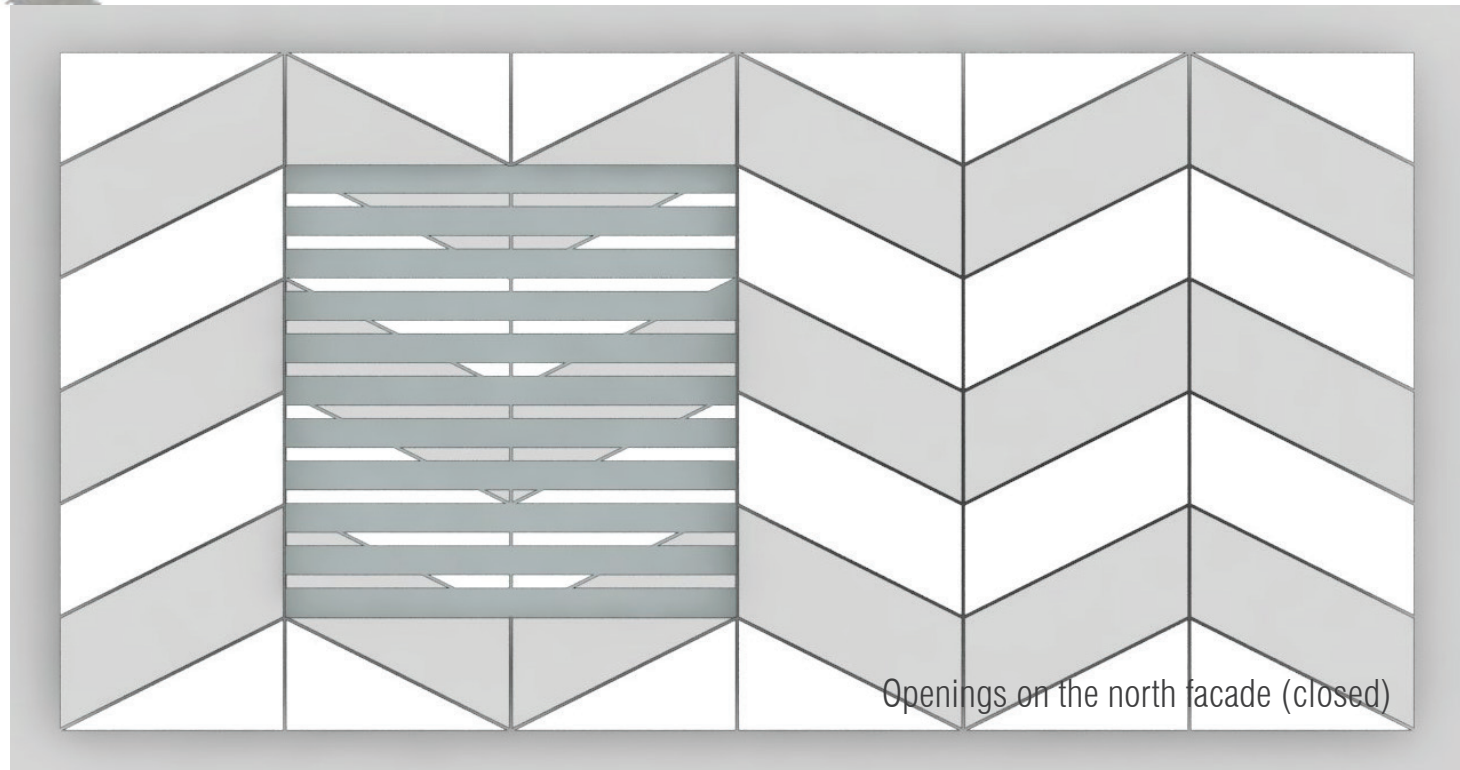


Steel Truss

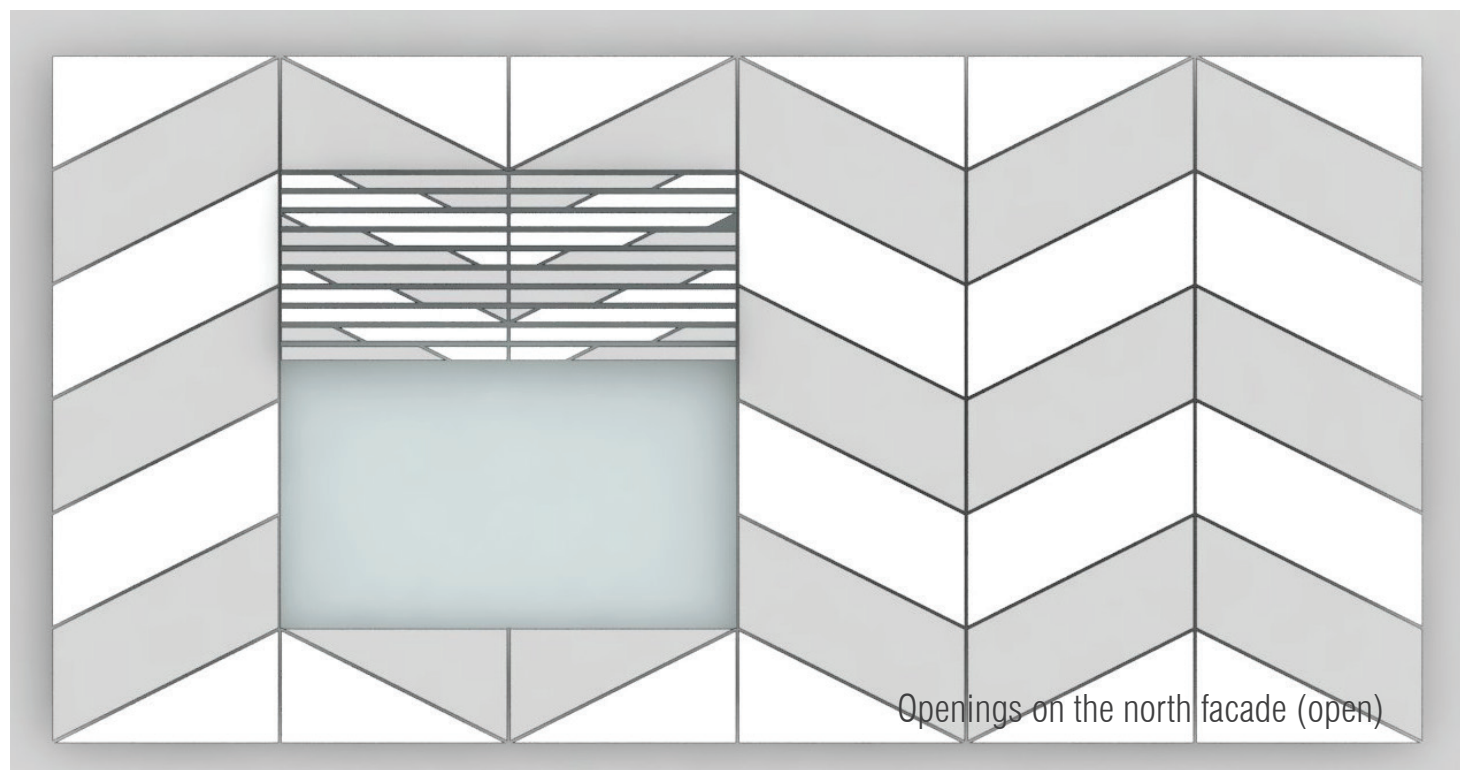
In between the two wings of the building where the boat making occurs, the structure is of steel columns and trusses that span 50 feet and cantilever 20 feet on each side. A gantry system is also supported by the columns and trusses at this area.



- | | |
|---------------------------|-------------------------------|
| 1 Ceramic Cladding | 9 HVAC / Water Pipes |
| 2 Sheathing / Air Barrier | 10 Ceiling Panels |
| 3 Rigid Insulation (9") | 11 Radiant Heating Tubes |
| 4 I-Joists (9") | 12 Corrugated Metal Deck (6") |
| 5 Glulam. Lateral Braces | 13 Concrete Decking (4") |
| 6 Window Mullion | 14 I-Beam (I 30 - 133) |
| 7 Double Pane Window | 15 I-Beam (I 18 - 64) |
| 8 Sun Shade / Sun Shelf | 16 Glulamined Ribs (60") |



Openings on the north facade (closed)



Openings on the north facade (open)

Ceramic Cladding

The ceramic cladding takes advantage of the existing ceramics manufacturing factories in Oregon. It is extremely easy to make in any form and color. The zig-zag pattern creates a wave pattern with straight lines and on the north facade the window openings also mimic the pattern.



