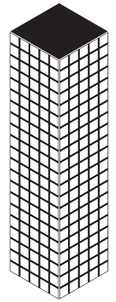
PIXEL FACADE

APPROACH DIAGRAM



500 Kent Avenue

OWNER

Economic
Flexible
Construction Cost
Aesthetic
Added Value
Energy Efficient

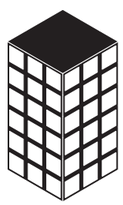
TENANT

Customizable
Enhances office environment
Expandable
Adaptable

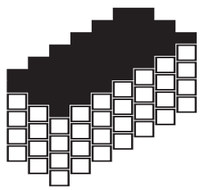
USER

Enhances work Environment
Health and Wellbeing
Connection to surrounding environment

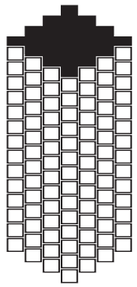
Adaptive - Flexible - Scalable - Building System



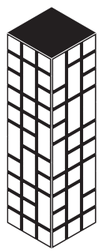
LINEAR



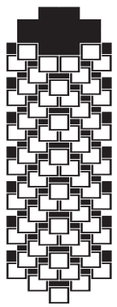
SAW-TOOTH (LOW)



SAW-TOOTH (HI)

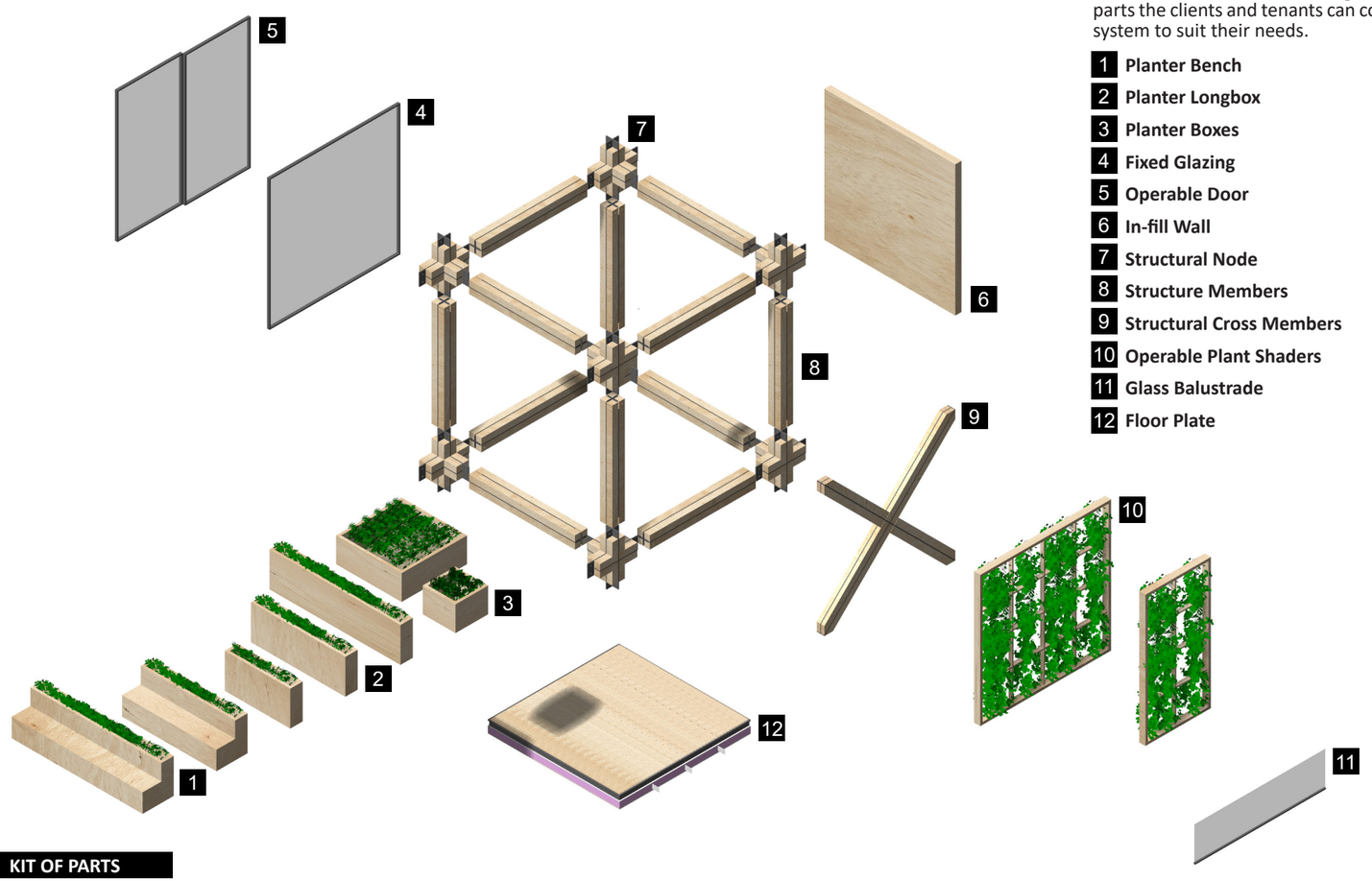


TETRIS



SAW-TOOTH SHIFT

FACADE SYSTEM

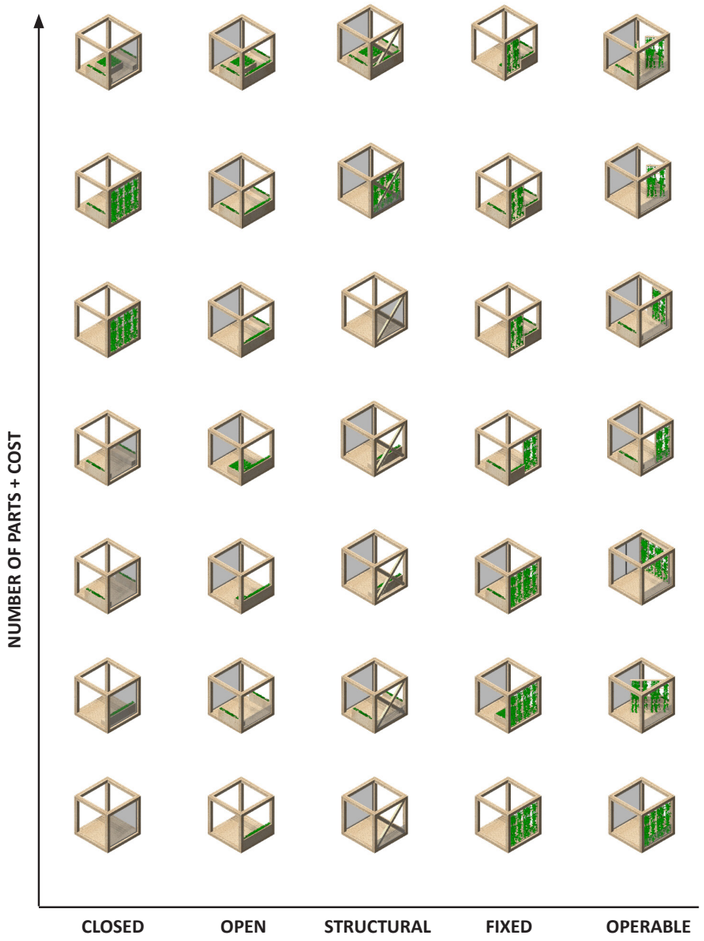


KIT OF PARTS

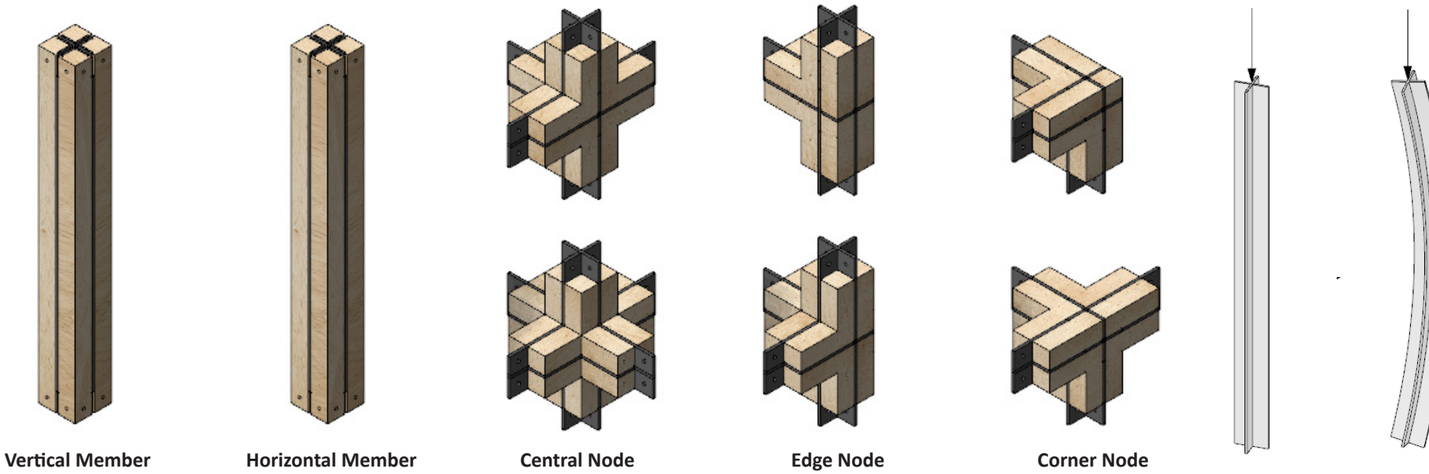
The facade system is made from a modular kit of parts for both the structure and functional elements. Using the kit of parts the clients and tenants can configure system to suit their needs.

1. Planter Bench
2. Planter Longbox
3. Planter Boxes
4. Fixed Glazing
5. Operable Door
6. In-fill Wall
7. Structural Node
8. Structure Members
9. Structural Cross Members
10. Operable Plant Shaders
11. Glass Balustrade
12. Floor Plate

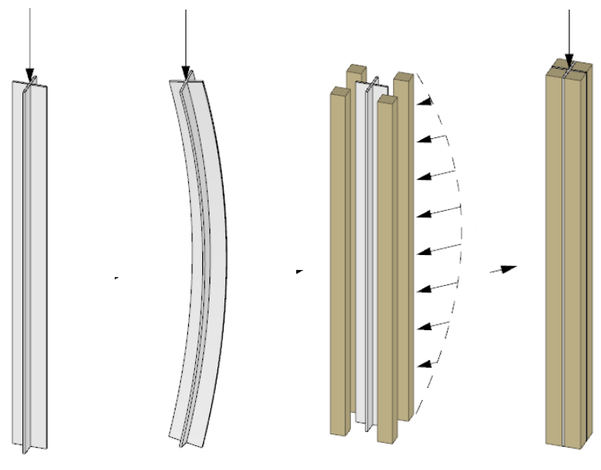
CONFIGURATION MATRIX



KIT OF PARTS



STRUCTURAL MODULES



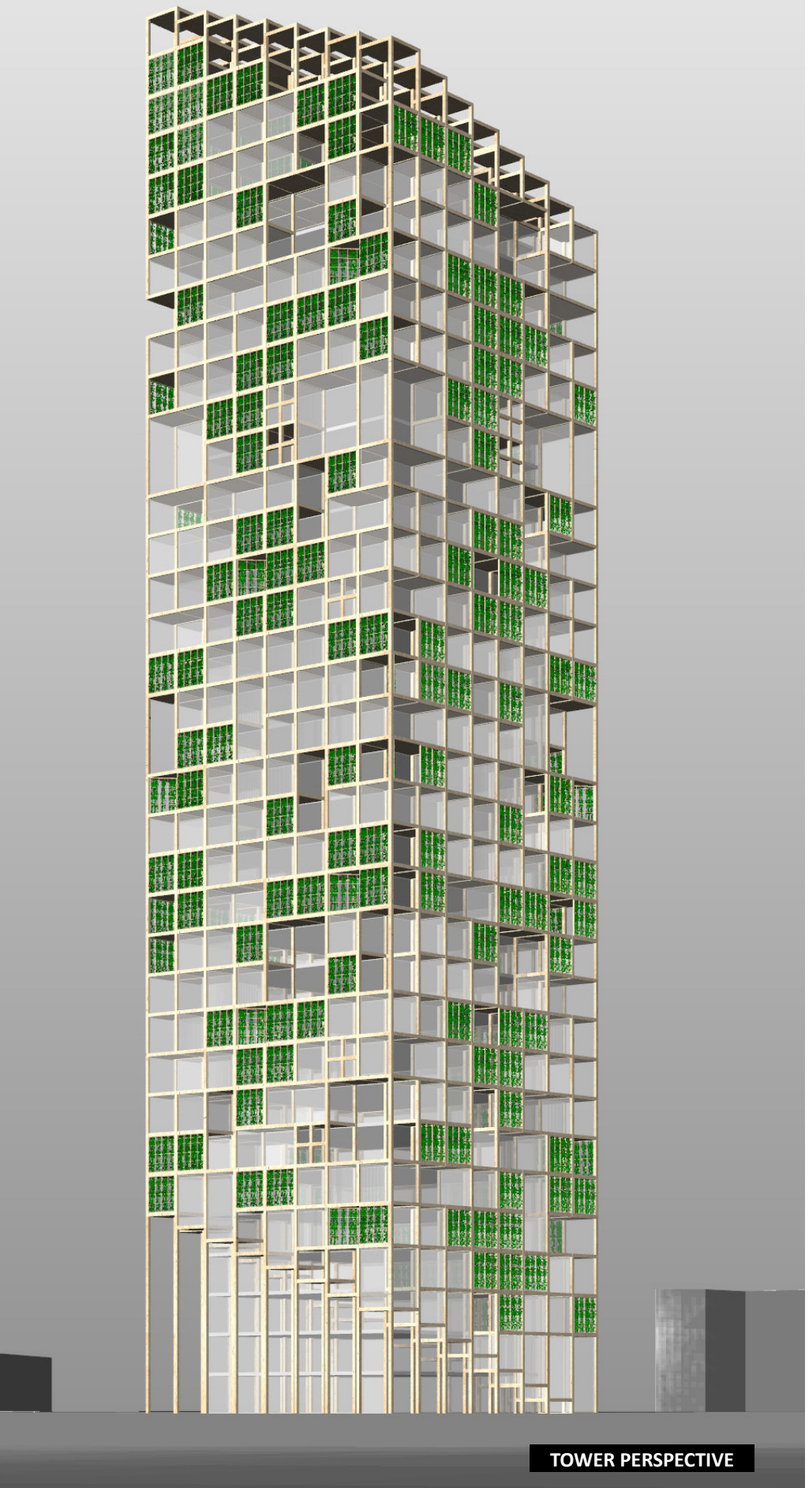
STRUCTURAL PROFILE

Structural steel provides many advantages over other building materials, including its strength-to-weight ratio, ductility, and continued strength over time. Together, this allows for slender elements that take up less floor space, have narrower sight lines, and allow for flexible deformations during seismic events. However a fire can quickly heat the slender elements, which reduce its stiffness and stability – leading to buckling.

By contrast, wood requires more volume to provide the same capacity as steel. It also has a reduced capacity for long-term loads. However, in a fire event, large timbers char on the outside, but the material stiffness is not affected.

By reinforcing the steel section with wood, the materials are used for what they do best: steel components do the long term work, and provide ductile behavior for seismic events. Wooden components only engage for short term loads, stabilize the slender steel cross section, and provide a protective char boundary to protect the steel in event of a fire. “

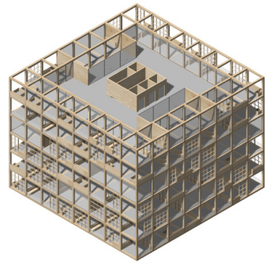
BUILDING TYPOLOGY



TOWER PERSPECTIVE

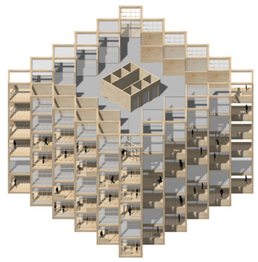
CONFIGURATION OPTIONS

The facade system and generation scripts allows exploration of a series of potential configurations for the facade structure. Models can be quickly generated and analyzed for efficiency, costs and energy.

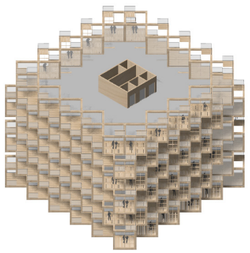


LINEAR

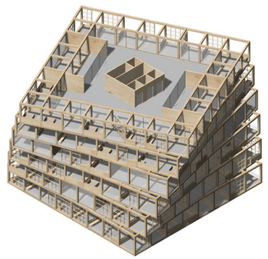
CHOSEN CONFIGURATION



SAW-TOOTH



SAW-TOOTH SHIFT



TWIST

ADAPTABILITY

The modular system allows the occupants to configure the layout of there space to suits their needs and employees. The balance between work and biophiliac space can be determined and re-configured throughout the occupancy of the tenant.

INNER GLAZING

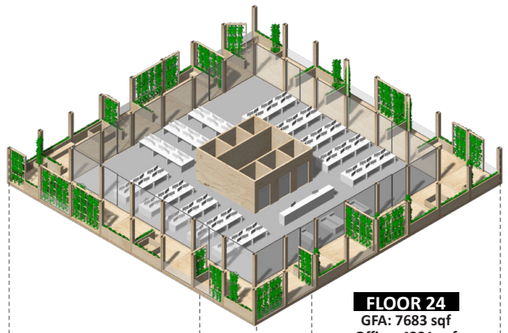
OUTER GLAZING

SHADER

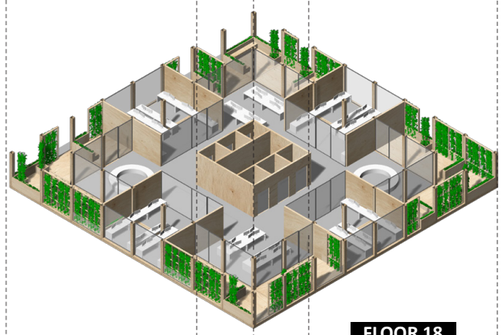
SHADER + FURNITURE

EXTERIOR FURNITURE

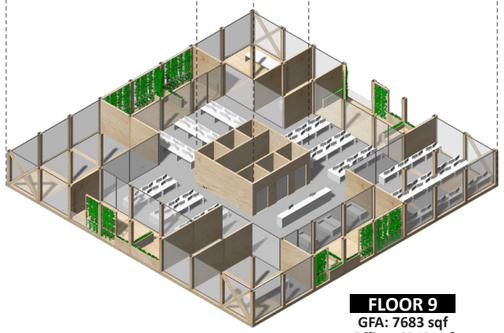
INTERIOR FURNITURE



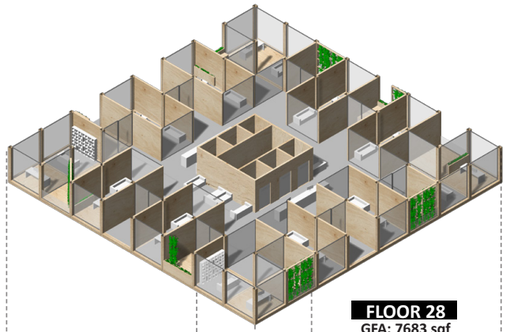
FLOOR 24
GFA: 7683 sqf
Office: 4321 sqf
External: 3362 sqf



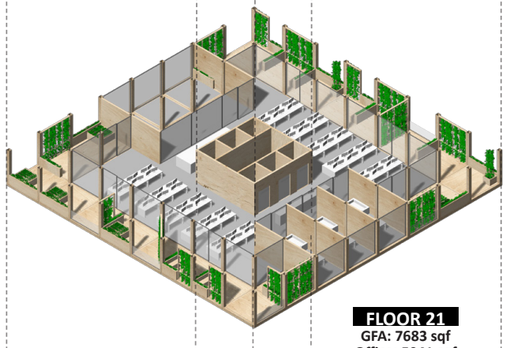
FLOOR 18
GFA: 7683 sqf
Office: 5281 sqf
External: 2402 sqf



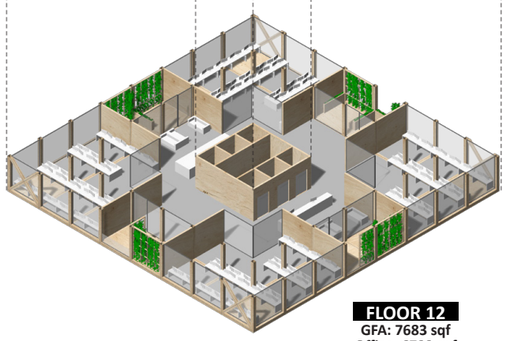
FLOOR 9
GFA: 7683 sqf
Office: 6243 sqf
External: 1440 sqf



FLOOR 28
GFA: 7683 sqf
Office: 6243 sqf
External: 1440 sqf



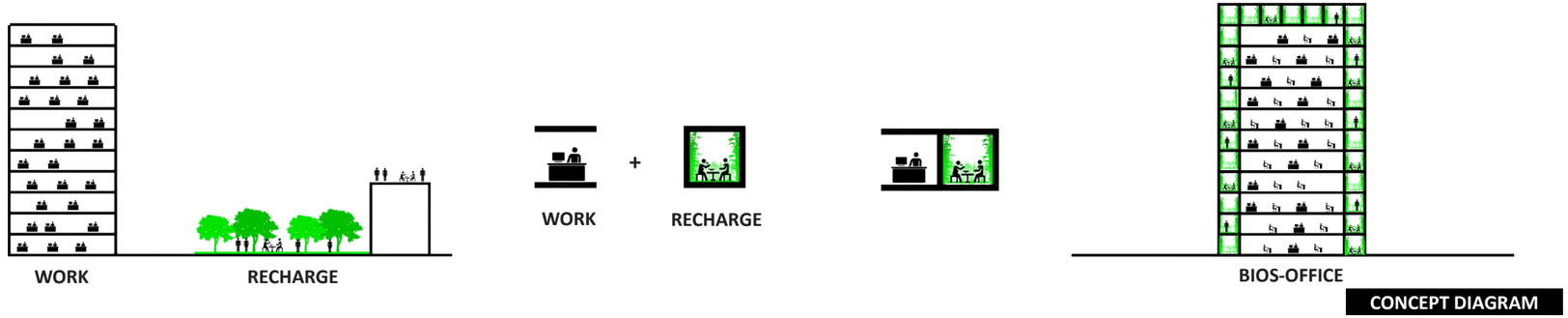
FLOOR 21
GFA: 7683 sqf
Office: 5041 sqf
External: 2642 sqf



FLOOR 12
GFA: 7683 sqf
Office: 6723 sqf
External:960 sqf

BIOPHILIA DESIGN

The driving concept for the design of our facade system is based on our instinctive desire for nature, also known as **biophilia**. The name is derived from the Greek words 'bios' (**organic life**) and 'philia' (**love**). Typically office buildings represent a clear and defined work environment with surrounding amenities, parks and public spaces serving as break-away spaces from the work environment. Our proposal aims to merge these two disparate elements to give occupants a sense of being immersed in nature inside the work environment, whilst also being able to breakout for brief periods throughout the day and immerse themselves in a biophiliac rich environment.

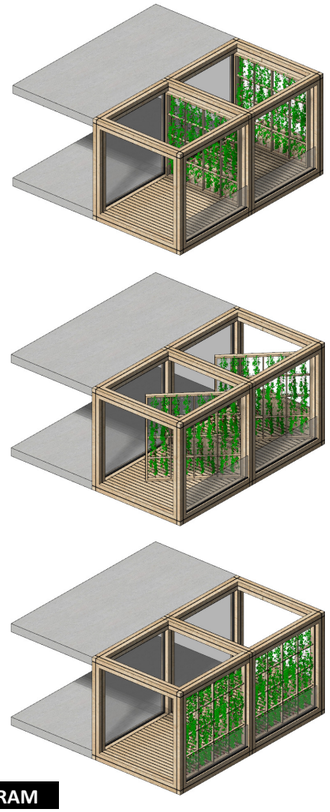


CONCEPT DIAGRAM

BIOPHILIA DESIGN

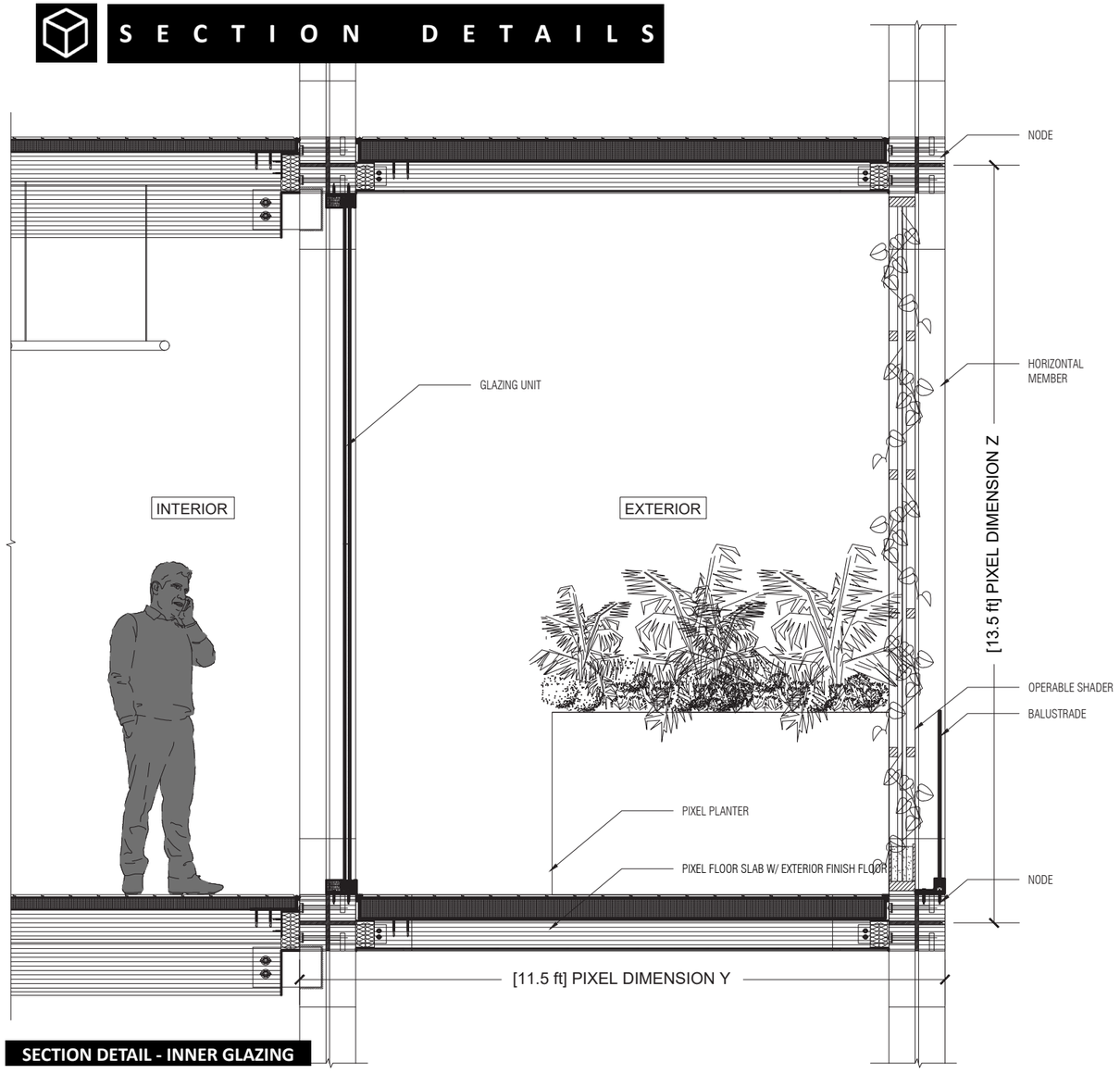
Our desire to be connected with nature causes us to seek its presence: taking a walk in the park, bringing plants indoors, preferring a window seat. When people are asked to list their favorite places, natural environments are overrepresented, within our cities people are willing to pay higher prices for real estate closer to lakes, beaches and parks, for high-rise views over cities and forests, or a mountain vista.

The system doesn't only create biophilic rich environment but also utilizes functional elements for shading, heat gain, energy consumption, fire safety and acoustic performance using natural materials and solutions. The system is built around two key elements, glazing and shading modules. The glazing module is designed as a pop in/pop out IGU system, the window units and structural system allows for full height glazing units that can be moved in or out from the perimeter structure, allowing the occupant unobstructed views of the surrounding cityscape. The shading modules incorporate the use of foliage as a natural solution to light management and enables occupiers to remotely or manually open/close shaders to access views of the cityscape or enclose themselves in an outdoor space.

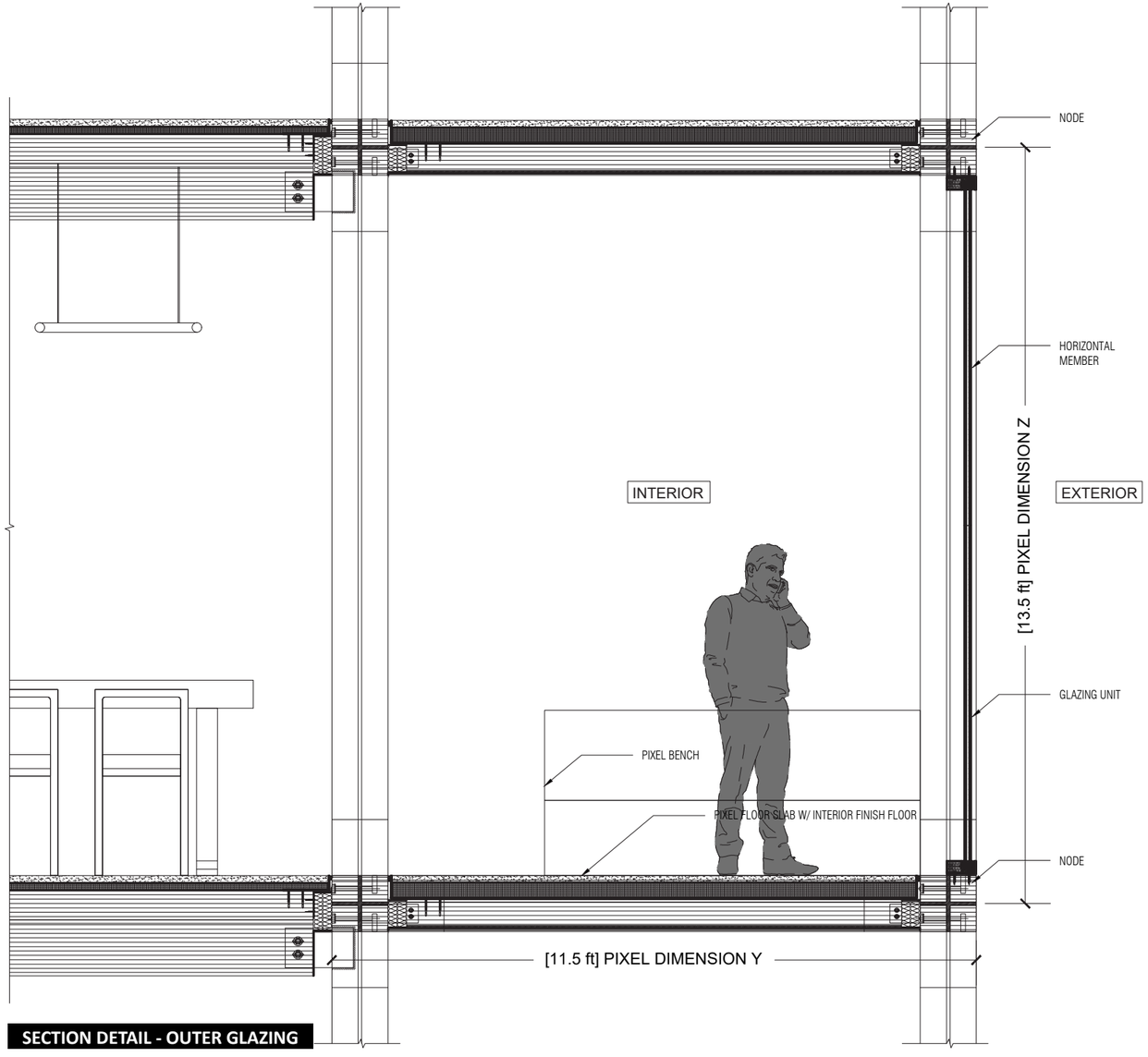


OPERABLE DIAGRAM

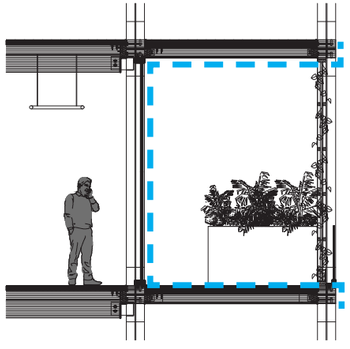
SECTION DETAILS



SECTION DETAIL - INNER GLAZING

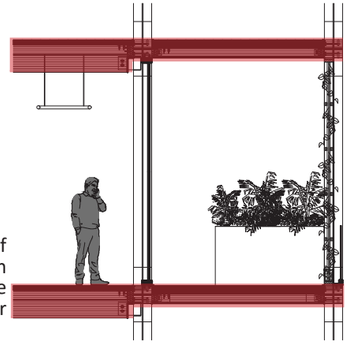


SECTION DETAIL - OUTER GLAZING



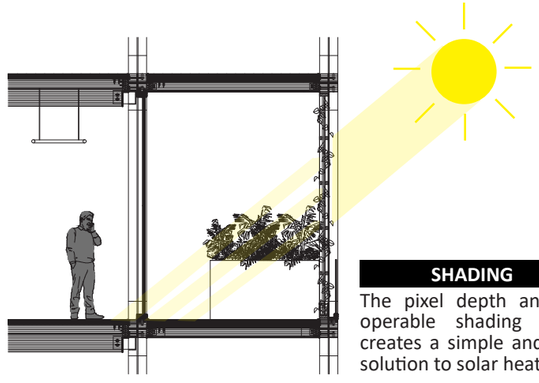
WATERPROOFING

The waterproofing line of the facade system has been designed to accommodate the glazing in both the inner and outer position.



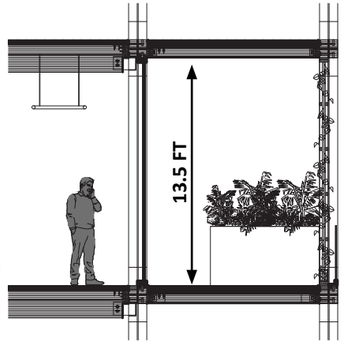
FIRE

The CLT composite frame provides significant fire resistant properties. The pixel floor plate is configured to withstand a fire regardless if it's in the exterior or interior position.



SHADING

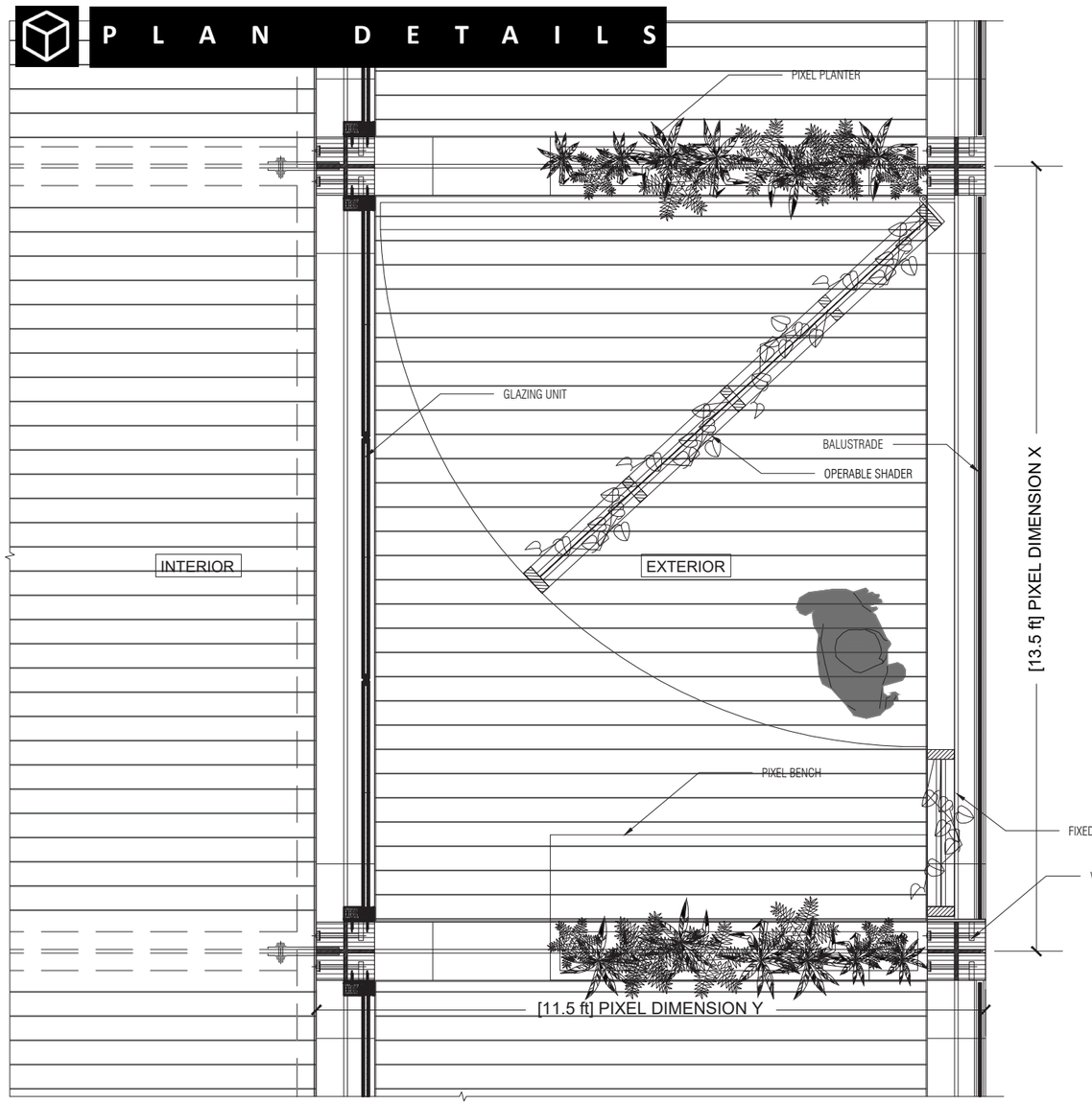
The pixel depth and green operable shading element creates a simple and natural solution to solar heat gain.

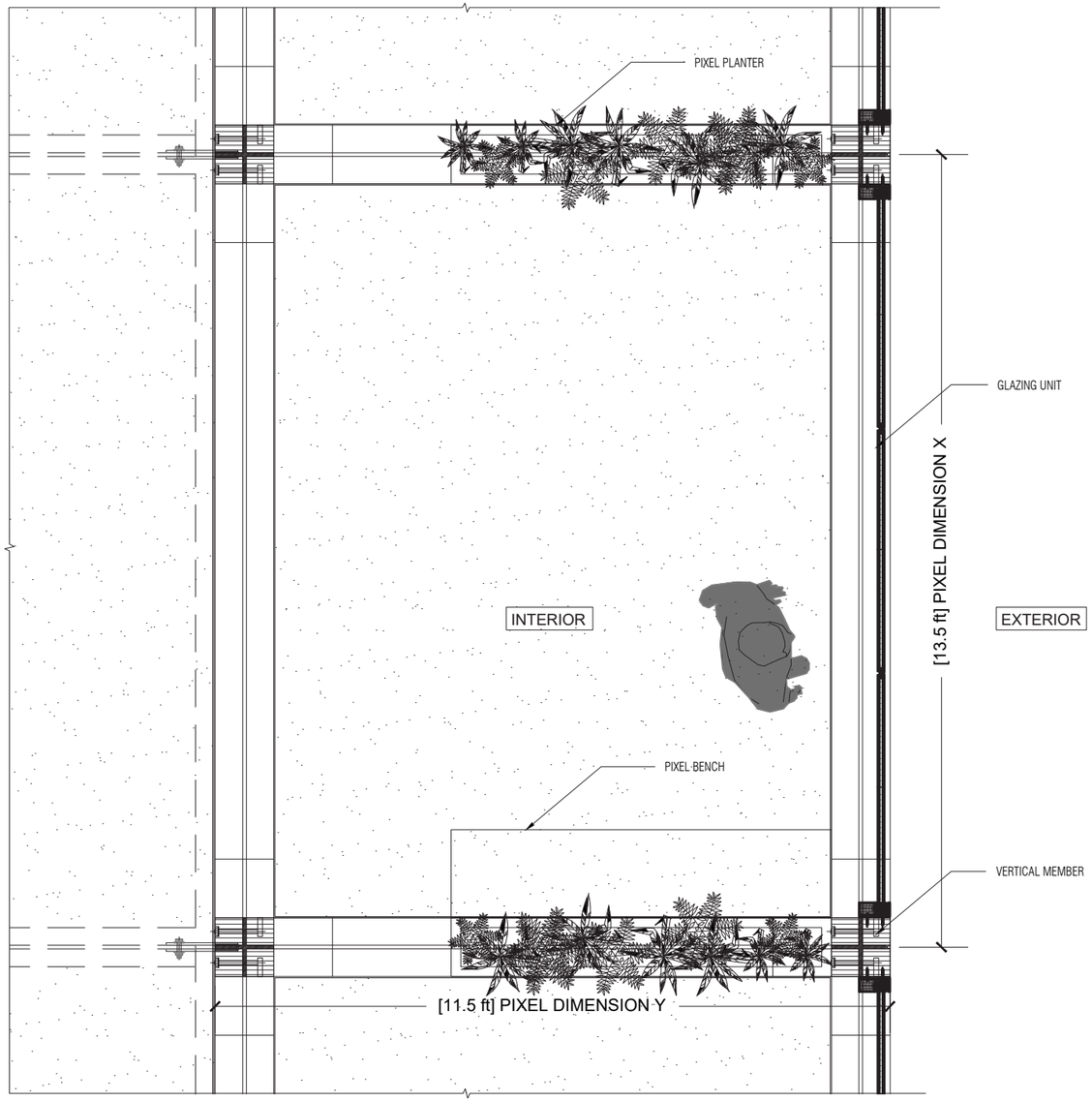


VIEWS

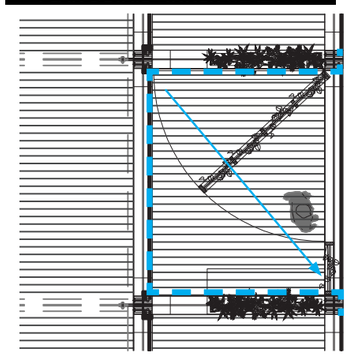
With a FTF high of 13.5 ft the facade system allows for natural daylight to flood the office and also creates floor to floor glazing to maximize views of the surrounding cityscape.

PLAN DETAILS



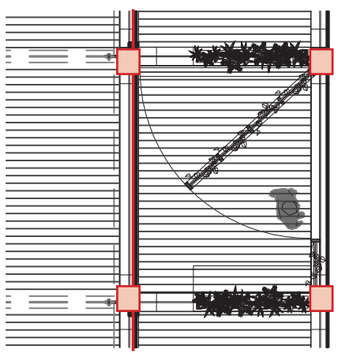


PLAN DETAIL - INNER GLAZING



WATERPROOFING

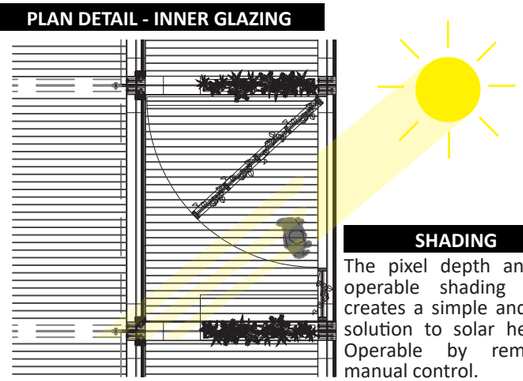
The waterproofing line of the facade system has been designed to accommodate the glazing in both the inner and outer position with a corner drain for excess water.



FIRE

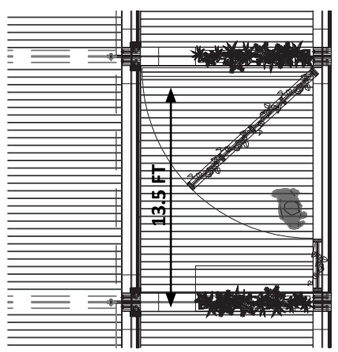
The CLT composite frame provides significant fire resistant properties. The outer portion of the structure slowly chars protecting the structural integrity of the steel in the case of a fire.

PLAN DETAIL - INNER GLAZING



SHADING

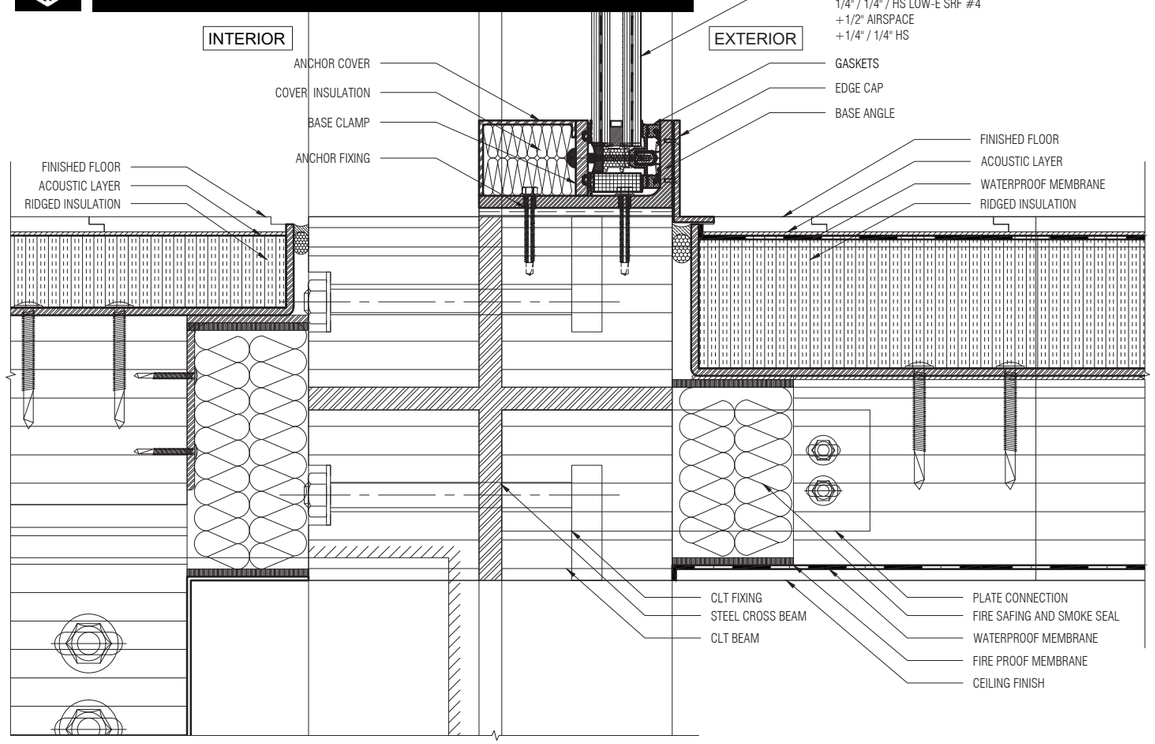
The pixel depth and green operable shading element creates a simple and natural solution to solar heat gain. Operable by remote or manual control.



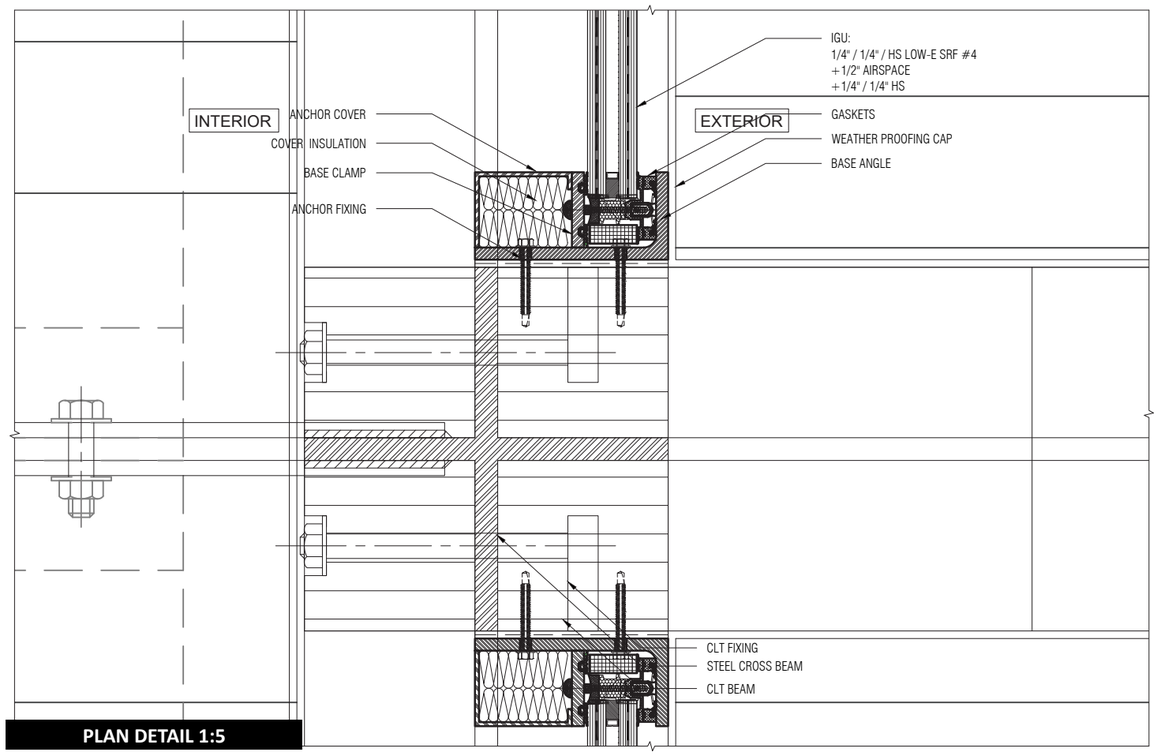
VIEWS

With a FTF high of 13.5 ft the facade system allows for natural daylight to flood the office and also creates floor to floor glazing to maximize views of the surrounding cityscape.

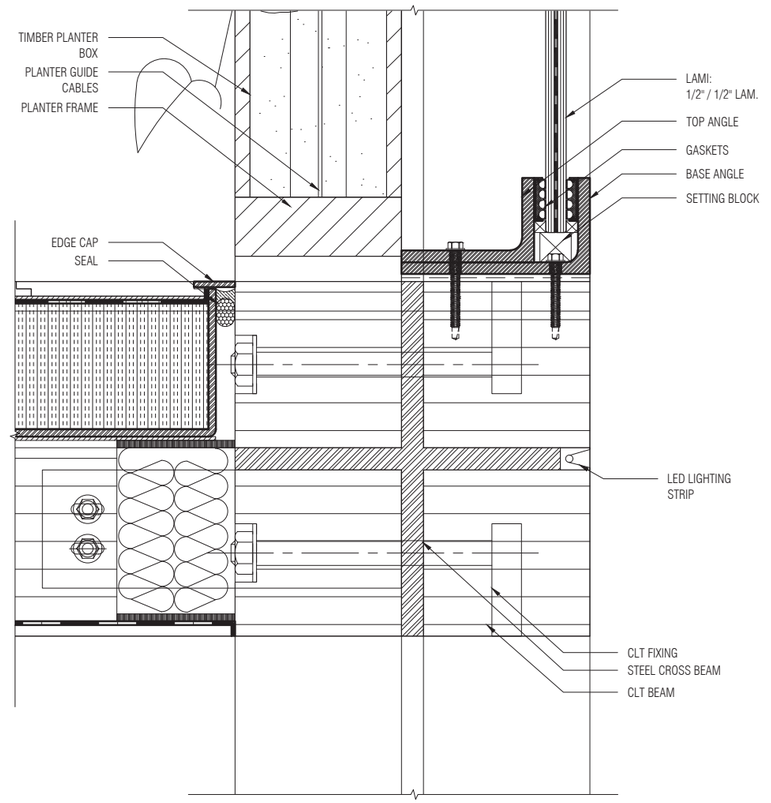
SYSTEM DETAILS



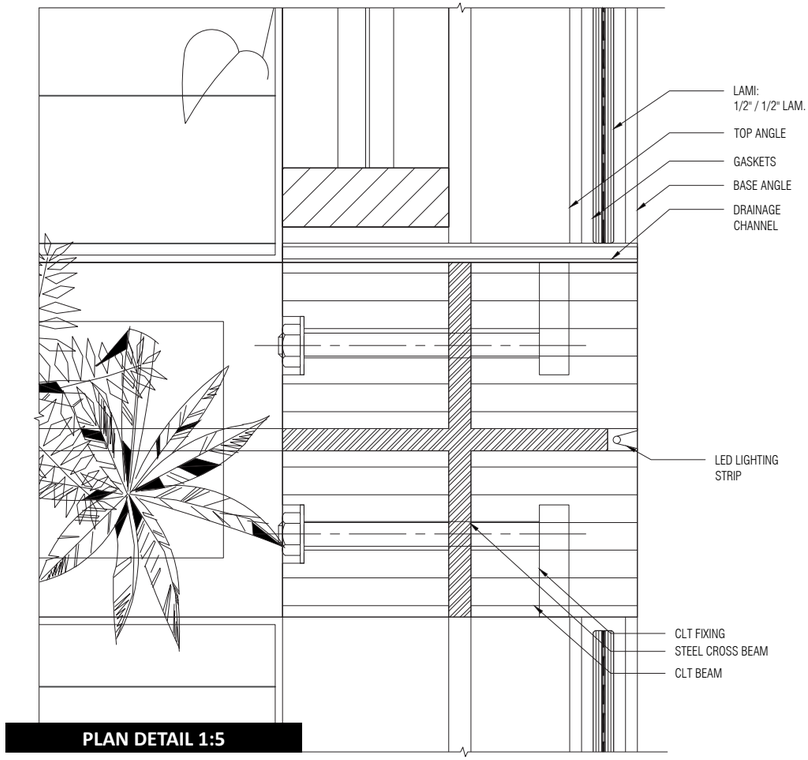
SECTION DETAIL 1:5



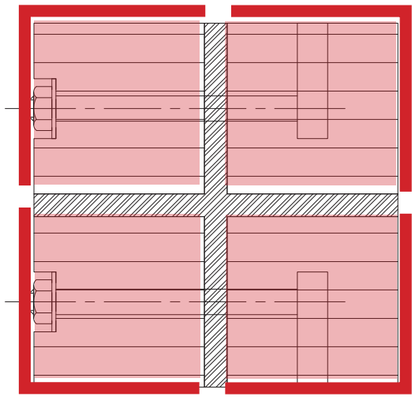
PLAN DETAIL 1:5



SECTION DETAIL 1:5

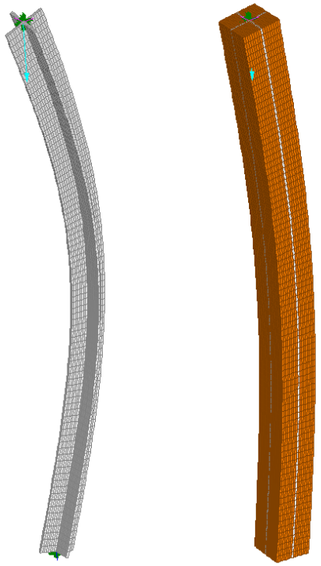


PLAN DETAIL 1:5



STRUCTURAL PROFILE

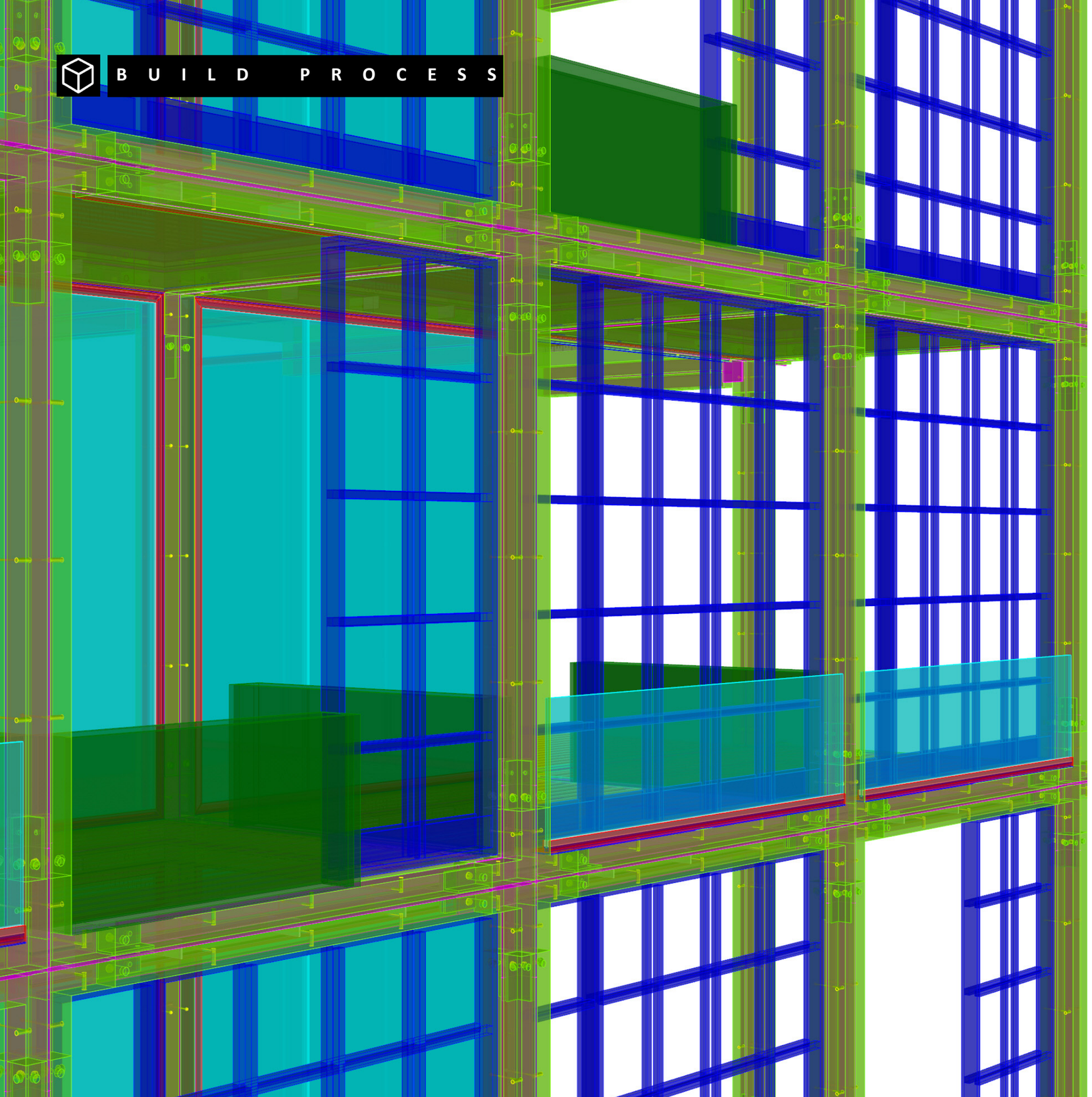
One of the major advantages of Cross Laminated Timber is its inherent fire resistance. CLT's fire resistance is provided through 'charring'. As the face of the timber panel is exposed to a fire that ramps up to a temperature in excess of 400 degrees C, the surface of the timber ignites and burns at a steady rate. As the timber burns it loses its strength and becomes a black layer of 'char'. The char becomes an insulating layer preventing an excessive rise in temperature within the unburnt core the member leaving the steel profile unaffected which continues to function for the period of the fire resistance.



FEA VERIFICATION

The analysis of the composite member verifies the bucking capacity is X2 when the steel is combined with the CLT secondary support.

Left Image (Steel only) Right Image (Composite)



DESIGN TO PRODUCTION

The system has been created using a series of algorithmic scripts and automated modeling process called Building Information Generation (BIG). The process takes the main input of the building mass and builds a model from a concept design level through to the production of fabrication information. A highly detailed a information rich model is developed using automated processes, once complete the model contains all the information required to build the facade and information can be extracted in any form required.

This process vastly expedites the design and construction process and enables a much more detailed level of information to base cost estimates, tenders and construction sequencing. The high level of detail enables clients to engage directly with fabricators and manufacturers in order to reduce cost and time spend dealing with further design consultants.