CLACKAMAS COUNTY BOARD OF COUNTY COMMISSIONERS
Policy Session Worksheet

Presentation Date: 2/4/2020 **Approx. Start Time:** 11:00 am **Approx. Length:** 30 min

Presentation Title: USDA Wood Innovations Grant – County Courthouse Mass Timber Design Studio Project

Departments: County Administration
Business and Community Services (BCS)

Presenters: Rick Gruen, BCS Parks Manager
Judith Sheine, University of Oregon School of Architecture
Gary Barth, County Courthouse Project Manager

Other Invitees: Laura Zentner, BCS Director
Sarah Eckman, BCS Deputy Director

WHAT ACTION ARE YOU REQUESTING FROM THE BOARD?
No action is being requested from the Board. This Policy Session is an informational update on the WIG Phase 1 – County Courthouse Mass Timber Design Project - Fall Design Studio with the University of Oregon School of Architecture.

EXECUTIVE SUMMARY:
The WIG Phase 1 – County Courthouse Mass Timber Design Project – Fall Design Studio project supports Clackamas County's Cross Laminated Timber (CLT) initiative and further advances the Board's desire to consider mass timber construction as part of the proposed new County Courthouse.

Funding for the project was secured by BCS on behalf of the County from a USDA – Wood Innovations Grant. The grant covers the cost for the University of Oregon School of Architecture to conduct an architecture design studio that focused on student teams developing courthouse designs utilizing mass timber for the main structural system. The design studio was held during the 2019 fall term and engaged 24 upper level and graduate students grouped in six teams. Architects and engineers with expertise in courthouse design and function, energy and daylight performance, building codes and mass timber engineering worked with the students.

Judith Sheine, University of Oregon School of Architecture Professor and project lead, will be presenting the six (6) unique courthouse designs developed by the student teams.

One of the designs will be selected to undergo a Life Cycle Analysis that will analyze and compare the economic and environmental co-benefits of a mass timber constructed courthouse with a more conventional steel and concrete courthouse. This will constitute Phase 2 of the WIG project.

FINANCIAL IMPLICATIONS (current year and ongoing):

The project is grant funded and supported by staff from both BCS and County Administration. There are no ongoing implications.

Is this item in your current budget? ☒ YES ☐ NO

What is the cost? $100,000 What is the funding source? USDA Wood Innovations Grant

STRATEGIC PLAN ALIGNMENT:

- **How does this item align with your Department's Strategic Business Plan goals?**

  The Mass Timber Design Project supports Business & Community Services Assets line of business goal related to carbon sequestration.

- **How does this item align with the County's Performance Clackamas goals?**

  The Mass Timber Design Project supports the Board's key initiative of growing the mass timber industry in Clackamas County which creates family wage jobs.

LEGAL/POLICY REQUIREMENTS: N/A

PUBLIC/GOVERNMENTAL PARTICIPATION:
CLT Courthouse Subcommittee; Public Outreach

OPTIONS:
N/A – Informational update on the Wood Innovations Grant.

RECOMMENDATION:
N/A – Informational update only.

ATTACHMENTS:
Power Point Presentation

SUBMITTED BY:
Division Director/Head Approval
Department Director/Head Approval
County Administrator Approval

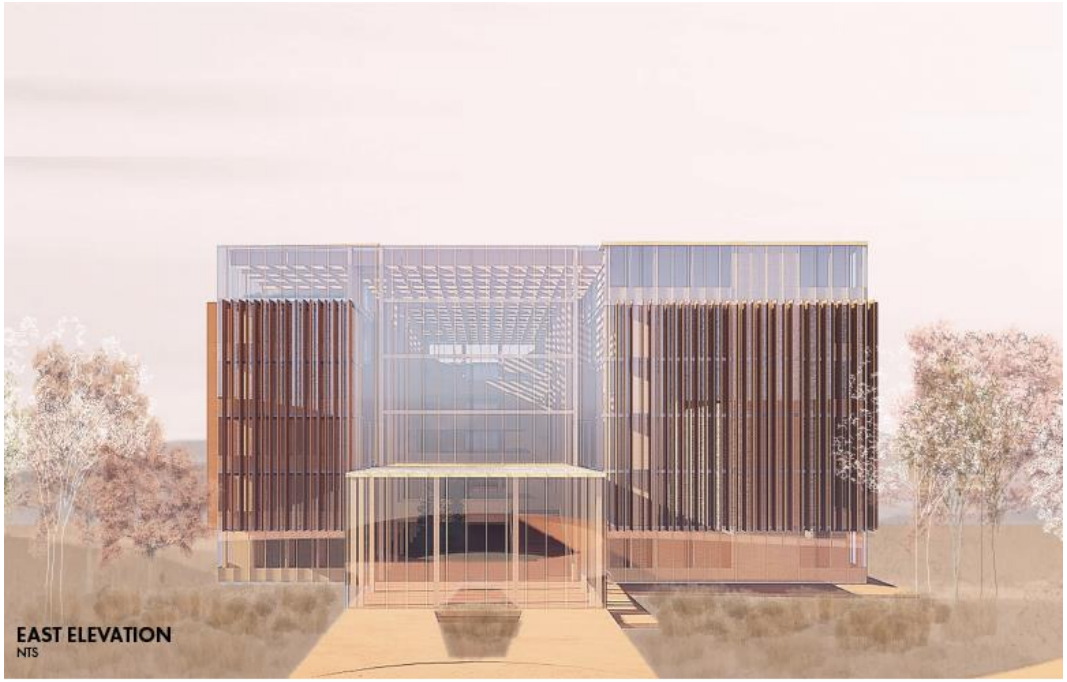
For information on this issue or copies of attachments, please contact Rick Gruen@ x4345

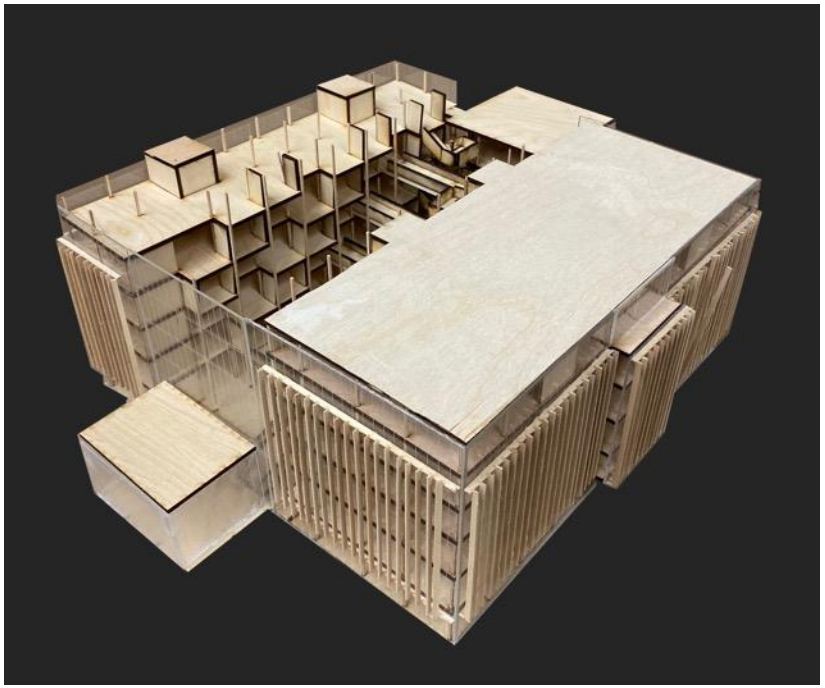
CLACKAMAS COUNTY MASS TIMBER COURTHOUSE

Judith Sheine, Kevin Van Den Wymelenberg
Department of Architecture
University of Oregon

Mikhail Gershfeld
Department of Civil Engineering
California State Polytechnic University, Pomona

Justin Stenkamp
PAE Consulting Engineers, Inc.





Clackamas County Courthouse
Mass Teambers

Gemma Fucigna, Jessi Gahl, Aaryn Gray, Lorine Moellentine

Clackamas County Courthouse
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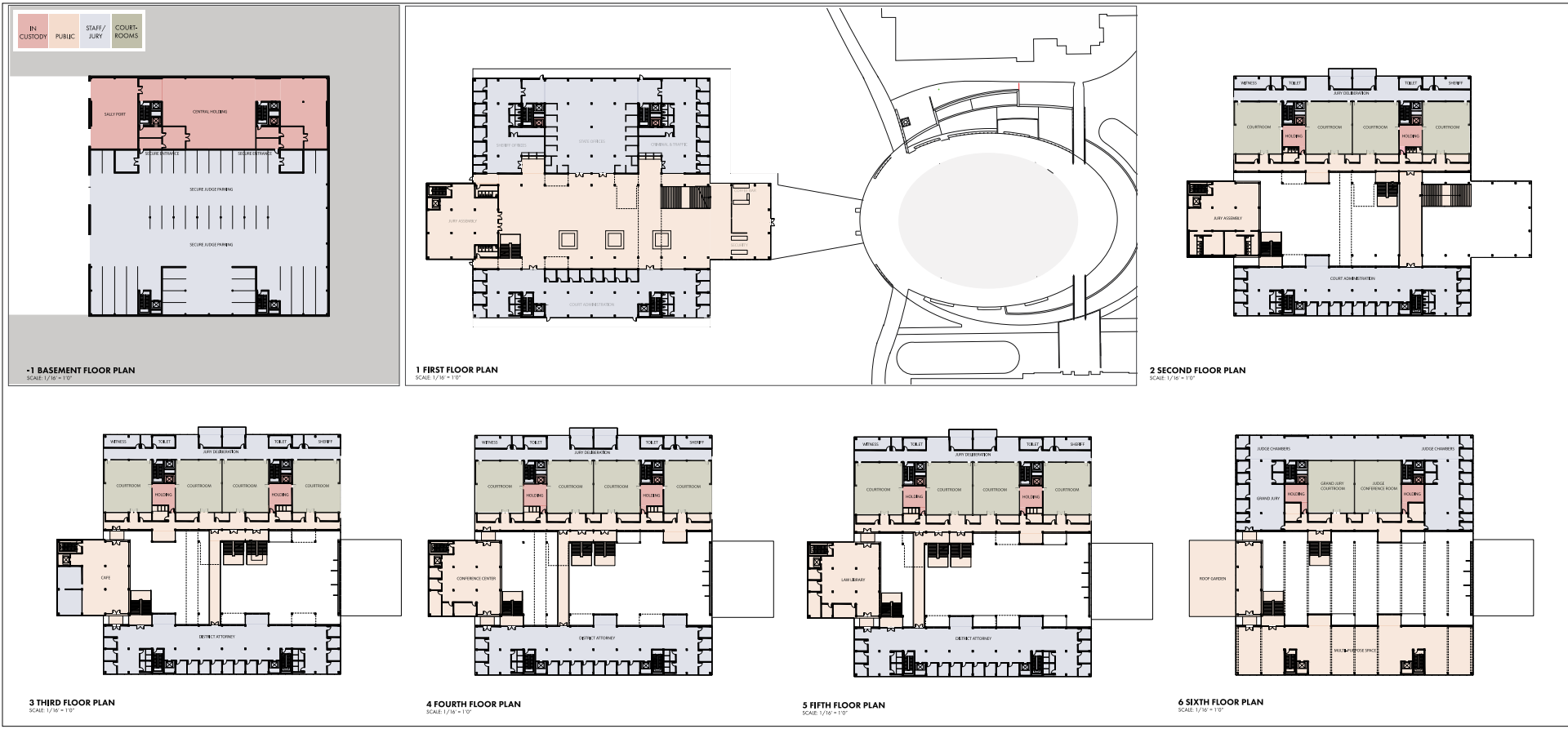

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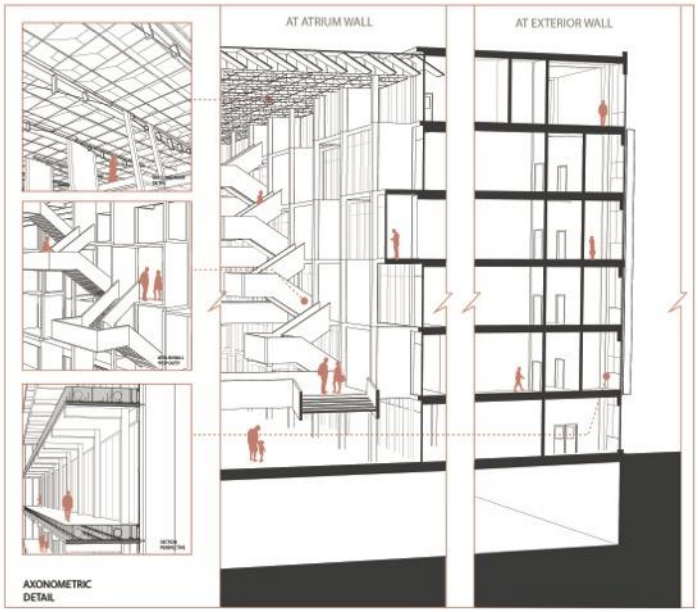
SITE PLAN



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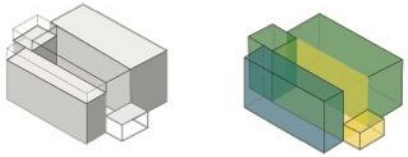

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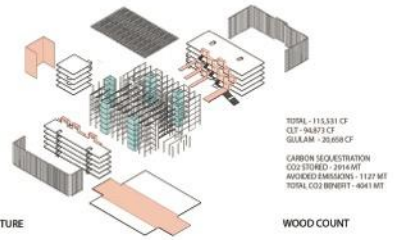
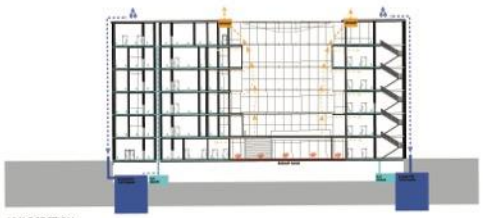
PUBLIC - PRIVATE



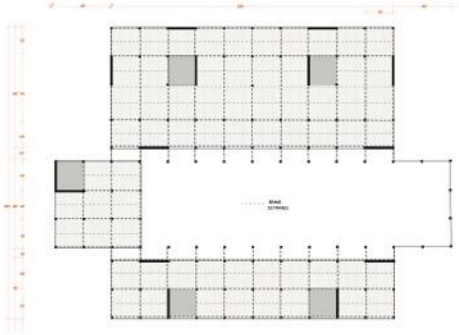
3D STRUCTURE

WOOD COUNT

FURNISHED COURTROOM



HVAC SECTION



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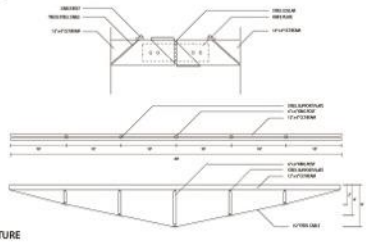

TRUSS STRUCTURE

Clackamas County Courthouse
Mass Teambers

Gemma Fucigna, Jessi Gahl, Aaryn Gray, Lorine Moellentine

Clackamas County Courthouse
Mass Teambers

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Clackamas County Courthouse
Lumber Liquidators

Austin Gutierrez, Aizeder Iriondo, Alex McCord, Molly Winter

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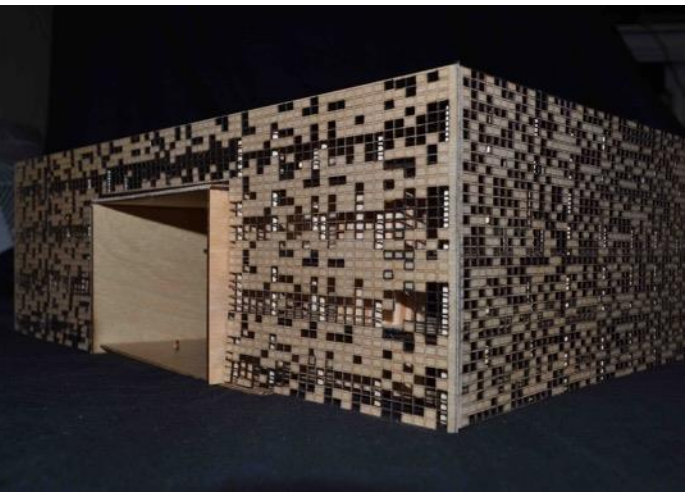

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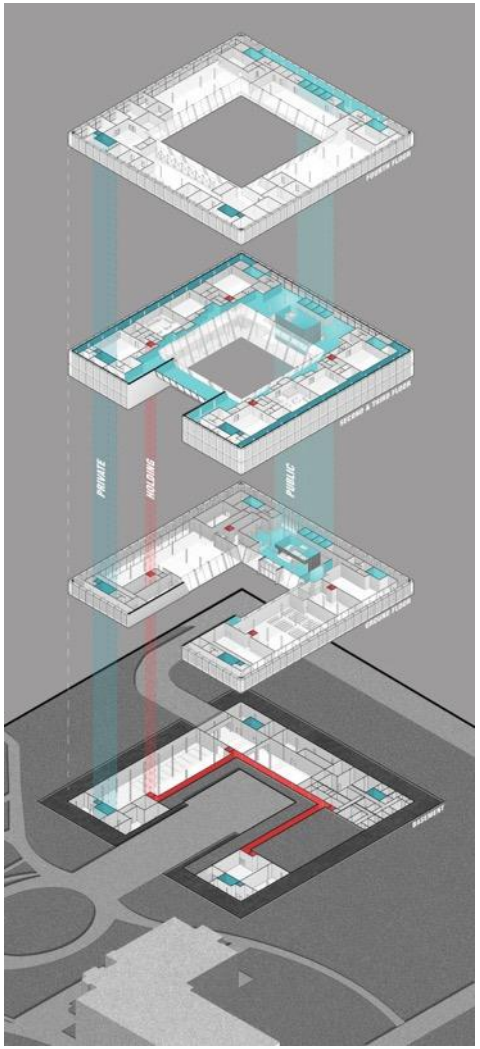

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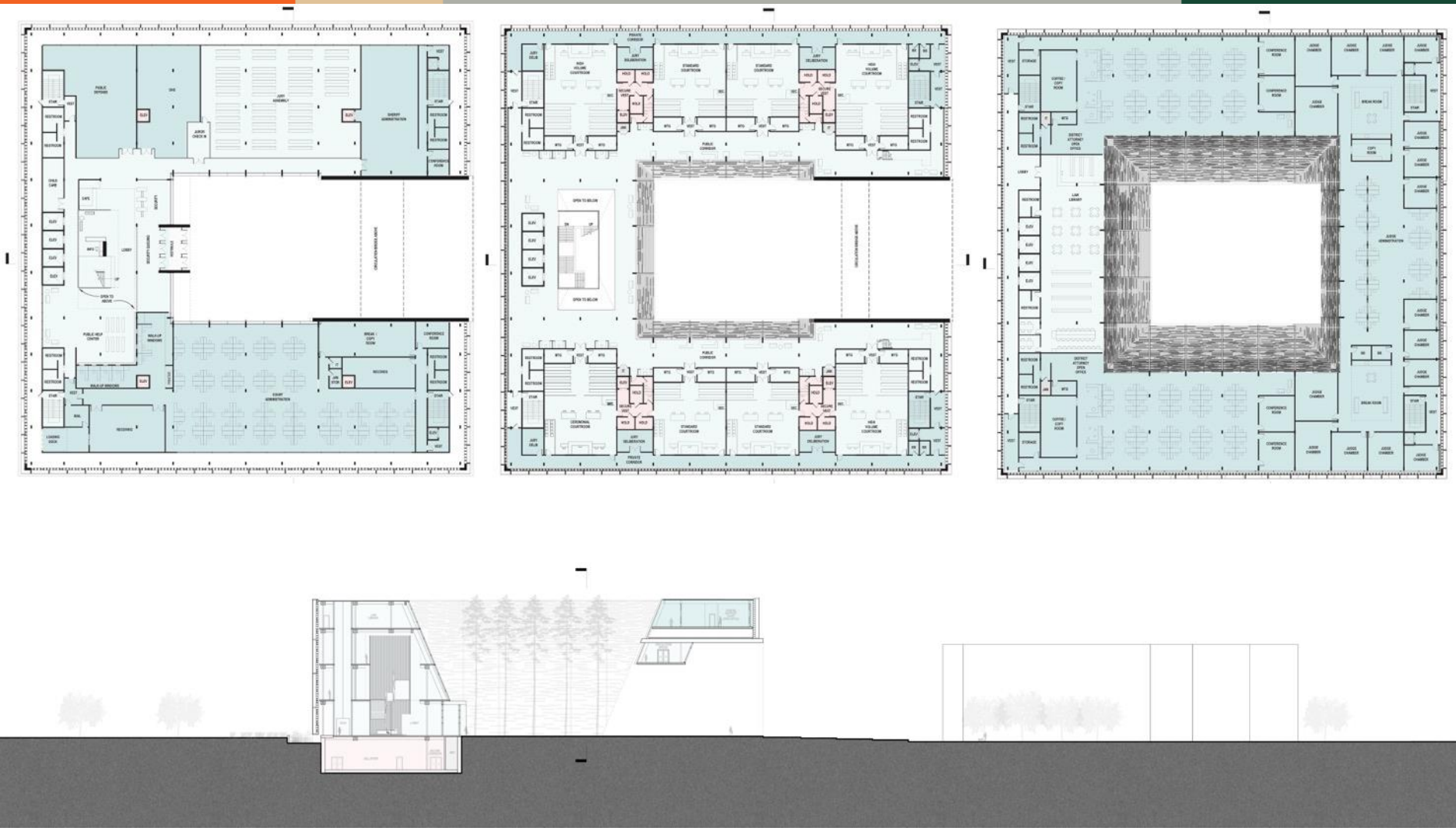

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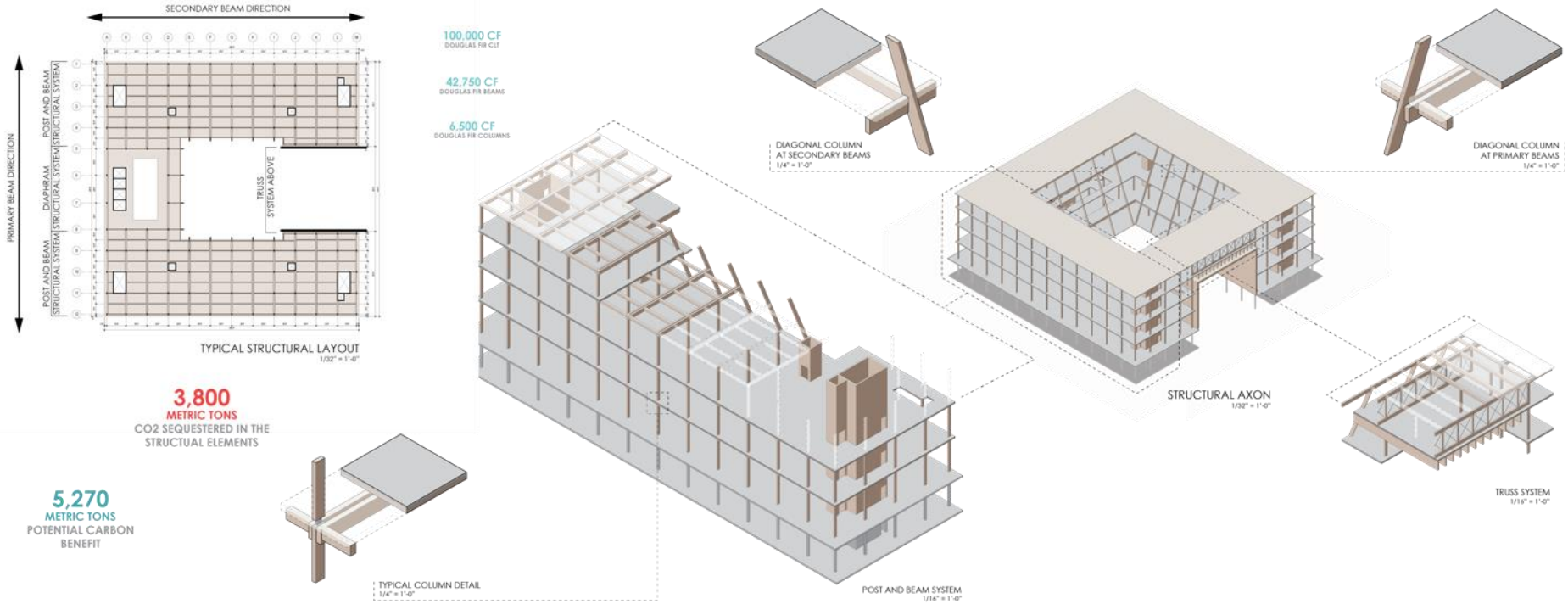

Clackamas County Courthouse
Lumber Liquidators

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Carbon Summary

WoodWorks™
WOOD PRODUCTS COUNCIL

Results

Volume of wood products used:
4,226 cubic meters (149,250 cubic feet)

U.S. and Canadian forests grow this much wood in:
12 minutes

Carbon stored in the wood:
3800 metric tons of carbon dioxide

Avoided greenhouse gas emissions:
1470 metric tons of carbon dioxide

Total potential carbon benefit:
5270 metric tons of carbon dioxide

Equivalent to:

1114 cars off the road for a year

Energy to operate 557 homes for a year

Project Name: Project Name (optional)
Date: December 5, 2019

Results from this tool are based on wood volumes only and are estimates of carbon stored within wood products and avoided emissions resulting from the substitution of wood products for non-wood products. The results do not indicate a carbon footprint or global warming potential and are not intended to replace a detailed life cycle assessment (LCA) study. Please refer to the References and Notes' for assumptions and other information related to the calculations.

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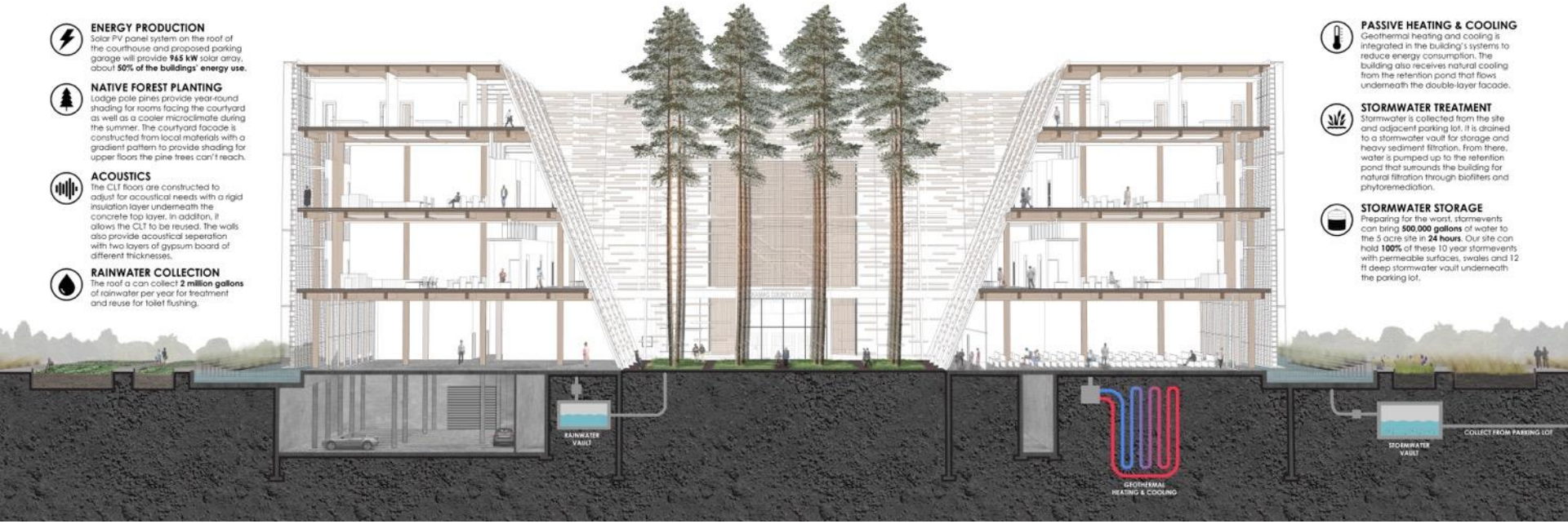

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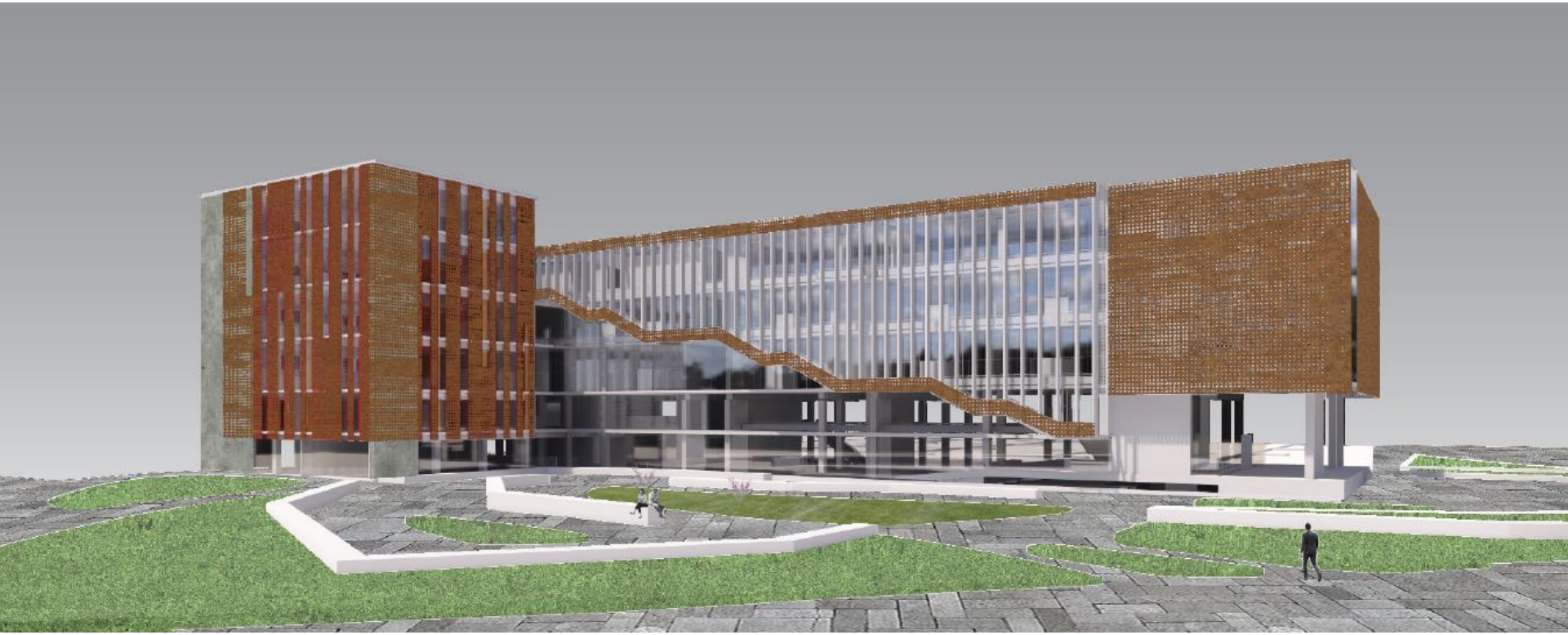
Clackamas County Courthouse

Chiles

Diego Cardiel, Brennen Donnelly, Isaac Hadnutt, Cameron Reid



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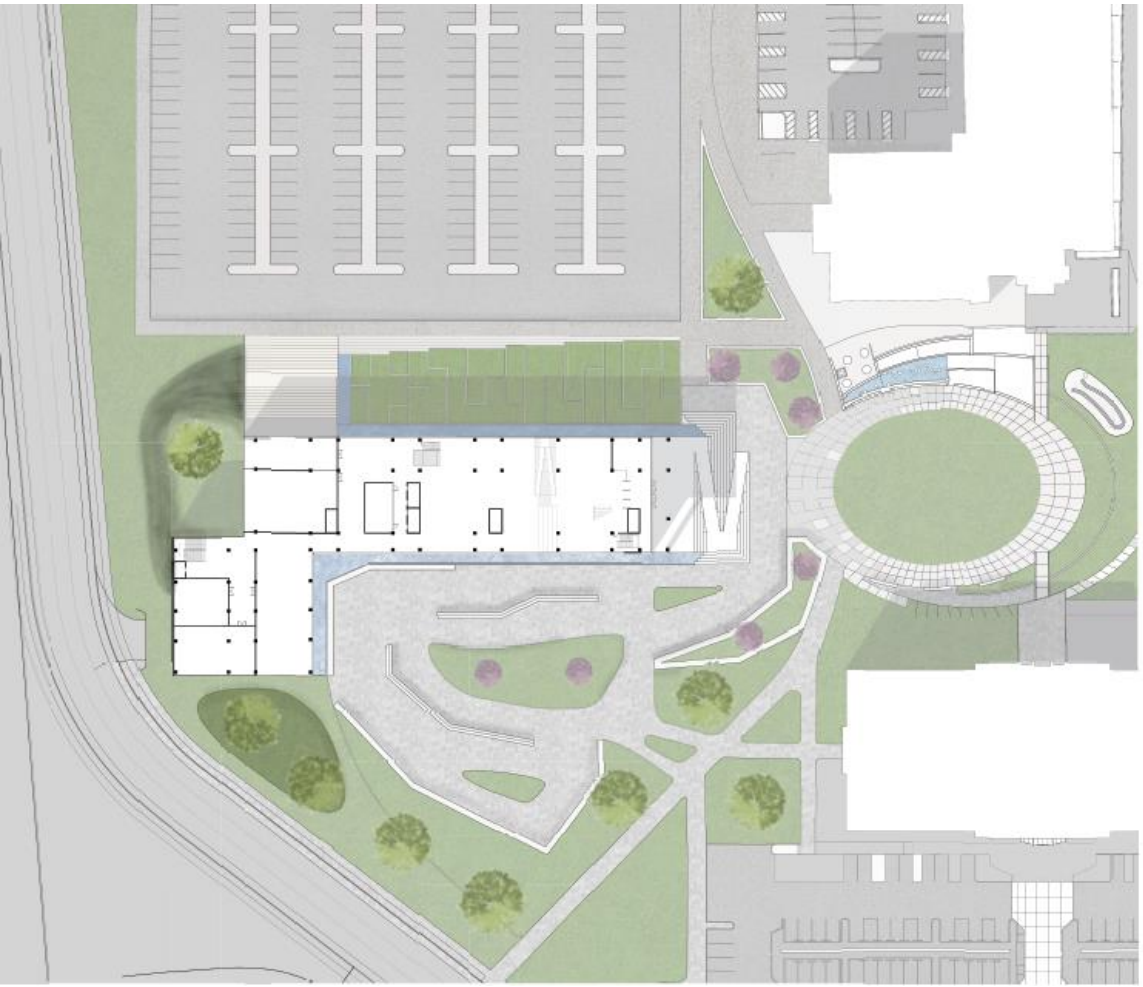

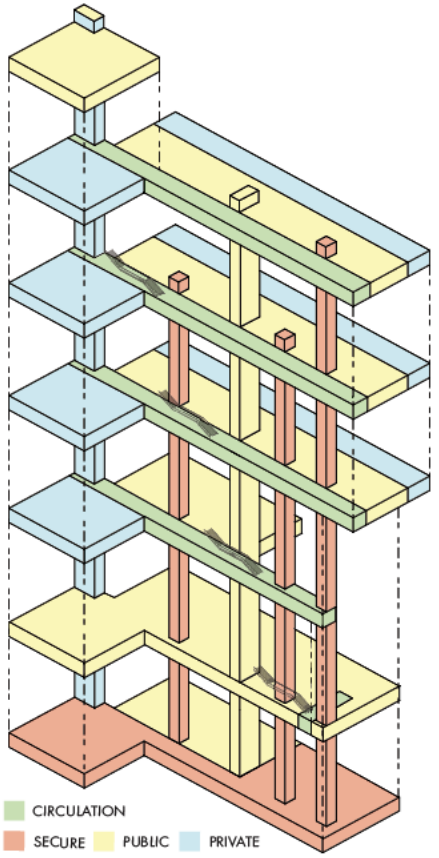

PROGRAM

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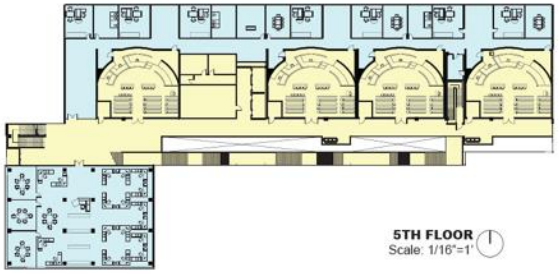

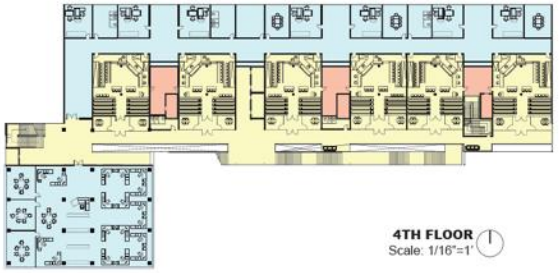

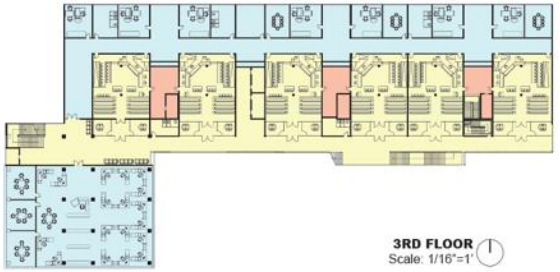

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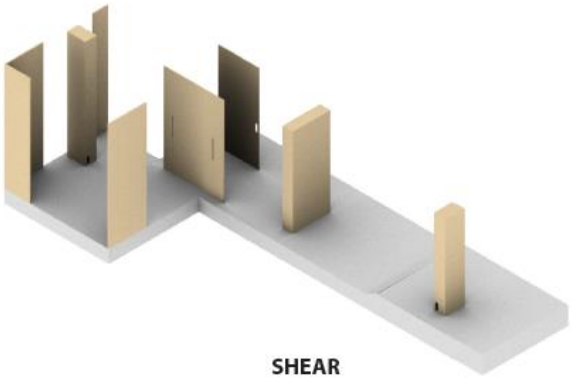

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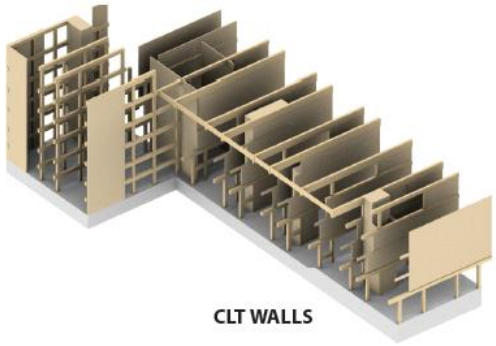
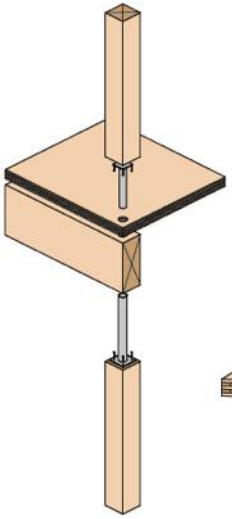
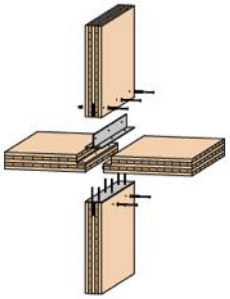


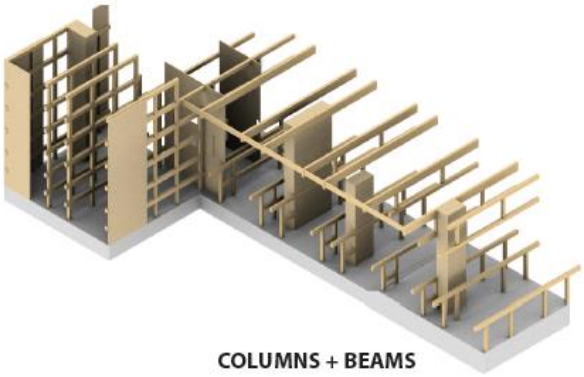
CLT WALLS



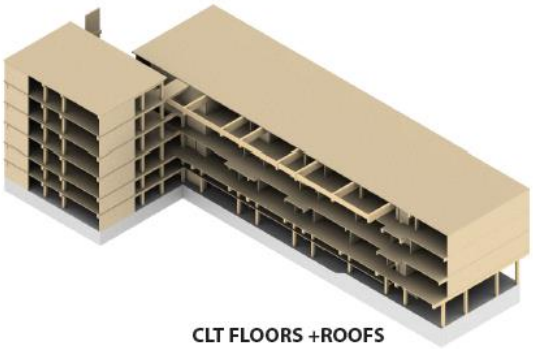
COLUMN TO FLOOR



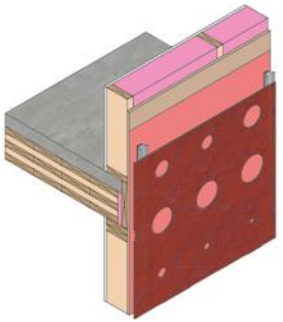
CLT TO CLT CONNECTION



COLUMNS + BEAMS



CLT FLOORS +ROOFS



FLOOR TO WALL DETAIL

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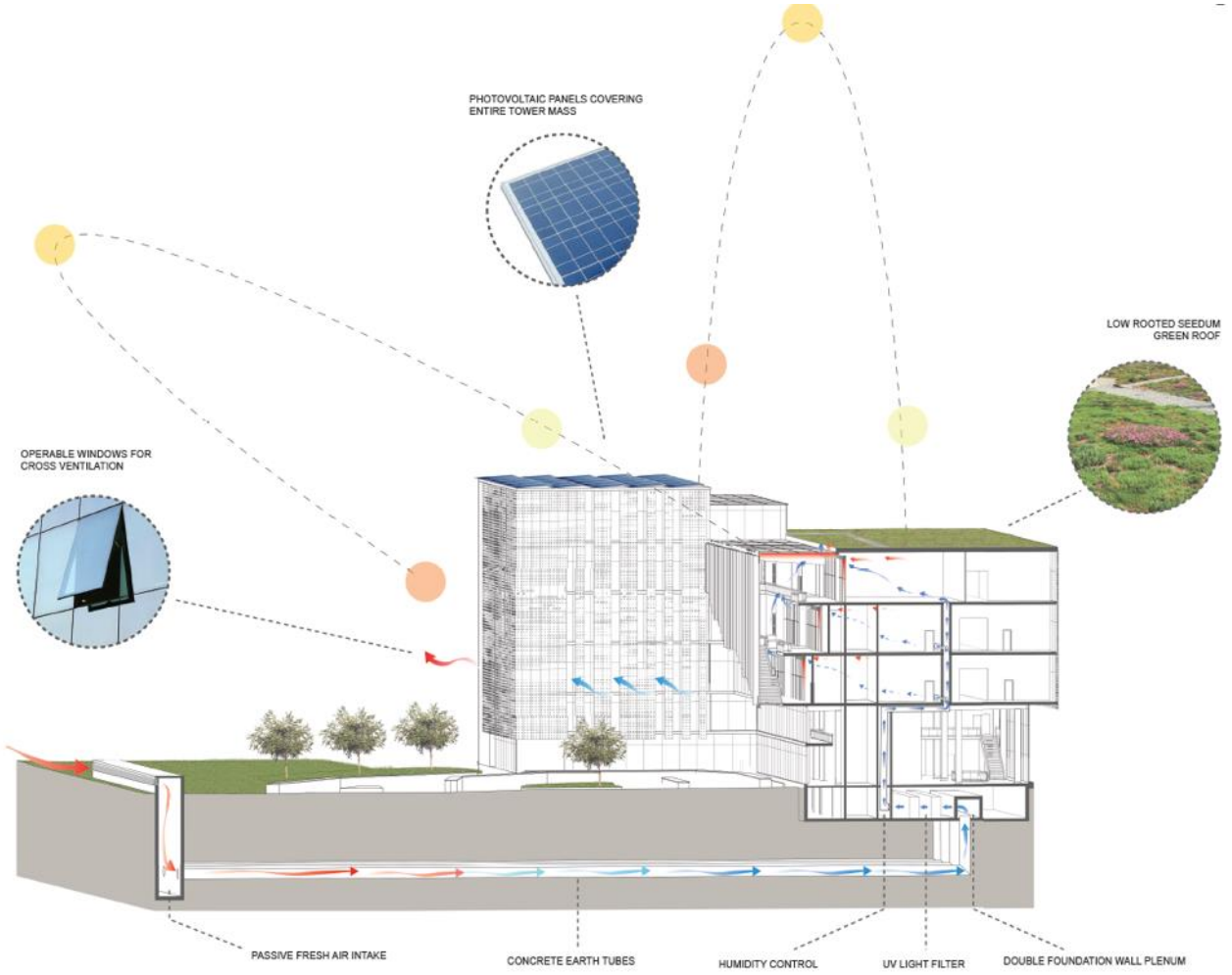

Clackamas County Courthouse
Chiles

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Clackamas County Courthouse
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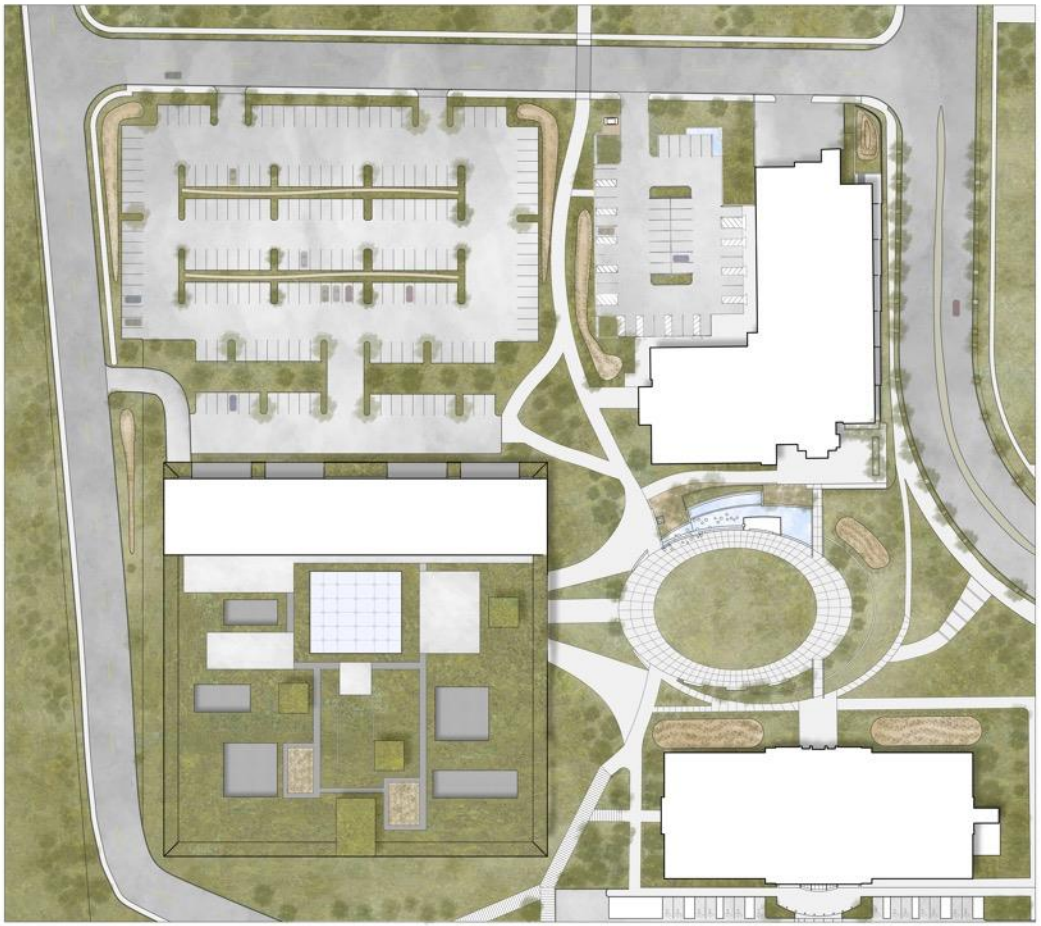
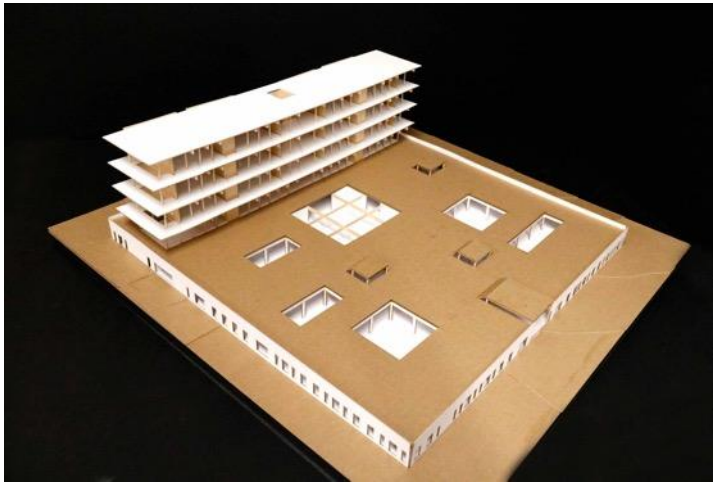
Clackamas County Courthouse
Archiducks

Isais Lawrence, Zhixuan Liang, Matthew Robinson, Nicholas Stanek





Clackamas County Courthouse
Archiducks

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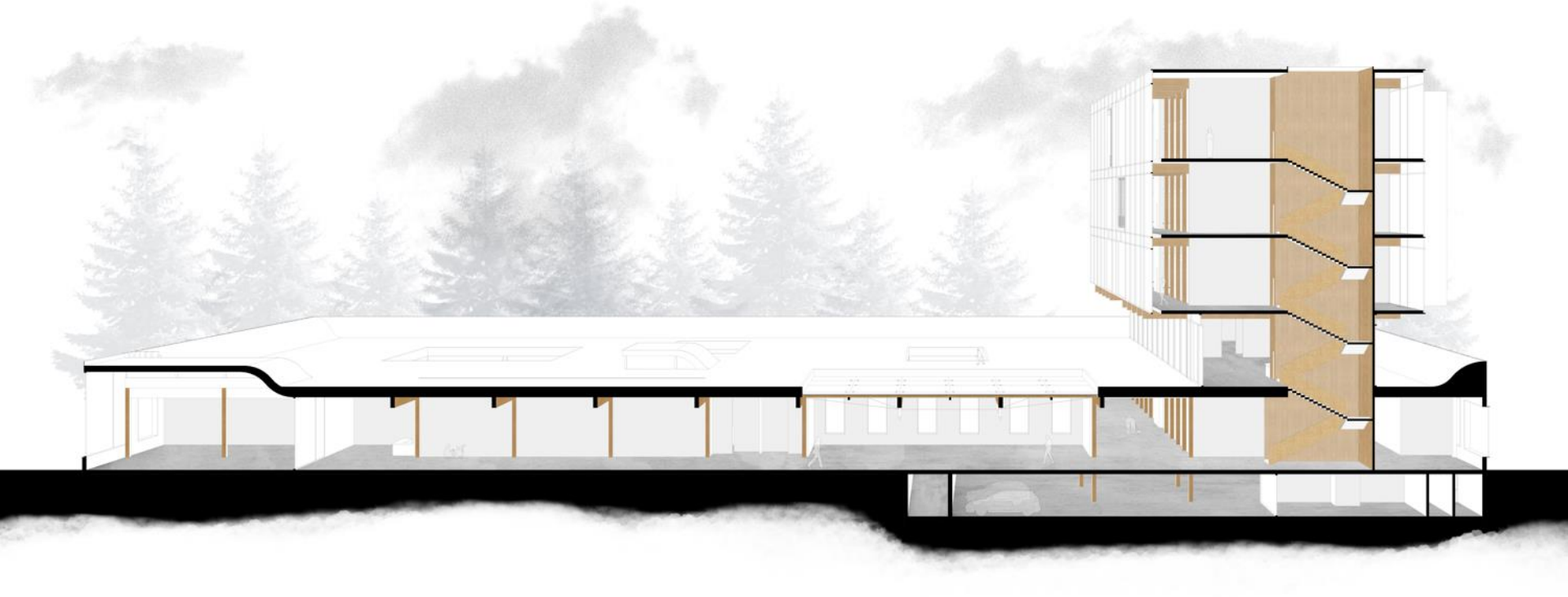

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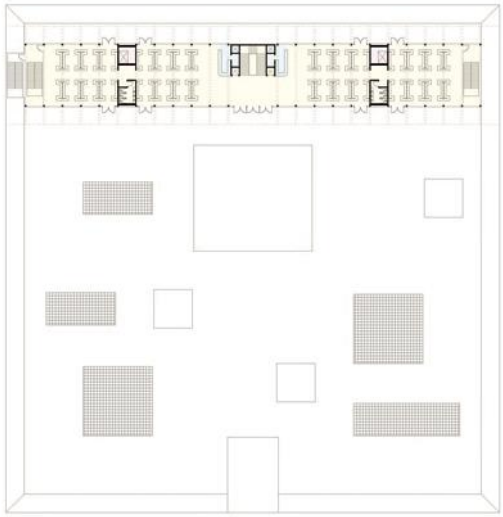

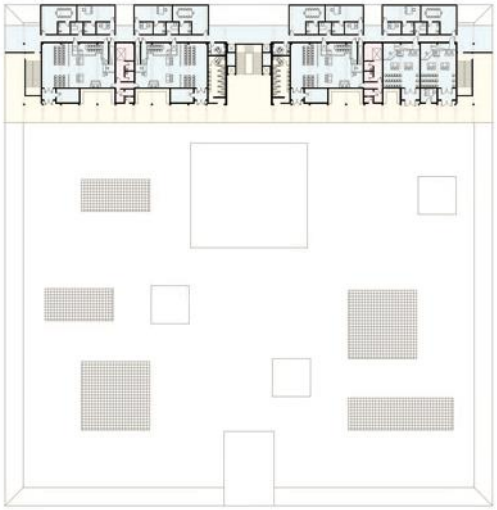

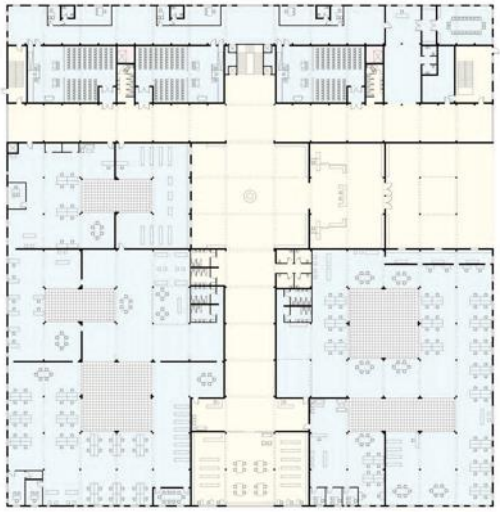

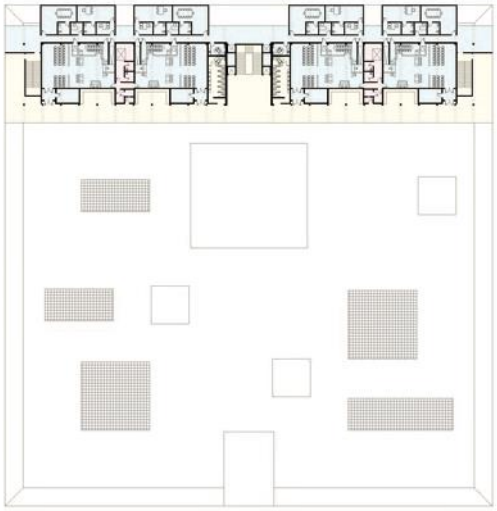

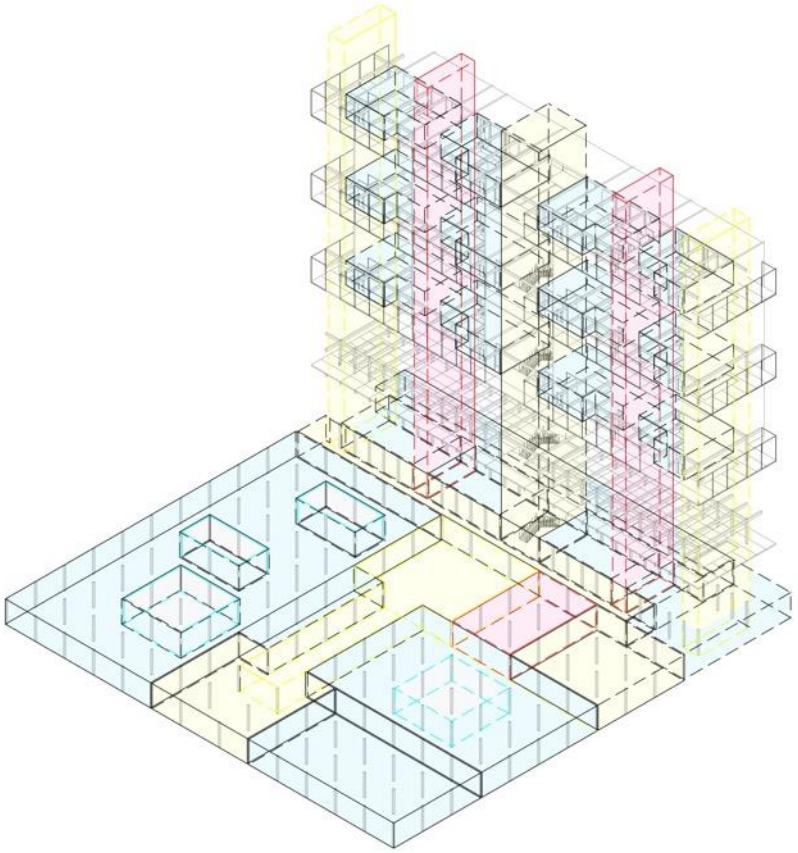

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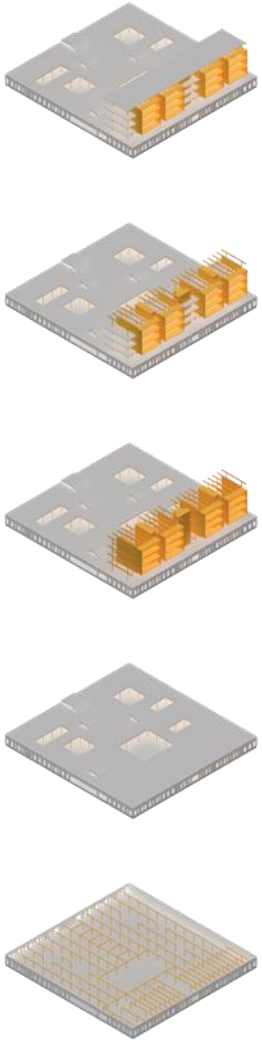

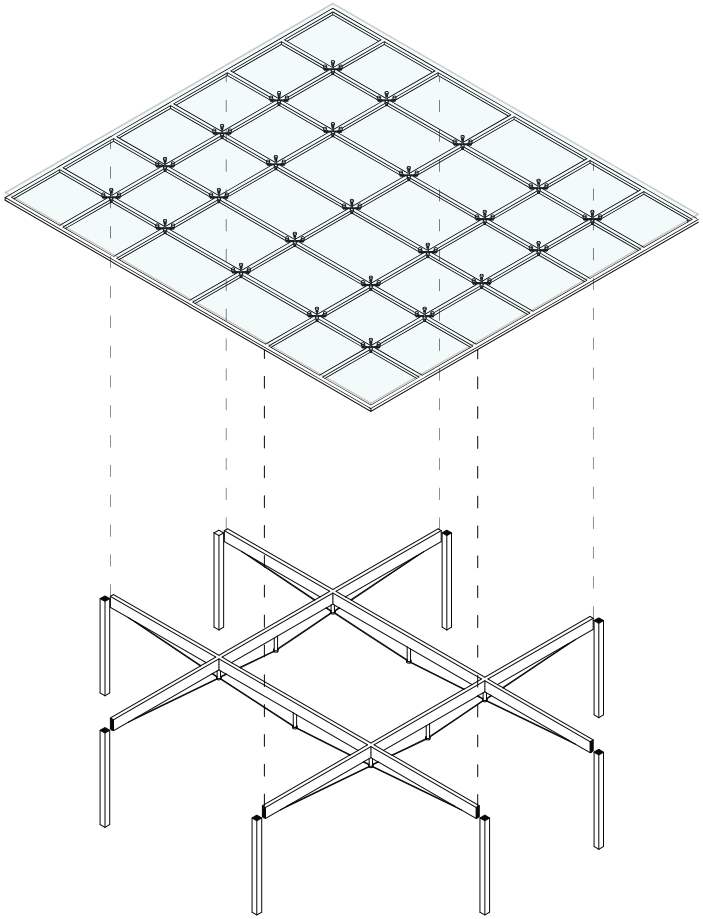

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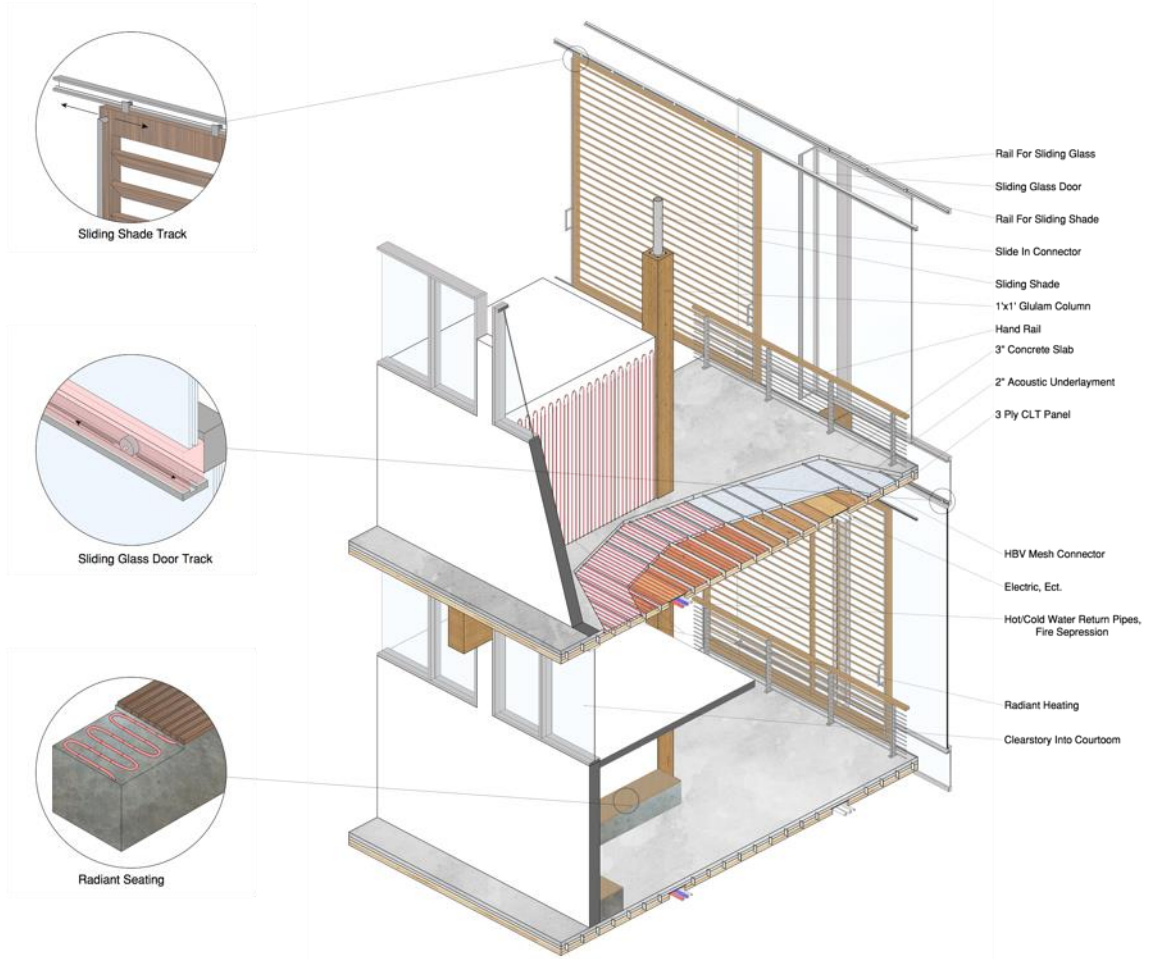

Clackamas County Courthouse
Archiducks

Isais Lawrence, Zhixuan Liang, Matthew Robinson, Nicholas Stanek

Clackamas County Courthouse Rocket

Chandler Arnsdorf, Brooke Everard, Chiara Maggiore, Matthew Weldon

Clackamas County Courthouse Rocket

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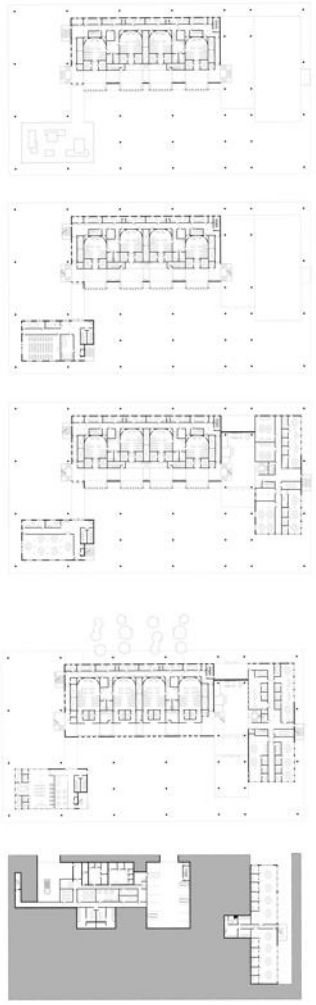

Clackamas County Courthouse
Rocket

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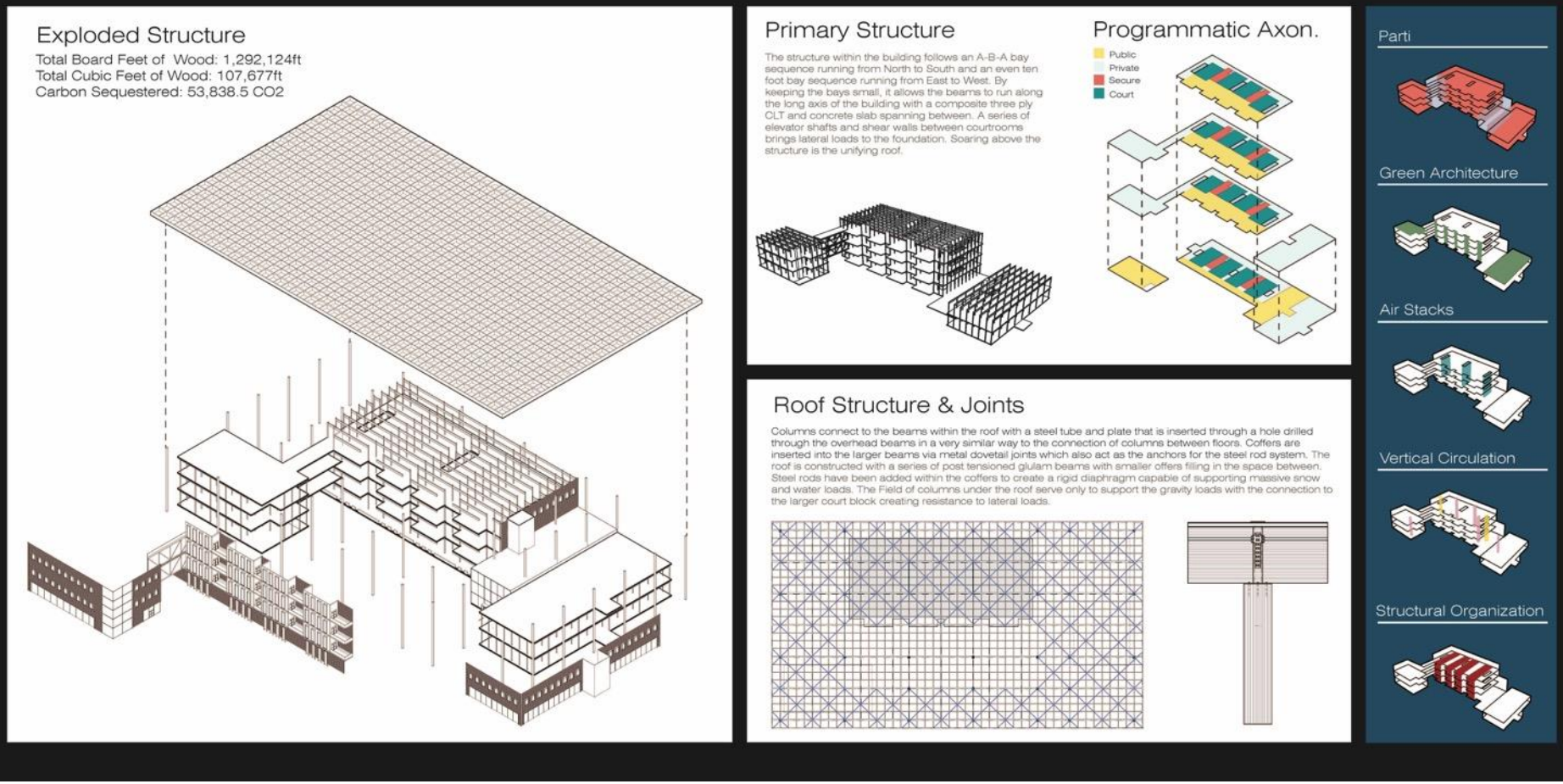

Clackamas County Courthouse
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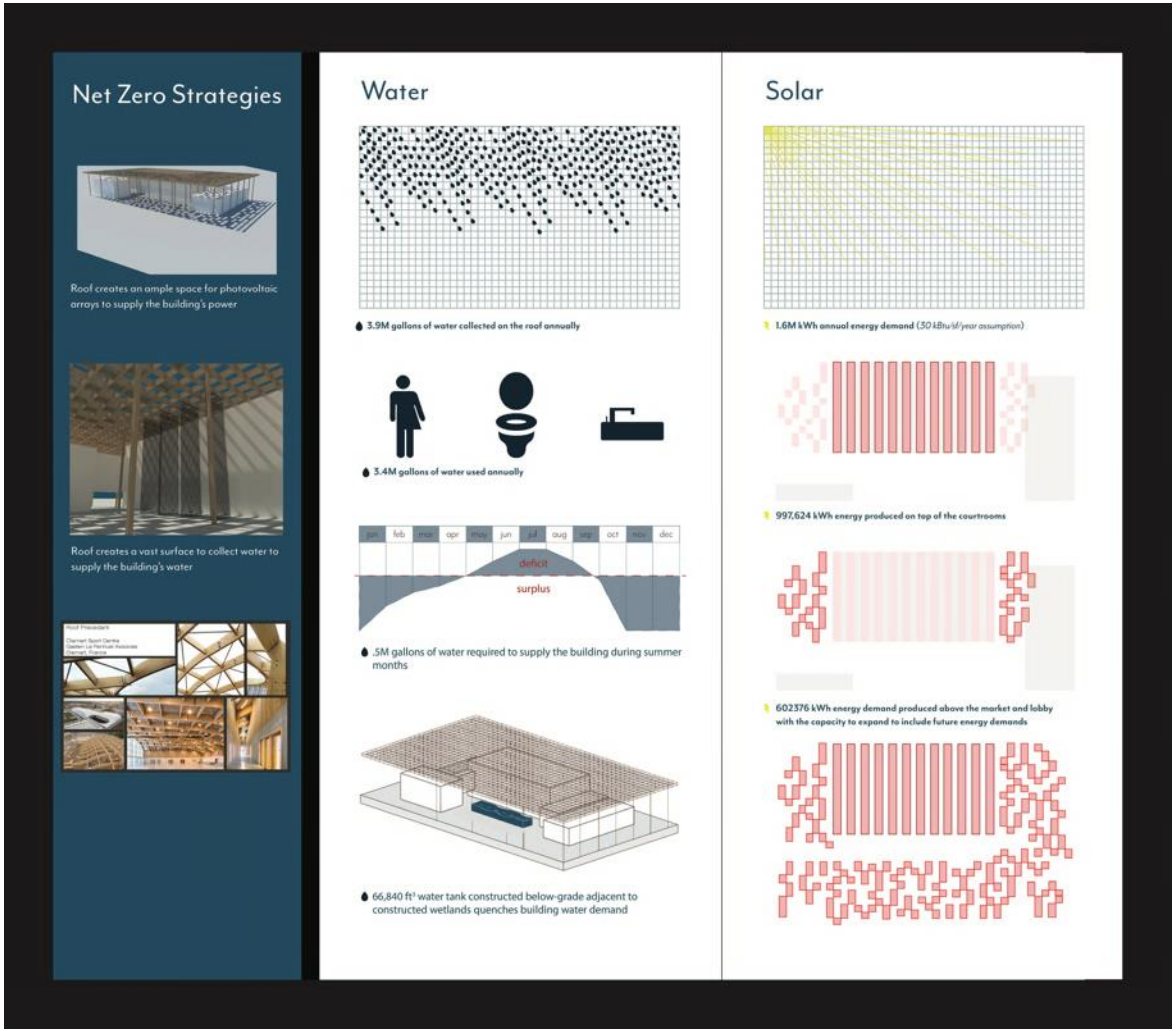

Clackamas County Courthouse Rocket

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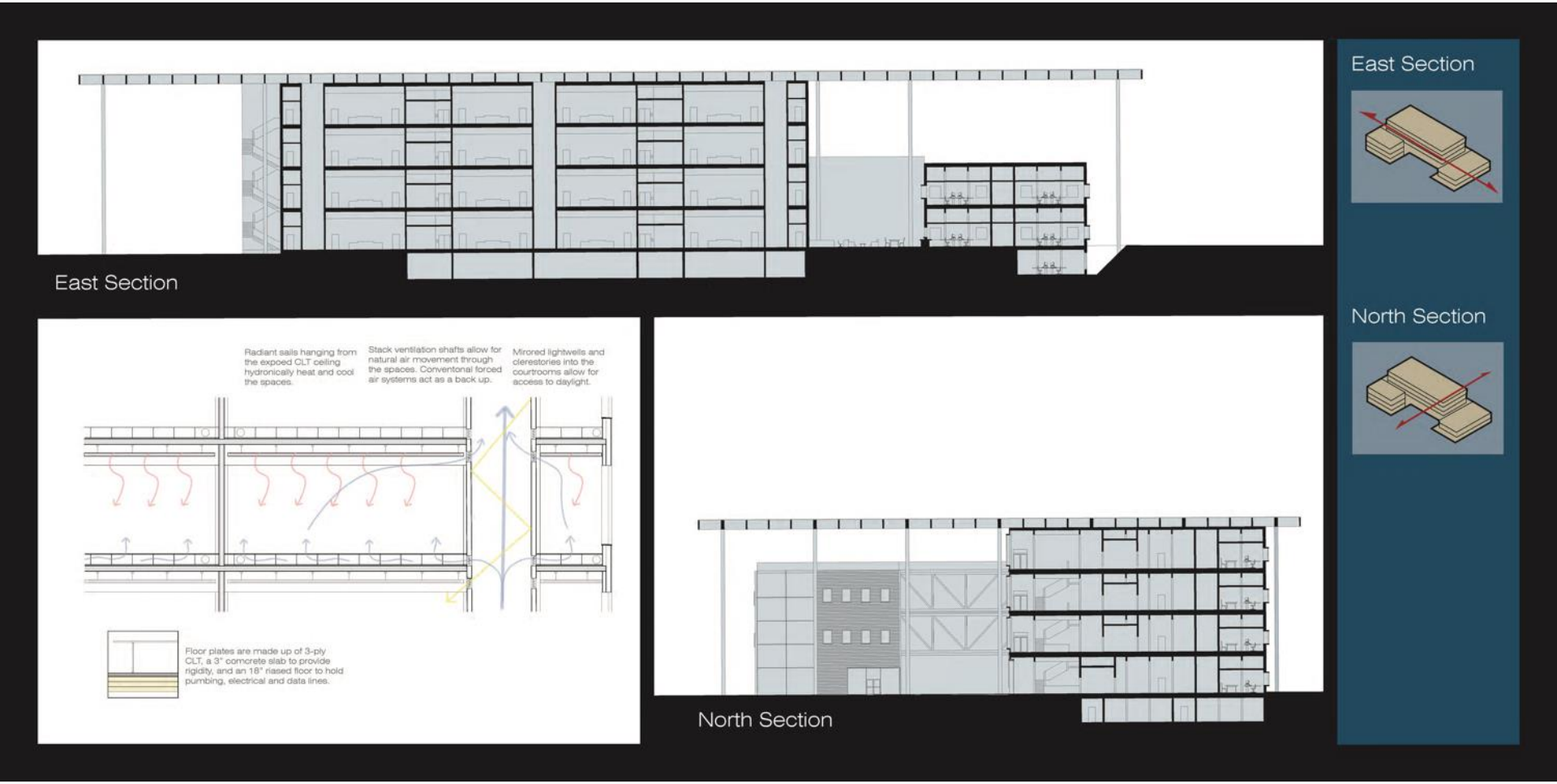


Clackamas County Courthouse
Rocket

Chandler Arnsdorf, Brooke Everard, Chiara Maggiore, Matthew Weldon

Oregon State University

TALLWOOD DESIGN INSTITUTE

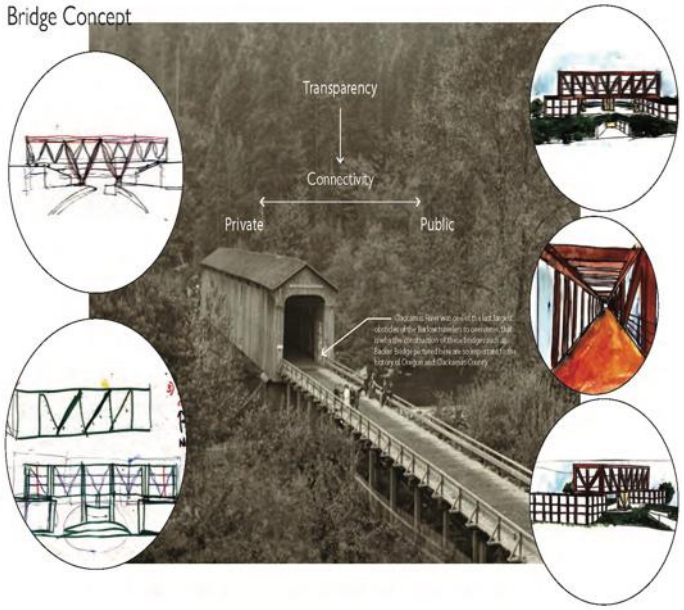
UNIVERSITY OF OREGON

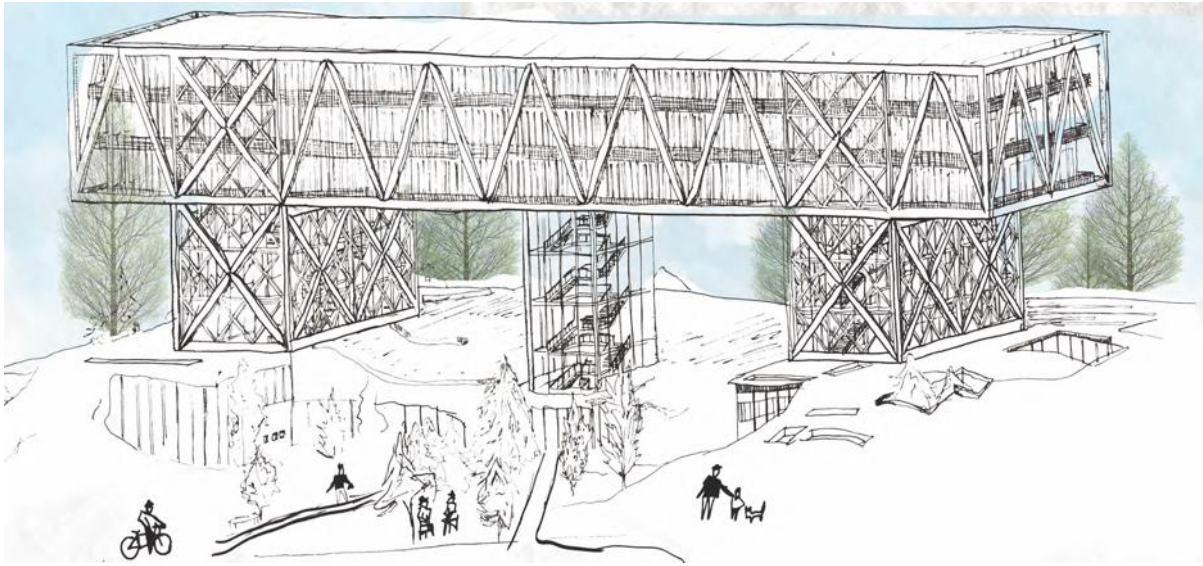
Clackamas County Courthouse
Rocket

Chandler Arnsdorf, Brooke Everard, Chiara Maggiore, Matthew Weldon

Clackamas County Courthouse
Rocket

Ryan Anderson, Marin Nagle, Khang Ngo, Nicholas Vawter





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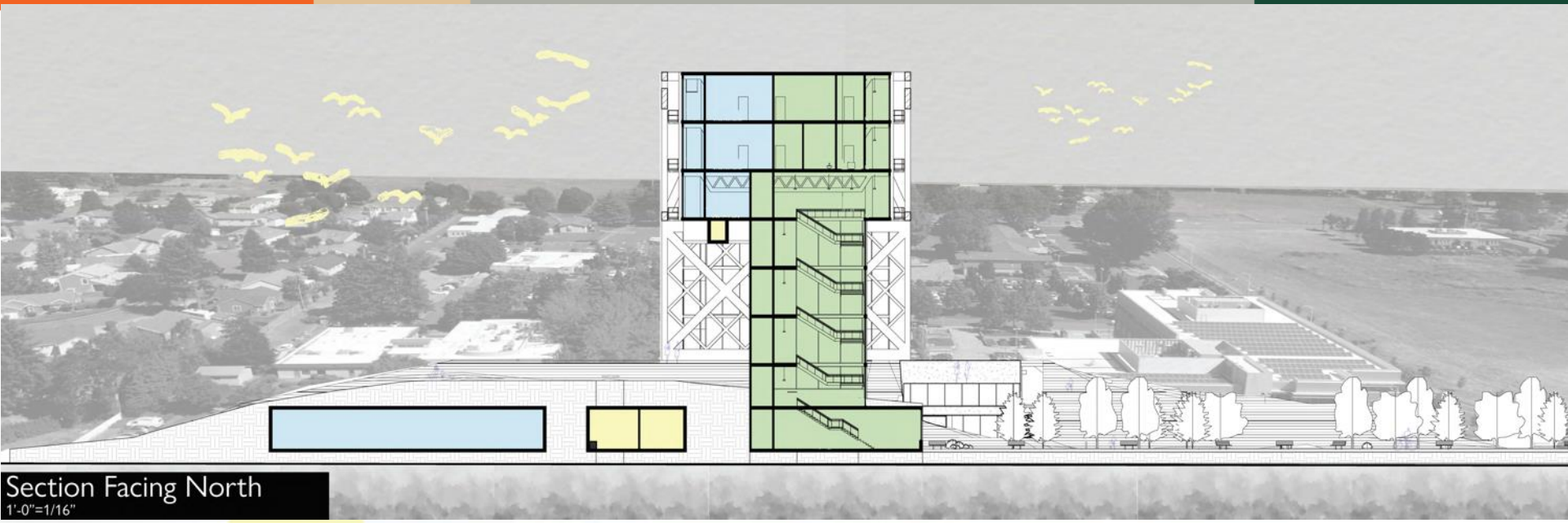

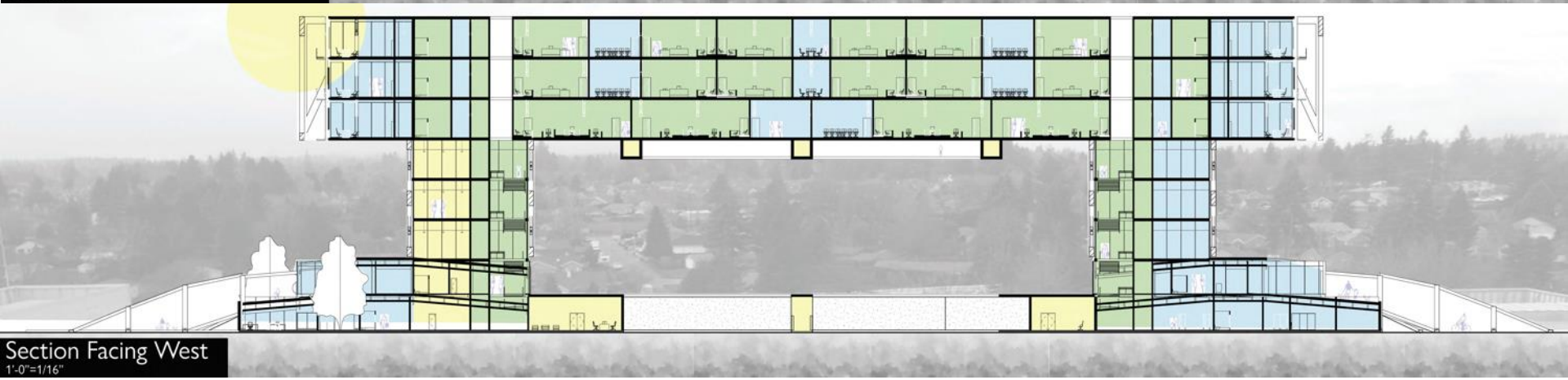

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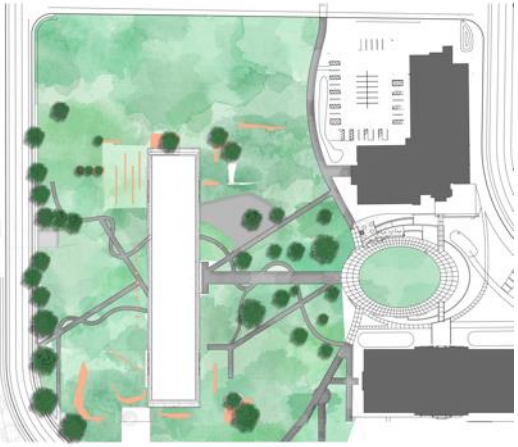

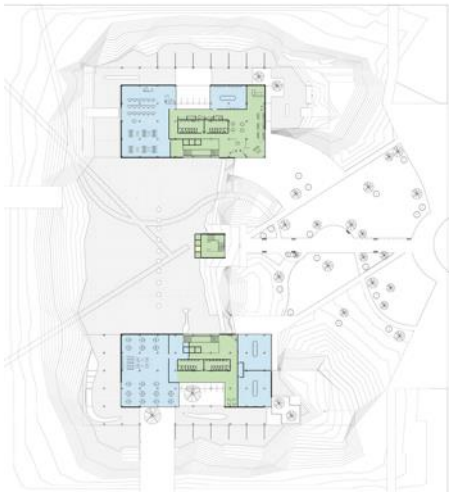

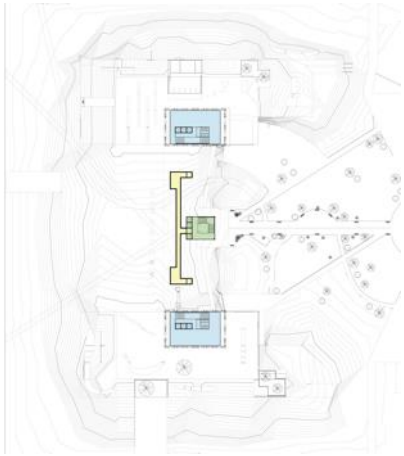

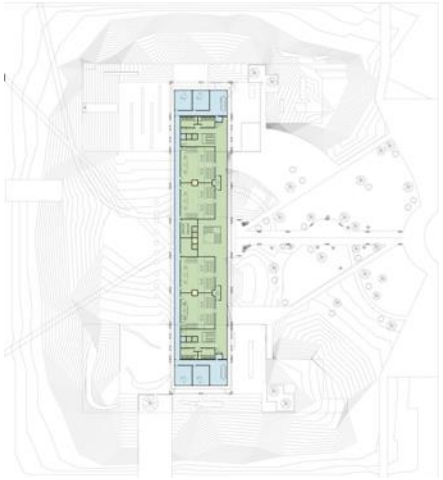

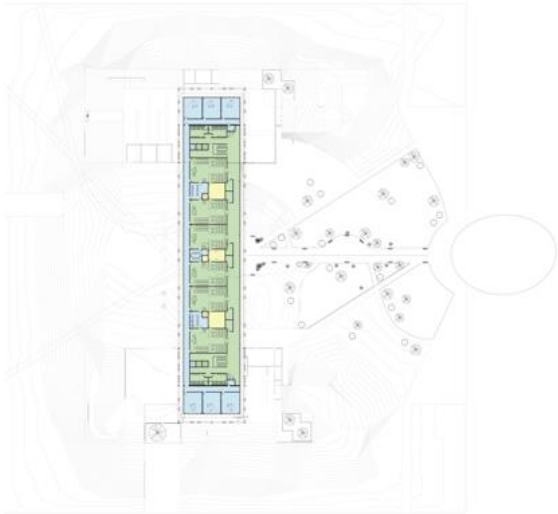

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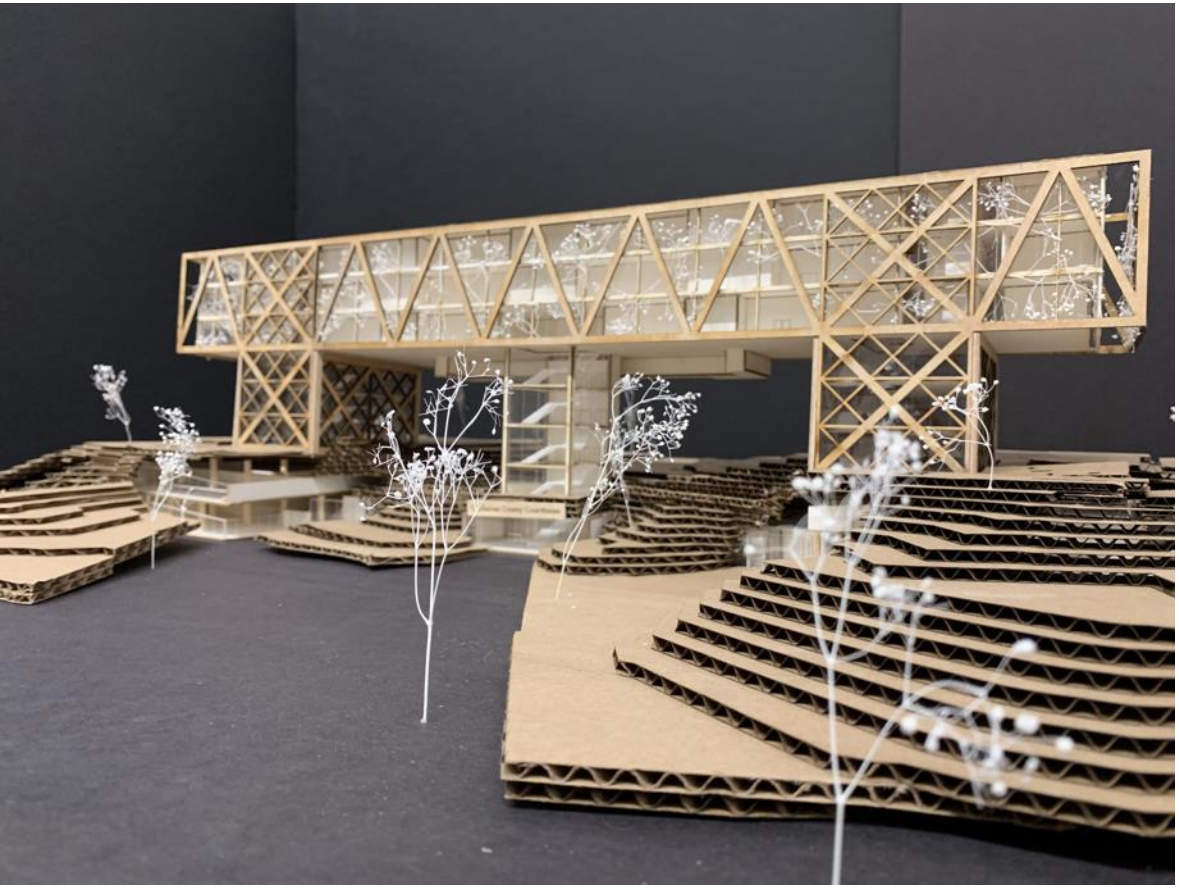

MASS TIMBER VOLUME

Columns Material Volume	12,926.71 CF
Floor Material Volume	255,816.08 CF
Wall Material Volume	84,391.70 CF
Interior and Exterior Truss Material Volume (lvl 3-7)	87,048.99 CF
Structural Framing Material Volume (lvl 1-2)	23,854.31 CF
Total Mass Timber Volume	464,037.79 CF

BY TYPES

Glulam	123,830.01 CF
Cross Laminated Timber	340207.78 CF

CARBON SUMMARY

Carbon Stored in the Wood	11685 Metric Tons of CO2
Avoided Greenhouse Gas Emissions	4521 Metric Tons of CO2
Total Potential Benefit Carbon	16206 Metric Tons of CO2

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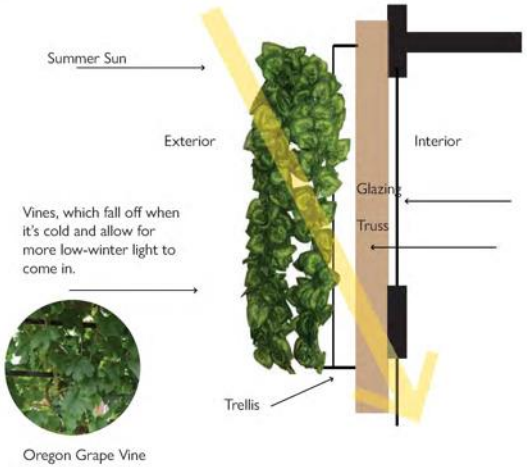
Enviormental Control Systems

Shading Devices

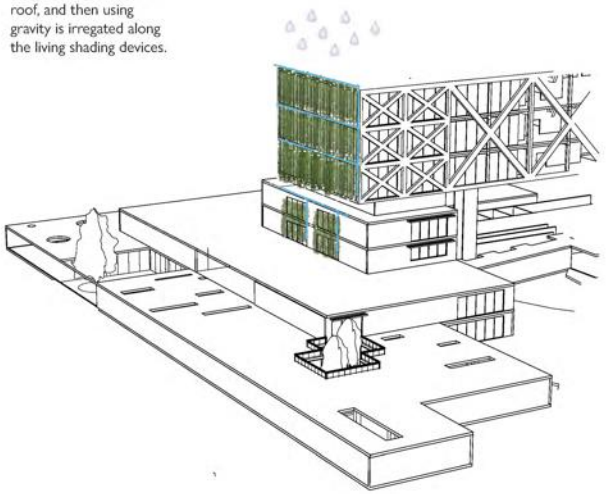
Living Trellis• System



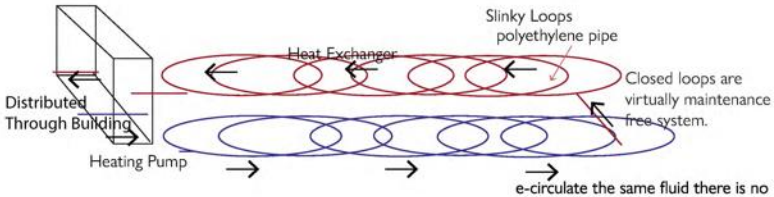
Oregon Grape Vine

Rainwater Harvesting System

Rain is collected on the roof, and then using gravity is irregated along the living shading devices.

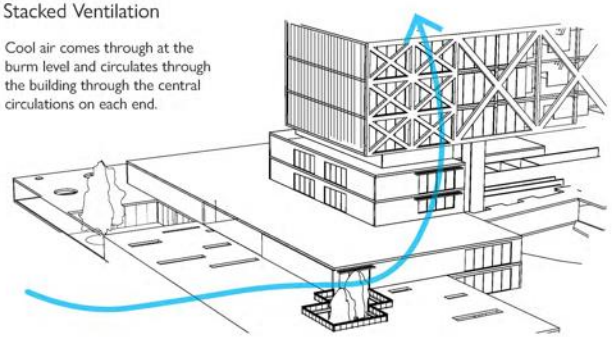


Geothermal Heating System



Stacked Ventilation

Cool air comes through at the burm level and circulates through the building through the central circulations on each end.



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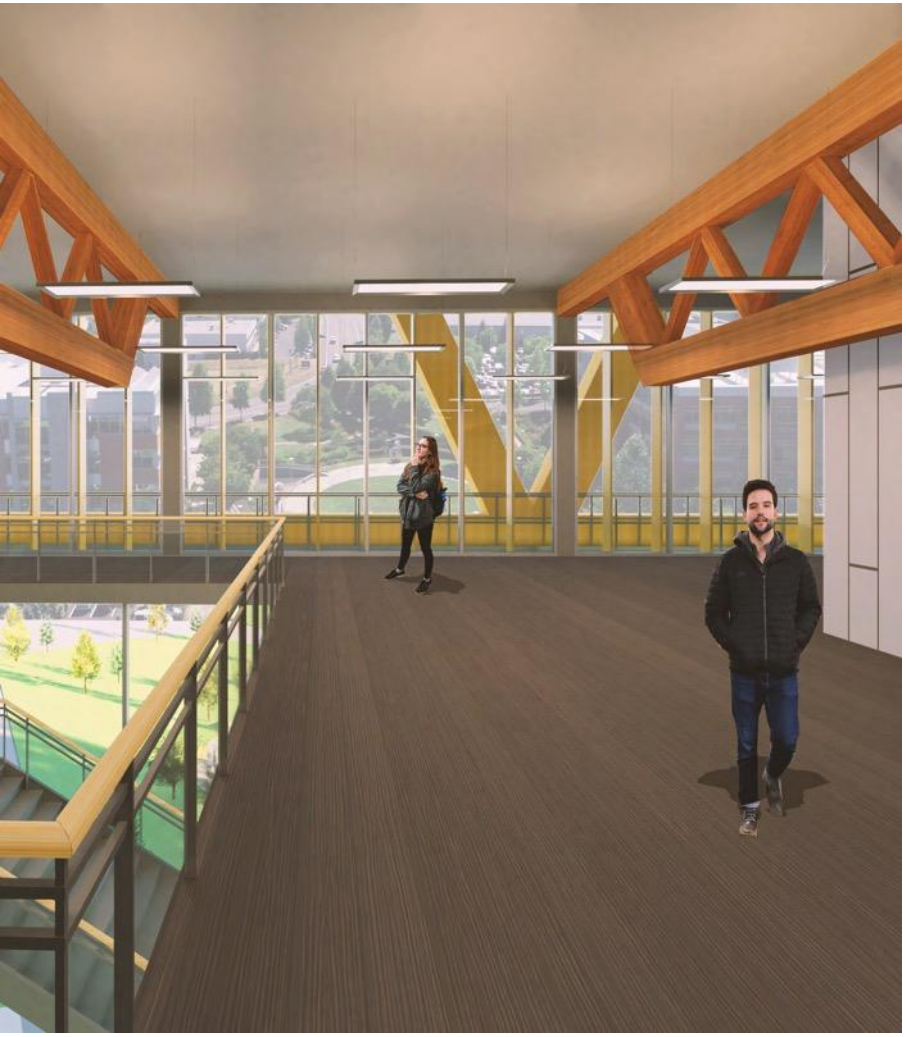

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