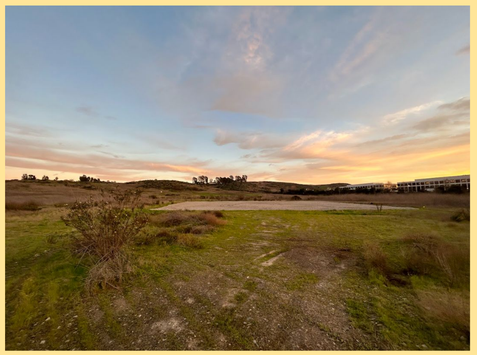
PJHM–181 Senior Design Project
The *UN*-COMMONS



Project Description

- A common area for students to hold small events or classes
- Minimal impact structure which will meld well with the pre-existing ecosystem
- A show of the combination of high tech solution (AI integration) and low impact sustainability

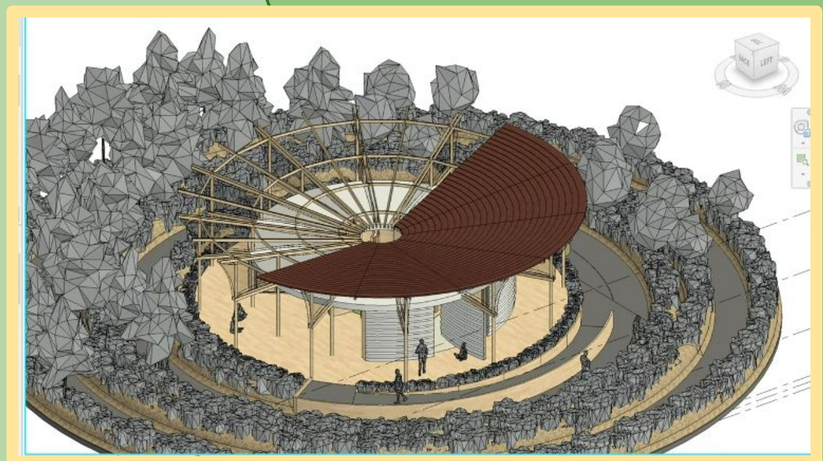
Design Constraints:

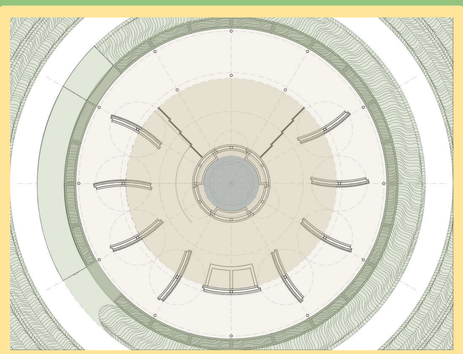
- The first and second rings of impact are highlighted in order to minimize the environmental disruption
- Site location near UCI's Ecological Reserve requires strict regulations and considerations for material choice and construction impacts
- Localized and biodegradable materials
- Improved accessibility to campus

Design Methods:

- Central core water system for internal air cooling, passive pressure systems, geothermal cooling and heating systems
- Retention basin and remediation stream (serving all 3 levels of concentric rings),
- Glass Fiber Reinforced Polymer (GFRP) - implications for global ring

BUILDING





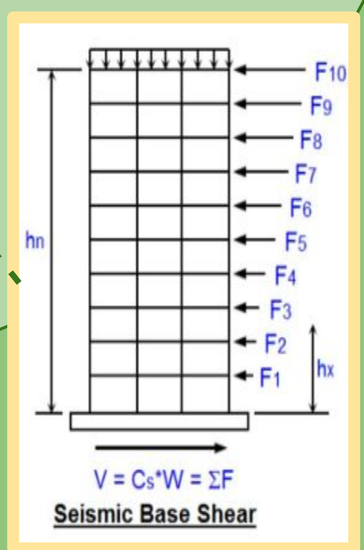
Artificial Intelligence Integration:

- Optimize the dynamic operation of rotating walls (based on external weather conditions)
- Predict and address maintenance needs
- Data collection for research

Next Phase:

- Life Cycle Analysis, material selection, structural calculations
- Collaborations: UCI Ecological Preserve, Naturescape Vision Teams
- Lecture on AI Integration by Pat Fuscoe
- Cost-analysis and Project Schedule
- Render of site design

LOCAL SITE



Structural Calculations:

- Structural Calculations were done to ensure structural stability
- Seismic : V=Cs * W
- Gravitational: Involves dead load and live load. Ultimate Load: 1.2D + 1.6L + E
- Wind: qz= 0.00256 * Kz * Kzt * Kd * Ve^2

GLOBAL IMPACT

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