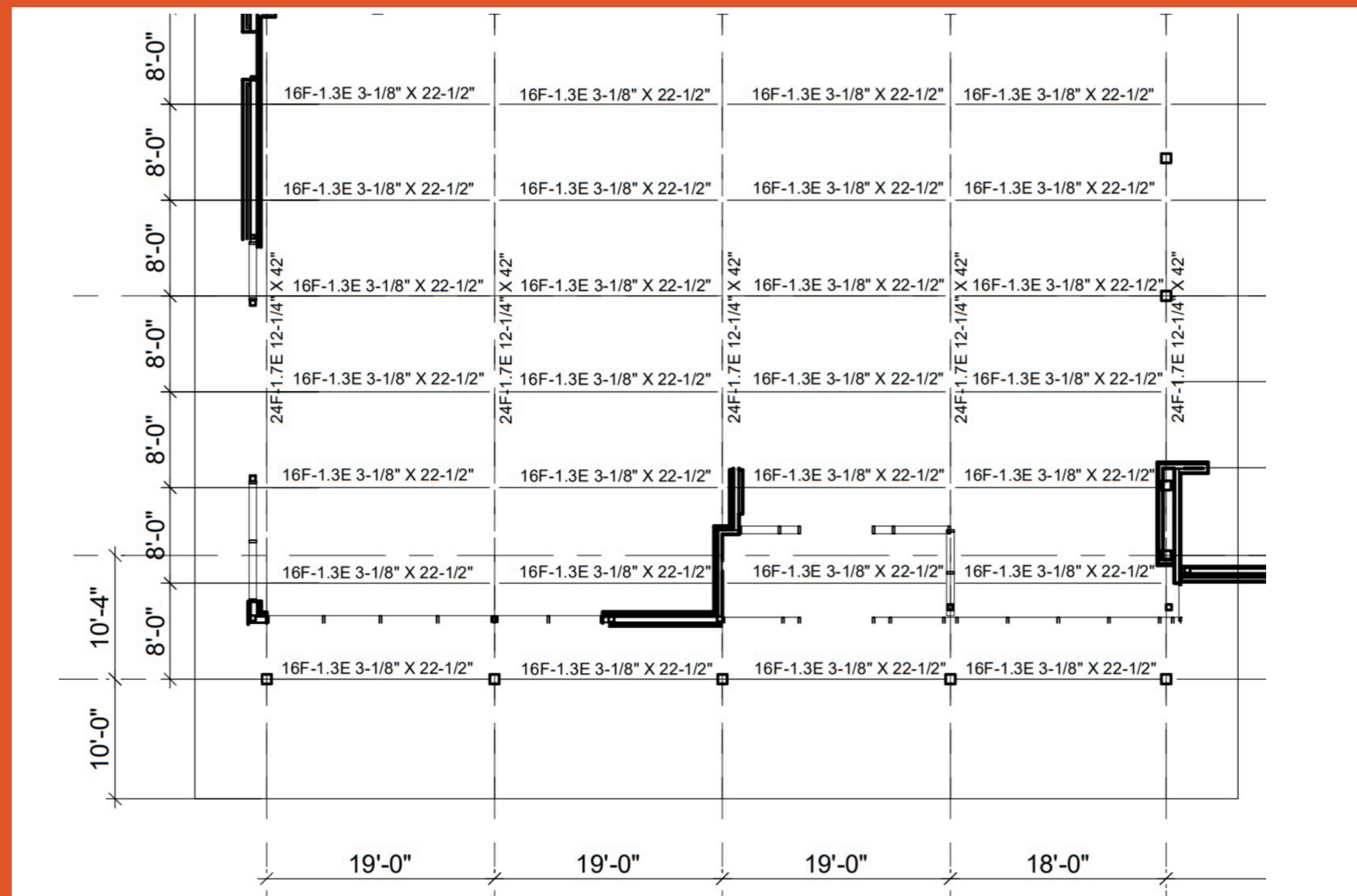


STRUCTURAL SYSTEM

Gravity Force Resisting System

- Beams, girders, and columns
- Steel vs. Mass timber
- Long spans in the courtroom



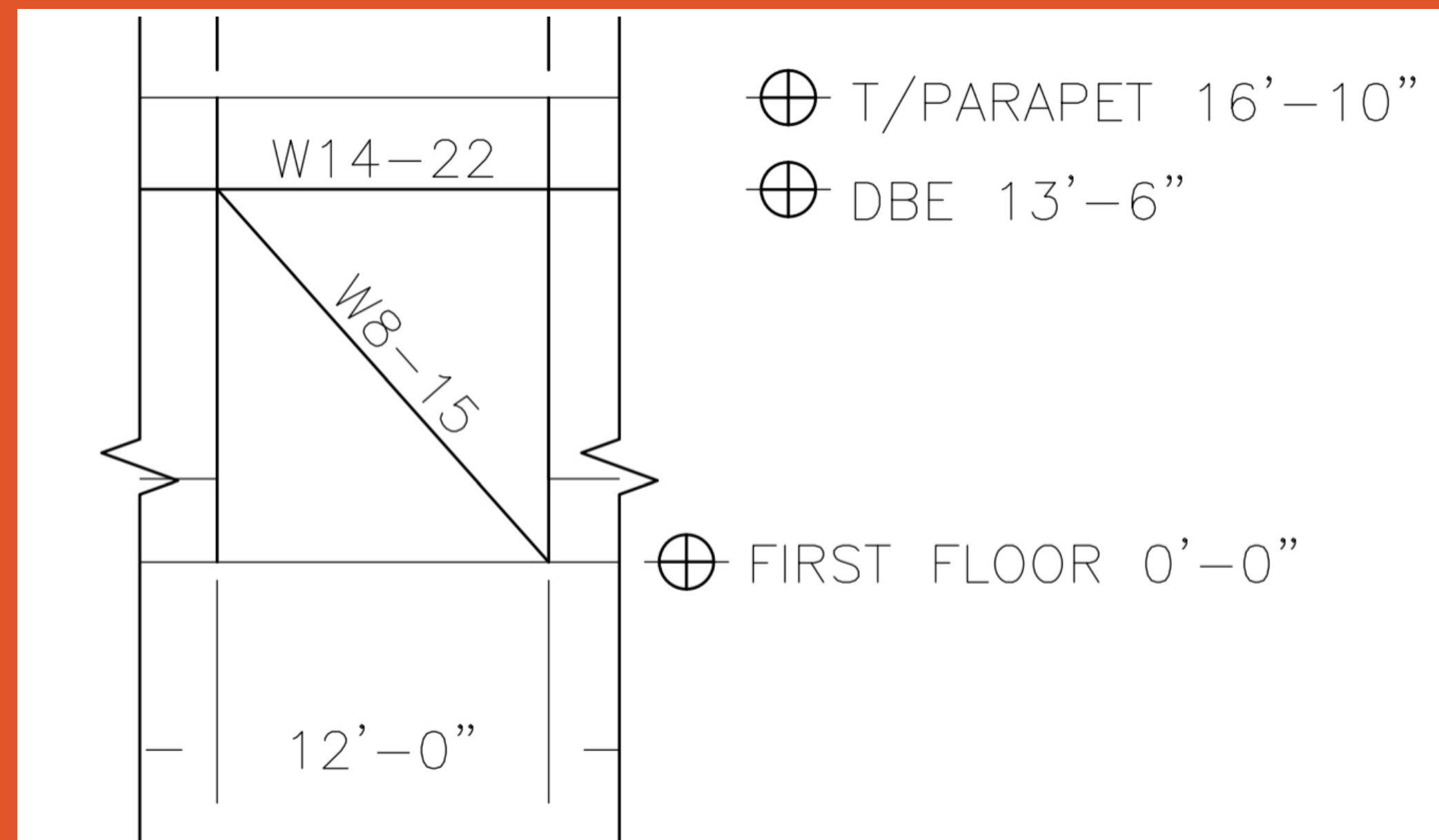
Glulam beam and column plan for the courtroom.

Material Type	Embodied Carbon (CO ₂ e/kg)	GWP
Steel	344,142	17
Mass Timber	101,861	5

Embodied carbon and global warming potential for both courtroom gravity force resisting systems.

Lateral Force Resisting System

- Steel braced frames vs. Metal stud shear walls



Courtroom braced frame.



ST. HELENS PUBLIC SAFETY BUILDING

Sustainability – Cost Efficiency - Safety

PROJECT DESCRIPTION

The Public Safety Building (PSB) in St. Helens, Oregon is being designed as a new build police station with an assembly area.

Design Requirements

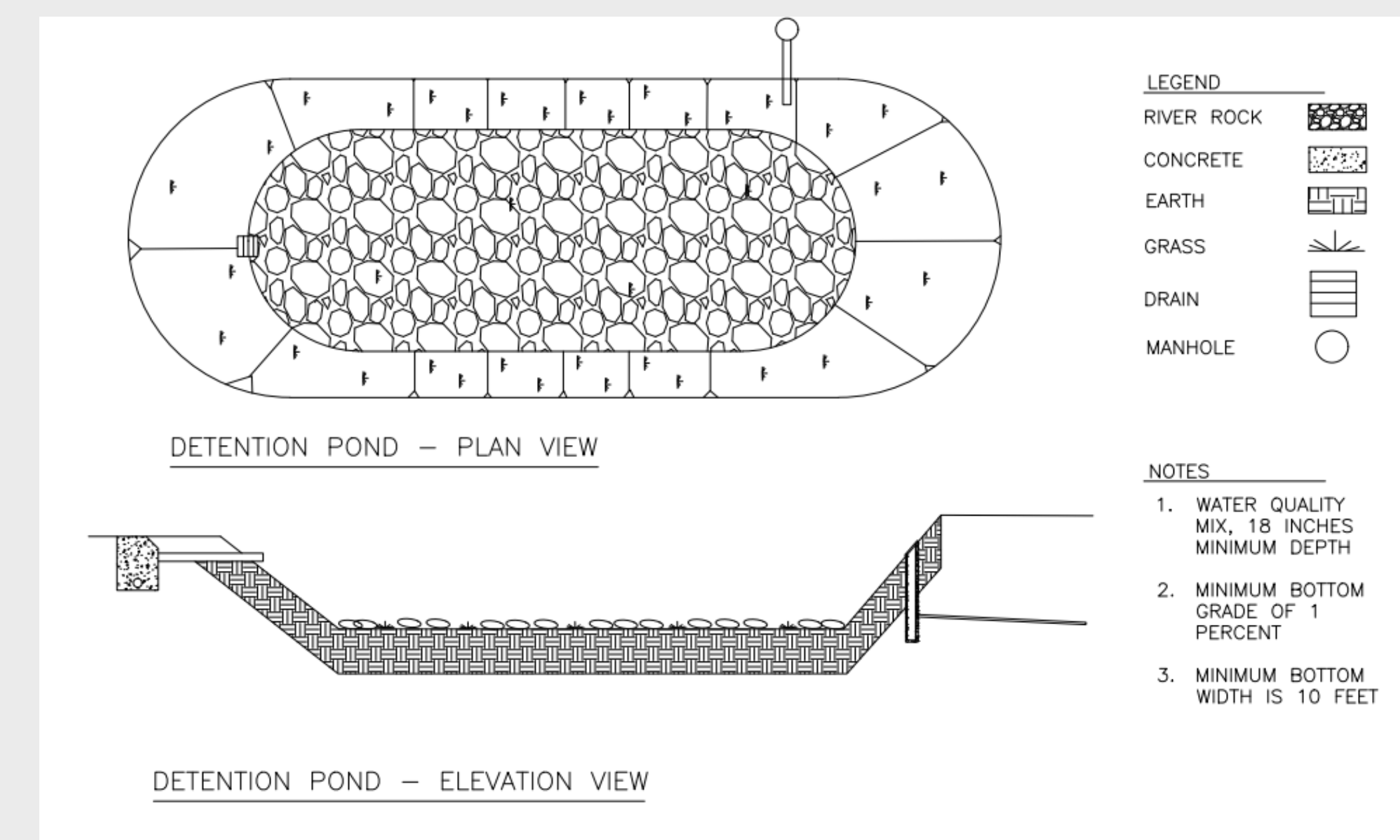
- 22,000 square foot building
- 35 public spaces
- 48 secure parking spaces

Our two groups have prepared two different structural, stormwater and building envelope designs to compare for sustainability.

Disciplines

- Building Envelope
- Water Resources
- Structural

WATER RESOURCES



Detail of water detention pond.

Rain Gardens

- Combined water detention/water quality
- Filtration rain gardens
- Offers native planting
- Sustainable and efficient



Rendering of the proposed building (Mackenzie).



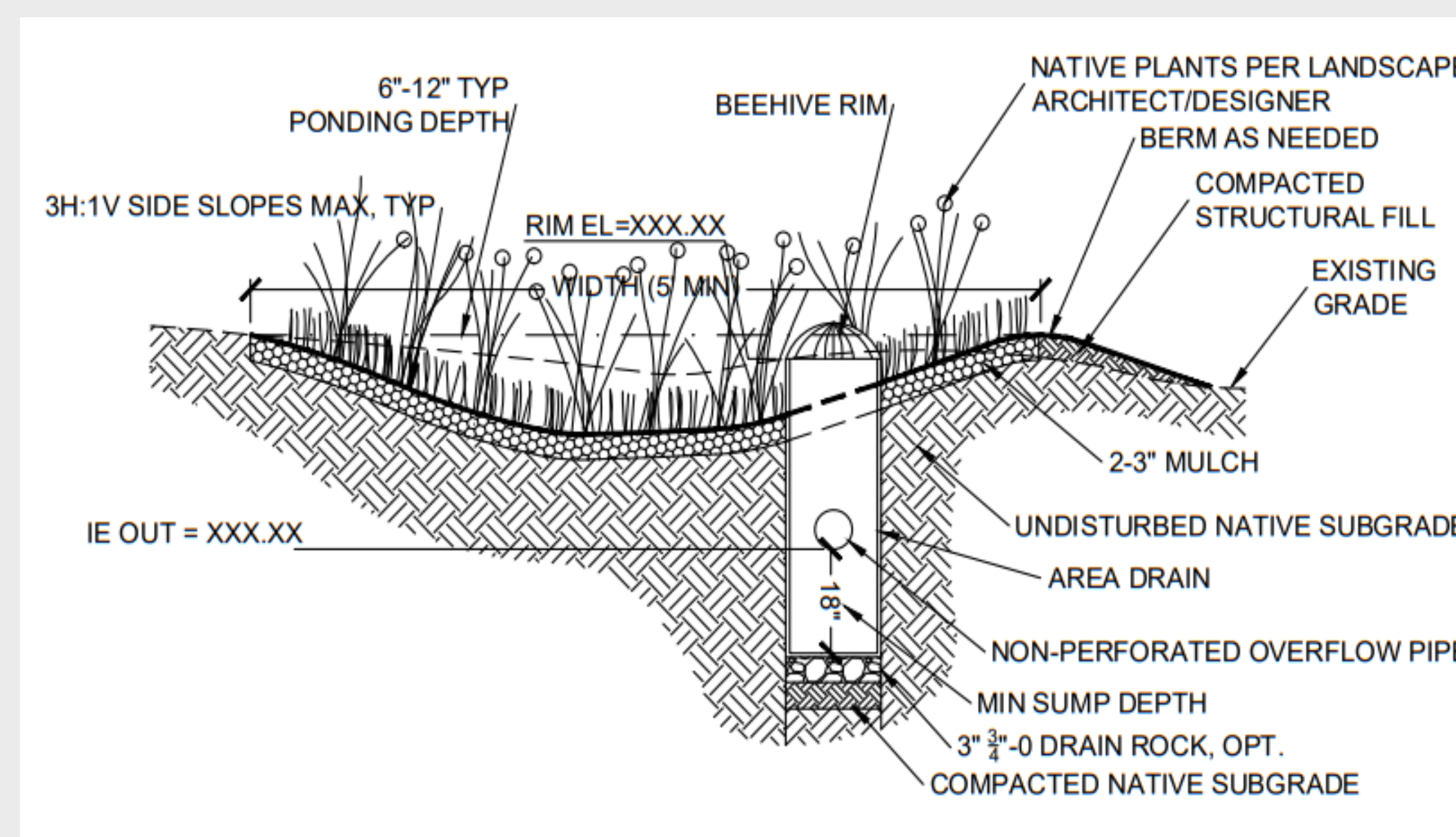
Site map of the proposed location.

Site

- 2.3 acres
- Tax lots (2)
- Light Industrial (LI)
- General Residential (R-5)
- 100-year and 500-year flood plain

Water Detention Pond

- Combined water detention/water quality
- Design Dimensions: 50ft x 100ft x 4ft
- Storage Capacity: 15000 ft³
- Discharge treated water into wetlands
- Sustainable and efficient



Detail of rain gardens.

BUILDING ENVELOPE

Design

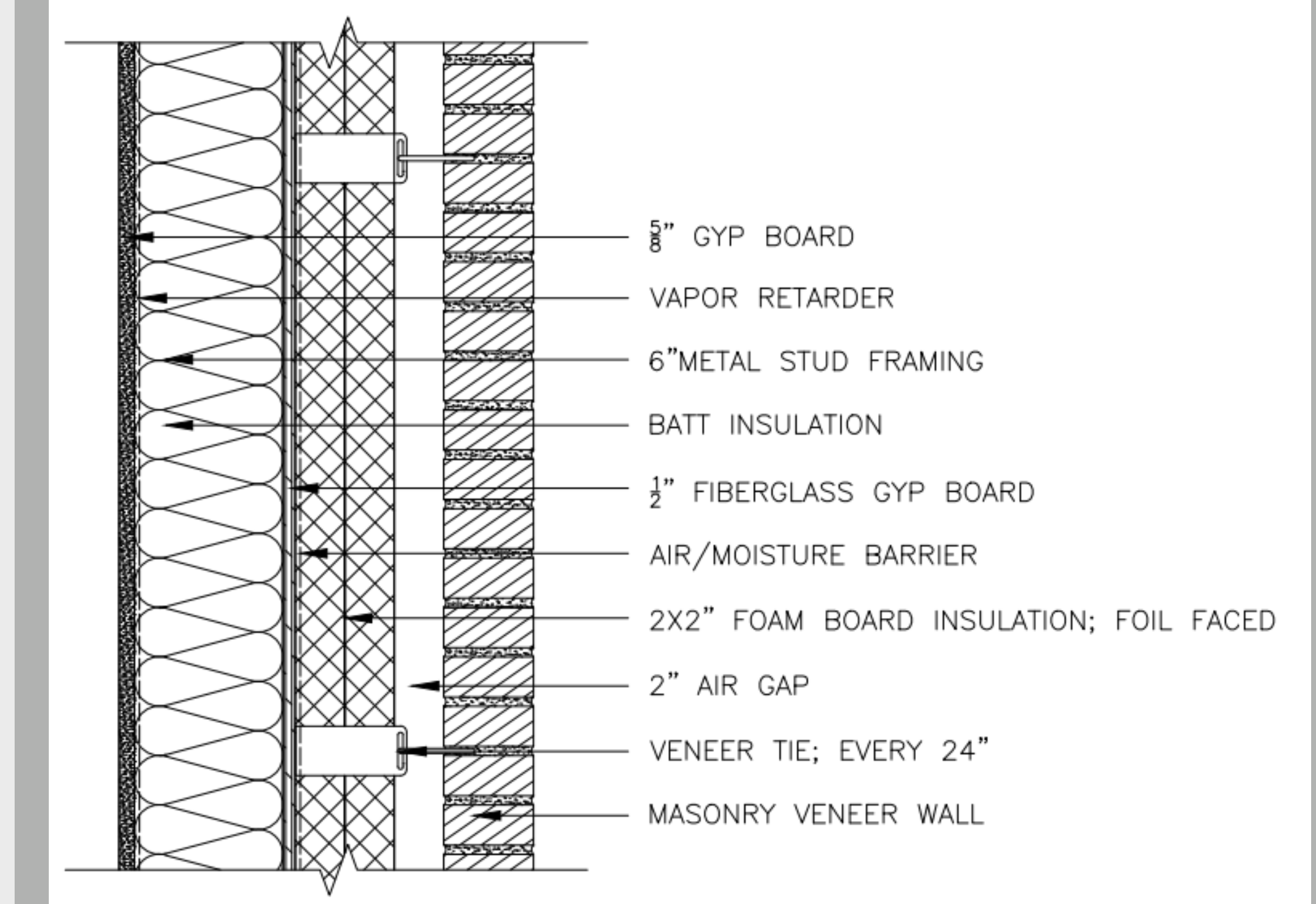
- Wall systems
- Roof systems
- Windows

Insulation Comparison

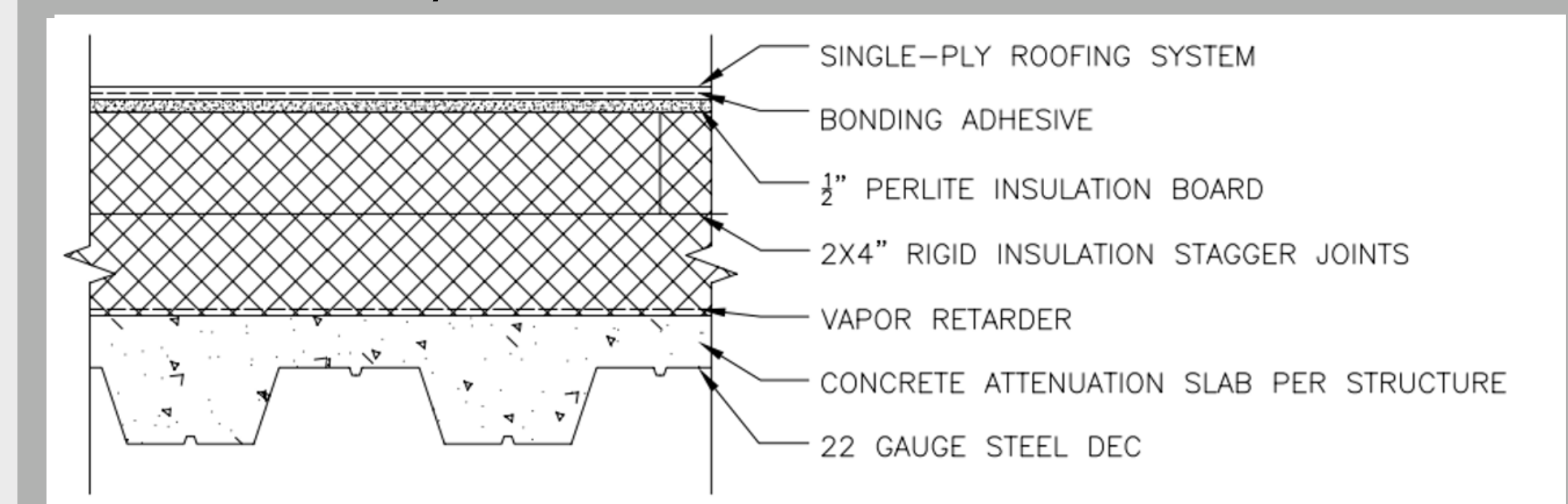
- Cellulose vs. Batt

Type	Embodied Carbon	GWP
Cellulose	10.49 MJ/kg	0.70
Batt	28.00 MJ/kg	1.04

Embodied carbon and global warming potential for both building envelope designs.



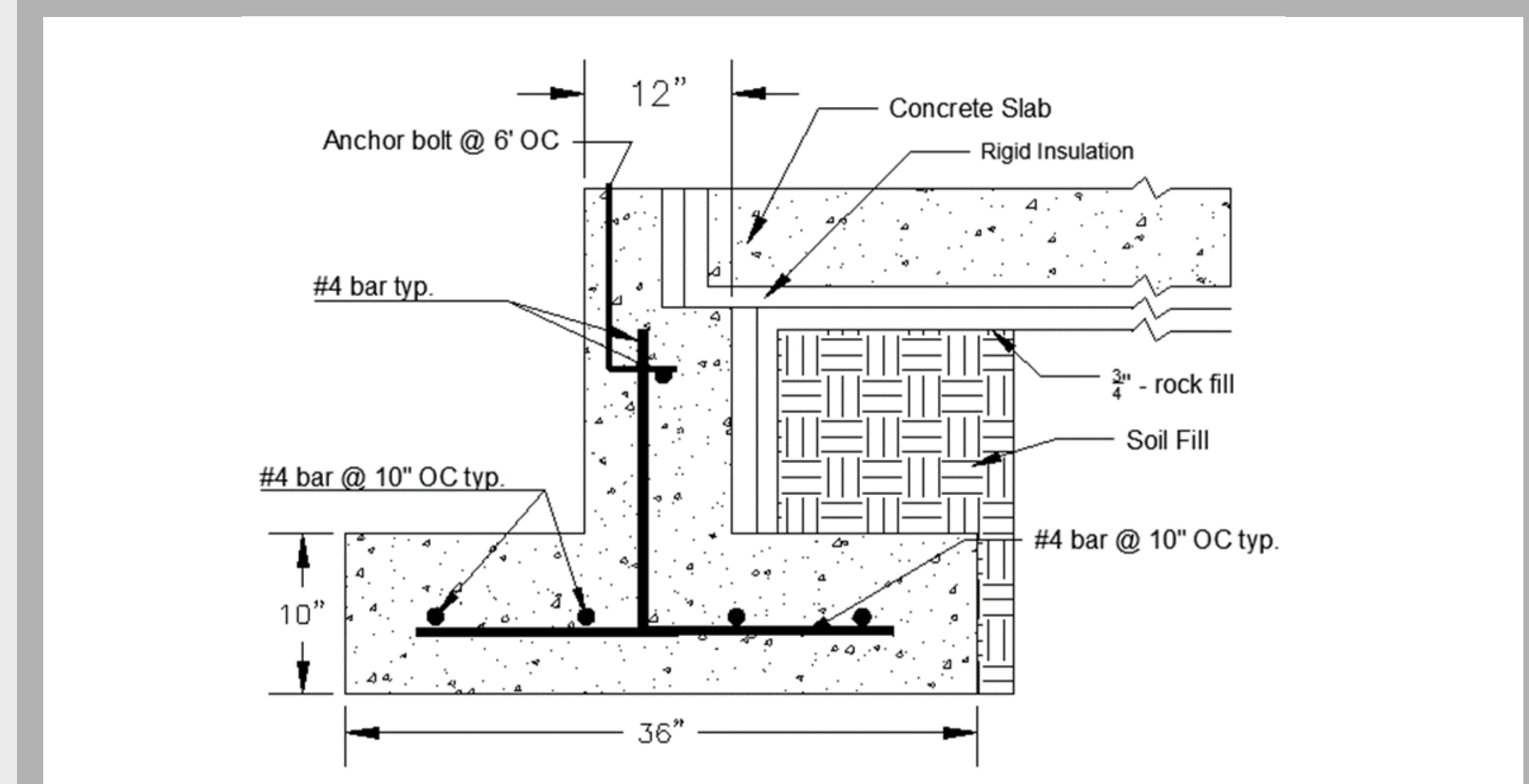
Detail of wall system.



Detail of roof system.

Foundation

- Shallow footing design with slab on grade vs. Spread footings



Outside perimeter footing and stem wall detail.