



# Ridge View Apartments

1200 E 1100 N, Logan, Utah 84321

## Think Bold Design

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### Proposal Summary

Utah State University continues to increase admissions every year, and our team recognizes the importance of providing students with on-campus housing. The major requirements of the project were:

- Two buildings with 200-250 residents each
- Full apartment style
- Nonfamily housing with six or fewer tenants per unit
- Three or fewer tenants per bathroom



Figure 1: Current Site Conditions

These requirements were met, while still providing an economical and sustainable design. Our design includes insulated concrete forms (ICF) to ensure that the buildings will be fire-resistant, durable, and energy efficient. The proposed design maximizes space and emphasizes simplicity. Our team designed one apartment building that can be duplicated and mirrored to maximize residents and space on the property. The scope of this project included: a site plan, a complete calculation package, and engineering plans to construct the buildings.

### Decision Matrix

The alternatives were judged on an equally weighted scale from 1 to 5 with 5 being the best.

- **Cost** for design and construction of the structure
- **Schedule** from the beginning of construction to the finished product
- **Environmental impact** including LEED certification and sustainability of materials
- Ability to adapt to the client's preferred **aesthetic preference**

### Selected Alternative



Figure 2: Sample 12" ICF Block

Our team selected ICF with metal stud walls as the chosen alternative for the building design.

### Presented Design

The final design includes two mirrored five-story structures with enough square footage to accommodate 474 residents and required office, recreational, and utility spaces.

Using the ASCE 7-16 and additional online resources, our team determined the loading conditions for the building. We designed the lateral system to support wind and seismic loads using ordinary reinforced concrete shear walls (ICF filled with reinforced concrete) and both metal decking and composite decking diaphragms. We designed the gravity system to support dead, live, and snow loads with steel beams, girders, columns, and reinforced ICF walls. All loads were ultimately designed to be transferred to and through the foundation. We detailed connections throughout the building to facilitate the transfer of loads.

The building was modeled with Revit and designed using hand calculations and software including Enecalc, Risa 3D, Vulcraft design tools, and SkyCiv.



Figure 4: Prospective Design

Building Square Footage: 88,475 ft<sup>2</sup>  
 Building Dimensions: 340 ft x 60 ft x 70 ft

### Alternatives

#### Framing Options

##### Wood

- Lower cost
- Quick build time
- Low environmental impact
- Lower strength members

##### ICF (Insulated Concrete Forms)

- More expensive (depending on current concrete costs)
- Quick build time
- Durable
- Great insulation

##### Steel

- More expensive
- Recyclable
- High strength to weight ratio
- Durable

#### Interior Options

##### Wood Studs

- Lower cost
- Less quality control of members
- Susceptible to mold/water damage

##### Metal (Steel) Studs

- Higher cost
- Higher strength-to-weight ratio
- Fire Retardant



Figure 3: Site Plan

### Support

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