

Abstract: Redeveloping an Abandoned Religious House

This project centers on the redevelopment of a three-story farmhouse that was built in the 1890s and is located on the lakeshore of a Midwestern suburb. The building was a residential home for many years before it was utilized by several religious orders as a residence from the early 20th to 21st centuries. Recently, the house and the 10-acre property it's located on were purchased by the surrounding city. The land is now a public park, despite having limited amenities.

With a desire to transform the location into a community attraction and resource for all, the city provided a Request for Proposal (RFP) to students in a senior engineering design course. Objectives identified in the RFP include:

- Maintaining the historical characteristics of the site
- Respecting the unique, natural beauty of the forested lakeshore
- Providing appropriate treatment of the site's Native American burial grounds
- Generating revenue from the facility, while supporting the local economy
- Providing additional recreational facilities for the community's use of the lake

A team of four students responded with a formal engineering proposal. Study emphasis of the student team spans construction management, structural engineering, geotechnical engineering, and transportation engineering. The students were mentored by a registered architect and a licensed engineer during the process. Additional guidance was provided by three class instructors, all of whom are licensed engineers. A city representative served as the client liaison and contact.

After the proposal's acceptance, three alternative design concepts were developed by the team. All three options include a new building, situated close to the lakeshore, for kayak and canoe rentals and storage, as well as a refreshment stand, first aid station, and restrooms. Additions to the current parking area, including several handicap spaces, are also featured in all alternatives.

The first alternative renovates the existing building to create a coffee shop and catering kitchen. The second renovation alternative includes a restaurant, event space, industrial kitchen, and two-story deck with a lake view. The third alternative demolishes the existing building and replaces it with an open pavilion.

The students presented a preliminary design report with the three alternatives to a panel of judges and mentors. The panel included licensed engineers and architects, members of the public, and a city representative. Three-dimensional modeling was used for virtual walk throughs of each alternative. An evaluation matrix was used to quantify the merits of each alternative. Factors evaluated included the objectives in the RFP, the team's opinion of probable cost, a present worth analysis, and an evaluation of environmental impact. The team recommended the second alternative, which the city selected as well.

With the city's approval, the team proceeded with the final design. Their work product includes a geotechnical report, verification of compliance with applicable codes, structural calculations, drawings, and specifications. The specifications included bid forms, terms and conditions, and sections for key project elements. The student team presented their work in a formal presentation to the client and panel of judges. It included a slide show explaining the design details and considerations used to create the final configuration. A projected construction schedule, final opinion of probable cost, and copies of the project manual were included with the presentation materials.