Northridge Park

Civil Engineering Capstone Spring 2024

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Project Objectives

The objective of this project is to redesign and improve the existing Northridge Park. As pickleball is an increasingly popular sport, it has become necessary to replace the existing cracked and faded tennis courts with four pickleball courts and one new tennis court. This will increase the activities available at the park while not depriving the community of the existing tennis court area.

Figure 1. Northridge Park aerial image.

Design Requirements

- Develop three alternative layouts for project.
- Must have four pickleball courts and one tennis court.
- Use regulation court dimensions, markings, and netting.
- Include court lighting plans consistent with City standards.
- Improve accessibility to courts by adding addition points of access, and providing routes that comply with the Americans with Disabilities Act (ADA).
- Develop cost estimates for each design.
- Analyze cost effectiveness of each design.
- Use typical construction practices for sports courts including using post tensioned concrete slabs.

Alternative Designs

- The use of various lighting features was explored along with their impact on the surrounding residential neighborhoods.
- Introduction of different amenities to be included such as shade structures, benches, and fencing. Impact on cost will be compared to benefit for residents.
- Explore options for landscaping the areas around the courts. Investigate potential impact to maintenance, drainage, and overall aesthetics.

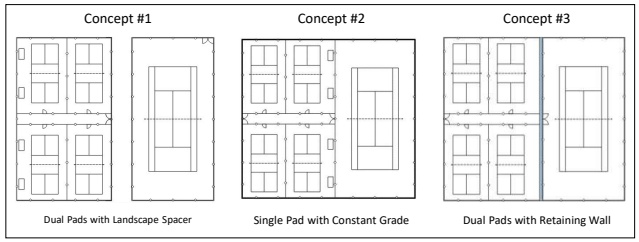

Figure 2. Three Alternatives

Alternative Data Collection Method

As an alternative to the survey data that the city provided, the students decided to use drone photogrammetry to survey the site.

Figure 3. 3D model created using drone photogrammetry.

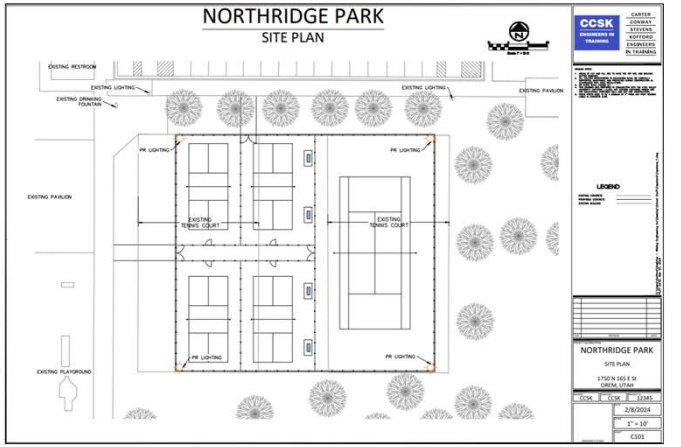

Figure 4. Northridge Park Final Design

Lessons Learned

Students learned about the following processes and software:

- Creating cost estimates.
- Preparing construction drawings.
- Developing Storm Water Pollution Prevention Plans.
- Analyzing storm drain runoff and routing.
- Working with regulatory bodies to meet requirements.
- Iterative design process.
- Using Civil3D to create models in three dimensions.
- The process of collecting survey information using drone photogrammetry.
- Processing survey information using Pixel4Dsurvey to create 3D models.

Software

- Civil3D by Autodesk
- Pixel4Dsurvey
- Microsoft Excel

Resources

- Survey information
- Examples of similar projects