

Proposal for
Camp Verde Community Park Infrastructure

Prepared for:
Ron Long
Camp Verde Town Engineer

Submitted by:

Steven Tallas

Elwid Mubarak

Dejan Dudich

LeAnne Little

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Project Personnel

Elwid Mubarak

Currently an Environmental Engineering undergraduate student at Northern Arizona University. Expected date of graduation is December 2013.

The student has taken the following classes that are related to the capstone project, and has the following background information for each class:

- CENE 333: Water Resources
- CENE 410: Unit Operations in Environmental Engineering
- CENE 332: Solid and Hazardous Waste Management
- CENE 383: Geotechnical Engineering

Dejan Dudich

Working towards a B.S. in Civil Engineering, at Northern Arizona University. With an expected graduation date of December 2013.

Has taken several classes that pertain to the project and form a background from which to satisfactorily work with.

- Cene 420: traffic and signal studies
- Cene 543: Urban Transportation Planning
- Cene 333: Hydraulics/ water resources
- Cene 383: Geotechnical Engineering
- Cene 336: Water resources 2/ hydrology and flood control.

LeAnne Little

Working towards a B.S. in Civil Engineering, at Northern Arizona University.

Has experience with working in a team on engineering fundamental designs.

The following classes taken are relevant to technical engineering writing and in designing an entry road.

- Introduction to Engineering Design
- Engineering Design: Process
- Engineering Design: The Methods
- Computer Aided Drafting
- Water Resources Lab
- Surveying
- Traffic Study and Signal
- Highway Engineering

LeAnne Little will be designing the entry road to Camp Verde's new 118-acre park. The design of horizontal and vertical alignments, cross-sections, roadside design, and drainage system are the following perimeters LeAnne will aid in design.

Steven Tallas

Currently an Environmental Engineering undergraduate student at Northern Arizona University. Expected date of graduation is December 2013.

Has taken several classes that pertain to the project and form a background from which to satisfactorily work with.

- CENE 333: Water Resources
- CENE 410: Unit Operations in Environmental Engineering
- CENE 332: Solid and Hazardous Waste Management
- CENE 383: Geotechnical Engineering
- CENE 485: Leupp Family Farms conservation/solar planning

WORK PLAN

Introduction:

The Town of Camp Verde is planning to construct a Community recreation Park that will include baseball fields, BMX course, Soccer and football fields, trails, picnic areas and more recreation activities. The park is planned to be built on an undeveloped 118 acres of land that the city has purchased. There are currently no engineered plans except topography maps, minor surveying maps, and a conceptual plan for the future.

Understanding and Approach

The proposed Camp Verde Community Park is located on a 118 acre parcel of land on the east side of Camp Verde located between McCracken Lane and State Route HWY 260. While a Conceptual plan for the park layout is available and no Engineering plans have been developed paper at this time. The 118 acres are situated right in front of an ADOT drainage basin and the parcel has significant topographical challenges with an estimated 5% slope falling from the northeast to the southwest approximately.

The proposed project will provide preliminary engineering and environmental services to successfully guide and facilitate the construction and completion of the Community Park in Camp Verde. Key objectives for this project include:

- Designing a road for the main park entrance.
- Designing and laying out the internal roads of the park.
- Develop a comprehensive grading plan with drainage analysis.
- Layout of Park plumbing and a presentation of alternative plumbing ideas with a recommendation for the optimal solution.

To achieve these objectives a carefully planned approach that emphasizes these elements is summarized below and detailed in the scope of services.

Tasks:

1. Team Management

a. Client and Technical advisor meetings

Technical design meetings will be coordinated with the Town of Camp Verde engineer Ron Long and the groups Technical Advisor Mark Lamar. A minimum of 8 meetings will be held during the projects duration.

Deliverable: Meeting minutes and action items

b. Group meetings

Meetings will serve as the primary forum for reviewing the status of the project and identifying and resolving project issues. Meetings will be held at a minimum once a week.

Deliverable: Meeting minutes and action items

2. Review documents and existing plans

a. Review concept plan

b. Review existing utilities, roads, and drainages

Deliverable: memo with subtasks

3. Existing maps

a. Topography

b. Other

Deliverable: site plan

4. Site Visit

A site visit is essential to the understanding of the scope of the project. A visit will be coordinated with the Client to conduct a field review. This review will be to identify and document physical features, potential design constraints, and environmental considerations. Field information will be recorded using field notes and digital photos.

Deliverables: Field notes and photographs of site

5. Determine expected use

- a. Population
- b. Traffic
- c. other

Deliverable: Park usage

6. Water Resources Systems - This task is composed of irrigation, sewer, storm drains, potable water, and well drilling. There is no development on the site so our task would be to develop the best possible locations for each of the utilities. There would be a cost analysis on each locations analyzed. The first location to be investigated would be the location given to us by the client. The client also mentioned there was a sewer plant with than half a mile away. Also mentioned was the fact that the Verde River flows nearby and is a potential source of both irrigation and potable water.

- a. Irrigation

Deliverable: irrigation plans and data on different types of irrigation methods

- b. Drainage

Deliverable: topography map of possible drainage sites

- c. Drinking water

Deliverable: possible drinking water locations

- d. Wastewater

Deliverable: Possible wastewater management areas and methods

Deliverable: a description of different scenarios of each plan. The scenarios would be composed of going the traditional route or using the new sustainable techniques. There would be a cost analysis of each system.

7. Roadway Design Task:

A proposal of one-fifth a mile roadway design which is off of Highway 260 will contain the following perimeters: horizontal and vertical alignment subtasks, cross sections, roadside design concepts, and drainage systems. All subtasks will comply with American Association of State Highway and Transportation Officials (AASHTO), Arizona Department of Transportation (ADOT), and Maricopa County Department of Transportation (MCDOT) regulations/requirements.

a. Horizontal Alignment Subtask:

- Bearings
- Distances
- Stations
- Calculations

Deliverables: Horizontal alignment design and calculations

b. Vertical Alignment Subtask:

- Vertical curve designs
- Elevations
- Sight distances
- Earthworks (cut and fill)
- Calculations

Deliverables: Vertical alignment design and calculations

c. Cross-Sections Subtask:

- Lanes
- Crowns
- Shoulders
- Ditches
- Control drawings
- Calculations

Deliverables: Design control drawings and cross-sectional calculations

d. Roadside Design Subtask:

- Clear zones
- Roadside geometry (fore slope, back slope, and drainage)
- Longitudinal barriers (guardrails where needed)
- Bicycles and pedestrians road design
- Calculations

Deliverables: Typical cross-section design drawings and calculations

e. Drainage System Subtask:

- Surface drainage (runoff, rainfall intensity, & area)
- The rational method for small drainage areas
- Watershed delineation
- Culvert performance and design
- Drainage calculations

Deliverable: Drainage design and calculations

Staffing Plan:

Table 1.0 shows the staffing plan on how the tasks will be divided among the team members. Each member will work equal hours with a total of 530 hours for the overall project.

Task	Dejan (hrs)	LeAnne (hrs)	Elwid (hrs)	Steven (hrs)	Total (hrs)
Project Management	5	5	5	5	20
Review Documents & Existing Plans	1.25	1.25	1.25	1.25	5
Existing Maps	1.25	1.25	1.25	1.25	5
Site Visit	1	1	1	1	4
Determine Expected Use	4	4	4	4	16
Water Resource Systems	0	0	120	120	240
Roadway Design	120	120	0	0	240
Total	132.5	132.5	132.5	132.5	530

Table 1.0: Staffing Plan

Budget:

Table 2.0 shows how the each team member will have a minimum hourly pay rate of thirty dollars. The overall project is estimated to cost \$15,900.

Task	Civil Engineer	Civil Engineer	Env. Engineer	Env. Engineer	
Project Management	5	5	5	5	
Review Documents & Existing Plans	1.25	1.25	1.25	1.25	
Existing Maps	1.25	1.25	1.25	1.25	
Site Visit	1	1	1	1	
Determine Expected Use	4	4	4	4	
Water Resource Systems	0	0	120	120	
Roadway Design	120	120	0	0	
Total Estimated Hours	132.5	132.5	132.5	132.5	
Base Hourly Rate (\$)	30	30	30	30	
Total Cost (\$)	3975	3975	3975	3975	15900

Table 2.0: Budgeting Plan

Scheduling Plan:

Figure 1.0 provides the scheduling plan of when each task will be completed by either the whole team or by individual members. The scheduling plan maybe modified in the future. See last page of the proposal report for the full size scheduling plan.

Camp Verde Community Park Infrastructure

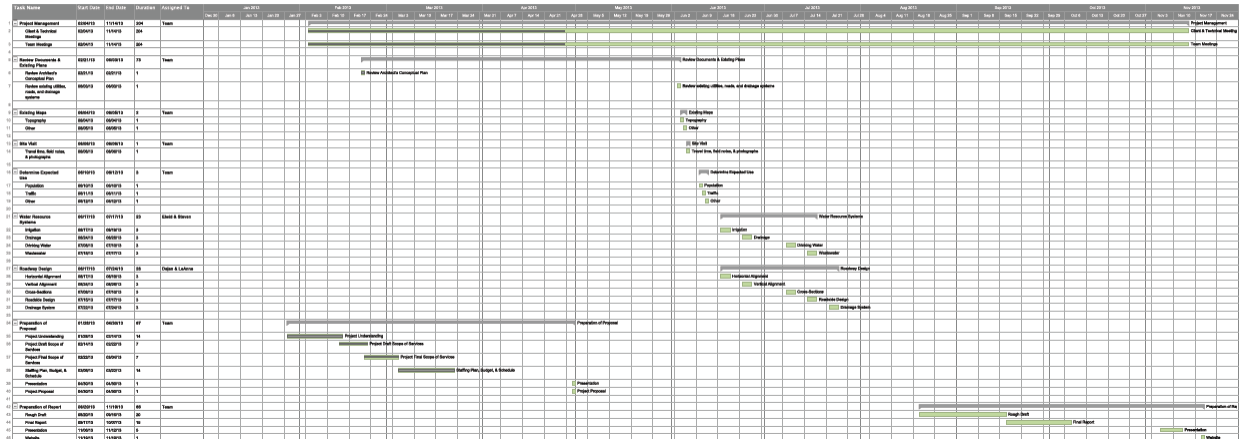


Figure 1.0: Scheduling Plan

Conclusion:

The four major objectives will be adhered to help in design of the construction of the new 118 acre community park located on the east side Camp Verde. The identified tasks will help in developing engineering plans for delivery to the client Ron Long-Town of Camp Verde Engineer.