

Trax Retaining Wall: CENE 476 Project Proposal Presentation

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The logo for Wall E. Wallerson & Associates Inc. (WEW) is located in the bottom left corner. It consists of the letters "WEW" in a bold, serif font, set within a dark rectangular box with a light-colored border. The background of the slide is a light-colored stone or brick pattern.

WEW

Project Introduction

Purpose:

- Design a retaining wall which allows the land owner, Trax, to maximize land use, including the proposed construction of the Holiday Inn, its parking lot, and the adjacent Flagstaff Urban Trail System (FUTS) trail.

Goals:

- Design a suite of three retaining walls.
- Recommend one design to client.

Stakeholders:

- Client- Steve Irwin, Shephard-Wesnitzer Inc.
- Technical Advisor- Thomas Nelson
- City of Flagstaff

Location

Figure 1: Project Location

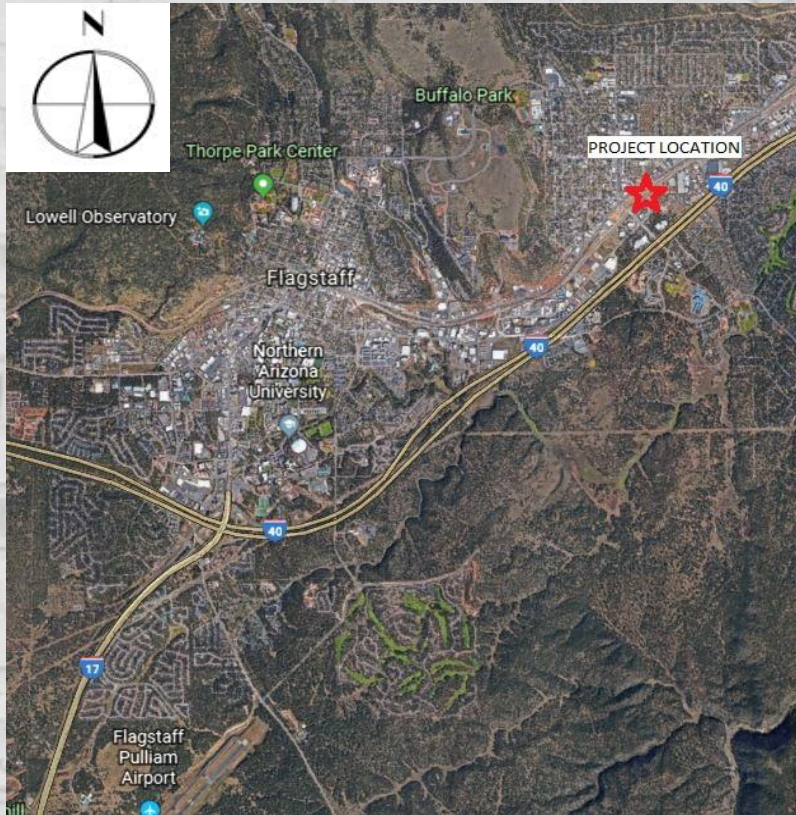
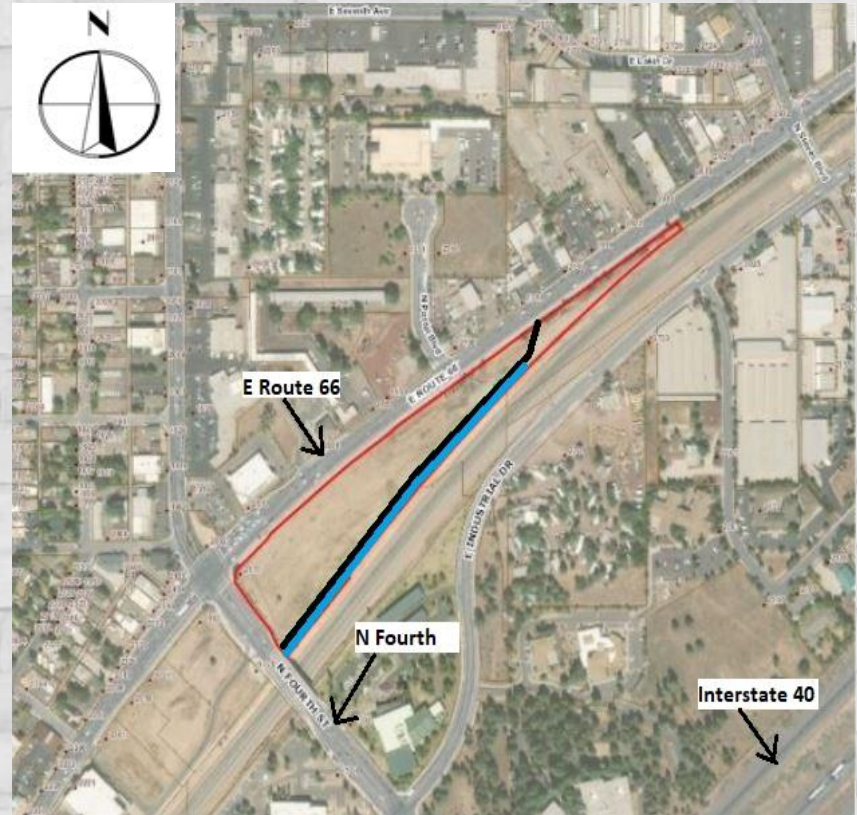


Figure 2: Proposed Retaining Wall Alignment



Location

Figure 3: West Wall Location



Figure 4: East Wall Location



Scope of Engineering Services

Task 1.0: Site Investigation

Task 2.0: Field Sampling

- Task 2.1 Field Work Plan
 - Field Safety Plan
 - Sampling Plan
 - Sample Transportation
- Task 2.2 Field Work
 - 3 to 5 soil samples
 - NAU's boring equipment
 - Transportation of samples to NAU lab facilities

Figure 5: Site Soil



Figure 6: Boring Equipment



Task 3.0: Geotechnical Analysis

- Task 3.1 Sieve Analysis: Soil particle size distribution
- Task 3.2 Hydrometer: Soil particle size distribution
- Task 3.3 Atterberg Limits: Plastic and liquid limits
- Task 3.4 Sand-cone: Soil density
- Task 3.5 Tri-Axial: Shear strength
- Task 3.6 Consolidation: Long term settlement

Figure 7: Sieve Analysis



Figure 8: Atterberg Limit



Task 4.0: Hydrological Analysis

- Task 4.1 Watershed Delineation
- Task 4.2 Time of Concentration
- Task 4.3 Storm Event Runoff

Task 5.0: Hydraulics

- Task 5.1 Proposed Water Drainage
- Task 5.2 Pre/ Post Floodplain Mapping
- Task 5.3 Low Impact Development

Task 6.0: Wall Design

- Task 6.1 Wall Designs Options
 - Design Suite
 - FUTS handrail and connections
- Task 6.2 Plans and Profiles
 - Civil 3D
- Task 6.3 Final Design Recommendations

Figure 9: Existing Retaining Wall



Task 7.0: Impacts

- **Environmental:**
 - Impacts on the natural hydrology
- **Economic:**
 - Impacts on the nearby economy
 - Impact on Railroad
- **Societal:**
 - Impacts upon the community
 - Encourages physical activity

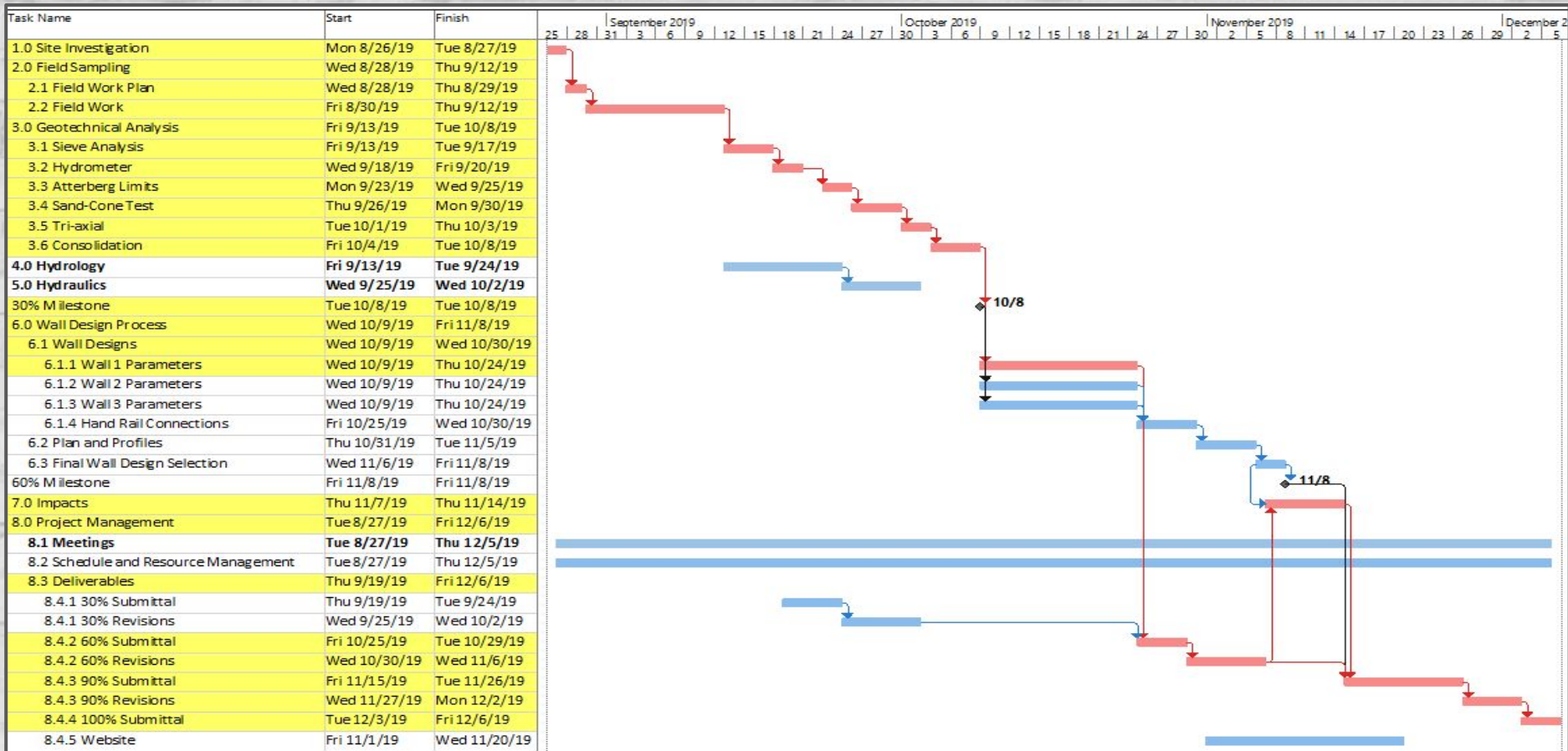
Task 8.0: Project Management

- **Meetings**
 - Team Meetings
 - Grading Instructor Meetings
 - Technical Advisor Meetings
 - Client Meetings
- **Schedule and Resource Management**
- **Deliverables**
 - 30% Report and Presentation
 - 60% Report and Presentation
 - 90% Report and Website
 - 100% Final Report, Presentation, and Website

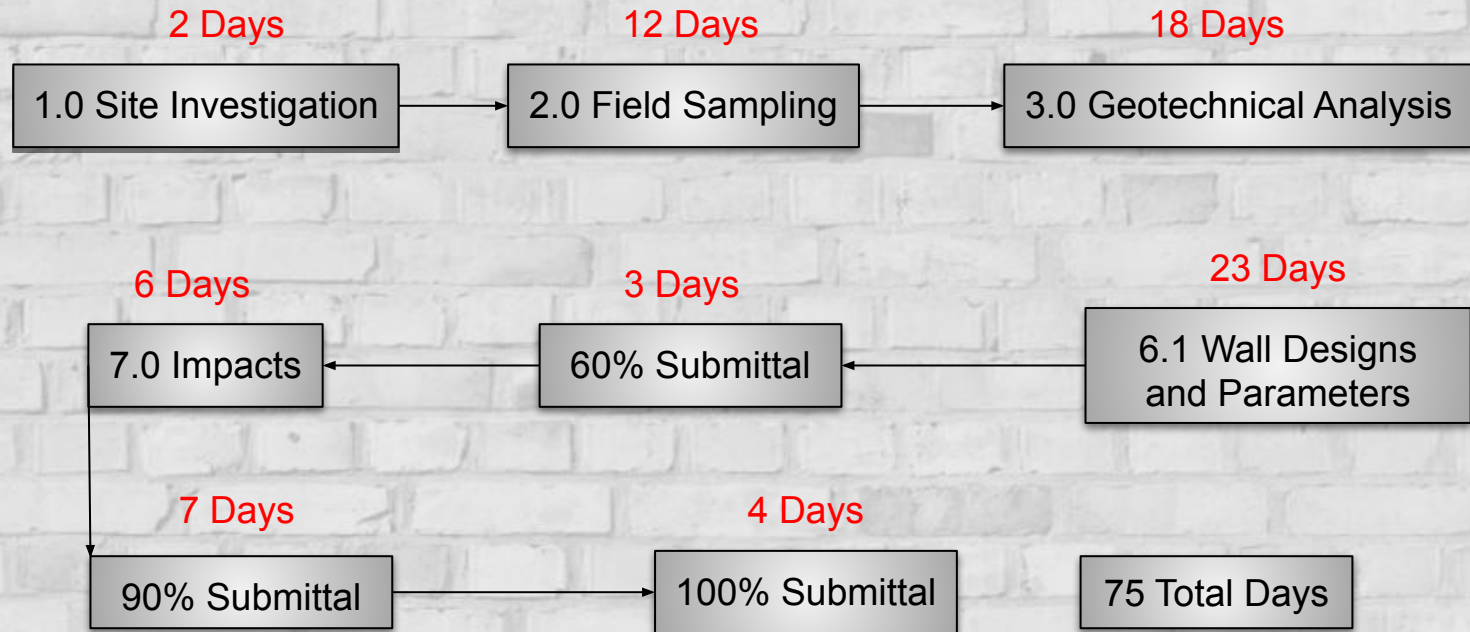
Exclusions

- Survey Data: Client will provide grading and drainage plans
- Environmental Impact Study/Report: Completed before construction
- FUTS Trail Design: Trail design not accounted for in scope of services
- TTC Plan: Temporary Traffic Control Plan not accounted for in scope of services

Schedule



Critical Path



Staffing

Task	Hours Per Staff Member			Total Hours
	Sr. ENG	Assoc. ENG	EIT	
1.0 Site Investigation	3	3	3	9
2.0 Field Sampling				
2.1 Field Work Plan	1	1	7	9
2.2 Field Work	1	9	20	30
3.0 Geotechnical Analysis				
3.1 Sieve Analysis	1	2	15	18
3.2 Hydrometer	1	2	15	18
3.3 Atterberg Limits	1	2	15	18
3.4 Sand-Cone Test	1	2	15	18
3.5 Tri-axial	1	2	15	18
3.6 Consolidation	1	2	15	18
4.0 Hydrology				
4.1 Watershed Delineation	1	3	8	12
4.2 Time of Concentration	2	6	16	24
4.3 Storm Event Runoff	1	3	8	12
5.0 Hydraulics				
5.1 LID Development	1	3	8	12
5.2 Pre/Post Floodplain Map	1	3	8	12
5.3 Proposed Water Disbursement	1	3	8	12
30% Milestone				

Task	Hours Per Staff Member			Total Hours
	Sr. ENG	Assoc. ENG	EIT	
6.0 Wall Design Process				
6.1 Wall Designs	4	48	38	90
6.2 Plan and Profiles	1	1	7	9
6.3 Final Wall Design Selection	2	6	1	9
60% Milestone				
7.0 Impacts	3	3	3	9
8.0 Project Management				
8.1 Meetings				
8.1.1 Team Meetings	10	10	10	30
8.1.2 Grading Instructor Meetings	15	15	15	45
8.1.3 Technical Advisor Meetings	8	8	8	24
8.1.4 Client Meetings	2	2	2	6
8.2 Schedule and Resource Management	16	3	1	20
8.3 Deliverables				
8.3.1 30% Submittal and Revisions	1	6	17	24
8.3.2 60% Submittal and Revisions	1	6	17	24
8.3.3 90% Submittal and Revisions	6	12	30	48
8.3.4 100% Submittal	1	6	17	24
8.3.5 Website	4	10	14	28
PROJECT TOTALS	92	182	356	630

Cost of Engineering Services

Item	Description	Cost per Unit	Number of Units	Units	Cost
1.0 Personnel:	Sr. Eng.	\$200	92	Hours	\$18,400
	Assoc. Eng.	\$140	182	Hours	\$25,480
	EIT	\$90	356	Hours	\$32,040
	Total Personnel:				\$75,920
2.0 Supplies:	Lab Rental	\$100	108	Hours	\$10,800
3.0 Travel	12 miles round trip @ 10 visits	\$0.62	120	Miles	\$74
4.0 Total					\$86,794

References

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- [2] Gismaps.coconino.az.gov. (2019). *Coconino Parcel Viewer*. [online] Available at: <https://gismaps.coconino.az.gov/parcelviewer/> [Accessed 25 Feb. 2019].
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Questions?