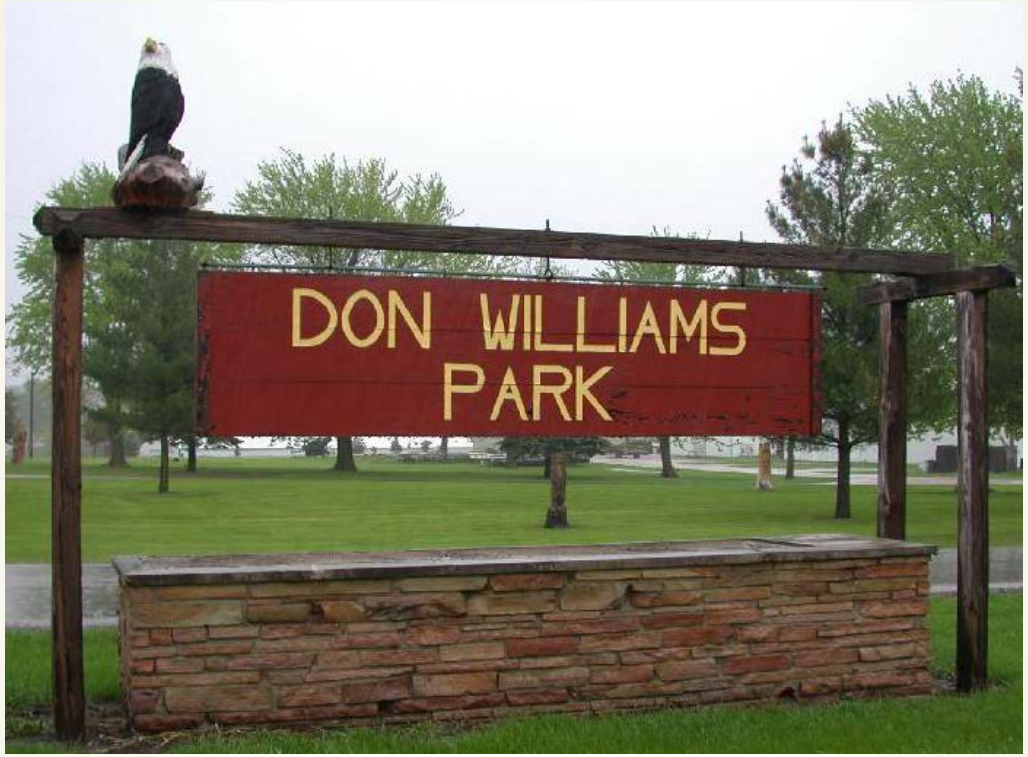
Open Shelter at Forney's Point



JTC Engineering

Members: Cristian Treto, John Hill, Tyler Conkling

Today's Outline

- Project Team Members
- Scope of Work/Descriptions
- Design Methods/Constraints
- Proposed Designs
- Total Projected Costs for Designed Project

Project Team

- Cristian Treto, Project Manager
  - Hydraulic Analysis and Cost Estimates
- John Hill, Technical Services
  - Design of Roadway and Parking Lot
- Tyler Conkling, Editor
  - Structural Modeling and Design Analysis of Pavilion

Project Objectives

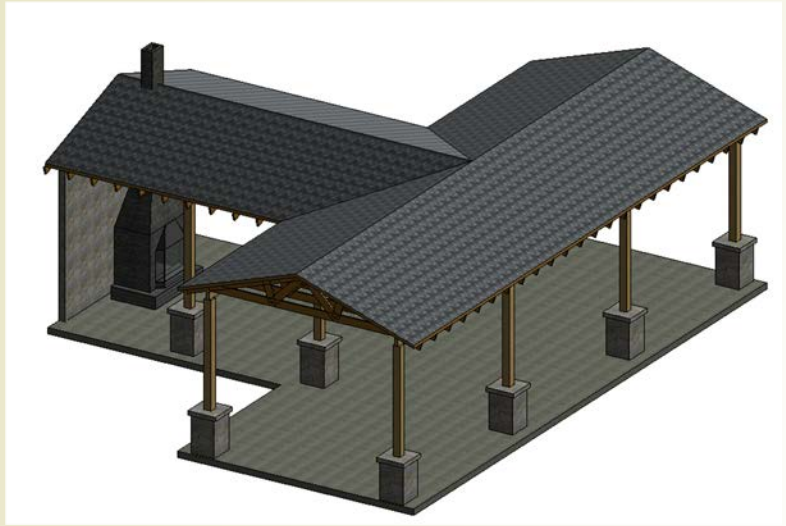
Don Williams Lake

Social Gatherings

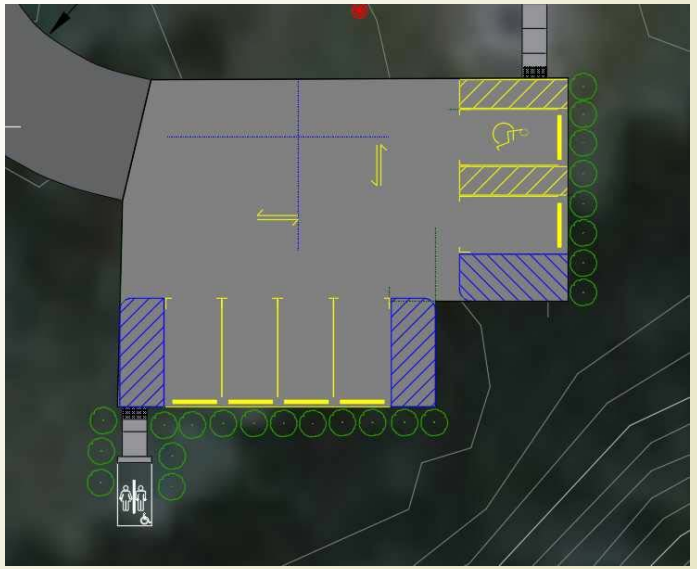
Accesibility

Osprey Viewing

Project Scope



- Overlook Pavilion
- Roadway
- Parking Lot
- Bathroom



Design Methods

Design Standards

Hydraulic Analysis: Iowa DOT, SUDAS

Pavilion Design: ADA, IBC, ASD, AWC-NDS , ACI

Road and Parking Lot Design: SUDAS

Design Tools

Architectural Design: Autodesk Revit

Pavilion Load Analysis: Autodesk Robot Structural Analysis

Site Design: ArcMaps GIS, Civil 3D, Hydroflow Express

Road and Parking Design: Civil 3D

Design Constraints & Challenges

Challenges

- Unique Topography
- Incorporate Osprey Breeding Nest

Constraints

- Budget knowledge
- Tree preservation

Proposed Site Plan

Osprey Background

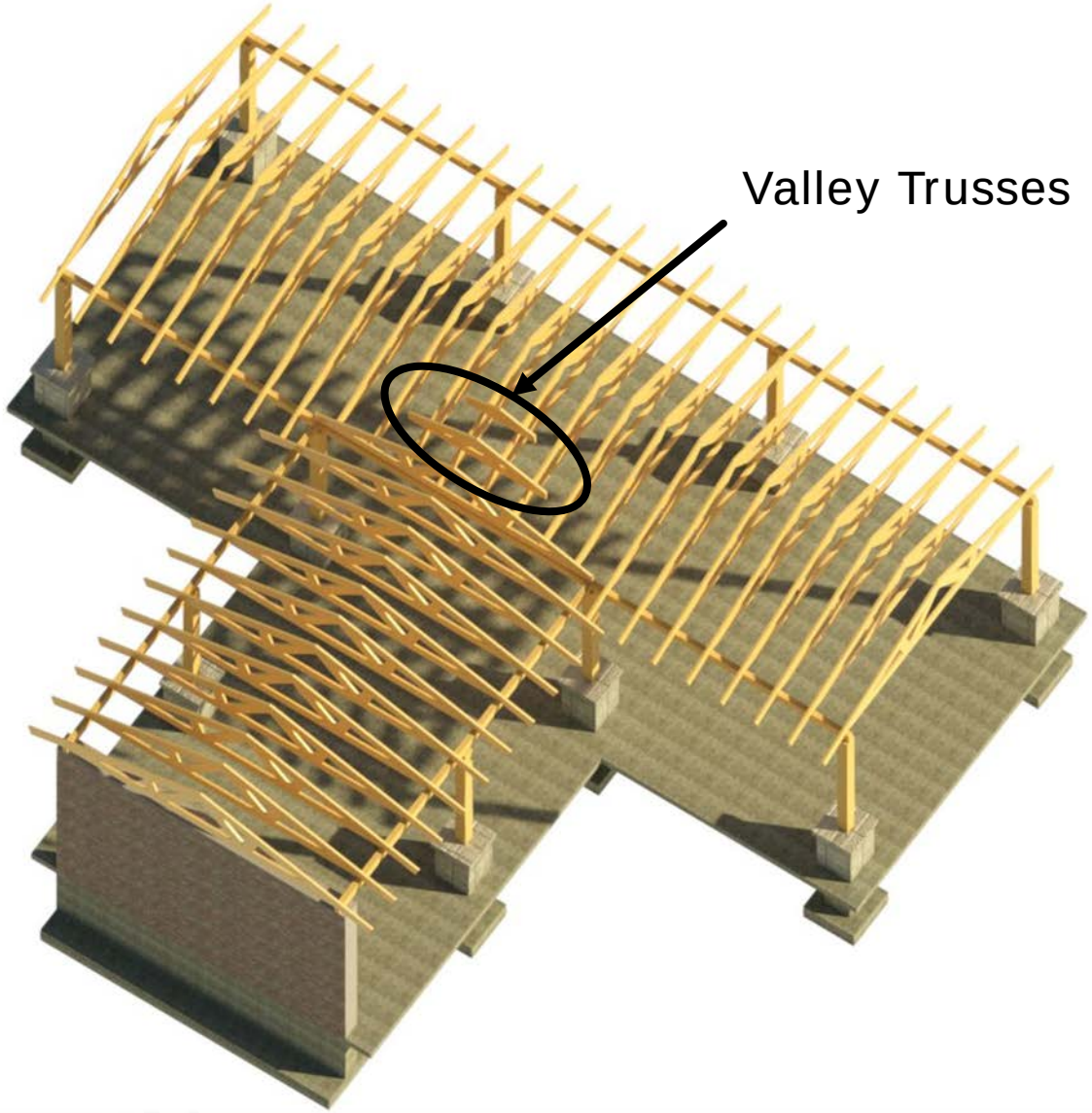
- Very Protective of Offspring
- Nests ~ 50-100m from activity

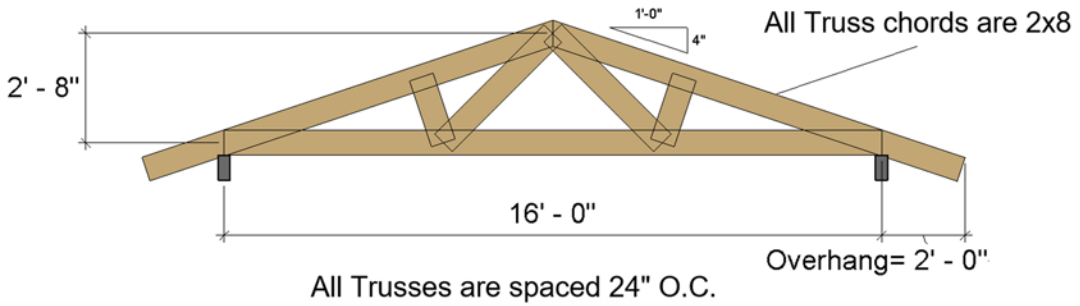
Pavilion Concepts

Final Pavilion Design

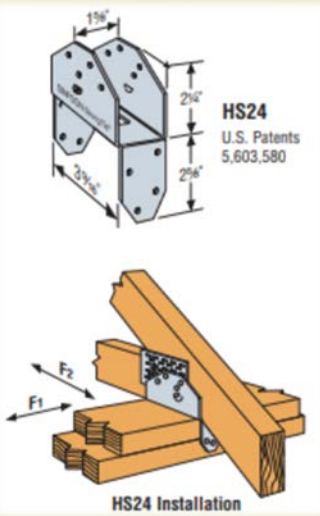
Total Cost: $52,000

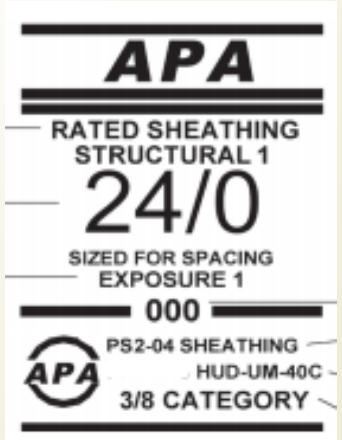
Roof Design





- Tie Connections:



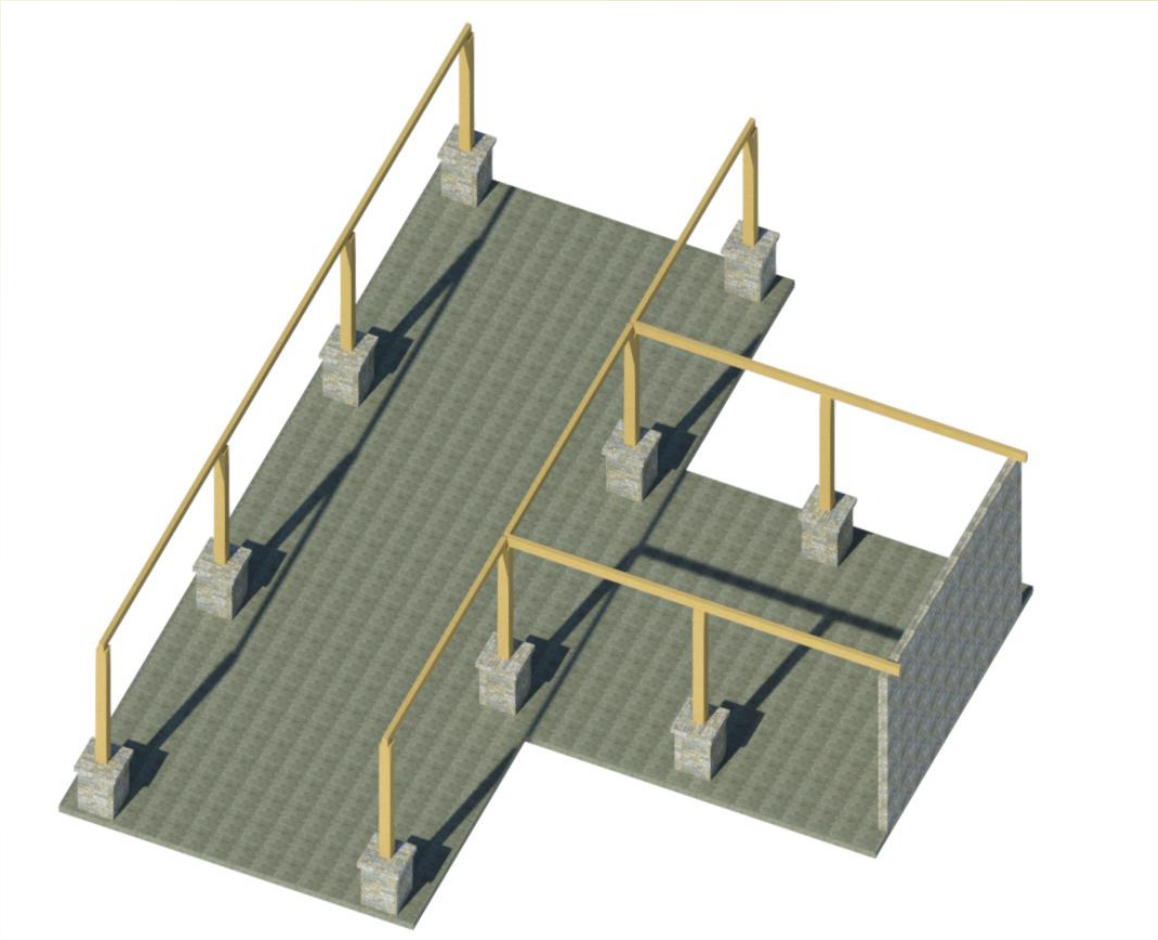


SIMPSON Strong-Tie

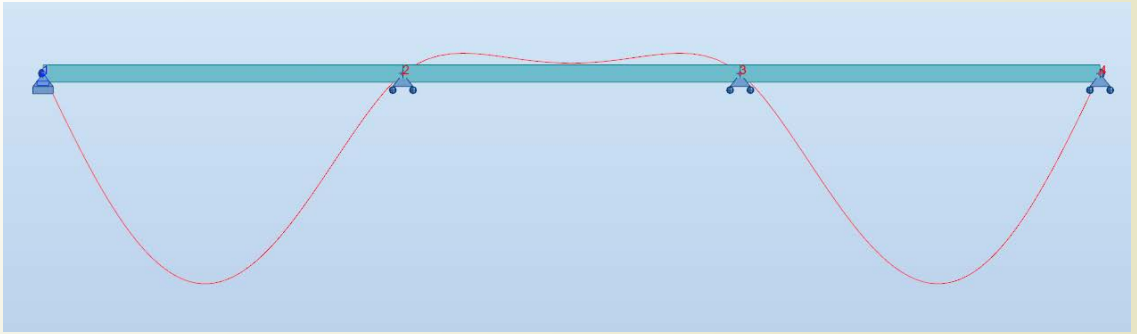
Beam Design

Span of 16’-0”

All members 6x10

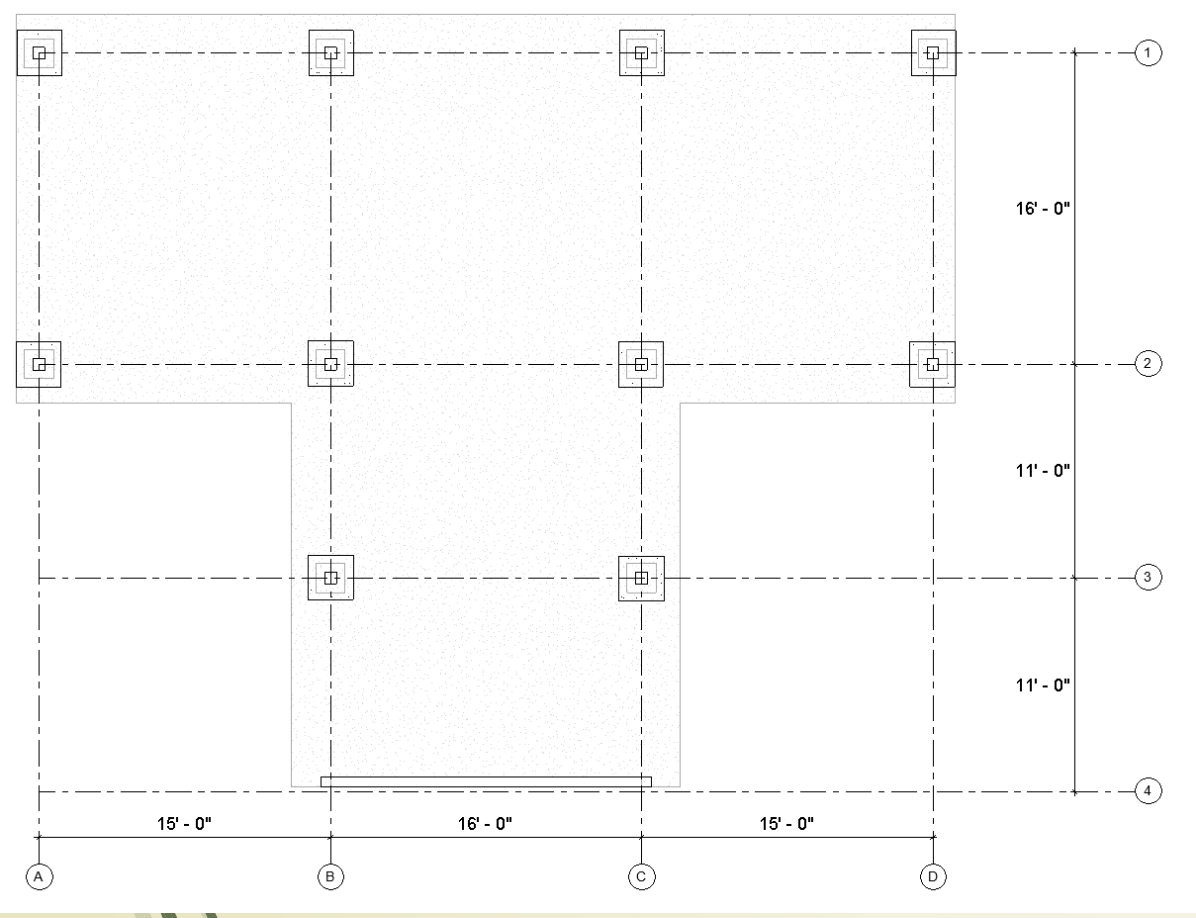


- Beam Governed by Deflections:
  - Short Term Deflection $\delta \geq \frac{L}{240}$
  - Long Term Deflection $\delta \geq \frac{L}{360}$

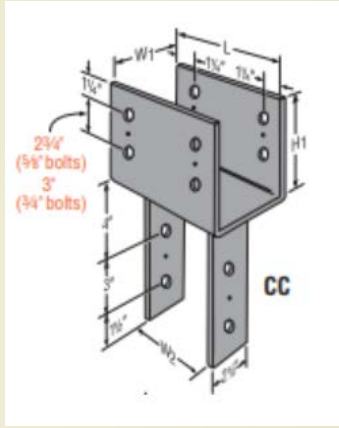


Column Design

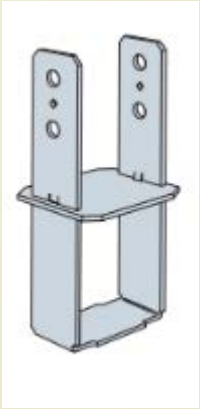
8x8 Timber Columns



- Column Cap:

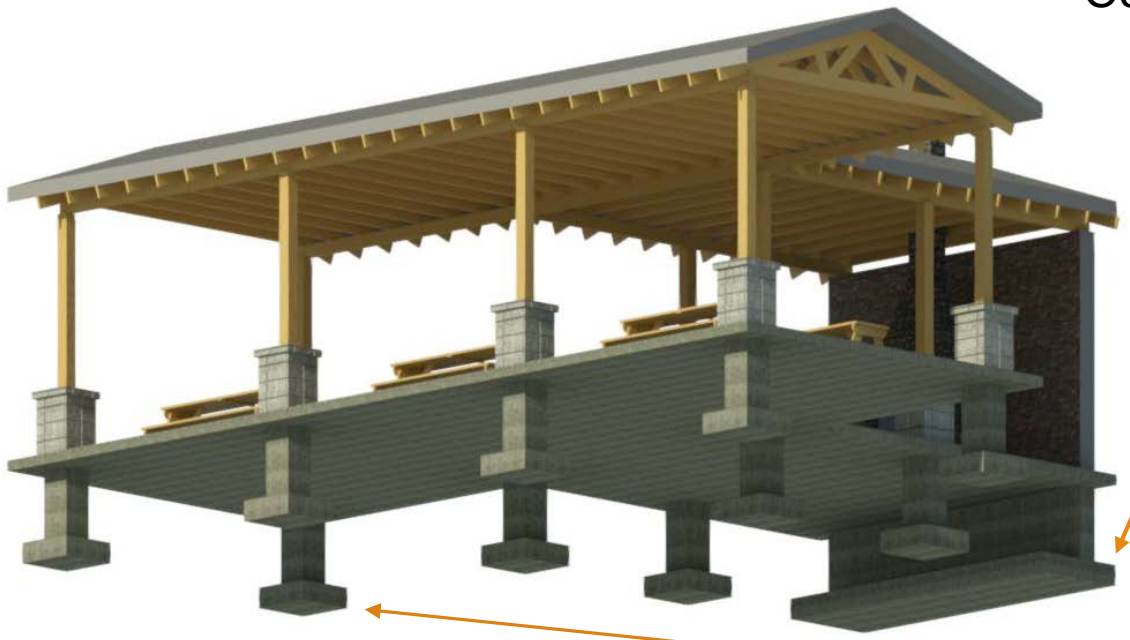


- Column Base:

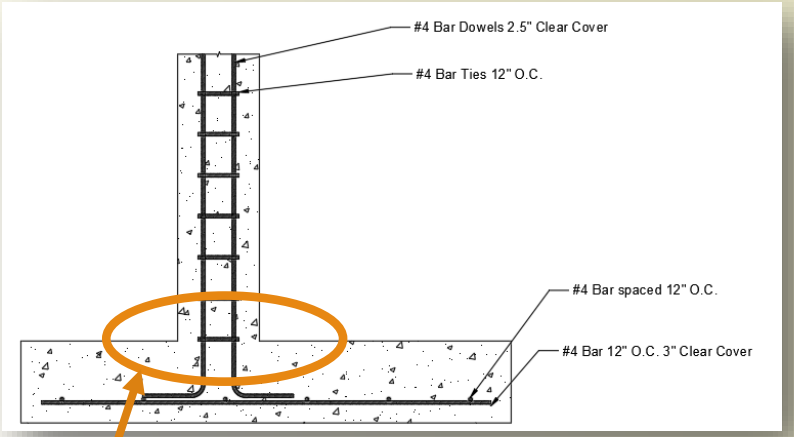


SIMPSON Strong-Tie

Pavilion Foundation

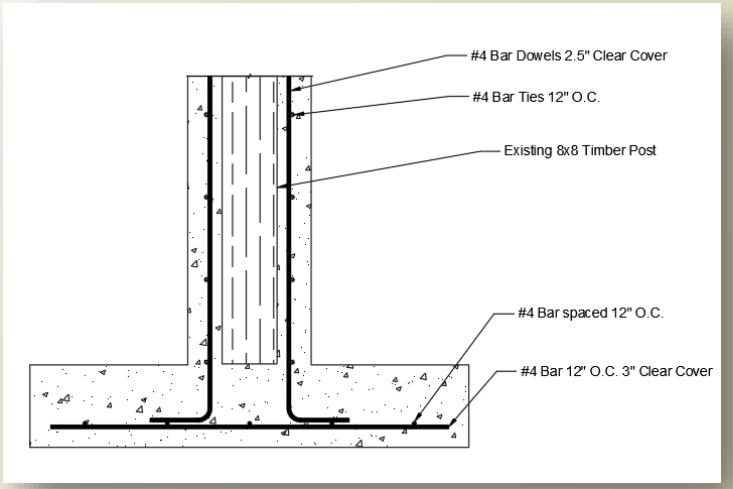


Continuous Footing:



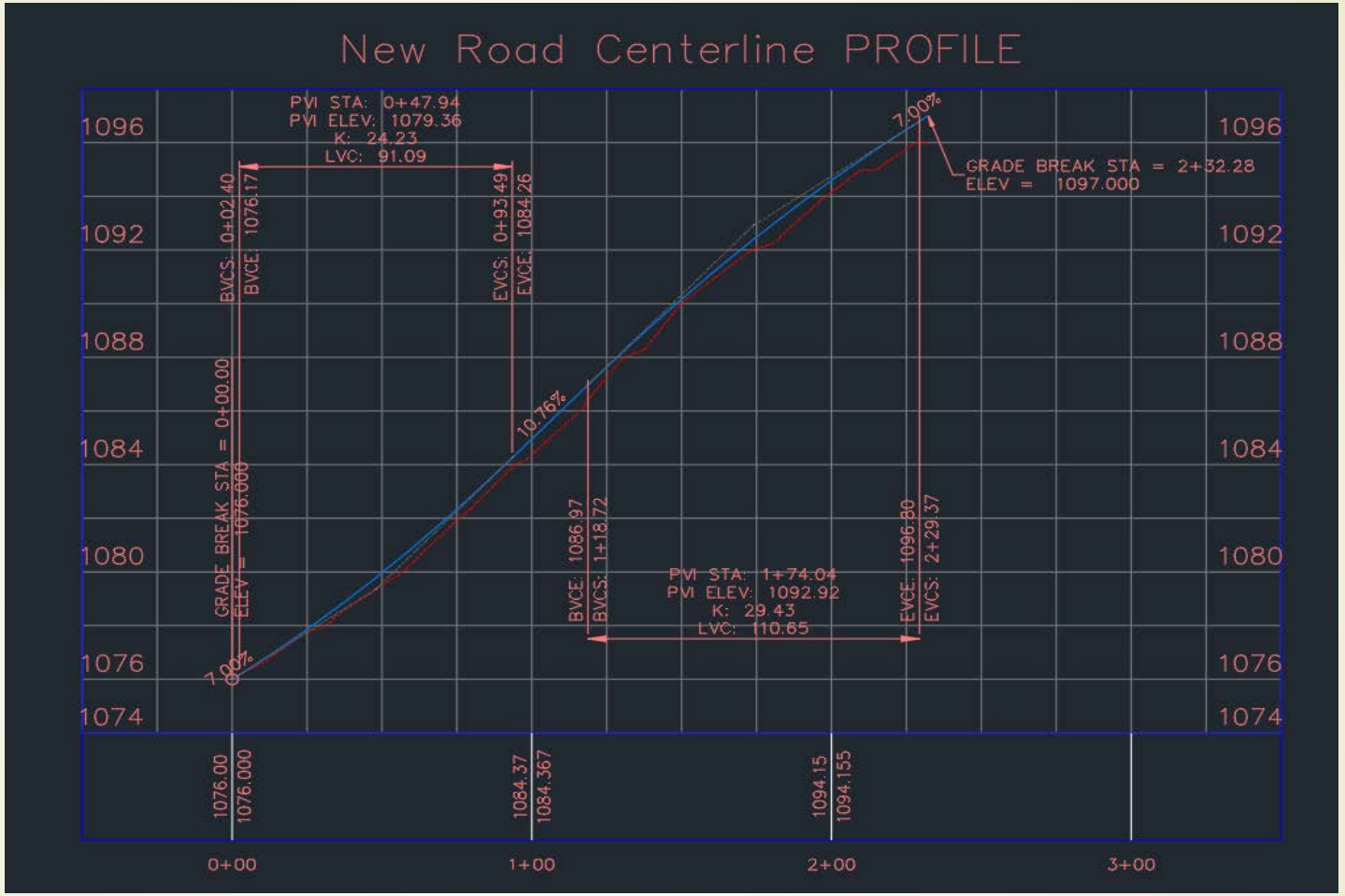
Eccentric Loading

Spread Footings:



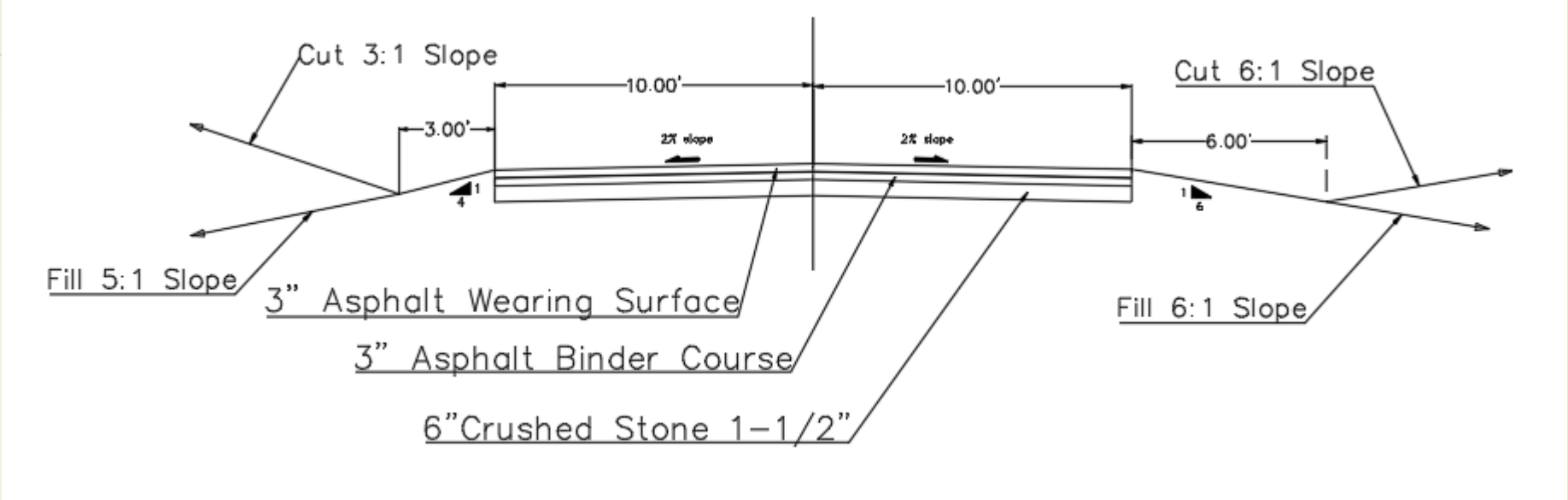
- 42” Frost Line in Boone County

Proposed Road Details



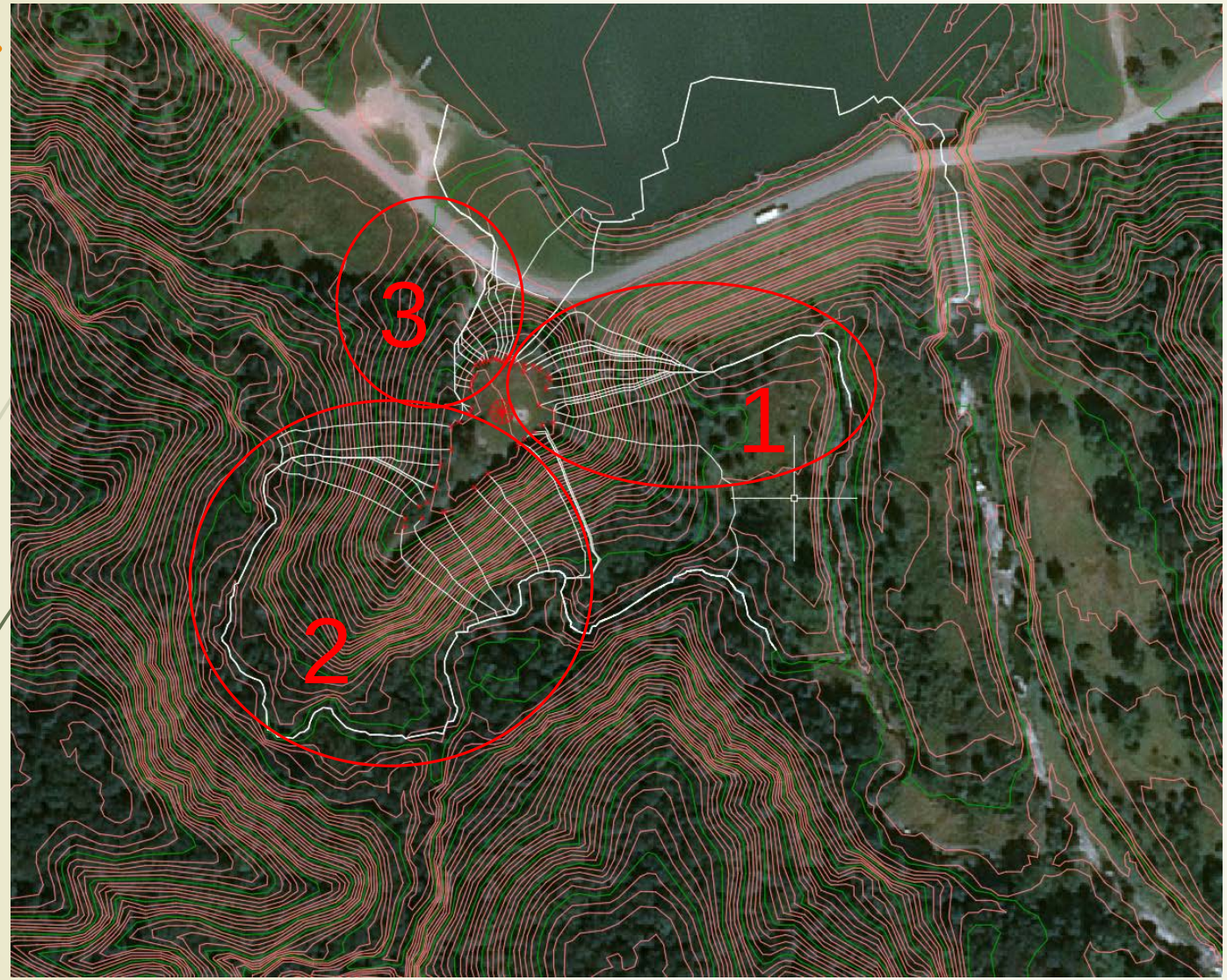
Material Alternatives	Asphalt	Concrete
Price:	$21,000	$22,500

Recommended Roadway Design



- All layers consist of densely fine graded asphalt with PG Binder 58-28S and a mix size of ½"

Drainage Plan



Predevelopment Drainage

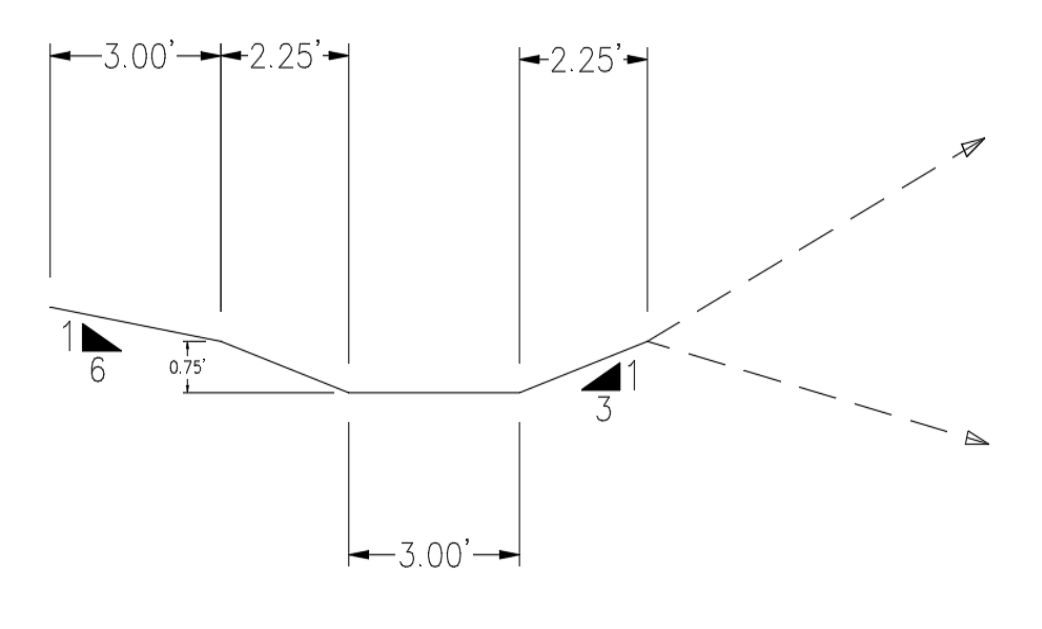
- Rational Method- Iowa DOT Design Manual
- Designed for 10 Year Storm

Predevelopment Drainage Quadrant	Peak Flow (CFS)	Rainfall Intensity (in/hr)
1	0.96	7.238
2	1.26	8.251
3	1.30	7.238

Developed Drainage Plan

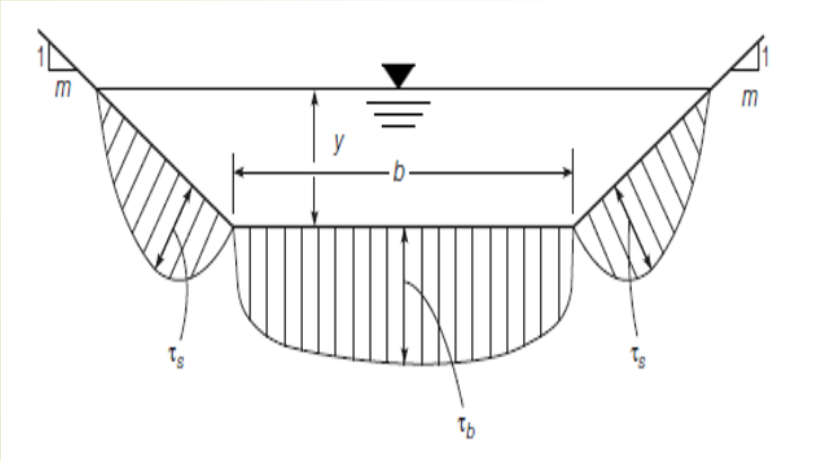
- Drainage Management Measures
  - Two grass lined Open Channels
  - Bio-Infiltration Swale removes pollutants

Post Development Drainage Results		
Post Development Drainage	Peak Flow (CFS)	Rainfall Intensity (in/hr)
1 Central Zone	2.5	5.675

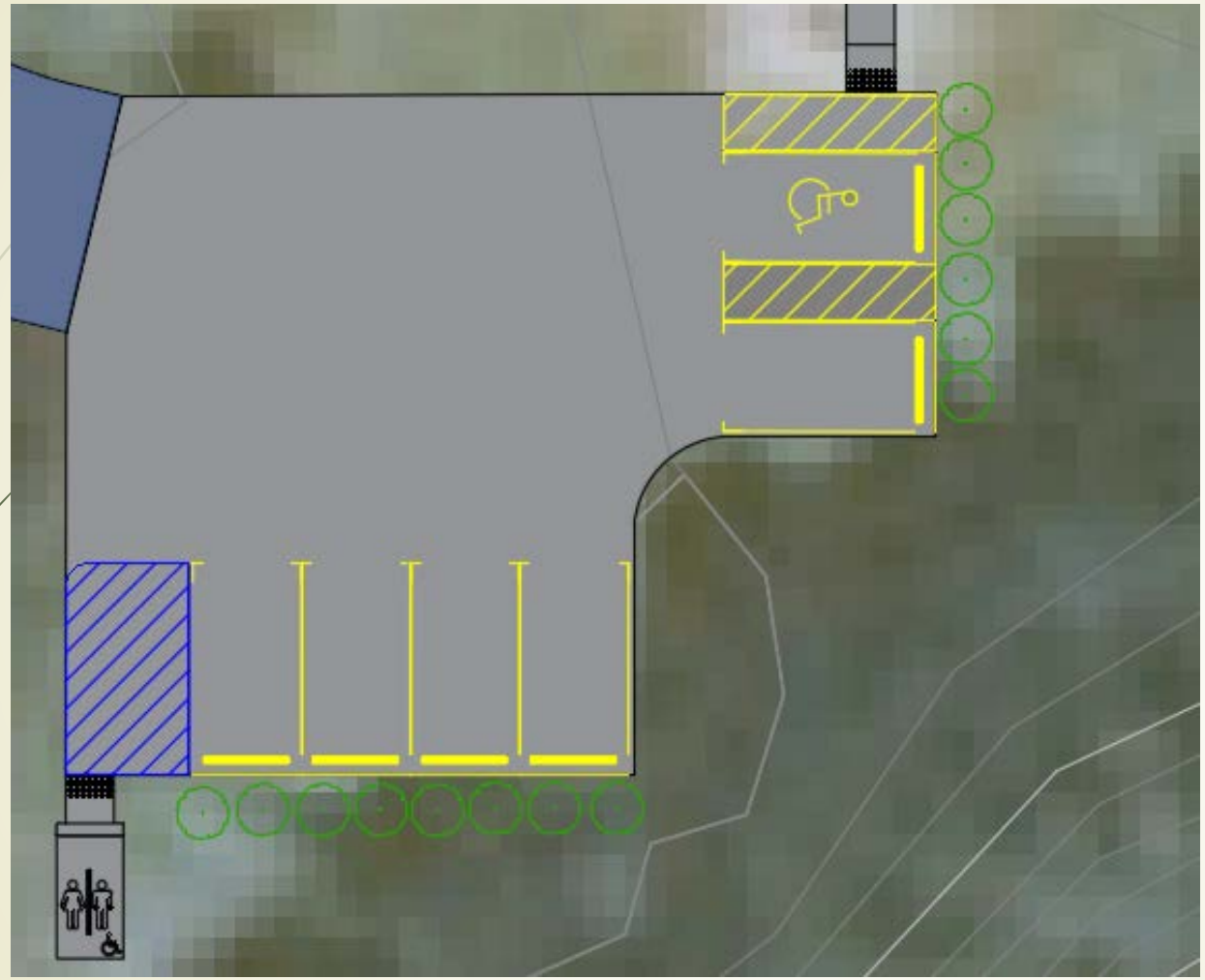


Erosion Control

- Erosion Control
  - Shear Force Analysis
  - Riprap implementation/locatio



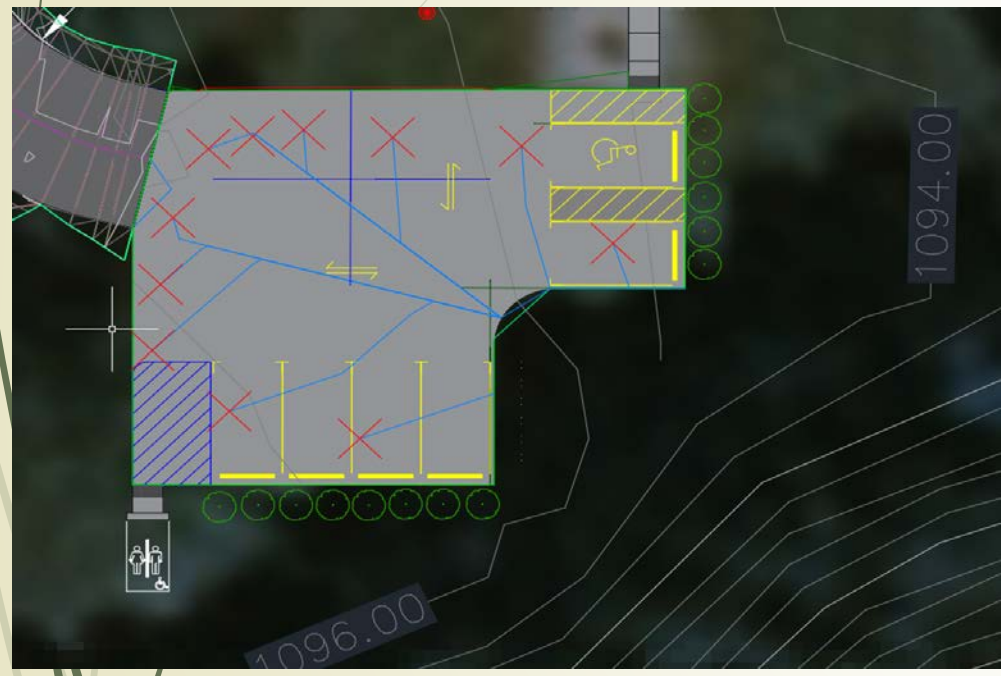
Parking Lot & Landscaping

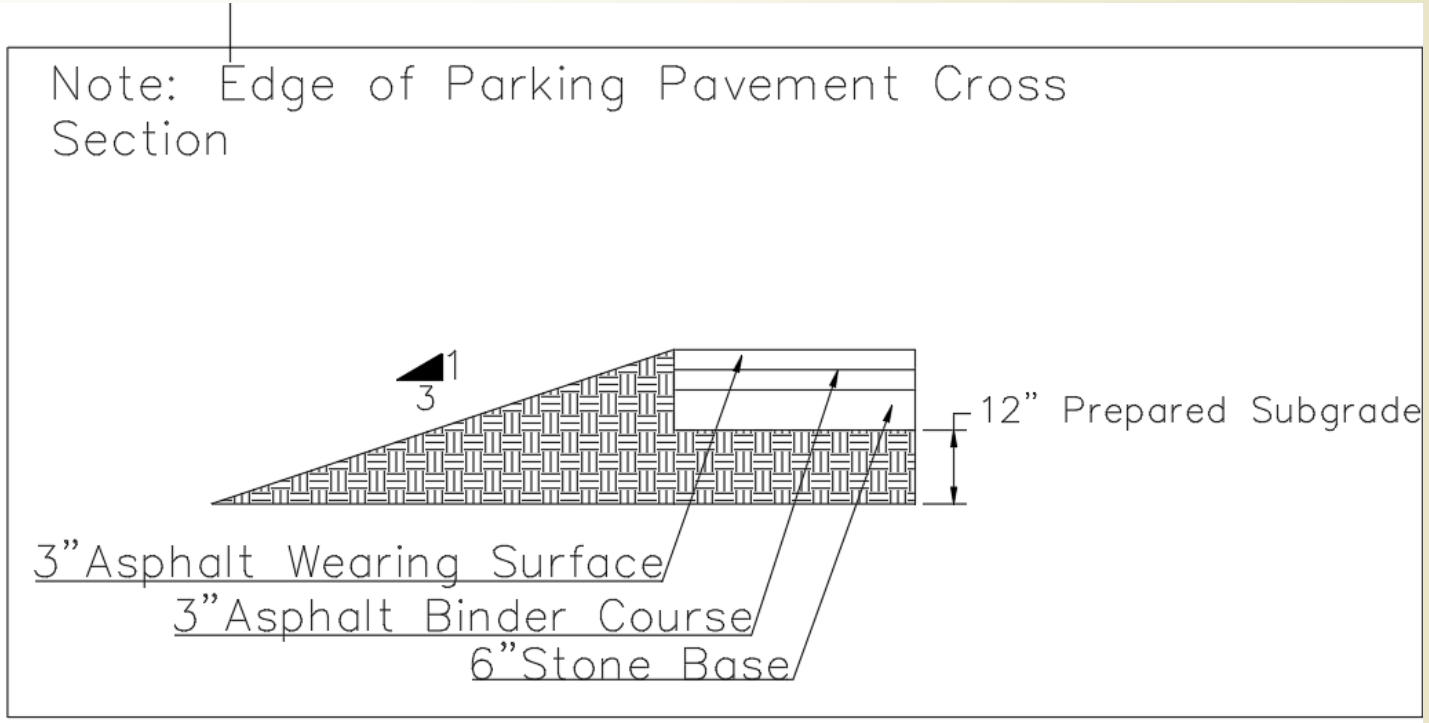


- Wood parking bumpers made from recycled material
- Deciduous Tree's surrounding exterior

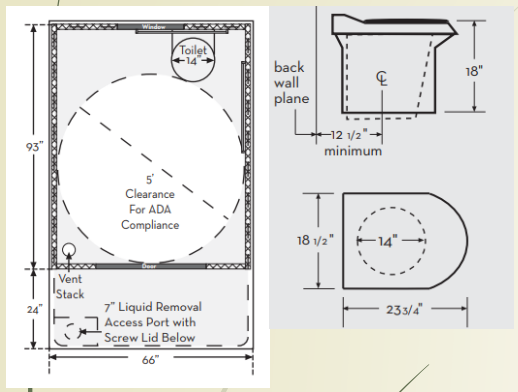
Material Alternatives:	Concrete	Asphalt
Price:	$17,300	$16,200

Recommended Parking Lot Design

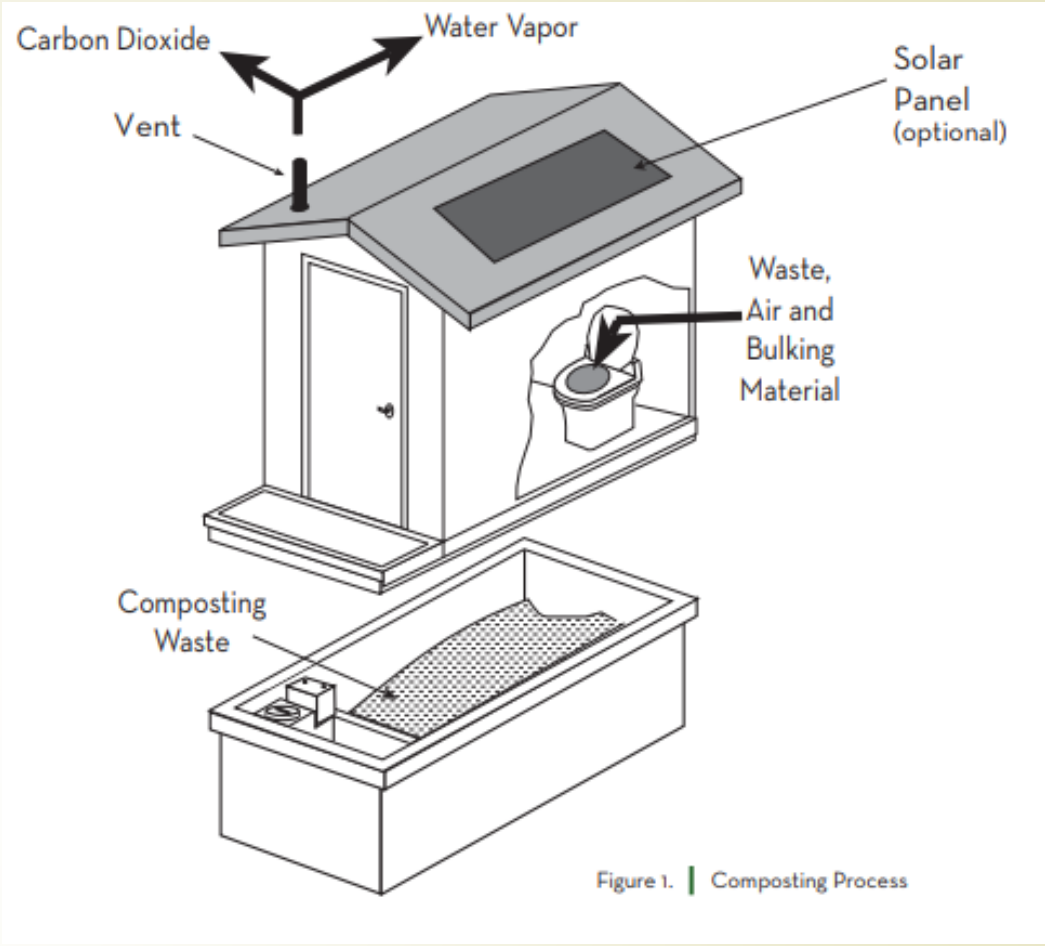




Bathroom Detail



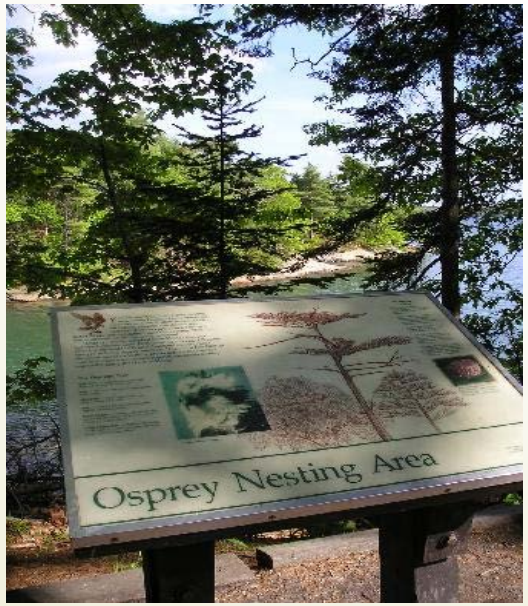
- Self-Composting
- ADA Compliance

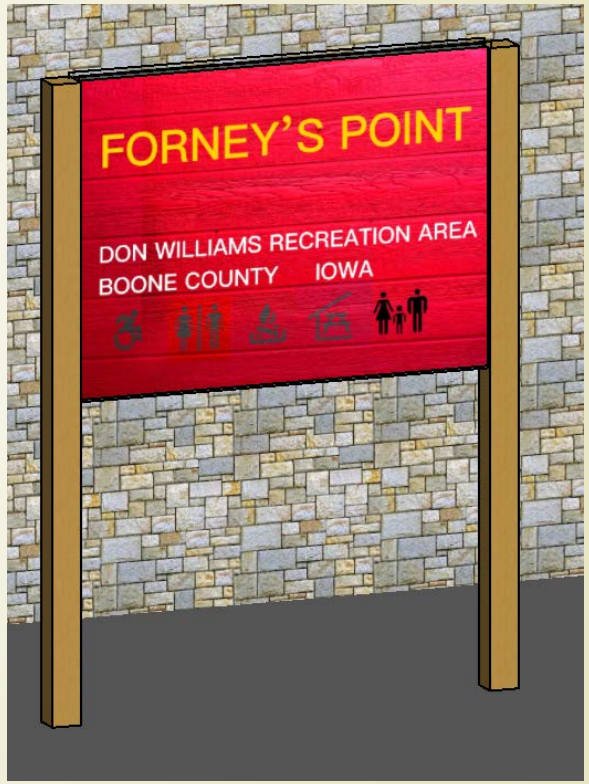


Recommendation: Clivus Multrum M54 Trail Head Series

- $24,000-single stall unit

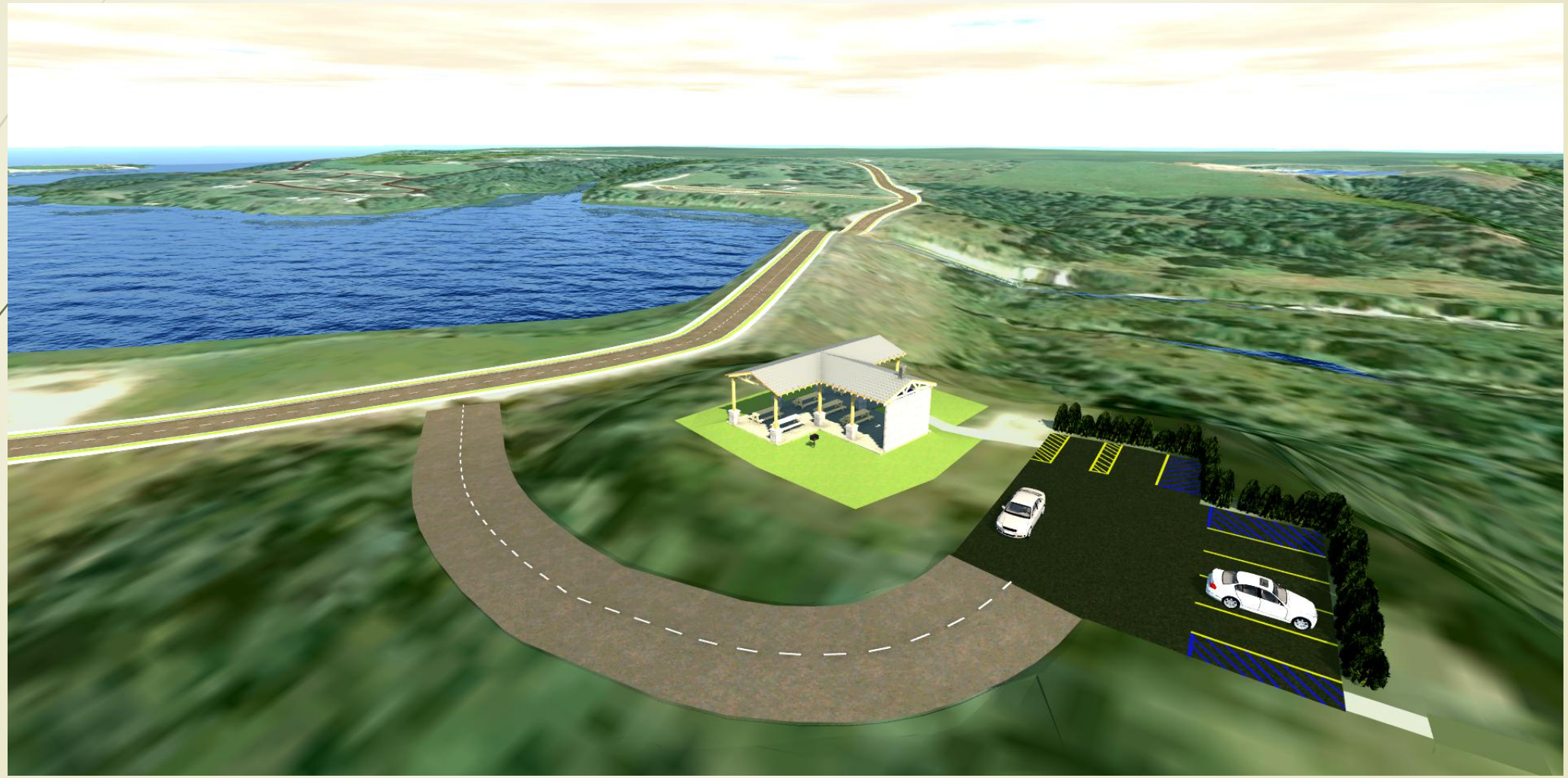
Amenities


Osprey Nesting Area


FORNEY'S POINT
DON WILLIAMS RECREATION AREA
BOONE COUNTY IOWA

Total Project Cost	
Overlook Pavilion	$81,000
Roadway	$21,000
Parking Lot	$16,000
Bathroom	$24,000.00
Site Development	$4,275.00
Total	$ 146,275.00

Final Design Recommendations



Questions?