



# Pedestrian Bridge for Mexican Ministry Center

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# Vision Statement

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*We believe access to food, water, education, and healthcare is a basic human right and therefore are committed to constructing appropriate, quality infrastructure...*

# Empowering *Trigo y Miel*

A ministry of Forward Edge International

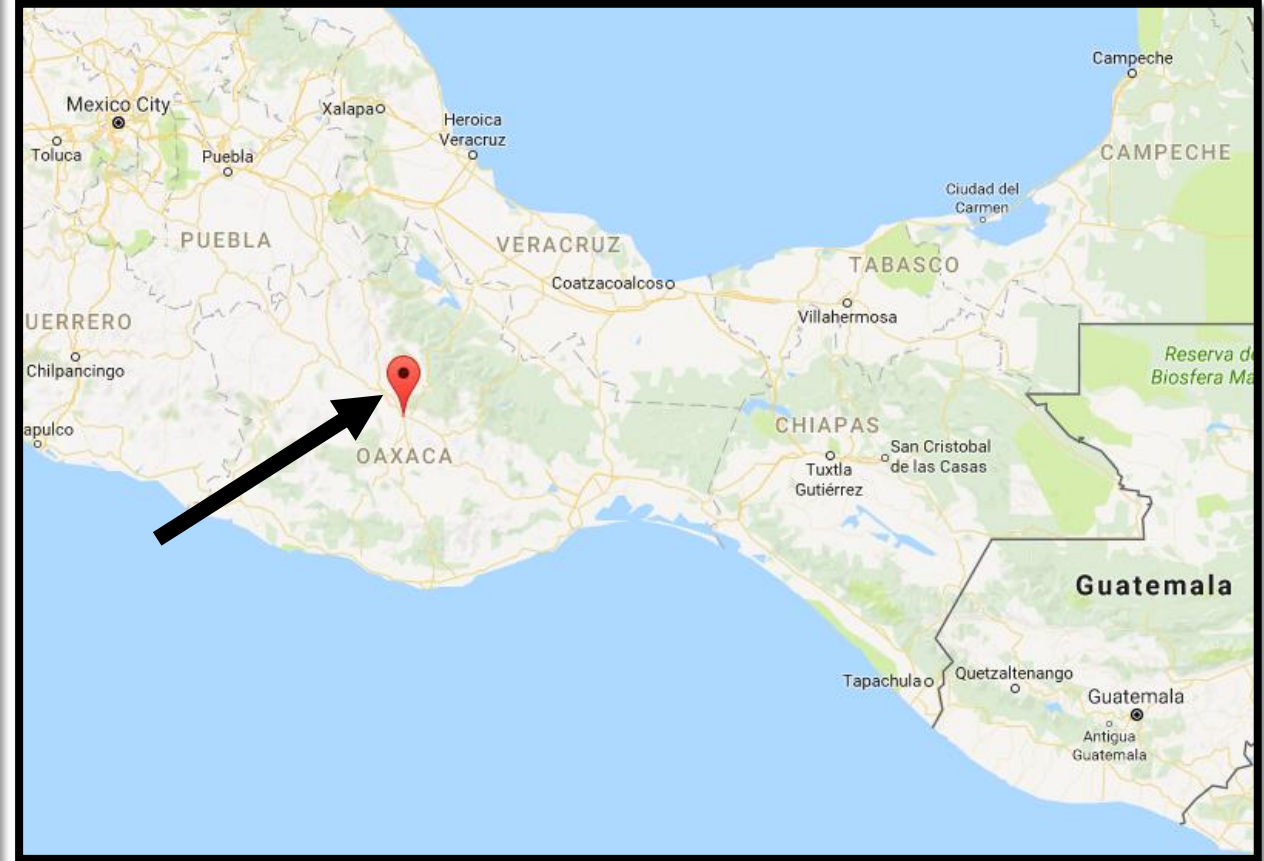
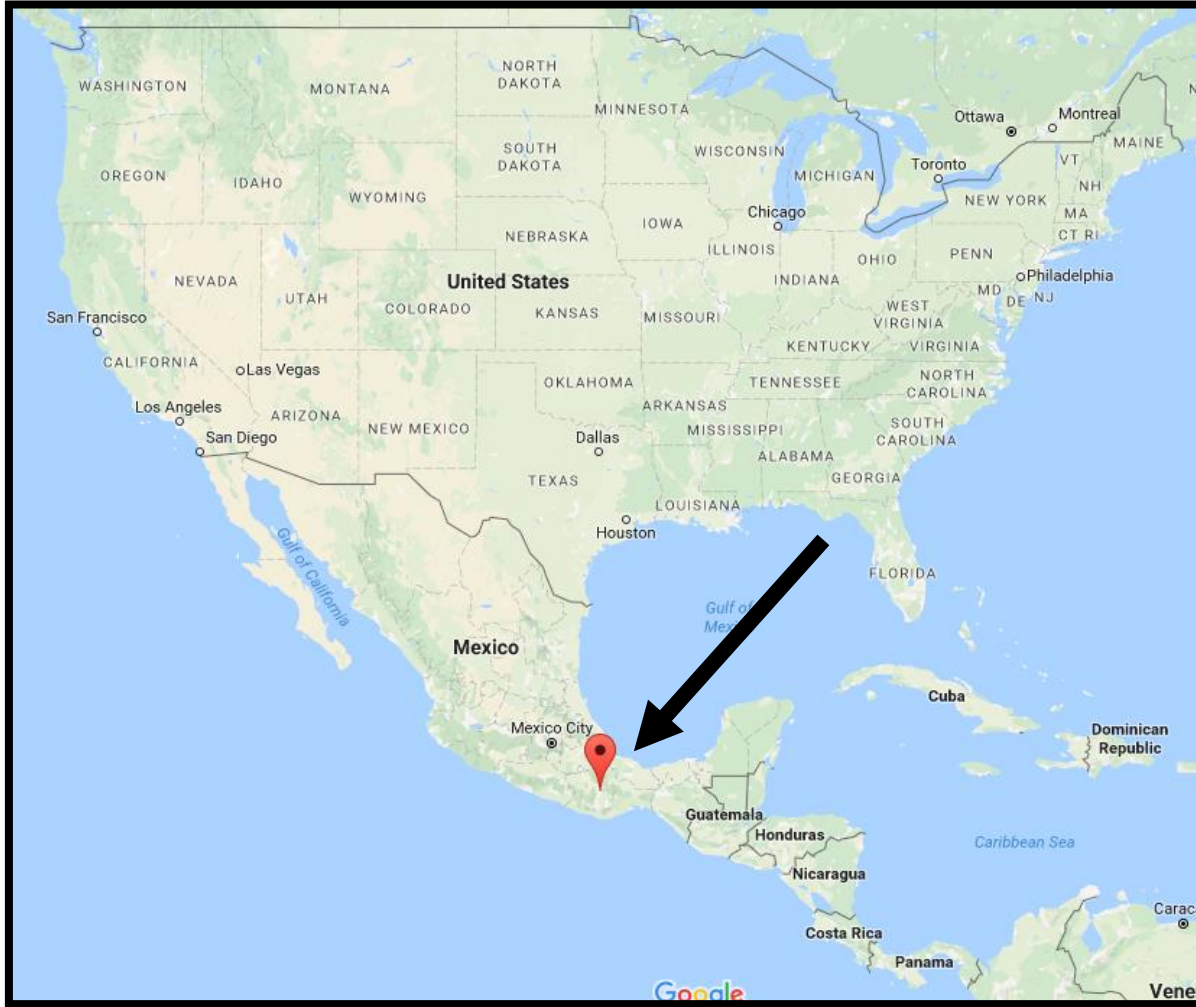
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INTERNATIONAL

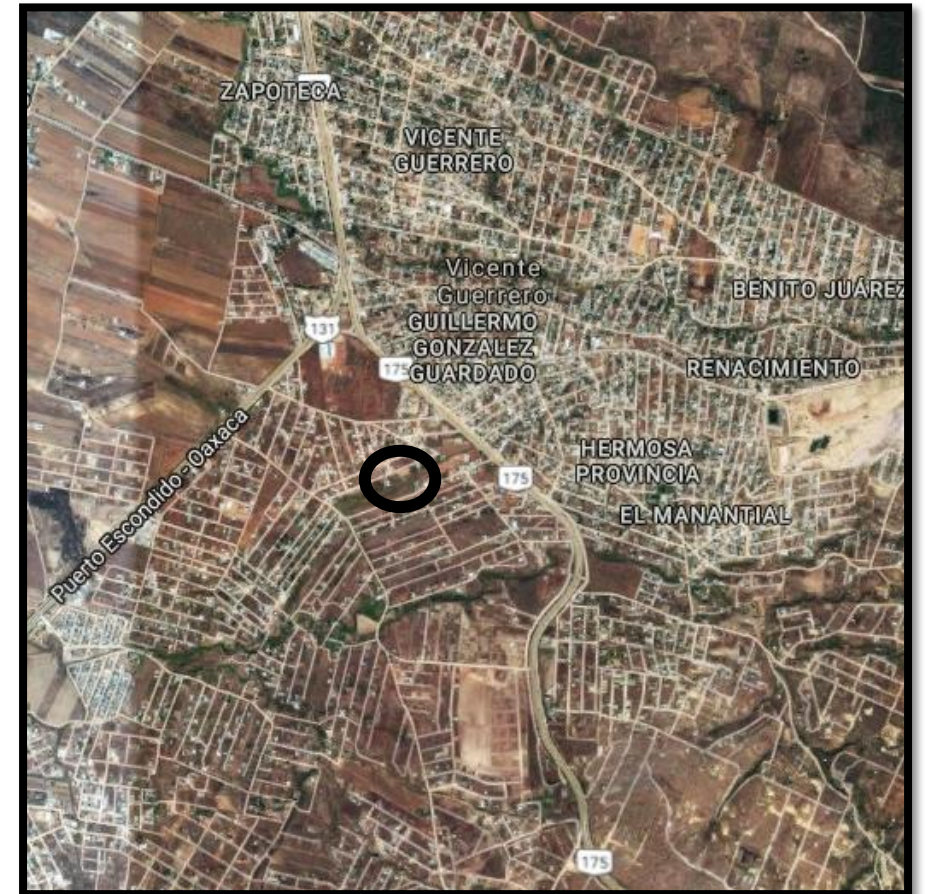
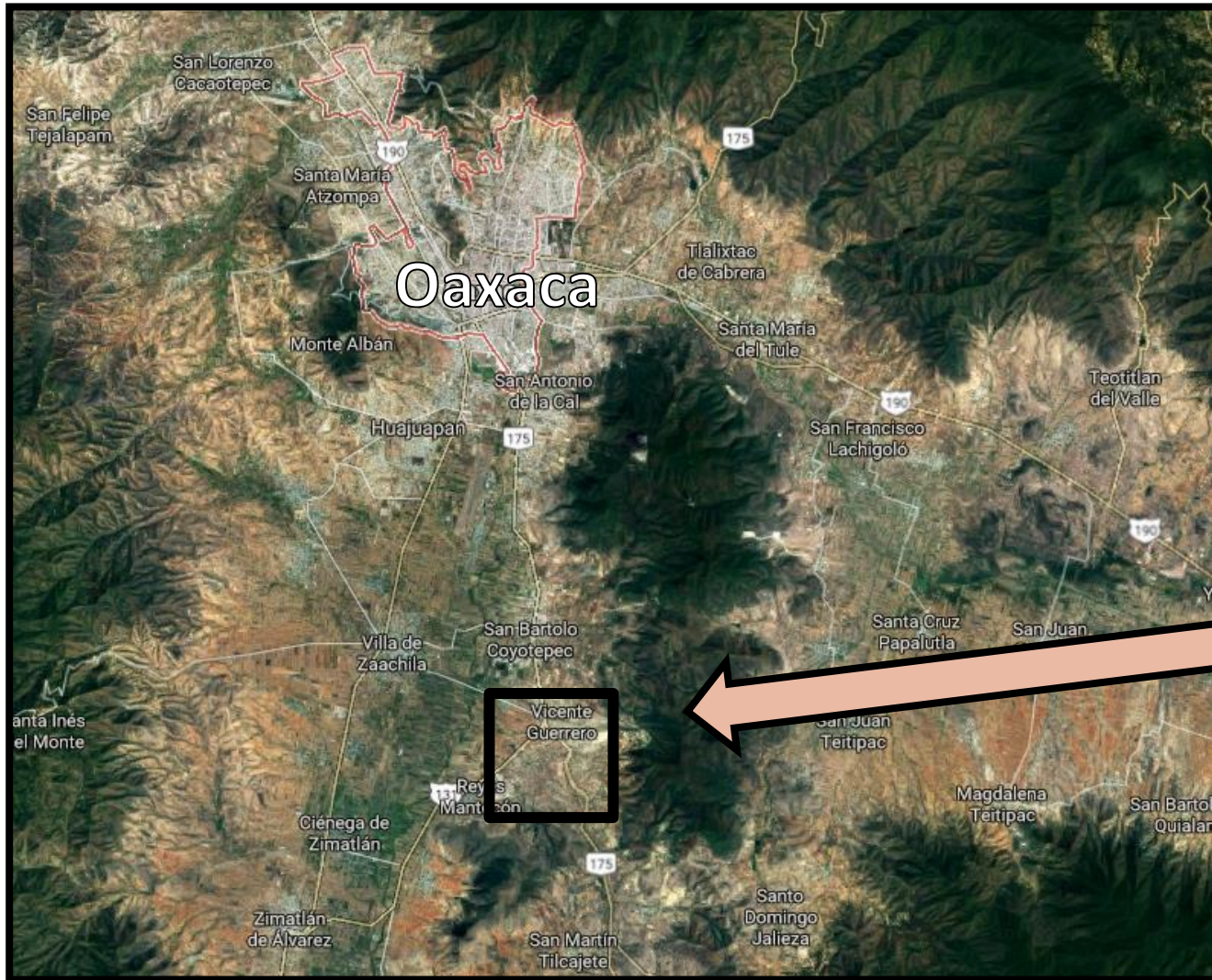


# Where is Oaxaca, Mexico?





# Where is *Trigo y Miel*





# Empowering *Trigo y Miel*

A ministry of Forward Edge International

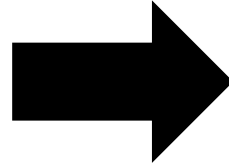
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# VWOS Connection





# What is the Need?





# Site Details







Site Details





Site  
Challenges



# Fall Survey Trip

Obtained: Material and Soil Data

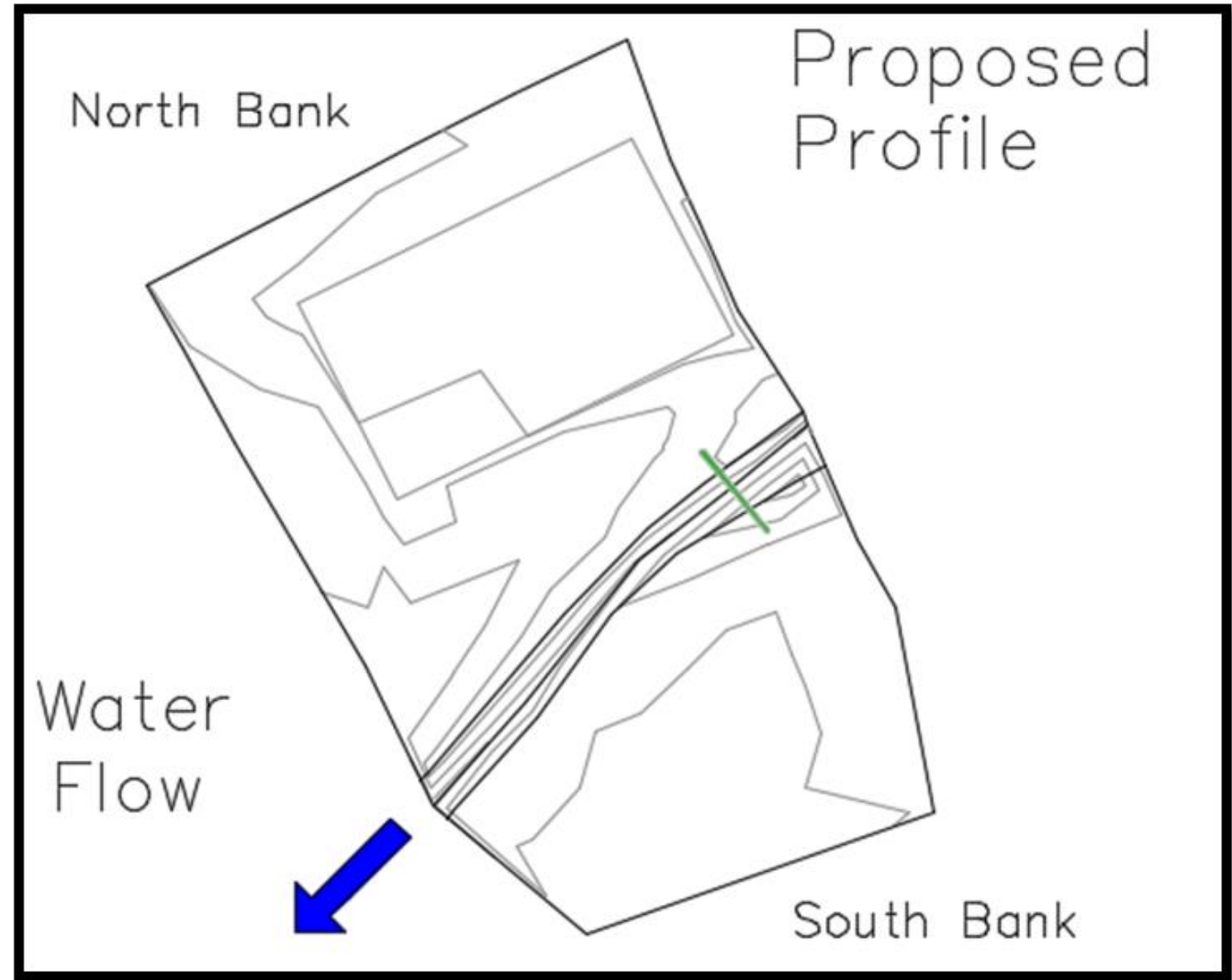
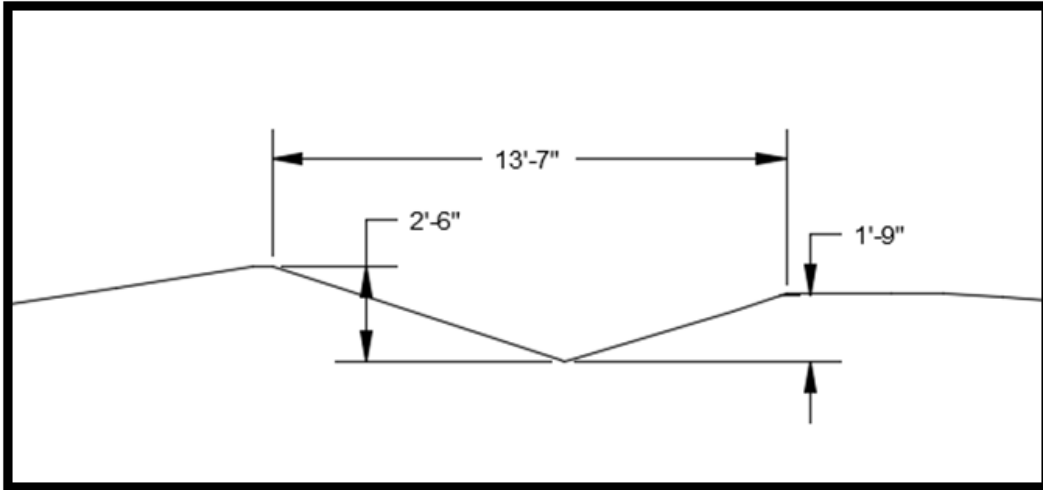






Proposed  
Profile and  
Placement

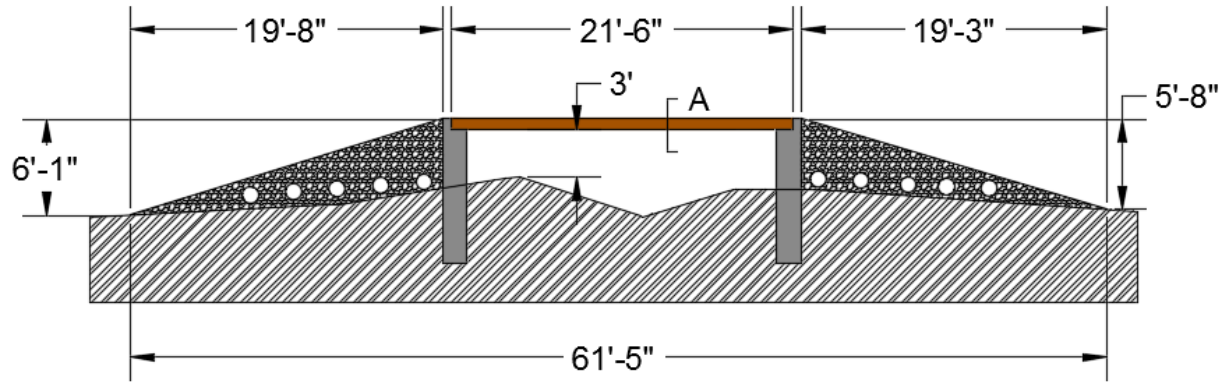
# Proposed Profile and Placement



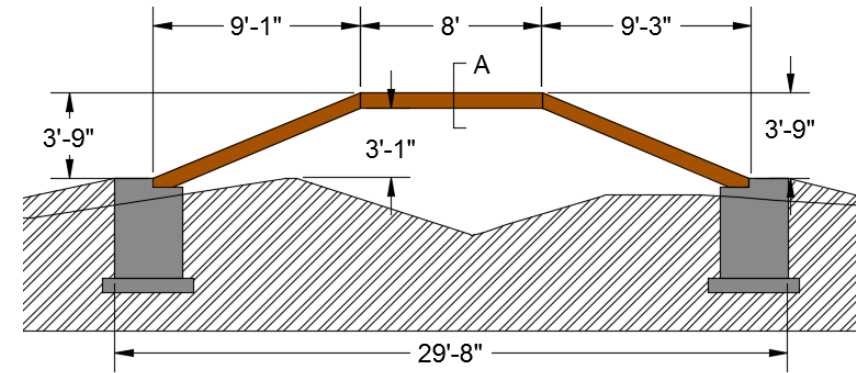


# Decision Matrix

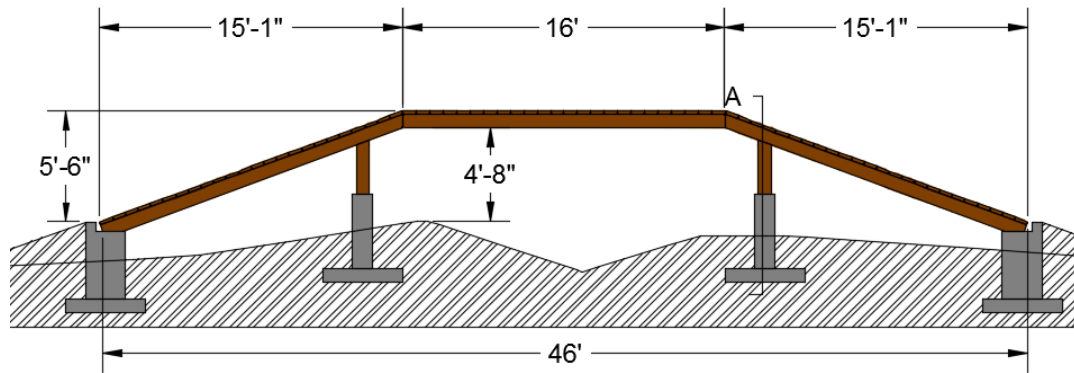
		Timber Beam Single Span	Timber Beam Triple Span	Arched Timber Beam	Arched Timber Truss
Selection Criteria	Criteria Weight %	Rating (0-10)	Rating (0-10)	Rating (0-10)	Rating (0-10)
Material Availability	2.5%	7	9	4	6
Aesthetics	2.5%	3	6	6	7
Community Acceptance	5.0%	2	3	6	7
Lifecycle Cost	10%	5	5	5	5
Footprint	20%	1	2	8	8
Constructability	20%	8	5	4	5
Cost	40%	4	3	5	7
Total		30	33	38	45
Weighted Total	100.0%	4.25	3.625	5.45	6.575
Selected Alternative:		Arched Timber Truss			



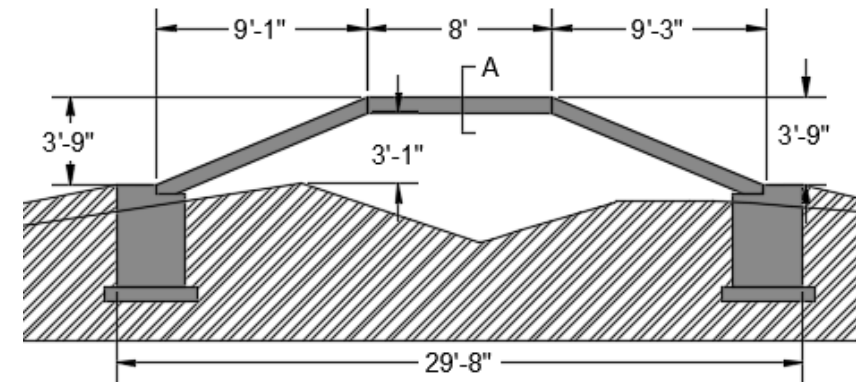
**Timber Beam – Single Span**



**Arched Timber Beam**

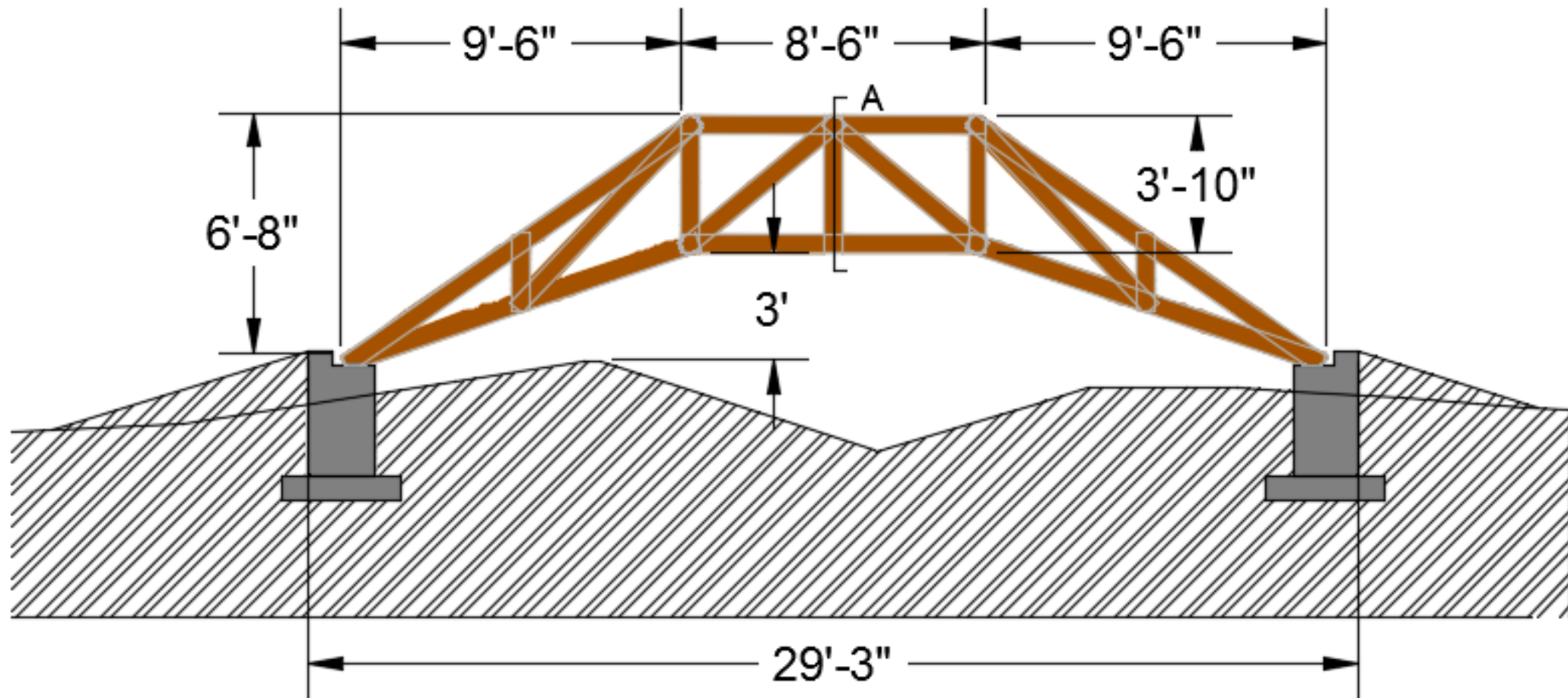


**Timber Beam – Triple Span**



**Arched Concrete Beam**





Chosen Structure Type – Arched Timber Truss

# Design Development

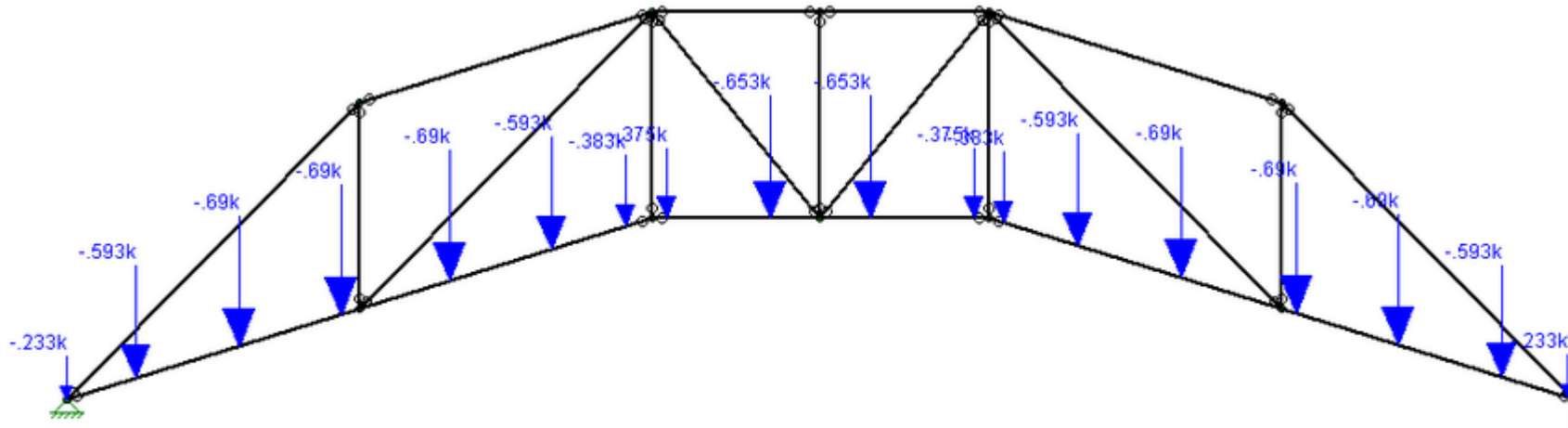


Figure 1: Live Loads on Risa Model

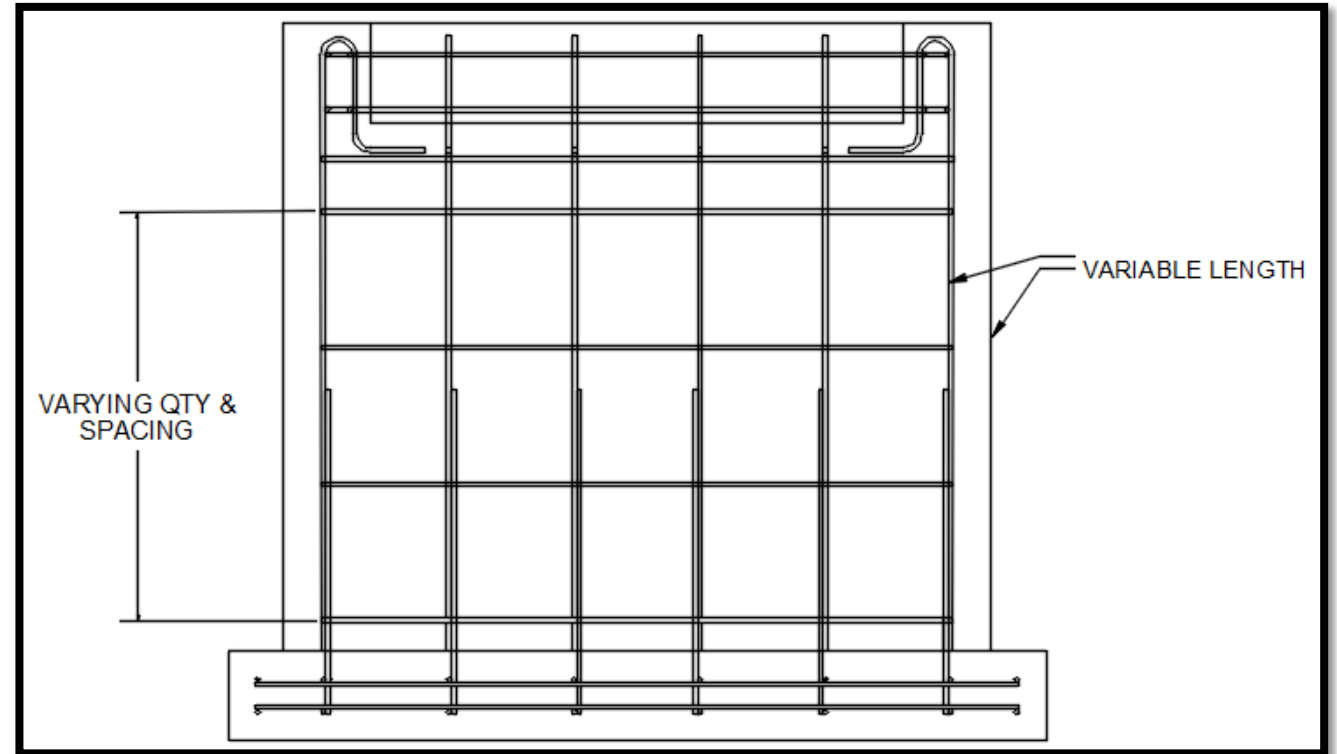
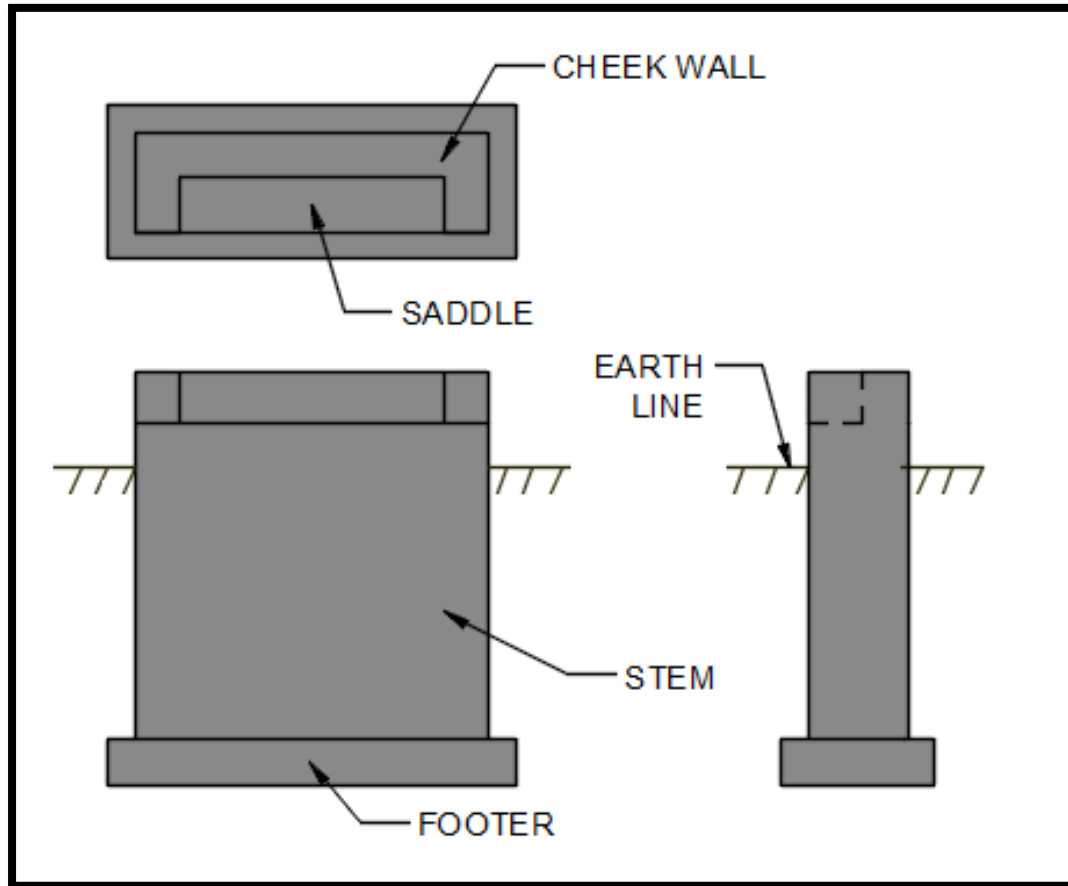
- \* Initial Truss layout developed with advisors

- \* Design according to AASHTO

- \* Framework for design of Timber Truss

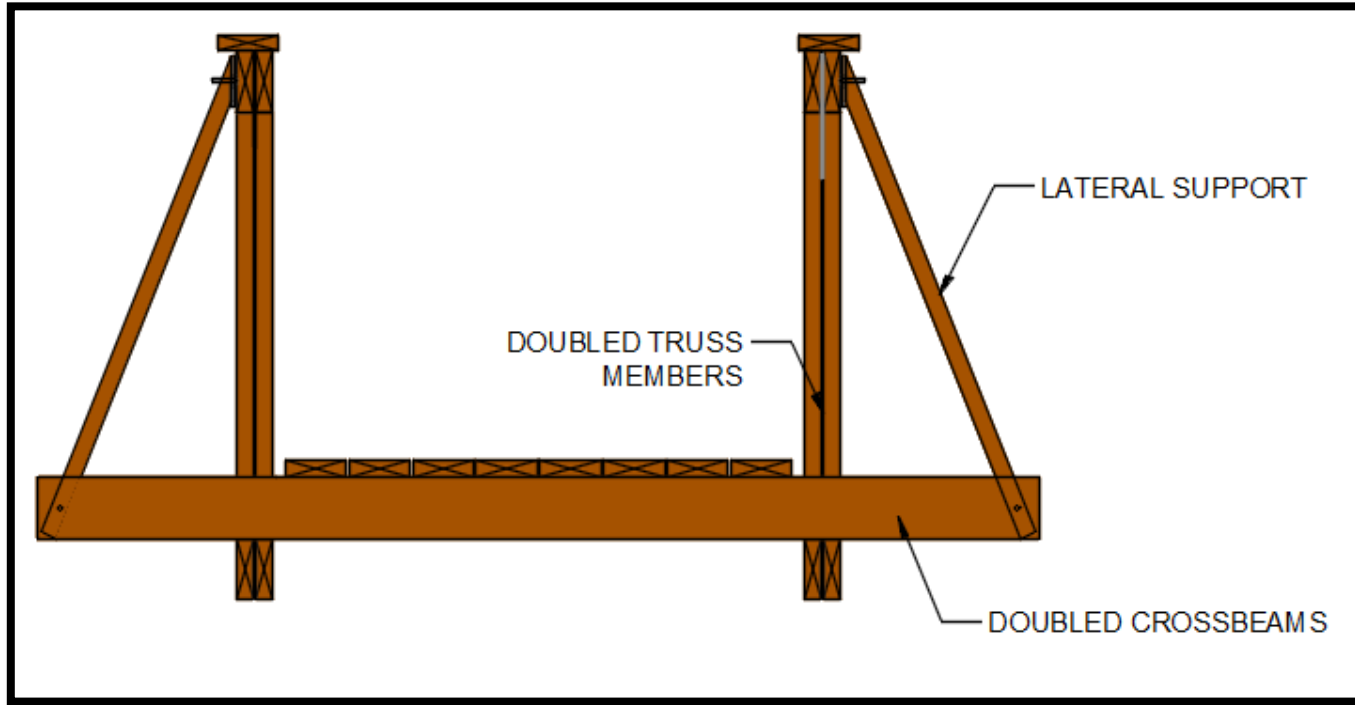


# Foundation Considerations



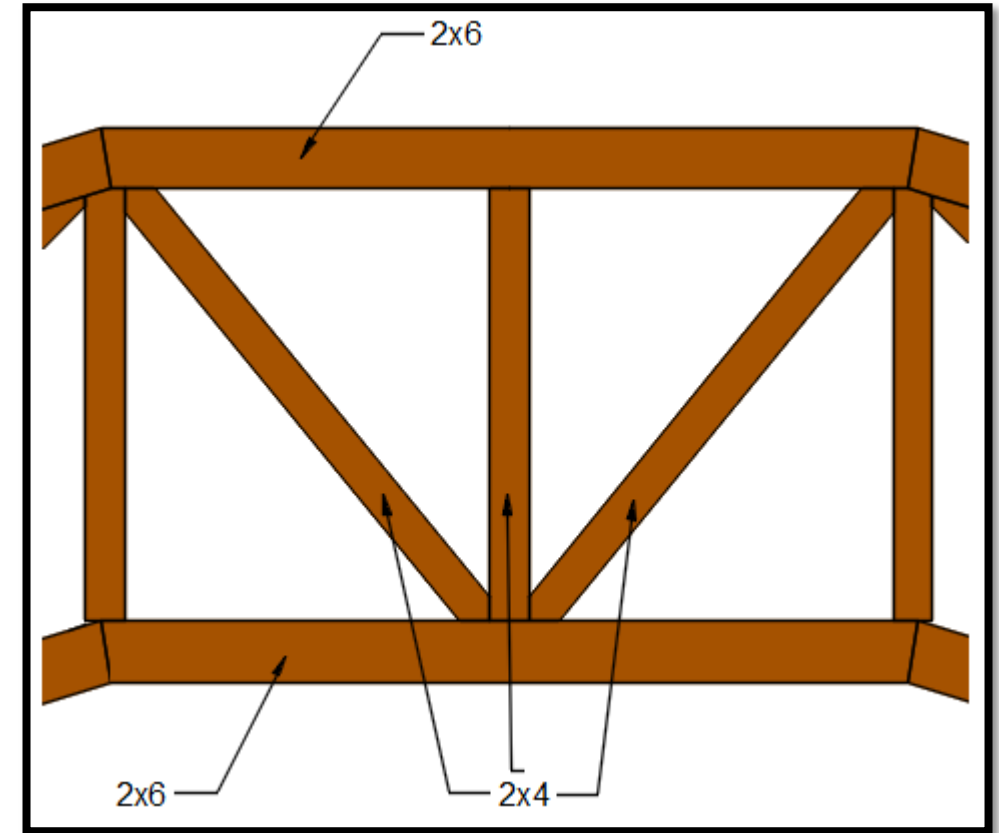
- \* Designed for variable depth of excavation
- \* Geometric constraints drove the design

# Timber Design Takeaways



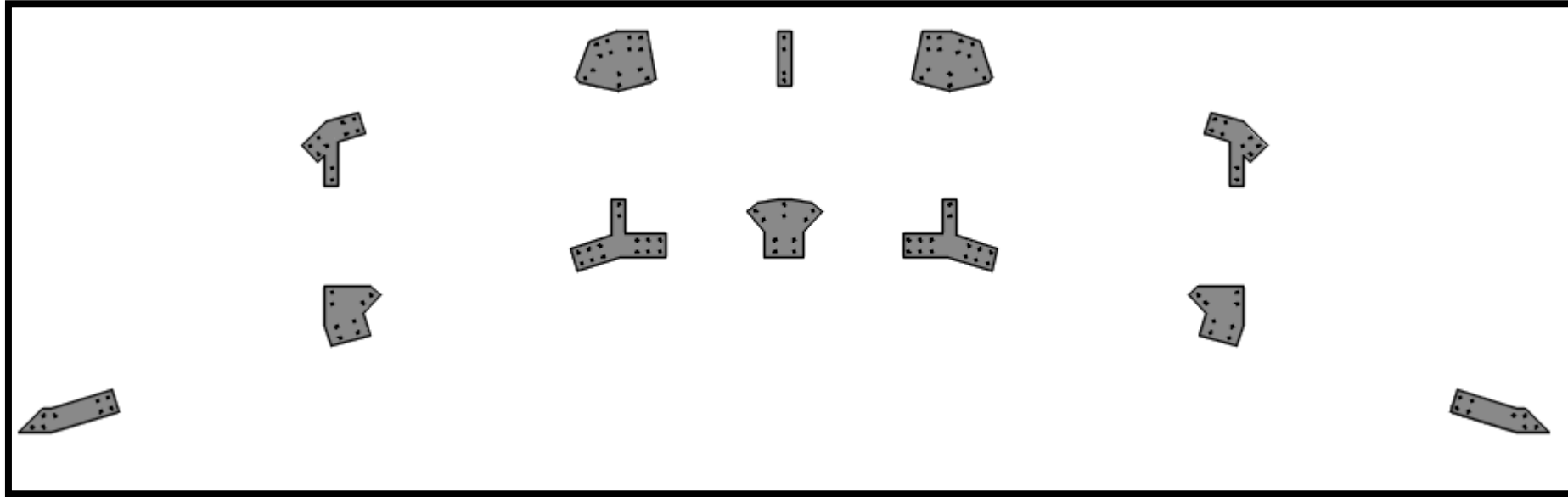
\* Use doubled members for constructability & strength

\* Use common size boards



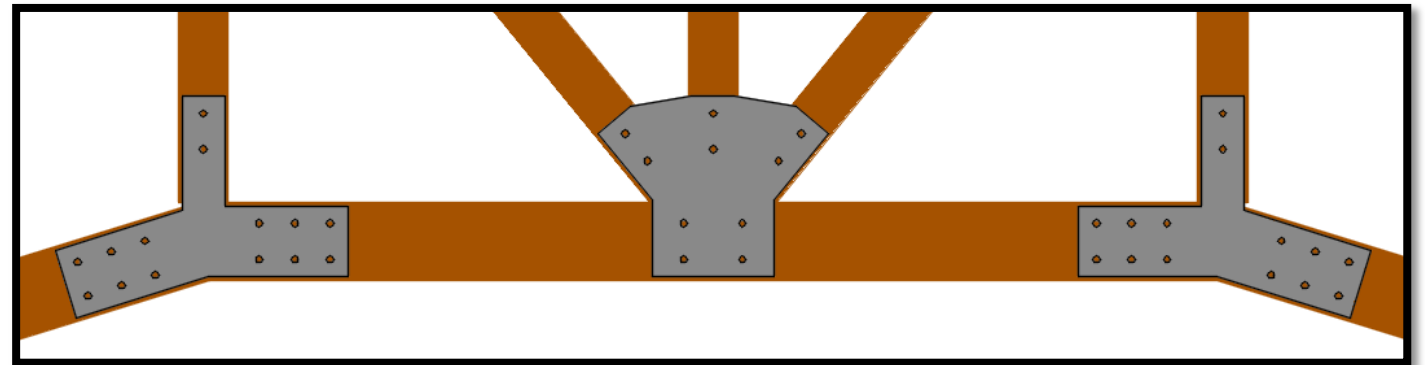


# Connection Considerations

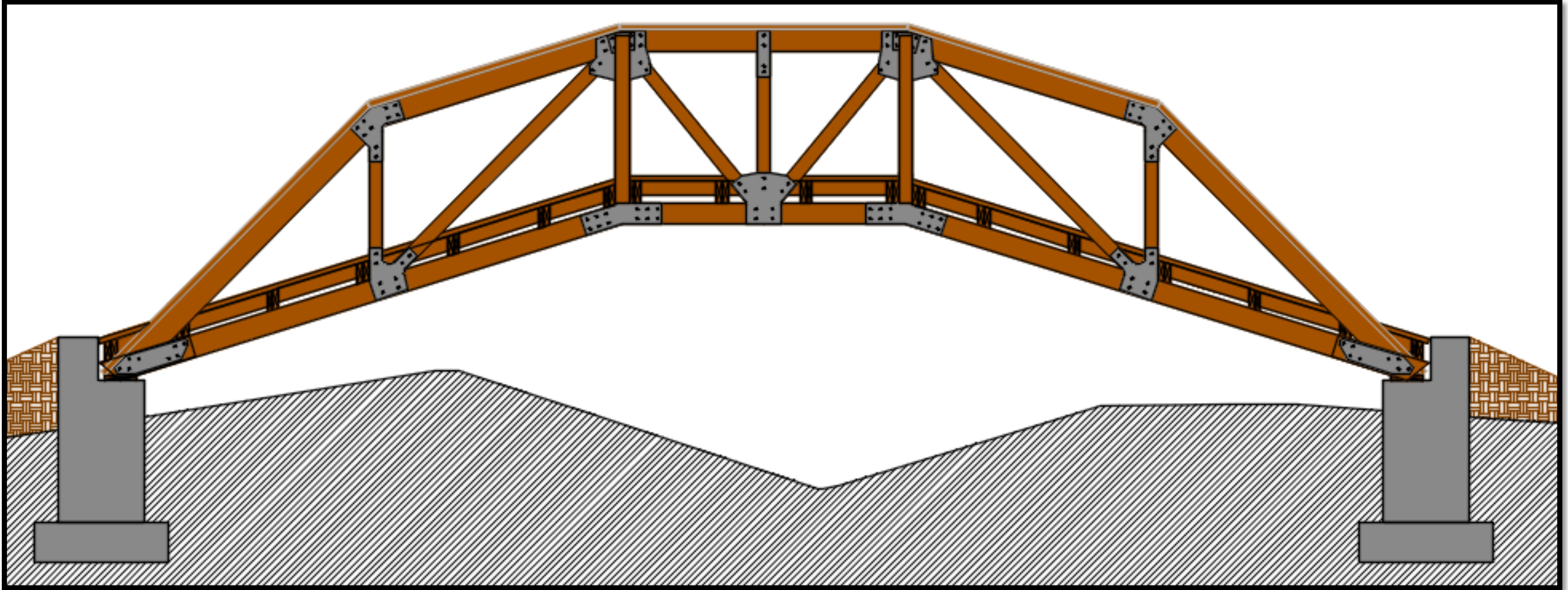


\* Steel gusset plates between truss layers

\* 7 Unique Plates



# Final Design





# Site Team Trip

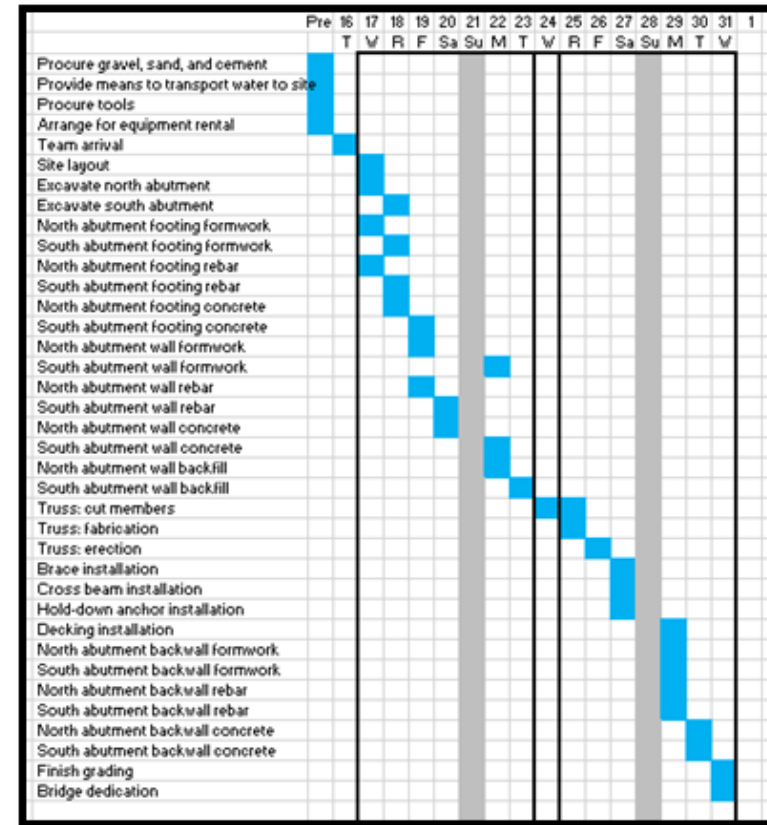
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Mexico 2017 Site Team



# Construction Planning

- \* Compiling a construction manual
- \* Finalizing the construction schedule and sequence
- \* Complete a final material list





# Site Preparations

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- \* Forward Edge is dredging the ditch before we arrive.
- \* Forward Edge will procure the materials and tools necessary for construction.



# Acknowledgements

## **Project Advisers**

Dr. Brian Swartz  
Tim Zimmerman  
Russel Woleslagle

## **Student Volunteers**

Benjamin Reinert  
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Erin Brennerman  
Erika Boice

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Dr. Brian Swartz  
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# Acknowledgements

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Dawood Engineering

Pennsylvania Society of Professional Engineers

## **Project Partner**

Forward Edge International

Questions?



