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# Pedestrian Trail and Bridge Volga, IA

Ryan McDonough  
Nathan Gjersvik  
Ryan Kowalsky  
Spencer McDermott

May 5, 2020



# Design Team

Ryan McDonough



Project Manager  
Structural Design  
Bridge Design

Nathan Gjersvik



Substructure Design  
Hydrologic Design

Ryan Kowalsky



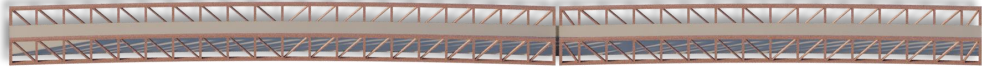
Trail Design  
Water Resources

Spencer McDermott



Structural Design  
Bridge Design

# Outline



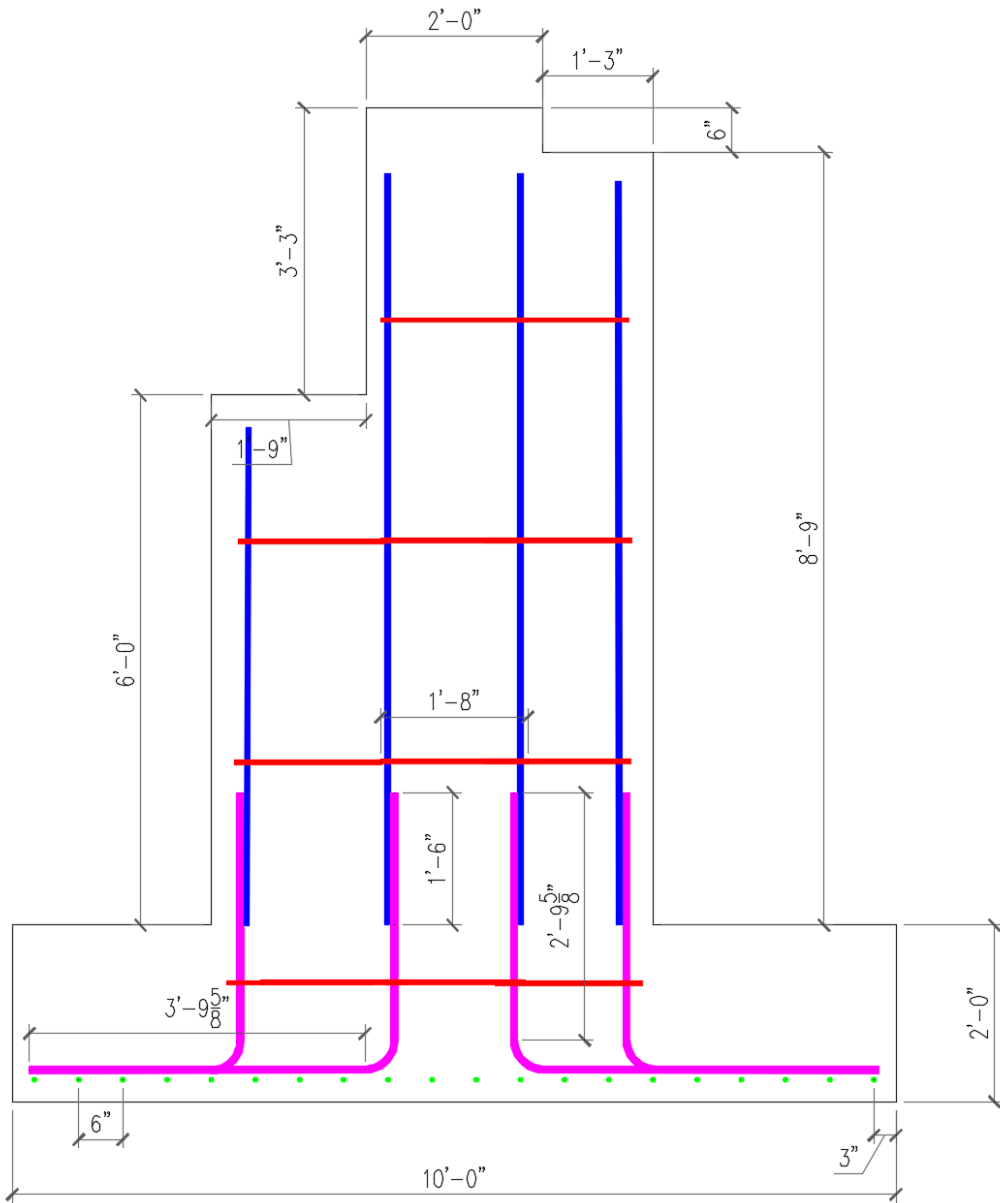
**Project Overview**

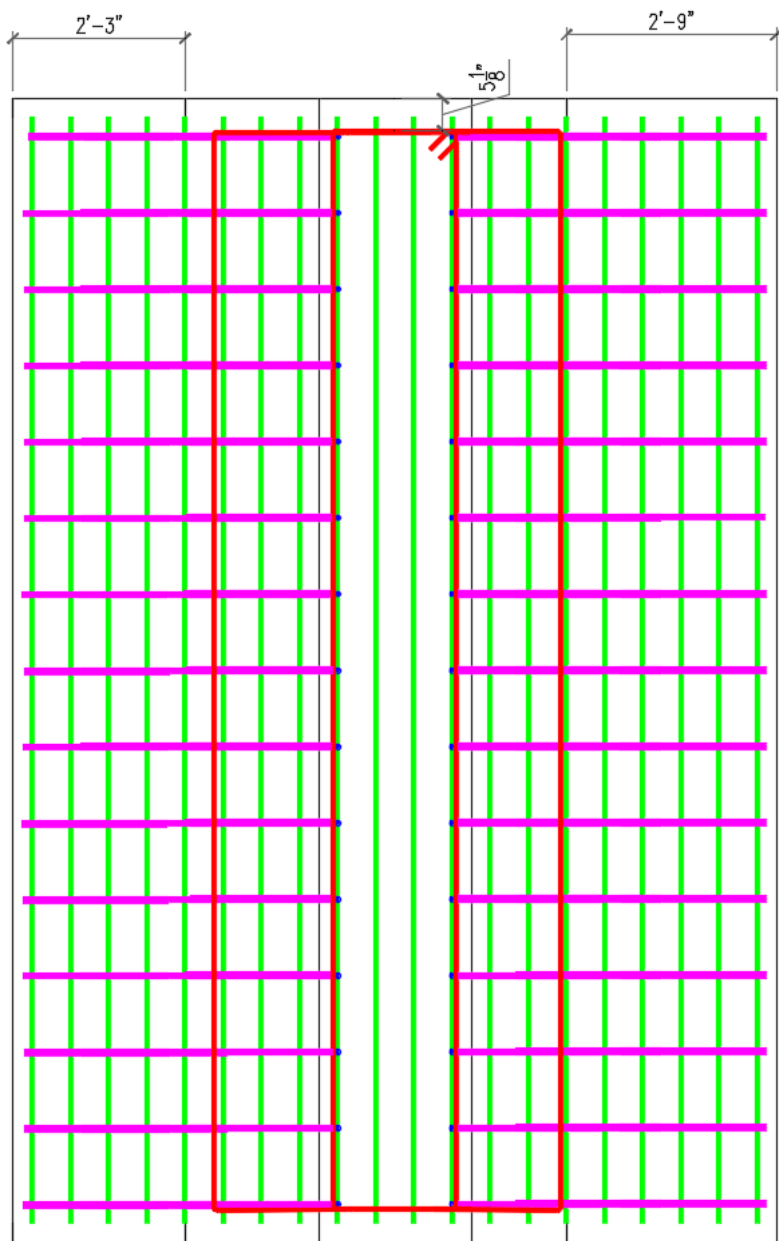
# Project Statement & Goals



# Stub Abutments

## Cross Section





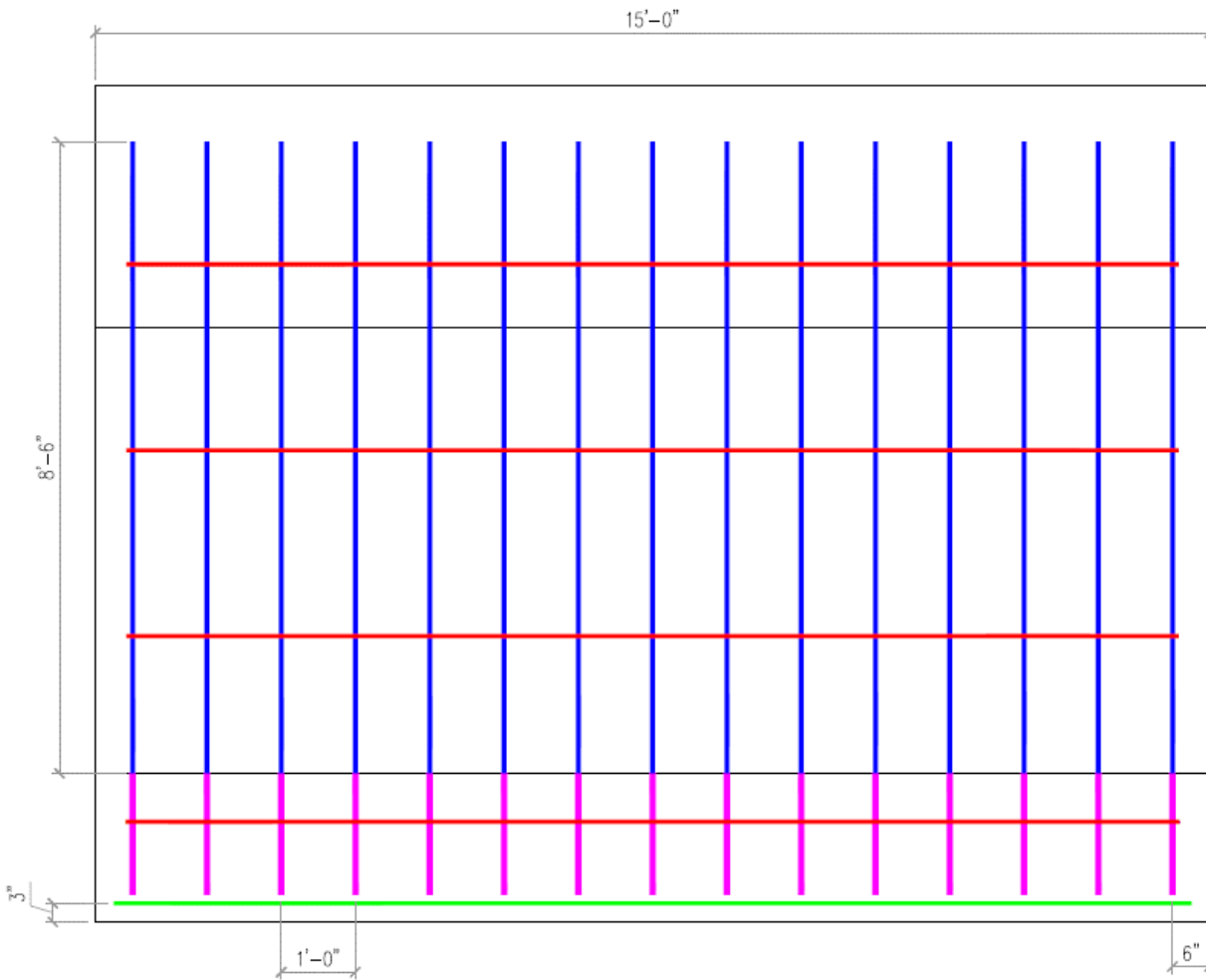
# Stub Abutments

Plan View



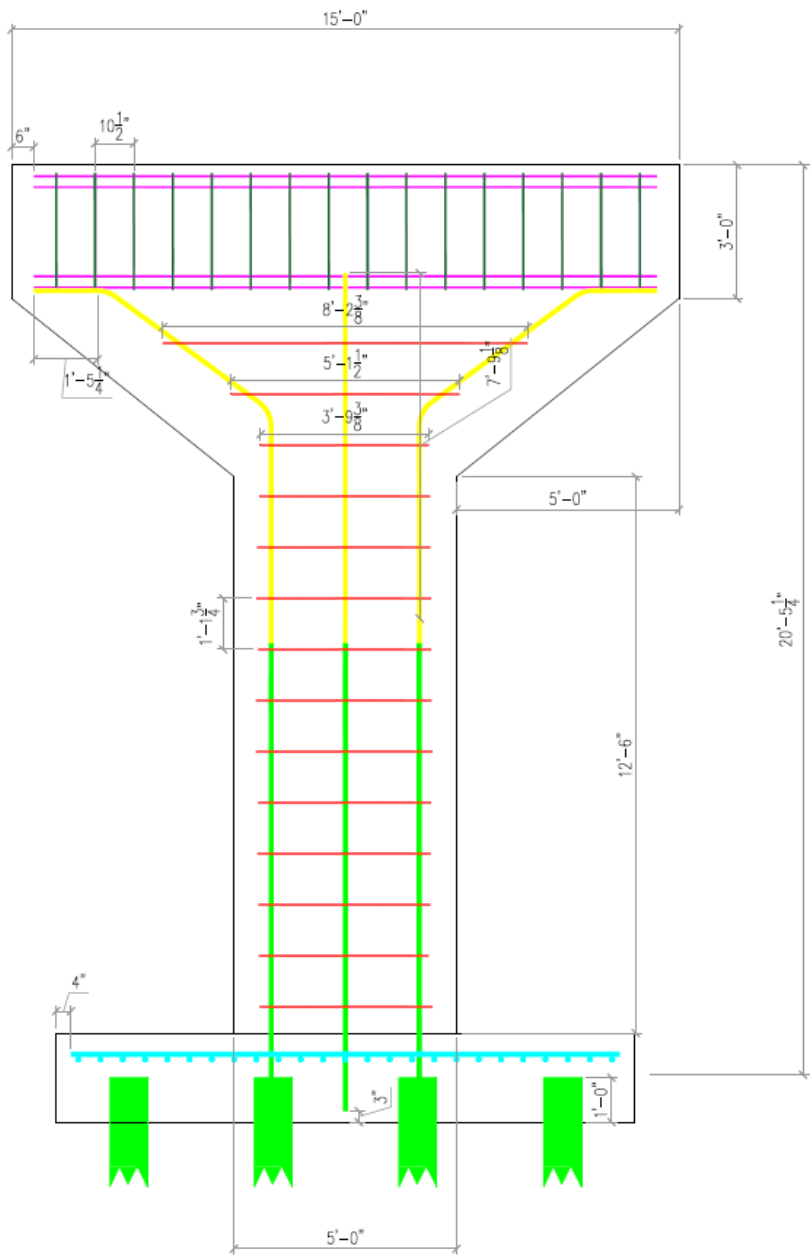
# Stub Abutments

## Profile View

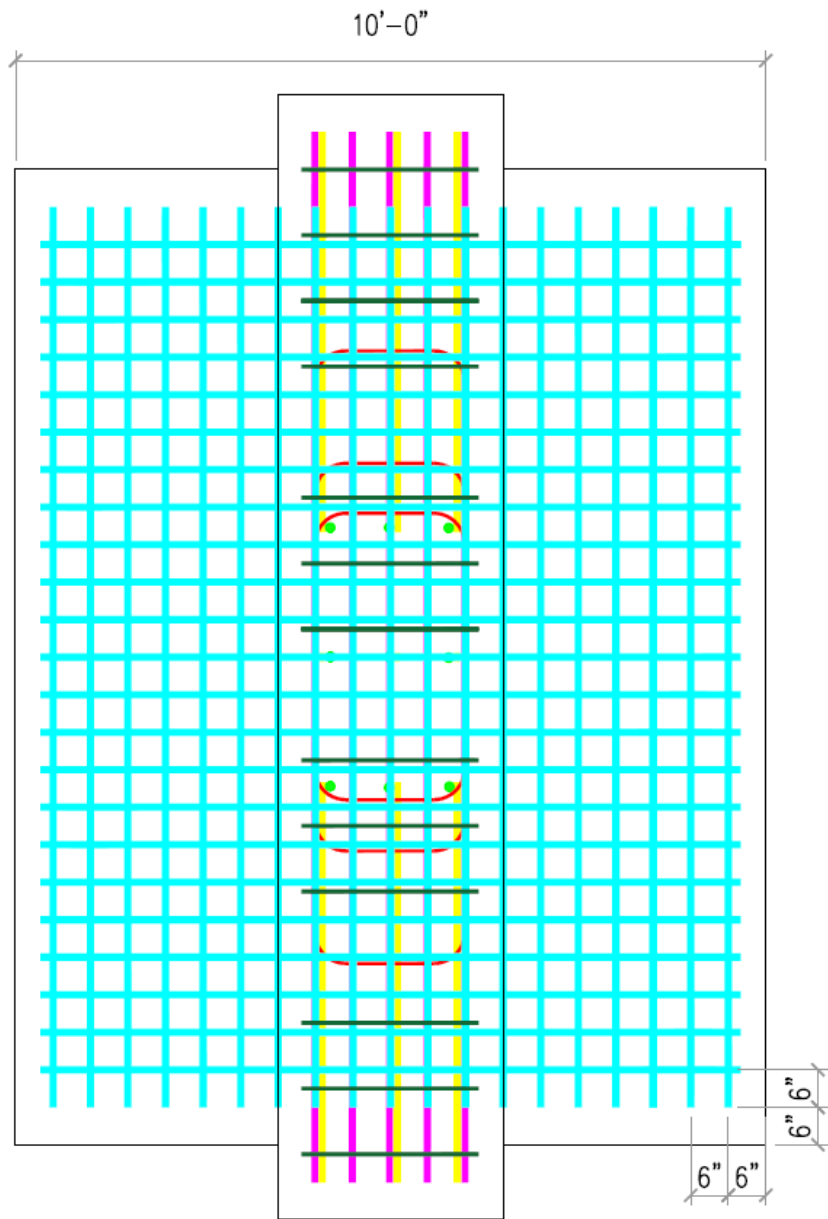


# Pile-founded Pier

## Cross Section







# Pile-founded Pier

Plan View

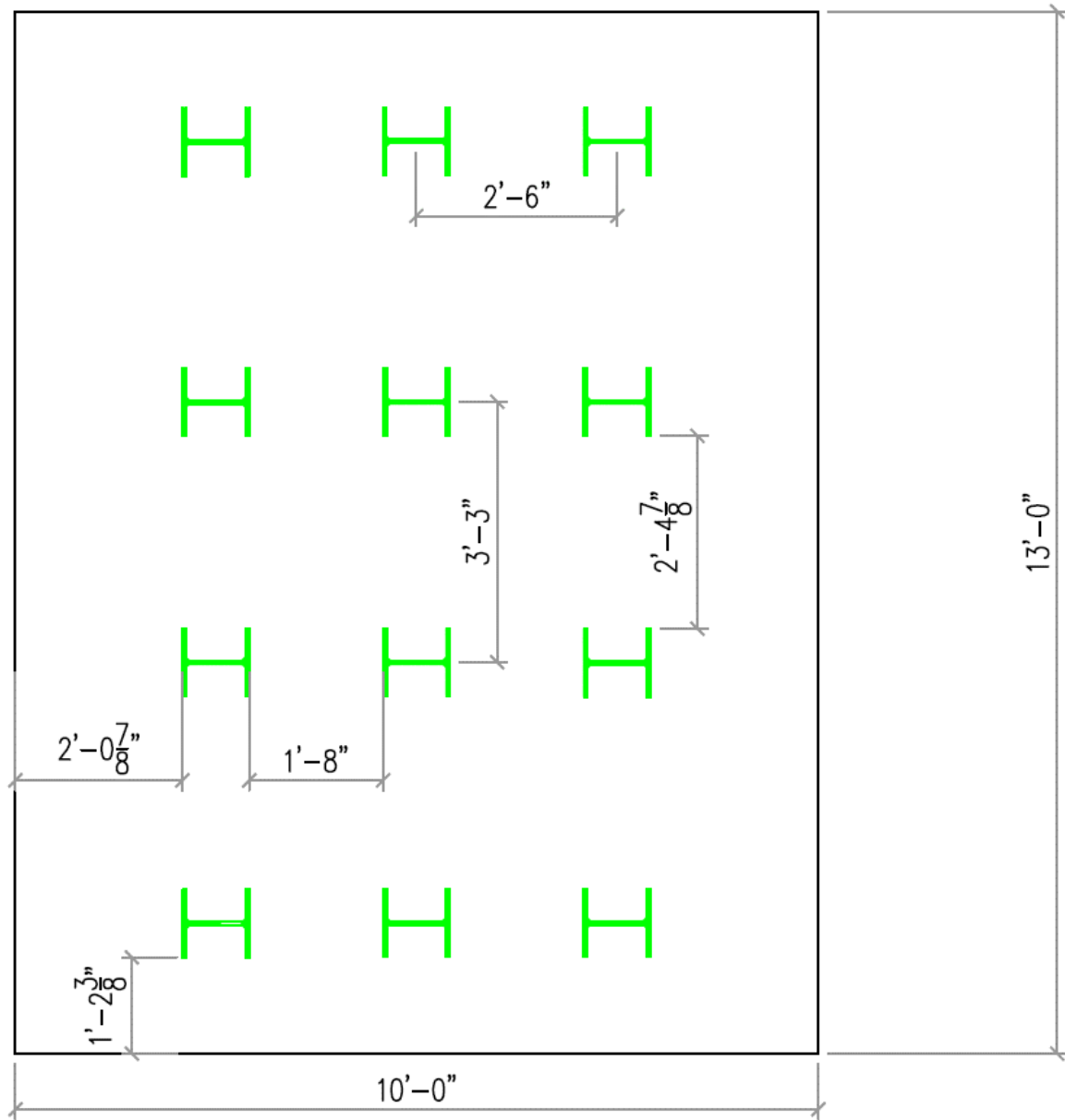




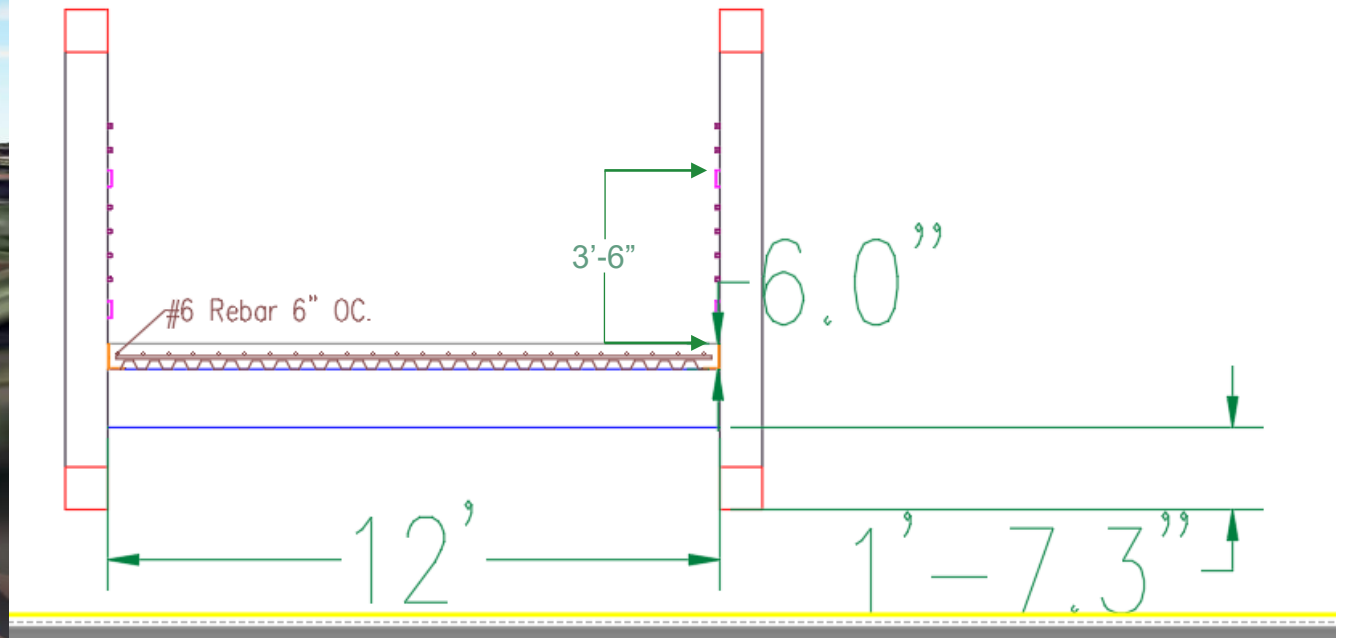
# Pile-founded Pier

Pile Cap Plan View

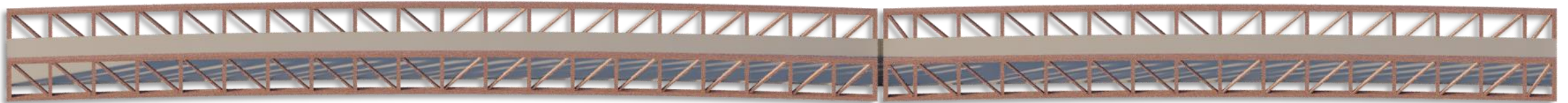
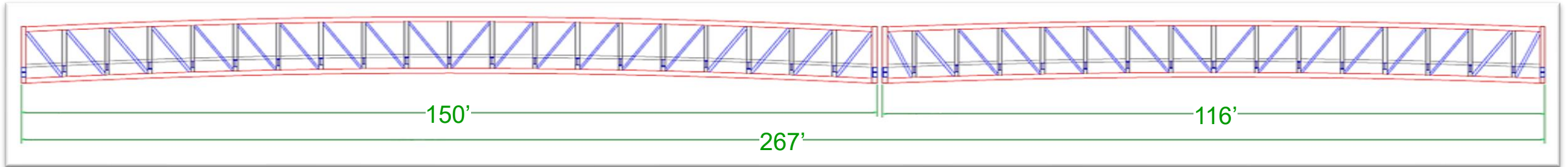
Symmetrical pile layout



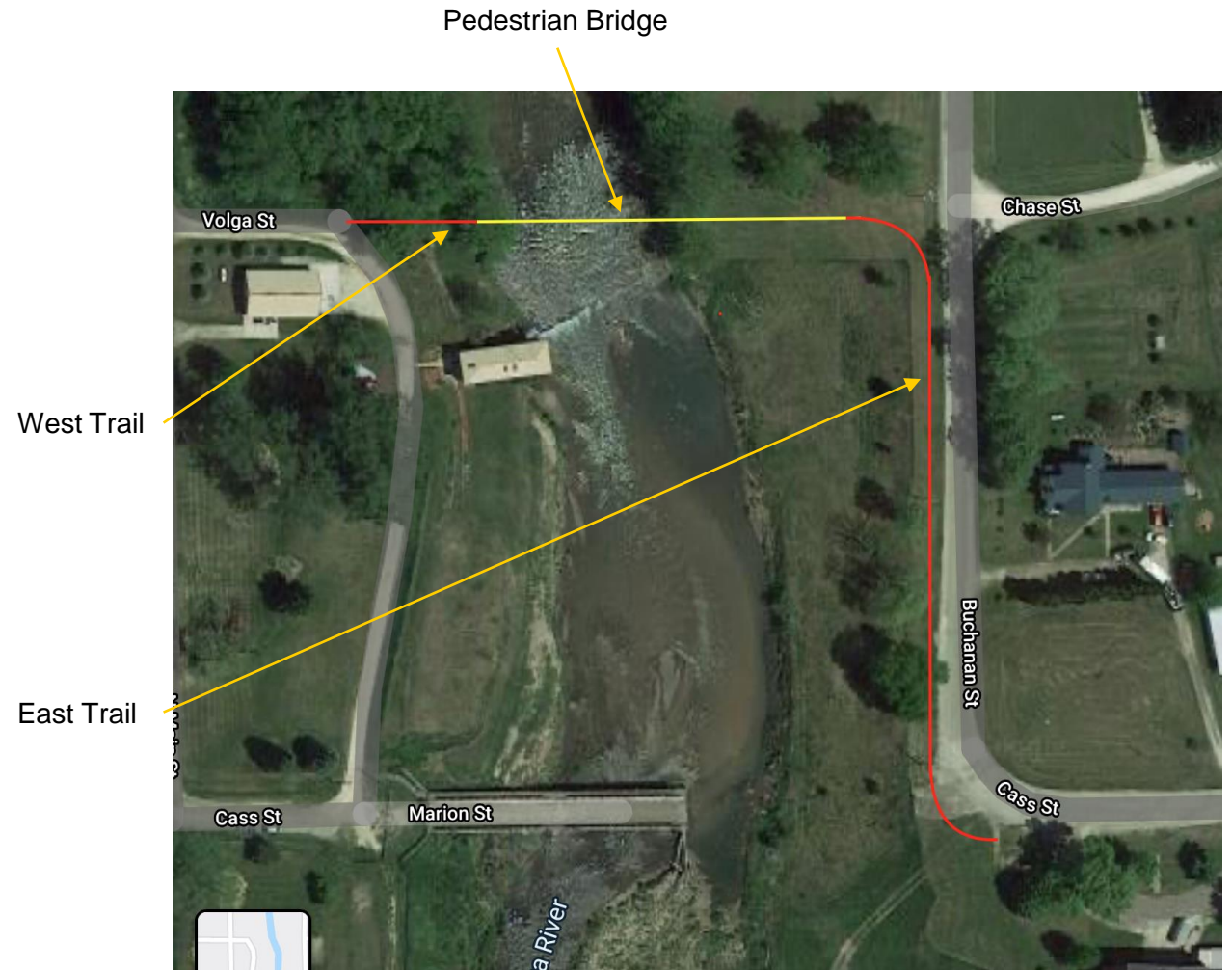
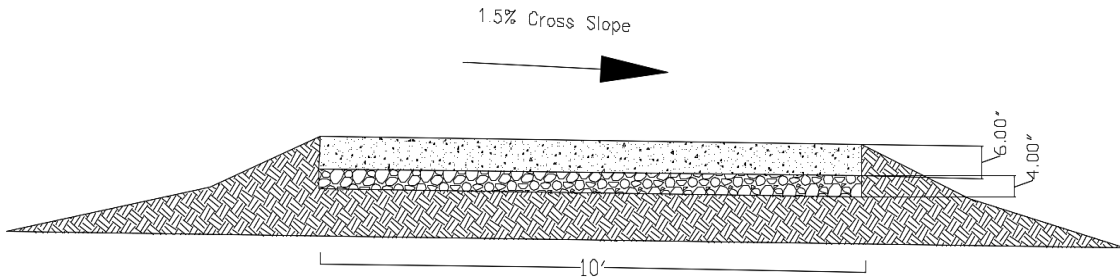
# Bridge Deck



# Bridge Truss



# Trail Design



# Scour Protection



## Riprap

10' upstream and downstream at each abutment

2'-3' thick

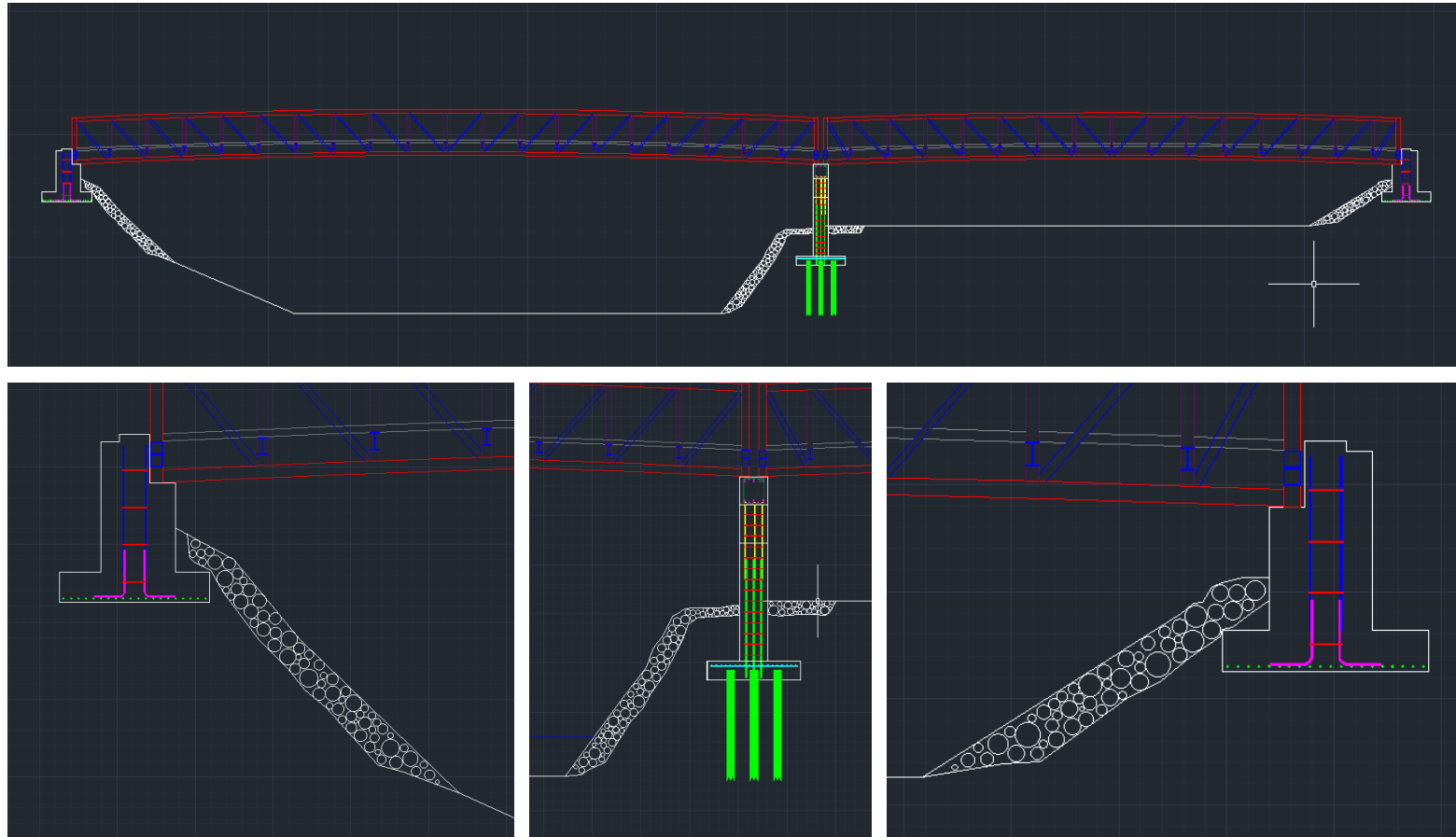
10' in all directions around pier

3' thick

Engineering fabric under all riprap

Class E revetment stone with 1.0' median diameter (IADOT BDM)

# Scour Protection





# Outline



# Bridge Cost Estimate - \$979,790.00

Item	Unit	Quantity	Price/Unit	Total
Steel Truss	EA	4	\$219,000.00	\$876,000.00
Bridge Deck PCC	CY	60	\$200.00	\$12,000.00
Subgrade Stabilization Material	SY	260	\$3.00	\$780.00
Scour Protection	CY	173	\$40.00	\$6,925.00
Cast-In-Place PCC	CY	91	\$280.00	\$25,500.00
#4 Reinforcement Bar	TON	0.25	\$695.00	\$175.00
#9 Reinforcement Bar	TON	3.1	\$800.00	\$2,500.00
#11 Reinforcement Bar	TON	0.49	\$835.00	\$410.00
H-Pile	LF	780	\$71.00	\$55,500.00
			<b>Total Bridge Cost</b>	<b>\$979,790.00</b>

# Trail Cost Estimate - \$47,340.00

Item	Unit	Quantity	\$ Price/Unit	Total
Recreational Trail, PCC 6"	SY	710	\$34.98	\$24,900.00
Backfill	CY	567.57	\$ 21.13	\$11,900
Corrugated Metal Culvert (12")	LF	14	\$ 21.50	\$300.00
Temporary Erosion Control	EA	2	\$500.00	\$1,000.00
Granular Subbase	SY	710	\$8.20	\$5,825.00
Aluminum, Reflective Trail Signs	EA	5	\$25.00	\$125.00
Wood Posts for Trail Signs (4x4)	EA	5	\$16.98	\$85.00
Seeding and Fertilizing	ACRE	0.1304	\$2,027.37	\$265.00
Clearing and Grubbing	ACRE	0.3260	\$1,757.56	\$575.00
Special Compaction of Subgrade for Recreational Trail	STA	6.39	\$365.65	\$2,350.00
			<b>Total Trail Cost</b>	<b>\$47,340.00</b>

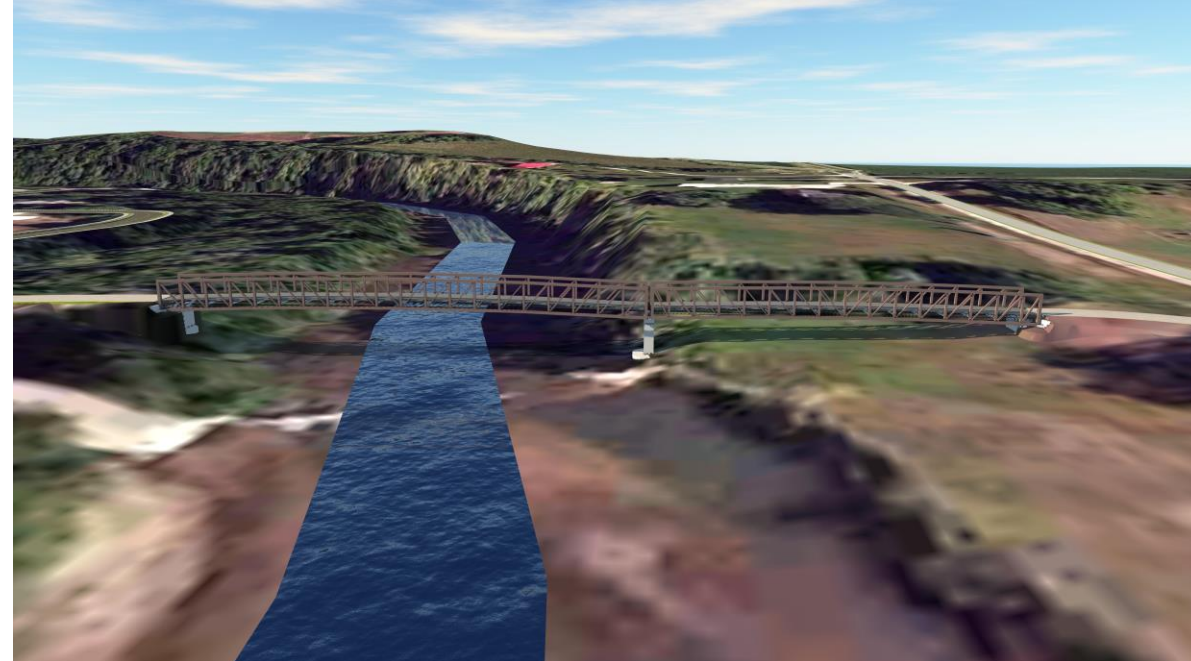
# Total Project Cost - \$1,494,000.00

Bridge (Superstructure and Substructure)				
Item	Unit	Quantity	\$ Price/Unit	Total
Steel Truss	EA	4	\$ 219,000.00	\$ 876,000.00
Deck(267x12x.5)	CY	60	\$ 200.00	\$ 12,000.00
Subgrade Stabilization Material	SY	260	\$ 3.00	\$ 780.00
Scour Protection	CY	173	\$ 40.00	\$ 6,925.00
Cast-In-Place Portland Cement Concrete	CY	91	\$ 280.00	\$ 25,500.00
#4 Reinforcement Bar	TON	0.25	\$ 695.00	\$ 175.00
#9 Reinforcement Bar	TON	3.1	\$ 800.00	\$ 2,500.00
#11 Reinforcement Bar	TON	0.49	\$ 835.00	\$ 410.00
H-Pile installation	LF	780	\$ 71.00	\$ 55,500.00
			<b>Total Bridge Cost</b>	<b>\$ 979,790.00</b>
Trail				
Recreational Trail, PCC 6"	SY	710	\$ 34.98	\$ 24,900.00
Backfill	CY	562.79	\$ 21.13	\$ 11,900.00
Corrugated Metal Culvert (12")	LF	14	\$ 21.50	\$ 300.00
Seeding and Fertilizing	ACRE	0.1304	\$ 2,027.37	\$ 265.00
Clearing and Grubbing	ACRE	0.3260	\$ 1,757.56	\$ 575.00
Granular Subbase	SY	710	\$ 8.20	\$ 5,825.00
Special Compaction of Subgrade for Recreational Trail	STA	6.39	\$ 365.65	\$ 2,350.00
Temporary Erosion Control	EA	2	\$ 500.00	\$ 1,000.00
Aluminum, Reflective Trail Signs	EA	5	\$ 25.00	\$ 125.00
Wood Posts for Trail Signs (4x4)	EA	5	\$ 16.98	\$ 85.00
			<b>Total Trail Cost</b>	<b>\$ 47,340.00</b>
Bridge Removal				
Bridge Removal (350x68)	SF	23800	\$ 7.00	\$ 167,000.00
			<b>Total Removal Cost</b>	<b>\$ 167,000.00</b>

Phase 1 Construction	\$ 1,027,500.00
Phase 2 Construction	\$ 167,000.00
<b>Total Construction Cost</b>	<b>\$ 1,194,500.00</b>
Easements	
10% Contingencies	\$ 120,000.00
15% Engineering and Administration	\$ 179,500.00
<b>Total Project Cost</b>	<b>\$ 1,494,000.00</b>

# Phase 1 – Construction

Bridge Construction	\$ 980,000.00
Construction of Trail	\$ 47,340.00
Contingencies	\$ 103,000.00
Engineering/Admin	\$ 154,000.00
Estimated Total Cost	<b><u>\$1,284,000.00</u></b>



# Phase 2 – Demolition

Removal of Cass Street Bridge	\$167,000.00
Contingencies	\$ 16,700.00
Engineering/Admin	\$ 25,050.00
Estimated Total Cost	<b><u>\$209,000.00</u></b>

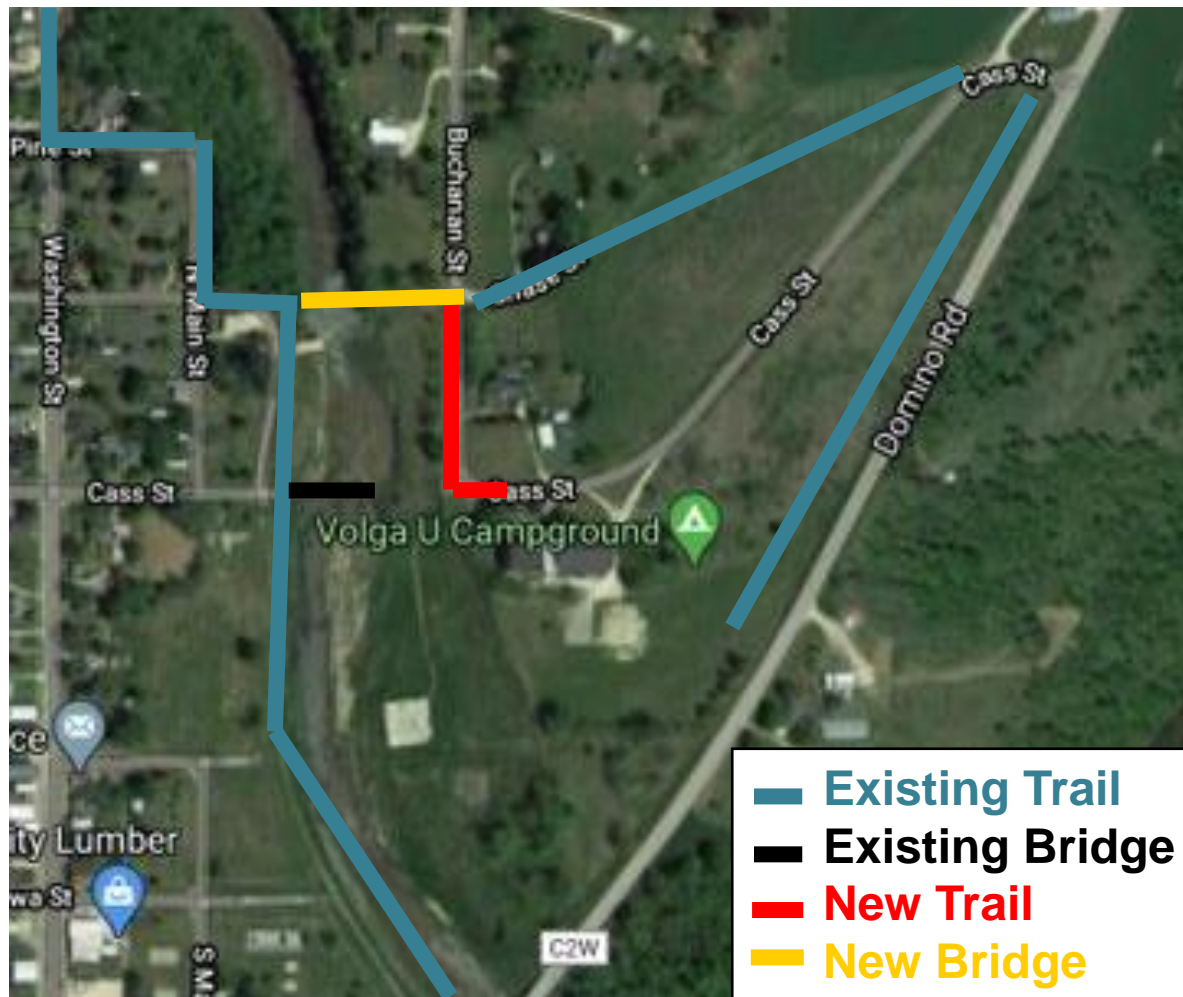


# Outline



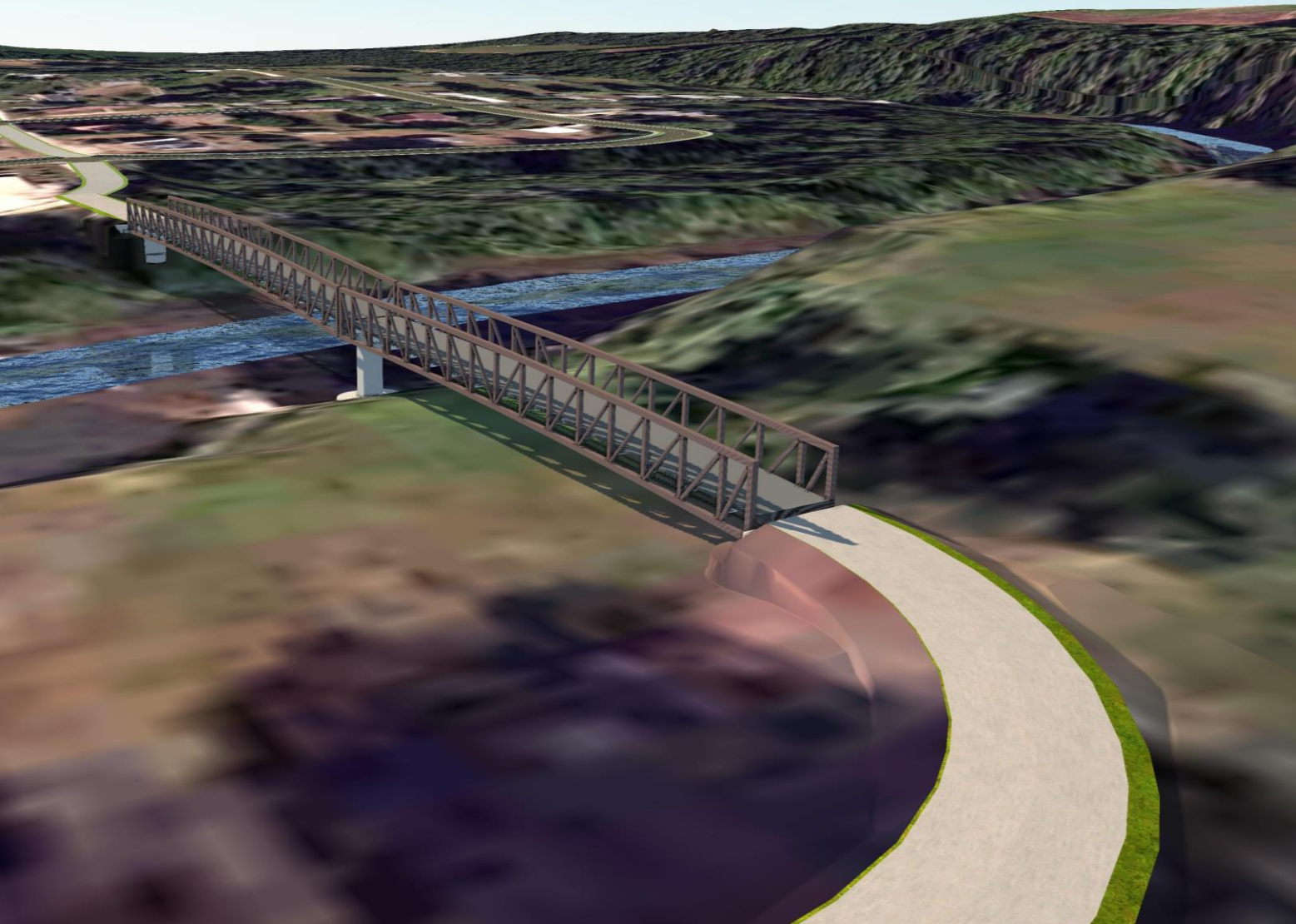
**Project Overview**

# Project Overview











# Questions?



## KGMM Engineering

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