

**IOWA**<sup>TM</sup>

CIVIL & ENVIRONMENTAL  
**ENGINEERING**

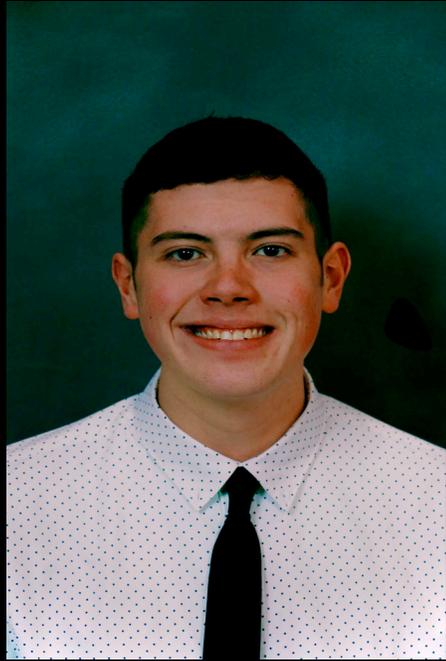


# Maquoketa River Pedestrian Bridge

Tiger Hawk Engineering – Student Engineering Group



**Christian Stekl**  
*Structural*



**Sam Landsteiner**  
*Environmental*



**Barrett Wise**  
*Structural*



**Tyler Tuttle**  
*General Practice*



**Jun Li**  
*General Practice*

# Team Members





# Agenda

Client & Existing Site

Project Overview

Design Details

Phasing Plan

Cost Estimation

# Client & Project Location



**Manchester**  
IOWA  
FAMILY. COMMUNITY. OPPORTUNITY.

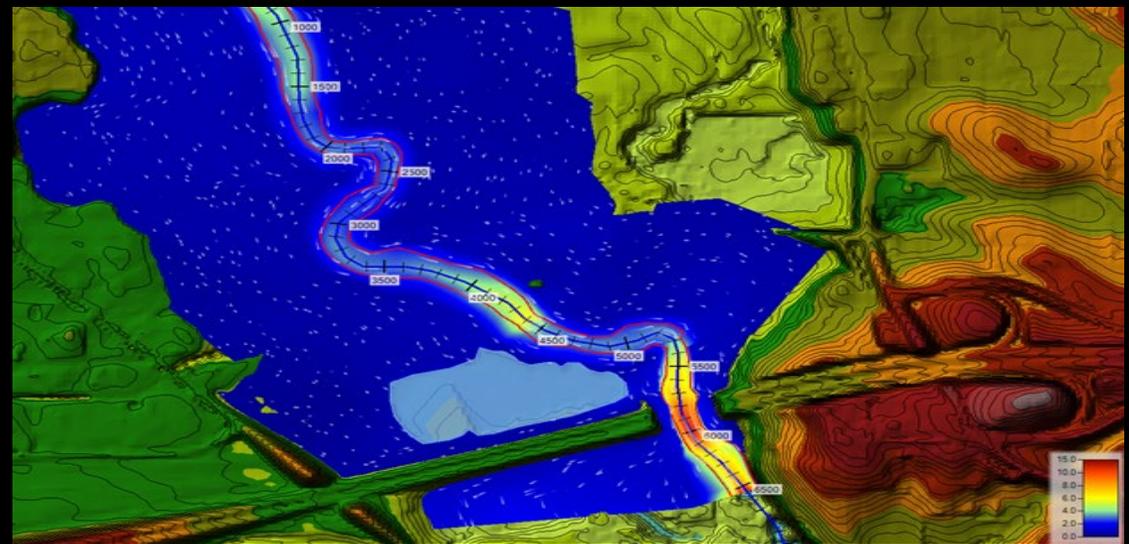
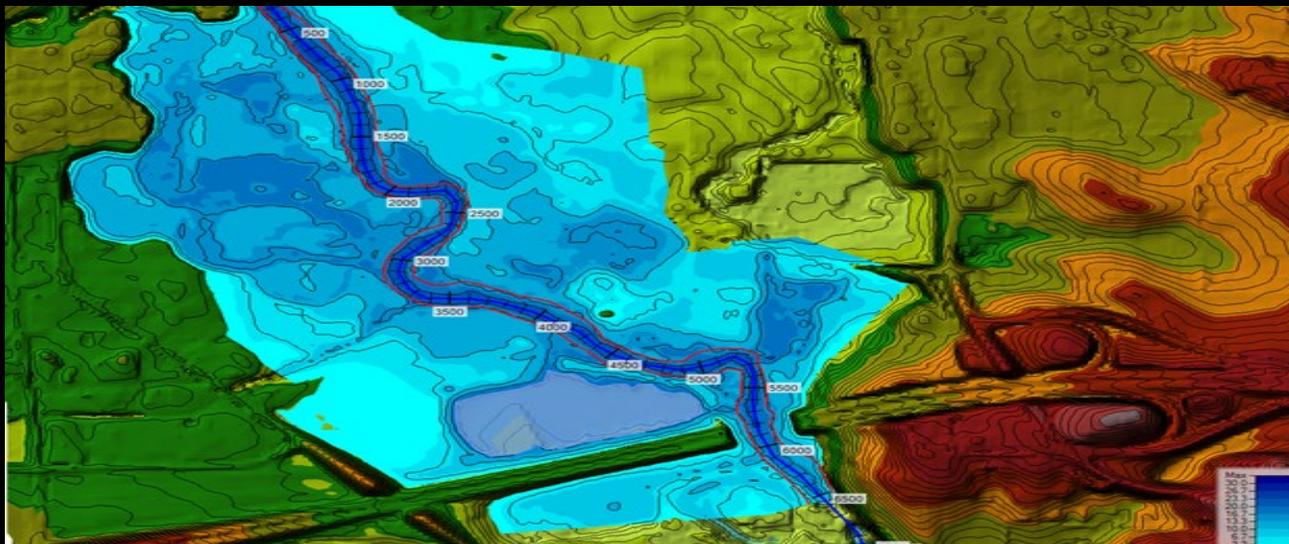
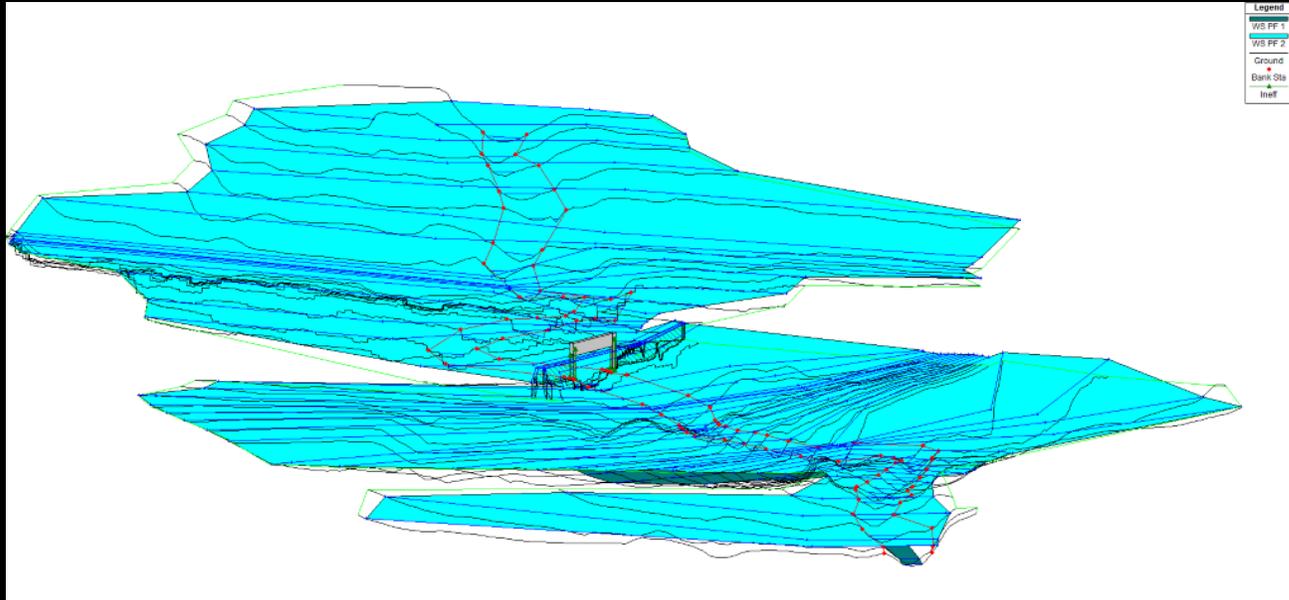
- ❖ Doug Foley, Parks & Recreational Director
- ❖ Ryan Wicks, FEHR Graham Engineering



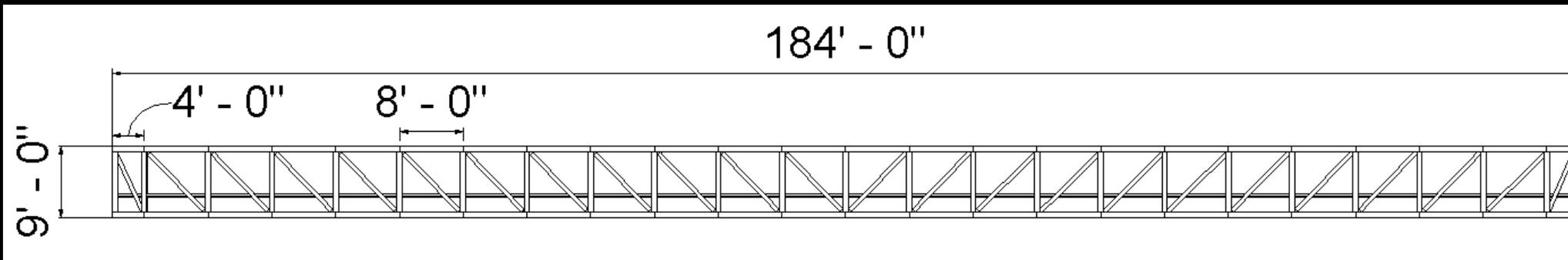
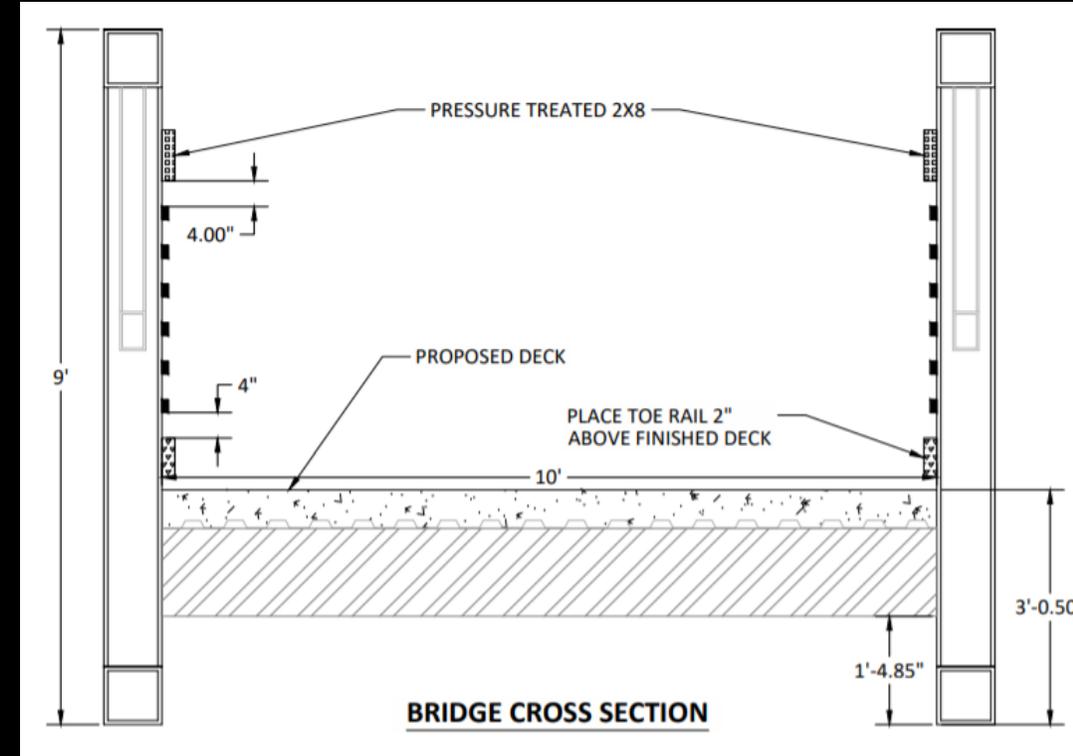
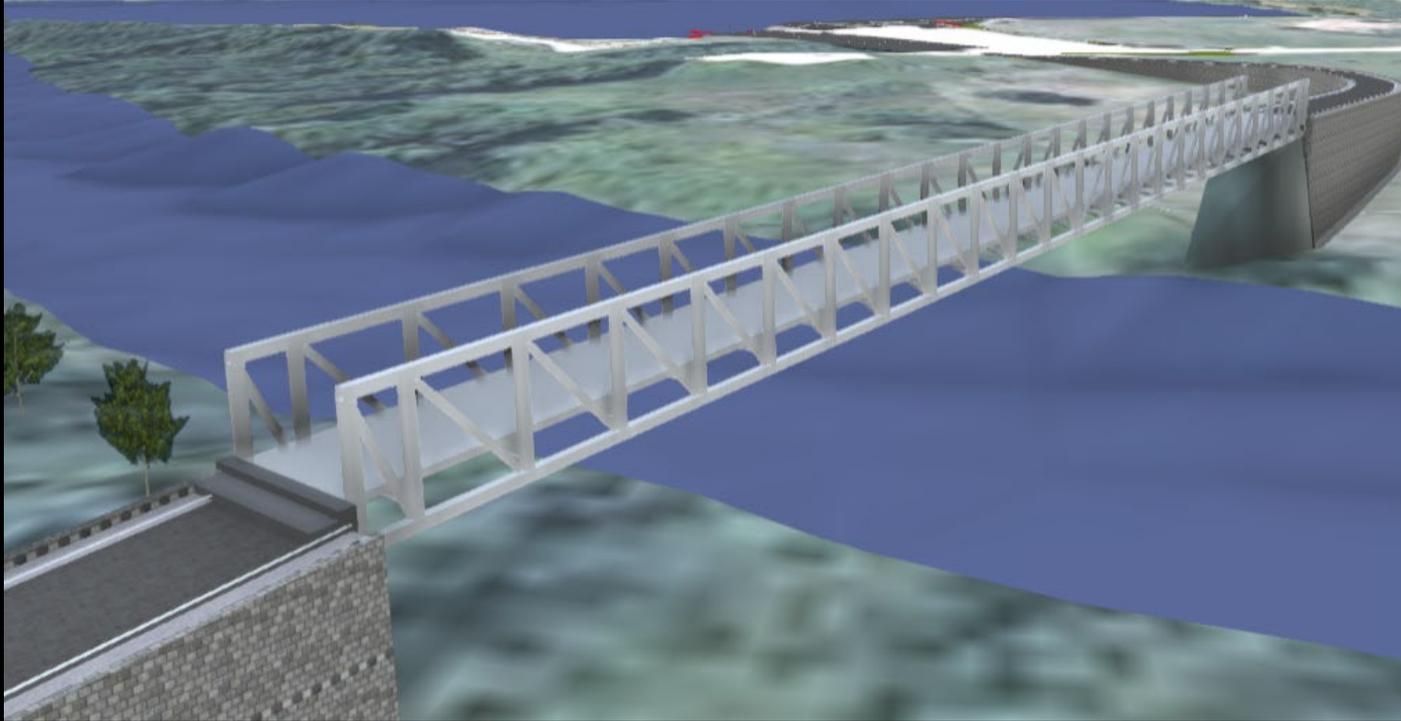
# Project Overview



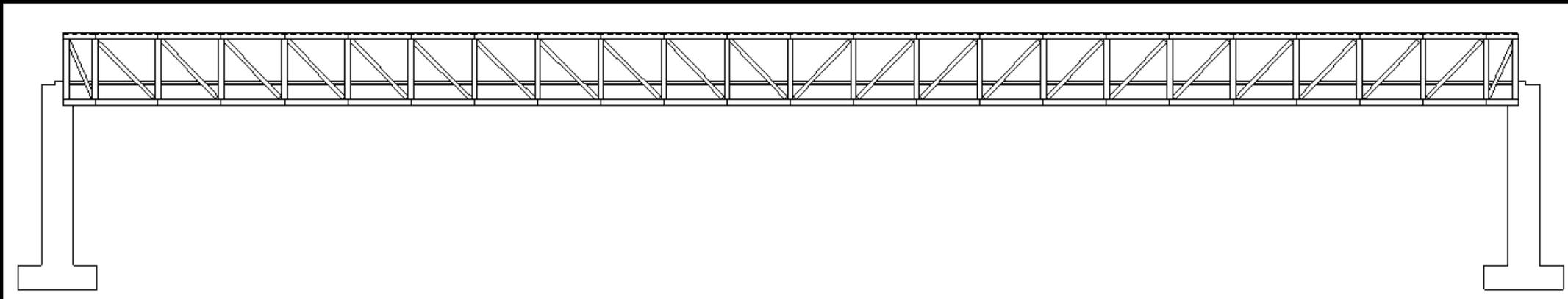
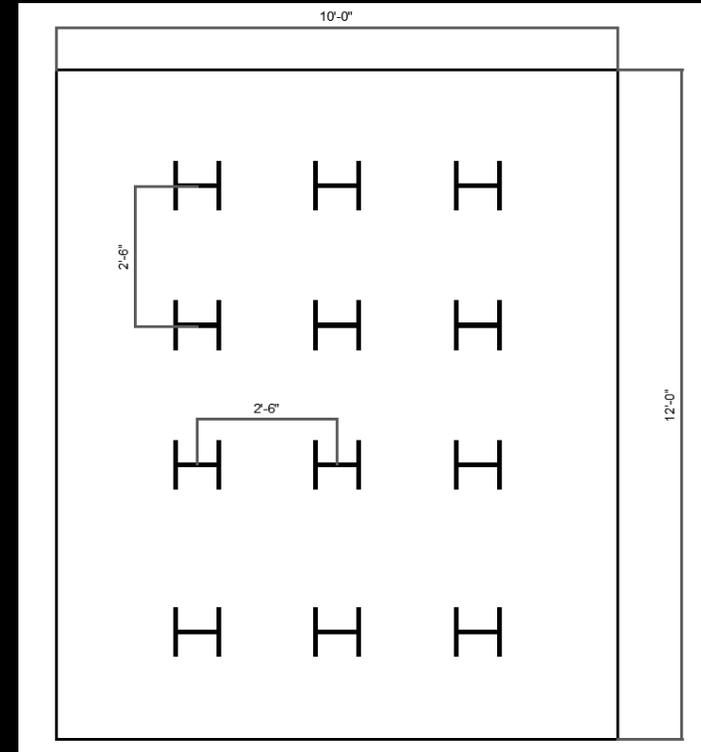
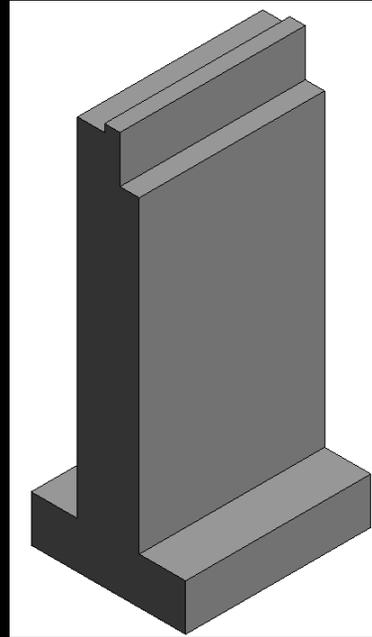
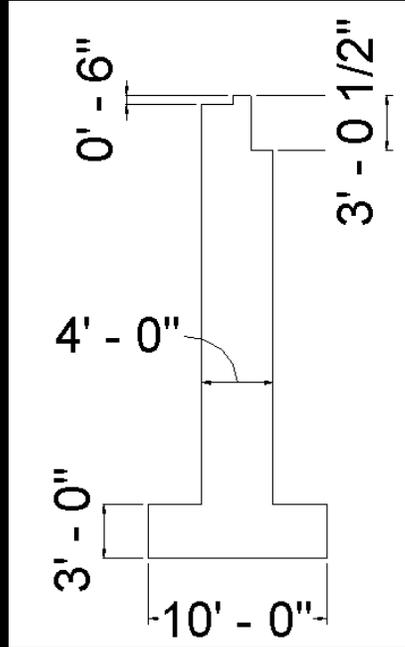
# 1-D River Analysis



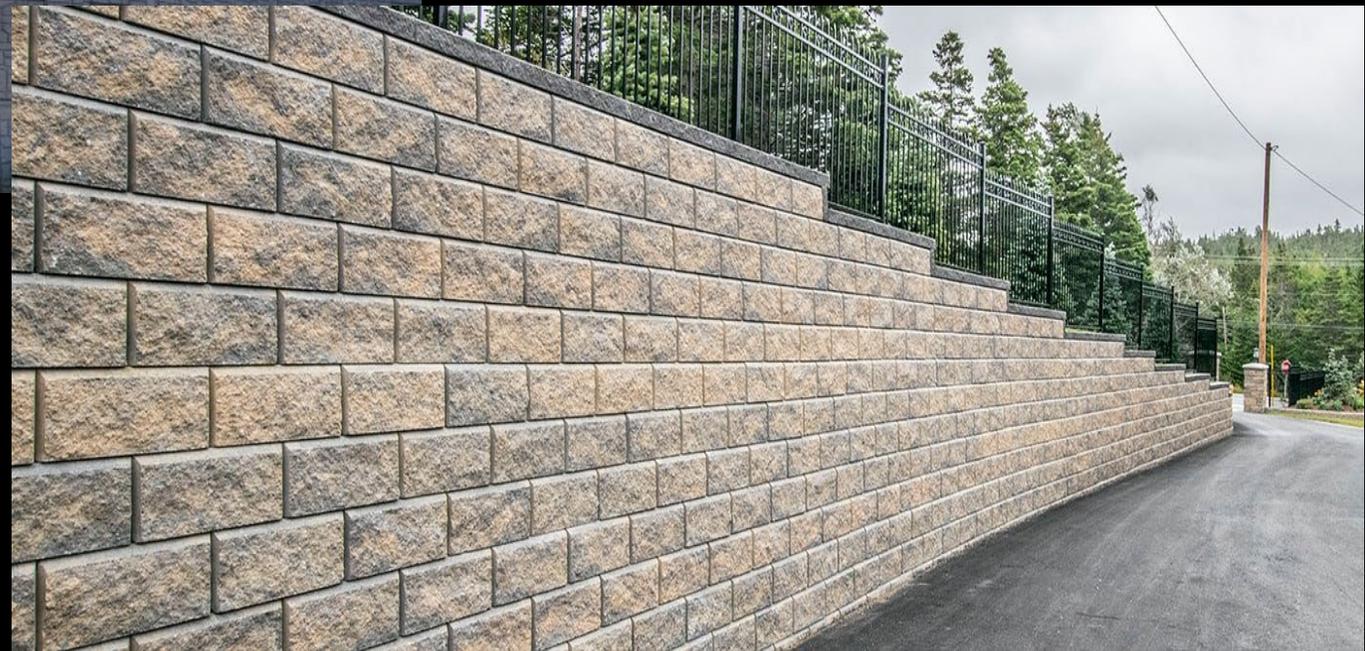
# Pedestrian Bridge



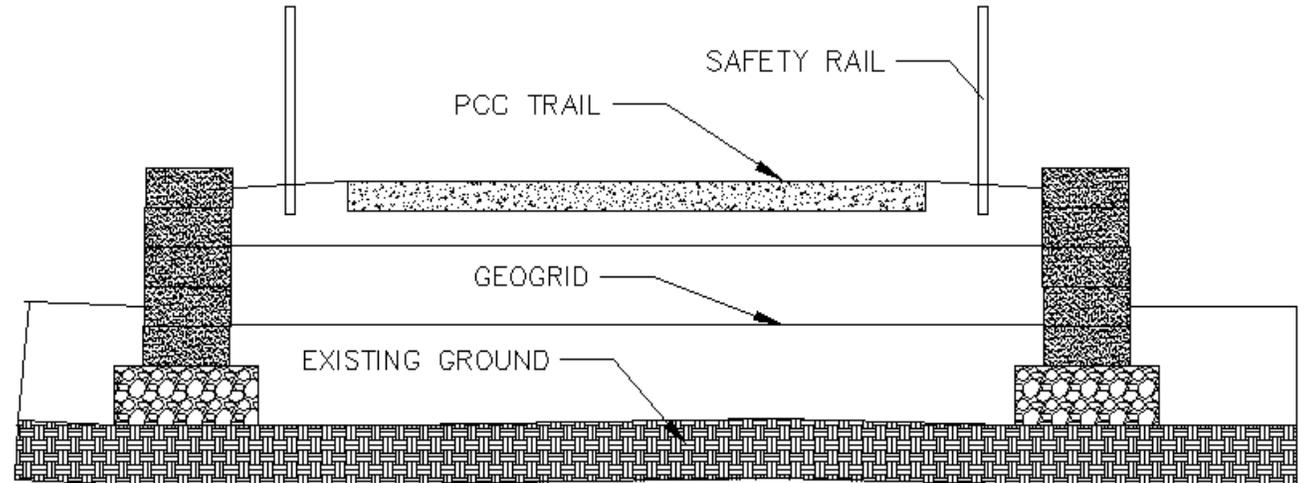
# Abutments



# Retaining Wall



# Retaining Wall

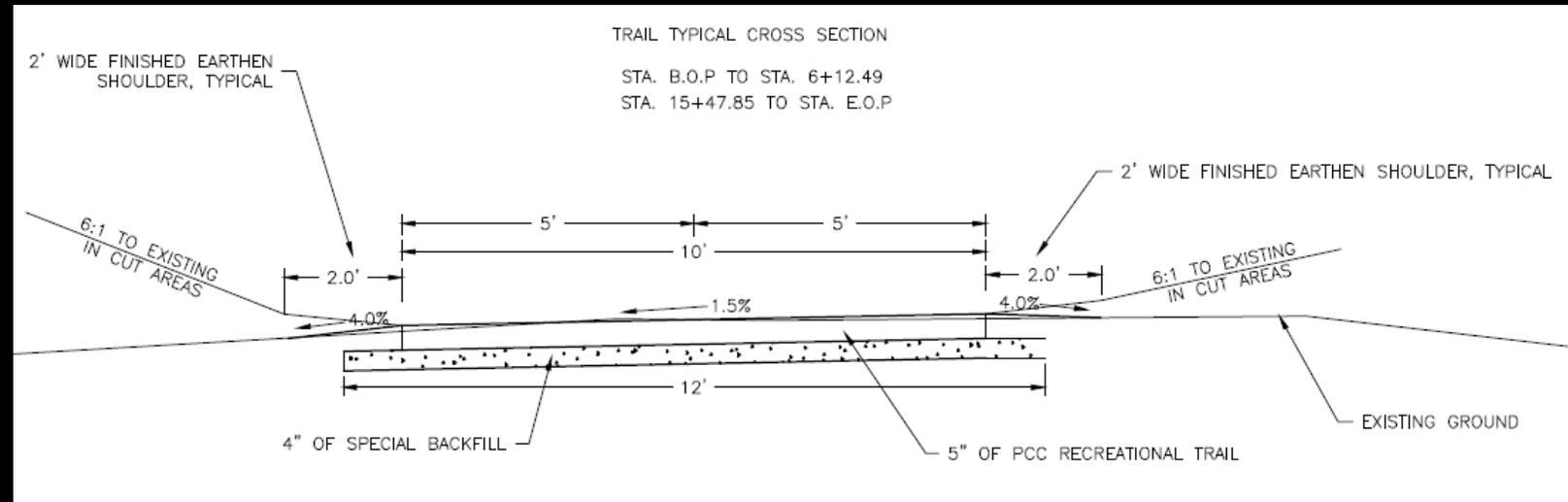
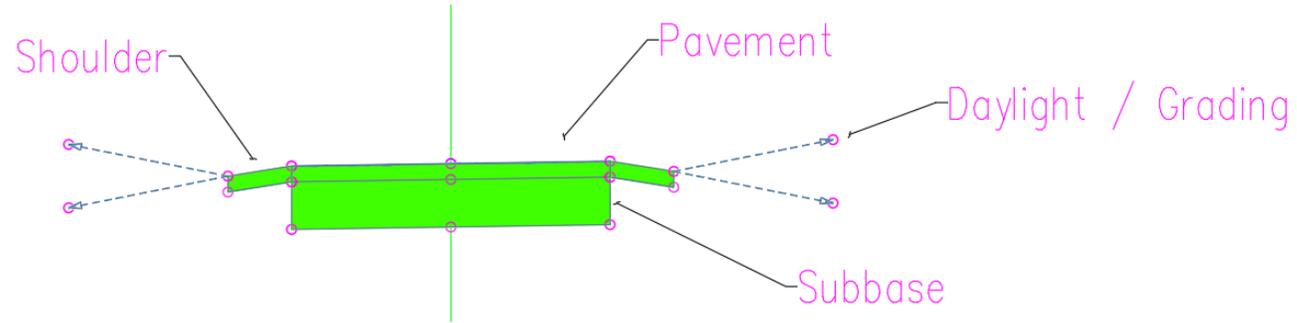


RETAINING WALL CROSS SECTION

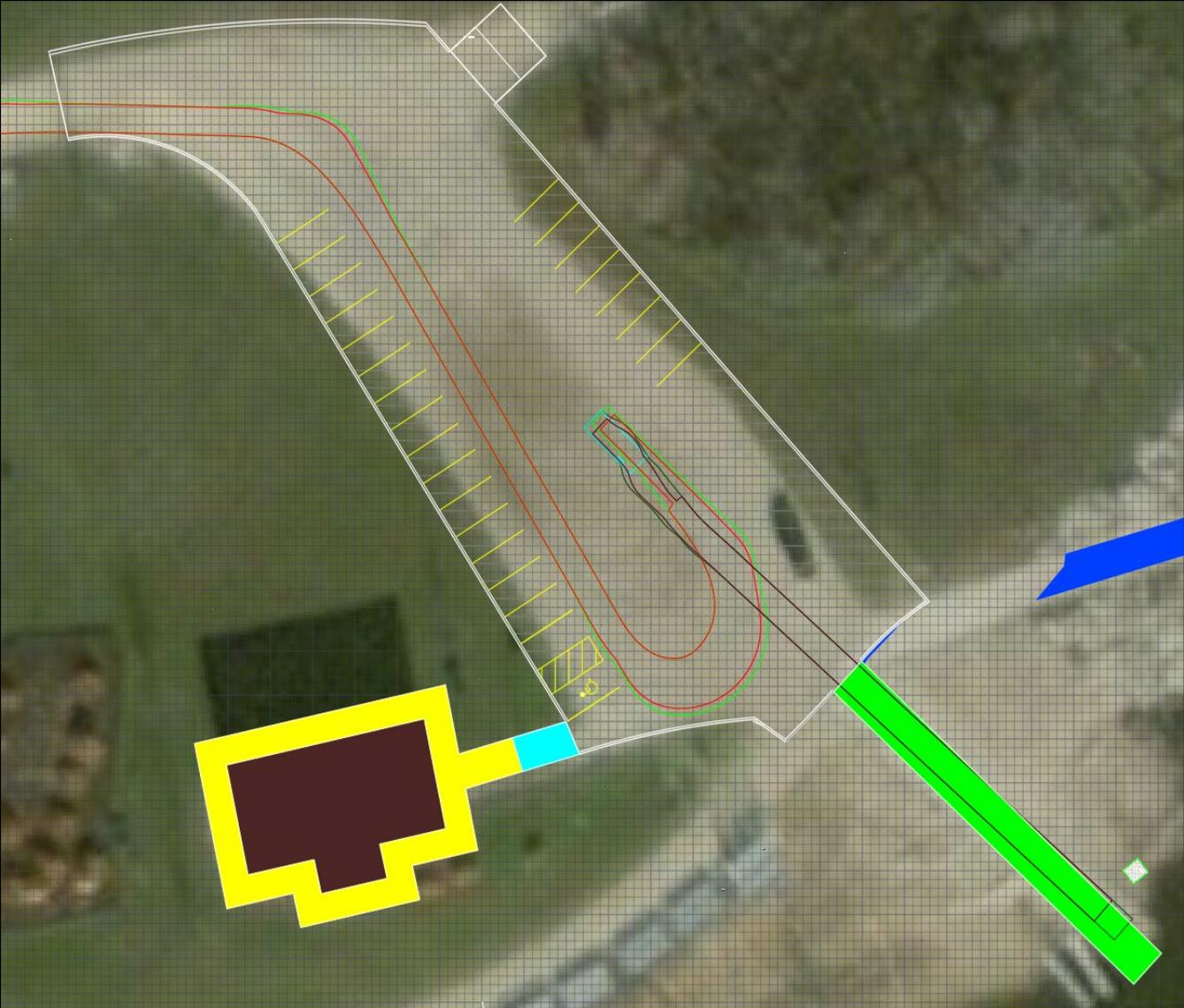
# Pedestrian Trail



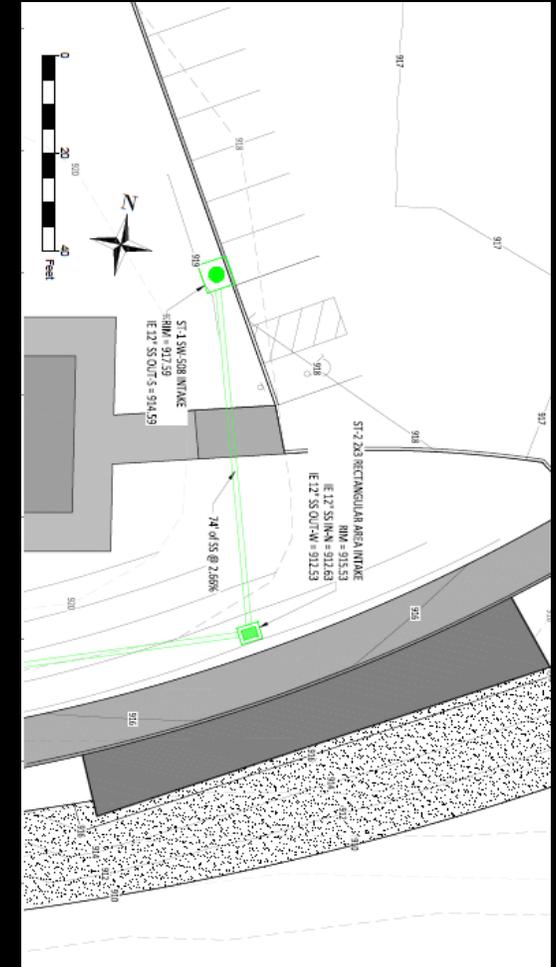
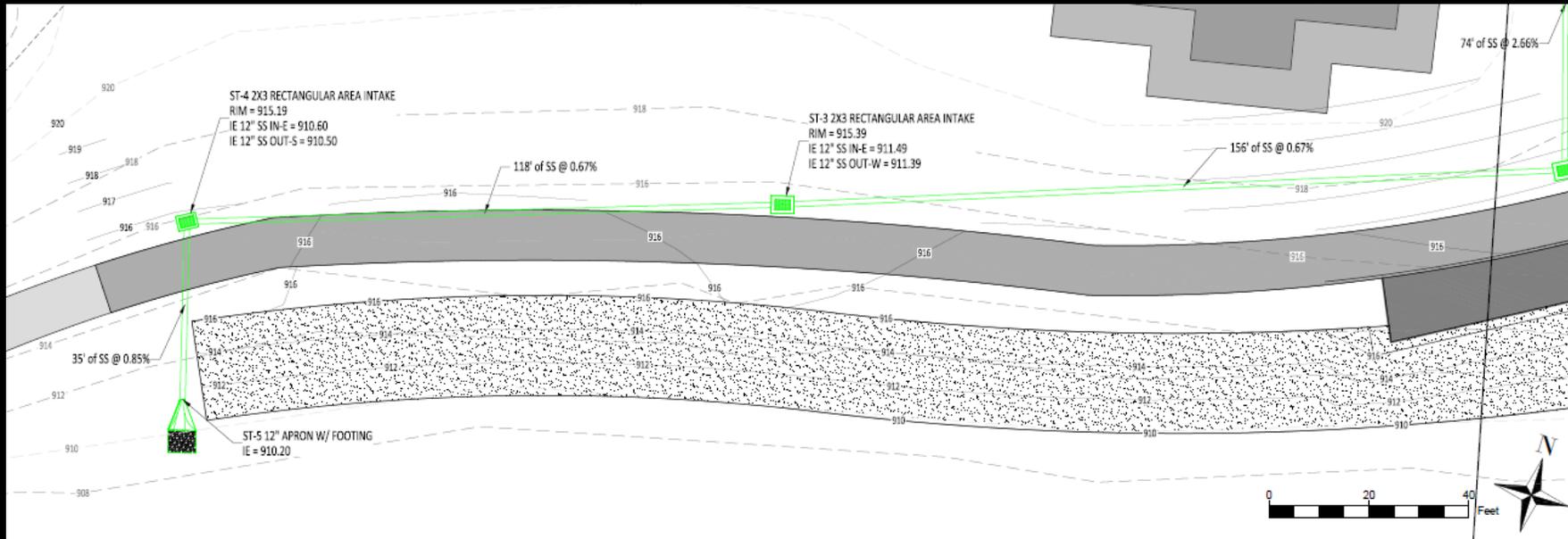
# Pedestrian Trail



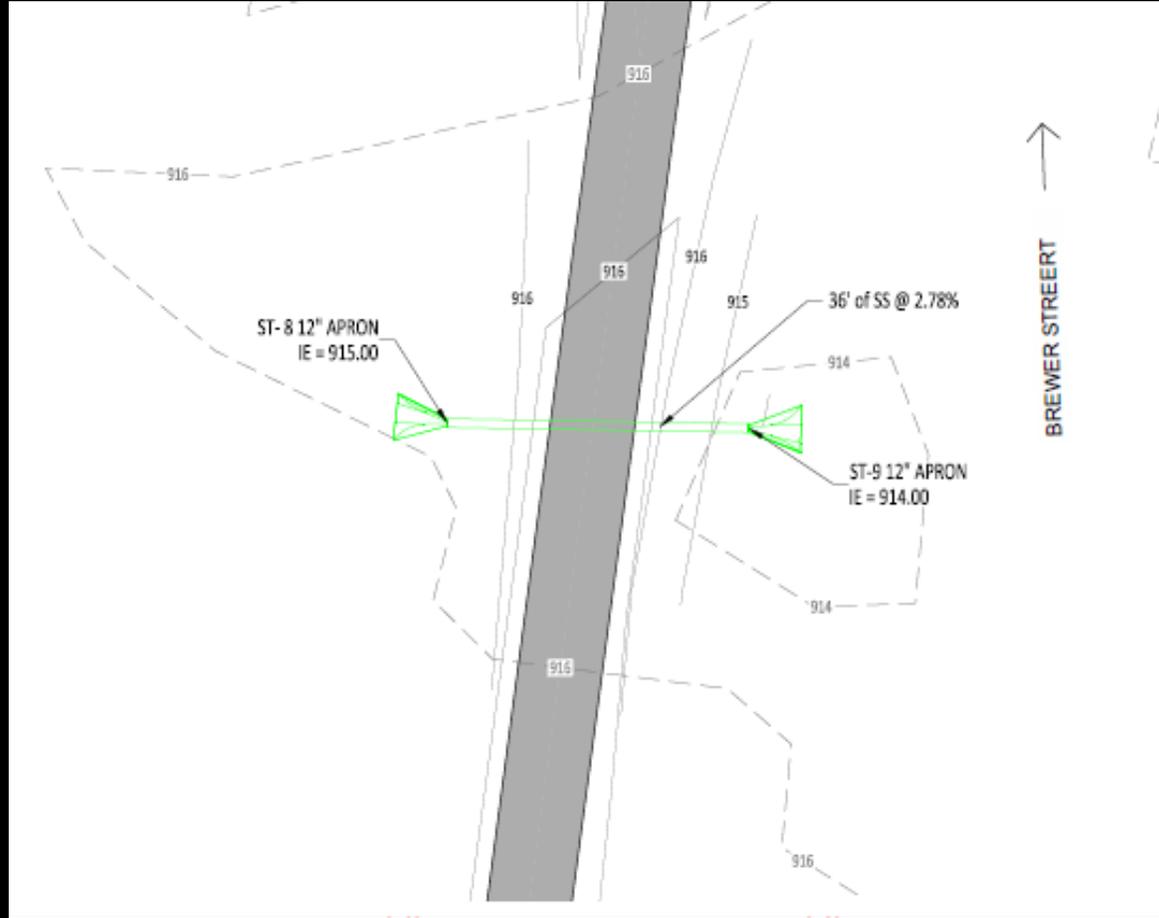
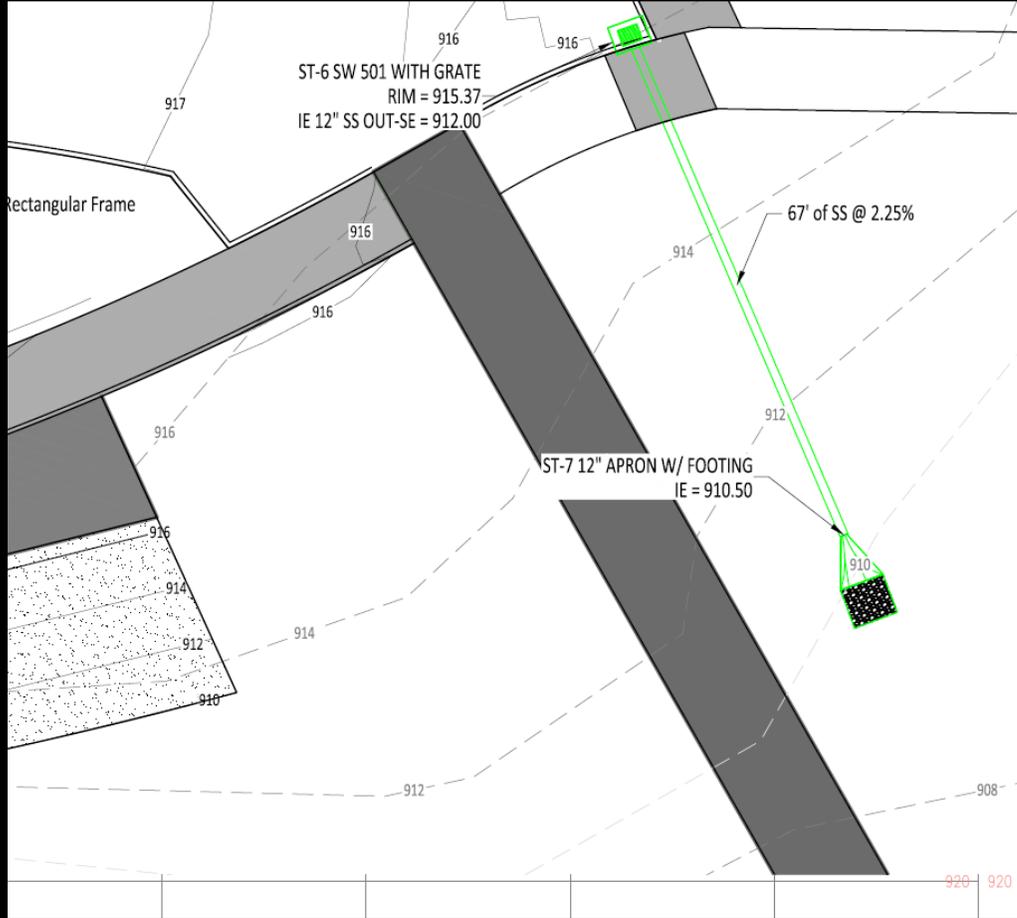
# Parking Lot Layout



# Storm Sewer



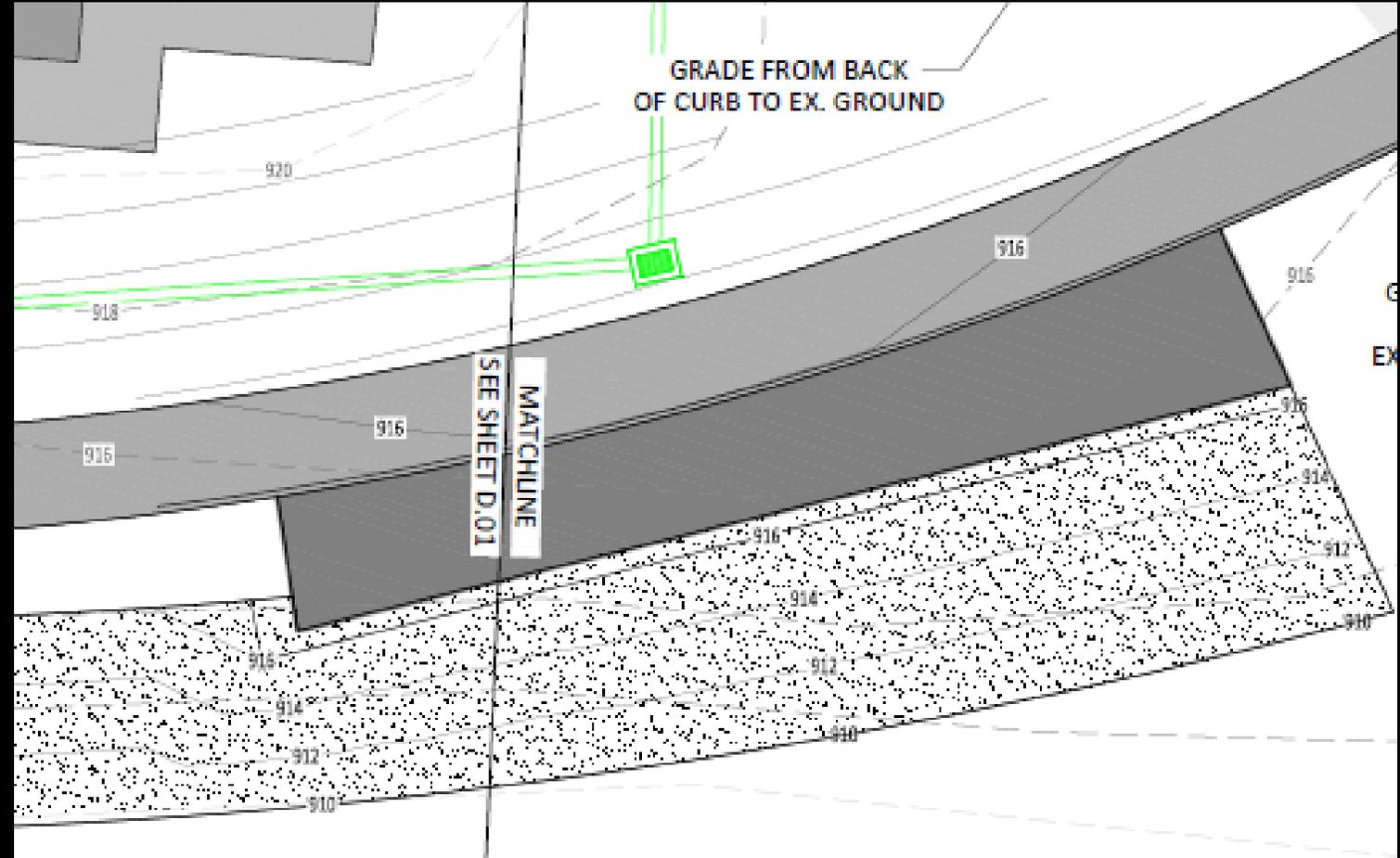
# Storm Sewer



# Natural Stone Steps



# Bleacher Pad Drawing



# Phase 1: Plan & Cost Estimate

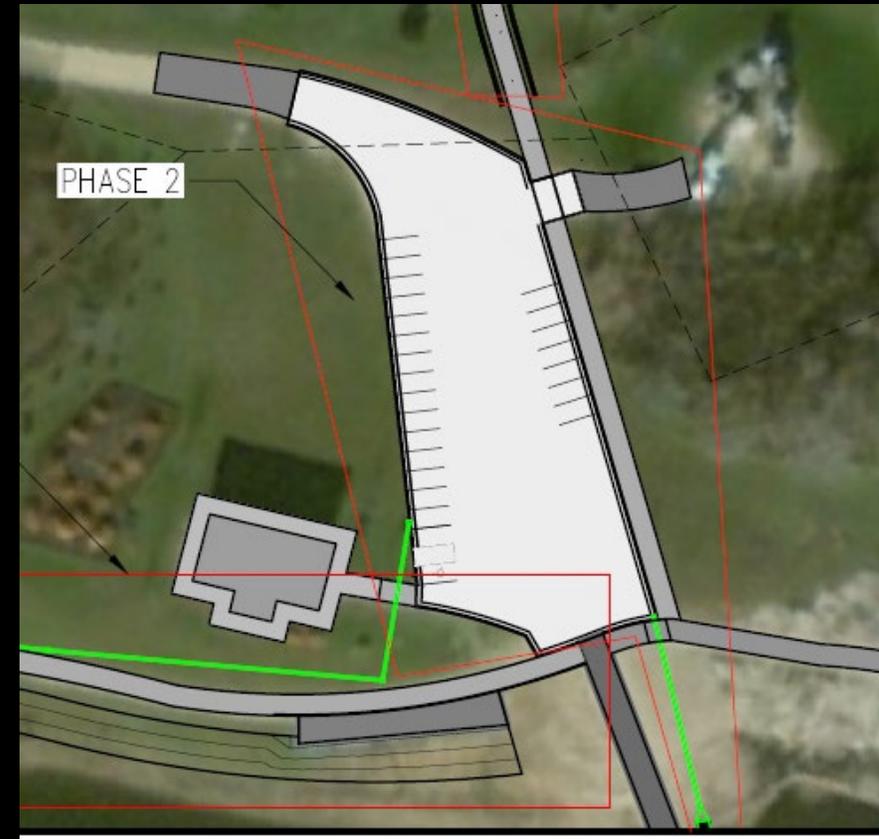
ESTIMATED PROJECT COST PHASE 1 - POND AREA		
Item No.	Item	TOTAL
1	Erosion control Measures	\$ 10,000.00
2	Borrow	\$ 360.00
3	Rip Rap/Revetmetn Class E	\$ 52.00
4	Granular backfill	\$ 6,480.00
5	Natural Stone	\$ 544,000.00
6	Rectangular Area Intake	\$ 7,500.00
7	Seeding and Fertilizing (Urban)	\$ 200.00
8	5in PCC Trail	\$ 12,960.00
9	5in PCC Pad	\$ 420.00
10	Storm Sewer, 12 in	\$ 18,540.00
11	Pipe Apron, 12 in	\$ 600.00
12	Footing for Concrete Apron	\$ 600.00
13	Special Backfill for Trail	\$ 1,500.00
14	Mobilization	\$ 25,000.00
	Sub Total	\$ 628,212.00
	Engineering - 10%	\$ 62,822.00
	Contingency - 15%	\$ 94,232.00
	<b>Grand Total</b>	<b>\$ 785,266.00</b>



- Natural Stone Steps
- Trail – Northern Pond Bank
- Storm Sewer (West)
- Bleacher Pad

# Phase 2: Plan & Cost Estimate

ESTIMATED PROJECT COST PHASE 2 - PARKING LOT		
Item No.	Item	Total
1	Storm Sewer, 12 in	\$ 8,400.00
2	Pipe Apron, 12 in	\$ 600.00
3	Footing for Concrete Apron	\$ 600.00
4	Removal of Sidewalk	\$ 220.00
5	Removal of Trail	\$ 110.00
6	Sidewalk, 5in PCC Replacment	\$ 880.00
7	Detectable Warnings	\$ 480.00
8	Painted Pavement Markings	\$ 1,572.00
9	SW-501 Intake with Grate	\$ 3,000.00
10	SW-508 Intake	\$ 5,200.00
11	Rip Rap/Revetment Class E	\$ 52.00
12	Removal of Fence	\$ 1,000.00
13	Bollard and Sign	\$ 1,000.00
14	Seeding and Fertilizing (Urban)	\$ 200.00
15	5 in PCC Trail	\$ 7,410.00
16	Special Backfill for Trail	\$ 1,950.00
17	Erosion Control Measures	\$ 10,000.00
18	Class 10 Excavation	\$ 2,080.00
19	Mobilization	\$ 15,000.00
<b>HMA Paving Option</b>		
19	PCC Curb and Gutter, 30", 7.5 " Thick	\$ 17,800.00
20	PCC 4 in Sloped Curb 30", 7.5" Thick	\$ 1,530.00
21	Pavement, HMA, 7.5"	\$ 59,010.00
22	Asphalt Binder PG 58-28S Standard Traffic- 5%	\$ 20,210.00
<b>PCC Paving Option</b>		
23	Pavement, PCC, 6"	\$ 126,500.00
<b>Gravel Surface Option</b>		
24	Gravel for Parking Lot	\$ 6,384.00
		Grand Total
PCC Option		\$ 232,818.00



- PCC Parking Lot
- Storm Sewer (East)
- Trail Connection

# Phase 3: Plan & Cost Estimate

ESTIMATED PROJECT COST PHASE 3 - BRIDGE/RETAINING WALL		
Item No.	Item	Total
1	Storm sewer, 12 in	\$ 2,160.00
2	Pipe apron, 12 in	\$ 1,200.00
3	Segmental block retaining wall	\$ 480,000.00
4	Granular backfill	\$ 153,200.00
5	Prefab bridge 180x10	\$ 274,000.00
6	Structural concrete	\$ 17,340.00
7	Bridge Installation	\$ 200,000.00
8	Abutments	\$ 120,000.00
9	Safety rail	\$ 128,000.00
10	HP 10x42	\$ 32,400.00
11	Clearing and Grubbing	\$ 600.00
12	Subdrain & Outlet	\$ 5,000.00
13	Class 10 Excavation	\$ 656.00
14	Seeding and fertilizing (Urban)	\$ 500.00
15	5in PCC trail	\$ 45,000.00
16	Mobilization	\$ 80,000.00
17	Erosion control measures	\$ 10,000.00
18	Rip Rap/Hard Armor	\$ 11,360.00
	<b>Sub Total</b>	\$ 1,561,416.00
	Engineering	\$ 156,141.60
	Contingency	\$ 234,212.40
	<b>Grand Total</b>	<b>\$ 1,951,770.00</b>



- Retaining Wall
- Pedestrian Bridge
- Trail Connection
  - Brewer Street to Ped Bridge
  - Ped Bridge to Parking Lot



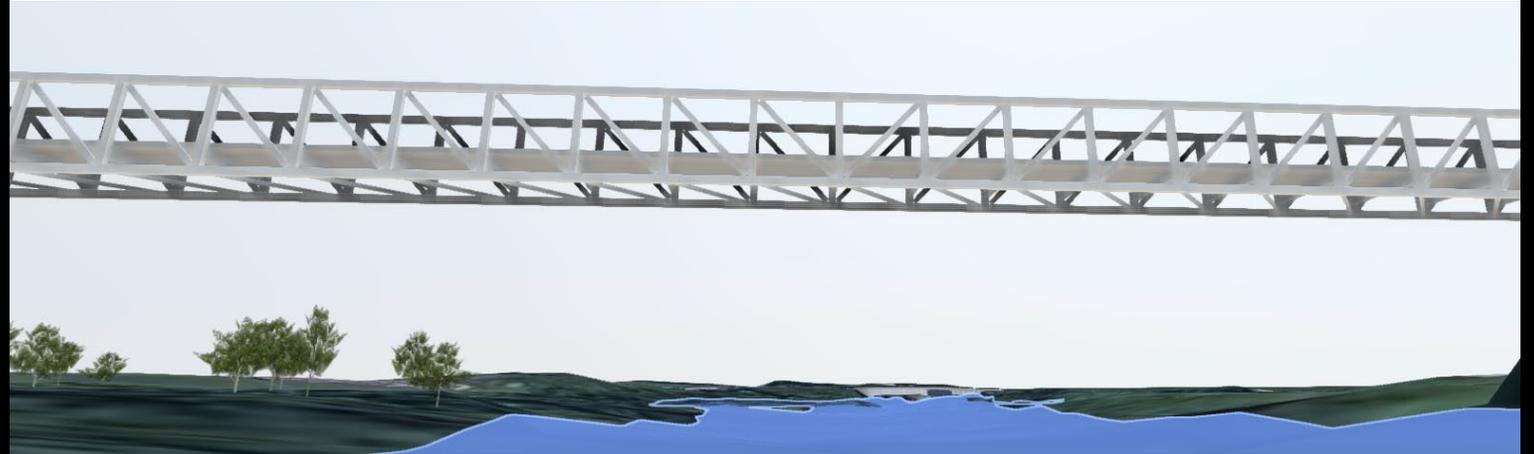
# Estimated Total Cost

Phase 1: \$ 785,266.00

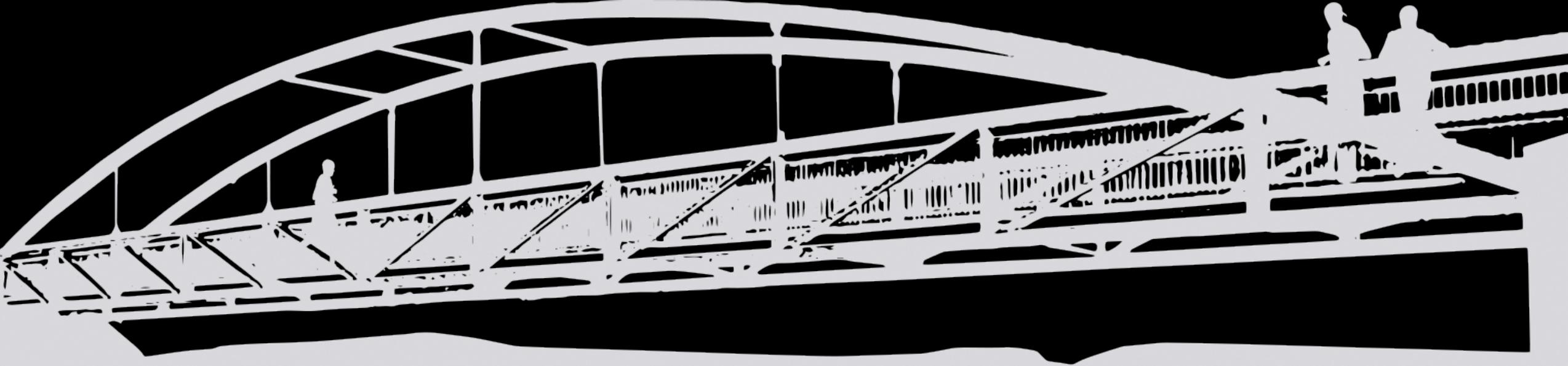
Phase 2: \$ 232,818.00

Phase 3: \$ 1,951,770.00

Total Cost: \$ 2,969,854.00



Source of data: Iowa DOT Letting bid tabs from Nov. 2020, bid tabs from projects in Manchester for year 2020.



**Thank you!**

Questions?

