

# MLDC Engineering Co.

## Cedar Prairie Trail Bridge Replacement

### Option 2: Eastern Trail Alignment

### Waterloo, IA

**Owner Contact Information:**

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 Wayne Castle – wayne.castle@waterloo-ia.org

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Tabulation of Length, Elevation, and Design Data

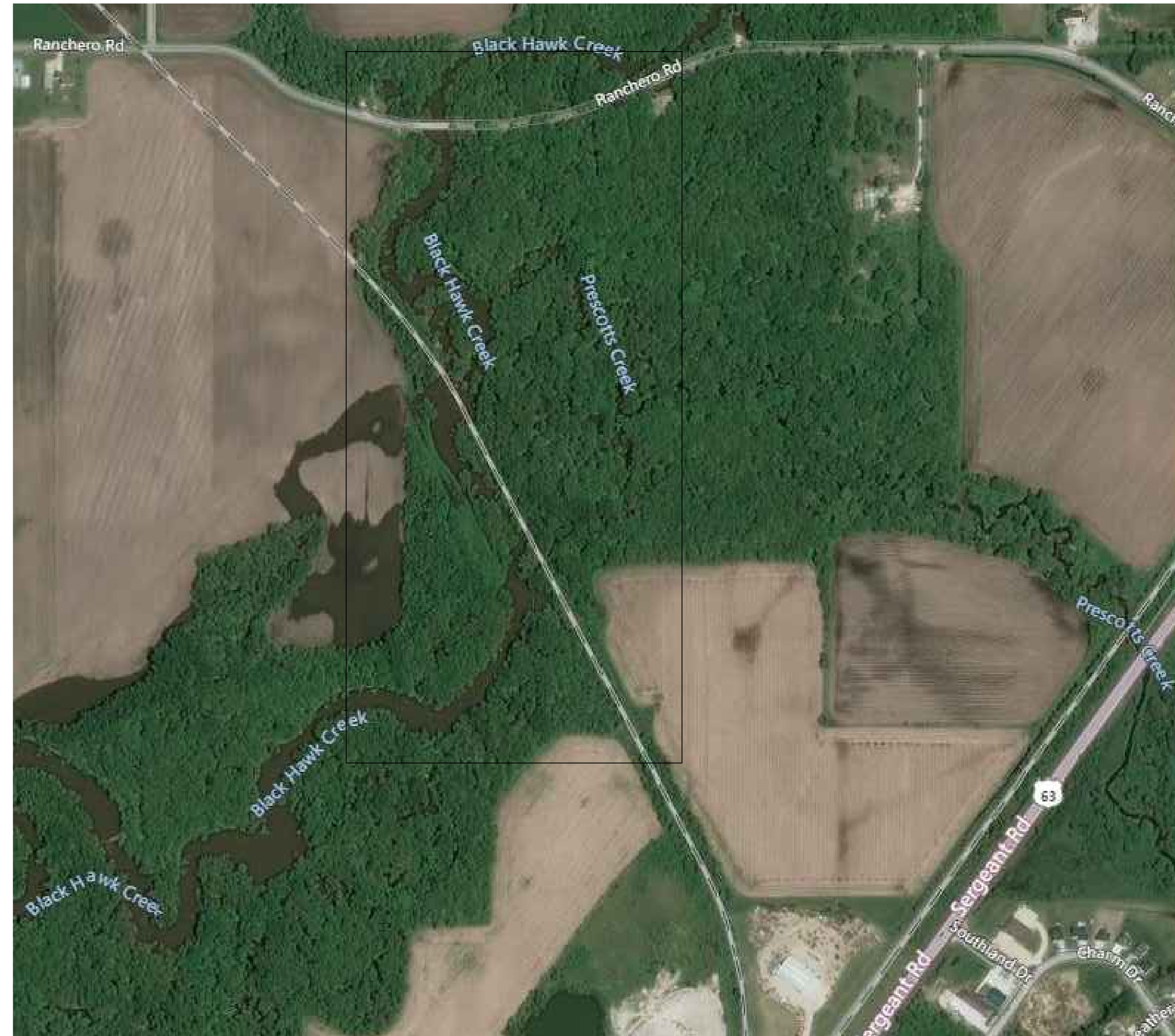
Length: 2284.65 ft = 0.44 miles

**Elevation**

start: 862.0 ft  
 at bridge ends: 860.0 ft  
 end: 868.0 ft

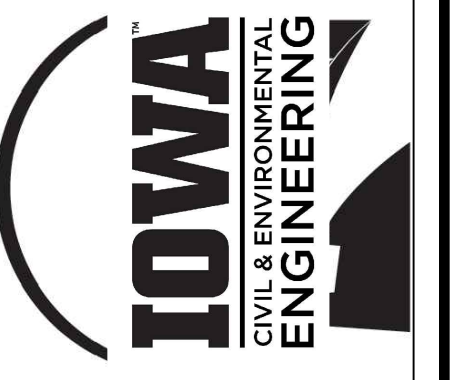
**Design Data**

minimum radius: 115 ft  
 maximum grade: 5.00 %  
 minimum sag K-value: 12  
 minimum crest K-value: 26  
 maximum design speed: 25 mph



PROJECT:	CEE: 4850
DATE :	05/06/21
DRAWN BY:	LUCY DENT
REVISION:	

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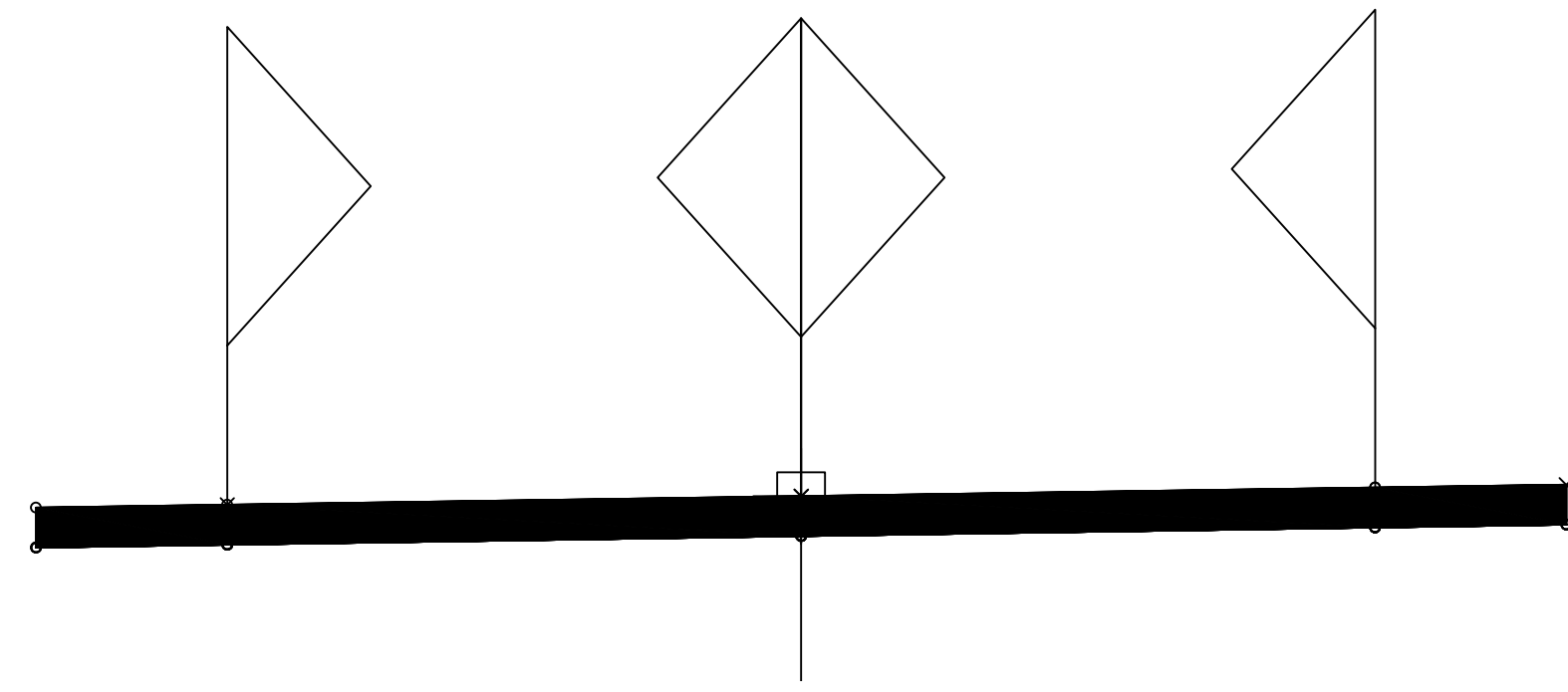


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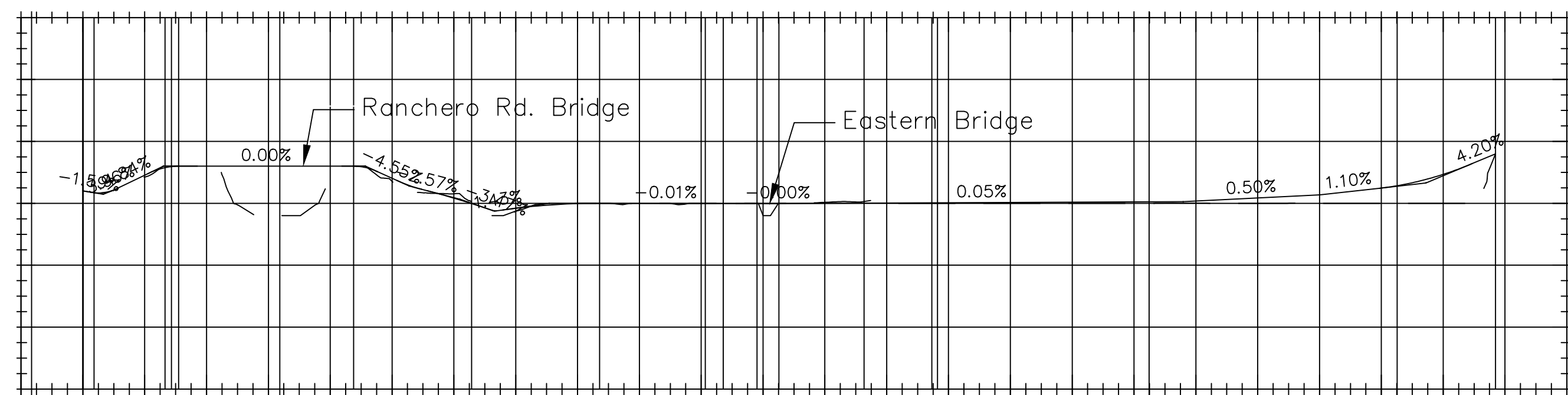
**BRIDGE REPLACEMENT**  
 CEDAR PRAIRIE TRAIL  
 WATERLOO, IA

SHEET NAME  
 EASTERN ALT.  
 TITLE SHEET

SHEET NO.  
**T-1**



Pavement Cross Section



Vertical Alignment

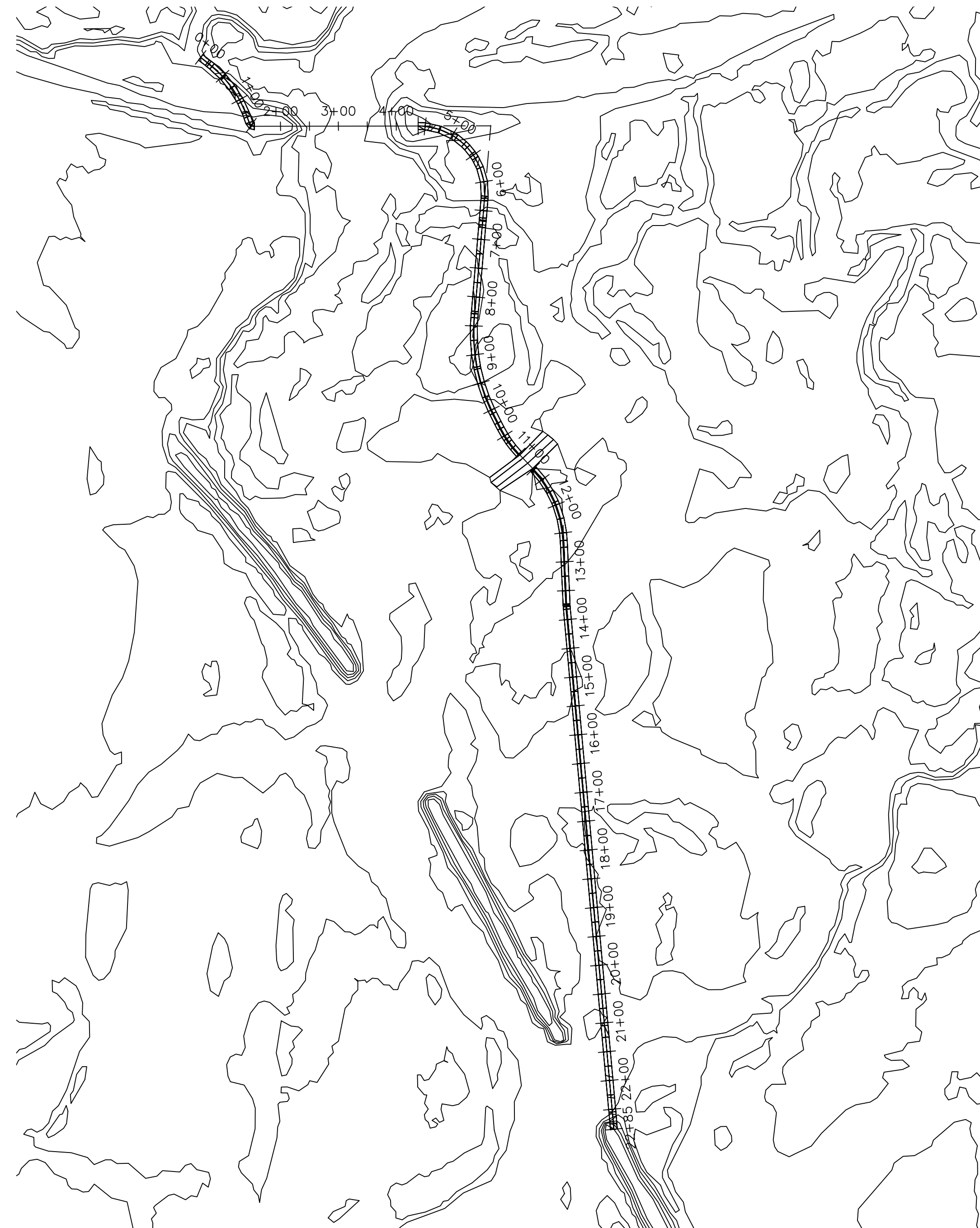
Trail Pavement Design

12 ft wide path – 5” asphalt

2 ft wide shoulders on either side – soil/grass

1.5% slope down toward Black Hawk Creek

\*Note: consider adding 6” subgrade below asphalt



Horizontal Alignment

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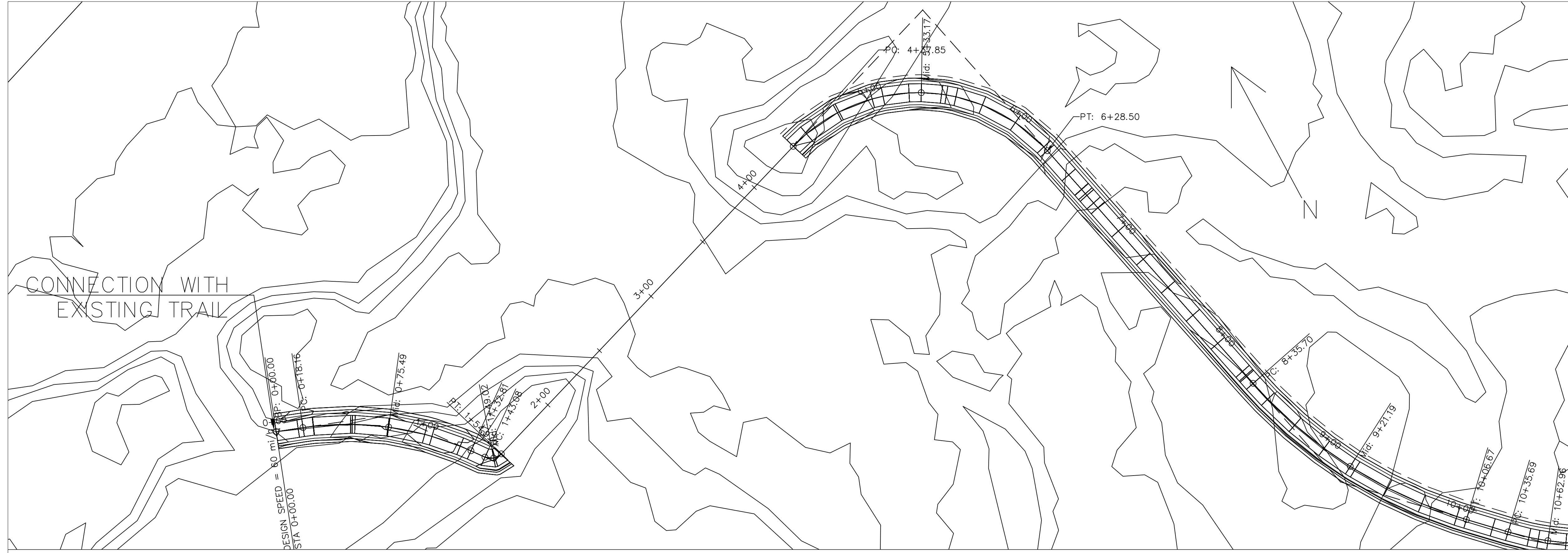


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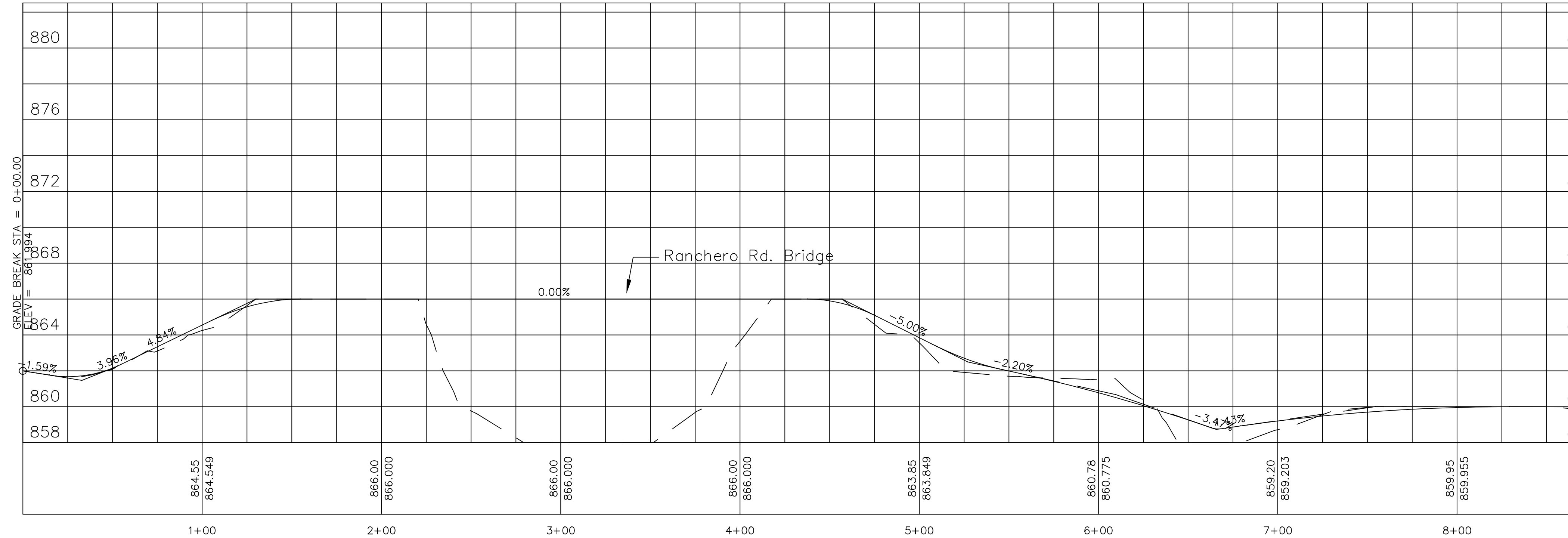
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 CEDAR PRAIRIE TRAIL  
 WATERLOO, IA

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 DESIGN OVERVIEW

SHEET NO.  
**1**

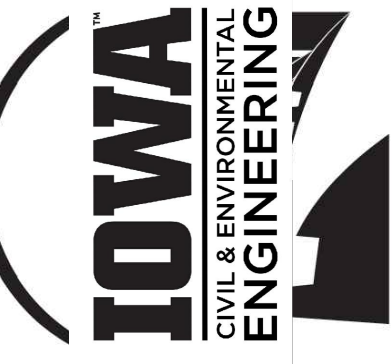


Alternative5HorizontalAlignment PROFILE



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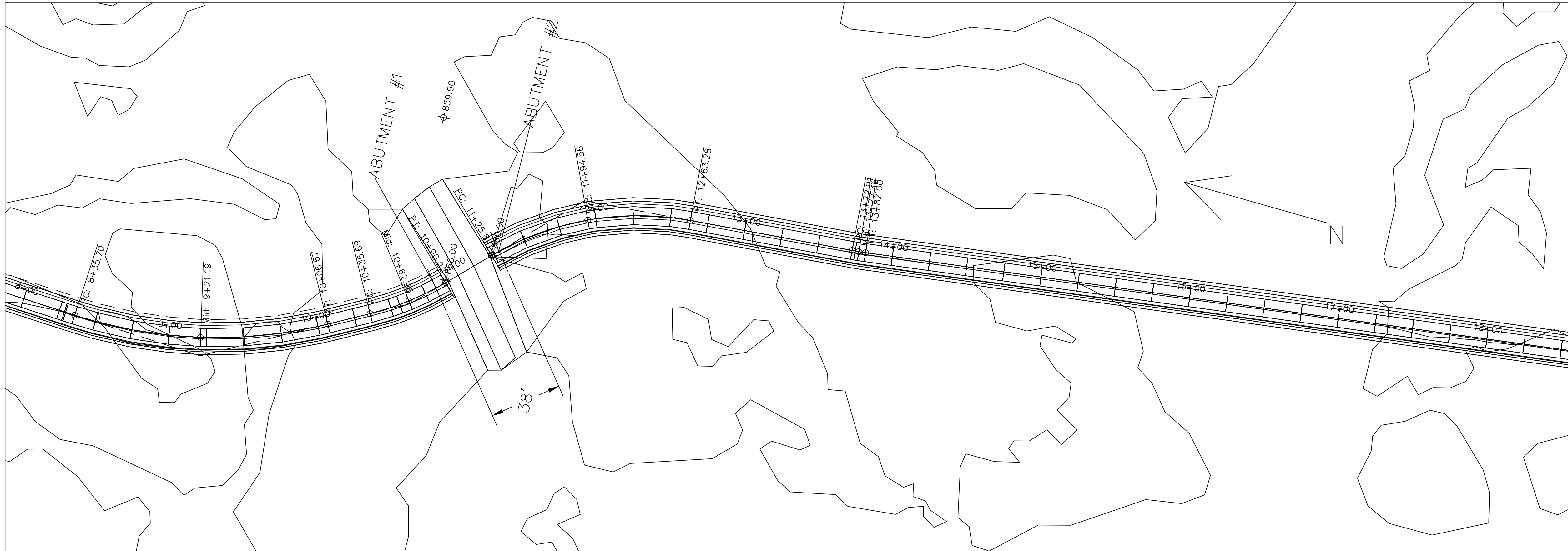
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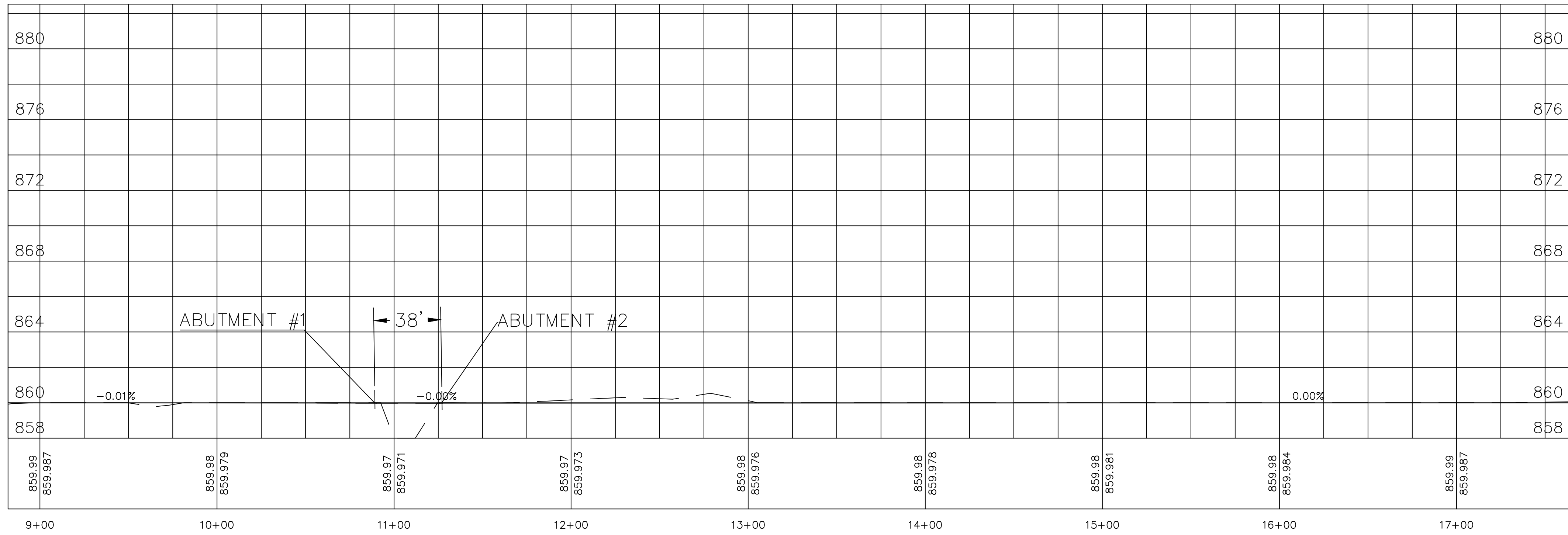
CEDAR PRAIRIE TRAIL  
 WATERLOO, IA

SHEET NAME  
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 PLAN & PROFILE 1

SHEET NO.  
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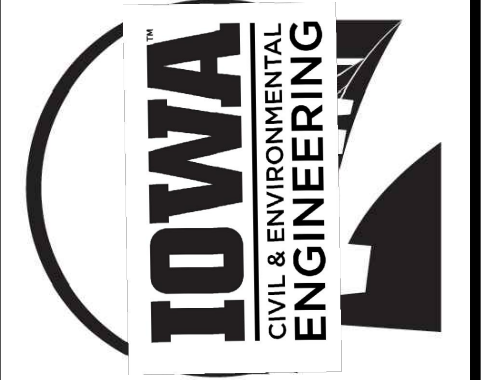


Alternative5HorizontalAlignment PROFILE



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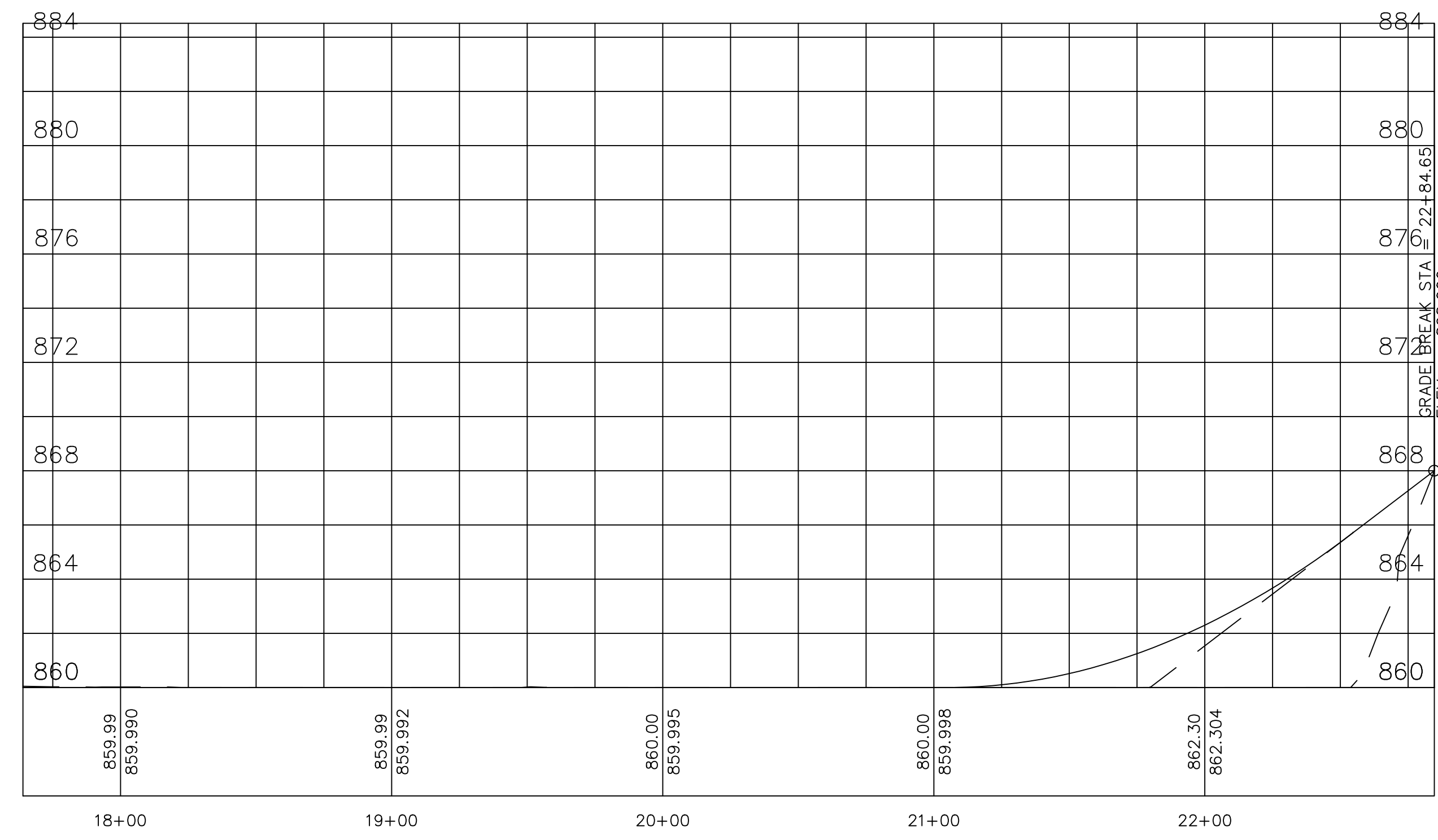
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 WATERLOO, IA

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 EASTERN ALT.  
 PLAN & PROFILE 2

SHEET NO.  
**3**



Alternative5HorizontalAlignment PROFILE



PROJECT: CEE: 4860

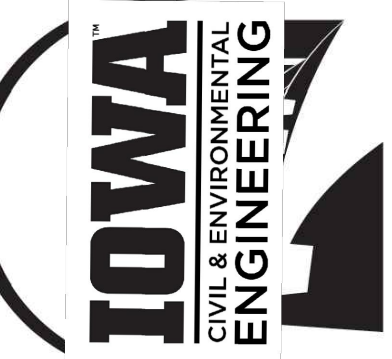
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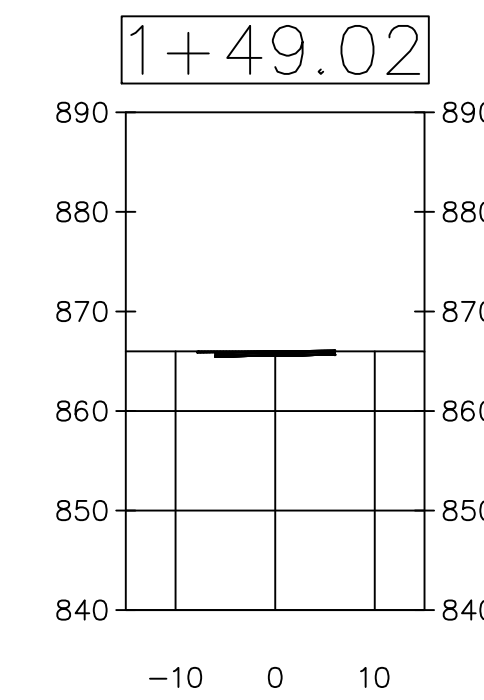
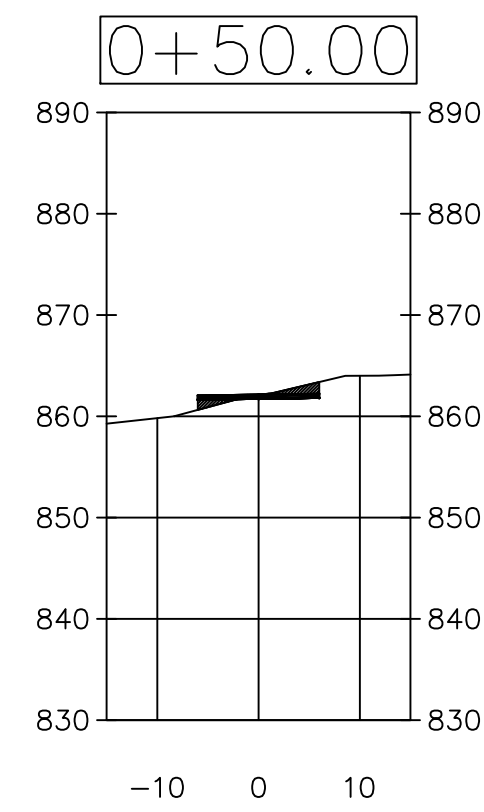
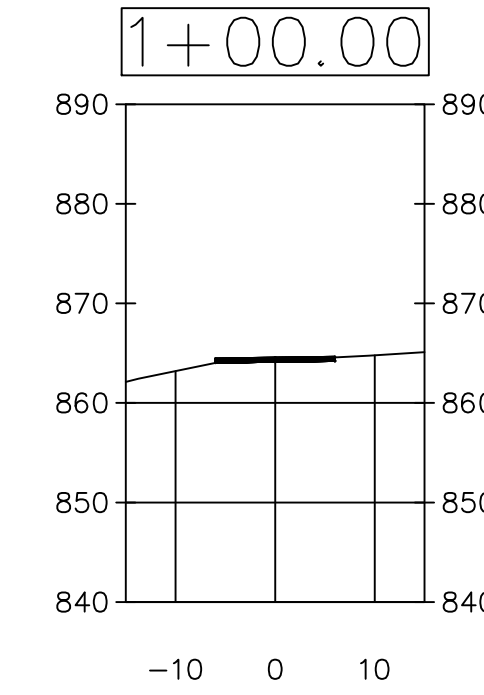
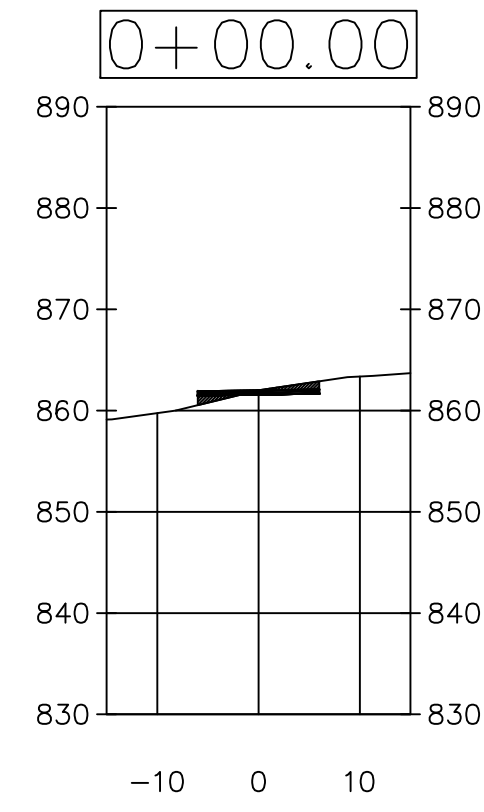
CEDAR PRAIRIE TRAIL  
WATERLOO, IA

SHEET NAME

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PLAN & PROFILE 3

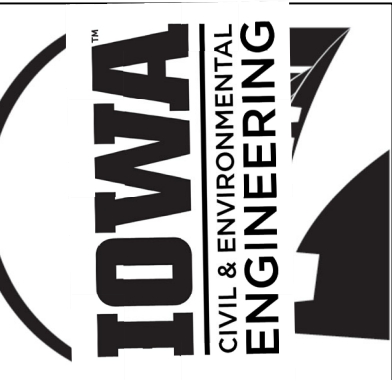
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**4**



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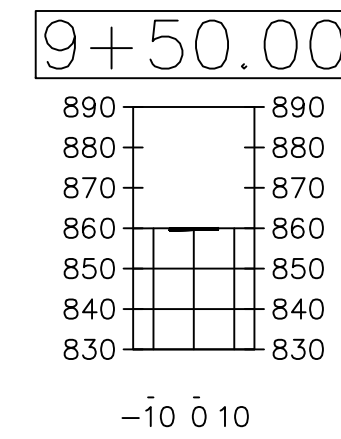
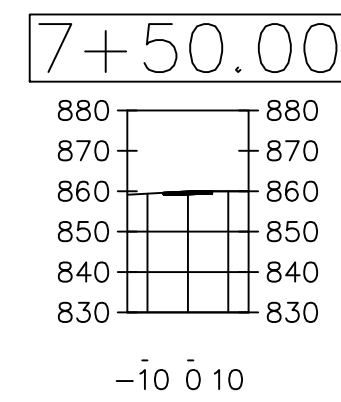
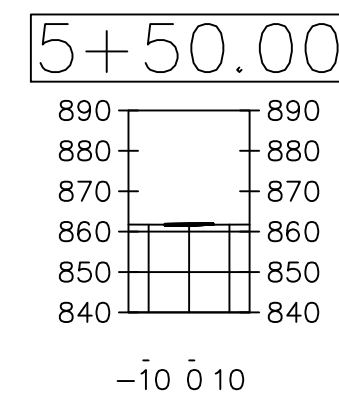
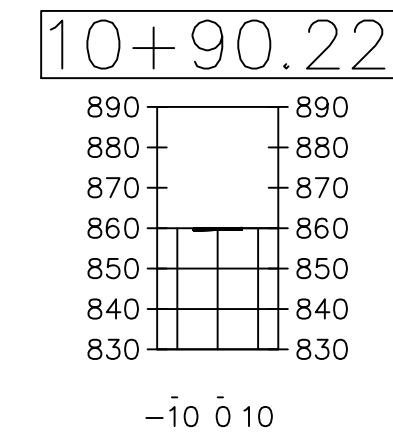
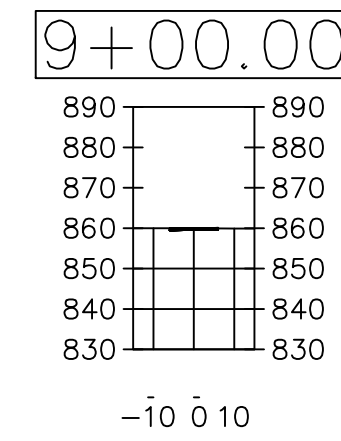
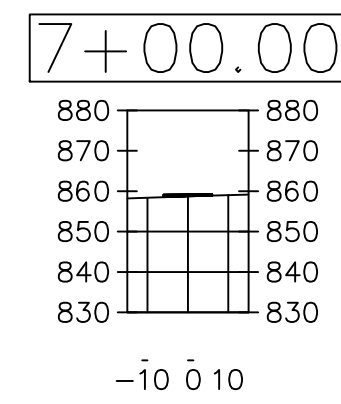
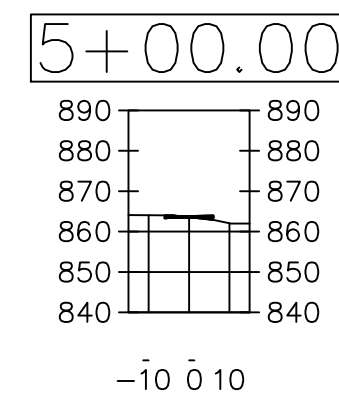
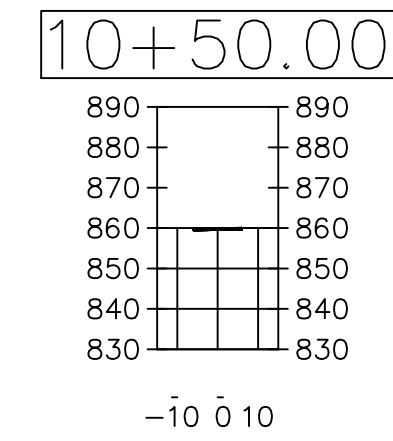
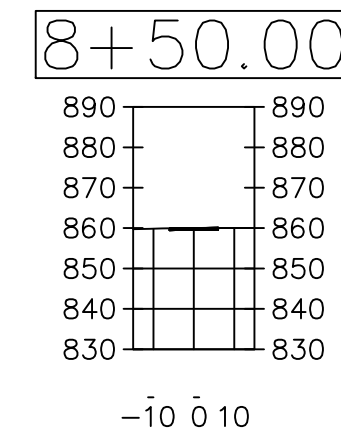
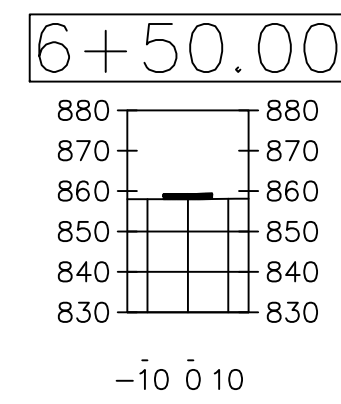
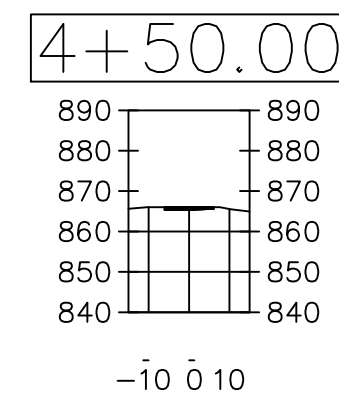
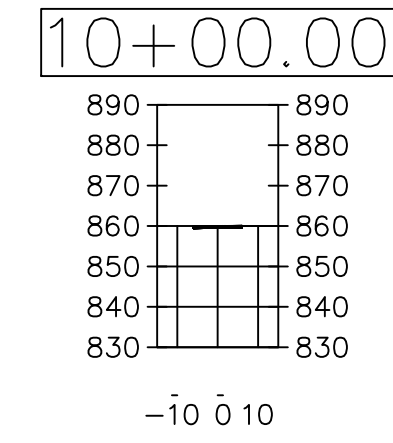
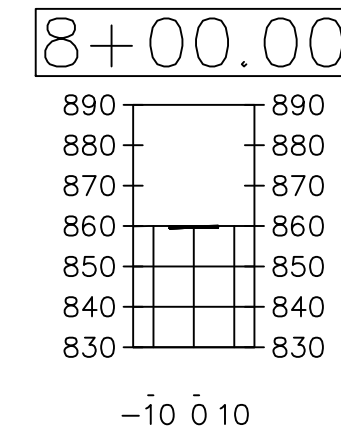
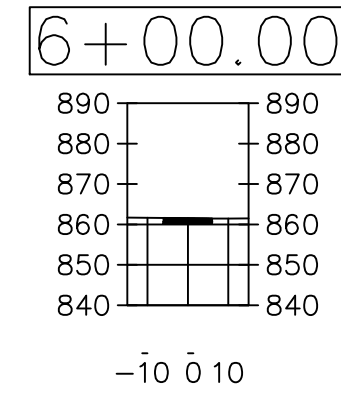
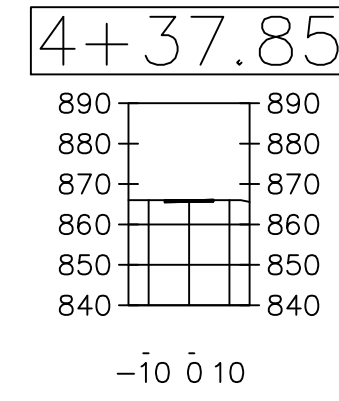


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 CEDAR PRAIRIE TRAIL  
 WATERLOO, IA

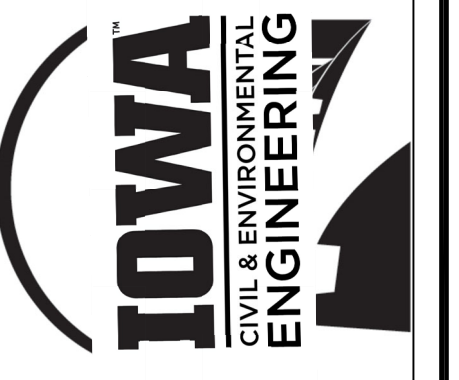
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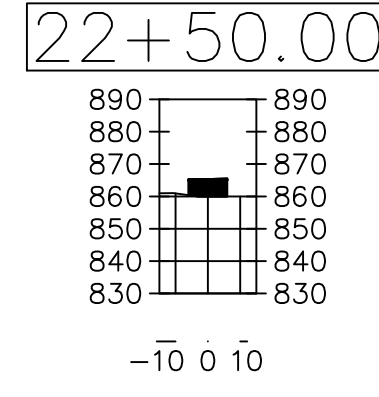
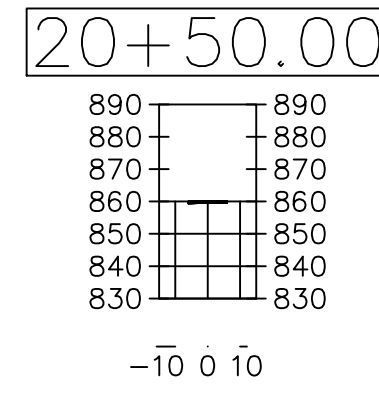
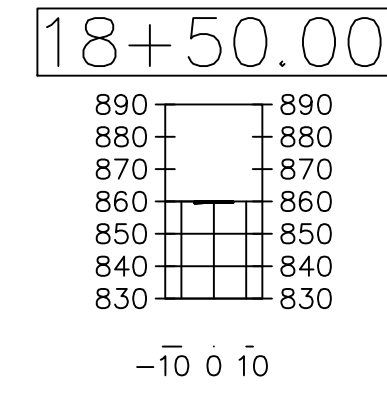
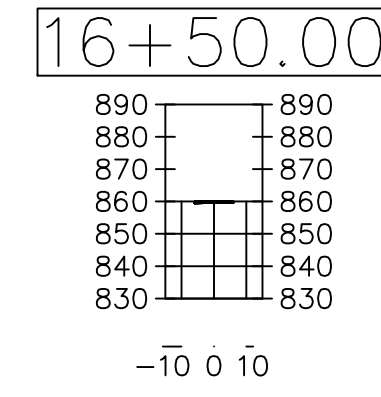
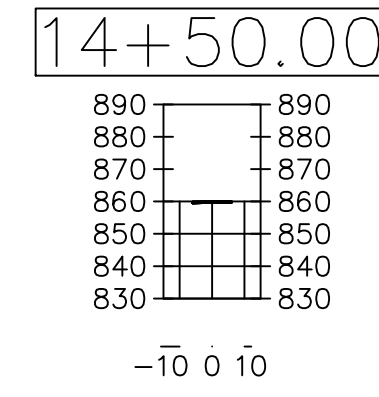
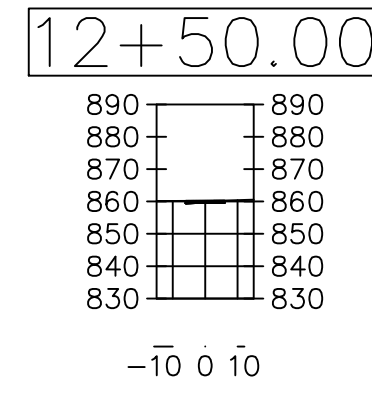
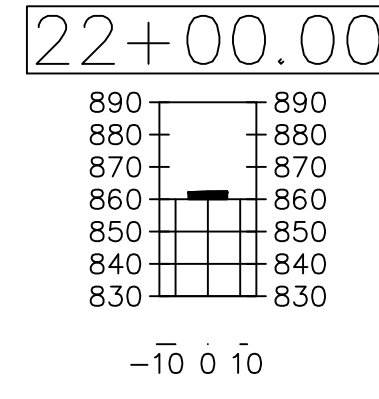
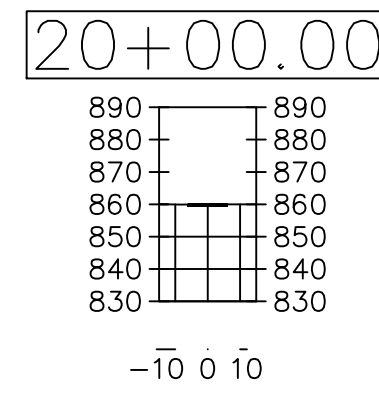
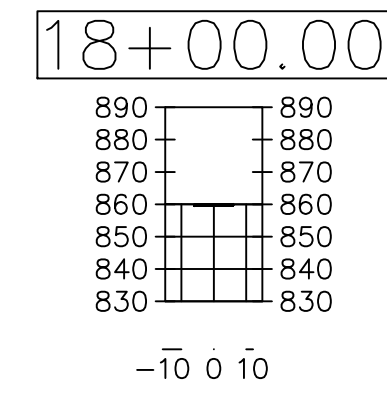
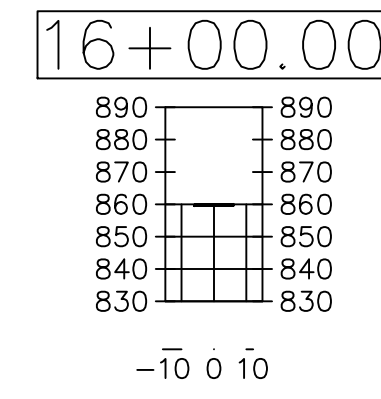
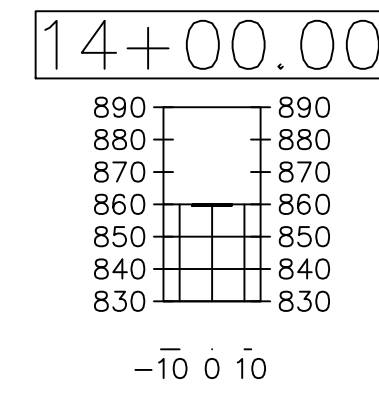
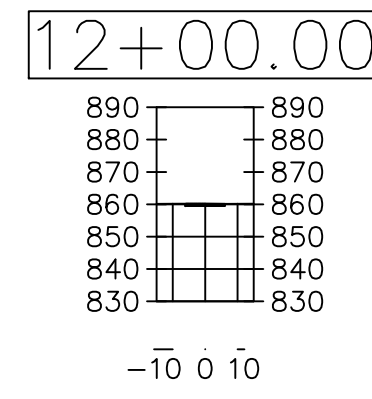
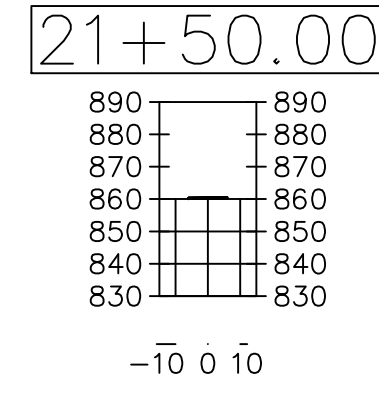
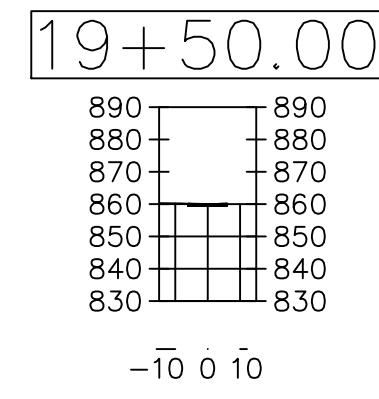
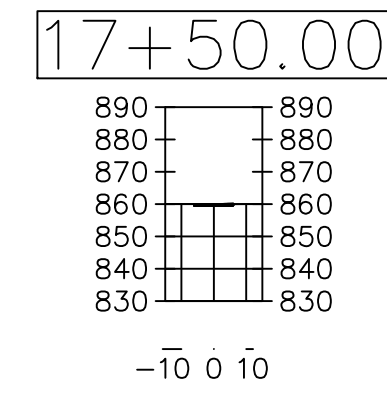
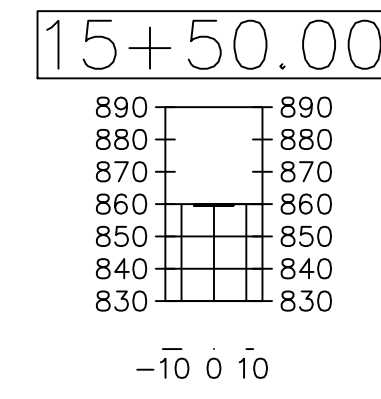
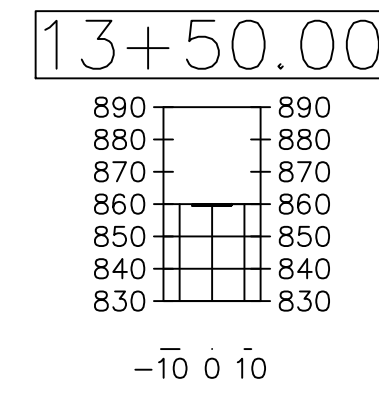
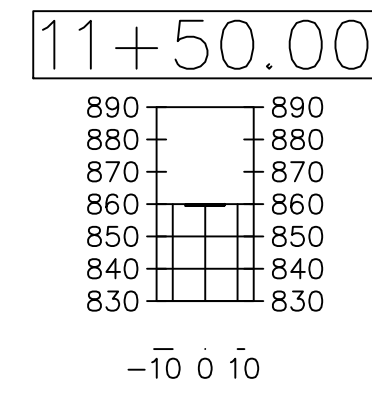
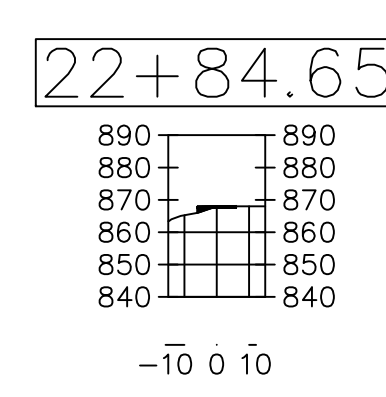
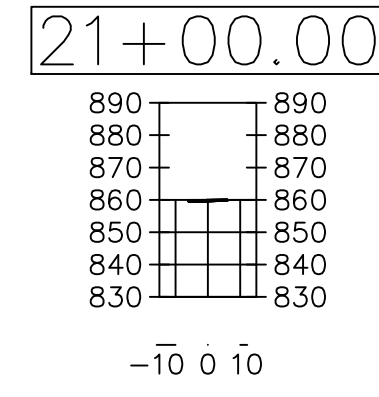
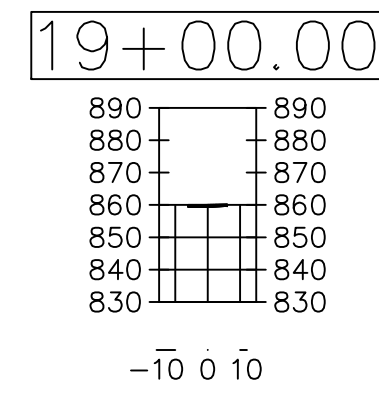
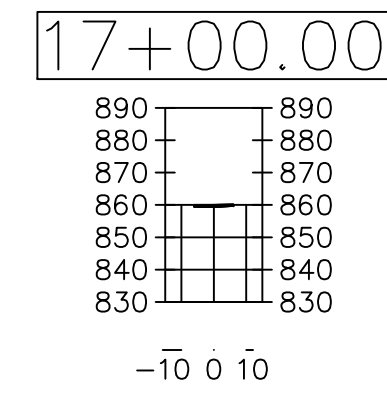
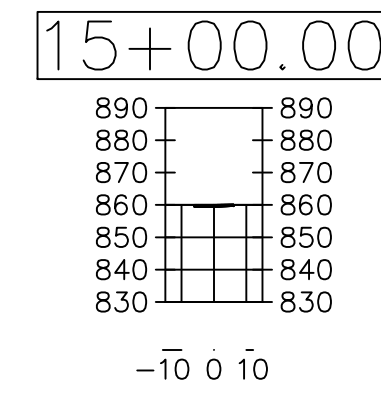
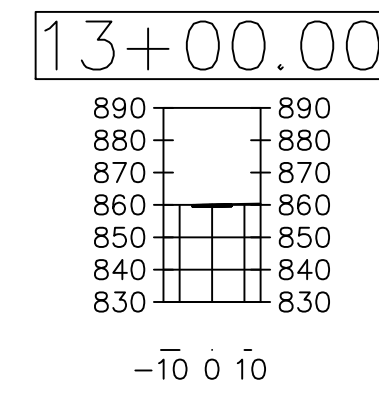
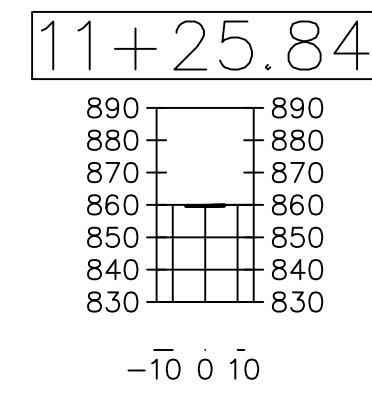


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**BRIDGE REPLACEMENT**  
 CEDAR PRAIRE TRAIL  
 WATERLOO, IA

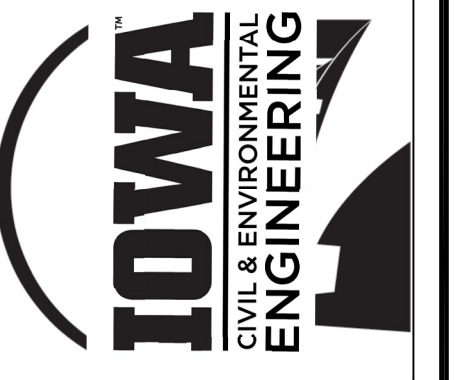
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 CROSS SECTIONS 2

SHEET NO.  
**6**



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CEDAR PRAIRIE TRAIL  
WATERLOO, IA

SHEET NAME  
EASTERN ALT.  
CROSS SECTIONS

SHEET NO.  
**7**

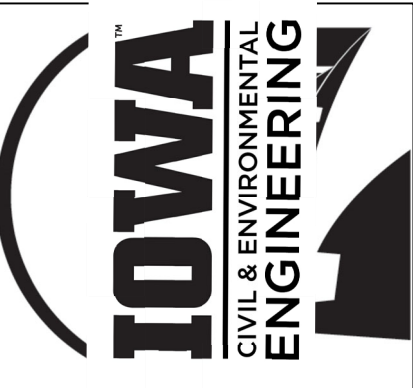


Total Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
0+00.00	4.10	2.41	0.00	0.00	0.00	0.00
0+50.00	4.12	3.00	7.71	4.95	7.71	4.95
1+00.00	3.57	0.00	7.23	2.72	14.94	7.67
1+49.02	0.18	0.61	3.37	0.53	18.31	8.20

Material Table			
Station	Area	Volume	Cumulative Volume
0+00.00	5.00	0.00	0.00
0+50.00	5.00	9.26	9.26
1+00.00	5.00	9.26	18.52
1+49.02	5.00	9.08	27.60

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**BRIDGE REPLACEMENT**

CEDAR PRAIRIE TRAIL  
WATERLOO, IA

SHEET NAME  
EASTERN ALT.  
MATERIAL VOL 1

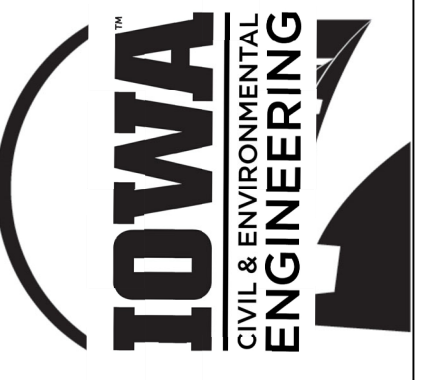
SHEET NO.  
**8**

Total Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
4+37.85	0.27	0.27	0.00	0.00	0.00	0.00
4+50.00	0.00	1.19	0.06	0.33	0.06	0.33
5+00.00	4.26	0.65	3.83	1.74	3.89	2.08
5+50.00	3.41	0.00	6.97	0.63	10.86	2.70
6+00.00	0.00	9.14	3.14	8.49	14.00	11.20
6+50.00	15.11	0.00	13.98	8.48	27.99	19.67
7+00.00	5.79	0.00	19.36	0.00	47.34	19.67
7+50.00	0.00	2.38	5.36	2.21	52.71	21.88
8+00.00	0.07	0.61	0.06	2.77	52.77	24.65
8+50.00	0.22	0.13	0.27	0.69	53.04	25.34
9+00.00	0.37	0.35	0.55	0.44	53.59	25.78
9+50.00	0.22	0.31	0.55	0.60	54.15	26.38
10+00.00	0.16	0.41	0.36	0.66	54.50	27.03
10+50.00	0.14	0.44	0.28	0.79	54.78	27.82
10+90.22	0.13	0.47	0.20	0.67	54.98	28.49

Material Table			
Station	Area	Volume	Cumulative Volume
4+37.85	5.00	0.00	0.00
4+50.00	5.00	2.25	2.25
5+00.00	5.00	9.26	11.51
5+50.00	5.00	9.26	20.77
6+00.00	5.00	9.26	30.03
6+50.00	5.00	9.26	39.29
7+00.00	5.00	9.26	48.55
7+50.00	5.00	9.26	57.81
8+00.00	5.00	9.26	67.06
8+50.00	5.00	9.26	76.32
9+00.00	5.00	9.26	85.58
9+50.00	5.00	9.26	94.84
10+00.00	5.00	9.26	104.10
10+50.00	5.00	9.26	113.36
10+90.22	5.00	7.45	120.81

PROJECT: CEE: 4850  
DATE : 05/06/2021  
DRAWN BY: LUCY DENT  
REVISION:

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**BRIDGE REPLACEMENT**

CEDAR PRAIRIE TRAIL  
WATERLOO, IA

SHEET NAME  
EASTERN ALT.  
MATERIAL VOL. 2

SHEET NO.  
**9**

Total Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
11+25.84	0.13	0.47	0.00	0.00	0.00	0.00
11+50.00	0.17	0.36	0.13	0.38	0.13	0.38
12+00.00	0.00	2.23	0.15	2.42	0.28	2.80
12+50.00	0.00	2.98	0.00	4.84	0.28	7.64
13+00.00	0.00	1.66	0.00	4.30	0.28	11.94
13+50.00	0.16	0.41	0.15	1.92	0.42	13.86
14+00.00	0.18	0.39	0.31	0.74	0.73	14.59
14+50.00	0.16	0.40	0.32	0.73	1.05	15.32
15+00.00	0.17	0.39	0.31	0.74	1.36	16.06
15+50.00	0.18	0.38	0.32	0.71	1.68	16.77
16+00.00	0.19	0.37	0.34	0.69	2.02	17.46
16+50.00	0.20	0.36	0.35	0.67	2.37	18.12
17+00.00	0.20	0.35	0.36	0.66	2.74	18.78
17+50.00	0.09	0.58	0.27	0.86	3.00	19.64
18+00.00	0.15	0.57	0.22	1.06	3.23	20.70
18+50.00	0.22	0.33	0.34	0.83	3.57	21.53
19+00.00	0.23	0.32	0.41	0.60	3.98	22.13
19+50.00	0.23	0.80	0.42	1.03	4.41	23.16
20+00.00	0.24	0.30	0.44	1.02	4.85	24.18
20+50.00	0.25	0.29	0.45	0.55	5.30	24.73

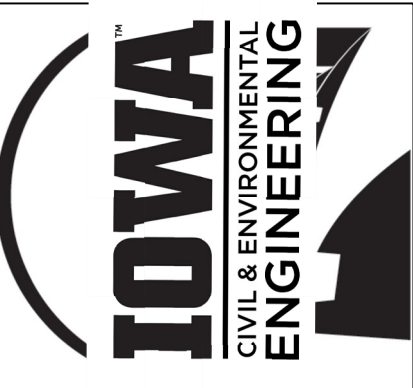
Total Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
21+00.00	0.26	0.28	0.47	0.53	5.77	25.26
21+50.00	6.22	0.00	5.99	0.26	11.76	25.52
22+00.00	27.65	0.00	31.36	0.00	43.12	25.52
22+50.00	63.78	0.00	84.66	0.00	127.78	25.52
22+84.65	6.03	0.00	44.79	0.00	172.57	25.52

Material Table			
Station	Area	Volume	Cumulative Volume
11+25.84	5.00	0.00	0.00
11+50.00	5.00	4.47	4.47
12+00.00	5.00	9.26	13.73
12+50.00	5.00	9.26	22.99
13+00.00	5.00	9.26	32.25
13+50.00	5.00	9.26	41.51
14+00.00	5.00	9.26	50.77
14+50.00	5.00	9.26	60.03
15+00.00	5.00	9.26	69.29
15+50.00	5.00	9.26	78.55
16+00.00	5.00	9.26	87.81
16+50.00	5.00	9.26	97.07
17+00.00	5.00	9.26	106.33
17+50.00	5.00	9.26	115.59
18+00.00	5.00	9.26	124.84
18+50.00	5.00	9.26	134.10
19+00.00	5.00	9.26	143.36
19+50.00	5.00	9.26	152.62
20+00.00	5.00	9.26	161.88
20+50.00	5.00	9.26	171.14

Material Table			
Station	Area	Volume	Cumulative Volume
21+00.00	5.00	9.26	180.40
21+50.00	5.00	9.26	189.66
22+00.00	5.00	9.26	198.92
22+50.00	5.00	9.26	208.18
22+84.65	5.00	6.42	214.59

PROJECT: CEE: 4850  
DATE : 05/06/2021  
DRAWN BY: LUCY DENT  
REVISION:

**THE UNIVERSITY OF IOWA**  
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**BRIDGE REPLACEMENT**

CEDAR PRAIRIE TRAIL  
WATERLOO, IA

SHEET NAME  
EASTERN ALT.  
MATERIAL VOL. 3

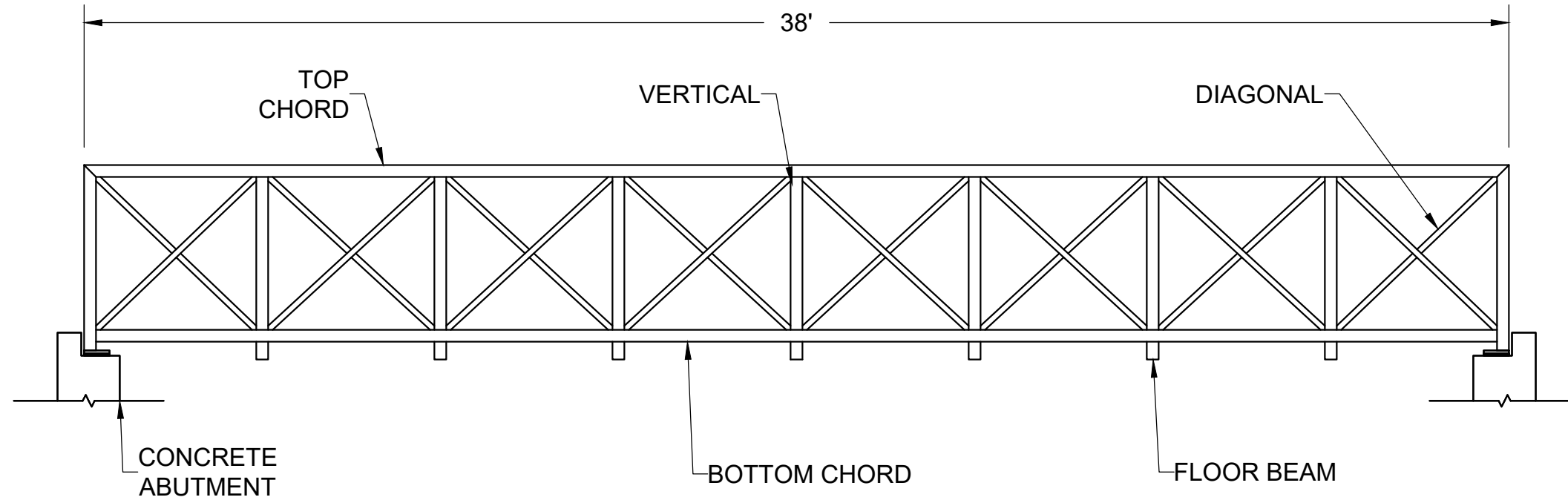
SHEET NO.  
**10**

**BRIDGE SUMMARY**

**Link Pedestrian Bridge 38' Span x 12' Width**

**Deck Type: IPE (Hardwood)**

**Bridge Finish: Weathering Steel**



**BRIDGE ELEVATION**

The graphic information and details contained in these plans is schematic in nature. The plans, elevations and sections have been developed automatically in a way that demonstrates your current input in a relative and proportional manner. The details included in these plans have been selected to represent commonly built construction assemblies. These are not Engineering drawings, and as such, the details may vary in the final design for your project depending on many variables that are selected in your final scope of work and specifications.

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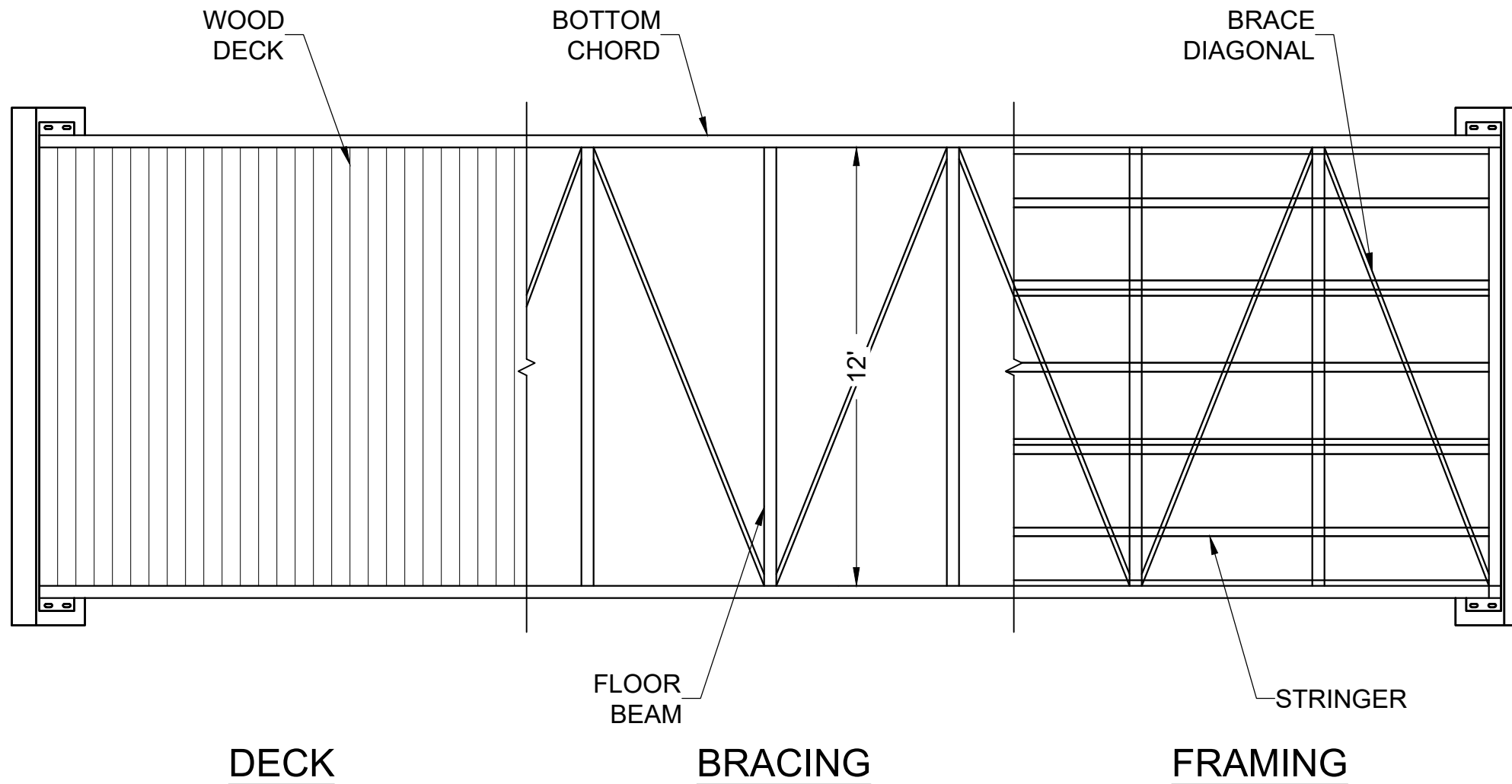
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DYOB®  
DRAWING

Link® 38' Span x 12' Width  
Trail Bridge Replacement  
Pedestrian Bridge  
Waterloo, Iowa

PROJECT NUMBER: 219343	DATE: 4/7/2021
DESIGNED: DYOB	DRAWN: DYOB
CHECKED:	APPROVED:
SHEET NO.: 1 OF 4	

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# BRIDGE PLAN

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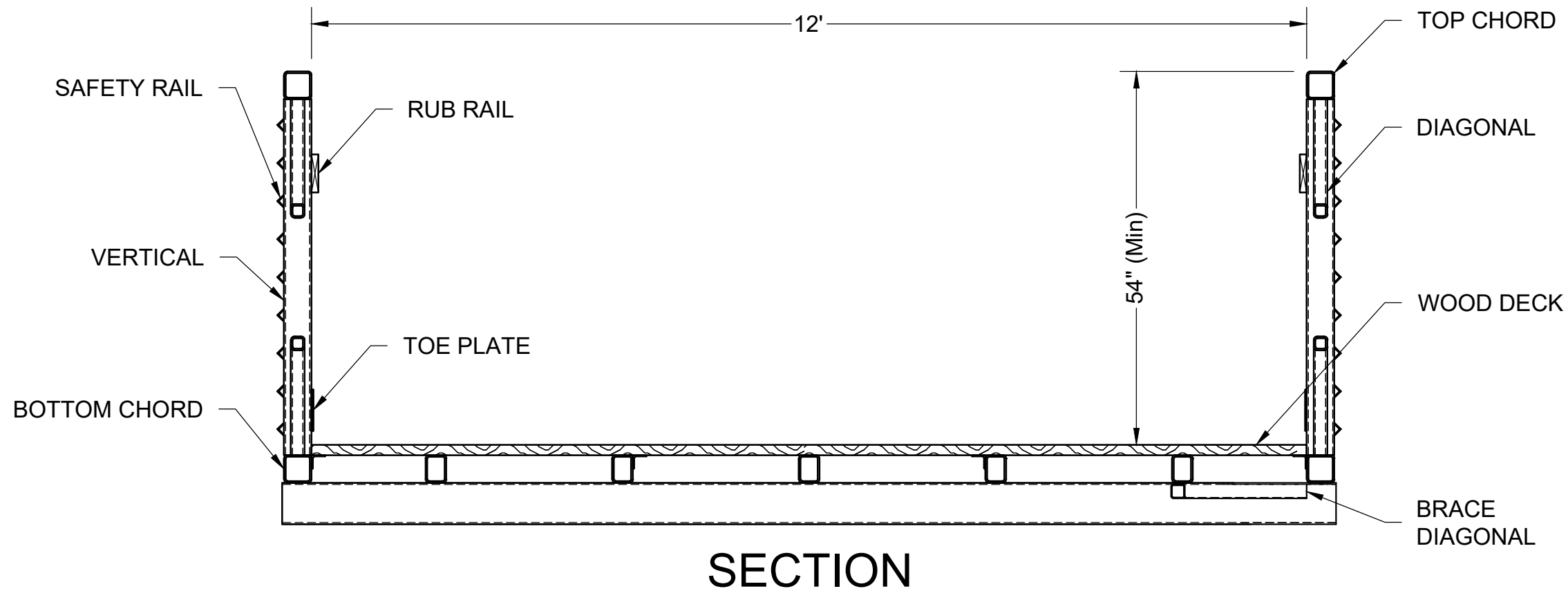
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BRIDGE

CONTECH  
DYOB®  
DRAWING

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Trail Bridge Replacement  
Pedestrian Bridge  
Waterloo, Iowa

PROJECT NUMBER: 219343	DATE: 4/7/2021
DESIGNED: DYOB	DRAWN: DYOB
CHECKED:	APPROVED:
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**SECTION**

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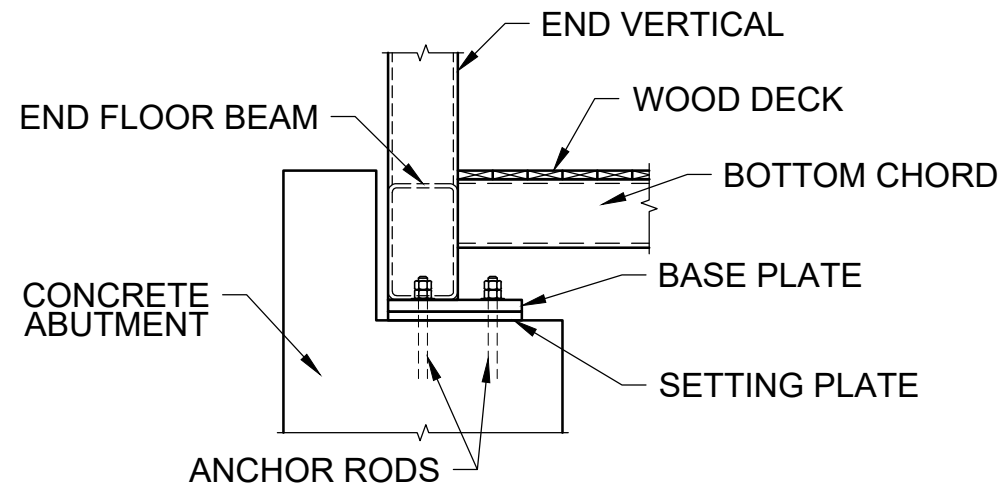
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Pedestrian Bridge  
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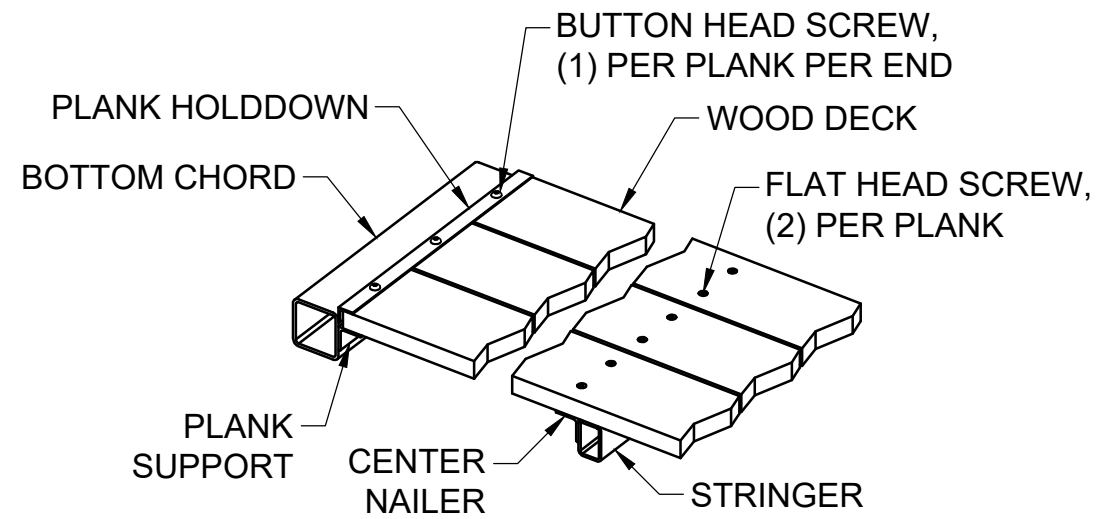
PROJECT NUMBER: 219343	DATE: 4/7/2021
DESIGNED: DYOB	DRAWN: DYOB
CHECKED:	APPROVED:
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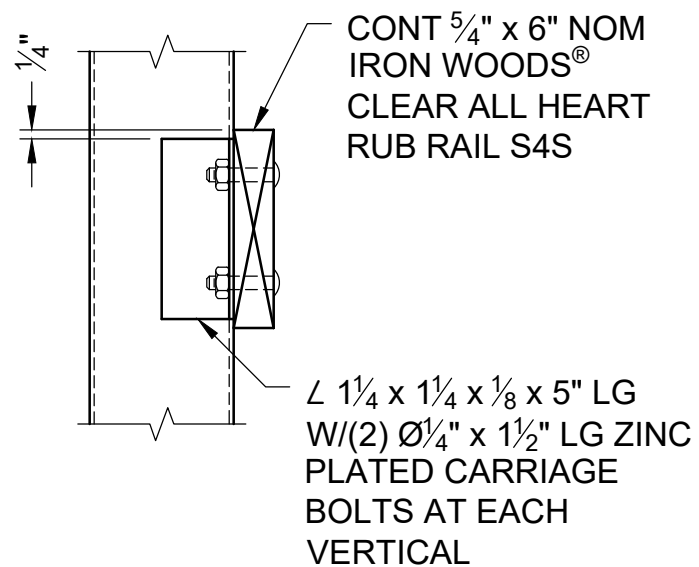


## BEARING SIDE VIEW

INFORMATION PROVIDED FOR REPRESENTATION ONLY.  
ACTUAL BEARING DIAGRAMS TO BE BASED ON FINAL DESIGN.



## WOOD DECK DETAIL



## RUB RAIL DETAIL

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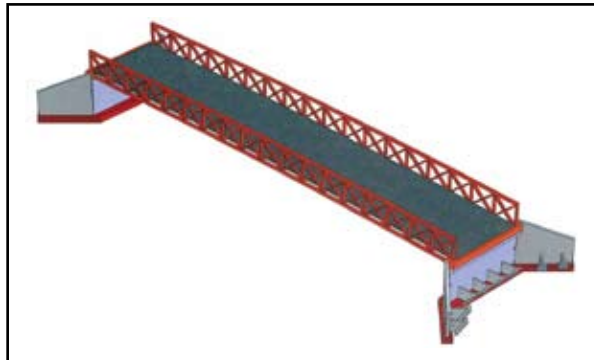
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Trail Bridge Replacement  
Pedestrian Bridge  
Waterloo, Iowa

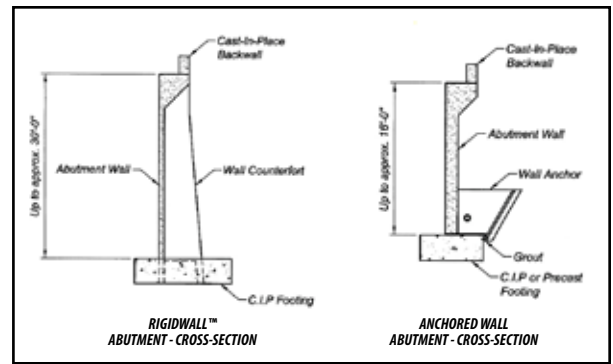
PROJECT NUMBER: 219343	DATE: 4/7/2021
DESIGNED: DYOB	DRAWN: DYOB
CHECKED:	APPROVED:
SHEET NO.: 4 OF 4	

# Precast Abutment System

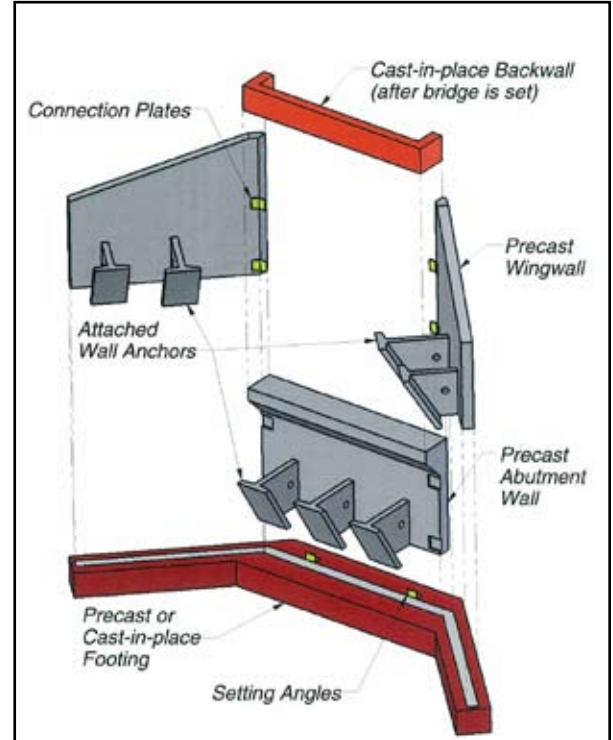
- Rapid installation
- Reduced on-site construction time means reduced traffic delays and detours
- Precast anchored wall system reduces excavation area
- Easy use of decorative finishes such as formliners
- Complete bridge solution from design support to material installation
- Patented system
- Extensive technical support



**Precast Abutment with Truss** – Can be used in conjunction with vehicular or pedestrian truss structures



**Cross sections of abutment wall types** – Wall style depends on required abutment height

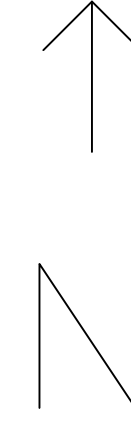
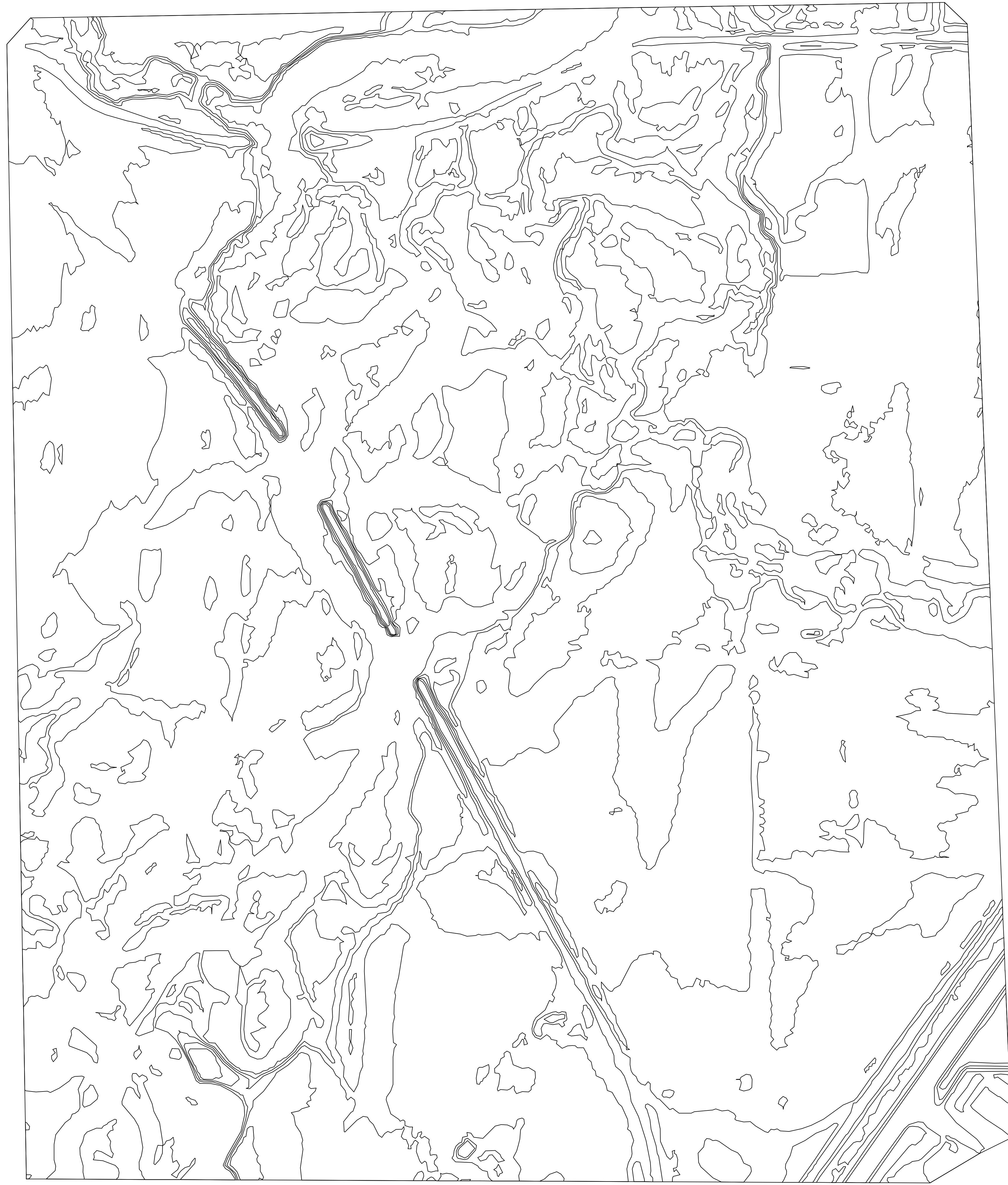


**Assembly View** – Precast wall pieces are assembled on the footing and then typically backfilled prior to setting the truss superstructure



**Precast Abutment System installed (Colerain, OH)** – Readily available materials and precast pieces means quick installation and overall faster project cycles





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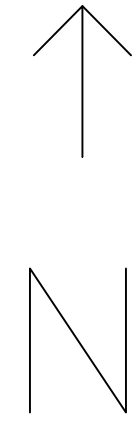
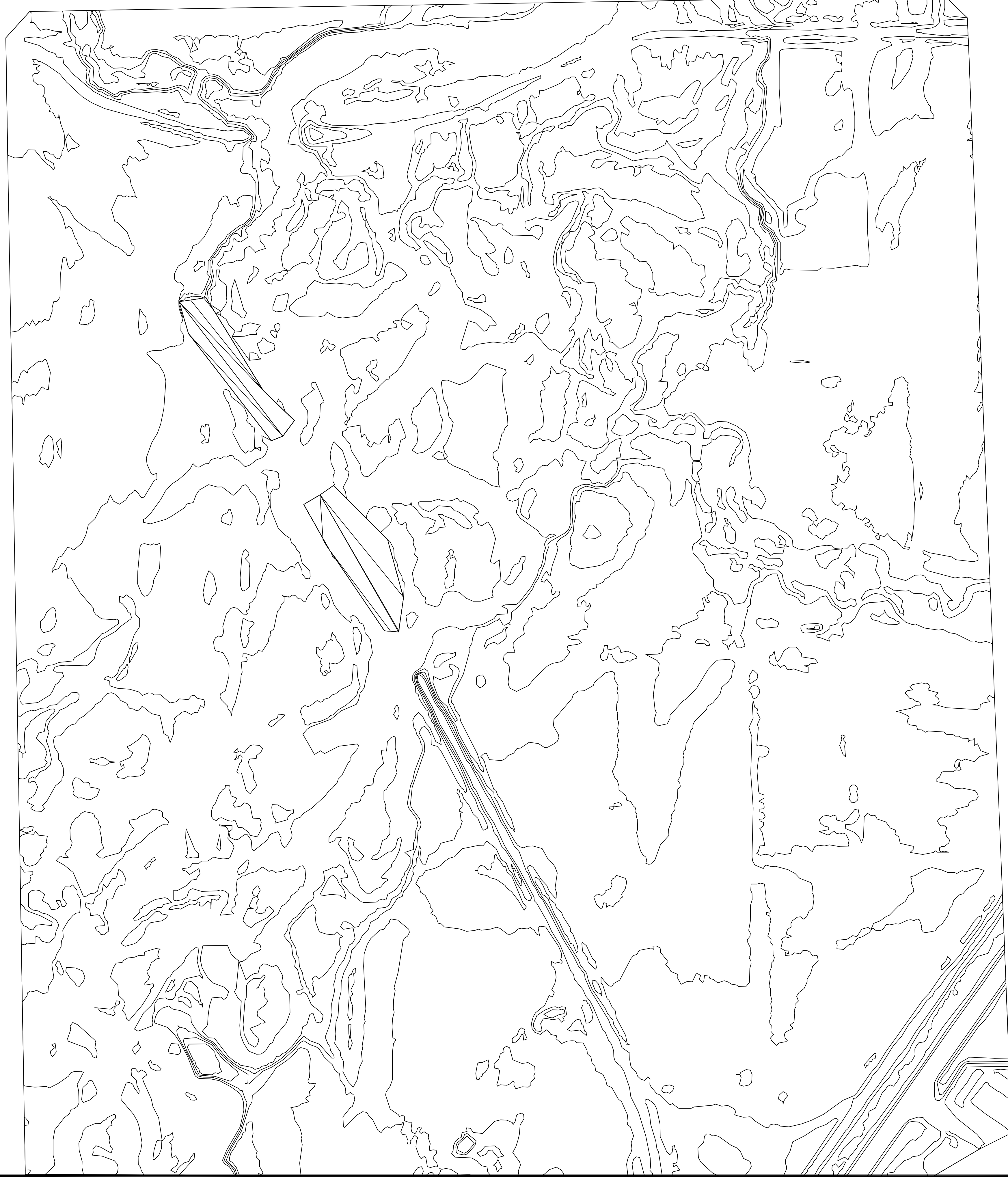
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PROJECT: CEE-485C

DATE : 05/14/2021

DRAWN BY: LUCY DENT

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