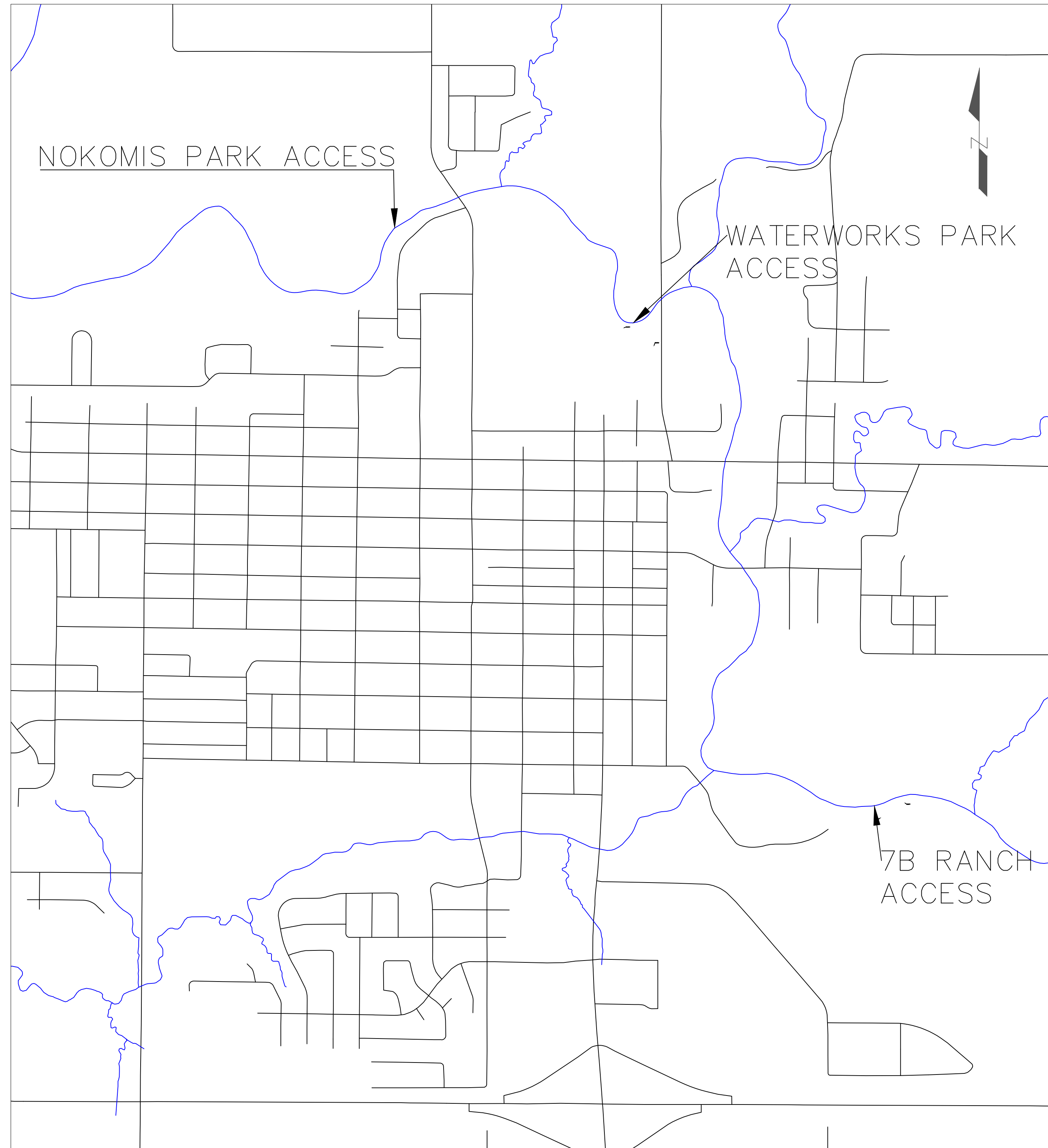


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RECREATIONAL RIVER ACCESS WEBSTER CITY, IA

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12	INFILTRATION TRENCH DESIGN



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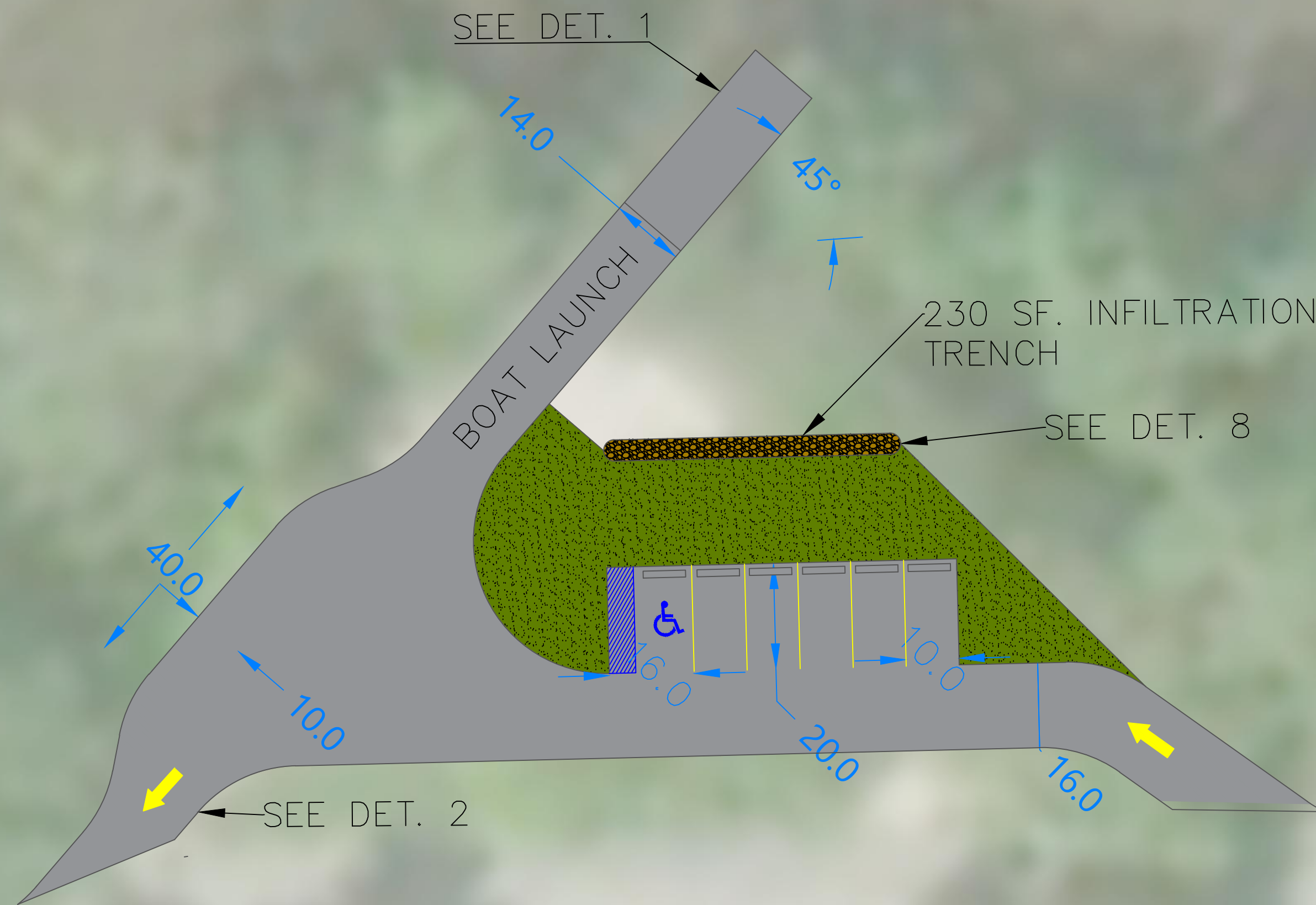
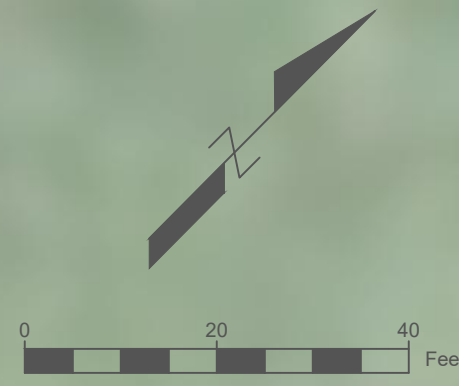


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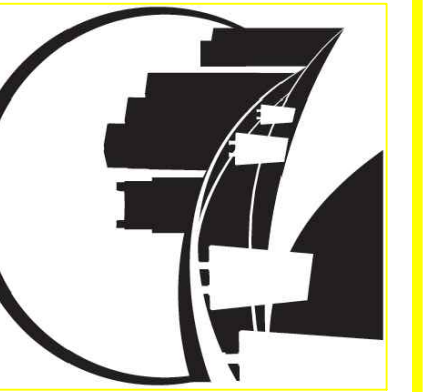
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TITLE SHEET

SHEET NO.
00



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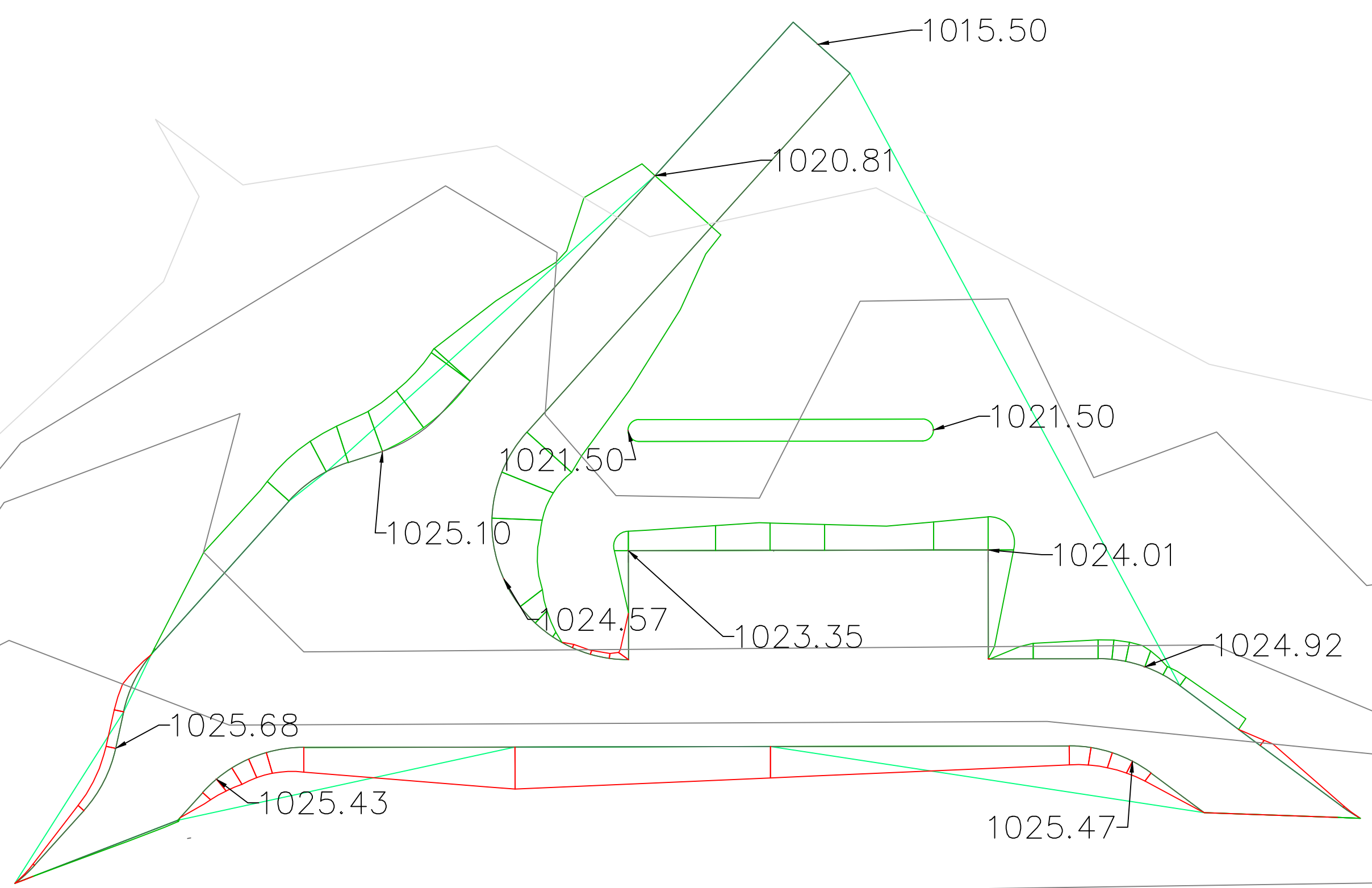
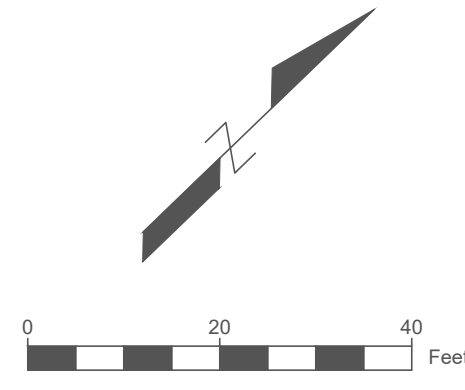
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SHEET NAME

NOKOMIS PARK
 SITE PLAN

SHEET NO.

01



PROJECT:	CEE: 4860
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SHEET NAME
**NOKOMIS PARK
 GRADING**

SHEET NO.
02



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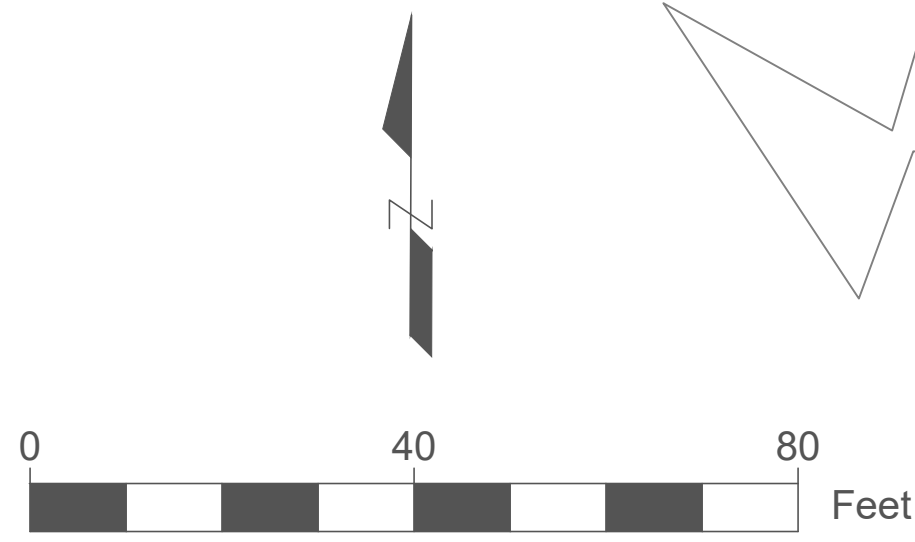


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SHEET NAME
 WATER WORKS
 PARK SITE PLAN

SHEET NO.
03



PROJECT:	CEE: 4860
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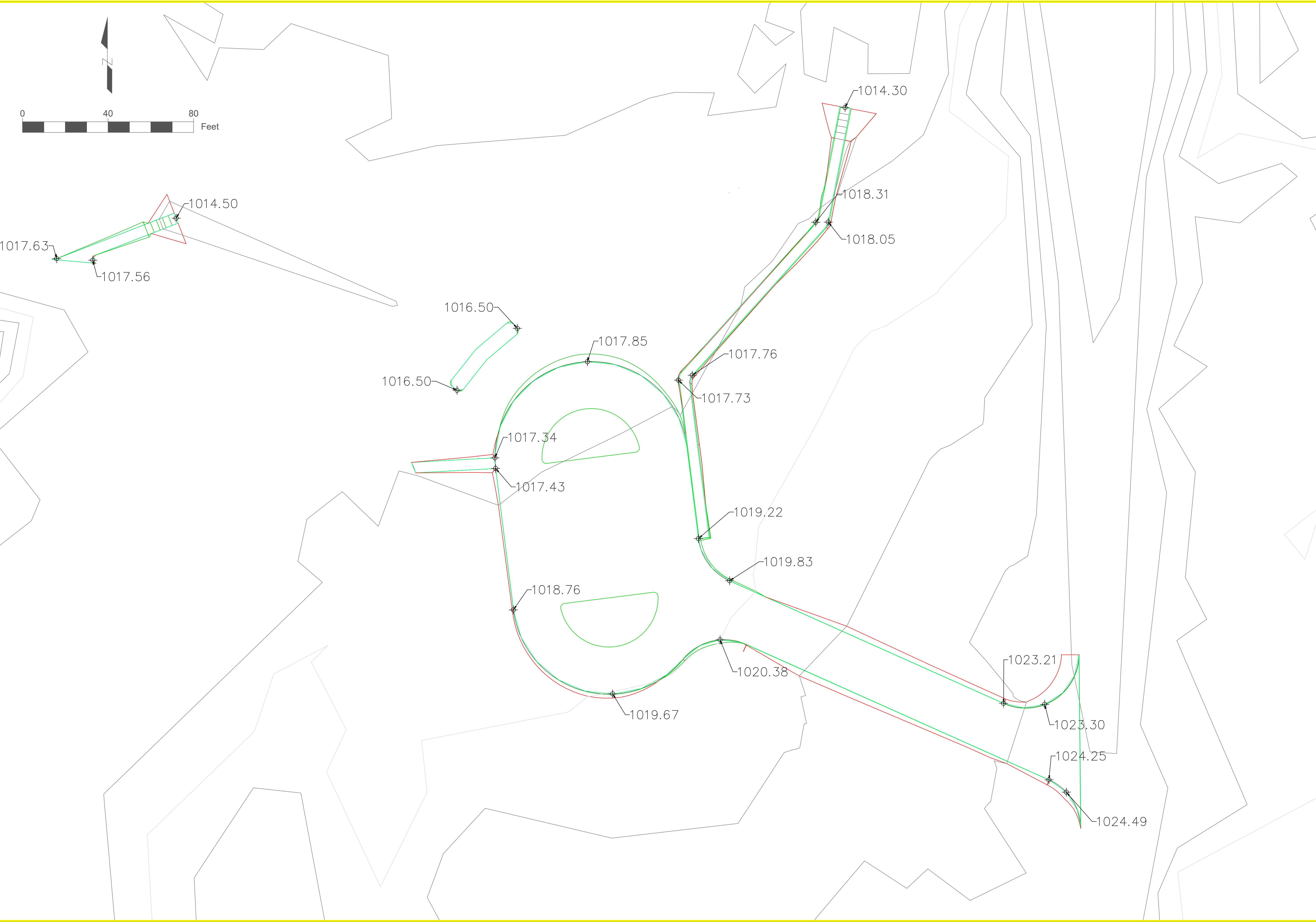


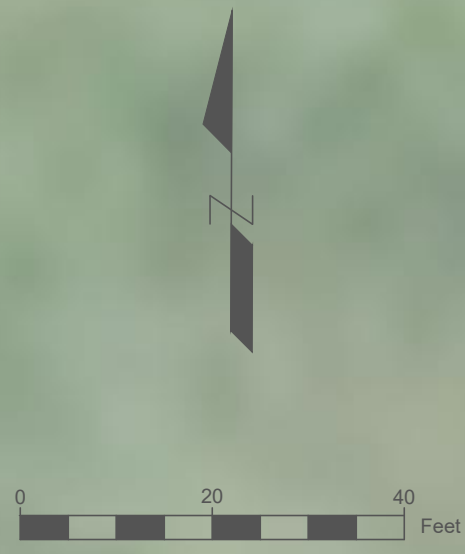
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SHEET NAME
**WATER WORKS
 PARK GRADING**

SHEET NO.
04





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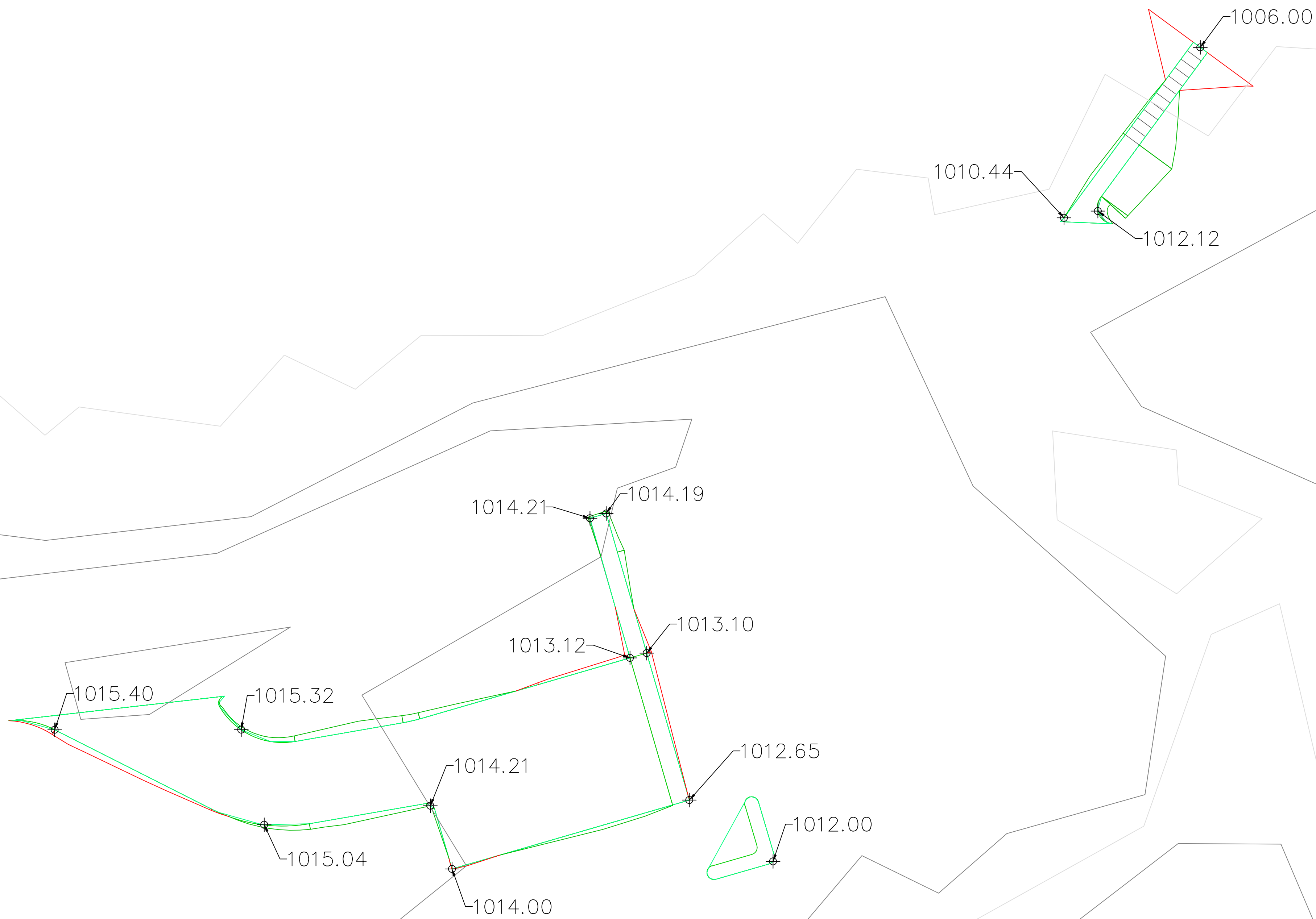
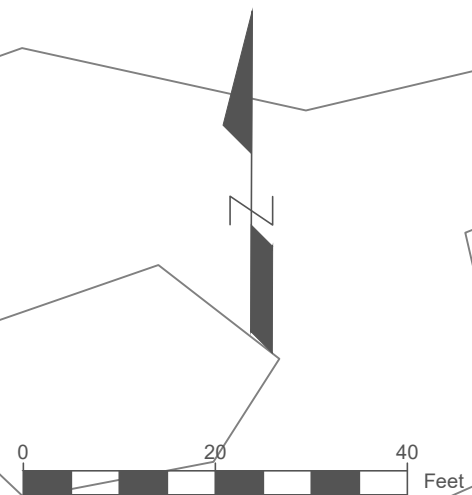
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WEBSTER CITY, IA

SHEET NAME
**7B RANCH
SITE PLAN**

SHEET NO.
05



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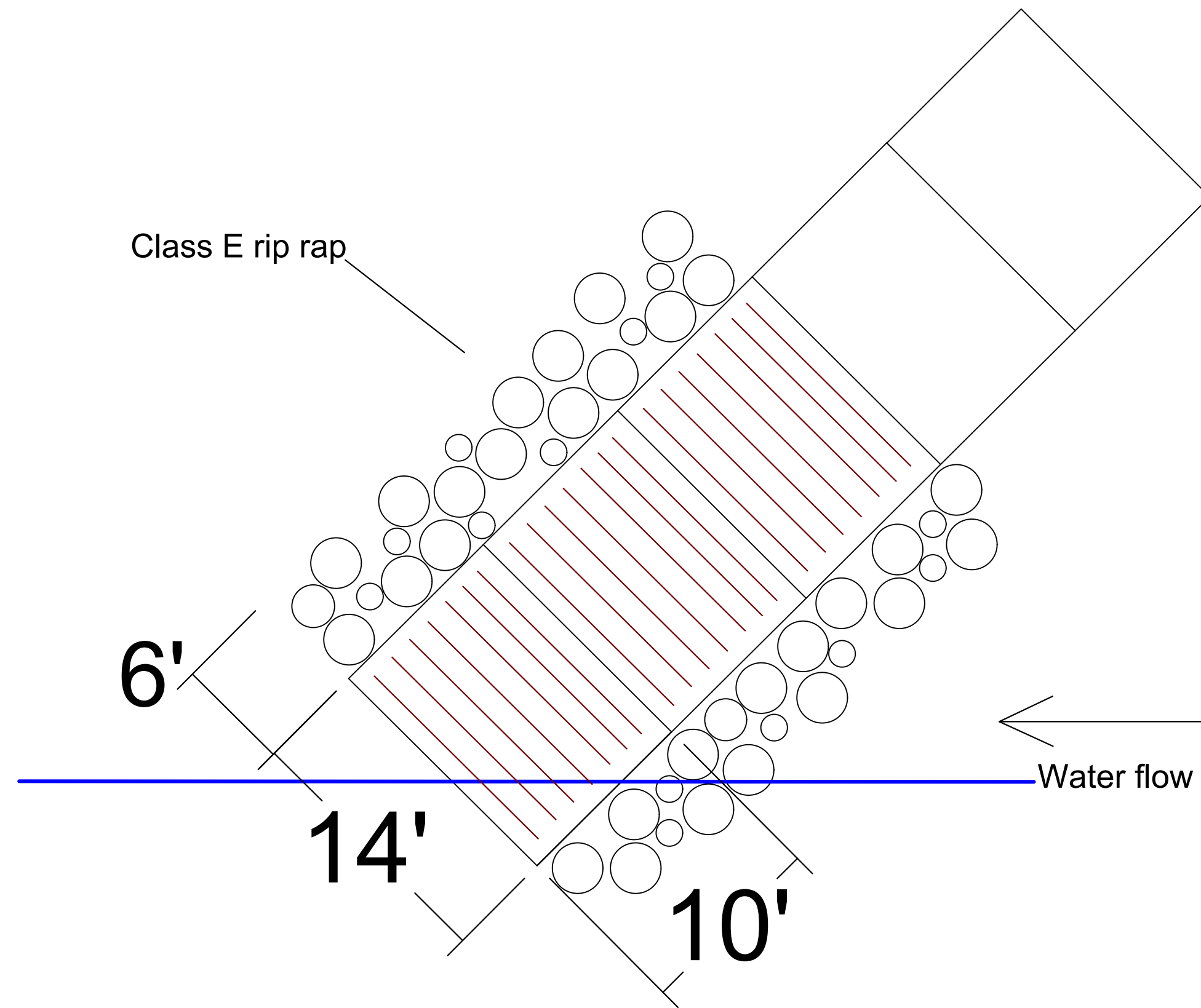
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SHEET NAME
**7B RANCH
 GRADING**

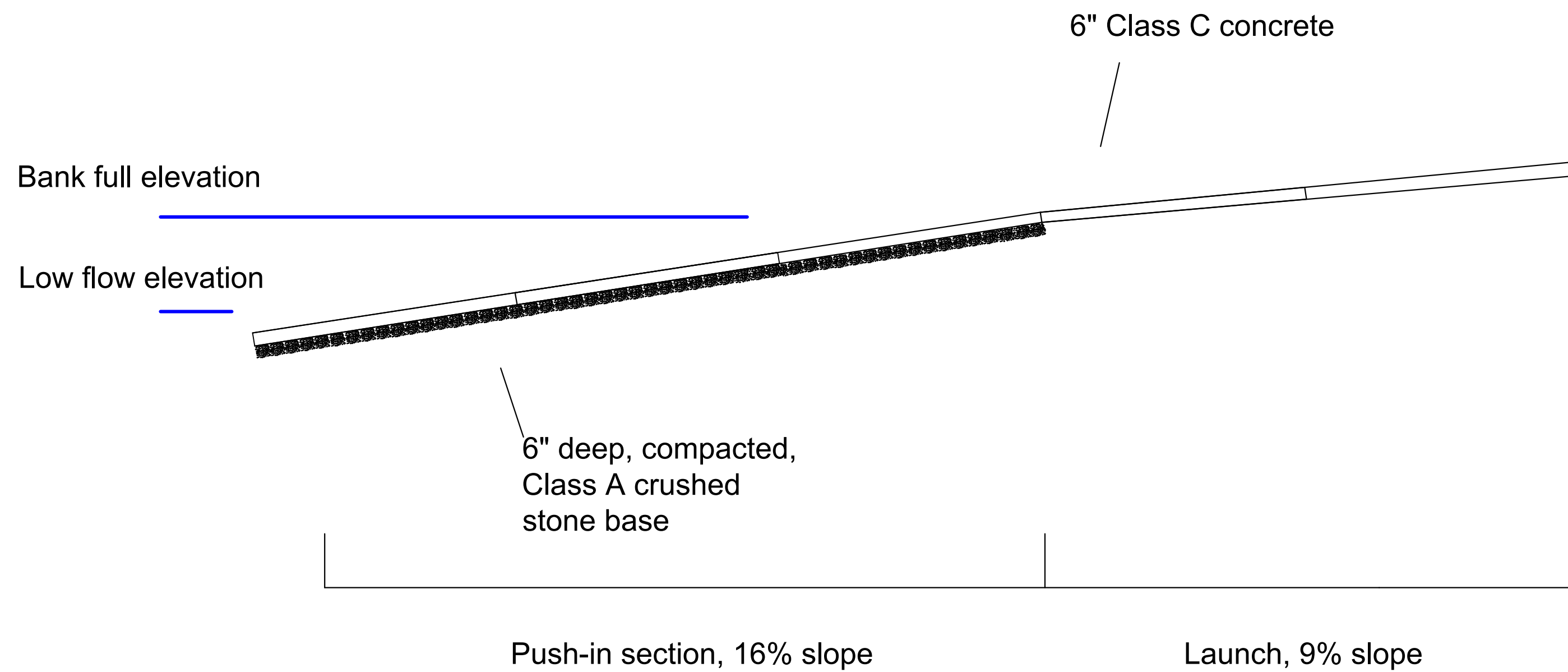
SHEET NO.
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Plan View

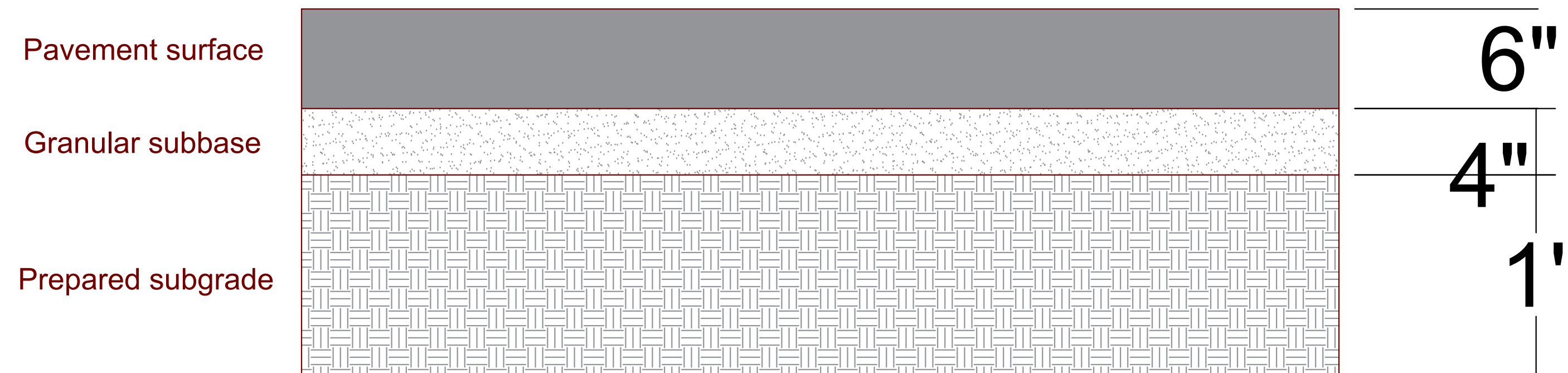


- Notes
- Launch is angled 45 degrees to water
 - Class C concrete
 - Armor both shoulders with Class E rip rap
 - 1/2" expansion joints every 10 ft
 - Bank full elevation: 1020 ft
 - Low flow elevation: 1015.5 ft

Cross Section



Cross Section



- Notes
- Pavement surface consists of Class C Concrete
 - Granular subbase consists of sand or gravel
 - prepared subgrade consists of appropriate soil

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SHEET NAME

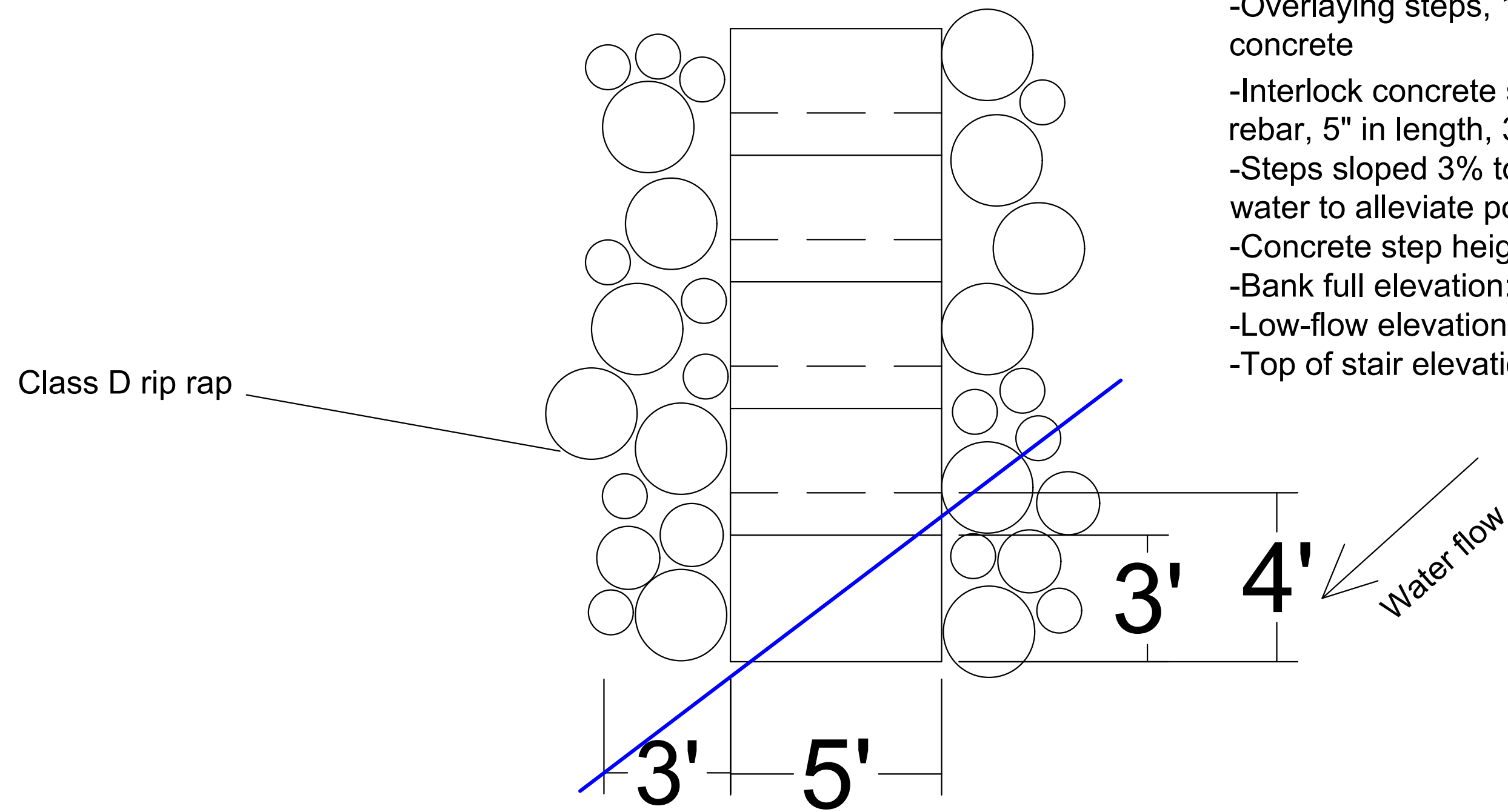
NOKOMIS LAUNCH DESIGN

SHEET NO.

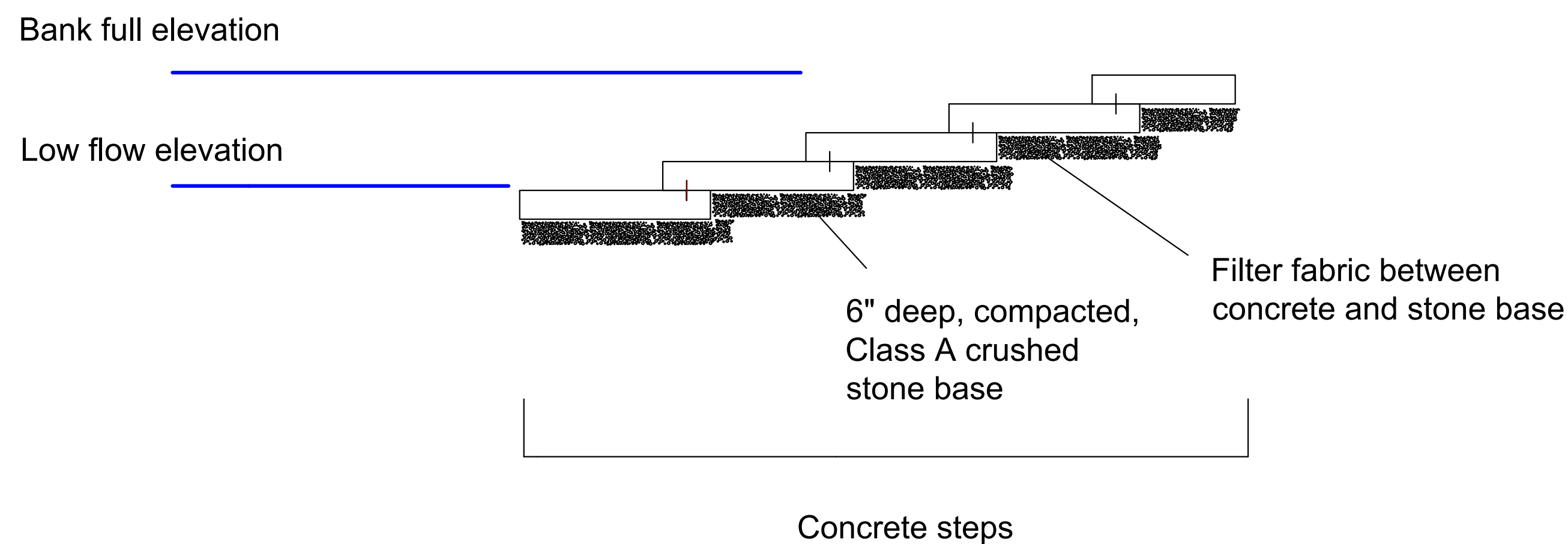
07

Plan View

- Notes:
- Launch is angled 45 degrees to water
 - Class C concrete
 - Armor both sides with Class D rip rap
 - Overlaying steps, 12" on concrete
 - Interlock concrete steps with $\frac{1}{2}$ " rebar, 5" in length, 3 per step
 - Steps sloped 3% towards water to alleviate ponding
 - Concrete step height: 7.25"
 - Bank full elevation: 1017.2 ft
 - Low-flow elevation: 1014.5 ft
 - Top of stair elevation: 1017.5 ft

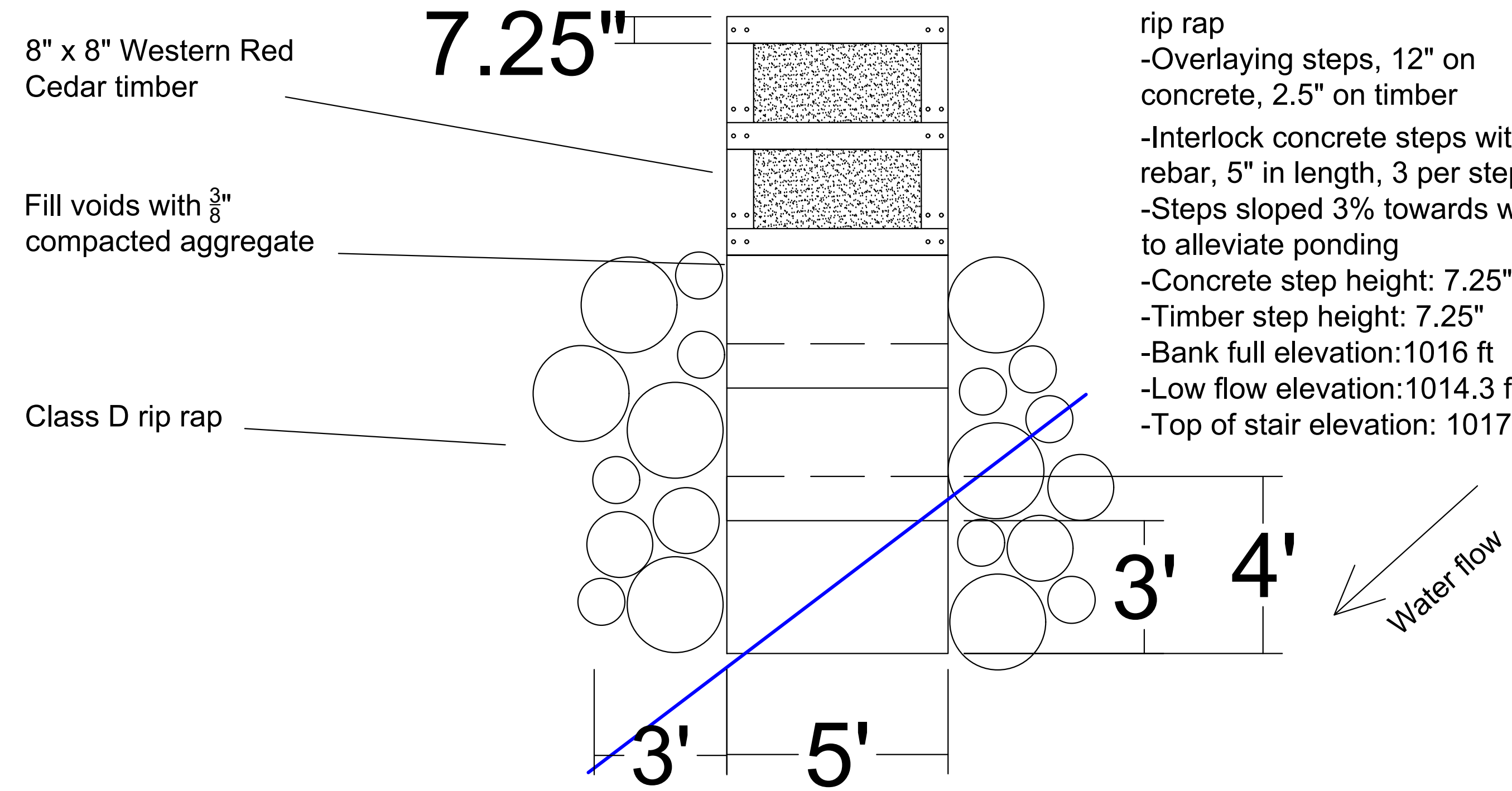


Cross Section

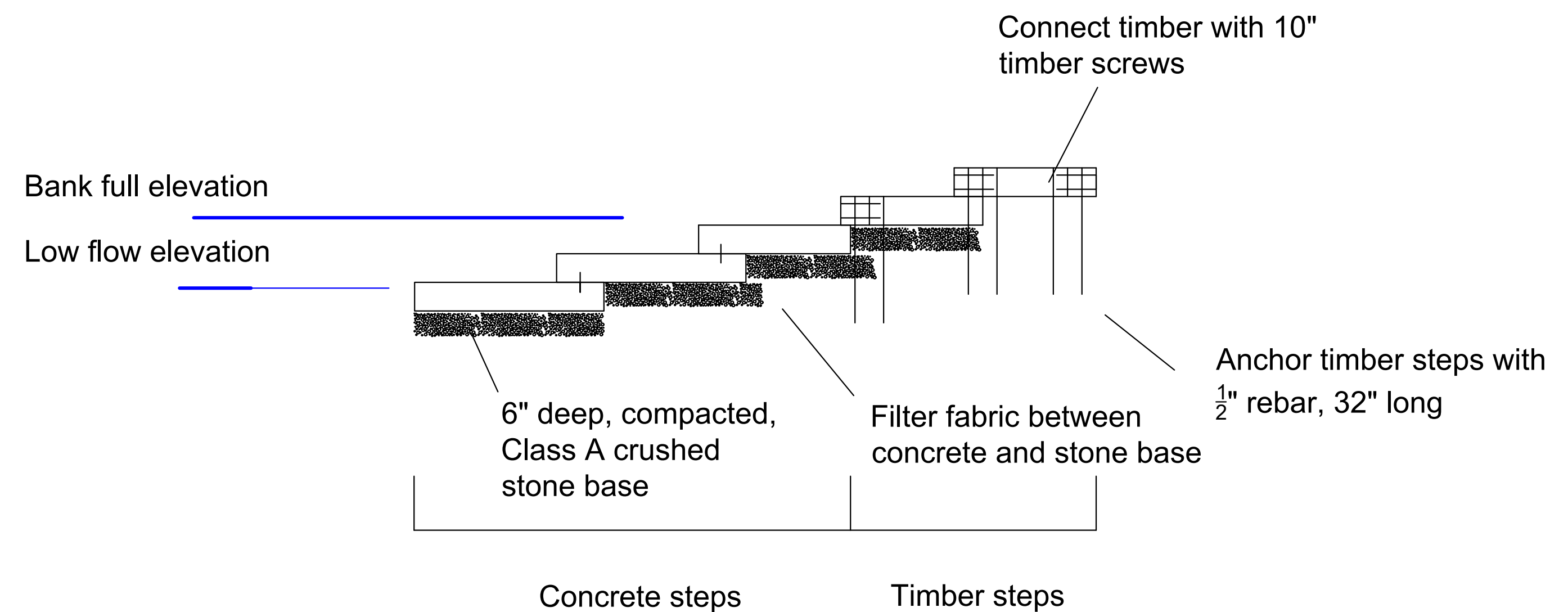


Plan View

- Notes:
- Launch is angled 45 degrees to water
 - Class C concrete
 - Armor both sides with Class D rip rap
 - Overlaying steps, 12" on concrete, 2.5" on timber
 - Interlock concrete steps with $\frac{1}{2}$ " rebar, 5" in length, 3 per step
 - Steps sloped 3% towards water to alleviate ponding
 - Concrete step height: 7.25"
 - Timber step height: 7.25"
 - Bank full elevation: 1016 ft
 - Low flow elevation: 1014.3 ft
 - Top of stair elevation: 1017.3 ft



Cross Section



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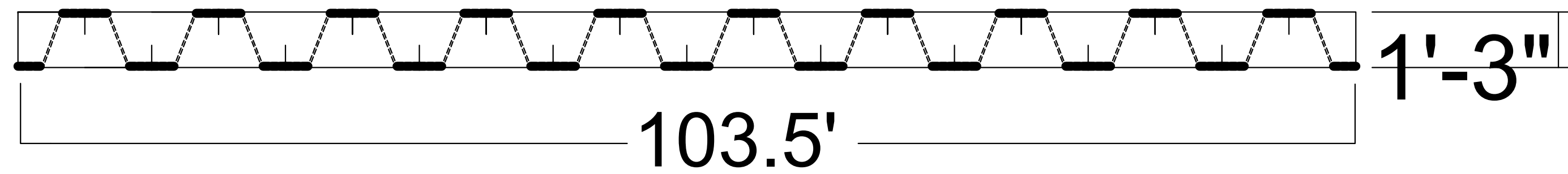
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SHEET NAME
 WATER WORKS LAUNCH DESIGN

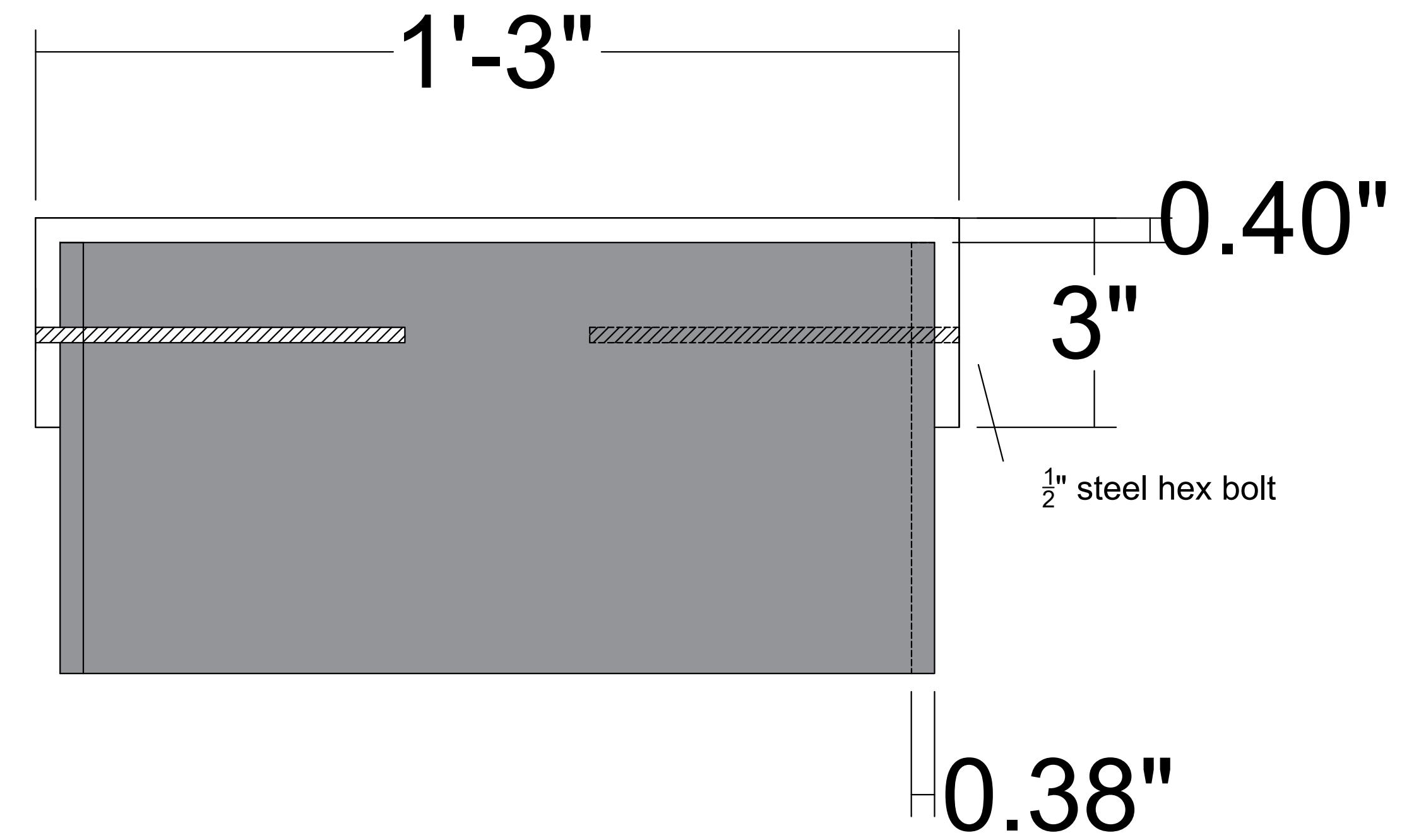
SHEET NO.
08

Plan View

- Notes:
- C-shaped galvanized steel beam overlaying sheet pile
 - Beam: C 15x33.9
 - Total length: 103.5'
 - Bolted every 18" to secure beam to sheet pile
 - Bolts: $\frac{3}{4}$ " 316 stainless steel hex cap screw, 6" in length



Cross Section



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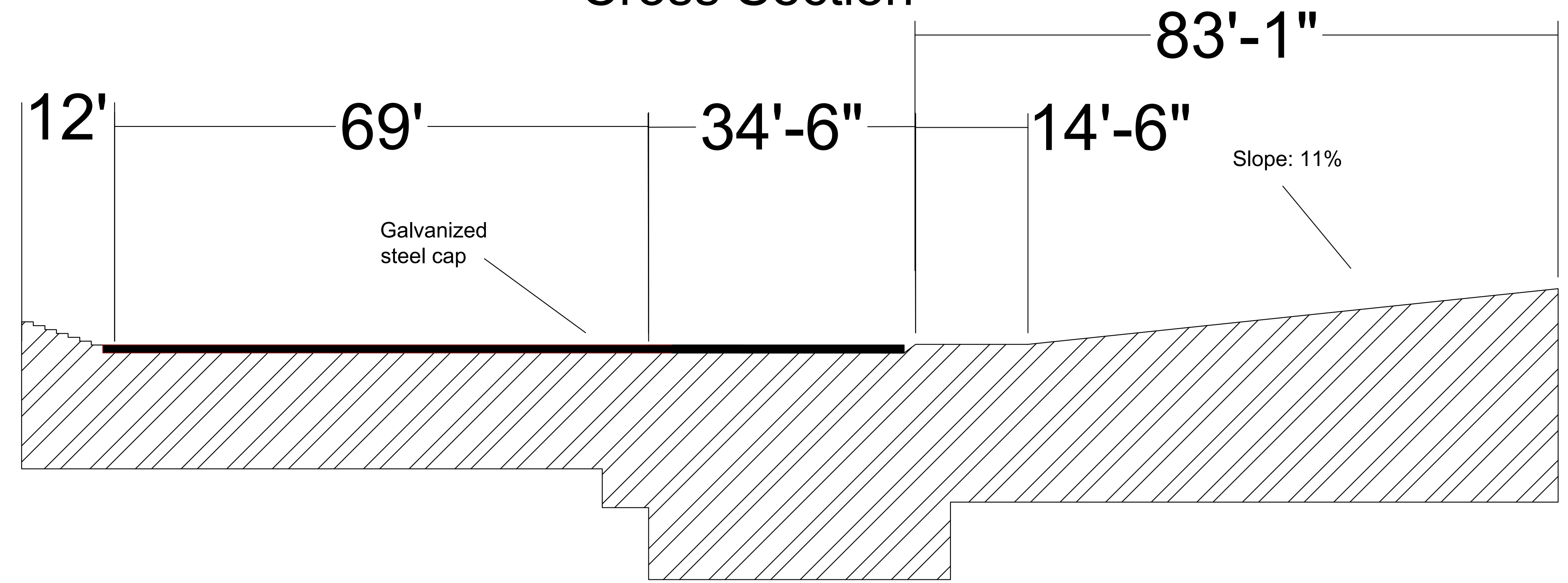
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SHEET NAME
 LOW-HEAD DAM CAP

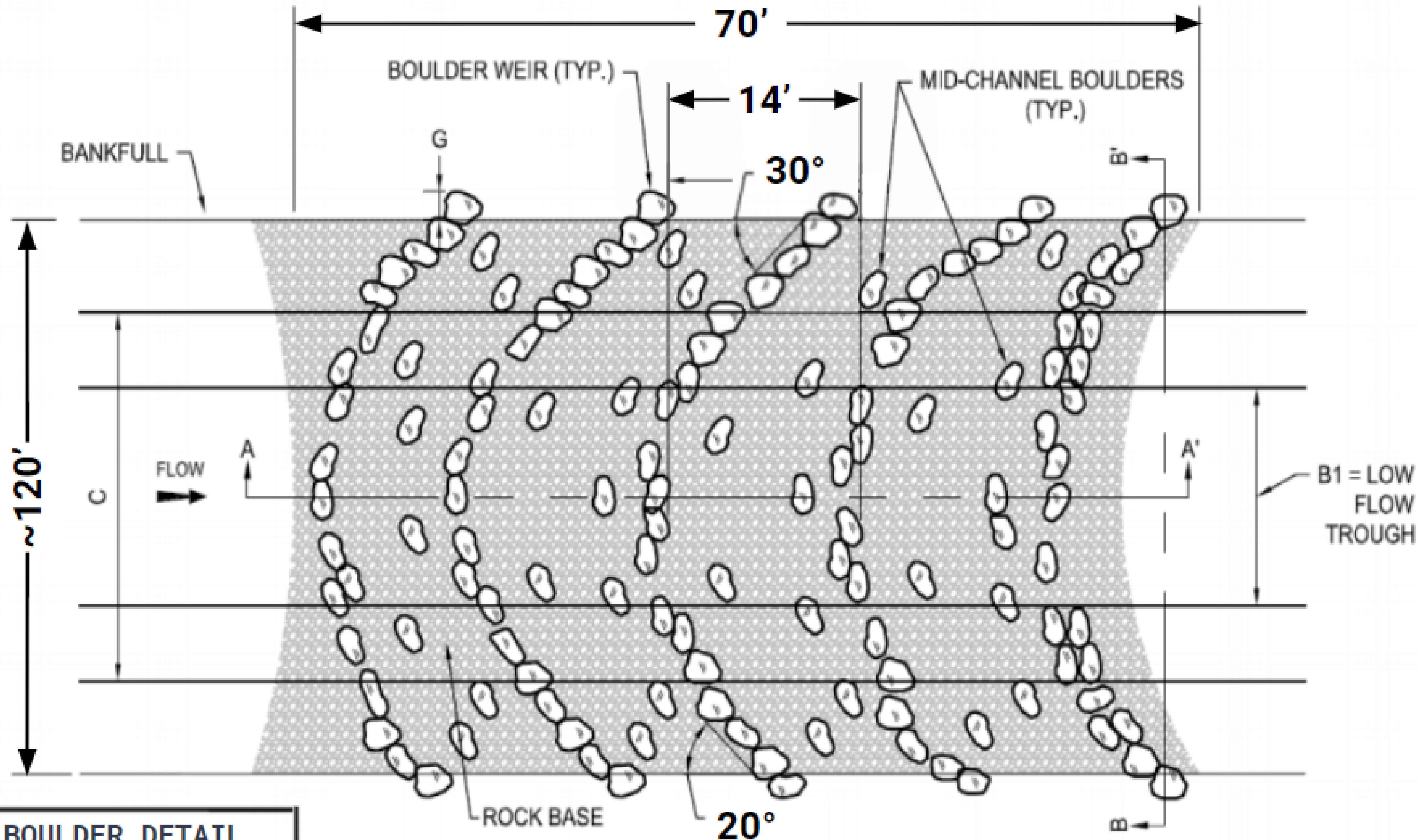
SHEET NO.
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(5) Waterworks Park, Dam Cap Design

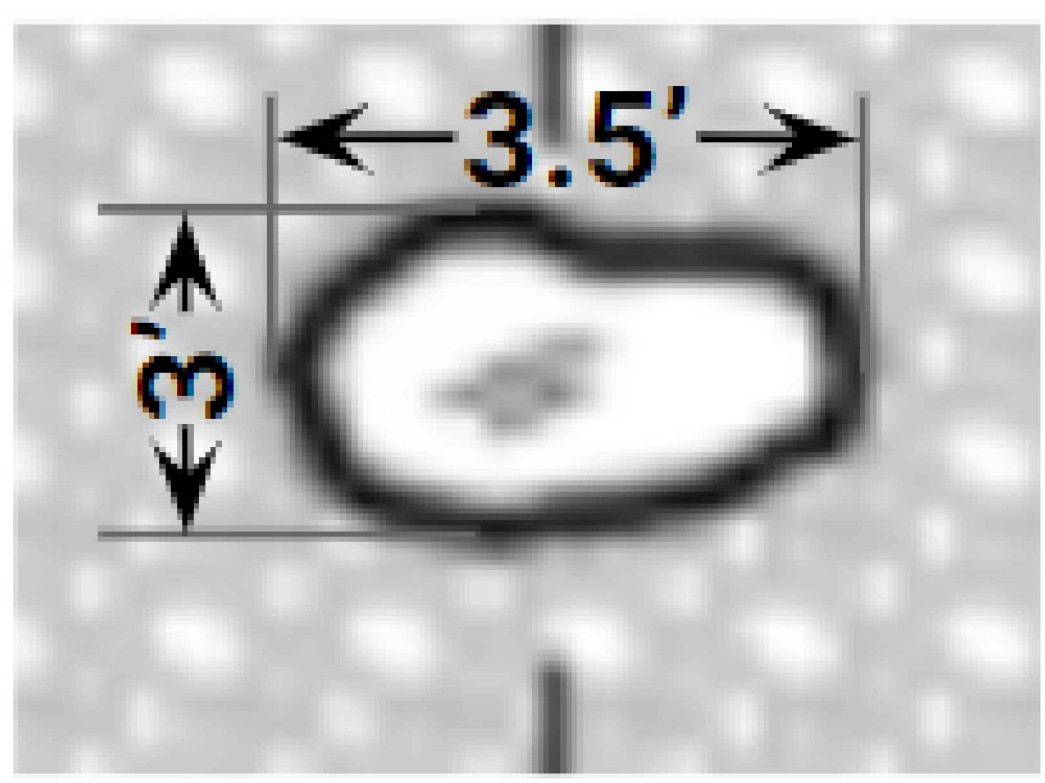
Cross Section



(6) Waterworks Park, Low-Head Dam Design



BOULDER DETAIL



PLAN VIEW



River Restoration Toolbox
Grade Control Practices
Rock Arch Rapids
 Page 1 of 3

Version 1.0 2/13/2017

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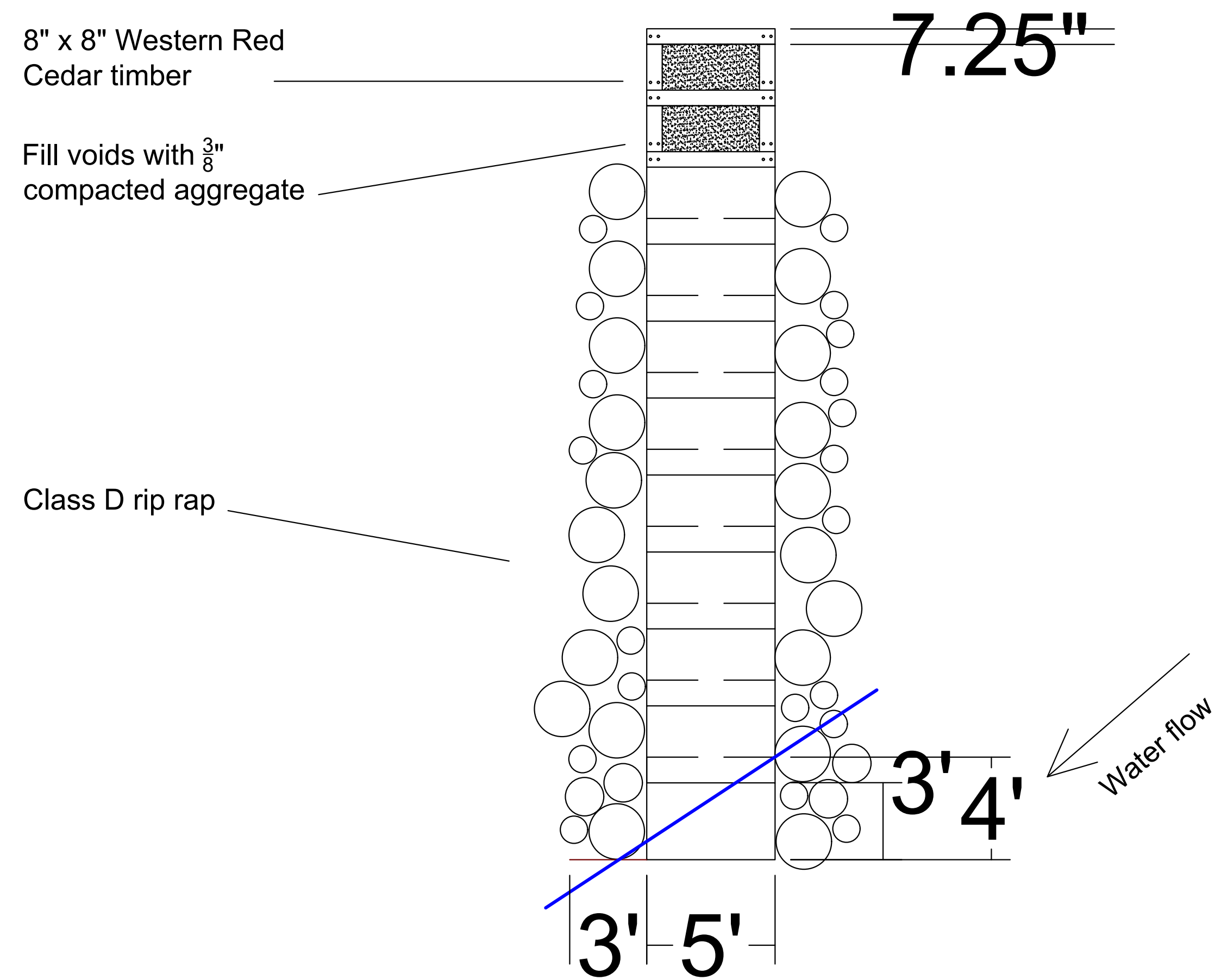
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SHEET NAME
ROCK ARCH RAPIDS DESIGN

SHEET NO.
10

Plan View



- Notes:
- Launch is angled 45 degrees to water
 - Class C concrete
 - Armor both sides with Class D rip rap
 - Overlaying steps, 12" on concrete, 2.5" on timber
 - Interlock concrete steps with $\frac{1}{2}$ " rebar, 5" in length, 3 per step
 - Steps sloped 3% towards water to alleviate ponding
 - Concrete step height: 7.25"
 - Timber step height: 7.25"
 - Bank full elevation: 1012 ft
 - Low flow elevation: 1006.6 ft
 - Top of stair elevation: 1013.2 ft

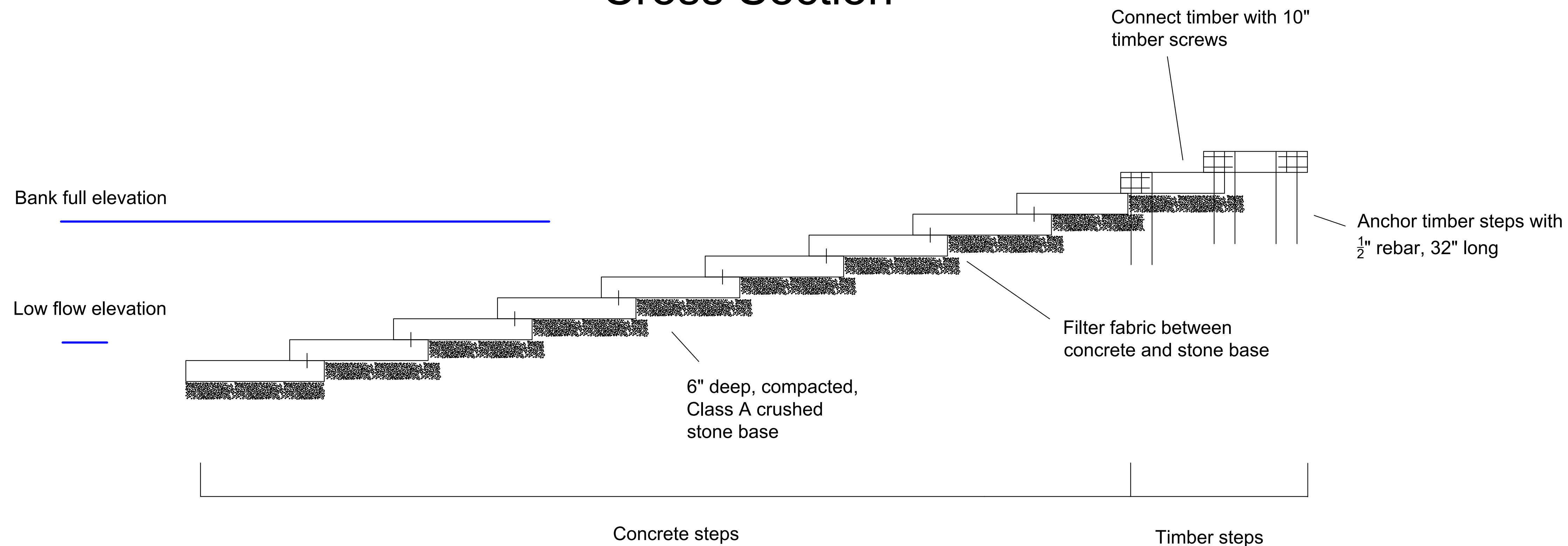
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Cross Section



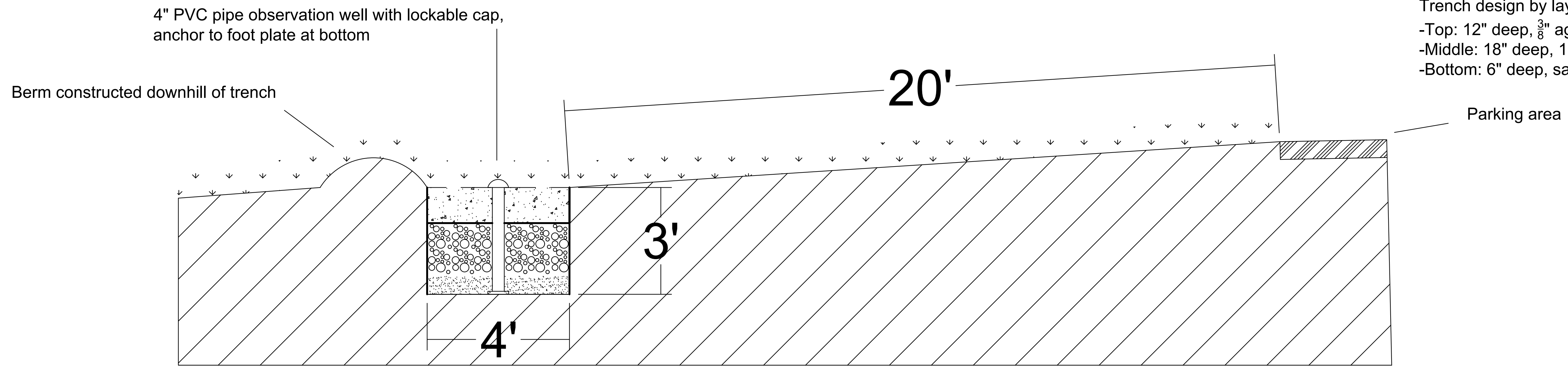
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SHEET NAME
 7B RANCH
 LAUNCH DESIGN

SHEET NO.
11

Cross Section



Notes:
 -Line the sides of trench with filter fabric
 -Filter fabric between top and middle layer of aggregate
 Trench design by layer:
 -Top: 12" deep, 3/8" aggregate
 -Middle: 18" deep, 1-3" aggregate
 -Bottom: 6" deep, sand

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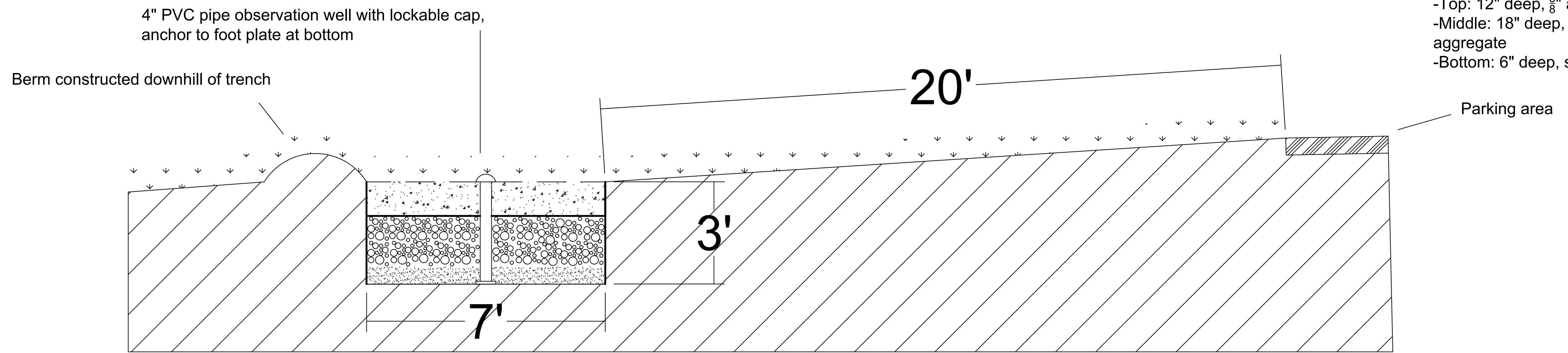
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SHEET NAME
 INFILTRATION TRENCH DESIGN

SHEET NO.
12

(8) Nokomis Park, Ranch 7-B Infiltration Trench Design

Cross Section



Notes:
 -Line sides of trench with filter fabric
 -Filter fabric between top and middle layer of aggregate
 Trench design by layer:
 -Top: 12" deep, 3/8" aggregate
 -Middle: 18" deep, 1-3" aggregate
 -Bottom: 6" deep, sand

(9) Waterworks Park Infiltration Trench Design