11-5-15

1. Build erosion protection at pipe outfalls w=L = ~4 times pipe Diameter

2. Remove/minimize loose dirt piles in Arroyo at flow line

3. Improve BMP at east end of project.

Erosion in arroyo bed 10-20-15

Piles of loose dirt eroding.

Sediment BMP working a little

from Urban Storm drainage
FHWA
USBR

$$P_d = (V^2 + gd)^{1/2}$$

$$= \left(\left(13 \frac{ft}{sec}\right)^2 + 32.2 \frac{ft}{sec}(2')\right)^{1/2}$$

$$= (169 + 64.4)^{1/2}$$

$$= \sqrt{233} = 15.2$$

Size L

$D_{50} = 9$ inches

Stone Specific gravity 2.5

$62.4 \frac{\#}{ft^3}(2.5) = 156 \#/ft^3$

$156 \frac{\#}{ft^3} \cdot \frac{27\ ft^3}{1\ yd^3} = 4200 \#/yd$

Lower Rule 1800#/yd

rip rap depth

$T = 1.75\ D_{50}$

$= 1.75(9'') = 16''$

$W = 4D = 16$ ft

$L = 4D = 16$ ft or $D^{1/2}\left(\frac{V}{2}\right)$

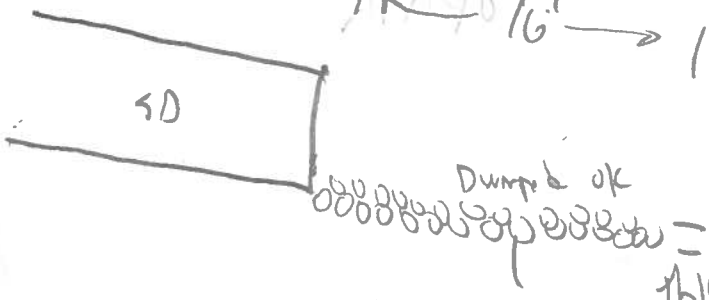
$= 2 \cdot 6.5 = 13$

For 48" SD inlet Array

area 10 ft²

$A = 4'$ $= \pi r^2$

$= 3.14 \cdot 4 = 12.47/1.8 = 10$ ft²

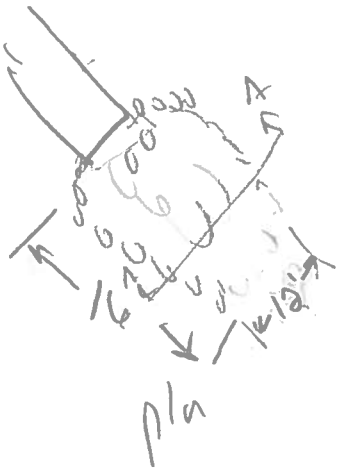


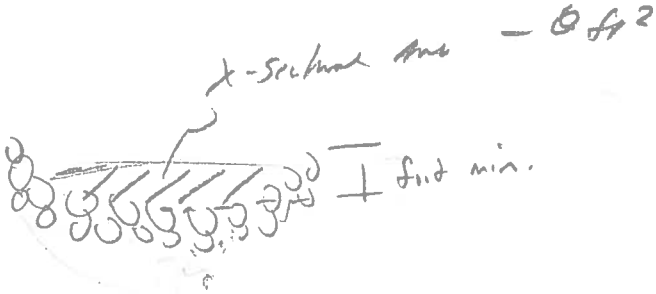
Profile

Rock Size

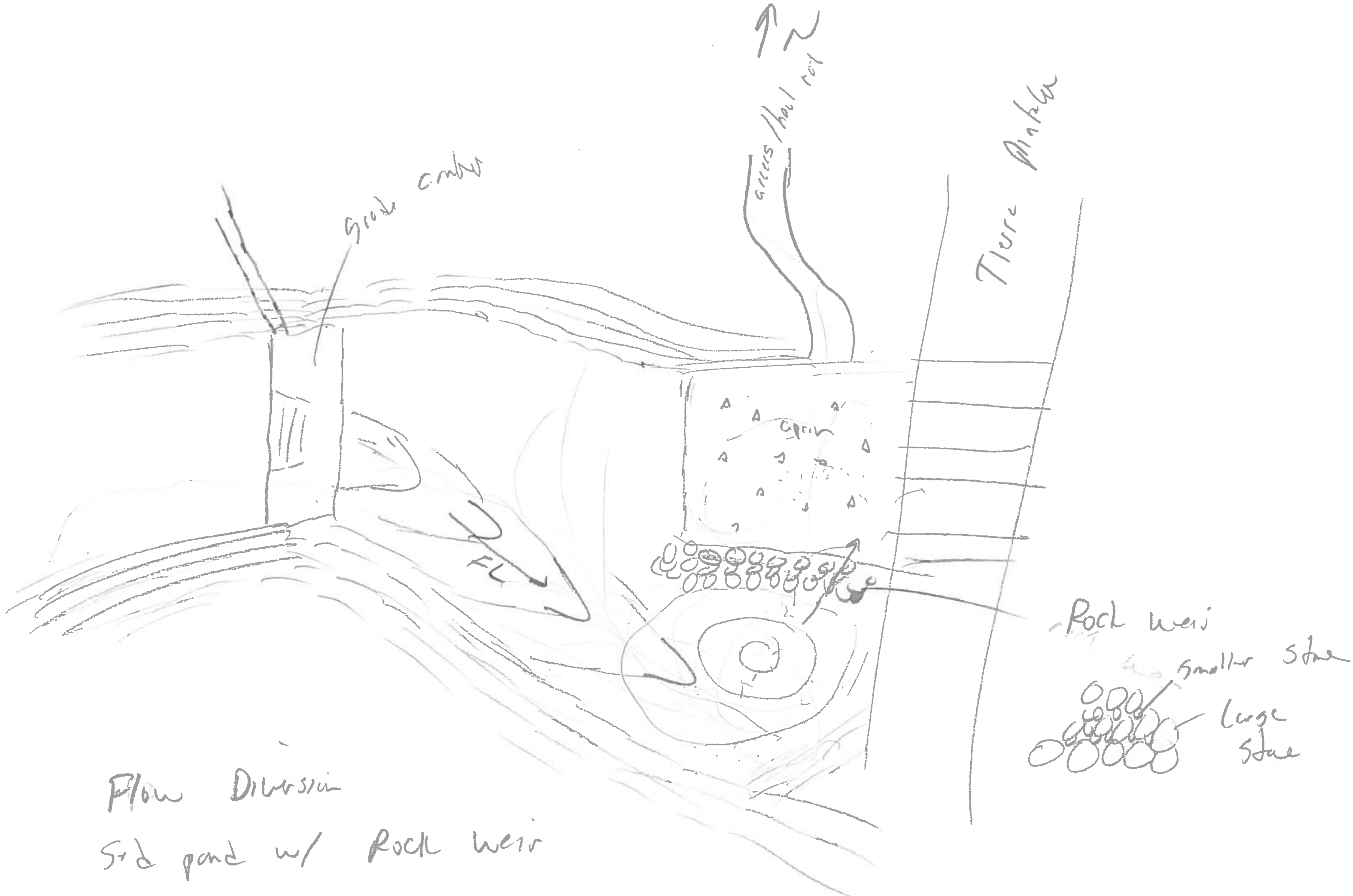
D_{50} = 9" heavy stone

D_{51} = 12" Lighter stone



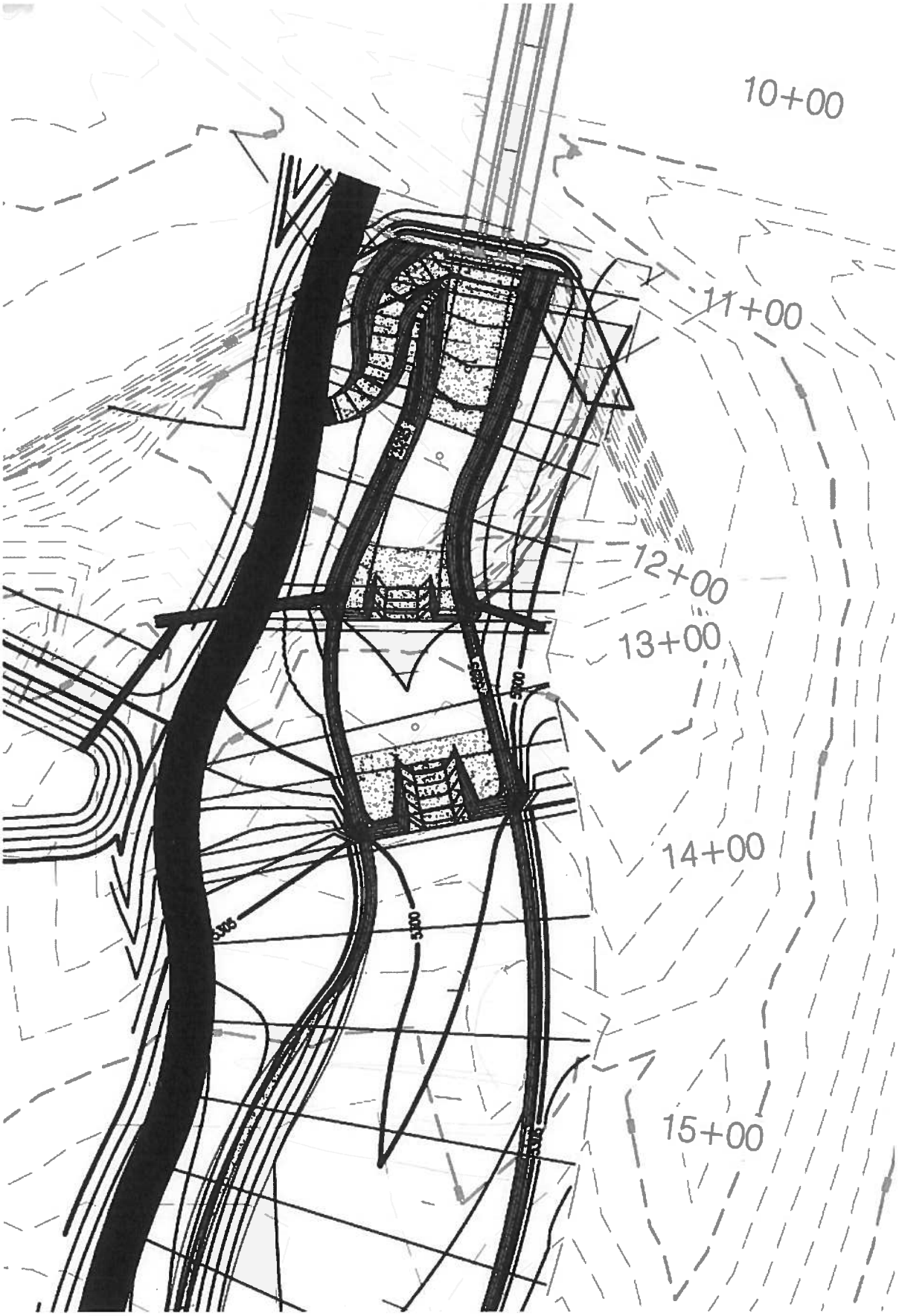


Section A-A



Flow Diversion

Side pond w/ Rock weir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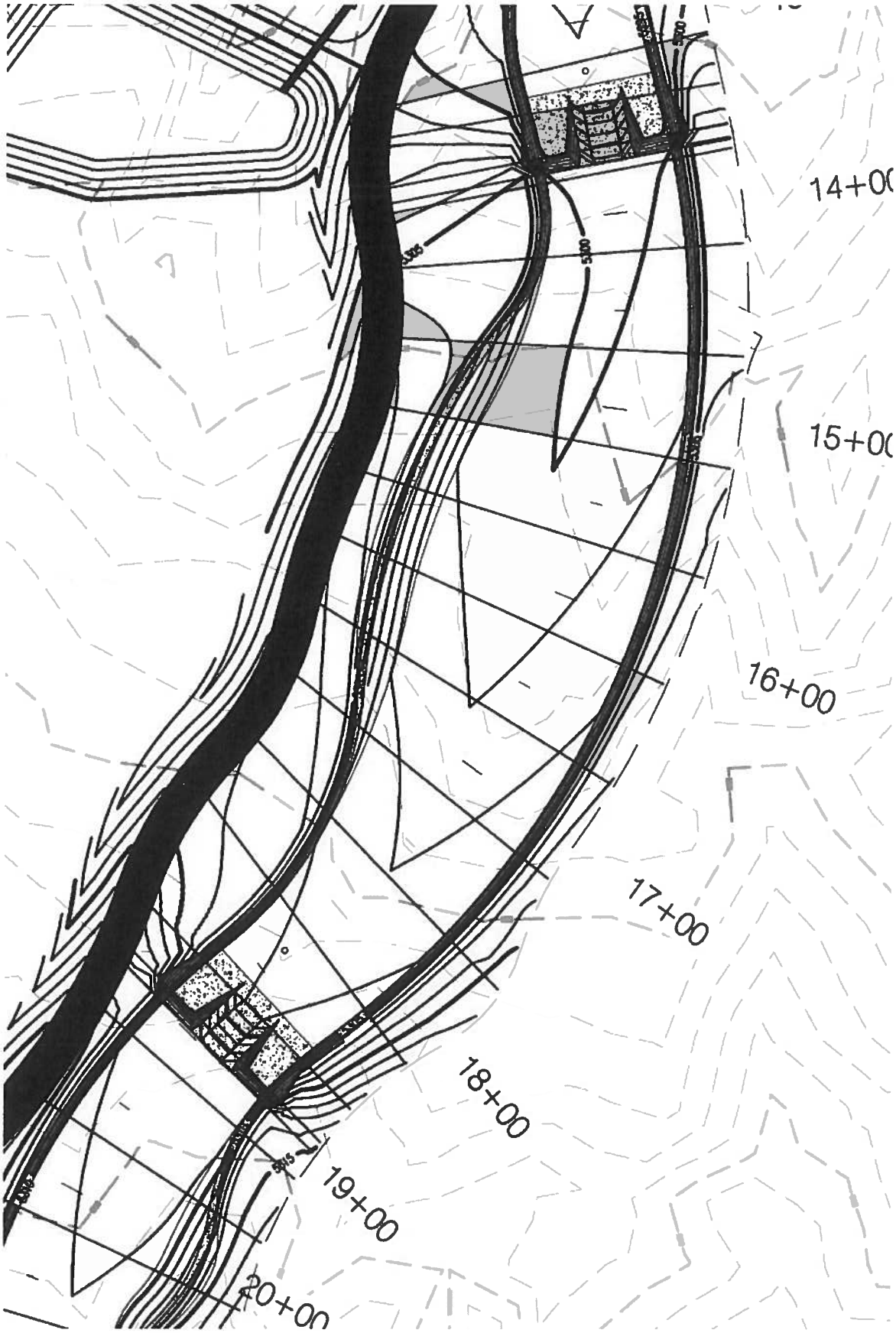
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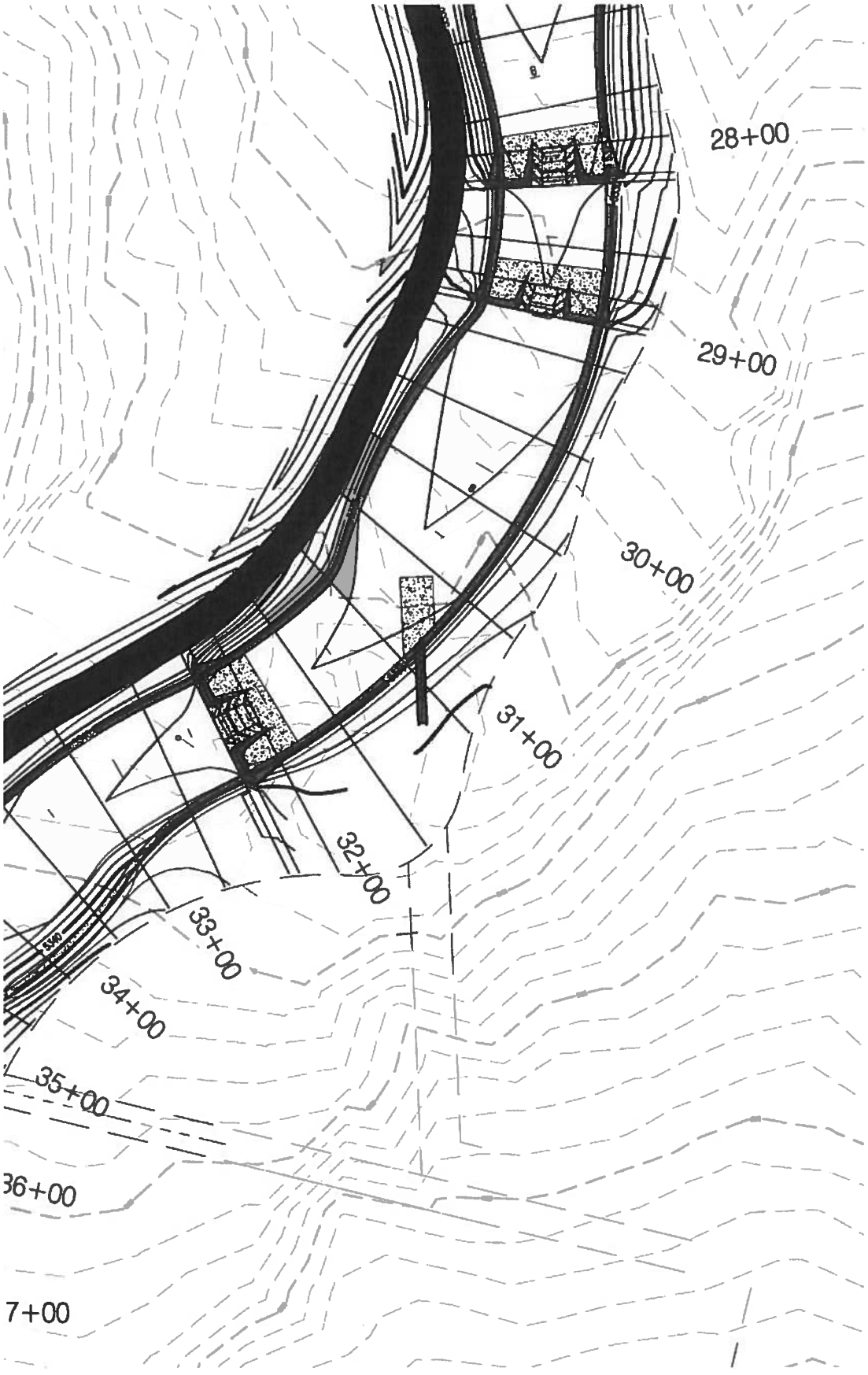
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