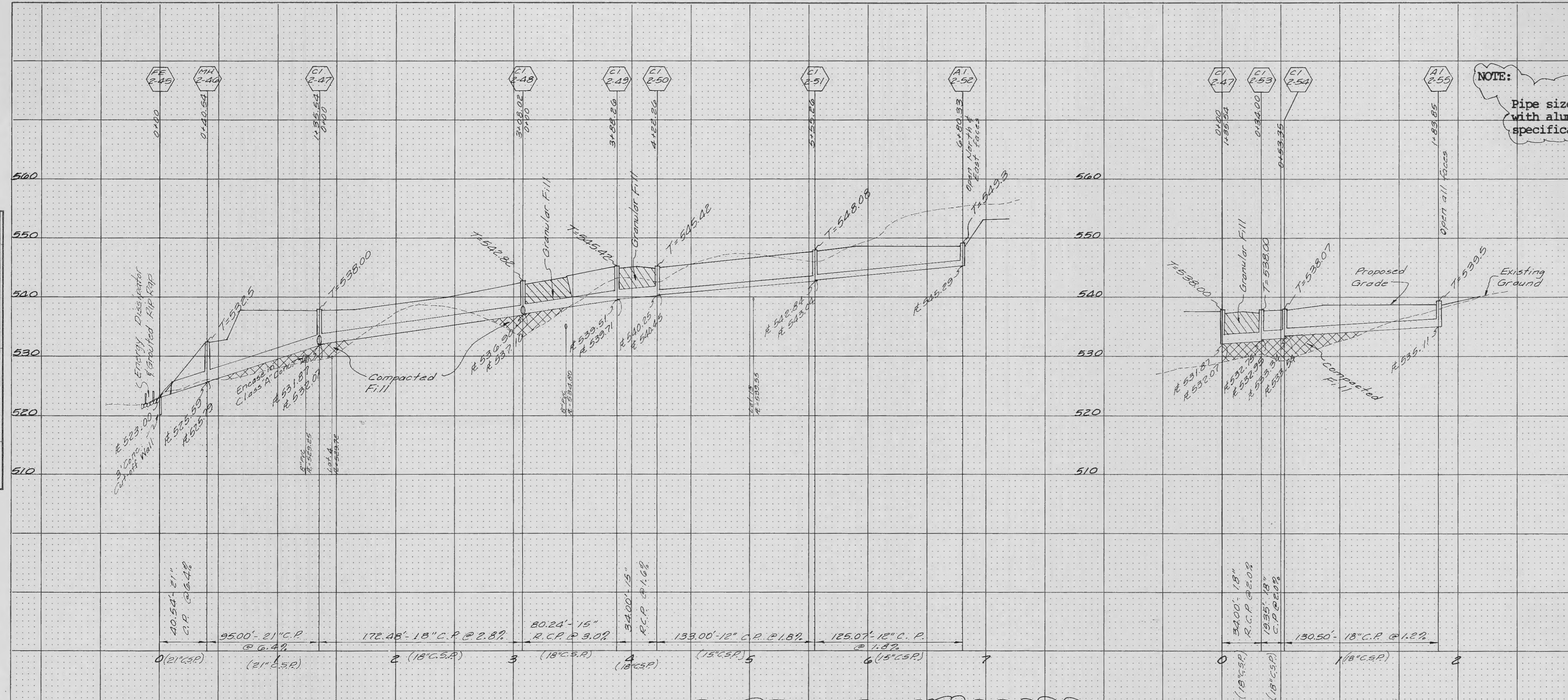


SCALE:
HORIZ. - 1" = 50'
VERT. - 1" = 10'

NOTE:
Pipe sizes in parenthesis are alternates for corrugated steel pipe with aluminized Type 2 coating per the City of O'Fallon specifications.



DETENTION CALCULATIONS (25 Year)
Developed Q to dry pond 25.37 Ac x 3.04 = 77.12 cfs.
Undeveloped Q to dry Pond 25.37 Ac x 2.15 = 54.55 cfs.
Differential Runoff = 22.57 cfs.
Storage Required 22.57 cfs x 1800 (30 min) = 40,626 cu.ft.
Storage of dry pond @ elev 514.50 = 46,213 cu.ft.
(see sheet 20 of 31)

OVERFLOW CALCULATIONS
Capacity of a 18" C.P. as an orifice
 $Q = C a \sqrt{2gh}$ Constant C = 0.6
Area a = 1.767 Gravity g = 32.2
Avg. head h = 7.75
 $Q = 0.6 \times 1.767 \times \sqrt{2 \times 32.2 \times 7.75}$
 $Q = 1.06 \times \sqrt{499.1}$
 $Q = 1.06 \times 22.34$
 $Q = 23.68$ cfs.

Q to dry pond 16.14 Ac x 3.04 = 49.07 cfs
Out Overflow structure = 23.68 cfs
Storage Required = 25.39 cfs
25.39 cfs x 1800 (30 min) = 45,702 cu.ft.

EMERGENCY SPILLWAY (Grouted Rip Rap)
Q to dry pond 16.14 Ac @ 4.17 (100 year) = 67.30 cfs.
Top dam 517.00

$Q = a \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2}$ a = 16.75
 $Q = 14.75 \times \frac{1.486}{0.0225} \times 0.613 \times 0.10$ WP = 35.14
 $Q = 67.81$ cfs S = 0.01 5/8 = 0.10
R = 1.75 1/2 = 0.48 R^{2/3} = 0.63
n = 0.0225

SIDE SLOPE (Grouted Rip Rap)

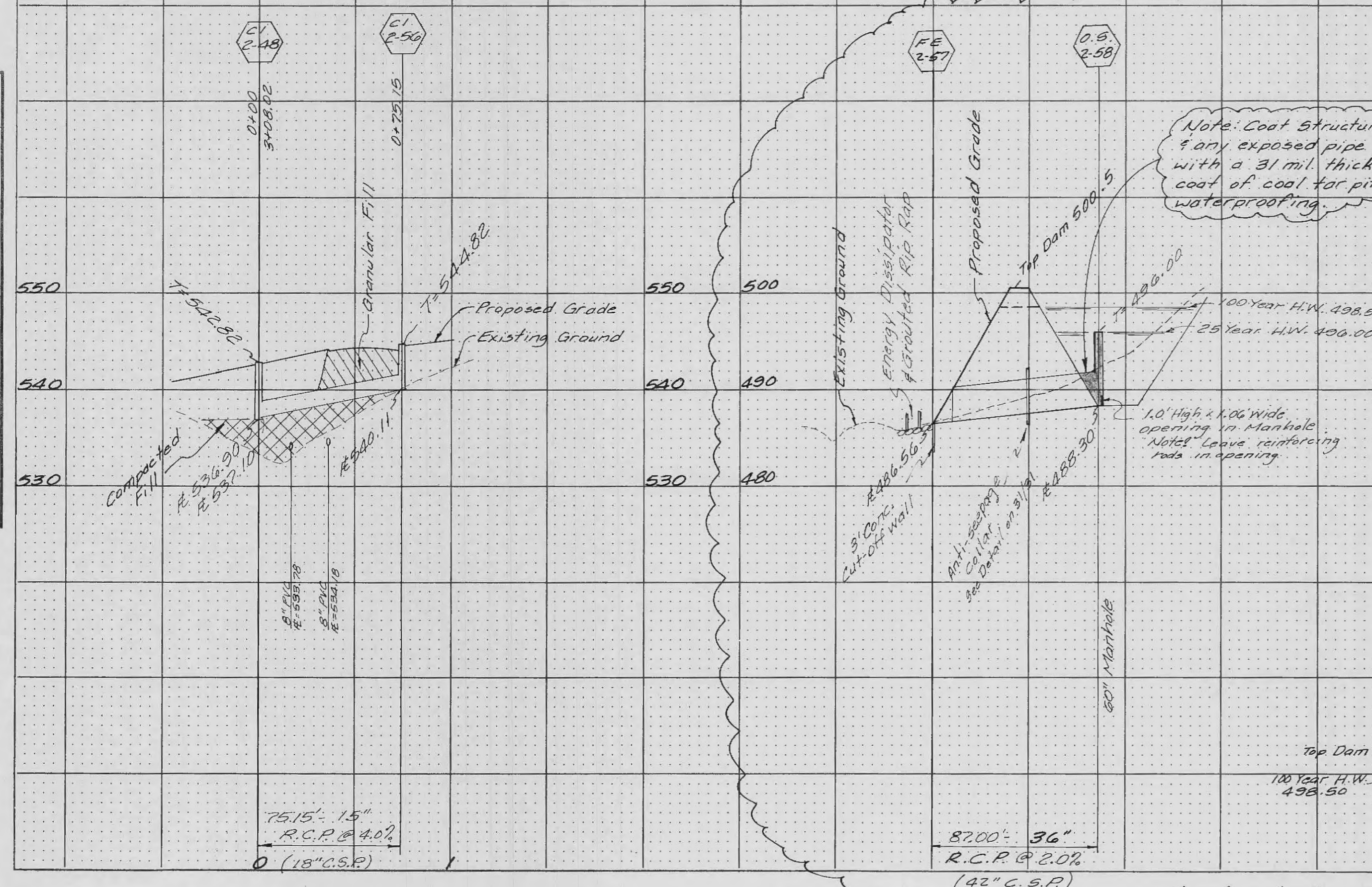
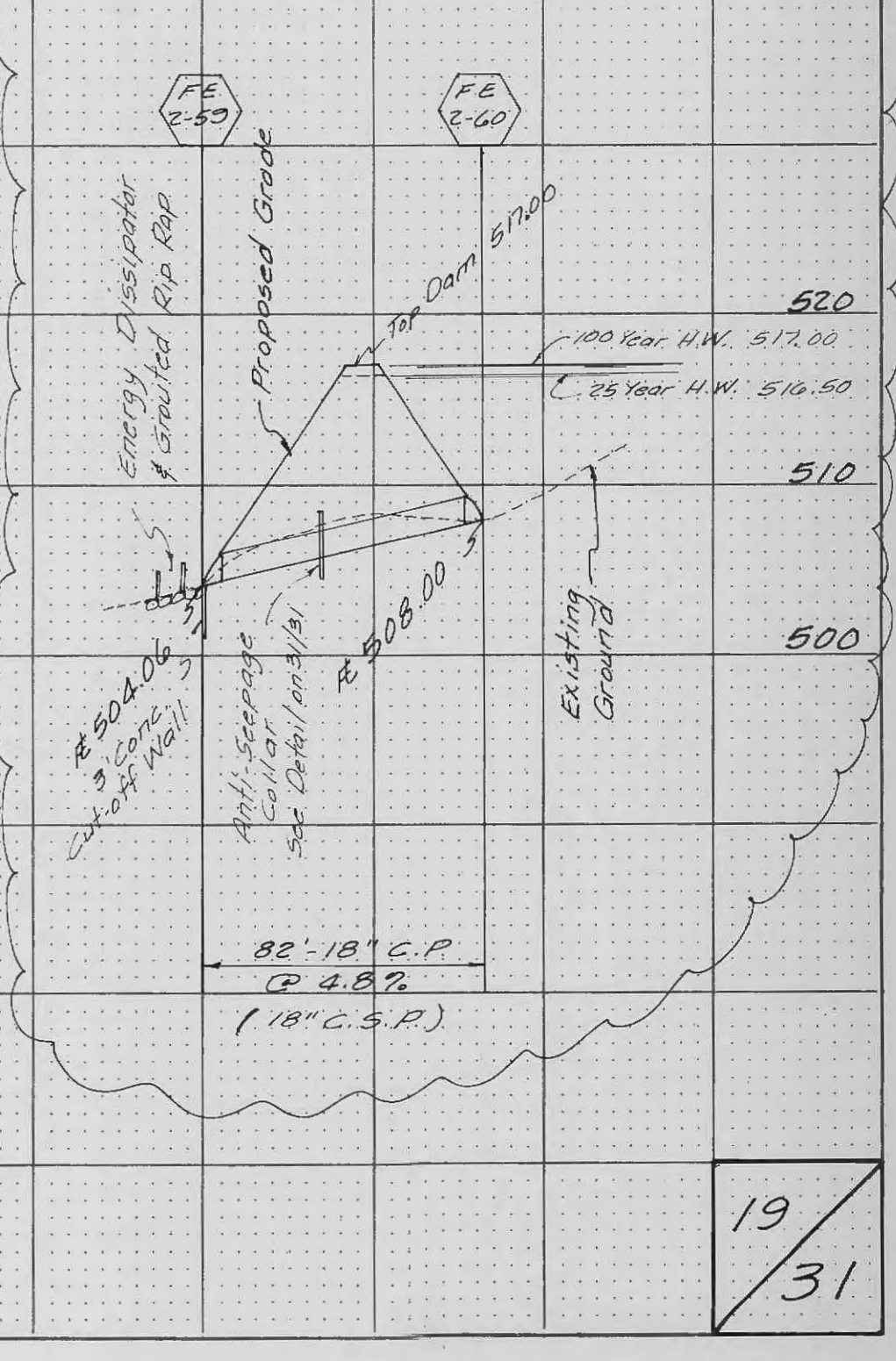
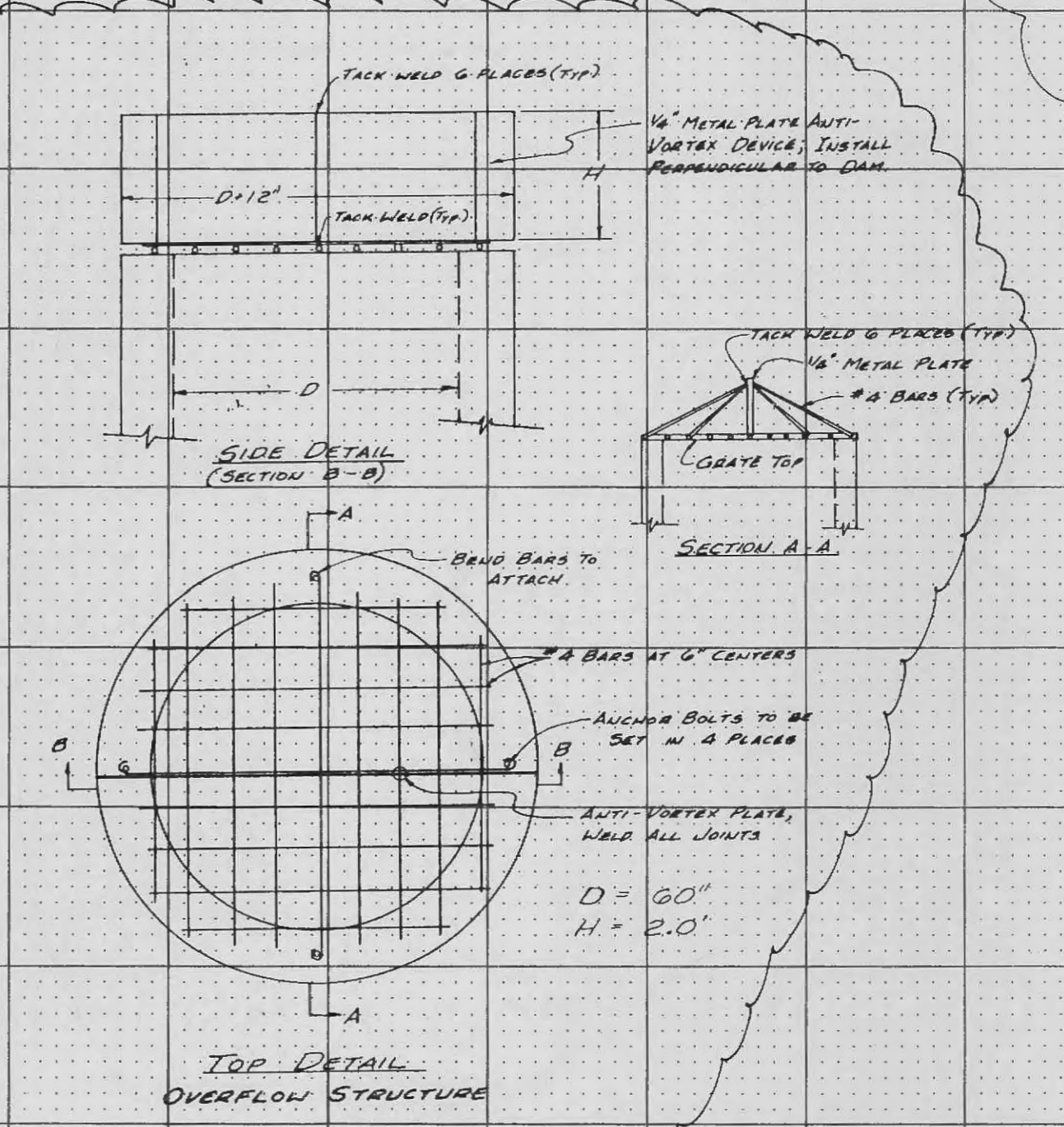
$Q = a \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2}$ a = 3.75
 $Q = 4.75 \times \frac{1.486}{0.0225} \times 0.57 \times 0.39$ WP = 11.14
 $Q = 69.74$ cfs S = 0.15 5/8 = 0.39
R = 1.75 1/2 = 0.43 R^{2/3} = 0.57
n = 0.0225

DETENTION CALCULATIONS (25 Year)
Developed Q to dry pond 73.42 Ac @ 3.04 = 223.20 cfs.
Undeveloped Q to dry pond 73.42 Ac @ 2.15 = 157.85 cfs.
Differential Runoff = 65.35 cfs.
Storage Required 65.35 cfs x 1800 (30 min) = 117,630 cu.ft.
Storage of dry pond @ elev 496.00 = 119,378 cu.ft.
Storage of dry pond @ elev 498.50 = 198,759 cu.ft.
(see sheet 20 of 31)

OVERFLOW STRUCTURE CALCULATIONS
Capacity of a 1.0' high x 1.00' wide opening in a 60" Manhole
 $Q = C a \sqrt{2gh}$ Constant C = 0.6
Area a = 1.06 Gravity g = 32.2
Avg. head h = 7.20
 $Q = 0.6 \times 1.06 \times \sqrt{2 \times 32.2 \times 7.2}$
 $Q = 0.64 \times \sqrt{463.48}$
 $Q = 0.64 \times 21.93$
 $Q = 13.78$ cfs.
Q to dry Pond 26.39 Ac x 3.04 = 80.23 cfs.
Out Overflow structure = 13.78 cfs.
Storage Required = 66.45 cfs
66.45 cfs x 1800 (30 min) = 119,610 cu.ft.
Head on top 60" Manhole to handle 80.23 cfs.

$Q = C L H^{3/2}$ Constant H = 3.0
Length L = 75.11
Quantity Q = 80.23
 $80.23 = 3 \times 15.71 \times H^{3/2}$
 $H^{3/2} = \frac{80.23}{47.13} = 1.71$
H = 1.43

EMERGENCY SPILLWAY (50D)
Q to dry pond 26.39 Ac x 4.17 (100 year) = 110.05 cfs.
Top Dam 500.57 110.05 cfs x 1800 (30 min) = 198,090 cu.ft.
100 Year H.W. 512.00
25 Year H.W. 516.50



FINAL SURVEY PLOTTED TEMPLATE AREAS CHECKED

ORIGINAL SURVEY PLOTTED TEMPLATE AREAS CHECKED