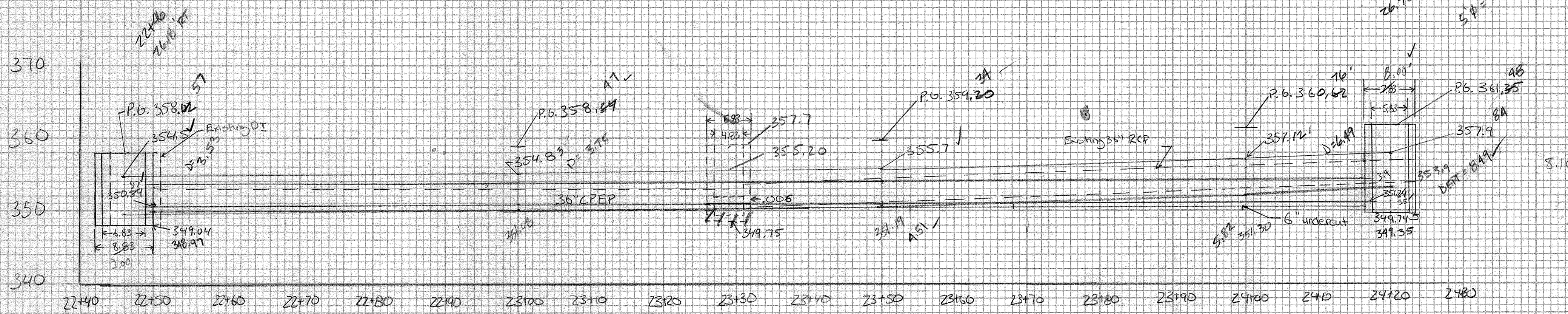
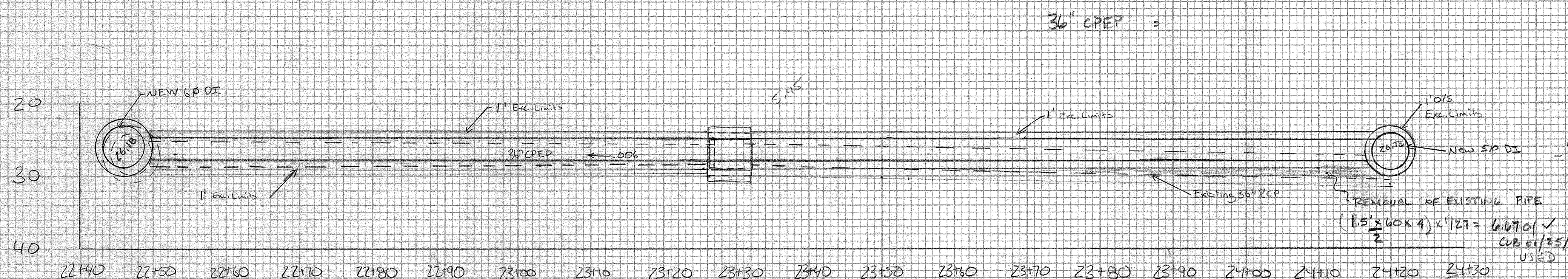


DR # 24+20 RT ~ 22+46.1 RT 36" CPEP



PIPE	DEPTH	AVG	VOL	
22+50	3.53'	3.69'	(3.69 x 50)	182.5
23+00	3.75'	4.13'	(4.13 x 50)	206.5
23+50	4.51'	5.17'	(5 + (0.17 x 5)) x 50	262.75
24+00	5.82'	6.16'	(5 + (1.16 x 5)) x 16.5	111.21
24+65	6.49'			762.46

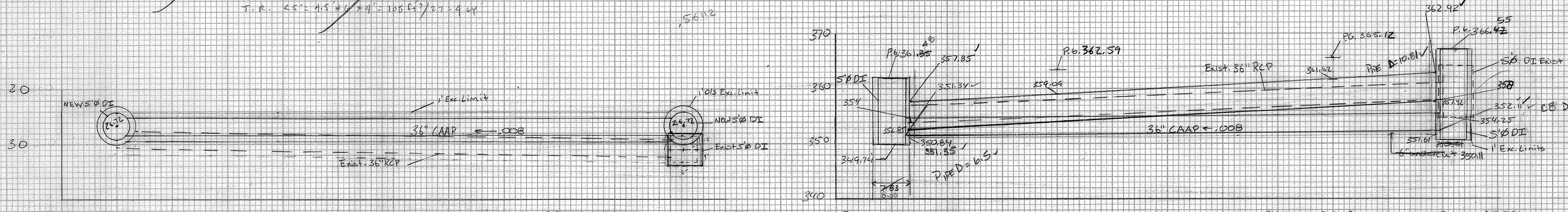
84.8
 $762.46 \text{ SF} \times 5.5' \times 1.27 = 155.32 \text{ cy}$
 EXIST DI DEDUCT = 3.88 cy
 $51.94 \text{ cy} \checkmark$ CB 01/25/08
 TB 01/25/08
 NEW DI = $[5 + (1.15 \times 3.49)] (4^2) (1.27) = 19.05 \text{ cy}$
 EXIST PIPE VOL = 6.67 cy
 $177.16 \text{ cy} \checkmark$ TRG 1/25/08
 EXIST DI @ 23+29 RT FULL TBG 08/27/06 6' x 4' x 8'
 203.16 SOLID ROCK = $3.16 \times 6 \times 4 / 27 = 3.24 \text{ cy}$
 204.21 TRENCH ROCK = $(8 - 3.16) \times 6 \times 4 / 27 = 3.88 \text{ cy}$



Granular Backfill
 $5.5' \times 2.25' \times 169.8' = 2048.80 \text{ cu ft} = 133.59 \text{ cy}$
 $(3.14 \times 1.5^2) (169.8) = 385.78 \text{ cu ft} = 25.38 \text{ cy}$
 $1283.34 / 27 = 47.53 \text{ cy}$ RD 6/14/07
 $638.02 / 27 = 23.63 \text{ cy}$
 $1283.34 / 27 = 47.53 \text{ cy}$
 $638.02 / 27 = 23.63 \text{ cy}$
 TOTAL = 26.8 cy
 TBG 1/25/08

Pipe trench Exc @ Outlet @ Inlet
 $\text{Area} = \frac{1}{2} (4.16 + 3.14) \times 5 = 16.76 \text{ sq ft}$
 $\text{Area} = \frac{1}{2} (3' \times 2.11) + (2.11 \times 5.15 \times 1.27) = 55.55 \text{ sq ft}$
 $\text{VOL} = (25.76 + 55.55) \times 1.27 = 100.47 \text{ cy}$ (must subtract portion of EXIST W/P trench) = $(1.5' \times 4' \times 6') / 27 = 1.33 \text{ cy}$
 Existing Pipe = $(\frac{3.14 \times 5^2}{2}) \times 4 \times 1.27 = 37.12 \text{ cy}$
 $\text{CY} = \frac{1}{2} (1.5 \times 6^2) \times (4 \times 1.27) = 20.17 / 27 = 7.47 \text{ cy}$
 DI @ 24+20 RT $(3.14 \times 3.92^2) = 48.25 \text{ sq ft}$
 $\text{VOL} = 48.25 \times 5' \times 1.27 = 30.94 \text{ cy}$
 $\text{VOL} = 48.25 \times 3.14 \times 1.15 \times 1.27 = 27.76 \text{ cy}$
 total for DI 58.71 cy
 EXIST DI @ 23+29 RT $(6.83^2 \times 5.15) = 8.64 \text{ cy}$
 $(6.83^2 \times 4.51) = 11.11 \text{ cy}$
 Rock Exc. 9.84 cy
 Solid rock = $3.5' \times 6' \times 4' = 84 \text{ ft}^3 / 27 = 3.11 \text{ cy}$
 T.R. 4.5' = $1.5' \times 4' \times 4' = 108 \text{ ft}^3 / 27 = 4.00 \text{ cy}$

DR # 25+22.2 RT ~ 24+20.0 RT 36" CAAP



TRENCH EARTH
 $\text{PIPE} = [(5 \times 94 \times 5.1) + (1.5 \times 1.15 \times 5.8) \times 5.1 \times 94] / 27 = 186.12 \text{ cy}$
 $\text{CB} [(5 \times 11 \times 4^2) + (1.15 \times (12.81 - 5) \times 4^2)] \times 1.27 = 16.25 \text{ cy}$
 EXIST PIPE = $(1.5 \times 2.7) \times 100 \times (4.9 \times 5) + (1.15 \times 0.5) \times 1.27 = 37.92 \text{ cy}$
 DEDUCT FOR EXISTING DI = 10.07 / 27 = 5.33 cy
 TOTAL TE = 239.96 cy
 EXISTING PIPE DEPTH @ 24+20 D = 4' @ 25+22 D = 5.5'

Pipe trench Exc @ outlet @ inlet
 $\text{Area} = (5' \times 5') - (\frac{7.01 \times 5.1 \times 1.15}{2}) = 40.88 \text{ sq ft}$
 $\text{Area} = (6' \times 5.1) + (\frac{6.31 \times 5.1 \times 1.15}{2}) = 73.77 \text{ sq ft}$
 $\text{VOL} = (40.88 + 73.77) \times 1.27 = 195.69 \text{ cy}$
 Existing Pipe = $(\frac{3.85 \times 2.4}{2}) = 9.24 \text{ cy}$
 $(5.0 \times 4.0) = 20.0 \text{ cy}$
 $\text{VOL} = (9.24 + 20.0) \times 92.17 \times 1.27 = 48.91 \text{ cy}$
 DI @ 25+22.2
 $\text{Area} = \frac{3.14 \times 3.92^2}{2} = 23.85 \text{ sq ft}$
 $\text{VOL} = (23.85 \times 5) + (6.31 \times 3.67 \times 1.15) = 23.85 \text{ cy}$
 $(3.14 \times 3.92^2) = 48.25 \text{ sq ft}$
 $(48.25 \times 5) + (48.25 \times 7.31 \times 1.15) = 228.31 \text{ sq ft}$
 $228.31 / 27 = 8.46 \text{ cy}$
 Remove exist (EXIST TBG)
 Solid rock = $3.5' \times 6' \times 4' = 84 \text{ ft}^3 / 27 = 3.11 \text{ cy}$
 T.R. 4.5' = $1.5' \times 4' \times 4' = 108 \text{ ft}^3 / 27 = 4.00 \text{ cy}$

Granular Backfill
 $9' \times 2' \times 5.1 \times 2.05 = 106.23 \text{ cu ft} = 7.85 \text{ cy}$
 $(3.14 \times 1.5^2) (3.14 \times 1.5^2) = 36.63 \text{ cu ft} = 2.69 \text{ cy}$
 $644.60 / 27 = 24.06 \text{ cy}$ RD 6/14/07
 $15.80 \text{ cy} \times 14.72 \text{ cy} = 231.82 \text{ cy}$
 36" CAAP USED, 97.75 LF
 EXISTING DI FULL TBG 09/05/07
 NO SOLID ROCK
 204.21 TRENCH ROCK = $(6.6 \times 6) + (6.6 \times 6 \times 1.5) = 106.7 \text{ cy}$
 TBG 1/25/08

ORIGINAL SURVEY	DATE	BY

FINAL SURVEY	DATE	BY