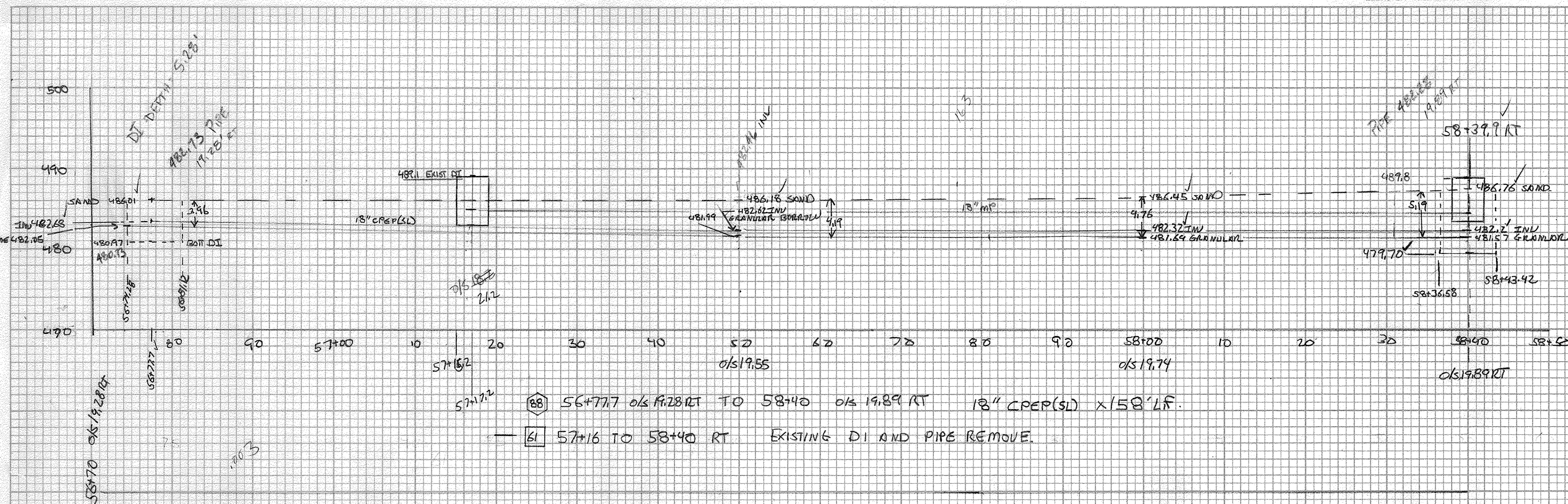


OUTSIDE DI = 21" 18" CRP
TH = 15" = 0.15'

NO UNDERCUT

ITEM 20420 TRENCH EXCAVATION OF EARTH

PIPE AUG DEPTH = $3.46 + 4.19 + 4.76 + 5.19/4 = 4.53' \pm 0.065'$
 $(12.85 RT \ 22.48 + 15.862 + 20.5 \times 1.6717) \times 4.53 \times 1/2 = 114.18 \text{ cy}$
 ROCK EXCAVATION FOR REMOVAL OF DI $4 \times 4 \times 6.12/27 = 3.61 \text{ cy}$
 TOTAL TRENCH = 110.57 cy
 EXCAVATION FOR DI 56+77.7 = 8.73 cy
 119.3 cy BL 6/6/07

TRENCH Exc OF EARTH

PIPE = $(156 \times 4.065 \times 3.75)/27 = 88.08 \text{ cy}$
 DI = $4 \times 4 = 16 \text{ sq ft}$
 $(5 \times \pi \times 4.83^2)/4 + (15.862 \times \pi \times 4.83^2)/2 = 3.68 \text{ cy}$
 DEDUCT EXIST DI = $3.87 \times 4 \times 3.75/27 = 2.15 \text{ cy}$
 8 = 89.61 cy

NEED TO CHECK!

GRAND DAKOTA
 $\frac{1}{2} \pi (0.84)^2 \times 6.5' = 1.23 \text{ cy}$
 $\frac{1}{2} \pi (0.84)^2 \times 6.5' \times 12.5' = 4.52 \text{ cy}$

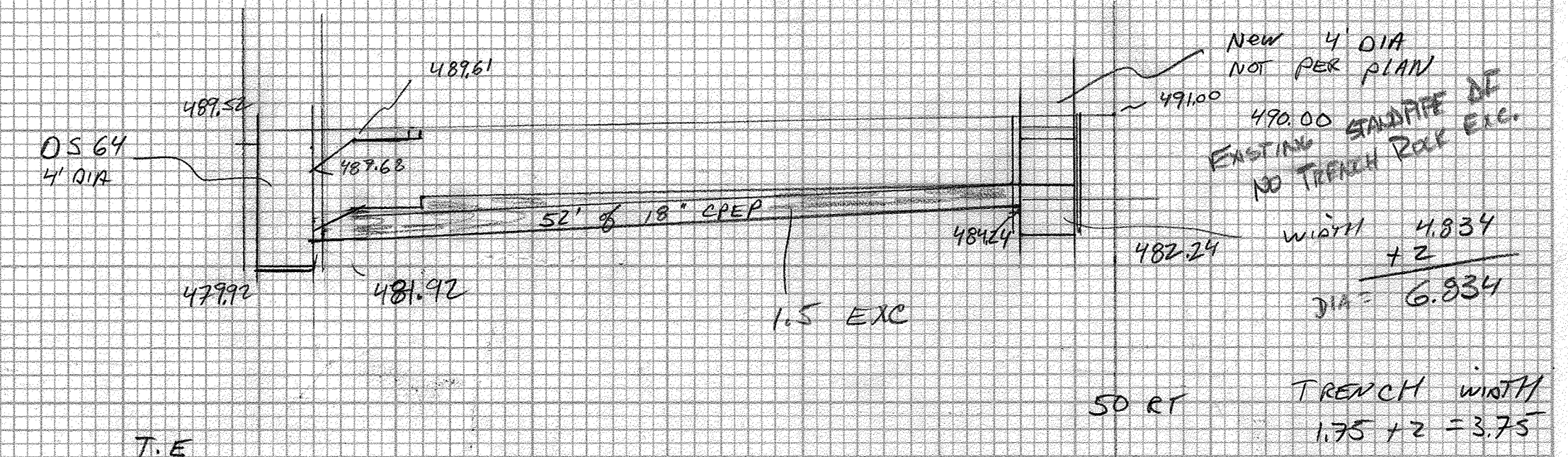
GRAND BULK

$[(156 \times 3.75 \times 0.875) + (\pi \times 0.875^2 \times 6.5)] \times 1/27 = 11.61 \text{ cy}$

EXIST DI @ 57+16.5 RT

FROM X-SECTIONS 4' x 4' x 6.5' DI
 $203.16 = 2.63 \times 4 \times 4 \times 1/27 = 1.56 \text{ cy}$
 $204.21 = (6.5 - 2.63) \times 4 \times 4 \times 1/27 = 2.29 \text{ cy}$
 01/24/08
 1/25/08

DI 65 STA 46+15 RT - STA 46+65 RT



T.E
AUG

$5' \times 50.5 \times 3.75 = 946.88/27 = 35.07 \text{ cy}$

1.5
 $(\frac{AUG}{96 \pm 2})$ WIDTH
 $1.38 \times 3 \times 3.75 = 15.53 \text{ ft}^3$
 $2 \times 4 \times 3.75 = 30.00 \text{ ft}^3$
 $(\frac{AUG}{2.61 + 1.5}{20.5}) 43.5 \times 3.75 = 335.2 \text{ ft}^3$

$380.75 \times 1.5 = 571.2/27 = (21.15 \text{ cy})$

GRANULAR BACK FILL

$[50 \times (3.14 \times .875^2)]/27 = 4.45$

$50' \times 3.75 \times 1.75 = 328.13/27 = 12.15 \text{ cy}$

7.70 cy CP# 12/07/07

DI

AUG DEPTH $(49.21 + 49.69)/2 = 49.45$

$5' \times 6.834 \times 11$
 AREA $5 \times \pi R^2 = [5' \times 3.14 (3.417^2)]/27 = 6.79 \text{ cy}$

1.5 TIME $\frac{486.05}{482.24}$
 $1.5 \times 3.81 \times 3.14 (3.417^2)/27 = 7.76 \text{ cy}$

56.22 cy T.E PIPE T.E TOTAL

HAVEN DI

T.E STRUCTURE DI
 14.55 cy
 21.15 cy
 35.70 cy

ORIGINAL SURVEY NOTE BOOK NO. DATE

FINAL SURVEY PLOTTED TEMPLATE AREA CHECKED NO. DATE

TRENCH EARTH FOR DI