Area of Catch Basin = 4.83 (13) (1.5+1.5) + (3.0) = 7.83 x 7.83 = 61.3 ft²

Area @ 100% = 5 ft x 61.3 ft² = 306.5 ft³

Area @ 150% = 6.9 ft (Ave) x 61.3 ft² = 423.0 x 1.5 = 634.5 ft³

941 ft³ x 1/27 = 34.85 cy

WRF 8-14-09

Pipe (w) (D) (L)

Area @ 100% = 5 ft x 5 ft x 2.3 ft = 57.5 ft³

Area @ 150% = 5 ft x 4.2 x 2.3 = 48.3 ft² x 1.5 = 72.5 ft³

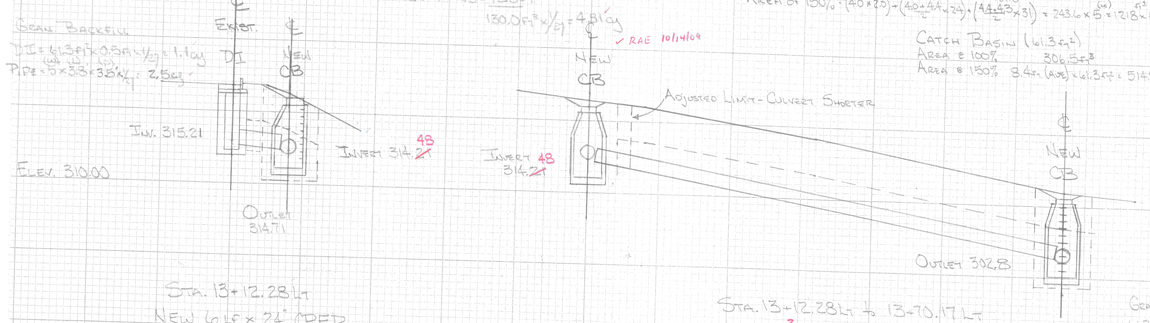
130.0 ft³ x 1/27 = 4.81 cy

✓ RAE 10/14/09

Gran. Backfill

DI = 61.3 ft² x 0.5 ft x 1/27 = 1.1 cy

Pipe = 5 x 3.5 ft x 3.5 ft x 1/27 = 2.5 cy



Trench Earth

Area of 100% = 5 ft (b) x 5 ft (L) x 5 ft (w/de) = 1425 ft³

Area of 150% = (40 x 8.9/2.0) + (40 x 100.8/2.4 x 2.4) + (44 x 134.8/2.3 x 3.1) = 243.6 x 5 (w) = 1218 ft² x 1.5 = 1827 ft³

3252 ft³ x 1/27 = 120.4 cy WRF 10-08-09

✓ RAE 10/14/09

Catch Basin (61.3 ft²)

Area @ 100% 306.5 ft³

Area @ 150% 8.4 ft (Ave) x 61.3 ft² = 514.9 x 1.5 = 772.3 ft³

1078.8 ft³ x 1/27 = 40.0 cy WRF 10-08-09

1078.9

✓ RAE 10/14/09

Trench Earth

Area of 100% = (50 x 8) + (50+4.8/2 x 4) + (43.6/2 x 9) + (43.9 - 50/2 x 5) + (50 x 102.5/2) - (50+44.9/2 x 13) = 2357.9 - 1108.2 x 5 ft = 1249.5 x 5 ft = 1291.0 ft³

Area of 150% = (7.6+10.4/2 x 8) + (8.0+12.0/2 x 2.3) + (14.0 x 1041.8/2 x 10) + (7.2 x 118.2+10.0/2 x 8) = 32.8 x 5.0 = 164.0 ft² x 1.5 = 246.0 ft³

1537.0 ÷ 1/27 = 56.9 cy WRF 10-12-09

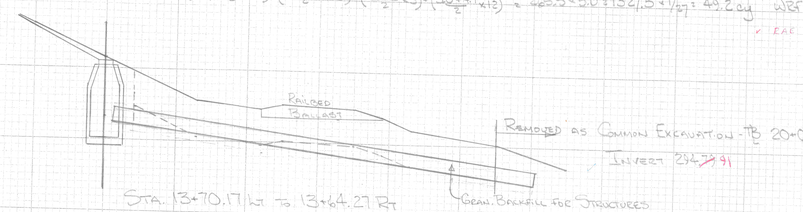
1535.5

✓ RAE 10/14/09

Granular Backfill for Structures

(7.6+4.8/2 x 8) + (4.8+4.9/2 x 9) + (3.9+6.0/2 x 18) + (6.0+5.0/2 x 3) + (5.0+4.9/2 x 13) = 265.5 x 5.0 = 1327.5 ÷ 1/27 = 49.2 cy WRF 10-12-09

✓ RAE 10/14/09



Sta. 13+12.28 Lt

New 6 lf x 24" CPEP

New Precast Reinforced Concrete Catch Basin w/ Frame & Grate (w/ Steps) (w/ 24" Sump)

Sta. 13+12.28 Lt to 13+70.17 Lt

New 6 lf x 24" CPEP

New Precast Reinforced Catch Basin (w/ Steps) (w/ 24" Sump)

Invert 302.8 3

Gran. Backfill Under CB

61.3 ft² x 0.5 ft x 1/27 = 1.1 cy

WRF 10-08-09

✓ RAE 10/14/09

Limit of CB-2

Sta. 13+70.17 Lt to 13+64.27 Rt

New 60 lf x 24" CSP

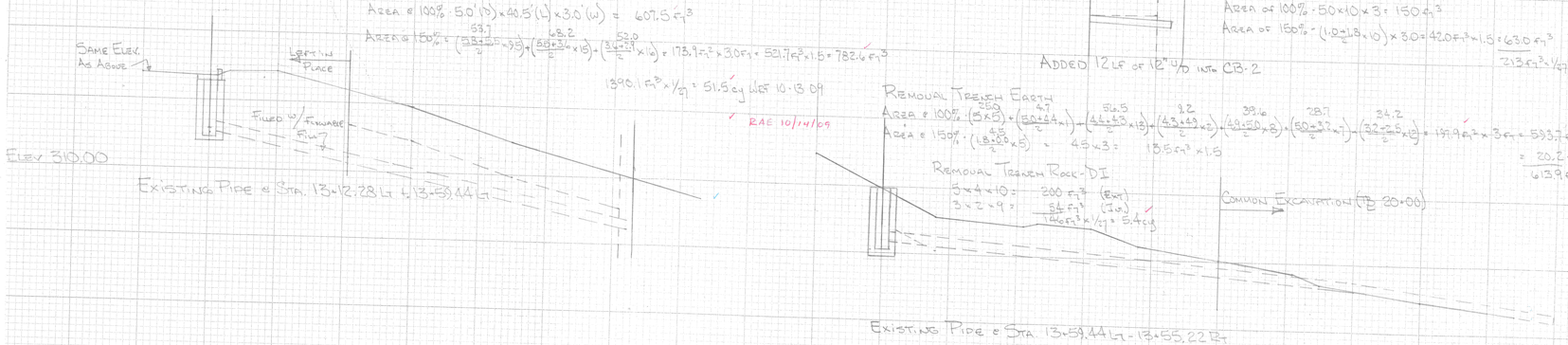
Removal Trench Earth

Area @ 100% = 5.0' (D) x 40.5' (L) x 3.0' (w) = 607.5 ft³

Area @ 150% = (53.7/2 x 9.5) + (68.2/2 x 15) + (52.0/2 x 10) = 173.9 ft² x 3.0 ft = 521.7 ft³ x 1.5 = 782.6 ft³

1398.1 ft³ x 1/27 = 51.5 cy WRF 10-13-09

✓ RAE 10/14/09



Trench Earth

Area of 100% = 50 x 10 x 3 = 1504 ft³

Area of 150% = (1.0+1.8/2 x 10) x 3.0 = 42.0 ft² x 1.5 = 63.0 ft³

213 ft³ x 1/27 = 7.9 cy WRF 10-12-09

✓ RAE 10/14/09

Removal Trench Earth

Area @ 100% = (5.5 - 2.0/2 x 4.7/2 x 1) + (5.0+4.4/2 x 1) + (4.4+5.0/2 x 13) + (4.3+4.9/2 x 2) + (4.9+5.0/2 x 8) + (5.0+3.2/2 x 7) - (3.2+2.5/2 x 10) = 197.4 ft² x 3 ft = 593.7 ft³

Area @ 150% = (1.8+5.0/2 x 5) = 45 x 3 = 135 ft² x 1.5

= 20.2 ft³

613.9 ft³ x 1/27 = 22.7 cy WRF 10-13-09

✓ RAE 10/14/09

Removal Trench Rock - DI

5 x 4 x 10 = 200 ft³ (Ext)

3 x 2 x 9 = 54 ft³ (Int)

146 ft³ x 1/27 = 5.4 cy

Sheet Total - Trench Earth

Sta. 13+12.28 Lt	New	39.6 cy
Sta. 13+12.28 to 13+70.17 Lt	New	160.4 cy
Sta. 13+70.17 to 13+64.27 Rt	New	56.9 cy
Sta. 13+12.28 to 13+59.44 Lt	Removal	51.5 cy
Sta. 13+59.44 to 13+55.22 Rt	Removal	22.7 cy
U-1		13.4 cy
U-2		5.0 cy
U-3		10.1 cy
U-4		2.2 cy
UD - 38.6 cy		7.9 cy
Added 12 lf of 12" U/D into CB-2		
To Be #1, Pg 29		369.7 cy

✓ RAE 10/14/09

Sheet Total - Trench Rock

Sta. 13+59.44 To Be #1, Pg 29 5.4 cy

Granular Backfill for Structures

Sta. 13+12.28 Lt	3.6 cy
Sta. 13+70.17 Lt	1.1 cy
Sta. 13+70.17 to 13+64.27 Rt	49.3 cy
To Be #1, Pg 35	53.9 cy

✓ RAE 10/14/09

U 1

Begin Underdrain New 12" x 42 lf Underdrain

0	5.7		
28	7.5	134.8	
40	16.2	142.2	
42	18.6	34.8	

361.8 x 1/27 = 13.4 cy

WRF 8-17-09

✓ RAE 10/14/09

U 2

Begin Underdrain New 12" x 24 lf Underdrain End

0	5.7		
4	5.7	22.8	
14	5.1	54.0	
24	6.3	57.0	

133.8 x 1/27 = 5.0 cy

WRF 8-17-09

✓ RAE 10/14/09

U-3

Begin Underdrain End Underdrain

New 12" x 23 lf Underdrain

0	13.6		
15	9.6	211.5	
22	6.0	54.6	
23	6.0	6.0	

272.1 x 1/27 = 10.1 cy

WRF 8-17-09

✓ RAE 10/14/09

U-4

Begin Underdrain End Underdrain

New 12" x 20 Underdrain

0	60	
20	20	60
20	0	

60 x 1/27 = 2.2 cy

WRF 8-17-09

✓ RAE 10/14/09

ESSEX

STP 030-1(20)

DRAINAGE

K&E STANDARD @ CROSS SECTION 10 X 10 TO THE INCH

KEUFFEL & ESSER CO. MADE IN U.S.A.