# CAD-BASED VOLUME ESTIMATES
# STORAGE YARD MATERIALS

Parcel Volume Table: Unadjusted

| | Cut cu.yds | Fill cu.yds | Net cu.yds | Method |
|---|---|---|---|---|
| Parcel: 1 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 14472 | 0 | 14472 | (C) Grid |
| | 14487 | 0 | 14487 | (C) Composite |
| Parcel: 2 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 732 | 0 | 732 | (C) Grid |
| | 731 | 0 | 731 | (C) Composite |
| Parcel: 3 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 2606 | 0 | 2606 | (C) Grid |
| | 2612 | 0 | 2612 | (C) Composite |
| Parcel: 4 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 29430 | 0 | 29430 | (C) Grid |
| | 29444 | 0 | 29444 | (C) Composite |
| Parcel: 5 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 4832 | 0 | 4832 | (C) Grid |
| | 4835 | 0 | 4835 | (C) Composite |
| Parcel: 6 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 1802 | 1 | 1801 | (C) Grid |
| | 1814 | 2 | 1811 | (C) Composite |
| Parcel: 7 | | | | |
| Stratum: exist | exist surface | pre-fill surface | | |
| | 791 | 13 | 778 | (C) Grid |
| | 797 | 17 | 780 | (C) Composite |

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Parcel: 8
  Stratum: exist  exist surface  pre-fill surface
                  12501                0            12501 (C) Grid
                  12538                0            12538 (C) Composite

Parcel: 9
  Stratum: exist  exist surface  pre-fill surface
                   3572                2             3569 (C) Grid
                   3582                3             3578 (C) Composite
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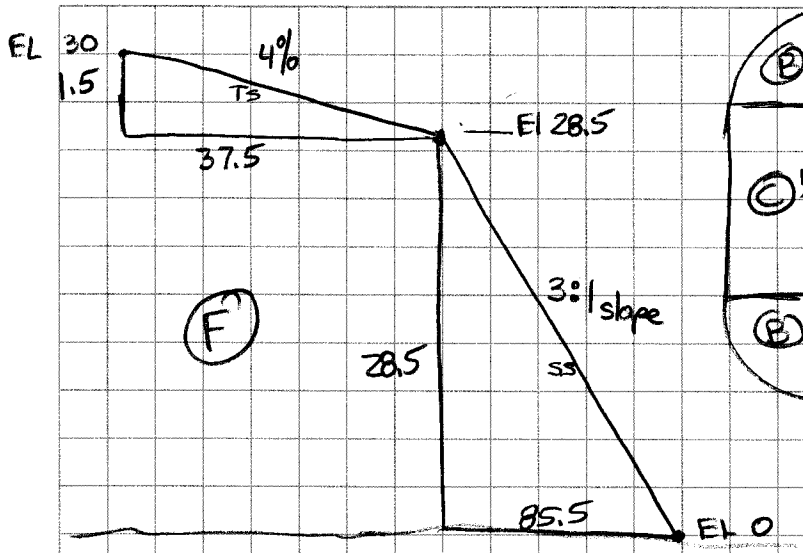
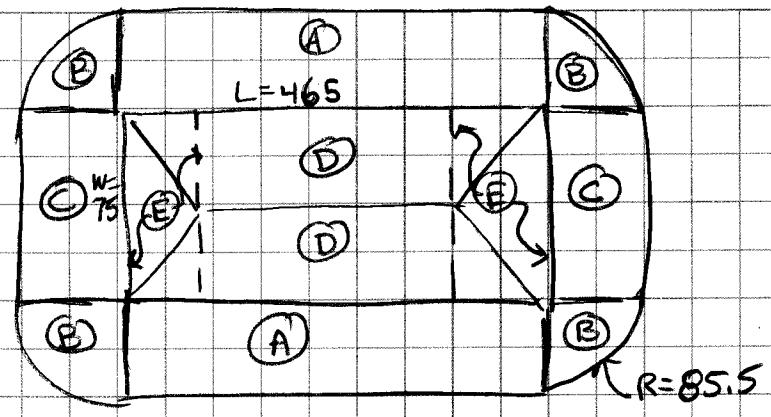
# BARRIER MATERIAL VOLUME ESTIMATES
# LONG TERM CONTROL ALTERNATIVE

SHEET NO. 1 OF 3
PROJECT NO. 26770
DATE 6/1/06
BY MNB
CHK'D

**TRC**

SUBJECT SMC PILE CONFIGURATION
Area and Volume Calculations




- TS = Top Slope length = $\sqrt{1.5^2+37.5^2}$ = **37.53'**
- SS = Side Slope length = $\sqrt{28.5^2+85.5^2}$ = **90.12'**

Surface Area Calculations:

- Topslopes: $2 \cdot D + 2 \times E$

  D = TS · (L − W) = 37.53 · 390 = 14,636 ft²
  E = 2 · ½ · L × TS = 37.53 · 75 = 2814 ft²

  = 2 · 14,636 ft² + 2 · 2,814 ft²

  = **34,900 sf**

- Sideslopes: $2 \cdot A + 2 \cdot C + 4 \cdot B$

  A = L × SS = 465 · 90.12 = 41,906 ft²
  C = W × SS = 75 · 90.12 = 6,759 ft²
  B = ¼ · π · R · SS = ¼ · π · 85.5 · 90.12 = 6,051 ft²

  = 2 · 41,906 + 2 · 6,759 + 4 · 6,051

  = **121,534 sf**

- Total = 121,534 + 34,900 = 156,434 sf = **17381 sy**
- Perimeter = 2 · 465 + 2 · 75 + 4 × (¼ · 2 · π · R) = **1617 ft**

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PROJECT NO. 26770
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SUBJECT SMC PILE CONFIG CALCS

Volume of Pile: $= 2\cdot Ⓐ + 4\cdot Ⓑ + 2\cdot Ⓒ + 2\cdot Ⓓ + 2\cdot Ⓔ + 1\cdot Ⓕ$

Ⓐ $= \frac{1}{2}(85.5\cdot 28.5)\cdot 465 = 566{,}544\ ft^3$
Ⓑ $= \frac{1}{4}\cdot(\frac{1}{3}\cdot\pi\cdot 85.5^2\cdot 28.5) = 54{,}544\ ft^3$
Ⓒ $= \frac{1}{2}(85.5\cdot 28.5)\cdot 75 = 91{,}378\ ft^3$
Ⓓ $= \frac{1}{2}(37.5\times 1.5)\times(465-75) = 10{,}969\ ft^3$
Ⓔ $= \frac{1}{2}\cdot(\frac{1}{3}\cdot 75^2\cdot 1.5) = 1{,}406\ ft^3$
Ⓕ $= 465\times 75\times 28.5 = 993{,}938\ ft^3$

- Total Volume $= 2{,}552{,}708\ ft^3 = 94{,}545\ CY$
- Volume of cover soils (clean soil isolation layer and stone) $= 39''\times\frac{1'}{12''}\times 156{,}434\ sf$
  $= 508{,}450\ ft^3 = \boxed{18831\ CY}$
- Volume of Slag in pile $= \boxed{75{,}662\ CY}$
- Volume of Topslope clean fill and filter layer $=$ Topslope Area $\cdot$ depth $= 34{,}900\ ft^2\cdot 36''\times\frac{1'}{12''} = 104{,}700\ ft^3$
  $= \boxed{3878\ CY}$
- Volume of sideslope clean fill and filter layer $=$ Sideslope Surface Area $\cdot$ depth $= 121{,}534\cdot 33''\times\frac{1'}{12''} = 334{,}219\ ft^3$
  $\boxed{= 12{,}378\ CY}$
- Volume of 2"-4" Stone $=$ Sideslope Area $\cdot$ depth $= 121{,}534\cdot 6''\cdot\frac{1'}{12''} = 60{,}767\ ft^3$
  $= \boxed{2251\ CY}$
- Volume of 4-6" Stone $=$ Perimeter $\times$ Apron width $\times$ depth $= 1617'\times 7'\times 15''\times 1'/12'' = 14{,}149\ ft^3$
  $= \boxed{524\ CY}$
- Volume of ½"-1½" Stone $=$ Top Surface Area $\cdot$ depth $= 34{,}900\ ft^2\cdot 3''\times\frac{1'}{12''} = 8{,}725\ ft^3$
  $= \boxed{323\ CY}$
- Additional disturbance w/ Topsoil + Restoration Area $= 600\times(\frac{1}{2})(350+200) = 165{,}000\ ft^2 = \boxed{18{,}350\ yd^2}$
  Topsoil $= 165000\times 6''/12''\times\frac{1\ cy}{27\ ft^3} = \boxed{3055\ CY}$

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SHEET NO. 3 OF 3
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SUBJECT SMC PILE VOLUME CALCS

Determine Volume of filter layers

Assume filter layer will be ½ thickness of stone layer (IE half volume)

Volume Filter = ½ Volume stone

= ½ (2,251 CY + 524 CY + 323 CY) = **1549 CY**

Total Volume Clean Fill

Volume Fill = Volume Clean Fill and Filter layers − Volume Filter layers

= 3,878 CY + 12378 CY − 1549 CY

**= 14707 CY**

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