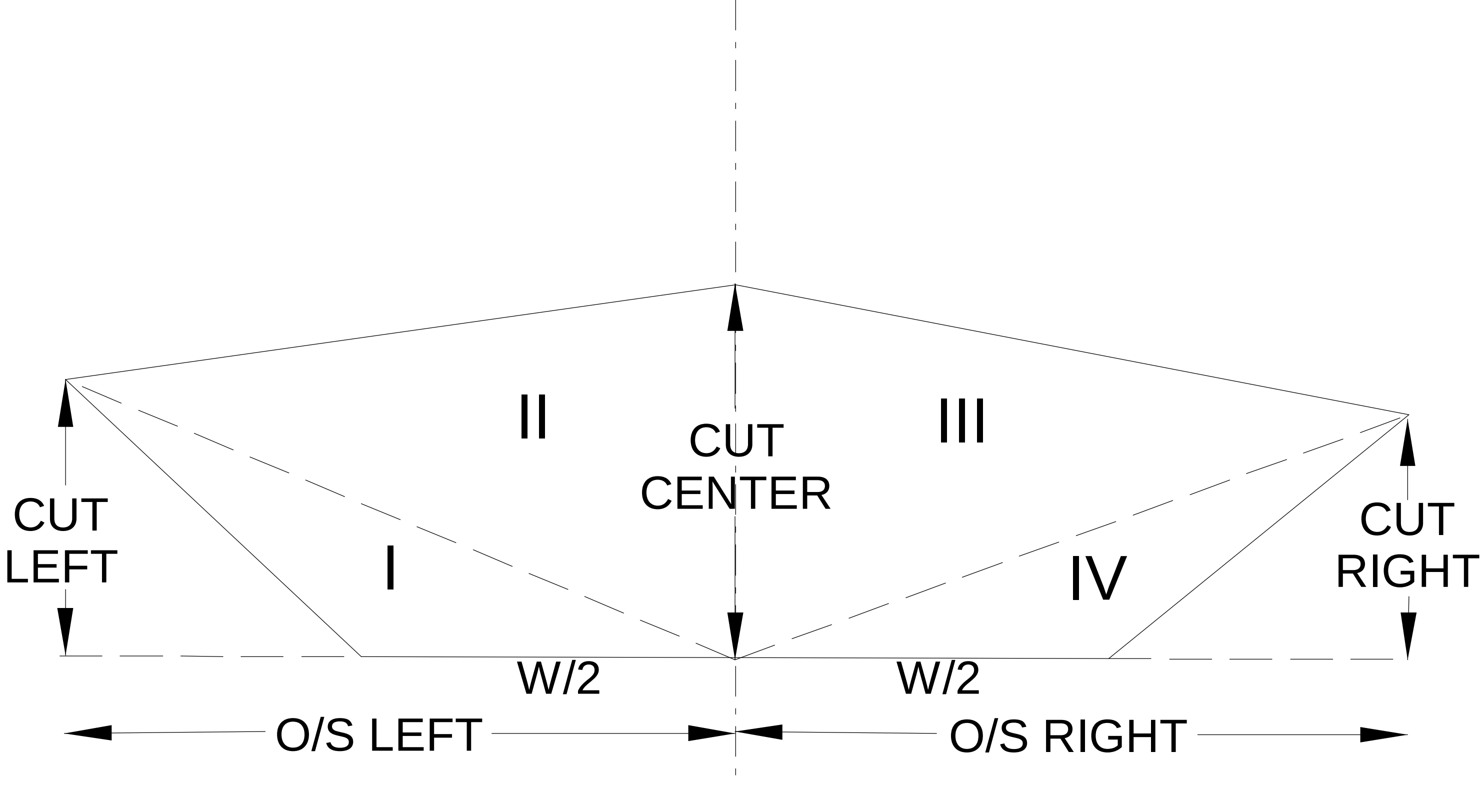
II
III
CUT
CENTER
CUT
LEFT
I
IV
CUT
RIGHT
W/2
W/2
O/S LEFT
O/S RIGHT

The drawing shows that a cross section may be divided into four triangles: I, II, II, and IV. Their areas are: $\frac{(W/_2)\cdot C_L}{2}$, $\frac{(O/_S)_L \cdot C_C}{2}$, $\frac{(O/_S)_R \cdot C_C}{2}$, $\frac{(W/_2)\cdot C_R}{2}$, where C_L, C_C, and C_R are cut left, cut center, and cut right, respectively, with $W/_2$ being the half width and $(O/_S)_L$ and $(O/_S)_R$ being the offsets left and right. Their sum reduces to

$$\frac{W/_2(C_L+C_R)}{2} + \frac{C_C[(O/_S)_L + (O/_S)_R]}{2}$$, all known quantities.

For the Average End Area Method: take the average of the areas of the enclosing sections, multiply by the distance between them, and divide by 27 to get cubic yards:

(the offsets being calculated from the half-width plus the slope ratio times the cut)

For 15+00: $\frac{33}{2}\cdot(23.3+11.9)+\frac{17.1}{2}\cdot(56.3+56.8)=1547.8$ sq. ft

$\frac{1547.8+1769.8}{2}\cdot\frac{50}{27}$ = 3072 cu.yd.

For 15+50: $\frac{33}{2}\cdot(23.2+15.2)+\frac{19.0}{2}\cdot(56.2+63.4)=1769.8$ sq.ft.

$\frac{1769.8+1706.7}{2}\cdot\frac{50}{27}$ = 3219 cu.yd.

For 16+00: $\frac{33}{2}\cdot(17.9+13.7)+\frac{21.3}{2}\cdot(50.9+60.4)=1706.7$ sq. ft.

$\frac{1706.7+1459.2}{2}\cdot\frac{50}{27}$ = 2931 cu.yd.

For 16+50: $\frac{33}{2}\cdot(22.2+10.9)+\frac{16.6}{2}\cdot(55.2+54.8)=1459.2$ sq. ft.

$\frac{1459.2+1577.6}{2}\cdot\frac{50}{27}$ = 2812 cu.yd.

And 17+00: $\frac{33}{2}\cdot(20.0+12.6)+\frac{18.7}{2}\cdot(53.0+58.2)=1577.6$ sq. ft.

For a total of 12,034 cubic yards.

The Prismoidal Formula requires a fictional cross section between any two consecutive cross sections with dimensions being the average of the two enclosing sections, not the average area, and it is weighted four times as much as the enclosing sections.

For 15+00: $\frac{33}{2}\cdot(23.3+11.9)+\frac{17.1}{2}\cdot(56.3+56.8)=1547.8$ sq. ft

For fictional 15+25: $\frac{33}{2}\cdot(23.25+13.55)+\frac{18.05}{2}\cdot(56.25+60.1)=1657.3$ sq.ft.

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For 15+50: $\frac{33}{2} \cdot (23.2 + 15.2) + \frac{19.0}{2} \cdot (56.2 + 63.4) = 1769.8$ sq.ft.

Fictional 15+75: $\frac{33}{2} \cdot (20.55 + 14.45) + \frac{20.15}{2} \cdot (53.55 + 61.9) = 1740.7$ sq.ft.

For 16+00: $\frac{33}{2} \cdot (17.9 + 13.7) + \frac{21.3}{2} \cdot (50.9 + 60.4) = 1706.7$ sq. ft.

Fictional 16+25: $\frac{33}{2} \cdot (20.05 + 12.3) + \frac{18.95}{2} \cdot (53.05 + 57.6) = 1582.2$ sq.ft.

For 16+50: $\frac{33}{2} \cdot (22.2 + 10.9) + \frac{16.6}{2} \cdot (55.2 + 54.8) = 1459.2$ sq. ft.

Fictional 16+75: $\frac{33}{2} \cdot (21.1 + 11.75) + \frac{17.65}{2} \cdot (54.1 + 56.5) = 1518.1$ sq. ft.

And 17+00: $\frac{33}{2} \cdot (20.0 + 12.6) + \frac{18.7}{2} \cdot (53.0 + 58.2) = 1577.6$ sq. ft.

The volumes, after multiplying by the distances between the enclosing sections and dividing by 27 to obtain cubic yards (cy), are

$$\frac{1547.8+(4)1657.3+1769.8}{6} \cdot \frac{50}{27} = 3070.0 \text{ cy}$$

$$\frac{1769.8+(4)1740.6+1706.7}{6} \cdot \frac{50}{27} = 3221.9 \text{ cy}$$

$$\frac{1706.7+(4)1582.2+1459.2}{6} \cdot \frac{50}{27} = 2930.5 \text{ cy}$$

$$\frac{1459.2+(4)1518.1+1577.6}{6} \cdot \frac{50}{27} = 2811.5 \text{ cy}$$

For a total of 12,034 cubic yards.

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