CROSS SECTIONS AND VOLUMES: Beach PostDredge Compensating Slopes

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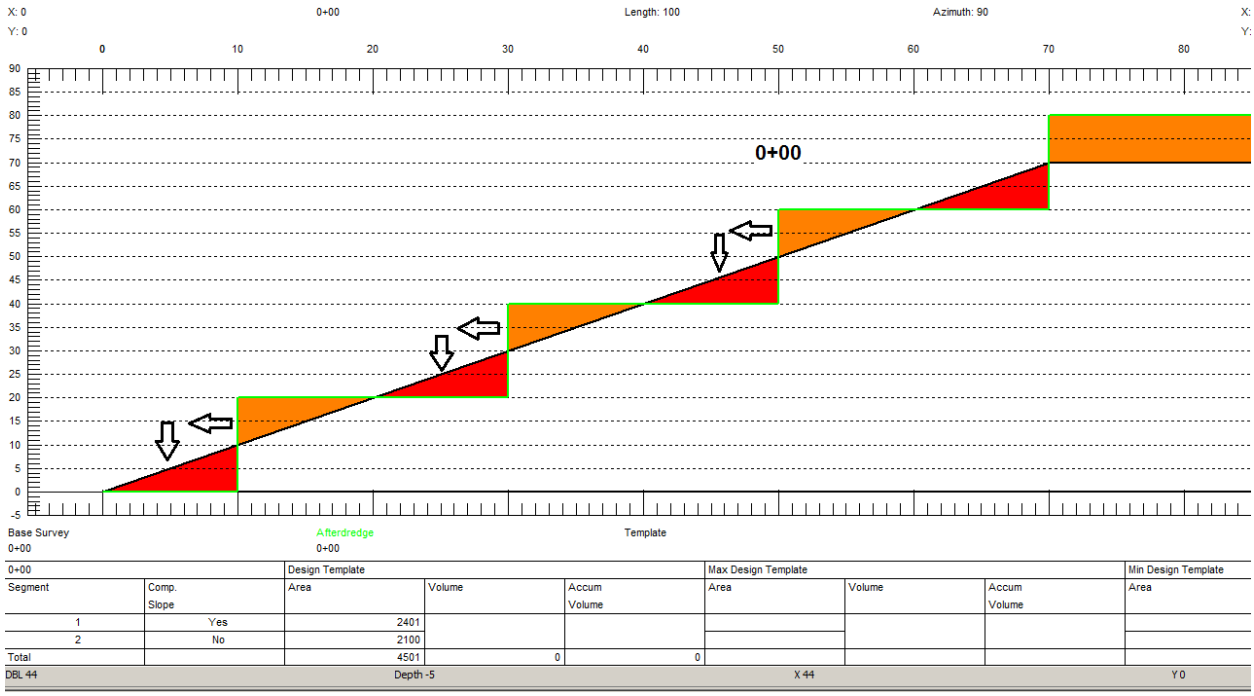
The Beach PostDredge method allows for material piled up on a slope to fall into a void downhill from the material. In my first example (Figure 1), I have a simple design where segment one is on a slope and segment two is a flat segment.

FIGURE 1.

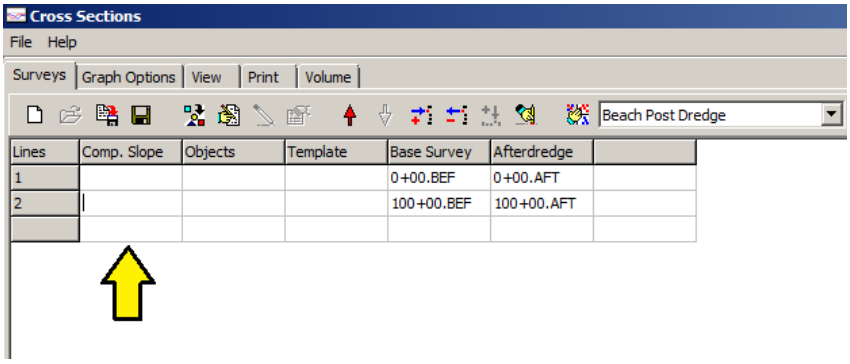


0+00		Design Template			Max Design Template			Min Design Template
Segment	Comp. Slope	Area	Volume	Accum Volume	Area	Volume	Accum Volume	Area
1	Yes	2401						
2	No	2100						
Total		4501	0	0				

DBL 44 Depth -5 X 44 Y 0

In the Surveys Tab of CROSS SECTIONS AND VOLUMES (CSV), there is a column for 'Compensating Slope'. If there are no entries, or if the entry is '0', then the feature is disabled.

FIGURE 2. *Compensating Slopes are Disabled*



Lines	Comp. Slope	Objects	Template	Base Survey	Afterdredge
1				0+00.BEF	0+00.AFT
2				100+00.BEF	100+00.AFT

In Figure 2, there are no entries in the Comp Slope column, so the feature is disabled. In the report (Volumes Tab), the Compensating Slope shown in the header will be equal to 0.

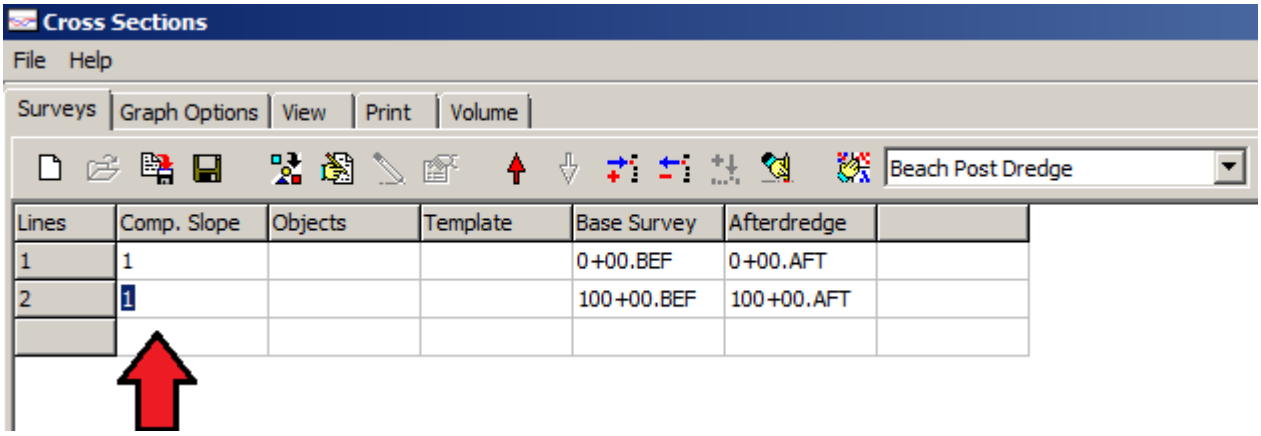
FIGURE 3. Disabled Compensating Slope Reports Zero in the Volumes Report

```
Beach Volume Report:  Post Dredge Report
Volumes: Cubic Meters
Compensating Slopes: Not Used
Calc Min Required              false
Z Level Reference              0

Design Template
Total Material Added Beneath Template:       435299
Total Material Added Above Template:          45101
Total Material Remaining to be Added:         19701
Total Compensating Slope Material:                0
```

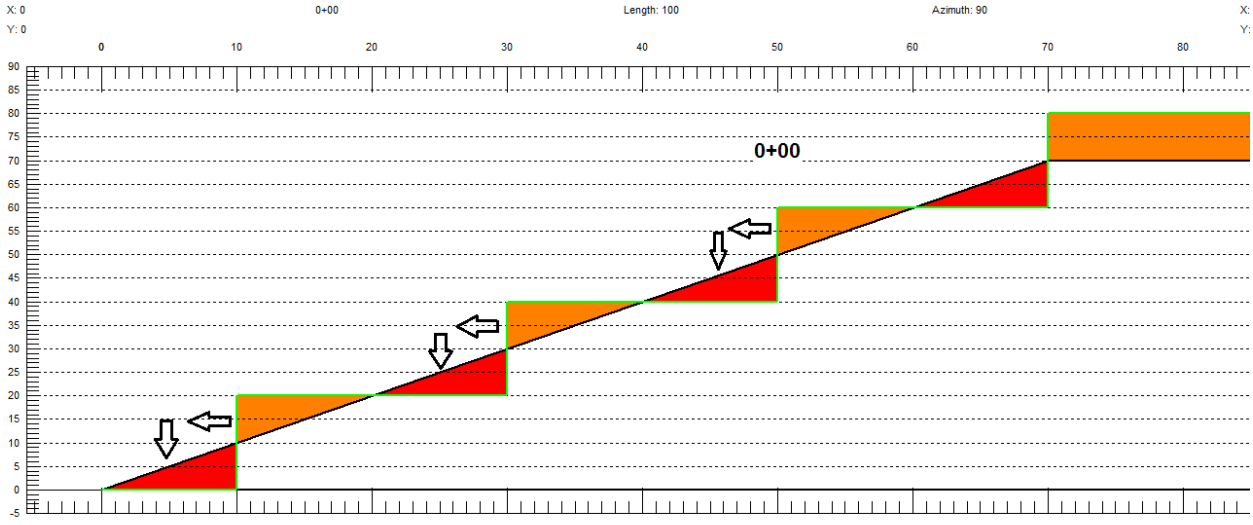
To enable the compensating slope option, list the segments (working from left to right, the first segment = 1) with commas between them. For example, if segments 1, 4, and 8 were slopes and you wanted to compute the compensation slope, you would enter “1,2,8”. In our example, only slope 1 will be used for compensating slopes, so the Surveys Tab looks like Figure 4:

FIGURE 4. Only Segment 1 is Designated as a Compensating Slope



Now, let’s examine the profile:

FIGURE 5. *Example 1—Orange Material Can Fill Red Voids*



0+00		Design Template			Max Design Template			Min Design Template
Segment	Comp. Slope	Area	Volume	Accum Volume	Area	Volume	Accum Volume	Area
1	Yes	2401						
2	No	2100						
Total		4501	0	0				

DBL 44 Depth -5 X 44 Y 0

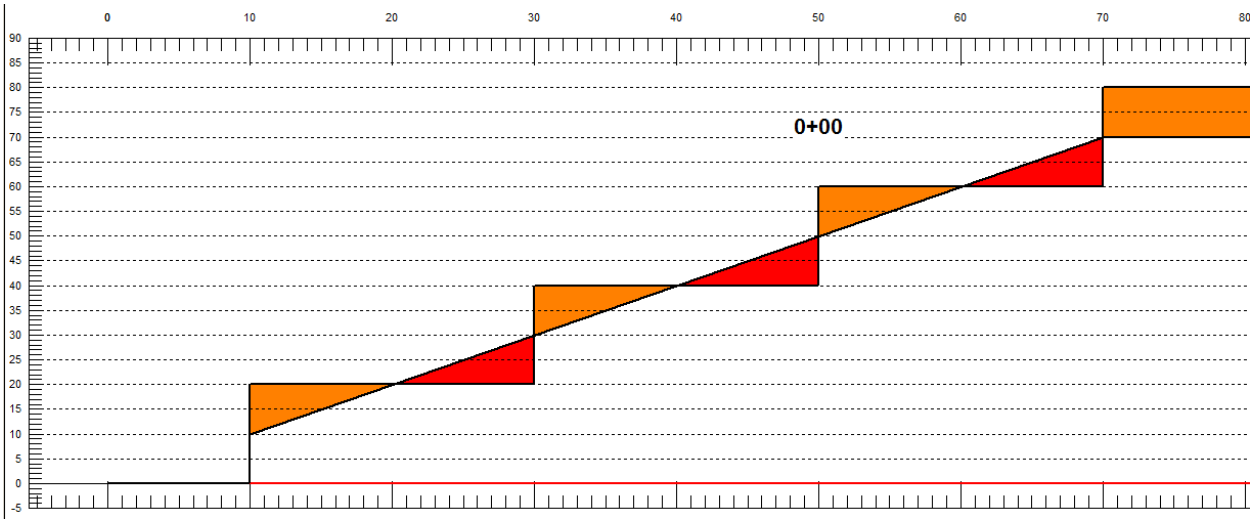
I have 3 ‘blocks’ of material (orange color) that can fall into the voids beneath the design template (red). Each ‘block’ is a triangle with a base and height of 10m. The area of each triangle is 50m^2. If my lines are 100m apart, the total compensating volume would be 15,000m^3. The Volumes report says there is a Compensating Slope credit of 14,801m^3. the difference is because I can’t make a vertical wall of material so my sample data is slightly sloped when it makes the 20m jumps.

FIGURE 6. *Example 1 Volumes Report*

```
Design Template
Total Material Added Beneath Template:       450100
Total Material Added Above Template:          45101
Total Material Remaining to be Added:          4900
Total Compensating Slope Material:            14801
```

Let's take a look at another profile:

FIGURE 7. *Example 2 Profile*



In this example, I have three 'blocks' (orange) of material above design and three 'voids' (red), each with an area of 50m^2. With compensating slopes, a block of material can only fall into a downhill void. The bottommost block (orange) has nowhere to fill, so it won't be included in the Compensating Slope value.

With two lines 100m apart, I should have a Compensating Slope credit of 10,000m^3. The report shows 9,875. Once again, the difference is that my sample data isn't exactly vertical on the 20m transitions.

FIGURE 8. *Example 2 Volumes Report*

```
Design Template
Total Material Added Beneath Template:       445100
Total Material Added Above Template:          45075
Total Material Remaining to be Added:          4900
Total Compensating Slope Material:             9875
```

So, in summary:

- Enable Compensating Slopes by entering the segments (separated by commas) in the Surveys tab's 'Comp. Slope' column.
- Uphill blocks of material can only fall into voids that are downhill from the block.
- The Compensating Slope credit is computed on the Design Template. The maximum and minimum templates have no effect on the results.