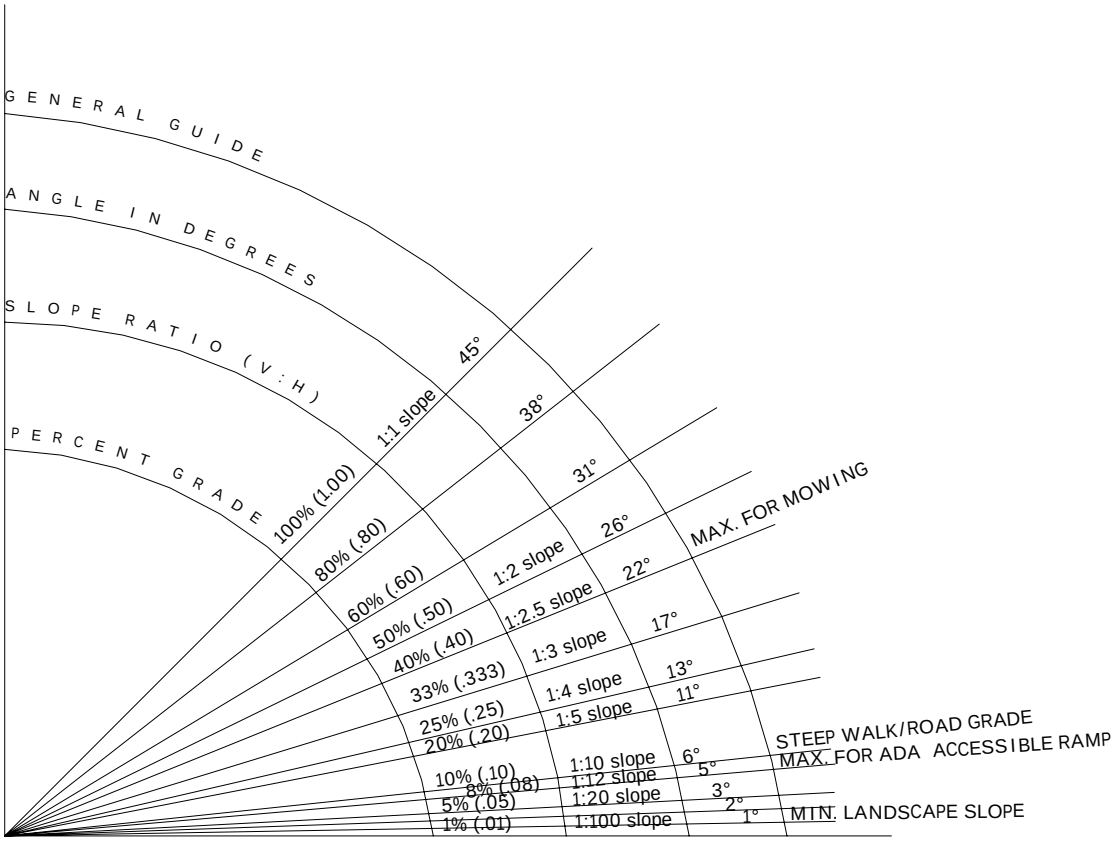
Appendix A
Signature Authority

Landscape Architects

- Roadside Restoration Plans
- Wetland Mitigation Plans
- Contour Grading Plans
- Planting Plans
- Site Development Plans
- Irrigation Plans
- Co -signatory on Soil Bioengineering Plans, with Geotechnical Engineer or Engineering Geologist.

Appendix B
Slope Visualization Diagram



Note:

- Maximum slopes for cut and fill depend upon the materials involved. See the region's Materials Engineer and the *Standard Specifications for Road, Bridge and Municipal Construction* 2-03.3(14) for guidance.
- The preferred slope for mowing is 1:3 or flatter. Refer to the *Maintenance Manual* for more specific information.

Appendix C
Sun Angles and Solar Exposure

Figure 1 shows hourly sun angles for December 21st on a highway with a southwest-northeast road alignment with a tree canopy height that might be typical for forested areas where shading is a concern. The drawing shows that for this road alignment, shading is caused by vegetation far outside the average right of way dimensions. For example, at 11:00 AM trees that shade the roadway are a minimum of 300 to 400 feet beyond the roadway centerline.

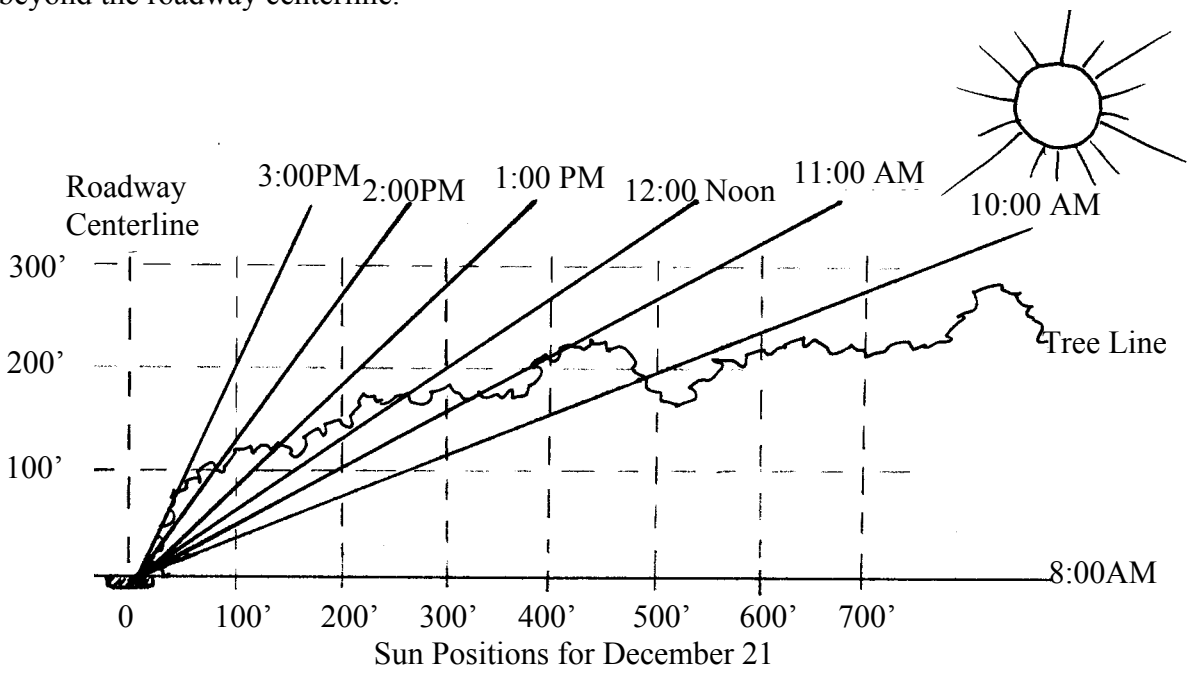
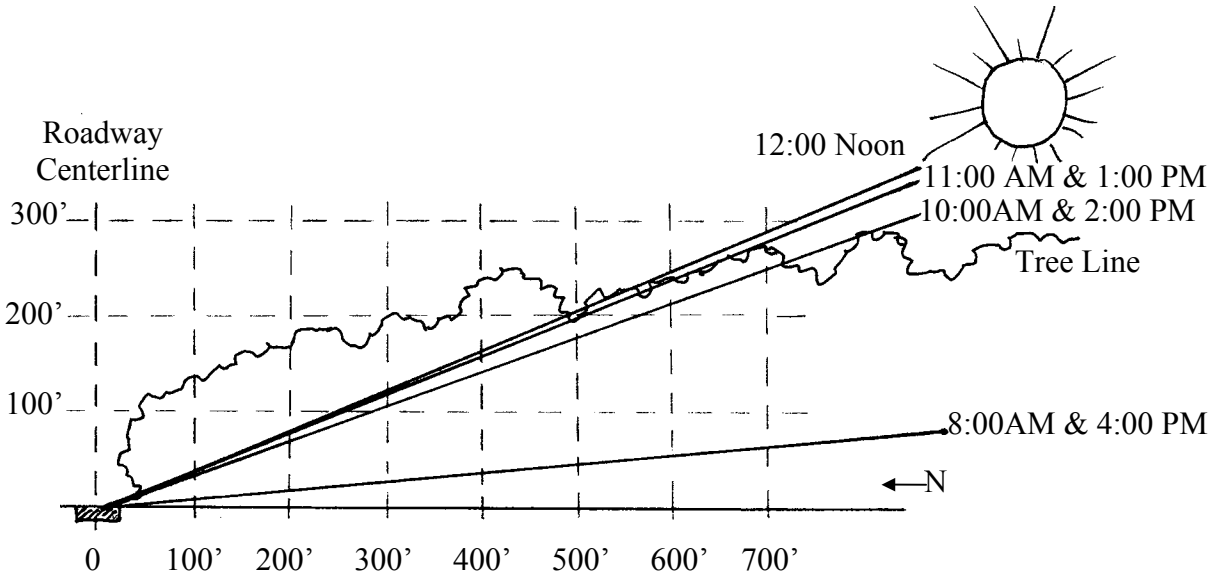


Figure 1 Southwest to Northeast Road Alignment

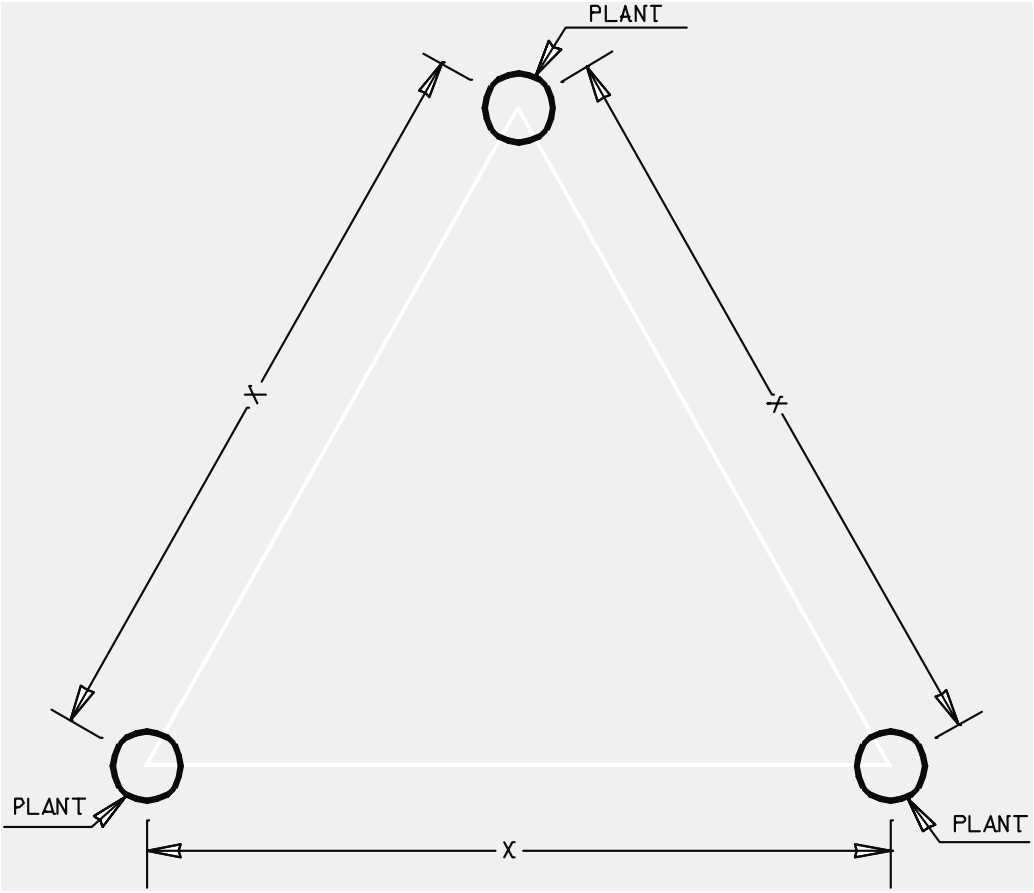
Figure 2 shows hourly sun angles for November 21st and January 21st on a road having an East-West alignment. It also depicts a tree canopy height that might be typical for forested areas where shading is a concern. The drawing shows that for this road alignment, shading is caused by vegetation far outside the average right of way dimensions. For example, at this time of year, for this road alignment, shading at 12:00 noon is caused by vegetation 500' to 600' beyond the roadway centerline. At no time during the day, for this example, does the sun reach an angle where it could reach the roadway.



Sun Positions for November 21 and January 21

Figure 2 East-West Road Alignment

Assumed geometric pattern for plant spacing



If this is the geometric shape that plants will be spaced, the area of the equilateral triangle is:

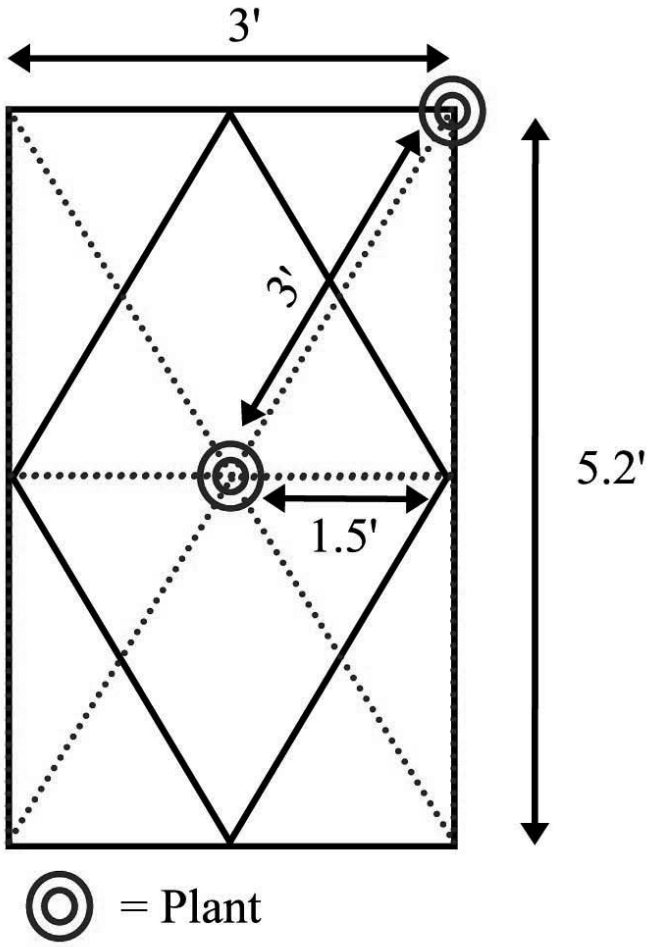
Area = $2^* X / 2 * \sqrt{(X^2 - X^2 / 4)} = X^2 / 2 * \sqrt{3}$

There will be one plant for each equilateral triangle shaped area throughout the area to be planted, plus two extra plants.

Therefore, the number of plants that will be needed for an area in acreage is:

No. of plants = acreage to be planted * 43560 sq. ft. per acre / $X^2 / 2 * \sqrt{3}$ (where X is the plant spacing in ft.) + 2 more plants.

Formula first developed by Julie Nelson, P.E. for the SCR WSDOT Environmental Office
DRAFT Plant Spacing Formula for Vegetation Mitigation Projects



Assuming a 3' on center planting requirement the following applies:

A. Total Area of Above: 3' x 5.2' = 15.6 sq ft.
B. Two (2) plants per 15.6 sq. ft. or one plant per 7.8 sq. ft.
C. If at first you don't think it will work try stacking the rectangles side by side and top to bottom and you will start to see how it works.
D. The only possible flaw would be around the edges of a large area to cover, where it may come up a little short.
E. When used in the Selah project the planting numbers came out just right.
F. In the field construction of the formula is not expected to be exactly 3' on-center for each plant. Some variation will occur.
G. There may be room for improvement so if you have suggesting please forward them to the SCR Environmental Office (your comments are greatly appreciated)
H. Formula easily changed for 2', 4', 5', 8', or 10' on-center calculations.