

Advanced Road Design



Grading Quick Start



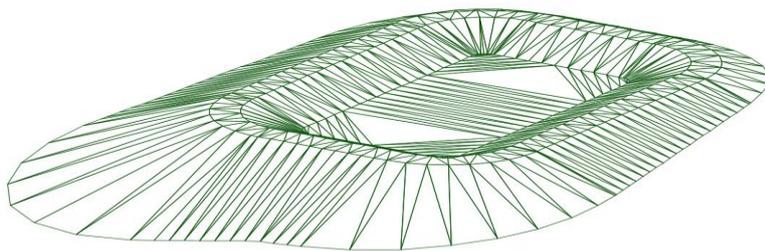
Advanced Road Design Grading Quick Start

Introduction to Gradings

As part of Advanced Road Design (ARD), the gradings module provides tools to perform surface gradings for design and planning purposes. Grading is a technique to design unusual shapes that do not work well when created using a traditional string and cross section approach.

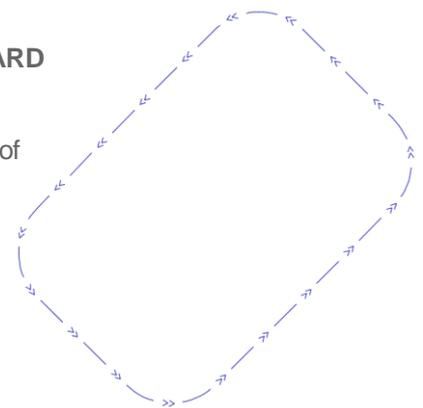
Templates for Gradings

In order to construct a grading, we generally know the shape the grading is going to look like. In ARD this shape is initially defined by the use of templates. By developing an appropriate template we can easily define the cross sectional shape the new grading is going to be constructed with.



The cross sectional shape we're going for here is to have a 2m wide top around the perimeter, with wall slopes of 1 in 3 outside and 1 in 2 internally. We also want the floor of the basin to be 2m below the top of bank.

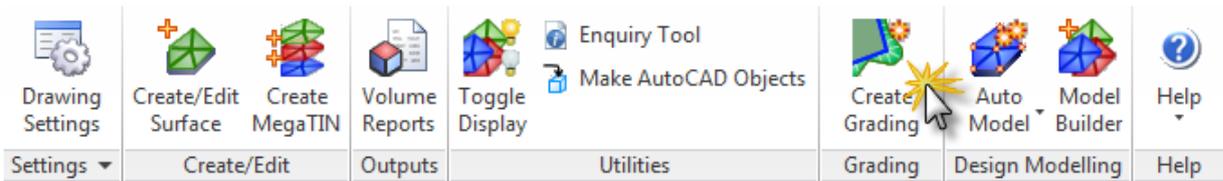
1. For this quick start design, please open the drawing **Quick Start ARD Grading.dwg**
2. To begin the basin design, the drawing includes the proposed top of the basin as a closed polyline. A linetype has been applied to the polyline to show that the polyline was drawn in a counter clockwise direction.
3. Next, a template is required for grading. From the Roads Ribbon Tab, click on the **Create/Edit Section** button to begin building a new template.
4. This example is running counter clockwise, the template needs to be created with the internal segments drawn on the left hand side. From the **Template Options** button select **Create New Template in Local Library**, click OK, and name it: **CCW Basin 2m deep**.
5. Next, define the template as shown below, and add a batter condition to the right at 1 in 3. This completes the template for the basin.



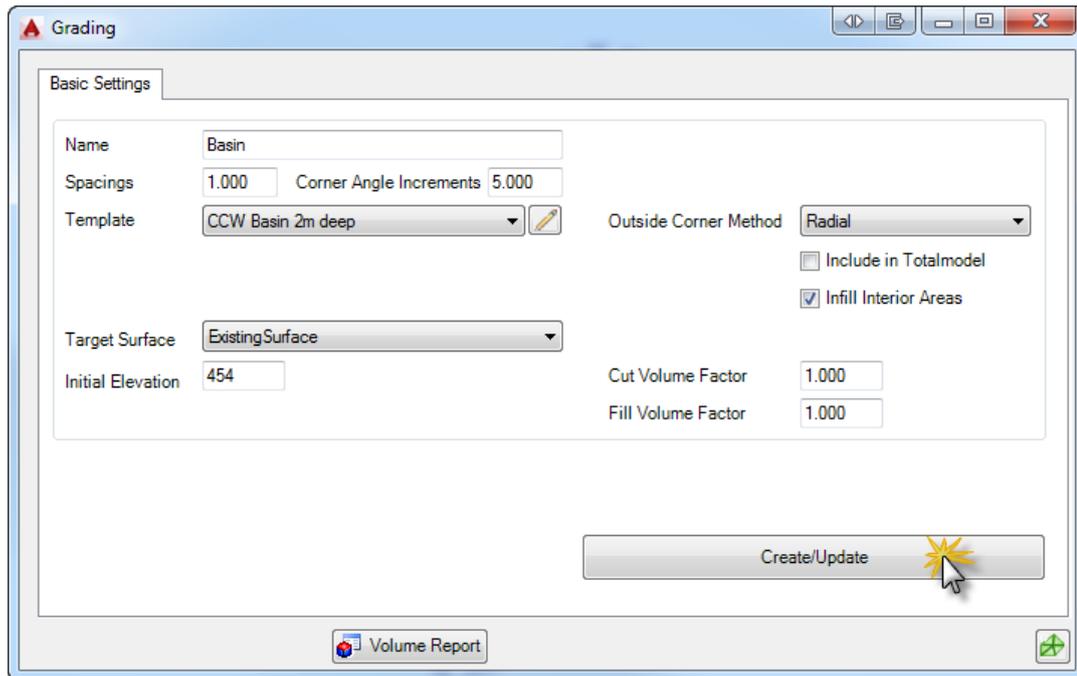
Leg	Horizontal Distance	Slope %	Vertical Distance	Plot (Y/N)	Code	Horizontal Distance	Slope (%)	Vertical Distance	Plot (Y/N)	Code
1	4		-2	Y	LTOE	2	0		Y	RTOPB
2										
3										
4										
5										
6										
7										
8										
9										
10										

The 2D cross-section diagram shows a trapezoidal shape with labels: LTOE (Left Top of Embankment), C.L. (Center Line), RTOPB (Right Top of Bank), and RBAT (Right Batter). The top width is 2m, and the depth is 2m.

- Now we have completed all the preparation work and can now go ahead and select the Create Grading option from the surfaces panel on the ribbon.



- In the grading form, we need to apply a name for this grading, assign a template, set a target surface and define an initial elevation.



- Once the grading model has been built we can go ahead and further design the basin vertically by using the **Vertical Grading Editor** or the **Grid View (Vertical Grading tab on the Grading form)**.
- Next we can obtain a quick bulk earthworks volume by clicking on the **Volume Report** button. These volumes are calculated based on a difference of the grading model and the surface selected as the target surface in the grading dialog box.
- Finally, if the initial shape of the grading needs to be changed, this can be done by simply modifying the polyline that the grading was created from. Add in a vertex along one of the long edges and put a kink in the base. You will see the software will add a radial flare on external bends or trim internal bends between polyline segments.

