

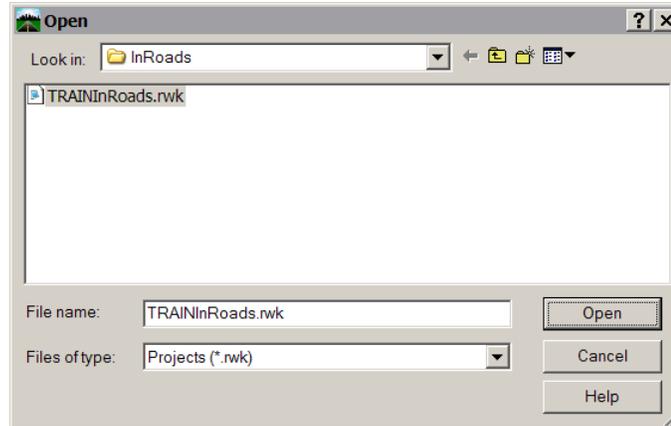


This document guides you through three methods to calculate volume: Grid, Triangle, and End Area.

Measure XY Distance

Open your InRoads data file

1. Select **File>Open**.



2. Toggle the **Files of Type** option to **Projects (*.rwk)**.
3. Double-click on **TRAINInRoads.rwk**.
4. **Cancel** the Open dialog.

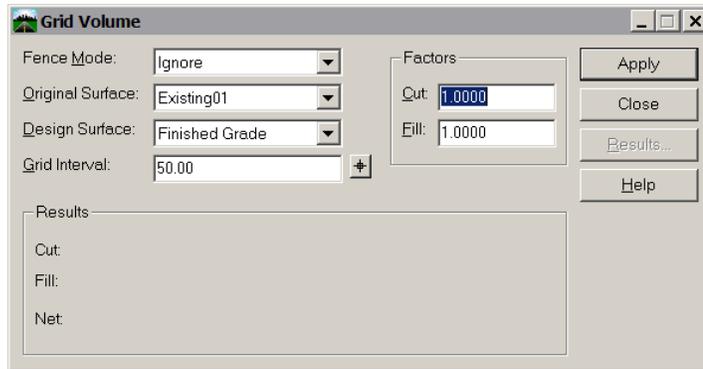
Make Lock Settings

1. Toggle **Write** lock on
2. Toggle **Station** lock on
3. Set the mode to **Pencil**

Calculating Grid Volumes

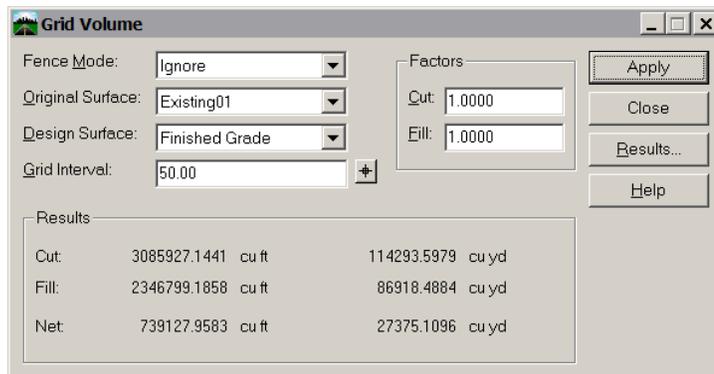
Calculate the volume between the existing surface and the proposed surface using the grid volume method.

1. Select **Tool > Customize > Volume**, then **Close** the **Customize** dialog.
2. Select the **Grid Volume** command.



- Set the *Original Surface* to: **Existing01**.
- Set the *Design Surface* to: **Finished Grade**.
- Enter the *Grid Interval*: **50** and **Tab** to accept.
- Leave the *Cut Factor* and *Fill Factor* set to **1.0**.

3. Select **Apply**.



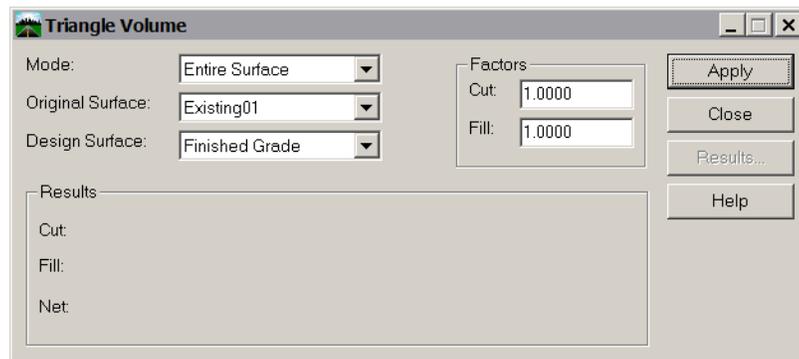
4. Record the results in the table provided.
5. Enter the *Grid Interval*: **10** and **Tab** to accept.
6. Select **Apply**.

7. Record the results in the table provided.
8. Enter the **Grid Interval: 5** and **Tab** to accept.
9. Select **Apply**.
10. Record the results in the table provided.
11. Select **Close** to dismiss the **Grid Volume** command.

Calculating Triangle Volumes

Calculate the volume between the existing surface and the proposed surface using the triangle volume method.

1. From the **Volumes** toolbar select the **Triangle Volume**.



- Set the **Mode** to **Entire Surface**.
 - Set the **Original Surface** to: **Existing01**.
 - Set the **Design Surface** to: **Finished Grade**.
 - Leave the **Cut Factor** and **Fill Factor** set to **1.0**.
2. Select **Apply**.
- This method will take longer to process than the grid method.
3. Record the results in the table provided.
 4. Select **Close** to dismiss the **Triangle Volume** command.

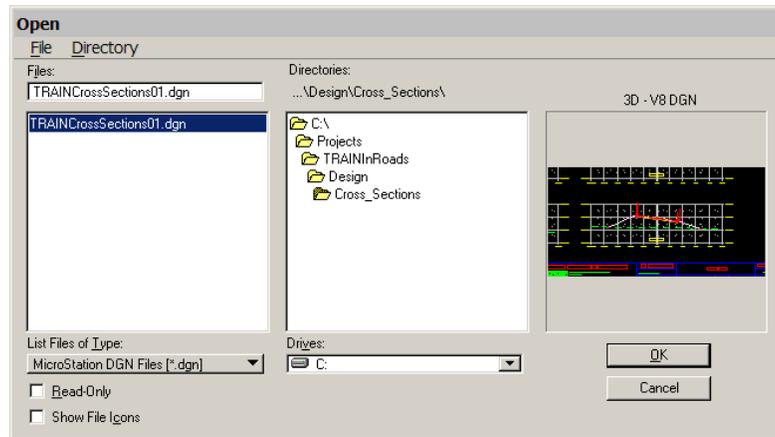
Calculating End-Area Volumes

Calculate the volume between the existing surface and the proposed surface using the end-area volume method (CDOT standard method). With the first run, you will not take the subgrade into account.

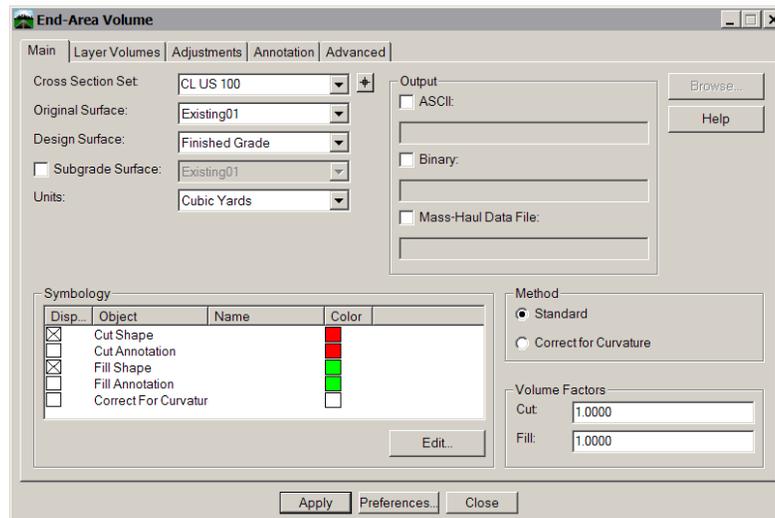
End Area w/o subgrade

In order to use this command, you must be in the design file where your final cross sections were cut.

1. Select **File > Open** and open the cross section design file.



2. From the **Volumes** toolbar, select the **End-Area Volume** command.



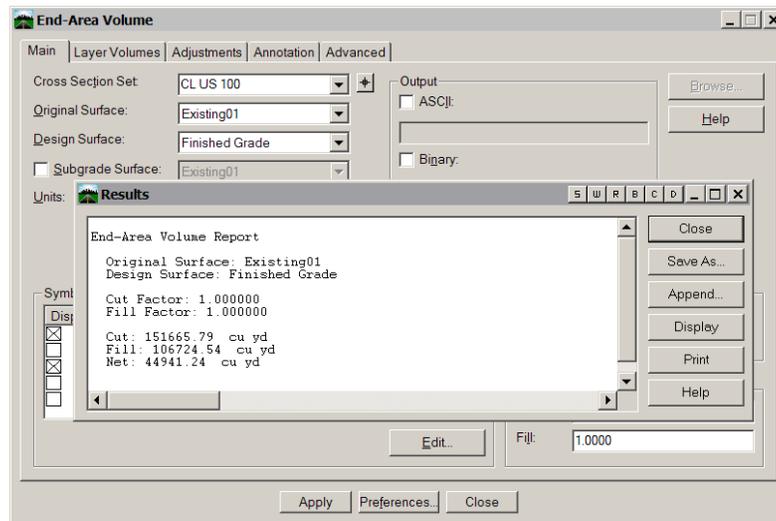
3. Define the cross sections and surfaces to be used for the volume calculations.

- Select the *final section* set from the **Cross Section Set** list.

This should be a full set of cross sections generated along the alignment. A box is drawn around the set to show which one you've picked.

- Set the *Original Surface* to **Existing01**.
- Set the *Design Surface* to **Finished Grade**.
- Set *Units* to **Cubic Yards**.
- Leave the *Cut Factor* and *Fill Volume Factors* set to **1.0**.

4. Select **Apply**.



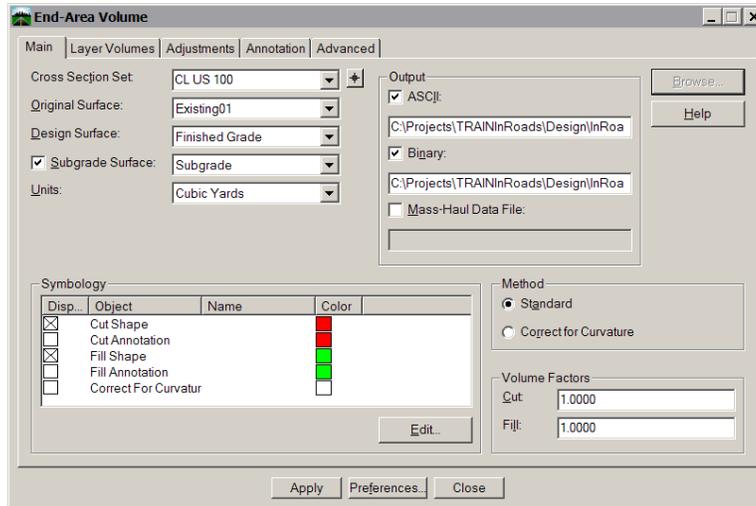
Results appear in a separate dialog box.

5. Record the results in the table provided, then **Close** the **Results** dialog.

End Area w/subgrade considered

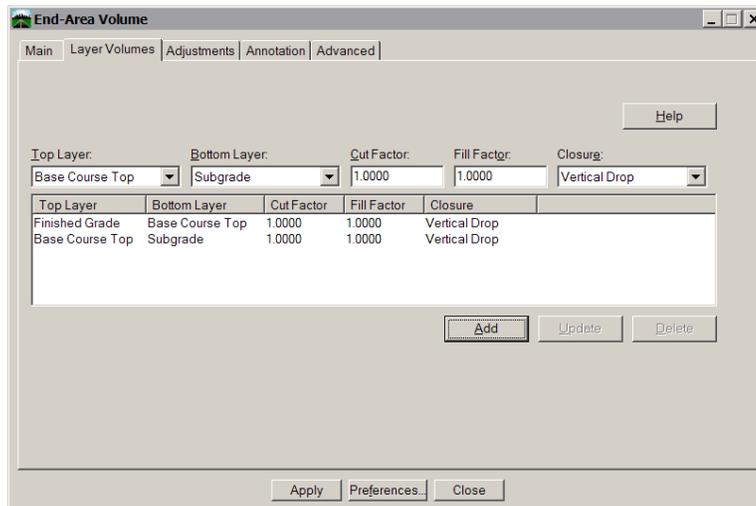
Calculate the volume between the existing surface and the proposed surface including the subgrade surface using the end-area volume method and generate an ASCII report and binary file to be formatted into an ASCII report in a later exercise. You will also calculate the additional material volumes.

6. In the **End Area** Volume dialog.



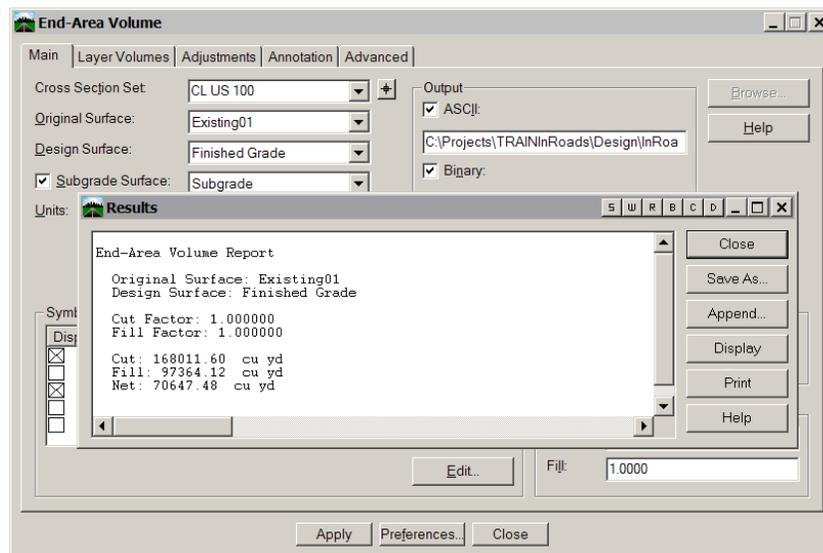
- Toggle on ***Subgrade Surface*** and set to **Subgrade**.
- Toggle on ***ASCII Report***.
- Browse and enter a File Name of ***endvol.txt***.
- Toggle on ***Binary Report***.
- Browse and enter a File Name of ***endvol.bin***.

7. To calculate additional sublayer volumes, select the **Layer Volumes** tab.



CDOT Calculate Volume.pdf

- Set the *Top layer* to **Finished Grade**.
 - Set the *Bottom layer* to **Base Course Top**.
 - Set the *Closure* to **Vertical Drop**.
 - Select **Add**.
 - Set the *Top layer* to **Base Course Top**.
 - Set the *Bottom layer* to **Subgrade**.
 - Set the *Closure* to **Vertical Drop**.
 - Select **Add**.
8. Review the other tabs and make any changes you would like.
 9. Select **Apply** on the **End-Area Volume** dialog box



10. Record the results in the table provided
11. **Close** the **Results** box
12. Select **Close** to dismiss the **End-Area Volume** command

Note the difference in the volumes as the subgrade is removed from fill volumes and added to the cut volumes.