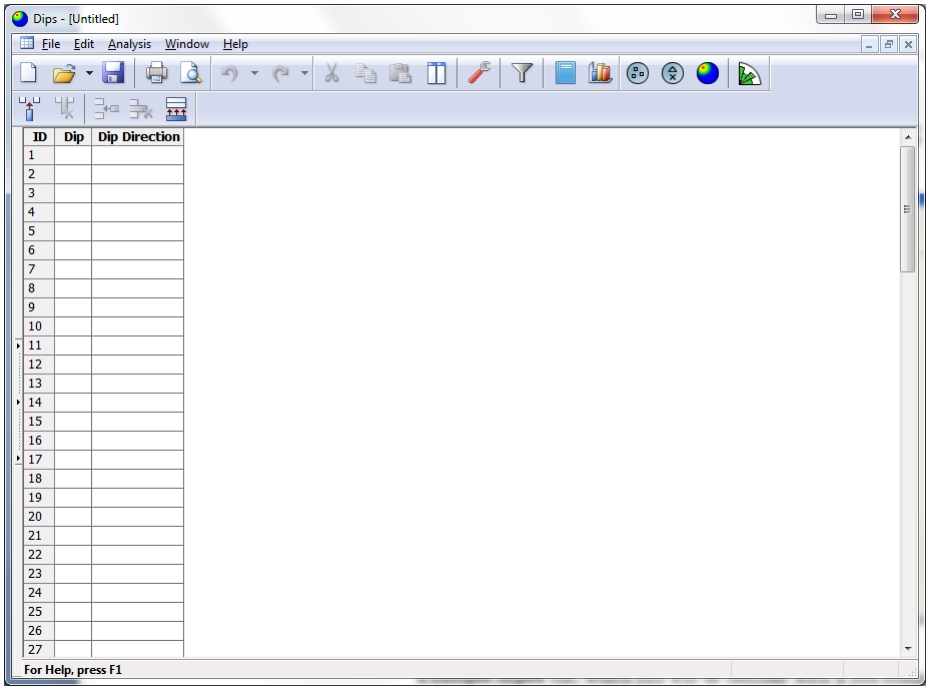
Creating a *Dips* File



In this tutorial we outline the steps necessary to create the **Example.dips6** file, which you will be familiar with if you completed the Quick Start Tutorial.

If you have not already done so, run *Dips* by double-clicking on the *Dips* icon in your installation folder. Or from the Start menu, select Programs → Rocscience → Dips 6.0 → Dips.

If the *Dips* application window is not already maximized, maximize it now, so that the full screen is available for viewing the data.

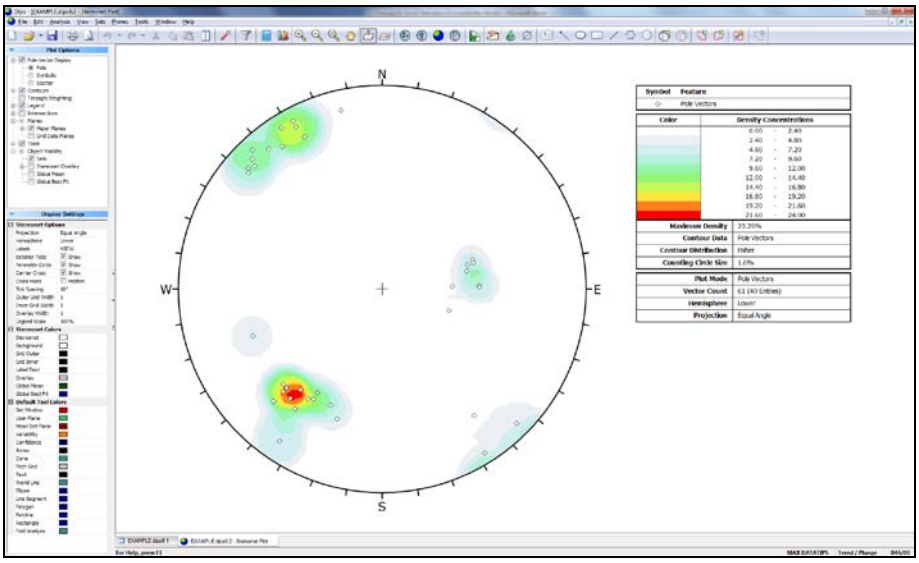
Example.dip File

Since we will be re-creating the **Example.dips6** file, let's first examine this file.

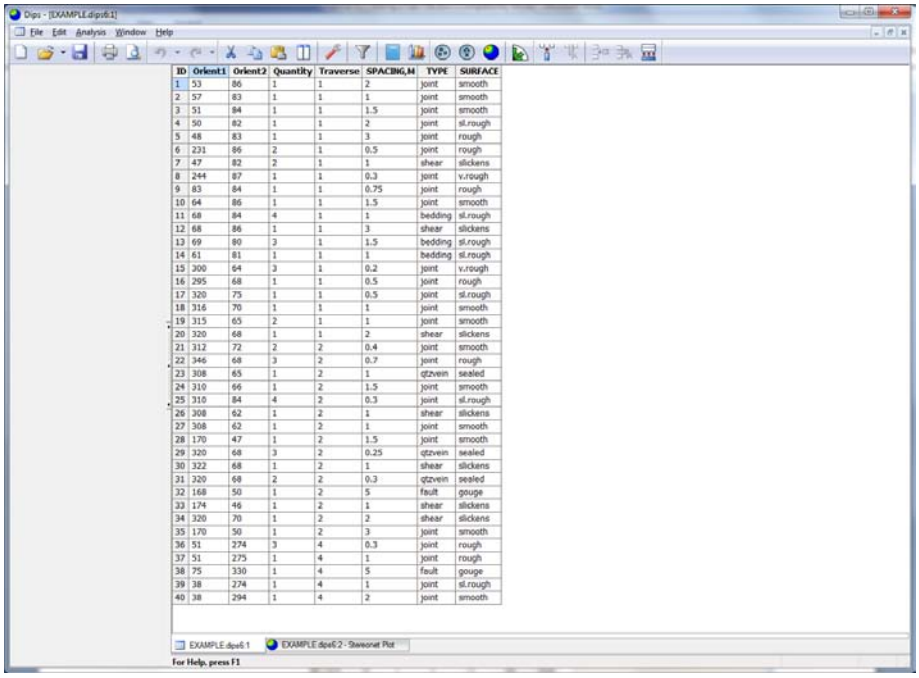
Select: File → Recent Folders → Examples Folder

Open the **Example.dips6** file.

You should see the stereonet plot view shown in the following figure. (Note: if the example file has been previously opened and saved, the screen may show a different view or plot, since *Dips* saves the most recent view state when a file is saved).



Switch to the grid view by selecting the grid view tab at the bottom left of the view.



ID	Orient1	Orient2	Quantity	Traverse	SPACING,M	TYPE	SURFACE
1	53	86	1	1	2	joint	smooth
2	57	83	1	1	1	joint	smooth
3	51	84	1	1	1.5	joint	smooth
4	50	82	1	1	2	joint	sl.rough
5	48	83	1	1	3	joint	rough
6	231	86	2	1	0.5	joint	rough
7	47	82	2	1	1	shear	slickens
8	244	87	1	1	0.3	joint	v.rough
9	83	84	1	1	0.75	joint	rough
10	64	86	1	1	1.5	joint	smooth
11	68	84	4	1	1	bedding	sl.rough
12	68	86	1	1	3	shear	slickens
13	69	80	3	1	1.5	bedding	sl.rough
14	61	81	1	1	1	bedding	sl.rough
15	300	64	3	1	0.2	joint	v.rough
16	295	68	1	1	0.5	joint	rough
17	320	75	1	1	0.5	joint	sl.rough
18	316	70	1	1	1	joint	smooth
19	315	65	2	1	1	joint	smooth
20	320	68	1	1	2	shear	slickens
21	312	72	2	2	0.4	joint	smooth
22	346	68	3	2	0.7	joint	rough
23	308	65	1	2	1	qtzvein	sealed
24	310	66	1	2	1.5	joint	smooth
25	310	84	4	2	0.3	joint	sl.rough
26	308	62	1	2	1	shear	slickens
27	308	62	1	2	1	joint	smooth
28	170	47	1	2	1.5	joint	smooth
29	320	68	3	2	0.25	qtzvein	sealed
30	322	68	1	2	1	shear	slickens
31	320	68	2	2	0.3	qtzvein	sealed
32	168	50	1	2	5	fault	gouge
33	174	46	1	2	1	shear	slickens
34	320	70	1	2	2	shear	slickens
35	170	50	1	2	3	joint	smooth
36	51	274	3	4	0.3	joint	rough
37	51	275	1	4	1	joint	rough
38	75	330	1	4	5	fault	gouge
39	38	274	1	4	1	joint	sl.rough
40	38	294	1	4	2	joint	smooth

Notice that this file contains the following columns:

- Two Orientation Columns
- A Quantity Column
- A Traverse Column
- Three Extra Columns

When you have finished examining the **Example.dips6** data, close the file, and we will discuss how to re-create this file from scratch.

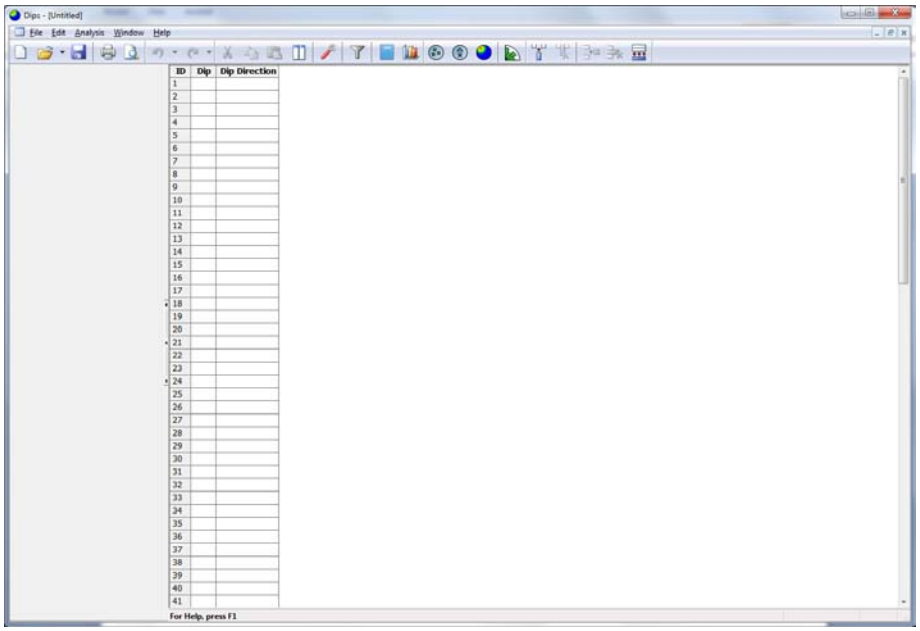
New File

To begin creating a new *Dips* file, select New from the toolbar or the File menu.

Select: File → New

You will see the following blank *Dips* spreadsheet, which contains:

- Two Orientation Columns
- 100 rows



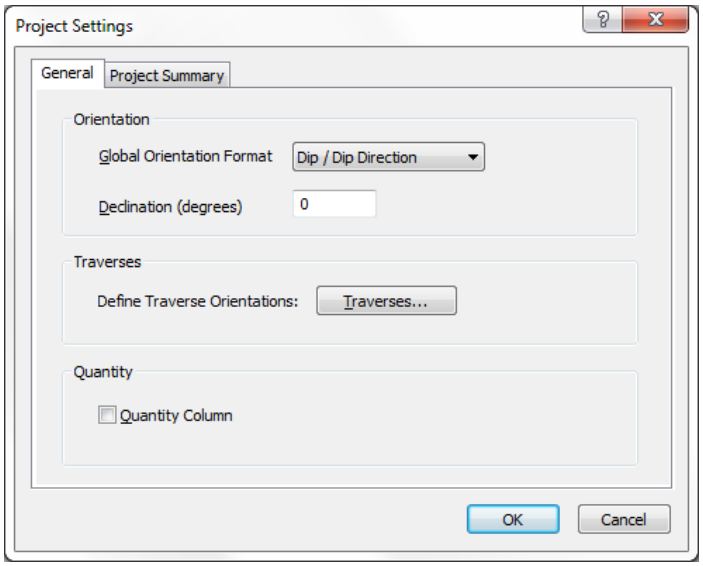
If you have not already, maximize the Grid View.

As you can see from the titles of the two Orientation Columns, the default Global Orientation Format for a New file is DIP/DIPDIRECTION. For this example, we need to change this to STRIKE/DIP (right hand rule). This is done through the **Project Settings** option.

Project Settings

When creating a new *Dips* file, you will generally need to use the **Project Settings** option before proceeding to enter data.

Select: Analysis → Project Settings



For this example, we need to configure the:

- Global Orientation Format
- Declination
- Quantity Column

Global Orientation Format

The Global Orientation Format in the Project Settings dialog determines how *Dips* will interpret the data in the two Orientation Columns.

For this example, most of our data is in STRIKE/DIP (right hand rule) format, so change the Global Orientation Format to **Strike (Right) / Dip**.

NOTE: mixed orientation formats can be combined in the same *Dips* file by using the optional Traverse Orientation Format, described later in this tutorial.

Declination

Enter a Declination of –5.5.

The Declination is typically used to correct for magnetic declination, but can be used to adjust to grid north.

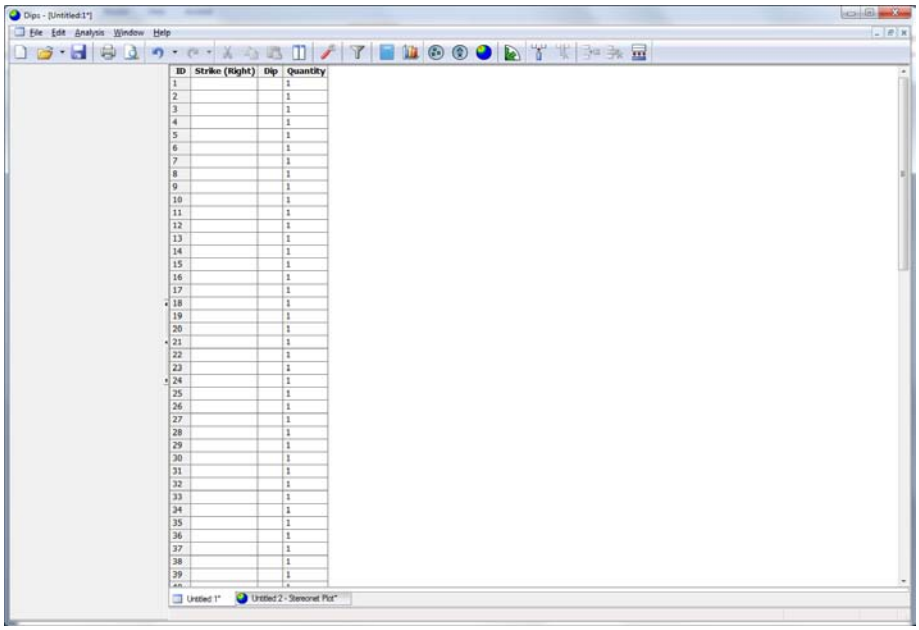
Note that the declination is ADDED to all azimuth values, therefore a POSITIVE value corrects for EAST declination, and a NEGATIVE value corrects for WEST declination (which is the case in this example).

Quantity Column

A Quantity Column in a *Dips* file allows you to record single data entries which refer to multiple identical features having the same orientation.

Select the Quantity Column checkbox in the Project Settings dialog and select OK. Note the following changes to the spreadsheet:

- The titles of the two Orientation Columns are now Strike (Right) and Dip.
- A Quantity Column has been added to the spreadsheet. For convenience, the Quantity Column values are initially set to 1 when the column is created. The user can enter higher values as necessary (e.g. 2, 3, 4…)

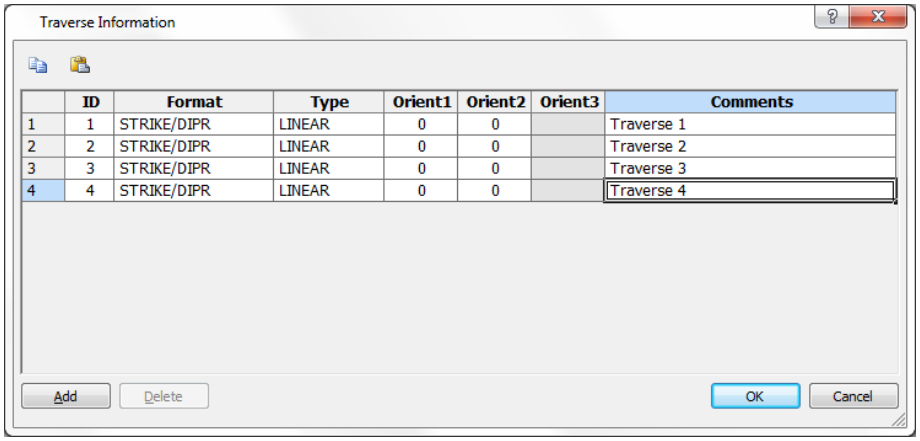


Traverses

Traverses are used to group data units, and are also used by *Dips* to weight the data to correct for measurement bias. To define Traverses:

Select: Analysis → Traverses

You will see the Traverse Information dialog. The **Example.dips6** file uses four Traverses, so select the **Add** button and add 4 new rows.



Enter the following information for the four Traverses.

ID	Format	Type	Or1	Or2	Or3	Comment
1	STRIKE/ DIPR	LINEAR	120	30		Traverse 1
2	STRIKE/ DIPR	PLANAR	100	10		Traverse 2
3		BORE HOLE	20	145	120	Traverse 3
4	DIP/ DIPDIRECTION	PLANAR	10	190		Traverse 4

Traverse ID

The Traverse ID can be any integer value greater than 0. Each Traverse must have its own unique ID. When you initially add traverses, they are automatically given default ID numbers (in this case 1, 2, 3, 4).

Traverse Orientation Format

The Traverse Orientation Format is very important, because it allows you to combine mixed orientation formats in the same *Dips* file.

Whenever the Traverse Orientation Format is different from the Global Orientation Format, *Dips* will interpret the orientation data for the Traverse according to the Traverse Orientation Format.

In this example:

- Traverses 1 and 2 have the same data format as the Global Orientation Format (STRIKE/DIPR).

- Traverse 3 is a BOREHOLE traverse. The Traverse Orientation Format is not applicable, since data is measured in terms of alpha and beta angles on the oriented core. See the *Dips* Help system for detailed discussion of BOREHOLE traverses.

- Traverse 4 uses a different orientation format from the Global Orientation Format. In this case, the data on Traverse 4 is in DIP/DIPDIRECTION format.

Traverse Type

Four Traverse Types are available in *Dips*:

- LINEAR
- PLANAR
- BOREHOLE
- CLINORULE

Traverse Orientation

The orientations required to define the Traverse Orientation depend on the Traverse Type, and may also depend on the Traverse Orientation Format.

- Traverse 1 is a LINEAR traverse. For a LINEAR traverse, the Orient 1 and Orient 2 values are always in TREND/PLUNGE format (i.e. Orient 1 = Trend, Orient 2 = Plunge for a LINEAR traverse).

- Traverse 2 is a PLANAR traverse. For a PLANAR traverse, the Orient 1 and Orient 2 values correspond to the Traverse Orientation Format, in this case STRIKE/DIPR (i.e. Orient 1 = Strike, Orient 2 = Dip).

- Traverse 3 is a BOREHOLE traverse, which requires THREE orientations to define. See the *Dips* Help system for details.

- Traverse 4 is a PLANAR traverse. In this case, the Traverse Orientation Format is DIP/DIPDIRECTION, therefore the Orient 1 and Orient 2 values are in DIP/DIPDIRECTION format (i.e. Orient 1 = Dip, Orient 2 = Dip Direction).

Traverse Comment

An optional Traverse Comment can be added for each Traverse, to further identify / describe each traverse.

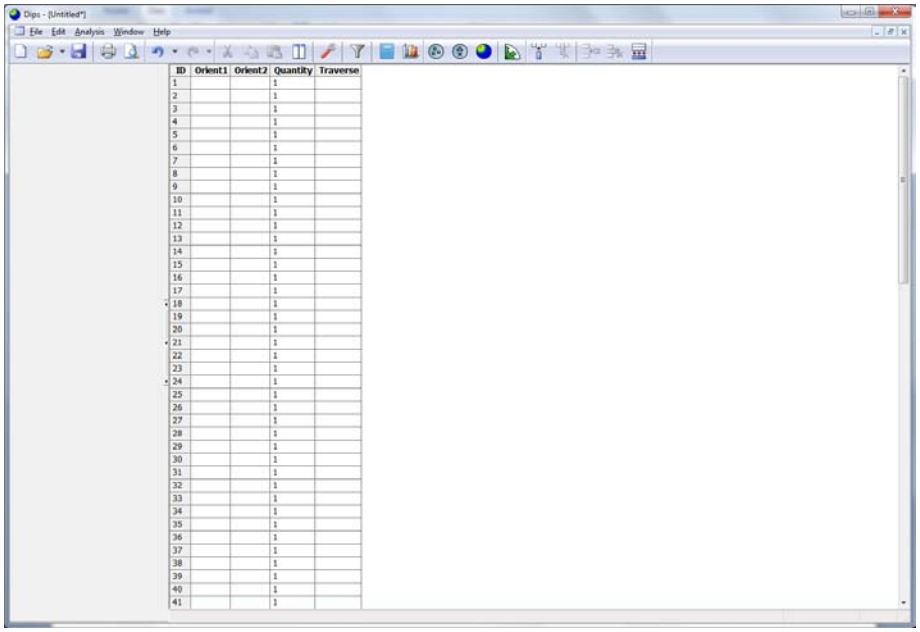
You may inspect the original **Example.dips6** file to view the comments added for these four traverses.

Traverse Column

When you are finished entering the Traverse Information, select OK, and you will see that a Traverse Column has been added to the spreadsheet, after the Quantity Column.

The Traverse Column is for recording the Traverse ID of each data unit. In this case the Traverse ID numbers are 1, 2, 3 and 4.

Also notice that the titles of the two Orientation Columns are now Orient 1 and Orient 2, instead of Strike (Right) and Dip. Since there are mixed orientation formats in this data file (remember that the Traverse Orientation Format for Traverse 4 is DIP/DIPDIRECTION while the Global Orientation Format is STRIKE/DIPR), the titles of the Orientation Columns are simply Orient 1 and Orient 2, to avoid misinterpretation of the data.



Extra Columns

In *Dips*, any columns AFTER the two mandatory Orientation Columns, and the optional Quantity and Traverse Columns (if present), are referred to as **Extra Columns**.

Extra Columns can be used to store any other QUANTITATIVE or QUALITATIVE data that you wish to record.

Recall that the Example.dips6 file used three Extra Columns:

- SPACING
- TYPE
- SURFACE

Extra Columns are added to the *Dips* spreadsheet with the Add Column option in the Edit menu.

Add Column

Since Extra Columns can only be added AFTER the Orientation, Quantity and Traverse Columns, the current highlighted spreadsheet cell must be either:

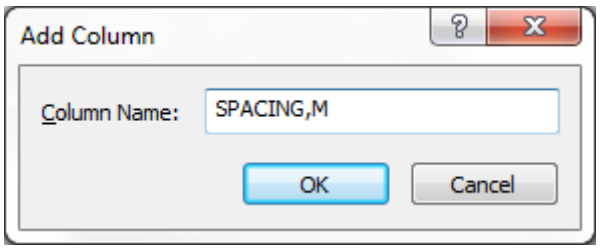
- IN AN EXISTING EXTRA COLUMN, or
- IN THE LAST OF THE ORIENTATION, QUANTITY, OR TRAVERSE COLUMNS, AS APPLICABLE,

in order for the Add Column option to be enabled.

In this case, since no Extra Columns currently exist, click the mouse in the Traverse Column. The Add Column option will be enabled.

Select: Edit → Add Column

You will see the Add Column dialog, allowing you to enter the column name. Enter the name SPACING,M:



Select OK to add the Extra Column.

NOTE: the title of an Extra Column is always displayed in UPPERCASE.

Now let's add the TYPE and SURFACE Extra Columns. An alternative way to add an Extra Column, is to RIGHT-CLICK on the title of an existing Extra Column, or the LAST of the Orientation, Quantity or Traverse columns, as applicable. For example:

1. Right-click the mouse on the title of the SPACING,M column which you just created.

2. Select Add Column from the right-click menu.

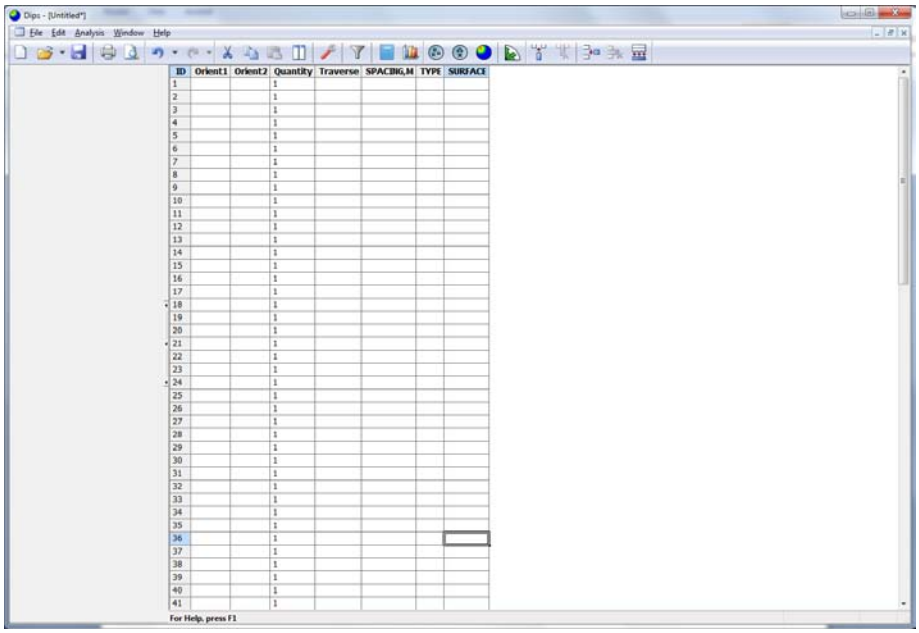
3. Enter the name TYPE in the Add Column dialog, and select OK, and the TYPE Extra Column will be added to the spreadsheet.

4. Now right-click the mouse on the title of the TYPE column.

5. Select Add Column from the right-click menu.

6. Enter the name SURFACE in the Add Column dialog, and select OK, and the SURFACE Extra Column will be added to the spreadsheet.

Congratulations! You have now re-created all of the columns of the **Example.dips6** file as shown below. You are now ready to start entering data.



Entering Data

To conclude this tutorial, we will:

- Open the **Example.dips6** file and copy the data into our new file.
- Generate contour plots for both files, and hopefully they will be identical!

Select: File → Recent Folders → Examples Folder

Open the **Example.dips6** file and switch to the grid view.

1. In the **Example.dips6** spreadsheet, click on the ID button at the upper left corner, to select the entire spreadsheet.
2. Right-click the mouse anywhere in the **Example.dips6** spreadsheet and select Copy.
3. Use the tabs at the bottom of the view to switch to the grid view of the **new** file. Click the mouse in the FIRST cell of the new spreadsheet (i.e. the Row 1 , Orient 1 cell). Right-click and select Paste.
4. The data from the **Example.dips6** file should now be pasted into the new file.
5. Let's verify that we have correctly re-created the **Example.dips6** file.

6. Select the Contour Plot toolbar button. Compare this to the contour plot of the original Example file. The plots should be identical (max density = 23.29 percent, vector count 61/40 entries).
7. Now select the Terzaghi weighting checkbox in the sidebar for both contour plots, to view the weighted contours. The maximum density should be 26.83 percent for both files.
8. If the plots are not identical, examine the Project Settings and Traverse dialogs of the new file, and make sure they are the same as the **Example.dips6** file. Also check that there are 40 rows of data in the new file, since the **Example.dips6** file contains forty rows.

Note that the Legend of the new file indicates "Invalid data after row 40". This is because the file still contains 100 rows, but only the first 40 have valid data. Select rows 41 to 100 with the mouse, and use the Remove Rows option in the toolbar or the Edit menu to delete these rows. The "invalid data" message should disappear from the Legend.

Save the file with a new name (e.g. Example New) and read it back in again just to check that the file has been saved properly.

Borehole Traverse

You may have noticed that we defined a Borehole traverse (in the Traverse Information dialog) but we did not actually enter any borehole data in the main *Dips* spreadsheet (i.e. Traverse ID = 3 is not used in the traverse column, only ID numbers 1, 2 and 4 are used).

Borehole (oriented core) data is discussed in more detail in Tutorial 5.

That concludes this tutorial on how to create a *Dips* file.