



 MineModeller

MINEMODELLER
SURVEY AND MODELLING IN
MICROSTATION

MineModeller

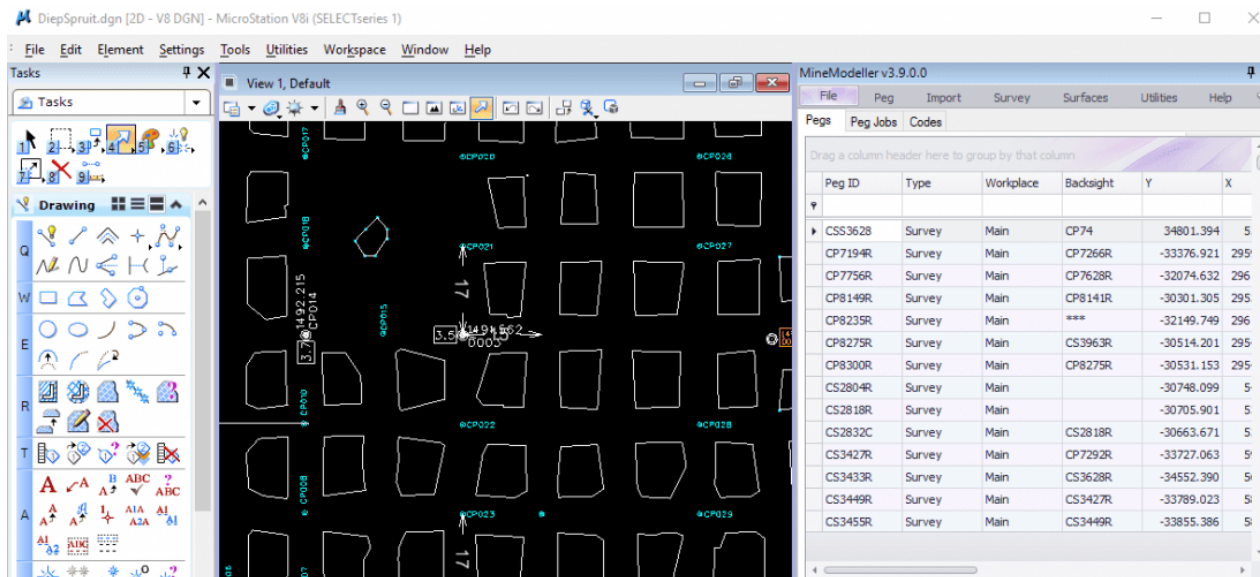
MineModeller is a complete underground and surface survey package hosted in the familiar Microstation environment.

(minemodeller.com)

(If you don't have Microstation, see SurveyXL.net and ask us for a SurveyXL presentation)

Features:

- ❖ Different surveying methods catered for
- ❖ Pegs storage done securely in database.
- ❖ Imports data from different formats
- ❖ Synchronization of spatial data with databases
- ❖ Surface operations
- ❖ Import data directly from total station



Methods of Surveying

MineModeller caters for the following methods of surveying:

- ❖ Double Button
- ❖ Double setup
- ❖ Traverse calculations with Bowditch correction
- ❖ Offsetting
- ❖ Contouring
- ❖ Measuring reports
- ❖ Automatic over and under mining calculations
- ❖ Gyro calibration and calculations

MineModeller also caters for:

- ❖ Automatic pillar creation
- ❖ Peg plotting

MineModeller allows importing data from:

- ❖ Modelmaker
- ❖ GemCom Surpac
- ❖ DataMine
- ❖ All text formats

When importing you can transform your data using general coordinate conversions (LO <-> Lat/Long) etc

Data Storage

- ❑ Pegs registry is stored in securely in a central database – in either SQL Server, Oracle or SQLite for standalone installations.

- ❑ Standard relational model with no proprietary data storage.

- ❑ Complex fields like survey job properties stored in published XML format, keeping data open in case of migration to other systems or integration to other systems.

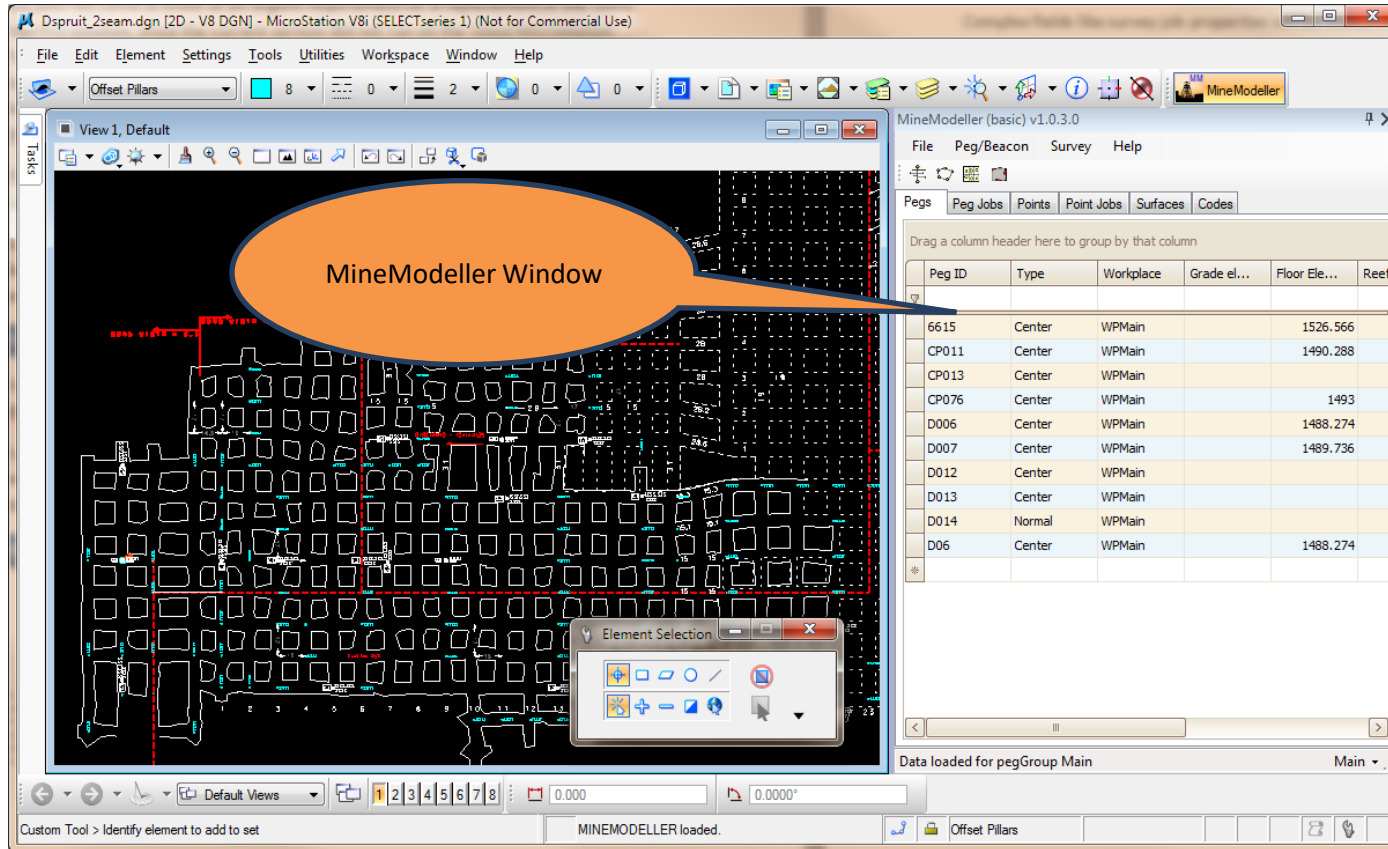
- ❑ All data is stored in the Well Known Binary format of the Open Geospatial Consortium so that data is open to access by third party programs as needed, not locked in.

www.opengeospatial.org

- ❑ Usual backup and restore procedures available since data is stored in central database server. Usual access control also because of this.

The MineModeller Application

MineModeller is a Microstation add-in that fully integrates with Microstation.



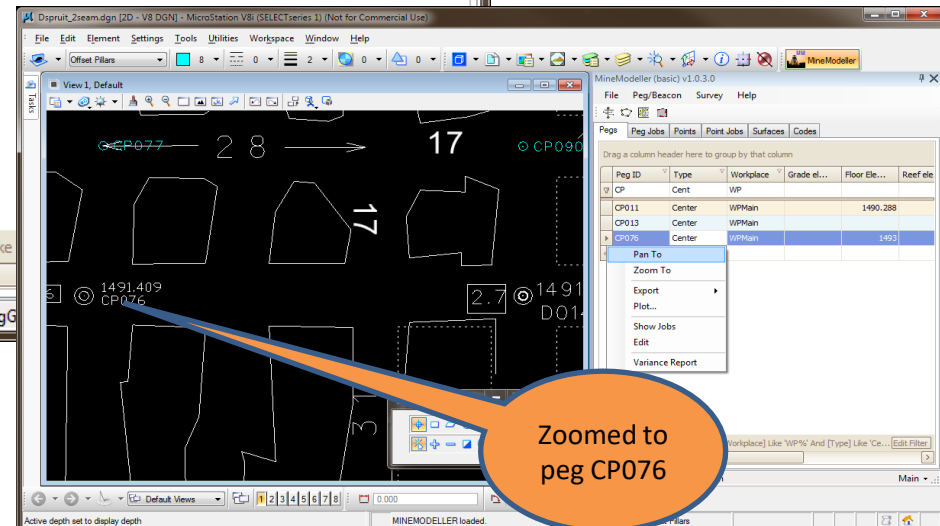
Error tolerances can be configured as well as the external database. Access control is applied, meaning only survey admins can approve pegs and set tolerances.

Working with pegs

When you are working with pegs you can use a grid to look at or filter data by pegs, peg jobs etc. You can apply multiple filters or even complex filters and then look at these pegs in Microstation by zooming to them as well.

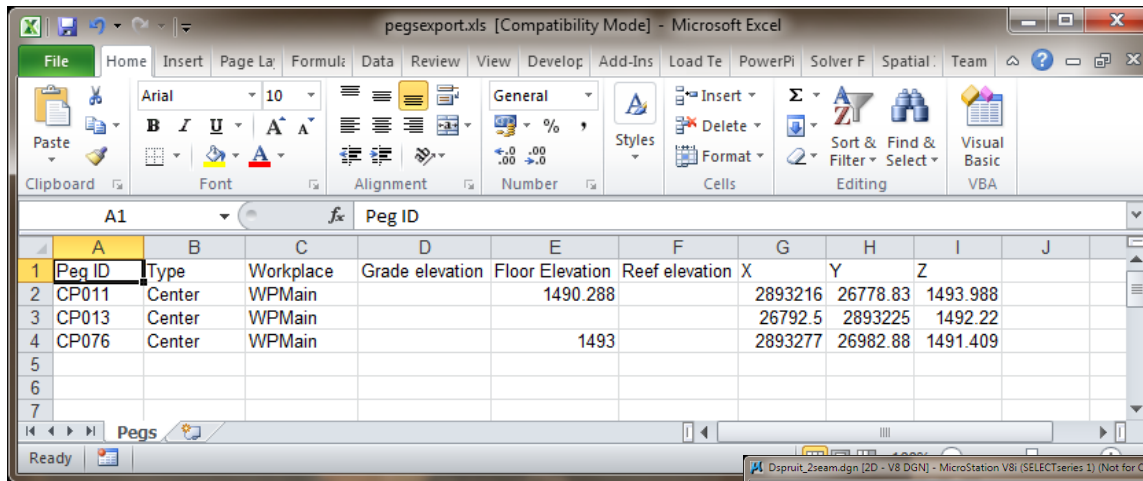
Peg ID	Type	Workplace	Grade el...	Floor Ele...	Reef ele...
6615	Center	WPMMain		1526.566	
CP011	Center	WPMMain		1490.288	
CP013	Center	WPMMain			
CP076	Center	WPMMain		1493	
D006	Center	WPMMain		1488.274	
D007	Center	WPMMain		1489.736	
D012	Center	WPMMain			
D013	Center	WPMMain			
D014	Normal	WPMMain			
D06	Center	WPMMain		1488.274	

Peg ID	Type	Workplace	Grade el...	Floor Ele...	Reef ele...
CP					
CP011	Center	WPMMain		1490.288	
CP013	Center	WPMMain			
CP076	Center	WPMMain			

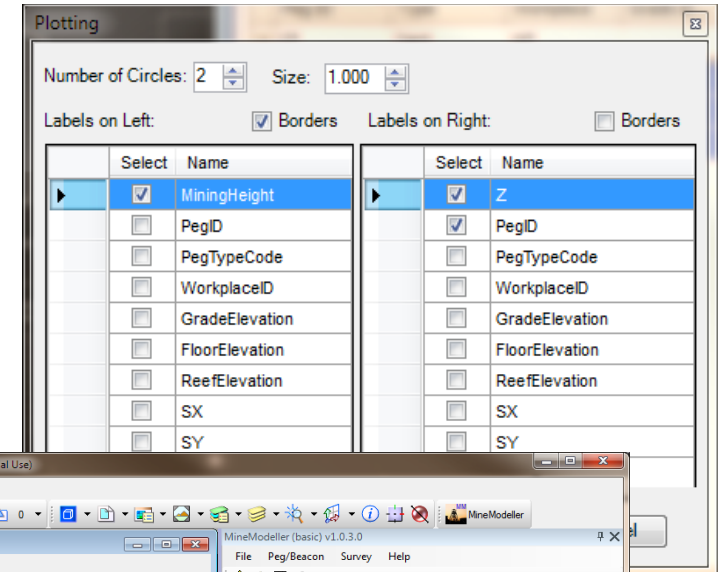


Exporting to Excel & Plotting pegs

Selected pegs can be exported to Excel or a CSV file.



	A	B	C	D	E	F	G	H	I	J
	Peg ID	Type	Workplace	Grade elevation	Floor Elevation	Reef elevation	X	Y	Z	
1	CP011	Center	WPMain		1490.288		2893216	26778.83	1493.988	
2	CP013	Center	WPMain				26792.5	2893225	1492.22	
3	CP076	Center	WPMain		1493		2893277	26982.88	1491.409	
4										
5										
6										
7										

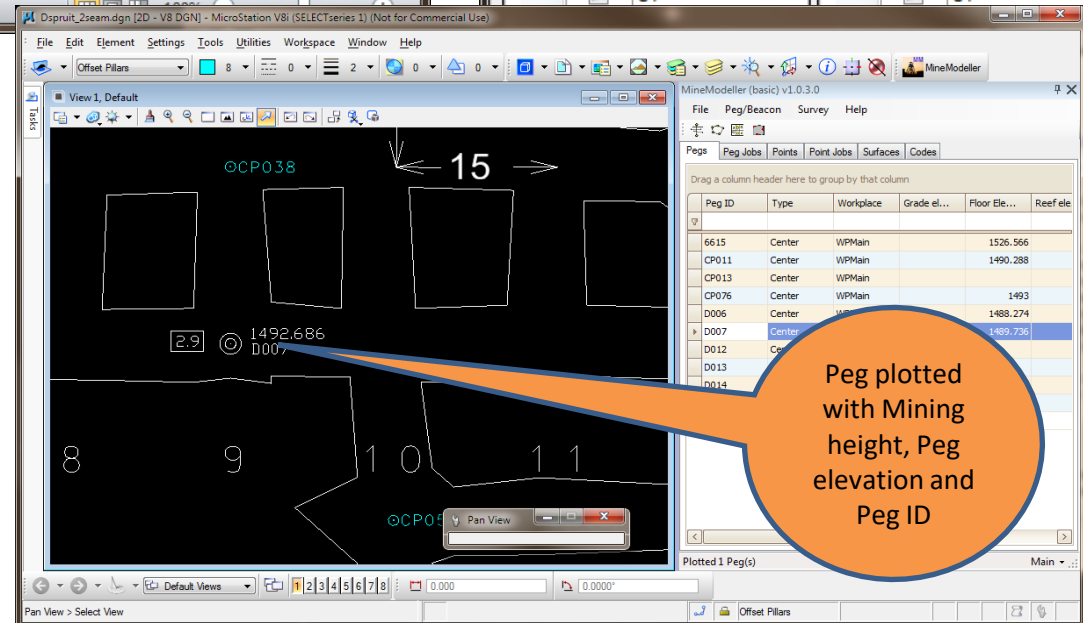


Number of Circles: 2 Size: 1.000

Labels on Left: Borders Labels on Right: Borders

Select	Name	Select	Name
<input checked="" type="checkbox"/>	MiningHeight	<input checked="" type="checkbox"/>	Z
<input type="checkbox"/>	PegID	<input checked="" type="checkbox"/>	PegID
<input type="checkbox"/>	PegTypeCode	<input type="checkbox"/>	PegTypeCode
<input type="checkbox"/>	WorkplaceID	<input type="checkbox"/>	WorkplaceID
<input type="checkbox"/>	GradeElevation	<input type="checkbox"/>	GradeElevation
<input type="checkbox"/>	FloorElevation	<input type="checkbox"/>	FloorElevation
<input type="checkbox"/>	ReefElevation	<input type="checkbox"/>	ReefElevation
<input type="checkbox"/>	SX	<input type="checkbox"/>	SX
<input type="checkbox"/>	SY	<input type="checkbox"/>	SY

Selected pegs can be plotted and one can choose the type and size of the peg symbol, what text to display and where relative to the peg and specify borders to. The default options plot according to the DME standards.



MicroStation V8i (SELECTseries 1) (Not for Commercial Use)

View: Default

Plot: 1492.686

Callout bubble: Peg plotted with Mining height, Peg elevation and Peg ID

Peg ID	Type	Workplace	Grade el...	Floor Ele...	Reef ele
6615	Center	WPMain		1526.566	
CP011	Center	WPMain		1490.288	
CP013	Center	WPMain			
CP076	Center	WPMain		1493	
D006	Center	WPMain		1488.274	
D007	Center	WPMain		1489.736	
D012	Center	WPMain			
D013	Center	WPMain			
D014	Center	WPMain			

Peg Jobs

Importing pegs, manually entering pegs and surveying pegs operations are recorded as peg jobs and you can get information on these jobs.

The screenshot shows the MineModeller (basic) v1.0.3.0 interface. The 'Peg Jobs' tab is selected. The main window displays a table with the following data:

Description	Job Date	Surveyor	Approve...	Group
Peg Export	2010/04/20	Derek Diam...		Test
Manual peg creation	2010/06/24	Derek Diam...		Test

At the bottom of the window, there is a filter bar with a red 'X' icon, a checked checkbox, and the text '[JobID] In ('28', '30')'. An 'Edit Filter' button is also present. The status bar at the bottom indicates 'Data loaded for pegGroup Test' and 'Test'.

The screenshot shows the MineModeller (basic) v1.0.3.0 interface. The 'Peg Jobs' tab is selected, and the 'Peg Export' job is expanded. The 'Pegs In Job' sub-tab is active, displaying a table of peg data:

Peg ID	Peg Gro...	Peg Typ...	X	Y
CP013	Test	Center	2893225.035	-26792.50
CP076	Test	Center	26982.877...	-2893276.6
D007	Test	Center	26883.42	-2893369.34
D012	Test	Center	26895.456...	-2893296.1
D013	Test	Center	26932.596...	-2893241.7
D014	Test	Normal	27021.685	-2893303.08
D06	Test	Center	26921.72	-2893313.17

Below this table, the 'Manual peg creation' job is also visible in the main table. The filter bar and status bar are identical to the first screenshot.

Peg Variance Report

Variance reports will display a report for all selected pegs showing if they have been re-surveyed and if so, the variance measurement. This shows the greyed pegs which have not been re-surveyed and the actual variance of the others.

Peg ID	Type	Workplace	Date	X	Y	Z	DX	DY	DZ	Delta
D006	Center	WPMain	2010/06/24	2893313.178	26792.504	1491.144	0	0	0	0.000
CP013	Center	WPMain	2010/04/20	26792.504	2893225.035	1492.220	0	0	0	0.000
D06	Center	WPMain	2010/04/20	2893313.178	26921.720					
D014	Normal	WPMain	2010/04/20	2893303.083	27021.685	0.000				
D013	Center	WPMain	2010/04/20	2893241.745	26932.596	1491.096				
D012	Center	WPMain	2010/04/20	2893296.133	26895.456	1490.910				
D007	Center	WPMain	2010/04/20	2893369.344	26883.420	1492.686				
CP076	Center	WPMain	2010/04/20	2893276.618	26982.878	1491.409				
CP011	Center	WPMain	2010/04/20	2893215.549	26778.829	1493.988				

Peg Groups

Peg ID	Type	Workplace	Grade el...	Floor Ele...	Reef ele...
CP011	Center	WPMain		1490.288	
CP013	Center	WPMain		1493	
		WPMain	10	1488.274	
		WPMain		1489.736	
		WPMain			
		WPMain		1488.274	

Pegs can be stored in independent Peg Groups and can be exported between groups and be viewed by codes as well.

Peg surveying methods

Currently MineModeller reads from total station files. When the data is read in from the device files lines of separate jobs have separate colours and readings can be edited before the job is loaded. You can also convert the displayed angles to decimal degrees or degrees minutes seconds.

Col0	Col1	Code	Point Name	HA	SD	VA	Target Hei...
-----		2	CP011				-1.894
-----		2	CP014				2.036
-----		4	CP011	124.43944...	53.375		0
-----		5	CP013		36		0
-----		5	CP011	124.43944...			0
-----		2	CP013				22
-----		4	CP013		16		0
-----		5	CP011			1 89	0

2	CP011		
2	CP014		
4	CP011	124.2622	
5	CP013	124.1758	
5	CP011	124.2622	
	CP013	304.1800	
	CP019	34.1756	
	CP014	304.1754	

Col0	Col1	Code	Point Name
-----		2	CP01
-----		2	CP014
-----		4	CP01

Reading from devices

- Topcon and Leica instruments can be read with the Instrument I/F button on the double set up or double button screens.

The screenshot displays the PrimeThought InstrumentIQ v1.1 software interface. The window title is "PrimeThought InstrumentIQ v1.1". The interface includes a navigation pane on the left with "Home", "Download", "Open", "Save", and "Stop" buttons. The main area is divided into sections: "Settings" (with "Settings File" set to "LeicaComm1.device" and "Device" set to "Leica"), "Survey Setups", and "Measurements".

Survey Setups

Station	Code	Inst. Height	Surveyor	Date	X	Y	Z
CP076	2	-1.572		0001/01/01			
D014	2	0		0001/01/01			

Measurements

Point	Code	Ref. Height	SD	VA	HA	X	Y	Z
CP076	4	0.15	46.987	89.5505555...	124.3			
CP076	4	0.15	46.987	89.5472222...	124.3			
CP076	5	0.15	46.987	89.5472222...	124.3			
CP090	5	0	16.976	89.8763888...	214.299722...			
CP091	5	0	34.004	92.6708333...	214.299722...			
CP092	5	0	50.97	92.0580555...	214.3			
D015	5	0	68.035	91.7125	214.3			
CP093	5	0	85.041	92.3169444...	214.299722...			
CP094	5	0	102.045	91.525	214.299722...			
D015	5	0.14	68.004	90.4497222...	214.299722...			

2 Point(s) Loaded

Reading from devices

Pegs can be manually captured, imported from a file or surveyed using the double button or double set up methods. The field book is included and gives an electronic recording of the field book page. With the roof height the floor elevation can be calculated and the data saved.

The screenshot shows the MineModeller (basic) v1.0.3.0 software interface. The main window displays a table of peg data. A 'New Peg Double Button' dialog box is open, showing the 'Vertical Angles' tab. The dialog box contains the following information:

- New Peg: CP011
- Surveyor: Derek Diamond
- Date: 24 June 2010
- Setup Peg: D007
- Backsight Peg: CP011
- Workplace: WPMain
- Peg Type: Center

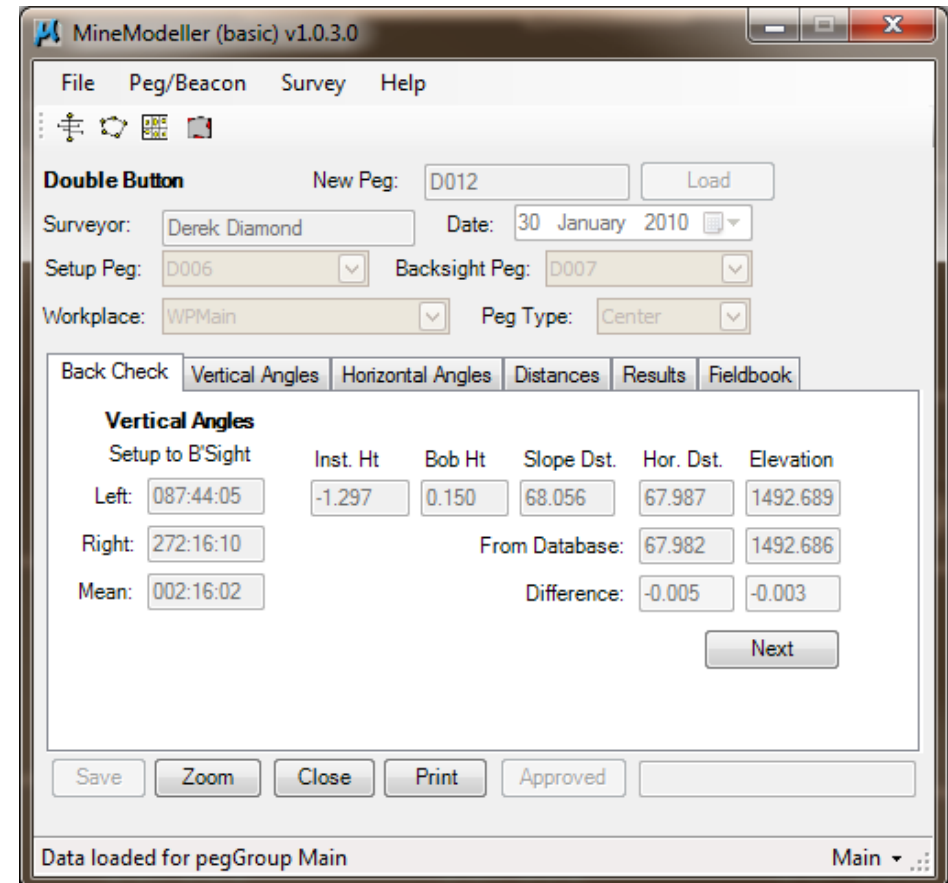
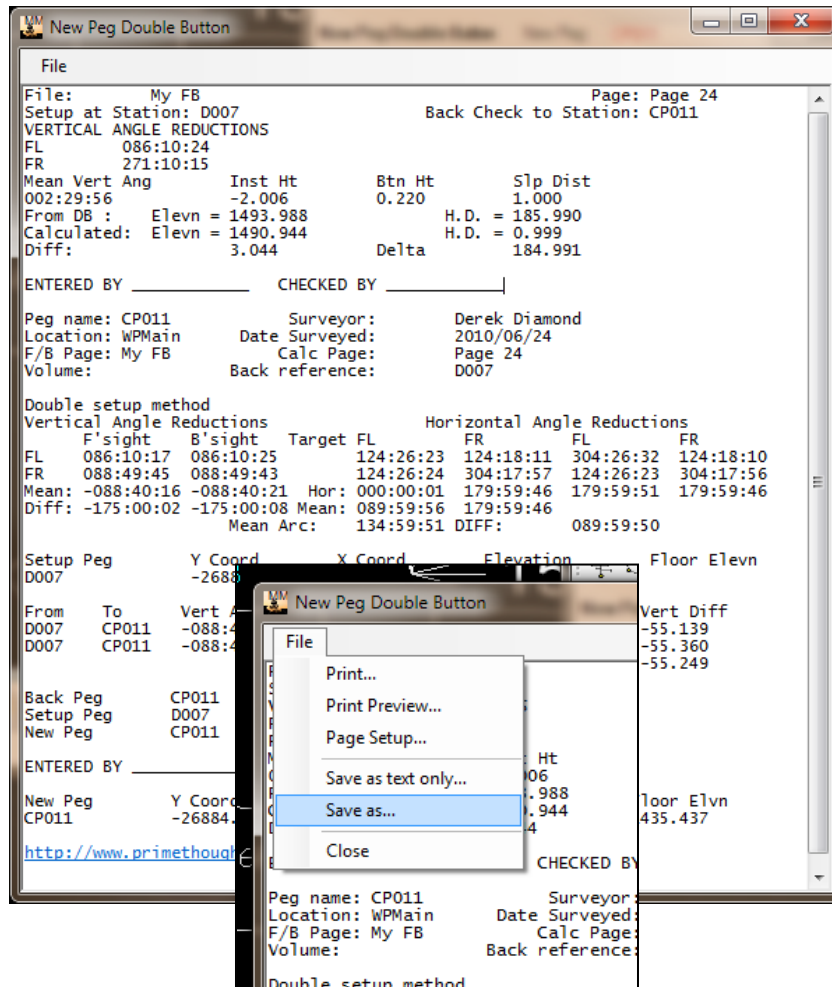
The 'Vertical Angles' tab shows the following data:

Setup to B'Sight	Inst. Ht	Bob Ht	Slope Dst.	Hor. Dst.	Elevation
Left: 086:10:24	-2.006	0.220	1.000	0.999	1490.944
Right: 271:10:15			From Database:	185.990	1493.988
Mean: 002:29:56			Difference:	184.991	3.044

The 'Difference' values (184.991 and 3.044) are highlighted in red, indicating that error bounds have been exceeded. A callout bubble points to these values with the text: "Error bounds are exceeded in this case."

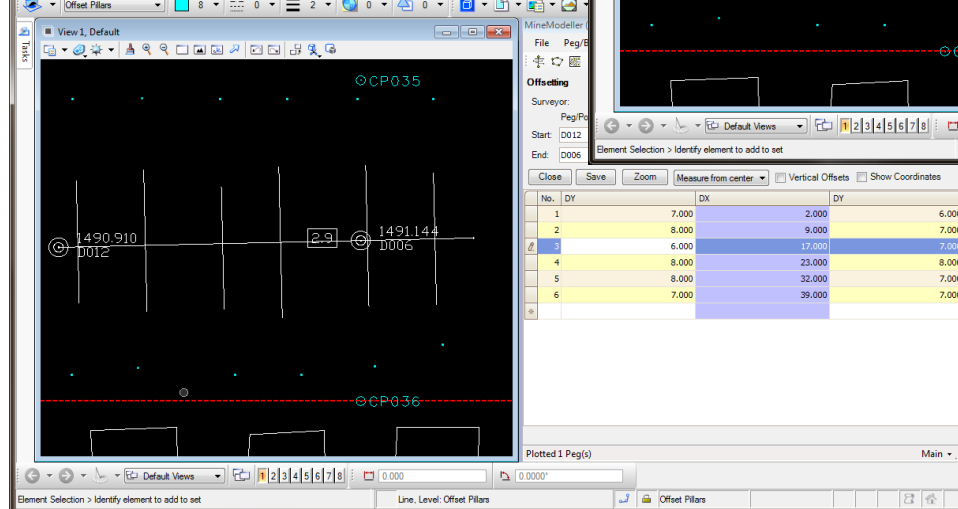
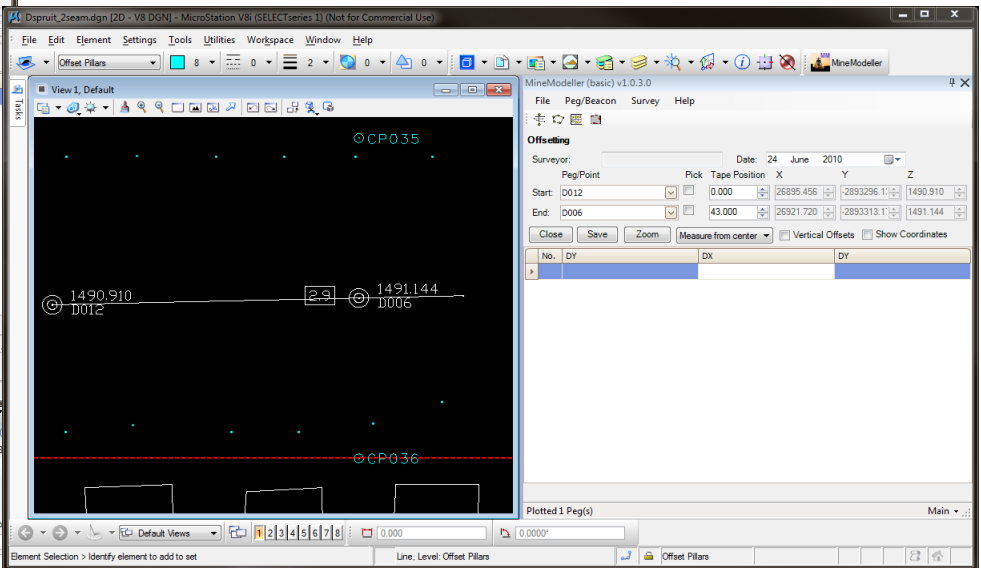
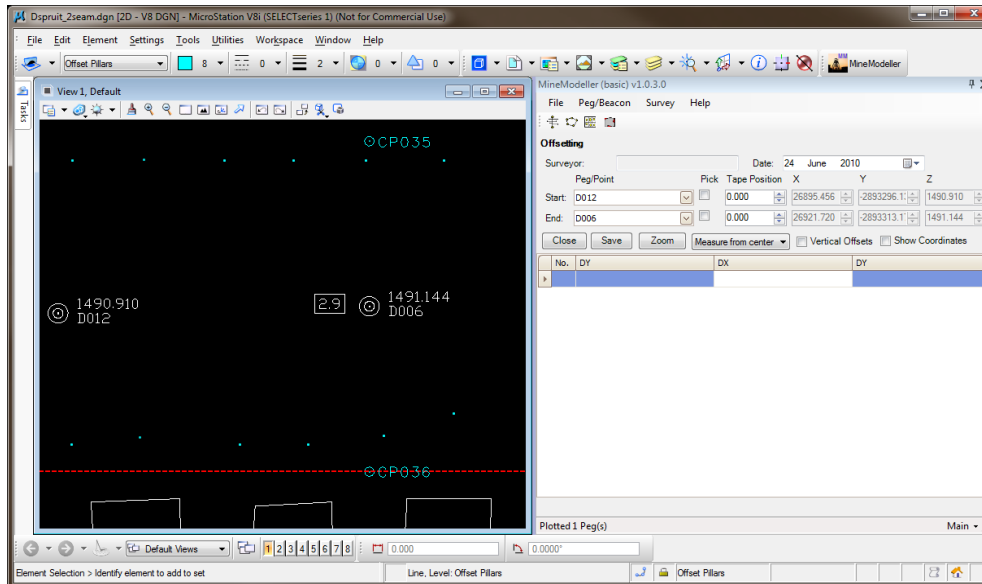
Printing & historical reports

With customisable templates, you can set up how you want your prints to look and also can save a particular print. You can also look at historical surveys, as you can see the data cannot be edited for an old survey.



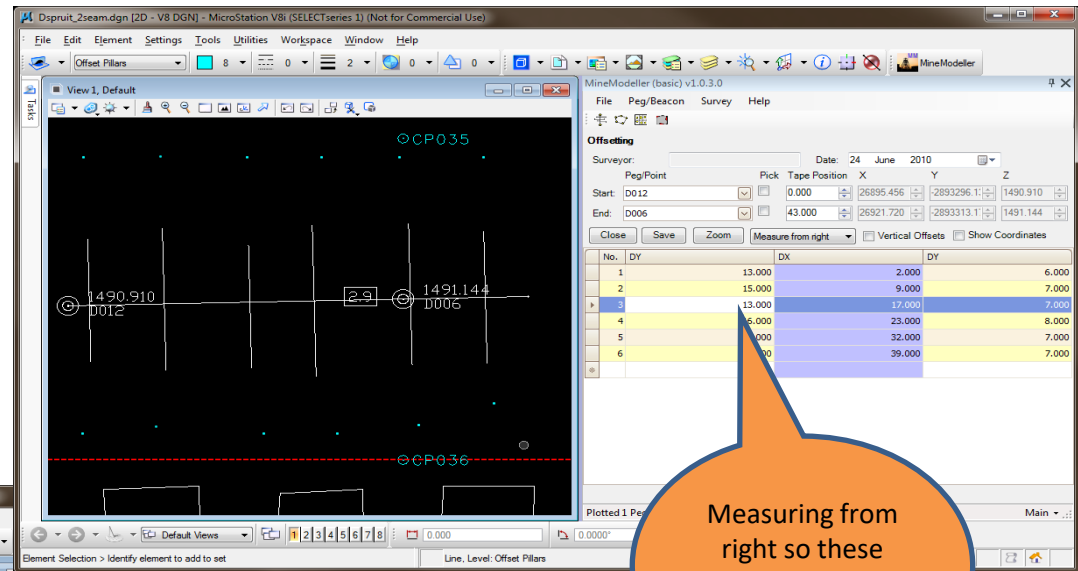
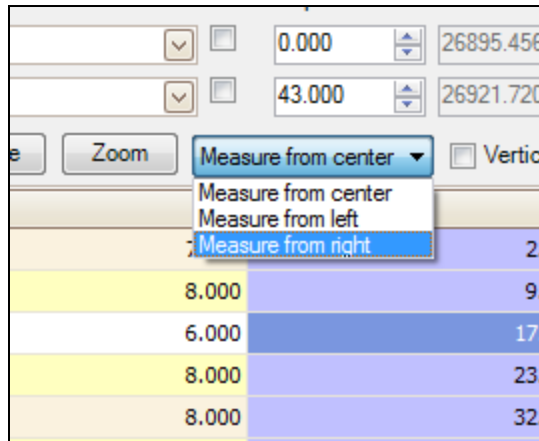
Offsetting

You can choose offsetting pegs in a dropdown or by using a pick checkbox. Then you can zoom to the area in graphics, draw the tape (drawn automatically when the tape position and length is entered) and then enter the offsets in the grid. Vertical offsetting is also supported.

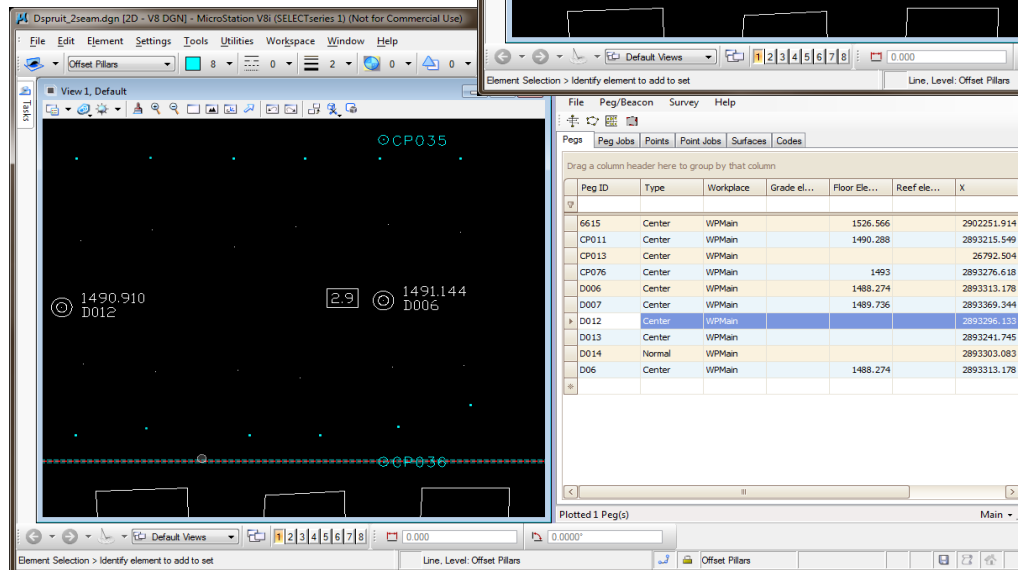


More about offsetting

Measurements can be entered from the left, from the right or from the center. Once you are happy with the data, saving creates the offset points and removes the construction.

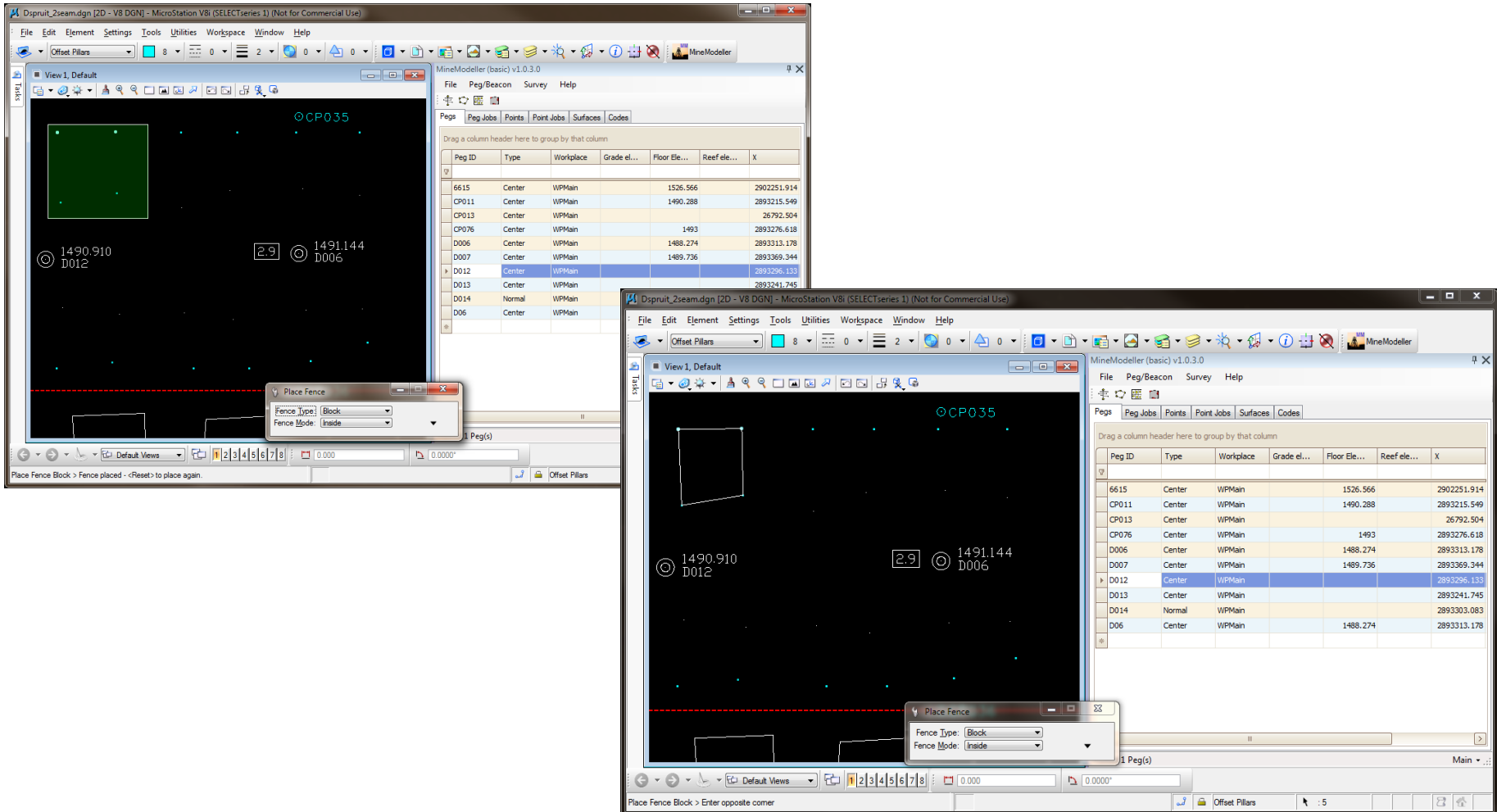


Measuring from right so these values are total length of tape



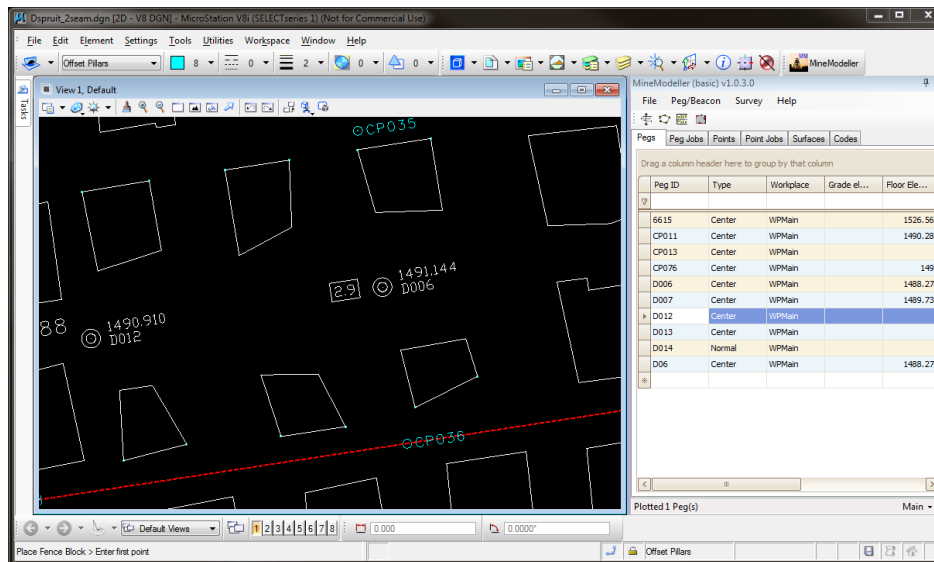
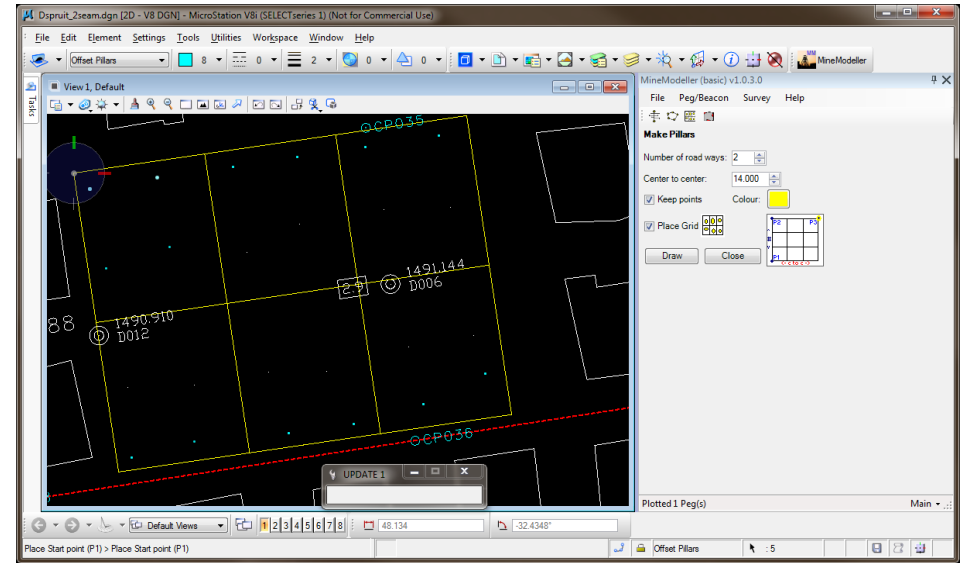
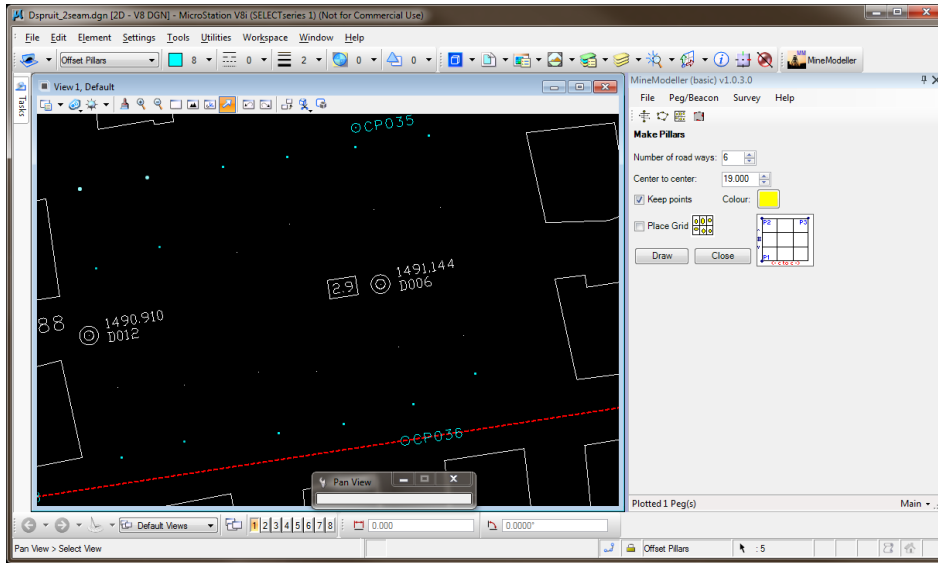
Pillar Creation: One by One Method

Once offsetting has been done you can create pillars by using the pillar tool. You can create pillars one by one as the following shows:



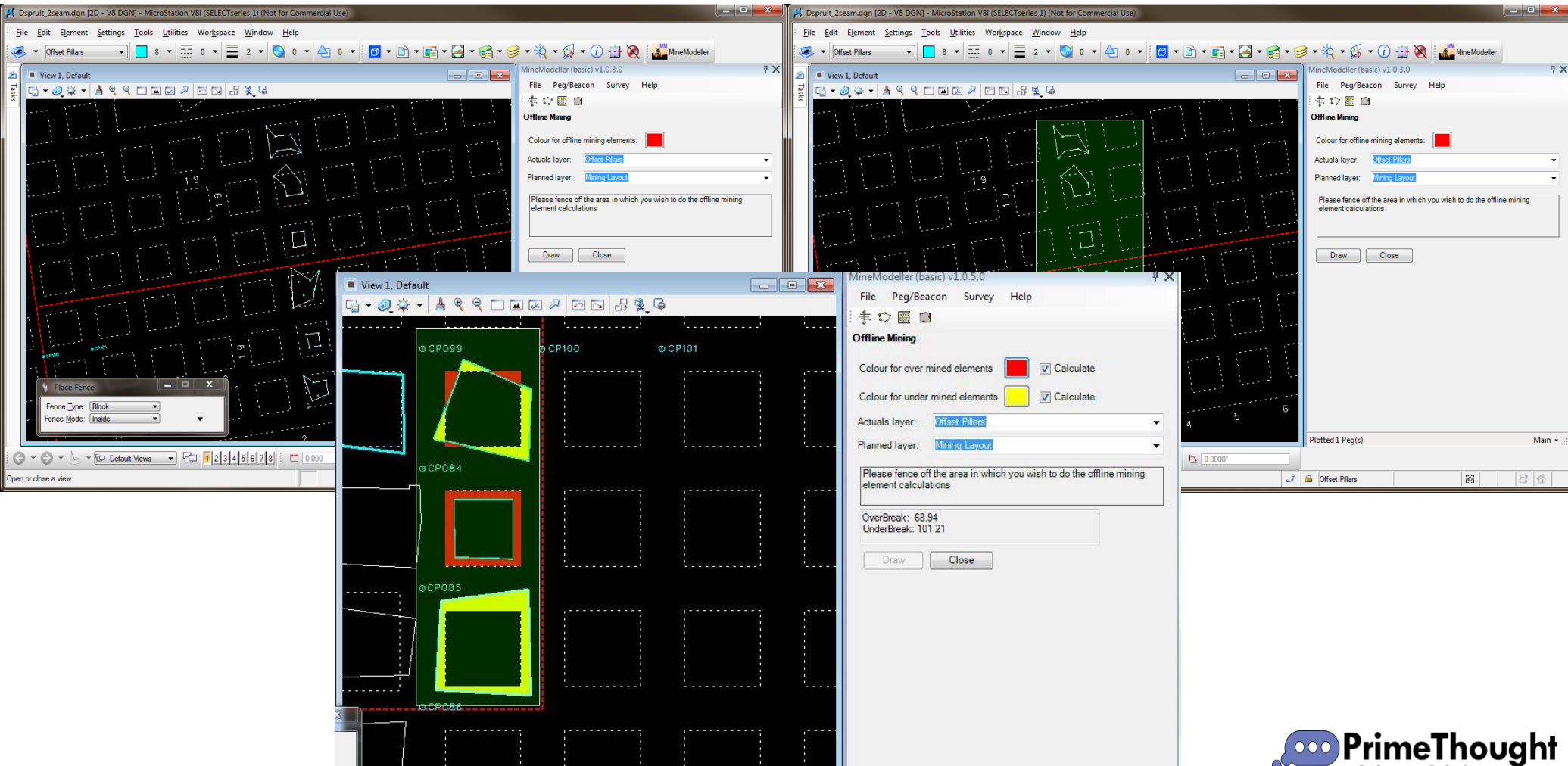
Pillar Creation: Grid method

You can also use a grid to create multiple pillars simultaneously if the pillars are in semi rectangular layout.



Offline Mining Calculation

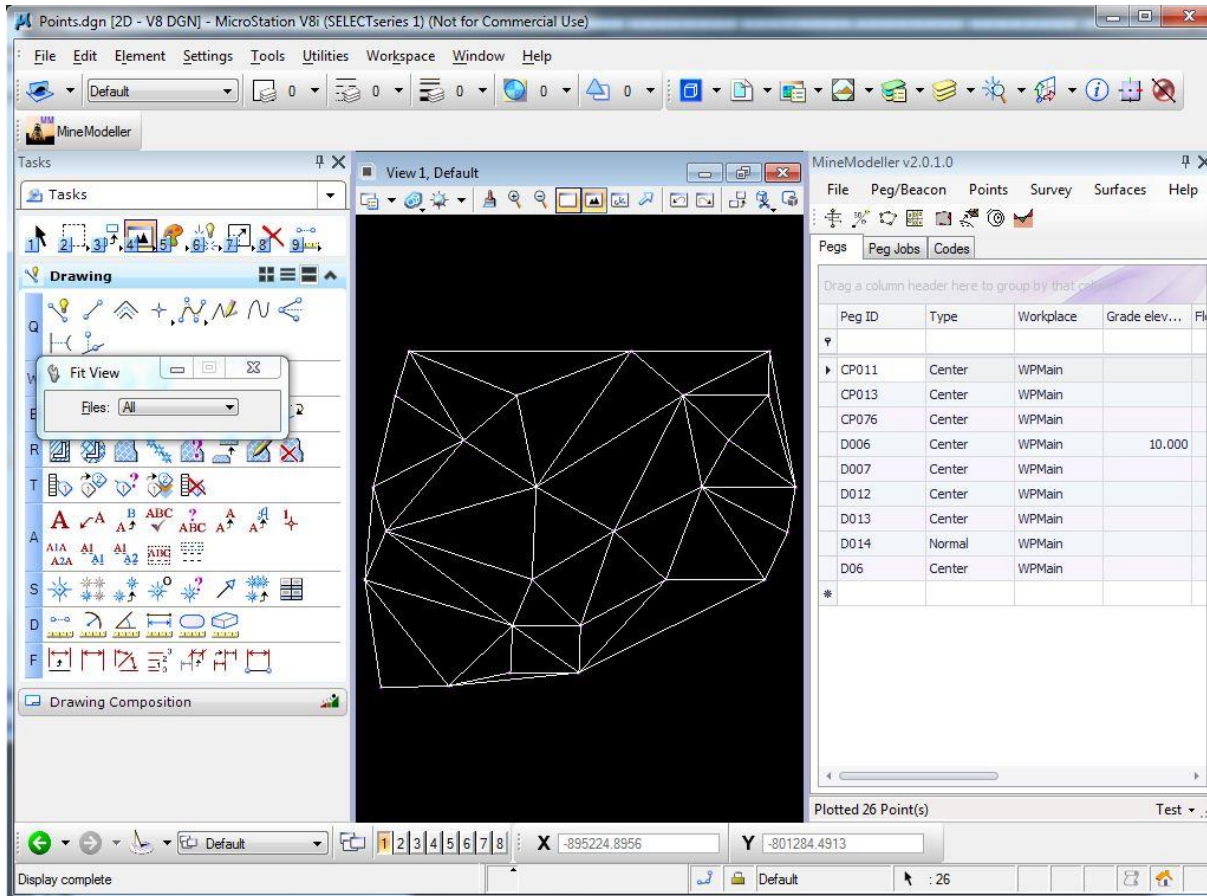
Offline mining of pillars' calculations can be a tedious operation in Microstation. For each pillar we need to calculate the over mined and under mined area. This is usually done by tracing the over mined bits into shapes, pillar by pillar. With the offline mining tool this can be done automatically.



Surface Building

Surfaces can be built from survey points and other elements with break lines as needed.

You can import points from CSV files for creating surfaces.



Contour / Section Selected

Contours or sections can be generated with MineModeller. MineModeller can generate colour filled contours as well.

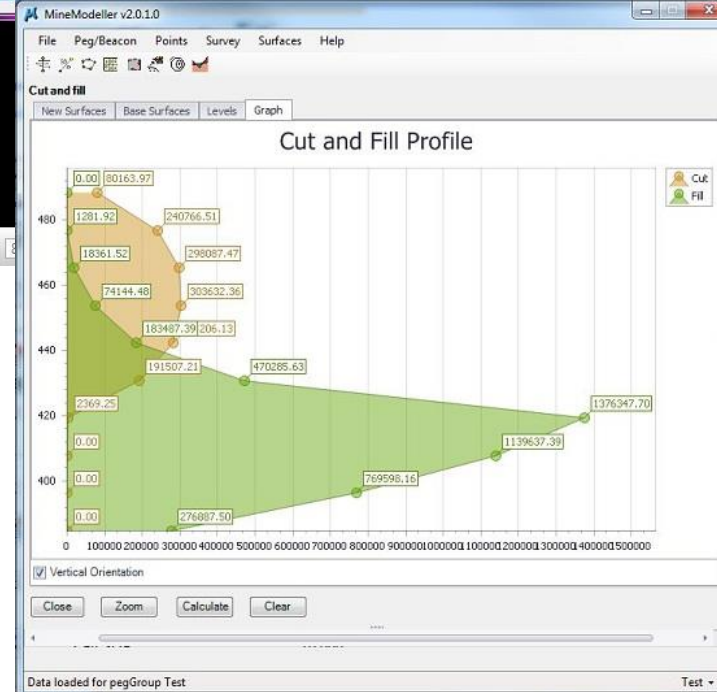
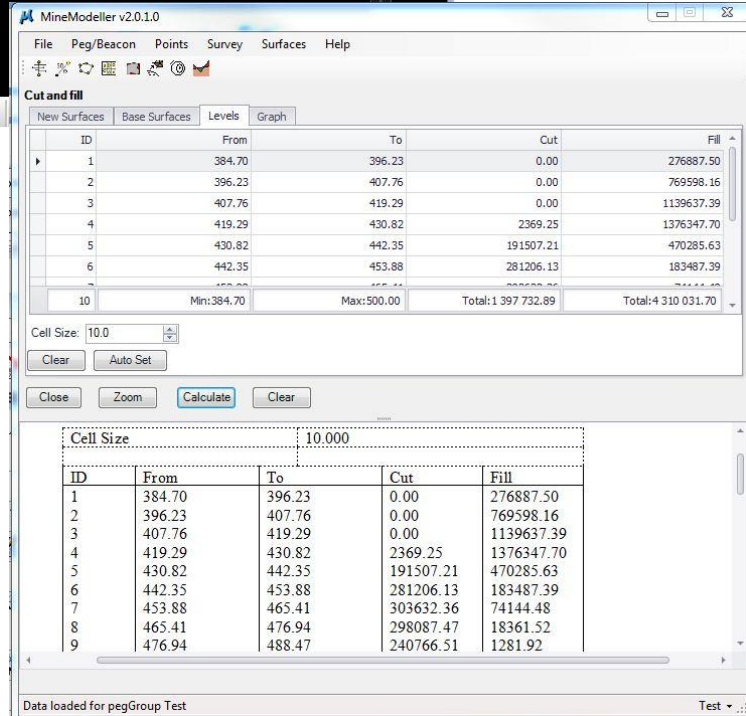
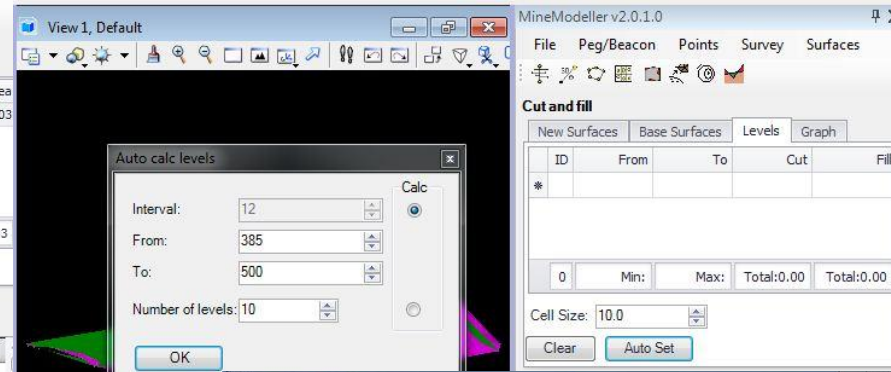
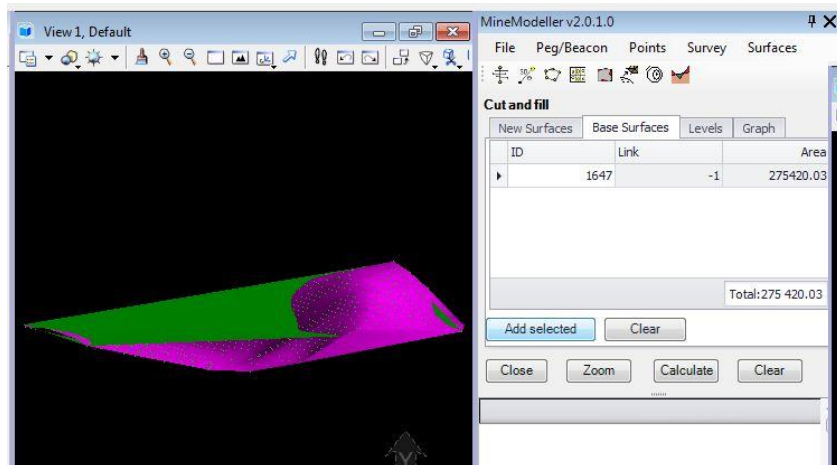
The screenshot displays the MineModeller v2.0.1.0 interface. The main window shows a 3D view of a terrain model with several horizontal contour lines. The right-hand panel contains the 'Contours/Sections' configuration window, which is currently open. This panel includes input fields for Direction X (0.000), Y (1.000), and Z (0.000), along with Start Level (-801250.000), Interval (10.000), Count (17), and End Level (-801240.000). There are 'Pick' checkboxes and a 'Flip' button. Below these settings, a 'Contoured 1 surfaces' section contains 'Contour' and 'Close' buttons. At the bottom of the panel is a table with 'Grid' and 'Graph' tabs. The table lists the following data:

ID	Level	Area	Volume
648	-801250	68.08	680.796957130599
652	-801240	148.63	1486.33104459783
656	-801230	389.87	3898.70585744755
660	-801220	440.30	4403.04293254679
662	-801210	587.34	5873.43582403998
664	-801200	2220.04	22200.384363206
667	-801190	2624.35	26243.5000845088
670	-801180	3019.70	30197.0153538654
673	-801170	614.31	6143.07262379291
677	-801160	1034.63	10346.2008585407
Total:		23 178.98	231 789.79

At the bottom of the interface, the status bar shows 'Plotted 26 Point(s)' and a 'Test' dropdown menu. The coordinate fields at the very bottom indicate X: -895378.2378, Y: -801188.0881, and Z: 316.0106.

Cut & Fill

Cut & Fill done gives graphs and reports.



Save to databases

You can now also use Minemodller to synchronize with Oracle or SQL Server spatial data.

Each layer in the below screenshot is linking to a separate spatial query.

The screenshot displays the Minemodller v4.0.0.0 interface. The main window shows a data table with columns: SURFACE_ID, MINE, LAYER_N..., LAYER_..., STRAT_S..., BASE, NOTE, EST, DIGITISED, USER_CR..., DATE_CR..., and USER_MOOD... The table contains 126 rows of data. The right-hand panel shows the 'Layer Sources' window, which lists the following layers:

Number	Name	Type	Error
0	Casts	Grade	
1	TestUStation	Grade	
2	Lithology	Grade	
3	Map_Surfaces	Grade	
-1	Default		

The bottom portion of the screenshot shows a 3D visualization of a terrain surface with a pink line and blue markers overlaid on a grid.

Foundation software needed

Foundation Software needed:

FOR THE DATABASE SERVER:

- Windows Server 2003 R2 or above
- Microsoft SQL Server 2005, 2008 or above or Oracle 9.x or above or SQLite

FOR THE CLIENT MACHINES:

- Bentley Microstation V8i or above (if purchasing MineModeller, not needed for SurveyXL)
- Microsoft Windows XP or above



THANK YOU

Visit primethought.biz for more information

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