

becomes



Surpac 6.3

Solids



3DEXPERIENCE

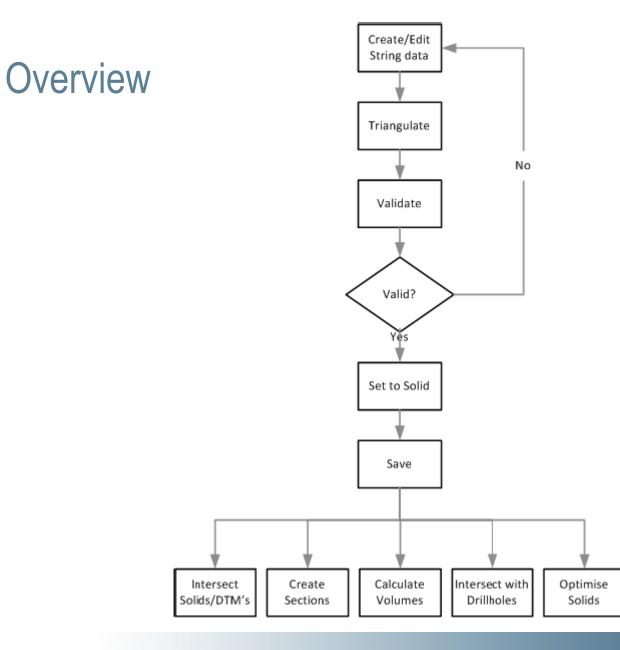


Table of Content

- Solids Concepts
- Preparing Data
- Creating a Solid
- Editing Solids
- Validating Solids
- Viewing Solids
- Triangulating Using a Centre Line and Profile
- Intersecting Solids and DTM Surfaces
- Creating Sections
- Reporting Volumes of Solids
- Intersecting Drill Holes with Solid Models











Solids Concepts

- Solid modelling allows us to use triangulation to create three-dimensional models based on Digital Terrain Models (DTMs) and String files.
- Solid models use triangles to link polygonal shapes together to define a solid object or a void.
- Solid models can be used for:
 - ▷ Visualisation
 - ▷ Volume calculations
 - Extraction of slices in any orientation
 - ▷ Intersection with data from the geological database module
- Solid model is created by forming a set of triangles from the points contained in the string.
- Triangles in a solid model may completely enclose a structure.





Solids Concepts

- ► A solid model is made up of a set of non-overlapping triangles
- Triangles form objects that may have numerical identifier between 1 and 32000
 Objects represent discrete features in a solid model
- Object and trisolation numbers give reference to all the objects contained in solid model
- An object trisolation may be open or closed or can contain both trisolations
 - > Open: if there is a gap in the set of triangles that make up the trisolation
- ► The reasons for treating objects as open or closed:
 - A closed object can have its volume determined directly by summing the volumes of each of the triangles to an arbitrary datum plane
 - ▷ A closed object always produces closed strings when sliced by a plane
 - A closed object could be used as a constraint in the block modelling module





WE ask the right questions e can change the world.

Preparing a Data

- To ensure trouble free model creation, the integrity of strings should be checked prior to beginning modelling
 - ▷ String direction:
 - Strings should all be in the same direction, even if they are open strings
 - ▷ Foldbacks (spikes):
 - Foldbacks in a string will cause problems with your model as they may cause overlapping triangles to be formed
 - ▷ Excessive number of points:
 - Large number of points will slow model creation and you should filter strings as necessary
 - ▷ Duplicate points
- All data to be modelled needs to be in the same coordinate systems
- Use of normal <u>plan projection</u> will considerably simplify the modelling of the data





Preparing a Data

Edit > Layer > Clean

🔍 Clean layer	×
Function	
00	osure
00	ross-overs
💿 D	uplicate Point
OD	uplicate Segment
○ M	inimum Area
○ M	inimum Points
O 51	pikes
Target (Minimum trap distance 0) mark () remove () warn) layer () string () segment
Maximum trap distance 0	.05
Marker colour red	
Measure distances and an	gles in 🔿 2D space 💿 3D space
0	Apply 🗙 Cancel





Assignment 1 – Preparing Data

- Prepare mod1.str for further processing
- Edit > Layer > Clean
 - ▷ Check if the data is in right projection
 - ▷ Check for spikes
 - ▷ Check for duplicate points
 - ▷ Save as mod1.str

 Set to 3D space or Surpac will delete all points trying to flatten the model
 Where applicable, set minimum trap distance to 0.05, otherwise Surpac will remove too many points.

🕙 Clean layer	×
Function	
0	Closure
0	Cross-overs
۲	Duplicate Point
0	Duplicate Segment
0	Minimum Area
Ô	Minimum Points
\odot	Spikes
Action	⊚ mark ⊚ remove ⊚ warn
Target	🖲 layer 🔘 string 🔘 segment
Minimum trap distance	0
Maximum trap distance	0
Marker colour red	-
Measure distances and a	angles in 💿 2D space 🔘 3D space
•	Apply Xancel





Creating a Solid

- Various triangulation methods can be used to create a solid model
 - ▷ Using between segments
 - ▷ Using control strings
 - ▷ Using bifurcation techniques
 - ▷ Using manual triangulation
 - ▷ Using many segments
 - ▷ Using segment to a point
 - ▷ Using inside segment and one triangle

olic	ls.	Block model	[Design	Plotting	Customise	Help					
	Tr	iangulate	۲		Between s	egments						
	Eq	lit object	•		Inside a segment							
	Eq	it trisolation	•		Segment to) a point						
	Eq	lit triangle	١.		Many segn	nents						
	Di	splay	•		Using conti	rol strings						
	V	alidation	١.		By manually selecting points							
	S	olids tools	١.		One triangl	e						
					-	ent to two se <u>c</u> ent to many se	·					
					Extrude and triangulate a segment							
					Extrude and triangulate a string							
					Extrude and triangulate a string range							
					Using centre line & profile							
					Triangulation algorithm							
					Connected segments							
					String morp	ohing						

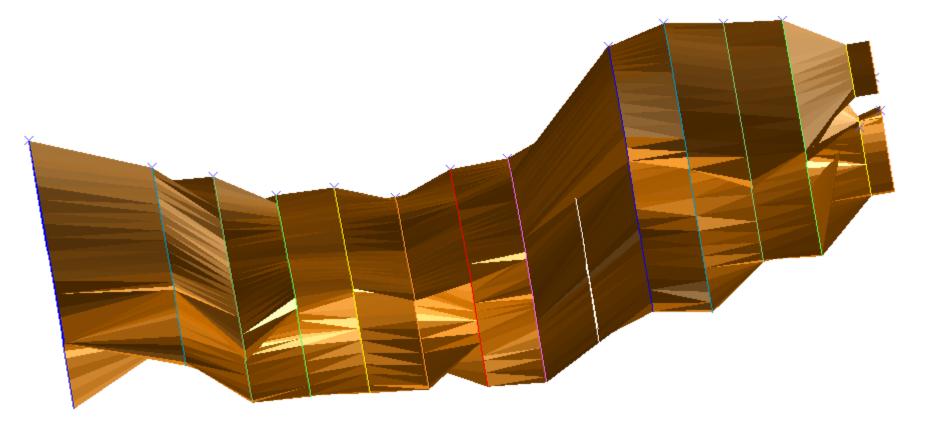
Also available in the solids toolbar (profile)

╘╔╕╕╗╗╮┍╵╘ҵҵѻ҇ѻℭ҄ҡ҄Ҟ҉Ҡ҉Ҡ҉ӏ<mark>ѷ</mark>Ҍ҂ӹӂҩ╵╭_┶҄҂┼╶╵<u>╡Ӽѽѽѽӹѿ</u>ѡѡ ๏ѻѵ_ѽ๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛

S GEOVIA



Why we use different triangulation types...



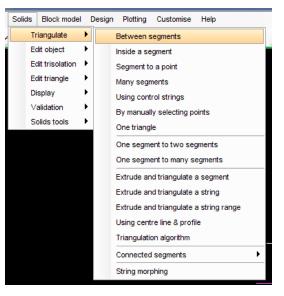




| **IF WE** ask the right questions we can change the world.

Triangulating using Between the Segments

- Triangulation between segments is the most commonly used of the solid creation techniques
- It uses algorithms that minimise the surface area of triangles formed between polygons
- It is simple to use and for many objects produces the best results

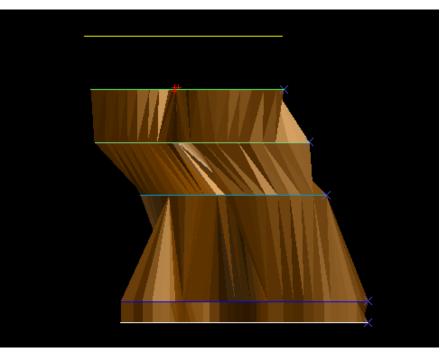






Assignment 2 – Triangulating between segments

- Open mod1.str
- Display string numbers
- Triangulate between segments 1-2-3-4-5
- Press Esc
- ► Save as Mod1.dtm







F WE ask the right questions ve can change the world.

Triangulating using Control Strings

- Control strings are strings created to control the triangulation process WHY?
- These strings link together points on your object polygons that have a strong structural relationship
- Rules:
 - ▷ 2-10 control strings
 - ▷ The first control string (master) must link all the segments to be triangulated
 - Subsequent control string may link some or all of the segments and may not have more points than master control string
 - ▷ Control strings must be all in the same direction
 - Control strings must not cross
 - ▷ Do not use same string numbers as the polygons you are modelling
 - ▷ Strings should make sense structurally





WE ask the right questions we can change the world.

Assignment 3 – Triangulating, Control Strings

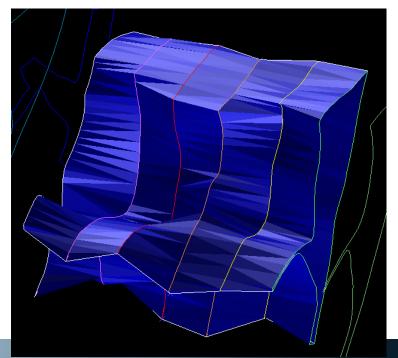
- Open mod2.str
- Solids > Triangulate > Using control strings
- Click on each control string
- ► Esc

GEØVIA

Enter the information below:

Define the trisolation to be created								
Function	TRIANGULATE CONTROL STRINGS							
Layer name	mod2.dtm							
Object	2							
Trisolation	1							
2	🗸 Apply 🔀 Cancel							

Save as Mod1_control_string.dtm





Triangulation using Many Segments

- Useful if the data is not numerically sequenced
- ► It is possible to select segments in the order you want triangulation to occur
- Rules:
 - ▷ Organize data in numerical sequence if selecting strings or segments by a range
 - Only display what needs to be displayed if selecting segments manually i.e. erase objects that might obscure the string data





Assignment 4 – Triangulation, Many Segments

- ► Open mod3.str (display strings 11 14)
- Select Solids > triangulate > Many segments

Define the trisolation to be created	×			
Function TRIANGULATE MANY SEGMENTS				14
Layer name mod3.dtm				
Object 3				
Trisolation 1				13
Apply	Cancel			1.
<u>.</u>			6	
Triangulate many segments options	1			1
Use O Manual	1			
Range selection for the segments				
				11
Do you wish to close both ends of the trisolation to create a 3DM? 🛛 🗌				11
Do you wish to create a solid or a void?	Range definition		×	
		amont Danag		
Apply 🔪 🔀 Cancel	String Range O Second Secon	egment Range		
	Segment number 1			
	String range 11,14			

Apply

🗶 Cance

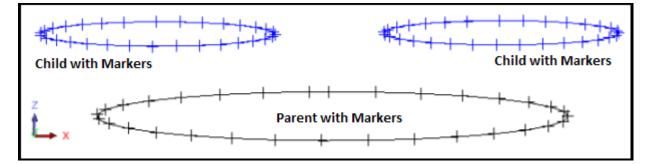


SDS.COM/GEOVIA© Dassault Systèmes | Confidential Information | 10/29/2012 | ref.: 3DS_Document_2012



Triangulating using Bifurcation Techniques

- One segment to many segments
 - ▷ For triangulation between one closed parent segment and many children



- One segment to two segments (bifurcation union)
 - ▷ Function allows you to triangulate between one closed parent and two children.
 - ▷ Can give more flexibility in where the bifurcation actually occurs
 - ▷ It has the potential to be more geologically correct
 - Option to join all of the parent segment to all of the child segments, or to split the parent segment up and join a portion of it up with each segment





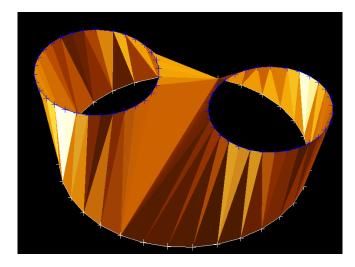
Assignment 5 – Bifurcation Techniques

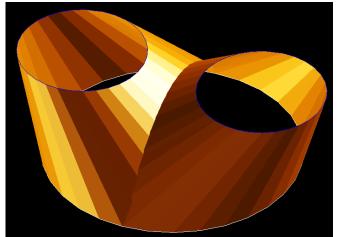
- A. Create bifurcation on strings:
 - ▷ Open Bifurc1.str
 - ▷ Display point markers
 - ▷ Select bifurcation one to many
 - ▷ Follow instructions
 - ▷ Save as one_to_many.dtm

- B. Now use one to two segments
 - ▷ Open Bifurc1.str
 - ▷ Select bifurcation one to two
 - ▷ Follow instructions

GE@VIA

- Save as one_to_two.dtm
- ▷ Notice the difference?







IF WE ask the right questions we can change the world.

Triangulating using Manual Triangulation

- Gives high level of control, while still leaving a degree of automation to the triangulation process
- You are able to create solid of extremely complex geometry that will exactly match geometrical interpretation of the data
- You control start and end points of the triangulation on a segment-by-segment basis
- Same direction of strings rule must apply







Triangulating using Segment to a Point

- This function allows you to automatically triangulate from a selected segment to a selected point
- Another technique which can be used to close the ends of an open DTM
 Closed DTMs are significant because the volume report can be generated from them
- The triangulate to a point function can be used to accurately model 'pinch outs' in geological lenses





Triangulating using String Morphing

- This function creates new segments equally spaced between two existing segments which are selected in graphics.
- String morphing can greatly improve the nature of solid models by ensuring a smoother transition between structures on adjacent segments, and can greatly reduce the *staircasing* effect when solid modelling.
- Morphing additional intervening segments often enables the solid modelling of otherwise difficult segments.





F WE ask the right questions we can change the world.

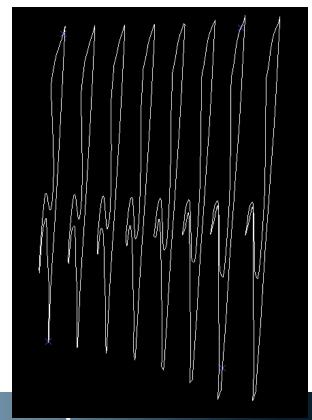
Assignment 6 – String Morphing

- Open mod1.str
- Display string numbers
- Select: Solids > Triangulate > String Morphing

String morphing	X
Number of new segments	5
New string number	20
Preserve master segments?	
Remove duplicates?	V
Trap distance for removing duplicates	0.1
Remove control strings?	V
Triangulate segments?	
Object ID	1
Trisolation ID	1
Apply	🔀 Cancel

- Select: Solids > Triangulate > Many segments
- Select Manual in the following form
- Save as morph_mod1.dtm

GEØVIA





Triangulating Using Centre Line & Profile

- This function allows you to create a DTM of a given profile along a specified string
- The centre line is chosen by selecting a string in the graphics window with the mouse and the profile is taken from the string file
- This profile is placed at each point on the centre line string and rotated to be perpendicular to the centre line string
- Finally the strings are stitched together to create a solid
- ► The ends of this DTM may be optionally closed or left open
- In order for the profile to be correctly applied to a centre line, the centre bottom point of the profile needs to have coordinates of X=0 and Y=0

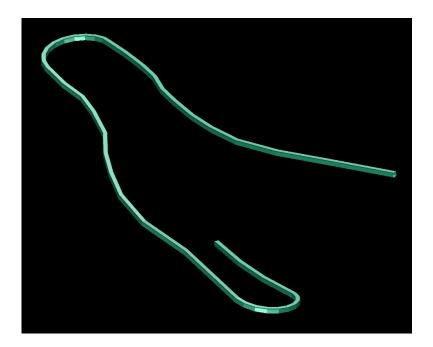




Assignment – Centre Line & Profile

- Open Dcl100.str
- Select Solids > Triangulate > Using centre line and profile

Triangulate centre line and profile		X
Enter Profile String File		
Location profile		•
ID number 1		
Use explicit object ID		
Object ID 1		
Profile Scale Factor 1		
Define Offsets from Centreline String —		
Yo Xo	Z O	
Profile Rotation (in degrees)		
Progressive Profile Expansion Along Cen	treline String	
Factor 1		
Vertically Constrained		
Triangulate first face		
Triangulate last face		
2	🖌 🖌 Apply	🔀 Cancel



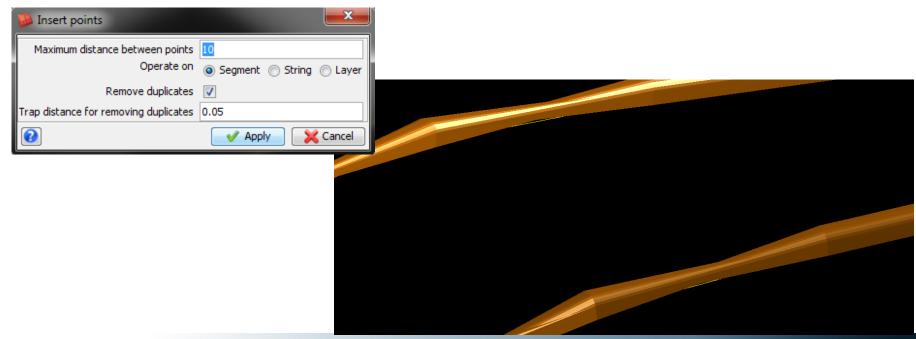




| **IF WE** ask the right questions we can change the world.

If you see twisting of the DTM...

- ► If the model looks like this, there are not enough points along the string.
- ► To add more points:
 - ▷ Edit>segment>normalise segment
 - ▷ Fill in a below and apply







| **IF WE** ask the right questions we can change the world.

Editing Solids

- Functions for making permanent changes to the objects, trisolations and triangles
 - ▷ Edit object: applies to object and all trisolations of the selected object
 - ▷ Edit trisolation: applies to trisolations and all triangles on the selected trisolation
 - ▷ Edit triangle: applies to individual triangles

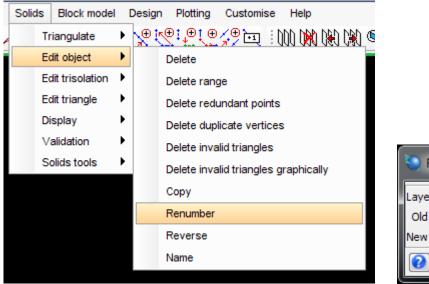
	_																	
Solid	s Block model	D)esigi	n Plotting Customise	Help	Solid	ls Block model	De	sign	Plotting Customise	Help	Solid	s Block model	D	esign	Plotting	Customis	e Help
	Triangulate	۲					Triangulate 🔹 🕨						Triangulate	×				
	Edit object	۲		Delete			Edit object		⊕ [ĸ	⊕∶₽Į⊕∠⊕⊨∃∭	nh h ai n nain hain (Edit object	•	.⊕ [r.	⊕i⊕i⊕	€ ⊡	: 000 🕅 080 🕅
	Edit trisolation	۲		Delete range			Edit trisolation			Delete			Edit trisolation	۲				
	Edit triangle	۲		Delete redundant points			Edit triangle 🔷 🕨			Delete range			Edit triangle	•		Delete sing	le triangle	
	Display	۲		Delete duplicate vertices			Display 🕨 🕨			Delete redundant points			Display	•		Delete trian	gles attacl	ned to a segment
	Validation	۲		Delete invalid triangles			Validation 🔹 🕨			Delete duplicate vertices			Validation	•		Delete trian	gles inside	a segment
	Solids tools	۲		Delete invalid triangles gra	aphically		Solids tools			Delete invalid triangles			Solids tools	۲		Delete trian	gles conne	ected to a point
				Сору						Delete invalid triangles gra	aphically				⊾ [⊡]	Display tria	ngle prope	rties
				Renumber						Сору					_			
				Reverse						Renumber								
Name						Reverse												
									Name									
						Optimise												
										Split connected triangles i	into trisolations							

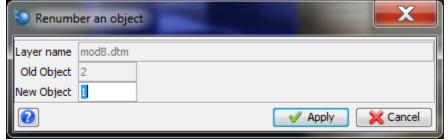




Assignment 7 – Editing Solids

- Assignment:
 - ▷ Change the solid number 2 to solid number 1 in file mod8.dtm









Validating Solids

- To check that the model has been correctly formed
- Only correctly formed models are used for volume calculations, block model constraints, intersecting drillholes...

 Solids
 Block model
 Design
 Plotting
 Customise
 Help
- Different validation techniques

Solid	s Block model	Design	Plotting	Customise	Help
	Triangulate I	•			
	Edit object	• <u>⊕</u> [<	⊕i'⊕i ⊕	(⊕⊡ :)	00 D X 0 D&C
	Edit trisolation		×0 × •		
	Edit triangle				n - n - 2
	Display I				
	Validation	•	Validate ob	oject	
	Solids tools	•	Validate tri	solation	
			Set object i	to solid or voi	d
			Set trisolati	ion to solid or	void
			Display ope	en sides for o	bject
			Display ope	en sides for tr	risolation
			Close oper	n sides for obj	iects
			Close oper	n sides for tris	olations
			Close oper	n sides by sel	ection
			Hide duplic	ate triangle e	dges
			Hide invalio	triangle edge	es
			Hide open :	side edges	
			Hide self in	tersection ed	ges





FWE ask the right questions ve can change the world.

Validating Solids

- Creates topology index for a DTM and validates it
 - > Topology index = each triangle contains information about three triangles which are its neighbours
- Trisolation is evaluated as being open or closed
- Validation consists of looking for:
 - Duplicate triangles
 - ▷ Invalid trisolation edges
 - ▷ Self intersecting triangles
 - ▷ Open sides triangles
- If all above mentioned are found, these are highlighted on the screen in a user chosen colour and the trisolation is validated as false
- Set object (trisolation) to solid or void
 - ▷ To ensure that all the triangles in all trisolations of a DTM are consistent in direction





Validating Solids

🥘 Set neighbour:	s and validate objects								
Layer name	mod10.dtm								
Object range									
Location of report file	valid	×							
Id number	1								
Self-intersection triang	les colour <mark>cyan</mark>	¥							
Duplicate triangles colo	Duplicate triangles colour								
Invalid edges triangles	colour orange	~							
0	(🗸 Apply 🛛 🔀 Cancel							

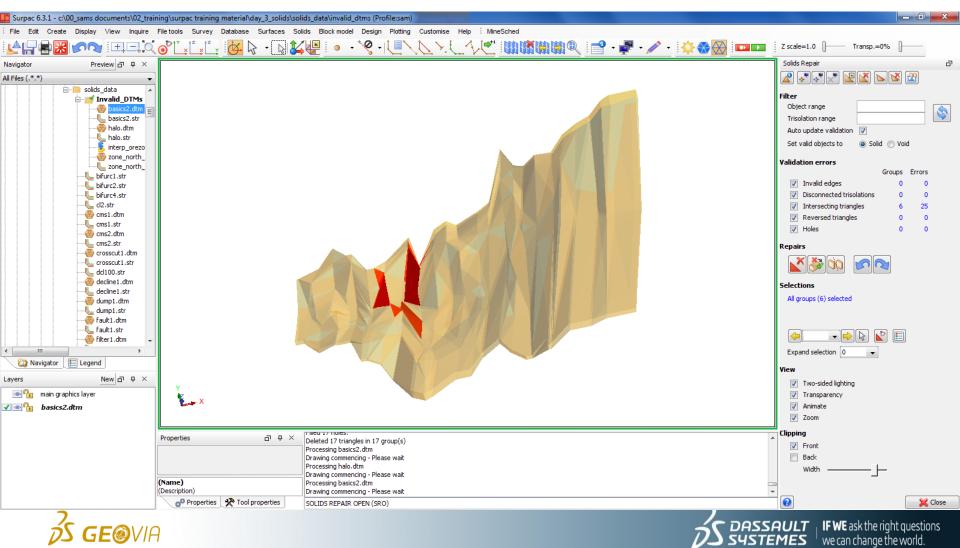
OBJECT 1, TRISOLATION 1
Validated = TRUE Status = CLOSED
DUPLICATE TRIANGLES:
TRIANGLES ATTACHED TO INVALID EDGES:
SELF INTERSECTION TRIANGLES:
OPEN SIDES TRIANGLES: NONE





Solids Fixing

► Fixing solids in Surpac is automated.



Solids Fixing

- ► In solids > validation > solids repair.
- ► A new toolbar will be displayed.
- ► The problem triangles are highlighted and categorised.
- ► These can be deleted, redrawn, split, etc.
- In the folder Invalid_DTMS there are several solids to test.
 Can you fix all of these solids?
- Set valid objects to Solid O Void Validation errors Groups Errors Invalid edges 2 6 Disconnected trisolations 1 0 0 Intersecting triangles 5 1 Reversed triangles V 0 0 1 Holes 0 0 Repairs Selections All groups (3) selected R • Expand selection 0 Ŧ View Two-sided lighting 1 Transparency V V Animate Zoom Clipping Front Back Width 0 K Close





Solids Repair

Filter

📲 🐺

Object range

Trisolation range Auto update validation

1

IF WE ask the right questions we can change the world.

D

\$

Reporting Volumes of Solids

- Used to generate .not file indicating the status, surface area and volume for each trisolation of an object.
- Function calculates the volume of a closed object or trisolation
- In order to generate a volume, the solid must be validated and also have its direction set
 SOLID MODELLING OBJECT REPORT

Solids	Block model	[Design	Plotting	Customis	se Help
Ti	riangulate	Þ				
E	dit object	۲	.⊕ [r.(ÐI [°] ⊕Í⊕	(⁺)-1	1900 (XX) (XX)
E	dit trisolation	١.	No	X0 🕺 🦷		
E	dit triangle	×.	\$ 175 	<u> </u>	<u>∽⊼ </u>	a n eit
D	isplay	×.				
V	alidation	۲				
S	olids tools	۲		Create sec	tions	
			:	Section us	ing centre	line
				Report volu	ume of soli	ids

```
Layer Name: mod12.dtm
Object: 1
Trisolation: 1
Validated = true
Status = solid
Trisolation Extents
× Minimum: 5184.820 × Maximum: 5468.470
Y Minimum: 10055.129 Y Maximum: 10634.653
Z Minimum: 836.580 Z Maximum: 1078.760
Surface area: 421501
Volume : 5337158
Object: 2
Trisolation: 1
Validated = true
Status = solid
Trisolation Extents
× Minimum: 5225.070 × Maximum: 5477.490
Y Minimum: 10619.466 Y Maximum: 10920.397
Z Minimum: 904.633 Z Maximum: 1058.910
Surface area: 191274
Volume : 2293278
Totals
Surface area: 612775
```

Volume : 7630436



Intersecting Solids and DTM Surfaces

- With intersections of solids you can create:
 - \triangleright Union solids
 - ▷ Intersect solids
 - Outersect solids \triangleright
 - ▷ Clip solid above DTM
 - ▷ Clip DTM outside a solid

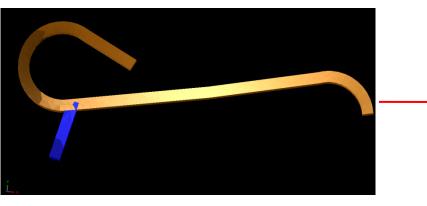
Solid	sk	Block model	[Design	Plotting	Customis	e Help	1
Triangulate I		Þ		⊕: [†] ⊕í⊕	,⊕ ⊡	: 000 🕅		
Edit object			۲.	, NR	X9 📉	🖳 🎾 📗	F 🖳	ÐÌ
	Edit trisolation 🔸		•		1000000			
	Edit triangle		•					
	Display 🕨		•					
	V	alidation	۲					
Solids tools			۲		Create sec	tions		
					Section usi	ng centre l	line	
					Report volu	ume of soli	ds	
					Drillhole 3D	M intersec	tion	
					Intersect s	olids		
					Union solid	s		
					Outersect	solids		
					Clip solid al	oove a DTN	M	
					Clip solid b	elow a DTI	M	
					Clip DTM in	side a solio	b	
					Clip DTM ou	utside a so	lid	
					Points insic	le / outside	e a solid	
					File interse	ction		•

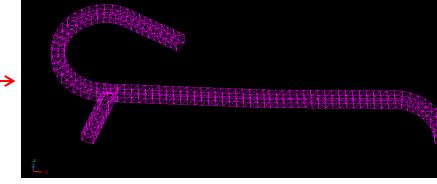




Intersecting Solids and DTM Surfaces

- Solids Union:
 - ▷ This function allows you to merge two solids together
 - ▷ Solid Tools > Union Solids
 - ▷ The order of selection is not important





(decline1.dtm and crosscut1.dtm)





IF WE ask the right questions we can change the world.

Assignment 8 – Intersecting Solids

- Open decline1.dtm and crosscut1.dtm
- ► Type ZA
- Select: Solids > Solid Tools > Union Solids

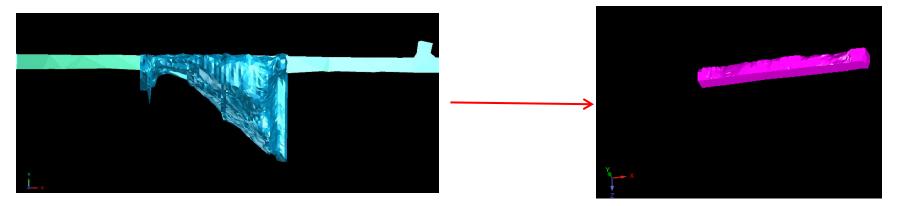
🗿 3dm/3dm union re:	ults storage		
Graphics layer name Object number Additional object number	1		
		Apply X Cancel	





IF WE ask the right questions we can change the world.

- Solids Intersection:
 - Function allows you to intersect two solids and creates a new solid, which represents the volume common to both
 - Solid Tools > Intersect Solids
 - ▷ Order of selection is not important

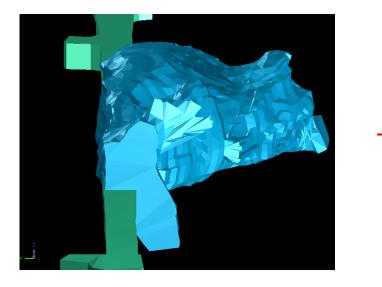


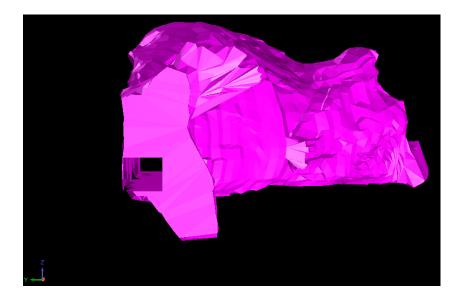




WE ask the right questions e can change the world.

- Outersection of Solids:
 - ▷ Function allows you to find the difference between two solids
 - ▷ The order of selection is important:
 - First to select is the solid to be outersected
 - Second to select is the outersecting solid
 - ▷ Solid Tools > Outersect Solids



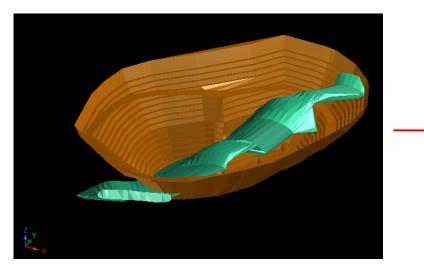


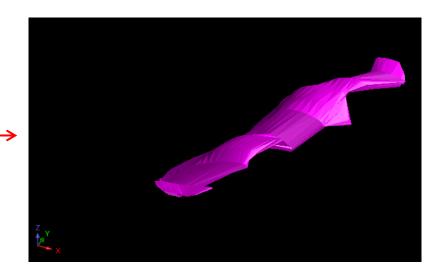




IF WE ask the right questions we can change the world.

- Clipping a Solid Above a DTM:
 - ▷ Function allows you to find the portion of a solid that is above DTM
 - Creating a solid that represents the volume of an ore body above the DTM
 - ▷ Solid Tools > Clip Solid Above a DTM



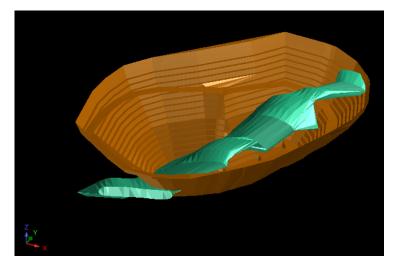


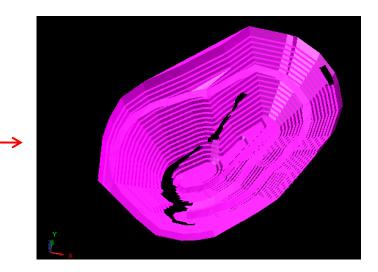




IF WE ask the right questions we can change the world.

- Clipping a DTM Outside a Solid:
 - ▷ Function will retain part of the DTM that occurred outside the solid
 - ▷ Solid Tools > Clip a DTM Outside a Solid









| **IF WE** ask the right questions we can change the world.

- Three different methods used to create sections from solids:
 - ▷ Creating sections using the interactive method
 - ▷ Creating sections by range
 - ▷ Creating sections using a centre line
- Creating sections using the interactive method:

ystèi							
Solid	s Block	model [Design	Plotting	Customise	e Help	Н с
	Triangulate			Ði⊕í⊕	,⊕⊡	000 🕅	
	Edit object		. NB	X0 🔨 🤇			٦١F
	Edit trisola	ation 🕨	~~/~	<u>×//× ×//× </u>	Y/A Y/A I L		
Edit triangle		le 🕨					
Display		•					
	Validation	i 🕨					
	Solids too	ils 🕨 🕨		Create sec	tions		
			:	Section us	ing centre li	ne	
				Report volu	ume of solic	ls	
				Drillhole 3D)M intersect	ion	

	s della d
Section orientation	Press this button to digitise the axis
Perpendicular to axis	
C Parallel to axis	Digitise
Dip -90	
Axis start	Axis end
Y 10000	Y 11000
x 5350	X 5350
Z 960	Z 960

Extract slices through objects								
ayer name mod12.dtm Define the objects to be siced and the new layer name								
Slice Layer tmp								
Object range 1,2								
Define the files to be created which contain the slices								
Location int_sec								
Section definition method								
C Define sections using a range								
Oefine sections using interactive slider controls								
Select the section start, end and interval								
Start distance 10000 11000 10000								
End distance 10000 11000								
Section spacing 1 1000 50								
Apply Kancel								

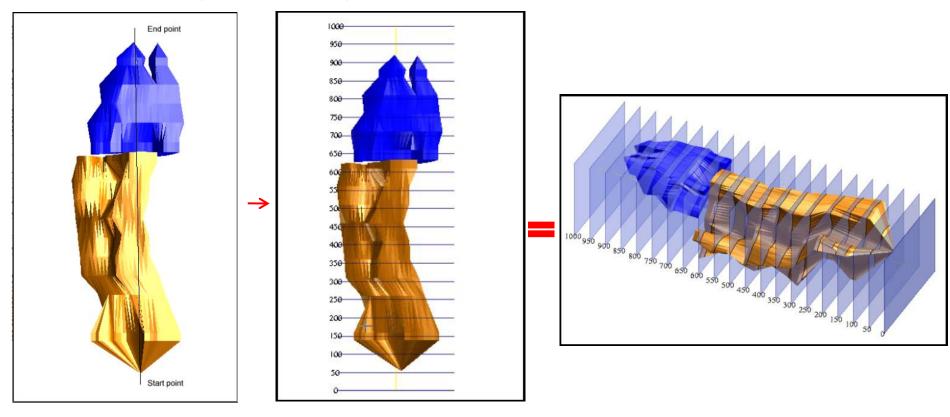


- Creating sections using the interactive method:
 - ▷ Function allows you to extract horizontal, vertical or inclined slices through an object
 - ▷ The plane of intersection of the slices is defined by entering the Y,X,Z coordinates at each end of a 3D axis line and by specifying the interval along that axis at which slices are to be taken
 - ▷ Two results are produced:
 - Range of a string files which contain the extracted sections in section coordinates (saved to disk)
 - ► File which contains the extracted sections in real world coordinates → displayed on the screen in different layer
 - Reason to slice a DTM is to show one section at a time through a geological model along with the drill holes for that section posted to it





Creating sections using the interactive method:







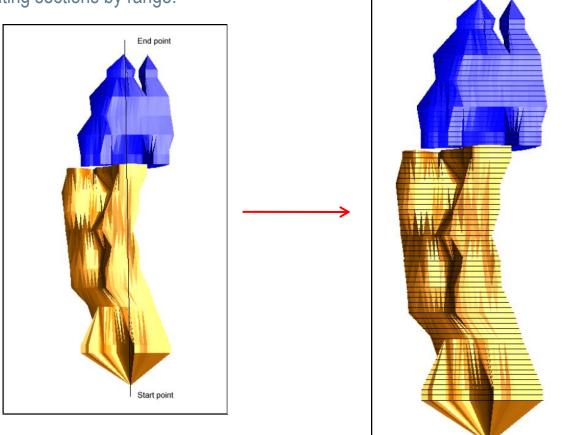
Creating sections by range:

2012			Extract slices through objects
bourment 20	🔄 Define an axis line	×	Layer name mod12.dtm Define the objects to be siced and the new layer name
Solids Block model Design Plotting Customise Help : Triangulate Edit object Edit trisolation Edit trisolation Edit triangle Image: Create sections Solids tools Create sections Section using centre line Report volume of solids Drillhole 3DM intersection	Section orientation Press this button to digitis Perpendicular to axis Digitise Dip -90 Axis start Axis end Y 0 X 0 Z 0	e the axis	Slice Layer tmp Object range 1,2 Define the files to be created which contain the slices Location sec Section definition method C Define sections using a range Define sections using interactive slider controls Define the slices required by a distance range Range 10140,10880,10 Output file IDs Cancel





Creating sections by range:







- Creating sections using a centre line:
 - ▷ This function allows you to extract slices through a DTM and/or a block model in the current graphics layer along a segment (centre line)
 - ▷ The centre line along which the slices are taken is defined by selecting two points on a segment
 - ▷ Slices are taken along the segment at a specified spacing and at a specified dip

			Extract slices through objects
	Slice information	×	Define the objects to be sliced and the new layer name
Solids Block model Design Plotting Customise Help : 0 Triangulate Edit object Triangulate Triangulate Edit object Triangulate Edit object Triangulate Tri	First slice dip 90 degrees		Object range Slice layer ring slices Slice Block Model ? BM Slice Layer
Edit trisolation Edit triangle Display Validation Create sections Solids tools Report volume of solids	Slice dip angles • absolute • relative The slices for any portion of the centre line segment that is vertical will only be created in the XY plane regardless of the dip values entered for the slices. The dip is effectively locked at 90 degrees for any slices in a vertical centre line.		Define the files to contain the slices Location 1055sec ID numbers are sequence numbers C chainages Start ID number 1
		Cancel	Chainage offset 0 Coordinates real world O section





Assignment 9 – Sections using centre line

Open cl2.str

GE@VIA

- Open stope2.dtm
- Select: Solids > Solids tools > Section using centreline

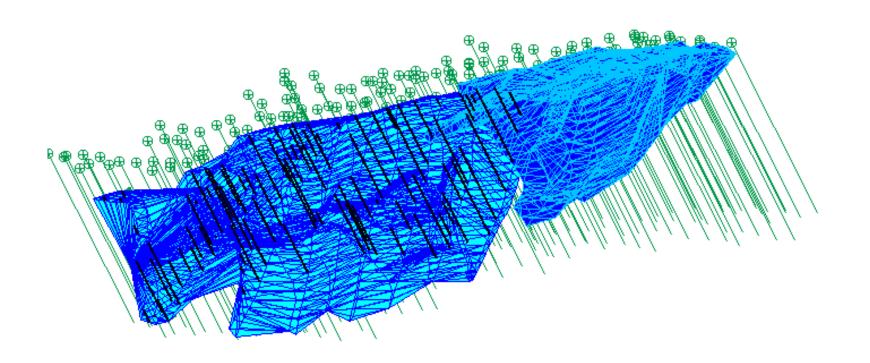
Slice information	Extract slices through objects
Spacing I Calculate no. of Slices Number 64 Calculate Spacing First slice dip 90 degrees Last slice dip 60 degrees Slice dip angles (absolute (relative))	Define the objects to be sliced and the new layer name Object range Slice layer Slice Block Model ? BM Slice Layer
The slices for any portion of the centre line segment that is vertical will only be created in the XY plane regardless of the dip values entered for the slices. The dip is effectively locked at 90 degrees for any slices in a vertical centre line.	Define the files to contain the slices Location 1055sec ID numbers are escuence numbers chainages Start ID number 1 Chainage offset 0 Coordinates ereal world section Coordinates Cancel

Turn edges off to view the sections



Intersecting Drill Holes with Solid Models

This function allows you to perform intersection between drill holes stored in a drill hole database and 3D objects and then store the intersection data in a database







WE ask the right questions te can change the world.

Assignment 10 - Drill Holes/Solid Intersection

- Open mod12.dtm and connect to solids.ddb
- Display drillholes, accept defaults
- Select Database > Analysis > Drillhole 3DM intersection

						Intersect drill ho	les and objects
🕒 De	fine query constraints			X		Define the object nur	ber to intersect with
Table N	Name collar					Object 1	•
	Field Name	Operand	Constraint Value	Load		Name the layer for sa	ving the resultant hole trace segments
1				Save		Layer name main gr	aphics layer 👻
	L					Save intersec	tions to database
						Table name	intersect 🗨
						Field name	zone 💌
				-		Intersection of	ode south
2			🖌 🎸 Apply	🛛 💥 Cancel		Define the log file for	results
					-	Report file name int	ersect 👻
						Format .n	ot - Surpac Note File
						2	Apply 🔀 Cancel



3DS.COM/GEOVIA© Dassault Systèmes | Confidential Information | 10/29/2012 | ref.: 3DS_Document_2012



Assignment 10 - Continued

Select: Database > Edit > View table constrained

Select the database table to process	×			Define view/edit rows template
Table name intersect	Cancel			Table Name intersect Field Name 1 hole_id 2 samp_id
Define query constraints		×		3 depth_from 4 depth_to 5 zone
Table Name intersect Field Name Operand	Constraint Value	Load		Zone Zone Zone Zone Zone Zone Zone Zone Zone Zone
		Save	4	
	🗸 Apply	Cancel		

- Close the database
- ► Turn transparency to 40%



IDS.COM/GE





Any Questions?







DASSAULT SUSTEMES | IF WE ask the right questions we can change the world.