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LAMPIRAN PETA TUNJUK LOKASI PENELITIAN



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T	FAK	ULTAS TEKNIK TAS HASANUDDIN 2022					
SKRIPSI PERENCANAAN JANGKA PANJANG PIT COMPARTMENT 2 DI BLOK BAHODOPI PT VALE INDONESIA TBK PROVINSI SULAWESI TENGAH							
DIGAMBAR OLEH	TASYAH SHAFIRA D111181006						
PEMBIMBING UTAMA	Dr. Eng. RINI NOVRIANTI SUTADJO TUI, S.T., M.T. NIP. 198311142014042001						
PEMBIMBING PENDAMPING	Dr. ARYANT NIP. 1	I VIRTANTI ANAS, S.T., M.T. 197101012010121001					
PETA TUNJUK LOKASI PENELITIAN							
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VALUATION LABORATOR LAMPIRAN B

TOPOGRAFI BLOK BAHODOPI





LAMPIRAN C

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AND VALUATION FEB

BLOCK MODEL PIT COMPARTMENT 2



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DIGAMBAR OLEH	TASYAH SHAFIRA					
PEMBIMBING UTAMA	D111181006 Dr. Eng. RINI NOVRIANTI SUTADJO TUI, S.T., M.T. NIP. 198311142014042001					
PEMBIMBING PENDAMPING	Dr. ARYANTI VIRTANTI ANAS, S.T., M.T. NIP. 197101012010121001					
MODEL BLOK PIT COMPARTMENT 2						
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LAMPIRAD DESAIN PIT COMPARTMENT 2

DESAIN PIT COMPARTMENT 2





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DEPARTEMEN TEKNIK PERTAMBANGAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN 2022						
SKRIPSI PERENCANAAN JANGKA PANJANG AREA <i>PIT COMPARTMENT</i> 2						
	PROVINSI SUL	AWESI TENGAH				
DIGAMBAR OLEH	TASYAH SHAFIRA D111181006					
PEMBIMBING UTAMA	Dr. Eng. RINI NOVRIANTI SUTADJO TUI, S.T., M.T. NIP. 198311142014042001					
PEMBIMBING PENDAMPING	Dr. ARYANTI VIRTANTI ANAS, S.T., M.T. NIP. 197101012010121001					
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DESAIN MINE HAUL ROAD









LAMPIRAN DESAIN DISPOSAL DAN DYKE

DESAIN DISPOSAL DAN DYKE



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PEMBIMBING UTAMA	Dr. Eng. RINI NOVRIANTI SUTADJO TUI, S.T., M.T. NIP. 198311142014042001						
PEMBIMBING PENDAMPING	Dr. ARYANTI VIRTANTI ANAS, S.T., M.T. NIP. 197101012010121001						
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AND VALUATION TABORTON

DESAIN QUARRY





LAMPIRAN PIT COMPARTMENT 2

CADANGAN PIT COMPARTMENT 2

TOTAL CADANGAN PIT COMPARTMENT 2

Bench	<i>Overburden</i> (wmt)	<i>Ore</i> (wmt)	<i>Overburden</i> dan <i>waste</i> (wmt)	SR (%)	<i>Bluezone</i> (Ton)	Ni_ <i>Ore</i> (%)	Fe_ <i>Ore</i> (%)	Si_ <i>Ore</i> (%)	Mg_ <i>Ore</i> (%)	SM_ <i>Ore</i> (%)	Co_ <i>Ore</i> (%)	Cr_ <i>Ore</i> (%)	Al_ <i>Ore</i> (%)	Mn_ <i>Ore</i> (%)	Ca_ <i>Ore</i> (%)	Ton Ni	SSP (wmt)	DKP (dmt)
915	9.763	-	9.763	-	-	- /-	D-1	-	-	-47	10	-		-	-	-	-	-
910	111.903	-	111.903		- / /		5 -	-	-	-	· OA	-	-	-	-	-	-	-
905	173.851	11.812	173.851	14,72	31	2,09	27,92	21,55	12,39	1,74	0,09	1,22	<mark>3,80</mark>	0,62	0,11	100,50	9.450	5.788
900	171.133	94.710	171.133	1,81	933	2,22	20,83	29,69	17,37	1,71	0,06	0,93	<mark>2,7</mark> 6	0,45	0,18	856,65	75.768	46.408
895	256.802	105.163	256.802	2,44	<mark>30</mark> .135	2,00	14,95	35,08	23,31	1,50	0,03	0,69	1,91	0,27	0,27	857,89	84.130	51.530
890	302.750	113.464	302.750	2,67	<mark>24.720</mark>	2,15	20,89	29,44	17,98	<mark>1,64</mark>	0,06	0,91	2,70	0,46	0,18	995,41	90.771	55.597
885	375.539	187.167	376.421	2,0 <mark>1</mark>	28.195	2,26	17,51	32,68	20,70	1,58	0,04	0,78	2,29	0,40	0,20	1.724,87	149.733	91.712
880	336.541	232.178	336.541	1, <mark>45</mark>	63.042	2,09	17,14	32,95	21,15	1,56	0,04	0,75	2,18	0,38	0,23	1.973,40	185.743	113.767
875	334.668	201.394	335.843	1 <mark>,67</mark>	95.080	2,11	15,86	<mark>34,</mark> 25	21,82	1,57	0,04	0,70	2,02	0,30	0,25	1.732,43	161.115	98.683
870	397.340	215.429	398.222	1 <mark>,85</mark>	78.944	2,14	15,82	34,8 <mark>9</mark>	21,13	1,65	0,03	0,71	1,93	0,29	0,24	1.881,77	172.343	105.560
865	342.117	254.270	342.705	1 <mark>,35</mark>	76.720	2,08	15,55	35,27	21,27	1,66	0,03	0,71	1,98	0,29	0,29	2.155,16	203.416	124.592
860	252.136	266.853	253.789	0 <mark>,95</mark>	109.323	2,02	15,04	36,07	21,54	1,67	0 <mark>,03</mark>	0,69	1,95	0,28	0,31	2.197,57	213.482	130.758
855	166.579	202.593	167.895	0 <mark>,83</mark>	82.558	2,03	14,85	36,25	21,68	1,67	0,03	0,68	1,85	0,28	0,33	1.677,79	162.074	99.271
850	125.016	155.405	125.016	<mark>0,8</mark>	78.221	1,95	14,63	36,18	21,91	1,65	0,03	0,69	1,8 <mark>5</mark>	0,27	0,34	1.232,05	124.324	76.148
845	99.287	103.959	99.287	0,96	<mark>61.806</mark>	1,94	14,12	36,78	22,52	1,63	0,03	0,68	1 <mark>,89</mark>	0,25	0,39	823,59	83.167	50.940
840	68.748	76.598	68.748	0,9	<mark>34</mark> .181	2,02	14,17	36,51	22,65	1,61	0,03	0,68	1,90	0,25	0,34	629,99	61.279	37.533
835	46.716	63.506	46.716	0 <mark>,74</mark>	<mark>22.33</mark> 0	1,99	13,34	37,12	23,35	1,59	0,03	0,66	1,66	0,23	0,35	514,26	50.805	31.118
830	20.738	43.153	20.738	0 <mark>,48</mark>	26.782	1,96	14,85	35,57	22,40	1,59	0,03	0,74	2,03	0,28	0,42	343,92	34.522	21.145
825	3.775	21.560	3.775	0 <mark>,18</mark>	17.097	1,89	13,47	36,12	23,78	1,52	0,03	0,67	1,80	0,25	0,45	165,79	17.248	10.565
820	853,52	6.447	854	0 <mark>,13</mark>	8.794	1,86	13,49	35,52	25,58	1,39	0,03	0,67	1,80	0,26	0,60	48,73	5.158	3.159
815	-	2.733	-	-	6.241	2,06	9,48	38,85	29,58	1,31	0,02	0,48	1,08	0,15	0,53	22,96	2.187	1.339
810	-	993,75	-		1.349	1,83	8,67	39,10	29,32	1,33	0,02	0,48	0,68	0,14	0,26	7,40	795	487
Total	3.596.256	2.359.388	3.602.751	1,52	846.482	2,07	16,02	34,54	21,31	1,62	0,04	0,73	2,05	0,31	0,28	19.942	1.887.510	1.156.100

LAMPIRAN I

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STANDAR OPERASIONAL PROSEDUR (SOP)

D



MINING DEPARTEMENT LTP Creating Conceptual Pit Design STANDARD JOB PROCEDURE

NOMOR	: 07.LTP.04
DEPARTEMENT	: Mine Technology
SECTION/AREA	: LTP
PROCEDURE	: Creating Conceptual Pit Design
ТҮРЕ	: Routine
Date of writer	: April 24 th 2007
Number of Revision	: 1
Next Revision	: April 24 th 2008
Pages	: 1 – 15

Made by: Yudhistianto	Date: 24-04-07	
Revised by: Ruth Sitorus	Date: 20-08-07	
Checked by: Harry Ginting	Date:	
Approved by: Dwayne Kroll	Date:	

1. Introduction

The main reason of making this procedure is to make guidance for Vulcan user to have the right procedure to create Pit Design from Vulcan Block model.

2. Responsible

The qualified person in LTP who has already coached or trained in order to produce optimal and safe pit design so there aren't ore will be loss because of an unknown procedure.

3. Definition and Abbreviation

- *dgd = base file for running Vulcan software where all the design file saved
- *dg1 = base file for running Vulcan software that consist of your range working area (Easting Northing and Elevation)
- *dgx = base file for running Vulcan software for all the system and index design file that follows *.dgd
- *scd = base file for running Vulcan Software that related with colour display for every scheme in Vulcan

4. Reference

This Vulcan Software is referring to Vulcan Help menu that available in Vulcan 4.5 and Vulcan 6.0 version menu.

5. Related Procedure

This working procedure is related with other LTP procedures; SJP Transferring Block Model from Datamine to Vulcan.

6. Standard Document and Form

There is a document that must be seen before create a pit. This Document is related with the validity of BM which will be used to create a pit. The document is located in 02-ltp\BlockModel\BM_Assigning Form

7. Training and Other Qualification

Basic training that should be followed is:

- Basic knowledge about Computer and Hardware.
- Basic Vulcan
- Basic of Block Model

8. Environment, Health and Safety Consideration

Good communication between all Vulcan users in every section is important due to limited Vulcan licenses in PT. Inco because it might affect to the bad working condition if all Vulcan users are selfish.

9. Procedure

9.1. Preparation

- Make sure that in your working directory already have all these files below. The file is located in 02-ltp\V\3vulcandata;
- 1. *.dgd
- 2. *.dg1
- 3. *.dgx
- 4. *.scd

Long Term Planning Section – Mine Technology

- Make sure that Block Model that you used to design a pit is the correct one (see SJP transferring block model from datamine to Vulcan & BM Assigning Form).
- Make sure that you copy the right *.scd file. The file is in directory; 02-ltp\V\3vulcandata.
- Make sure that you copy the latest update blue zone. The file is located in 02-ltp\BlockModel\BZ_Orex.

9.2. Job Execution

Creating Pit Design

1. Load the update topography and make triangulation.



Load the update blue zone (mined out area) and make solid polygon, go to Model > Triangle Solid > Polygons

Cut topography triangulation with blue zone solid polygon, go to Model > Triangle Utility > Boolean. Exclude topography area which inside Blue zone boundary and save with new name of topography triangulation.



Long Term Planning Section – Mine Technology

2. Open Block model below topography triangulation.

Go to Block > Open, select the block model

Open Block Model	×
Block model file name 0531smp151s.bmf	Browse
Display block model extent	
3	OK Cancel

Go to Block > Viewing > Block, put "ni' for Variable name and select "ni" on schemes table.

Load Blocks
Block model: C:\V\SJP\0531smp151s.bmf
What to display
Load individual blocks
Variable name ni
O Box O 2D cross O 3D cross
○XY rectangle ○XZ rectangle ○YZ rectangle
Shrink blocks Scale factor 0.1
How to save
💿 Underlay 🔲 Use solid shading 🗌 Draw outlines 📃
Layer Display each block as one object
OK Cancel

Select specific block by : Variable "product", Value "ore" and click Bounding triangulation.

Block Selection				
Model: C:\Vulcan_Training\latihan\0532snk151s.bmf				
O Select all blocks				
 Select specific blocks by: 				
🗹 Variable product 💽 Value ore 💽				
Bounding triangulation				
Bounding box				
Section thickness				
Condition				
Bounding surfaces				
Cut and fill surfaces				
Reverse matching				
Use block centres				
Cancel				

Long Term Planning Section – Mine Technology



3. Create block slice per 10 m

To active slice view table, right click on the "Toggle Sliced View"



Fill the clip : "By width", Step/Interval : 10, Front : 0.1, Back : 9.9,

Click icon slice backwards or slice forward.

Slice			×
Clip: By width 🔽 Step: 10	Front: 0.1	Back: 9.9	🛃 🛅 🐑 🅪 🗇 🗇 🗇 Display 🖓
Current: Primary 💌			

4. Prepare to Create pit.

a. Put the colour of toe & crest: Go to Open Pit > Ramps > Graphic Toe/Crest/Road

Long Term Planning Section – Mine Technology

Open pit graphics attributes 🛛 🔀						
Crests: Toes: Haul roa	ad:	Please follow the color codes in the sample				
2	OK	Cancel				

b. Design pit start from the lowest bench of the block model: go to View > Create

Section > Fill Backward with = 9.9 > Fill Forward with = 0.1 > Fill level with the lowest

ore level, ex = 360.

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- c. Generate grid 12.5 X 12.5 m
- 5. Create a Pit
 - a. Make Polygon: go to Design > Create > Polygon, put the name of pit.



Digitize: snap to grid > click at the gridline > digitize all ore counter wise.



b. Offset existing polygon 0.5 m from original: go to Open pit> open cut design > berm string

c. Curve the offset polygon to make it smooth: go to Design > point insert > apply curve >select object for curve > select point at which to apply curve (click at the first point to be

Curve & so on) > input radius curvature 3-10 (as required) > number of point = 10 (as required) > OK

> retain curve

Long Term Planning Section – Mine Technology



d. Delete previous polygon



- e. Flagging the boundary being toe/crest (as needed): go to open pit > open cut design > flag toe/crest string
- f. Projected pit up: go to Open pit > open cut design > project string > fill default batter
 angle = "56.26°" for west block and "45°" for east block > fill Project to level = "R10" >
 OK > retain > click at the polygon (toe)

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To see the projected polygon, go up to the next level: Slice backward > (-)



g. Create berm at it level: Open pit > Open cut design > berm string > Click at the polygon
 line > fill default berm width = 5 > ok > retain:

Safety Berms and Benches						
Default berm width						
Override berm widths with default						
✓ Override berm direction (as implied by batters) with this default						
O Horizontal berm (only points not on the limiting surface)						
Follow surface [only points on the limiting surface]						
 Horizontal berm [ignoring the limiting surface] 						
Check string for cross overs						
Use projection plane						
Condition berm strings						
Cancel						

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h. Modify berm to counter all ore in that level: go to design > point insert > replace string >

Click at first & end point > digitize snap to gridline >



Curve the berm and do the same step from 5b to 5h until get ore in the highest level.



MINING DEPARTEMENT LTP DESIGN DISPOSAL STANDARD JOB PROCEDURE

NOMOR	: 07.LTP.07

- **DEPARTEMENT** : Mine Technology
- SECTION/AREA : LTP
- PROCEDURE : Design Disposal
- TYPE : Routine
- **Date of writer** : August 29th 2007
- Number of Revision : 0
- **Next Revision** : August 29th 2008

Pages : 1 – 8

Made by: Ruth Sitorus	Date: 29-08-07	
Revised by:	Date:	
Checked by: Harry Ginting	Date:	
Approved by: Dwayne Kroll	Date:	

1. Introduction

Disposal is the dump location of overburden as the impact of mining activity. There are some of parameter has to be applied on disposal design in order to fulfill the safety standard.

2. Responsible

The qualified person in LTP who has already coached or trained in order to produce optimal and safe disposal design so there aren't ore will be dumped because of an unknown procedure.

3. Definition and Abbreviation

- *dgd = base file for running Vulcan software where all the design file saved
- *dg1 = base file for running Vulcan software that consist of your range working area (Easting Northing and Elevation)
- *dgx = base file for running Vulcan software for all the system and index design file that follows *.dgd
- *scd = base file for running Vulcan Software that is related with colour display for every scheme in Vulcan

4. Reference

This Vulcan Software is referring to Vulcan Help menu that available in Vulcan 4.5 and Vulcan 6.0 version menu.

5. Related Procedure

This working procedure is not related with other LTP procedures.

6. Standard Document and Form

There is a document that related with this SJP. The document is located in This document is consisting of all area have already released so those area can be used for disposal.

7. Training and Other Qualification

Basic training that should be followed by Vulcan user is:

- Basic knowledge about Computer and Hardware
- Basic Vulcan
- Basic knowledge of Block Model.

8. Environment, Health, and Safety Consideration

Good communication between all Vulcan users in every section is important due to limited Vulcan licenses in PT. Inco because it might affect to the bad working condition if all Vulcan users are selfish.

9. Procedure 9.1. Preparation

- Make sure that in your working directory already have all these files below. The file is located in 02-ltp\V\3vulcandata:
 - 1. *.dgd
 - 2. *.dg1
 - 3. *.dgx
 - 4. *.scd

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- Make sure that you copy the right *.scd file. The file is located in; 02-ltp\V\3vulcandata.
- Make sure that you copy the latest update blue zone. The file is located in 02ltp\BlockModel\BZ_Orex

9.2. Job Execution

Creating Pit Design

1. Load the update topography and make triangulation; go to model > triangle surface > create > choose layer topography which be triangulated > fill triangulation name cell (usually same with layer name) > Ok.



2. Usually conceptual disposal design by LTP mostly is located in mine out pit compartment. Load the update blue zone and release boundary before you plan disposal design.



- 3. There are some technical aspect has to be considerate before designing the disposal in order to safe in operation. The technical aspect as below:
 - Finger Disposal ; The height is 10-15 m, the slope plan of disposal is 26°
 - Induce Flow Disposal: 1st height is 10 m with angle of slope is 5°, 2nd height is 10 m with angle of slope 10-15°, 3rd height is 15 m with angle of slope 26°.

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4. Create disposal design, choose area where disposal will be made (blue zone area, release area, mine out area). For example we will make finger disposal in mine out area. The design could be started from crest or toe; go to design > create > polygon > fill name cell (ex. D_ANS_01 = Disposal at Anoa South stage 1)> OK.

llocate lay	er 🔀
Name Description	D_ANS_01
2	OK Cancel

> design the polygon (create the polygon) > OK.



Register polygon level (z) in order to the height of design not more than provision; go to design > object edit > z value > click the polygon > fill enter string z tag cell as needed (ex. 510) > OK

Enter the following value -				
Enter string Z tag	510.0			
2	ОК С	ancel		

Flagging the polygon as toe or crest; go to open pit > open cut design > flag toe/crest string > click the polygon > OK.

If you need to modify the polygon, there are many tools to do that, for example; go to design > point edit > move.

Project the polygon up or down with height and angle of slope as needed (see number 3); go to open pit > open cut design > project string > click the polygon > fill the cells below > OK.

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5. Create triangulation of disposal layer; go to model > triangle surface > create > BOUNDARY (click use boundary polygon) > OK > next step same with number 1.

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6. Calculating disposal capacity; look at SJP Updating Reserves.

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 Conceptual disposal usually achieve 3 stages. Berm length between every stage is 25m. To create a berm; go to open pit > open cut design > berm string. Design Disposal stage 2 & 3 same as design disposal stage 1 (see number 5-7).



8. Every finish design a disposal, give disposal string file to geotech team to do geotechnical assessment. The result will explain wether design disposal must be revised or not.



MINING DEPARTEMENT LTP Road Design STANDARD JOB PROCEDURE

NOMOR	:	07.LTP.05

DEPARTEMENT : Mine Technology

SECTION/AREA : LTP

- PROCEDURE : Road Design
- TYPE : Routine
- **Date of writer** : August 21th 2007
- **Number of Revision** : 0
- Next Revision : August 21th 2008

Pages : 1 – 14

Made by: Ruth Sitorus	Date: 21-08-07	
Revised by:	Date:	
Checked by: Harry Ginting	Date:	
Approved by: Dwayne Kroll	Date:	

1. Introduction

Road is one of important part that support mine succeed. The main reason of making this procedure is to make guidance for Vulcan user to have the right procedure to create Road Design by Vulcan.

2. Responsible

The qualified person in LTP who has already coached or trained in order to produce optimal and safe road design and support operation team to achieve their target by reduce cycle time.

3. Definition and Abbreviation

- *dgd = base file for running Vulcan software where all the design file saved
- *dg1 = base file for running Vulcan software that consist of your range working area (Easting Northing and Elevation)
- *dgx = base file for running Vulcan software for all the system and index design file that follows *.dgd
- *scd = base file for running Vulcan Software that is related with colour display for every scheme in Vulcan

4. Reference

This Vulcan Software is referring to Vulcan Help menu that available in Vulcan 4.5 and Vulcan 6.0 version menu.

5. Related Procedure

This working procedure is not related with other procedures.

6. Standard Document and Form

There is a standard road dimension document that published by geotech team that related with this SJP.

7. Training and Other Qualification

Basic training that should followed by Vulcan user is:

- Basic knowledge about Computer and Hardware
- Basic Vulcan
- Basic of Block Model

8. Environment, Health and Safety Consideration

Good communication between all Vulcan users in every section is important due to limited Vulcan licenses in PT. Inco because it might affect to the bad working condition if all Vulcan users are selfish.

9. Procedure

9.1. Preparation

- Make sure that in you working directory, you already have all the files below. The file is located in 02-ltp\V\3vulcandata;
 - 1. *.dgd
 - 2. *.dg1

3. *.dgx

4. *.scd

• Make sure that you copy the latest update topography. The file is located in 02ltp\Vulcan\SURVEY_TOPO2007

9.2. Job Execution

Preparing Topography

1. Load the update topography and make triangulation; go to model > triangle surface create



2. Create centre line of road design; go to design > create > line > fill name cell > OK



 Make sure the grade of centre line not more than 10% (as road standard dimension PT. Inco). To check centre line grade; go to Analyse > label > object label > click gradient > % (attributes) > OK

Label Object	×
C Name C Value C Group C Feature C Gradient	Attributes: C Degrees C Ratio C % Decimals 3
20	K Cancel

4. You can change the grade automatic without move all points at centreline; go to design > object edit > grade > specific grade manually > fill gradient cell (max 10%) > OK.

Gradient		X
Gradient	8%	
Ratio, incl	ination or percentage	
(eg. 1:25,	60, 12%)	
🔲 Grade v	with constant length	
2	OK	Cancel

5. Curve all point at centre line as needed (min = 15); go to design > point insert > apply curve > click point to curve > fill radius cell > OK

urve para	meters	2
Radius	of curvature	
Radius	30	_
C Tanger	nt offset from point	to intersection
Offset		-
Number of	points in curve	10
 Genera Genera 	te curve in plane o te curve in plan	of line
2	OK	Cancel

Copy existing centre line that already curved with new name; go to design > layer edit > copy > fill name cell > OK.

Allocate laye	er		
Name	R_LAT-ANS		
Description	UL road LAT-ANS already curved		
2		OK Cance	el

Keep the first centre line (layer CL_LAT-ANS) original (without curve).

6. Create left and right side road; go to open pit > ramps > build road > click centre line > fill width of road cell = 25 m (as road standard dimension PT. Inco) > OK > retain road > OK.



7. Join the left and right line at layer R _LAT-ANS being one polygon; go to design > object edit > join lines > click point > replace object > OK after that go to design > object edit > connection > select object > OK



8. Project the polygon up and down; go to open pit > open cut design > project string > click the polygon > fill angle cell (up = 56° & down = 45°) and project to level cell (R10 as road standard dimension PT. Inco, bench height for road is 10 m).

Bench Projection		×
Default batter angle	56.0	
🔽 Override set batters (with default	
🔲 Maintain current batt	ter sign	
Project to level	R10	
Use either (R)elative, (l	U)p, (D)own	
or relative to (M)inimum	i (e.g. R-10,U130,M20)	
Nominal bench height	10.0	
🗌 Limit projection to su	rface model	
Limiting surface nam	ne	
Triangulation	Browse	
C Grid	Browse	_
Convoluted surfac	ce	
Project to level if no	limiting surface found	
Check string for cross	s overs	
Condition projected a	strings	
		-
2	OK Cancel	

For cut are, you must implement berm with length 5 m; go to open pit > open cut design > berm > click road polygon > fill default berm width cell = 5 > OK

		_			
Safety Ber	ms and Bench	es			×
Default be	rm width	5		_	
🔽 Overrid	le berm widths wi	, th default			
🔽 Overrid	le berm direction	(as implied	by batters) with	n this default	
C Horizor	ntal berm (only po	ints not or	the limiting sur	face]	
C Follow	surface [only poir	nts on the	- limiting surface]		
Horizor	ntal berm (ignoring	g the limitin	g surface]		
Check	string for cross or	- vers			
Use pr	ojection plane				
Conditi	ion berm strings				
2			OK	Cancel	
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For fill area, you should not implement berm.



Save both layer with name RC_LAT-ANS for road cut layer and RF_LAT-ANS for road fill layer go to design > layer edit > copy.

9. Create triangulation for both layer; go to model > triangulation surface > create > click Data (Triangulate data in plan view)

Triangulation	×
Data Boundary Triending Spurs Condition Data projection Triangulate data in plan view Triangulate data projected against a plane Triangulate data projected against a sphere Alternate elevation value Use W tag in place of Z value Offset of W value Breaklines (will be forced if boundary part of triangulation) Breakline tolerance 0.01 	
(?) OK Canc	el

> click Boundary (use boundary polygon to limit triangulation)

Triangulation	×
Data Boundary Trending Spurs Condition ✓ Use boundary polygon to limit triangulation Boundary parameters ✓ Triangulation of data inside boundary polygon ✓ Use boundary polygon as part of triangulation data C Exclude boundary polygon from data C Relimit triangulation with boundary polygon	
СК	Cancel

 $> \rm OK > Select$ Boundary polygon $> \rm Triangulate > fill triangulation name cell (same with layer name).$



Create solid to calculate cut & fill volume to build the road; load topo triangulation & cut or fill triangulation

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After that go to open pit > open cut design > pit topography > > click construct the enclosed volume triangulation > OK

And the second
×
OK Cancel

> Fill triangulation name cell for example srf_lat-ans (solid road cut_LAT-ANS) > OK

Enclosed volume
Triangulation Name: src_lat-ans Browse
Shading Advanced
Solid Shading:
Solid shade triangulation.
Draw wireframe mesh over surface.
Ensure triangulation is not striped.
Smooth Shading.
Surface definition angle: 60
Use load time shading.
C Draw as wireframe.
Fill triangles with pattern. Pattern
Display simple contours.
Contour interval 10
Colours:
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RGB colour
OK Cancel

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10. Calculate solid volume (both cut & fill colume); go to model > triangle solid > volume > pick all solid > OK



LAMPIRANJ KARTU KONSULTASI

KARTU KONSULTASI

Lampiran B 10

Kartu Konsultasi Tugas Akhir

JUDUL: Perenanaan Jangka Panjang Area Pit Compartment 2, di Blok Bahadopi PT Vale Indonesia Tbk, Provinsi suldwesi Tangaha

(Konsultasi minimal 8 kali)

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
1 April 2022	- format penulisan kaporan - pergantian Judul - BAB II (Penulisan bahasa asingtidak dicetak mining)	ł
is April 202	- Kesalahan format penulisan - BAB [1 (pesculisan bahasa asing, tata hubung tidk seuci) - BAB [11 (Penulisan bahasa asing, kata hubung tidtit sesuri) - Bagan Alir Penelitian	ŀ
20 April 202	 Kesakahan format penulisan BAB II (penulisan bahaso asing, penggunan huruf tapital) BAB III (tata hubung tidak sesuai) Bagan Alir penelitian 	ly.
By Mei 2022	- Kesalahan Format gambat - BAB II (Kenggurakan kata terja diawal talimat) - BAB III (penulisan bahasa asing) - BAB IV (pengguraan huruf kapital tidak tepat)) ,
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19 Juni 19 Juni 2020	- Kesalahan for mat penulisan - BAB IV (penggunan huruf kapital tidak sesuai, penggunaan bakasa tidak tepat)	No

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TANGGAL	MATERI KONSULTASI	PARAF DOSEN
29 Juni 2022	- Kesalahan format Penulisan - BAB IV (penggunaan bahasa tidak tepat) - BAB V (penggunaan bahasa tidak tepat)	Ŋ
5 Juli 2022	- Format Penulisan - BAB I (Penggunaan bahasa tidak tepat) - BAB II (Penulisan bahasa asing, Penggunaan hunut koitd) - BAB III (Penggunaan spasi yang salah antarg gawikar) - BAB IV (Penggunaan hunuf kapital tidak tepat) - BAB V (Penggunaan bahasa tidak tepat	la.
7 Juli 2022	- BAB II (Penggunaan kata yang kurang tepat) - BAB V (penggunaan kata yang kurang tepat) - Dattar Pustaka	Ŷf .
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27 Juli 20	- penulisan kata tidak baku 22 - Penulisan bahasa asing tidak dicetak	AL
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TANGGAL	MATERI KONSULTASI	PARAF DOSEN
7 Agustus 2022	 perhitungan cashflow Yang belum sesuai penulisan angka desimal dalam bahasa Indonesia perhitungan analisis sensitoritas yang belum sesuai 	Y.
7 Agustus 202	- penulisan kata tidak baku ACC	k
1 september 2022	- Penggungan tata Yang kurang tepat - Penulisan bahasa asing yang kurang tepat - Perhitungan cashflow diperbaiki - Penulisan rumus diperbaiki - Penulisan bahasa asing yang tidak Sesuai (tidak dicetak miring).	ŀ
13 September 2022	 Penggunaan kata yang kurang tepat Penulisan bahasa asing yang tidak sesuai (tidak dicetak mining). format gambar yang belum sesuai Penggunaan kata yang kurang tepat Pada cash flow 	٩
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20 Septem 2022	br- Penulisan bahasa asing yang belum Sesuai (tidat dicetak miring) - Penggunaan huruf kapital yang ticlak tepat	ł

Catatan: Lembar konsultasi asli dilampirkan pada satu dokumen skripsi.



TANGGAL	MATERI KONSULTASI	PARAF DOSEN
23 Sept 2022	 pengguncian kalimat yang kurang tepat penulisian halaman pada daftar isi dan daftar tabel yang kurang tepat ACC 	h h

Catatan: Lembar konsultasi asli dilampirkan pada satu dokumen skripsi.