Ground Condition Consultants

ANGELS SANDPIT, STORRINGTON, WEST SUSSEX

SLOPE STABILITY ASSESSMENT

OCTOBER 2023

Prepared for
Mibri Ltd
2 Angell Sands
Storrington
West Sussex
RH20 4FL

Prepared by
Ground Condition Consultants Ltd
10 Waldegrave Close
Southampton
Hampshire
SO19 9RY

ask@groundcc.com
www.groundcc.com

VERSION CONTROL

Project Name	Angels Sandpit, Storrington – Slope Stability Assessment
Project No.	J20-002
Report No.	J20-002-R07

Slope Stability Assessment	
Prepared by: David Fall – Geotechnical and Environmental Consulting Ltd	Reviewed by: Antony Platt - Director

Version	Date	Description
1.0	30.10.23	Slope Stability Assessment

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1. INTRODUCTION

1.1 REPORT CONTEXT

Ground Condition Consultants Ltd. (GCC) was commissioned by Mibri Limited in July 2023 to undertake a Slope Stability Assessment of a site located at Angels Sandpit, Storrington, West Sussex RH20 4FL.

The brief was to use the results of the GCC ground investigation (GCC Report No. J20-022/R06 dated September 2023) to undertake an assessment of the stability of the site known as Angels Sandpit.

This report is prepared in line with the agreed brief and is subject to the report conditions shown in Appendix 1.

1.2 PROPOSED USE

It is currently understood that the site is to be redeveloped for residential housing with gardens. A change in the site use from that currently proposed may result in the need for reassessment of risk criteria and the conclusions and recommendations resulting from the risk assessment could therefore significantly change.

1.3 PREVIOUS REPORTS

The site has been the subject of various investigations and assessments and the following documents have been provided by the Client or produced by GCC:

- Hemsley Consulting (Oct 2008 Draft & Dec 2008 Final), *Angell's Sand Pit, Storrington , West Sussex, Residential Area* (Ref: HC3815)
- WYG Environment (Nov 2009), *Sampling to support Closure of Angells Sandpit* (Ref: A057957/SJS/pg-1)
- WYG Environment (Nov 2010), *Ground Condition Assessment Report* (Ref: A064537 V2)
- WYG Environment (Jun 2011), *Angell's Sandpit Closure Report Update* (Ref: A059751)
- Geo-Environmental Services Limited (Dec 2017), *Desk Study Report* (Ref: GE16049-DSR-DEC17)
- Ground Condition Consultants Ltd (Apr 2020), Ground Condition Assessment Report (Ref: J20-002-R02 V3)
- Hemsley Consulting (Nov 2022), Site Investigation Report (Ref: HC6085)

- Paul Basham Associates (PBA) Drawing No. 120.05844.0251-P01 Sheets I-3 Cross Sections dated September 2023.
- Ground Condition Consultants Ltd (Sep 2023), Geotechnical Design Report Report (Ref: J20-002-R06 V2)

1.4 REPORT SCOPE AND LIMITATIONS

The stability assessment is based on the information collected and assessed during the previous phases of ground investigation.

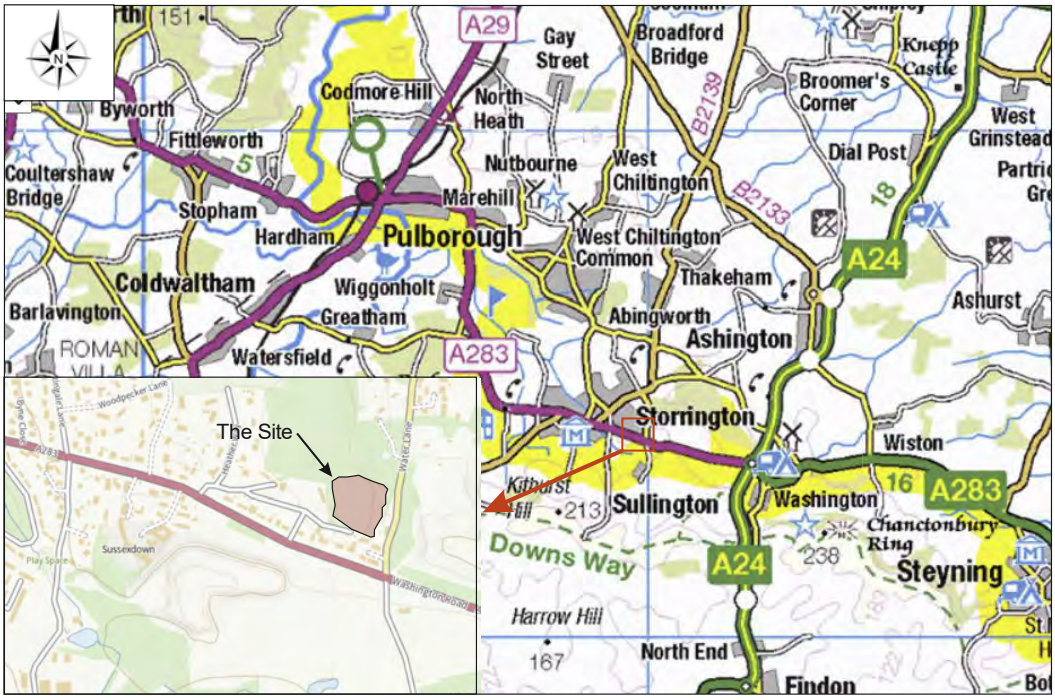
The information contained in this report is intended for the use of Mibri Limited and GCC can take no responsibility for the use of this information by any other party or for uses other than that described in this report.

2. CONCEPTUAL STABILITY SITE MODEL

2.1 LOCATION

The site is an irregularly shaped parcel of land of approximately 1.27Ha located to the north of Washington Road and the west of Water Lane in Storrington, West Sussex at NGR 509850, 114050 (Figure 2.1).

Figure 2.1. Site Location Plan



The area surrounding the site comprises :

- deciduous woodland to the north;
- to the east, existing residential properties situated to the west of Water Lane with Sandgate Quarry beyond;
- to the south existing residential properties situated to the north of the A238 Washington Road;
- to the west a large detached property and associated gardens.

Access to the site is via a private residential access way from Water Lane.

2.2 REGIONAL GEOLOGY

Solid Geology

With reference to British Geological Survey Sheet 317/332 Chichester and Bognor 1:50000 Solid and Drift (1996) the site is underlain by the Folkestone Formation of the Lower Greensand Group (Figure 2.2).

Figure 2.2. Regional geology of the area around Angels Sandpit



The BGS Lexicon of Named Roak Units describes the Folkestone Formation as medium- and coarse-grained, well-sorted cross-bedded sands and weakly cemented sandstones. Whilst the Gault Formation is a pale to dark grey or blue-grey clay or mudstone, glauconitic in part, with a sandy base.

Superficial Deposits

Superficial strata are largely absent across much of the surrounding area. Polymictic head deposits of variable composition, comprising clays, silts, sands, and gravel, overly the bedrock irregularly in the area around the site. Alluvial deposits are present in watercourse valleys, with the closest being the River Stor, located 1.4 km north-west of the site. Clay with Flints Formation crops out on higher ground 1.7 km south of the site.

Local Geology

It is understood that the sand pit was infilled as an inert waste facility in between 2000 and 2006 with restoration works continuing into 2008.

Multiple phases of ground investigation have been carried out since the completion of restoration. The local stratigraphy identified during these intrusive investigations have been reported in the GCC Geotechnical Design Report, dated September 2023, and indicate the site to be underlain by up to 40m of inert waste Material over Folkestone Formation.

The Inert Waste Material (IWM) was described as comprising a discontinuous layer of silty fine to coarse Sand up to 2.10m thick but more usually between 0.25 to 0.50m thick. Beneath the sand, the fine-grained IWM comprises a variety of silty sandy Clays and silty gravelly Clays, much of which is still identifiable as being of London Clay Formation or Reading Formation in origin. The Folkestone Formation is described in the two locations where encountered as comprising dense yellowish brown and pinkish brown medium Sand.

2.3 GROUNDWATER

Groundwater was not recorded during the drilling of any of the windowless sample boreholes. However, groundwater was monitored during the initial monitoring rounds in the GCC wells and BH1 at between 0.6mbgl and 6.73mbgl with some wells dry to up to 4.87mbgl and considerable fluctuation in the recorded groundwater levels.

As the majority of the fill material encountered was of a clay matrix with pockets of sand, groundwater is considered likely to be present in discrete pockets of granular fill at various depths throughout the former landfill material and a consistent groundwater body within the fill material that correlates with groundwater levels in the surrounding natural soils is considered unlikely.

2.4 SITE TOPOGRAPHY

Cross sections across the site and across the proposed locations of the individual structures have been drawn and these sections are shown on PBA Drawing 120.05844.0251-P01 Sheets I-3, presented in Appendix 2 of this Report. These sections will be used to create a series of ground models, which will be used in the following slope stability assessment.

3. SLOPE STABILITY ASSESSMENT

3.1 JUSTIFICATION OF MODELLING APPROACH AND SOFTWARE

Two-dimensional limiting equilibrium stability analyses will be used in the assessment of the stability of the inert waste mass of the site at Angels Pit, Storrington. The method of analysis used in each particular case was determined from an examination of the form of failure being considered. The stability analyses were carried out using the Slope/W computer programme, using the Morgenstern and Price method of slices to determine the Degree of Utilisation against instability for both total stress and effective stress conditions.

3.2 JUSTIFICATION OF GEOTECHNICAL PARAMETERS SELECTED FOR ANALYSES

The characteristic geotechnical parameters used in the stability analyses are based on those Presented in Table 5.8 of the GCC Geotechnical Design Report (Report No. J20-002-R06 - Angels - GDR AUG23 V2). The relevant parts of Table 5.8 are reproduced below and presented as Table 3.1.

Table 3.1. Characteristic geotechnical parameters

Stratum	Geotechnical Parameter			Notes	Characteristic Value
Inert Waste Material	Unit Weight γ			Lab UUT	19kN/m^3
	Shear Strength	Undrained	c_{uk}	Lab UUT and SPT Correlation	35kN/m2 in the upper 5.00m - increasing thereafter
			ϕ_{uk}		0°
		Drained	c'_k	BS8004	0kN/m^2
			ϕ'_k		26°
Folkestone Formation	Unit Weight γ			BS8004	18MN/m^2
	Shear Strength		c_k	BS8004	0kN/m^2
			fk	Relationship with SPTN	35°

3.3 SELECTION OF APPROPRIATE FACTORS OF SAFETY

The stability analyses have been carried out in accordance with EC7. The United Kingdom has adopted Design Approach 1 (DA1) Combination 1 & 2 (C 1 & 2) whereby partial factors are applied to either the actions or the material properties and a resultant factor of safety of 1.00 is required.

Table 3.2. Partial Factors used in Design in Accordance with the UK National Annex to EC7

Design Approach	Combination	Partial Factor Sets	Partial Factor Value			
1	1	A1 + M1 + R1	Actions A1			
			Permanent (G)	Unfavourable	$\gamma_{G;dst}$	1.35
				Favourable	$\gamma_{G;stb}$	1.00
			Variable (Q)	Unfavourable	$\gamma_{Q;dst}$	1.50
				Favourable	$\gamma_{G;dst}$	0
			Materials M1			
			Coefficient of shearing resistance ($tan\phi$)		$\gamma_{\phi'}$	1.00
			Effective cohesion (c')		$\gamma_{c'}$	1.00
			Undrained shear strength (c_u)		γ_{cu}	1.00
			Resistance R1			
			Resistance		$\gamma_{R;e}$	1.00
	2	A2 + M2 + R1	Actions A2			
			Permanent (G)	Unfavourable	$\gamma_{G;dst}$	1.00
				Favourable	$\gamma_{G;stb}$	1.00
			Variable (Q)	Unfavourable	$\gamma_{Q;dst}$	1.30
				Favourable	$\gamma_{G;dst}$	0
			Materials M2			
			Coefficient of shearing resistance ($tan\phi$)		$\gamma_{\phi'}$	1.25
			Effective cohesion (c')		$\gamma_{c'}$	1.25
			Undrained shear strength (c_u)		γ_{cu}	1.40
			Resistance R1			
			Resistance		$\gamma_{R;e}$	1.00

The values of the partial factors used are termed “nationally determined parameters” and EC7 (as published by CEN) allows these to be specified in National Annexes, which recognise regional variations in design philosophy.

4. STABILITY ANALYSIS

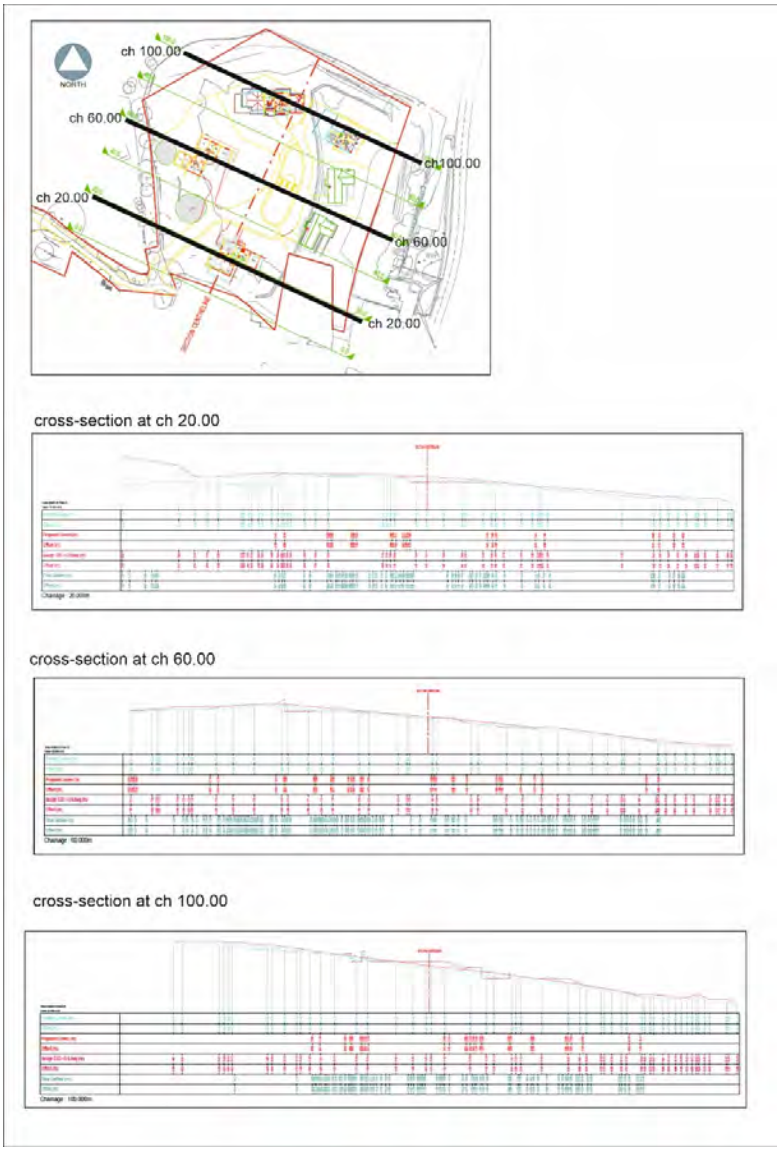
4.1 INTRODUCTION

The stability analysis will be carried out in two stages. Initially the stability of the site in its current condition will be determined; before the stability of each of the individual construction platforms will be considered.

4.2 GLOBAL STABILITY

The global stability of the site has been undertaken using the cross sections supplied by the client and the ground conditions and characteristic geotechnical parameters determined from the ground investigations.

Figure 4.1. Sections used in global stability analyses



Results of Stability Analysis

The results of the global stability analyses are presented in Table 4.1; whilst the SlopeW stability worksheets are located in Appendix 3 of this Report.

The undrained shear strength of the Inert Waste Material was identified as increasing below 5.00m. Therefore, a cohesion function has been adopted for use in the total stress analyses (Figure 4.2).

Figure 4.2 Cohesion function used in the total stress analyses

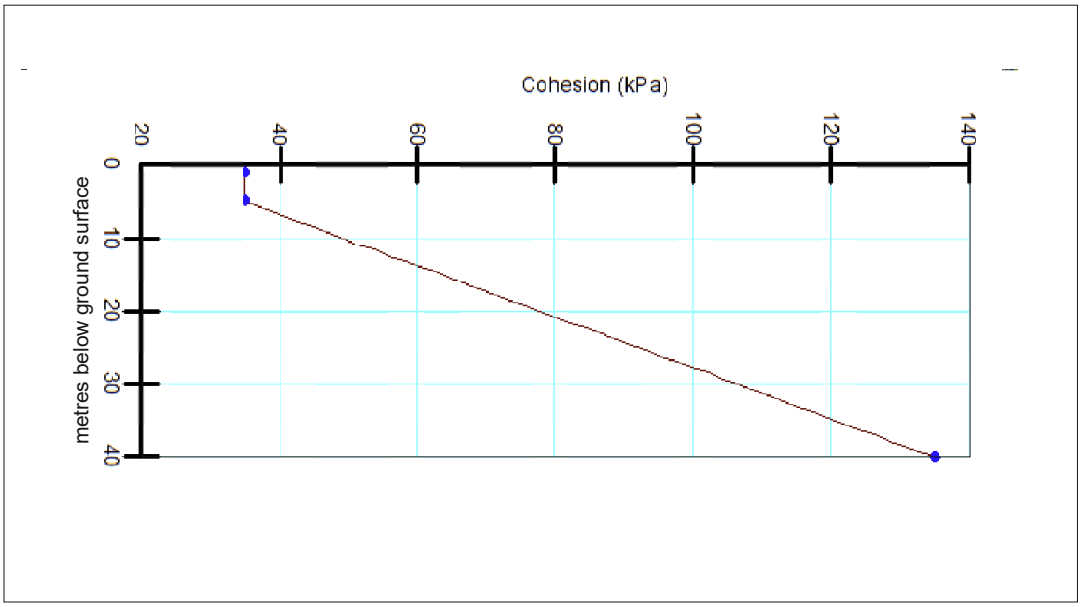


Table 4.1. Results of the global stability analyses

Section	SlopeW Run	Stress Conditions	Degree of Utilisation (%)		Notes
			Combination 1	Combination 2	
Ch 20.00	GLOBAL1	Total	0.302		Porewater Pressure Coefficient Ru = 0.2
	GLOBAL2			0.170	
	GLOBAL3	Effective	0.302		
	GLOBAL4			0.333	
	GLOBAL5			0.537	Fully Saturated
Ch 60.00	GLOBAL6	Total	0.296		Porewater Pressure Coefficient Ru = 0.2
	GLOBAL7			0.166	
	GLOBAL8	Effective	0.256		
	GLOBAL9			0.170	
	GLOBAL10			0.271	Fully Saturated
Ch !00.00	GLOBAL11	Total	0.300		
	GLOBAL12			0.192	

Section	SlopeW Run	Stress Conditions	Degree of Utilisation (%)		Notes
			Combination 1	Combination 2	
	GLOBAL13	Effective	0.307		Porewater Pressure Coefficient Ru = 0.2
	GLOBAL14			0.233	
	GLOBAL15			0.373	Fully Saturated

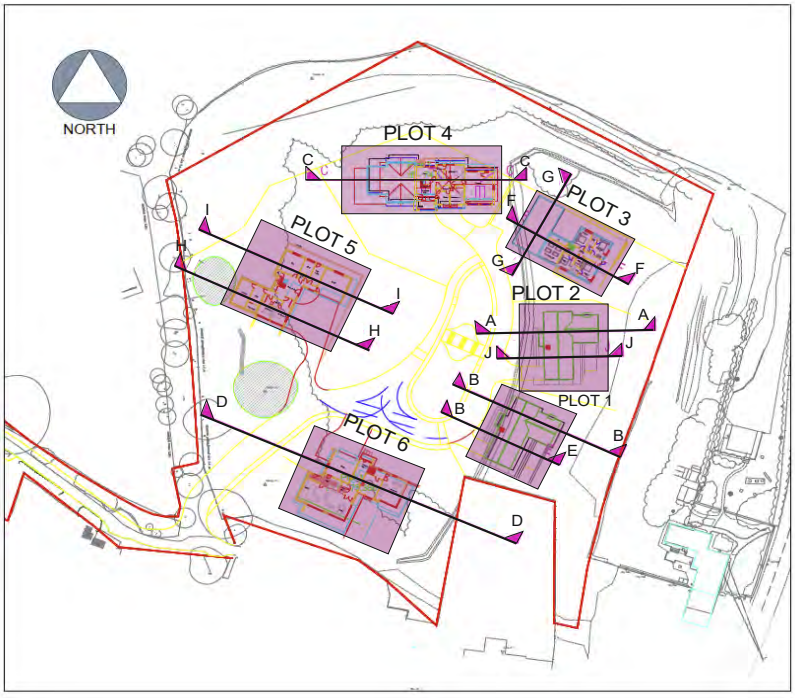
Results

The results of the global stability analyses of the Angels Sandpit site indicate it to be stable under the present site condition with all analyses retuning a degree of utilisation of 0.333 or less. The site remains stable even under worst case condition when a porewater pressure coefficient of 0.50 (saturated) is applied to the Inert Waste Material.

4.3 INDIVIDUAL PLOT STABILITY

The stability of the five (5no.) individual construction platforms has been undertaken in accordance with EC7, as detailed earlier in this Report. Where any of the individual construction platforms require a retaining structure, it is assumed that the internal stability (sliding and overturning) of any such structure will be considered during the retaining wall design.

Figure 4.3. Location of individual construction plots



Results of the Stability Analyses

The results of the individual construction plot stability analysis is presented in Table 4.2., whilst the SlopeW worksheets are located in Appendix 4.

Table 4.2. Results of the construction plot stability analyses

Plot No	SlopeW Run	Stress Conditions	Degree of Utilisation (%)		Notes
			Combination 1	Combination 2	
Plot 1	CON1	Total	0.101		Section B-B
	CON2			0.099	
	CON3	Effective	0.388		
	CON4			0.488	
Plot 2	CON5	Total	0.115		Section A-A
	CON6			0.113	
	CON7	Effective	0.377		
	CON8			0.472	
Plot 3	CON9	Total	0.076		Section F-F
	CON10			0.075	
	C0N11	Effective	0.336		
	CON12			0.419	
Plot 4	CON13	Total	0.149		Section C-C
	CON14			0.145	
	CON15	Effective	0.363		
	CON16			0.454	
Plot 5	CON17	Total	0.036		Section H-H
	CON18			0.030	
	CON19	Effective	0.109		
	CON20			0.108	
Plot 6	CON21	Total	0.083		Section D-D
	CON22			0.081	
	CON23	Effective	0.219		
	CON24			0.263	
Plot 1	CON25	Effective		0.795	Fully Saturated

The stability analyses of the individual construction plots all returned degrees of utilisation of less than 1.00 under both total and long term effective stress conditions. Plot 1 under effective stress conditions and combination 2 factoring gave the highest degree of utilisation of 0.488 and therefore was subsequently analysed under fully saturated conditions (CON25) and still returned a degree of utilisation of less than 1.00. Therefore, it is concluded that the construction plots are stable in the form set out in cross-sections supplied by the Client (Appendix 2).

5. CONCLUSIONS

5.1 INTRODUCTION

This stability assessment has been carried out in accordance Eurocode 7 (EC7) using the results of the previous ground investigations and associated laboratory geotechnical testing.

The slope stability analyses have been carried out on cross-section through the site and individual development platforms supplied by the Client. The software programme used was Geostudio SLOPEW, which is EC7 compliant and allows for the application of Design Approach 1 Combination 1 and 2 partial factors to the stability model.

5.2 GLOBAL STABILITY

Three (3no.) cross-sections across the site were analysed under short and long term conditions including fully saturated ground. The results show that the site is stable in its current configuration with the highest degree of utilisation of 0.537. Therefore, unless there is considerable excavation or other change to the existing cross-sections the larger site can be considered as stable.

5.3 INDIVIDUAL PLOT STABILITY

Six individual construction plots are to be developed to accommodate residential properties on the site (Figure 4.3). The stability of each of these plots has been determined separately using the SLOPEW stability programme with an additional surcharge load of 60kNm^2 to represent an evenly loaded raft foundation.

It should be noted that where vertical faces are shown on the cross-sections and stability ground models, it is assumed that these will be formed by the placement of an appropriate gravity retaining structure that will be designed by a qualified geotechnical engineer.

The stability analyses of the construction platforms show that they are stable in the form set out in the supplied cross-sections under both short and long term ground conditions.

APPENDIX 1: REPORT CONDITIONS

This report is produced solely for the benefit of **Mibri Limited** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the Site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the Site.

This report is based on a visual Site inspection, study of readily accessible referenced historical records, information supplied by those parties noted in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. Where ground contamination is suspected but no physical Site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to detailed activities related to the Site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, not revealed by this research cannot be discounted.

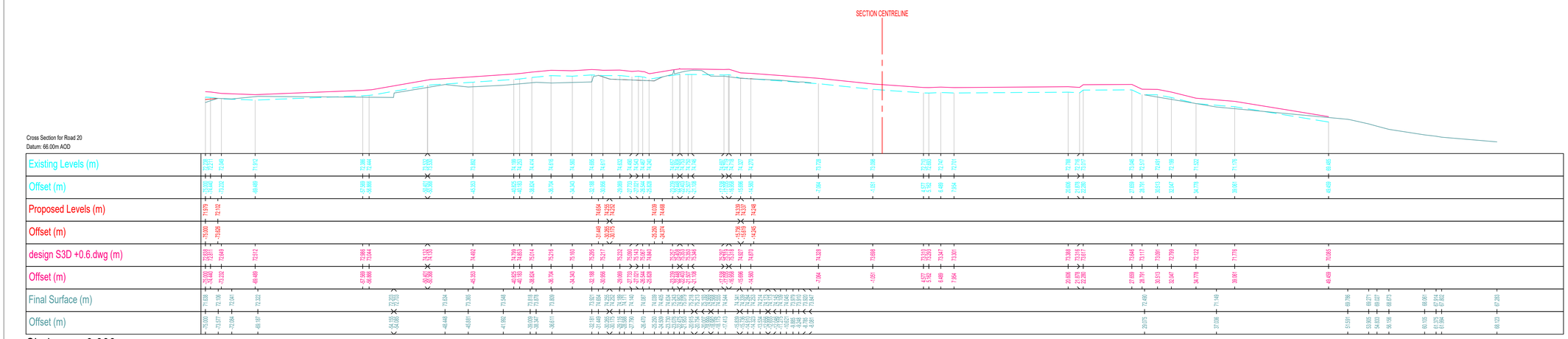
Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question, as such bodies may have unpublished, often more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Ground Condition Consultants Ltd. In time improved practices or amended legislation may necessitate a re-assessment.

The report is necessarily limited to those aspects of land contamination specifically reported on and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents that may occur. The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous use and abuse of the Site and adjacent Sites. The report concentrates on the Site as defined in the report and provides an opinion on surrounding Sites. If migrating pollution or contamination (past or present) exists this can only practically be better assessed following extensive on and off Site intrusive investigations and monitoring.

APPENDIX 2: CROSS-SECTIONS



LOCATION PLAN (SCALE 1:1000)



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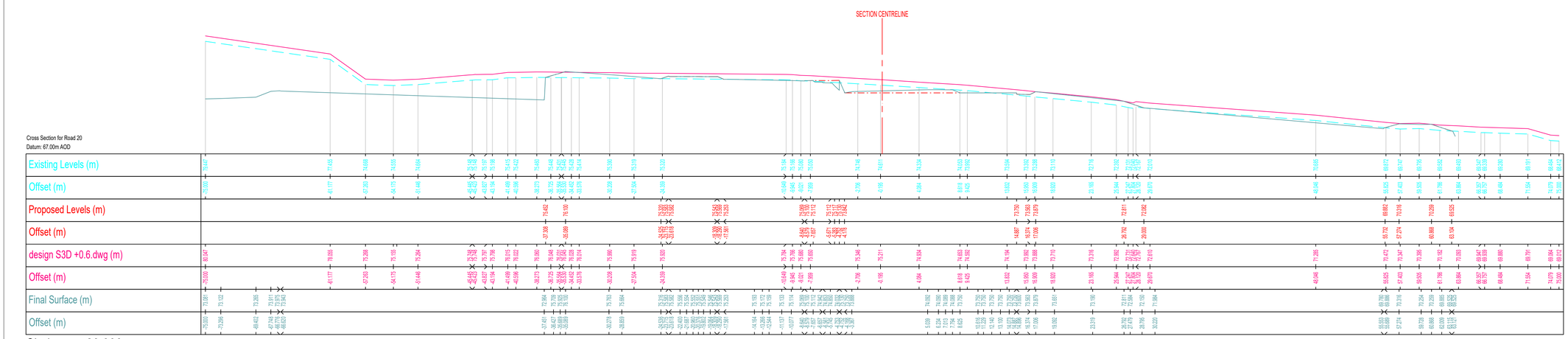

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Rev	Description	Date	By	Appvd
P01	FIRST ISSUE	12.09.2023	RL	RW

paulbasham associates
Paul Basham Associates Ltd
The Bothy, Cams Hall Estate, Fareham, PO16 8UT
01329 711 000
info@paulbashamassociates.com www.paulbashamassociates.com

Client
MIBRI LIMITED

Project Name
ANGEL SANDPIT,
STORRINGTON

Title
SITE CROSS SECTIONS
SHEET 1 OF 3

Project Phase
PRELIMINARY

Date Created	Drawn By	Approved By	Suitability Code
06.09.2023	RL	RW	-

PBA Project Number	Scale	
020.5844	1:250	(AT A1)

PBA Drawing No:	Revision
020.5844.0251	P01

QMS2010/v8/310723/JM



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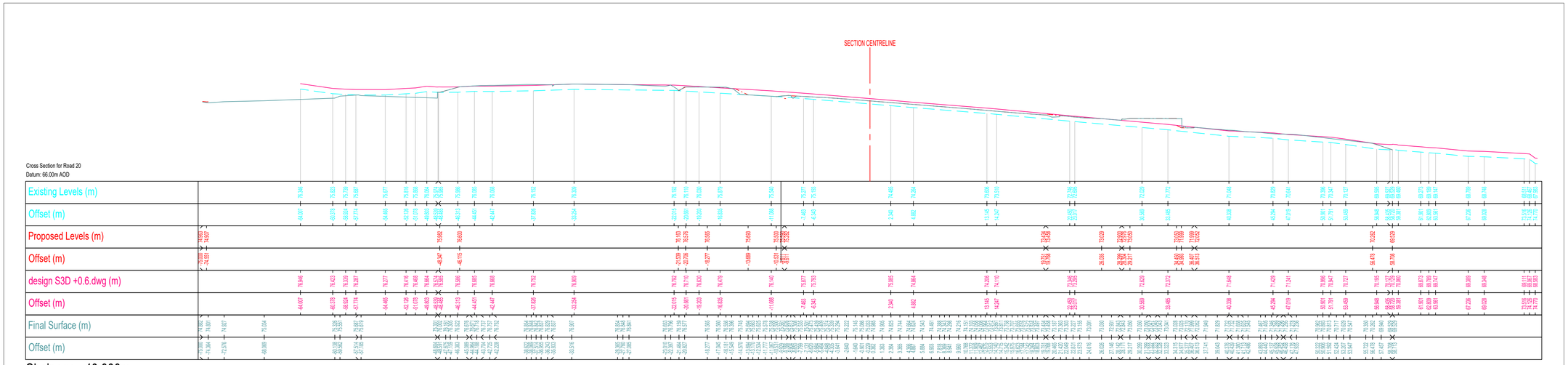

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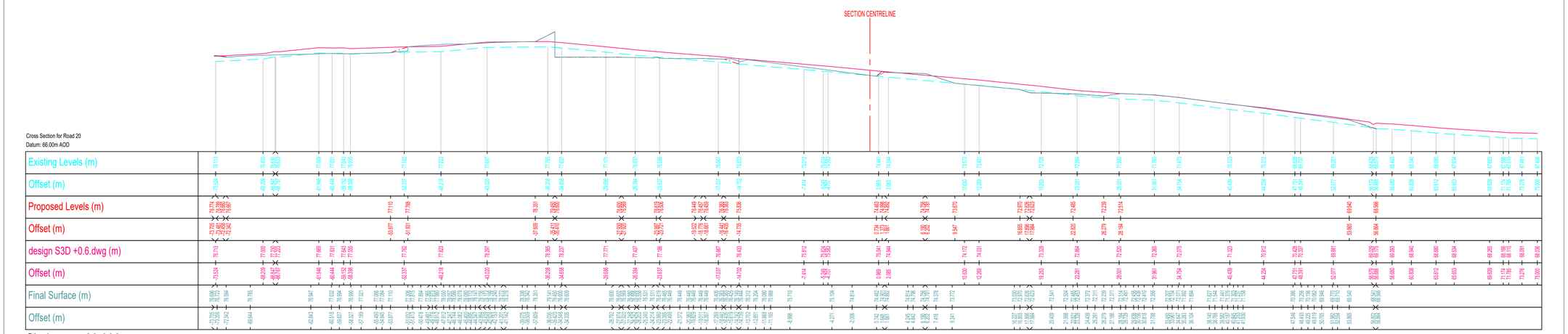

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paulbasham associates
Paul Basham Associates Ltd
The Bothy, Cams Hall Estate, Fareham, PO16 8UT
01329 711 000
info@paulbashamassociates.com www.paulbashamassociates.com

Client
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Project Name
ANGEL SANDPIT, STORRINGTON

Title
SITE CROSS SECTIONS
SHEET 2 OF 3

Project Phase
PRELIMINARY

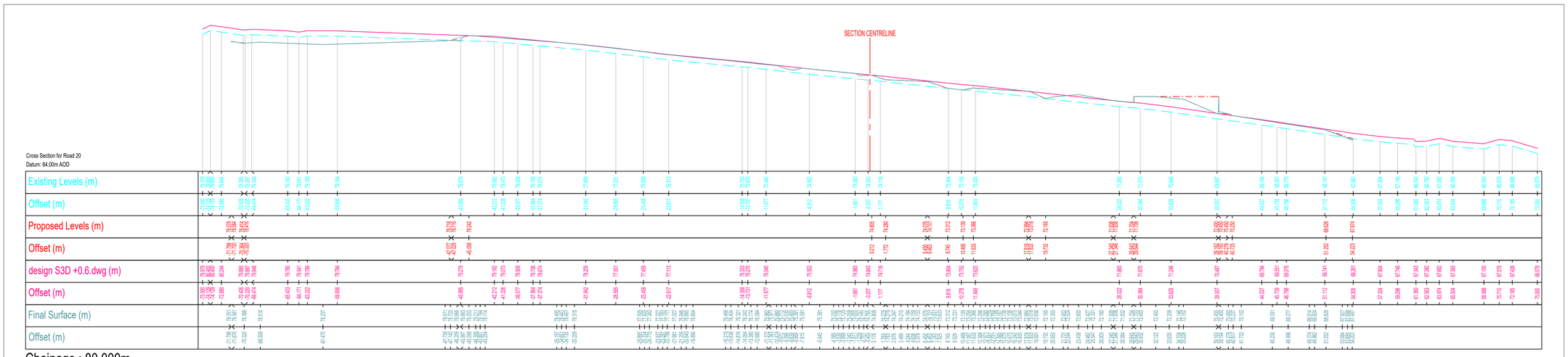
Date Created	Drawn By	Approved By	Suitability Code
06.09.2023	RL	RW	-

PBA Project Number	Scale	
020.5844	1:250H, 1:250V	(AT A1)

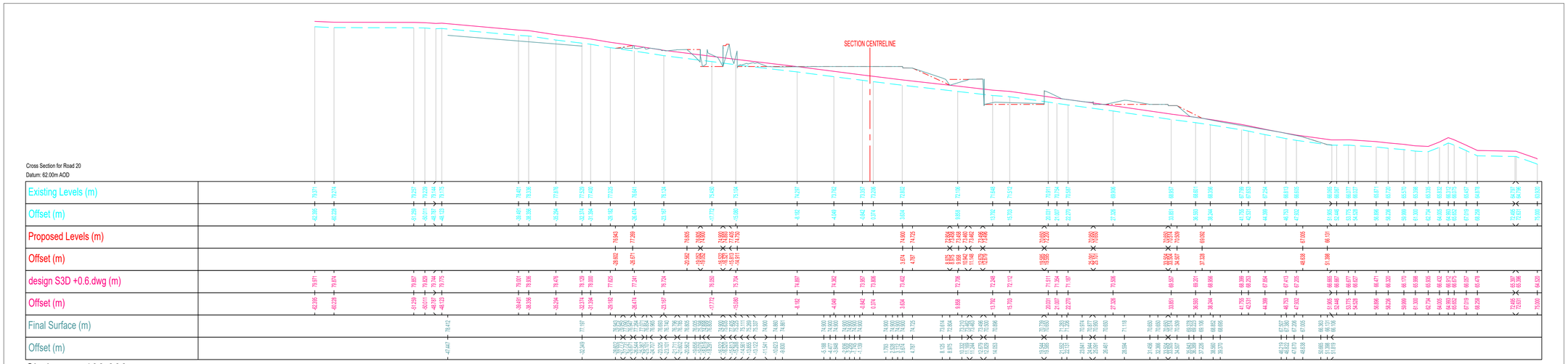
PBA Drawing No:	Revision
020.5844.0252	P01



LOCATION PLAN (SCALE 1:1000)



Chainage : 80.000m



Chainage : 100.000m

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PRELIMINARY

DRAWING/DESIGN IS STILL 'IN DEVELOPMENT'
YOU ARE ADVISED TO MAKE DUE ALLOWANCE

Rev	Description	Date	By	Appvd
P01	FIRST ISSUE	12.09.2023	RL	RW

paul basham associates
Paul Basham Associates Ltd
The Bothy, Cams Hall Estate, Fareham, PO16 8UT
01329 711 000
info@paulbashamassociates.com www.paulbashamassociates.com

Client

MIBRI LIMITED

Project Name

ANGEL SANDPIT,
STORRINGTON

Title

SITE CROSS SECTIONS
SHEET 3 OF 3

Project Phase

PRELIMINARY

Date Created	Drawn By	Approved By	Suitability Code
06.09.2023	RL	RW	-

PBA Project Number	Scale
020.5844	1:250H, 1:250V (AT A1)

PBA Drawing No:	Revision
020.5844.0253	P01

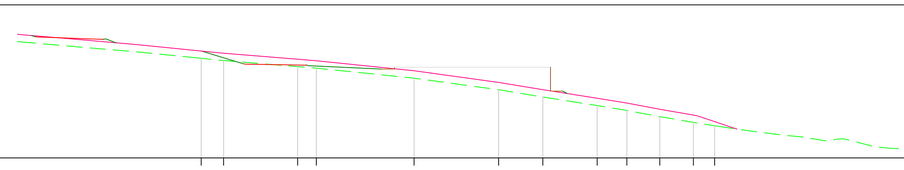
QMS2010/v8/310723/JM



LOCATION PLAN (SCALE 1:1000)

SECTION A-A

Datum: 65.000m AOD



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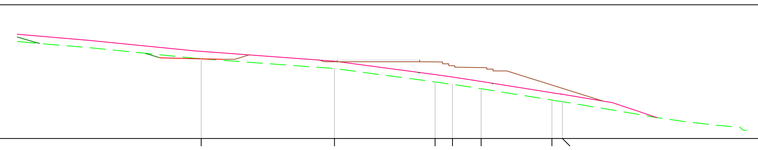
EXISTING LEVELS (m)	73.122	72.940	72.448	72.323	71.504	70.562	69.966	69.269	68.872	68.368	67.895	67.627
design S3D +0.6.dwg (m)	73.722	73.540	73.048	72.923	72.104	71.162	70.566	69.869	69.472	68.968	68.495	68.227
PROPOSED CHAINAGE (m)	-13.883	-13.490	-11.172	-9.802	-7.876	-7.662	-7.962	-5.849	-4.012	2.842	3.450	4.782	6.077	7.350	8.515	14.378	14.707	28.485	29.465	40.829	41.911	43.742
PROPOSED LEVELS (m)	74.990	74.869	74.785	74.734	74.683	74.694	74.072	73.523	72.858	72.671	72.625	72.604	72.582	72.561	72.412	72.248	70.452	70.451	68.319	67.957	67.344

SECTION J-J

Datum: 66.000m AOD



EXISTING CHAINAGE (m)	0.000	10.885	19.096	20.510	22.853	28.629	29.487																	
EXISTING LEVELS (m)	72.510	71.715	70.617	70.423	70.062	69.142	69.004																	
design S3D +0.6.dwg (m)	73.110	72.315	71.217	71.023	70.662	69.742	69.604																	
PROPOSED CHAINAGE (m)	-15.000	-13.185	-4.545	-3.468	0.000	0.000	1.181	1.181	2.560	3.675	7.333	7.542	17.698	19.644	23.767	23.853	34.091	35.678	37.206					
PROPOSED LEVELS (m)	74.279	73.757	72.952	72.613	72.504	72.504	72.464	72.464	72.383	72.842	72.079	72.079	71.404	71.198	70.460	70.503	68.755	68.221	67.707					

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PRELIMINARY

DRAWING/DESIGN IS STILL 'IN DEVELOPMENT'
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Rev	Description	Date	By	Appd
P01	FIRST ISSUE	12.09.2023	RL	RW

paulbasham associates
Paul Basham Associates Ltd
The Bothy, Cams Hall Estate, Fareham, PO16 8UT
01329 711 000
info@paulbashamassociates.com www.paulbashamassociates.com

Client
MIBRI LIMITED

Project Name
ANGEL SANDPIT,
STORRINGTON

Title
PLOT CROSS SECTIONS
SHEET 1 OF 5

Project Phase
PRELIMINARY

Date Created	Drawn By	Approved By	Suitability Code
06.09.2023	RL	RW	-

PBA Project Number	Scale	
020.5844	1:250H, 1:250V	(AT A1)

PBA Drawing No:	Revison
020.5844.0261	P01

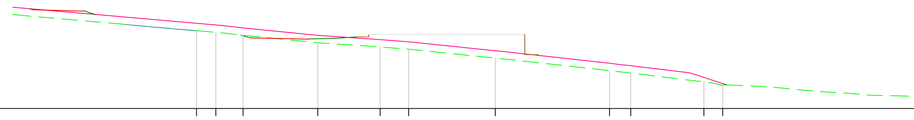


LOCATION PLAN (SCALE 1:1000)



SECTION B-B

Datum: 67.000m AOD



| | | |

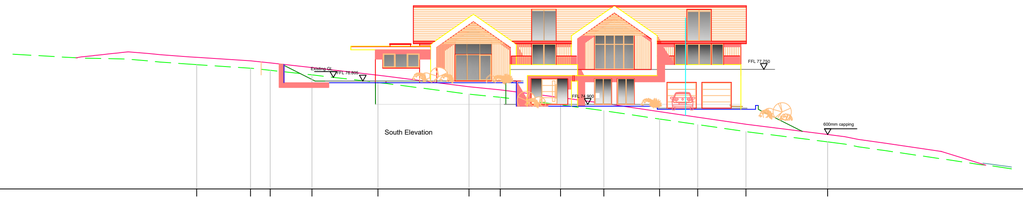


LOCATION PLAN (SCALE 1:1000)



SECTION C-C

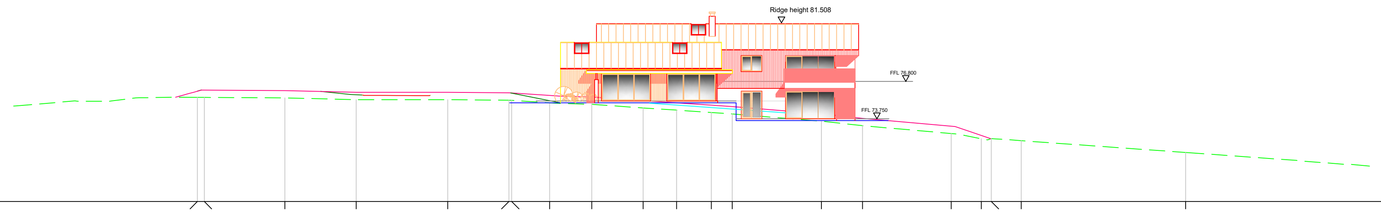
Datum: 68.000M AOD



EXISTING CHAINAGE (m)	0.000	4.392	6.004	9.408	14.796	22.230	24.775	29.700	33.233	37.783	40.895	44.832	51.503	
EXISTING LEVELS (m)	78.134	77.851	77.681	77.305	76.677	75.730	75.477	74.861	74.379	73.703	73.246	72.673	71.836	
design S3D +0.6.dwg (m)	78.734	78.451	78.281	77.905	77.277	76.330	76.077	75.461	74.979	74.303	73.846	73.273	72.436	
EARTHWORK LEVELS (m)				76.805	76.805 76.805	76.805		76.805	76.805					

SECTION D-D

Datum: 67.000m AOD



| | | | | | | | | | | | | | |



LOCATION PLAN (SCALE 1:1000)



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SECTION F-F

Datum: 65.000m AOD



| | | |

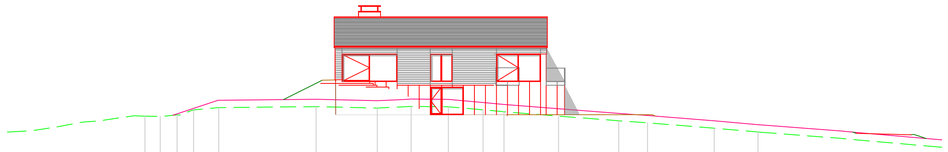


LOCATION PLAN (SCALE 1:1000)



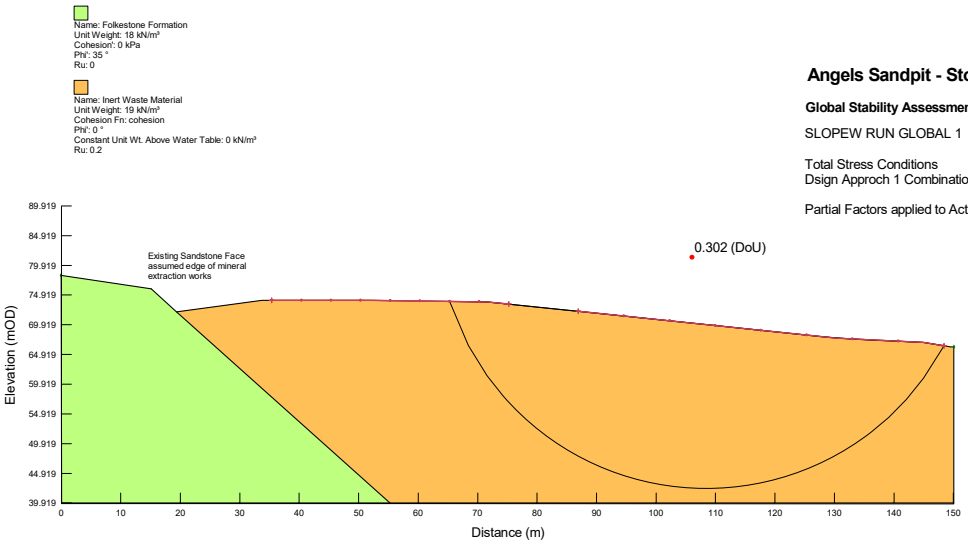
SECTION H-H

Datum: 73.000m AOD



| | | |

APPENDIX 3: SLOPEW WORKSHEETS – GLOBAL STABILITY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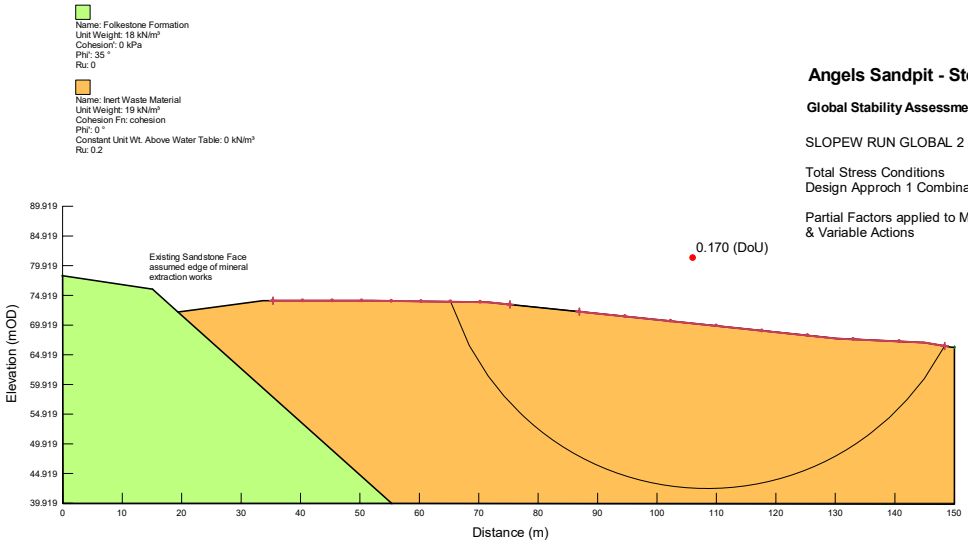
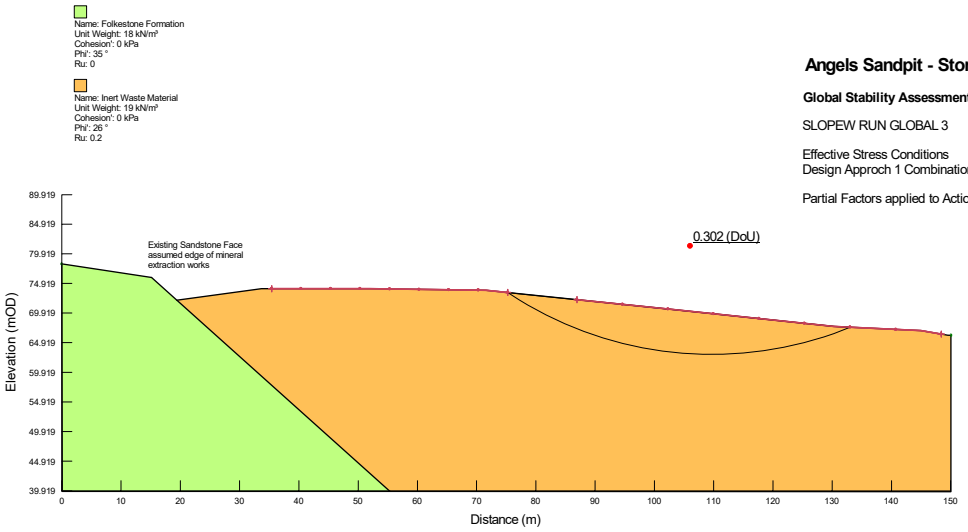
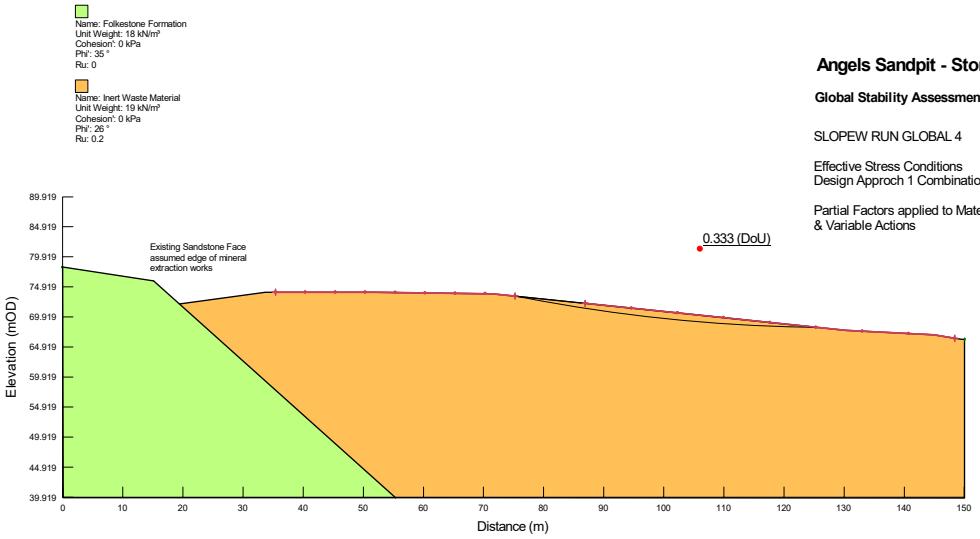
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 35 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
Angels Sandpit - Storrington
Global Stability Assessment
SLOPEW RUN GLOBAL 1
Total Stress Conditions
Dsign Approch 1 Combination 1
Partial Factors applied to Actions
0.302 (DoU)
Existing Sandstone Face
assumed edge of mineral
extraction works
Elevation (mOD)
Distance (m)


Name: Folkestone Formation
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 35 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
Angels Sandpit - Storrington
Global Stability Assessment
SLOPEW RUN GLOBAL 2
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
0.170 (DoU)
Existing Sandstone Face
assumed edge of mineral
extraction works
Elevation (mOD)
Distance (m)


Name: Folkestone Formation
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 35 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Ru: 0.2
Angels Sandpit - Storrington
Global Stability Assessment
SLOPEW RUN GLOBAL 3
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
0.302 (DoU)
Existing Sandstone Face
assumed edge of mineral
extraction works
Elevation (mOD)
Distance (m)



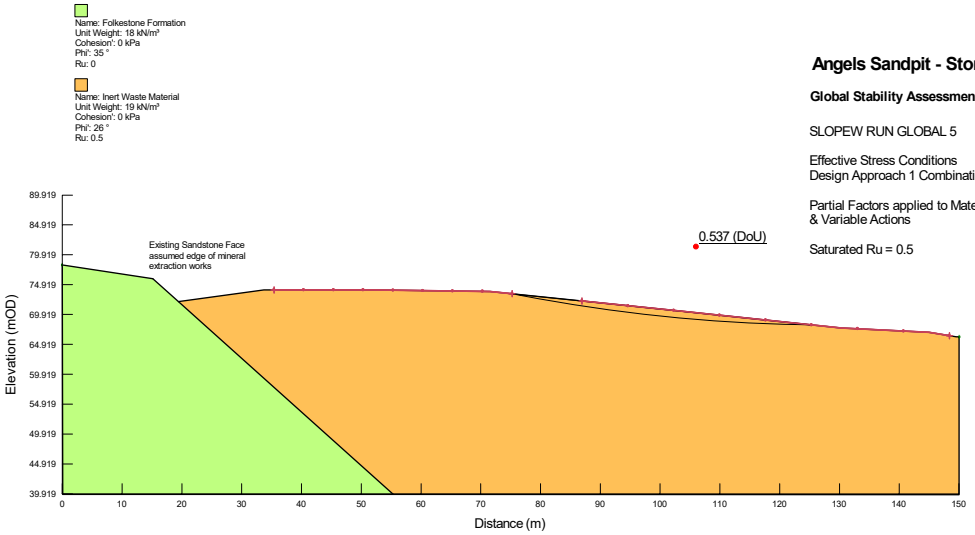
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 4

Effective Stress Conditions
Design Approch 1 Combination 2

Partial Factors applied to Materials
& Variable Actions



Angels Sandpit - Storrington

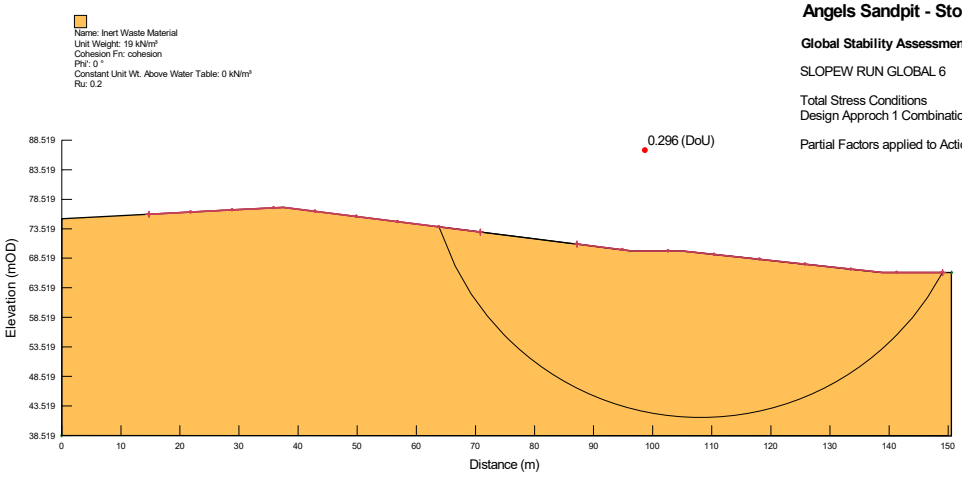
Global Stability Assessment

SLOPEW RUN GLOBAL 5

Effective Stress Conditions
Design Approach 1 Combination 2

Partial Factors applied to Materials
& Variable Actions

Saturated Ru = 0.5



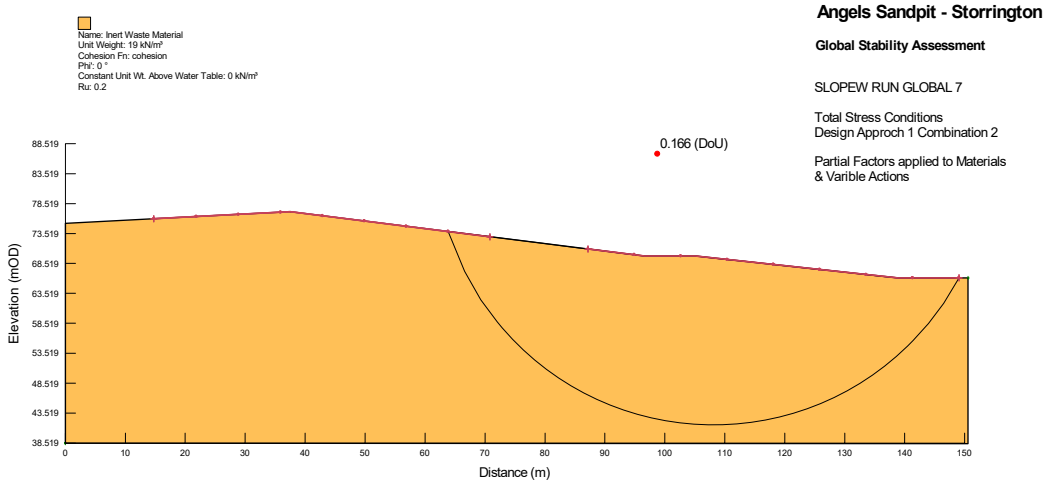
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 6

Total Stress Conditions
Design Approch 1 Combination 1

Partial Factors applied to Actions



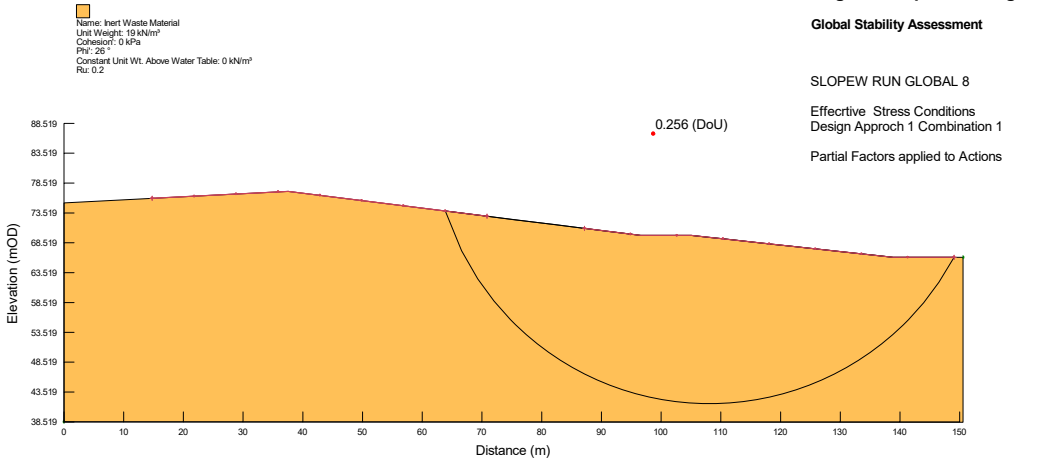
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 7

Total Stress Conditions
Design Approch 1 Combination 2

Partial Factors applied to Materials
& Varible Actions



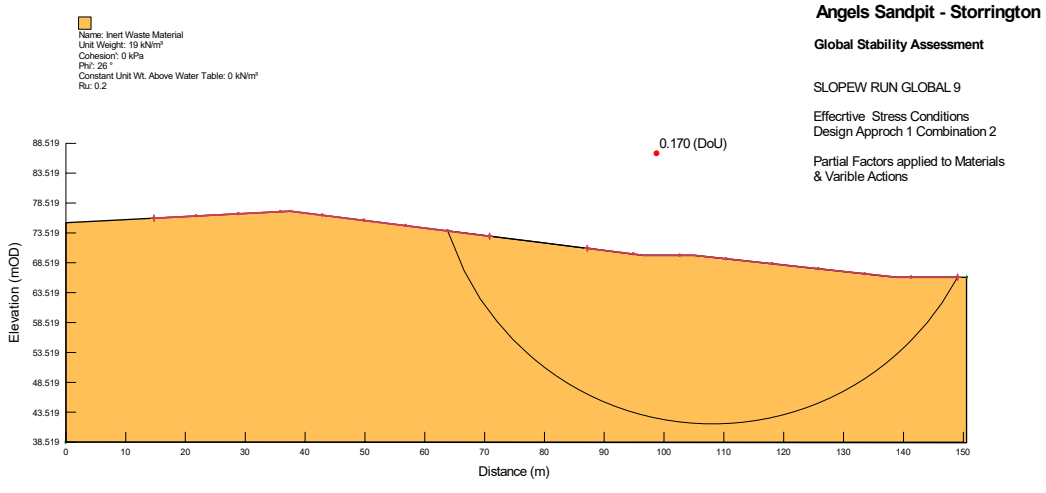
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 8

Effecrtive Stress Conditions
Design Approch 1 Combination 1

Partial Factors applied to Actions



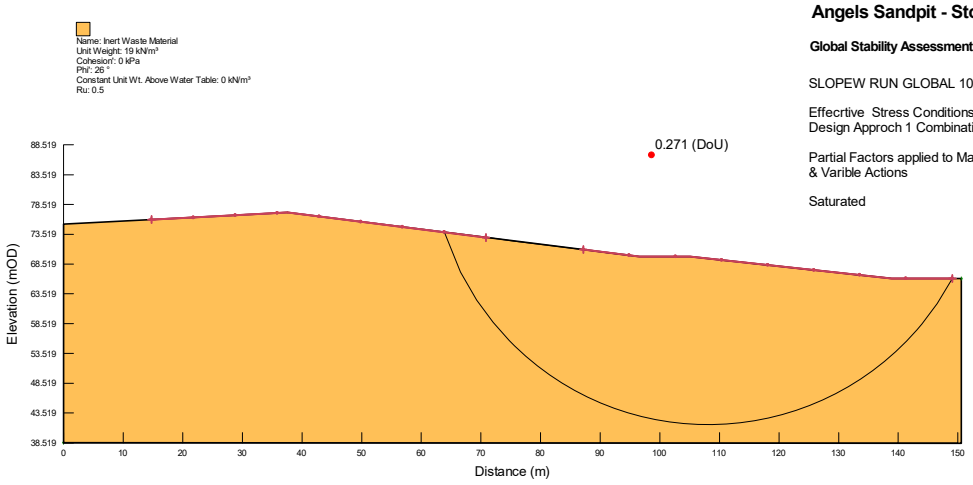
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 9

Effecrtive Stress Conditions
Design Approch 1 Combination 2

Partial Factors applied to Materials
& Varible Actions



Angels Sandpit - Storrington

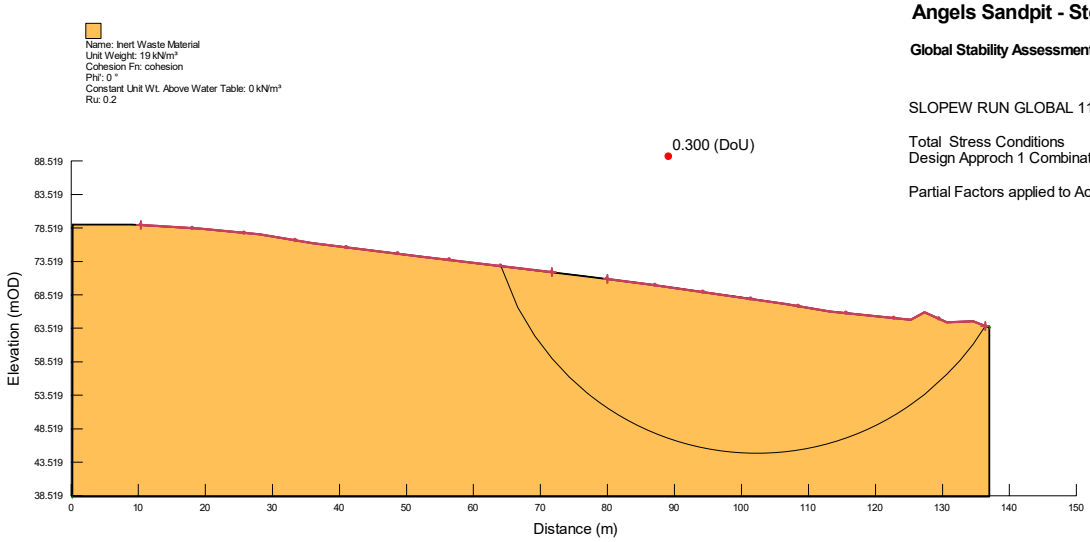
Global Stability Assessment

SLOPEW RUN GLOBAL 10

Effecrtive Stress Conditions
Design Approch 1 Combination 2

Partial Factors applied to Materials
& Varible Actions

Saturated



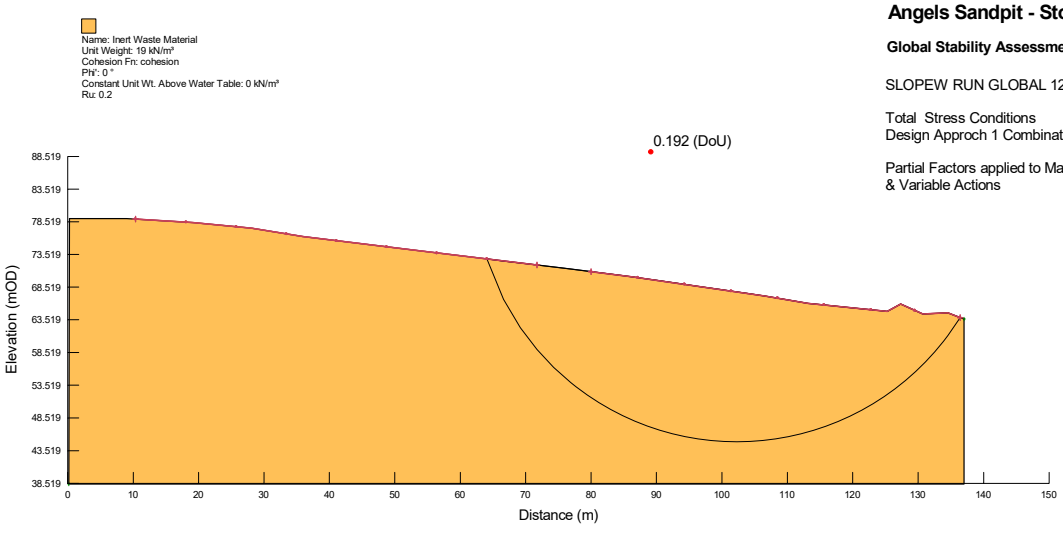
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 11

Total Stress Conditions
Design Approch 1 Combination 1

Partial Factors applied to Actions



Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 12

Total Stress Conditions
Design Approch 1 Combination 2

Partial Factors applied to Materials
& Variable Actions

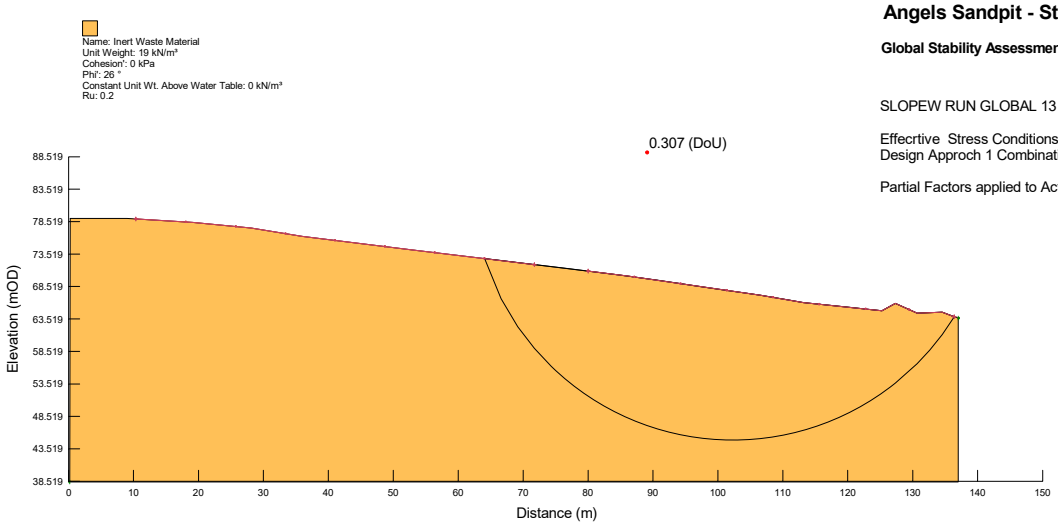
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 13

Effecrtive Stress Conditions
Design Approch 1 Combination 1

Partial Factors applied to Actions



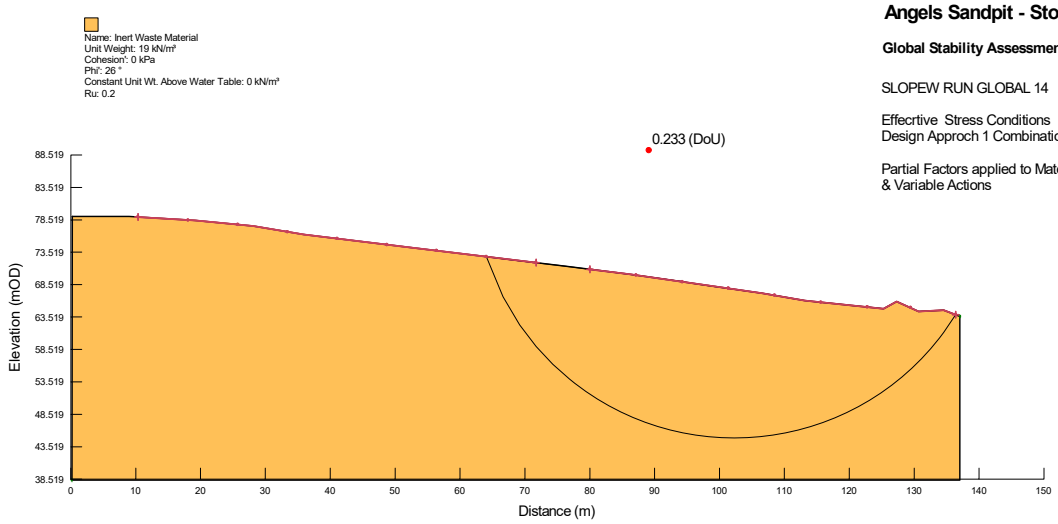
Angels Sandpit - Storrington

Global Stability Assessment

SLOPEW RUN GLOBAL 14

Effecrtive Stress Conditions
Design Approch 1 Combination 2

Partial Factors applied to Materials
& Variable Actions



Angels Sandpit - Storrington

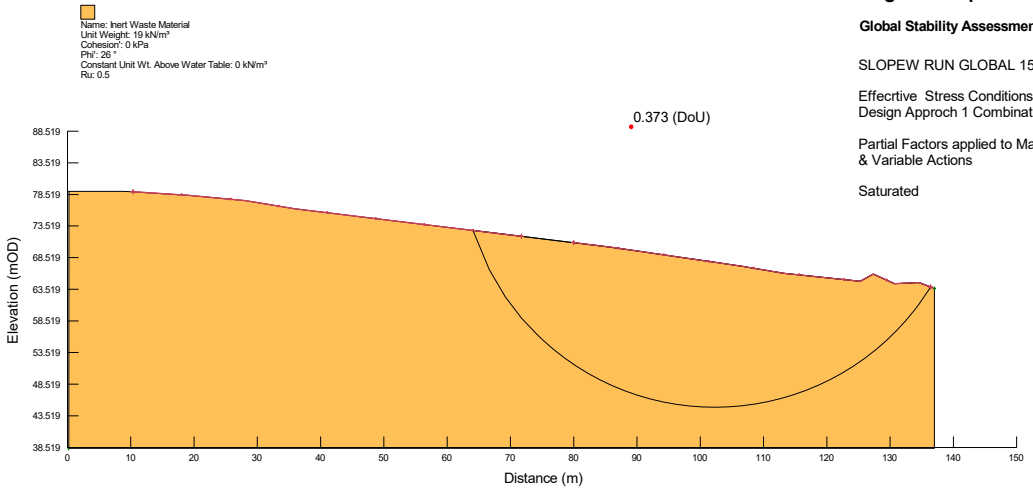
Global Stability Assessment

SLOPEW RUN GLOBAL 15

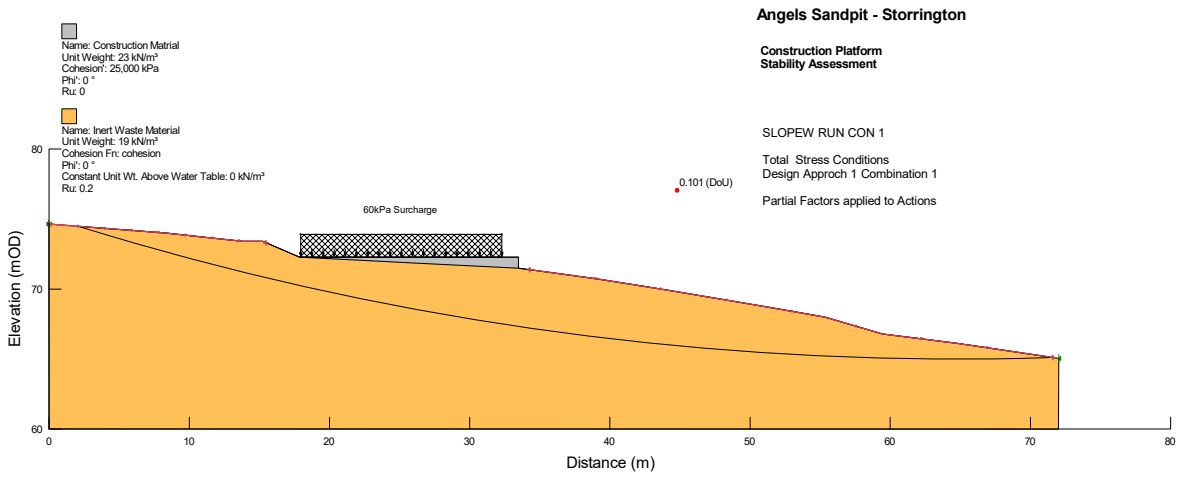
Effecrtive Stress Conditions
Design Approch 1 Combination 2

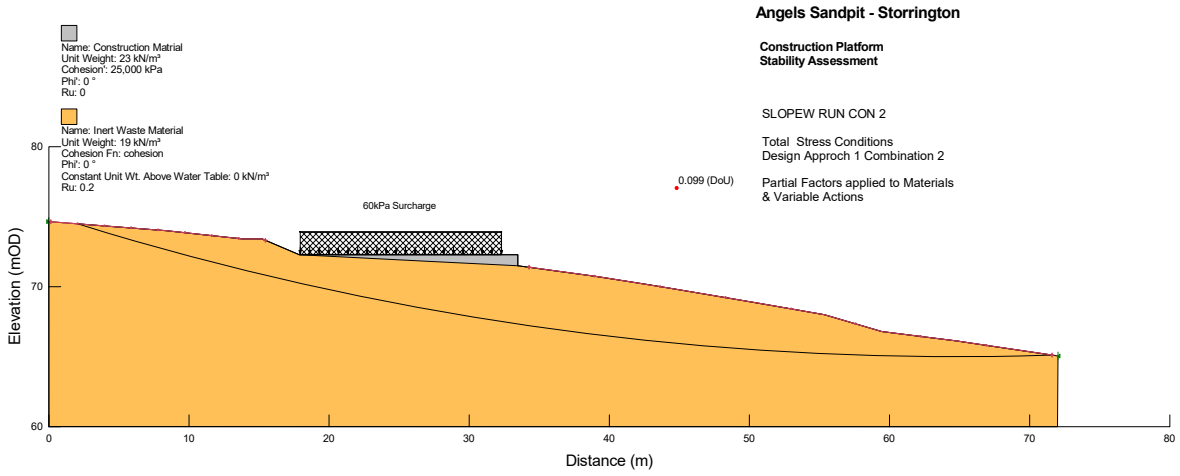
Partial Factors applied to Materials
& Variable Actions

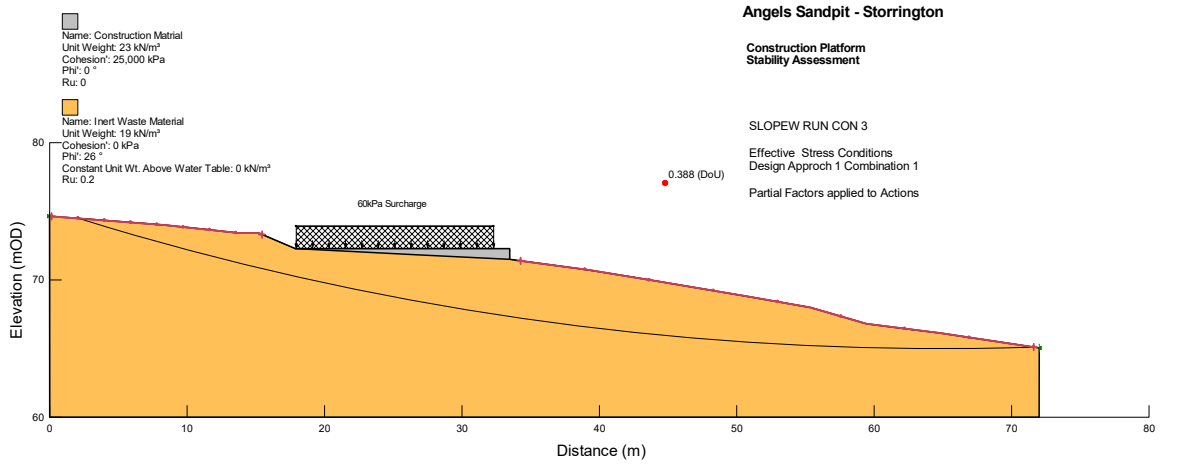
Saturated

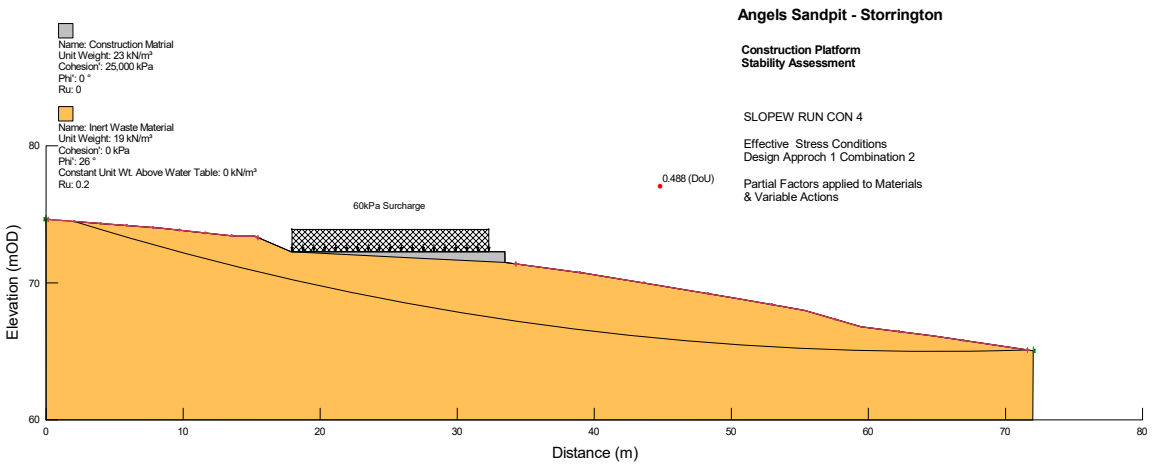


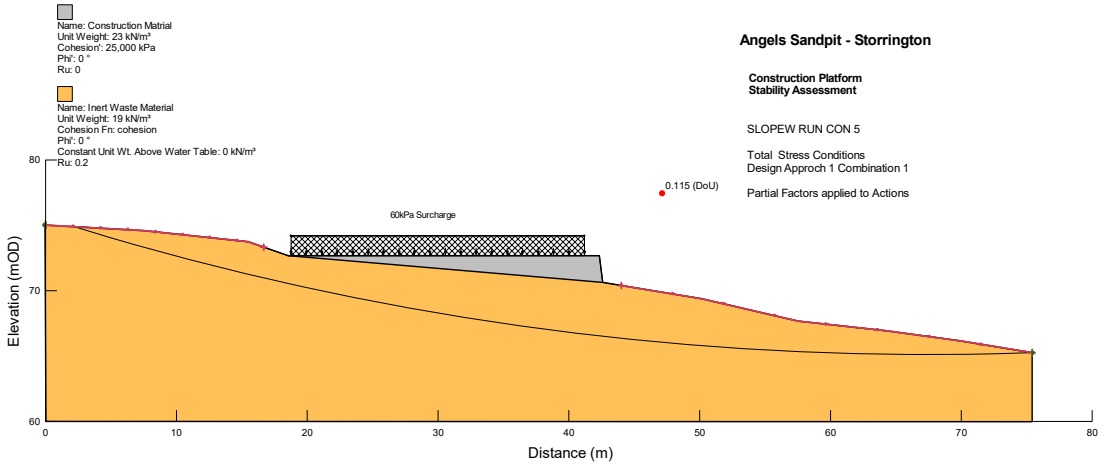
APPENDIX 4: SLOPEW WORKSHEETS – INDIVIDUAL PLOT STABILITY

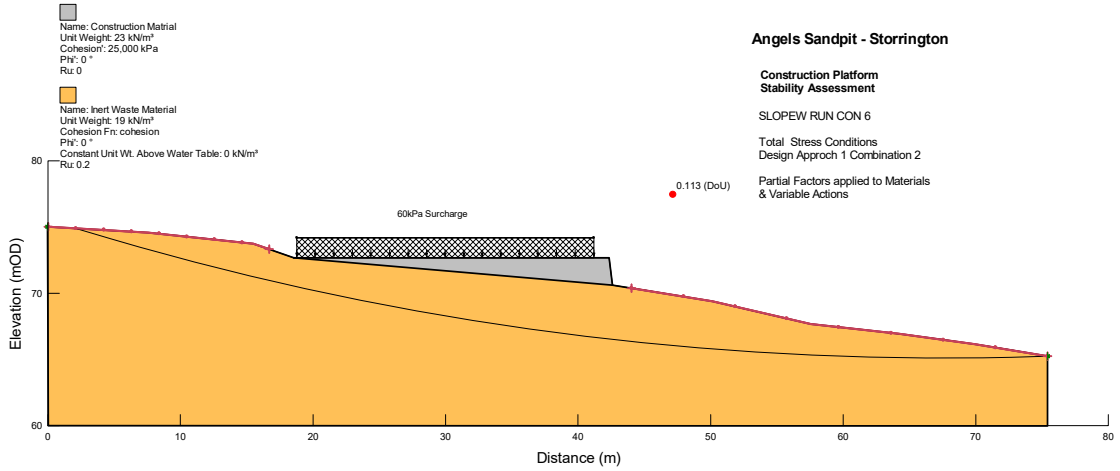

Angels Sandpit - Storrington
Construction Platform
Stability Assessment
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
SLOPEW RUN CON 1
Total Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
0.101 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

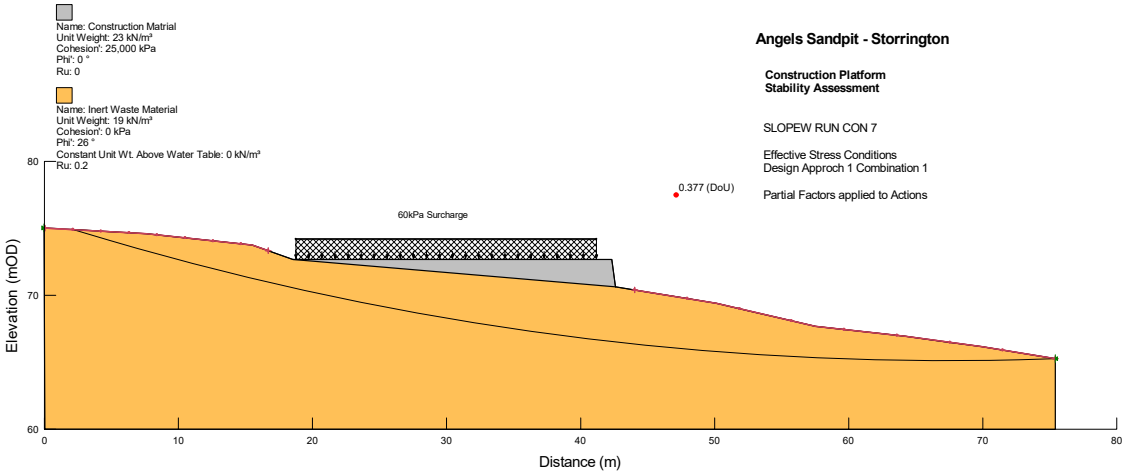

Angels Sandpit - Storrington
Construction Platform
Stability Assessment
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
SLOPEW RUN CON 2
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
0.099 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

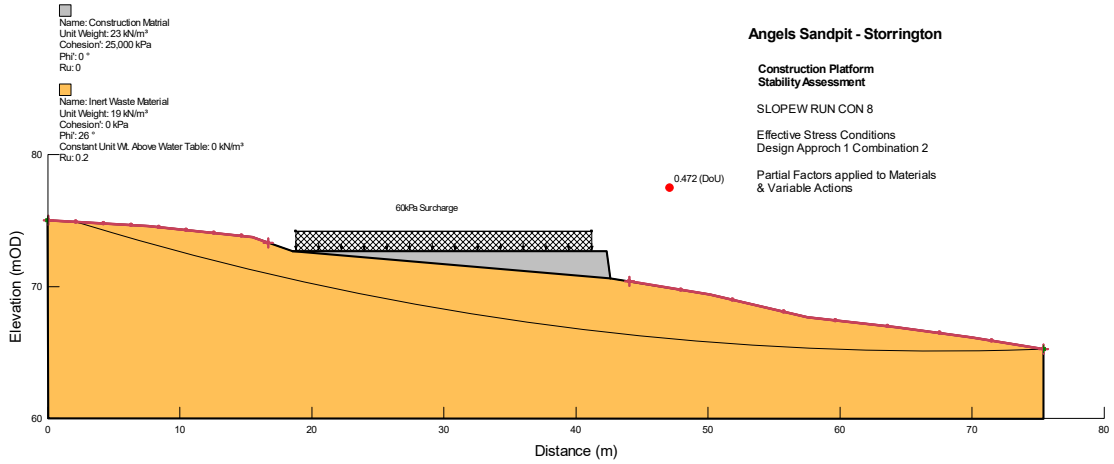

Angels Sandpit - Storrington
Construction Platform
Stability Assessment
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
SLOPEW RUN CON 3
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
0.388 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

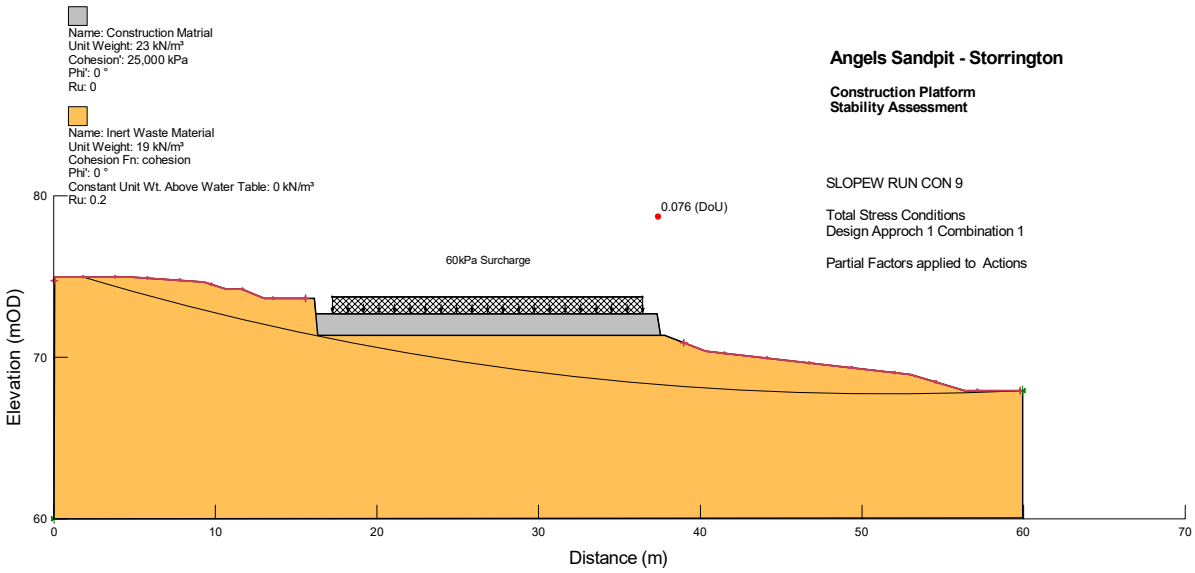

Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 4
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.488 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

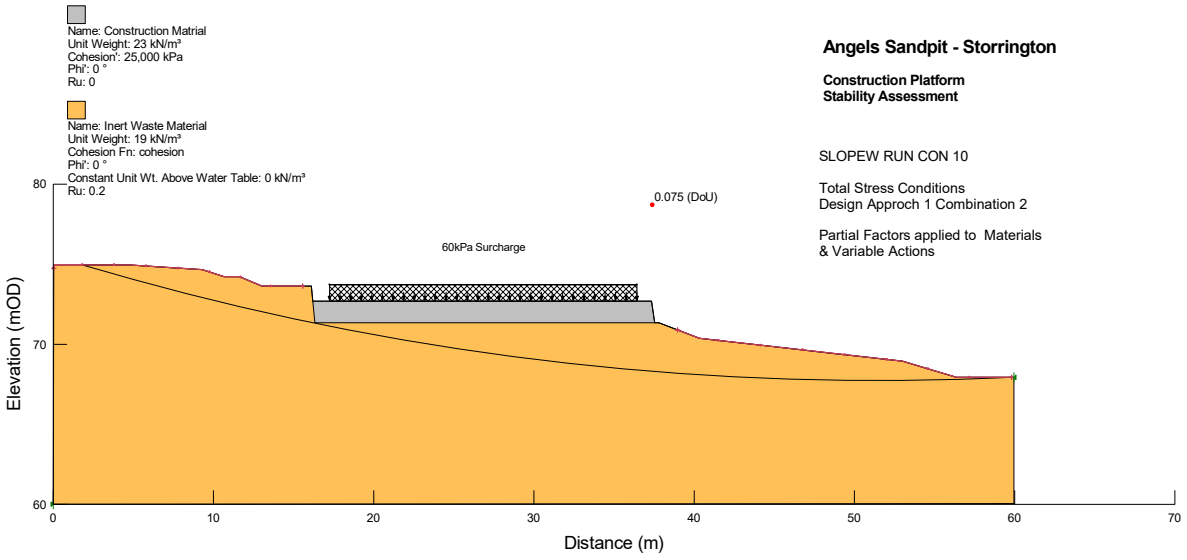

Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 5
Total Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.115 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

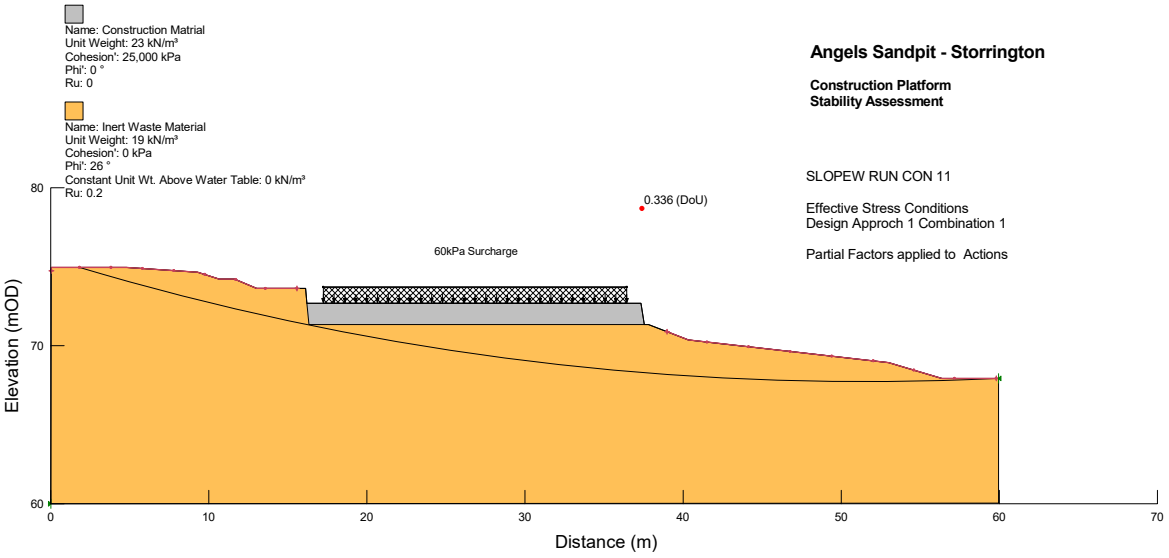

Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 6
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.113 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

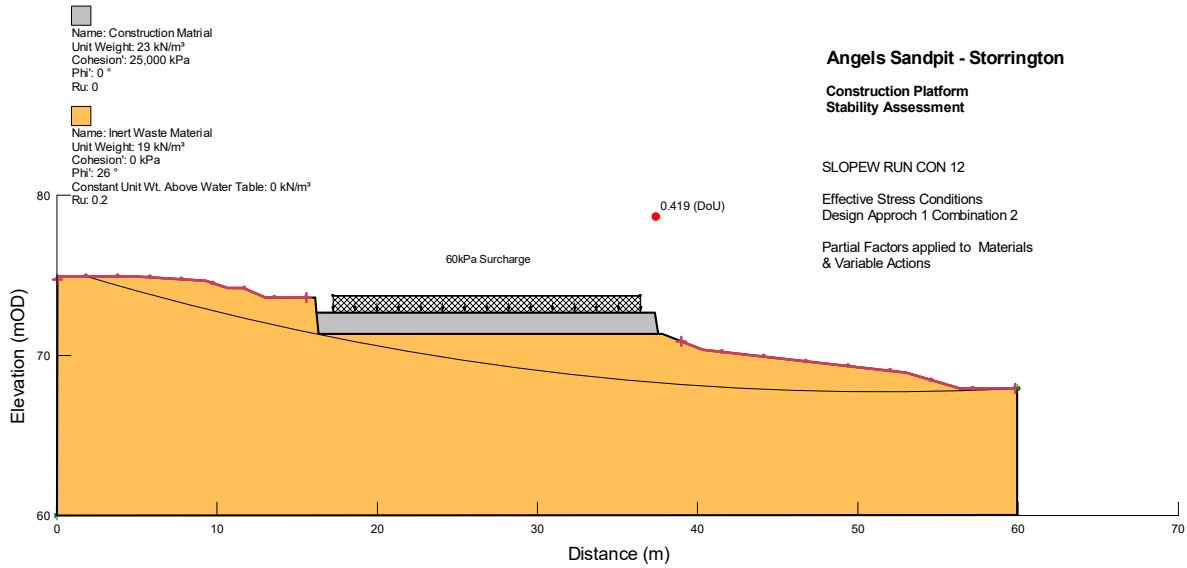

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 7
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
0.377 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

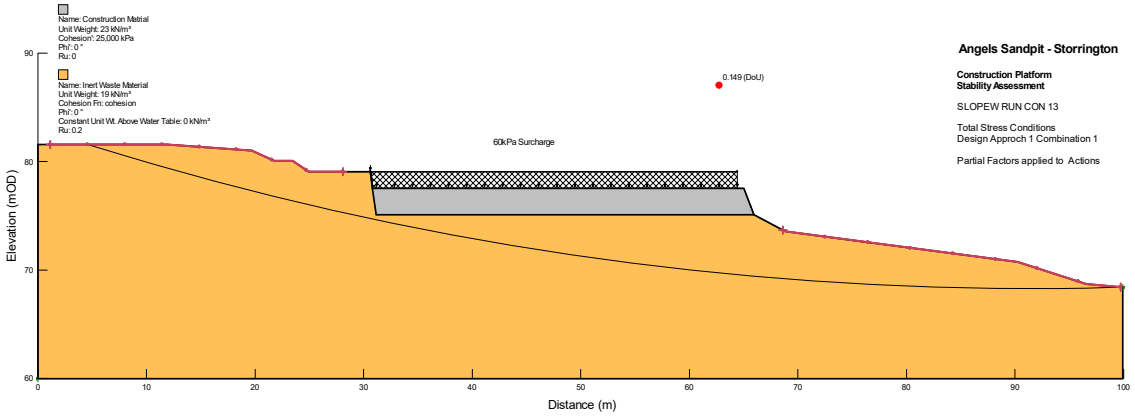

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 8
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
0.472 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

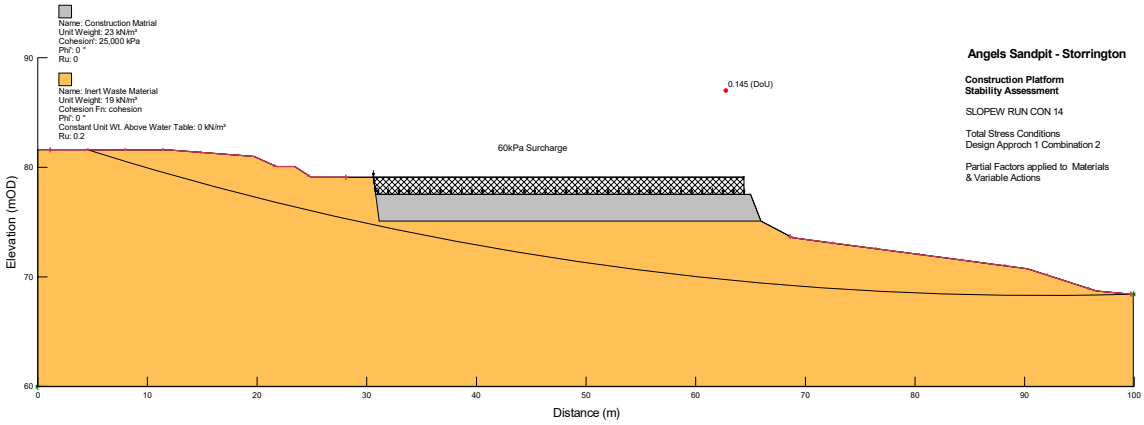

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 9
Total Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
0.076 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)

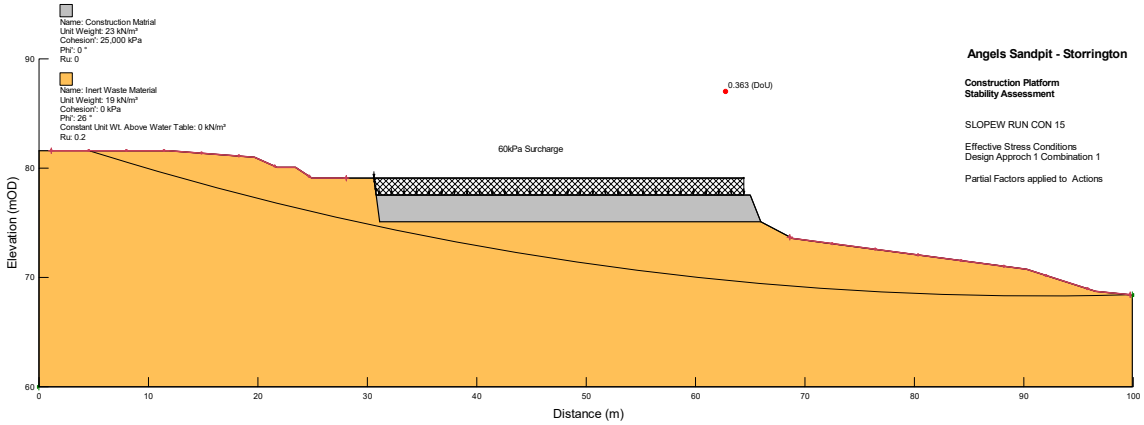

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.075 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 10
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)

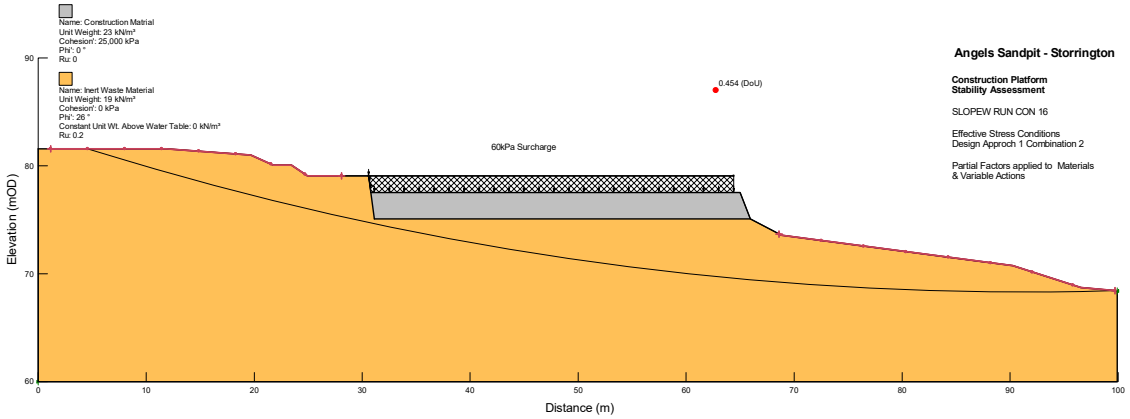

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.336 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 11
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)

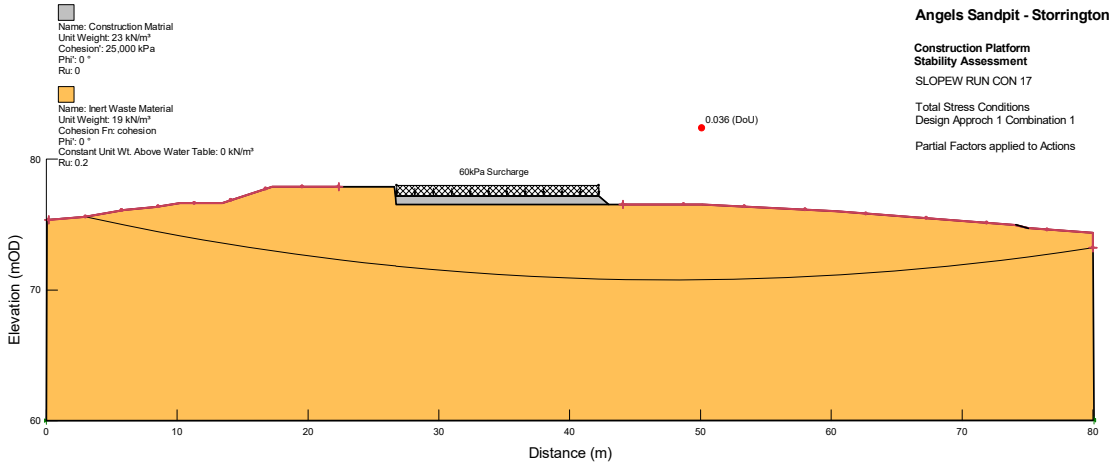

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.419 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 12
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)

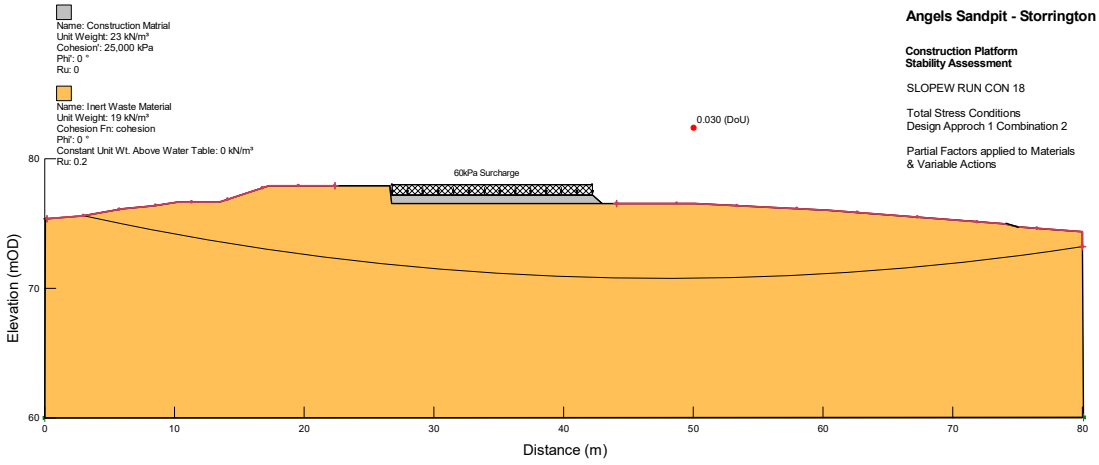

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.149 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 13
Total Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)

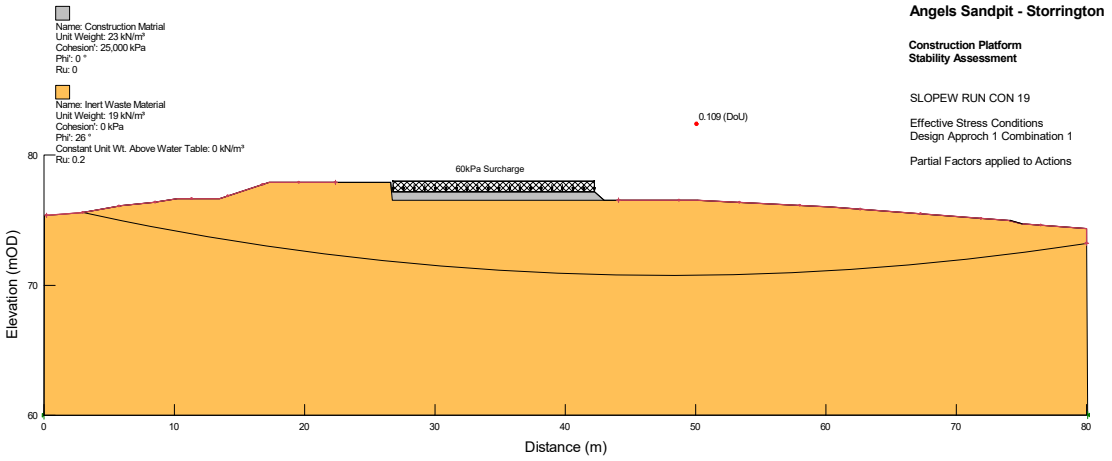

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.145 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 14
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)

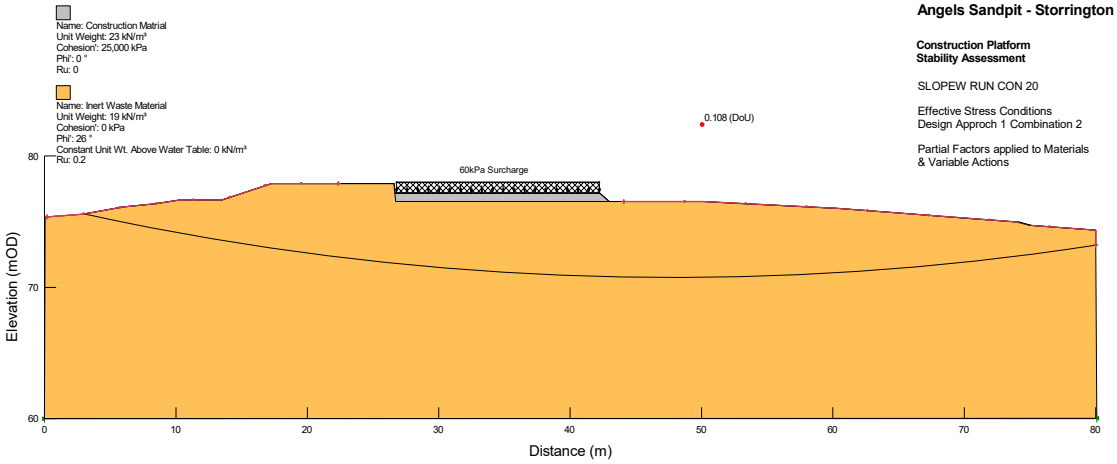

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.363 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 15
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)

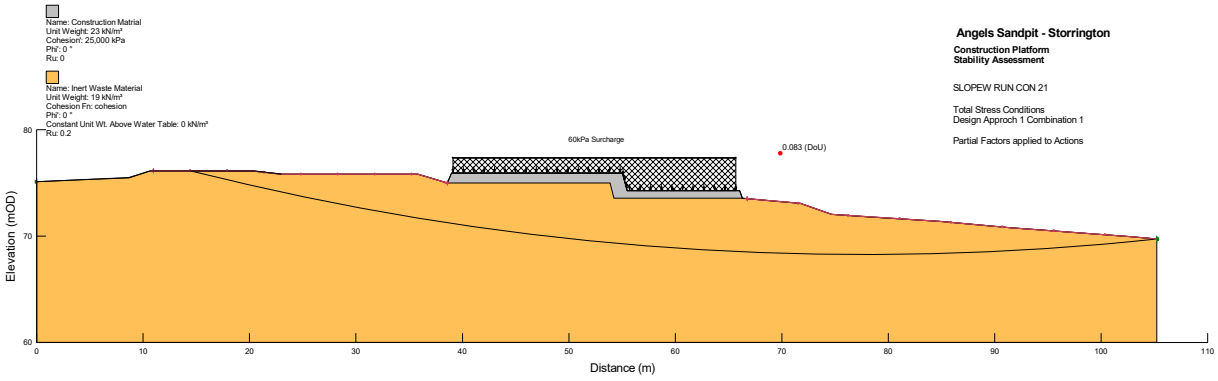

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.454 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 16
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)

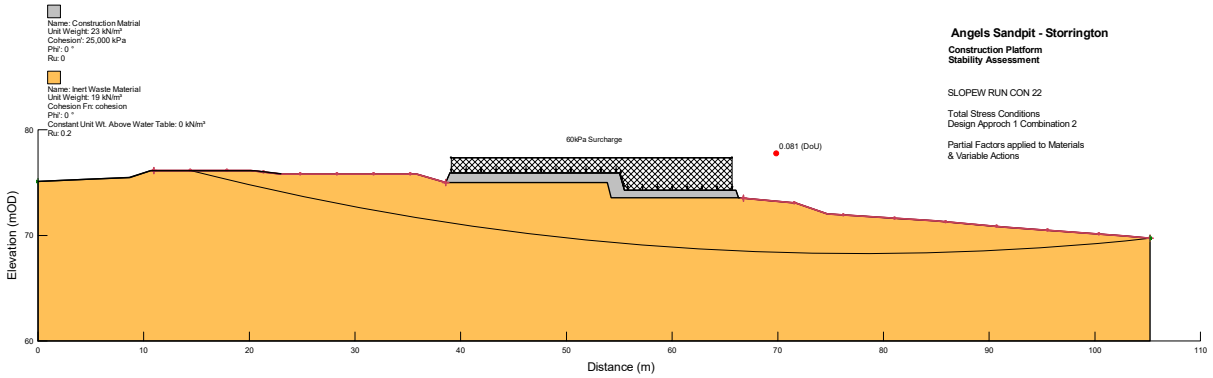

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.036 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 17
Total Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)

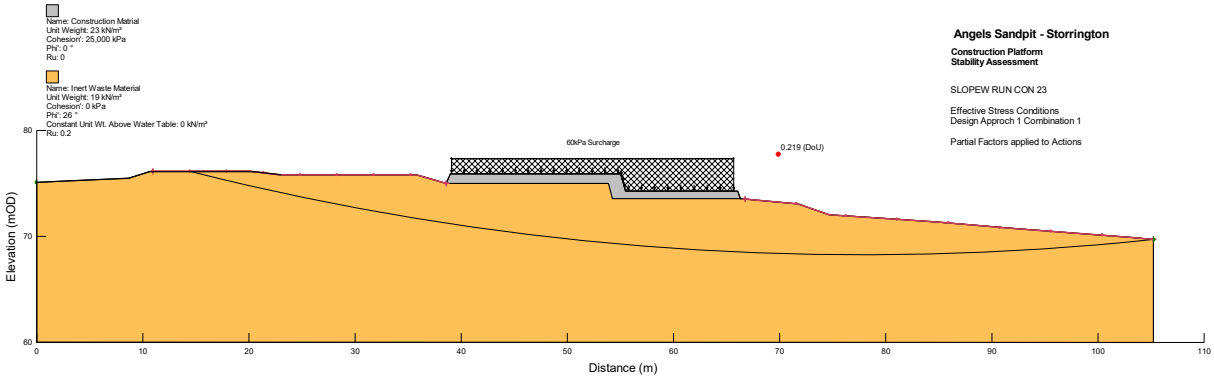

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.030 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 18
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)

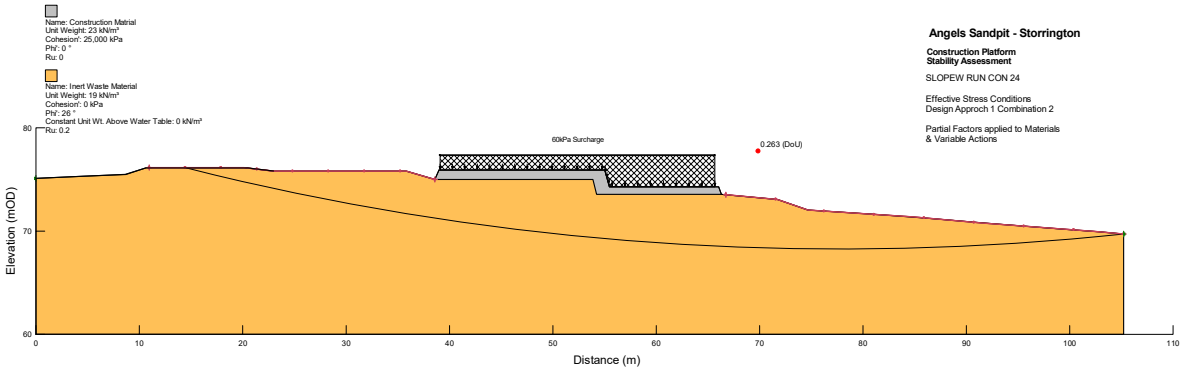

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.109 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 19
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)

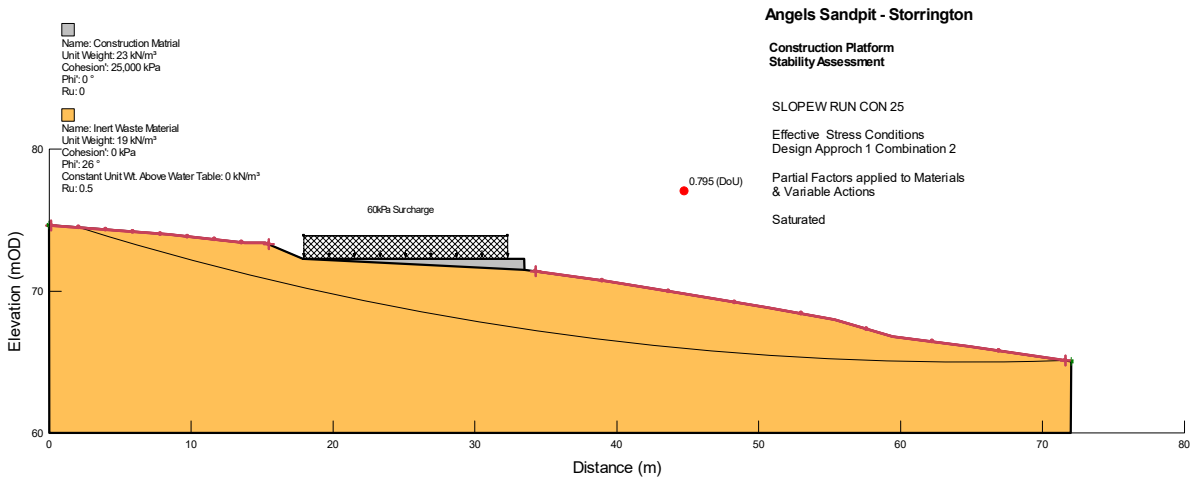

Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
0.108 (DoU)
60kPa Surcharge
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 20
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)


Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
60kPa Surcharge
0.083 (DoU)
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 21
Total Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)


Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion Fn: cohesion
Phi': 0 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
60kPa Surcharge
0.081 (DoU)
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 22
Total Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)


Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
60kPa Surcharge
0.219 (DoU)
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 23
Effective Stress Conditions
Design Approch 1 Combination 1
Partial Factors applied to Actions
Elevation (mOD)
Distance (m)


Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.2
60kPa Surcharge
0.263 (DoU)
Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 24
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Elevation (mOD)
Distance (m)


Angels Sandpit - Storrington
Construction Platform
Stability Assessment
SLOPEW RUN CON 25
Effective Stress Conditions
Design Approch 1 Combination 2
Partial Factors applied to Materials
& Variable Actions
Saturated
Name: Construction Matrial
Unit Weight: 23 kN/m³
Cohesion': 25,000 kPa
Phi': 0 °
Ru: 0
Name: Inert Waste Material
Unit Weight: 19 kN/m³
Cohesion': 0 kPa
Phi': 26 °
Constant Unit Wt. Above Water Table: 0 kN/m³
Ru: 0.5
0.795 (DoU)
60kPa Surcharge
Elevation (mOD)
Distance (m)
80
70
60
0
10
20
30
40
50
60
70
80