DESIGN PROPOSAL USING FIBRODEX SYSTEM AS SLOPE PROTECTION AND EROSION CONTROL ALONG JALAN KAMPUNG TULANG RIMAU, JOHOL, KUALA PILAH, NEGERI SEMBILAN.

Design Proposal

23 May 2023

Ref: DC 23002-N

By:

DANAMIK UNGGUL CONSTRUCTION.
No.007 Block C, Jalan AU1B/1,
Taman Keramat Permai,
54200 Keramat, Wilayah Persekuyuan,
Kuala Lumpur
Malaysia
H/P: 019 3616528

Table of Content

DESIGN PROPOSAL USING FIBRODEX SYSTEM AS SLOPE PROTECTION AND EROSION CONTROL ALONG JALAN KAMPUNG TULANG RIMAU, JOHOL, KUALA PILAH, NEGERI SEMBILAN.

1.0 INTRODUCTION

This report presents the design proposal to prevent further soil erosion of slope with a gradient of 1(V):1(H) at about 7m vertical height with Fibrodex system with hydro-mulching. The design calculation and the assumption made will be first presented, followed by the evaluation of the system and finally recommendations for the proposed rehabilitation works will be highlighted.

Attached below are some photos taken at site.

2.0 BRIEF DESCRIPTION OF THE SLOPE EROSION

The eroded section of the slope is due the surface runoff from the road since this area is the lowest point of the road. Most of the runoff is diverted towards the lowest point of the road and onto the slope, forming gullies along the slope. The main aim of using the Fibrodex system is to protect the slope from scouring and to infill the with

fertile soil and spray hydro-mulching on top of the filled Fibrodex. This will give a much better environment to strengthen the top-soil from erosion and allow grass to grow over the slope area giving a green aesthetic look to the surrounding. All trees need to be cut off and a proper road drain need to be constructed together with a cascading drain at the lowest point of the road to allow surface water to be captured and distributed to the bottom of the slope.

3.0 ASSUMPTIONS

Based on the information given regarding the site (history, hydrology, subsoil & topography survey data, underground and overhead services, etc.), some assumptions were made to accomplish the design proposal based on the knowledge and engineering judgements of the designer. All engineering assumptions must be verified and confirmed by soil investigation and topography survey.

4.0 DESIGN & PROPOSAL

Section of the proposed slope rehabilitation was modelled and checked for Fibrodex with fertilised infilled soil material for grass and then perform hydro-mulching on top of the infilled soil.

5.0 RECOMMENDATIONS & CONCLUSIONS

Basically, our proposed rehabilitation design is a combination of the following elements:

1. Drainage controls – berm drain to cater for the upslope catchments, subsoil drainage media to cater for the underground water and infiltration during construction.

2. The proposed design can be constructed easily without the need of heavy machinery. Excellent flexibility aspect of the Fibrodex system is another advantage over the conventional rigid wall system. We believe the above proposal suits the budget of the project without sacrificing the stability aspect.

6.0 LIMITATIONS

The design proposal was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by engineers practising in this or similar localities. No warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The assumptions and engineering judgements made to accomplish the proposal are believed to be representative of the entire contract area. However, as revealed by many previous developments, the actual soil and geologic conditions faced during the construction may vary drastically from the soil investigation result. If this occurs, the changed of conditions must be evaluated by geotechnical engineer and revision or alteration of design may be made accordingly

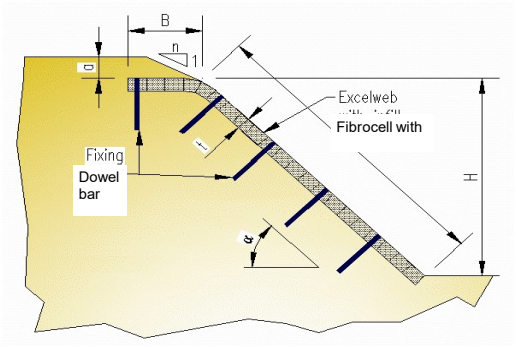
Appendix A

Design Calculation

DYNAMIK UNGGUL CONSTRUCTION N0:007 Block C, Jalan AU1B/1, Taman Keramat Permai, 54200 Keramat, Wilayah Persekutuan, Kuala Lumpur Malaysia	Job title: Proposed Slope Protection for a slope with a gradient of 1 : 1 with Fibrodex at Jalan Kpg. Tulang Rimau, Johol, N.S.			Job No. DC-23002-N
	Calc. by: kh	Chk. by: kh	Date: 24/5/23	Page: 1

Fibrocell Stability Check

Slope gradient, α (°)	=	1 : 1.00	=	45 °
	=	0.785398 π		
Ht of Fibrocell slope, H (m)	=	7		
Slope length, L (m)	=	9.899495		
Length of anchorage head, B (m)	=	0		
Overburden on anchorage, a (m)	=	0		
No. of dowel on anchorage (/m)	=	3		
Type. of Fibrocell	=	FD80		
Thk of Fibrocell, t (m)	=	0.08		
Infill material wt, (kN/cu.m)	=	18		
Cohesion of Fibrocell block/soil (kN/m^2)	=	5		
Friction angle of soil/geocell block, φ (°)	=	28		
	=	0.488692 π		
Wt of Fibrocell with infill (kN/m/m)	=	2.04		
Sliding force, F_{Slip} (kN/m)	=	14.26		
Friction, P_F (kN/m)	=	57.08		
Dowel bar allw. Capacity, Q (kN)	=	0.375		
Spacing of dowel bar, S_{Bar} (m)	=	1		
No of dowel bar	=	8		
Resistance of dowel bar-slope, P_{Bar} (kN/m)	=	3.00		



$$FoS_{Slope} = \frac{P_F + P_{Bar}}{F_{Slip}}$$

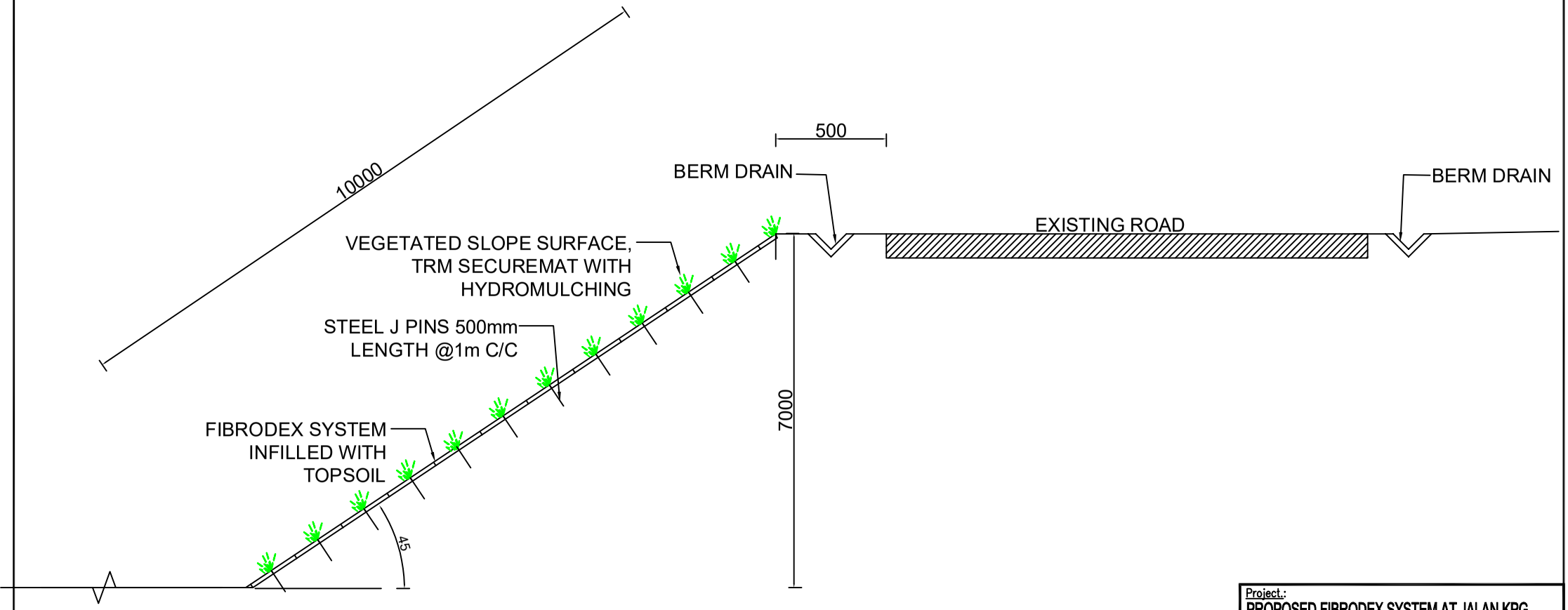
Anchorage Head

Anchorage friction	=	0.00		
Anchorage dowel resistance	=	0.38		
Total anchorage resistance	=	0.38		
Total resisting force	=	60.45		
FOS for sliding over slope, FOS_{Slope}	=	4.24	>1.0	OK

Appendix B

Drawings

DYNAMIK UNGGUL
CONSTRUCTION



Typical Cross Section

Not to scale

Project.:
PROPOSED FIBRODEX SYSTEM AT JALAN KPG TULANG RIMAU, JOHOL, KUALA PILAH, NEGERI SEMBILAN.

Title:
TYPICAL CROSS SECTION

Drawing No.:	Revision:	Date:
DC23001-D1	00	23-May-2023

DYNAMIK UNGGUL CONSTRUCTION.
e-mail: dynamikunggul@gmail.com
H/P: 0193616528

Appendix C

Specification