



REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT

Site Specific Environmental and Social Management Plan

Site No. 150

**Failed Slope between culvert No. 98/4 and 99/1 of Colombo Kandy Road
A-001 (Pahala Kadugannawa area)
Kegalle District**

September 2023

Prepared for:



**ASIAN INFRASTRUCTURE
INVESTMENT BANK**

Prepared by:



**National Building Research Organisation
99/1, Jawatta Rd | Colombo 05**

Tel: 011-2588946, 011-2503431, 0112-2500354

Table of Content

1. Introduction	1
1.1 Project overview	1
1.2 Intended users	1
2. Description of the project	1
2.1 Name of the project	1
2.2 Location details	1
2.3 Topography and land ownership	2
2.4 Meteorology of the area.....	3
2.5 Demographic feature of the area	3
3. Landslide hazard incident details	3
3.1 Account of incident	3
3.2 Effects and consequences of landslide	4
3.3 Description of any remedial measures already undertaken to reduce the potential risk.....	4
3.4 Evacuations.....	5
3.5 Resettlement (progress)	5
4. Description of the area of the landslide/slope failure and areas adjacent to the landslide and current level of risk.....	5
4.1 Area of the landslide.....	5
4.2 Areas adjacent to the landslide	6
4.3 Current level of risk.....	6
5. Description of the works envisaged under the project.....	6
5. Brief description on the surrounding environment with special reference to sensitive elements that may be affected by the project actions	7
6. Identification of social and environmental impacts and risks related to the works.....	9
6.1 Positive impacts.....	9
6.2 Negative impacts	9
6.2.1 Hydrological and water Quality impacts.....	9
6.2.1.1 Impacts of the drainage pattern of the area	9
6.2.1.2 Water pollution and impacts on surface water quality	9
6.2.1.3 Erosional impacts and stream/ reservoir bed alterations.....	9
6.2.1.4 Open defecation and waterborne infections	9
6.2.1.5 Impacts on ground water table and ground water quality	10
6.2.1.6 Impacts on water or wetlands.....	10
6.2.2 Environmental Impacts	10
7.2.2.1 Noise and vibration impacts.....	10
6.2.2.2 Air pollution impacts	10
6.2.2.3 Solid waste disposal issues	10

6.2.2.4 Explosive hazards and hazardous materials	10
6.2.3 Biological /Ecological Impacts	10
6.2.3.1 Effects on Fauna & Flora.....	10
6.2.4 Social and Economic Impacts	11
6.2.4.1 Impacts on agriculture within the area to be remedied/ immediately to the site.....	11
6.2.4.2 Cracks in the building due to vibration impacts.....	11
6.2.4.3 Loosing access to land and future development activities	11
6.2.4.4 Impacts on livelihood/ business and income activities	11
6.2.4.5 Impacts on service provision (water supply, sewage, electricity).....	11
6.2.4.6 Effect due to loss of infrastructure and safety.....	11
6.2.4.7 Work camps and lay-down site requirements	11
6.2.4.8 Relations between workers and staff/ people living in the vicinity of the site and possibility of disputes	11
6.2.4.9 Workers safety during construction	11
6.2.4.10 Safety to the public from construction activities: High risk for commuters	12
6.2.4.11 Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion)	12
6.2.4.12 Areas used for businesses, agriculture or other immediately adjacent to the site	12
6.2.4.13 Need for people to enter or cross the site	12
7. Significant Environmental and Social Impacts: Social or Environmental impacts or risks that will require special measures on the part of NBRO and the contractor; Indicative significant impacts	12
7.1 Significant Environmental and Social Impacts	12
7.2 Priority Health and Safety Issues. Specific H&S concerns that require measures that go beyond the standard contractual requirements for contractors.....	13
7.3 Child labour & forced labour.....	13
8. Environmental Social Management Plan (ESMP)	13
8.1 Resettlement action plan.....	13
8.2 Evacuation of people	13
8.3 Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles)	13
8.4 Requirement for compensation for loss of property /uses due to project actions.....	13
8.5 Public awareness and education- needed for following areas	13
8.6 Design based Environmental/ Social Management considerations	13
8.7 Mitigation of impacts during the construction phase	15
8.7.1 Construction contractors' requirement to comply with environmental and social management during the construction phase	15
8.7.2 Site Specific mitigation	16
8.7.3 Monitoring requirements specific to the site.....	19
9. Labour management.....	20
10. Preventive measures for COVID-19 that was issued by Sri Lankan national health authority.....	20
11. Public and Stakeholder Consultations -the public consultations that have been and/or will be held..	21

11.1 Public Consultations	21
11.2 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure II)	21
12. Clearances, no objection, consent and approvals required for the implementation of the project	21
12.1 Project implementation.....	21
12.2 Approval from the state lands owners relevant to the project	21
12.3 Consent/ no objection/ legally bound agreement from the private land ownerships	22
13. Grievance redress mechanism for this site	22
14. Information disclosure.....	23

List of Annexures

Annexure I: Images of the site condition and the consultation	i
Annexure II: Proposed procedure for obtaining approvals from state land owners and environmental agencies.....	i
Annexure III: Study team.....	ii
Annexure IV: List of references.....	ii
Annexure V: Due diligence report on the exhumation and re burial graves in the location of land slide area (CH 97 + 830 – 97 + 865) – RMC 01 – Colombo Kandy road (A 001)	iii

List of Figures

Figure 1: Road map showing the accessibility to the site	2
Figure 2: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.	2
Figure 3: Drone image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.	3
Figure 4: Google image, cross sections, land use, risk elements and the photographs of special features of the location.....	5
Figure 6: Cross sections, land use, risk elements of the location.....	5
Figure 7a: Upslope area of the mitigation site	7
Figure 7b: Down slope of the mitigation site.....	7
Figure 7c: Damaged toilet compound	7
Figure 7d: Water tank	7
Figure 7e: Colombo-Kandy road and small boutiques at the downslope (Towards kandy)	8
Figure 7f: Colombo-Kandy road and small boutiques at the downslope (Towards Colombo).....	8
Figure 7g –A boutique at the downslope (RHS of road)	8
Figure 7h: Up slope forest area.....	8
Figure 7i- Access road of the Cemetery located boundary of the mitigation site	8
Figure 7j- Location of recent cemetery.....	8

List of Tables

Table 1: Negative impacts and their level of significance	9
Table 2: Design stage Environmental & Social considerations	14
Table 3: Contractor requirement to comply with ES & HS	15
Table 4: Site specific ES & HS mitigation measures.....	17
Table 5: Environmental and Social monitoring plan; construction phase	20
Table 6: Clearances, no objection, consent and approvals.....	21
Table 7: Tentative timeline for getting approvals	22
Table 8: Proposed scheme of information disclosure	23
Table 9: Level of information gathered through consulting institutions.....	23

Abbreviations

AIIB	Asian Infrastructure Investment Bank
CEA	Central Environmental Authority
DFC	Department of Forest Conservation
DS	Divisional Secretary
DWLC	Department of Wild Life Conservation
EH & S	Environmental Health & Social
E&SU of PMU	Environmental & Social Unit of Project Management Unit
ESMF	Environmental and Social Management Framework
SSE&SMP	Site Specific Environmental and Social Management Plan
ESMP	Environmental and Social Management Plan
GN	Grama Niladhari
GOSL	Government of Sri Lanka
GSMB	Geological Surveys & Mines Bureau
NBRO	National Building Research Organization
PRDA	Provincial Road Development Authority
RHS	Right Hand Side
LHS	Left Hand Side

1. Introduction

1.1 Project overview

The Government of Sri Lanka has received a loan from the Asian Infrastructure Investment Bank (AIIB) for mitigating/rectifying 127 unstable slopes in high-risk areas especially in 11 districts of 06 provinces of the country. The project requires to be implemented in accordance with environmental and social safeguards and mandates of the AIIB and that of Sri Lanka. Considering the nature of project actions and its implementation, an Environmental and Social Management Framework (ESMF) has been prepared as required by the AIIB environmental and social safeguard policy.

The purpose of the Environmental and Social Management Framework (ESMF) is to provide a guide for application of AIIB safeguards and national environmental and social mandates during the implementation of project actions. The project implementing agency (NBRO) is expected to ensure implementation of environmental and social management plans prepared under the ESMF during all phases of project implementation so that the impacts on the environment and community are minimum.

During the scoping exercise it was revealed that the environmental & social setting, and health & safety conditions are more site specific, and require to be addressed specific to site conditions. Therefore, the ESMF has recommended site specific environmental and social assessments followed by Site Specific Environmental and Social Management Plans (SSE&SMP) for each site. The SSE&SMP gives planning, design, construction and operation phase environmental, social, and health & safety management measures to be considered in the project Implementation.

This is the site specific environmental and social management plan for **Failed Slope between culvert No. 98/4 and 99/1 of Colombo Kandy Road A001 in Pahala Kadugannawa area** landslide mitigation site. This plan has been prepared by an in-depth environmental and social assessment to:

- i. Identify sensitive environmental and social elements in the project influence area
- ii. Identify significant environmental and social impacts due to project actions
- iii. Propose mitigation measures
- iv. Decide appropriate environmental and social monitoring requirements specific to this project
- v. Study relevant environmental regulations and procedures to be followed during project implementation specific to the site

1.2 Intended users

The document provides an in-depth insight into site specific environmental and social issues associated with the proposed project and the mitigation measures and intends to be used by landslide mitigation design team, the PMU and the contractor in the implementation of Environmental and Social Management component of the project. The SSE&SMP is published in NBRO website and can be viewed by wide range of interested parties (public, stakeholder organizations) can be utilized by the contractors for the project and will form the basis of site-specific management plans that will be prepared by the contractors as part of their Site Specific Environmental and Social Management Action Plans (SSE-SMAP) prior to commencing works.

2. Description of the project

2.1 Name of the project

Rectification of Site No. 149, Kegalle District, for **failed slope between culvert No. 98/4 and 99/1 of Colombo - Kandy main road A001 (Pahala Kadugannawa area)**

2.2 Location details

The proposed mitigation site falls under 25/A Ganethenna GN division of Mawanella DS division, Kegalle district, Sabaragamuwa province.

GPS references of the site–7. 253393°N and 80.503571°E

Nearest town and accessibility to the site – Mawanella.

Mawanella town is about 7.4 km from the site. The site can be accessed via A1 Colombo - Kandy Road (Ref. fig. 1).



Figure 1: Road map showing the accessibility to the site

2.3 Topography and land ownership

The proposed mitigation site is located left hand side of the slope segment between culvert 98/4 and 99/1 on Colombo - Kandy Main Road (A-1), the land is within the road reservation area of Road Development Authority. The elevation of the area is 518 m. The unstable area is located in a sloppy terrain where the natural slope has been cut for the road construction. The extent of site proposed to be mitigated is about 22000 m².

Refer figure 2: Google image and 3: Drone image of the proposed landslide mitigation site showing the surrounding environmental features and service infrastructure.



Figure 2: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.



Figure 3: Drone image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.

2.4 Meteorology of the area

Annual average rainfall – 2226 m

Annual average temperature – 23.9 °C

(Source: Website of Divisional Secretariat –Mawanella)

2.5 Demographic feature of the area

The Population of Ganethenna Division is 2028 including 982 males and 1046 females. (Census and statistical report - 2012)

3. Landslide hazard incident details

3.1 Account of incident

Land instability had developed at the left-hand side slope segment located between culvert 98/4 and 99/1 on Colombo- Kandy main road (A-1) in the Pahala Kadugannawa area of the 25 / A Ganethenna Grama Niladhari Division in the Mawanella Divisional Secretariat in the Kegalle District on 09.11.2021 and 10.11.2021 followed by heavy rains during the first week of November 2021. A major slope movement had occurred at the toe region of an intermediate part of a long extending steep slope, severely damaging some of the fruit stalls which were erected at the road side and also obstructing the traffic of Colombo - Kandy main road (Ref. Fig.4a).



3.2 Effects and consequences of landslide

Due to the slope movement, 51 boutiques (fruit stalls) located at the roadside, immediately downslope of slope moved, Pahala Kadugannawa area were partially/ completely damaged obstructing the traffic and the road was kept closed for a period of two weeks, forcing the traffic to detour to Kandy city using alternative roads. The boutiques were Tax payers registered with Divisional Secretariat Mawanella and Pradeshiya Sabha Mawanella.

The damaged boutiques were removed with the support of Army and the process was directed and coordinated by, Divisional Secretariat Mawanella, Pradeshiya Sabha Mawanella, Urban Development Authority (UDA) and Road Development Authority (RDA) (Ref. Fig 4b).

Out of 51 boutiques, only 21 boutiques bordering the site (6 towards Colombo + 15 towards Kandy) were reestablished, and according to the information of the boutique owners, the others have not reestablished their boutiques and moved for seeking job opportunities in other areas or in overseas. Reestablishing boutiques at previous locations (immediately downslope of the slope moved) were restricted by the above authorities.

3.3 Description of any remedial measures already undertaken to reduce the potential risk

According to the request of the Kegalle District Secretary, preliminary field studies were conducted on 09th and 10th of November 2021 by the professionals of National Building Research Organisation (NBRO). Accordingly, taking into account the risk situation and the emergency situation at the place, recommendations for emergency response were issued on 12-11-2021 through a report NBRO/LRRMD/KG/MWP/LI/2021/ERR-00049.

Based on the results of detailed geophysical / geotechnical exploration, laboratory testing and slope stability analysis, a detailed engineering design for slope mitigation was provided by NBRO including following mitigation measures to eliminate the failure threat of this location.

- Construction of Gravity type retaining wall at the toe area of the slope
- Installation of 12 m long soil nail system at 2 m C/C spacing in the cut slope above the proposed retaining wall.
- Provide horizontal long drains through the toe of the earth cut and middle part of the cut slope to control the development of excess pore pressures within the slope.
- Construct well planned reinforced concrete surface drainage system to control water intrusion into the soil.

(Source: Design Report (2021) Mitigation of the landslide between culvert no 98/4 and 99/1 – Colombo Kandy Highway, Geotechnical Engineering Division, NBRO)

Subsequently, with the request of the District Secretary, Kegalle, to implement mitigation measures to re stabilize failed slope, Ministry of Transport and Highways which is the relevant line ministry had taken necessary initiatives to incorporate the proposed landslide rectification measures at Kadugannawa into the Integrated Road Investment Program (iRoad Program), road rehabilitation project which was in operation at the time of submission of technical proposal. (Integrated Road Investment Program- Improvement, Rehabilitation and Maintenance of Nittambuwa (39.710 km) - Kadugannawa (100.000 km) section of Colombo – Kandy (A001) Highway)

An Initial Environmental Examination (IEE) for the Rehabilitation of Nittambuwa – Kadugannawa section of Colombo – Kandy (A001) Road under iRoad program was conducted by RDA in April 2020. (https://www.adb.org/sites/default/files/project-documents/47273/47273-004-47273-005-47273-006-iee-en_0.pdf). However, for this mitigation for the road section between culvert 98/4 and 99/1 on Colombo-Kandy main road separate or site-specific IEE or Environmental and Social assessments has not been conducted and mitigation measures were commenced and continued. However, due to the unexpected economic crisis of the country, funding had been delayed for the iRoad Program and the Ministry of Transport and Highways had decided to discontinue all the on-going contracts under iRoad program and the measures required (mentioned below) for assuring slope stability are in partial completed stage in the site.

- Slope Excavation
- Drilling and Grouting of Soil Nails
- Chemical Blasting in Progress (Rock & Boulders)
- DS (B) - B (Type-01) Drain Construction
- DS (C) - B Drain Construction
- DS (M) - A Drain Construction
- Grid Beam Construction in Progress
- Horizontal Drains Construction
- Excavation for Retaining Wall
- Retaining Wall Construction in Progress

(Source: Progress Presentation as at End of March 2023 CONTRACT PACKAGE: RDA /ADB /iRoad /NCB/RMC/01-D).

3.4 Evacuations

Fifty-one (51) temporary boutiques (stalls selling fruits, sweet, toys and etc) located at the toe area of the slope (left of Colombo –Kandy Road) were damaged due to the slope failure, and were evacuated (*Pl. ref. 3.2*).

3.5 Resettlement (progress)

There is no requirement of project-based resettlement programme for this site.

4. Description of the area of the landslide/slope failure and areas adjacent to the landslide and current level of risk

4.1 Area of the landslide

The area of the slope failure is located between culvert No. 98/4 and 99/1 in Pahala Kadugannawa area, on the left, when traveling from Colombo to Kandy. The unstable area is located in a deep sloppy terrain where the natural slope has been cut for the Colombo Kandy Road construction.

The existing condition of the site;

Construction of cascade drains has been stopped in its halfway leading for high water flow into the landslide body. b) Soil nailing works have not been completed yet, leaving a stretch of unprotected steep slope section with a high probability to fail during a heavy rain, with the absence of a properly functioning

drainage management system. c) The toe wall has been constructed for a length of 42 m for which the backfilling has not been carried out while 94 m of toe wall is remaining to be completed. Accordingly, the toe wall is not providing the designed toe support, essentially making the total slope segment unstable
d) Part of the unstable debris mass displaced during the landslide situation in 2021 are still deposited on the steep slope, which can dislodge easily into another catastrophic failure or a debris flow during the next monsoon season (*Please refer figure 5*).

A water tank of National Water Supply and Drainage Board that was constructed in 1989 to collect the spring water for the use of the settlements of the downslope area is located immediately at the upslope area of the site. Currently, the tank and the supply lines are not functioning. An old damaged toilet complex is located between the road and cemetery area and is currently not functioning.

A cemetery is located at the boundary of the site towards Mawanella. It is located Ch.97+830- 97+865, this has been found during the mitigation activities under iRoad program. The cemetery yard had been used by the villagers since 1982 and the land belongs to the Divisional secretary of Mawanella. This cemetery was commonly used by the Buddhists and Christians of Ganethenna Grama Niladhari Division. According to the villagers around the location, there are 45 graves buried at this cemetery premises. This cemetery is not used currently for the burial purposes. According to the information of GN officer of the area, two bodies were buried recently in a land close to the site towards Colombo, the access road to this land is located bordering the site. This land is not a registered cemetery and burial of dead bodies has not controlled by authorities according to the GN officer.

The upslope area of the site is dominated by shrubs and trees of forested area called “Goramenthu Jungle” owned by the Department of Forest.

There are 21 temporary boutiques at downslope bordering the site (6 towards Colombo + 15 towards Kandy). The boutiques are mainly of fruits and beverages and functioning at the road side of the slope and they are the income source of the dwellers of the nearby villagers since the area has a high tourist attraction (local and foreign) due to beautiful sceneries of the mountain range and the pleasing climate.

The road (Colombo - Kandy A001 Road) is the only main access road to Kadugannawa area.

Refer Fig 6: Cross sections, land use, risk elements of the location



Figure 5: Illustration of current situation of the site

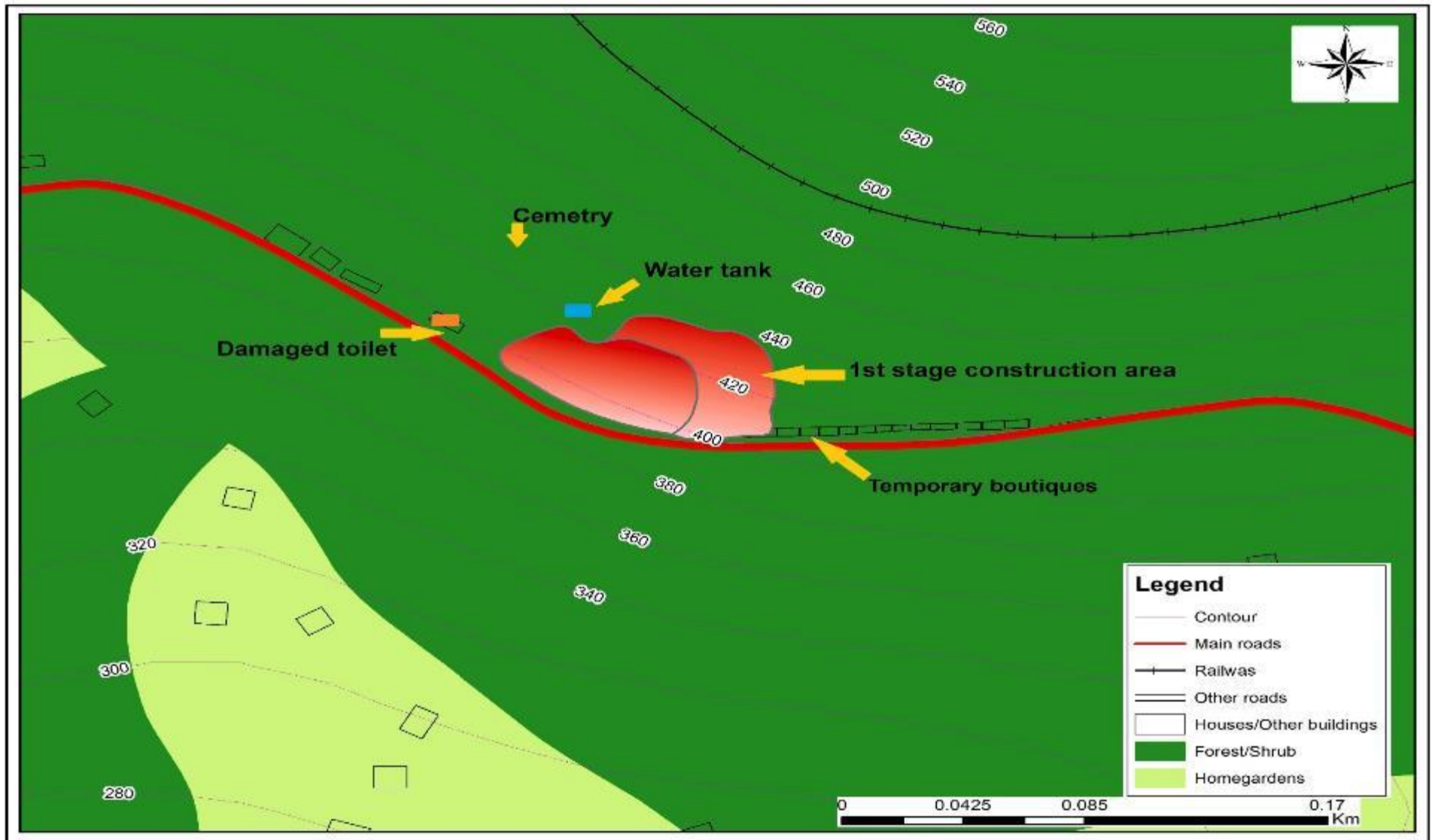


Fig 6: Cross sections, land use, risk elements of the location

4.2 Areas adjacent to the landslide

The Colombo - Kandy Main Road (A-1) is located bordering the downslope of the unstable slope. The right-hand side of the slope segment of the Colombo- Kandy main road is a deep slope with high density of trees and shrubs. One boutique (fruit stall) is located at the right-hand side, opposite to the mitigation site.

There are many famous and tourist attractive places located around the unstable area. Both local and foreign tourists visit these places while traveling this Colombo - Kandy main road. “Kadugannawa rock pass” is the one of the most popular destination, tourist attraction and a place of highest significance landmark in the Colombo -Kandy Road. It is a common roadside stop for tourists to enjoy the Kegalle valley below and view the prominent rock known as the Bible Rock. The Kadugannawa Pass was a lookout point in the Kingdom of Kandy. The Balana fort which was the main fortress established to protect the Kandyan Kingdom from foreign powers was situated near the Kadugannawa pass.

The Colombo-Kandy Road was constructed during the British period. Remarkably, they pierced a rock at the Kadugannawa Pass instead of blasting it away or simply bypassing it. This Kadugannawa tunnel is a symbol. This rock piercing is known as the Kadugannawa Tunnel and is still preserved as a bypass. This location is a famous tourist attraction. A beautiful recreation park with a car park near the tunnel is constructed and it is a lovely vantage point.

At the highest point of the pass, there is a memorial column known as Captain Dawson Tower built during the British period to the memory of the British Engineer W. F. Davidson, who designed the Kadugannawa pass.

Kadugannawa Ambalama is a historic wayside rest that is found on the left, 600 meters from the unstable slope area. This was built in the early 19th century during the British period and the structure resembles the Kandyan Kingdom architecture and is of archaeological value and this structure is considered a national heritage item of Sri Lanka.

4.3 Current level of risk

The mitigation works carried out under iRoad program has managed to reduce part of the risk, halting the remaining works at this stage has led creating a situation worse than its initial position. In particular, the cut-off drains proposed to capture and divert the surface runoff away from the landslide mass are half-constructed, and release the diverted water mid-slope, back into the affected mass completely robbing its original purpose. Therefore, there is a possibility of instability will be activated again with the upcoming rains, and it poses a risk to Colombo - Kandy Main Road (A-1). Also, during future failures, it would limit the continuous functions of the Colombo Kandy Road between Mawanella and Kadugannawa as this is the main access way to Kandy, the obstruction of accessibility may pose a significant impact on life line facilities, services, tourism and related economic activities including the transactions.

According to the geophysical investigations carried out by NBRO, the road and the railway line are stabilized on the existing bed rock. The colluvium mass in between these is slightly displaced, but no significant horizontal or vertical displacement are observed and hence the risk to the boutiques relocated adjacent to the proposed mitigation works and the steep at the right-hand side of the road are low.

5. Description of the works envisaged under the project

Based on preliminary investigations, NBRO has carried out detailed investigations and design of suitable rectification measures to minimize the risk posed by this unstable slope section to ensure the safety of the commuters and continue functions of this main road of Colombo - Kandy. The proposed activities include;

- Earthworks including excavation and removal of debris
- Protecting the slope with soil nailing

- Drainage management using surface and subsurface drainage network
- Alleviate local slope failures by way of increasing the development metric solution of exposed finished surface via nature-based solution.
- Further, in order to restore and retain the natural aesthetic outlook of this location, the protection works will essentially include nature-based surface protection solutions like turfing and planting.

5. Brief description on the surrounding environment with special reference to sensitive elements that may be affected by the project actions

The elements and services at risk during the project implementation are;

- Functions, commuters, pedestrians and vehicles of Colombo Kandy main road A1 between culvert No. 98/4 and 99/1.
- Small scale boutiques
- Present functioning cemetery and its access road
- Current services, economic and tourism activities of the area
- Abandoned water tank, toilet compound and cemetery (not functioning)
- Upslope forest; “Goramenthu Jungle”

(Ref. Fig.7 Sensitive elements that may be affected by the project actions)



Figure 7a: Upslope area of the mitigation site



Figure 7b: Down slope of the mitigation site



Figure 7c: Damaged toilet compound



Figure 7d: Water tank



Figure 7e: Colomo-Kandy road and small boutiques at the downslope (Towards kandy)



Figure 7f Colomo-Kandy road and small boutiques at the downslope (Towards Colombo)



Figure 7g –A boutique at the downslope (RHS of road)



Figure 7h:: Up slope forest area



Figure 7i-Acess road of the Cemetry located boundry of the mitigation site



Figure 7j- Location of recent cemetry

Figure 7: Sensitive elements that may be affected by the project actions

6. Identification of social and environmental impacts and risks related to the works

6.1 Positive impacts

The mitigation will make currently unstable slope at the road side stable, securing safety of commuters, pedestrians and traffic. Road closure will not result in the rainy periods ensuring good connectivity between the cities. This road is the only access road from Colombo to Kandy, religious places, universities, business and administrative places also a route with exceptional scenic beauty for current and future ecotourism. Hence, the mitigation work will ensure uninterrupted traffic flow and road connectivity throughout and will increase the safety of commuters during rainy season. Further, above mentioned industry, economic activities and other cultural and religious activities are benefitted largely by this mitigation.

6.2 Negative impacts

The mitigation works are generally confined to already failed land area. Therefore, negative impacts are much localized and also limited to construction period.

Table 1: Negative impacts and their level of significance

Impacts during the construction period	Level of Significance
6.2.1 Hydrological and water Quality impacts	
<p>6.2.1.1 Impacts of the drainage pattern of the area</p> <p>Disruption to existing surface and sub-surface drainage pattern in the area is envisaged with the project implementation. The mitigation works in this site will focus on the drainage improvement. Therefore, during rainy season heavy flow of water is expected to be generated and would be accumulated between the road and the slope. The water inundation of the existing drainages may be expected. Increase of water through the unstable slope may intensify the risk of slope failures of the unstable section.</p>	Highly Significant
<p>6.2.1.2 Water pollution and impacts on surface water quality</p> <p>During the slope excavation, removal of debris can generate high sediment laden runoff there could be a possibility that contaminated runoff may pollute the water within the heavy seepages through the affected area. Improper disposal of oils and other harmful substances/contaminants from machineries, leakages from temporary storage tanks, solid waste and wastewater disposal/dumping could occur causing adverse impacts on quality of the water. However, during rainy season, the rainwater running through the disturbed slope tends to pick up sediment, oil and other pollutants generated during construction can contaminate the water.</p>	Significant
<p>6.2.1.3 Erosional impacts and stream/ reservoir bed alterations</p> <p>The project activities will open the slope for surface erosion during the construction phase. The existing surface and sub-surface drainage pattern in the area will be disrupted during construction phase. Therefore, the erosional impacts are significant.</p>	Significant
<p>6.2.1.4 Open defecation and waterborne infections</p> <p>As site is located close to the road, possibility of open defecation is less. However, there is a forest at the upslope area there may a possibility of open defecation causing Faecal contamination of storm water.</p>	Significant

<p>6.2.1.5 Impacts on ground water table and ground water quality</p> <p>Addition or mixing of construction materials including cements, grout materials with sub-surface water flows will cause temporary water quality degradation and accumulation of unwanted substances. During the construction period, the hazardous waste from chemical substances, waste water from the construction activities and discharge of waste matter from onsite septic systems would cause adverse impacts on the ground water quality as the water of the downstream is used by the nearby people and tourists for washing including car washing (as a livelihood). Due to the mitigatory activities carried out in the slope area there will be an impact of the ground water quality and drawdown of ground water table.</p>	<p>Significant</p>
<p>6.2.1.6 Impacts on water or wetlands</p> <p>Since there are no water ways close to the site impact will be insignificant.</p>	<p>Insignificant</p>
<p>6.2.2 Environmental Impacts</p>	
<p>6.2.2.1 Noise and vibration impacts</p> <p>Noise and vibration are expected from construction equipment. The pedestrians and commuters on roads will also have an effect from noise and vibration. The commuters on the road will be exposed to high noise during heavy noise generating activities, such as operating loading and unloading of materials, movement of machinery in addition to above mentioned construction works.</p>	<p>Significant</p>
<p>6.2.2.2 Air pollution impacts</p> <p>Construction activities that contribute to air pollution include: land clearing, operation of diesel engines, demolition and burning. Operating vehicles at high speed under dry weather conditions can increase such pollution. Improper handling and transferring of materials can also generate dust. Improper storage of materials can potentially generate dust if not properly covered. During construction, it generates high levels of dust typically from concrete, cement, wood, stone, and silica. The Colombo-Kandy Road is used heavily for vehicles moving (buses, bicycles, lorries, trucks, tippers, three wheels). The air pollution may have significant impact on the commuters and pedestrians.</p>	<p>Highly Significant</p>
<p>6.2.2.3 Solid waste disposal issues</p> <p>Haphazard disposal of solid waste; various types of waste such as litter, food waste, construction waste will be generated and may store or dispose on site. The littering and hap hazard storage and disposal of solid waste in and around the site will create inconveniences to the commuters, pedestrians. It can block the drainages to make breeding grounds for water borne diseases. Waste can pollute the soil, and leave various environmental impacts if proper disposal mechanism is not in place during the construction period.</p>	<p>Highly Significant</p>
<p>6.2.2.4 Explosive hazards and hazardous materials</p> <p>Since the affected area has rock boulders, explosives may be used if the rock blasting is envisaged. This may pose risk due to unsafe use. As these operations are to be done on affected slopes the risk of improper use of explosive and accidents from rock fragments are highly significant.</p>	<p>Significant</p>
<p>6.2.3 Biological /Ecological Impacts</p>	
<p>6.2.3.1 Effects on Fauna & Flora</p> <p>There are no cultivated crops/ naturally grown important (edible/ religious/ecologically) plants within the area under mitigation and there won't be impact on them. The vegetation in the already disturbed area due to the landslide is dominated by herb species most of them are exotic species. The impacts on terrestrial ecosystems are localized as many project actions will be taking place on already failed or mitigated slopes. However, the upslope area is dominated by shrubs and trees of forested area called "Goramenthu Jungle" owned by the Department of Forest. The forest ecology (fauna and flora) on the crest of the slope can be disturbed during construction works as follows;</p>	<p>Significant</p>

<ul style="list-style-type: none"> i. Clearance of vegetation for construction ii. Illegal extraction of specimens (flora and fauna) protected under regulations. iii. Poaching and hunting iv. Forest fires 	
6.2.4 Social and Economic Impacts	
<p>6.2.4.1 Impacts on agriculture within the area to be remedied/ immediately to the site</p> <p>There are no agricultural activities immediately adjacent to unstable slope area.</p>	Insignificant
<p>6.2.4.2 Cracks in the building due to vibration impacts</p> <p>There are no houses located close to the site and the buildings located are the abandoned toilets and a water tank. The boutiques at the downslope are temporary constructed, they want be impacted due to vibration.</p> <p>The Colombo-Kandy Road is running downslope to the site. Vibrations can create cracks on the road</p>	Less significant
<p>6.2.4.3 Loosing access to land and future development activities</p> <p>The mitigation works will be concentrated on the upslope of the road. The cemetery (not functioning) is located bordering the site. It will be impacted by land clearing and machinery moving during construction if the cemetery area is not restricted from entry. The current functioning cemetery and its access road are located outside the mitigation area and will not be impacted from project activities.</p>	Significant
<p>6.2.4.4 Impacts on livelihood/ business and income activities</p> <p>There are 21 temporary boutiques at downslope bordering the site (6 towards Colombo + 15 towards Kandy). There wont'be an impact during construction on these boutiques. The workers may purchase the things from these stalls therefore the impact is positive.</p>	Significant
<p>6.2.4.5 Impacts on service provision (water supply, sewage, electricity)</p> <p>There is no water supply, sewage and electricity lines to be impacted by the construction period. The construction activities should not be affected to structures of both abandoned tank and the toilet compound.</p>	Significant
<p>6.2.4.6 Effect due to loss of infrastructure and safety</p> <p>During construction phase the main road from Colombo-Kandy Road will be obstructed by frequently moving machinery, loaders, trucks etc. Therefore, most of the heavy machinery, trucks and loaders can obstruct the pedestrian passage and cause traffic during peak times.</p>	Significant
<p>6.2.4.7 Work camps and lay-down site requirements</p> <p>The camps site will be selected in the neighbourhood of community. If proper camp management is not in place, it may result several labour issues, social issues with community, conflicts for shared resources with the community, nuisances, and management of waste etc. If temporary camps are built in the close proximity of the site, management of solid waste and sewage will be an issue.</p>	Significant
<p>6.2.4.8 Relations between workers and staff/ people living in the vicinity of the site and possibility of disputes</p> <p>There may be disputes with the people in boutiques at downslope and the workers of construction site</p>	Significant
<p>6.2.4.9 Workers safety during construction</p> <p>Fatal injuries may occur if the slope fails. The risk of slope failure is aggravated during the rainy season. This risk is highly significant. Risk of hazard from vehicle and construction machinery accidents is highly significant at this site. Contractor may engage under age workers (children) for construction work, which is risky and can results serious accidents and injuries.</p>	Highly Significant

<p>6.2.4.10 Safety to the public from construction activities: High risk for commuters</p> <p>During construction phase the road will be obstructed by the frequently moving machinery, loaders, trucks etc. As most of the mitigation works are to be carried out in limited space on slopes the heavy machinery, the trucks and loaders etc. can obstruct the commuter/pedestrian passage and may pose high risk on their life. There is a risk of falling loose rocks on the road during excavations and removal of rocks posing risk on the commuters. Railway line is located on a bed rock, about 100 m away from the site, the trains, railway commuters, railway line are not impacted during construction related activities.</p>	<p>Highly Significant</p>
<p>6.2.4.11 Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion)</p> <p>The traffic due to full/partial road closure may obstruct the smooth flow of vehicles during the week days, in office hours, school times, on holy days, season of pilgrimage. This will cause nuisance to pedestrians and commuters</p>	<p>Significant</p>
<p>6.2.4.12 Areas used for businesses, agriculture or other immediately adjacent to the site</p> <p>Impact on business -Ref. 6.2.2.4. There are no agriculture related activities immediately adjacent to the site to be affected by project activities.</p>	<p>Significant</p>
<p>6.2.4.13 Need for people to enter or cross the site</p> <p>Excavation machineries, loaders, trucks etc. will be used in the area used to access in to the unstable slope area. There is no special need for commuters and neighbouring community to enter the site for other purposes. Construction may use materials such as metal aggregates, steel etc. which can be injurious under improper storage and handling. However, unauthorised entry of ordinary people may occur due to intentional or unintentional purposes and they may be at risk due to operating machinery, vehicles, electricity, and may be blasting materials.</p>	<p>Highly Significant</p>
<p>6.2.4.14 Cultural impacts on human remains and relatives of the graves</p> <p>The cemetery (not functioning) is located bordering the site. If due respect to the human remains/ skeletal/ coffin is not given there may be disputes/ complaints from the relatives of the remains.</p> <p>And also, there may be disagreement with people if access road to the cemetery, (currently function is bordering the site) is blocked/ altered.</p>	<p>Highly significant</p>

7. Significant Environmental and Social Impacts: Social or Environmental impacts or risks that will require special measures on the part of NBRO and the contractor; Indicative significant impacts

7.1 Significant Environmental and Social Impacts

The cemetery is located bordering the mitigation area and is not currently functioning. When the soil nailing works were under process under iRoad program information about this cemetery was identified by the project team during. Then, construction works on soil nailing at the particular location were immediately stopped with the decision made by Grama Niladhari, NBRO and project team. This cemetery was being used commonly in this village. According to the villagers around the location, there are 45 graves buried at this cemetery premises and 29 graves has to be reburial out of 45 graves during the mitigation. Grievance Redress Committee GN level meeting had been conducted on 16th of June 2022 with Pahala Kadugannawa Welfare Society (Maranadara Samithi) to discuss the issue and people who are relatives for the graves were there in the meeting. The villagers are still using the closes land area of this cemetery as a cemetery. (Source: Due Diligence Report on the Exhumation and Re burial graves in the Location of Landslide area (CH: 97+830 – 97+865) – RMC 01- Colombo Kandy Road (A001)/Oriental Consultants Global Co. Ltd. In Joint Venture with Consulting Engineers and Architects Associated (Pvt.) Ltd. (CEA)).

Therefore, during the proposed process of mitigation if buried body/ skeletal / coffin is found, it should be reburied by the contractor under the direction of Engineer and consulting Mawanella Divisional Secretary, Mawanella Pradeshiya Sabha and NBRO ensuring burial graves due respect to the human remains and there will not be any cultural impacts in this case. The cost incurred on reburial to be borne by the contractor.

7.2 Priority Health and Safety Issues. Specific H&S concerns that require measures that go beyond the standard contractual requirements for contractors

The health and safety issues pertinent to this site is significant as the workers have to work on an unstable slope with a risk of falling. Such common E & HS issues have been discussed in the **ESMF**. Worker safety requirement in the construction site is more detailed under 2003 5: Safety equipment and clothing in the section 2003: Working conditions and community health and safety in the Bidding document.

7.3 Child labour & forced labour

Child labor & Forced labor is detailed under 2003.3 under section 2003: Working conditions and community health and safety in the Bidding document.

8. Environmental Social Management Plan (ESMP)

Measures to manage and or mitigate the impacts and risk. Especially the significant impacts and risks identified in sections 7 & 8. This section will include the specific recommendations and requirements of the ESMP for design stage, construction phase and maintenance operation phase.

8.1 Resettlement action plan

There is no project-based resettlement in this site.

8.2 Evacuation of people

There are 21 temporary boutiques at downslope bordering the site (6 towards Colombo + 15 towards Kandy). During the construction there won't be a requirement of evacuation.

8.3 Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles)

There is an abandoned water tank and a toilet compound located in the periphery of the project site. If these structure need removing relevant authorities are needed to be consulted to get their consent and project/contractor shall bear the cost.

8.4 Requirement for compensation for loss of property /uses due to project actions

There won't any property loss during construction. Only 2 boutiques need to be evacuated temporary during cascade drain and catch pit construction. The owners agree to restore their boutiques opposite side (RHS of Colombo-Kandy Road) during the said construction.

8.5 Public awareness and education- needed for following areas

- i. Programs to inform and educate people in the vicinity and small boutiques owners along the mitigation site
- ii. Requirement for special awareness for commuters and the people passing through the area using the road with potentially high-risk during construction phase, signage and early warning.

8.6 Design based Environmental/ Social Management considerations

The site is located in an aesthetically beautiful, environmentally sensitive natural environment in the rural setup. Hence, following environmentally and socially significant design considerations are recommended.

Table 2: Design stage Environmental & Social considerations

Design feature	Recommended level of consideration for this site
<p>i. To reinstate the 51 boutiques lost during the slope failure</p> <p>Project design has already considered keeping a 9 m area from the central line of the road to be kept for a UDA development plan comprising viewing desk, leisure area 2-storied commercial area (to reinstate the 51 boutiques).</p>	Very High
<p>ii. Natural resource management and resource optimized designs</p> <p>Project specific designs should be considered to eliminate mass clearing of vegetation and minimum number of removals of grown tree species. Sufficient emphasis should be made to consider conservation of trees if important tree species are found.</p>	High
<p>iii. Site Planning</p> <p>During site planning it is necessary to be cautious on possible re-activation of landslide with rock fall. Also, the site is located in a very limited space of a slope with a road. The vehicle parking sites, material storage and temporary shelters etc. should not be installed in the danger zones of the slides. It is very necessary to keep trained flagman or safety officer during the construction period and proper communication between contractor's workforce and the other responsible officials should be maintained.</p>	Very High
<p>iv. Habitat connectivity and animal trails</p> <p>If large fractions of vegetation are required to be cleared in ecologically fragile habitats as for permanent structures or for access, or if deep drains etc. are to be made the designs should include habitat connectivity features, animal trails and vegetation strips and etc. even if the impacts are localized</p>	Low
<p>v. Conservation of water resources</p> <p>If involves extraction of water both surface and sub-surface. The water extracted is in relatively good quality. In a well thought design this extracted water can be conveyed in such a manner that the water can be accessed people (commuters/ pedestrians/ fruit sellers in boutiques, etc.) as well as the neighboring communities for washing and other domestic purposes</p>	Very High
<p>vi. Interruption to water supplies</p> <p>If the water in the mitigated slope is used as a source for individual or community water supply, the chance the water source can be affected by the mitigation work is high due to water table draw down.</p>	Low
<p>vii. Aesthetically compatible design considerations</p> <p>The designs in aesthetically sensitive environments should consider structures that blend with natural environment to keep the visual pollution to minimum. As the tourism industry is one of the major economic growth points for the project area, greening could be used in construction activities to develop the area as a tourist attraction. Due consideration should be given to UDA development plan prepared for the area. The resettling boutiques at the downslope of the mitigation location will be controlled by UDA, Divisional Secretary Mawanella and Pradeshiya Sabha Mawanella.</p>	Very High for upslope area
<p>viii. Consideration of green environmental features</p> <p>As many of the mitigatory works are carried out in ecologically sensitive habitats, it is recommended to consider green environmental designs as much as possible in the designs e.g.: use of local vegetation species for erosion control, combination of plants to sustain species diversity in the environment, avoiding inclusion of potentially invasive species & etc.</p>	High

<p>ix. Conservation of social and Cultural features</p> <p>The local cultures and heritages are strengthened by their close connections to the natural environment that sustains them. Therefore, the project actions should be carried out considering local culture and social aspects, providing opportunities to reinforce them during the project actions.</p>	High
<p>x. Workers/ commuters and community safety</p> <p>Due to the close proximity to the roads people may face accidents specially the workforce during the construction phase. Unauthorized entry and ignorance may cause severe accidents around the site. Activation of slides or ground subsidence may occur during construction phase and may pose threat, passengers and commuters. Therefore, design-based safety consideration such as beams, safety nets etc. should be considered.</p>	Very high
<p>xi. Erosion control structures</p> <p>In drainage management, water is extracted and conveyed to nearby stream often through culverts. During rainy season the flow in these drainage structures can be significantly high and this may cause stream bed erosion. Hence the design should adequately consider flow speed breakers to reduce erosive flows entering natural streams. This should be an inclusive part of the design if there are streams and culverts in the proximity of the mitigation site.</p>	High
<p>xii. Low post maintenance and operation designs</p> <p>The mitigation should consider passive techniques such as gravity drains for drainage management. Correct pipe diameters, pore diameters and laying angles should be considered to avoid clogging of drains. Low maintenance structures and designs such as designs to withstand erosive forces, sediment trapping systems etc should be considered if drain water is expected to be directed to natural streams.</p> <p>The materials used for structures and should be chosen carefully so as to withstand weather conditions with high durability. Designs should specially consider corrosion prevention techniques if steel structures are used.</p>	Very High

8.7 Mitigation of impacts during the construction phase

8.7.1 Construction contractors' requirement to comply with environmental and social management during the construction phase

Measures to manage and to mitigate the environmental and social impacts are generally common to all landslide mitigation sites. Such impacts are largely attributed to activities in the construction phase. The mitigation of impacts therefore becomes an obligation of construction contractor. NBRO has prepared a comprehensive document on “*contractors’ requirement to comply with Environmental and Social Health and Safety (ES & HS) management during the construction phase*” to be included in construction contractors’ bid document. The main sections are summarised below (Table 3) indicating the degree of relevancy for this site. For details ESMP for construction contractors should be referred.

Table 3: Contractor requirement to comply with ES & HS

Reference No. as per construction contractor's obligation to ESMP	Item	Relevant to the project
2002. Environmental and Social Monitoring		
2002.2 1)	Storage on site	Highly Relevant (road reservation)
2002.2 2)	Noise and Vibration	Highly relevant (commuters, pedestrians)
2002.2 3)	Cracks and damages to the buildings	Less Relevant
2002.2 4)	Disposal of waste	Relevant
2002.2 5)	Disposal of refuse	Highly relevant (road reservation)

2002.2 6)	Dust control	Highly Relevant (commuters, pedestrians)
2002.2 7)	Transport of Construction materials and waste	Relevant
2002.2 8)	Water	Highly Relevant
2002.2 9)	Flora and Fauna	Relevant
2002.2 10)	Physical and cultural resources	Not relevant
2002.2 11)	Soil Erosion	Relevant
2002.2 12)	Soil Contamination	Relevant
2002.2 13)	Borrowing Earth	Relevant
2002.2 14)	Quarry Operations	Not relevant
2002.2 15)	Maintenance vehicles and Machinery	Relevant
2002.2 16)	Disruption to public	Highly relevant (community nearby)
2002.2 17)	Utilities and roadside amenities	Highly relevant (road)
2002.2 18)	Visual environment enhancement	Highly relevant (Aesthetically sensitive road section)
2002-5. Environmental Monitoring	Baseline surveys (air, water, noise, vibration, crack surveys)	Refer site specific monitoring plan
	Surveys during construction (air, water, noise, vibration, crack surveys)	Refer site specific monitoring plan
	Surveys during operation phase	Refer site specific monitoring plan
	Reporting and maintenance of records	Relevant
2003. Working Conditions and Community Health and Safety		
2003.2	Safety organization and communication	Highly relevant (unsafe slope, commuters, heavy machinery)
2003.3	Child Labor and Forced Labor	Relevant
2003.4	Safety reports and notification of accidents	Highly relevant
2003.5	Safety Equipment and Clothing	Highly relevant
2003.6	Safety inspections	Highly relevant
2003.7	First Aid Facilities	Highly relevant
2003.8	Health and safety information and training	Highly relevant
2003.9	Plant equipment and qualified personnel	Relevant
<p>Relevant: The section is relevant to the site as a common ESMP applicable to any site</p> <p>Highly relevant: The contractor should pay special emphasis in the preparation of environmental method statements to ensure that the relevant ESMP is implemented specific to the site</p> <p>Possibly relevant: This ESMP will be triggered if the site come across with relevant aspect during project implementation</p> <p>Not relevant: The section may not be relevant to this site under disclosed conditions</p> <p>Optional: require to be implement if needed only</p> <p>Refer site specific monitoring plan: Contractor is obliged to carry out monitoring as specified in the site-specific monitoring plan</p> <p>Reference: Contractors Obligation for implementation of ESMP</p>		

8.7.2 Site Specific mitigation

Table 4 summarizes the site-specific mitigation measures that the project is expected to implement during the construction period.

Table 4: Site specific ES & HS mitigation measures

Mitigation item	Project implementation phase	Responsibility
<p>i. Exhumation and re burial graves During the mitigation if buried body/skeletal/ coffin is found, it should be reburied at the cemetery near the Samurdhi Bank, located in Mawela GN Division of Mawanella Divisional Secretary Division (GPS Location – 7 014’45.2’’N 80029’33.1’’E.) under the direction of Engineer and consulting Mawanella Divisional Secretary and NBRO, Funeral Aid Society Mawanella ensuring burial graves due respect to the human remains and there will not be any cultural impacts in this case. The exhumation of bodies should follow procedure which was applied to reburial graves to the new location during the mitigation of the location under iRoad program. According to funding agency iRoad program; Asian Development Bank (ADB) concurrence, reburial graves to the said location and the process to be completed within one week. Step 01. Within the first 06 days, the graves in the affected area to be excavated and graves to be reserved at the location recommended by the courts. Step 02. During the final day, all excavated graves to be buried again with the religious last respects. Entire process to be monitored by third party which to be recommended by the courts. Step 03. After completion of the re burial process, a report to be submitted by the Consultants to the PMU. Relatives of the members buried in this cemetery had declared that they do not expect any compensations, objection or other benefit for the removal of the body parts re buried or after removal (<i>Ref. Annexure V</i>). The cost incurred on reburial to be borne by the contractor.</p>	Site preparation & construction	PMU Construction Contractor
<p>ii. Minimize erosional impacts during construction It is recommended that mitigation works involved with site clearance, slope reshaping, removal of debris etc. are avoided during rainy season. Therefore, it is imperative that site works in upslope mitigation are carried out in the dry season and avoid such activities on upslope area in the wet season as much as possible. This should be considered in project planning stage. Silt traps should be introduced to cut down sediment laden runoff.</p>	Site preparation & construction	Construction Contractor
<p>iii. Invasive species Should be avoided in using vegetative erosion control structures. Native plants in the local environment should be chosen for vegetative control. The species used for vegetative control measures need approval from the Department of Wildlife Conservation & Department of Forest.</p>	Construction	Construction Contractor
<p>iv Impacts on transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion) A good traffic control should be implemented in the construction stage. As there is a bend on the road adjacent to the site & the area is tourists moving area, proper road safety measures should be included with warning signs and permanent trained watchmen, luminous sign boards indicating slope instability risk and road obstruction signs, night lamps etc. are strongly recommended at this site.</p>	Construction	Construction Contractor and
<p>i. Priority Health and Safety Issues</p> <ul style="list-style-type: none"> As the workers in the site have to work in high-risk conditions, it is imperative to implement recommendations given in section 2003 of contractors’ obligation on ESMP under “working conditions and community health and safety”. These 	Construction	PMU Construction Contractor

<p>recommendations should be followed carefully in a proper organization and safety monitoring system.</p> <ul style="list-style-type: none"> • Prepare a special Occupational Health and Safety Management Plan prior to commencement of construction activities • A good warning system and fulltime watchmen is highly recommended for this site for both worker and commuter safety. • Safety barriers and safety nets should be installed at places of risk to protect workers and commuters from boulder falling risk • Adoption of standard worker safety methods • Provision of personal protective equipment (PPE) such as safety boots, helmets, protective clothing goggle etc. • Provision of trainings and awareness programs to employees • Conducting hazard analysis and plan/provide adequate mitigation measures for such hazards identified, prior to carrying out major construction activities • If the wasp nest is in the vicinity, it is mandatory to use Evacuation Centres for ensure of workers' safety • Additionally, work should be discontinued for sufficient time period during rainy period as working on unstable land will be highly risky in the rainy season 		
<p>ii. Sign Boards Put up the safety sign boards prior to the construction site indicating people at work. The commuters should be aware about the construction activities through notices erected before reaching the proposed mitigation site.</p>	Site preparation & construction	Construction Contractor
<p>iii. Injuries due to rock particles due to explosions/ blasting Minimize all blasting activities during peak times and making awareness announcements through the blasting period. Establish an emergency accidents preparedness plan for their injuries due to rock particles due to explosions/ blasting.</p>	Construction	Construction Contractor
<p>iv. Minimize erosional impacts during construction It is recommended that mitigation works involved with site clearance, slope reshaping, removal of debris etc. are avoided during rainy season. Therefore, it is imperative that site works in slope mitigation are carried out in the dry season and avoid such activities on slope area in the wet season as much as possible. This should be considered in project planning stage. Silt traps should be introduced to cut down sediment laden runoff.</p>	Site preparation & construction	Construction Contractor
<p>v. Disposal of construction waste The contractor should pay special attention with respect to disposal of construction waste. This site is located close to a main road in landscape with a pleasing environment. Also, this main road is used by many tourists as Therefore, such waste if generated should store properly without getting washed off and dispose according to approved procedures by the PMU. Construction waste should not dispose along the road or into the drainages.</p>	Site preparation & construction	Construction Contractor
<p>VI. Onsite sanitary facilities for the workers The contractor should prepare temporary sanitary facilities for the workforce within the site, to mitigate open defecation of the workers.</p>	Site preparation & construction	Construction Contractor
<p>vii. Water for construction Water for construction works should be obtained only from the approved sites.</p>	Construction	Construction Contractor
<p>viii. Working hours The construction activities should be restricted to day time only. Working after 6.p.m. is not recommended for any reason due to safety issues.</p>	Construction	Construction Contractor

<p>ix. Need for people to enter or cross the site Possible unauthorized access to the site should be avoided by awareness, warning signs and vigilance by the contractor’s full-time watchmen.</p>	Construction	Construction Contractor
<p>x. During construction good housekeeping should be maintained to minimize visual pollution</p>	Site preparation & construction	Construction Contractor
<p>xi. Worker’s code of conduct Possible disputes between the labor force and the commuters and tourists should be prevented by maintaining the agreed code of conduct by the contractor. The contractor work force should follow Code of Conduct included in the Tender Document during the period of construction. Possible disputes between workforce and communities (owners of boutiques) should be avoided especially when using shared resources such as common bathing and washing places etc. To avoid disputes the contractor should arrange a water supply for construction activities and workforce requirements.</p>	Construction	Construction Contractor
<p>xii.Snake bites management and emergency management by accidents Proper emergency management system for snake bites (include awareness on snake bites, safety shoes while at work, first aid on a snake bite, hospitalization and admission to correct hospital where snake bite management facilities are available) should be introduced. Accidents are common in these kinds of sites. Proper emergency management unit for other accidents (first aids facilities, safety items, hospitalization facilities and transportation facilities) should be maintained for this site.</p>	Construction	Construction Contractor
<p>xiii. Disturbance to fauna and flora The contractor should not deviate from the design without permission from the PMU to fell forest trees, clear large section of forest trees etc. construction activities should be carried out with minimum disturbance to wild life habitats. The wild fauna niches (dens and wild animals) in found should be protected or relocate safely. Hunting and poaching wild animals and collection of valuable forest specimen are prohibited under the fauna protection ordinance and hence such activities should be strictly prohibited.</p>	Construction	Construction Contractor

8.7.3 Monitoring requirements specific to the site

Following monitoring plan is strongly emphasized during the construction phase specific to this site. In addition to this, monitoring procedure indicated in the contractors’ obligation to ESMP should also be implemented by construction contractor. The contractor is expected to indicate in the bid the ESMP procedure to be implemented along with relevant proofs of his competency. The cost for ESMP will require to be indicated as a separate pay item. The environmental and social management method statement is expected to be submitted by the selected construction contractor and to be approved by the PMU unit.

Table 5: Environmental and Social monitoring plan; construction phase

Monitoring requirement	Parameters	Frequency
i. Baseline monitoring	Water quality (Stream)	-
	Air quality: particulate matter	Once*
	Construction noise	Once a month during heavy noise generation times *
	Ground vibration	Once*
ii. During construction	Water quality (Stream)	-
	Air quality: particulate matter	Once a month *
	Ground vibration	During operation of drilling machinery, boring works, or any works that generate ground vibrations*
	Construction noise	Once a month during heavy noise generation times *
iii. Vehicular Emission	All machinery/vehicles operational should have the emission control test certificate as applicable - should be checked by the site ES officer of the consultant	
iv. Monitoring agency	* A competent independent monitoring agency with registration of Central Environmental Authority for all parameters except crack surveys	
v. Reporting requirements	Air quality particulate matter- The National Ambient Air Quality standards stipulated under the Extraordinary Gazette, No. 1562/22 August 15, 2008 -Central Environmental Authority of Sri Lanka.	

9. Labour management

Labor Influx activities impact on the local community to be minimized by elements such as worker codes of conduct, training programs on HIV/AIDS, etc.

Sound worker-management relationships, treating workers in the project fairly and providing safe and healthy working conditions is required. Responsibility is lies with the PMU and the construction contractor.

The Objectives are;

- To promote safety and health at work.
- To promote the fair treatment, nondiscrimination and equal opportunity of project workers.
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children and migrant workers, contracted workers, community workers and primary supply workers, as appropriate.
- To prevent the use of all forms of forced labor and child labor.
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national laws.
- To provide project workers with accessible means to raise workplace concerns.

10. Preventive measures for COVID-19 that was issued by Sri Lankan national health authority

COVID-19, the novel coronavirus infection has not been totally eradicated in the world. Therefore, to prevent/ control of the spread of infection also to prevent panic situations in the event of detecting a suspected case, all contractors are required to develop a COVID-19 Preparedness plan and need implementing in the site as per the “Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 outbreak” Guidelines given by Construction Industry Development Authority CIDA 29th April 2020.

11. Public and Stakeholder Consultations -the public consultations that have been and/or will be held

11.1 Public Consultations

The boutique owners; Mr. L Thisara, Mr Washinton Thisera, Mr A Premchandra were made aware of the project, funding mechanism and benefits. They said that the boutique owners are in a society they would support the project knowing the risk of future failures and impacts on their livelihoods with the road closures during such failures. They also informed about the project specific Grievance Redress Mechanism and Project Affected Peoples's Mechanism. Relatives of members buried in the cemetery was consulted and she explained the previous incident of founding skeletal, coffins at the cemetery during slope stabilization work, public committees and the process.

11.2 Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure II)

Mr. S. M. A. Senanayake, the Provincial Director of Central Environmental Authority in Sabaragamuwa Province was informed about the project works and got the clearances for the project. He emphasized; landslide mitigation projects are not considered as prescribed projects in the Gazette. As the proposed project intends to reduce the risk from landslide for an emergency action, CEA approval is not needed considering the priority of the project. Mr. WGNA Bandara GN Officer of Ganethenna GN area was consulted to obtain information about the current process of boutique operation and the cemetery located bordering the mitigation site (not functioning) and the cemetery functioning at present. According to Mr. Bandara interment of dead bodies at the cemetery bordering the mitigation site is restricted. Recently two bodies were buried in a land close to the site towards Colombo, however, the land is not a registered cemetery and burial of dead bodies has not controlled by authorities.

12. Clearances, no objection, consent and approvals required for the implementation of the project

Table 6: Clearances, no objection, consent and approvals

Requirement / Approval / Institution	Relevance to the project
12.1 Project implementation	
Approval from the District Secretariat	The approvals will be required and the proposals need to be presented at the District Coordinating Committee, to which chief minister and stakeholder agencies in the district will also participate. The Officer of PMU will present the project, disclose the project details and various concerns including environmental and social issues will be discussed at this meeting. The issues arrived will be addressed in the ESMP, the decisions and recommendations taken up at this meeting will be considered in the ESMP.
Approval from the planning committee	The approval from the planning committee of the Mawanella Pradeshiya Shabha.
12.2 Approval from the state lands owners relevant to the project	
Central Environmental Authority	Consent from District Central Environmental Authority is required as Kegalle District is under the sensitive area under Soil Conservation Act 25 of 1951.

Department of Forest Department of Wildlife Conservation	As there is no forest reservations and wildlife habitats; Department of Forest and Department of Wildlife Conservation approvals are not needed
Geological Surveys and Mines Bureau	Approval will be obtained for extraction of materials, transportation and disposal of earth, rocks and mineral debris. (If necessary, only).
Mawanella Divisional Secretariat	Approvals from Mawanella Divisional Secretariat will be obtained for the disposal of waste and plant litter.
Ceylon Electricity Board	Approvals from regional office of Ceylon Electricity Board will be required for power supply for site operation.
National Plant Quarantine Service	Approval from Additional Director National Plant Quarantine Service Katunayake for Director General of Agriculture under the Plant Protection Act No. 35 of 1999 Plant or seed if needed for bio-Project Managed slope mitigation shall be imported into Sri Lanka under the authority and in accordance with the conditions, of a plant importation permit issued.
12.3 Consent/ no objection/ legally bound agreement from the private land ownerships	
Land owner (RDA)	Signing a legally bound agreement between the land owner (RDA) and the project implementing authority allowing no-objection to remove the structures, access the land, implement construction works, and engage in long-term maintenance works

The tentative timeline for getting approval is given in the table 7.

Table 7: Tentative timeline for getting approvals

Approvals	Month 1				Month 2			
	W1	W2	W3	W4	W1	W2	W3	W4
Project implementation								
<i>Approval from the District Secretariat</i>								
Submission of application	—							
Project briefing		—						
Respond to comments			—	—				
Approvals					—	—		
<i>Approval from planning committee</i>								
Submission of application		—						
Project briefing			—	—				
Respond to comments				—	—			
Approvals					—	—		
<i>Approval from state land owners RDA</i>								
Submission of application		—	—					
Respond to comments			—	—				
Approvals				—	—			
Other approvals								
GSMB		—	—	—				
Ministry of Defense (Depends on the requirement)								
Consent/ no objection from the land ownership	—	—						

13. Grievance redress mechanism for this site

The PMU ES officer is responsible for establishing the grievance redress mechanism for this site for impact communities. (Reference: *Environmental and Social Management Framework for recommended procedure for establishment of grievance redress mechanism*).

14. Information disclosure

It is the responsibility of the PMU to disclose the ES information to following agencies and organizations by indicated modes as a minimum as given in the following table.

Table 8: Proposed scheme of information disclosure

Information	Proposed agencies	Mode of information disclosure
i. Project plan (site details, design, implementation arrangements)	District CEA, District Secretariat, Divisional secretary, RDA, Other district levels Agencies, NBRO district office, AIIB	Meetings, District coordination committee, submission of relevant report to sign agreements, approvals and consents.
ii. Environmental and Social Management plan	District CEA, AIIB,	Meetings, District Coordination Committee, submission of relevant report to sign agreements, approvals and consents
iii. Monitoring reports (baseline and during construction)	District CEA, AIIB and relevant parties as appropriate	Progress meetings, special meetings, submission of relevant reports
iv. Site inspections for environmental conformance workers health and safety	District CEA, RDA, Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRO, AIIB and relevant parties as appropriate	Written and verbal communications, submission of relevant reports
v. Decisions taken and progress review meetings pertinent to ES matters	District CEA, RDA, Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRO, AIIB and relevant parties as appropriate	Meetings, submission of relevant reports
vi. Grievance redress mechanism	Relevant parties, AIIB	Meetings, written and verbal communications, brochures, posters

Table 9: Level of information gathered through consulting institutions

Date	Institution	Person contacted for information
07/09/2023 @ 11.00 hrs	Central Environmental Authority	Mr. S. M. A. Senanayake, Provincial Director, Central Environmental Authority Sabaragamuwa Province
07/09/2023 and 30/09/2023	Mawanella Divisional Secretariat Division	Mr. W.G.N.A Bandara Grama Niladhari Ganethenna

Annexure I: Images of the site condition and the consultation

	
<p><i>Present condition of the site (03/09/2023)</i></p>	<p><i>Mr. L Thisara owner of the fruit selling boutique located very close to the mitigation area was informed about the project works</i></p>
	
<p><i>Consultation Boutique owner</i></p>	<p><i>Consultation relative of members buried in the cemetery</i></p>

Annexure II: Proposed procedure for obtaining approvals from state land owners and environmental agencies.

1. **Proposed procedure by RDA for approval for implementation of landslide mitigation projects in RDA reservation areas**
 - i. The design to be accepted by the RDA: The project implementing agency should submit detailed design report to RDA with a formal request on nature of approvals required. PMU should prepare above documents and should submit the documents to RDA regional office.
 - ii. RDA regional office will evaluate the proposal and may call for project briefing. The PMU should provide necessary briefing as appropriate
 - iii. On the approval by RDA an agreement will be signed between RDA and Project implementing agency to access the site, erect structures, and implement mitigation works.
 - iv. A condition that would include is
 - A proper handing over of the project is required after the mitigation
 - RDA will do the maintenance after mitigation
 - It is emphasized that during the construction the contractor should use Personal Protective Equipment
 - At all times, the contractor shall provide safe and convenient passage for vehicles, pedestrians, and traffic safety measures, barricades, flagmen and for the night work, lights and illumination should be provided.
 - Construction waste/ excavated materials should not be a nuisance to public/commuters

Annexure III: Study team

Name	Designation	Position in the study
SAMS Dissanayake	Senior Scientist/ESSD/NBRO	Coordinating officer
VDW Sumanasekara	Scientist/ ESSD/NBRO	Field survey, Report preparation
Prabath Liyanaarachchi	Scientist/ ESSD/NBRO	Field survey, Report preparation
H Kusalasiri	Technical Officer/ESSD/NBRO	GIS/Demographic data /survey support

Annexure IV: List of references

1. Contractor's obligations for Generic Environmental and Social Management Plan- Sri Lanka Landslide Mitigation Project-AIIB
2. Environmental and Social Management Framework-Sri Lanka Landslide Mitigation Project - AIIB
3. Resettlement Planning Framework- Sri Lanka Landslide Mitigation Project -AIIB
4. Felling Trees (Control) Act by Ministry of Agriculture, Rural Economic Affairs, Livestock Development, Irrigation and Fisheries and Aquatic Resources Development
5. Census and Statistical Report (2012), Department of Census and Statistics -2012
6. NBRO report Ref No. NBRO/LRRMD/KG/MWP/LI/2021/ERR-00049.
7. Design Report (2021) Mitigation of the landslide between culvert no 98/4 and 99/1 – Colombo Kandy Highway, Geotechnical Engineering Division, NBRO
8. Progress Presentation as at End of March 2023 CONTRACT PACKAGE: RDA /ADB /iRoad - /NCB/RMC/01-D).
9. Due Diligence Report on the Exhumation and Re burial graves in the Location of Landslide area (CH: 97+830 – 97+865) – RMC 01- Colombo Kandy Road (A001)/Oriental Consultants Global Co. Ltd. In Joint Venture with Consulting Engineers and Architects Associated (Pvt.) Ltd. (CEA)).
10. Initial Environmental Examination (IEE) for the Rehabilitation of Nittambuwa – Kadugannawa section of Colombo – Kandy (A001) Road under iRoad program was conducted by RDA in April 2020 (https://www.adb.org/sites/default/files/project-documents/47273/47273-004-47273-005-47273-006-iee-en_0.pdf).

Annexure V: Due diligence report on the exhumation and re burial graves in the location of landslide area (CH 97 + 830 – 97 + 865) – RMC 01 – Colombo Kandy road (A 001)



DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

Road Development Authority

Ministry of Transports and Highways

**Monitoring Consultants (MC) for Road Management Contracts (RMC)
of National Roads**



**Due Diligence Report on the Exhumation and Re burial graves in the
Location of Landslide area (CH: 97+830 – 97+865) – RMC 01-
Colombo Kandy Road (A001)**

Prepared by:

Oriental Consultants Global Co. Ltd. In Joint Venture with Consulting
Engineers and Architects Associated (Pvt.) Ltd. (CEA)

Submitted to:

Project Implementation Unit (PIU) Road Development Authority, Ministry
of Transport & Highways

Table of Contents

1. Introduction	1
2. Purpose of This Report.....	3
3. Background of Location (Cemetery Premises) - Between Culvert No. 98/4 to 99/1....	4
3.1 Past Condition of the Cemetery Premises	7
3.2 Present Condition, Public and Stakeholder Consultation.....	7
3.3 Proposed Location for Re Burials	8
3.4 Proposed Procedure for Re Burial of remains at Ganethanna Public Cemetery	9
4. Justification of Re burial of remain.....	9
5. Conclusion	9
6. Annexures.....	11

List of Figures

Figure 2-1 Conditions of previous Grave Area.....	3
Figure 3-1 Project Location Map of RMC 01 Pasyala to Kadugannawa.....	5
Figure 3-2 Land slide areas between culverts 98 / 4 to 99 /1	6
Figure 3-3 Discussion with Government officers, police and people to close the Road.....	6
Figure 3-4 Discussion with Pahala Kadugannawa welfare society members	7
Figure 3-5 Present graves areas.....	8
Figure 3-6 Proposed land area for re burial of remains at Ganethanna Cemetery	8

1. Introduction

1. Integrated Road Investment Program (iRoad) is funded by the Asian Development Bank (ADB) through a Multi tranche Financing Facility (MFF). The Government of Sri Lanka (GoSL) is implementing the Road Management Contract (RMC) under the Ministry of Transport and Highways, where the Road Development Authority (RDA) is the project implementing agency. Part of the funds is to be used for rehabilitating and maintaining about 248 km (FAM-2014) of national roads under the Road Management Contract (RMC) model.
2. The program intends to stimulate economic growth and enhance the quality of life and welfare in rural areas by improving transport connectivity between rural communities and socioeconomic centers. Enhancement of the connectivity is to be achieved through improving rural access roads linking the rural hubs to trunk road network to all weather standards and operating a sustainable trunk road network, encompassing national roads of at least in fair condition. Improvements comprise bringing selected roads to an all-weather standard through the rehabilitation and upgrading of existing carriageways and associated drainage works.
3. The Monitoring Consultants (MC) for the Road Management Contracts (RMC) were selected from joint ventures of International and Local consultancy firms through a procurement process in accordance with the ADB Guidelines and this Consultancy Contract was awarded to the joint venture of Oriental Consultants Global Co. Ltd and Consulting Engineers and Architects Associated (Pvt.) Ltd.
4. Currently following road sections have been awarded under RMC packages where civil works are in progress.
 - I. Karapitiya – Thawalama Road - RMC SP 01 /- Galle District, Southern Province.
 - II. Maradankadawala – Habarana Road – RMC 03 / Anuradhapura District, North Central Province.
 - III. Thalawa – Kekirawa – Dachchihalmillawa Road – RMC 05 Anuradhapura District, North Central Province.
 - IV. Colombo – Kandy Road / Ambepussa – Kadugannawa – RMC 01 Western Province, Central province and Sabaragamuwa Province.
 - V. Paliyagoda – Puttalama Road - RMC 06 North Western province.
 - VI. Naula to Dabulla Road RMC 07 (Kandy – Jaffna Road) Central province.
 - VII. Pelmadulla – Ebilipitiya –Nonagama –RMC 06 Sabaragamuwa Province.
5. RMC 01 starts from Pasyala Junction town center at 44+300km and ends at Kadugannawa at 100+000km. The road section passes through populated main town centers of Pasyala Junction (39+710km – 41+000km), Warakapola (56+500km – 57+750km), Kegalle (76+750km – 79+150km) and Mawanella (89+000km – 91+500km).
6. RMC 01 is located in the Kandy, Kegalle and Gampaha Districts of the Central, Sabaragamuwa and Western Provinces of Sri Lanka while the working are carried out by

four main contractors 1). WKK-World Kaihatsu JV – Ch. 44+300km – 59+200km, 2). Consulting Engineers and Contractors (Pvt) Ltd – 59+200km – 72+100km, 3) PND Construction (Pvt)Ltd – 72+100km – 86+000km, 4) MAGA Engineering (Pvt)Ltd 86+000km – 100+000km).

7. According to the National Building Research Organization (NBRO) report, landslide has been occurred due to the heavy rain. When the construction works were in progress in RMC 01, a land slide occurred in the road section between CH. :97+826 – 97+963 (LHS) locations in Pahala Kadugannawa. The District Secretary, Kegalle requested the Secretary, Ministry of Transport and Highways to apply suitable mitigation process to stabilize and improve the land slide area with appropriate standards (Annex 01). Then Project Engineer was informed by Chief Engineer, Kegalle to commence the land slide mitigation process adopting Soil nailing technique at the location as immediately as possible based on the decision taken at the Sri Lanka Parliament (Annex 02. I and Annex 02.II) and recommendations made by NBRO as follows (Annex 03 - 6.4 Proposed mitigation Measures)

Considering the reasons identified for the instability in the slope, the failure modes identified in the existing stability assessments, and also the proposed space acquisition excavation for the development work, the following mitigation measures are proposed to eliminate the failure threat of this location.

- ✓ Construction of Gravity type retaining wall at the toe area of the slope
 - ✓ Installation of 12m long soil nail system at 2m C/C spacing in the cut slope above the proposed retaining wall.
 - ✓ Provide horizontal long drains through the toe of the earth cut and middle part of the cut slope to control the development of excess pore pressures within the slope.
 - ✓ Construct well planned reinforced concrete surface drainage system to control water intrusion into the soil.
8. While soil nailing works were in process at the location CH, 97+830 - 97+960 (LHS) recommendations made by NBRO, a cemetery that had been used by the villagers since 1982 was found and that land was belong to the government of Divisional Secretary of Mawanella. There is no legal registration evidence for this cemetery in order to improve the landslide area around 850m² from the above cemetery is required to be utilized out of 2100 M² area and this necessity was officially informed by Project Engineer to District Secretary, Kegalle based on the decisions provided. (Annex 04)

2. Purpose of This Report

9. According to the proposed soil nailing plan utilizing of an area of 850m² from this existing cemetery was revealed to be mandatory as a part of the land slide mitigation process. The project team, therefore decided to inform the issue to SLRM ADB and obtain their concurrence for this cemetery relocation with re burial graves to another appropriate place and as ordered by the District/ Magistrate's Courts Mawanella. (Annex 05). Therefore, this report is prepared to receive ADB concurrence.
10. The report is based on the information available in the existing records developed by the project team for this incident, field observations and discussions held with the villagers as well as government officers who explained their concerns and suggestions for using cemetery premises and re burial of graves, detail investigations as well as recommendations of courts and explanations given by Divisional Secretary, NBRO, Project Engineer of PIU, Resident Engineer, Social Gender Resettlement Specialist, Environmental Specialist of PIC.



Figure 2-1 Conditions of previous Grave Area

3. Background of Location (Cemetery Premises) - Between Culvert No. 98/4 to 99/1

11. Rehabilitation, Improvement and Maintenance of Colombo – Kandy Road (A001) (Ch. 86+000km – 100+000km) is under Road management contract (RMC) of Package RMC 01 D - MAGA Engineering (Pvt) Ltd. The road section is located within the Divisional Secretary (DS) Division of Rabukkana, Mawanella and Yati Nuwara. The road passes through 12 Grama Niladari (GN) Divisions. A map of road RMC 01 D is presented in figure 3.1.
12. A landslide occurred on 2021.11.10 between culvert No.98/4 and culvert No.91/1 on Colombo -Kandy road (Pahala -Kadugannawa area). This road section is located within the Mawanella Divisional Secretary area, Ganethanna Grama Niladarai area. Land ownership of this cemetery is with the Divisional Secretary of Mawanella.
13. Due to the practical concerns mentioned below, NBRO, Road Development Authority, District Secretary and the other relevant government officers decided to mitigate this section as soon as possible
 - The Colombo -Kandy railway line traverses 100 m above this landslide area.
 - If rain continues, the danger is severe for further activation of landslide.
 - No road improvement work in this section could be carried out without mitigation of the landslide.

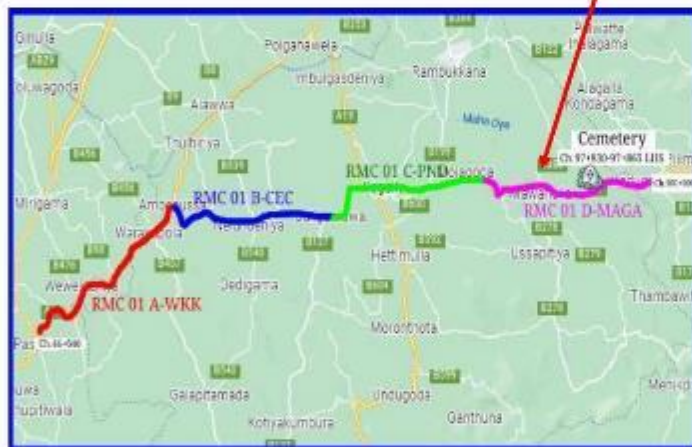
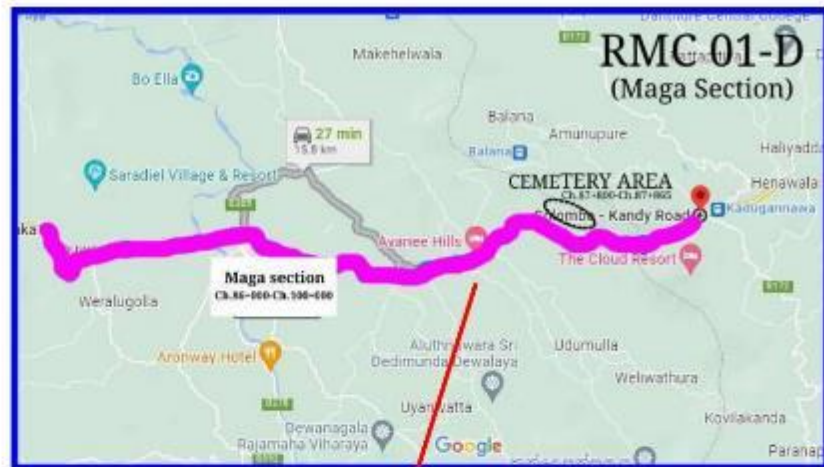


Figure 3-1 Project Location Map of RMC 01 Pasyala to Kadugannawa (01/D – MAGA Section)



Figure 3-2 Land slide areas between culverts 98 / 4 to 99 / 1



Figure 3-3 Discussion with Government officers, police and people to close the Road section

3.1 Past Condition of the Cemetery Premises

14. The cemetery premises are located Ch.97+830- 97+865 in Ganethanna Gramaniladari Division of Mawanella Divisional Secretary area. A cemetery that had been used by the villagers since 1982 was found and that land was belong to the government of Divisional Secretary of Mawanella. There is no legal registration evidence for this cemetery. In this village the religious groups are Buddhism and Christianity. The nationality of them are Sinhala. This cemetery was being used commonly in this village. According to the villagers around the location, there are 45 graves buried at this cemetery premises and 29 graves has to be reburial out of 45 graves.

3.2 Present Condition, Public and Stakeholder Consultation

15. When the soil nailing works are under process at the land slide area, information about this cemetery was identified by the project team. Then, construction works on soil nailing at the particular location were immediately stopped (Annex 06. I and Annex 6.II) with the decision made by Grama Niladari, NBRO and project team including PIU, MC and Contractor.
16. GRC GN level meeting was conducted on 16th of June 2022 with Pahala Kadugannawa Welfare Society (Maranadara Samithi) to discuss the issue and people who are relative for the graves were there in the meeting. They were agreed to re burial graves for another place with appropriate procedures and the management of the cemetery has been done by the welfare societies. The villagers are still using the other land area this cemetery and according to their request project will provide an access to the cemetery (Annex 07). With this decision, Divisional Secretary of Mawanella obtained the Court Order to relocate the 850m² area from existing cemetery with reburial the graves. (Annex 05).



Figure 3-4 Discussion with Pahala Kadugannawa welfare society members



Figure 3-5 Present graves areas

3.3 Proposed Location for Re Burials

17. An order was issued by the District/ Magistrate's Courts, Mawanella to the remains in the cemetery (only 850m² area) at the Ganethenna Public Cemetery near the Samurdi Bank, which is located in Ganethenna GN Division of Mavanella Divisional Secretary Division (GPS Location – 7°14'45.2"N 80°29'33.1"E.). 29 graves have to be reburial and the proposed land extent will be 44.5 m² (Annex 08) for re burial process. Relative of the graves have agreed to re burial the graves in one place. Consent from the executive committee (Maranadara Samithi, Mawela) has been already issued for this relocation. (Annex 09).



Figure 3-6 Proposed land area for re burial of remains at Ganethenna Cemetery

3.4 Proposed Procedure for Re Burial of remains at Ganethanna Public Cemetery

18. As the landslide was in the Project area, it was decided to carry out the mitigation work through the project. Accordingly, Project Management Unit (RDA) and Engineer have issued Variation Order to the Contactor for applying the mitigation as per the guidelines issued by NBRO
19. Several times we had discussed with the relatives of the deceased. Through Divisional Secretary, submit the list of members buried in this cemetery and hereby declare that they do not expect any compensations, objection or other benefit for the removal of the body parts re buried or after removal. (Annex 10).
20. With the ADB concurrence, the following procedure will be applied to re burial graves at the proposed new location and the process will be completed within one week.
Step 01. Within the first 06 days, the graves in the affected area will be excavated and graves will be reserved at the location where recommended by the courts.
Step 02. During the final day, all excavated graves will be buried again with the religious last respects. Entire process will be monitored by third party which is recommended by the courts. (Annex 11. I, Annex 11.II Annex 11.III.).
Step 03. After completion of the re burial process, a report will be submitted by the MC.

4. Justification of Re burial of remain.

21. Colombo-Kandy Road (A001) is very important road to connecting Central, Western and Sabaragamuwa Provinces. It is an urgent and essential requirement for mitigate this land slide to ensure road safety for smooth transportation.
22. As per the NBRO recommendation, this land slide must be mitigated and no works in this section could be carried out without applying mitigation measures. Therefore, shifting of this 850m² of cemetery and relocation is a mandatory work for carrying out proper soil nailing.
23. Accordingly, this re burial graves will ensure due respect to the human remains and there will not be any cultural impacts in this case.

5. Conclusion

24. Considering the factors stipulated in NBRO recommendation and the significance of this particular road, this mitigation measure must be applied with the appropriate standards.
25. All necessary approvals, legal clearances and recommendations were received Majestic court Mawanalla, (Annex- 05) relevant Community, (Annex- 07,09,10) relevant health department (Annex- 11.III) and Divisional Secretary (Annex- 11.II) by Project team to shift the re burial graves to another suitable location.

26. After obtaining the ADB concurrence, the process will be commenced and within one week it will be done as per the procedure mentioned in this report. A completion report will be submitted.
27. The process will ensure that no any disrespect is caused to the owners and will not cause any IR impacts in the case of culturally sound facts as the process will be done with the religious last respects and the process will be strictly monitored.

6. Annexures

Annex- 01. Request letter from District Secretary to mitigation land slide area

R/7496 492

දිස්ත්‍රික් ලේකම් කාර්යාලය
කච්චේරිය - කෑගල්ල
மகாவட்ட செயலகம் / கச்சேரி - கேகலே
DISTRICT SECRETARIAT/ KACHCHERI - KEGALLE

සේවා අංකය / අංශ නි. / My No } DSK/EST/ADM සේවා අංකය / අංශ නි. / Your No } දිනය / අංකය / Date } 2021.11.18

ලේකම්,
මහා මාර්ග අමාත්‍යාංශය,
මහලොහුම් මහ මැදුර,
8 වන මහල,
පොත්පිල් පොම්බුකඩු මාවත,
කොස්ගම,
කන්තලේ.

මහල කළමනාකරණ අධ්‍යක්ෂ ජනරාල් මහත්මයාණනි

දුම්රි පරිවහණ මැදසුම් කෝස්ගමයි

උන්න කාර්යය සම්බන්ධයෙන් කැමැත්ත, දුම්රි පරිවහණ ප්‍රතිපත්ති මැදසුම් පදනම්කරණයට
විසින් මා වෙත පොසු කාර්ය ලද කෝස්ගමයි මැදසුම් මාර්ගයට මේ සමඟ සිට වෙත පොසු
කරමි.

02.ව් අදාළ, අදාළ කාලයේ අවදානම් කලාපය නිරීක්ෂණය සිදු කිරීමෙන් අනතුරුව පවත්නා
කන්ඩය යටතේ නිරිත මඳහන්, මෙහිකාමියා, ආවර්තමය හා මාර්ගවිකමය වටිනාකම ආරක්ෂා කර
කරීමක් අත්විඳීම ඉතිරි කළුණු හරි මාර්ගය ආකර්ෂණය මැදිහත් කළුණු ප්‍රමුඛ දුම්රි
පරිවහණයක් මැදි නිරීක්ෂණ අධ්‍යක්ෂ ජනරාල් කෝස්ගමයි මැදසුම් මහ අතර මේ සම්බන්ධ
සබඳතා කාර්ය මාර්ග අධ්‍යක්ෂ ජනරාල් අවසර මුමානිත කන්තා මලය කාර්ය මාර්ග අවදානම්.

අ/කරුණේ
මහින්ද රත්වික්‍රම,
දිස්ත්‍රික් ලේකම්,
කැමැත්ත පරිපාලන දිස්ත්‍රික්කය.

විටපත් 1. ලේකම්, මාර්ග අමාත්‍යාංශය - කාර්ය, දි. 04.
2. ප්‍රධාන ලේකම්, ප්‍රධාන ලේකම් කාර්යාලය, කන්තලේ පොත් - කාර්ය, දි. 04.
3. අධ්‍යක්ෂ ජනරාල්, දුම්රි පරිවහණ ප්‍රතිපත්ති මැදසුම් පදනම්කරණයට - කාර්ය, දි. 04.
4. අධ්‍යක්ෂ ජනරාල්, මාර්ග මාර්ගවික අධ්‍යක්ෂ - කාර්ය, දි. 04.
5. අධ්‍යක්ෂ ජනරාල්, ආපදා කළමනාකරණ අමාත්‍යාංශය - කාර්ය, දි. 04.
6. ප්‍රාදේශීය ලේකම්, ප්‍රාදේශීය ලේකම් කාර්යාලය, මාර්ගවික - කාර්ය, දි. 04.
7. කොට්ඨාශ ලේකම්, දුම්රි පරිවහණ මැදසුම් පදනම්කරණයට - කාර්ය, දි. 04.
8. පළාත් ලේකම්, මාර්ග මාර්ගවික අධ්‍යක්ෂ, කන්තලේ පොත් - කාර්ය, දි. 04.
9. ප්‍රධාන ඉංජිනේරු, මාර්ග මාර්ගවික අධ්‍යක්ෂ, කැමැත්ත - කාර්ය, දි. 04.

E.E.(K)
WJH

TRANSLATION

Date 2021.11.15
Secretary,
Ministry of Highways,
"Maganeguma Mahamedura"
8th Floor,
Denzil Kobbekaduwa Avenue,
Koswatta,
Battaramulla.

Regarding the Lower Kadugannawa Landslide Prone Area

Land Usage Planning Proposal

I am attaching herewith the report containing the proposal sent to me by the Department of Land Use Policy Planning in Kegalle regarding the above subject matter.

02. So that, after observing the relevant landslide prone area to conserving unstable land to enhance tourist attraction while protecting historical economic and environmental value, it is included a land usage proposal to form proper land usage. So, it is kindly requesting to give your kind attention in this regard take necessary action.

Signed by
Mahinda S.Weerasuriya,
District Governor/ District Secretary,
Kegalle Administrative District.

CC	1. Secretary, Ministry of Tourism	- f.i.p
	2. Chief Secretary, Chief Secretary Office, Local Authority in Sabaragamuwa Province	- f.i.p
	3. Director General, Department of Land Use Policy Planning	- f.i.p
	4. Director General, Urban Development Authority	- f.y.p
	5. Director General, Ministry of Disaster Management	- f.y.p
	6. Divisional Secretary, Divisional Secretary Office, Mawanalla	- f.y.p
	7. Assistant Director, Department of Land Use Policy Planning	- f.y.p
	8. Provincial Director, RDA, Local Authority in Sabaragamuwa Province	- f.y.p
	9. Chief Engineer, Road Development Authority-Kegalle	- f.y.p

Annex- 02.1 Chief Engineer (Kegalle) letter to Project Engineer RMC 01

 <p>මාර්ග සංවර්ධන අධිකාරිය මිනිසාගේ ජීවිතයේ ජීවිතයක් සඳහා Road Development Authority</p> <p>ප්‍රධාන ඉංජිනේරු කාර්යාලය (කෛල්ල), ගඹුලමුල්ල නගරය මහලය (Kegalle), Gallempaaya Town Chief Engineer's office (Kegalle), Gallempaaya Town</p> <p>විද්‍යුත් ලිපිනය / E-mail Address - cekeg@rda.gov.lk rdakeg@gmail.com</p>	මගේ අංකය අංකය My No } CE/RDA/KG/R/01
	දිනය දිනය Date } 2022-01-29
	දුරකථන / ෆැක්ස් දුරකථන / ෆැක්ස් දුරකථන / ෆැක්ස් } 035-2229554 035-2229554
	දුරකථන / ෆැක්ස් දුරකථන / ෆැක්ස් Tel / Fax No }

වහලයේ ඉංජිනේරු,
 I Road වහලයේ කාර්යාලය,
 හෝ 122/4,
 ප්‍රාග්ධින මහලයේ මාර්ග,
 වැවුම්පොල,
 කෛල්ල.

- **2022.01.05 දින පැවති කෛල්ල දිස්ත්‍රික් සම්බන්ධීකරණ සමිටු සිරිසා දැනුම්දීම.**
 පහත සටහනකට ප්‍රදේශයේ නගර සමිටු මගින් ඉදිරිපත් කළ ජනාධිපතිවරයාගේ නිර්දේශ හා ප්‍රතිචාරය ප්‍රකාශිත කරන්නට පැමිණිම.

උත්තර කොටස සම්බන්ධයෙන් මා අමතන දුර කෛල්ල දිස්ත්‍රික් දේපල සේවා අංශ DSK/DPS/PLN/DCCME/D3/1 දරණ 2022.01.25 දිනැති ලිපිය සම්බන්ධයි. (පිටපත අමුණා ඇත)

පහත සටහනකට ප්‍රදේශයේ නගර සමිටු මගින් ඉදිරිපත් කළ ජනාධිපතිවරයාගේ නිර්දේශ හා ප්‍රතිචාරය ප්‍රකාශිත කරන්නට පැමිණි මාර්ග සංවර්ධන වහලයේ මගින් සිදුකරන නිර්දේශ සම්බන්ධ කරන මාර්ග හා ප්‍රදේශ පාරිභෝගිකයන්ගේ පැවති කැමැත්තන්දී එකතුව පරිදි අදාළ දින වකවානු අතුරු මගින් සංවර්ධන කටයුතු සම්බන්ධ නිර්දේශ කටයුතු කරන ලද පරිදි දිස්ත්‍රික් සම්බන්ධීකරණ සමිටු රැස්වීමේදී සිරිසා පරිදි අප වෙත දැනවා ඇත. සුදුසු කටයුතු සඳහා ආරක්ෂිතව දැන්වීම.

ප්‍රධාන ඉංජිනේරු
 (මා සං අ) කෛල්ල
 ප්‍රධාන ඉංජිනේරු
 මාර්ග සංවර්ධන අධිකාරිය
 කෛල්ල.

- පිටපත: 01. දිස්ත්‍රික් දේපල, දිස්ත්‍රික් දේපල කාර්යාලය, කෛල්ල. - සා.දු.පි.
 02. විධායක ඉංජිනේරු, මාසංඅ, කෛල්ල - දු.පි.

TRANSLATION

Project Engineer,
I Road Project Office,
No: 122/4,
Fransis Molamure Mawatha,
Kegalle.
09.01.2022

Dear Sir,

**Inform of Kegalle District Coordination Committee decisions held on 05.01.2022
Stabilization of the landslide Pahala Kadugannawa area and restoration of people's
life.**

The letter dated 25.01.2022 bearing No. DSK/DPS/PLN/DCCME/D3/31 of the District Secretary to whom I am addressing regarding the said matter (Copy of the letter attached herewith)

The stabilization of the landslide area of the Pahala Kadugannawa is to be carried out by the Pasyala Kadugannawa Road development project.

We have been informed in the district coordination committee meeting to complete the stabilization work as soon as possible according to the relevant dates as agreed in the discussion held in the parliament.

Thank you.

Chief Engineer,
Road Development Authority,
Kegalle.

Copy- District Secretariat, District Secretariat, Kegalle
Executive Engineer, Road Development Authority, Kegalle

Annex- 02.II. Sri Lanka Parliament Decision informing letter



දිස්ත්‍රික් ලේකම් කාර්යාලය

කච්චේරිය - කෑගල්ල

කච්චේරිය - කෑගල්ල

DISTRICT SECRETARIAT/ KACHCHERI - KEGALLE

මගේ අංකය
எனது இலக்கம்

My No. { }

ඔබේ අංකය
உமது இலக்கம்

Your No. { }

දිනය
திகதி

Date { 2022.01.26 }



ප්‍රධාන ඉංජිනේරු,
මහජන සංවර්ධන අධිකාරිය,
කෑගල්ල.

2022.01.05 දින පැවැති කෑගල්ල දිස්ත්‍රික් සම්බන්ධීකරණ සමිටු නිරණ දැනුම්දීම.

සහඳුන්වනාච ප්‍රදේශයේ නායකත්ව පුස්තක පොදු සේවා ස්ථානීකරණය කිරීම හා ස්නේහිත ප්‍රකාශිත ක්‍රියාමාර්ග පත්කිරීම.

ඉහත දින පැවැති කෑගල්ල දිස්ත්‍රික් සම්බන්ධීකරණ සමිටු රැස්වීමේදී, සහඳුන්වනාච ප්‍රදේශයේ නායකත්ව පුස්තක පොදු සේවා ස්ථානීකරණය කිරීම හා ස්නේහිත ප්‍රකාශිත ක්‍රියාමාර්ග පත්කිරීම සම්බන්ධව අවබෝධයක් සම්බන්ධයෙන්, අවධානයට යොමු කළ බවට තීරණය කරන ලදී.

02. ඒ අනුව ස්නේහිත ප්‍රකාශිත පොදු සේවා ස්ථානීකරණය කිරීම, සහඳුන්වන ලද, විස්තරාත්මක පැහැදිලි මාර්ග සංවර්ධන පටිපාටිය වෙත ලද සම්බන්ධ ප්‍රකාශන මාර්ග සංවර්ධන ප්‍රකාශන වෙත, මෙය ක්‍රියාත්මක කිරීමට නියමය වශයෙන් අනුමතය විය.

03. මේ සම්බන්ධ මුළු ලාභා පාර්ලිමේන්තුවේදී පැවැති, සාකච්ඡාවේදී එකඟව තීරණය කරන ලද, අදාළ දින වකවානු අනුව, මෙහි සංවර්ධන කටයුතු සම්බන්ධ කිහිපයකට කටයුතු කරන ලදහ, දිස්ත්‍රික් සම්බන්ධීකරණ සමිටුවේ නිරණය වශයෙන් කාර්යයට දක්වයි.



මහජන ව. විජේසිරි,
දිස්ත්‍රික් ලේකම්/දිසායනි,
කෑගල්ල සම්බන්ධීකරණ සමිටුවේ
ප්‍රධාන අධිකාරී, මහජන ව. විජේසිරි
ප්‍රධාන අධිකාරී විජේසිරි

සටහන් :

01. ප්‍රධාන අධිකාරී, මහජන සංවර්ධන අධිකාරිය, කෑගල්ල.
02. නියෝජිත අධිකාරී, කෑගල්ල සංවර්ධන අධිකාරිය, කෑගල්ල.
03. සම්බන්ධීකරණ නිලධාරී, ස්නේහිත ප්‍රකාශිත පොදු සේවා කාර්යාල, කෑගල්ල.
04. සහකාර අධිකාරී, (ආයතන සහකාරයන්) කෑගල්ල.

"සැලැස්වූ" ගණිතමය වගකීම් කිහිපයක් මෙහි ඇතුළත් කර ඇත. ඒවායින් "සැලැස්වූ" ගණිතමය වගකීම් වන්නේ:

<p>දිස්ත්‍රික් ලේකම් කාර්යාලය කච්චේරිය, කෑගල්ල</p> <p>දුරකථන : 011-2222222 ෆැක්ස් : 011-2222222 විද්‍යුත් තැපෑල : kachchery@slps.gov.lk</p>	<p>කච්චේරිය කාර්යාලය කච්චේරිය, කෑගල්ල</p> <p>දුරකථන : 011-2222222 ෆැක්ස් : 011-2222222 විද්‍යුත් තැපෑල : kachchery@slps.gov.lk</p>	<p>කෑගල්ල කාර්යාලය කෑගල්ල, කෑගල්ල</p> <p>දුරකථන : 011-2222222 ෆැක්ස් : 011-2222222 විද්‍යුත් තැපෑල : kachchery@slps.gov.lk</p>	<p>කෑගල්ල කාර්යාලය කෑගල්ල, කෑගල්ල</p> <p>දුරකථන : 011-2222222 ෆැක්ස් : 011-2222222 විද්‍යුත් තැපෑල : kachchery@slps.gov.lk</p>
--	---	---	---

TRANSLATION

Chief Engineer,
Road Development Authority,
Kegalle.
25.01.2022.
Dear Sir,

**Inform of Kegalle District Coordination Committee decisions held on 05.01.2022
Stabilization of the landslide Pahala Kadugannawa area and restoration of people's
life.**

At the Kegalle District Coordination Committee meeting held on the previous day, attention was drawn to the need to speed up the stabilization of the landslide-prone part of the Lower Kadugannawa area and the restoration of people's lives.

Accordingly, it was revealed that the detailed plans prepared by National Building and Research Organization have been sent to the Road Development Authority and that this will be implemented under the Pasyala - Kadugannawa Road Development Project.

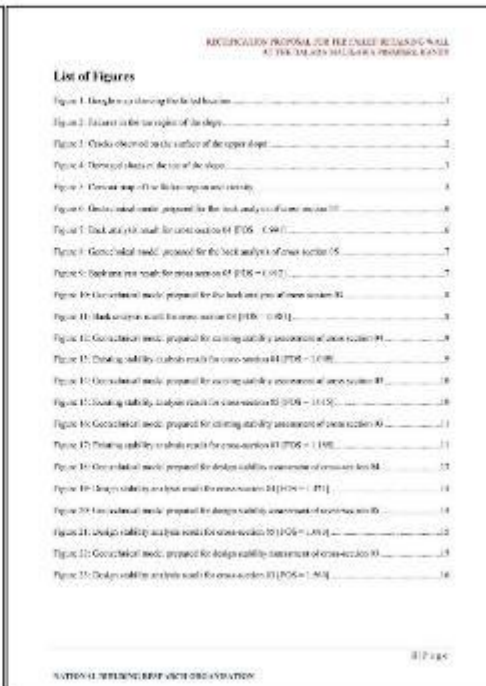
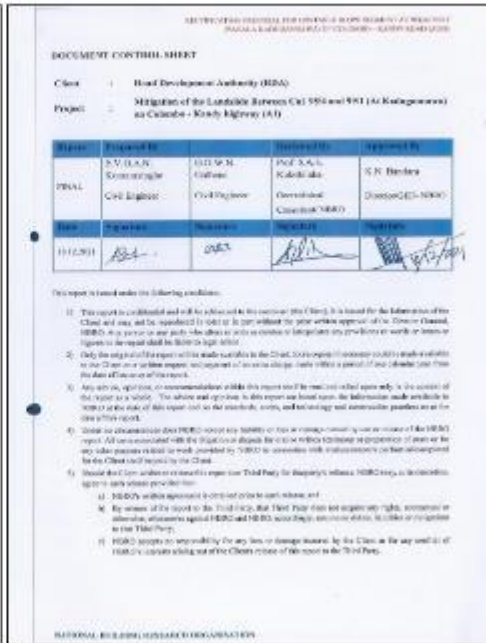
I would like to inform you of the decision of the District Coordinating Committee to complete the development work here as soon as possible according to the relevant dates as agreed in the discussion held in the Parliament of Sri Lanka.

Thank you.

Mahinda S Weerasooriya,
District Secretariat,
Kegalle Administrative District

Copy- Divisional Secretariat – Mawanella
Chairman, Pradeshiya sabha, Mawanella

Annex-03 Recommendations made by NBRO



RECREATION HOSPITAL FOR THE DISABLED BUILDING WALL
AT THE SINGAJAYA MOUNTAIN A PROBABIL KAMEN

List of Tables

Table 1. How the geology can be analyzed 3

Table 2. Summary of the stability analysis result 17

18 | 2 page

NATION U. BUILDING INFORMATION ORGANIZATION

MITIGATION OF THE LANDSLIDE BETWEEN THE SINGAJAYA
AND SAKRAMAN MOUNTAINS (KALIMANTAN - KALIMantan)

1. INTRODUCTION

Following heavy rainfall occurred over a few days, a steep embankment was collapsed on 17 November 2021 in the slope segment in 950m per (Pakaj Kalimantan) of Colombia - Kuala Lumpur (MOR).

This report describes a back analysis of failure soil - provided counter measures for mitigating the instability of the slope. During the study, slope profile, actual ground level, three dimensional presentation of the soil, soil characteristics information were gathered from the topographical survey, geophysical survey and geotechnical investigation according three methods. The counter measures were proposed based on a detailed analysis taking into account the site specific geology, technical requirement and experience based on similar projects in Sri Lanka.

2. DETAIL OF THE DESIGN LOCATION

2.1. SITE LOCATION

The landslide segment is located near 950m per (Pakaj Kalimantan) of Colombia - Kuala Lumpur. Figure 1 shows the site location in Google map.




Figure 1. Google map showing the study location

3. FAILURE MECHANISM

Failure of the location has also place in the top region of the upper slope of the wall during a period of heavy rain and excessive water percolated to the soil. Major water content were at the top of the slope, thereby percolating and damaging the line of slope here. Nevertheless, the soil slope up to the rock surface has been subjected to slight lateral movement and the two overall vertical cracks formed on the soil slope (Figure 2 & Figure 3).

19 | 2 page

NATION U. BUILDING INFORMATION ORGANIZATION

MITIGATION OF THE LANDSLIDE BETWEEN THE SINGAJAYA
AND SAKRAMAN MOUNTAINS (KALIMANTAN - KALIMantan)

By visualizing the hydrological and geomorphological conditions of the area, it could be hypothesized that the failure has occurred, owing to the infiltration of water into the soil and consequent loss of the moisture and the possible development of pore water in the column of soil (top and bottom) soil formation above the rock subjected to different levels of saturation. Some water discharge from the rock surface directly above the soil slope has played a major role in the soil saturation process.

The loss of moisture saturation and formation of pore water pressure within the soil mass above the rock has triggered the movement within the soil mass. Moving soil has pushed the slope through the structural complexity (Figure 4). All the movements were above the rock surface and there were no indications of subsequent failure below the rock formation.



Figure 2. Failure in the top region of the slope



Figure 3. Cracks observed on the surface of the upper slope

20 | 2 page

NATION U. BUILDING INFORMATION ORGANIZATION

MITIGATION OF THE LANDSLIDE BETWEEN THE SINGAJAYA
AND SAKRAMAN MOUNTAINS (KALIMANTAN - KALIMantan)




Figure 4. Damaged slope at the top of the slope

4. GEOMORPHOLOGY & GEOTECHNICAL DATA FOR THE DESIGN

4.1. CLIMATOLOGICAL DATA

A topographic survey and investigation on the failure segment of the site was carried out to generate data of the geomorphology of the area. Moreover, cross-sections perpendicular to the slope were prepared in the field and several failure locations in the study region. Figure 5 below shows the topographic survey data for the failure region. Moreover, the contour plan and the cross-sections proposed are included separately in pages with this construction set.




Figure 5. Contour map of the failure region and vicinity

21 | 2 page

NATION U. BUILDING INFORMATION ORGANIZATION

4.2 GEOTECHNICAL DATA

Geological mapping was done as the required data to determine the boundaries of the potential failure, identify existing features such as tension cracks, sub-levels, splines, and to collect the data related to the profile of the area such as strike, dip, foliation, weathering conditions, joints of the rock exposure and also the location of wells.

Further, a check survey and borehole investigations were done at the selected location based on the landslide investigation and geological mapping results to identify the geology and subsurface condition. Report of the check survey and the borehole logs have been included in the Annexure II of this report.

5. ASSESSMENT OF THE EXISTING CONDITION OF THE SLOPE

5.1 ANALYZING CONDITIONS

The stability of the failed location was assessed using Geo-studio[®] Slope W 2016 version using American method, considering the most critical cross-sections taken along the failure region. Further, the information gathered during the field work, geological mapping, geophysical survey, and borehole investigation were incorporated into the analysis.

The most critical cross-section for the analysis was selected based on the geomorphology and also the site-specific condition dictated by the topographic survey and geotechnical investigation respectively.

According to the geomorphology, cross-sections 04 and 05 were critical. However, the geotechnical investigation revealed that the subsurface profile in the cross-section 05 is more suited compared to the cross-section 04. Therefore, cross-section 05 was analyzed with a more critical nature for the failure from section.

Then, cross-section 04 was analyzed initially using finite analysis, deducing the failure mode and the critical slip surface, in addition to the most suitable counter measure required in the stabilization process. Moreover, cross-section 05 and 07 were also analyzed in addition to the critical cross-section to determine the magnitude of the counter measure required for such cross-section locations.

5.2 SHEAR STRENGTH PARAMETERS OF THE SOIL USED IN THE ANALYSES

Resistivity at the failed location was obtained based on the soil profile derived through the check survey and the borehole investigation. Moreover, the soil shear strength properties were carefully

related considering SPT correlations in their strength properties, soil experiences on slope stability movement in their in field conditions, and also back analysis results. The selected shear strength parameters for each material are presented in Table 1 below.

Table 1. Shear strength properties for soil types

Soil type	Stratium	γ (kN/m ³)	ϕ' (deg)	c' (kPa)
Thinly Colloidal	Green	17	29	5
Compactly Very loose Rock	Orange	19	41	13
Highly Weathered Rock	Grey	22	45	50
Thinly	Blue	18	36	7
Block	Pink	18	40	10

5.3 BACK ANALYSIS

A back analysis of the failed failure was carried out to verify the soil parameters used in the geotechnical model. In this regard, the geomorphology of the slope before the failure was studied with aid of the terrain elevation and cross-sections data as well as comparing the failure images extracted from the Google map together with the photographs taken after the failure. The geotechnical model generated for each cross-section considered and the results obtained have shown in Figure 6 to Figure 11.

The soil and shear strength parameters and geotechnical table were then adjusted between possible ranges and the critical failure surface of the back analysis come out to closely resemble the actual failure mode described in the field investigation.

Moreover, it should be noted that this adjustment was carried out in any case of shear strength table will come near the failure movement that has taken place. As such, it further validates to display the counter measures on the possible solution of shear strength parameters in order to be considered. This is done by identifying a zone of lower shear strength parameters around failure.

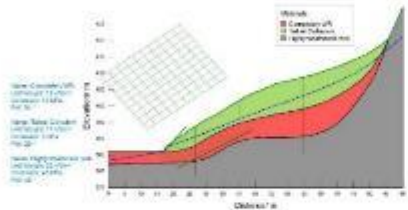


Figure 6: Geotechnical model prepared for the back analysis of cross section 04

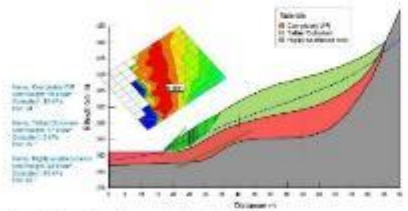


Figure 7: Back analysis result for cross section 04 (FS = 0.99)

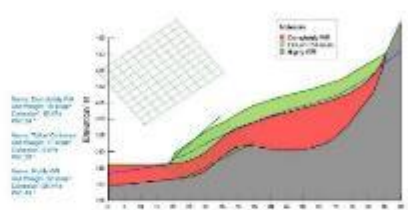


Figure 8: Geotechnical model prepared for the back analysis of cross section 05

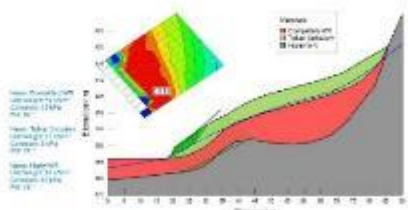
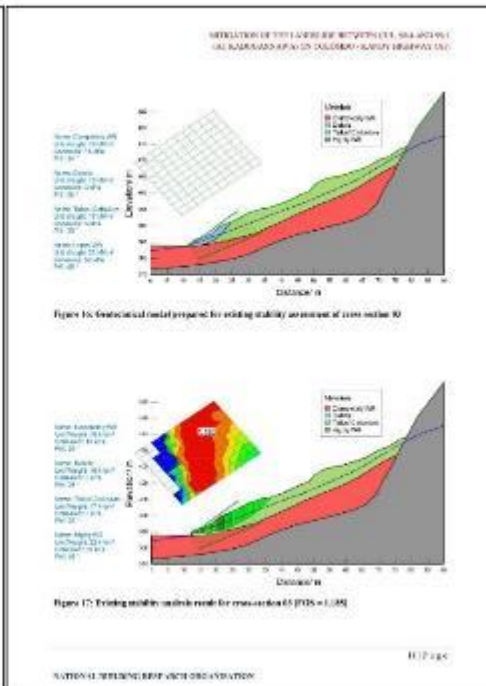
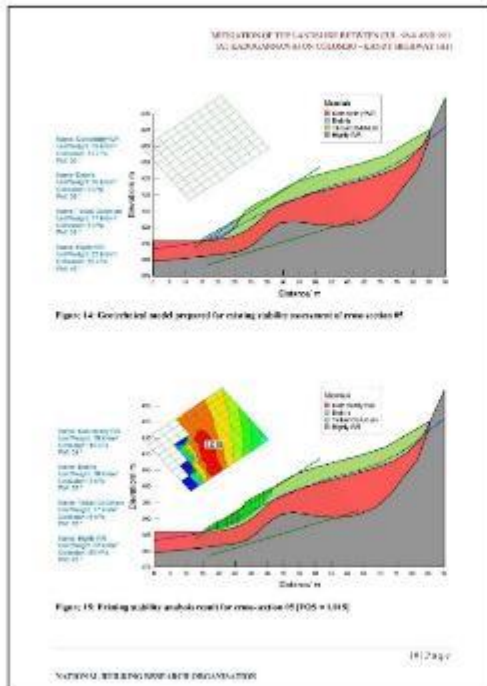
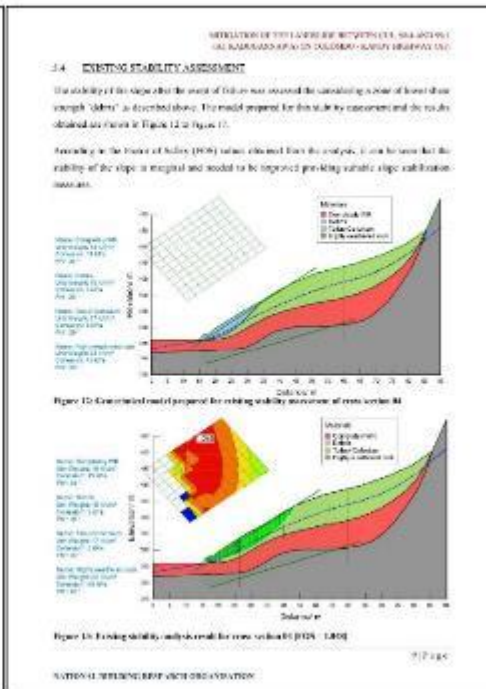
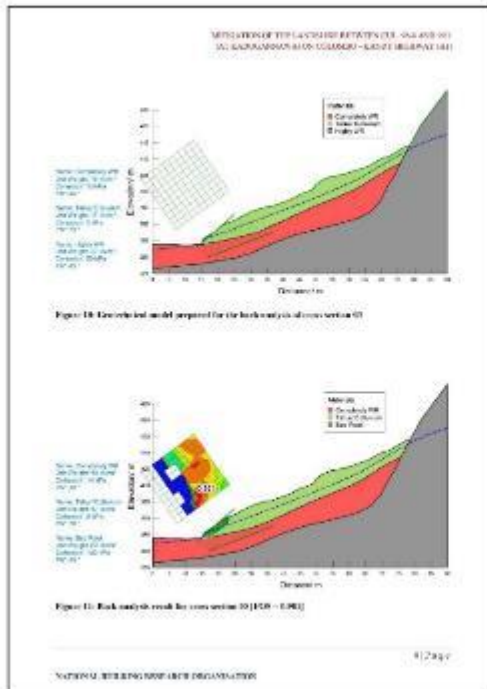


Figure 9: Back analysis result for cross section 05 (FS = 0.92)



6. RECTIFICATION DESIGN

6.1 THE FACTOR OF SAFETY FOR THE DESIGN

As per the information received from the District authorities, landslides occurred from the top of the slope needed to be relocated in the location. Moreover, the upper slope can be improved to develop a least stable condition.

Accordingly, it was noted that the life and property loss needs to be prevented when the proposed development is completed or higher. Therefore, a 1.40 safety margin was adopted for the design slope stability assessment, considering the risk associated with the life and property damage.

6.2 THE DESIGN CONCEPT

As the design needed to be implemented to ensure stability, the remedial measures essentially include the proper surface drainage system to minimize the water infiltration into the potential failure zones. Moreover, it was evident that the surface runoff from the rock outcrop directly above the soil can play an important role in this destabilization process. Therefore, it is essential to construct a cut-off drain above the base of the soil slope to direct the water away from the slope to the access road. Further, this flow should be directed to the side drains of the road through a series of catchment and control drains.

Moreover, according to the existing state of the storage water and existing water supply to the site, it is equally important to reduce the risk of flood. Some subsurface drains have been already laid out at the toe of the slope for this purpose as a temporary measure. Further, it would be necessary to install several rows of additional horizontal and vertical pipes at different locations to effectively remove seepage water from different soil horizons.

To maintain the design and to verify the fundamental alignment of the design project, a 5m space between the proposed slope and the existing edge of the road was requested for the relocation. According to the geomorphological condition of the mass-eroded landside, it was noted that a nearly high cut slope will result from this space acquisition requirement. In order to stabilize the work on such high height, the support together with several stabilization methods such as soil nailing would be required.

6.3 DESIGN STABILITY ASSESSMENT

Considering the design model described in Section 6.2, the final design together with knowledge of the ground water table was checked for the purpose of providing safety, as necessary, for the space for the proposed space acquisition and achieving the target FOS under the design conditions.

In actual design, three different soil types were selected for the calculations with varying depth below the ground surface. The physical properties of the soils at different levels of embankment was collected using the borehole data below.

$$\sigma_v = C_u + \gamma \times h$$

- Where: C_u = The ultimate shear strength
- γ = Area of saturation between the ground table
- h = Average of vertical and horizontal distance from the end length of the soil
- $\sigma_v = \gamma \times h + C_u$

Moreover, values of safety factors of 1.0 and 1.2 have been used for the physical resistance and tensile strength of the concrete slab respectively.

After several trials, the most stable condition and maximum strength of the slope system was achieved. Figure 18 to Figure 23 below presents the proposed model prepared for the critical design stability assessment and the results used for the design stability assessment.

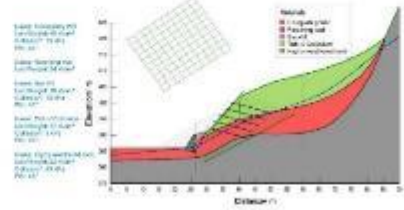


Figure 18: Geotechnical model prepared for design stability assessment of connection #1

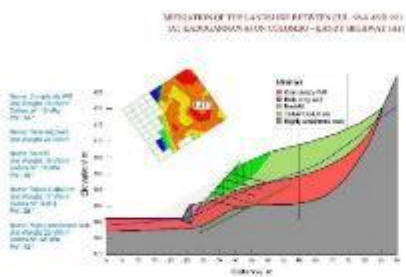


Figure 19: Design stability analysis result for connection #1 (FOS = 1.47)

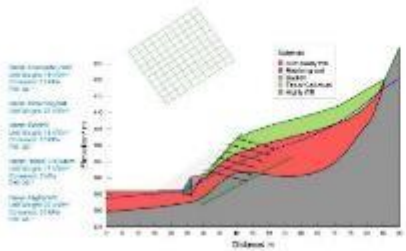


Figure 20: Geotechnical model prepared for design stability assessment of connection #2

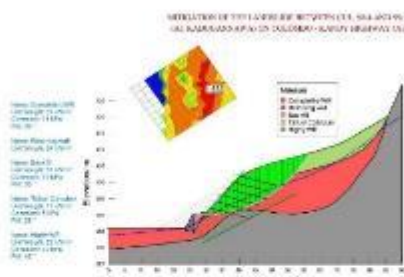


Figure 21: Design stability analysis result for connection #2 (FOS = 1.68)

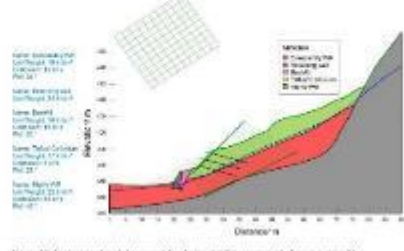
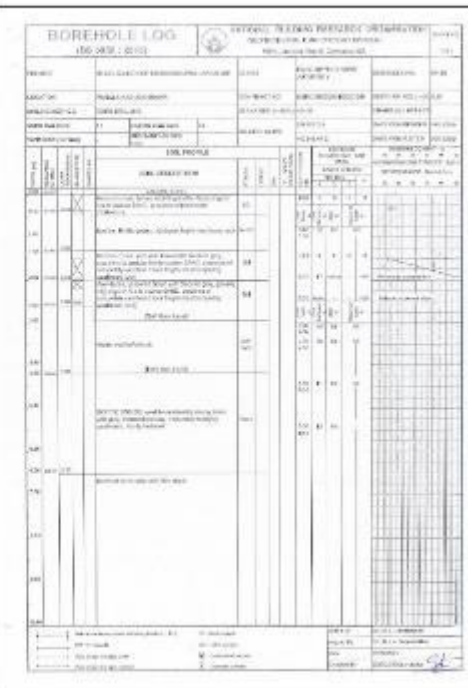
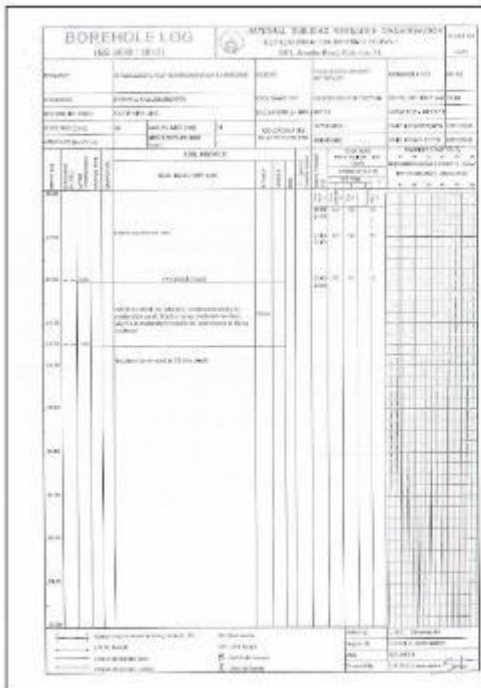
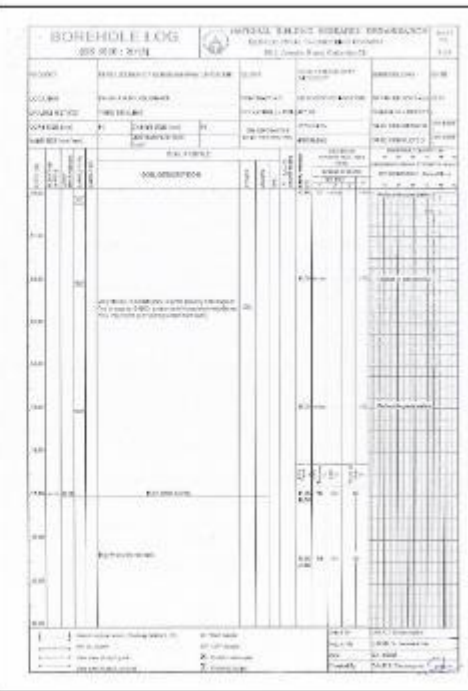
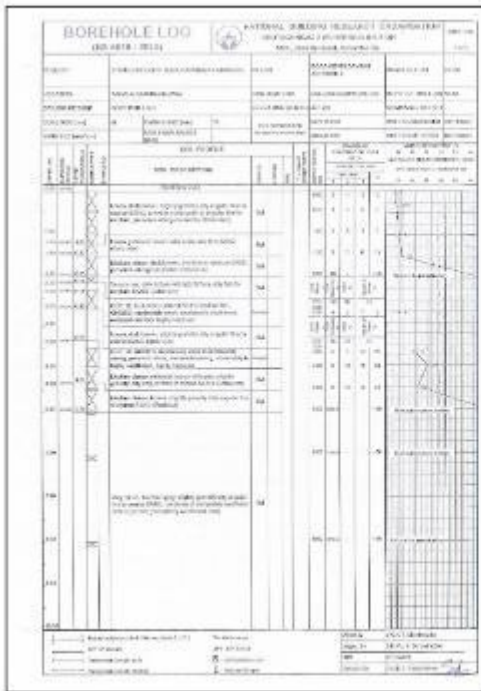


Figure 22: Geotechnical model prepared for design stability assessment of connection #3



TRANSLATION

District Secretariat,
District Secretariat Office,
Kegalle.

Dear Sir,

INTEGRATED ROAD INVESTMENT PROGRAM
Rehabilitation & Improvement works & Maintenance work of Colombo Kandy Road
(A001) from Pasyala to Kadugannawa Section
CONTRACT PACKAGE NO: RDA/ADB/IROAD/NCB/RMC/01

The letter sent by the Chief Engineer, Road Development Authority, Kegalle on 29.01.2022 is related to your reference number DSK/DPS/PLN/DCCME/D3/1 dated 25.01.2022.

We have received the plan prepared by the National Building Research Organization for the stabilization of the Pahala Kadugannawa landslide area. In accordance with that plan, Maga Engineering (Pvt) Ltd has started the construction work. The implementation of the plan will be under the supervision of the National Building Research Organization.

A public cemetery and a water tank belong to National Water Supply and Drainage Board are located at the place. Those have to be removed for construction activities.

I kindly request you to pay your kind attention in this regard and take necessary actions please.

The plan approved by the National Building Research Institute is attached herewith for your information.

Thank you.

Chamara Herath,
Project Engineer,
Integrated Road Investment Programme.

Copy- Divisional Secretariat – Mawanella
Chairman, Pradeshiya Sabha, Mawanella

TRANSLATION

Case No: AR 22698/2022

District/ Magistrate's Courts
Mawanella
2022.06.23

Divisional Secretary
Divisional Secretariat
Mawanella

Order regarding the burial of parts of skeletal remains of human bodies at the cemetery located near the Samurghi Bank at Ganetenna if they are found when conducting stabilization activities at the location subjected to earth-slips at Pahala Kadugannawa.

It has been revealed by investigations conducted by Inspector of Police Sanjeeva Bandara on reports submitted by the Divisional Secretary, Mawanella by his letter number M.W.N./SOS/DISA SA/12/7/2/ dated 22.06.20 and by the Project Engineer of the Integrated Road Investment Programme, Chamara Herath by his letter number RDA/iROAD/RMC/01/GEN/07 dated 09 June 2022, that parts of coffins used for burial has been found when conducting stabilization activities at the location at Pahala Kadugannawa that was subjected to earth-slips, that this location which is a reservation has been used for burial of human remains.

The Officer-in-Charge of the Mawanella police station reports to me that it is the belief of the Project Engineer and the senior residents of the area that more such parts of coffins and skeletal remains will be found when conducting further stabilization activities.

Therefore, I order you that if such parts of coffins or skeletal remains of human bodies are found at this location, they should be buried at the cemetery located near the Samurghi Bank at Ganetenna without causing any disrespect to the human remains.

Magistrate
District/Magistrate's Courts
Mawanella.
2022.06.23

Annex-06.1. Contactor informed a grave is exposed while the excavation.

RANC 0864 20 10 00 217

Our Ref: 503M (0864) 09566
Date: 13th June 2022

Resident Engineer,
Resident Engineer's Office,
No. 122/4, Sir Francis Molamure Mawatha,
Kegalle.

Dear Sir,

INTEGRATED ROAD INVESTMENT PROGRAM: REHABILITATION, IMPROVEMENT AND MAINTENANCE OF COLOMBO - KANDY ROAD (A001) (86+000 KM TO 109+000 KM)

CONTRACT NO. RDA/ADB/ROAD/NCB/RMC/01-D

SUB: COST PROPOSAL NO.15: MITIGATION OF THE LANDSLIDE BETWEEN CUL 98/4 & 99/1 (@ KADUGANNAWA) ON COLOMBO - KANDY HIGHWAY

OBSTRUCTION FOR EXCAVATION

Please note that a grave is exposed while carryout the excavation at cemetery area (refer attached plan) for soil nailing in landslide between culvert no.98/4 and 99/1. Therefore, execute the work in ahead is held up and it is subjected to idling the Sub Contractor.


Hence, you are requested to take remedy action for overcome the same matter as soon as possible.

Any delay for execute the work in ahead shall be subjected to claims of additional time and cost under Sub-Clause 8.4 (d) (Extension of Time for Completion and 20.1 (Contractor's Claims) of the Conditions of Contract.

Thank you.


Yours faithfully,

MAGA ENGINEERING (PVT) LTD


H.G.P. Jeevantha
Contractor's Representative

Cc: Team Leader – OCG JV CEA

I Road
RMC Monitoring Consultants
OCG-CEA JV
Resident Engineer's Office
RMC-01
13 JUN 2022
RECEIVED



OCG-CEA JV				
RDA/ADB/ROAD/NCB/01-A/B/C/D				
RE OFFICE RECEIVING NO				
DATE				
SLT	INITIALS	ACTION	IND	REP
01				
02-14				
02-16				
02-20				
02-20				
SOFTEN				
S.O.R.R				
S.3				
S.4				
S.5				
S.6				
S.7				
S.8				
S.9				
S.10				
S.11				
S.12				
S.13				
S.14				
S.15				
S.16				
S.17				
S.18				
S.19				
S.20				

WINNER OF IFAWPCA GOLD MEDAL AND CEA AWARDS FOR CONSTRUCTION EXECUTION

Maga Engineering (Pvt) Ltd
Construction Engineers

200, Nawala Road, Nishanagar, Colombo 05, Sri Lanka
Tel: +94 11 250 8833 upto 14. Fax: +94 11 250 8940 & +94 11 250 8847
E-mail: mag@mag.lk Web: www.mag.lk Company Reg No. PV 374

Annex-06. II. Engineer instruction given the contactor to stopped work grave area.

**INTEGRATED ROAD INVESTMENT PROGRAM
MONITORING CONSULTANTS FOR ROAD MANAGEMENT
CONTRACTS OF NATIONAL ROADS**

ORIENTAL CONSULTANTS GLOBAL CO. LTD.
Joint Venture with
CONSULTING ENGINEERS & ARCHITECTS ASSOCIATED (Pvt) LTD.

CEA

Our Ref: RMC-1/ENG/RE/1D/22/297

17th June 2022

Project Manager,
Maga Engineering (PVT) Ltd,
Project Office,
No.20/1,
Kandewaththa
Galathara
Mawamella.

Dear Sir,

Contract Package: Rehabilitation, Improvement and Maintenance of Colombo – Kandy Road (A001)
Contract Number: RDA/ADB/ROAD/NCB/RMC/01-D

Subject: Obstruction for Excavation.

Your reference: 503M(0864) 09566 dated 13th June 2022.

Note that the sub contractor's (Finex) work has not been held up due to the encountered grave, instead work near grave has been temporarily stopped & sub-contractor has started slope excavation from 97+875 onwards & drilling soil nails subsequently. Sub-contractor can proceed works of slope excavation from 97+880, drilling of nails, excavation for lined drains & other rock blasting without any hindrance.

During the meeting held on 16th June with the participation of representatives of Engineer, Employer, NBRO, villagers, Finex (Sub Contractor) & you, villagers informed that they have no objection in shifting the grave to another place. Both Employer & Divisional Secretary are in the process of solving the problem as soon as possible.

Therefore, you are requested to proceed with the work in the available area.

Further, it is noticed that from the New year season until the start of June 2022, hardly any work has been carried out by the sub-contractor other than rock blasting.

This is for your information and further consideration.

Thanking you,
Yours faithfully,


N. U. Akwatta
Resident Engineer -RMC1
Monitoring Consultants for Road Management Contracts of National Roads.



Attachment:
CC: 01. PE 02. TL 03. DTL 04. CE-2D 05. NBRO 06. SGRS 07. Esp. 08. File

Resident Engineer's Office, OCG-CEA JV, No.122/4, Sir Francis Molanure Mawatha, Welimannathota, Kegalle.
Email : reoffice@mc1@gmail.com

එහිදී දැක්වූ සඟවන හා කේතන

එහිදී එක් එක් පාර්ශවයන් දැක්වූ අදහස් සහ එකඟතාවයන් පහතින් දැක්වා ඇත.

හෙළ උකහන භූමියක් ලෙස එම ජර්නලය දීමට කලකට පෙරින් පහසු කටයුතුන්හැටි ගම්පොළින් එයින් පවත්වාගෙන යන වෙත උකහන භූමිය එම ජර්නලයෙන් මුදා හැරීම සිදුකිරීමට ගම්පොළින්ගේ අත්සන්ගෙන් කොමිෂනර් මධ්‍යස්ථ උකහන කරන ලදී.

පවුල උකහන භූමියේ ඇති අවශේෂ කොටස් වෙතත් සුදුසු ජර්නලයක පත්පත් කරන ලෙසත් මුද්‍රා සිටුවන.

පවුල මුද්‍රාව උකහන භූමියක් ලෙස පවත්වාගෙන යාමට සුදුසු වෙතත් ජර්නලයක් කඩිනමින් මේ දිනට සටහනු කරන ලෙසද ගම්පොළින් මුද්‍රා සිටුවන.

උදෙසාම මුද්‍රා සිටුවීමට සහතික කොට සුදුසු ක්‍රියාමාර්ගයක් ගැනීමට සටහනු කරන මවුල උකහන කරන ලදී.

ලේඛනී



H.M. ඩිසානායක
එකතුවේ මුද්‍රාකරු
මාර්ග සංවර්ධන අධිකාරිය

සහලකාහිමිකම් නාම ලිපියේදානය සහවර්ධන කටයුතු පිළිබඳ සාකච්ඡාව - පැමිණිලි ලේඛණය

දිනය: 2022-06-16 ස්ථානය: වැව් පාරේ මෙහෙයුම්: 9. උ

අනු අංකය	නම	ප්‍රධානියා	පිටපත	දුරකථන අංකය	මේවා
01	D. M. විජේතිලක	සේනාපති	සා.ම. පුද්ගලික	093 900 1348	Dr. M. K. Jayasinghe
02	D. S. සිංහලාලික	විද්‍යාලයේ ප්‍රධානියා	සා.ම. පුද්ගලික	075 569 5179	සිංහලාලික
03	D. S. වි. විජේතිලක	"	"	085 68 63 15	වි. වි. විජේතිලක
04	D. S. වි. විජේතිලක	"	"	076 832 248	වි. වි. විජේතිලක
05	D. S. වි. විජේතිලක	සා.ම. පුද්ගලික	"	075 446 909	වි. වි. විජේතිලක
06	D. S. වි. විජේතිලක	සා.ම. පුද්ගලික	"	075 507 0327	වි. වි. විජේතිලක
07	D. S. වි. විජේතිලක	සා.ම. පුද්ගලික	"	075 295 2726	වි. වි. විජේතිලක
08	D. S. වි. විජේතිලක	"	"	077 516 944	වි. වි. විජේතිලක
09	D. S. වි. විජේතිලක	සා.ම. පුද්ගලික	"	077 267 68	වි. වි. විජේතිලක
10	D. S. වි. විජේතිලක	"	"	077 267 68	වි. වි. විජේතිලක
11	D. S. වි. විජේතිලක	"	"	077 267 68	වි. වි. විජේතිලක
12	D. S. වි. විජේතිලක	"	"	075 519 48 14	වි. වි. විජේතිලක
13	D. S. වි. විජේතිලක	"	"	075 529 5 295	වි. වි. විජේතිලක
14	D. S. වි. විජේතිලක	"	"	076 452 755	වි. වි. විජේතිලක
15	D. S. වි. විජේතිලක	"	"	078 483 0745	වි. වි. විජේතිලක
16	D. S. වි. විජේතිලක	"	"		වි. වි. විජේතිලක
17	D. S. වි. විජේතිලක	"	"		වි. වි. විජේතිලක
18	D. S. වි. විජේතිලක	"	"		වි. වි. විජේතිලක

№№	№№	№№	№№	№№	№№	№№
19	20	21	22	23	24	25
26	27	28	29	30	31	32
33	34	35	36	37	38	39
40	41	42	43	44	45	46
47	48	49	50	51	52	53
54	55	56	57	58	59	60
61	62	63	64	65	66	67
68	69	70	71	72	73	74
75	76	77	78	79	80	81
82	83	84	85	86	87	88
89	90	91	92	93	94	95
96	97	98	99	100		

Photographs



TRANSLATION

Integrated Investment Road Programme (iRoad)

Rehabilitation, Improvement & Maintenance of Pasyala - Kadugannawa road section.

Grievance Redress Committee regarding the removal of the public cemetery at the site

of the Pahala Kadugannawa Landslide area

Committee report

Introduction

In conjunction with the development of the Pasyala-Kadugannawa road under the Integrated Road Investment Program, in accordance with the plans of the National Building Research Institute, during the re-stabilization of the Pahala Kadugannawa landslide area, it was necessary to remove a public cemetery that was maintained at that place.

A discussion in this regard was held on 16.06.2022 at 9.00 a.m. near the landslide site of Pahala Kadugannawa with the participation of the villagers of Pahala Kadugannawa, the village official, the president of the mortuary society, the officials of the National Building Research Institute, the representatives of the Road Development Authority, the consulting company and the contract company.

Participants

No	Name	Institute	Designation
01	H.M.Chamara Herath	Road Development Authority	Project Engineer
02	S.W.S.Widyasekara	Consultant Engineer (CEA)	Construction Engineer
03	D.A.D.Ranjith	Consultant Engineer (CEA)	Social Gender & Resettlement Specialist
04	R.Karunaratne	Consultant Engineer (CEA)	Environment Specialist

05	W.L.M.Madumika	Road Development Authority	Environment & Social Safeguard Officer
06	D.D.S.Gunasekara	Consultant Engineer (CEA)	Environment Officer
07	R.B.Jayasekara	Consultant Engineer (CEA)	Social Officer
08	C.R.Ekanayaka	Contractor (Maga)	Environment Officer
09	Sisira Kumara	Contractor (Maga)	Social Officer
10	W.Tharaka Nayanakantha	Contractor (ELS)	Technical Officer
11	E.G.U.I.Jayawardhane	NBRO	Technical Officer
12	M.W.J.M.K.Bambaradeniya	Divisional Secretariat Office	Grama Niladhari

Comments and suggestions made there

The views and agreements expressed by each party are given below.

It was stated that the place has been maintained as a public burial ground by the villagers of Pahala Kadugannawa for a long time and the villagers have no objection to removing the burial ground from that place.

They also requested to bury the remains in the cemetery in another suitable place.

The villagers also demanded that another suitable place to be maintained as a burial ground should be given to them as soon as possible.

It was also stated that appropriate action will be taken after discussion with the Divisional Secretary.

H.M. Chamara Herath
Project Engineer
Road Development Authority

നം.	ഉടമ്പട	കുടുംബം.
8. ജി. ജി. ജി. ജി. ജി.	കുടുംബം	കുടുംബം
9. H.P. കുടുംബം	" " "	കുടുംബം
10. W.M.J. കുടുംബം	" " "	കുടുംബം
11. R.H.A. Nianta	332 Puhala kadugamawa Hingula	കുടുംബം
12. H.M. കുടുംബം	124 " " "	കുടുംബം
13. M.M. കുടുംബം	134 " " "	കുടുംബം
14. കുടുംബം	125 കുടുംബം	കുടുംബം
15. കുടുംബം	129 " " "	കുടുംബം
16. കുടുംബം	3001 " " "	കുടുംബം
17. കുടുംബം	301 കുടുംബം	കുടുംബം
18. കുടുംബം	301 കുടുംബം	കുടുംബം
19. കുടുംബം	230 കുടുംബം	A.L. Tissera
20. E.K.C. കുടുംബം	281 കുടുംബം	Silva
21. I.J.L. കുടുംബം	283 കുടുംബം	കുടുംബം
22. കുടുംബം	00/29 കുടുംബം	കുടുംബം
23. കുടുംബം	00/29 " " "	കുടുംബം
24. കുടുംബം	00/29 " " "	കുടുംബം
25. കുടുംബം	00/29 " " "	കുടുംബം
26. കുടുംബം	199/1 കുടുംബം	കുടുംബം
27. M.T.J. കുടുംബം	122/3 കുടുംബം	കുടുംബം
28. കുടുംബം	I 22 കുടുംബം	കുടുംബം
29. കുടുംബം	I 22/2 കുടുംബം	കുടുംബം
30. D.P. കുടുംബം	779/3 " " "	കുടുംബം
31. കുടുംബം	09 " " "	കുടുംബം
32. കുടുംബം	29/1 കുടുംബം	കുടുംബം
33. V.P.L. കുടുംബം	I/45/1 കുടുംബം	കുടുംബം
34. B.M. കുടുംബം	00/23 കുടുംബം	കുടുംബം
35. S.D. Hiseera	Puhala kadugamawa Hingula	കുടുംബം
36. S.P. Rani	I 20/3, Puhala kadugamawa	കുടുംബം

നം	വിവര	മുദ്ര
37. Krishanthi	No 32, Pahala Kadugannawa,	കടവ
dias	Hingula.	
38 D.C.L. കോള	678 39/2 ഗവൺമെന്റ് സ്കൂൾ	കടവ
40 B.W. മേൽക്കൽ	I-10 ട്രാൻസ്ഫർ ചെയ്ത കോള	കടവ
41 കോള	I 13/4 " "	കടവ
42 കോള	I 13 " "	കടവ
43 W.M. കോള	26 " "	കടവ
44 W.O.A. കോള	212/3, ഗവൺമെന്റ് സ്കൂൾ	കടവ
45 കോള	I 14/1 " "	കടവ
46 കോള	I 10 " "	കടവ
47 കോള	I 18 " "	കടവ
48 കോള	I 20/1 " "	കടവ
49 കോള	I 19 " "	കടവ
50 W.M. @ R.കോള	I 1/1 " "	കടവ
D.A. Sasanka	11. കോള	കടവ

TRANSLATION

Villagers,
Pahala Kadugannawa.
16.06.2022.

Project Director,
Road Development Authority,
Pahala Kadugannawa Development Project.

Dear Sir,

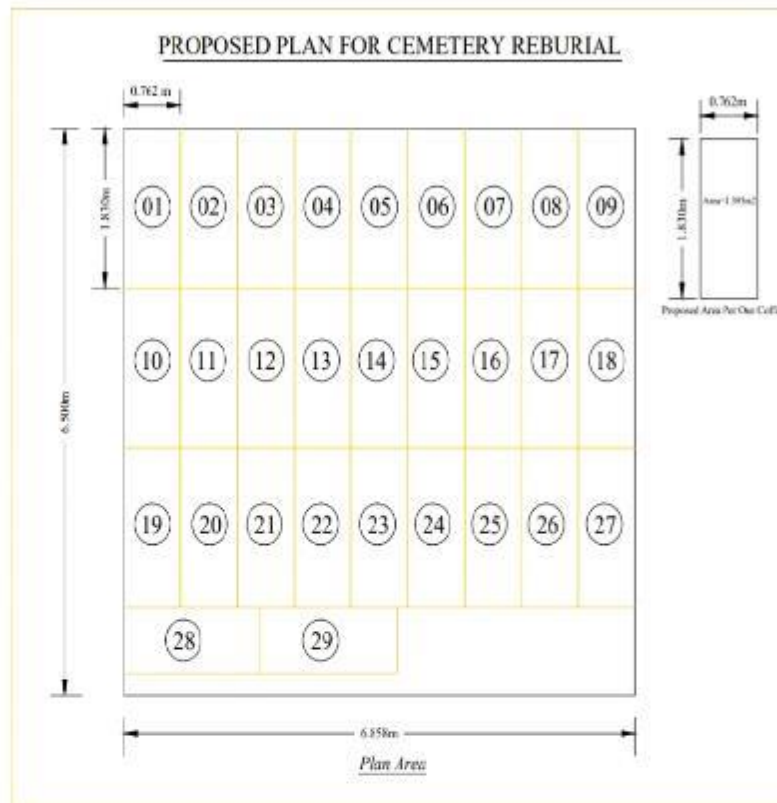
Reconstruction works at the Pahala Kadugannawa Landslide area

We would like to mention that there is no objection from the villagers regarding the removal of the existing part of remains from the existing cemetery which is an obstacle to the soil stabilization work at the site of the Pahala Kadugannawa landslide and bury them in another suitable place.

Also, we kindly request to prepare an access road to the remaining land which after getting the necessary land for soil stabilization.

Thank you.
Villagers,
Pahala Kadugannawa

Annex-08. Proposed Plan for cemetery reburial.



Annex-09. Consent letter Mawela Welfare society.

<p>මාවෙල අවමංගලාධාර සමිතිය (ලි.ප. අං. කැ/මාව/සු/95) (ආරම්භය: 1986)</p>	
<p>දු: අංකය: 071.62.76.263</p>	<p>මල්වතු විහාරය මාවෙල - නිඟල</p>
<p>ගෞරවයෙන් මාර්ග සංවර්ධන අධිකාරිය පුනර්ජීව මොලවුරේ මාවත කැගල්ල</p> <p>මහත්මයානෙනි,</p> <p style="text-align: center;">මෙහි අංක RDA/ROAD/RMC/01/GGN/12 දරණ 2022/07/12 දිනැති මෙහි ලිපිය හා බැඳේ</p> <p>ගනන්කැන්ත පොදු සුසාන භූමිය භාවිතා කිරීම සම්බන්ධව 2022/07/17 දින පැවැත්වූ අප සමිතියේ මහා සභා රැස්වීමේදී සාකච්ඡා කළ බවත් මෙම අවස්ථාවේදී පමණක් මෙම මියගිය අයගේ අස්ඵ කොටස් හා මිණි පෙට්ටිවල ඉතිරි වී ඇති කොටස් ගනන්කැන්ත පොදු සුසාන භූමියේ මිහිදත් කිරීමට ඉඩ ලබාදීම සුදුසු බවත් තීරණය විය. එබැවින් මඛ ආයතනය මගින් මේ කටයුත්ත සඳහා දිනයක් යොදා ගන්නා විට එදිනට අප සමිතියේ නිලධාරීන් කිහිපදෙනෙක් සහභාගී කිරීම සඳහා අප දැනුවත් කරන ලෙසටත් මෙයින් ඉල්ලා සිටිමි.</p> <p style="text-align: center;">මාවෙල අවමංගලාධාර සමිතිය මාවෙල, නිඟල මාවෙල අවමංගලාධාර සමිතිය මාවෙල, නිඟල</p>	
<p>මාවෙල මල්වතු විහාරය, මාවෙල, නිඟල.</p>	

TRANSLATION

Residential Engineer
Road Development Authority
Fransis Molamure Mawatha
Kegalle
Dear Sir,

**Reference to Your Letter dated 12/07/2022 being your number
RDA/IROAD/RMC/01/GEN/12**

We had a general meeting on 17/07/2022 to discuss regarding the use of Ganethenna cemetery for bury parts of remains.

It has decided to bury parts of remains and parts of coffins in Ganethella public cemetery only for this occasion.

So, we request you let us know to participate a few officers from our society when suggest the date for this work.

Secretary
Mawela Funeral Aid Society
Mawela Malwathu temple,
Mawela, Hingula.

ලේඛ
 ආදි කළ කළමනාකරණ විද්‍යාලය
 මහලයාර්ග පාර
 ආදි කළ කළමනාකරණ
 කොට්ඨාස
 2022/10/14

ප්‍රධාන කළමනාකරු
 ආදි කළ කළමනාකරණ
 කොට්ඨාස

ආදි කළ කළමනාකරණ කාර්යාලයේ වර්ධනය වීමට ආවේ දැන
 දැනට ඇතිව ඇති ප්‍රවෘත්ති ආදියට අමතරව ආදි කළ කළමනාකරණ
 ප්‍රධාන කළමනාකරු (පාලන කළමනාකරු) වර්ධනය වීමට
 හේතු විය.

ආදි කළ කළමනාකරණ 2022/10/12 වන දින ආදි.
 10.00 ට වර්ග කළමනාකරණ කාර්යාලයේ පැවැත්වූ, ආදි කළ කළමනාකරණ
 - ආදි කළ කළමනාකරණ කළමනාකරු වන ආදි කළ කළමනාකරණ
 කළමනාකරු වන ආදි කළ කළමනාකරණ කළමනාකරු.

ආදි කළ කළමනාකරණ කළමනාකරු ආදි කළ කළමනාකරණ කළමනාකරණ
 වර්ධනය වීමට ආවේ දැන දැනට ඇති ප්‍රවෘත්ති ආදියට අමතරව
 (ආදි කළ කළමනාකරණ කළමනාකරණ) ආදි කළ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ.

ආදි කළ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ

ආදි කළ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ

ආදි කළ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ


 ආදි කළ කළමනාකරණ කළමනාකරණ

ආදි කළ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ
 කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ කළමනාකරණ

පහළ සමුදායයේ සාමාන්‍ය සේවකයන් විසින් ප්‍රකාශ කළ පිළිබඳ විකල්ප සඳහා වූ ප්‍රධාන ප්‍රවෘත්ති සාරාංශය.

අනු අංක	විස්තරය	ලිපිනය	විකල්ප වර්ෂය	වැඩ/විදුලි වර්ෂය	විකල්ප ප්‍රවෘත්ති/සාමාන්‍ය සේවකයන්	දැන්වීම
1	සී.සී.සී. - පිටුපස සේවකයන්	202, පලමු පෙළ පාර, සමුදායය	1984	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
2	පලමු සේවක සේවකයන්	202, පලමු පෙළ පාර, සමුදායය	1986	විදුලි	සේවක සේවකයන්	සේවකයන්
3	පලමු සේවක සේවකයන්	202, පලමු පෙළ පාර, සමුදායය	1997	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
4	සී.සී.සී. - පිටුපස සේවකයන්	202, පලමු පෙළ පාර, සමුදායය	2001	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
5	සී.සී.සී. - පිටුපස සේවකයන්	202, පලමු පෙළ පාර, සමුදායය	2005	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
6	සේවක සේවකයන්	292 නැංවුම්, පිටුපස පාර	2012	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
7	පලමු සේවකයන්	142 නැංවුම්, පිටුපස පාර	2020	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
8	සී.සී.සී. - පිටුපස සේවකයන්	I 14, පහළ පෙළ පාර, පිටුපස	2017	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
9	සී.සී.සී. - පිටුපස සේවකයන්	I 13, පහළ පෙළ පාර, පිටුපස	2008	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
10	සී.සී.සී. - පිටුපස සේවකයන්	පහළ පෙළ පාර, පිටුපස	2009	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
11	සී.සී.සී. - පිටුපස සේවකයන්	I 17, පහළ පෙළ පාර, පිටුපස	2016	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
12	සී.සී.සී. - පිටුපස සේවකයන්	පහළ පෙළ පාර, පිටුපස	1985	විදුලි	සේවක සේවකයන්	සේවකයන්
13	සේවක සේවකයන්	පහළ පෙළ පාර, පිටුපස	1982	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
14	සී.සී.සී. - පිටුපස සේවකයන්	I 19, පහළ පෙළ පාර, පිටුපස	1998	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
15	සේවක සේවකයන්	I 19, පහළ පෙළ පාර, පිටුපස	2018	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
16	සේවක සේවකයන්	I 17, පහළ පෙළ පාර, පිටුපස	2002	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
17	සී.සී.සී. - පිටුපස සේවකයන්	I 19, පහළ පෙළ පාර, පිටුපස	1986	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
18	සී.සී.සී. - පිටුපස සේවකයන්	I 19, පහළ පෙළ පාර, පිටුපස	1986	ප්‍රධාන	සේවක සේවකයන්	සේවකයන්
19	සී.සී.සී. - පිටුපස සේවකයන්	I 19, පහළ පෙළ පාර, පිටුපස	1990	විදුලි	සේවක සේවකයන්	සේවකයන්

TRANSLATION

Project Engineer,
Integrated Road Investment Programme,
Road Development Authority,
Kegalle.
28.10.2022

Dear Sir,

Related to the stabilization of Pahala Kadugannawa landslide area

The report which was given by the Funeral Aid Society related to the removal of the cemetery near the Pahala Kadugannawa landslide area has been received.

According to that report, it has been reported to me that they do not ask for any objection or any benefit in removing the body parts that have been buried.

Also, the Grama Niladhari has submitted to me the list of names of twenty-nine people who have been buried in this burial ground so far.

I am kindly informed that a copy of the letter given by the Funeral Aid Society and the list of the buried persons submitted by the Grama Niladhari have also been submitted for your reference accordingly.

V.O.L.Rathnasekara
Divisional Secretariat
Mawanella.

TRANSLATION

Secretary,
Pahala Kadugannwa Funeral Aid Association,
Pahala Kadugannawa,
Hingula.

14.10.2022.

Divisional Secretariat,
Divisional Secretariat Office,
Mawanella.

The remains of our relatives buried at the Pahala Kadugannawa landslide area are related to the burials at the Ganethenna Public Cemetery

A discussion was held on 12th October 2022 at 10.00 am regarding the above matter with the officers of the road development project, Grama Niladhari – Ganethenna, and the relatives of the deceased persons.

It is stated that a court order has been received. And I request that the buried body parts be respectfully buried in the public cemetery after religious rites.

We are not able to afford the financial contribution required to carry out the above work and for that, I request that it be done through the project that is carrying out development work at this landslide site or from your organization.

We hereby submit the list of members buried in this cemetery and hereby declare that we do not claim any objection or benefit with respect to the removal of the body parts buried or after removal.

we kindly request you that complete this removal process quickly and restore the landslide location as soon as possible.

A list of deceased relatives and details of their relatives are attached.

Seretary
Funeral Aid Association,
Pahala Kadugannawa,
Hingula.

Chairman,
Funeral Aid Association,
Pahala Kadugannawa,
Hingula.

TRANSLATION

My No: MWN/SOS/DISA/12/07/02

2022.06.20

Officer-in-Charge
Police Station
Mawanella

Sir/Madam

Regarding the stabilization activities of the area subjected to earth-slips at Pahala – Kadugannawa

This refers to the letter number RDA/iROAD/RMC/01/GEN/07 dated 09 June 2022 and the special discussion held on 15 June 2022 at the District Secretariat regarding the mitigation of the earth-slips at Pahala Kadugannawa.

02. Accordingly, the re-stabilization activities of the area is being conducted under the supervision of the National Building Research Organization according to plans formulated by them. These activities are being conducted by the MAGA Engineering Organization and when earth excavation was being done at the site, signs of a public burial ground has been found and when obtaining information from the Grama Niladhari of the area it has been confirmed that this reservation has been used for burial of human remains by the residents of the area.

03. Hence, it was revealed at this discussion that human remains will be likely be found when conducting further excavations at this site and the assistance of an immediate supervising officer will be required. Therefore, I kindly request you to extend assistance for further action regarding this matter and to provide the services of a supervising officer.

Signed: V O L S Rathnasekera
Divisional Secretary
Mawanella

Annex-11 .II Divisional Secretariat letter to Chief Engineer-Kegalle about courts order

<p> ප්‍රාදේශීය ලේකම් Divisional Secretary } 812 424228 කාර්යාල Office } 915 424228 ෆැක්ස් Fax } 811 424228 විද්‍යුත් තැපෑල E-mail } divsecwaw@lka.lk </p>	 <p> ප්‍රාදේශීය මහ ලේකම් කාර්යාලය - මාවතලේ பிரதேச செயலகம் - மாவட்டமலை Divisional Secretariat - Mawanella </p>	<p> ඔබේ අංකය S. No. / Your No } ඔබේ අංකය My No } MWN/SOS/DI -SAS/A/20/02 දිනය Date } 2022.06.23 </p>
<p> ප්‍රධාන ඉංජිනේරු, මාවත සංවර්ධන අධිකාරිය, කාවැරට </p> <p> සහභාගිකරුණයෙන්ම කාලය යාමට ලක් වූ ස්ථානයේ ස්ථානීකරණ කටයුතු සිදු කිරීමේ සම්බන්ධයෙන් </p> <p> උක්ත කරුණට අදාළව මෙහි අංක RDA/ROAD/RMC/D1/GEN/07 හා 2022.06.09 දිනැති ලිපිය හා බැඳේ </p> <p> ඒ අනුව සහභාගිකරුණයෙන් කාලය යාමට ලක් වූ ස්ථානයේ ස්ථානීකරණ කටයුතු සිදු කිරීමේදී හමු වූ ඕනෑම ඉඩ සිරුරු වල අස්ථි කොටස් සම්බන්ධව ඉදිරි ක්‍රියාමාර්ග ගැනීම සම්බන්ධයෙන් අප විසින් 2022.06.20 දින මාවතලේ පොලීසි ස්ථානවලට පවත්වාගෙන යාමට සූදානම් කරන ලද ලිපියට පිළිතුරු ලෙස මාවතලේ දිනාමසේනගොඩ අධිකරණයේ හමු අංක AR 22698/2022 යටතේ 2022.06.23 දින ලබා දී ඇති නියෝගයට අනුව, ඕනෑම සිරුරු වල අස්ථි කොටස් හෝ ඉඩ සිරුරු ඔබ්බෙන් කිරීමට භාවිතා කරන මිනිස් ලෙවර් වල කොටස් හමු වුවහොත් ගනුදෙනු සම්බන්ධ බැංකුවේ අයදුම් පිහිටි සුභාගිකරුණයේ ස්ථානවලට අවමන් කොටන ලදීදී වල දැනීම හඳුනා දැනුම් දී ඇත. </p> <p> මේ සම්බන්ධයෙන් ඉදිරි වැඩ කටයුතු හඳුනා අධිකරණ නියෝගයෙහි පිටපතක් හා පොලීසි ස්ථානවලට පවත්වාගෙන යාමට සූදානම් කර ලිපියෙහි පිටපතක් මේ සමඟ ඉදිරිපත් කරමි. </p> <p style="text-align: center;">  වි. ජී. එල්. එස්. රත්නපක්ෂ ප්‍රාදේශීය ලේකම්, මාවතලේ. </p> <hr/> <p style="text-align: center;"> වි. ජී. එල්. එස්. රත්නපක්ෂ ප්‍රාදේශීය ලේකම් මාවතලේ </p>		
<p>පිටපත්.</p> <p> 01. දිස්ත්‍රික් ලේකම්, දිස්ත්‍රික් ලේකම් කාර්යාලය, කාවැරට } 01.00.00 02. පොලීසි ස්ථානවලට, පොලීසි ස්ථානය, මාවතලේ } 01.00.00 </p>		

TRANSLATION

Divisional Secretariat
Mawanella

My No. MWN/SOS/DI/SAS/A12/07/2

2022/06/24

Chief Engineer
Road Development Authority
Kegalle

Regarding Conducting of Stabilization Activities at the Location Subjected to Landslides

This refers to your letter number RDA/IROAD/RMC/01/GEN/07 dated 09 June 2022.

Accordingly, as ordered by the District/Magistrate's Courts in the case number AR 22698/2022 of 23 June 2022, in the case filed by the Police in response to our letter dated 20 June 2022, regarding further action to be taken if remains of coffins or human body parts are found when conducting stabilization activities at the location at Pahala Kadugannawa that was subjected to earth-slips, they should be buried at the cemetery located near the Samurghi Bank at Ganetenna, without causing any disrespect to these human remains.

Copies of the court order and the letter submitted to the Officer in Charge of the police station is attached for further action.

Signed: V O L S Rathnasekera
Divisional Secretary
Mawanella

Annex-11. III Health Guideline for the re burial process.



සෞඛ්‍ය වෛද්‍ය නිලධාරී කාර්යාලය-මාවතලේ
MEDICAL OFFICER OF HEALTH-MAWANELLA
"සුවසිරි දිවියට පුරුණු ලැක්-උදෙසා කැපවූ රජයේ සේවක"
 දුරකථන 035 2246335 විද්‍යුත් තැපෑල mah.mawanela@gmail.com

දුරකථන - MOH/MW/2022 දින - 2022.11.03

ප්‍රධාන ආරක්ෂක,
 මාර්ග සංවර්ධන අධිකාරිය,
 කොළඹ.

සෞඛ්‍ය සහතිකයක් නොමැතිව ලැක් වූ ස්වභාවයේ ස්වයංකරණ කටයුතු සිදු කිරීම පවත්වාගෙන යාම.

ඒ අනුව සෞඛ්‍ය සහතිකයක් නොමැතිව ලැක් වූ ස්වභාවයේ ස්වයංකරණ කටයුතු සිදු කිරීමේදී හමු වූ මිහිම සහ පිරිසිදු බව අත්පිටි කොටස් පවත්වාගෙන යාම සම්බන්ධව මාවතලේ දින /වසරේදී අධිකාරියේ හමු වූ නො AR22698/2022 යටතේ 2022.06.23 දින ලබා දී ඇති ඒකෝපයට අනුව සහතිකයක් සහ මාර්ග සංවර්ධන අධිකාරියේ පවත්වාගෙන යාම සම්බන්ධව ලැක් වූ දින දී අදාළ ආයතනය විසින් එම සිදු කළ යුතු ආකාරය පිළිබඳව අදාළ ආයතනය වෙත උපදෙස් ලබා දී ඇත.

ඒ අනුව අදාළ ආයතනය විසින් අදාළ ප්‍රධානතම සෞඛ්‍ය සහතිකයක් නිරීක්ෂණය කර අනුමත කටයුතු කරන්න.

1. අදාළ ප්‍රධානතම සෞඛ්‍ය සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය.
2. ඒ සඳහා සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය.
3. ප්‍රධානතම සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය.
4. සෞඛ්‍ය සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය.
5. සෞඛ්‍ය සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය.
6. සෞඛ්‍ය සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය. මෙහිදී අදාළ ප්‍රධානතම ස්වයංකරණ කටයුතු සහතිකයක් සහතික කළ යුතුය.



සෞඛ්‍ය වෛද්‍ය නිලධාරී,
මාවතලේ

TRANSLATION

Chief Engineer,
Road Development Authority,
Kegalle.
03.11.2022

Dear Sir,

Related to stabilization work at Pahala Kadugannawa landslide area

According to the order given on June 23, 2022, under case number AR22698/2022 of the Mawanella, District Magistrate's Court regarding the bone fragments of the human corpses found during the stabilization work at the place where the Pahala Kadugannawa landslide was carried out, the public health inspector in charge of the division examined. And, instructions have been given to the relevant institution on how to do it. The relevant institution should follow the following recommendations while transporting the bone fragments of human bodies accordingly.

1. A suitable vehicle should be used for bone fragments transportation. In this case, arrangements should be made to prevent the bone fragments from falling or scattering on the road and to have them covered and transported in such a way that it is not exposed to the public.
2. For that purpose, the employed staff should make necessary arrangements to use protective clothing (PPE).
3. The place used for disposal should be subject to the full supervision of the public health inspector in charge of the division.
4. If one pit is not enough for disposal, should arrange to use several suitable pits.
5. After finishing the disposal, Should be appropriately covered with soil so that do not contaminate the external environment.
6. If disposal activities are carried out from time to time within a few days, follow the health instructions mentioned above in each case.

Once the entire disposal process is complete, arrange to notify the relevant agency that it has been completed.

Medical Officer of Health,
Mawanella.