



REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT

Site Specific Environmental and Social Management Plan

**Site No. 244
Vidyarthi College - Kandy
Kandy District**

May 2026

Prepared for:



**ASIAN INFRASTRUCTURE
INVESTMENT BANK**

Prepared by:



National Building Research Institute
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 (Kandy)	3
2.5 Demographic feature of the school.....	3
3. Landslide hazard incident details	3
3.1 Account of incident	3
3.2 Effects and consequences of landslide/ slope failure	4
3.3 Description of any remedial measures already undertaken to reduce the potential risk.....	5
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	7
4.1 Area of the landslide / slope failure	7
4.2 Areas adjacent to the landslides.....	7
4.3 Current level of risk.....	8
5. Description of the works envisaged under the project.....	8
6. Brief description of the surrounding environment with special reference to sensitive elements that may be affected by the project actions.....	9
7. Identification of social and environmental impacts and risks related to the works.....	11
7.1 Positive impacts.....	11
7.2 Negative impacts	12
7.2.1 Hydrological and water Quality impacts	12
7.2.1.1 Impacts of the drainage pattern of the area.....	12
7.2.1.2 Water pollution and impacts on surface water quality	12
7.2.1.3 Erosional impacts and stream bed alterations.....	12
7.2.1.4 Open defecation and waterborne infections	12
7.2.1.5 Impacts on the downstream water uses	12
7.2.1.6 Impacts on groundwater table and groundwater quality.....	12
7.2.1.7 Impacts on water or wetlands	13
7.2.2 Environmental Impacts.....	13
7.2.2.1 Noise and vibration impacts	13
7.2.2.2 Air pollution impacts	13
7.2.2.3 Solid waste disposal issues	13

7.2.2.4 Explosive hazards and hazardous materials	13
7.2.3 Biological /Ecological Impacts.....	13
7.2.3.1 Effects of important wildlife habitats	13
7.2.3.2 Effects on Fauna & Flora.....	13
7.2.4 Social and Economic Impacts.....	13
7.2.4.1 Impacts on agriculture within the area to be remedied/ immediately to the site	13
7.2.4.2 Cracks in the building due to vibration impacts	14
7.2.4.3 Loosing access to land and future development activities.....	14
7.2.4.4 Impacts on livelihood/ business and income activities.....	14
7.2.4.5 Impacts on service provision (water supply, sewage, electricity)	14
7.2.4.6 Effect due to loss of infrastructure and safety	14
7.2.4.7 Work camps and lay-down site requirements.....	14
7.2.4.8 Relations between workers and the school children / staff / people living in the vicinity of the site and possibility of disputes.....	14
7.2.4.9 Workers safety during construction.....	15
7.2.4.10 Safety to the public from construction activities: High risk for students of the school.....	15
7.2.4.11 Impacts on transport infrastructure (especially temporary loss of road access, risks of traffic congestion).....	15
7.2.4.12 Areas used for businesses, agriculture or other immediately adjacent to the site.....	15
7.2.4.13 Need for students, staff of the school or to enter or cross the site	15
8. Site Specific Risk Analysis	15
9. Significant Environmental and Social Impacts	16
9.1 Priority Health and Safety Issues. Specific H&S concerns that require measures that go beyond the standard contractual requirements for contractors.....	16
9.2 Child labour & forced labour.....	16
10. Environmental Social Management Plan (ESMP)	16
10.1 Resettlement action plan.....	16
10.2 Evacuation of people	16
10.3 Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles).....	16
10.4 Requirement for compensation for loss of property /uses due to project actions	17
10.5 Public awareness and education- needed for following areas	17
10.6 Design based Environmental/ Social Management considerations	17
10.7 Mitigation of impacts during the construction phase	18
10.7.1 Construction contractors' requirement to comply with environmental and social management during the construction phase.....	18
10.7.2 Site Specific mitigation	20
10.7.3 Monitoring requirements specific to the site	25
11. Labour management	25
12. Public and Stakeholder Consultations -the public consultations that have been and/or will be held.....	26

12.1 Public / Stakeholder Consultations.....	26
13. Clearances, no objection, consent and approvals required for the implementation of the project.....	26
13.1 Project implementation.....	26
13.2 Approval from the state lands owners relevant to the project	26
13.3 Consent/ no objection/ legally bound agreement from the private land ownerships	27
14. Grievance redress mechanism for this site	27
15. Information disclosure.....	28

List of Annexes

Annexure I: Images of the stakeholder consultation	i
Annexure II: Report on the Stakeholder Consultation: Kandy District.....	i
Annexure III: Proposed procedure for obtaining approvals from state land owners and environmental agencies.....	ii
Annexure IV: Study team.....	ii
Annexure V: List of references	ii

List of Figures

Figure 1: Road map showing accessibility to the site	2
Figure 2: Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.....	3
Figure 3: Google image, cross sections, land use, risk elements and the photographs of special features of the location	6
Figure 4a: Mitigation location of Vidyarthi College adjacent to shrine room with Owila tree (Location 1).....	9
Figure 4b: Fence net and the principal's car parking area with Mango tree and Bamboo shrubs (Location 1).....	9
Figure 4c: Destructed retaining wall at the edge of downslope with rock, Kandy – Colombo main road (A9) at the bottom of the slope (Location 1)	9
Figure 4d: Affected two storied building with staircase and fence net (Location 2).....	9
Figure 4e: Neglected washing basin, risk slope and vegetation (Location 2).....	10
Figure 4f: Tarpaulin covered steep slope with grasses and houses at the downslope (Location 2).....	10
Figure 4g: Soil mass failure and soil erosion adjacent to Grade 6,7 and 8 building (Location 2)	10
Figure 4h: Retaining wall with fence at the edge of the upslope (Location 3)	10
Figure 4i: Three storey private building for residential and commercial purposes, Surface drainage pattern, and vegetation along the downslope (Location 3)	10
Figure 4j: Cracked floor of the cadet band building and Mango tree at the edge of upslope (Location 3)	10
Figure 4k: Kandy – Colombo main road (A9) at the downslope and vegetation (Location 3).....	11
Figure 4l: Single storey canteen building beside to the cadet band building with cracked walls (Location 3).....	11
Figure 4m: Three storey private building adjacent to mitigation Location 03, retaining wall and the Colombo – Kandy main road (A9)	11
Figure 4n: Steep slope of Location 03 with vegetation and school boundary	11

List of Tables

Table 1: Negative impacts and their level of significance	12
Table 2: Site specific risk analysis.....	15
Table 3: Design stage Environmental & Social considerations	17
Table 4: Contractor requirement to comply with ES & HS	19
Table 5: Site specific ES & HS mitigation measures.....	20
Table 6: Environmental and Social monitoring plan; construction phase	25
Table 7: Clearances, no objection, consent and approvals.....	26
Table 8: Tentative timeline for getting approvals	27
Table 9: Proposed scheme of information disclosure	28
Table 10: Level of information gathered through consulting institutions.....	28

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
NBRI	National Building Research Institute
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 unstable slopes in high-risk areas, especially in 13 districts of 06 provinces of the country, under the Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP). The project requires implementation in accordance with environmental and social safeguards and mandates of the AIIB and those of Sri Lanka. Considering the nature of project actions and their 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 the application of AIIB safeguards and national environmental and social mandates during the implementation of project actions. The project implementing agency (NBRI) 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 minimal.

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 a site-specific environmental and social assessment 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 **the unstable cut slope failures at Vidyarthi College, Kandy**, selected for mitigation under RLVMMP. 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 the landslide mitigation design team, the PMU, and the contractor in the implementation of the Environmental and Social Management component of the project. The SSE&SMP is published in on the project website (<https://rlvmmp.lk/>) and can be viewed by a 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. 244, Kandy District, for **Vidyarthi College, Kandy**

2.2 Location details

The proposed mitigation site falls under 239 Mahaiyawa GN division of Gangawatakorale DS division, Kandy District, Central Province.

GPS references of the site –

Location 01 (L1) – 7.305898°N and 80.634721°E

Location 02 (L2) – 7.306828°N and 80.634986°E

Location 03 (L3) – 7.306628°N and 80.634730°E

Nearest town - Kandy

Accessibility to the site - The identified mitigation site No.244 is situated within the premises of Vidyarthi College, specifically adjacent to the front boundary area of the school. The school can be accessed via Kandy – Jaffna Road (A9). Vidyarthi College is situated 2 km from the highly urbanized and historically significant city of Kandy, offering convenient accessibility through the major transportation network connecting the city center and surrounding suburban areas.

(Refer to Figure 1; Road map showing accessibility to the site.)

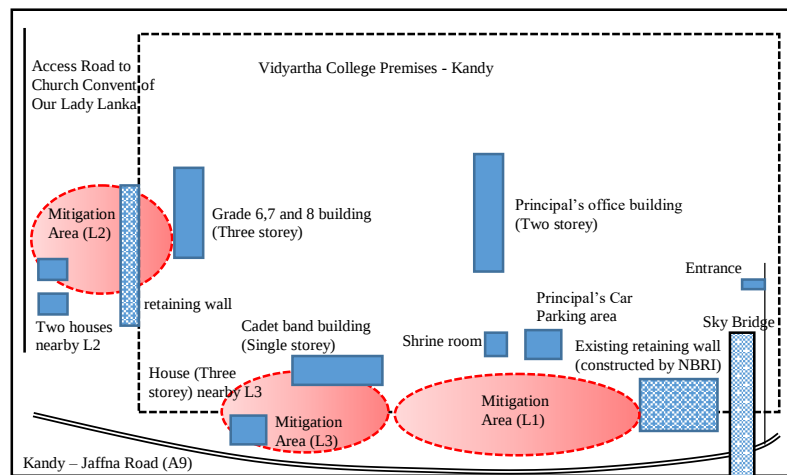


Figure 1: Road map showing accessibility to the site

2.3 Topography and land ownership

The proposed mitigation sites are located within Vidyarthi College, in a densely urbanized environment situated in the central highlands of Kandy. The unstable areas are located in sloppy terrains where the natural slopes have been cut for their construction. The land ownership of the project area primarily belongs to the school premises, while limited adjacent lands are occupied by residential properties and roadside reservations associated with the nearby Kandy – Jaffna (A9) Road. The land ownership of the school is the Ministry of Education.

The elevation of Vidyarthi College is 493 m. topographically, the area is characterized by moderately steep to steep slopes, uneven terrain, and highly weathered soil profiles typical of the Kandy highland region.

(Refer to Figure 2; Google image of the proposed landslide mitigation site, the surrounding environmental features and service infrastructure.)



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

2.4 Meteorology of the area (Kandy)

Annual average rainfall – > 2000 mm

Annual average temperature – 23.5 °C

(Source: <https://weatherandclimate.com>)

2.5 Demographic features of the school

According to the school authorities of Vidyartha College, the population of the Vidyartha College is 3039, including 2880 students (male), 148 academic staff (112 female & 36 male), and 11 non-academic staff (7 male & 4 female.)

3. Landslide hazard incident details

3.1 Account of incident

Three major cut failure locations (L1, L2 and L3) were identified within the premises of Vidyartha College, following the intense rainfall associated with Cyclone Ditwah on 27th November 2026. The continuous heavy precipitation caused excessive saturation of the slope materials, reduction of soil shear strength, and destabilization of the cut slope sections within the school premises. The observed failures were primarily characterized as shallow to moderately deep soil mass failures associated with slope-modified terrain and inadequate slope stability under prolonged wet conditions.

The first location (L1) was observed at the front boundary of the school premises near the principal's car parking area and the shrine room, adjacent to the Kandy - Jaffna Road (A9). This location is situated at the downslope of a steep cut slope. The failure was characterized by the downward movement of saturated soil masses from the cut slope towards the boundary area. Tension cracks, displaced soil materials, and localized ground deformation were observed within the affected section. Evidence of previous slope failure

near the school bridge indicates that the slope had already remained vulnerable to progressive instability prior to the recent incident.

The second location (L2) was identified near the two-storey building situated close to the roadside section of the school premises. At this location, a soil mass failure occurred from the adjacent cut slope characterized by steep terrain and highly weathered soil materials. The failed soil mass showed clear signs of downslope displacement, erosion, and surface scouring caused by concentrated runoff during heavy rainfall. Minor ground settlement and instability features were observed along the upper portion of the slope, indicating continued vulnerability to additional slope movement under future rainfall events. The proximity of the failed slope to nearby structures and access areas has increased the potential risk to school infrastructure and safety.

The third failure location (L3) is situated between the cadet band room building and the school boundary adjacent to the Kandy - Jaffna (A9) Road. This section experienced a significant soil failure extending from the edge of the cut slope downward toward the roadside area and the nearby private three-storey building. The failure was characterized by progressive soil sliding, erosion of slope materials, and lateral displacement of the retaining ground. Formation of cracks and deformation within the slope surface indicated active ground movement and loss of slope stability. Due to the steep slope geometry, proximity to the road corridor, and adjacent built structures, this location requires immediate stabilization and slope protection measures to prevent further failure and associated structural damage.

Refer to Fig 3: Google image, land use, risk elements and the photographs of special features of the location

3.2 Effects and consequences of landslide/ slope failure

At the first location (L1), no direct structural damage except to the concreted ground and retaining wall. The nearby shrine room and the failure resulted in noticeable displacement of saturated soil masses near the cut slope to the principal's parking area toward the lower boundary section. The movement of soil materials did not cause damage to the school properties. The incident further increased the vulnerability of the front boundary area to future slope failures, particularly due to the presence of steep cut slopes and surcharge loading from large trees such as Owila, Mango, and Avocado located along the slope. In addition, the proximity of the failure zone to the Kandy - Jaffna Road (A9) poses potential long-term risks to nearby transportation infrastructure and pedestrian safety if further slope deterioration occurs.

At the second location (L2), soil mass displacement was observed along the steep cut slope adjacent to the two-storey building and the roadside section. Although no major structural damage was identified at this location except the structural displacement of wash basin in front of the building, the slope failure significantly weakened the stability of the surrounding terrain. Surface erosion around the building, localized scouring, and downslope movement of soil materials were evident within the affected section. The unstable slope conditions may increase the susceptibility of the area to future failures during prolonged rainfall events, thereby posing potential threats to nearby school structures, access pathways, and roadside areas.

The third location (L3) experienced the most severe impacts among the identified failure sites. The soil failure extended from the edge of the cut slope toward the adjacent roadside area and the nearby private three-storey building located close to the Kandy - Jaffna (A9) Road. Significant slope instability and progressive ground movement caused visible structural cracks within the building, indicating foundation stress and differential settlement associated with soil displacement. Furthermore, retaining walls within the affected section were damaged, and a private three-storey building was also partially covered with soil mass and surface runoff. The failure at this location has created a highly hazardous condition with potential risks to human safety, nearby infrastructure, and road accessibility.

However, all three mitigation areas (L1, L2, and L3) belong to the school and road reservation, and there were no casualties or injuries to the students, staff, and pedestrians. Immediate stabilization and engineering mitigation measures are therefore essential to prevent further ground movement and minimize additional structural deterioration within the affected area.

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

At all three mitigation locations (L1, L2, and L3), were covered with Tarpaulin, and a retaining wall and surface drainage system were installed in some risk locations to reduce the potential risk of the area as part of the remedial measures. Previously (before the Ditwah storm), landslides that occurred on this school premises have been mitigated under CRIP.

3.4 Evacuations

No evacuations had been implemented at the buildings grade 6,7 and 8 three storey building (L2) and cadet band building (L3) due to the risk. However, students and staff had been advised to evacuate the cadet band building near Location 03 in the event of heavy rainfall.

3.5 Resettlement (progress)

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

Mitigation sites located in Vidyarthi College – Kandy



Figure 3: Google image, land use, risk elements and the photographs of special features of the location

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/slope failure

All three mitigation locations of the slope failures and potential cut slope failures are located in the Vidyarthi College premises, which is recognized as one of Sri Lanka's prominent national schools, located within the historic and culturally significant city of Kandy. Established on 18 May 1942 by the Vidyarthi Society under the original name of King's College, the institution has developed into a prestigious center of academic excellence, discipline, and leadership. As a leading government educational institution offering education from primary level to Advanced Level, the college has played a significant role in shaping generations of students into responsible and capable citizens through comprehensive academic and extracurricular development.

The college is widely respected for its strong commitment to holistic education, integrating academic achievement with character formation, cultural values, sportsmanship, and leadership training. In addition to its educational excellence, Vidyarthi College maintains a proud heritage rooted in Buddhist traditions and continues to produce graduates who contribute successfully to higher education, professional sectors, and national development, making the institution an important educational landmark within Sri Lanka's central highland region.

Despite its educational significance and long-standing reputation, the college premises are currently exposed to several geotechnical hazards due to the topographic and environmental conditions of the surrounding terrain. The total land extent of Vidyarthi College comprises approximately 2.5 acres and accommodates nearly 2,880 students. Within the school premises, three locations have been identified as potential slope failure zones requiring immediate attention and mitigation measures.

(Refer to Fig.3 Google image, cross sections, land use, risk elements and the photographs of special features of the location)

1. Location 01 (L1): Edge of unstable slope nearby shrine room and principal's car parking area, and steep slope towards the Kandy – Jaffna main road (A9) - 7.305898°N, 80.634721°E
2. Location 02 (L2): Unstable slope beside to the Grade 6,7 and 8 building (three storey building) and near by the fence net – 7.306828°N, 80.634986°E
3. Location 03 (L3): Unstable slope in between cadet band building (single story building) and Kandy main road (A9) – 7.306628 °N, 80.634730°E

4.2 Areas adjacent to the landslides

The surrounding area of the unstable slope section (L1) of the Vidyarthi College is consisted with car park, a shrine room, and a three-storey building (Approximately 150 people are seen around this area every day). Few plants and shrubs, such as Owila (*Polyanthia* sp.), Avocado, Bamboo, and Mango, can also be observed adjacent to the location. Currently, the mitigation area is bounded by a fence net to avoid accidents from falling from the steep slopes. The retaining wall was partially destroyed due to soil failure. However, students and staff are using the shrine room for daily rituals.

The mitigation location (L2) adjacent to grade 6,7 and 8. This two-storey building is observed cracks at the bottom of walls. The water line for the 6,7 and 8 building is laid nearby the mitigation location 02. Approximately 240 students and 7 teachers (2 male and 5 female) are used this building. The fence net is observed adjacent to the building.

Third location (L3) is located in between single storey cadet band building and Kandy - Jaffna Road (A9). Surface drainage system and retaining wall with fence avoid the soil failure by supporting the soil mass. Usually, this single storey building is occupying by cadet students and staff (approximately 15 - male). Canteen (Approximately 150-200 are used daily) also located close to the mitigation location. Banana, Mango and Maana like plants and shrubs can be observed. Few rock boulders also are observed

at the edge of the slope. (Refer Fig 3: Google image, cross sections, land use, risk elements and the photographs of special features of the location).

4.3 Current level of risk

The unstable slope sections within the school premises impose a high risk on the students, staff, commuters, vehicles and pedestrians. Therefore, the entire Vidyarthi College premises are highly prone to cutting and slope failures at these sites. During the rainy season, it poses a high risk to the students, teachers, other non-academic staff and pedestrians due to the potential risk of slope failure. The mitigation areas L1, L2, and L3, which are located adjacent to the shrine room, the Grade 6, 7, and 8 building, the cadet room building of Vidyarthi College, and the downslope area near Kandy – Jaffna Road (A9), respectively, are still at risk. If the site is not rectified to prevent future failures, the slope failure with soil masses would disturb all functions of the road. The students, staff, other school activities, and transportation would be at risk due to these unstable slope sections. As this is one of the important schools in the Kandy district, the risk of slope failures may pose a significant impact.

5. Description of the works envisaged under the project

Locations are highly potential for slope failures and cutting failures within the school premises. The proposed project aims to ensure that further progressive slope failures are prevented. Permanent mitigation measures for location 01 and 02 are below mentioned;

Location 01:

- Soil nails shall be installed starting from the level of the existing 3.0 m high toe retaining wall and extended upslope up to the intermediate road level
- At the intermediate road level, it is proposed to construct an L-shaped reinforced concrete retaining wall above the soil-nailed slope
- The wall shall be designed to retain the reconstructed road embankment. (In this zone, the soil nails shall be provided at closer spacing than usual to effectively transfer and resist the loads imposed by the overlying retaining structure and road)
- Following the construction of the L-shaped retaining wall, the intermediate road may be reconstructed by placing engineered backfill behind the wall
- The road width shall be restricted to a maximum of 2.0 m in order to limit surcharge loading on the stabilized slope and retaining structures
- Above the intermediate road level, soil nailing shall be continued upslope up to the top of the slope

Location 02:

- It is proposed to install soil nails to stabilize the slope
- The school community has already decided to demolish the Western Music Room, as it was constructed at a later stage and is separate from the main building
- In addition, it is proposed to construct a chain-link fence along the slope boundary

Location 3

- It is proposed to install soil nails to stabilize the slope
- Improvement of surface drain system

6. Brief description of 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;

- i. School students, staff, residents, and their activities
- ii. Shrine room, Grade 6,7 and 8 three-storey building, private houses, and structures
- iii. Kandy - Jaffna Road (A9), and pedestrians

(Ref. Fig.4 Sensitive elements that may be affected by the project actions)



Figure 4a: Mitigation location of Vidyarthi College adjacent to the shrine room (Location 1)
An Owila tree is observed on the slope area



Figure 4b: Fence net made at the Location, Principal's car parking area - Mango tree and Bamboo shrubs are observed (Location 1)



Figure 4c: Destroyed retaining wall at the edge of the upslope with rock (Location 1)
Kandy - Jaffna main road (A9) is observed at the downslope



Figure 4d: Affected two-storey building with staircase and fence net (Location 2)



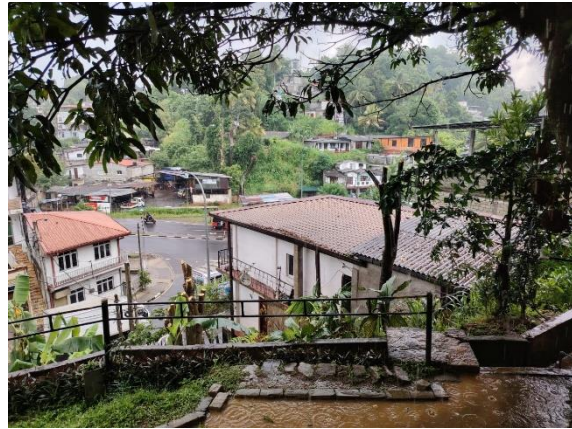
Figure 4e: Abandoned washing basin, risk slope, and vegetation (Location 2)



*Figure 4f: Steep slope area covered with Tarpaulin-
steep slope (Location 2), Grasses and small herbs are
seen in the slope*



*Figure 4g: Soil mass failure and soil erosion adjacent
to the Grade 6, 7, and 8 building (Location 2)*



*Figure 4h: Retaining wall with fence at the edge of the
upslope (Location 3)*



*Figure 4i: Three-storey private building for
residential and commercial purposes, Surface
drainage pattern, and vegetation along the
downslope (Location 3)*



*Figure 4j: Cracked floor of the cadet band building, a
Mango tree at the edge of the upslope (Location 3)*



Figure 4k: Slope area with vegetation. The Kandy – Jaffna main road (A9) is seen at the downslope (Location 3)



Figure 4l: Single-storey canteen building beside the cadet band building with cracked walls (Location 3)



Figure 4m: Three-storey private building adjacent to mitigation Location 03, retaining wall and the Kandy - Jaffna main road (A9)



Figure 4n: Steep slope of Location 03 with vegetation and school boundary

Figure 4: Sensitive elements that may be affected by the project actions

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

7.1 Positive impacts

The objective of this project is to ensure that the further occurrence of slope failures is prevented to an acceptable level in the unstable land sections of Vidyarthi College, Kandy. The project will provide the following benefits:

- Enhancement of the safety of students, staff, and visitors by reducing the risk of landslides and slope failures within the school premises.
- Protection of school buildings (grades 6, 7 and 8 building), cadet band and other facilities and other infrastructure from potential damage caused by slope instability.
- Prevention of disruptions to educational activities and school operations resulting from landslide-related incidents.
- Reduction of risks to the adjacent public road (Kandy - Jaffna Road) and neighboring properties that may be affected by slope failures originating from the school land.
- Improvement of surface and subsurface drainage conditions, thereby minimizing soil erosion and water-induced slope instability.
- Increased confidence among students, parents, and the local community regarding the safety and usability of the school environment.

7.2 Negative impacts

The mitigation works are generally confined to already failed land areas and unstable areas. Therefore, negative impacts are much localized and also limited to the construction period.
(Refer to Table 1; Negative impacts and their level of significance).

Table 1: Negative impacts and their level of significance

Impacts during the construction period	Level of Significance
7.2.1 Hydrological and water Quality impacts	
7.2.1.1 Impacts of the drainage pattern of the area Disruption to the existing surface and sub-surface drainage pattern in front of the cadet room and the boundary of the school is envisaged with the project implementation. The mitigation works at this site will focus on the drainage improvement. Therefore, during the rainy season, heavy flow of water is expected to be generated and would be accumulated between the cadet band building and the slope (Location 03) and between the fence net and slope (Location 01). The water inundation of the existing drainage may be expected. An increase in water through the unstable slope may intensify the risk of slope failures in the unstable section.	Significant
7.2.1.2 Water pollution and impacts on surface water quality 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 drains and the streams. Improper disposal of oils and other harmful substances/contaminants from machinery, leakages from temporary storage tanks, solid waste, and wastewater disposal/dumping could occur, causing adverse impacts on the quality of the water. However, during the rainy season, the rainwater running through the disturbed slope tends to pick up sediment, oil, and other pollutants generated during construction, which can contaminate the water in the streams. Since there are no water streams close to the site, the water pollution impact will be insignificant.	Insignificant
7.2.1.3 Erosional impacts and stream bed alterations The project activities will open the slope to surface erosion during the construction phase. The existing surface and sub-surface drainage pattern in the Location 02 and Location 03 areas will be disrupted during the construction phase. Therefore, the erosional impacts are significant. The mitigation works in these sites will focus largely on the drainage improvement. Therefore, during the rainy season, a heavy flow of water is expected to be generated to enter the natural stream either through a culvert or directly into the stream through step drains, etc. There are no streams nearby; hence, the effect on bank erosion and stream bed scouring will not be significant.	Insignificant
7.2.1.4 Open defecation and waterborne infections As sites are located within school premises, the possibility of open defecation is less. However, Faecal contamination of the stream water or runoff water flow will be expected during construction due to open defecation by the contractor's workforce, as the area has thick vegetation cover.	Insignificant
7.2.1.5 Impacts on the downstream water uses Since there are no water streams close to the site, the impact will be insignificant.	Insignificant
7.2.1.6 Impacts on groundwater table and groundwater quality Addition or mixing of construction materials, including cements and 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 groundwater quality.	Significant

7.2.1.7 Impacts on water or wetlands	
Since there are no water streams or wetlands close to the site, the impact will be insignificant.	Insignificant
7.2.2 Environmental Impacts	
7.2.2.1 Noise and vibration impacts	
Noise and vibration are expected from construction equipment. Noise and vibration impacts are significant as the sites are located within the Vidyarthi College premises. The students of the schools, staff, and pedestrians would 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. The pedestrians and commuters on roads will have not an effect from noise and vibration. However, the project will have a significant noise impact on the activities of the schools.	Highly Significant
7.2.2.2 Air pollution impacts	
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. As sites located near the shrine room, cadet band building, and Grade 6,7 and 8 building of the Vidyarthi College within the school premises, the effects are highly significant. The Kandy - Jaffna Road (A9) is used heavily for vehicles moving (buses, bicycles, lorries, trucks, tippers, three-wheelers). The air pollution may have a significant impact on the commuters and pedestrians. Further, the students of the school, staff, and the public visiting the parents at the school will be affected by air pollution. The air pollution impacts from the construction are locally significant during dry periods for the students of the school, commuters, and staff.	Highly Significant
7.2.2.3 Solid waste disposal issues	
Hazardous disposal of solid waste: various types of waste, such as litter, food waste, and construction waste, will be generated and may be stored or disposed of on site. The littering, hazard storage, and disposal of solid waste in and around the site will create inconveniences to the students, commuters, pedestrians, parents, and the staff. It can block the drainage to make breeding grounds for waterborne diseases. Waste can pollute the soil and leave various environmental impacts if a proper disposal mechanism is not in place during the construction period.	Highly Significant
7.2.2.4 Explosive hazards and hazardous materials	
Since the affected area has rock boulders, explosives may be used if rock blasting is envisaged. This may pose a risk due to unsafe use. As these operations are to be done on affected slopes and close to the school buildings, the risk of improper use of explosives and accidents from rock fragments is highly significant.	Highly Significant
7.2.3 Biological /Ecological Impacts	
7.2.3.1 Effects of important wildlife habitats	
There are no forested/ wild-life reservation areas within the project influence area with high biodiversity.	Insignificant
7.2.3.2 Effects on Fauna & Flora	
The failed sloppy areas consist with small shrubs, herbs and grasses, and the removal is not a significant impact.	Insignificant
7.2.4 Social and Economic Impacts	
7.2.4.1 Impacts on agriculture within the area to be remedied/ immediately to the site	
There is no agricultural activity within the area to be remediated / immediately to the site.	Insignificant

7.2.4.2 Cracks in the building due to vibration impacts The unstable slopes are located within the school premises. Shrine room, Grade 6,7 and 8 three storey building, in between the cadet band building and the private building near the mitigation sites, Location 01, Location 02, and Location 03, respectively, of Vidyarthi College, effects are highly significant. Proposed mitigation sites are located within close proximity of Vidyarthi College. Therefore, vibration impact on buildings near sites is highly significant. During the construction, heavy machinery will be used, and the vibration can widen the cracks and may create new ones in the buildings. Also, vibration can affect the stability of the nearby buildings.	Highly Significant
7.2.4.3 Losing access to land and future development activities The land where the project activities are envisaged belongs to the Ministry of Education. The mitigation works will be concentrated on the unstable slope areas adjacent to the shrine room, the three-storey building the cadet band building, and of the Vidyarthi college, and slope area adjacent to the Kandy - Jaffna Road near the Vidyarthi College. This area is mainly a public premise; there will be some impacts to the school with regard to losing access to the land (during construction) and loss of valuable use of the buildings close to the construction site. In contrary, remediation works in the unstable slope will increase the stability of the buildings and protect the land from future failures.	Significant
7.2.4.4 Impacts on livelihood/ business and income activities Although a three-storey private building nearby Location 03 is rented out for income-generating or business activity. There will not be an impact on those commercial activities during the construction period due to	Insignificant
7.2.4.5 Impacts on service provision (water supply, sewage, electricity) Some water lines are running close to the unstable slopes (Location 02), providing a water facility to students in grade 6, 7 and 8, which is expected to be impacted by the construction period.	Significant
7.2.4.6 Effect due to loss of infrastructure and safety During the construction phase, the Kandy – Jaffna Road (A9) will be obstructed by frequently moving machinery, loaders, trucks, etc if operated during the school starting and over times as the main access road to the school is Kandy - Jaffna Road (A9).	Significant
7.2.4.7 Work camps and lay-down site requirements The work camps will be established closer to the site. Often, the contractor rents out houses in the vicinity. The campsite will be selected in the neighbourhood of the community. If proper camp management is not in place, it may result in several labour issues, social issues with the community, conflicts for shared resources with the community, nuisances, and management of waste, etc. If temporary camps are built in close proximity to the site, management of solid waste and sewage will be an issue. Therefore, the effects are significant.	Significant
7.2.4.8 Relations between workers and the school children/staff / people living in the vicinity of the site and the possibility of disputes The mitigation site is within the school premises. The construction workers at this site will be from different social backgrounds and from different geographical areas often under poverty. Usually, they are with poor educational and social background. Such communities may have a wide range of social issues to cause dis-stress on the school staff and the children as indicated below. • Cause nuisance to smooth operation of school works • Unauthorised entry into school premises • Bullying and harassment to children • Quarrels with children and parents • Distracting children from education • Tempting children and parents towards offensive deals • Informal form of child labour	highly significant

• Use of sanitary facilities of school by the workforce • Sexual abuses for the children Although the workers who would engage in such issues will be rare, even few possibilities cannot be ignored. Therefore, issues indicated above at this site will be considered highly significant.	
7.2.4.9 Workers safety during construction The workers may be exposed to risk from falling. 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. Contractors may engage underage workers (children) for construction work, which is risky and can result in serious accidents and injuries.	Highly Significant
7.2.4.10 Safety to the public from construction activities: High risk for students of the school During the construction phase, the school premises will be obstructed by the frequently moving machinery, loaders, trucks, etc. As most of the mitigation works are to be carried out in a limited space on slopes and the school premises, the heavy machinery, the trucks and loaders, etc., can obstruct the access to the school, and it may pose a high risk to students' and staff's lives. They will be exposed to a longer duration of this risk during the construction phase. Therefore, the risk to them is highly significant. There is a risk of loose rocks falling on the proposed site during excavations and removal of rocks posing a risk to the students.	Highly Significant
7.2.4.11 Impacts on transport infrastructure (especially temporary loss of road access, risks of traffic congestion) The traffic on the Kandy - Jaffna Road (A9) due to full/partial road closures may obstruct the smooth flow of vehicles during weekdays, in office hours, school times or holy days. This will cause a nuisance to pedestrians and commuters.	Significant
7.2.4.12 Areas used for businesses, agriculture or other uses immediately adjacent to the site There are areas used for business (a three-storey private building nearby Location 03), specific agriculture practices or other within the area to be remediated.	Significant
7.2.4.13 Need for students, staff of the school or to enter or cross the site Excavation machinery, loaders, trucks etc. will be used in the school premises where school children and staff are moving. There is no special need for students and the staff 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, unauthorized 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.	Highly Significant

8. Site Specific Risk Analysis

Table 2: Site specific risk analysis

Risk	Affected group	Risk level
1. Facing accidents when working in a limited space	Workers/school children/staff/pedestrians	Very high
2. Transporting materials and machineries	Workers/school children / commuters/ pedestrians	Very high

3. Throw out disposals (litter, bottles, and food) to the school premises from the construction site	school children/ staff	Very high
4. Facing accidents during constructions at night time	Workers/pedestrians	Very high
5. Accidents from the construction activities and materials placed in the limited space	Workers/school children/staff	Very high
6. Injuries due to rock particles due to explosions/ blasting	Workers/school children/staff	Very High
7. Rock fall from the unstable area	Workers/ Students and staff/pedestrians	High
8. Site Working – Working in poor visibility	Workers	High
9. Lone Working	Workers	High
10. Emergency evacuation	Workers/ Students and staff	High
11. Extreme weather conditions (wind, rain etc.)	Workers	High

9. Significant Environmental and Social Impacts

Environmental, social impacts or risks that will require special attention on the part of NBRI.

9.1 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 are 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 requirements 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.

9.2 Child labour & forced labour

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

10. Environmental Social Management Plan (ESMP)

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

10.1 Resettlement action plan

There is no project-based resettlement in this site. The buildings may have some impacts in the form of structural damage during the project actions due to ground vibration induced by heavy machinery operation. (The scheme of compensation, in case of damage to structures due to project, should be arranged, (Refer 2002.2.17) utilities and roadside amenities in contracts requirement to ESMP.

10.2 Evacuation of people

Project-based evacuations are not required for Location 01 and Location 02. However, evacuation is required for the cadet band building near Location 03.

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

This risk may not be triggered on this site.

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

It may require compensating for the loss that occurred due to closing the water supply lines due to project actions. If the water line is disturbed, it may require providing alternative water sources to maintain a discontinuous water supply to the school. The engineer should consult the school management on this matter before the construction of the location.

10.5 Public awareness and education- needed for the following areas

- i. Programs to inform and educate about the risks posed by landslide to specially the nearby residents, school children, teachers, and the parents of the school.

10.6 Design based Environmental/ Social Management considerations

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

(Refer to Table 3; Design stage Environmental & Social considerations)

Table 3: Design stage Environmental & Social considerations

Design feature	Recommended level of consideration for this site
i. Natural resource management and resource-optimized designs Project-specific designs should be considered to eliminate mass clearing of vegetation and the minimum number of removals of grown tree species. Sufficient emphasis should be made to consider conservation of trees if important tree species are found. During planning, designs should consider to prevent cutting/ uprooting existing plants such as Owila (<i>Polyanthia</i> sp.), Avocado, Bamboo, Mango and Banana	Moderate
ii. Site Planning During site planning, it is necessary to be cautious of possible reactivation of slope failures and movements of soil masses. Also, the site is located in a very limited space on a slope with other buildings. 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 a trained flagman or safety officer during the construction period, and proper communication between the contractor's workforce and the other responsible officials should be maintained.	Very High
iii. Habitat connectivity and animal trails 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, etc., even if the impacts are localized.	Very Low
iv. Conservation of water resources If the extraction of water is involved as a mitigation measure, as the extracted water is of good quality and yield it can be considered as a source of water for school usage, such as gardening and sanitary activities.	Low
v. Interruption to water supplies If the water line laid in the mitigated slope is used as water supply, the chance that the water line can be damaged by the mitigation work is high. In such instances, the design should include an alternative water line for the school community (temporary/or permanent).	High

vi. Aesthetically compatible design considerations The designs in aesthetically sensitive environments should consider structures that blend with the natural environment to keep the visual pollution to a minimum. As the proposed mitigation site is located in a school premise, greening could be used in construction activities to develop the area as an aesthetically pleasant environment. Service of landscape architect may be important for the design of suitable mitigation structures.	Very High
vii. Consideration of green environmental features As many of the migratory works are carried out in well maintained school premises with green landscape, 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.	Very High
viii. Conservation of social and cultural features 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.	Low
ix. Workers/ staff and community safety Due to the limited space in the proposed mitigatory site 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 to students and staff. Therefore, design-based safety consideration such as beams, safety nets etc. should be considered specific to safety of school children should be considered.	Very high
x. Erosion control structures During rainy season the flow in these drainage structures can be significantly high. During rainy season the heavy flow of surface runoff can be expected through the unstable slopes. This water should be conveyed to nearby storm water drains. Hence the design should adequately consider flow speed breakers to reduce erosive flows of slopes within the school.	High
xi. Low post maintenance and operation designs 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 be directed to natural streams. 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	Very High

10.7 Mitigation of impacts during the construction phase

10.7.1 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. NBRI 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 summarized below (Table 4) indicating the degree of relevancy for this site. For details ESMP for construction contractors should be referred.

(Refer to Table 4; Contractor requirement to comply with ES & HS)

Table 4: 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 (school premises)
2002.2 2)	Noise and Vibration	Highly Relevant (school premises)
2002.2 3)	Cracks and damages to the buildings	Highly Relevant (buildings)
2002.2 4)	Disposal of waste	Highly Relevant (school premises)
2002.2 5)	Disposal of refuse	Highly Relevant (school premises)
2002.2 6)	Dust control	Highly Relevant (school premises)
2002.2 7)	Transport of Construction materials and waste	Highly Relevant (road reservation, commuters, pedestrians)
2002.2 8)	Water	Relevance
2002.2 9)	Flora and Fauna	Not Relevant
2002.2 10)	Physical and cultural resources	Relevant
2002.2 11)	Soil Erosion	Highly 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	Highly Relevant
2002.2 16)	Disruption to public	Highly Relevant
2002.2 17)	Utilities and roadside amenities	Highly Relevant
2002.2 18)	Visual environment enhancement	Highly Relevant
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 (school children, workers)
2003.3	Child labor and forced labor	Highly Relevant (school premises)
2003.4	Safety reports and notification of accidents	Highly Relevant (school children, workers)
2003.5	Safety Equipment and Clothing	Highly Relevant (school children, workers)
2003.6	Safety inspections	Highly Relevant (school children, workers)
2003.7	First Aid Facilities	Highly Relevant (school children, workers)
2003.8	Health and safety information and training	Highly Relevant (school children, workers)
2003.9	Plant equipment and qualified personnel	Highly Relevant (school children, workers)
Relevant: The section is relevant to the site as a common ESMP applicable to any site 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		

Possibly relevant: This ESMP will be triggered if the site come across with relevant aspect during project implementation

Not relevant: The section may not be relevant to this site under disclosed conditions

Optional: require to be implement if needed only

Refer site specific monitoring plan: Contractor is obliged to carry out monitoring as specified in the site-specific monitoring plan

Reference: Contractors Obligation for implementation of ESMP

10.7.2 Site Specific mitigation

Given below are the site-specific mitigation measures that the project is expected to implement during the construction period.

(Refer to Table 5; Site specific ES & HS mitigation measures)

Table 5: Site specific ES & HS mitigation measures

Mitigation item	Project implementation phase	Responsibility
i. Minimize erosional impacts during construction It is recommended mitigation works at affected locations around the front boundary of Vidyarthi College adjacent to the Kandy – Jaffna Road (A9) and private land involved with site clearance, slope reshaping, removal of debris etc., However, those activities 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.	Site preparation & construction	Construction Contractor
ii. Planning project activities inside the school premises As the contractor has to operate mitigation actions within the school premises, he should carefully prepare a plan for the management of construction activities inside the school premises, considering the uses and activities of the buildings, and surrounding adjacent to the sites and the examination periods. This should include careful selection of material storage, such as vehicle parking, mixing of concrete, cleaning activities, etc., considering the safety and optimization of space. The contractor should discuss the scales of project operations with a time plan and should make the school management adequately aware of the construction plan. Necessary adjustments to the plan should be made after discussing with the school management in order to minimize the disruption to school activities, with special attention to working hours, minimizing nuisance to during conducting classes and special school events, etc.	Site preparation & construction	Construction Contractor
iii. No Entry Zone The PMU should make a detailed assessment on possible risk of slope destabilization in the site during construction phase. No entry zones may need to be declared. This should be made adequately documented and communicated to the contractor and the school management. Also, mitigating the risk of accidents from moving vehicles operational machinery, construction activities, electrical leakages etc. should be given high priority in the health and safety management plan especially considering the potential high risk on school children. As there are school premises within the site proper safety measures should be included with warning signs and	Construction	E & S Unit of PMU contractor

permanent trained watchmen. Signboards indicating slope instability risk are strongly recommended at this site.		
iv. Machinery and material transportation Access roads need to be used for machinery, materials, and vehicle transportation for three locations during the construction phase. Machinery and material transportation should not be done through the staircases of the school. School premises should not be used as a location for material storage. The contractor should pay special attention to this matter and extreme care should be taken to prevent possible accidents on the Kandy – Jaffna Road (A9) and damage to the school buildings and access roads. The management of the school should be aware if the location requires access for shifting machinery.	Construction	Construction Contractor
v. 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.	Construction	Construction Contractor
vi. Noise and vibration control The noise and vibration-generating activities may disturb the smooth flow of activities at the school. Vibration-generating activities should be done within the prescribed limits to avoid damage to structures and disturbance during class hours. Cracks in the buildings should be monitored before, during and after completion of the project. Suitable compensation should be made if cracks from the damage or cracks enlarge due to construction work.	Construction	Construction Contractor
vii. Traffic management and safety Traffic management system should be in place day and night. A good traffic management plan should be prepared site adjacent to the Kandy – Jaffna main road (A9) with bends vulnerable to accidents. It should be approved by the PMU. Proper road safety measures should be included with warning signs and permanently trained watchmen, luminous sign boards indicating slope instability risk, and road obstruction signs, night lamps, etc. are strongly recommended at this site.	Construction	Construction Contractor and
viii. Priority Health and Safety Issues 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 recommendations should be followed carefully in a proper organization and safety monitoring system. - Prepare a special Occupational Health and Safety Management Plan prior to the commencement of construction activities - A good warning system with clear signboards indicating slope instability, construction hazards, and road obstructions shall be installed at all locations. Full-time trained watchmen shall be deployed day and night to ensure the safety of workers, students in nearby buildings, and commuters using the Kandy Road (A9). - Safety barriers and safety nets shall be installed at identified risk locations to protect workers, students,	Construction	PMU Construction Contractor

residents, and commuters from potential boulder or debris falling hazards. Standard worker safety practices and protective measures shall be strictly adopted during all construction activities. iv. Provision of personal protective equipment (PPE) such as safety boots, helmets, protective clothing goggle etc. v. Provision of trainings and awareness programs to employees vi. Conducting hazard analysis and plan/provide adequate mitigation measures for such hazards identified, prior to carrying out major construction activities vii. 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		
ix. Safety of school children The school management should be made adequately aware of possible issues detrimental to school children as indicated bellow i. Expose school children towards narcotics, alcohol, sex abuse, smuggling, and various criminal offenses and a wide range of un-suitable habitual behaviours ii. Unauthorised entry into school premises iii. Bulling and harassment to children iv. Quarrels with children and parents v. Distracting children from education vi. Tempting children and parents towards offensive deals vii. Informal form of child labour The PMU ES unit should engage in meaning full consultation with school management regarding above mentioned issues. Each issue should be properly communicated and adequately discussed with the school management. Also, it is advised that PMU request from the school management on the following i. Make students and parents aware of the project ii. Possible social issues that will have impact on children iii. Establish a system of vigilance to monitor the behaviour of children with the workforce and the movement of workforce during construction phase iv. Establish a confidential information receive system in the school premises to receive any complains pertinent to the project v. Enforce a system to punish or remove troublesome workers The PMU should made contractor aware on all potential issues with contractor workforce and school children that should be properly managed. Following is recommended for contractors' workforce i. Proper awareness, education, monitoring and punishing. ii. Define project activity zone beyond which workers cannot enter iii. Workers cannot use water sources of the school iv. Workers cannot use sanitary facilities of the school v. The contractor should not use children for any form of project related works (direct/indirect) vi. The heavy machinery operators should be extremely cautious in operation of machinery as possible accidents will be high	Construction	E & S Unit of PMU contractor

vii. Full time watchmen should be kept in the risk area to ensure safe movement of heavy machinery and vehicles Other i. Adequate no entry / danger signs and monitoring should be established so that school children are not permitted in the project area ii. The electrical wiring systems and layout should be done with proper safety measures approved by the PMU ensure that accidents mainly to children from electric shocks are prevented iii. Parking and storage areas should be done in approved locations by the PMU.		
viii. Throw out disposals (litter, bottles, and food) to the construction site. Put up the safety sign boards prior to the construction site indicating people at work. The students and visitors should be aware about the construction activities through notices erected before reaching the proposed mitigation site.	Site preparation & construction	Construction Contractor
ix. Injuries due to rock particles due to explosions/ blasting The water lines currently running across the failed slope need to be installed properly without being affected during the construction phase. The school management should be consulted during project mobilization to inform the requirement to shift the water lines to a safer location.	Construction	Construction Contractor
x. Disposal of construction waste The contractor should pay special attention with respect to disposal of construction waste. This site is located within a school premises with a pleasing and clean environment. 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 within the school premises or along the Kandy – Jaffna Road (A9).	Site preparation & construction	Construction Contractor
xi. Onsite sanitary facilities for the workers The contractor should prepare temporary sanitary facilities for the workforce within the site. Workers should not use the wash rooms or toilets of the students and school staff.	Site preparation & construction	Construction Contractor
xii. Dust and aerosol control screens Dust particles generated during the construction period can influence the residents, staff and students of school and commuters and pedestrians of the adjacent road. Therefore, dust and aerosol control measures shall be implemented, including the use of protective screens or barriers where heavy dust-generating activities are carried out. Regular dust suppression methods shall also be adopted to minimize impacts on surrounding sensitive receptors	Site preparation & construction	Construction Contractor
xiii. Water for construction Water for construction works should be obtained only from approved locations.	Construction	Construction Contractor

xiv. 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. Construction activities at three mitigation locations within the premises of Vidyarthi College should be carried out in close coordination with the school administration to minimize disturbances to educational and residential activities. Noise, vibration and dust generating operations should preferably be conducted after school hours while ensuring minimum inconvenience to the nearby residential properties and pedestrians along the adjacent Kandy – Jaffna (A9) Road. The construction activities during examination periods to be done upon agreed with the school. Night time construction work required to achieve project targets should only be undertaken with adequate safety measures, proper traffic management practices, and prior approval from the school management and relevant local authorities.	Construction	Construction Contractor
xv. Impact on service infrastructure Telecommunication, electricity, water lines should be relocated before construction starts as per the approval of PMU.	Construction	Construction Contractor
xvi. Need for people to enter or cross the site Unauthorized access to the site shall be restricted through appropriate warning signage, public awareness measures, and continuous site supervision by the contractor's full-time watchmen. Proper access control procedures shall be implemented to ensure the safety of workers, students, staff, nearby residents, and commuters within the construction area.	Construction	Construction Contractor
xvii. During construction good housekeeping should be maintained to minimize visual pollution	Site preparation & construction	Construction Contractor
xviii. 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. Possible disputes between the workforce and school users, students, and commuters shall be avoided, particularly where shared access areas, common facilities, and movement routes are involved. Proper site management, clear separation of work zones, and controlled access shall be maintained to prevent conflicts and ensure smooth and safe operation of construction activities	Construction	Construction Contractor
xix. Management of emergency accidents Accidents are likely in a site of this nature; therefore, a proper emergency management system shall be established and maintained throughout the construction period. This shall include first aid facilities, essential safety equipment, and trained personnel on site. Arrangements shall also be in place for rapid hospitalization and reliable transport facilities to ensure immediate response during emergencies.	Construction	Construction Contractor
xx. Emergency Response Plan The contractor for the project shall establish Emergency Response Procedures for the site, as it is located in a public place, to ensure a rapid, organized, and effective response to emergencies that may arise during construction activities. Approval to be obtained for the Emergency Response Plan and to be communicated to the workers and the school.	Construction	Construction Contractor

10.7.3 Monitoring requirements specific to the site

The following monitoring plan is strongly emphasized during the construction phase specific to this site. In addition to this, the 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.

(Refer to Table 6; Environmental and Social monitoring plan; construction phase)

Table 6: Environmental and Social monitoring plan; construction phase

Monitoring requirement	Parameters	Frequency
i. Baseline monitoring	Water quality	-
	Pre-construction crack survey of the school buildings	Once*
	Ground vibration	Once*
	Air quality: particulate matter	Once*
	Background noise measurement	Once*
ii. During construction	Water quality	-
	Crack survey for the risk buildings	If noticeable displacement is observed during construction **
	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 *
	Air quality particulate matter	Once a month *
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 **Crack surveys should be conducted by competent agency acceptable to PMU	
v. Reporting requirements	Stream water quality – Comparison with National Environmental (ambient water quality) regulations, no.01 of 2019 Pre-construction crack survey of the high-risk Buildings -Professional report Ground vibration -as per the interim standards on vibration for the Machinery, Construction activities and Vehicular movements, CEA Background noise measurement –Extraordinary Gazette No.924.1, May 23,1996, CEA 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.	

11. Labour management

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.

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

12.1 Public / Stakeholder Consultations

Mrs. R.A.D.I.L.Ranasinghe, Vice principal and Mr. Samal Liyanarachchi, Drama Teacher of Vidyarthi College, were consulted and made aware of landslide early warning alerts, the mitigation project and the funding mechanism. They stated that the mitigation works are appreciable and expressed their willingness to the project with the full support of the staff.

Mr. E.M.S.M.Edirisooriya, resident of nearby three storey building was consulted and made aware of landslide early warning alerts, the mitigation project and the funding mechanism. They stated that the mitigation works are appreciable and expressed his willingness to the project with the full support.

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

Table 7: Clearances, no objection, consent and approvals

Requirement / Approval / Institution	Relevance to the project
13.1 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 Mahaiyawa Local Authority
13.2 Approval from the state lands owners relevant to the project	
Central Environmental Authority	Consent from District Central Environmental Authority is required as Kandy 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).
Gangawatakorale Divisional Secretariat	Approvals from Gangawatakorale 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 Protect 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.
13.3 Consent/ no objection/ legally bound agreement from the private land ownerships	
Land owner (Ministry of Education)	Signing a legally bound agreement between the land owner 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 Table 8.

Table 8: 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</i>								
Submission of application		—	—					
Respond to comments		—	—	—				
Approvals				—	—	—		
<i>Other approvals</i>								
GSMB	—	—	—					
Ministry of Education (Depends on the requirement)								
Consent/ no objection from the land ownership (Ministry of Education)	—	—						

14. 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*).

15. 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 9: 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, other district levels Agencies, NBRI 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, Divisional secretary, Police, State Land Owners, Grama Niladhari, District Office NBRI, 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, Police, State Land Owners, Grama Niladhari, District Office NBRI, AIIB and relevant parties as appropriate	Meetings, submission of relevant reports
vi. Grievance redress mechanism	Relevant parties, AIIB	Meetings, written and verbal communications

Table 10: Level of information gathered through consulting institutions

Date	Institution	Person contacted for information
18/09/2025	Vidyarthi College	Mr. Suranga Sri Lal – Principal (0719457937) Mrs. R. A. D. I. L. Ranasinghe – Vice principal (0717219291) Mr. Samal Liyanarachchi – Drama Teacher (0715477932)
18/09/2025	Owner of a three-storey building	Mr. E.M.S.M. Edirisooriya (0773292577)

Annexure I: Images of the stakeholder consultation



Consultation with Mrs. R.A.D.I.L.Ranasinghe, Vice principal , Vidyarthi college



Consultation with Mr. Samal Liyanarachchi, Drama Teacher, Vidyarthi College



Consultation with the wife of the owner (Mr.E.M.S.M. Edirisooriya), of a three-storey house nearby Location 03

Annexure II: Report on the Stakeholder Consultation: Kandy District

Institution	Name and designation of the contact officer	Concerns raised
Central Environmental Authority	Mr. M.M.A.I Janaka, Provincial Director, Central Environmental Authority Central Province.	✓ Under the Soil Conservation Act, No 25 of 1951 and No 29 of 1953. of National Resource Management Centre, Kandy District has been gazetted as a sensitive area. ✓ Under this gazette any development is not allowed irrespective of the magnitude of the project. ✓ In a disaster this is not needed. ✓ Landslide mitigation projects are not considered projects prescribed in the Gazette ✓ As the proposed project (mitigation) intends to reduce the risk from landslide for an emergency action CEA approval is not needed considering the priority of the project. ✓ Before project commence a request indicating the mitigation sites need.

		✓ If the project is carried out in a sensitive area, even not within a prescribed project, consideration of sensitive area will govern the process.
--	--	---

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

1. Proposed approval procedure for Environmental Clearance form District Central Environmental Authority

- i. In the project preparation phase, the ES & H&S unit of PMU study the Site specific ESMPs and should submit the project proposal to district office of CEA with details of the Aerial extent that would be influenced by the project actions with spatial references, sections of site specific ESMP relevant to the project.
- ii. A basic information questioner (BIQ) should be completed and submitted along with the above details
- iii. CEA may call for project briefing and further information on ESMP that should be provided by the PMU
- iv. Approval will be granted subjected to site specific conditions that should be adhered by the project

Annexure IV: Study team

Name	Designation	Position in the study
SAMS Dissanayake	Senior Scientist / ESSD / NBRI	Senior Environmental Scientist
Prabath Liyanaarachchi	Scientist/ ESSD/NBRI	Environmental Scientist, GIS/ Demographic data collection /survey, Report preparation
K.R.H.M.O.N Herath	Civil Eng. (Scientist)/ ESSD/ NBRI	Demographic data collection, Report preparation
A.G. Randombage	Project Assistant	Demographic data collection /survey, Report preparation

Annexure V: 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 the Ministry of Agriculture, Rural Economic Affairs, Livestock Development, Irrigation and Fisheries and Aquatic Resources Development