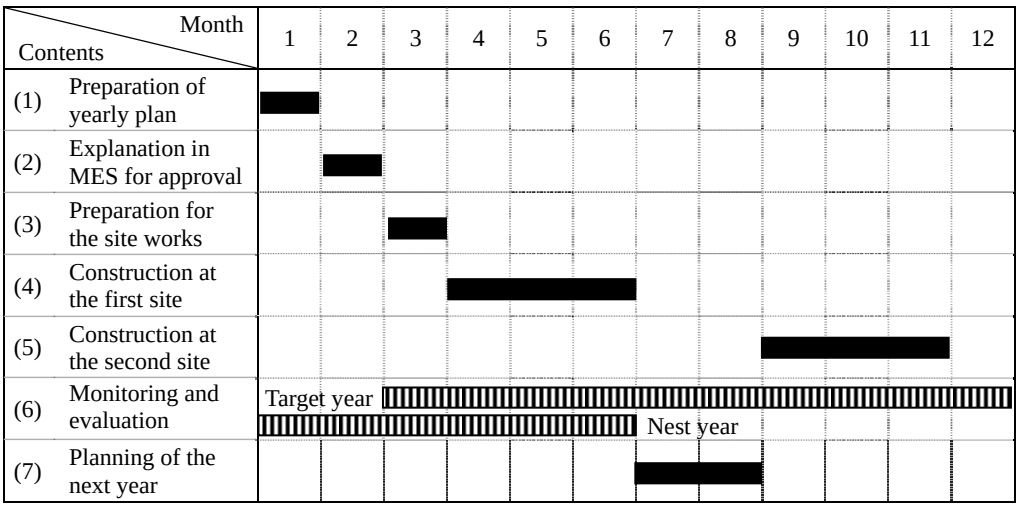
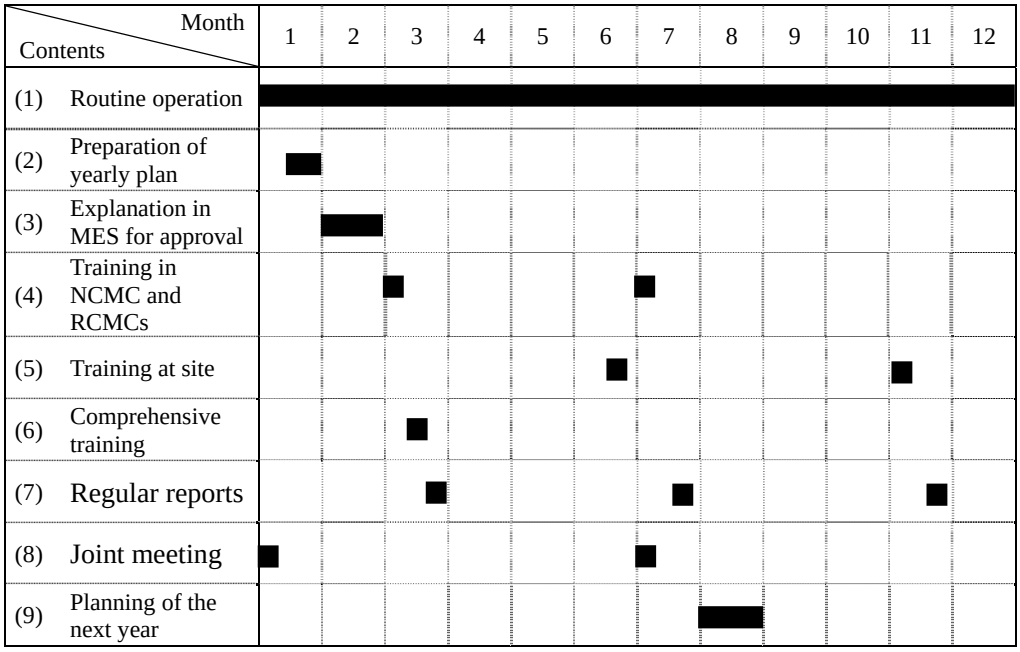
添付 4　実施計画書（排水ボーリング工）

## Action plan 1 (Drainage drilling)

| | |
|---|---|
| Purpose | To reduce landslide disaster risk by means of construction of drainage drillig facilities in two priority areas (activeness and importance are high) every year. |
| Organization | Managing organizatin: Department of Organization of Population Protection and Liquidation of Disaster Consequences (DOPPLDC), RS, MES RA<br>Implementing organization: Civil Protection Department, RS, MES RA<br>Related organizations: Regional Crisis Management Center, MES R, Marz office, Village administration of the project area |
| Task | Managing organization: Overall management, Preparation for implementation such as preparation of the detailed plan, explanation to related organizations, etc. Securing budget<br>Implementing organization: Construction of drainage drilling facilities<br>Related organization: Cooperation for site works, monitoring, etc. Maintenance of the constructed facilities |
| Contents | (1) Preparation of yearly plan for 2 sites (6 holes in total) by managing organization<br>(2) Explanation in MES for approval of the Minister on the plan by managing organization<br>(3) Preparation of the site works by implementing organizaiton and explanation to Marz an vilage by managing organization<br>(4) Construction of the facility (the first site) by implementing organiztion<br>(5) Construction of the facility (the second site) by implementing organiztion<br>(6) Monitoring and evauation of the effectiveness by iplementing and related organizations<br>(7) Preparation and submission of plan of the next year and mid-term plan by managing organization |
| Schedule |  |
| Cost | Foe two sites (in total 6 hoels of each 50 m long)<br>Project cost (Dorect and Indirect cost): 6.0 mil. AMD<br>Doirect cost (for materials, fuel, consumable, etc.): 3.3 mil. AMD<br>Indirect cost (for travel, accomoation, transportation): 2.7mil. AMD<br>Staff cost (allocated as salary and allowance for 14ays×5persons/1 hole): 6.0 mil. AMD |
| Reference | List of priority landslides for countermeasure works<br>Calculation sheet of drainage drillig works |

添付５　実施計画書（リアルタイムシステム運用）

## Action Plan 2 (real-time monitoring)

| | |
|---|---|
| Purpose | Continuos operation and functioning of rela-time monitoring system which connected National Crisis Management Center (NCMC) MES RA and Regional Crisis Managemnt Centers (RCMCs) MES RA responsible for 3 landslide sites |
| Organization | Managing organization: NCMC MES RA<br>Implementing organization: RCMC MES RA<br>Related organizaitons: Regional Rescue Service Departments responsible for the 3 target sites, Marzes, Village administrations, Maintenance company for the servers of MES, and Software development company |
| Task | Conducting training, evaluation, review, updating of the real-time monitoring sysytem for continuos operation and improvement of the system, together with routine operation of the real-time monitoring system |
| Contents | (1) Routine operation, in accordance with the exisiting SOP by implementing organiation<br>(2) Preparation of yearly plan<br>(3) Explanation in MES for approval of the Minister on the plan by managing organization<br>(4) Training in Crisis Management Centers, aiming at confirmation of collaboration among NCMC and RCMCs<br>(5) Training at site (evacuation drill), aiming at confirmation of collaboration between RCMC and village offices/ residents<br>(6) Comprehensive training, aiming at confirmation of collabolation among all the related organizaitons (managing, implementing, and related organizations)<br>(7) Regular reports on operational status, issues, and measures on the issues<br>(8) Joint meeting for improving the sytem, operation, and SOP<br>(9) Preparation and submission of plan of the next year and mid-term plan by managing organization |
| Schedule |  |
| Cost | Staff cost: no cost is required, since staff cost for the above-mentioned activities are included in ordinary activity cost (salary of the staffs)<br>Maintenance cost of equipment: Hardware (500,000 AMD), Software (500,000 AMD)<br>Training materials: 200 mil. AMD |
| Reference | Manuals of the system<br>SOP of the system |

添付 6　プロジェクトデザインマトリクス（PDM ver.0～PDM ver.3）

PDM ver.0

Annex 1-A

**Project Design Matrix (PDM Ver.0)**

**Creation date: Sept. 20, 2013**

**Project Name: Landslide Disaster Management Project**

**Duration of the project: 3 years**

**Project site: The Republic of Armenia**

**Target Group: Land slide disaster management Inter-agency Working Group (WG)**

| Narrative Summary | Objectively Verifiable Indicator | Means of Verification | Important Assumption |
|---|---|---|---|
| **[Overall goal]**<br>Reducing landslide disaster damage in Armenia through the formulation of a comprehensive landslide disaster management plan and implementation of measures on the basis of results of investigation/ assessment of landslide disaster risks | 1. Approving mid-term plan of landslide disaster management measures, based on the comprehensive landslide disaster management plan<br>2. Implementing landslide disaster management measures in accordance with the mid-term plan of landslide management measures | 1. Approval of the mid-term landslide management measures<br>2. Implementation of landslide disaster management measures | • National budget of Armenia for disaster management is not reduced |
| **[Project Purpose]**<br>Improving landslide disaster management capacity of WG | Members of WG;<br>1. understand and acquire mechanism of landslide activities and a sequence of landslide disaster management process, including investigation, assessment, and design/ order/ supervision of measures, [knowledge]<br>2. can formulate guidelines and manuals for standardization of necessary technology on landslide disaster risk reduction, [technology]<br>3. can propose for improvement of organizational and legal framework, and [organization and Institution]<br>4. can prepare for implementation of landslide disaster reduction measures and manage the implantation of the measures. [implementation of measures] | 1. Activity record of WG such as records of meetings and materials of the meeting<br>2. Guidelines and manuals approved by the Minister of MES<br>3. Proposals submitted to the Minister of MES<br>4. Comprehensive landslide disaster management plan approved by the Minister of MES, Design and tender documents for implementation of pilot projects, and installed real-time monitoring system, and landslide disaster management measures such as dewatering drilling | • Policy for landslide disaster management in Armenia is not changed<br>• Members of WG are not changed<br>• Function of the crisis management center is maintained<br>• Staffs for dewatering drilling are not changed<br>• Staffs for formulating plans and implementing measures are not changed |

**Project Design Matrix (PDM0)**

| Narrative Summary | Objectively Verifiable Indicator | Means of Verification | Important Assumption |
|---|---|---|---|
| [Outputs]<br>1. The members of WG acquire technology and know-how on investigation, assessment, and design/ order/ supervision of measures | 1-1 Existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures are updated.<br>1-2 WG proposes landslide risk reduction measures to the Minister of MES | 1-1 Updated landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>1-2 Proposal to the Minister submitted by WG | • The framework of WG is maintained.<br>• WG members continue working in their original organizations. |
| 2. A comprehensive landslide disaster management plan in Armenia is formulated, guidelines for landslide disaster management (investigation, assessment, and design/ order/ supervision of measures) are prepared, and laws and regulations for implementation of the measures are improved. | 2-1 A comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures are formulated.<br>2-2 Guidelines for landslide disaster management are prepared.<br>2-3 WG organizes seminars four times or more, aiming at utilization of the guidelines in related ministries.<br>2-4 Laws and regulations for implementation of landslide disaster management are formulated. | 2-1 A comprehensive landslide disaster management plan in Armenia<br>2-2 Approved guidelines<br>2-3 Data/ records kept in MES<br>2-4 Draft of laws and regulations submitted to the Minister of MES | |
| 3. Organizational and institutional framework for implementation of monitoring, proactive measures, emergency measures, and permanent measures is improved in related ministries and agencies, in accordance with the concept for landslide disaster management. | 3-1 Evaluation of pilot projects, such as monitoring and dewatering drilling works, is evaluated, and then, implementation plans of the projects is prepared.<br>3-2 Data base on landslide disaster management is added to the existing real-time monitoring system.<br>3-3 The rescue team of RS, MES acquires skills for operation of dewatering drilling machine to be provided in the project, and the team operates and maintains dewatering drilling at two locations or more.<br>3-4 Ministries and agencies, being in charge of implementation of measures, prepare design documents and tender documents of landslide disaster measures, in accordance with the guidelines. | 3-1 Evaluation reports and implementation plans of pilot projects<br>3-2 Real-time monitoring system on landslide disaster (observation and information system operated by MES in cooperation with local communities and real-time system in the crisis management center of MES)<br>3-3 Operation records of MES<br>3-4 Data in related ministries and agencies | • Existing real-time monitoring system is maintained.<br>• Armenian budget for investigation and measures is not reduced from the present level. |

**Project Design Matrix (PDM0)**

| Narrative Summary<br>[Activities] | [Inputs] | | Important Assumption |
|---|---|---|---|
| (1-1)Updating existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>(1-1-1)Adding locations of landslides which damages are identified after 2006 and preparing landslide inventory sheets for the newly identified landslides (assumed to be several landslides)<br>(1-1-2)Updating the contents of the existing landslide inventory sheets<br>(1-1-3)Updating priority list of landslide measures, based on activeness and damages of landslides described in the inventory sheet<br>(1-2)Organizing seminars, workshops, co-working, site training in WG for acquisition of technology and capacity on investigation, assessment (stability analysis), and design/ order/ supervision for implementation, necessary for landslide disaster management works<br>- Acquisition of methodology and know-how on information dissemination of landslide disaster management to population<br>- Acquisition of investigation method and technique on data processing<br>- Acquisition of stability analysis<br>- Acquisition of design method<br>- Clarifying soft measures and issues in implementation<br>- Clarifying the procedure for order of countermeasure works and issues in implementation<br>- Clarifying the procedure for supervision of countermeasure works and issues in implementation<br>(1-3)Preparing plans to resolve the identified issues and submitting proposal for the solution to Minister, MES<br>(2-1) WG formulates a comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures.<br>(2-2) WG prepares the following guidelines for landslide disaster management.<br>- Investigation method and data processing<br>- Method of stability analysis<br>- Method of design of countermeasure works<br>- Soft measures<br>- Procedure of order<br>- Procedure of supervision of countermeasure works<br>(2-3)Organizing seminars/ lectures/ site training initiated by members of WG in charge of the above-mentioned items for better use of guidelines in the related ministries and agencies<br>(2-4) Assisting improvement of laws and regulations for implementation of measures.<br>(2-4-1) Arranging and reviewing existing laws and regulations related to disaster management, and then, picking up laws and regulation requiring addition or | **Armenian side**<br>● Allocation of budget<br>1) Salaries and other allowances for the Armenian counterpart personnel for co-working in Armenia<br>2) Expenses for utility such as domestic telecommunication, electricity, water supply for the project office<br>3) Operational expenses for customs clearance, storage and domestic transportation for the equipment provided by the Japanese side<br>4) Expenses for operation and maintenance of facilities and equipment provided by the Japanese side<br><br>● Allocation of personnel<br>1) Assignment suitable number of capable counterpart personnel in order to ensure the effective implementation of the Project<br><br>● Principal facilities<br>1) Preparation of air-conditioned office space with one telephone line, internet connection and office furniture (desks and chairs) in MES<br><br>● Necessary items<br>1) Access to information necessary for the Project such as landslide data base, maps | **Japanese side**<br>● Experts<br>1) Chief advisor/ landslide disaster measures<br>2) Landslide investigation/analysis/ monitoring<br>3) Drilling technique<br>4) System creation<br>5) Institution<br><br>● Equipment (hand-over of import equipment is at arrival location in Armenia)<br>・Drilling machinery capable for horizontal drilling with accessories: 1 set<br>・Landslide monitoring equipment such as digital water level gauge, extensometer, rain gauge: 4 sets<br>・Internet communication devices: 2 sets<br>・Landslide stability analysis software: 5 sets<br>● Training in Japan<br><br>● Local cost (investigation drilling, | WG maintains functioning |

| | | | |
|---|---|---|---|
| revision.<br>(2-4-2) Holding discussion with related ministries on laws and regulations which require addition or revision, and then, having consensus on necessity of improvement.<br>(2-4-3) Assisting related ministries for improvement of laws and regulations, such as providing technical advices and preparing drafts<br>(3-1) Evaluating projects of landslide disaster measures such as monitoring and dewatering drilling as well as planning and preparation of the projects<br>(3-2) Adding landslide monitoring system (observation and information system operated by MES in cooperation with local communities and real-time system in the crisis management center of MES, each two systems) to the existing real-time monitoring system on landslide disaster<br>(3-2-1) Formulating a plan for installation of landslide monitoring system, including arrangement plan of equipment, after the clarification of the purpose and items of the monitoring.<br>(3-2-2) Procurement of equipment necessary for the monitoring<br>(3-2-3) Preparing a manual on monitoring and conducting training<br>(3-3) The Rescue Department, RS, MES acquires technique on operation of the provided dewatering drilling equipment, and then, implementing/ maintaining the dewatering drilling<br>(3-3-1) Procuring dewatering drilling equipment<br>(3-3-2) Conducting operation training, in accordance with operation manual of drilling<br>(3-3-3) Selecting landslides for implementation of dewatering drilling and preparing implementation plans, including location and depth of the drilling<br>(3-3-4) Perforating dewatering drilling, finishing the dewatering holes, and installing drainage ditch, if required.<br>(3-3-5) Maintaining dewatering holes and carrying out necessary monitoring such as measurement of discharge and quality check of drained groundwater.<br>(3-4) Preparing design documents and tender documents for implementation of landslide disaster measures by responsible ministries, with assistance and advice of WG<br>(3-4-1) Preparing stability analysis reports and summary of countermeasure works by WG<br>(3-4-2) Ordering design works of countermeasure works and supervising the sublet works by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG<br>(3-4-3) Checking the prepared design documents and preparing tender documents, including specifications by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG. | 2) Securing necessary land for installation of dewatering holes and monitoring equipment<br>3) Maintenance of equipment necessary for the dewatering and monitoring<br>4) Maintenance of devices necessary for the data transmission for real-time monitoring | in-situ tests, laboratory tests for soil) | |

PDM ver.1

**Project Design Matrix (PDM Ver.1)** **Creation date: 12 August 2014**

**Project Name: Landslide Disaster Management Project**

**Duration of the project: 3 years**

**Project site: The Republic of Armenia** **Target Group: Land slide disaster management Inter-agency Working Group (WG)**

| Narrative Summary | Objectively Verifiable Indicator | Means of Verification | Important Assumption |
|---|---|---|---|
| **[Overall goal]**<br>Reducing landslide disaster damage in Armenia through the development of a comprehensive landslide disaster management plan and implementation of measures on the basis of results of investigation/ assessment of landslide disaster risks | 1. Approving mid-term plan of landslide disaster management measures, based on the comprehensive landslide disaster management plan<br>2. Implementing landslide disaster management measures in accordance with the mid-term plan of landslide management measures | 1. Approval of the mid-term landslide management measures<br>2. Implementation of landslide disaster management measures | |
| **[Project Purpose]**<br>Improving landslide disaster management capacity of WG | WG is able to<br>1. perform disaster management process, including investigation, assessment, and design/ order/ supervision of measures, [knowledge]<br>2. formulate guidelines and manuals for standardization of necessary technology on landslide disaster risk reduction, [technology]<br>3. propose for improvement of organizational and legal framework [organization and Institution], and<br>4. prepare for implementation of landslide disaster reduction measures and manage the implantation of the measures. [implementation of measures] | 1. Activity record of WG such as records of meetings and materials of the meeting<br>2. Guidelines and manuals approved by the Minister of MES<br>3. Proposals submitted to the Minister of MES<br>4. Comprehensive landslide disaster management plan approved by the Minister of MES, Design and tender documents for implementation of pilot projects, and installed real-time monitoring system, and landslide disaster management measures such as dewatering drilling | ・ Policy for landslide disaster management in Armenia does not change and WG continues to function |

**Project Design Matrix (PDM1)**

| Narrative Summary | Objectively Verifiable Indicator | Means of Verification | Important Assumption |
|---|---|---|---|
| **[Outputs]**<br>1. The members of WG acquire technology and know-how on investigation, assessment, and design/ order/ supervision of measures | 1-1 Existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures are updated.<br>1-2 WG proposes landslide risk reduction measures to the Minister of MES | 1-1 Updated landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>1-2 Proposal to the Minister submitted by WG | ・WG members continue to work in their original organizations |
| 2. A comprehensive landslide disaster management plan in Armenia is formulated, guidelines for landslide disaster management (investigation, assessment, and design/ order/ supervision of measures) are prepared, and laws and regulations for implementation of the measures are improved. | 2-1 A comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures are formulated.<br>2-2 Guidelines for landslide disaster management are prepared.<br>2-3 WG organizes seminars four times or more, aiming at utilization of the guidelines in related ministries.<br>2-4 Laws and regulations for implementation of landslide disaster management are formulated. | 2-1 A comprehensive landslide disaster management plan in Armenia<br>2-2 Approved guidelines<br>2-3 Data/ records kept in MES<br>2-4 Draft of laws and regulations submitted to the Minister of MES | |
| 3. Organizational and institutional framework for implementation of monitoring, proactive measures, emergency measures, and permanent measures is improved in related ministries and agencies, in accordance with the concept for landslide disaster management in the Republic of Armenia.. | 3-1 Evaluation of pilot projects, such as monitoring and dewatering drilling works, is evaluated, and then, implementation plans of the projects is prepared.<br>3-2 Data base on landslide disaster management is added to the existing real-time monitoring system.<br>3-3 The rescue team of RS, MES acquires skills for operation of dewatering drilling machine to be provided in the project, and the team operates and maintains dewatering drilling at two locations or more.<br>3-4 Ministries and agencies, being in charge of implementation of measures, prepare design documents and tender documents of landslide disaster measures, in accordance with the guidelines. | 3-1 Evaluation reports and implementation plans of pilot projects<br>3-2 Real-time monitoring system on landslide disaster (observation and information system operated by MES in cooperation with local communities and real-time system in the crisis management center of MES)<br>3-3 Operation records of MES<br>3-4 Data in related ministries and agencies | ・Crisis management center of MES continues to function and maintain real-time monitoring system<br>・Armenian budget for landslide investigation and measures is not reduced from the present level. |

**Project Design Matrix (PDM1)**

| **Narrative Summary**<br>**[Activities]** | **[Inputs]** | | **Important Assumption** |
|---|---|---|---|
| (1-1)Updating existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>(1-1-1)Adding locations of landslides which damages are identified after 2006 and preparing landslide inventory sheets for the newly identified landslides (assumed to be several landslides)<br>(1-1-2)Updating the contents of the existing landslide inventory sheets<br>(1-1-3)Updating priority list of landslide measures, based on activeness and damages of landslides described in the inventory sheet<br>(1-2)Organizing seminars, workshops, co-working, site training in WG for acquisition of technology and capacity on investigation, assessment (stability analysis), and design/ order/ supervision for implementation, necessary for landslide disaster management works<br>− Acquisition of methodology and know-how on information dissemination of landslide disaster management to population<br>− Acquisition of investigation method and technique on data processing<br>− Acquisition of stability analysis<br>− Acquisition of design method<br>− Clarifying soft measures and issues in implementation<br>− Clarifying the procedure for order of countermeasure works and issues in implementation<br>− Clarifying the procedure for supervision of countermeasure works and issues in implementation<br>(1-3)Preparing plans to resolve the identified issues and submitting proposal for the solution to Minister, MES<br>(2-1) WG formulates a comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures.<br>(2-2) WG prepares the following guidelines for landslide disaster management.<br>− Investigation method and data processing<br>− Method of stability analysis<br>− Method of design of countermeasure works<br>− Soft measures<br>− Procedure of order<br>− Procedure of supervision of countermeasure works<br>(2-3)Organizing seminars/ lectures/ site training initiated by members of WG in charge of the above-mentioned items for better use of guidelines in the related ministries and agencies<br>(2-4) Assisting improvement of laws and regulations for implementation of measures.<br>(2-4-1) Arranging and reviewing existing laws and regulations related to disaster management, and then, picking up laws and regulation requiring addition or | **<u>Armenian side</u>**<br>● Allocation of budget<br>1) Salaries and other allowances for the Armenian counterpart personnel for co-working in Armenia<br>2) Expenses for utility such as domestic telecommunication, electricity, water supply for the project office<br>3) Operational expenses for customs clearance, storage and domestic transportation for the equipment provided by the Japanese side<br>4) Expenses for operation and maintenance of facilities and equipment provided by the Japanese side<br><br>● Allocation of personnel<br>1) Assignment suitable number of capable counterpart personnel in order to ensure the effective implementation of the Project<br><br>● Principal facilities<br>1) Preparation of air-conditioned office space with one telephone line, internet connection and office furniture (desks and chairs) in MES<br><br>● Necessary items<br>1) Access to information necessary for the Project such as landslide data base, maps | **<u>Japanese side</u>**<br>● Experts<br>1) Chief advisor/ landslide disaster measures<br>2) Landslide investigation/ analysis/ monitoring<br>3) Slope stabilization, Draining<br>4) Monitoring network<br>5) Institution and law<br><br>● Equipment<br>・Drilling machinery with accessories for horizontal drilling: 1 set<br>・Landslide monitoring equipment such as digital water level gauge, extensometer, rain gauge: 4 sets<br>・Internet communication devices: 2 sets<br>・Landslide stability analysis software: 5 sets<br><br>● Training in Japan<br><br>● Cost<br>(investigation drilling, in-situ tests, soil tests) | WG members are selected |

| | | | |
|---|---|---|---|
| revision.<br>(2-4-2) Holding discussion with related ministries on laws and regulations which require addition or revision, and then, having consensus on necessity of improvement.<br>(2-4-3) Assisting related ministries for improvement of laws and regulations, such as providing technical advices and preparing drafts<br>(3-1) Evaluating projects of landslide disaster measures such as monitoring and dewatering drilling as well as planning and preparation of the projects<br>(3-2) Installing landslide monitoring system for two pilot project areas to the Crisis Management Center MES, to be operated by MES in cooperation with local communities<br>(3-2-1) Formulating a plan for installation of landslide monitoring system, including arrangement plan of equipment, after the clarification of the purpose and items of the monitoring.<br>(3-2-2) Procurement of equipment necessary for the monitoring<br>(3-2-3) Preparing a manual on monitoring and conducting training<br>(3-3) The Rescue Department, RS, MES acquires technique on operation of the provided dewatering drilling equipment, and then, implementing/ maintaining the dewatering drilling<br>(3-3-1) Procuring dewatering drilling equipment<br>(3-3-2) Conducting operation training, in accordance with operation manual of drilling<br>(3-3-3) Selecting landslides for implementation of dewatering drilling and preparing implementation plans, including location and depth of the drilling<br>(3-3-4) Perforating dewatering drilling, finishing the dewatering holes, and installing drainage ditch, if required.<br>(3-3-5) Maintaining dewatering holes and carrying out necessary monitoring such as measurement of discharge and quality check of drained groundwater.<br>(3-4) Preparing design documents and tender documents for implementation of landslide disaster measures by responsible ministries, with assistance and advice of WG<br>(3-4-1) Preparing stability analysis reports and summary of countermeasure works by WG<br>(3-4-2) Ordering design works of countermeasure works and supervising the sublet works by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG<br>(3-4-3) Checking the prepared design documents and preparing tender documents, including specifications by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG. | 2) Securing necessary land for installation of dewatering holes and monitoring equipment<br>3) Maintenance of equipment necessary for the dewatering and monitoring<br>4) Maintenance of devices necessary for the data transmission for real-time monitoring. | | |

MES: Ministry of Emergency Situations

PDM ver.2

**Project Design Matrix (PDM Ver.2)** **Creation date: 25 September 2015**

**Project Name: Landslide Disaster Management Project**

**Duration of the project: 3 years**

**Project site: The Republic of Armenia** **Target Group: Land slide disaster management Inter-agency Working Group (WG)**

| Narrative Summary | Objectively Verifiable Indicator | Means of Verification | Important Assumption |
|---|---|---|---|
| **[Overall goal]**<br>Reducing landslide disaster damage in Armenia through the development of a comprehensive landslide disaster management plan and implementation of measures on the basis of results of investigation/ assessment of landslide disaster risks | 1. Approving mid-term plan of landslide disaster management measures, based on the comprehensive landslide disaster management plan<br>2. Implementing landslide disaster management measures in accordance with the mid-term plan of landslide management measures | 1. Approval of the mid-term landslide management measures<br>2. Implementation of landslide disaster management measures | |
| **[Project Purpose]**<br>Improving landslide disaster management capacity of WG | WG is able to<br>1. perform disaster management process, including investigation, assessment, and design/ order/ supervision of measures, [knowledge]<br>2. formulate guidelines and manuals for standardization of necessary technology on landslide disaster risk reduction, [technology]<br>3. propose for improvement of organizational and legal framework [organization and Institution], and<br>4. prepare for implementation of landslide disaster reduction measures and manage the implantation of the measures. [implementation of measures] | 1. Activity record of WG such as records of meetings and materials of the meeting<br>2. Guidelines and manuals approved by the Minister of MTAES<br>3. Proposals submitted to the Minister of MTAES<br>4. Comprehensive landslide disaster management plan approved by the Minister of MTAES, Design and tender documents for implementation of pilot projects, and installed real-time monitoring system, and landslide disaster management measures such as dewatering drilling | ・ Policy for landslide disaster management in Armenia does not change and WG continues to function |

**Project Design Matrix (PDM2)**

| Narrative Summary | Objectively Verifiable Indicator | Means of Verification | Important Assumption |
|---|---|---|---|
| **[Outputs]**<br>1. The members of WG acquire technology and know-how on investigation, assessment, and design/ order/ supervision of measures | 1-1 Existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures are updated.<br>1-2 WG proposes landslide risk reduction measures to the Minister of MTAES | 1-1 Updated landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>1-2 Proposal to the Minister submitted by WG | ・WG members continue to work in their original organizations |
| 2. A comprehensive landslide disaster management plan in Armenia is formulated, guidelines for landslide disaster management (investigation, assessment, and design/ order/ supervision of measures) are prepared, and laws and regulations for implementation of the measures are improved. | 2-1 A comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures are formulated.<br>2-2 Guidelines for landslide disaster management are prepared.<br>2-3 WG organizes seminars four times or more, aiming at utilization of the guidelines in related ministries.<br>2-4 Laws and regulations for implementation of landslide disaster management are formulated. | 2-1 A comprehensive landslide disaster management plan in Armenia<br>2-2 Approved guidelines<br>2-3 Data/ records kept in MTAES<br>2-4 Draft of laws and regulations submitted to the Minister of MTAES | |
| 3. Organizational and institutional framework for implementation of monitoring, proactive measures, emergency measures, and permanent measures is improved in related ministries and agencies, in accordance with the concept for landslide disaster management in the Republic of Armenia.. | 3-1 Evaluation of pilot projects, such as monitoring and dewatering drilling works, is evaluated, and then, implementation plans of the projects is prepared.<br>3-2 Data base on landslide disaster management is added to the existing real-time monitoring system.<br>3-3 The rescue team of RS, MTAES acquires skills for operation of dewatering drilling machine to be provided in the project, and the team operates and maintains dewatering drilling at two locations or more.<br>3-4 Ministries and agencies, being in charge of implementation of measures, prepare design documents and tender documents of landslide disaster measures, in accordance with the guidelines. | 3-1 Evaluation reports and implementation plans of pilot projects<br>3-2 Real-time monitoring system on landslide disaster (observation and information system operated by MTAES in cooperation with local communities and real-time system in the crisis management center of MTAES)<br>3-3 Operation records of MTAES<br>3-4 Data in related ministries and agencies | ・Crisis management center of MTAES continues to function and maintain real-time monitoring system<br>・Armenian budget for landslide investigation and measures is not reduced from the present level. |

**Project Design Matrix (PDM2)**

| **Narrative Summary**<br>**[Activities]** | **[Inputs]** | | **Important Assumption** |
|---|---|---|---|
| (1-1)Updating existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>(1-1-1)Adding locations of landslides which damages are identified after 2006 and preparing landslide inventory sheets for the newly identified landslides (assumed to be several landslides)<br>(1-1-2)Updating the contents of the existing landslide inventory sheets<br>(1-1-3)Updating priority list of landslide measures, based on activeness and damages of landslides described in the inventory sheet<br>(1-2)Organizing seminars, workshops, co-working, site training in WG for acquisition of technology and capacity on investigation, assessment (stability analysis), and design/ order/ supervision for implementation, necessary for landslide disaster management works<br>− Acquisition of methodology and know-how on information dissemination of landslide disaster management to population<br>− Acquisition of investigation method and technique on data processing<br>− Acquisition of stability analysis<br>− Acquisition of design method<br>− Clarifying soft measures and issues in implementation<br>− Clarifying the procedure for order of countermeasure works and issues in implementation<br>− Clarifying the procedure for supervision of countermeasure works and issues in implementation<br>(1-3)Preparing plans to resolve the identified issues and submitting proposal for the solution to Minister, MTAES<br>(2-1) WG formulates a comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures.<br>(2-2) WG prepares the following guidelines for landslide disaster management.<br>− Investigation method and data processing<br>− Method of stability analysis<br>− Method of design of countermeasure works<br>− Soft measures<br>− Procedure of order<br>− Procedure of supervision of countermeasure works<br>(2-3)Organizing seminars/ lectures/ site training initiated by members of WG in charge of the above-mentioned items for better use of guidelines in the related ministries and agencies<br>(2-4) Assisting improvement of laws and regulations for implementation of measures.<br>(2-4-1) Arranging and reviewing existing laws and regulations related to disaster management, and then, picking up laws and regulation requiring addition or | **<u>Armenian side</u>**<br>● Allocation of budget<br>1) Salaries and other allowances for the Armenian counterpart personnel for co-working in Armenia<br>2) Expenses for utility such as domestic telecommunication, electricity, water supply for the project office<br>3) Operational expenses for customs clearance, storage and domestic transportation for the equipment provided by the Japanese side<br>4) Expenses for operation and maintenance of facilities and equipment provided by the Japanese side<br><br>● Allocation of personnel<br>1) Assignment suitable number of capable counterpart personnel in order to ensure the effective implementation of the Project<br><br>● Principal facilities<br>1) Preparation of air-conditioned office space with one telephone line, internet connection and office furniture (desks and chairs) in MTAES<br><br>● Necessary items<br>1) Access to information necessary for the Project such as landslide data base, maps | **<u>Japanese side</u>**<br>● Experts<br>1) Chief advisor/ landslide disaster measures<br>2) Landslide investigation/ analysis/ monitoring<br>3) Slope stabilization, Draining<br>4) Monitoring network<br>5) Institution and law<br><br>● Equipment<br>・Drilling machinery with accessories for horizontal drilling: 1 set<br>・Landslide monitoring equipment such as digital water level gauge, extensometer, rain gauge: 4 sets<br>・Internet communication devices: 3 sets<br>・Landslide stability analysis software: 5 sets<br><br>● Training in Japan<br><br>● Cost<br>(investigation drilling, in-situ tests, soil tests) | WG members are selected |

| | | | |
|---|---|---|---|
| revision.<br>(2-4-2) Holding discussion with related ministries on laws and regulations which require addition or revision, and then, having consensus on necessity of improvement.<br>(2-4-3) Assisting related ministries for improvement of laws and regulations, such as providing technical advices and preparing drafts<br>(3-1) Evaluating projects of landslide disaster measures such as monitoring and dewatering drilling as well as planning and preparation of the projects<br>(3-2) Installing landslide monitoring system for two pilot project areas to the Crisis Management Center MTAES, to be operated by MTAES in cooperation with local communities<br>(3-2-1) Formulating a plan for installation of landslide monitoring system, including arrangement plan of equipment, after the clarification of the purpose and items of the monitoring.<br>(3-2-2) Procurement of equipment necessary for the monitoring<br>(3-2-3) Preparing a manual on monitoring and conducting training<br>(3-3) The Rescue Department, RS, MTAES acquires technique on operation of the provided dewatering drilling equipment, and then, implementing/ maintaining the dewatering drilling<br>(3-3-1) Procuring dewatering drilling equipment<br>(3-3-2) Conducting operation training, in accordance with operation manual of drilling<br>(3-3-3) Selecting landslides for implementation of dewatering drilling and preparing implementation plans, including location and depth of the drilling<br>(3-3-4) Perforating dewatering drilling, finishing the dewatering holes, and installing drainage ditch, if required.<br>(3-3-5) Maintaining dewatering holes and carrying out necessary monitoring such as measurement of discharge and quality check of drained groundwater.<br>(3-4) Preparing design documents and tender documents for implementation of landslide disaster measures by responsible ministries, with assistance and advice of WG<br>(3-4-1) Preparing stability analysis reports and summary of countermeasure works by WG<br>(3-4-2) Ordering design works of countermeasure works and supervising the sublet works by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG<br>(3-4-3) Checking the prepared design documents and preparing tender documents, including specifications by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG. | 2) Securing necessary land for installation of dewatering holes and monitoring equipment<br>3) Maintenance of equipment necessary for the dewatering and monitoring<br>4) Maintenance of devices necessary for the data transmission for real-time monitoring. | | |

MTAES: Ministry of Territorial Administration and Emergency Situations

PDM ver.3

**Appendix 1: Project Design Matrix (PDM) Ver.3 Draft**

Creation date: 25 January 2017

Project Name: Landslide Disaster Management Project

Duration of the Project: 3 years

Project site: The Republic of Armenia

Target Group: Landslide disaster management Inter-agency Working Group (WG)

| Narrative Summary | Verifiable Indicators | Means of Verification | Important Assumptions |
|---|---|---|---|
| [Overall Goal]<br>Landslide disaster risk in Armenia is reduce through the development of Comprehensive Landslide Disaster Management Plan and implementation of measures on the basis of results of investigation/assessment of landslides. | 1. Groundwater drainage drilling holes are planned and implemented at two priority landslides in a year.<br>2. Landslide monitoring system is functioned at three regional crisis management center in accordance with the latest SOP. | 1. Records of operation of drainage drilling works to be done by drilling team of RS.<br>2. Records of operation of crisis management centers in three regions. | |
| [Project Purpose]<br>Landslide disaster risk reduction capacity of the WG is improved. | WG is able to<br>1. perform disaster risk reduction process, including investigation, assessment, and design/order/supervision of measures, [knowledge]<br>2. formulate Guideline for standardization of necessary technology on landslide disaster risk reduction, [technology]<br>3. propose for improvement of organizational and legal framework [organization and institution], and<br>4. implement and manage landslide disaster risk reduction measures. [implementation of measures] | 1. Records of WG such as meetings and activities.<br>2. Guideline approved by the Minister of MES.<br>3. Proposals submitted to the Minister of MES.<br>4. Comprehensive landslide disaster management plan approved by the Minister of MES, Design and tender documents for implementation of pilot projects, and installed real-time monitoring system, and landslide disaster risk reduction measures such as drainage drilling. | · Policy for landslide disaster management in Armenia does not change and WG continues to function. |
| [Outputs]<br>1. The members of WG acquire technology and know-how on investigation, assessment, and design/order/supervision of measures. | 1-1 Existing landslide distribution maps, landslide inventory sheets, and priority list of landslide measures are updated.<br>1-2 WG proposes landslide risk reduction measures to the Minister of MES. | 1-1 Updated landslide distribution maps, landslide inventory sheets, and priority list of landslide measures.<br>1-2 Proposals to the Minister submitted by WG. | · WG members continue to work in their original organizations. |
| 2. Comprehensive Landslide Disaster Management Plan in Armenia is formulated, Guideline for landslide disaster risk reduction (investigation, assessment, and design/order/supervision of measures) is prepared, and laws and regulations for implementation of the measures are improved. | 2-1 Comprehensive Landslide Disaster Management Plan, covering monitoring, proactive measures, emergency measures, and permanent measures are formulated.<br>2-2 Guideline for landslide disaster risk reduction is prepared.<br>2-3 WG organizes seminars four times or more, aiming at utilization of the Guideline in related ministries.<br>2-4 Drafts of addition and revision of laws and regulations for implementation of landslide disaster risk reduction measures are prepared. | 2-1 Comprehensive Landslide Disaster Management Plan in Armenia.<br>2-2 Approved Guideline.<br>2-3 Data/records kept in MES.<br>2-4 Drafts of laws and regulations. | |
| 3. Organizational and institutional framework for implementation of monitoring, proactive measures, emergency measures, and permanent measures is improved in related ministries and agencies, in accordance with the Concept for Landslide Disaster Management in the Republic of Armenia. | 3-1 Results of monitoring and drainage drilling works are evaluated, and then, implementation plans of further measures are prepared.<br>3-2 Landslide real-time monitoring system is developed and functioned.<br>3-3 The rescue team of RS, MES acquires skills for operation of drainage drilling equipment provided by the project, and the team operates drainage drilling at two locations or more.<br>3-4 Ministries and agencies, being in charge of implementation of measures, prepare plans of landslide measures, in accordance with the Guideline. | 3-1 Evaluation reports of pilot projects and implementation plans of further measures.<br>3-2 Operation record of landslide real-time monitoring system.<br>3-3 Operation records of drainage drilling works.<br>3-4 Plans in related ministries and agencies. | · Armenian budget for landslide investigation and measures is not reduced from the present level. |

| Narrative Summary<br>[Activities] | [Input] | | Important Assumption |
|---|---|---|---|
| (1-1) Updating existing landslide distribution maps, landslide inventory sheets, and priority list of landslide measures.<br>(1-1-1) Adding locations of landslides which damages are identified after 2006 and preparing landslide inventory sheets for the newly identified landslides (assumed to be several landslides)<br>(1-1-2) Updating the contents of the existing landslide inventory sheets.<br>(1-1-3) Updating priority list of landslide measures, based on activeness and damages of landslides described in the inventory sheet.<br>(1-2) Organizing seminars, workshops, co-working, site training in WG for acquisition of technology and capacity on investigation, assessment (stability analysis), and design/order/supervision for implementation, necessary for landslide disaster risk reduction works.<br>- Acquisition of methodology and know-how on information dissemination of landslide disaster risk reduction to population.<br>- Acquisition of investigation method and technique on data processing.<br>- Acquisition of stability analysis.<br>- Acquisition of design method.<br>- Clarifying soft measures and issues in implementation.<br>- Clarifying the procedure for order of countermeasure works and issues in implementation.<br>(1-3) Preparing plans to resolve the identified issues and submitting proposal for the solution to the Minister, MES.<br>(2-1) WG formulates a comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures.<br>(2-2) WG prepares the following guidelines for landslide disaster risk reduction.<br>- Investigation method and data processing.<br>- Method of stability analysis.<br>- Soft measures<br>- Procedure of order<br>- Procedure of supervision of countermeasure works.<br>(2-3) Organizing seminars/lectures/site training initiated by members of WG in charge of the above-mentioned items for better use of guidelines in the related ministries and agencies.<br>(2-4) Assisting improvement of laws and regulations for implementation of measures.<br>(2-4-1) Arranging and reviewing existing laws and regulations related to disaster management, and then, picking up laws and regulation requiring addition or revision.<br>(2-4-2) Holding discussion with related ministries on laws and regulations which require addition or revision, and then, having consensus on necessity of improvement.<br>(2-4-3) Assisting related ministries for improvement of laws and regulations, such as providing technical advices and preparing drafts.<br>(3-1) Evaluating projects of landslide measures such as monitoring and drainage drilling as well as planning and preparation of the projects.<br>(3-2) Installing landslide monitoring systems for three pilot project areas in the Crisis Management Centers, to be operated by MES in cooperation with local communities.<br>(3-2-1) Formulating a plan for installation of landslide monitoring system, including arrangement plan of equipment, after the clarification of the purpose and items of the monitoring.<br>(3-2-2) Procurement of equipment necessary for the monitoring.<br>(3-2-3) Preparing a manual on monitoring and conducting training.<br>(3-3) The Rescue Department, RS, MES acquires technique on operation of the provided drainage drilling equipment, and then, implementing/maintaining the drainage drilling.<br>(3-3-1) Procuring dewatering drilling equipment.<br>(3-3-2) Conducting operation training, in accordance with operation manual of drilling.<br>(3-3-3) Selecting landslides for implementation of drainage drilling and preparing implementation plans, including location an depth of drilling.<br>(3-3-4) Perforating drainage drilling, finishing the drainage holes, and installing drainage ditch, if required.<br>(3-3-5) Maintaining drainage holes and carrying out necessary monitoring such as measurement of discharge and quality check of drained groundwater.<br>(3-4) Preparing design documents and tender documents for implementation of landslide disaster measures by responsible ministries, with assistance and advice of WG.<br>(3-4-1) Preparing stability analysis reports and summary of countermeasure works by WG.<br>(3-4-2) Ordering design works of countermeasure works and supervising the sublet works by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG.<br>(3-4-3) Checking the prepared design documents and preparing tender documents, including specifications by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG. | **Armenian Side**<br>● Allocation of budget<br>1) Salaries and other allowances for the Armenian counterpart personnel for co-working in Armenia.<br>2) Expenses for utility such as domestic telecommunications, electricity, water supply for the project office.<br>3) Operational expenses for customs clearance, storage and domestic transportation for the equipment provided by the Japanese side.<br>4) Expenses for operation and maintenance of facilities and equipment provided by the Japanese side.<br><br>● Allocation of personnel<br>1) Assignment suitable number of capable counterpart personnel in order to ensure the effective implementation of the Project.<br><br>● Principal facilities<br>1) Preparation of air-conditioned office space with one telephone line, internet connection and office furniture (desks and chairs) in MATES.<br><br>● Necessary items<br>1) Access to information necessary for the Project such as landslide data base, maps.<br>2) Securing necessary land for installation of dewatering holes and monitoring equipment.<br>3) Maintenance of equipment necessary for the dewatering and monitoring.<br>4) Maintenance of devices necessary for the data transmission for real-time monitoring. | **Japanese Side**<br>● Experts<br>1)Chief advisor/landslide disaster measures<br>2)Landslide investigation/ analysis/ monitoring<br>3)Slope stabilization, Draining<br>4)Monitoring network<br>5)Institution and law<br><br>● Equipment<br>・ Drilling machinery with accessories for horizontal drilling: 1 set<br>・ Landslide monitoring equipment such as digital water level gauge, extensometer, rain gauge: 4 sets<br>・ Internet communication devices: 3 sets<br>・ Landslide stability analysis software: 5 sets<br><br>● Training in Japan<br><br>● Cost<br>(investigation drilling, in-situ tests, soil tests) | WG members are selected. |

MES: Ministry of Territorial Administration and Emergency Situations, RS: Rescue Service

**Project Design Matrix (PDM3)**

| **Narrative Summary**<br>**[Activities]** | **[Inputs]** | | **Important Assumption** |
|---|---|---|---|
| (1-1)Updating existing landslide distribution map, landslide inventory sheets, and priority list of landslide measures<br>(1-1-1)Adding locations of landslides which damages are identified after 2006 and preparing landslide inventory sheets for the newly identified landslides (assumed to be several landslides)<br>(1-1-2)Updating the contents of the existing landslide inventory sheets<br>(1-1-3)Updating priority list of landslide measures, based on activeness and damages of landslides described in the inventory sheet<br>(1-2)Organizing seminars, workshops, co-working, site training in WG for acquisition of technology and capacity on investigation, assessment (stability analysis), and design/ order/ supervision for implementation, necessary for landslide disaster management works<br>− Acquisition of methodology and know-how on information dissemination of landslide disaster management to population<br>− Acquisition of investigation method and technique on data processing<br>− Acquisition of stability analysis<br>− Acquisition of design method<br>− Clarifying soft measures and issues in implementation<br>− Clarifying the procedure for order of countermeasure works and issues in implementation<br>− Clarifying the procedure for supervision of countermeasure works and issues in implementation<br>(1-3)Preparing plans to resolve the identified issues and submitting proposal for the solution to Minister, MES<br>(2-1) WG formulates a comprehensive landslide disaster management plan, covering monitoring, proactive measures, emergency measures, and permanent measures.<br>(2-2) WG prepares the following guidelines for landslide disaster management.<br>− Investigation method and data processing<br>− Method of stability analysis<br>− Method of design of countermeasure works<br>− Soft measures<br>− Procedure of order<br>− Procedure of supervision of countermeasure works<br>(2-3)Organizing seminars/ lectures/ site training initiated by members of WG in charge of the above-mentioned items for better use of guidelines in the related ministries and agencies<br>(2-4) Assisting improvement of laws and regulations for implementation of measures.<br>(2-4-1) Arranging and reviewing existing laws and regulations related to disaster management, and then, picking up laws and regulation requiring addition or | **<u>Armenian side</u>**<br>● Allocation of budget<br>1) Salaries and other allowances for the Armenian counterpart personnel for co-working in Armenia<br>2) Expenses for utility such as domestic telecommunication, electricity, water supply for the project office<br>3) Operational expenses for customs clearance, storage and domestic transportation for the equipment provided by the Japanese side<br>4) Expenses for operation and maintenance of facilities and equipment provided by the Japanese side<br><br>● Allocation of personnel<br>1) Assignment suitable number of capable counterpart personnel in order to ensure the effective implementation of the Project<br><br>● Principal facilities<br>1) Preparation of air-conditioned office space with one telephone line, internet connection and office furniture (desks and chairs) in MES<br><br>● Necessary items<br>1) Access to information necessary for the Project such as landslide data base, maps | **<u>Japanese side</u>**<br>● Experts<br>1) Chief advisor/ landslide disaster measures<br>2) Landslide investigation/ analysis/ monitoring<br>3) Slope stabilization, Draining<br>4) Monitoring network<br>5) Institution and law<br><br>● Equipment<br>・Drilling machinery with accessories for horizontal drilling: 1 set<br>・Landslide monitoring equipment such as digital water level gauge, extensometer, rain gauge: 4 sets<br>・Internet communication devices: 3 sets<br>・Landslide stability analysis software: 5 sets<br><br>● Training in Japan<br><br>● Cost<br>(investigation drilling, in-situ tests, soil tests) | WG members are selected |

| | | | |
|---|---|---|---|
| revision.<br>(2-4-2) Holding discussion with related ministries on laws and regulations which require addition or revision, and then, having consensus on necessity of improvement.<br>(2-4-3) Assisting related ministries for improvement of laws and regulations, such as providing technical advices and preparing drafts<br>(3-1) Evaluating projects of landslide disaster measures such as monitoring and drainage drilling as well as planning and preparation of the projects<br>(3-2) Installing landslide monitoring system for three pilot project areas to the crisis management centers, to be operated by MES in cooperation with local communities.<br>(3-2-1) Formulating a plan for installation of landslide monitoring system, including arrangement plan of equipment, after the clarification of the purpose and items of the monitoring.<br>(3-2-2) Procurement of equipment necessary for the monitoring<br>(3-2-3) Preparing a manual on monitoring and conducting training<br>(3-3) The Rescue Department, RS, MES acquires technique on operation of the provided drainage drilling equipment, and then, implementing/ maintaining the drainage drilling<br>(3-3-1) Procuring drainage drilling equipment<br>(3-3-2) Conducting operation training, in accordance with operation manual of drilling<br>(3-3-3) Selecting landslides for implementation of drainage drilling and preparing implementation plans, including location and depth of the drilling<br>(3-3-4) Perforating drainage drilling, finishing the drainage holes, and installing drainage ditch, if required.<br>(3-3-5) Maintaining drainage holes and carrying out necessary monitoring such as measurement of discharge and quality check of drained groundwater.<br>(3-4) Preparing design documents and tender documents for implementation of landslide disaster measures by responsible ministries, with assistance and advice of WG<br>(3-4-1) Preparing stability analysis reports and summary of countermeasure works by WG.<br>(3-4-2) Ordering design works of countermeasure works and supervising the sublet works by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG.<br>(3-4-3) Checking the prepared design documents and preparing tender documents, including specifications by responsible ministries for implementation of measures, in accordance with manuals, with assistance and advice of WG. | 2) Securing necessary land for installation of drainage holes and monitoring equipment<br>3) Maintenance of equipment necessary for the drainage and monitoring<br>4) Maintenance of devices necessary for the data transmission for real-time monitoring | | |

MES: Ministry of Emergency Situations

添付７　供与機材引き渡し証

# Handover Note

## Landslide Disaster Management Project in the Republic of Armenia

Both side acknowledged that the equipment provided by Japanese side has already been handed over to the Ministry of Emergency Situation, according to the Record of Discussions of the Project signed on 18th February 2014, with full guidance of their operation and maintenance by JICA experts. The list of equipment is as attached.

The Armenian side agreed to operate and maintain them at its own expense to continue and extent the outputs of the Project for further improvement of landslide disaster risk reduction measures under the related decisions, laws and regulations of Armenia.

Yerevan, 25 January, 2017

三輪 準二

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Ministry of Emergency Situations,
Republic of Armenia

矢野 賢治

Kenji Yano
Chief Advisor
Landslide Disaster Management Project

Attachment 1 List of Drilling equipment

| | | | |
|---|---|---|---|
| 1 | YBM-1WA DRILLING MACHINE | 1 | UNIT |
| | S/No. 1383 DATED 10TH DECEMBER, 2015 | | |
| | MAX. DRILLING DEPTH: 150m | | |
| | DRILLING ANGLE: 360° | | |
| | SPINDLE INNER DIAMETER: 48mm | | |
| | SPINDLE STROKE: 500mm | | |
| | MAX. PRESSURE: 27.3KN | | |
| | MAX. BALANCE: 32.5KN | | |
| | HOISTING CAPACITY: 14.7KN | | |
| | PRIME MOVER (ENGINE): 7.5PS | | |
| 2) | OPERATION MANUAL & PARTS LIST: 1 SET | | |
| 2 | SPARE PARTS FOR DRILLING MACHINE | | |
| 1) | CHUCK BOLT, 00000022 | 8 | PCS. |
| 2) | CHUCK PIECE, R=40.5mm | 8 | PCS. |
| 3) | CLUTCH PLATE φ200, 00002261 | 2 | PCS. |
| 4) | NEEDLE BEARING NA4906UU, 33002870 | 1 | PC. |
| 5) | THRUST BEARING T45E, 33002770 | 1 | PC. |
| 6) | OIL SEAL AC 35 47 7, 33004105 | 1 | PC. |
| 7) | GREASE NIPPLE PT 1/8" JIS-A, 32500001 | 2 | PCS. |
| 8) | GREASE NIPPLE PT 1/8" JIS -B, 32500003 | 1 | PC. |
| 9) | BRAKE BAND, 00002303 | 2 | PCS. |
| 10) | PRESSURE GAUGE DVU 3/8PF x φ75 x 10M Pa, 35000984 | 2 | PCS. |
| 11) | PRESSURE GAUGE 213-63-10MPa-F, 35000299 | 1 | PC. |
| 12) | HYDRAULIC HOSE 1/4"x 360L 70K | 1 | PC. |
| 13) | HYDRAULIC HOSE 1/4"x 380L 70K | 1 | PC. |
| 14) | HYDRAULIC HOSE 1/4"x 450L 70K | 1 | PC. |
| 15) | HYDRAULIC HOSE 1/2"x 360L 70K | 1 | PC. |
| 16) | HYDRAULIC HOSE (SPRING) 3/4"x 550L | 1 | PC. |
| 17) | HOISTING WIRE ROPE 9mm x 38m | 1 | PC. |
| 18) | STANDARD DISASSEMBLING TOOLS | 1 | SET |
| 19) | HEAD WRENCH φ48mm | 1 | PC. |
| 20) | CHUCK WRENCH φ48mm | 1 | PC. |
| 3 | GP-10Ⅲ GROUT PUMP | 1 | UNIT |
| | S/No. 10746 DATED 10TH DECEMBER, 2015 | | |
| | MAX. DISCHARGE VOLUME: 100L/min | | |
| | MAX. PRESSURE: 2.5MPa | | |

| | | | |
|---|---|---|---|
| 1) | HIGH PRESSURE HOSE : 20m x 1" | | |
| 2) | SUCTION HOSE : 4.5m x 2" | | |
| | PRIME MOVER: 10PS | | |
| 3) | OPERATION MANUAL & PARTS LIST: 1 SET | | |
| 4 | SPARE PARTS FOR GROUT PUMP | | |
| 1) | LINER CLAMP, 10002485 | 2 | PCS. |
| 2) | PISTON ROD, 10001812 | 6 | PCS. |
| 3) | PACKING GLAND, 10003715 | 2 | PCS. |
| 4) | PACKING GUIDE,10001820 | 4 | PCS. |
| 5) | LANTERN RING, 10002489 | 4 | PCS. |
| 6) | O-RING 1AP-22.4,YBMM115P025 | 4 | PCS. |
| 7) | O-RING 1AP-90, YBMM115P071 | 4 | PCS. |
| 8) | O-RING 1AP-105, YBMM115P075 | 4 | PCS. |
| 9) | O-RING 1AG-100, YBMM115G016 | 4 | PCS. |
| 10) | JAM NUT M18, YBMY7615009 | 2 | PCS. |
| 11) | V-PACKING H-22.4, YBMM1500415 | 72 | PCS. |
| 12) | VALVE SEAT BALL TYPE, 10001821 | 12 | PCS. |
| 13) | O-RING 1AP-60, YBMM115P061 | 12 | PCS. |
| 14) | STEEL BALL 1-1/2",YBMM8200021 | 12 | PCS |
| 15) | CYLINDER LINER φ75, 10001810 | 4 | PCS. |
| 16) | PISTON BODY φ75, 10001811 | 4 | PCS. |
| 17) | PISTON WASHER φ75, 10001385 | 8 | PCS. |
| 18) | PISTON RUBBER CP357515, 10004366 | 12 | PCS. |
| 19) | BEARING NUT AN-07, YBMM7900007 | 8 | PCS. |
| 20) | BOLT FOR VALVE SEAT PULLER, 10001858 | 1 | PC. |
| 21) | PLATE FOR VALVE SEAT PULLER, 10001859 | 1 | PC. |
| 22) | HEX.NUT M30 FOR VALVE SEAT PULLER, YBMY7500030 | 1 | PC. |
| 23) | BOLT CYLINDER LINER PULLER, 10001860 | 1 | PC. |
| 24) | BRACKET CYLINDER LINER PULLER, 10001861 | 1 | PC. |
| 25) | PLATE FOR CYLINDER LINER PULLER, 10001862 | 1 | PC. |
| 26) | HEX. NUT M20, YBMY7500020 | 1 | PC. |
| 27) | DOUBLE-ENDED WRENCH SN1013 10x 13,YBMA1200150 | 1 | PC. |
| 28) | DOUBLE-ENDED WRENCH SN1719 17x 19,YBMA1200160 | 1 | PC. |
| 29) | DOUBLE-ENDED WRENCH SN2430 24 x 30, YBMA1200180 | 1 | PC. |

| | | | |
|---|---|---|---|
| 30) | SINGLE-ENDED WRENCH 41mm, YBMA1200201 | 1 | PC. |
| 31) | HEX. ROD WRENCH 4.0mm, YBMA0600008 | 1 | PC. |
| 32) | HEX. ROD WRENCH 6.0mm, YBMA0600010 | 1 | PC. |
| 33) | HEX. ROD WRENCH 8.0mm, YBMA0600011 | 1 | PC. |
| 34) | MONKEY SPANNER 250mm, YBMA1200230 | 1 | PC. |
| 35) | PACKING WRENCH, 10001863 | 1 | PC. |
| 5 | DRILLING TOOLS | | |
| 1) | HOISTING WATER SWIVEL R=40.5 | 1 | PC. |
| 2) | HOISTING WIRE ROPE WITH SHACKLE φ9mm x 38m | 1 | PC. |
| 3) | BORING ROD JIS 40.5 x 1m | 5 | PCS. |
| 4) | METAL CROWN JIS 66mm | 40 | PCS. |
| 5) | SINGLE DIAMOND IMPREGNATED BIT JIS 66mm | 2 | PCS. |
| 6) | ROD CORE TUBE COUPLING JIS 64 x JIS 40.5 | 4 | PCS. |
| 7) | CORE TUBE φ84mm x 1.0m | 100 | PCS. |
| 8) | METAL CROWN JIS86mm | 60 | PCS. |
| 9) | DIAMOND IMPREGNATED BIT JIS 86mm | 20 | PCS. |
| 10) | ROD CORE TUBE COUPLING φ84mm x JIS 40.5 | 4 | PCS. |
| 11) | CORE TUBE φ114mm x 1.0m | 20 | PCS. |
| 12) | METAL CROWN JIS 116mm | 80 | PCS. |
| 13) | ROD CORE TUBE COUPLING φ114mm x JIS 40.5 | 2 | PCS. |
| 14) | PIPE WRENCH 450mm | 4 | PCS. |
| 15) | PIPE WRENCH 900mm | 2 | PCS. |
| 16) | CHAIN TONG ST-2 | 2 | PCS. |
| 17) | SHOE FOR STANDARD PENETRATION TEST SAMPLER φ51mm x φ35mm | 10 | PCS. |
| 18) | BORING ROD JIS 40.5 x 1.5m | 5 | PCS. |
| 19) | CORE TUBE JIS 64 x 1.5m | 10 | PCS. |
| 20) | PROLONG COUPLING φ64 | 5 | PCS. |
| 21) | PIPE WRENCH 600mm | 2 | PCS. |
| 22) | ROD TONG φ40.5mm | 1 | PC. |
| 23) | ROPE TONG φ40.5mm | 1 | PC. |
| 24) | SNATCH BLOCK φ3 | 3 | PCS. |
| 25) | CASING BAND φ84mm | 1 | PC. |
| 26) | CASING BAND φ114mm | 1 | PC. |

| | | | |
|---|---|---|---|
| 27) | DELIVERY LINE (RELIEF PORT) 1-1/4"x1 | 1 | PC. |
| 28) | HIGH PRESSURE HOSE 1"x10m 7MPa | 1 | PC. |
| 29) | DELIVERY HOSE 1"x 20m 2MPa | 1 | PC. |
| 30) | REDUCER HW -4-2 1" (F) 1009 | 1 | PC. |
| 31) | SUCTION FOOT VALVE 2" | 1 | PC. |
| 32) | BASKET (SCREEN) 2mm φ250 x 400mm | 1 | PC. |
| 6 | SHIPPING CHARGES | | |
| 1) | INLAND TRANSPORTAION FEE (FACTORY-HAKATA) | 1 | LOT |
| 2) | EXPORT PACKING FEE | 1 | LOT |
| 3) | TRANSPORTATION FEE (HAKATA - YEREVAN) | 1 | LOT |
| 4) | UNLOADING FEE | 1 | LOT |

## Real-time observation monitoring equipment (Procured in Japanese)

| No. | Item | Description | Model | Q'ty | Unit | Breakdown [Serial number] | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Headquarter | Arapi | Getahovit | Voghjaberd | |
| 1 | Surface Extensometer | Extensometer Data Logger with LCD | SLG-10E | 6 | unit | | 2 North: [1665] South: [1664] | 2 North: [1661] South: [1666] | 2 North: [2200] South: [2199] | Fixed base, Iron pile, Guard net、Pipe, etc, local procurement Storage box is local procurement in Voghjaberd |
| 2 | | Invar wire 30m | | 6 | roll | | | | | |
| 3 | | Wooden box | | 4 | pc | | | | | |
| 4 | Vertical Extensometer | Extensometer Data Logger with LCD | SLG-10E | 4 | unit | | 2 North: [1662] South: [1663] | 2 North: [1660] South: [1659] | | Fixed base, Iron pile, Guard net、Pipe, etc, local procurement |
| 5 | | Invar wire 30m | | 4 | roll | | | | | |
| 6 | | Wooden box | | 4 | pc | | | | | |
| 7 | | Parts for extensometer | | 4 | set | | | | | |
| 8 | Strain & Water level gauge | Strain and Water level data logger | Net LG-301E | 4 | unit | | 2 North: [000023] South: [000025] | 2 North: [000022] South: [000024] | | Fixed base, Iron pile, Guard net、Pipe, etc, local procurement |
| 9 | | AAS box for strain and water gauge | PB18-5040C | 4 | pc | | | | | |
| 10 | | Water level detector | DS-1 | 4 | unit | | | | | |
| 11 | | Pipe strain gauge 1-direction 2-gauge | VP40 | 4 | set | | | | | |
| 12 | | Parts for VP40 30m (1m x 30 ) | | 4 | set | | | | | |
| 13 | Rain gauge | Precipitation Data logger | NetLG-201E | 2 | unit | | 1 [000032] | 1 [000031] | | Fixed base, Iron pile, Guard net、Pipe, etc, local procurement |
| 14 | | AAS box 16C for rain gauge | PB12-1525C | 2 | pc | | | | | |
| 15 | | Tipping bucket rain gauge | RS-2 | 2 | unit | | | | | |
| 16 | Network hub | 6-port hub | NetHB-1E | 5 | unit | | 2 | 2 | 1 | Storage box is local procurement in Voghjaberd |
| 17 | | AAS box -16c for 6-port hub | PB16-2540C | 4 | pc | | | | | |
| 18 | Converter | RS232C converter | NetGW-1E | 3 | unit | | 1 | 1 | 1 | Power supply is local procurement |
| 19 | Controller | Network controller | NetCT-1E | 3 | unit | | 1 | 1 | 1 | Keep in a village office or resional rescue |
| 20 | | CF card set with adapter 256MB | | 3 | pc | | 1 | 1 | 1 | |
| 21 | Others | Lighting arresters for communication | NetSP-2 | 24 | unit | | 10 | 10 | 4 | Storage box is local procurement |
| 22 | | Communication Cable FCPEV 09X2P | | 7,400 | m | | | | | Used in three region |
| 23 | | Automatioc observation software | OSNET OBSERVER ver.1.10 | 1 | set | 1 | | | | Used in three region |
| 24 | | Ethernet converter MOXA | Nport 5110A | 1 | unit | 1 | | | | Spare parts |

## Real-time observation computer equipment (Procured in Armenia)

| No. | Item | Description | Model | Q'ty | Unit | Breakdown of installation number | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Headquarter | Arapi | Getahovit | Voghjaberd | |
| 1 | Observation PC | Desktop PC, Monitor, WinOS, Virus | | 3 | unit | | 1 | 1 | 1 | |
| 2 | Monitoring Server | Rack mount type, Monitor, WinSVR2012, MSOffice, Virus | | 1 | unit | 1 | | | | |
| 3 | Operator PC | Desktop PC, Monitor, WinOS, Virus | | 2 | unit | 2 | | | | |
| 4 | UPS | For Server | | 1 | unit | 1 | | | | |
| 5 | UPS | For PC | | 5 | unit | 2 | 1 | 1 | 1 | |
| 6 | ADSL modem | Modem router | | 3 | unit | | | | | |
| 7 | 3G modem | Modem router | | 3 | unit | | | | | |

## Other equipment (Procured in Japanese)

| No. | Item | Description | Model | Q'ty | Unit | Breakdown of installation number | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Headquarter | Arapi | Getahovit | Voghjaberd | |
| 1 | Manual observation equipment | Inclinometer | OT-1401 | 4 | unit | | 4 | | | Set-up base was prepared in Armenia |
| 2 | | Invar wire for simple extensometer (30m) | | 12 | roll | | | | | Used in each site |

添付８　排水ボーリング費用算定表

Calculation sheet of unit price of drainage drilling works

| Item | Unit | Qy't | Unit price (AMD) | Price (AMD) | Remark |
|---|---|---|---|---|---|
| **Direct cost** | | | | **11,490,900** | |
| Materials | | | | 255,200 | |
| *Perforated pipe* | *hole* | *11* | *20,000* | *220,000* | 500AMD × 40m/hole |
| *Cement and sand* | *hole* | *11* | *3,200* | *35,200* | 3200AMD/hole |
| Labour cost | | | | 7,088,400 | |
| *Salary* | *MD* | *109* | *8,700* | *948,300* | *Leader* |
| | *MD* | *109* | *6,100* | *664,900* | *Subleader* |
| | *MD* | *109* | *5,900* | *643,100* | *Operator A* |
| | *MD* | *109* | *5,350* | *583,150* | *Operator B* |
| | *MD* | *57* | *5,350* | *304,950* | *Operator C* |
| *Allowance* | *MD* | *109* | *8,000* | *872,000* | *Leader* |
| | *MD* | *109* | *8,000* | *872,000* | *Subleader* |
| | *MD* | *109* | *8,000* | *872,000* | *Operator A* |
| | *MD* | *109* | *8,000* | *872,000* | *Operator B* |
| | *MD* | *57* | *8,000* | *456,000* | *Operator C* |
| Machine cost | | | | 834,000 | |
| *Maintenance* | *LS* | | | *834,000* | Direct cost × 6% |
| Consumable | | | | 2,780,000 | |
| *Drilling tools* | *LS* | *1* | | *2,780,000* | Direct cost × 20% |
| Fuel and lublicant | | | | 533,300 | |
| *Grease* | *LS* | *1* | *82,300* | *82,300* | |
| *Fuel* | *month* | *5.5* | *82,000* | *451,000* | |
| **Indirect cot** | | | | **3,516,000** | |
| Transportation to site | time | 6 | 205,000 | 1,230,000 | |
| Tools | LS | 1 | 991,600 | 991,600 | |
| Temporary facility cost | LS | 1 | 1,205,400 | 1,205,400 | |
| Travelling cost | month | 1 | 89,000 | 89,000 | fuel (gasoline) |
| **Grand total for 11 holes (390 m long)** | | | | **15,006,900** | |

| | | | | | |
|---|---|---|---|---|---|
| Cost per m | 15,006,900 | ÷ | 390 m | 38,479 | AMD/m |
| Cost per hole (35 m) | 15,006,900 | ÷ | 11 hole | 1,364,264 | AMD/hole (35.45 m long) |
| C0st per hole (50 m) | 38,479 | × | 50 m | **1,923,962** | AMD/hole (50 m long) |

添付 9　業務従事者従事計画／実績表

# 業務従事者の従事計画／実績表

## 1．現地業務

| 氏名（担当業務） | 格付 | 項目 | 渡航回数 | 第1年次 2014 7 | 8 | 9 | 10 | 11 | 12 | 2015 1 | 2 | 3 | 4 | 5 | 6 | 7 | 第2年次 2016 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2017 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 人日合計 | 人月合計 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 矢野　賢治 | 2 | 計画 | 7 | | | | (174) | | | | | (120) | | | | | | (90) | | | | | (180) | | | | | | | (75) | | | | (90) | | | | (90) | | | | 819 | 27.30 |
| （総括／地すべり対策） | | 実績 | (6) | 7/22 | | | (186) | | | 1/23 | 2/1 | | (134) | | 6/14 | | 8/19 | (89) | | 11/15 | 12/6 | | (183) | | | | 6/5 | | 8/29 | (93) | | 11/29 | 1/6 | | (177) | | | 7/1 | | (862) | (28.73) |
| 田中　健一 | 3 | 計画 | 3 | | | (54) | | | | (90) | | | | (60) | | | | | | | | | | | | | | | | | | | | | | | | | | | 204 | 6.80 |
| （地すべり調査・解析・ﾓﾆﾀﾘﾝｸﾞ） | | 実績 | (2) | | 9/5 | (54) | 10/28 | 11/16 | (36) | 12/21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (90) | (3.00) |
| 中村　二三雄 | 3 | 計画 | 5 | | | | | | | | | | | | | | | (30) | | | | (75) | | | | | | | (30) | | | | | (90) | | | | (45) | | | 270 | 9.00 |
| （地すべり調査・解析・ﾓﾆﾀﾘﾝｸﾞ） | | 実績 | (1) | | | | | | | | | 4/3 | (45) | 5/17 | | | 8/19 | (30) | 9/17 | | | | | | | | | | | | | | | | | | | | | | (75) | (2.50) |
| 小川　洋 | 3 | 計画 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0.00 |
| （地すべり調査・解析・ﾓﾆﾀﾘﾝｸﾞ） | | 実績 | (2) | | | | | | | | | | | | | | | | | | | | | | | | | | 8/29 | (76) | | 11/12 | | 1/17 | | | (153) | | 6/18 | | | (229) | (7.63) |
| 松浦　薫 | 4 | 計画 | 4 | | | | | | (45) | | | | | | | | | | | | | | | (60) | | | | | (60) | | | | | | (30) | | | | | | | 195 | 6.50 |
| （ボーリング技術） | | 実績 | (5) | | | | | 11/28 | (45) | 1/11 | | 3/27 | (47) | 5/12 | | | | | | | | | | 3/4 | (70) | 5/12 | | | 8/29 | (51) | 10/18 | | | | | 4/3 | (29) | 5/1 | | | | (242) | (8.07) |
| 伊関　道夫 | 5 | 計画 | 5 | | | | | | | (63) | | | | | | | | | | | | (60) | | | | | | | (60) | | | | | (60) | | | | | (15) | | | 258 | 8.60 |
| （システム構築） | | 実績 | (5) | | | | | 11/28 | (62) | 1/28 | | | | | | | | | | | | 1/17 | (66) | 3/22 | | | | | 8/29 | (62) | | 10/29 | | 1/15 | (91) | | 4/15 | | 6/20 | (9) | 6/28 | | (290) | (9.67) |
| 古賀　省三 | 5 | 計画 | 4 | | | | | | (30) | | | | | | | | | | | | | (30) | | | | | | | | (45) | | | | (45) | | | | | | | | 150 | 5.00 |
| （ｶﾞｲﾄﾞﾗｲﾝ・法令・省令整備） | | 実績 | (2) | | | | | | 12/23 | (30) | 1/21 | | | | | | | | | | 12/20 | (28) | 1/16 | | | | | | | | | | | | | | | | | | | (58) | (1.93) |
| 工藤　唯志 | 5 | 計画 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0.00 |
| （ｶﾞｲﾄﾞﾗｲﾝ・法令・省令整備） | | 実績 | (1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5/8 | (49) | 6/25 | | (49) | (1.63) |
| 現地業務小計 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 計画 | 1896 | 63.20 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 実績 | (1895) | (63.16) |

## 2．国内業務

| 氏名（担当業務） | 格付 | 項目 | 渡航回数 | 2014 7 | 8 | 9 | 10 | 11 | 12 | 2015 1 | 2 | 3 | 4 | 5 | 6 | 7 | 2016 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2017 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 人日合計 | 人月合計 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 矢野　賢治 | 2 | 計画 | － | (4) | | | | | | | | | | | (10) | | | | | | | | | | | | | | | | | | | | | | | | | (10) | | 24 | 1.20 |
| （総括／地すべり対策） | | 実績 | 7/14 － | 17 (4) | | | | | | | | | | | 6/17 6/30 うち (10) | | | | | | | | | | | | | | | | | | | | | | | | 7/3 7/14 (10) | | (24) | (1.20) |
| 田中　健一 | 3 | 計画 | － | (4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | 0.20 |
| （地すべり調査・解析・ﾓﾆﾀﾘﾝｸﾞ） | | 実績 | 7/14 － | 17 (4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (4) | (0.20) |
| 小川　洋 | 5 | 計画 | － | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0.00 |
| （地すべり調査・解析・ﾓﾆﾀﾘﾝｸﾞ） | | 実績 | － | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (14) | 2/5, 6, 11-22 | | | | | | | | (14) | (0.70) |
| 松浦　薫 | 4 | 計画 | － | | | | | | | | | | | | (30) | | | | | | | | | | | | | | | | | | | | | | | | | | 40 | 2.00 |
| （ボーリング技術） | | 実績 | － | | | | | | | | | | | 6/1 6/26 うち (20) | | | | 9/24 10/31 うち (10) | | | | | | | | | | | | | | | | | | | | | | | (30) | (1.50) |
| 伊関　道夫 | 5 | 計画 | － | (4) | | | | | | | | | | (14) | (10) | | | | | | | | | | | (14) | | | | | | | | | | | | (14) | | | 56 | 2.80 |
| （システム構築） | | 実績 | 7/14 － | /17 (4) | | | | | | | | | 4/10 4/29 うち (14) | 6/17 6/30 うち (10) | | | | | | | | | | | | 5/5 5/28 (14) | | | | | | | | | | | | | | | (42) | (2.10) |
| 国内業務小計 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 計画 | 124 | 6.20 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 実績 | (114) | (5.70) |

凡例：業務従事実績　業務従事計画　自社負担

| 合計 | 計画 | 69.40 |
|---|---|---|
| | 実績 | (68.86) |

| 報告書等 | 2014 | | 2015 | | 2016 | | 2017 | |
|---|---|---|---|---|---|---|---|---|
| | △ 業務計画書 | △ ワークプラン | △ 業務進捗報告書 | △ 業務完了報告書 | △ 業務計画書 | △ ワークプラン | △ 業務進捗報告書 | △ 業務進捗報告書 | △ 業務完了報告書 |

アルメニア共和国
非常事態省

# アルメニア国
# 地すべり災害対策プロジェクト
# 業務完了報告書（第２年次）

## 別添資料（CD-ROM 版）

平成 29 年 8 月
（2017 年）

独立行政法人
国際協力機構（JICA）

日本工営株式会社

# 別添資料（CD-ROM 版）リスト

別添資料 1　地すべり台帳
別添資料 2　地すべり災害総合管理計画
別添資料 3　ガイドライン
別添資料 4　地すべり地における水利用・土工に係わる運用則
別添資料 5　パイロット事業地区選定一覧表
別添資料 6　地質調査再委託業務報告書
別添資料 7　パイロット事業実施計画書
別添資料 8　地すべりリアルタイムモニタリングシステム標準作業手順書
別添資料 9　ボーリング作業用手引き、フォーム
別添資料 10　地すべりリアルタイムモニタリングシステム再委託業務報告書

別添資料１　地すべり台帳

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| ARAG-113-0010 | | ARAGATSOTN | Kurubo | K-38-113 | 40 | 41 | 36 | 44 | 22 | 19 | 2268 | 450 | 800 | 36 | III | M | C | | | |
| ARAG-113-0030 | | ARAGATSOTN | Lenapar | K-38-113 | 40 | 44 | 41 | 44 | 10 | 22 | 2246 | 100 | 100 | 1 | III | M | C | | | |
| ARAG-113-0050 | | ARAGATSOTN | Lenapar | K-38-113 | 40 | 44 | 55 | 44 | 9 | 23 | 2197 | 100 | 100 | 1 | III | M | C | | | |
| ARAG-124-0020 | | ARAGATSOTN | Zovasar | K-38-124 | 40 | 29 | 12 | 43 | 58 | 24 | 2333 | 1750 | 2600 | 290 | III | M | C | | | |
| ARAG-125-0040 | | ARAGATSOTN | 125-A-d | K-38-125 | 40 | 31 | 56 | 44 | 9 | 37 | 3023 | 200 | 600 | 14 | III | L | D | | | |
| ARAG-125-0060 | | ARAGATSOTN | 125-C-b | K-38-125 | 40 | 29 | 4.5 | 44 | 9 | 11 | 3160 | 1000 | 1800 | 141 | III | L | D | | | |
| ARAG-125-0070 | | ARAGATSOTN | 125-C-b | K-38-125 | 40 | 29 | 50 | 44 | 9 | 58 | 3398 | 750 | 2550 | 170 | III | L | D | | | |
| ARAG-125-0080 | | ARAGATSOTN | 125-A-d | K-38-125 | 40 | 33 | 26 | 44 | 10 | 47 | 3007 | 350 | 2000 | 78 | III | L | D | | | |
| ARAG-125-0090 | | ARAGATSOTN | 125-C-b | K-38-125 | 40 | 29 | 0.3 | 44 | 11 | 12 | 3322 | 850 | 4200 | 288 | III | L | D | | | |
| ARAG-125-0100 | | ARAGATSOTN | 125-A-d | K-38-125 | 40 | 33 | 42 | 44 | 12 | 35 | 3112 | 750 | 3900 | 211 | III | L | D | | | |
| ARAG-125-0110 | | ARAGATSOTN | 125-C-b | K-38-125 | 40 | 29 | 18 | 44 | 12 | 36 | 3109 | 1300 | 3100 | 214 | III | L | D | | | |
| ARAG-125-0120 | | ARAGATSOTN | 125-A-d | K-38-125 | 40 | 34 | 29 | 44 | 14 | 7.2 | 3010 | 1500 | 2600 | 275 | III | L | D | | | |
| ARAG-125-0130 | | ARAGATSOTN | 125-A-d | K-38-125 | 40 | 30 | 55 | 44 | 13 | 42 | 3156 | 400 | 1000 | 39 | III | L | D | | | |
| ARAG-125-0140 | | ARAGATSOTN | 125-A-d | K-38-125 | 40 | 31 | 2.5 | 44 | 14 | 48 | 3174 | 850 | 4000 | 329 | III | L | D | | | |
| ARAG-125-0150 | | ARAGATSOTN | 125-C-b | K-38-125 | 40 | 28 | 44 | 44 | 14 | 47 | 2981 | 600 | 2500 | 138 | III | L | D | | | |
| ARAG-125-0160 | | ARAGATSOTN | 125-C-b | K-38-125 | 40 | 27 | 11 | 44 | 14 | 19 | 2852 | 900 | 6400 | 530 | III | L | D | | | |
| ARAG-125-0170 | | ARAGATSOTN | 125-B-c | K-38-125 | 40 | 33 | 51 | 44 | 15 | 3.1 | 2988 | 1100 | 2800 | 229 | III | L | D | | | |
| ARAG-125-0180 | | ARAGATSOTN | 125-B-c | K-38-125 | 40 | 31 | 45 | 44 | 15 | 41 | 3169 | 1050 | 3100 | 272 | III | L | D | | | |
| ARAG-125-0190 | | ARAGATSOTN | 125-B-c | K-38-125 | 40 | 33 | 56 | 44 | 16 | 35 | 2960 | 900 | 1900 | 135 | III | L | D | | | |
| ARAG-125-0200 | | ARAGATSOTN | 125-B-c | K-38-125 | 40 | 32 | 47 | 44 | 16 | 48 | 2988 | 800 | 2600 | 182 | III | L | D | | | |
| ARAG-125-0210 | | ARAGATSOTN | Byurakan | K-38-125 | 40 | 21 | 0.7 | 44 | 15 | 14 | 1618 | 350 | 900 | 30 | III | M | C | | | |
| ARAG-125-0220 | | ARAGATSOTN | Byurakan | K-38-125 | 40 | 21 | 16 | 44 | 15 | 46 | 1652 | 400 | 1000 | 37 | III | M | C | | | |
| ARAG-125-0230 | | ARAGATSOTN | Byurakan | K-38-125 | 40 | 20 | 34 | 44 | 15 | 30 | 1512 | 750 | 1100 | 79 | III | M | C | | | |
| ARAG-125-0240 | | ARAGATSOTN | Tsakhkahovit | K-38-125 | 40 | 38 | 15 | 44 | 14 | 7.9 | 2087 | 200 | 400 | 6 | III | M | C | | | |
| ARAG-125-0250 | | ARAGATSOTN | Kondakhsaz | K-38-125 | 40 | 39 | 26 | 44 | 18 | 21 | 2063 | 500 | 350 | 19 | III | M | C | | | |
| ARAG-125-0260 | | ARAGATSOTN | Mirak | K-38-125 | 40 | 38 | 21 | 44 | 19 | 45 | 2032 | 800 | 300 | 24 | III | M | C | | | |
| ARAG-125-0270 | | ARAGATSOTN | Melikgyugh | K-38-125 | 40 | 39 | 39 | 44 | 22 | 26 | 2170 | 250 | 450 | 14 | III | M | C | | | |
| ARAG-125-0280 | | ARAGATSOTN | Melikgyugh | K-38-125 | 40 | 39 | 37 | 44 | 22 | 49 | 2197 | 400 | 600 | 25 | III | M | C | | | |
| ARAG-125-0290 | | ARAGATSOTN | Lusagyugh | K-38-125 | 40 | 36 | 42 | 44 | 22 | 9.4 | 2014 | 400 | 800 | 31 | III | M | C | | | |
| ARAG-125-0300 | | ARAGATSOTN | Lusagyugh | K-38-125 | 40 | 37 | 8 | 44 | 23 | 38 | 2188 | 550 | 1450 | 48 | III | M | C | | | |
| ARAG-125-0310 | | ARAGATSOTN | Apnagyugh | K-38-125 | 40 | 26 | 22 | 44 | 23 | 58 | 1789 | 400 | 250 | 8 | III | M | C | | | |
| ARAG-125-0350 | | ARAGATSOTN | Ttujur | K-38-125 | 40 | 33 | 2.5 | 44 | 25 | 59 | 1924 | 550 | 600 | 31 | III | M | C | | | |
| ARAG-125-0360 | | ARAGATSOTN | Ttujur | K-38-125 | 40 | 33 | 32 | 44 | 26 | 55 | 1926 | 800 | 700 | 60 | III | M | C | | | |
| ARAG-125-0370 | | ARAGATSOTN | Ttujur | K-38-125 | 40 | 33 | 34 | 44 | 27 | 20 | 1940 | 400 | 1100 | 30 | III | M | C | | | |
| ARAG-125-0380 | | ARAGATSOTN | 125-D-b | K-38-125 | 40 | 28 | 50 | 44 | 26 | 28 | 1800 | 250 | 250 | 8 | III | L | D | | | |
| ARAG-125-0400 | | ARAGATSOTN | Mravyan | K-38-125 | 40 | 31 | 33 | 44 | 28 | 19 | 2040 | 400 | 800 | 23 | III | M | C | | | |
| ARAG-125-0430 | | ARAGATSOTN | Mravyan | K-38-125 | 40 | 30 | 51 | 44 | 29 | 31 | 2403 | 300 | 600 | 14 | III | M | C | | | |
| ARAG-125-0440 | | ARAGATSOTN | 125-D-b | K-38-125 | 40 | 29 | 40 | 44 | 29 | 26 | 2452 | 600 | 350 | 21 | III | L | D | | | |
| ARAG-126-0010 | | ARAGATSOTN | 126-A-c | K-38-126 | 40 | 33 | 49 | 44 | 31 | 14 | 2294 | 350 | 850 | 26 | III | L | D | | | |
| ARAG-126-0030 | | ARAGATSOTN | Bujakan | K-38-126 | 40 | 27 | 29 | 44 | 30 | 44 | 1937 | 750 | 800 | 32 | III | M | C | | | |
| ARAG-126-0100 | | ARAGATSOTN | 126-A-c | K-38-126 | 40 | 33 | 20 | 44 | 33 | 17 | 2289 | 750 | 500 | 32 | III | L | D | | | |
| ARAG-137-0010 | | ARAGATSOTN | 137-A-d | K-38-137 | 40 | 14 | 5.8 | 44 | 8 | 32 | 1199 | 150 | 400 | 7 | III | L | D | | | |
| ARAG-137-0020 | | ARAGATSOTN | Kosh | K-38-137 | 40 | 18 | 48 | 44 | 9 | 59 | 1418 | 900 | 3100 | 270 | III | M | C | | | |
| ARAG-137-0030 | | ARAGATSOTN | Kosh | K-38-137 | 40 | 18 | 26 | 44 | 10 | 38 | 1356 | 350 | 1950 | 68 | III | M | C | | | |
| ARAG-137-0040 | | ARAGATSOTN | Kosh | K-38-137 | 40 | 18 | 33 | 44 | 11 | 28 | 1356 | 650 | 1850 | 108 | III | M | C | | | |
| ARAG-137-0050 | | ARAGATSOTN | Ujan | K-38-137 | 40 | 18 | 28 | 44 | 12 | 34 | 1352 | 800 | 1450 | 102 | III | M | C | | | |
| ARAG-137-0060 | | ARAGATSOTN | Ujan | K-38-137 | 40 | 17 | 54 | 44 | 12 | 30 | 1135 | 200 | 400 | 10 | III | M | C | | | |
| ARAG-137-0070 | | ARAGATSOTN | Ujan | K-38-137 | 40 | 18 | 35 | 44 | 13 | 6.1 | 1332 | 300 | 1100 | 28 | III | M | C | | | |
| ARAG-137-0080 | | ARAGATSOTN | Dzorap | K-38-137 | 40 | 19 | 0.2 | 44 | 13 | 41 | 1422 | 800 | 1700 | 114 | III | M | C | | | |
| ARAG-137-0090 | | ARAGATSOTN | Dzorap | K-38-137 | 40 | 19 | 29 | 44 | 14 | 28 | 1403 | 1400 | 2900 | 339 | III | M | C | | | |
| ARAG-137-0100 | | ARAGATSOTN | Parpi | K-38-137 | 40 | 19 | 37 | 44 | 18 | 17 | 1157 | 750 | 1100 | 58 | III | M | C | | | |
| ARAR-006-0010 | | ARARAT | Kaghtsrashen | J-38-006 | 39 | 58 | 17 | 44 | 38 | 14 | 982 | 1300 | 1800 | 184 | III | M | C | | | |
| ARAR-006-0020 | | ARARAT | 006-A-b | J-38-006 | 39 | 59 | 57 | 44 | 40 | 52 | 1076 | 500 | 1100 | 41 | III | L | D | | | |
| ARAR-006-0030 | | ARARAT | Dashtakar | J-38-006 | 39 | 55 | 4.5 | 44 | 45 | 20 | 960 | 300 | 300 | 8 | III | M | C | | | |
| ARAR-006-0040 | | ARARAT | Urtsadzor | J-38-006 | 39 | 54 | 52 | 44 | 46 | 36 | 1062 | 800 | 900 | 36 | III | M | C | | | |
| ARAR-006-0050 | | ARARAT | 006-B-c | J-38-006 | 39 | 50 | 19 | 44 | 46 | 29 | 988 | 1300 | 2050 | 239 | III | L | D | | | |
| ARAR-006-0060 | | ARARAT | Urtsadzor | J-38-006 | 39 | 54 | 38 | 44 | 47 | 33 | 1080 | 1200 | 1600 | 186 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| ARAR-006-0070 | | ARARAT | 006-D-a | J-38-006 | 39 | 49 | 13 | 44 | 47 | 25 | 1018 | 3000 | 3800 | 722 | III | L | D | | | |
| ARAR-006-0080 | | ARARAT | 006-B-a | J-38-006 | 39 | 59 | 34 | 44 | 48 | 57 | 1423 | 500 | 650 | 17 | III | L | D | | | |
| ARAR-006-0090 | | ARARAT | 006-B-a | J-38-006 | 39 | 58 | 54 | 44 | 49 | 33 | 1424 | 250 | 500 | 10 | III | L | D | | | |
| ARAR-006-0100 | | ARARAT | 006-B-a | J-38-006 | 39 | 58 | 49 | 44 | 49 | 58 | 1609 | 450 | 900 | 36 | III | L | D | | | |
| ARAR-006-0110 | | ARARAT | Urtsadzor | J-38-006 | 39 | 55 | 5.6 | 44 | 50 | 0.8 | 1128 | 500 | 850 | 44 | III | M | C | | | |
| ARAR-006-0120 | | ARARAT | 006-B-c | J-38-006 | 39 | 53 | 12 | 44 | 49 | 26 | 1308 | 400 | 1150 | 33 | III | L | D | | | |
| ARAR-006-0130 | | ARARAT | 006-B-c | J-38-006 | 39 | 53 | 5.3 | 44 | 49 | 10 | 1293 | 250 | 800 | 13 | III | L | D | | | |
| ARAR-006-0140 | | ARARAT | 006-B-a | J-38-006 | 39 | 59 | 1.7 | 44 | 50 | 13 | 1595 | 450 | 800 | 31 | III | L | D | | | |
| ARAR-006-0150 | | ARARAT | 006-B-a | J-38-006 | 39 | 57 | 9.9 | 44 | 51 | 3.5 | 1297 | 300 | 250 | 7 | III | L | D | | | |
| ARAR-006-0160 | | ARARAT | Urtsadzor | J-38-006 | 39 | 55 | 24 | 44 | 51 | 2.6 | 1168 | 850 | 700 | 51 | III | M | C | | | |
| ARAR-006-0170 | | ARARAT | 006-B-c | J-38-006 | 39 | 53 | 12 | 44 | 50 | 53 | 1256 | 1700 | 2450 | 295 | III | L | D | | | |
| ARAR-006-0180 | | ARARAT | 006-B-c | J-38-006 | 39 | 52 | 17 | 44 | 50 | 21 | 1422 | 650 | 1000 | 30 | III | L | D | | | |
| ARAR-006-0190 | | ARARAT | 006-B-a | J-38-006 | 39 | 58 | 28 | 44 | 52 | 1.2 | 1456 | 900 | 1550 | 115 | III | L | D | | | |
| ARAR-006-0200 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 3.8 | 44 | 52 | 42 | 1299 | 1050 | 750 | 33 | III | L | D | | | |
| ARAR-006-0210 | | ARARAT | 006-B-b | J-38-006 | 39 | 56 | 27 | 44 | 53 | 0.5 | 1355 | 1650 | 2950 | 339 | III | L | D | | | |
| ARAR-006-0220 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 26 | 44 | 52 | 55 | 1496 | 400 | 900 | 27 | III | L | D | | | |
| ARAR-006-0230 | | ARARAT | 006-B-d | J-38-006 | 39 | 54 | 23 | 44 | 52 | 19 | 1475 | 2500 | 1900 | 342 | III | L | D | | | |
| ARAR-006-0240 | | ARARAT | Shagap | J-38-006 | 39 | 52 | 37 | 44 | 52 | 44 | 1286 | 900 | 1400 | 73 | III | M | C | | | |
| ARAR-006-0250 | | ARARAT | 006-B-b | J-38-006 | 39 | 59 | 16 | 44 | 54 | 20 | 1522 | 200 | 500 | 8 | III | L | D | | | |
| ARAR-006-0260 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 60 | 44 | 53 | 52 | 1496 | 800 | 600 | 42 | III | L | D | | | |
| ARAR-006-0270 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 27 | 44 | 53 | 38 | 1674 | 650 | 1300 | 59 | III | L | D | | | |
| ARAR-006-0280 | | ARARAT | 006-B-b | J-38-006 | 39 | 56 | 29 | 44 | 54 | 1.3 | 1396 | 450 | 300 | 8 | III | L | D | | | |
| ARAR-006-0290 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 5.8 | 44 | 53 | 59 | 1953 | 700 | 1300 | 55 | III | L | D | | | |
| ARAR-006-0300 | | ARARAT | Shaghap | J-38-006 | 39 | 53 | 44 | 44 | 53 | 18 | 1372 | 850 | 1300 | 97 | III | M | C | | | |
| ARAR-006-0310 | | ARARAT | Shaghap | J-38-006 | 39 | 53 | 42 | 44 | 53 | 59 | 1439 | 600 | 800 | 36 | III | M | C | | | |
| ARAR-006-0320 | | ARARAT | Shaghap | J-38-006 | 39 | 52 | 13 | 44 | 53 | 41 | 1373 | 1300 | 2200 | 190 | III | M | C | | | |
| ARAR-006-0330 | | ARARAT | 006-B-b | J-38-006 | 39 | 59 | 54 | 44 | 55 | 14 | 1808 | 200 | 500 | 8 | III | L | D | | | |
| ARAR-006-0340 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 49 | 44 | 54 | 52 | 1633 | 400 | 700 | 18 | III | L | D | | | |
| ARAR-006-0350 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 22 | 44 | 55 | 42 | 1546 | 350 | 800 | 23 | III | L | D | | | |
| ARAR-006-0360 | | ARARAT | 006-B-b | J-38-006 | 39 | 57 | 38 | 44 | 55 | 16 | 1443 | 400 | 400 | 13 | III | L | D | | | |
| ARAR-006-0370 | | ARARAT | 006-B-b | J-38-006 | 39 | 56 | 14 | 44 | 54 | 36 | 1641 | 300 | 800 | 19 | III | L | D | | | |
| ARAR-006-0380 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 53 | 44 | 55 | 11 | 1914 | 200 | 550 | 11 | III | L | D | | | |
| ARAR-006-0390 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 43 | 44 | 54 | 35 | 1864 | 300 | 1000 | 25 | III | L | D | | | |
| ARAR-006-0400 | | ARARAT | 006-B-d | J-38-006 | 39 | 53 | 22 | 44 | 55 | 32 | 1639 | 400 | 900 | 30 | III | L | D | | | |
| ARAR-006-0410 | | ARARAT | Lanjanist | J-38-006 | 39 | 51 | 16 | 44 | 55 | 44 | 1580 | 1850 | 1750 | 200 | III | M | C | | | |
| ARAR-006-0420 | | ARARAT | 006-B-b | J-38-006 | 39 | 57 | 15 | 44 | 56 | 4.1 | 1425 | 750 | 800 | 45 | III | L | D | | | |
| ARAR-006-0430 | | ARARAT | 006-B-b | J-38-006 | 39 | 57 | 26 | 44 | 56 | 51 | 1404 | 500 | 800 | 31 | III | L | D | | | |
| ARAR-006-0440 | | ARARAT | 006-B-d | J-38-006 | 39 | 54 | 59 | 44 | 56 | 43 | 2126 | 550 | 1100 | 43 | III | L | D | | | |
| ARAR-006-0450 | | ARARAT | Lanjanist | J-38-006 | 39 | 53 | 2.3 | 44 | 56 | 3.7 | 1773 | 300 | 950 | 18 | III | M | C | | | |
| ARAR-006-0460 | | ARARAT | Lanjanist | J-38-006 | 39 | 52 | 22 | 44 | 56 | 0.7 | 1677 | 2900 | 4500 | 632 | III | M | C | | | |
| ARAR-006-0470 | | ARARAT | Kyarki | J-38-006 | 39 | 47 | 59 | 44 | 57 | 3.1 | 1656 | 1100 | 1200 | 113 | III | M | C | | | |
| ARAR-006-0480 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 57 | 44 | 58 | 26 | 1626 | 300 | 400 | 10 | III | L | D | | | |
| ARAR-006-0490 | | ARARAT | 006-B-b | J-38-006 | 39 | 56 | 45 | 44 | 58 | 0.4 | 1479 | 500 | 700 | 19 | III | L | D | | | |
| ARAR-006-0500 | | ARARAT | 006-B-b | J-38-006 | 39 | 56 | 20 | 44 | 57 | 59 | 1561 | 400 | 700 | 23 | III | L | D | | | |
| ARAR-006-0510 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 31 | 44 | 57 | 29 | 1883 | 400 | 500 | 17 | III | L | D | | | |
| ARAR-006-0520 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 43 | 44 | 58 | 23 | 1687 | 200 | 400 | 9 | III | L | D | | | |
| ARAR-006-0530 | | ARARAT | 006-B-b | J-38-006 | 39 | 55 | 16 | 44 | 57 | 55 | 1794 | 1000 | 1500 | 120 | III | L | D | | | |
| ARAR-006-0540 | | ARARAT | 006-B-d | J-38-006 | 39 | 53 | 45 | 44 | 57 | 26 | 2458 | 400 | 350 | 11 | III | L | D | | | |
| ARAR-006-0550 | | ARARAT | Lusashogh | J-38-006 | 39 | 51 | 23 | 44 | 57 | 38 | 1861 | 500 | 1000 | 17 | III | M | C | | | |
| ARAR-006-0560 | Lanjor-Lusashogh H-10 Road | ARARAT | Lusashogh | J-38-6 | 39 | 50 | 31 | 44 | 58 | 6 | 1946 | 300 | 740 | 57 | I | M | B | | | |
| ARAR-006-0561 | | ARARAT | Lusashogh | J-38-006 | 39 | 49 | 59 | 44 | 58 | 18 | 1954 | 100 | 100 | 1 | III | M | C | | | |
| ARAR-006-0562 | | ARARAT | Lusashogh | J-38-006 | 39 | 49 | 52 | 44 | 58 | 19 | 1928 | 100 | 100 | 1 | III | M | C | | | |
| ARAR-006-0563 | Lanjar | ARARAT | Lanjar | J-38-6 | 39 | 49 | 33 | 44 | 58 | 27 | 1834 | 160 | 300 | 8 | I | M | B | | | |
| ARAR-006-0564 | | ARARAT | Lusashogh | J-38-006 | 39 | 49 | 38 | 44 | 58 | 14 | 1876 | 100 | 300 | 4 | III | M | C | | | |
| ARAR-006-0570 | | ARARAT | Lanjar | J-38-006 | 39 | 48 | 34 | 44 | 57 | 58 | 1654 | 750 | 600 | 29 | III | M | C | | | |
| ARAR-006-0580 | | ARARAT | 006-B-b | J-38-006 | 39 | 59 | 12 | 44 | 59 | 40 | 1928 | 350 | 400 | 246 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| ARAR-006-0590 | | ARARAT | 006-B-b | J-38-006 | 39 | 59 | 2.7 | 44 | 58 | 41 | 1683 | 200 | 250 | 4 | III | L | D | | | |
| ARAR-006-0600 | | ARARAT | 006-B-b | J-38-006 | 39 | 58 | 17 | 44 | 59 | 54 | 2163 | 600 | 700 | 49 | III | L | D | | | |
| ARAR-006-0610 | | ARARAT | 006-B-b | J-38-006 | 39 | 57 | 57 | 44 | 58 | 59 | 1958 | 300 | 600 | 9 | III | L | D | | | |
| ARAR-006-0630 | | ARARAT | 006-B-d | J-38-006 | 39 | 54 | 52 | 44 | 58 | 50 | 1910 | 350 | 700 | 21 | III | L | D | | | |
| ARAR-006-0640 | | ARARAT | Lanjanist | J-38-006 | 39 | 53 | 1.5 | 44 | 58 | 55 | 2337 | 850 | 1000 | 53 | III | M | C | | | |
| ARAR-006-0650 | | ARARAT | Lusashogh | J-38-006 | 39 | 51 | 32 | 44 | 59 | 1.6 | 2038 | 600 | 900 | 44 | III | M | C | | | |
| ARAR-006-0660 | | ARARAT | Lusashogh | J-38-006 | 39 | 50 | 15 | 44 | 59 | 38 | 2091 | 300 | 1100 | 18 | III | M | C | | | |
| ARAR-006-0670 | | ARARAT | Lanjar | J-38-006 | 39 | 49 | 23 | 44 | 59 | 1 | 1904 | 1000 | 1000 | 74 | III | M | C | | | |
| ARAR-006-0671 | Urtsalandj | ARARAT | Urtsalanj | J-38-6 | 39 | 49 | 11 | 44 | 59 | 51 | 1793 | 500 | 1000 | 35 | I | M | B | | | |
| ARAR-006-0672 | | ARARAT | Urtsalanj | J-38-006 | 39 | 49 | 32 | 44 | 59 | 58 | 1886 | 300 | 400 | 10 | III | M | C | | | |
| ARAR-006-0680 | | ARARAT | 006-D-b | J-38-006 | 39 | 45 | 32 | 44 | 59 | 29 | 1588 | 350 | 600 | 21 | III | L | D | | | |
| ARAR-006-0690 | | ARARAT | 006-D-b | J-38-006 | 39 | 45 | 29 | 44 | 59 | 13 | 1517 | 200 | 800 | 17 | III | L | D | | | |
| ARAR-007-0010 | | ARARAT | 006-B-b | J-38-007 | 39 | 55 | 9.7 | 45 | 0 | 37 | 2083 | 4000 | 6500 | 1968 | III | L | D | | | |
| ARAR-007-0020 | | ARARAT | Vardashat | J-38-007 | 39 | 50 | 16 | 45 | 0 | 41 | 1924 | 150 | 250 | 3 | III | M | C | | | |
| ARAR-007-0030 | | ARARAT | Vardashat | J-38-007 | 39 | 49 | 49 | 45 | 1 | 24 | 1785 | 500 | 400 | 18 | III | M | C | | | |
| ARAR-007-0040 | | ARARAT | Urtsalanj | J-38-007 | 39 | 49 | 16 | 45 | 0 | 35 | 1728 | 800 | 1000 | 67 | III | M | C | | | |
| ARAR-007-0050 | | ARARAT | 007-A-a | J-38-007 | 39 | 57 | 50 | 45 | 1 | 43 | 2049 | 3800 | 3400 | 1141 | III | L | D | | | |
| ARAR-007-0060 | | ARARAT | 007-A-a | J-38-007 | 39 | 56 | 28 | 45 | 1 | 56 | 1886 | 3800 | 1800 | 586 | III | L | D | | | |
| ARAR-007-0070 | | ARARAT | 007-A-c | J-38-007 | 39 | 54 | 15 | 45 | 2 | 46 | 2629 | 700 | 1100 | 56 | III | L | D | | | |
| ARAR-007-0080 | | ARARAT | 007-A-c | J-38-007 | 39 | 53 | 12 | 45 | 2 | 29 | 2430 | 600 | 1050 | 24 | III | L | D | | | |
| ARAR-007-0090 | | ARARAT | 007-A-c | J-38-007 | 39 | 52 | 10 | 45 | 2 | 8.9 | 2138 | 700 | 900 | 54 | III | L | D | | | |
| ARAR-007-0100 | | ARARAT | 007-A-c | J-38-007 | 39 | 51 | 16 | 45 | 1 | 45 | 2136 | 200 | 500 | 8 | III | L | D | | | |
| ARAR-007-0110 | | ARARAT | 007-A-c | J-38-007 | 39 | 50 | 56 | 45 | 1 | 34 | 2065 | 500 | 1300 | 52 | III | L | D | | | |
| ARAR-007-0120 | | ARARAT | 007-A-c | J-38-007 | 39 | 51 | 3.6 | 45 | 2 | 37 | 1988 | 450 | 700 | 25 | III | L | D | | | |
| ARAR-007-0125 | | ARARAT | Zangakatoun | J-38-007 | 39 | 49 | 30 | 45 | 2 | 57 | 1745 | 420 | 490 | 16 | III | M | B | | | |
| ARAR-007-0130 | | ARARAT | Sovetashen | J-38-007 | 39 | 48 | 37 | 45 | 2 | 45 | 1725 | 1050 | 2900 | 198 | III | M | C | | | |
| ARAR-007-0140 | | ARARAT | Sovetashen | J-38-007 | 39 | 47 | 33 | 45 | 1 | 49 | 1746 | 700 | 1200 | 42 | III | M | C | | | |
| ARAR-007-0150 | | ARARAT | 007-A-a | J-38-007 | 39 | 57 | 57 | 45 | 4 | 14 | 2226 | 4100 | 3000 | 1054 | III | L | D | | | |
| ARAR-007-0160 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 39 | 45 | 3 | 15 | 2328 | 400 | 700 | 23 | III | L | D | | | |
| ARAR-007-0170 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 13 | 45 | 3 | 40 | 2296 | 300 | 450 | 10 | III | L | D | | | |
| ARAR-007-0180 | | ARARAT | 007-A-c | J-38-007 | 39 | 53 | 0.4 | 45 | 3 | 51 | 2479 | 400 | 1050 | 25 | III | L | D | | | |
| ARAR-007-0190 | | ARARAT | 007-A-c | J-38-007 | 39 | 51 | 25 | 45 | 2 | 49 | 1942 | 400 | 600 | 22 | III | L | D | | | |
| ARAR-007-0200 | | ARARAT | 007-A-c | J-38-007 | 39 | 51 | 31 | 45 | 4 | 4.2 | 2051 | 700 | 450 | 28 | III | L | D | | | |
| ARAR-007-0210 | | ARARAT | 007-A-a | J-38-007 | 39 | 59 | 22 | 45 | 5 | 2.6 | 2553 | 250 | 350 | 7 | III | L | D | | | |
| ARAR-007-0220 | | ARARAT | 007-A-a | J-38-007 | 39 | 59 | 6.6 | 45 | 5 | 20 | 2597 | 650 | 850 | 48 | III | L | D | | | |
| ARAR-007-0230 | | ARARAT | 007-A-a | J-38-007 | 39 | 56 | 28 | 45 | 4 | 22 | 2259 | 1100 | 1650 | 149 | III | L | D | | | |
| ARAR-007-0240 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 12 | 45 | 4 | 16 | 2300 | 1100 | 1850 | 159 | III | L | D | | | |
| ARAR-007-0250 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 56 | 45 | 4 | 31 | 2217 | 150 | 300 | 4 | III | L | D | | | |
| ARAR-007-0260 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 14 | 45 | 4 | 49 | 2255 | 650 | 850 | 44 | III | L | D | | | |
| ARAR-007-0270 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 23 | 45 | 5 | 9.7 | 2177 | 150 | 150 | 3 | III | L | D | | | |
| ARAR-007-0280 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 14 | 45 | 5 | 19 | 2216 | 400 | 450 | 16 | III | L | D | | | |
| ARAR-007-0290 | | ARARAT | 007-A-c | J-38-007 | 39 | 51 | 48 | 45 | 5 | 9.6 | 2370 | 200 | 350 | 6 | III | L | D | | | |
| ARAR-007-0310 | | ARARAT | 007-A-a | J-38-007 | 39 | 59 | 9.1 | 45 | 5 | 48 | 2500 | 200 | 350 | 6 | III | L | D | | | |
| ARAR-007-0320 | | ARARAT | 007-A-a | J-38-007 | 39 | 58 | 46 | 45 | 6 | 52 | 2530 | 200 | 200 | 3 | III | L | D | | | |
| ARAR-007-0330 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 49 | 45 | 5 | 47 | 2501 | 700 | 850 | 47 | III | L | D | | | |
| ARAR-007-0340 | | ARARAT | 007-A-a | J-38-007 | 39 | 55 | 16 | 45 | 5 | 49 | 2360 | 500 | 800 | 34 | III | L | D | | | |
| ARAR-007-0350 | | ARARAT | 007-A-a | J-38-007 | 39 | 54 | 60 | 45 | 5 | 48 | 2405 | 600 | 850 | 41 | III | L | D | | | |
| ARAR-007-0360 | | ARARAT | 007-A-a | J-38-007 | 39 | 54 | 55 | 45 | 6 | 53 | 2436 | 400 | 200 | 8 | III | L | D | | | |
| ARAR-007-0380 | | ARARAT | 007-A-b | J-38-007 | 39 | 58 | 5.2 | 45 | 7 | 14 | 2424 | 250 | 700 | 16 | III | L | D | | | |
| ARAR-007-0390 | | ARARAT | 007-A-b | J-38-007 | 39 | 56 | 19 | 45 | 7 | 32 | 2329 | 1000 | 450 | 37 | III | L | D | | | |
| ARAR-138-0005 | Kharberd | ARARAT | Kharberd | K-38-138 | 40 | 5 | 41 | 44 | 30 | 52 | 1006 | 739 | 408 | 24 | I | H | A | | | |
| ARAR-138-0040 | | ARARAT | 138-C-d | K-38-138 | 40 | 6 | 20 | 44 | 38 | 16 | 1243 | 360 | 100 | 39 | III | L | D | | | |
| ARAR-138-0050 | Bardzrashen | ARARAT | Bardzrashen | K-38-138 | 40 | 4 | 9 | 44 | 37 | 39 | 1178 | 360 | 100 | 6 | I | M | B | | | |
| ARAR-138-0060 | | ARARAT | 138-C-d | K-38-138 | 40 | 4 | 26 | 44 | 38 | 4.8 | 1070 | 300 | 150 | 4 | III | L | D | | | |
| ARAR-138-0070 | | ARARAT | 138-C-d | K-38-138 | 40 | 4 | 1.2 | 44 | 38 | 32 | 1321 | 200 | 300 | 6 | III | L | D | | | |
| ARAR-138-0080 | | ARARAT | 138-C-d | K-38-138 | 40 | 1 | 21 | 44 | 38 | 44 | 1072 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0090 | | ARARAT | 138-C-d | K-38-138 | 40 | 5 | 0.3 | 44 | 39 | 13 | 1167 | 350 | 600 | 19 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| ARAR-138-0100 | | ARARAT | 138-C-d | K-38-138 | 40 | 3 | 32 | 44 | 40 | 28 | 1384 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0110 | | ARARAT | 138-C-d | K-38-138 | 40 | 4 | 45 | 44 | 42 | 17 | 1671 | 250 | 400 | 9 | III | L | D | | | |
| ARAR-138-0120 | | ARARAT | 138-C-d | K-38-138 | 40 | 2 | 44 | 44 | 42 | 28 | 1287 | 200 | 250 | 4 | III | L | D | | | |
| ARAR-138-0130 | | ARARAT | 138-C-d | K-38-138 | 40 | 1 | 53 | 44 | 41 | 48 | 1264 | 250 | 450 | 10 | III | L | D | | | |
| ARAR-138-0140 | | ARARAT | 138-C-d | K-38-138 | 40 | 1 | 34 | 44 | 42 | 11 | 1343 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0145 | | ARARAT | 138-C-d | K-38-138 | 40 | 5 | 50 | 44 | 43 | 49 | 1560 | 2000 | 1700 | 226 | III | L | D | | | |
| ARAR-138-0150 | | ARARAT | 138-C-d | K-38-138 | 40 | 3 | 31 | 44 | 43 | 25 | 1521 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0160 | | ARARAT | 138-C-d | K-38-138 | 40 | 2 | 44 | 44 | 43 | 53 | 1388 | 600 | 650 | 36 | III | L | D | | | |
| ARAR-138-0170 | | ARARAT | 138-D-c | K-38-138 | 40 | 5 | 21 | 44 | 46 | 16 | 1443 | 2100 | 1500 | 279 | III | L | D | | | |
| ARAR-138-0180 | | ARARAT | 138-D-c | K-38-138 | 40 | 3 | 13 | 44 | 46 | 3.9 | 1630 | 200 | 300 | 6 | III | L | D | | | |
| ARAR-138-0190 | | ARARAT | 138-D-c | K-38-138 | 40 | 2 | 45 | 44 | 46 | 39 | 1647 | 350 | 250 | 9 | III | L | D | | | |
| ARAR-138-0200 | | ARARAT | 138-D-c | K-38-138 | 40 | 1 | 54 | 44 | 46 | 54 | 1661 | 300 | 350 | 9 | III | L | D | | | |
| ARAR-138-0210 | | ARARAT | 138-D-c | K-38-138 | 40 | 0 | 33 | 44 | 47 | 17 | 1464 | 200 | 200 | 4 | III | L | D | | | |
| ARAR-138-0215 | | ARARAT | Gokht | K-38-138 | 40 | 7 | 42 | 44 | 47 | 39 | 1677 | 300 | 1300 | 37 | III | M | C | | | |
| ARAR-138-0220 | | ARARAT | Baiburd | K-38-138 | 40 | 6 | 5.3 | 44 | 48 | 2.1 | 1601 | 600 | 700 | 43 | III | M | C | | | |
| ARAR-138-0230 | | ARARAT | Baiburd | K-38-138 | 40 | 5 | 45 | 44 | 48 | 36 | 1627 | 1100 | 2000 | 204 | III | M | C | | | |
| ARAR-138-0240 | | ARARAT | Baiburd | K-38-138 | 40 | 5 | 21 | 44 | 48 | 37 | 1534 | 600 | 400 | 24 | III | M | C | | | |
| ARAR-138-0250 | | ARARAT | Baiburd | K-38-138 | 40 | 5 | 1.2 | 44 | 48 | 22 | 1588 | 100 | 100 | 1 | III | M | C | | | |
| ARAR-138-0260 | | ARARAT | Kerpikend | K-38-138 | 40 | 4 | 36 | 44 | 48 | 52 | 1593 | 350 | 550 | 15 | III | M | C | | | |
| ARAR-138-0270 | | ARARAT | Gelaisor | K-38-138 | 40 | 3 | 40 | 44 | 48 | 31 | 1592 | 1300 | 2500 | 288 | III | M | C | | | |
| ARAR-138-0280 | | ARARAT | 138-D-c | K-38-138 | 40 | 2 | 12 | 44 | 47 | 32 | 1721 | 650 | 850 | 52 | III | L | D | | | |
| ARAR-138-0290 | | ARARAT | 138-D-c | K-38-138 | 40 | 2 | 18 | 44 | 48 | 31 | 1816 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0300 | | ARARAT | 138-D-c | K-38-138 | 40 | 0 | 39 | 44 | 48 | 39 | 1672 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0305 | | ARARAT | Gokht | K-38-138 | 40 | 8 | 0.8 | 44 | 49 | 18 | 2047 | 400 | 500 | 18 | III | M | C | | | |
| ARAR-138-0310 | | ARARAT | Kerpikend | K-38-138 | 40 | 4 | 36 | 44 | 49 | 48 | 1667 | 900 | 1900 | 170 | III | M | C | | | |
| ARAR-138-0320 | | ARARAT | 138-D-c | K-38-138 | 40 | 1 | 52 | 44 | 49 | 35 | 1866 | 300 | 550 | 14 | III | L | D | | | |
| ARAR-138-0330 | | ARARAT | 138-D-c | K-38-138 | 40 | 2 | 33 | 44 | 48 | 51 | 1848 | 500 | 350 | 16 | III | L | D | | | |
| ARAR-138-0335 | | ARARAT | 138-D-c | K-38-138 | 40 | 5 | 13 | 44 | 50 | 35 | 2067 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0340 | | ARARAT | 138-D-c | K-38-138 | 40 | 4 | 42 | 44 | 51 | 14 | 1782 | 400 | 700 | 22 | III | L | D | | | |
| ARAR-138-0350 | | ARARAT | 138-D-c | K-38-138 | 40 | 1 | 43 | 44 | 50 | 40 | 1911 | 300 | 500 | 13 | III | L | D | | | |
| ARAR-138-0360 | | ARARAT | 138-D-c | K-38-138 | 40 | 1 | 19 | 44 | 50 | 26 | 1715 | 150 | 500 | 9 | III | L | D | | | |
| ARAR-138-0370 | | ARARAT | 138-D-c | K-38-138 | 40 | 4 | 31 | 44 | 51 | 54 | 1716 | 400 | 1400 | 55 | III | L | D | | | |
| ARAR-138-0380 | | ARARAT | 138-D-c | K-38-138 | 40 | 3 | 47 | 44 | 52 | 12 | 1658 | 700 | 900 | 57 | III | L | D | | | |
| ARAR-138-0390 | | ARARAT | 138-D-c | K-38-138 | 40 | 1 | 7.1 | 44 | 52 | 49 | 2035 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0400 | | ARARAT | 138-D-d | K-38-138 | 40 | 3 | 5.2 | 44 | 54 | 20 | 2193 | 200 | 500 | 13 | III | L | D | | | |
| ARAR-138-0410 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 46 | 44 | 53 | 40 | 1812 | 300 | 650 | 18 | III | L | D | | | |
| ARAR-138-0420 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 13 | 44 | 53 | 33 | 1669 | 300 | 250 | 12 | III | L | D | | | |
| ARAR-138-0430 | | ARARAT | 138-D-d | K-38-138 | 40 | 1 | 30 | 44 | 54 | 53 | 1847 | 350 | 750 | 29 | III | L | D | | | |
| ARAR-138-0440 | | ARARAT | 138-D-d | K-38-138 | 40 | 1 | 32 | 44 | 55 | 34 | 1940 | 1300 | 1000 | 120 | III | L | D | | | |
| ARAR-138-0450 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 38 | 44 | 55 | 8.8 | 1796 | 1000 | 1200 | 107 | III | L | D | | | |
| ARAR-138-0460 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 15 | 44 | 55 | 9.6 | 1718 | 400 | 1100 | 44 | III | L | D | | | |
| ARAR-138-0470 | | ARARAT | 138-D-d | K-38-138 | 40 | 4 | 41 | 44 | 57 | 5.8 | 2678 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0480 | | ARARAT | 138-D-d | K-38-138 | 40 | 3 | 58 | 44 | 56 | 27 | 2502 | 100 | 100 | 1 | III | L | D | | | |
| ARAR-138-0490 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 59 | 44 | 57 | 9.4 | 2096 | 600 | 600 | 33 | III | L | D | | | |
| ARAR-138-0500 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 18 | 44 | 56 | 37 | 1973 | 550 | 700 | 38 | III | L | D | | | |
| ARAR-138-0510 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 25 | 44 | 57 | 4.8 | 1962 | 400 | 300 | 14 | III | L | D | | | |
| ARAR-138-0520 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 22 | 44 | 57 | 59 | 2129 | 400 | 700 | 26 | III | L | D | | | |
| ARAR-138-0525 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 4.8 | 44 | 59 | 39 | 1841 | 100 | 100 | 34 | III | L | D | | | |
| ARAR-138-0530 | | ARARAT | 138-D-d | K-38-138 | 40 | 0 | 53 | 44 | 58 | 54 | 2241 | 300 | 700 | 19 | III | L | D | | | |
| ARAR-138-0540 | | ARARAT | 138-D-d | K-38-138 | 40 | 1 | 9.3 | 44 | 59 | 27 | 2252 | 950 | 900 | 81 | III | L | D | | | |
| GEGH-007-0010 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 58 | 40 | 45 | 8 | 28 | 2319 | 900 | 500 | 37 | III | L | D | | | |
| GEGH-007-0020 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 57 | 1.9 | 45 | 8 | 53 | 2300 | 200 | 250 | 4 | III | L | D | | | |
| GEGH-007-0030 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 55 | 28 | 45 | 8 | 59 | 2418 | 1000 | 1400 | 111 | III | L | D | | | |
| GEGH-007-0040 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 59 | 3 | 45 | 10 | 29 | 2329 | 200 | 400 | 7 | III | L | D | | | |
| GEGH-007-0050 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 58 | 7.7 | 45 | 10 | 18 | 2358 | 400 | 550 | 20 | III | L | D | | | |
| GEGH-007-0060 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 58 | 7 | 45 | 11 | 0.5 | 2324 | 450 | 700 | 16 | III | L | D | | | |
| GEGH-007-0070 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 57 | 43 | 45 | 10 | 7.1 | 2348 | 200 | 300 | 7 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| GEGH-007-0080 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 57 | 32 | 45 | 10 | 8.5 | 2355 | 200 | 300 | 5 | III | L | D | | | |
| GEGH-007-0090 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 57 | 39 | 45 | 10 | 60 | 2334 | 300 | 450 | 10 | III | L | D | | | |
| GEGH-007-0100 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 55 | 25 | 45 | 10 | 36 | 2422 | 800 | 2100 | 123 | III | L | D | | | |
| GEGH-007-0110 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 54 | 49 | 45 | 10 | 28 | 2455 | 300 | 350 | 8 | III | L | D | | | |
| GEGH-007-0130 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 59 | 41 | 45 | 11 | 41 | 2321 | 300 | 250 | 7 | III | L | D | | | |
| GEGH-007-0140 | | GEGHARKUNIK | 007-A-b | J-38-007 | 39 | 59 | 17 | 45 | 12 | 2.5 | 2333 | 450 | 800 | 30 | III | L | D | | | |
| GEGH-007-0180 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 58 | 38 | 45 | 15 | 3.9 | 2404 | 150 | 350 | 5 | III | L | D | | | |
| GEGH-007-0190 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 58 | 37 | 45 | 15 | 17 | 2434 | 250 | 500 | 9 | III | L | D | | | |
| GEGH-007-0200 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 58 | 49 | 45 | 15 | 57 | 2529 | 200 | 300 | 6 | III | L | D | | | |
| GEGH-007-0210 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 58 | 45 | 45 | 16 | 14 | 2573 | 250 | 400 | 7 | III | L | D | | | |
| GEGH-007-0220 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 58 | 40 | 45 | 18 | 7.7 | 2926 | 250 | 350 | 9 | III | L | D | | | |
| GEGH-007-0230 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 57 | 32 | 45 | 18 | 0.7 | 2812 | 1050 | 400 | 34 | III | L | D | | | |
| GEGH-007-0233 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 56 | 51 | 45 | 15 | 8.1 | 2329 | | | 2 | III | L | D | | | |
| GEGH-007-0234 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 56 | 58 | 45 | 15 | 37 | 2539 | | | 14 | III | L | D | | | |
| GEGH-007-0235 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 56 | 56 | 45 | 16 | 29 | 2663 | | | 10 | III | L | D | | | |
| GEGH-007-0240 | | GEGHARKUNIK | 007-B-a | J-38-007 | 39 | 58 | 32 | 45 | 21 | 24 | 3138 | 200 | 600 | 10 | III | L | D | | | |
| GEGH-007-0250 | | GEGHARKUNIK | 007-B-b | J-38-007 | 39 | 58 | 45 | 45 | 23 | 11 | 2848 | 400 | 500 | 17 | III | L | D | | | |
| GEGH-007-0260 | | GEGHARKUNIK | 007-B-b | J-38-007 | 39 | 58 | 27 | 45 | 23 | 56 | 3108 | 1650 | 1900 | 211 | III | L | D | | | |
| GEGH-114-0010 | | GEGHARKUNIK | 114-D-d | K-38-114 | 40 | 40 | 19 | 44 | 55 | 16 | 2196 | 500 | 1600 | 31 | III | L | D | | | |
| GEGH-115-0010 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 43 | 42 | 45 | 9 | 39 | 2014 | 500 | 900 | 32 | III | L | D | | | |
| GEGH-115-0020 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 43 | 32 | 45 | 10 | 23 | 2245 | 700 | 1150 | 25 | III | L | D | | | |
| GEGH-115-0030 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 42 | 17 | 45 | 12 | 0.7 | 2040 | 700 | 1600 | 52 | III | L | D | | | |
| GEGH-115-0040 | | GEGHARKUNIK | Karakaya | K-38-115 | 40 | 42 | 13 | 45 | 6 | 32 | 1322 | 500 | 700 | 18 | III | M | C | | | |
| GEGH-115-0050 | | GEGHARKUNIK | Karakaya | K-38-115 | 40 | 41 | 60 | 45 | 6 | 51 | 1379 | 750 | 900 | 38 | III | M | C | | | |
| GEGH-115-0060 | | GEGHARKUNIK | Antaramej | K-38-115 | 40 | 41 | 21 | 45 | 6 | 5.8 | 1363 | 300 | 350 | 4 | III | M | C | | | |
| GEGH-115-0070 | | GEGHARKUNIK | Meshakend | K-38-115 | 40 | 41 | 5.1 | 45 | 5 | 15 | 1542 | 400 | 1000 | 22 | III | M | C | | | |
| GEGH-115-0080 | | GEGHARKUNIK | Meshakend | K-38-115 | 40 | 40 | 29 | 45 | 5 | 42 | 1468 | 600 | 600 | 47 | III | M | C | | | |
| GEGH-115-0090 | | GEGHARKUNIK | Meshakend | K-38-115 | 40 | 40 | 36 | 45 | 5 | 57 | 1581 | 400 | 500 | 11 | III | M | C | | | |
| GEGH-115-0100 | Dzoravank-Karakaya | GEGHARKUNIK | Dzoravank | K-38-115 | 40 | 41 | 36 | 45 | 6 | 50 | 1178 | 350 | 600 | 18 | II | H | B | | | |
| GEGH-115-0110 | | GEGHARKUNIK | Chaikend | K-38-115 | 40 | 41 | 37 | 45 | 7 | 22 | 1277 | 900 | 1150 | 60 | III | M | C | | | |
| GEGH-115-0120 | | GEGHARKUNIK | Chaikend | K-38-115 | 40 | 41 | 37 | 45 | 8 | 8.8 | 1357 | 850 | 1600 | 78 | III | M | C | | | |
| GEGH-115-0130 | Dprabak-Chaykend | GEGHARKUNIK | Dprabak | K-38-115 | 40 | 40 | 7 | 45 | 8 | 9 | 1692 | 1000 | 1500 | 338 | I | M | B | | Houses,public buildings | (500 persons) |
| GEGH-115-0140 | | GEGHARKUNIK | Chaikend | K-38-115 | 40 | 41 | 2.7 | 45 | 8 | 24 | 1329 | 300 | 1100 | 20 | III | M | C | | | |
| GEGH-115-0150 | | GEGHARKUNIK | Chaikend | K-38-115 | 40 | 42 | 4.8 | 45 | 9 | 49 | 1629 | 2000 | 4200 | 590 | III | M | C | | | |
| GEGH-115-0160 | | GEGHARKUNIK | Chaikend | K-38-115 | 40 | 40 | 53 | 45 | 9 | 6.4 | 1387 | 750 | 1500 | 69 | III | M | C | | | |
| GEGH-115-0170 | Aygut-Gyolkend | GEGHARKUNIK | Aygut | K-38-115 | 40 | 41 | 17 | 45 | 10 | 43 | 1457 | 750 | 2700 | 164 | II | M | C | | | |
| GEGH-115-0180 | | GEGHARKUNIK | Gelkend | K-38-115 | 40 | 40 | 56 | 45 | 12 | 3.3 | 1616 | 200 | 700 | 9 | III | M | C | | | |
| GEGH-115-0181 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 41 | 27 | 45 | 13 | 41 | 1918 | 1150 | 950 | 1149 | III | L | D | | | |
| GEGH-115-0182 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 42 | 14 | 45 | 12 | 59 | 1872 | 400 | 1000 | 20 | III | L | D | | | |
| GEGH-115-0183 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 42 | 35 | 45 | 13 | 9.5 | 2097 | 500 | 1200 | 35 | III | L | D | | | |
| GEGH-115-0190 | | GEGHARKUNIK | 115-C-d | K-38-115 | 40 | 40 | 10 | 45 | 12 | 13 | 1666 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-115-0200 | | GEGHARKUNIK | Martuni | K-38-115 | 40 | 40 | 9.3 | 45 | 13 | 25 | 1578 | 750 | 600 | 40 | III | M | C | | | |
| GEGH-126-0010 | | GEGHARKUNIK | 126-B-a | K-38-126 | 40 | 36 | 47 | 44 | 49 | 31 | 2126 | 400 | 900 | 33 | III | L | D | | | |
| GEGH-126-0020 | | GEGHARKUNIK | Ddmashen | K-38-126 | 40 | 34 | 15 | 44 | 49 | 29 | 1810 | 400 | 400 | 19 | III | M | C | | | |
| GEGH-126-0030 | | GEGHARKUNIK | Ddmashen | K-38-126 | 40 | 34 | 5.4 | 44 | 49 | 35 | 1797 | 300 | 250 | 6 | III | M | C | | | |
| GEGH-126-0040 | | GEGHARKUNIK | 126-B-b | K-38-126 | 40 | 38 | 41 | 44 | 52 | 37 | 2206 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-126-0050 | | GEGHARKUNIK | 126-B-b | K-38-126 | 40 | 36 | 49 | 44 | 52 | 20 | 2188 | 400 | 900 | 21 | III | L | D | | | |
| GEGH-126-0060 | | GEGHARKUNIK | 126-B-b | K-38-126 | 40 | 37 | 29 | 44 | 54 | 14 | 2164 | 250 | 800 | 20 | III | L | D | | | |
| GEGH-126-0070 | | GEGHARKUNIK | Geghamavan | K-38-126 | 40 | 34 | 56 | 44 | 54 | 16 | 1932 | 450 | 900 | 36 | III | M | C | | | |
| GEGH-126-0080 | | GEGHARKUNIK | Geghamavan | K-38-126 | 40 | 36 | 59 | 44 | 55 | 23 | 2015 | 200 | 350 | 5 | III | M | C | | | |
| GEGH-126-0090 | | GEGHARKUNIK | Geghamavan | K-38-126 | 40 | 34 | 55 | 44 | 54 | 51 | 1900 | 400 | 550 | 23 | III | M | C | | | |
| GEGH-126-0100 | | GEGHARKUNIK | Geghamavan | K-38-126 | 40 | 35 | 12 | 44 | 55 | 6.1 | 1930 | 500 | 600 | 25 | III | M | C | | | |
| GEGH-126-0110 | | GEGHARKUNIK | Geghamavan | K-38-126 | 40 | 34 | 59 | 44 | 55 | 28 | 1973 | 500 | 1100 | 52 | III | M | C | | | |
| GEGH-126-0120 | | GEGHARKUNIK | Geghamavan | K-38-126 | 40 | 34 | 34 | 44 | 55 | 12 | 1973 | 650 | 800 | 51 | III | M | C | | | |
| GEGH-126-0130 | | GEGHARKUNIK | Tsovagyugh | K-38-126 | 40 | 39 | 11 | 44 | 57 | 14 | 2520 | 100 | 100 | 1 | III | M | C | | | |
| GEGH-127-0010 | | GEGHARKUNIK | 127-A-a | K-38-127 | 40 | 39 | 49 | 45 | 1 | 11 | 1891 | 600 | 1600 | 77 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| GEGH-127-0020 | | GEGHARKUNIK | 127-A-a | K-38-127 | 40 | 39 | 39 | 45 | 3 | 28 | 1991 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0030 | Kalavan-Amirkher | GEGHARKUNIK | Kalavan | K-38-127 | 40 | 39 | 44 | 45 | 6 | 39 | 1527 | 800 | 850 | 63 | II | M | C | Houses were destroyed in the 1988 earthquake and deformations still in progress | | |
| GEGH-127-0040 | | GEGHARKUNIK | Amirkher | K-38-127 | 40 | 38 | 56 | 45 | 6 | 28 | 1610 | 550 | 750 | 36 | III | M | C | | | |
| GEGH-127-0050 | | GEGHARKUNIK | Amirkher | K-38-127 | 40 | 39 | 14 | 45 | 6 | 56 | 1563 | 450 | 650 | 21 | III | M | C | | | |
| GEGH-127-0060 | | GEGHARKUNIK | Airivan | K-38-127 | 40 | 26 | 18 | 45 | 6 | 28 | 1907 | 400 | 900 | 34 | III | M | C | | | |
| GEGH-127-0070 | | GEGHARKUNIK | Amirkher | K-38-127 | 40 | 38 | 39 | 45 | 7 | 11 | 1747 | 1200 | 1400 | 91 | III | M | C | | | |
| GEGH-127-0080 | | GEGHARKUNIK | Amirkher | K-38-127 | 40 | 37 | 46 | 45 | 7 | 52 | 1832 | 2350 | 1400 | 255 | III | M | C | | | |
| GEGH-127-0100 | | GEGHARKUNIK | Amirkher | K-38-127 | 40 | 38 | 31 | 45 | 8 | 37 | 2250 | 500 | 1100 | 44 | III | M | C | | | |
| GEGH-127-0110 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 36 | 14 | 45 | 10 | 3.7 | 1959 | 400 | 600 | 22 | III | L | D | | | |
| GEGH-127-0120 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 35 | 45 | 45 | 10 | 8.8 | 2046 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0130 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 35 | 15 | 45 | 9 | 58 | 2248 | 500 | 500 | 23 | III | L | D | | | |
| GEGH-127-0140 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 39 | 39 | 45 | 11 | 16 | 1785 | 1100 | 600 | 55 | III | L | D | | | |
| GEGH-127-0150 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 39 | 7.6 | 45 | 10 | 50 | 1841 | 500 | 900 | 35 | III | L | D | | | |
| GEGH-127-0160 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 38 | 26 | 45 | 10 | 48 | 1885 | 1050 | 900 | 51 | III | L | D | | | |
| GEGH-127-0170 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 38 | 27 | 45 | 12 | 35 | 1918 | 600 | 500 | 28 | III | L | D | | | |
| GEGH-127-0180 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 37 | 17 | 45 | 12 | 18 | 2224 | 300 | 550 | 16 | III | L | D | | | |
| GEGH-127-0190 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 35 | 49 | 45 | 11 | 56 | 2288 | 800 | 500 | 38 | III | L | D | | | |
| GEGH-127-0200 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 35 | 13 | 45 | 11 | 41 | 2230 | 500 | 600 | 29 | III | L | D | | | |
| GEGH-127-0210 | | GEGHARKUNIK | Tokhluja | K-38-127 | 40 | 34 | 47 | 45 | 12 | 27 | 2191 | 250 | 550 | 12 | III | M | C | | | |
| GEGH-127-0220 | | GEGHARKUNIK | Tokhluja | K-38-127 | 40 | 34 | 8.5 | 45 | 12 | 23 | 2283 | 100 | 100 | 1 | III | M | C | | | |
| GEGH-127-0230 | | GEGHARKUNIK | Tokhluja | K-38-127 | 40 | 32 | 21 | 45 | 13 | 40 | 2062 | 600 | 700 | 34 | III | M | C | | | |
| GEGH-127-0240 | Martuni | GEGHARKUNIK | Martuni | K-38-127 | 40 | 38 | 40 | 45 | 14 | 26 | 2062 | 1700 | 3000 | 649 | I | H | A | Houses, telephone line, and old road | | |
| GEGH-127-0270 | | GEGHARKUNIK | 127-A-b | K-38-127 | 40 | 36 | 43 | 45 | 14 | 22 | 2711 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0280 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 37 | 21 | 45 | 15 | 29 | 2293 | 200 | 550 | 11 | III | L | D | | | |
| GEGH-127-0290 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 35 | 25 | 45 | 14 | 59 | 2347 | 200 | 550 | 10 | III | L | D | | | |
| GEGH-127-0300 | | GEGHARKUNIK | Tokhluja | K-38-127 | 40 | 33 | 20 | 45 | 14 | 41 | 2103 | 600 | 1400 | 86 | III | M | C | | | |
| GEGH-127-0320 | Getik | GEGHARKUNIK | Getik | K-38-127 | 40 | 39 | 26 | 45 | 15 | 41 | 1736 | 1000 | 1250 | 58 | II | M | C | | | |
| GEGH-127-0330 | | GEGHARKUNIK | Getik | K-38-127 | 40 | 39 | 13 | 45 | 16 | 27 | 1743 | 950 | 900 | 65 | III | M | C | | | |
| GEGH-127-0340 | | GEGHARKUNIK | Getik | K-38-127 | 40 | 39 | 47 | 45 | 17 | 2.7 | 1874 | 1000 | 1750 | 148 | III | M | C | | | |
| GEGH-127-0350 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 37 | 47 | 45 | 15 | 51 | 2114 | 500 | 550 | 25 | III | L | D | | | |
| GEGH-127-0360 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 36 | 5.2 | 45 | 16 | 37 | 2279 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0370 | | GEGHARKUNIK | Ttujur | K-38-127 | 40 | 39 | 50 | 45 | 18 | 13 | 1949 | 2200 | 3300 | 623 | III | M | C | | | |
| GEGH-127-0380 | | GEGHARKUNIK | Ttujur | K-38-127 | 40 | 38 | 5.5 | 45 | 17 | 32 | 1896 | 450 | 850 | 31 | III | M | C | | | |
| GEGH-127-0390 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 37 | 37 | 45 | 17 | 3 | 2108 | 200 | 350 | 7 | III | L | D | | | |
| GEGH-127-0400 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 37 | 12 | 45 | 17 | 4.1 | 2149 | 400 | 450 | 16 | III | L | D | | | |
| GEGH-127-0410 | | GEGHARKUNIK | Ttujur | K-38-127 | 40 | 37 | 40 | 45 | 18 | 3.8 | 2038 | 1000 | 400 | 42 | III | M | C | | | |
| GEGH-127-0420 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 35 | 51 | 45 | 17 | 46 | 2193 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0430 | | GEGHARKUNIK | Agbulakh | K-38-127 | 40 | 33 | 6.8 | 45 | 17 | 39 | 2359 | 100 | 100 | 1 | III | M | C | | | |
| GEGH-127-0440 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 33 | 33 | 45 | 18 | 18 | 2219 | 300 | 1000 | 33 | III | L | D | | | |
| GEGH-127-0450 | Ttjur | GEGHARKUNIK | Ttjur | K-38-127 | 40 | 38 | 20 | 45 | 19 | 2 | 1812 | 250 | 350 | 89 | II | M | C | | | There is a big landslide on the left bank of the river, not active in the present, but very dengerous for all village, if |
| GEGH-127-0460 | | GEGHARKUNIK | Ttujur | K-38-127 | 40 | 38 | 33 | 45 | 19 | 42 | 1856 | 400 | 400 | 15 | III | M | C | | | |
| GEGH-127-0470 | | GEGHARKUNIK | 127-B-a | K-38-127 | 40 | 36 | 55 | 45 | 18 | 34 | 1984 | 950 | 850 | 68 | III | L | D | | | |
| GEGH-127-0480 | | GEGHARKUNIK | Krasnoselsk | K-38-127 | 40 | 37 | 25 | 45 | 19 | 46 | 1829 | 1200 | 1500 | 161 | III | M | C | | | |
| GEGH-127-0490 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 33 | 16 | 45 | 19 | 6 | 2211 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0500 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 32 | 38 | 45 | 20 | 16 | 2223 | 200 | 500 | 10 | III | L | D | | | |
| GEGH-127-0510 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 32 | 33 | 45 | 20 | 28 | 2177 | 600 | 250 | 13 | III | L | D | | | |
| GEGH-127-0520 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 32 | 9.6 | 45 | 20 | 45 | 2216 | 150 | 400 | 6 | III | L | D | | | |
| GEGH-127-0530 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 31 | 57 | 45 | 21 | 0.9 | 2289 | 200 | 450 | 8 | III | L | D | | | |
| GEGH-127-0540 | | GEGHARKUNIK | 127-D-a | K-38-127 | 40 | 28 | 27 | 45 | 20 | 5.1 | 1977 | 700 | 500 | 27 | III | L | D | | | |
| GEGH-127-0550 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 31 | 41 | 45 | 22 | 20 | 2307 | 200 | 600 | 11 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| GEGH-127-0560 | | GEGHARKUNIK | 127-B-c | K-38-127 | 40 | 31 | 47 | 45 | 22 | 31 | 2289 | 200 | 500 | 9 | III | L | D | | | |
| GEGH-127-0570 | | GEGHARKUNIK | Orjonikidze | K-38-127 | 40 | 35 | 22 | 45 | 23 | 45 | 2051 | 400 | 550 | 19 | III | M | C | | | |
| GEGH-127-0580 | | GEGHARKUNIK | Artanish | K-38-127 | 40 | 31 | 11 | 45 | 23 | 21 | 2232 | 550 | 700 | 37 | III | M | C | | | |
| GEGH-127-0590 | | GEGHARKUNIK | Artanish | K-38-127 | 40 | 31 | 1.4 | 45 | 22 | 55 | 2149 | 550 | 750 | 36 | III | M | C | | | |
| GEGH-127-0600 | | GEGHARKUNIK | Artanish | K-38-127 | 40 | 29 | 50 | 45 | 22 | 24 | 2044 | 500 | 850 | 34 | III | M | C | | | |
| GEGH-127-0610 | | GEGHARKUNIK | Orjonikidze | K-38-127 | 40 | 35 | 2.2 | 45 | 25 | 16 | 2010 | 400 | 1150 | 46 | III | M | C | | | |
| GEGH-127-0620 | | GEGHARKUNIK | 127-B-d | K-38-127 | 40 | 32 | 28 | 45 | 24 | 18 | 2102 | 400 | 700 | 21 | III | L | D | | | |
| GEGH-127-0630 | | GEGHARKUNIK | 127-B-d | K-38-127 | 40 | 30 | 48 | 45 | 24 | 48 | 2330 | 850 | 1300 | 69 | III | L | D | | | |
| GEGH-127-0640 | | GEGHARKUNIK | 127-B-d | K-38-127 | 40 | 29 | 59 | 45 | 24 | 43 | 2308 | 550 | 600 | 28 | III | L | D | | | |
| GEGH-127-0650 | | GEGHARKUNIK | 127-B-d | K-38-127 | 40 | 34 | 18 | 45 | 25 | 39 | 2117 | 300 | 600 | 16 | III | L | D | | | |
| GEGH-127-0660 | | GEGHARKUNIK | 127-B-d | K-38-127 | 40 | 34 | 24 | 45 | 26 | 36 | 2089 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-127-0670 | | GEGHARKUNIK | 127-D-b | K-38-127 | 40 | 30 | 2.2 | 45 | 26 | 0.1 | 2287 | 250 | 350 | 9 | III | L | D | | | |
| GEGH-127-0680 | | GEGHARKUNIK | 127-D-b | K-38-127 | 40 | 29 | 54 | 45 | 25 | 42 | 2300 | 350 | 400 | 14 | III | L | D | | | |
| GEGH-127-0690 | | GEGHARKUNIK | 127-D-b | K-38-127 | 40 | 29 | 12 | 45 | 25 | 48 | 2261 | 250 | 700 | 14 | III | L | D | | | |
| GEGH-127-0700 | | GEGHARKUNIK | Jil | K-38-127 | 40 | 27 | 53 | 45 | 28 | 43 | 2411 | 300 | 600 | 14 | III | M | C | | | |
| GEGH-127-3740 | | GEGHARKUNIK | Ttujur | K-38-127 | 40 | 40 | 15 | 45 | 15 | 58 | 1920 | 2020 | 1500 | 393 | III | M | C | | | |
| GEGH-128-0010 | | GEGHARKUNIK | 128-C-a | K-38-128 | 40 | 25 | 49 | 45 | 30 | 11 | 2371 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-128-0020 | | GEGHARKUNIK | Pambak | K-38-128 | 40 | 23 | 45 | 45 | 30 | 23 | 2251 | 850 | 450 | 32 | III | M | C | | | |
| GEGH-128-0030 | | GEGHARKUNIK | 128-C-c | K-38-128 | 40 | 25 | 23 | 45 | 32 | 29 | 2466 | 200 | 350 | 6 | III | L | D | | | |
| GEGH-128-0040 | | GEGHARKUNIK | 128-C-c | K-38-128 | 40 | 24 | 39 | 45 | 34 | 41 | 2476 | 300 | 650 | 15 | III | L | D | | | |
| GEGH-128-0050 | | GEGHARKUNIK | 128-C-c | K-38-128 | 40 | 22 | 37 | 45 | 37 | 7.7 | 2625 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-128-0060 | | GEGHARKUNIK | 128-C-c | K-38-128 | 40 | 21 | 55 | 45 | 36 | 44 | 2569 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-128-0070 | | GEGHARKUNIK | 128-C-c | K-38-128 | 40 | 21 | 37 | 45 | 37 | 42 | 2523 | 650 | 700 | 37 | III | L | D | | | |
| GEGH-128-0080 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 21 | 36 | 45 | 38 | 4.2 | 2583 | 250 | 750 | 17 | III | L | D | | | |
| GEGH-128-0090 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 22 | 11 | 45 | 38 | 46 | 2835 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-128-0100 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 20 | 6.6 | 45 | 42 | 54 | 2729 | 100 | 100 | 6 | III | L | D | | | |
| GEGH-128-0110 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 20 | 59 | 45 | 42 | 52 | 3057 | 1000 | 1000 | 96 | III | L | D | | | |
| GEGH-128-0120 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 21 | 6 | 45 | 43 | 18 | 3102 | 200 | 300 | 6 | III | L | D | | | |
| GEGH-128-0130 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 20 | 41 | 45 | 44 | 22 | 3057 | 300 | 300 | 8 | III | L | D | | | |
| GEGH-128-0140 | | GEGHARKUNIK | 128-C-d | K-38-128 | 40 | 20 | 51 | 45 | 42 | 4 | 3034 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-139-0010 | | GEGHARKUNIK | 139-C-c | K-38-139 | 40 | 0 | 57 | 45 | 0 | 24 | 2008 | 800 | 1100 | 66 | III | L | D | | | |
| GEGH-139-0020 | | GEGHARKUNIK | 139-A-c | K-38-139 | 40 | 11 | 6.1 | 45 | 5 | 42 | 2674 | 200 | 700 | 11 | III | L | D | | | |
| GEGH-139-0030 | | GEGHARKUNIK | 139-A-c | K-38-139 | 40 | 12 | 11 | 45 | 6 | 52 | 2483 | 550 | 1000 | 36 | III | L | D | | | |
| GEGH-139-0040 | | GEGHARKUNIK | 139-A-c | K-38-139 | 40 | 11 | 8.7 | 45 | 6 | 28 | 2533 | 200 | 500 | 8 | III | L | D | | | |
| GEGH-139-0050 | | GEGHARKUNIK | 139-A-c | K-38-139 | 40 | 12 | 31 | 45 | 7 | 20 | 2428 | 300 | 750 | 18 | III | L | D | | | |
| GEGH-139-0060 | | GEGHARKUNIK | 139-A-d | K-38-139 | 40 | 13 | 17 | 45 | 8 | 21 | 2325 | 250 | 500 | 11 | III | L | D | | | |
| GEGH-139-0070 | | GEGHARKUNIK | 139-A-d | K-38-139 | 40 | 11 | 46 | 45 | 8 | 20 | 2315 | 400 | 700 | 25 | III | L | D | | | |
| GEGH-139-0080 | | GEGHARKUNIK | Lanjakhpyur | K-38-139 | 40 | 16 | 6.3 | 45 | 8 | 43 | 2096 | 250 | 250 | 7 | III | M | C | | | |
| GEGH-139-0090 | | GEGHARKUNIK | 139-C-b | K-38-139 | 40 | 8 | 30 | 45 | 8 | 40 | 2316 | 1000 | 3500 | 237 | III | L | D | | | |
| GEGH-139-0100 | | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 12 | 41 | 45 | 11 | 3.8 | 2059 | 700 | 1100 | 42 | III | M | C | | | |
| GEGH-139-0110 | | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 12 | 29 | 45 | 11 | 6 | 2037 | 250 | 300 | 7 | III | M | C | | | |
| GEGH-139-0120 | Yeranos | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 12 | 11 | 45 | 10 | 39 | 2091 | 1100 | 1675 | 93 | II | M | C | | | |
| GEGH-139-0130 | | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 11 | 51 | 45 | 11 | 2.3 | 2043 | 200 | 600 | 11 | III | M | C | | | |
| GEGH-139-0140 | | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 11 | 56 | 45 | 11 | 16 | 2004 | 200 | 300 | 7 | III | M | C | | | |
| GEGH-139-0150 | | GEGHARKUNIK | Vardadzor | K-38-139 | 40 | 11 | 17 | 45 | 11 | 9.3 | 2038 | 300 | 500 | 13 | III | M | C | | | |
| GEGH-139-0160 | | GEGHARKUNIK | Dzorakhpyur | K-38-139 | 40 | 10 | 4 | 45 | 11 | 5.4 | 2028 | 350 | 850 | 33 | III | M | C | | | |
| GEGH-139-0170 | | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 12 | 32 | 45 | 11 | 34 | 1974 | 200 | 300 | 7 | III | M | C | | | |
| GEGH-139-0180 | | GEGHARKUNIK | Yeranos | K-38-139 | 40 | 11 | 58 | 45 | 11 | 27 | 1986 | 250 | 300 | 6 | III | M | C | | | |
| GEGH-139-0190 | | GEGHARKUNIK | Vardadzor | K-38-139 | 40 | 10 | 42 | 45 | 11 | 46 | 1985 | 500 | 950 | 41 | III | M | C | | | |
| GEGH-139-0200 | | GEGHARKUNIK | Tazagyugh | K-38-139 | 40 | 8 | 30 | 45 | 11 | 40 | 2063 | 400 | 400 | 13 | III | M | C | | | |
| GEGH-139-0210 | | GEGHARKUNIK | Lichk | K-38-139 | 40 | 9 | 18 | 45 | 14 | 44 | 1925 | 300 | 300 | 10 | III | M | C | | | |
| GEGH-139-0220 | | GEGHARKUNIK | Lichk | K-38-139 | 40 | 9 | 20 | 45 | 15 | 5.2 | 1929 | 300 | 250 | 11 | III | M | C | | | |
| GEGH-139-0230 | | GEGHARKUNIK | Madina | K-38-139 | 40 | 4 | 32 | 45 | 15 | 15 | 2172 | 200 | 400 | 12 | III | M | C | | | |
| GEGH-139-0240 | | GEGHARKUNIK | Nerkin-Getashen | K-38-139 | 40 | 8 | 26 | 45 | 16 | 12 | 1940 | 200 | 300 | 10 | III | M | C | | | |
| GEGH-139-0250 | | GEGHARKUNIK | Geghovit | K-38-139 | 40 | 5 | 54 | 45 | 18 | 50 | 2202 | 700 | 1400 | 87 | III | M | C | | | |
| GEGH-139-0260 | | GEGHARKUNIK | Geghovit | K-38-139 | 40 | 6 | 9 | 45 | 19 | 8 | 2188 | 550 | 1300 | 59 | III | M | C | | | |
| GEGH-139-0270 | | GEGHARKUNIK | Astkhadzor | K-38-139 | 40 | 7 | 7.2 | 45 | 20 | 47 | 2103 | 1000 | 1000 | 76 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| GEGH-139-0280 | | GEGHARKUNIK | 139-D-d | K-38-139 | 40 | 1 | 7.4 | 45 | 29 | 47 | 2792 | 1000 | 1700 | 155 | III | L | D | | | |
| GEGH-140-0010 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 3 | 42 | 45 | 30 | 22 | 2546 | 600 | 400 | 27 | III | L | D | | | |
| GEGH-140-0020 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 2 | 46 | 45 | 30 | 36 | 2679 | 300 | 700 | 25 | III | L | D | | | |
| GEGH-140-0030 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 2 | 4.8 | 45 | 31 | 10 | 2837 | 700 | 850 | 46 | III | L | D | | | |
| GEGH-140-0040 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 1 | 43 | 45 | 31 | 28 | 2958 | 300 | 700 | 27 | III | L | D | | | |
| GEGH-140-0050 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 4 | 30 | 45 | 32 | 0.3 | 2487 | 800 | 1500 | 107 | III | L | D | | | |
| GEGH-140-0060 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 4 | 40 | 45 | 34 | 3.7 | 2541 | 600 | 1550 | 86 | III | L | D | | | |
| GEGH-140-0070 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 3 | 9.4 | 45 | 33 | 27 | 2772 | 750 | 1500 | 100 | III | L | D | | | |
| GEGH-140-0080 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 1 | 6.7 | 45 | 33 | 33 | 3151 | 400 | 1300 | 47 | III | L | D | | | |
| GEGH-140-0090 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 2 | 30 | 45 | 34 | 9.3 | 2945 | 650 | 900 | 54 | III | L | D | | | |
| GEGH-140-0100 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 1 | 58 | 45 | 35 | 6.9 | 2949 | 1800 | 4400 | 666 | III | L | D | | | |
| GEGH-140-0110 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 5 | 26 | 45 | 36 | 34 | 2343 | 400 | 900 | 26 | III | L | D | | | |
| GEGH-140-0120 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 1 | 13 | 45 | 36 | 21 | 3104 | 700 | 1250 | 76 | III | L | D | | | |
| GEGH-140-0130 | | GEGHARKUNIK | Tsovak | K-38-140 | 40 | 10 | 9.7 | 45 | 37 | 9.9 | 2012 | 300 | 400 | 13 | III | M | C | | | |
| GEGH-140-0140 | | GEGHARKUNIK | Lchavan | K-38-140 | 40 | 8 | 58 | 45 | 36 | 45 | 2061 | 200 | 400 | 8 | III | M | C | | | |
| GEGH-140-0150 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 3 | 35 | 45 | 37 | 16 | 2678 | 650 | 1700 | 88 | III | L | D | | | |
| GEGH-140-0160 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 2 | 7.3 | 45 | 37 | 43 | 2840 | 800 | 2900 | 234 | III | L | D | | | |
| GEGH-140-0165 | | GEGHARKUNIK | 140-C-c | K-38-140 | 40 | 1 | 5.3 | 45 | 38 | 21 | 2897 | 1500 | 600 | 576 | III | L | D | | | |
| GEGH-140-0170 | | GEGHARKUNIK | 140-C-d | K-38-140 | 40 | 2 | 1.5 | 45 | 39 | 37 | 2729 | 750 | 1600 | 98 | III | L | D | | | |
| GEGH-140-0180 | | GEGHARKUNIK | 140-C-b | K-38-140 | 40 | 6 | 20 | 45 | 40 | 54 | 2255 | 500 | 800 | 27 | III | L | D | | | |
| GEGH-140-0190 | | GEGHARKUNIK | Shishkaya | K-38-140 | 40 | 18 | 53 | 45 | 42 | 31 | 2303 | 550 | 1000 | 43 | III | M | C | | | |
| GEGH-140-0200 | Avazan | GEGHARKUNIK | Avazan | K-38-140 | 40 | 18 | 8 | 45 | 43 | 1 | 2201 | 200 | 1700 | 175 | I | M | B | | | |
| GEGH-140-0201 | | GEGHARKUNIK | Bagar | K-38-140 | 40 | 18 | 60 | 45 | 44 | 9.2 | 2615 | 1600 | 2700 | 390 | III | M | C | | | |
| GEGH-140-0202 | | GEGHARKUNIK | Bagar | K-38-140 | 40 | 17 | 52 | 45 | 44 | 21 | 2239 | 2000 | 1700 | 313 | III | M | C | | | |
| GEGH-140-0210 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 18 | 42 | 45 | 45 | 33 | 2449 | 1000 | 2000 | 164 | III | L | D | | | |
| GEGH-140-0220 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 19 | 8.2 | 45 | 46 | 13 | 2629 | 250 | 250 | 11 | III | L | D | | | |
| GEGH-140-0230 | | GEGHARKUNIK | 140-D-a | K-38-140 | 40 | 7 | 28 | 45 | 45 | 11 | 2148 | 500 | 1200 | 49 | III | L | D | | | |
| GEGH-140-0240 | | GEGHARKUNIK | 140-D-a | K-38-140 | 40 | 6 | 1.8 | 45 | 46 | 6.7 | 2333 | 300 | 800 | 25 | III | L | D | | | |
| GEGH-140-0250 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 17 | 56 | 45 | 46 | 58 | 2305 | 1150 | 1350 | 99 | III | L | D | | | |
| GEGH-140-0260 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 18 | 22 | 45 | 47 | 47 | 2472 | 500 | 600 | 22 | III | L | D | | | |
| GEGH-140-0270 | | GEGHARKUNIK | 140-D-a | K-38-140 | 40 | 5 | 51 | 45 | 46 | 44 | 2303 | 400 | 1150 | 38 | III | L | D | | | |
| GEGH-140-0280 | | GEGHARKUNIK | 140-D-a | K-38-140 | 40 | 5 | 38 | 45 | 47 | 33 | 2274 | 1100 | 1600 | 120 | III | L | D | | | |
| GEGH-140-0290 | | GEGHARKUNIK | 140-D-a | K-38-140 | 40 | 5 | 4.7 | 45 | 47 | 58 | 2406 | 300 | 600 | 16 | III | L | D | | | |
| GEGH-140-0300 | | GEGHARKUNIK | 140-D-c | K-38-140 | 40 | 3 | 52 | 45 | 48 | 24 | 2438 | 950 | 2100 | 179 | III | L | D | | | |
| GEGH-140-0310 | | GEGHARKUNIK | 140-D-c | K-38-140 | 40 | 3 | 16 | 45 | 48 | 57 | 2437 | 450 | 1600 | 55 | III | L | D | | | |
| GEGH-140-0320 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 18 | 15 | 45 | 50 | 0.9 | 2628 | 600 | 700 | 33 | III | L | D | | | |
| GEGH-140-0330 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 16 | 45 | 45 | 50 | 38 | 2219 | 650 | 1200 | 70 | III | L | D | | | |
| GEGH-140-0340 | | GEGHARKUNIK | Sariyagub | K-38-140 | 40 | 8 | 30 | 45 | 50 | 15 | 2279 | 300 | 700 | 18 | III | M | C | | | |
| GEGH-140-0345 | Jaghatsadzor-Sariyaghub | GEGHARKUNIK | Jaghatsadzor-Sariyaghub | K-38-140 | 40 | 8 | 31 | 45 | 49 | 13 | 2207 | 700 | 750 | 24 | II | M | C | | School building in front of the landslide | |
| GEGH-140-0350 | | GEGHARKUNIK | Sariyagub | K-38-140 | 40 | 8 | 12 | 45 | 50 | 36 | 2310 | 300 | 1000 | 33 | III | M | C | | | |
| GEGH-140-0360 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 7 | 17 | 45 | 49 | 52 | 2316 | 600 | 1000 | 59 | III | M | C | | | |
| GEGH-140-0370 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 6 | 54 | 45 | 49 | 45 | 2210 | 250 | 350 | 8 | III | M | C | | | |
| GEGH-140-0380 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 5 | 49 | 45 | 49 | 57 | 2264 | 100 | 100 | 1 | III | M | C | | | |
| GEGH-140-0390 | | GEGHARKUNIK | Verin-Shorja | K-38-140 | 40 | 5 | 27 | 45 | 50 | 36 | 2374 | 600 | 900 | 39 | III | M | C | | | |
| GEGH-140-0400 | | GEGHARKUNIK | 140-B-a | K-38-140 | 40 | 17 | 18 | 45 | 51 | 38 | 2405 | 400 | 700 | 23 | III | L | D | | | |
| GEGH-140-0410 | | GEGHARKUNIK | Azizlu | K-38-140 | 40 | 8 | 53 | 45 | 51 | 37 | 2198 | 650 | 1100 | 63 | III | M | C | | | |
| GEGH-140-0420 | | GEGHARKUNIK | Azizlu | K-38-140 | 40 | 8 | 35 | 45 | 51 | 59 | 2268 | 250 | 1300 | 24 | III | M | C | | | |
| GEGH-140-0430 | | GEGHARKUNIK | Azizlu | K-38-140 | 40 | 8 | 0.4 | 45 | 51 | 19 | 2381 | 800 | 1900 | 124 | III | M | C | | | |
| GEGH-140-0440 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 6 | 4.5 | 45 | 51 | 11 | 2422 | 600 | 2000 | 99 | III | M | C | | | |
| GEGH-140-0450 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 5 | 57 | 45 | 51 | 48 | 2473 | 600 | 2200 | 90 | III | M | C | | | |
| GEGH-140-0460 | | GEGHARKUNIK | 140-B-b | K-38-140 | 40 | 17 | 0.9 | 45 | 52 | 22 | 2355 | 500 | 1100 | 48 | III | L | D | | | |
| GEGH-140-0470 | | GEGHARKUNIK | 140-B-b | K-38-140 | 40 | 16 | 39 | 45 | 53 | 27 | 2380 | 500 | 900 | 43 | III | L | D | | | |
| GEGH-140-0480 | | GEGHARKUNIK | Zod | K-38-140 | 40 | 12 | 51 | 45 | 52 | 52 | 2129 | 900 | 3000 | 213 | III | M | C | | | |
| GEGH-140-0490 | | GEGHARKUNIK | Azizlu | K-38-140 | 40 | 9 | 53 | 45 | 52 | 42 | 2128 | 600 | 700 | 39 | III | M | C | | | |
| GEGH-140-0500 | | GEGHARKUNIK | Azizlu | K-38-140 | 40 | 10 | 0.2 | 45 | 53 | 6.6 | 2181 | 300 | 550 | 15 | III | M | C | | | |
| GEGH-140-0510 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 7 | 31 | 45 | 52 | 18 | 2491 | 500 | 1400 | 65 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| GEGH-140-0520 | | GEGHARKUNIK | Nerki-Shorja | K-38-140 | 40 | 7 | 40 | 45 | 53 | 8.8 | 2431 | 1500 | 3900 | 533 | III | M | C | | | |
| GEGH-140-0530 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 5 | 35 | 45 | 52 | 36 | 2584 | 250 | 700 | 19 | III | L | D | | | |
| GEGH-140-0540 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 4 | 26 | 45 | 52 | 53 | 2606 | 300 | 1000 | 26 | III | L | D | | | |
| GEGH-140-0550 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 4 | 2.1 | 45 | 52 | 46 | 2509 | 150 | 400 | 6 | III | L | D | | | |
| GEGH-140-0560 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 4 | 0.6 | 45 | 53 | 1.4 | 2552 | 300 | 300 | 9 | III | L | D | | | |
| GEGH-140-0570 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 3 | 21 | 45 | 53 | 9.6 | 2661 | 800 | 2200 | 110 | III | L | D | | | |
| GEGH-140-0580 | | GEGHARKUNIK | 140-B-b | K-38-140 | 40 | 16 | 22 | 45 | 53 | 57 | 2389 | 600 | 500 | 26 | III | L | D | | | |
| GEGH-140-0590 | | GEGHARKUNIK | Zarkend | K-38-140 | 40 | 11 | 10 | 45 | 54 | 21 | 2193 | 850 | 700 | 50 | III | M | C | | | |
| GEGH-140-0600 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 8 | 60 | 45 | 54 | 1.5 | 2307 | 450 | 400 | 16 | III | L | D | | | |
| GEGH-140-0610 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 8 | 25 | 45 | 54 | 4.5 | 2353 | 550 | 750 | 31 | III | L | D | | | |
| GEGH-140-0620 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 6 | 47 | 45 | 54 | 18 | 2582 | 250 | 900 | 24 | III | L | D | | | |
| GEGH-140-0630 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 6 | 47 | 45 | 54 | 44 | 2722 | 400 | 800 | 31 | III | L | D | | | |
| GEGH-140-0640 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 5 | 54 | 45 | 53 | 55 | 2730 | 200 | 250 | 6 | III | L | D | | | |
| GEGH-140-0650 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 5 | 25 | 45 | 53 | 36 | 2644 | 400 | 900 | 27 | III | L | D | | | |
| GEGH-140-0660 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 5 | 24 | 45 | 54 | 2.9 | 2640 | 250 | 450 | 11 | III | L | D | | | |
| GEGH-140-0670 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 4 | 20 | 45 | 54 | 11 | 2783 | 400 | 800 | 32 | III | L | D | | | |
| GEGH-140-0680 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 4 | 3.8 | 45 | 53 | 31 | 2612 | 400 | 200 | 9 | III | L | D | | | |
| GEGH-140-0690 | | GEGHARKUNIK | 140-D-d | K-38-140 | 40 | 3 | 57 | 45 | 53 | 51 | 2679 | 300 | 500 | 12 | III | L | D | | | |
| GEGH-140-0700 | | GEGHARKUNIK | 140-B-b | K-38-140 | 40 | 15 | 44 | 45 | 56 | 18 | 2487 | 300 | 400 | 15 | III | L | D | | | |
| GEGH-140-0710 | | GEGHARKUNIK | Zarkend | K-38-140 | 40 | 11 | 51 | 45 | 55 | 24 | 2223 | 1600 | 1700 | 230 | III | M | C | | | |
| GEGH-140-0720 | | GEGHARKUNIK | Zarkend | K-38-140 | 40 | 10 | 25 | 45 | 56 | 6.7 | 2424 | 650 | 1400 | 89 | III | M | C | | | |
| GEGH-140-0730 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 7 | 25 | 45 | 55 | 26 | 2678 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-140-0740 | | GEGHARKUNIK | 140-B-b | K-38-140 | 40 | 15 | 50 | 45 | 56 | 39 | 2632 | 200 | 300 | 7 | III | L | D | | | |
| GEGH-140-0750 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 14 | 1.5 | 45 | 57 | 12 | 2451 | 100 | 100 | 1 | III | L | D | | | |
| GEGH-140-0760 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 13 | 59 | 45 | 56 | 54 | 2284 | 600 | 250 | 13 | III | L | D | | | |
| GEGH-140-0770 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 12 | 6.8 | 45 | 57 | 16 | 2349 | 400 | 600 | 26 | III | L | D | | | |
| GEGH-140-0780 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 11 | 24 | 45 | 57 | 12 | 2490 | 450 | 750 | 32 | III | L | D | | | |
| GEGH-140-0790 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 11 | 25 | 45 | 57 | 41 | 2652 | 400 | 400 | 17 | III | L | D | | | |
| GEGH-140-0800 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 9 | 31 | 45 | 56 | 34 | 2403 | 600 | 3200 | 173 | III | L | D | | | |
| GEGH-140-0810 | | GEGHARKUNIK | 140-D-b | K-38-140 | 40 | 9 | 3.7 | 45 | 56 | 52 | 2672 | 1400 | 300 | 40 | III | L | D | | | |
| GEGH-140-0820 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 12 | 43 | 45 | 58 | 17 | 2355 | 400 | 1000 | 42 | III | L | D | | | |
| GEGH-140-0830 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 11 | 51 | 45 | 58 | 16 | 2551 | 450 | 750 | 29 | III | L | D | | | |
| GEGH-140-0840 | | GEGHARKUNIK | 140-B-d | K-38-140 | 40 | 11 | 53 | 45 | 58 | 34 | 2634 | 300 | 700 | 23 | III | L | D | | | |
| GEGH-140-0850 | | GEGHARKUNIK | 140-C-d | K-38-140 | 40 | 4 | 23 | 45 | 43 | 36 | 2594 | 500 | 500 | 20 | III | L | D | | | |
| KOTA-113-0010 | | KOTAYK | 113-D-d | K-38-113 | 40 | 40 | 2.7 | 44 | 26 | 2.8 | 2476 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-113-0020 | | KOTAYK | 113-D-d | K-38-113 | 40 | 41 | 31 | 44 | 29 | 48 | 2478 | 450 | 400 | 19 | III | L | D | | | |
| KOTA-113-0030 | | KOTAYK | 113-D-d | K-38-113 | 40 | 41 | 0.3 | 44 | 29 | 12 | 2331 | 400 | 300 | 10 | III | L | D | | | |
| KOTA-114-0010 | | KOTAYK | 114-C-c | K-38-114 | 40 | 40 | 48 | 44 | 33 | 37 | 2546 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-114-0020 | | KOTAYK | 114-C-c | K-38-114 | 40 | 41 | 53 | 44 | 31 | 5.1 | 2781 | 400 | 1000 | 34 | III | L | D | | | |
| KOTA-114-0030 | | KOTAYK | 114-C-c | K-38-114 | 40 | 42 | 1 | 44 | 35 | 13 | 2826 | 500 | 1100 | 40 | III | L | D | | | |
| KOTA-125-0010 | | KOTAYK | 125-B-b | K-38-125 | 40 | 39 | 39 | 44 | 29 | 56 | 2498 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-125-0020 | | KOTAYK | 125-B-b | K-38-125 | 40 | 39 | 30 | 44 | 26 | 2.7 | 2344 | 550 | 700 | 40 | III | L | D | | | |
| KOTA-125-0030 | | KOTAYK | 125-B-b | K-38-125 | 40 | 39 | 27 | 44 | 27 | 9.1 | 2154 | 800 | 500 | 33 | III | L | D | | | |
| KOTA-125-0040 | | KOTAYK | 125-B-b | K-38-125 | 40 | 38 | 46 | 44 | 27 | 31 | 2186 | 250 | 500 | 13 | III | L | D | | | |
| KOTA-125-0050 | | KOTAYK | Hankavan | K-38-125 | 40 | 37 | 26 | 44 | 28 | 35 | 2155 | 600 | 1100 | 49 | III | M | C | | | |
| KOTA-125-0060 | | KOTAYK | Hankavan | K-38-125 | 40 | 37 | 30 | 44 | 28 | 60 | 2179 | 600 | 1600 | 83 | III | M | C | | | |
| KOTA-125-0070 | | KOTAYK | 125-B-b | K-38-125 | 40 | 36 | 11 | 44 | 29 | 25 | 2428 | 400 | 550 | 23 | III | L | D | | | |
| KOTA-126-0010 | Hankavan | KOTAYK | Hankavan | K-38-126 | 40 | 37 | 59 | 44 | 30 | 20 | 2056 | 100 | 200 | 98 | II | M | C | | | |
| KOTA-126-0015 | | KOTAYK | 126-A-a | K-38-126 | 40 | 38 | 23 | 44 | 30 | 60 | 1981 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-126-0020 | | KOTAYK | 126-A-a | K-38-126 | 40 | 36 | 44 | 44 | 30 | 41 | 2524 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-126-0030 | | KOTAYK | 126-A-a | K-38-126 | 40 | 37 | 35 | 44 | 31 | 32 | 1986 | 800 | 1000 | 67 | III | L | D | | | |
| KOTA-126-0040 | | KOTAYK | 126-A-a | K-38-126 | 40 | 36 | 43 | 44 | 31 | 34 | 2284 | 300 | 700 | 18 | III | L | D | | | |
| KOTA-126-0050 | | KOTAYK | 126-A-a | K-38-126 | 40 | 36 | 50 | 44 | 31 | 49 | 2328 | 300 | 800 | 21 | III | L | D | | | |
| KOTA-126-0060 | | KOTAYK | 126-A-a | K-38-126 | 40 | 38 | 30 | 44 | 32 | 42 | 2095 | 400 | 750 | 25 | III | L | D | | | |
| KOTA-126-0070 | Marmarik reservoir | KOTAYK | Marmarik-reservoir | K-138-126 | 40 | 37 | 32 | 44 | 32 | 50 | 1936 | 250 | 1050 | 22 | II | M | C | | | |
| KOTA-126-0080 | | KOTAYK | 126-A-a | K-38-126 | 40 | 36 | 32 | 44 | 32 | 37 | 2212 | 500 | 800 | 35 | III | L | D | | | |
| KOTA-126-0090 | | KOTAYK | 126-A-a | K-38-126 | 40 | 36 | 9.6 | 44 | 32 | 50 | 2248 | 950 | 900 | 82 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| KOTA-126-0100 | | KOTAYK | Aragyugh | K-38-126 | 40 | 25 | 26 | 44 | 32 | 23 | 1833 | 300 | 850 | 24 | III | M | C | | | |
| KOTA-126-0101 | | KOTAYK | Bujakan | K-38-126 | 40 | 28 | 49 | 44 | 31 | 51 | 2238 | 200 | 1150 | 30 | III | M | C | | | |
| KOTA-126-0102 | | KOTAYK | Bujakan | K-38-126 | 40 | 28 | 6.7 | 44 | 31 | 23 | 1932 | 350 | 1200 | 46 | III | M | C | | | |
| KOTA-126-0103 | | KOTAYK | Bujakan | K-38-126 | 40 | 27 | 57 | 44 | 32 | 50 | 2027 | 300 | 900 | 28 | III | M | C | | | |
| KOTA-126-0104 | | KOTAYK | Bujakan | K-38-126 | 40 | 26 | 50 | 44 | 31 | 55 | 1862 | 700 | 800 | 55 | III | M | C | | | |
| KOTA-126-0110 | | KOTAYK | Aragyugh | K-38-126 | 40 | 24 | 26 | 44 | 32 | 27 | 1610 | 400 | 200 | 10 | III | M | C | | | |
| KOTA-126-0120 | | KOTAYK | 126-A-a | K-38-126 | 40 | 37 | 4 | 44 | 33 | 18 | 1976 | 500 | 1200 | 54 | III | L | D | | | |
| KOTA-126-0130 | | KOTAYK | 126-A-a | K-38-126 | 40 | 36 | 54 | 44 | 33 | 43 | 1893 | 350 | 250 | 7 | III | L | D | | | |
| KOTA-126-0140 | | KOTAYK | 126-A-c | K-38-126 | 40 | 30 | 50 | 44 | 33 | 51 | 1962 | 500 | 500 | 24 | III | L | D | | | |
| KOTA-126-0141 | | KOTAYK | 126-A-c | K-38-126 | 40 | 32 | 30 | 44 | 32 | 54 | 2404 | 300 | 450 | 11 | III | L | D | | | |
| KOTA-126-0142 | | KOTAYK | 126-A-c | K-38-126 | 40 | 31 | 35 | 44 | 32 | 43 | 2160 | 600 | 1600 | 88 | III | L | D | | | |
| KOTA-126-0150 | | KOTAYK | 126-A-c | K-38-126 | 40 | 30 | 28 | 44 | 33 | 57 | 1945 | 500 | 800 | 48 | III | L | D | | | |
| KOTA-126-0155 | | KOTAYK | 126-A-c | K-38-126 | 40 | 30 | 25 | 44 | 32 | 42 | 2228 | 650 | 1000 | 53 | III | L | D | | | |
| KOTA-126-0160 | | KOTAYK | 126-A-c | K-38-126 | 40 | 29 | 55 | 44 | 34 | 11 | 2034 | 1200 | 2300 | 259 | III | L | D | | | |
| KOTA-126-0170 | | KOTAYK | Tkhit | K-38-126 | 40 | 26 | 11 | 44 | 33 | 50 | 1835 | 600 | 1050 | 53 | III | M | C | | | |
| KOTA-126-0180 | | KOTAYK | Tkhit | K-38-126 | 40 | 24 | 42 | 44 | 33 | 27 | 1672 | 800 | 1000 | 71 | III | M | C | | | |
| KOTA-126-0190 | | KOTAYK | Tkhit | K-38-126 | 40 | 25 | 16 | 44 | 34 | 24 | 1592 | 1000 | 1900 | 163 | III | M | C | | | |
| KOTA-126-0200 | | KOTAYK | 126-A-a | K-38-126 | 40 | 38 | 9.1 | 44 | 35 | 35 | 2228 | 800 | 400 | 27 | III | L | D | | | |
| KOTA-126-0210 | | KOTAYK | 126-A-a | K-38-126 | 40 | 34 | 56 | 44 | 35 | 13 | 2064 | 550 | 1000 | 45 | III | L | D | | | |
| KOTA-126-0220 | | KOTAYK | Arzakan | K-38-126 | 40 | 27 | 35 | 44 | 34 | 55 | 1774 | 200 | 700 | 14 | III | M | C | | | |
| KOTA-126-0230 | | KOTAYK | Arzakan | K-38-126 | 40 | 27 | 9.9 | 44 | 34 | 50 | 1770 | 700 | 3100 | 186 | III | M | C | | | |
| KOTA-126-0240 | | KOTAYK | Arzakan | K-38-126 | 40 | 25 | 47 | 44 | 35 | 19 | 1551 | 1950 | 2000 | 308 | III | M | C | | | |
| KOTA-126-0250 | | KOTAYK | Karashamb | K-38-126 | 40 | 24 | 21 | 44 | 34 | 39 | 1463 | 500 | 400 | 14 | III | M | C | | | |
| KOTA-126-0260 | | KOTAYK | Korchlu | K-38-126 | 40 | 35 | 35 | 44 | 36 | 51 | 1963 | 1200 | 600 | 60 | III | M | C | | | |
| KOTA-126-0270 | | KOTAYK | Korchlu | K-38-126 | 40 | 34 | 47 | 44 | 36 | 53 | 2109 | 800 | 1000 | 63 | III | M | C | | | |
| KOTA-126-0280 | | KOTAYK | 126-C-a | K-38-126 | 40 | 29 | 47 | 44 | 36 | 33 | 1842 | 500 | 500 | 32 | III | L | D | | | |
| KOTA-126-0290 | | KOTAYK | 126-C-a | K-38-126 | 40 | 29 | 23 | 44 | 36 | 12 | 1749 | 500 | 1000 | 56 | III | L | D | | | |
| KOTA-126-0300 | | KOTAYK | Arzakan | K-38-126 | 40 | 26 | 56 | 44 | 36 | 14 | 1506 | 500 | 450 | 18 | III | M | C | | | |
| KOTA-126-0310 | | KOTAYK | 126-A-b | K-38-126 | 40 | 38 | 41 | 44 | 37 | 39 | 2461 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-126-0320 | | KOTAYK | Meghradzor | K-38-126 | 40 | 35 | 12 | 44 | 37 | 39 | 2033 | 1500 | 1500 | 193 | III | M | C | | | |
| KOTA-126-0330 | | KOTAYK | Meghradzor | K-38-126 | 40 | 34 | 26 | 44 | 37 | 13 | 2220 | 800 | 1200 | 75 | III | M | C | | | |
| KOTA-126-0340 | | KOTAYK | Meghradzor | K-38-126 | 40 | 34 | 27 | 44 | 38 | 36 | 2020 | 1500 | 1300 | 140 | III | M | C | | | |
| KOTA-126-0350 | | KOTAYK | Bjni | K-38-126 | 40 | 28 | 12 | 44 | 38 | 31 | 1802 | 300 | 400 | 15 | III | M | C | | | |
| KOTA-126-0360 | | KOTAYK | Bjni | K-38-126 | 40 | 27 | 52 | 44 | 38 | 4 | 1850 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-126-0370 | | KOTAYK | Meghradzor | K-38-126 | 40 | 35 | 45 | 44 | 38 | 43 | 1872 | 400 | 1100 | 47 | III | M | C | | | |
| KOTA-126-0380 | | KOTAYK | 126-A-b | K-38-126 | 40 | 38 | 51 | 44 | 40 | 40 | 2159 | 850 | 750 | 62 | III | L | D | | | |
| KOTA-126-0390 | | KOTAYK | 126-A-b | K-38-126 | 40 | 38 | 28 | 44 | 40 | 31 | 2081 | 400 | 600 | 26 | III | L | D | | | |
| KOTA-126-0400 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 35 | 31 | 44 | 40 | 18 | 1862 | 600 | 500 | 32 | III | M | C | | | |
| KOTA-126-0410 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 35 | 1.5 | 44 | 40 | 52 | 1907 | 500 | 800 | 38 | III | M | C | | | |
| KOTA-126-0420 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 33 | 38 | 44 | 40 | 5.1 | 1940 | 250 | 750 | 19 | III | M | C | | | |
| KOTA-126-0430 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 34 | 10 | 44 | 41 | 8.5 | 1791 | 600 | 300 | 17 | III | M | C | | | |
| KOTA-126-0440 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 33 | 53 | 44 | 41 | 29 | 2028 | 200 | 300 | 10 | III | M | C | | | |
| KOTA-126-0450 | | KOTAYK | Tsakhkadzor | K-38-126 | 40 | 31 | 11 | 44 | 40 | 34 | 2208 | 250 | 600 | 20 | III | M | C | | | |
| KOTA-126-0460 | | KOTAYK | Tsakhkadzor | K-38-126 | 40 | 30 | 41 | 44 | 41 | 13 | 2062 | 850 | 800 | 70 | III | M | C | | | |
| KOTA-126-0470 | | KOTAYK | 126-C-b | K-38-126 | 40 | 29 | 45 | 44 | 40 | 30 | 2330 | 100 | 100 | 1 | III | L | D | | | |
| KOTA-126-0480 | | KOTAYK | 126-C-b | K-38-126 | 40 | 29 | 34 | 44 | 40 | 56 | 2202 | 700 | 500 | 36 | III | L | D | | | |
| KOTA-126-0490 | | KOTAYK | 126-A-b | K-38-126 | 40 | 37 | 18 | 44 | 41 | 50 | 2090 | 200 | 400 | 9 | III | L | D | | | |
| KOTA-126-0500 | | KOTAYK | 126-A-b | K-38-126 | 40 | 36 | 57 | 44 | 42 | 10 | 2284 | 250 | 200 | 7 | III | L | D | | | |
| KOTA-126-0510 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 34 | 2.5 | 44 | 42 | 7.2 | 1757 | 550 | 400 | 21 | III | M | C | | | |
| KOTA-126-0520 | | KOTAYK | Tsakhkadzor | K-38-126 | 40 | 31 | 40 | 44 | 42 | 47 | 1947 | 1100 | 2200 | 205 | III | M | C | | | |
| KOTA-126-0530 | | KOTAYK | 126-C-b | K-38-126 | 40 | 28 | 56 | 44 | 41 | 42 | 1969 | 900 | 600 | 49 | III | L | D | | | |
| KOTA-126-0540 | | KOTAYK | 126-C-b | K-38-126 | 40 | 29 | 57 | 44 | 42 | 36 | 1844 | 1100 | 1100 | 122 | III | L | D | | | |
| KOTA-126-0550 | | KOTAYK | 126-A-b | K-38-126 | 40 | 39 | 24 | 44 | 44 | 5.8 | 2352 | 350 | 550 | 15 | III | L | D | | | |
| KOTA-126-0560 | | KOTAYK | 126-A-b | K-38-126 | 40 | 37 | 55 | 44 | 44 | 2.5 | 2213 | 300 | 650 | 19 | III | L | D | | | |
| KOTA-126-0570 | | KOTAYK | 126-A-b | K-38-126 | 40 | 37 | 35 | 44 | 43 | 35 | 2264 | 300 | 550 | 15 | III | L | D | | | |
| KOTA-126-0580 | | KOTAYK | Aghavnadzor | K-38-126 | 40 | 34 | 37 | 44 | 44 | 1.7 | 1973 | 600 | 1100 | 57 | III | M | C | | | |
| KOTA-126-0590 | | KOTAYK | Tsakhkadzor | K-38-126 | 40 | 33 | 17 | 44 | 43 | 23 | 1781 | 900 | 1100 | 71 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| KOTA-126-0600 | | KOTAYK | Tsakhkadzor | K-38-126 | 40 | 31 | 55 | 44 | 43 | 43 | 1805 | 600 | 400 | 25 | III | M | C | | | |
| KOTA-126-0610 | | KOTAYK | Aghbrak | K-38-126 | 40 | 30 | 48 | 44 | 43 | 58 | 1792 | 900 | 1200 | 91 | III | M | C | | | |
| KOTA-126-0620 | | KOTAYK | Aghbrak | K-38-126 | 40 | 31 | 9.5 | 44 | 44 | 23 | 1740 | 200 | 500 | 11 | III | M | C | | | |
| KOTA-126-0630 | | KOTAYK | Aghbrak | K-38-126 | 40 | 30 | 21 | 44 | 43 | 21 | 1831 | 1900 | 800 | 143 | III | M | C | | | |
| KOTA-126-0640 | | KOTAYK | 126-B-a | K-38-126 | 40 | 39 | 36 | 44 | 45 | 6.7 | 2403 | 1000 | 800 | 69 | III | L | D | | | |
| KOTA-126-0650 | | KOTAYK | 126-B-a | K-38-126 | 40 | 38 | 7.5 | 44 | 45 | 9.3 | 2409 | 1000 | 600 | 69 | III | L | D | | | |
| KOTA-126-0660 | | KOTAYK | 126-B-a | K-38-126 | 40 | 35 | 55 | 44 | 45 | 2 | 1936 | 300 | 800 | 34 | III | L | D | | | |
| KOTA-126-0670 | | KOTAYK | 126-B-a | K-38-126 | 40 | 38 | 32 | 44 | 46 | 46 | 2477 | 650 | 1200 | 78 | III | L | D | | | |
| KOTA-126-0680 | | KOTAYK | 126-B-a | K-38-126 | 40 | 38 | 0.9 | 44 | 46 | 32 | 2371 | 600 | 1100 | 114 | III | L | D | | | |
| KOTA-126-0690 | | KOTAYK | 126-B-a | K-38-126 | 40 | 37 | 1.6 | 44 | 47 | 14 | 2283 | 550 | 1900 | 111 | III | L | D | | | |
| KOTA-126-0700 | Argel | KOTAYK | 126-B-a | K-38-126 | 40 | 38 | 41 | 44 | 48 | 21 | 2320 | 50 | 60 | 43 | II | M | C | | | |
| KOTA-126-0710 | | KOTAYK | 126-B-a | K-38-126 | 40 | 38 | 17 | 44 | 48 | 15 | 2241 | 700 | 750 | 47 | III | L | D | | | |
| KOTA-126-0720 | | KOTAYK | Charentsavan | K-38-126 | 40 | 23 | 16 | 44 | 36 | 15 | 1454 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0010 | | KOTAYK | Kanakeravan | K-38-138 | 40 | 15 | 26 | 44 | 33 | 17 | 1240 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0011 | | KOTAYK | Kanakeravan | K-38-138 | 40 | 14 | 13 | 44 | 31 | 44 | 1157 | 350 | 800 | 28 | III | M | C | | | |
| KOTA-138-0012 | Kanakeravan | KOTAYK | Kanakeravan | K-38-138-a-v | 40 | 14 | 26 | 44 | 32 | 13 | 1171 | 142 | 275 | 12 | I | M | B | | | |
| KOTA-138-0013 | | KOTAYK | Kanakeravan | K-38-138 | 40 | 14 | 44 | 44 | 32 | 24 | 1225 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0014 | | KOTAYK | Kanakeravan | K-38-138 | 40 | 14 | 4.4 | 44 | 32 | 48 | 1303 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0020 | | KOTAYK | Getamech | K-38-138 | 40 | 16 | 13 | 44 | 34 | 13 | 1251 | 400 | 700 | 14 | III | M | C | | | |
| KOTA-138-0030 | Ptghni-Getamech | KOTAYK | Ptghni | K-38-138 | 40 | 15 | 43 | 44 | 34 | 6 | 1251 | 790 | 340 | 20 | II | H | B | | | |
| KOTA-138-0031 | | KOTAYK | Getamech | K-38-138 | 40 | 15 | 31 | 44 | 33 | 55 | 1249 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0032 | | KOTAYK | Getamech | K-38-138 | 40 | 15 | 26 | 44 | 33 | 51 | 1238 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0040 | | KOTAYK | Getamech | K-38-138 | 40 | 15 | 19 | 44 | 33 | 56 | 1231 | 250 | 400 | 8 | III | M | C | | | |
| KOTA-138-0050 | | KOTAYK | Getamech | K-38-138 | 40 | 15 | 0.6 | 44 | 33 | 49 | 1203 | 250 | 300 | 7 | III | M | C | | | |
| KOTA-138-0060 | | KOTAYK | Byureghavan | K-38-138 | 40 | 19 | 42 | 44 | 35 | 53 | 1440 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0070 | | KOTAYK | Getamech | K-38-138 | 40 | 16 | 58 | 44 | 35 | 12 | 1288 | 900 | 500 | 37 | III | M | C | | | |
| KOTA-138-0080 | | KOTAYK | Byureghavan | K-38-138 | 40 | 19 | 1.5 | 44 | 36 | 11 | 1448 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0085 | Arzni | KOTAYK | Arzni | K-38-138-A-a | 40 | 17 | 16 | 44 | 35 | 44 | 1343 | 40 | 90 | 1 | I | M | B | | | |
| KOTA-138-0120 | Jrvezh | KOTAYK | Jrvezh | K-38-138-a-v | 40 | 11 | 0 | 44 | 36 | 41 | 1418 | 250 | 557 | 14 | II | M | C | | | |
| KOTA-138-0130 | | KOTAYK | Jrvej | K-38-138 | 40 | 10 | 29 | 44 | 36 | 44 | 1495 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0140 | | KOTAYK | Jrvej | K-38-138 | 40 | 9 | 57 | 44 | 36 | 43 | 1356 | 700 | 1100 | 61 | III | M | C | | | |
| KOTA-138-0160 | Voghjaberd | KOTAYK | Voghjaberd | K-38-138-V-b | 40 | 9 | 57 | 44 | 38 | 34 | 1570 | 1913 | 2906 | 287 | I | H | A | | Village overall area, road | High risk on destruction of houses, the important road and other communications (2,000 persons) is |
| KOTA-138-0165 | Geghadir toxity waste | KOTAYK | Geghadir | K-38-138 | 40 | 8 | 36 | 44 | 36 | 57 | 1344 | 142 | 870 | 10 | I | H | A | | | |
| KOTA-138-0210 | | KOTAYK | Dzoraghpyur | K-38-138 | 40 | 12 | 4.4 | 44 | 40 | 4.4 | 1605 | 200 | 350 | 8 | III | M | C | | | |
| KOTA-138-0220 | Geghadir -1 | KOTAYK | Geghadir | K-38-138 | 40 | 9 | 12 | 44 | 39 | 13 | 1621 | 100 | 320 | 1 | I | M | B | | | |
| KOTA-138-0221 | | KOTAYK | Geghadir | K-38-138 | 40 | 9 | 25 | 44 | 39 | 0.6 | 1637 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0230 | Hatsavan | KOTAYK | Hatsavan | K-38-138 | 40 | 8 | 15 | 44 | 39 | 6 | 1514 | 480 | 923 | 41 | II | H | B | | Houses,public buildings | High risk on destruction of houses and other objects (1,000 persons) |
| KOTA-138-0240 | | KOTAYK | Hatsavan | K-38-138 | 40 | 7 | 24 | 44 | 39 | 0.7 | 1447 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0250 | Hatsavan | KOTAYK | Hatsavan | K-38-138 | 40 | 7 | 33 | 44 | 39 | 17 | 1383 | 400 | 400 | 18 | III | M | C | | Houses,public buildings | High risk on destruction of houses and other objects (1,000 persons) |
| KOTA-138-0260 | | KOTAYK | Kaputan | K-38-138 | 40 | 18 | 38 | 44 | 41 | 26 | 1718 | 800 | 1600 | 97 | III | M | C | | | |
| KOTA-138-0270 | | KOTAYK | Voghjaberd | K-38-138 | 40 | 10 | 56 | 44 | 40 | 59 | 1971 | 100 | 100 | 1 | III | M | C | | | |
| KOTA-138-0280 | Garni-Hatsavan Road | KOTAYK | Garni | K-38-138 | 40 | 7 | 43 | 44 | 40 | 59 | 1448 | 3168 | 3980 | 1567 | II | M | C | | | |
| KOTA-138-0285 | Garni | KOTAYK | Garni | K-38-138 | 40 | 7 | 3 | 44 | 43 | 57 | 1412 | 60 | 60 | 1 | II | M | C | | | |
| KOTA-138-0290 | | KOTAYK | Zovk | K-38-138 | 40 | 12 | 23 | 44 | 42 | 22 | 1759 | 400 | 700 | 27 | III | M | C | | | |
| KOTA-138-0300 | | KOTAYK | Zovk | K-38-138 | 40 | 11 | 28 | 44 | 43 | 30 | 2031 | 150 | 500 | 6 | III | M | C | | | |
| KOTA-138-0320 | | KOTAYK | Sevaberd | K-38-138 | 40 | 16 | 27 | 44 | 48 | 11 | 2065 | 600 | 500 | 23 | III | M | C | | | |
| KOTA-138-0330 | Goght-road | KOTAYK | Goght-road | K-38-138 | 40 | 8 | 24 | 44 | 48 | 25 | 1780 | 550 | 700 | 76 | I | M | B | | | |
| KOTA-138-0360 | | KOTAYK | 138-B-d | K-38-138 | 40 | 11 | 10 | 44 | 57 | 7.3 | 2963 | 1100 | 2900 | 258 | III | L | D | | | |
| KOTA-138-0370 | | KOTAYK | Gokht | K-38-138 | 40 | 8 | 12 | 44 | 47 | 11 | 1615 | 300 | 600 | 15 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-101-0010 | | LORI | 101-A-c | K-38-101 | 41 | 11 | 13 | 44 | 1 | 36 | 2438 | 700 | 300 | 21 | III | L | D | | | |
| LORI-101-0020 | | LORI | 101-C-a | K-38-101 | 41 | 5 | 8.7 | 44 | 4 | 26 | 2052 | 1100 | 2350 | 193 | III | L | D | | | |
| LORI-101-0030 | | LORI | 101-C-c | K-38-101 | 41 | 1 | 48 | 44 | 5 | 46 | 1939 | 400 | 700 | 26 | III | L | D | | | |
| LORI-101-0035 | | LORI | 101-C-c | K-38-101 | 41 | 0 | 39 | 44 | 4 | 48 | 2301 | 400 | 1200 | 35 | III | L | D | | | |
| LORI-101-0040 | | LORI | 101-C-d | K-38-101 | 41 | 1 | 38 | 44 | 7 | 54 | 1803 | 300 | 600 | 20 | III | L | D | | | |
| LORI-101-0050 | | LORI | 101-C-d | K-38-101 | 41 | 1 | 55 | 44 | 8 | 8.5 | 1748 | 200 | 300 | 6 | III | L | D | | | |
| LORI-101-0060 | | LORI | 101-C-d | K-38-101 | 41 | 1 | 16 | 44 | 8 | 50 | 1864 | 600 | 800 | 23 | III | L | D | | | |
| LORI-101-0070 | | LORI | 101-C-d | K-38-101 | 41 | 2 | 40 | 44 | 10 | 10 | 1639 | 400 | 300 | 10 | III | L | D | | | |
| LORI-101-0080 | | LORI | Shakhnazar | K-38-101 | 41 | 12 | 47 | 44 | 13 | 60 | 1662 | 200 | 800 | 11 | III | M | C | | | |
| LORI-101-0090 | | LORI | Evlu | K-38-101 | 41 | 12 | 19 | 44 | 17 | 39 | 1620 | 250 | 1000 | 21 | III | M | C | | | |
| LORI-101-0100 | | LORI | Evlu | K-38-101 | 41 | 12 | 4.3 | 44 | 18 | 11 | 1532 | 500 | 700 | 25 | III | M | C | | | |
| LORI-101-0110 | | LORI | Evlu | K-38-101 | 41 | 11 | 50 | 44 | 18 | 17 | 1539 | 500 | 750 | 37 | III | M | C | | | |
| LORI-101-0120 | | LORI | Evlu | K-38-101 | 41 | 12 | 11 | 44 | 18 | 26 | 1593 | 200 | 600 | 10 | III | M | C | | | |
| LORI-101-0130 | | LORI | Kuibishev | K-38-101 | 41 | 0 | 39 | 44 | 15 | 53 | 1656 | 200 | 400 | 5 | III | M | C | | | |
| LORI-101-0140 | | LORI | Kuibishev | K-38-101 | 41 | 0 | 49 | 44 | 18 | 8.3 | 1551 | 200 | 600 | 10 | III | M | C | | | |
| LORI-101-0150 | | LORI | Petrovka | K-38-101 | 41 | 9 | 43 | 44 | 19 | 26 | 1661 | 500 | 1800 | 62 | III | M | C | | | |
| LORI-101-0160 | | LORI | Saratovka | K-38-101 | 41 | 4 | 19 | 44 | 20 | 53 | 1711 | 100 | 100 | 1 | III | M | C | | | |
| LORI-101-0170 | | LORI | Kizildash | K-38-101 | 41 | 12 | 33 | 44 | 21 | 57 | 1692 | 450 | 600 | 26 | III | M | C | | | |
| LORI-101-0180 | | LORI | Kizildash | K-38-101 | 41 | 12 | 26 | 44 | 22 | 20 | 1724 | 200 | 500 | 9 | III | M | C | | | |
| LORI-101-0190 | | LORI | Sarchapet | K-38-101 | 41 | 11 | 20 | 44 | 21 | 53 | 1658 | 500 | 1800 | 33 | III | M | C | | | |
| LORI-101-0200 | | LORI | Medovka | K-38-101 | 41 | 7 | 51 | 44 | 21 | 57 | 1609 | 750 | 1200 | 56 | III | M | C | | | |
| LORI-101-0210 | | LORI | Medovka | K-38-101 | 41 | 7 | 10 | 44 | 21 | 31 | 1614 | 400 | 1000 | 34 | III | M | C | | | |
| LORI-101-0220 | | LORI | Sarchapet | K-38-101 | 41 | 11 | 35 | 44 | 22 | 51 | 1691 | 400 | 300 | 12 | III | M | C | | | |
| LORI-101-0230 | | LORI | Karakilisa | K-38-101 | 41 | 9 | 23 | 44 | 23 | 56 | 1696 | 550 | 1750 | 31 | III | M | C | | | |
| LORI-101-0240 | | LORI | Medovka | K-38-101 | 41 | 7 | 9.2 | 44 | 23 | 19 | 1753 | 200 | 600 | 11 | III | M | C | | | |
| LORI-101-0250 | | LORI | Sverdlov | K-38-101 | 41 | 6 | 43 | 44 | 23 | 41 | 1697 | 350 | 750 | 13 | III | M | C | | | |
| LORI-101-0260 | | LORI | Sverdlov | K-38-101 | 41 | 6 | 6.2 | 44 | 23 | 53 | 1587 | 400 | 1050 | 23 | III | M | C | | | |
| LORI-101-0270 | | LORI | Urut | K-38-101 | 41 | 3 | 43 | 44 | 24 | 3.2 | 1512 | 500 | 800 | 28 | III | M | C | | | |
| LORI-101-0280 | | LORI | Urut | K-38-101 | 41 | 3 | 32 | 44 | 24 | 36 | 1612 | 800 | 2850 | 140 | III | M | C | | | |
| LORI-101-0290 | | LORI | Privolnoe | K-38-101 | 41 | 9 | 6 | 44 | 26 | 16 | 1596 | 400 | 600 | 17 | III | M | C | | | |
| LORI-101-0300 | | LORI | Privolnoe | K-38-101 | 41 | 9 | 23 | 44 | 28 | 11 | 1747 | 500 | 500 | 17 | III | M | C | | | |
| LORI-101-0310 | | LORI | Privolnoe | K-38-101 | 41 | 7 | 27 | 44 | 27 | 22 | 1862 | 200 | 600 | 7 | III | M | C | | | |
| LORI-101-0320 | | LORI | 101-D-d | K-38-101 | 41 | 3 | 58 | 44 | 27 | 20 | 2019 | 300 | 650 | 10 | III | L | D | | | |
| LORI-101-0330 | | LORI | Lejan | K-38-101 | 41 | 1 | 50 | 44 | 27 | 58 | 1530 | 350 | 500 | 21 | III | M | C | | | |
| LORI-101-0340 | | LORI | 101-B-d | K-38-101 | 41 | 10 | 41 | 44 | 29 | 27 | 1475 | 500 | 600 | 27 | III | L | D | | | |
| LORI-101-0350 | | LORI | Privolnoe | K-38-101 | 41 | 8 | 2.2 | 44 | 29 | 4.3 | 1914 | 200 | 650 | 10 | III | M | C | | | |
| LORI-102-0010 | | LORI | 102-A-c | K-38-102 | 41 | 11 | 2.6 | 44 | 30 | 32 | 1416 | 800 | 1300 | 96 | III | L | D | | | |
| LORI-102-0020 | | LORI | 102-C-c | K-38-102 | 41 | 4 | 42 | 44 | 30 | 46 | 2057 | 350 | 250 | 6 | III | L | D | | | |
| LORI-102-0030 | | LORI | Hovnadzor | K-38-102 | 41 | 1 | 27 | 44 | 31 | 22 | 1430 | 350 | 650 | 20 | III | M | C | | | |
| LORI-102-0040 | | LORI | 102-A-c | K-38-102 | 41 | 11 | 15 | 44 | 32 | 51 | 1263 | 900 | 600 | 43 | III | L | D | | | |
| LORI-102-0050 | | LORI | 102-C-a | K-38-102 | 41 | 9 | 33 | 44 | 31 | 54 | 1493 | 550 | 1300 | 62 | III | L | D | | | |
| LORI-102-0060 | | LORI | 102-C-c | K-38-102 | 41 | 3 | 30 | 44 | 32 | 10 | 1718 | 600 | 950 | 47 | III | L | D | | | |
| LORI-102-0070 | | LORI | Hovnadzor | K-38-102 | 41 | 1 | 49 | 44 | 32 | 0.5 | 1502 | 300 | 400 | 9 | III | M | C | | | |
| LORI-102-0080 | | LORI | Hovnadzor | K-38-102 | 41 | 1 | 15 | 44 | 31 | 54 | 1500 | 650 | 1200 | 56 | III | M | C | | | |
| LORI-102-0090 | | LORI | 102-A-c | K-38-102 | 41 | 11 | 13 | 44 | 33 | 48 | 1319 | 300 | 700 | 19 | III | L | D | | | |
| LORI-102-0100 | | LORI | 102-A-c | K-38-102 | 41 | 11 | 7 | 44 | 34 | 17 | 1406 | 800 | 2300 | 141 | III | L | D | | | |
| LORI-102-0110 | | LORI | 102-A-c | K-38-102 | 41 | 10 | 17 | 44 | 33 | 25 | 1565 | 650 | 1900 | 99 | III | L | D | | | |
| LORI-102-0120 | | LORI | 102-C-a | K-38-102 | 41 | 7 | 40 | 44 | 32 | 59 | 1821 | 1500 | 600 | 81 | III | L | D | | | |
| LORI-102-0130 | | LORI | 102-C-c | K-38-102 | 41 | 2 | 33 | 44 | 33 | 5.2 | 1614 | 200 | 550 | 13 | III | L | D | | | |
| LORI-102-0140 | | LORI | 102-C-c | K-38-102 | 41 | 2 | 20 | 44 | 32 | 55 | 1601 | 250 | 500 | 10 | III | L | D | | | |
| LORI-102-0150 | | LORI | 102-C-c | K-38-102 | 41 | 3 | 19 | 44 | 33 | 51 | 1590 | 100 | 100 | 1 | III | L | D | | | |
| LORI-102-0160 | | LORI | 102-A-c | K-38-102 | 41 | 10 | 31 | 44 | 35 | 8.7 | 1765 | 550 | 650 | 28 | III | L | D | | | |
| LORI-102-0170 | | LORI | 102-A-c | K-38-102 | 41 | 10 | 5.7 | 44 | 35 | 5.4 | 2146 | 600 | 1000 | 51 | III | L | D | | | |
| LORI-102-0180 | Kachachkut | LORI | Kachachkut | K-38-102 | 41 | 6 | 48 | 44 | 35 | 2 | 1558 | 170 | 510 | 20 | I | M | B | | Houses,public buildings | (1,000 persons) |
| LORI-102-0190 | | LORI | Hagvi | K-38-102 | 41 | 4 | 3.9 | 44 | 34 | 50 | 1173 | 700 | 1500 | 95 | III | M | C | | | |
| LORI-102-0200 | | LORI | Odzun | K-38-102 | 41 | 2 | 51 | 44 | 35 | 27 | 1307 | 700 | 1350 | 85 | III | M | C | | | |
| LORI-102-0210 | | LORI | Ardvi | K-38-102 | 41 | 1 | 30 | 44 | 34 | 55 | 1491 | 650 | 150 | 8 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-102-0220 | | LORI | Ardvi | K-38-102 | 41 | 0 | 42 | 44 | 35 | 30 | 1365 | 400 | 1300 | 48 | III | M | C | | | |
| LORI-102-0230 | | LORI | 102-A-c | K-38-102 | 41 | 12 | 48 | 44 | 36 | 31 | 1229 | 900 | 1200 | 99 | III | L | D | | | |
| LORI-102-0240 | | LORI | 102-A-c | K-38-102 | 41 | 12 | 8.6 | 44 | 36 | 29 | 1363 | 400 | 850 | 29 | III | L | D | | | |
| LORI-102-0250 | | LORI | 102-A-c | K-38-102 | 41 | 11 | 17 | 44 | 36 | 19 | 1551 | 950 | 2200 | 165 | III | L | D | | | |
| LORI-102-0260 | | LORI | 102-C-a | K-38-102 | 41 | 9 | 1.2 | 44 | 36 | 19 | 1904 | 1100 | 2500 | 181 | III | L | D | | | |
| LORI-102-0270 | | LORI | Kachachkut | K-38-102 | 41 | 7 | 53 | 44 | 35 | 55 | 1888 | 650 | 1250 | 69 | III | M | C | | | |
| LORI-102-0280 | | LORI | Akori | K-38-102 | 41 | 5 | 59 | 44 | 37 | 2.4 | 1147 | 500 | 1250 | 57 | III | M | C | | | |
| LORI-102-0290 | | LORI | Odzun | K-38-102 | 41 | 2 | 37 | 44 | 36 | 25 | 1176 | 100 | 100 | 1 | III | M | C | | | |
| LORI-102-0300 | | LORI | Odzun | K-38-102 | 41 | 2 | 21 | 44 | 35 | 56 | 1284 | 400 | 900 | 30 | III | M | C | | | |
| LORI-102-0310 | | LORI | Jiliza | K-38-102 | 41 | 13 | 53 | 44 | 37 | 50 | 1019 | 450 | 1000 | 39 | III | M | C | | | |
| LORI-102-0320 | | LORI | Jiliza | K-38-102 | 41 | 13 | 31 | 44 | 38 | 18 | 1071 | 800 | 2000 | 128 | III | M | C | | | |
| LORI-102-0330 | | LORI | 102-A-c | K-38-102 | 41 | 12 | 27 | 44 | 37 | 9.7 | 1323 | 350 | 600 | 18 | III | L | D | | | |
| LORI-102-0340 | | LORI | 102-A-c | K-38-102 | 41 | 11 | 40 | 44 | 37 | 24 | 1343 | 500 | 500 | 23 | III | L | D | | | |
| LORI-102-0350 | | LORI | 102-C-b | K-38-102 | 41 | 9 | 39 | 44 | 38 | 6.2 | 1784 | 450 | 1500 | 67 | III | L | D | | | |
| LORI-102-0360 | | LORI | Akori | K-38-102 | 41 | 5 | 52 | 44 | 37 | 40 | 1086 | 700 | 1000 | 61 | III | M | C | | | |
| LORI-102-0370 | | LORI | Odzun | K-38-102 | 41 | 3 | 50 | 44 | 37 | 13 | 802 | 850 | 250 | 22 | III | M | C | | | |
| LORI-102-0371 | Odzun -1 | LORI | Odzun | K-38-102 | 41 | 3 | 21 | 44 | 37 | 36 | 772 | 150 | 320 | 1 | I | M | B | | Railroad, road | State importance railway and highway is threatened if the Pambuk River is |
| LORI-102-0380 | | LORI | 102-A-d | K-38-102 | 41 | 13 | 32 | 44 | 39 | 49 | 1012 | 950 | 200 | 14 | III | L | D | | | |
| LORI-102-0390 | | LORI | 102-A-d | K-38-102 | 41 | 10 | 40 | 44 | 39 | 42 | 1412 | 350 | 900 | 29 | III | L | D | | | |
| LORI-102-0400 | | LORI | 102-A-d | K-38-102 | 41 | 9 | 58 | 44 | 39 | 25 | 1396 | 1300 | 2300 | 197 | III | L | D | | | |
| LORI-102-0410 | | LORI | Sanain | K-38-102 | 41 | 5 | 17 | 44 | 40 | 5.4 | 996 | 700 | 900 | 43 | III | M | C | | | |
| LORI-102-0420 | | LORI | Shamlugh | K-38-102 | 41 | 10 | 0.2 | 44 | 42 | 26 | 1258 | 350 | 650 | 21 | III | M | C | | | |
| LORI-102-0430 | | LORI | 102-C-b | K-38-102 | 41 | 8 | 7.4 | 44 | 41 | 56 | 1463 | 100 | 100 | 1 | III | L | D | | | |
| LORI-102-0440 | | LORI | Akner | K-38-102 | 41 | 4 | 54 | 44 | 41 | 57 | 963 | 350 | 800 | 23 | III | M | C | | | |
| LORI-102-0450 | | LORI | Shamlugh | K-38-102 | 41 | 9 | 58 | 44 | 42 | 56 | 1205 | 650 | 800 | 46 | III | M | C | | | |
| LORI-102-0460 | | LORI | Shamlugh | K-38-102 | 41 | 10 | 15 | 44 | 43 | 29 | 1232 | 700 | 2150 | 128 | III | M | C | | | |
| LORI-102-0470 | | LORI | Shamlugh | K-38-102 | 41 | 10 | 10 | 44 | 43 | 57 | 1250 | 550 | 1700 | 87 | III | M | C | | | |
| LORI-102-0480 | | LORI | Shamlugh | K-38-102 | 41 | 8 | 58 | 44 | 43 | 7.7 | 1278 | 450 | 900 | 31 | III | M | C | | | |
| LORI-102-0490 | | LORI | Shamlugh | K-38-102 | 41 | 8 | 49 | 44 | 44 | 0.5 | 1063 | 450 | 700 | 23 | III | M | C | | | |
| LORI-102-0500 | | LORI | Verin Akhtala | K-38-102 | 41 | 9 | 26 | 44 | 45 | 6.3 | 895 | 850 | 900 | 56 | III | M | C | | | |
| LORI-102-0510 | | LORI | Tsaghkashat | K-38-102 | 41 | 5 | 9.9 | 44 | 45 | 27 | 1507 | 1200 | 500 | 64 | III | M | C | | | |
| LORI-102-0520 | | LORI | 102-D-c | K-38-102 | 41 | 1 | 34 | 44 | 45 | 8.7 | 1713 | 350 | 400 | 10 | III | L | D | | | |
| LORI-102-0530 | | LORI | 102-D-c | K-38-102 | 41 | 1 | 48 | 44 | 45 | 45 | 1552 | 200 | 600 | 9 | III | L | D | | | |
| LORI-102-0540 | | LORI | 102-B-c | K-38-102 | 41 | 13 | 2.1 | 44 | 45 | 44 | 637 | 300 | 1200 | 29 | III | L | D | | | |
| LORI-102-0550 | | LORI | Verin Akhtala | K-38-102 | 41 | 10 | 56 | 44 | 45 | 54 | 1192 | 1100 | 350 | 32 | III | M | C | | | |
| LORI-102-0560 | | LORI | Verin Akhtala | K-38-102 | 41 | 10 | 30 | 44 | 46 | 35 | 1260 | 100 | 100 | 1 | III | M | C | | | |
| LORI-102-0570 | | LORI | Akhtala | K-38-102 | 41 | 9 | 13 | 44 | 46 | 39 | 726 | 500 | 700 | 26 | III | M | C | | | |
| LORI-102-0580 | | LORI | 102-B-c | K-38-102 | 41 | 10 | 50 | 44 | 47 | 42 | 848 | 350 | 800 | 21 | III | L | D | | | |
| LORI-102-0590 | | LORI | Akhtala | K-38-102 | 41 | 9 | 27 | 44 | 47 | 50 | 772 | 1900 | 1100 | 177 | III | M | C | | | |
| LORI-102-0600 | | LORI | 102-D-a | K-38-102 | 41 | 6 | 11 | 44 | 48 | 32 | 1174 | 600 | 1300 | 65 | III | L | D | | | |
| LORI-102-0610 | | LORI | 102-D-a | K-38-102 | 41 | 5 | 53 | 44 | 47 | 44 | 1524 | 250 | 350 | 7 | III | L | D | | | |
| LORI-102-0630 | | LORI | 102-B-c | K-38-102 | 41 | 12 | 25 | 44 | 48 | 32 | 698 | 700 | 1850 | 96 | III | L | D | | | |
| LORI-102-0640 | | LORI | Chochkan | K-38-102 | 41 | 10 | 53 | 44 | 49 | 1.3 | 756 | 950 | 1700 | 124 | III | M | C | | | |
| LORI-102-0650 | | LORI | Ajrum | K-38-102 | 41 | 10 | 22 | 44 | 48 | 45 | 733 | 1000 | 1150 | 115 | III | M | C | | | |
| LORI-102-0660 | | LORI | Shnogh | K-38-102 | 41 | 7 | 56 | 44 | 49 | 52 | 681 | 900 | 1700 | 112 | III | M | C | | | |
| LORI-102-0680 | | LORI | Ptghavan | K-38-102 | 41 | 13 | 1.1 | 44 | 50 | 3 | 523 | 800 | 2450 | 137 | III | M | C | | | |
| LORI-102-0685 | | LORI | Ayrum | K-38-102 | 41 | 11 | 25 | 44 | 53 | 38 | 513 | 300 | 300 | 4 | III | M | C | | | |
| LORI-102-0690 | | LORI | Teghut | K-38-102 | 41 | 7 | 18 | 44 | 50 | 5.6 | 713 | 800 | 1750 | 109 | III | M | C | | | |
| LORI-102-0700 | | LORI | Teghut | K-38-102 | 41 | 6 | 54 | 44 | 51 | 2.6 | 781 | 650 | 850 | 47 | III | M | C | | | |
| LORI-102-0770 | Sanahin | LORI | Sanahin | K-38-102 | 41 | 4 | 24 | 44 | 37 | 45 | 1120 | 46 | 17 | 1 | I | M | B | | | |
| LORI-102-0771 | | LORI | Sanahin | K-38-102 | 41 | 4 | 30 | 44 | 37 | 42 | 1155 | 100 | 100 | 1 | III | M | C | | | |
| LORI-102-0772 | | LORI | Sanahin | K-38-102 | 41 | 4 | 24 | 44 | 37 | 38 | 1087 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0020 | | LORI | 113-C-a | K-38-113 | 40 | 47 | 11 | 44 | 1 | 53 | 2014 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0025 | | LORI | 113-A-c | K-38-113 | 40 | 54 | 7.4 | 44 | 5 | 47 | 2201 | 150 | 700 | 10 | III | L | D | | | |
| LORI-113-0026 | | LORI | 113-A-c | K-38-113 | 40 | 54 | 32 | 44 | 6 | 20 | 2079 | 550 | 1600 | 75 | III | L | D | | | |
| LORI-113-0027 | | LORI | 113-A-b | K-38-113 | 40 | 57 | 22 | 44 | 7 | 59 | 2426 | 250 | 500 | 11 | III | L | D | | | |
| LORI-113-0028 | | LORI | 113-A-b | K-38-113 | 40 | 56 | 31 | 44 | 7 | 43 | 2208 | 300 | 450 | 11 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-113-0029 | | LORI | 113-A-b | K-38-113 | 40 | 56 | 13 | 44 | 8 | 8.5 | 2241 | 200 | 350 | 7 | III | L | D | | | |
| LORI-113-0030 | | LORI | 113-A-c | K-38-113 | 40 | 54 | 22 | 44 | 7 | 31 | 1943 | 400 | 400 | 14 | III | L | D | | | |
| LORI-113-0040 | | LORI | Lenapar | K-38-113 | 40 | 45 | 31 | 44 | 9 | 52 | 2242 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0070 | | LORI | Lenapar | K-38-113 | 40 | 45 | 24 | 44 | 11 | 44 | 2174 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0080 | | LORI | Lenapar | K-38-113 | 40 | 45 | 37 | 44 | 11 | 44 | 2069 | 250 | 300 | 6 | III | M | C | | | |
| LORI-113-0090 | | LORI | 113-A-d | K-38-113 | 40 | 53 | 2.5 | 44 | 9 | 48 | 1927 | 250 | 900 | 21 | III | L | D | | | |
| LORI-113-0100 | | LORI | 113-A-b | K-38-113 | 40 | 58 | 6.5 | 44 | 11 | 21 | 1969 | 200 | 300 | 5 | III | L | D | | | |
| LORI-113-0110 | | LORI | 113-A-b | K-38-113 | 40 | 55 | 27 | 44 | 10 | 49 | 2343 | 400 | 400 | 16 | III | L | D | | | |
| LORI-113-0120 | | LORI | Geghasar | K-38-113 | 40 | 50 | 45 | 44 | 11 | 5.7 | 1686 | 400 | 900 | 25 | III | M | C | | | |
| LORI-113-0130 | | LORI | 113-A-b | K-38-113 | 40 | 55 | 49 | 44 | 11 | 53 | 2485 | 400 | 550 | 17 | III | L | D | | | |
| LORI-113-0140 | | LORI | Sarahart | K-38-113 | 40 | 52 | 4.1 | 44 | 12 | 44 | 1725 | 400 | 500 | 19 | III | M | C | | | |
| LORI-113-0150 | | LORI | Sarahart | K-38-113 | 40 | 51 | 51 | 44 | 12 | 54 | 1711 | 350 | 550 | 13 | III | M | C | | | |
| LORI-113-0160 | | LORI | 113-A-b | K-38-113 | 40 | 57 | 45 | 44 | 13 | 13 | 1902 | 500 | 750 | 30 | III | L | D | | | |
| LORI-113-0170 | | LORI | 113-A-b | K-38-113 | 40 | 57 | 45 | 44 | 14 | 15 | 1933 | 300 | 450 | 10 | III | L | D | | | |
| LORI-113-0180 | | LORI | Tsilkar | K-38-113 | 40 | 43 | 59 | 44 | 13 | 9.7 | 2161 | 350 | 550 | 16 | III | M | C | | | |
| LORI-113-0190 | | LORI | 113-A-b | K-38-113 | 40 | 57 | 18 | 44 | 15 | 41 | 1762 | 250 | 400 | 9 | III | L | D | | | |
| LORI-113-0200 | | LORI | 113-A-b | K-38-113 | 40 | 55 | 59 | 44 | 14 | 49 | 2345 | 200 | 1000 | 16 | III | L | D | | | |
| LORI-113-0210 | | LORI | 113-A-b | K-38-113 | 40 | 55 | 30 | 44 | 14 | 34 | 2615 | 300 | 400 | 13 | III | L | D | | | |
| LORI-113-0220 | | LORI | Arevashogh | K-38-113 | 40 | 53 | 49 | 44 | 15 | 1.5 | 2046 | 300 | 300 | 7 | III | M | C | | | |
| LORI-113-0230 | | LORI | Arevashogh | K-38-113 | 40 | 53 | 36 | 44 | 15 | 28 | 2136 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0240 | | LORI | Lernantsk | K-38-113 | 40 | 47 | 21 | 44 | 15 | 16 | 2032 | 350 | 950 | 26 | III | M | C | | | |
| LORI-113-0250 | | LORI | Lernantsk | K-38-113 | 40 | 46 | 17 | 44 | 15 | 34 | 2202 | 350 | 450 | 13 | III | M | C | | | |
| LORI-113-0260 | | LORI | 113-B-a | K-38-113 | 40 | 56 | 39 | 44 | 16 | 36 | 1903 | 300 | 350 | 7 | III | L | D | | | |
| LORI-113-0270 | | LORI | Arevashogh | K-38-113 | 40 | 52 | 46 | 44 | 16 | 15 | 1841 | 500 | 1100 | 40 | III | M | C | | | |
| LORI-113-0280 | | LORI | 113-D-a | K-38-113 | 40 | 45 | 35 | 44 | 17 | 18 | 2302 | 250 | 400 | 9 | III | L | D | | | |
| LORI-113-0290 | | LORI | Spitak | K-38-113 | 40 | 49 | 5.8 | 44 | 18 | 35 | 1825 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0300 | | LORI | Lernantsk | K-38-113 | 40 | 47 | 46 | 44 | 18 | 23 | 1982 | 500 | 850 | 38 | III | M | C | | | |
| LORI-113-0310 | | LORI | Avshen | K-38-113 | 40 | 44 | 43 | 44 | 17 | 35 | 2474 | 250 | 300 | 5 | III | M | C | | | |
| LORI-113-0320 | | LORI | Avshen | K-38-113 | 40 | 44 | 50 | 44 | 17 | 59 | 2270 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0330 | | LORI | Avshen | K-38-113 | 40 | 43 | 33 | 44 | 18 | 14 | 2347 | 700 | 1650 | 91 | III | M | C | | | |
| LORI-113-0340 | | LORI | 113-B-a | K-38-113 | 40 | 57 | 29 | 44 | 19 | 15 | 1977 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0350 | | LORI | 113-B-a | K-38-113 | 40 | 57 | 17 | 44 | 19 | 54 | 2142 | 350 | 950 | 28 | III | L | D | | | |
| LORI-113-0360 | | LORI | 113-D-a | K-38-113 | 40 | 46 | 47 | 44 | 20 | 5.9 | 1984 | 500 | 550 | 24 | III | L | D | | | |
| LORI-113-0370 | | LORI | 113-D-a | K-38-113 | 40 | 45 | 50 | 44 | 20 | 1.5 | 2205 | 300 | 550 | 13 | III | L | D | | | |
| LORI-113-0380 | | LORI | 113-D-a | K-38-113 | 40 | 45 | 8.2 | 44 | 19 | 43 | 2440 | 250 | 300 | 6 | III | L | D | | | |
| LORI-113-0390 | | LORI | 113-D-c | K-38-113 | 40 | 44 | 8.2 | 44 | 19 | 44 | 2588 | 300 | 500 | 14 | III | L | D | | | |
| LORI-113-0400 | | LORI | 113-B-a | K-38-113 | 40 | 57 | 35 | 44 | 20 | 44 | 2290 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0410 | | LORI | 113-B-a | K-38-113 | 40 | 57 | 20 | 44 | 21 | 27 | 1984 | 350 | 1050 | 29 | III | L | D | | | |
| LORI-113-0420 | | LORI | Nor Khachakap | K-38-113 | 40 | 49 | 46 | 44 | 21 | 4.6 | 1583 | 500 | 700 | 29 | III | M | C | | | |
| LORI-113-0430 | | LORI | Ghursali | K-38-113 | 40 | 49 | 0.9 | 44 | 20 | 3.6 | 1811 | 850 | 1400 | 103 | III | M | C | | | |
| LORI-113-0440 | | LORI | Ghursali | K-38-113 | 40 | 48 | 40 | 44 | 20 | 46 | 1704 | 250 | 250 | 6 | III | M | C | | | |
| LORI-113-0450 | | LORI | Ghursali | K-38-113 | 40 | 48 | 18 | 44 | 20 | 27 | 1831 | 800 | 1150 | 72 | III | M | C | | | |
| LORI-113-0460 | | LORI | 113-D-a | K-38-113 | 40 | 47 | 11 | 44 | 20 | 51 | 1864 | 350 | 400 | 12 | III | L | D | | | |
| LORI-113-0470 | | LORI | 113-D-a | K-38-113 | 40 | 46 | 18 | 44 | 20 | 23 | 2126 | 350 | 900 | 25 | III | L | D | | | |
| LORI-113-0480 | | LORI | Nor Khachakap | K-38-113 | 40 | 49 | 44 | 44 | 21 | 53 | 1653 | 500 | 1500 | 56 | III | M | C | | | |
| LORI-113-0490 | | LORI | Halavar | K-38-113 | 40 | 45 | 49 | 44 | 22 | 55 | 1686 | 350 | 700 | 21 | III | M | C | | | |
| LORI-113-0500 | | LORI | Halavar | K-38-113 | 40 | 45 | 7 | 44 | 22 | 22 | 2126 | 500 | 900 | 34 | III | M | C | | | |
| LORI-113-0510 | | LORI | Malaki | K-38-113 | 40 | 43 | 53 | 44 | 23 | 2.2 | 2506 | 300 | 650 | 14 | III | M | C | | | |
| LORI-113-0520 | | LORI | 113-B-b | K-38-113 | 40 | 58 | 26 | 44 | 22 | 59 | 1593 | 800 | 800 | 62 | III | L | D | | | |
| LORI-113-0530 | | LORI | Pushkino | K-38-113 | 40 | 57 | 48 | 44 | 23 | 33 | 1623 | 850 | 500 | 37 | III | M | C | | | |
| LORI-113-0540 | | LORI | Pushkino | K-38-113 | 40 | 57 | 6.2 | 44 | 24 | 8.4 | 1590 | 700 | 800 | 42 | III | M | C | | | |
| LORI-113-0550 | | LORI | Arjut | K-38-113 | 40 | 50 | 28 | 44 | 23 | 13 | 1445 | 1400 | 300 | 33 | III | M | C | | | |
| LORI-113-0560 | | LORI | Lernapat | K-38-113 | 40 | 48 | 14 | 44 | 23 | 22 | 1652 | 500 | 1400 | 51 | III | M | C | | | |
| LORI-113-0570 | | LORI | Aidarli | K-38-113 | 40 | 47 | 40 | 44 | 22 | 53 | 1744 | 400 | 800 | 26 | III | M | C | | | |
| LORI-113-0580 | | LORI | Aidarli | K-38-113 | 40 | 46 | 49 | 44 | 23 | 6.4 | 1908 | 200 | 500 | 9 | III | M | C | | | |
| LORI-113-0590 | | LORI | Aidarli | K-38-113 | 40 | 46 | 28 | 44 | 23 | 23 | 1993 | 200 | 500 | 8 | III | M | C | | | |
| LORI-113-0600 | | LORI | Halavar | K-38-113 | 40 | 45 | 19 | 44 | 23 | 31 | 1778 | 300 | 900 | 21 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-113-0610 | | LORI | Kilisa | K-38-113 | 40 | 44 | 59 | 44 | 23 | 58 | 1975 | 250 | 900 | 17 | III | M | C | | | |
| LORI-113-0620 | | LORI | Kilisa | K-38-113 | 40 | 44 | 38 | 44 | 23 | 39 | 2152 | 250 | 250 | 6 | III | M | C | | | |
| LORI-113-0630 | | LORI | Kilisa | K-38-113 | 40 | 44 | 52 | 44 | 24 | 23 | 1889 | 300 | 550 | 13 | III | M | C | | | |
| LORI-113-0640 | | LORI | Kilisa | K-38-113 | 40 | 44 | 34 | 44 | 24 | 13 | 2121 | 200 | 300 | 5 | III | M | C | | | |
| LORI-113-0650 | | LORI | Malaki | K-38-113 | 40 | 43 | 48 | 44 | 24 | 3.2 | 2230 | 400 | 600 | 24 | III | M | C | | | |
| LORI-113-0660 | | LORI | Malaki | K-38-113 | 40 | 43 | 54 | 44 | 24 | 27 | 2018 | 550 | 600 | 27 | III | M | C | | | |
| LORI-113-0670 | | LORI | 113-B-d | K-38-113 | 40 | 53 | 57 | 44 | 24 | 29 | 2162 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0680 | | LORI | Kilisa | K-38-113 | 40 | 45 | 34 | 44 | 25 | 11 | 2162 | 550 | 600 | 23 | III | M | C | | | |
| LORI-113-0690 | | LORI | Kilisa | K-38-113 | 40 | 43 | 29 | 44 | 24 | 40 | 2196 | 400 | 1200 | 39 | III | M | C | | | |
| LORI-113-0700 | | LORI | Kilisa | K-38-113 | 40 | 43 | 51 | 44 | 25 | 23 | 1984 | 250 | 450 | 9 | III | M | C | | | |
| LORI-113-0710 | | LORI | Kilisa | K-38-113 | 40 | 43 | 18 | 44 | 24 | 60 | 2097 | 400 | 700 | 22 | III | M | C | | | |
| LORI-113-0720 | | LORI | 113-D-d | K-38-113 | 40 | 43 | 1.1 | 44 | 25 | 14 | 2168 | 400 | 750 | 22 | III | L | D | | | |
| LORI-113-0730 | | LORI | 113-D-d | K-38-113 | 40 | 42 | 57 | 44 | 25 | 34 | 2133 | 200 | 400 | 7 | III | L | D | | | |
| LORI-113-0740 | | LORI | 113-D-d | K-38-113 | 40 | 42 | 25 | 44 | 25 | 38 | 2281 | 300 | 450 | 10 | III | L | D | | | |
| LORI-113-0750 | | LORI | Gerger | K-38-113 | 40 | 58 | 37 | 44 | 26 | 39 | 1500 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-0760 | | LORI | 113-B-b | K-38-113 | 40 | 56 | 8.9 | 44 | 26 | 25 | 1529 | 400 | 600 | 19 | III | L | D | | | |
| LORI-113-0770 | | LORI | 113-B-b | K-38-113 | 40 | 55 | 24 | 44 | 26 | 28 | 1779 | 400 | 600 | 19 | III | L | D | | | |
| LORI-113-0780 | | LORI | Aznvadzor | K-38-113 | 40 | 51 | 41 | 44 | 26 | 35 | 1524 | 600 | 350 | 18 | III | M | C | | | |
| LORI-113-0790 | | LORI | Kirovakan | K-38-113 | 40 | 47 | 56 | 44 | 26 | 1.5 | 1947 | 350 | 900 | 37 | III | M | C | | | |
| LORI-113-0800 | | LORI | Kirovakan | K-38-113 | 40 | 47 | 45 | 44 | 26 | 17 | 1999 | 300 | 800 | 19 | III | M | C | | | |
| LORI-113-0810 | | LORI | Kirovakan | K-38-113 | 40 | 47 | 24 | 44 | 26 | 38 | 2096 | 500 | 1200 | 52 | III | M | C | | | |
| LORI-113-0820 | | LORI | 113-D-b | K-38-113 | 40 | 45 | 49 | 44 | 27 | 14 | 2015 | 700 | 1700 | 94 | III | L | D | | | |
| LORI-113-0830 | | LORI | 113-D-d | K-38-113 | 40 | 43 | 25 | 44 | 26 | 0.8 | 2242 | 300 | 300 | 7 | III | L | D | | | |
| LORI-113-0840 | | LORI | 113-D-d | K-38-113 | 40 | 43 | 16 | 44 | 26 | 11 | 2333 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0850 | | LORI | 113-D-d | K-38-113 | 40 | 43 | 17 | 44 | 26 | 42 | 2223 | 150 | 900 | 13 | III | L | D | | | |
| LORI-113-0860 | | LORI | 113-D-d | K-38-113 | 40 | 42 | 49 | 44 | 26 | 49 | 2603 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0870 | | LORI | 113-D-d | K-38-113 | 40 | 42 | 29 | 44 | 25 | 60 | 2285 | 300 | 600 | 15 | III | L | D | | | |
| LORI-113-0880 | | LORI | 113-B-d | K-38-113 | 40 | 54 | 29 | 44 | 27 | 45 | 1808 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0890 | | LORI | 113-D-b | K-38-113 | 40 | 46 | 52 | 44 | 28 | 17 | 1680 | 300 | 1100 | 31 | III | L | D | | | |
| LORI-113-0891 | Vanadzor-Monument | LORI | Vanadzor | K-38-113,114 | 40 | 47 | 58 | 44 | 29 | 52 | 1348 | 15 | 30 | 1 | II | H | B | Lapid flow activity ceased | | |
| LORI-113-0892 | Vanadzor-400m from stadion | LORI | Vanadzor | K-38-113,114 | 40 | 47 | 36 | 44 | 29 | 44 | 1450 | 250 | 630 | 10 | II | M | C | | | |
| LORI-113-0900 | | LORI | 113-D-b | K-38-113 | 40 | 46 | 18 | 44 | 27 | 43 | 2004 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0910 | | LORI | 113-D-b | K-38-113 | 40 | 45 | 59 | 44 | 28 | 7.5 | 1719 | 600 | 800 | 37 | III | L | D | | | |
| LORI-113-0920 | | LORI | 113-D-d | K-38-113 | 40 | 43 | 59 | 44 | 28 | 32 | 2167 | 500 | 500 | 20 | III | L | D | | | |
| LORI-113-0930 | | LORI | 113-B-b | K-38-113 | 40 | 55 | 20 | 44 | 29 | 11 | 1853 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0940 | | LORI | 113-B-b | K-38-113 | 40 | 54 | 35 | 44 | 28 | 52 | 1812 | 300 | 600 | 14 | III | L | D | | | |
| LORI-113-0950 | | LORI | 113-D-b | K-38-113 | 40 | 45 | 38 | 44 | 29 | 49 | 2157 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0960 | | LORI | 113-D-d | K-38-113 | 40 | 44 | 15 | 44 | 29 | 39 | 2475 | 100 | 100 | 1 | III | L | D | | | |
| LORI-113-0990 | | LORI | Arevashogh | K-38-113 | 40 | 53 | 1 | 44 | 15 | 56 | 1918 | 100 | 100 | 1 | III | M | C | | | |
| LORI-113-1005 | Vanadzor-Chemical plant | LORI | Vanadzor | K-38-113,114 | 40 | 47 | 17 | 44 | 27 | 4 | 2109 | 650 | 1045 | 14 | I | M | B | | | |
| LORI-114-0010 | | LORI | Vardablur | K-38-114 | 40 | 57 | 56 | 44 | 30 | 42 | 1337 | 600 | 1000 | 37 | III | M | C | | | |
| LORI-114-0020 | | LORI | Vardablur | K-38-114 | 40 | 57 | 60 | 44 | 31 | 0.6 | 1334 | 300 | 700 | 16 | III | M | C | | | |
| LORI-114-0030 | | LORI | Vardablur | K-38-114 | 40 | 56 | 51 | 44 | 30 | 29 | 1427 | 1000 | 1650 | 145 | III | M | C | | | |
| LORI-114-0040 | | LORI | 114-A-c | K-38-114 | 40 | 55 | 32 | 44 | 30 | 27 | 1770 | 300 | 700 | 19 | III | L | D | | | |
| LORI-114-0050 | | LORI | 114-A-c | K-38-114 | 40 | 55 | 4.5 | 44 | 31 | 31 | 1770 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0060 | | LORI | 114-A-c | K-38-114 | 40 | 53 | 9.6 | 44 | 30 | 32 | 1804 | 300 | 750 | 26 | III | L | D | | | |
| LORI-114-0070 | | LORI | 114-A-c | K-38-114 | 40 | 52 | 31 | 44 | 31 | 6.7 | 1988 | 250 | 350 | 9 | III | L | D | | | |
| LORI-114-0080 | | LORI | Karaberd | K-38-114 | 40 | 50 | 30 | 44 | 31 | 17 | 1588 | 350 | 1000 | 32 | III | M | C | | | |
| LORI-114-0090 | | LORI | 114-C-a | K-38-114 | 40 | 49 | 33 | 44 | 30 | 3 | 1515 | 800 | 500 | 34 | III | L | D | | | |
| LORI-114-0100 | | LORI | Vanadzor | K-38-114 | 40 | 48 | 52 | 44 | 31 | 16 | 1291 | 200 | 200 | 5 | III | M | C | | | |
| LORI-114-0110 | | LORI | Vanadzor | K-38-114 | 40 | 48 | 12 | 44 | 31 | 29 | 1394 | 100 | 100 | 1 | III | M | C | | | |
| LORI-114-0120 | | LORI | Vanadzor | K-38-114 | 40 | 47 | 42 | 44 | 30 | 56 | 1413 | 150 | 200 | 2 | III | M | C | | | |
| LORI-114-0130 | | LORI | Vanadzor | K-38-114 | 40 | 47 | 40 | 44 | 31 | 29 | 1442 | 150 | 200 | 4 | III | M | C | | | |
| LORI-114-0140 | | LORI | 114-C-c | K-38-114 | 40 | 43 | 32 | 44 | 30 | 31 | 2523 | 100 | 100 | 1 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-114-0160 | | LORI | Kurtan | K-38-114 | 40 | 57 | 19 | 44 | 32 | 20 | 1321 | 2300 | 2850 | 310 | III | M | C | | | |
| LORI-114-0170 | | LORI | Antaramut | K-38-114 | 40 | 55 | 57 | 44 | 32 | 15 | 1481 | 500 | 800 | 32 | III | M | C | | | |
| LORI-114-0180 | | LORI | Antaramut | K-38-114 | 40 | 56 | 30 | 44 | 32 | 50 | 1489 | 300 | 450 | 12 | III | M | C | | | |
| LORI-114-0190 | | LORI | Antaramut | K-38-114 | 40 | 55 | 31 | 44 | 32 | 50 | 1511 | 100 | 100 | 1 | III | M | C | | | |
| LORI-114-0200 | | LORI | 114-A-c | K-38-114 | 40 | 54 | 2.5 | 44 | 31 | 54 | 1466 | 400 | 250 | 9 | III | L | D | | | |
| LORI-114-0210 | | LORI | 114-A-c | K-38-114 | 40 | 52 | 12 | 44 | 31 | 45 | 2142 | 200 | 900 | 14 | III | L | D | | | |
| LORI-114-0220 | | LORI | Karaberd | K-38-114 | 40 | 50 | 17 | 44 | 31 | 53 | 1487 | 750 | 400 | 22 | III | M | C | | | |
| LORI-114-0230 | | LORI | Vanadzor | K-38-114 | 40 | 47 | 35 | 44 | 31 | 38 | 1460 | 200 | 150 | 3 | III | M | C | | | |
| LORI-114-0240 | | LORI | Shahumyan | K-38-114 | 40 | 46 | 56 | 44 | 32 | 7.7 | 1446 | 200 | 300 | 8 | III | M | C | | | |
| LORI-114-0250 | Shahumyan | LORI | Shahumyan | K-38-114 | 40 | 46 | 46 | 44 | 32 | 28 | 1524 | 110 | 920 | 12 | II | M | C | | | |
| LORI-114-0260 | | LORI | Shahumyan | K-38-114 | 40 | 46 | 49 | 44 | 32 | 48 | 1467 | 400 | 400 | 1 | III | M | C | | | |
| LORI-114-0270 | | LORI | Shahumyan | K-38-114 | 40 | 46 | 29 | 44 | 32 | 51 | 1499 | 600 | 350 | 19 | III | M | C | | | |
| LORI-114-0280 | | LORI | Shahumyan | K-38-114 | 40 | 45 | 57 | 44 | 32 | 28 | 1751 | 1500 | 1000 | 125 | III | M | C | | | |
| LORI-114-0290 | | LORI | 114-C-c | K-38-114 | 40 | 45 | 14 | 44 | 32 | 14 | 1829 | 500 | 1150 | 55 | III | L | D | | | |
| LORI-114-0300 | | LORI | Kurtan | K-38-114 | 40 | 56 | 56 | 44 | 34 | 10 | 1261 | 500 | 650 | 22 | III | M | C | | | |
| LORI-114-0310 | | LORI | Antaramut | K-38-114 | 40 | 56 | 9.6 | 44 | 33 | 27 | 1354 | 800 | 850 | 50 | III | M | C | | | |
| LORI-114-0320 | | LORI | 114-A-c | K-38-114 | 40 | 53 | 13 | 44 | 33 | 40 | 1356 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0330 | | LORI | 114-A-c | K-38-114 | 40 | 52 | 36 | 44 | 33 | 4.9 | 1610 | 450 | 300 | 13 | III | L | D | | | |
| LORI-114-0340 | | LORI | 114-A-c | K-38-114 | 40 | 51 | 46 | 44 | 33 | 56 | 1548 | 300 | 500 | 13 | III | L | D | | | |
| LORI-114-0350 | | LORI | Shahumyan | K-38-114 | 40 | 45 | 13 | 44 | 33 | 13 | 1780 | 700 | 1900 | 115 | III | M | C | | | |
| LORI-114-0360 | | LORI | Kachagan | K-38-114 | 40 | 57 | 30 | 44 | 35 | 20 | 1050 | 1000 | 650 | 46 | III | M | C | | | |
| LORI-114-0370 | | LORI | Kurtan | K-38-114 | 40 | 57 | 9.8 | 44 | 35 | 0.2 | 1024 | 200 | 350 | 6 | III | M | C | | | |
| LORI-114-0380 | | LORI | Antaramut | K-38-114 | 40 | 55 | 25 | 44 | 34 | 48 | 1259 | 250 | 600 | 13 | III | M | C | | | |
| LORI-114-0390 | | LORI | Shagali | K-38-114 | 40 | 53 | 24 | 44 | 35 | 46 | 1185 | 900 | 1150 | 86 | III | M | C | | | |
| LORI-114-0400 | | LORI | 114-A-c | K-38-114 | 40 | 51 | 35 | 44 | 35 | 14 | 1197 | 250 | 500 | 13 | III | L | D | | | |
| LORI-114-0410 | | LORI | Pambak | K-38-114 | 40 | 49 | 47 | 44 | 34 | 28 | 1405 | 250 | 500 | 11 | III | M | C | | | |
| LORI-114-0420 | | LORI | 114-C-c | K-38-114 | 40 | 44 | 56 | 44 | 35 | 5.5 | 2058 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0430 | | LORI | 114-C-c | K-38-114 | 40 | 43 | 8.5 | 44 | 34 | 55 | 2611 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0450 | | LORI | Kachagan | K-38-114 | 40 | 57 | 32 | 44 | 35 | 51 | 1051 | 200 | 400 | 9 | III | M | C | | | |
| LORI-114-0460 | | LORI | Kachagan | K-38-114 | 40 | 57 | 42 | 44 | 36 | 15 | 1006 | 250 | 450 | 9 | III | M | C | | | |
| LORI-114-0470 | | LORI | Kachagan | K-38-114 | 40 | 57 | 46 | 44 | 36 | 43 | 1094 | 350 | 950 | 28 | III | M | C | | | |
| LORI-114-0480 | | LORI | Dzoragyugh | K-38-114 | 40 | 57 | 7.5 | 44 | 36 | 6.7 | 1056 | 300 | 1000 | 26 | III | M | C | | | |
| LORI-114-0490 | | LORI | Dzoragyugh | K-38-114 | 40 | 57 | 9.5 | 44 | 37 | 7.8 | 1115 | 450 | 500 | 15 | III | M | C | | | |
| LORI-114-0500 | | LORI | Dzoragyugh | K-38-114 | 40 | 55 | 56 | 44 | 36 | 3.9 | 1243 | 700 | 2100 | 124 | III | M | C | | | |
| LORI-114-0510 | | LORI | Vahagni | K-38-114 | 40 | 55 | 40 | 44 | 37 | 18 | 984 | 300 | 950 | 29 | III | M | C | | | |
| LORI-114-0520 | | LORI | Vahagni | K-38-114 | 40 | 54 | 27 | 44 | 35 | 38 | 1255 | 1200 | 3300 | 186 | III | M | C | | | |
| LORI-114-0521 | Vahagni | LORI | Vahagni | K-38-114 | 40 | 54 | 38 | 44 | 36 | 40 | 1046 | 180 | 150 | 1 | I | M | B | | | |
| LORI-114-0530 | | LORI | Shagali | K-38-114 | 40 | 53 | 8.4 | 44 | 36 | 25 | 1179 | 800 | 1100 | 61 | III | M | C | | | |
| LORI-114-0540 | | LORI | Shagali | K-38-114 | 40 | 53 | 29 | 44 | 37 | 0.6 | 1085 | 1050 | 950 | 94 | III | M | C | | | |
| LORI-114-0550 | | LORI | 114-A-c | K-38-114 | 40 | 52 | 12 | 44 | 36 | 24 | 1249 | 400 | 200 | 6 | III | L | D | | | |
| LORI-114-0560 | | LORI | 114-C-c | K-38-114 | 40 | 45 | 17 | 44 | 36 | 24 | 1892 | 350 | 1100 | 33 | III | L | D | | | |
| LORI-114-0570 | | LORI | 114-C-c | K-38-114 | 40 | 44 | 2.9 | 44 | 36 | 29 | 2039 | 950 | 1350 | 112 | III | L | D | | | |
| LORI-114-0580 | | LORI | Tsater | K-38-114 | 40 | 58 | 7.4 | 44 | 37 | 45 | 1183 | 200 | 550 | 10 | III | M | C | | | |
| LORI-114-0590 | | LORI | Debet | K-38-114 | 40 | 55 | 19 | 44 | 38 | 17 | 990 | 350 | 400 | 11 | III | M | C | | | |
| LORI-114-0600 | | LORI | Vahagni | K-38-114 | 40 | 54 | 40 | 44 | 37 | 29 | 1105 | 900 | 750 | 58 | III | M | C | | | |
| LORI-114-0610 | Yeghegnut | LORI | Yeghegnut | K-38-114 | 40 | 54 | 6 | 44 | 38 | 6 | 1159 | 80 | 110 | 98 | II | M | C | | | |
| LORI-114-0620 | | LORI | Yeghegnut | K-38-114 | 40 | 53 | 8.6 | 44 | 38 | 27 | 1428 | 750 | 2100 | 120 | III | M | C | | | |
| LORI-114-0630 | | LORI | 114-A-c | K-38-114 | 40 | 52 | 8.1 | 44 | 38 | 28 | 1636 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0640 | | LORI | Lermontovo | K-38-114 | 40 | 46 | 7 | 44 | 37 | 39 | 2009 | 600 | 850 | 46 | III | M | C | | | |
| LORI-114-0650 | | LORI | 114-C-d | K-38-114 | 40 | 41 | 56 | 44 | 38 | 10 | 2469 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0660 | | LORI | 114-A-b | K-38-114 | 40 | 59 | 11 | 44 | 39 | 18 | 895 | 200 | 300 | 5 | III | L | D | | | |
| LORI-114-0670 | | LORI | Debet | K-38-114 | 40 | 55 | 43 | 44 | 38 | 41 | 1208 | 500 | 1850 | 94 | III | M | C | | | |
| LORI-114-0680 | | LORI | Debet | K-38-114 | 40 | 55 | 3.3 | 44 | 39 | 24 | 1129 | 1600 | 1900 | 233 | III | M | C | | | |
| LORI-114-0690 | | LORI | Eghegnut | K-38-114 | 40 | 53 | 19 | 44 | 39 | 7.8 | 1414 | 650 | 1600 | 73 | III | M | C | | | |
| LORI-114-0700 | | LORI | Eghegnut | K-38-114 | 40 | 52 | 53 | 44 | 39 | 24 | 1457 | 550 | 1000 | 51 | III | M | C | | | |
| LORI-114-0710 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 54 | 44 | 39 | 17 | 1586 | 350 | 350 | 10 | III | L | D | | | |
| LORI-114-0720 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 16 | 44 | 39 | 54 | 1548 | 500 | 1200 | 48 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-114-0730 | | LORI | 114-A-d | K-38-114 | 40 | 50 | 5.5 | 44 | 39 | 58 | 1716 | 400 | 1000 | 37 | III | L | D | | | |
| LORI-114-0740 | | LORI | 114-C-b | K-38-114 | 40 | 48 | 26 | 44 | 39 | 4.8 | 2124 | 500 | 700 | 26 | III | L | D | | | |
| LORI-114-0750 | | LORI | 114-C-b | K-38-114 | 40 | 48 | 12 | 44 | 39 | 24 | 2218 | 300 | 450 | 11 | III | L | D | | | |
| LORI-114-0760 | | LORI | Lermontovo | K-38-114 | 40 | 45 | 41 | 44 | 39 | 30 | 2130 | 300 | 1300 | 52 | III | M | C | | | |
| LORI-114-0770 | | LORI | Hamzachiman | K-38-114 | 40 | 43 | 19 | 44 | 39 | 28 | 1798 | 1000 | 2600 | 255 | III | M | C | | | |
| LORI-114-0780 | | LORI | Hamzachiman | K-38-114 | 40 | 42 | 58 | 44 | 39 | 57 | 1793 | 700 | 2800 | 171 | III | M | C | | | |
| LORI-114-0790 | | LORI | Karinj | K-38-114 | 40 | 58 | 34 | 44 | 40 | 18 | 1101 | 350 | 600 | 18 | III | M | C | | | |
| LORI-114-0800 | | LORI | Karinj | K-38-114 | 40 | 57 | 47 | 44 | 40 | 50 | 1038 | 250 | 500 | 12 | III | M | C | | | |
| LORI-114-0810 | | LORI | Karinj | K-38-114 | 40 | 58 | 0.4 | 44 | 41 | 29 | 1128 | 500 | 150 | 7 | III | M | C | | | |
| LORI-114-0820 | | LORI | Dsekh | K-38-114 | 40 | 57 | 1.2 | 44 | 40 | 22 | 1352 | 350 | 800 | 25 | III | M | C | | | |
| LORI-114-0830 | | LORI | Karinj | K-38-114 | 40 | 57 | 17 | 44 | 41 | 8.1 | 1211 | 500 | 1200 | 53 | III | M | C | | | |
| LORI-114-0840 | | LORI | Debet | K-38-114 | 40 | 54 | 45 | 44 | 41 | 9.7 | 1440 | 1000 | 1800 | 132 | III | M | C | | | |
| LORI-114-0850 | | LORI | Debet | K-38-114 | 40 | 54 | 13 | 44 | 40 | 22 | 1202 | 300 | 500 | 13 | III | M | C | | | |
| LORI-114-0860 | | LORI | 114-A-d | K-38-114 | 40 | 52 | 2.6 | 44 | 40 | 12 | 1408 | 350 | 500 | 14 | III | L | D | | | |
| LORI-114-0870 | | LORI | 114-A-d | K-38-114 | 40 | 52 | 33 | 44 | 41 | 12 | 1609 | 200 | 400 | 6 | III | L | D | | | |
| LORI-114-0880 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 56 | 44 | 41 | 11 | 1642 | 300 | 800 | 20 | III | L | D | | | |
| LORI-114-0890 | | LORI | 114-A-d | K-38-114 | 40 | 50 | 11 | 44 | 41 | 8.5 | 1829 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-0900 | | LORI | 114-C-b | K-38-114 | 40 | 49 | 31 | 44 | 40 | 18 | 1925 | 250 | 400 | 10 | III | L | D | | | |
| LORI-114-0910 | | LORI | Lermontovo | K-38-114 | 40 | 46 | 37 | 44 | 40 | 11 | 2517 | 700 | 1000 | 55 | III | M | C | | | |
| LORI-114-0920 | | LORI | Hamzachiman | K-38-114 | 40 | 44 | 38 | 44 | 40 | 48 | 1916 | 500 | 550 | 23 | III | M | C | | | |
| LORI-114-0930 | | LORI | Hamzachiman | K-38-114 | 40 | 42 | 47 | 44 | 40 | 27 | 1756 | 150 | 300 | 5 | III | M | C | | | |
| LORI-114-0940 | | LORI | Hamzachiman | K-38-114 | 40 | 42 | 27 | 44 | 40 | 39 | 1797 | 1000 | 2300 | 204 | III | M | C | | | |
| LORI-114-0950 | | LORI | Hamzachiman | K-38-114 | 40 | 42 | 13 | 44 | 40 | 51 | 1829 | 350 | 500 | 14 | III | M | C | | | |
| LORI-114-0960 | | LORI | Hamzachiman | K-38-114 | 40 | 42 | 3.4 | 44 | 41 | 34 | 1841 | 1300 | 2300 | 289 | III | M | C | | | |
| LORI-114-0970 | | LORI | Marts | K-38-114 | 40 | 57 | 30 | 44 | 42 | 12 | 1168 | 350 | 1750 | 65 | III | M | C | | | |
| LORI-114-0980 | | LORI | Marts | K-38-114 | 40 | 56 | 46 | 44 | 41 | 54 | 1157 | 850 | 1500 | 101 | III | M | C | | | |
| LORI-114-0990 | | LORI | Marts | K-38-114 | 40 | 56 | 22 | 44 | 42 | 35 | 1206 | 1300 | 1700 | 145 | III | M | C | | | |
| LORI-114-1000 | | LORI | 114-A-d | K-38-114 | 40 | 53 | 57 | 44 | 42 | 29 | 1428 | 500 | 600 | 25 | III | L | D | | | |
| LORI-114-1010 | | LORI | 114-A-d | K-38-114 | 40 | 53 | 32 | 44 | 42 | 39 | 1655 | 750 | 850 | 48 | III | L | D | | | |
| LORI-114-1020 | | LORI | 114-A-d | K-38-114 | 40 | 52 | 33 | 44 | 42 | 1.9 | 1756 | 500 | 700 | 26 | III | L | D | | | |
| LORI-114-1030 | | LORI | 114-A-d | K-38-114 | 40 | 52 | 5.7 | 44 | 42 | 7.8 | 1844 | 300 | 650 | 12 | III | L | D | | | |
| LORI-114-1040 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 6.5 | 44 | 41 | 41 | 1733 | 250 | 650 | 12 | III | L | D | | | |
| LORI-114-1050 | | LORI | 114-A-d | K-38-114 | 40 | 50 | 42 | 44 | 41 | 32 | 1675 | 450 | 650 | 24 | III | L | D | | | |
| LORI-114-1060 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 14 | 44 | 42 | 29 | 1841 | 200 | 600 | 11 | III | L | D | | | |
| LORI-114-1070 | | LORI | 114-A-d | K-38-114 | 40 | 49 | 58 | 44 | 42 | 17 | 1822 | 400 | 700 | 21 | III | L | D | | | |
| LORI-114-1080 | | LORI | 114-A-d | K-38-114 | 40 | 50 | 5.5 | 44 | 42 | 35 | 1906 | 200 | 600 | 12 | III | L | D | | | |
| LORI-114-1090 | | LORI | 114-A-b | K-38-114 | 40 | 59 | 56 | 44 | 42 | 51 | 1722 | 350 | 200 | 6 | III | L | D | | | |
| LORI-114-1100 | | LORI | Marts | K-38-114 | 40 | 57 | 42 | 44 | 43 | 9.5 | 1274 | 700 | 1300 | 62 | III | M | C | | | |
| LORI-114-1110 | | LORI | 114-A-b | K-38-114 | 40 | 55 | 44 | 44 | 43 | 4.5 | 1201 | 350 | 950 | 27 | III | L | D | | | |
| LORI-114-1120 | | LORI | 114-A-b | K-38-114 | 40 | 56 | 4.9 | 44 | 44 | 8.3 | 1363 | 300 | 700 | 18 | III | L | D | | | |
| LORI-114-1130 | | LORI | 114-A-d | K-38-114 | 40 | 54 | 43 | 44 | 43 | 24 | 1368 | 1700 | 1500 | 223 | III | L | D | | | |
| LORI-114-1140 | | LORI | 114-A-d | K-38-114 | 40 | 54 | 39 | 44 | 44 | 20 | 1273 | 300 | 700 | 18 | III | L | D | | | |
| LORI-114-1150 | | LORI | 114-A-d | K-38-114 | 40 | 50 | 17 | 44 | 43 | 38 | 2193 | 600 | 1500 | 95 | III | L | D | | | |
| LORI-114-1160 | | LORI | 114-C-b | K-38-114 | 40 | 49 | 60 | 44 | 43 | 49 | 2210 | 500 | 1200 | 41 | III | L | D | | | |
| LORI-114-1170 | | LORI | 114-C-b | K-38-114 | 40 | 49 | 29 | 44 | 43 | 30 | 2081 | 500 | 2000 | 90 | III | L | D | | | |
| LORI-114-1180 | | LORI | 114-C-b | K-38-114 | 40 | 48 | 57 | 44 | 43 | 10 | 2029 | 500 | 1050 | 39 | III | L | D | | | |
| LORI-114-1190 | | LORI | 114-C-b | K-38-114 | 40 | 48 | 16 | 44 | 43 | 57 | 2140 | 400 | 1000 | 36 | III | L | D | | | |
| LORI-114-1200 | | LORI | 114-C-b | K-38-114 | 40 | 47 | 57 | 44 | 43 | 33 | 2248 | 500 | 600 | 24 | III | L | D | | | |
| LORI-114-1210 | | LORI | 114-C-b | K-38-114 | 40 | 47 | 42 | 44 | 43 | 48 | 2307 | 500 | 800 | 27 | III | L | D | | | |
| LORI-114-1220 | | LORI | Fioletovo | K-38-114 | 40 | 44 | 33 | 44 | 43 | 39 | 2011 | 300 | 600 | 12 | III | M | C | | | |
| LORI-114-1230 | | LORI | 114-A-b | K-38-114 | 40 | 57 | 48 | 44 | 44 | 16 | 1306 | 600 | 200 | 10 | III | L | D | | | |
| LORI-114-1240 | | LORI | 114-A-b | K-38-114 | 40 | 57 | 52 | 44 | 44 | 44 | 1436 | 650 | 350 | 16 | III | L | D | | | |
| LORI-114-1250 | | LORI | 114-B-a | K-38-114 | 40 | 56 | 27 | 44 | 45 | 9.5 | 1523 | 400 | 750 | 28 | III | L | D | | | |
| LORI-114-1260 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 57 | 44 | 44 | 32 | 1746 | 500 | 650 | 28 | III | L | D | | | |
| LORI-114-1270 | | LORI | 114-A-d | K-38-114 | 40 | 51 | 24 | 44 | 44 | 9 | 1959 | 400 | 800 | 28 | III | L | D | | | |
| LORI-114-1280 | | LORI | 114-A-d | K-38-114 | 40 | 50 | 59 | 44 | 44 | 38 | 2036 | 1100 | 1600 | 170 | III | L | D | | | |
| LORI-114-1290 | | LORI | 114-B-b | K-38-114 | 40 | 50 | 44 | 44 | 45 | 31 | 1925 | 150 | 150 | 3 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| LORI-114-1300 | | LORI | 114-D-a | K-38-114 | 40 | 49 | 24 | 44 | 45 | 34 | 2392 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-1310 | | LORI | 114-D-a | K-38-114 | 40 | 45 | 22 | 44 | 45 | 47 | 1951 | 2900 | 1900 | 337 | III | L | D | | | |
| LORI-114-1320 | | LORI | Fioletovo | K-38-114 | 40 | 44 | 9.8 | 44 | 45 | 24 | 2108 | 100 | 100 | 1 | III | M | C | | | |
| LORI-114-1330 | | LORI | Fioletovo | K-38-114 | 40 | 43 | 9.7 | 44 | 44 | 58 | 1769 | 400 | 750 | 24 | III | M | C | | | |
| LORI-114-1340 | | LORI | Fioletovo | K-38-114 | 40 | 42 | 50 | 44 | 45 | 31 | 1610 | 750 | 400 | 25 | III | M | C | | | |
| LORI-114-1350 | | LORI | 114-C-d | K-38-114 | 40 | 41 | 6.4 | 44 | 44 | 33 | 2417 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-1360 | | LORI | 114-B-a | K-38-114 | 40 | 59 | 52 | 44 | 46 | 54 | 1718 | 300 | 350 | 10 | III | L | D | | | |
| LORI-114-1370 | | LORI | 114-B-a | K-38-114 | 40 | 59 | 43 | 44 | 47 | 15 | 1656 | 500 | 250 | 11 | III | L | D | | | |
| LORI-114-1380 | | LORI | 114-B-a | K-38-114 | 40 | 58 | 30 | 44 | 46 | 0.1 | 1717 | 550 | 500 | 21 | III | L | D | | | |
| LORI-114-1390 | | LORI | 114-B-a | K-38-114 | 40 | 57 | 48 | 44 | 45 | 57 | 1642 | 800 | 850 | 56 | III | L | D | | | |
| LORI-114-1400 | | LORI | Lorut | K-38-114 | 40 | 56 | 27 | 44 | 46 | 20 | 1537 | 200 | 300 | 4 | III | M | C | | | |
| LORI-114-1410 | | LORI | Lorut | K-38-114 | 40 | 56 | 4.3 | 44 | 46 | 18 | 1484 | 200 | 300 | 5 | III | M | C | | | |
| LORI-114-1420 | | LORI | Lorut | K-38-114 | 40 | 55 | 1.2 | 44 | 46 | 19 | 1348 | 400 | 950 | 25 | III | M | C | | | |
| LORI-114-1430 | | LORI | 114-B-c | K-38-114 | 40 | 51 | 12 | 44 | 46 | 7.5 | 2056 | 2000 | 4500 | 536 | III | L | D | | | |
| LORI-114-1440 | | LORI | 114-B-c | K-38-114 | 40 | 50 | 15 | 44 | 46 | 7.9 | 2121 | 400 | 650 | 18 | III | L | D | | | |
| LORI-114-1450 | | LORI | 114-D-a | K-38-114 | 40 | 49 | 41 | 44 | 46 | 27 | 2313 | 800 | 1250 | 88 | III | L | D | | | |
| LORI-114-1460 | | LORI | 114-D-a | K-38-114 | 40 | 49 | 18 | 44 | 46 | 14 | 2330 | 500 | 1050 | 43 | III | L | D | | | |
| LORI-114-1470 | | LORI | 114-B-a | K-38-114 | 40 | 58 | 36 | 44 | 47 | 47 | 1774 | 500 | 750 | 32 | III | L | D | | | |
| LORI-114-1480 | | LORI | Lorut | K-38-114 | 40 | 57 | 36 | 44 | 47 | 37 | 1728 | 450 | 1100 | 44 | III | M | C | | | |
| LORI-114-1490 | | LORI | Lorut | K-38-114 | 40 | 57 | 21 | 44 | 47 | 34 | 1647 | 150 | 700 | 12 | III | M | C | | | |
| LORI-114-1500 | | LORI | Lorut | K-38-114 | 40 | 56 | 29 | 44 | 47 | 30 | 1481 | 300 | 350 | 12 | III | M | C | | | |
| LORI-114-1510 | | LORI | Shamut | K-38-114 | 40 | 56 | 12 | 44 | 47 | 46 | 1481 | 200 | 300 | 5 | III | M | C | | | |
| LORI-114-1520 | | LORI | Shamut | K-38-114 | 40 | 55 | 40 | 44 | 48 | 15 | 1423 | 200 | 300 | 7 | III | M | C | | | |
| LORI-114-1530 | | LORI | 114-B-c | K-38-114 | 40 | 54 | 50 | 44 | 47 | 17 | 1405 | 350 | 850 | 22 | III | L | D | | | |
| LORI-114-1540 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 43 | 44 | 48 | 21 | 1464 | 750 | 700 | 40 | III | M | C | | | |
| LORI-114-1550 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 31 | 44 | 48 | 20 | 1414 | 200 | 200 | 3 | III | M | C | | | |
| LORI-114-1560 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 6.2 | 44 | 48 | 6.5 | 1529 | 450 | 700 | 30 | III | M | C | | | |
| LORI-114-1570 | | LORI | Aghnidzor | K-38-114 | 40 | 53 | 48 | 44 | 48 | 7.6 | 1527 | 400 | 500 | 16 | III | M | C | | | |
| LORI-114-1580 | | LORI | 114-B-c | K-38-114 | 40 | 53 | 4.8 | 44 | 48 | 23 | 1606 | 300 | 300 | 8 | III | L | D | | | |
| LORI-114-1590 | | LORI | 114-B-c | K-38-114 | 40 | 52 | 16 | 44 | 48 | 34 | 1901 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-1600 | | LORI | 114-B-c | K-38-114 | 40 | 51 | 6 | 44 | 48 | 2.9 | 2182 | 700 | 1950 | 33 | III | L | D | | | |
| LORI-114-1610 | | LORI | 114-B-c | K-38-114 | 40 | 51 | 8.7 | 44 | 47 | 47 | 2149 | 400 | 1000 | 85 | III | L | D | | | |
| LORI-114-1620 | | LORI | 114-B-c | K-38-114 | 40 | 51 | 7.6 | 44 | 48 | 30 | 2151 | 300 | 300 | 8 | III | L | D | | | |
| LORI-114-1630 | | LORI | 114-B-c | K-38-114 | 40 | 50 | 9.5 | 44 | 48 | 13 | 2550 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-1640 | | LORI | 114-B-a | K-38-114 | 40 | 58 | 2.3 | 44 | 48 | 43 | 1748 | 100 | 100 | 1 | III | L | D | | | |
| LORI-114-1650 | | LORI | Atan | K-38-114 | 40 | 56 | 1 | 44 | 49 | 35 | 1509 | 300 | 300 | 9 | III | M | C | | | |
| LORI-114-1660 | | LORI | Atan | K-38-114 | 40 | 55 | 37 | 44 | 49 | 8.2 | 1556 | 400 | 500 | 13 | III | M | C | | | |
| LORI-114-1670 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 36 | 44 | 49 | 8.6 | 1465 | 200 | 200 | 4 | III | M | C | | | |
| LORI-114-1680 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 48 | 44 | 49 | 29 | 1552 | 250 | 500 | 11 | III | M | C | | | |
| LORI-114-1690 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 29 | 44 | 49 | 17 | 1477 | 150 | 150 | 3 | III | M | C | | | |
| LORI-114-1700 | | LORI | Aghnidzor | K-38-114 | 40 | 53 | 57 | 44 | 49 | 24 | 1572 | 1100 | 700 | 56 | III | M | C | | | |
| LORI-114-1710 | | LORI | Aghnidzor | K-38-114 | 40 | 54 | 9.9 | 44 | 50 | 4.4 | 1706 | 450 | 1250 | 50 | III | M | C | | | |
| LORI-114-1720 | | LORI | Aghnidzor | K-38-114 | 40 | 52 | 60 | 44 | 49 | 48 | 1680 | 600 | 550 | 25 | III | M | C | | | |
| LORI-114-1730 | | LORI | 114-B-c | K-38-114 | 40 | 50 | 39 | 44 | 49 | 41 | 2114 | 1100 | 700 | 57 | III | L | D | | | |
| LORI-114-1740 | | LORI | 114-B-a | K-38-114 | 40 | 58 | 36 | 44 | 50 | 21 | 1699 | 150 | 250 | 3 | III | L | D | | | |
| LORI-114-1750 | | LORI | Atan | K-38-114 | 40 | 56 | 41 | 44 | 50 | 58 | 1735 | 800 | 450 | 25 | III | M | C | | | |
| LORI-114-1760 | | LORI | Atan | K-38-114 | 40 | 55 | 51 | 44 | 50 | 8.2 | 1584 | 400 | 500 | 21 | III | M | C | | | |
| LORI-114-1770 | | LORI | Atan | K-38-114 | 40 | 55 | 58 | 44 | 50 | 34 | 1649 | 150 | 150 | 3 | III | M | C | | | |
| LORI-114-1780 | | LORI | Atan | K-38-114 | 40 | 55 | 38 | 44 | 50 | 38 | 1606 | 100 | 150 | 4 | III | M | C | | | |
| LORI-114-1790 | | LORI | Atan | K-38-114 | 40 | 55 | 57 | 44 | 51 | 15 | 1744 | 300 | 2000 | 57 | III | M | C | | | |
| LORI-114-1800 | | LORI | Atan | K-38-114 | 40 | 55 | 46 | 44 | 51 | 31 | 1758 | 500 | 1200 | 47 | III | M | C | | | |
| LORI-114-1810 | | LORI | Atan | K-38-114 | 40 | 55 | 22 | 44 | 51 | 25 | 1754 | 350 | 350 | 9 | III | M | C | | | |
| LORI-114-1860 | | LORI | 114-B-b | K-38-114 | 40 | 56 | 22 | 44 | 53 | 26 | 1844 | 300 | 500 | 12 | III | L | D | | | |
| SHIR-099-0010 | | SHIRAK | 099-D-b | K-38-099 | 41 | 5 | 56 | 43 | 28 | 7.2 | 2633 | 800 | 750 | 60 | III | L | D | | | |
| SHIR-099-0020 | | SHIRAK | 099-D-b | K-38-099 | 41 | 5 | 23 | 43 | 28 | 7.2 | 2573 | 700 | 850 | 56 | III | L | D | | | |
| SHIR-099-0030 | | SHIRAK | 099-D-d | K-38-099 | 41 | 4 | 54 | 43 | 28 | 39 | 2562 | 1000 | 1550 | 123 | III | L | D | | | |
| SHIR-100-0010 | | SHIRAK | 100-C-c | K-38-100 | 41 | 1 | 36 | 43 | 33 | 36 | 2388 | 750 | 2900 | 144 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SHIR-100-0020 | | SHIRAK | 100-C-c | K-38-100 | 41 | 2 | 31 | 43 | 34 | 58 | 2105 | 800 | 2150 | 99 | III | L | D | | | |
| SHIR-100-0030 | | SHIRAK | Tsaghkut | K-38-100 | 41 | 6 | 43 | 43 | 35 | 45 | 2190 | 2600 | 7000 | 1881 | III | M | C | | | |
| SHIR-100-0040 | | SHIRAK | Gyolli | K-38-100 | 41 | 4 | 51 | 43 | 45 | 0.4 | 2164 | 1600 | 2700 | 250 | III | M | C | | | |
| SHIR-100-0050 | | SHIRAK | Ghazanchi | K-38-100 | 41 | 4 | 37 | 43 | 51 | 22 | 2121 | 1400 | 3300 | 414 | III | M | C | | | |
| SHIR-100-0060 | | SHIRAK | Karmravan | K-38-100 | 41 | 0 | 43 | 43 | 52 | 2.5 | 2013 | 300 | 400 | 9 | III | M | C | | | |
| SHIR-100-0070 | | SHIRAK | 100-D-b | K-38-100 | 41 | 9 | 43 | 43 | 55 | 58 | 2806 | 1200 | 4000 | 230 | III | L | D | | | |
| SHIR-100-0080 | | SHIRAK | 100-D-d | K-38-100 | 41 | 3 | 25 | 43 | 57 | 41 | 2652 | 200 | 300 | 6 | III | L | D | | | |
| SHIR-100-0090 | | SHIRAK | 100-D-d | K-38-100 | 41 | 0 | 5.6 | 43 | 58 | 49 | 2297 | 400 | 400 | 13 | III | L | D | | | |
| SHIR-101-0010 | | SHIRAK | 101-C-c | K-38-101 | 41 | 2 | 15 | 44 | 2 | 19 | 2280 | 350 | 800 | 26 | III | L | D | | | |
| SHIR-101-0020 | | SHIRAK | 101-C-c | K-38-101 | 41 | 0 | 26 | 44 | 2 | 18 | 2285 | 900 | 1300 | 99 | III | L | D | | | |
| SHIR-101-0030 | | SHIRAK | 101-C-c | K-38-101 | 41 | 0 | 37 | 44 | 2 | 56 | 2229 | 500 | 900 | 39 | III | L | D | | | |
| SHIR-101-0040 | | SHIRAK | 101-C-c | K-38-101 | 41 | 0 | 58 | 44 | 3 | 58 | 2258 | 1650 | 2200 | 40 | III | L | D | | | |
| SHIR-112-0010 | | SHIRAK | Gyumri | K-38-112 | 40 | 48 | 26 | 43 | 48 | 15 | 1548 | 3000 | 800 | 247 | III | M | C | | | |
| SHIR-112-0020 | Arapi | SHIRAK | | K-38-112 | 40 | 47 | 6 | 43 | 48 | 16 | 1484 | 440 | 220 | 5 | II | H | B | | | |
| SHIR-112-0021 | | SHIRAK | Arapi | K-38-112 | 40 | 46 | 58 | 43 | 48 | 24 | 1479 | 100 | 200 | 3 | III | M | C | | | |
| SHIR-112-0022 | | SHIRAK | Arapi | K-38-112 | 40 | 46 | 52 | 43 | 48 | 30 | 1475 | 100 | 200 | 3 | III | M | C | | | |
| SHIR-112-0030 | | SHIRAK | Vardakhpyur | K-38-112 | 40 | 57 | 56 | 43 | 54 | 19 | 2117 | 100 | 100 | 1 | III | M | C | | | |
| SHIR-112-0040 | | SHIRAK | Torosgyukh | K-38-112 | 40 | 56 | 34 | 43 | 53 | 27 | 1944 | 1250 | 2000 | 134 | III | M | C | | | |
| SHIR-112-0060 | | SHIRAK | Pokrashen | K-38-112 | 40 | 54 | 1.3 | 43 | 54 | 5.2 | 2020 | 400 | 850 | 13 | III | M | C | | | |
| SHIR-112-0070 | | SHIRAK | Karmrakar | K-38-112 | 40 | 51 | 28 | 43 | 53 | 22 | 1828 | 2000 | 1500 | 179 | III | M | C | | | |
| SHIR-112-0080 | | SHIRAK | 112-B-b | K-38-112 | 40 | 57 | 16 | 43 | 54 | 48 | 2084 | 100 | 100 | 1 | III | L | D | | | |
| SHIR-112-0090 | | SHIRAK | 112-B-b | K-38-112 | 40 | 56 | 11 | 43 | 55 | 26 | 2145 | 100 | 100 | 1 | III | L | D | | | |
| SHIR-112-0100 | | SHIRAK | Lernut | K-38-112 | 40 | 52 | 10 | 43 | 55 | 8.2 | 1878 | 300 | 850 | 13 | III | M | C | | | |
| SHIR-112-0110 | | SHIRAK | Musaelyan | K-38-112 | 40 | 59 | 46 | 43 | 56 | 32 | 2143 | 100 | 100 | 1 | III | M | C | | | |
| SHIR-112-0120 | | SHIRAK | Mets Sariar | K-38-112 | 40 | 53 | 38 | 43 | 56 | 40 | 1984 | 100 | 100 | 1 | III | M | C | | | |
| SHIR-112-0130 | | SHIRAK | Mets Sariar | K-38-112 | 40 | 53 | 21 | 43 | 56 | 58 | 1974 | 500 | 600 | 33 | III | M | C | | | |
| SHIR-112-0140 | | SHIRAK | Kamo | K-38-112 | 40 | 49 | 26 | 43 | 57 | 47 | 1770 | 400 | 1000 | 25 | III | M | C | | | |
| SHIR-112-0150 | | SHIRAK | Kamo | K-38-112 | 40 | 49 | 9.6 | 43 | 58 | 43 | 1862 | 500 | 950 | 25 | III | M | C | | | |
| SHIR-112-0160 | Jajur-tunnel | SHIRAK | Jajur tunnel | K-38-112 | 40 | 52 | 12 | 43 | 59 | 24 | 1962 | 350 | 300 | 13 | II | M | C | | Railroad | State importance railway |
| SHIR-113-0010 | | SHIRAK | 113-A-c | K-38-113 | 40 | 52 | 35 | 44 | 0 | 16 | 2175 | 650 | 600 | 30 | III | L | D | | | |
| SHIR-113-0015 | | SHIRAK | 113-C-a | K-38-113 | 40 | 47 | 60 | 44 | 0 | 27 | 2133 | 500 | 750 | 28 | III | L | D | | | |
| SHIR-113-0020 | | SHIRAK | Jrarat | K-38-113 | 40 | 45 | 3.1 | 44 | 3 | 9.1 | 2135 | 100 | 100 | 1 | III | M | C | | | |
| SHIR-113-0021 | | SHIRAK | 113-A-a | K-38-113 | 40 | 54 | 52 | 44 | 3 | 48 | 1950 | 400 | 400 | 12 | III | L | D | | | |
| SHIR-113-0030 | | SHIRAK | 113-A-a | K-38-113 | 40 | 57 | 17 | 44 | 1 | 53 | 2328 | 200 | 400 | 8 | III | L | D | | | |
| SHIR-113-0040 | | SHIRAK | 113-A-a | K-38-113 | 40 | 59 | 29 | 44 | 3 | 18 | 2576 | 500 | 1000 | 43 | III | L | D | | | |
| SHIR-113-0050 | | SHIRAK | 113-A-a | K-38-113 | 40 | 58 | 56 | 44 | 4 | 12 | 2789 | 400 | 600 | 20 | III | L | D | | | |
| SHIR-113-0060 | | SHIRAK | 113-A-c | K-38-113 | 40 | 54 | 8.9 | 44 | 3 | 6.5 | 2154 | 400 | 1100 | 34 | III | L | D | | | |
| SHIR-113-0070 | | SHIRAK | 113-A-a | K-38-113 | 40 | 54 | 45 | 44 | 4 | 15 | 2018 | 500 | 400 | 16 | III | L | D | | | |
| SHIR-113-0080 | | SHIRAK | 113-A-a | K-38-113 | 40 | 59 | 35 | 44 | 5 | 22 | 2599 | 500 | 500 | 15 | III | L | D | | | |
| SHIR-113-0090 | | SHIRAK | 113-A-a | K-38-113 | 40 | 58 | 49 | 44 | 5 | 39 | 2627 | 450 | 900 | 33 | III | L | D | | | |
| SHIR-113-0100 | | SHIRAK | 113-A-a | K-38-113 | 40 | 54 | 47 | 44 | 5 | 21 | 1932 | 600 | 650 | 26 | III | L | D | | | |
| SHIR-113-0120 | | SHIRAK | 113-A-a | K-38-113 | 40 | 56 | 42 | 44 | 6 | 23 | 2436 | 100 | 100 | 1 | III | L | D | | | |
| SHIR-124-0010 | | SHIRAK | Dzorakap | K-38-124 | 40 | 33 | 14 | 43 | 53 | 10 | 1778 | 300 | 400 | 8 | III | M | C | | | |
| SHIR-124-0020 | | SHIRAK | Lernakert | K-38-124 | 40 | 34 | 8.8 | 43 | 55 | 23 | 1897 | 2000 | 5200 | 676 | III | M | C | | | |
| SHIR-124-0030 | | SHIRAK | Garnahovit | K-38-124 | 40 | 30 | 0.4 | 43 | 57 | 47 | 2208 | 350 | 600 | 25 | III | M | C | | | |
| SHIR-125-0010 | | SHIRAK | 125-A-c | K-38-125 | 40 | 31 | 9.3 | 44 | 7 | 25 | 2870 | 650 | 1200 | 42 | III | L | D | | | |
| SHIR-125-0020 | | SHIRAK | 125-A-c | K-38-125 | 40 | 31 | 21 | 44 | 7 | 45 | 2936 | 500 | 1100 | 29 | III | L | D | | | |
| SHIR-125-0030 | | SHIRAK | 125-A-c | K-38-125 | 40 | 30 | 49 | 44 | 0 | 57 | 2660 | 500 | 1500 | 64 | III | L | D | | | |
| SHIR-125-0040 | | SHIRAK | 125-A-c | K-38-125 | 40 | 30 | 4.4 | 44 | 3 | 18 | 2933 | 700 | 3800 | 233 | III | L | D | | | |
| SHIR-125-0050 | | SHIRAK | 125-A-d | K-38-125 | 40 | 32 | 18 | 44 | 8 | 50 | 3040 | 700 | 1600 | 107 | III | L | D | | | |
| SHIR-125-0060 | | SHIRAK | 125-A-d | K-38-125 | 40 | 30 | 32 | 44 | 8 | 58 | 3370 | 1100 | 3400 | 295 | III | L | D | | | |
| SYUN-008-0005 | | SYUNIK | 008-C-d | J-38-008 | 39 | 43 | 50 | 45 | 42 | 7.9 | 2538 | 500 | 1400 | 64 | III | L | D | | | |
| SYUN-008-0010 | | SYUNIK | 008-C-d | J-38-008 | 39 | 42 | 9.1 | 45 | 44 | 32 | 2503 | 1100 | 2600 | 173 | III | L | D | | | |
| SYUN-008-0020 | | SYUNIK | 008-D-c | J-38-008 | 39 | 42 | 24 | 45 | 45 | 45 | 2215 | 600 | 2550 | 92 | III | L | D | | | |
| SYUN-008-0030 | | SYUNIK | 008-D-a | J-38-008 | 39 | 48 | 44 | 45 | 48 | 32 | 2791 | 1700 | 5150 | 576 | III | L | D | | | |
| SYUN-008-0040 | | SYUNIK | 008-D-a | J-38-008 | 39 | 45 | 23 | 45 | 49 | 14 | 2698 | 1800 | 4150 | 463 | III | L | D | | | |
| SYUN-008-0050 | | SYUNIK | 008-D-b | J-38-008 | 39 | 46 | 10 | 45 | 53 | 30 | 2871 | 600 | 1400 | 70 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-008-0060 | | SYUNIK | 008-D-b | J-38-008 | 39 | 46 | 10 | 45 | 57 | 26 | 3011 | 500 | 1050 | 43 | III | L | D | | | |
| SYUN-009-0010 | | SYUNIK | 009-C-c | J-38-009 | 39 | 42 | 8.8 | 46 | 0 | 27 | 3098 | 500 | 800 | 31 | III | L | D | | | |
| SYUN-009-0020 | | SYUNIK | 009-C-c | J-38-009 | 39 | 41 | 8.4 | 46 | 0 | 50 | 3122 | 950 | 2300 | 141 | III | L | D | | | |
| SYUN-020-0001 | | SYUNIK | 020-A-b | J-38-020 | 39 | 36 | 34 | 45 | 42 | 6 | 2826 | 300 | 750 | 22 | III | L | D | | | |
| SYUN-020-0002 | | SYUNIK | 020-A-b | J-38-020 | 39 | 36 | 46 | 45 | 42 | 36 | 2766 | 200 | 1000 | 20 | III | L | D | | | |
| SYUN-020-0010 | | SYUNIK | 020-A-b | J-38-020 | 39 | 38 | 30 | 45 | 44 | 22 | 2399 | 300 | 950 | 19 | III | L | D | | | |
| SYUN-020-0020 | | SYUNIK | 020-B-a | J-38-020 | 39 | 39 | 45 | 45 | 45 | 5.8 | 2285 | 750 | 900 | 42 | III | L | D | | | |
| SYUN-020-0030 | | SYUNIK | 020-B-a | J-38-020 | 39 | 38 | 49 | 45 | 46 | 27 | 2210 | 400 | 550 | 20 | III | L | D | | | |
| SYUN-020-0040 | | SYUNIK | 020-B-a | J-38-020 | 39 | 37 | 59 | 45 | 48 | 18 | 2188 | 900 | 2200 | 114 | III | L | D | | | |
| SYUN-020-0050 | | SYUNIK | 020-B-a | J-38-020 | 39 | 37 | 34 | 45 | 49 | 22 | 2245 | 500 | 1850 | 48 | III | L | D | | | |
| SYUN-020-0060 | | SYUNIK | 020-B-c | J-38-020 | 39 | 34 | 15 | 45 | 49 | 17 | 2250 | 450 | 950 | 34 | III | L | D | | | |
| SYUN-020-0070 | | SYUNIK | 020-B-c | J-38-020 | 39 | 33 | 26 | 45 | 49 | 28 | 2293 | 550 | 1500 | 38 | III | L | D | | | |
| SYUN-020-0080 | | SYUNIK | 020-B-c | J-38-020 | 39 | 32 | 53 | 45 | 49 | 24 | 2261 | 1100 | 2900 | 196 | III | L | D | | | |
| SYUN-020-0090 | | SYUNIK | 020-B-c | J-38-020 | 39 | 30 | 11 | 45 | 50 | 5.4 | 2399 | 550 | 900 | 40 | III | L | D | | | |
| SYUN-020-0100 | | SYUNIK | Tsghuk | J-38-020 | 39 | 38 | 33 | 45 | 51 | 12 | 2085 | 300 | 550 | 13 | III | M | C | | | |
| SYUN-020-0110 | | SYUNIK | 020-B-a | J-38-020 | 39 | 37 | 47 | 45 | 51 | 4.1 | 2214 | 500 | 1100 | 31 | III | L | D | | | |
| SYUN-020-0120 | | SYUNIK | 020-B-a | J-38-020 | 39 | 36 | 34 | 45 | 50 | 34 | 2361 | 700 | 1250 | 71 | III | L | D | | | |
| SYUN-020-0130 | | SYUNIK | 020-B-c | J-38-020 | 39 | 33 | 23 | 45 | 50 | 31 | 2063 | 300 | 800 | 20 | III | L | D | | | |
| SYUN-020-0140 | | SYUNIK | 020-B-c | J-38-020 | 39 | 33 | 23 | 45 | 50 | 57 | 2063 | 250 | 850 | 9 | III | L | D | | | |
| SYUN-020-0150 | | SYUNIK | 020-B-c | J-38-020 | 39 | 33 | 1.8 | 45 | 50 | 60 | 1994 | 450 | 900 | 36 | III | L | D | | | |
| SYUN-020-0160 | | SYUNIK | 020-B-c | J-38-020 | 39 | 32 | 47 | 45 | 51 | 28 | 1976 | 300 | 1050 | 29 | III | L | D | | | |
| SYUN-020-0170 | | SYUNIK | 020-B-c | J-38-020 | 39 | 32 | 12 | 45 | 50 | 37 | 2109 | 1000 | 2300 | 161 | III | L | D | | | |
| SYUN-020-0180 | | SYUNIK | 020-B-c | J-38-020 | 39 | 31 | 17 | 45 | 50 | 50 | 2076 | 450 | 800 | 36 | III | L | D | | | |
| SYUN-020-0190 | | SYUNIK | 020-D-a | J-38-020 | 39 | 29 | 48 | 45 | 51 | 25 | 2327 | 400 | 1250 | 30 | III | L | D | | | |
| SYUN-020-0200 | | SYUNIK | 020-D-a | J-38-020 | 39 | 28 | 53 | 45 | 51 | 3.1 | 2567 | 500 | 900 | 23 | III | L | D | | | |
| SYUN-020-0210 | | SYUNIK | 020-D-a | J-38-020 | 39 | 28 | 33 | 45 | 50 | 23 | 2832 | 200 | 850 | 18 | III | L | D | | | |
| SYUN-020-0220 | | SYUNIK | 020-D-a | J-38-020 | 39 | 28 | 27 | 45 | 51 | 5.1 | 2733 | 400 | 1100 | 30 | III | L | D | | | |
| SYUN-020-0230 | | SYUNIK | 020-D-a | J-38-020 | 39 | 27 | 55 | 45 | 50 | 40 | 2873 | 350 | 750 | 23 | III | L | D | | | |
| SYUN-020-0240 | | SYUNIK | 020-D-a | J-38-020 | 39 | 27 | 35 | 45 | 51 | 6.2 | 2838 | 450 | 950 | 34 | III | L | D | | | |
| SYUN-020-0250 | | SYUNIK | 020-D-c | J-38-020 | 39 | 22 | 3.9 | 45 | 50 | 35 | 2403 | 900 | 1200 | 78 | III | L | D | | | |
| SYUN-020-0260 | | SYUNIK | 020-D-c | J-38-020 | 39 | 22 | 25 | 45 | 51 | 15 | 2262 | 700 | 800 | 38 | III | L | D | | | |
| SYUN-020-0270 | | SYUNIK | 020-B-a | J-38-020 | 39 | 37 | 54 | 45 | 51 | 56 | 1996 | 700 | 1200 | 32 | III | L | D | | | |
| SYUN-020-0280 | | SYUNIK | Spandaryan | J-38-020 | 39 | 36 | 50 | 45 | 52 | 23 | 2128 | 350 | 1300 | 43 | III | M | C | | | |
| SYUN-020-0290 | | SYUNIK | Spandaryan | J-38-020 | 39 | 36 | 57 | 45 | 52 | 44 | 2072 | 750 | 1000 | 32 | III | M | C | | | |
| SYUN-020-0300 | | SYUNIK | 020-B-d | J-38-020 | 39 | 34 | 53 | 45 | 52 | 13 | 2015 | 1000 | 2000 | 112 | III | L | D | | | |
| SYUN-020-0310 | | SYUNIK | 020-B-d | J-38-020 | 39 | 34 | 10 | 45 | 52 | 47 | 1829 | 300 | 700 | 16 | III | L | D | | | |
| SYUN-020-0320 | | SYUNIK | 020-B-d | J-38-020 | 39 | 33 | 36 | 45 | 52 | 42 | 1801 | 350 | 650 | 20 | III | L | D | | | |
| SYUN-020-0330 | | SYUNIK | 020-B-d | J-38-020 | 39 | 33 | 3.5 | 45 | 51 | 46 | 1849 | 200 | 900 | 17 | III | L | D | | | |
| SYUN-020-0340 | | SYUNIK | 020-B-c | J-38-020 | 39 | 32 | 16 | 45 | 51 | 47 | 2016 | 650 | 1000 | 51 | III | L | D | | | |
| SYUN-020-0350 | | SYUNIK | 020-D-a | J-38-020 | 39 | 29 | 50 | 45 | 51 | 41 | 2352 | 750 | 2000 | 135 | III | L | D | | | |
| SYUN-020-0360 | | SYUNIK | 020-D-a | J-38-020 | 39 | 29 | 56 | 45 | 52 | 11 | 2371 | 650 | 2000 | 123 | III | L | D | | | |
| SYUN-020-0370 | | SYUNIK | 020-D-a | J-38-020 | 39 | 28 | 42 | 45 | 51 | 55 | 2581 | 550 | 550 | 25 | III | L | D | | | |
| SYUN-020-0380 | | SYUNIK | 020-D-b | J-38-020 | 39 | 25 | 58 | 45 | 52 | 42 | 2455 | 300 | 500 | 12 | III | L | D | | | |
| SYUN-020-0390 | | SYUNIK | 020-D-d | J-38-020 | 39 | 22 | 27 | 45 | 52 | 14 | 2187 | 700 | 900 | 52 | III | L | D | | | |
| SYUN-020-0400 | | SYUNIK | Spandaryan | J-38-020 | 39 | 36 | 39 | 45 | 53 | 39 | 2028 | 1000 | 2150 | 139 | III | M | C | | | |
| SYUN-020-0410 | | SYUNIK | Saghat | J-38-020 | 39 | 34 | 53 | 45 | 54 | 4.6 | 1958 | 1600 | 3500 | 511 | III | M | C | | | |
| SYUN-020-0430 | | SYUNIK | Saghat | J-38-020 | 39 | 34 | 39 | 45 | 53 | 25 | 1929 | 500 | 800 | 33 | III | M | C | | | |
| SYUN-020-0440 | | SYUNIK | Saghat | J-38-020 | 39 | 34 | 4.4 | 45 | 53 | 34 | 1737 | 250 | 300 | 6 | III | M | C | | | |
| SYUN-020-0450 | Shaghat | SYUNIK | Shaghat | J-38-20 | 39 | 33 | 45 | 45 | 54 | 17 | 1744 | 700 | 550 | 103 | II | H | B | | | |
| SYUN-020-0460 | | SYUNIK | Bartsravan | J-38-020 | 39 | 32 | 12 | 45 | 53 | 8.7 | 1941 | 1000 | 2000 | 109 | III | M | C | | | |
| SYUN-020-0470 | | SYUNIK | Bartsravan | J-38-020 | 39 | 31 | 48 | 45 | 53 | 41 | 1956 | 1000 | 2300 | 144 | III | M | C | | | |
| SYUN-020-0480 | | SYUNIK | Bartsravan | J-38-020 | 39 | 31 | 14 | 45 | 53 | 25 | 2069 | 400 | 850 | 17 | III | M | C | | | |
| SYUN-020-0490 | Baradzravan | SYUNIK | Baradzravan | J-38-20 | 39 | 32 | 2 | 45 | 54 | 22 | 1882 | 10 | 20 | 10 | II | M | C | | | |
| SYUN-020-0500 | | SYUNIK | 020-B-d | J-38-020 | 39 | 30 | 1.3 | 45 | 53 | 30 | 2260 | 450 | 1300 | 31 | III | L | D | | | |
| SYUN-020-0510 | | SYUNIK | 020-D-b | J-38-020 | 39 | 27 | 39 | 45 | 53 | 31 | 2326 | 400 | 1150 | 37 | III | L | D | | | |
| SYUN-020-0520 | | SYUNIK | Arevis | J-38-020 | 39 | 24 | 21 | 45 | 53 | 48 | 1929 | 400 | 350 | 14 | III | M | C | | | |
| SYUN-020-0530 | | SYUNIK | 020-D-d | J-38-020 | 39 | 21 | 38 | 45 | 53 | 30 | 2344 | 800 | 1200 | 40 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-020-0540 | | SYUNIK | Balak | J-38-020 | 39 | 33 | 32 | 45 | 55 | 2.2 | 1715 | 350 | 650 | 19 | III | M | C | | | |
| SYUN-020-0550 | | SYUNIK | Balak | J-38-020 | 39 | 33 | 16 | 45 | 55 | 11 | 1754 | 200 | 500 | 9 | III | M | C | | | |
| SYUN-020-0560 | | SYUNIK | Balak | J-38-020 | 39 | 32 | 55 | 45 | 55 | 9.8 | 1823 | 250 | 750 | 19 | III | M | C | | | |
| SYUN-020-0570 | | SYUNIK | 020-B-d | J-38-020 | 39 | 30 | 26 | 45 | 54 | 32 | 2069 | 550 | 1450 | 49 | III | L | D | | | |
| SYUN-020-0580 | | SYUNIK | 020-B-d | J-38-020 | 39 | 30 | 4.8 | 45 | 55 | 37 | 2019 | 400 | 950 | 18 | III | L | D | | | |
| SYUN-020-0585 | Salavard | SYUNIK | Salavard | J-38-20 | 39 | 27 | 45 | 45 | 55 | 11 | 1940 | 180 | 180 | 16 | II | M | C | | | |
| SYUN-020-0586 | Salavard | SYUNIK | Salavard | | 39 | 27 | 40 | 45 | 54 | 29 | 2081 | | | 8 | III | M | C | | | |
| SYUN-020-0590 | | SYUNIK | Jomardlu | J-38-020 | 39 | 25 | 59 | 45 | 55 | 0.8 | 2009 | 550 | 900 | 27 | III | M | C | | | |
| SYUN-020-0600 | | SYUNIK | 020-D-d | J-38-020 | 39 | 25 | 6.7 | 45 | 55 | 30 | 1829 | 250 | 400 | 7 | III | L | D | | | |
| SYUN-020-0610 | | SYUNIK | Arevis | J-38-020 | 39 | 23 | 56 | 45 | 54 | 40 | 2081 | 650 | 2500 | 85 | III | M | C | | | |
| SYUN-020-0620 | | SYUNIK | Arevis | J-38-020 | 39 | 23 | 30 | 45 | 54 | 25 | 2105 | 350 | 800 | 12 | III | M | C | | | |
| SYUN-020-0630 | | SYUNIK | Arevis | J-38-020 | 39 | 22 | 49 | 45 | 54 | 33 | 2204 | 400 | 1600 | 29 | III | M | C | | | |
| SYUN-020-0640 | | SYUNIK | | J-38-020 | 39 | 33 | 14 | 45 | 56 | 47 | 1798 | 350 | 650 | 19 | III | L | D | | | |
| SYUN-020-0650 | | SYUNIK | Balak | J-38-020 | 39 | 32 | 29 | 45 | 56 | 23 | 1877 | 400 | 1400 | 38 | III | M | C | | | |
| SYUN-020-0660 | | SYUNIK | 020-B-d | J-38-020 | 39 | 31 | 0.5 | 45 | 56 | 35 | 1943 | 500 | 1250 | 30 | III | L | D | | | |
| SYUN-020-0670 | | SYUNIK | Brnakot | J-38-020 | 39 | 29 | 55 | 45 | 56 | 46 | 1843 | 300 | 300 | 8 | III | M | C | | | |
| SYUN-020-0680 | | SYUNIK | Arevis | J-38-020 | 39 | 25 | 13 | 45 | 55 | 48 | 1849 | 400 | 950 | 24 | III | M | C | | | |
| SYUN-020-0690 | | SYUNIK | 020-D-d | J-38-020 | 39 | 24 | 22 | 45 | 56 | 14 | 2223 | 500 | 1700 | 78 | III | L | D | | | |
| SYUN-020-0700 | | SYUNIK | 020-D-d | J-38-020 | 39 | 20 | 39 | 45 | 55 | 47 | 2659 | 500 | 1100 | 39 | III | L | D | | | |
| SYUN-020-0710 | | SYUNIK | 020-D-d | J-38-020 | 39 | 20 | 26 | 45 | 56 | 22 | 2852 | 300 | 500 | 8 | III | L | D | | | |
| SYUN-020-0715 | Angekhakot | SYUNIK | Angekhakot | J-38-20 | 39 | 34 | 5 | 45 | 56 | 30 | 1828 | 1600 | 1000 | 144 | I | M | B | | | |
| SYUN-020-0720 | | SYUNIK | Balak | J-38-020 | 39 | 33 | 33 | 45 | 57 | 37 | 1818 | 350 | 500 | 14 | III | M | C | | | |
| SYUN-020-0730 | | SYUNIK | Shaki | J-38-020 | 39 | 32 | 50 | 45 | 58 | 28 | 1777 | 650 | 1200 | 28 | III | M | C | | | |
| SYUN-020-0740 | | SYUNIK | Brnakot | J-38-020 | 39 | 31 | 4.5 | 45 | 57 | 22 | 1902 | 650 | 1450 | 49 | III | M | C | | | |
| SYUN-020-0750 | | SYUNIK | Hatsavan | J-38-020 | 39 | 28 | 6.7 | 45 | 57 | 42 | 1823 | 750 | 1300 | 55 | III | M | C | | | |
| SYUN-020-0751 | Hatsavan(Sisian) | SYUNIK | Hatsavan (Sisian) | J-38-20 | 39 | 27 | 39 | 45 | 58 | 9 | 1738 | 450 | 280 | 6 | II | H | B | | | |
| SYUN-020-0752 | | SYUNIK | Hatsavan | | 39 | 27 | 29 | 45 | 58 | 1.2 | 1738 | | | 20 | III | M | C | | | |
| SYUN-020-0760 | Tasik | SYUNIK | Tasik | J-38-20 | 39 | 26 | 58 | 45 | 57 | 24 | 1765 | 800 | 1450 | 164 | II | H | B | | | |
| SYUN-020-0770 | | SYUNIK | Tasik | J-38-020 | 39 | 26 | 9.1 | 45 | 57 | 19 | 1787 | 1000 | 1400 | 75 | III | M | C | | | |
| SYUN-020-0780 | | SYUNIK | Tasik | J-38-020 | 39 | 26 | 30 | 45 | 58 | 9.3 | 1790 | 250 | 800 | 19 | III | M | C | | | |
| SYUN-020-0790 | | SYUNIK | Murkhuz | J-38-020 | 39 | 21 | 56 | 45 | 58 | 5.3 | 2137 | 850 | 2000 | 69 | III | M | C | | | |
| SYUN-020-0800 | | SYUNIK | 020-B-d | J-38-020 | 39 | 33 | 3.9 | 45 | 58 | 53 | 1638 | 400 | 500 | 13 | III | L | D | | | |
| SYUN-020-0810 | | SYUNIK | 020-B-d | J-38-020 | 39 | 32 | 30 | 45 | 58 | 43 | 1799 | 500 | 1200 | 37 | III | L | D | | | |
| SYUN-020-0820 | Murkhuz | SYUNIK | Murkhuz | J-38-020 | 39 | 21 | 33 | 45 | 58 | 34 | 2082 | 400 | 1300 | 31 | III | M | C | | | |
| SYUN-020-0830 | Murkhuz | SYUNIK | Murkhuz | J-38-20 | 39 | 21 | 31 | 45 | 59 | 24 | 2057 | 10 | 20 | 14 | II | M | C | | | |
| SYUN-020-0840 | | SYUNIK | Tsghuni | J-38-020 | 39 | 20 | 24 | 45 | 59 | 1.6 | 2095 | 450 | 550 | 23 | III | M | C | | | |
| SYUN-021-0010 | Uyts | SYUNIK | Uyts | J-38-21 | 39 | 28 | 49 | 46 | 0 | 10 | 1678 | 300 | 360 | 24 | II | H | B | | | |
| SYUN-021-0020 | | SYUNIK | Ashotavan | J-38-021 | 39 | 28 | 23 | 46 | 0 | 15 | 1664 | 500 | 600 | 23 | III | M | C | | | |
| SYUN-021-0030 | | SYUNIK | Ashotavan | J-38-021 | 39 | 27 | 56 | 46 | 0 | 32 | 1730 | 500 | 850 | 38 | III | M | C | | | |
| SYUN-021-0040 | | SYUNIK | Sofulu | J-38-021 | 39 | 22 | 58 | 46 | 0 | 29 | 1909 | 300 | 500 | 15 | III | M | C | | | |
| SYUN-021-0050 | | SYUNIK | Dastakert | J-38-021 | 39 | 22 | 32 | 46 | 0 | 56 | 2047 | 300 | 900 | 21 | III | M | C | | | |
| SYUN-021-0060 | | SYUNIK | 021-C-c | J-38-021 | 39 | 21 | 24 | 46 | 1 | 14 | 2257 | 250 | 600 | 12 | III | L | D | | | |
| SYUN-021-0070 | | SYUNIK | 021-A-a | J-38-021 | 39 | 37 | 11 | 46 | 1 | 45 | 2301 | 850 | 1200 | 86 | III | L | D | | | |
| SYUN-021-0080 | | SYUNIK | Ishkhanasar | J-38-021 | 39 | 34 | 14 | 46 | 2 | 8.9 | 1835 | 250 | 500 | 12 | III | M | C | | | |
| SYUN-021-0090 | | SYUNIK | Ishkhanasar | J-38-021 | 39 | 34 | 26 | 46 | 2 | 26 | 1884 | 200 | 450 | 5 | III | M | C | | | |
| SYUN-021-0100 | Ishkhanasar -1 | SYUNIK | Ishkhanasar | J-38-21 | 39 | 34 | 17 | 46 | 2 | 37 | 1889 | 510 | 710 | 24 | II | H | B | | | |
| SYUN-021-0101 | | SYUNIK | Ishkhanasar | J-38-021 | 39 | 33 | 43 | 46 | 2 | 16 | 1806 | 350 | 400 | 14 | III | M | C | | | |
| SYUN-021-0130 | Akhltyan | SYUNIK | Akhltyan | J-38-21 | 39 | 27 | 2 | 46 | 1 | 46 | 1712 | 1450 | 540 | 44 | I | M | B | | | |
| SYUN-021-0140 | | SYUNIK | Akhlatyan | J-38-021 | 39 | 26 | 17 | 46 | 1 | 46 | 1736 | 300 | 500 | 15 | III | M | C | | | |
| SYUN-021-0150 | | SYUNIK | Akhlatyan | J-38-021 | 39 | 25 | 59 | 46 | 1 | 51 | 1777 | 250 | 500 | 10 | III | M | C | | | |
| SYUN-021-0160 | | SYUNIK | Akhlatyan | J-38-021 | 39 | 25 | 42 | 46 | 2 | 1 | 1849 | 600 | 500 | 26 | III | M | C | | | |
| SYUN-021-0170 | | SYUNIK | Akhlatyan | J-38-021 | 39 | 25 | 26 | 46 | 1 | 50 | 1843 | 300 | 600 | 15 | III | M | C | | | |
| SYUN-021-0180 | | SYUNIK | Akhlatyan | J-38-021 | 39 | 26 | 19 | 46 | 2 | 11 | 1765 | 500 | 300 | 13 | III | M | C | | | |
| SYUN-021-0190 | | SYUNIK | Akhlatyan | J-38-021 | 39 | 25 | 57 | 46 | 2 | 37 | 1831 | 400 | 1200 | 44 | III | M | C | | | |
| SYUN-021-0200 | | SYUNIK | Torunik | J-38-021 | 39 | 24 | 52 | 46 | 2 | 2.2 | 1879 | 1300 | 1700 | 130 | III | M | C | | | |
| SYUN-021-0210 | | SYUNIK | Torunik | J-38-021 | 39 | 23 | 55 | 46 | 1 | 44 | 1892 | 650 | 1400 | 64 | III | M | C | | | |
| SYUN-021-0220 | | SYUNIK | Torunik | J-38-021 | 39 | 24 | 4.7 | 46 | 2 | 22 | 1988 | 750 | 750 | 42 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-021-0230 | Dastakert | SYUNIK | Dastakert | J-38-21 | 39 | 22 | 50 | 46 | 1 | 51 | 2011 | 320 | 280 | 9 | II | H | B | | | |
| SYUN-021-0231 | | SYUNIK | Dastakert | J-38-021 | 39 | 22 | 28 | 46 | 1 | 56 | 2049 | 200 | 500 | 9 | III | M | C | | | |
| SYUN-021-0240 | | SYUNIK | 021-C-c | J-38-021 | 39 | 21 | 33 | 46 | 1 | 44 | 2239 | 650 | 550 | 30 | III | L | D | | | |
| SYUN-021-0250 | | SYUNIK | 021-C-c | J-38-021 | 39 | 20 | 29 | 46 | 2 | 6.7 | 2593 | 350 | 1200 | 38 | III | L | D | | | |
| SYUN-021-0260 | | SYUNIK | Uz | J-38-021 | 39 | 29 | 55 | 46 | 3 | 55 | 1655 | 2500 | 4950 | 760 | III | M | C | | | |
| SYUN-021-0270 | | SYUNIK | 021-A-a | J-38-021 | 39 | 37 | 11 | 46 | 4 | 58 | 2327 | 1450 | 1550 | 188 | III | L | D | | | |
| SYUN-021-0280 | | SYUNIK | 021-A-a | J-38-021 | 39 | 36 | 50 | 46 | 5 | 22 | 2298 | 600 | 2600 | 129 | III | L | D | | | |
| SYUN-021-0300 | | SYUNIK | Vaghudi | J-38-021 | 39 | 30 | 19 | 46 | 6 | 8.5 | 1534 | 250 | 350 | 7 | III | M | C | | | |
| SYUN-021-0310 | | SYUNIK | Vaghudi | J-38-021 | 39 | 30 | 20 | 46 | 6 | 36 | 1544 | 400 | 350 | 12 | III | M | C | | | |
| SYUN-021-0311 | Vagattin-vaghudi | SYUNIK | Vagattin-vaghudi | J-38-21 | 39 | 30 | 15 | 46 | 6 | 56 | 1591 | 250 | 345 | 1 | II | H | B | | | |
| SYUN-021-0320 | | SYUNIK | 021-C-a | J-38-021 | 39 | 27 | 28 | 46 | 6 | 9.1 | 1733 | 300 | 800 | 24 | III | L | D | | | |
| SYUN-021-0330 | Noravan(Syunik) | SYUNIK | Noravan | J-38-21 | 39 | 31 | 59 | 46 | 7 | 57 | 1953 | 440 | 480 | 145 | I | M | B | | | |
| SYUN-021-0340 | | SYUNIK | Vaghudi | J-38-021 | 39 | 30 | 16 | 46 | 7 | 20 | 1539 | 350 | 550 | 14 | III | M | C | | | |
| SYUN-021-0350 | | SYUNIK | Vorotan | J-38-021 | 39 | 29 | 15 | 46 | 7 | 51 | 1374 | 250 | 200 | 5 | III | M | C | | | |
| SYUN-021-0351 | Vorotan | SYUNIK | Vorotan | J-38-21 | 39 | 29 | 24 | 46 | 8 | 33 | 1408 | 1450 | 540 | 1 | II | H | B | | | |
| SYUN-021-0352 | | SYUNIK | Vorotan | J-38-021 | 39 | 29 | 18 | 46 | 8 | 40 | 1415 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-021-0360 | Shamb-reservoir | SYUNIK | Shamb | J-38-21 | 39 | 27 | 35 | 46 | 8 | 15 | 1379 | 900 | 1000 | 113 | I | M | B | | | |
| SYUN-021-0370 | | SYUNIK | Darbas | J-38-021 | 39 | 26 | 6.5 | 46 | 7 | 55 | 1642 | 850 | 1850 | 91 | III | M | C | | | |
| SYUN-021-0380 | | SYUNIK | Getatagh | J-38-021 | 39 | 25 | 28 | 46 | 7 | 27 | 1605 | 300 | 550 | 14 | III | M | C | | | |
| SYUN-021-0390 | | SYUNIK | 021-A-b | J-38-021 | 39 | 37 | 35 | 46 | 9 | 13 | 2759 | 400 | 1200 | 38 | III | L | D | | | |
| SYUN-021-0400 | | SYUNIK | Vorotan | J-38-021 | 39 | 29 | 8.7 | 46 | 9 | 22 | 1661 | 700 | 700 | 44 | III | M | C | | | |
| SYUN-021-0410 | Shamb-village | SYUNIK | Shamb | J-38-21 | 39 | 27 | 59 | 46 | 9 | 5 | 1386 | 100 | 190 | 1 | I | M | B | | | |
| SYUN-021-0411 | | SYUNIK | Shamb | J-38-021 | 39 | 28 | 10 | 46 | 9 | 0.5 | 1384 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-021-0412 | | SYUNIK | Shamb | J-38-021 | 39 | 28 | 6.4 | 46 | 8 | 58 | 1373 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-021-0420 | | SYUNIK | 021-C-d | J-38-021 | 39 | 21 | 13 | 46 | 9 | 16 | 2192 | 700 | 1100 | 60 | III | L | D | | | |
| SYUN-021-0430 | | SYUNIK | 021-C-d | J-38-021 | 39 | 24 | 31 | 46 | 10 | 40 | 2095 | 700 | 1150 | 43 | III | L | D | | | |
| SYUN-021-0440 | | SYUNIK | Harzhis | J-38-021 | 39 | 33 | 20 | 46 | 13 | 30 | 2680 | 700 | 1200 | 63 | III | M | C | | | |
| SYUN-021-0450 | | SYUNIK | Svarants | J-38-021 | 39 | 25 | 33 | 46 | 13 | 27 | 1453 | 400 | 800 | 23 | III | M | C | | | |
| SYUN-021-0460 | | SYUNIK | Svarants | J-38-021 | 39 | 21 | 56 | 46 | 13 | 35 | 1716 | 700 | 1000 | 37 | III | M | C | | | |
| SYUN-021-0470 | | SYUNIK | 021-A-d | J-38-021 | 39 | 34 | 8.2 | 46 | 14 | 25 | 2842 | 500 | 850 | 34 | III | L | D | | | |
| SYUN-021-0480 | | SYUNIK | 021-A-d | J-38-021 | 39 | 33 | 27 | 46 | 14 | 19 | 2693 | 550 | 1200 | 52 | III | L | D | | | |
| SYUN-021-0490 | | SYUNIK | 021-A-d | J-38-021 | 39 | 32 | 27 | 46 | 14 | 58 | 2422 | 300 | 700 | 18 | III | L | D | | | |
| SYUN-021-0500 | | SYUNIK | Tatev | J-38-021 | 39 | 23 | 36 | 46 | 15 | 5.7 | 1204 | 350 | 1150 | 38 | III | M | C | | | |
| SYUN-021-0510 | | SYUNIK | Svarants | J-38-021 | 39 | 21 | 27 | 46 | 14 | 34 | 1701 | 850 | 850 | 43 | III | M | C | | | |
| SYUN-021-0520 | | SYUNIK | Svarants | J-38-021 | 39 | 20 | 50 | 46 | 14 | 5.1 | 1804 | 700 | 2400 | 115 | III | M | C | | | |
| SYUN-021-0530 | | SYUNIK | Svarants | J-38-021 | 39 | 20 | 56 | 46 | 14 | 38 | 1878 | 500 | 1900 | 68 | III | M | C | | | |
| SYUN-021-0540 | | SYUNIK | 021-B-c | J-38-021 | 39 | 32 | 35 | 46 | 16 | 10 | 1966 | 700 | 1000 | 51 | III | L | D | | | |
| SYUN-021-0550 | | SYUNIK | 021-D-a | J-38-021 | 39 | 26 | 19 | 46 | 15 | 39 | 1758 | 550 | 650 | 27 | III | L | D | | | |
| SYUN-021-0560 | | SYUNIK | 021-D-c | J-38-021 | 39 | 24 | 23 | 46 | 15 | 27 | 1201 | 400 | 600 | 20 | III | L | D | | | |
| SYUN-021-0570 | | SYUNIK | 021-D-c | J-38-021 | 39 | 24 | 37 | 46 | 15 | 58 | 1279 | 500 | 700 | 29 | III | L | D | | | |
| SYUN-021-0580 | | SYUNIK | 021-D-c | J-38-021 | 39 | 24 | 18 | 46 | 15 | 54 | 1267 | 500 | 850 | 40 | III | L | D | | | |
| SYUN-021-0590 | | SYUNIK | Tatev | J-38-021 | 39 | 23 | 34 | 46 | 15 | 52 | 1124 | 800 | 1400 | 71 | III | M | C | | | |
| SYUN-021-0600 | | SYUNIK | Brun | J-38-021 | 39 | 33 | 0.8 | 46 | 17 | 44 | 1846 | 2500 | 5000 | 543 | III | M | C | | | |
| SYUN-021-0610 | | SYUNIK | 021-B-a | J-38-021 | 39 | 36 | 34 | 46 | 18 | 22 | 2132 | 750 | 1000 | 72 | III | L | D | | | |
| SYUN-021-0620 | | SYUNIK | Shinuhayr | J-38-021 | 39 | 26 | 17 | 46 | 18 | 47 | 1511 | 300 | 300 | 6 | III | M | C | | | |
| SYUN-021-0630 | | SYUNIK | 021-C-c | J-38-021 | 39 | 20 | 19 | 46 | 18 | 29 | 1982 | 650 | 400 | 19 | III | L | D | | | |
| SYUN-021-0640 | | SYUNIK | Goris | J-38-021 | 39 | 31 | 11 | 46 | 19 | 44 | 1463 | 700 | 800 | 45 | III | M | C | | | |
| SYUN-021-0650 | | SYUNIK | Goris | J-38-021 | 39 | 31 | 12 | 46 | 20 | 35 | 1465 | 450 | 700 | 25 | III | M | C | | | |
| SYUN-021-0670 | | SYUNIK | | | 39 | 20 | 14 | 46 | 20 | 15 | 1863 | | | 22 | III | L | D | | | |
| SYUN-021-0680 | Karahunj -1 | SYUNIK | Karahunj | J-38-21 | 39 | 28 | 52 | 46 | 21 | 42 | 1131 | 250 | 850 | 11 | I | H | A | | | |
| SYUN-021-0681 | Karahunj -2 | SYUNIK | Karahunj | J-38-21 | 39 | 28 | 40 | 46 | 21 | 37 | 1169 | 250 | 550 | 13 | I | M | B | | | |
| SYUN-021-0690 | | SYUNIK | 021-D-c | J-38-021 | 39 | 24 | 46 | 46 | 21 | 55 | 1202 | 450 | 300 | 12 | III | L | D | | | |
| SYUN-021-0700 | | SYUNIK | Khnatsakh | J-38-021 | 39 | 36 | 43 | 46 | 22 | 52 | 1419 | 1100 | 1400 | 92 | III | M | C | | | |
| SYUN-021-0710 | | SYUNIK | Karashen | J-38-021 | 39 | 32 | 58 | 46 | 23 | 43 | 1639 | 600 | 1400 | 68 | III | M | C | | | |
| SYUN-021-0720 | | SYUNIK | Karashen | J-38-021 | 39 | 32 | 37 | 46 | 23 | 44 | 1641 | 650 | 2000 | 116 | III | M | C | | | |
| SYUN-021-0730 | | SYUNIK | 021-A-a | J-38-021 | 39 | 25 | 21 | 46 | 22 | 34 | 798 | 250 | 900 | 20 | III | L | D | | | |
| SYUN-021-0740 | | SYUNIK | 021-D-d | J-38-021 | 39 | 23 | 20 | 46 | 23 | 21 | 1493 | 650 | 1150 | 60 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-021-0750 | | SYUNIK | Karashen | J-38-021 | 39 | 32 | 10 | 46 | 24 | 19 | 1549 | 650 | 1100 | 58 | III | M | C | | | |
| SYUN-021-0760 | | SYUNIK | Khndzoresk | J-38-021 | 39 | 30 | 31 | 46 | 24 | 58 | 1521 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-021-0770 | | SYUNIK | Dzorashen | J-38-021 | 39 | 29 | 7 | 46 | 25 | 17 | 1182 | 250 | 650 | 13 | III | M | C | | | |
| SYUN-021-0780 | | SYUNIK | Tegh | J-38-021 | 39 | 33 | 24 | 46 | 26 | 34 | 1527 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-021-0790 | | SYUNIK | Tegh | J-38-021 | 39 | 33 | 33 | 46 | 28 | 44 | 1348 | 550 | 400 | 22 | III | M | C | | | |
| SYUN-032-0010 | | SYUNIK | 032-B-b | J-38-032 | 39 | 19 | 46 | 45 | 56 | 22 | 2869 | 700 | 1000 | 40 | III | L | D | | | |
| SYUN-032-0020 | | SYUNIK | 032-B-b | J-38-032 | 39 | 19 | 49 | 45 | 59 | 22 | 2266 | 700 | 900 | 42 | III | L | D | | | |
| SYUN-032-0030 | | SYUNIK | 032-B-b | J-38-032 | 39 | 18 | 58 | 45 | 59 | 20 | 2340 | 750 | 1100 | 45 | III | L | D | | | |
| SYUN-033-0010 | | SYUNIK | 033-A-c | J-38-033 | 39 | 15 | 9.1 | 46 | 0 | 46 | 2978 | 300 | 800 | 20 | III | L | D | | | |
| SYUN-033-0020 | | SYUNIK | 033-A-c | J-38-033 | 39 | 14 | 22 | 46 | 0 | 49 | 2781 | 700 | 1000 | 70 | III | L | D | | | |
| SYUN-033-0030 | | SYUNIK | 033-A-c | J-38-033 | 39 | 13 | 42 | 46 | 0 | 35 | 3007 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0040 | | SYUNIK | 033-A-a | J-38-033 | 39 | 19 | 38 | 46 | 2 | 28 | 2878 | 200 | 800 | 13 | III | L | D | | | |
| SYUN-033-0050 | | SYUNIK | 033-A-a | J-38-033 | 39 | 17 | 10 | 46 | 2 | 17 | 2863 | 250 | 600 | 11 | III | L | D | | | |
| SYUN-033-0060 | | SYUNIK | 033-A-c | J-38-033 | 39 | 10 | 23 | 46 | 1 | 14 | 3073 | 300 | 1350 | 41 | III | L | D | | | |
| SYUN-033-0070 | | SYUNIK | 033-A-c | J-38-033 | 39 | 11 | 3.4 | 46 | 2 | 0.5 | 2884 | 350 | 1000 | 37 | III | L | D | | | |
| SYUN-033-0080 | | SYUNIK | 033-A-c | J-38-033 | 39 | 10 | 12 | 46 | 1 | 35 | 3267 | 300 | 450 | 10 | III | L | D | | | |
| SYUN-033-0090 | | SYUNIK | 033-C-a | J-38-033 | 39 | 5 | 50 | 46 | 2 | 17 | 3339 | 300 | 600 | 17 | III | L | D | | | |
| SYUN-033-0100 | Ajibash | SYUNIK | | J-38-33 | 39 | 15 | 13 | 46 | 3 | 52 | 2102 | 200 | 90 | 26 | I | M | B | | | |
| SYUN-033-0101 | | SYUNIK | | | 39 | 15 | 4.8 | 46 | 4 | 45 | 1977 | | | 9 | III | L | D | | | |
| SYUN-033-0102 | | SYUNIK | | | 39 | 14 | 59 | 46 | 5 | 5.5 | 1954 | | | 12 | III | L | D | | | |
| SYUN-033-0103 | | SYUNIK | | | 39 | 15 | 0.3 | 46 | 5 | 22 | 1891 | | | 5 | III | L | D | | | |
| SYUN-033-0104 | | SYUNIK | | | 39 | 15 | 11 | 46 | 5 | 20 | 2081 | | | 17 | III | L | D | | | |
| SYUN-033-0110 | | SYUNIK | 033-A-c | J-38-033 | 39 | 14 | 28 | 46 | 3 | 47 | 2275 | 300 | 400 | 10 | III | L | D | | | |
| SYUN-033-0120 | | SYUNIK | 033-A-c | J-38-033 | 39 | 11 | 41 | 46 | 3 | 15 | 2538 | 700 | 1200 | 65 | III | L | D | | | |
| SYUN-033-0130 | | SYUNIK | 033-C-a | J-38-033 | 39 | 9 | 7 | 46 | 2 | 48 | 2894 | 350 | 800 | 26 | III | L | D | | | |
| SYUN-033-0140 | | SYUNIK | 033-C-c | J-38-033 | 39 | 5 | 17 | 46 | 2 | 52 | 3477 | 200 | 300 | 6 | III | L | D | | | |
| SYUN-033-0150 | | SYUNIK | 033-C-c | J-38-033 | 39 | 5 | 8.3 | 46 | 3 | 27 | 3270 | 300 | 650 | 15 | III | L | D | | | |
| SYUN-033-0160 | | SYUNIK | 033-A-a | J-38-033 | 39 | 18 | 19 | 46 | 4 | 44 | 2640 | 400 | 350 | 12 | III | L | D | | | |
| SYUN-033-0170 | | SYUNIK | 033-A-a | J-38-033 | 39 | 17 | 57 | 46 | 4 | 45 | 2527 | 250 | 500 | 11 | III | L | D | | | |
| SYUN-033-0180 | | SYUNIK | 033-A-c | J-38-033 | 39 | 11 | 55 | 46 | 4 | 3.7 | 2285 | 300 | 400 | 11 | III | L | D | | | |
| SYUN-033-0190 | | SYUNIK | 033-C-a | J-38-033 | 39 | 9 | 8.4 | 46 | 5 | 8 | 2519 | 300 | 500 | 14 | III | L | D | | | |
| SYUN-033-0200 | | SYUNIK | 033-C-a | J-38-033 | 39 | 7 | 29 | 46 | 4 | 17 | 2711 | 450 | 500 | 18 | III | L | D | | | |
| SYUN-033-0210 | | SYUNIK | 033-C-c | J-38-033 | 39 | 4 | 4.7 | 46 | 4 | 36 | 3392 | 200 | 700 | 14 | III | L | D | | | |
| SYUN-033-0220 | | SYUNIK | 033-C-c | J-38-033 | 39 | 3 | 32 | 46 | 5 | 1.7 | 3440 | 200 | 400 | 8 | III | L | D | | | |
| SYUN-033-0230 | | SYUNIK | 033-A-a | J-38-033 | 39 | 17 | 54 | 46 | 6 | 33 | 2442 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0240 | | SYUNIK | 033-A-a | J-38-033 | 39 | 16 | 40 | 46 | 6 | 34 | 2002 | 250 | 400 | 9 | III | L | D | | | |
| SYUN-033-0245 | Gyard | SYUNIK | Gyard | J-38-33 | 39 | 13 | 10 | 46 | 6 | 32 | 1873 | 380 | 250 | 15 | I | M | B | | | |
| SYUN-033-0250 | | SYUNIK | 033-A-c | J-38-033 | 39 | 12 | 29 | 46 | 5 | 28 | 2096 | 300 | 500 | 13 | III | L | D | | | |
| SYUN-033-0260 | | SYUNIK | 033-A-c | J-38-033 | 39 | 10 | 52 | 46 | 5 | 55 | 2704 | 200 | 300 | 6 | III | L | D | | | |
| SYUN-033-0270 | | SYUNIK | 033-A-c | J-38-033 | 39 | 10 | 25 | 46 | 6 | 11 | 2417 | 200 | 500 | 9 | III | L | D | | | |
| SYUN-033-0280 | | SYUNIK | 033-C-a | J-38-033 | 39 | 5 | 35 | 46 | 5 | 51 | 3170 | 300 | 700 | 18 | III | L | D | | | |
| SYUN-033-0290 | | SYUNIK | 033-C-c | J-38-033 | 39 | 3 | 55 | 46 | 6 | 11 | 2912 | 200 | 600 | 13 | III | L | D | | | |
| SYUN-033-0300 | | SYUNIK | 033-C-c | J-38-033 | 39 | 2 | 37 | 46 | 5 | 19 | 3490 | 150 | 450 | 7 | III | L | D | | | |
| SYUN-033-0310 | | SYUNIK | 033-C-c | J-38-033 | 39 | 2 | 23 | 46 | 5 | 14 | 3451 | 400 | 700 | 22 | III | L | D | | | |
| SYUN-033-0320 | | SYUNIK | 033-A-b | J-38-033 | 39 | 18 | 4.4 | 46 | 7 | 49 | 2381 | 150 | 350 | 4 | III | L | D | | | |
| SYUN-033-0330 | | SYUNIK | Hachatin | J-38-033 | 39 | 13 | 8.9 | 46 | 8 | 1.9 | 1899 | 300 | 400 | 9 | III | M | C | | | |
| SYUN-033-0340 | | SYUNIK | 033-A-d | J-38-033 | 39 | 12 | 0.9 | 46 | 7 | 54 | 2397 | 150 | 300 | 5 | III | L | D | | | |
| SYUN-033-0350 | | SYUNIK | 033-A-c | J-38-033 | 39 | 11 | 4.7 | 46 | 6 | 51 | 2642 | 150 | 500 | 7 | III | L | D | | | |
| SYUN-033-0360 | | SYUNIK | 033-A-d | J-38-033 | 39 | 11 | 16 | 46 | 7 | 32 | 2887 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0370 | | SYUNIK | Kajaran | J-38-033 | 39 | 9 | 6.8 | 46 | 7 | 52 | 1927 | 550 | 1050 | 45 | III | M | C | | | |
| SYUN-033-0380 | | SYUNIK | 033-C-a | J-38-033 | 39 | 7 | 54 | 46 | 7 | 16 | 2430 | 300 | 600 | 16 | III | L | D | | | |
| SYUN-033-0390 | | SYUNIK | 033-C-a | J-38-033 | 39 | 7 | 46 | 46 | 6 | 52 | 2612 | 350 | 750 | 22 | III | L | D | | | |
| SYUN-033-0400 | | SYUNIK | 033-C-a | J-38-033 | 39 | 5 | 48 | 46 | 6 | 36 | 3060 | 300 | 450 | 13 | III | L | D | | | |
| SYUN-033-0410 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 6.6 | 46 | 7 | 54 | 2825 | 350 | 700 | 19 | III | L | D | | | |
| SYUN-033-0420 | | SYUNIK | 033-C-c | J-38-033 | 39 | 1 | 57 | 46 | 7 | 22 | 2990 | 150 | 600 | 12 | III | L | D | | | |
| SYUN-033-0430 | | SYUNIK | Hachatin | J-38-033 | 39 | 12 | 40 | 46 | 8 | 7.5 | 1987 | 250 | 500 | 11 | III | M | C | | | |
| SYUN-033-0440 | | SYUNIK | Geghi | J-38-033 | 39 | 13 | 18 | 46 | 9 | 11 | 1568 | 450 | 450 | 19 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-033-0450 | | SYUNIK | Kajaran | J-38-033 | 39 | 9 | 1.6 | 46 | 8 | 28 | 1847 | 1200 | 700 | 78 | III | M | C | | | |
| SYUN-033-0460 | | SYUNIK | Kajaran | J-38-033 | 39 | 8 | 27 | 46 | 9 | 16 | 2078 | 250 | 550 | 11 | III | M | C | | | |
| SYUN-033-0470 | | SYUNIK | 033-C-b | J-38-033 | 39 | 6 | 29 | 46 | 8 | 56 | 2392 | 300 | 800 | 19 | III | L | D | | | |
| SYUN-033-0480 | | SYUNIK | 033-C-b | J-38-033 | 39 | 6 | 17 | 46 | 9 | 12 | 2224 | 300 | 350 | 13 | III | L | D | | | |
| SYUN-033-0490 | | SYUNIK | 033-C-b | J-38-033 | 39 | 6 | 0 | 46 | 9 | 18 | 2152 | 150 | 400 | 5 | III | L | D | | | |
| SYUN-033-0500 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 45 | 46 | 9 | 9.1 | 2194 | 300 | 400 | 11 | III | L | D | | | |
| SYUN-033-0510 | | SYUNIK | 033-C-d | J-38-033 | 39 | 5 | 5.6 | 46 | 8 | 27 | 2493 | 400 | 1200 | 29 | III | L | D | | | |
| SYUN-033-0520 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 51 | 46 | 9 | 17 | 2156 | 400 | 1000 | 27 | III | L | D | | | |
| SYUN-033-0530 | | SYUNIK | 033-C-d | J-38-033 | 39 | 3 | 56 | 46 | 9 | 19 | 2088 | 350 | 1000 | 26 | III | L | D | | | |
| SYUN-033-0540 | | SYUNIK | Kajaran | J-38-033 | 39 | 8 | 51 | 46 | 10 | 26 | 1703 | 200 | 250 | 6 | III | M | C | | | |
| SYUN-033-0550 | | SYUNIK | Kajaran | J-38-033 | 39 | 7 | 56 | 46 | 9 | 27 | 2411 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-033-0560 | | SYUNIK | 033-C-b | J-38-033 | 39 | 6 | 25 | 46 | 9 | 56 | 2291 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0570 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 43 | 46 | 9 | 35 | 2252 | 150 | 250 | 5 | III | L | D | | | |
| SYUN-033-0580 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 30 | 46 | 10 | 3.5 | 1987 | 200 | 250 | 5 | III | L | D | | | |
| SYUN-033-0590 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 53 | 46 | 9 | 43 | 2170 | 250 | 250 | 6 | III | L | D | | | |
| SYUN-033-0600 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 39 | 46 | 10 | 21 | 2148 | 200 | 250 | 5 | III | L | D | | | |
| SYUN-033-0610 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 5.7 | 46 | 9 | 35 | 2044 | 750 | 900 | 60 | III | L | D | | | |
| SYUN-033-0620 | Tashtun | SYUNIK | Tashtun | J-38-33 | 39 | 4 | 2 | 46 | 10 | 13 | 2003 | 200 | 400 | 54 | I | M | B | | | |
| SYUN-033-0630 | | SYUNIK | 033-C-d | J-38-033 | 39 | 3 | 42 | 46 | 10 | 8.4 | 1882 | 150 | 200 | 4 | III | L | D | | | |
| SYUN-033-0634 | | SYUNIK | | | 39 | 3 | 34 | 46 | 10 | 29 | 1836 | | | 1 | III | L | D | | | |
| SYUN-033-0635 | Lichk | SYUNIK | Lichk | J-38-33 | 39 | 3 | 23 | 46 | 10 | 34 | 1777 | 500 | 110 | 1 | I | M | B | | | |
| SYUN-033-0640 | | SYUNIK | 033-A-b | J-38-033 | 39 | 17 | 12 | 46 | 11 | 49 | 2888 | 800 | 200 | 13 | III | L | D | | | |
| SYUN-033-0650 | | SYUNIK | Lernadzor | J-38-033 | 39 | 9 | 28 | 46 | 11 | 54 | 1587 | 150 | 450 | 7 | III | M | C | | | |
| SYUN-033-0660 | Kajaran | SYUNIK | Kajaran | J-38-33 | 39 | 8 | 43 | 46 | 10 | 49 | 1922 | 50 | 200 | 35 | I | M | B | | | The complex of landslides caused damage to water channels, bridges, and state priority road, and thretens gas facilities and waste discharge channel |
| SYUN-033-0670 | | SYUNIK | Kajaran | J-38-033 | 39 | 8 | 31 | 46 | 11 | 15 | 1764 | 450 | 400 | 16 | III | M | C | | | |
| SYUN-033-0680 | | SYUNIK | 033-C-b | J-38-033 | 39 | 7 | 9.8 | 46 | 11 | 21 | 2107 | 200 | 450 | 8 | III | L | D | | | |
| SYUN-033-0690 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 33 | 46 | 11 | 0.9 | 1991 | 300 | 400 | 12 | III | L | D | | | |
| SYUN-033-0700 | | SYUNIK | 033-C-d | J-38-033 | 39 | 3 | 14 | 46 | 11 | 54 | 1621 | 300 | 300 | 10 | III | L | D | | | |
| SYUN-033-0710 | | SYUNIK | 033-C-d | J-38-033 | 39 | 2 | 47 | 46 | 11 | 46 | 1614 | 400 | 400 | 14 | III | L | D | | | |
| SYUN-033-0720 | | SYUNIK | 033-C-d | J-38-033 | 39 | 2 | 23 | 46 | 12 | 0.4 | 1518 | 300 | 450 | 11 | III | L | D | | | |
| SYUN-033-0730 | | SYUNIK | 033-C-d | J-38-033 | 39 | 2 | 13 | 46 | 11 | 26 | 1706 | 150 | 550 | 9 | III | L | D | | | |
| SYUN-033-0740 | | SYUNIK | 033-C-d | J-38-033 | 39 | 1 | 53 | 46 | 11 | 1.4 | 1742 | 500 | 700 | 31 | III | L | D | | | |
| SYUN-033-0780 | | SYUNIK | 033-C-d | J-38-033 | 39 | 1 | 35 | 46 | 11 | 20 | 1792 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0790 | | SYUNIK | 033-C-d | J-38-033 | 39 | 0 | 12 | 46 | 10 | 48 | 1815 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0800 | | SYUNIK | 033-A-b | J-38-033 | 39 | 19 | 25 | 46 | 13 | 21 | 2161 | 350 | 1600 | 51 | III | L | D | | | |
| SYUN-033-0810 | | SYUNIK | 033-A-b | J-38-033 | 39 | 16 | 27 | 46 | 12 | 55 | 2655 | 350 | 900 | 23 | III | L | D | | | |
| SYUN-033-0820 | | SYUNIK | 033-A-b | J-38-033 | 39 | 16 | 4.3 | 46 | 12 | 53 | 2859 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0830 | | SYUNIK | Bagarlu | J-38-033 | 39 | 13 | 51 | 46 | 13 | 29 | 2048 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-033-0840 | | SYUNIK | 033-C-b | J-38-033 | 39 | 8 | 51 | 46 | 13 | 25 | 2049 | 200 | 350 | 8 | III | L | D | | | |
| SYUN-033-0850 | | SYUNIK | 033-C-b | J-38-033 | 39 | 7 | 26 | 46 | 13 | 21 | 2091 | 250 | 300 | 7 | III | L | D | | | |
| SYUN-033-0860 | | SYUNIK | 033-C-b | J-38-033 | 39 | 6 | 16 | 46 | 12 | 19 | 2548 | 200 | 500 | 11 | III | L | D | | | |
| SYUN-033-0870 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 53 | 46 | 13 | 17 | 2477 | 200 | 400 | 7 | III | L | D | | | |
| SYUN-033-0880 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 31 | 46 | 13 | 0.6 | 2402 | 200 | 550 | 12 | III | L | D | | | |
| SYUN-033-0890 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 60 | 46 | 12 | 39 | 2146 | 350 | 400 | 13 | III | L | D | | | |
| SYUN-033-0900 | | SYUNIK | 033-C-d | J-38-033 | 39 | 5 | 3.2 | 46 | 12 | 54 | 2208 | 300 | 400 | 13 | III | L | D | | | |
| SYUN-033-0910 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 37 | 46 | 12 | 11 | 2110 | 150 | 500 | 8 | III | L | D | | | |
| SYUN-033-0920 | | SYUNIK | 033-C-d | J-38-033 | 39 | 2 | 55 | 46 | 13 | 4.3 | 1858 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0930 | | SYUNIK | 033-C-d | J-38-033 | 39 | 1 | 9.9 | 46 | 12 | 14 | 1435 | 200 | 250 | 6 | III | L | D | | | |
| SYUN-033-0940 | | SYUNIK | 033-A-b | J-38-033 | 39 | 18 | 11 | 46 | 14 | 15 | 2449 | 250 | 800 | 16 | III | L | D | | | |
| SYUN-033-0950 | | SYUNIK | 033-A-b | J-38-033 | 39 | 17 | 6 | 46 | 14 | 43 | 2514 | 200 | 400 | 10 | III | L | D | | | |
| SYUN-033-0960 | | SYUNIK | 033-A-b | J-38-033 | 39 | 15 | 50 | 46 | 13 | 53 | 2384 | 400 | 900 | 32 | III | L | D | | | |
| SYUN-033-0970 | | SYUNIK | 033-A-b | J-38-033 | 39 | 15 | 15 | 46 | 13 | 56 | 2615 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-0980 | | SYUNIK | 033-A-d | J-38-033 | 39 | 14 | 37 | 46 | 13 | 56 | 2347 | 200 | 500 | 9 | III | L | D | | | |
| SYUN-033-0990 | | SYUNIK | 033-A-d | J-38-033 | 39 | 10 | 7.9 | 46 | 13 | 40 | 1503 | 200 | 200 | 5 | III | L | D | | | |
| SYUN-033-1000 | | SYUNIK | Pkhrut | J-38-033 | 39 | 8 | 19 | 46 | 14 | 42 | 2315 | 500 | 900 | 36 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-033-1010 | | SYUNIK | Pkhrut | J-38-033 | 39 | 7 | 40 | 46 | 13 | 59 | 2378 | 600 | 1050 | 49 | III | M | C | | | |
| SYUN-033-1020 | | SYUNIK | Pkhrut | J-38-033 | 39 | 7 | 24 | 46 | 13 | 36 | 2161 | 200 | 250 | 6 | III | M | C | | | |
| SYUN-033-1030 | | SYUNIK | Pkhrut | J-38-033 | 39 | 7 | 4.7 | 46 | 14 | 22 | 2398 | 200 | 700 | 14 | III | M | C | | | |
| SYUN-033-1040 | | SYUNIK | Pkhrut | J-38-033 | 39 | 6 | 57 | 46 | 14 | 8.3 | 2437 | 200 | 200 | 5 | III | M | C | | | |
| SYUN-033-1050 | | SYUNIK | Pkhrut | J-38-033 | 39 | 6 | 49 | 46 | 14 | 3.4 | 2434 | 250 | 450 | 9 | III | M | C | | | |
| SYUN-033-1060 | | SYUNIK | 033-C-b | J-38-033 | 39 | 6 | 32 | 46 | 14 | 25 | 2637 | 250 | 550 | 15 | III | L | D | | | |
| SYUN-033-1070 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 33 | 46 | 13 | 30 | 2409 | 750 | 250 | 20 | III | L | D | | | |
| SYUN-033-1080 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 52 | 46 | 14 | 5.6 | 2601 | 550 | 150 | 9 | III | L | D | | | |
| SYUN-033-1090 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 54 | 46 | 14 | 37 | 2808 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-1100 | | SYUNIK | 033-C-b | J-38-033 | 39 | 5 | 2.2 | 46 | 14 | 18 | 2472 | 300 | 500 | 13 | III | L | D | | | |
| SYUN-033-1110 | | SYUNIK | 033-C-b | J-38-033 | 39 | 4 | 60 | 46 | 14 | 1.4 | 2376 | 250 | 500 | 12 | III | L | D | | | |
| SYUN-033-1120 | | SYUNIK | 033-C-d | J-38-033 | 39 | 4 | 12 | 46 | 14 | 3.9 | 2263 | 150 | 400 | 5 | III | L | D | | | |
| SYUN-033-1130 | | SYUNIK | 033-C-d | J-38-033 | 39 | 3 | 56 | 46 | 13 | 50 | 2122 | 200 | 300 | 4 | III | L | D | | | |
| SYUN-033-1140 | | SYUNIK | 033-C-d | J-38-033 | 39 | 3 | 48 | 46 | 14 | 33 | 2227 | 100 | 300 | 4 | III | L | D | | | |
| SYUN-033-1150 | | SYUNIK | 033-B-a | J-38-033 | 39 | 18 | 14 | 46 | 15 | 14 | 2530 | 400 | 450 | 15 | III | L | D | | | |
| SYUN-033-1160 | | SYUNIK | 033-B-a | J-38-033 | 39 | 18 | 16 | 46 | 15 | 35 | 2314 | 150 | 300 | 4 | III | L | D | | | |
| SYUN-033-1170 | | SYUNIK | 033-B-a | J-38-033 | 39 | 18 | 16 | 46 | 15 | 54 | 2170 | 150 | 300 | 5 | III | L | D | | | |
| SYUN-033-1180 | | SYUNIK | 033-B-a | J-38-033 | 39 | 17 | 56 | 46 | 15 | 24 | 2466 | 700 | 650 | 36 | III | L | D | | | |
| SYUN-033-1190 | | SYUNIK | 033-B-a | J-38-033 | 39 | 17 | 48 | 46 | 16 | 18 | 2071 | 350 | 600 | 20 | III | L | D | | | |
| SYUN-033-1200 | | SYUNIK | 033-B-a | J-38-033 | 39 | 16 | 44 | 46 | 16 | 21 | 2415 | 250 | 600 | 13 | III | L | D | | | |
| SYUN-033-1210 | | SYUNIK | 033-B-c | J-38-033 | 39 | 14 | 27 | 46 | 15 | 41 | 1660 | 200 | 400 | 7 | III | L | D | | | |
| SYUN-033-1220 | | SYUNIK | 033-B-c | J-38-033 | 39 | 14 | 34 | 46 | 16 | 6.1 | 1820 | 200 | 350 | 6 | III | L | D | | | |
| SYUN-033-1230 | | SYUNIK | 033-B-c | J-38-033 | 39 | 14 | 23 | 46 | 16 | 1.6 | 1770 | 200 | 350 | 6 | III | L | D | | | |
| SYUN-033-1240 | | SYUNIK | 033-B-c | J-38-033 | 39 | 13 | 24 | 46 | 16 | 20 | 1509 | 250 | 300 | 8 | III | L | D | | | |
| SYUN-033-1250 | | SYUNIK | 033-D-a | J-38-033 | 39 | 8 | 31 | 46 | 15 | 41 | 1934 | 300 | 700 | 17 | III | L | D | | | |
| SYUN-033-1260 | | SYUNIK | 033-D-a | J-38-033 | 39 | 8 | 13 | 46 | 15 | 27 | 1873 | 200 | 200 | 5 | III | L | D | | | |
| SYUN-033-1270 | | SYUNIK | 033-D-a | J-38-033 | 39 | 8 | 6.9 | 46 | 16 | 10 | 2452 | 250 | 550 | 12 | III | L | D | | | |
| SYUN-033-1280 | | SYUNIK | 033-D-a | J-38-033 | 39 | 7 | 56 | 46 | 15 | 47 | 2175 | 200 | 350 | 7 | III | L | D | | | |
| SYUN-033-1290 | | SYUNIK | 033-D-a | J-38-033 | 39 | 7 | 37 | 46 | 15 | 52 | 2211 | 250 | 500 | 11 | III | L | D | | | |
| SYUN-033-1300 | | SYUNIK | 033-D-a | J-38-033 | 39 | 6 | 40 | 46 | 15 | 22 | 2697 | 150 | 300 | 5 | III | L | D | | | |
| SYUN-033-1310 | | SYUNIK | 033-D-a | J-38-033 | 39 | 6 | 36 | 46 | 15 | 12 | 2730 | 200 | 400 | 7 | III | L | D | | | |
| SYUN-033-1320 | | SYUNIK | 033-D-a | J-38-033 | 39 | 6 | 5.1 | 46 | 15 | 50 | 2729 | 250 | 450 | 9 | III | L | D | | | |
| SYUN-033-1330 | | SYUNIK | 033-D-a | J-38-033 | 39 | 5 | 56 | 46 | 16 | 10 | 2806 | 250 | 400 | 9 | III | L | D | | | |
| SYUN-033-1340 | | SYUNIK | 033-D-a | J-38-033 | 39 | 5 | 1.2 | 46 | 15 | 47 | 2549 | 200 | 600 | 11 | III | L | D | | | |
| SYUN-033-1350 | | SYUNIK | 033-D-a | J-38-033 | 39 | 5 | 18 | 46 | 16 | 11 | 2681 | 450 | 800 | 33 | III | L | D | | | |
| SYUN-033-1360 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 20 | 46 | 15 | 27 | 1948 | 300 | 450 | 14 | III | L | D | | | |
| SYUN-033-1370 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 28 | 46 | 16 | 0.9 | 2130 | 150 | 500 | 9 | III | L | D | | | |
| SYUN-033-1380 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 22 | 46 | 15 | 47 | 2061 | 200 | 200 | 5 | III | L | D | | | |
| SYUN-033-1390 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 7.1 | 46 | 15 | 49 | 2038 | 300 | 400 | 9 | III | L | D | | | |
| SYUN-033-1400 | | SYUNIK | 033-D-c | J-38-033 | 39 | 2 | 54 | 46 | 15 | 16 | 2013 | 300 | 500 | 13 | III | L | D | | | |
| SYUN-033-1410 | | SYUNIK | 033-B-a | J-38-033 | 39 | 18 | 4 | 46 | 17 | 7 | 1754 | 600 | 1500 | 72 | III | L | D | | | |
| SYUN-033-1420 | | SYUNIK | David-Bek | J-38-033 | 39 | 13 | 3.4 | 46 | 16 | 40 | 1305 | 250 | 400 | 9 | III | M | C | | | |
| SYUN-033-1430 | | SYUNIK | David-Bek | J-38-033 | 39 | 12 | 27 | 46 | 16 | 34 | 1321 | 300 | 650 | 16 | III | M | C | | | |
| SYUN-033-1440 | | SYUNIK | David-Bek | J-38-033 | 39 | 12 | 26 | 46 | 17 | 32 | 1777 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-033-1450 | | SYUNIK | 033-D-a | J-38-033 | 39 | 9 | 48 | 46 | 17 | 38 | 2052 | 200 | 350 | 7 | III | L | D | | | |
| SYUN-033-1460 | | SYUNIK | 033-D-a | J-38-033 | 39 | 9 | 40 | 46 | 17 | 23 | 1933 | 200 | 400 | 8 | III | L | D | | | |
| SYUN-033-1470 | | SYUNIK | 033-D-a | J-38-033 | 39 | 9 | 23 | 46 | 17 | 19 | 1848 | 300 | 200 | 5 | III | L | D | | | |
| SYUN-033-1480 | | SYUNIK | 033-D-a | J-38-033 | 39 | 6 | 33 | 46 | 16 | 40 | 2670 | 350 | 700 | 20 | III | L | D | | | |
| SYUN-033-1490 | | SYUNIK | 033-D-a | J-38-033 | 39 | 5 | 27 | 46 | 16 | 32 | 2792 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-1500 | | SYUNIK | 033-D-c | J-38-033 | 39 | 4 | 58 | 46 | 16 | 26 | 2582 | 300 | 500 | 13 | III | L | D | | | |
| SYUN-033-1510 | | SYUNIK | 033-D-c | J-38-033 | 39 | 4 | 45 | 46 | 16 | 26 | 2513 | 250 | 400 | 12 | III | L | D | | | |
| SYUN-033-1520 | | SYUNIK | 033-D-c | J-38-033 | 39 | 4 | 54 | 46 | 17 | 0.8 | 2682 | 200 | 500 | 8 | III | L | D | | | |
| SYUN-033-1530 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 43 | 46 | 16 | 36 | 2197 | 200 | 250 | 5 | III | L | D | | | |
| SYUN-033-1540 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 45 | 46 | 16 | 50 | 2249 | 200 | 300 | 6 | III | L | D | | | |
| SYUN-033-1550 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 34 | 46 | 16 | 24 | 2185 | 200 | 600 | 11 | III | L | D | | | |
| SYUN-033-1560 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 31 | 46 | 16 | 35 | 2208 | 150 | 400 | 7 | III | L | D | | | |
| SYUN-033-1570 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 21 | 46 | 17 | 12 | 2386 | 500 | 1200 | 47 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-033-1580 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 34 | 46 | 17 | 27 | 2443 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-1590 | | SYUNIK | 033-D-c | J-38-033 | 39 | 1 | 48 | 46 | 17 | 24 | 2225 | 350 | 1150 | 38 | III | L | D | | | |
| SYUN-033-1600 | | SYUNIK | 033-D-c | J-38-033 | 39 | 0 | 48 | 46 | 16 | 60 | 1941 | 700 | 1100 | 29 | III | L | D | | | |
| SYUN-033-1610 | | SYUNIK | 033-D-c | J-38-033 | 39 | 0 | 13 | 46 | 16 | 31 | 2129 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-1620 | | SYUNIK | Achghlu | J-38-033 | 39 | 13 | 60 | 46 | 18 | 26 | 1317 | 500 | 600 | 26 | III | M | C | | | |
| SYUN-033-1630 | | SYUNIK | Achghlu | J-38-033 | 39 | 13 | 41 | 46 | 18 | 23 | 1167 | 350 | 1000 | 33 | III | M | C | | | |
| SYUN-033-1640 | | SYUNIK | Achghlu | J-38-033 | 39 | 13 | 9.5 | 46 | 18 | 26 | 1256 | 500 | 700 | 30 | III | M | C | | | |
| SYUN-033-1650 | | SYUNIK | 033-D-a | J-38-033 | 39 | 8 | 20 | 46 | 18 | 7 | 2224 | 150 | 300 | 5 | III | L | D | | | |
| SYUN-033-1660 | | SYUNIK | 033-D-a | J-38-033 | 39 | 8 | 0.1 | 46 | 18 | 4.2 | 2296 | 500 | 100 | 5 | III | L | D | | | |
| SYUN-033-1670 | | SYUNIK | 033-D-a | J-38-033 | 39 | 5 | 50 | 46 | 18 | 15 | 2853 | 250 | 450 | 12 | III | L | D | | | |
| SYUN-033-1680 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 9.1 | 46 | 18 | 38 | 2468 | 150 | 450 | 9 | III | L | D | | | |
| SYUN-033-1690 | | SYUNIK | 033-D-c | J-38-033 | 39 | 3 | 5.2 | 46 | 18 | 52 | 2445 | 250 | 450 | 7 | III | L | D | | | |
| SYUN-033-1700 | | SYUNIK | Shgharjik | J-38-033 | 39 | 14 | 3.7 | 46 | 20 | 1.9 | 1086 | 600 | 250 | 11 | III | M | C | | | |
| SYUN-033-1710 | | SYUNIK | 033-B-c | J-38-033 | 39 | 10 | 21 | 46 | 20 | 18 | 1698 | 400 | 750 | 24 | III | L | D | | | |
| SYUN-033-1720 | | SYUNIK | 033-D-a | J-38-033 | 39 | 6 | 21 | 46 | 19 | 32 | 2256 | 250 | 550 | 9 | III | L | D | | | |
| SYUN-033-1730 | | SYUNIK | 033-D-a | J-38-033 | 39 | 5 | 16 | 46 | 20 | 16 | 1977 | 150 | 250 | 5 | III | L | D | | | |
| SYUN-033-1740 | | SYUNIK | 033-D-c | J-38-033 | 39 | 2 | 53 | 46 | 20 | 5.3 | 2293 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-1750 | | SYUNIK | 033-B-a | J-38-033 | 39 | 18 | 23 | 46 | 21 | 14 | 1400 | 400 | 1200 | 43 | III | L | D | | | |
| SYUN-033-1760 | | SYUNIK | Antarashat | J-38-033 | 39 | 18 | 8.5 | 46 | 21 | 28 | 1374 | 450 | 1850 | 55 | III | M | C | | | |
| SYUN-033-1770 | | SYUNIK | Vaneq | J-38-033 | 39 | 16 | 43 | 46 | 20 | 47 | 1168 | 600 | 1400 | 89 | III | M | C | | | |
| SYUN-033-1780 | | SYUNIK | Oghtar | J-38-033 | 39 | 16 | 36 | 46 | 21 | 32 | 1045 | 250 | 550 | 13 | III | M | C | | | |
| SYUN-033-1790 | | SYUNIK | Dzorastan | J-38-033 | 39 | 16 | 1.4 | 46 | 21 | 25 | 1123 | 1150 | 600 | 56 | III | M | C | | | |
| SYUN-033-1800 | | SYUNIK | Dzorastan | J-38-033 | 39 | 16 | 18 | 46 | 21 | 59 | 1019 | 300 | 250 | 7 | III | M | C | | | |
| SYUN-033-1810 | | SYUNIK | Dzorastan | J-38-033 | 39 | 15 | 54 | 46 | 21 | 34 | 1129 | 550 | 250 | 15 | III | M | C | | | |
| SYUN-033-1820 | | SYUNIK | 033-B-a | J-38-033 | 39 | 15 | 21 | 46 | 20 | 47 | 1373 | 200 | 1000 | 20 | III | L | D | | | |
| SYUN-033-1830 | | SYUNIK | Shgharjik | J-38-033 | 39 | 14 | 15 | 46 | 20 | 51 | 1189 | 150 | 450 | 7 | III | M | C | | | |
| SYUN-033-1840 | | SYUNIK | Shgharjik | J-38-033 | 39 | 13 | 14 | 46 | 20 | 45 | 968 | 550 | 500 | 26 | III | M | C | | | |
| SYUN-033-1850 | | SYUNIK | 033-D-c | J-38-033 | 39 | 12 | 53 | 46 | 21 | 53 | 874 | 500 | 350 | 19 | III | L | D | | | |
| SYUN-033-1860 | | SYUNIK | 033-D-a | J-38-033 | 39 | 9 | 7.7 | 46 | 21 | 41 | 1669 | 250 | 350 | 9 | III | L | D | | | |
| SYUN-033-1870 | | SYUNIK | 033-D-a | J-38-033 | 39 | 7 | 58 | 46 | 21 | 34 | 2075 | 400 | 850 | 31 | III | L | D | | | |
| SYUN-033-1880 | | SYUNIK | 033-D-a | J-38-033 | 39 | 7 | 29 | 46 | 21 | 17 | 2369 | 400 | 1300 | 47 | III | L | D | | | |
| SYUN-033-1890 | | SYUNIK | 033-D-a | J-38-033 | 39 | 6 | 46 | 46 | 21 | 35 | 2211 | 250 | 900 | 23 | III | L | D | | | |
| SYUN-033-1900 | | SYUNIK | Shishkert | J-38-033 | 39 | 4 | 27 | 46 | 20 | 34 | 1970 | 350 | 1100 | 36 | III | M | C | | | |
| SYUN-033-1910 | | SYUNIK | Shishkert | J-38-033 | 39 | 4 | 24 | 46 | 21 | 2.7 | 1846 | 250 | 300 | 7 | III | M | C | | | |
| SYUN-033-1920 | | SYUNIK | Shishkert | J-38-033 | 39 | 3 | 55 | 46 | 21 | 43 | 1881 | 700 | 850 | 50 | III | M | C | | | |
| SYUN-033-1930 | | SYUNIK | 033-D-c | J-38-033 | 39 | 2 | 53 | 46 | 20 | 56 | 1983 | 300 | 600 | 17 | III | L | D | | | |
| SYUN-033-1940 | | SYUNIK | 033-D-c | J-38-033 | 39 | 1 | 49 | 46 | 20 | 26 | 2293 | 150 | 300 | 5 | III | L | D | | | |
| SYUN-033-1950 | | SYUNIK | 033-D-c | J-38-033 | 39 | 1 | 18 | 46 | 21 | 5.1 | 2020 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-033-1960 | | SYUNIK | 033-D-c | J-38-033 | 39 | 0 | 36 | 46 | 20 | 46 | 1749 | 350 | 750 | 23 | III | L | D | | | |
| SYUN-033-1970 | | SYUNIK | 033-B-b | J-38-033 | 39 | 19 | 15 | 46 | 22 | 38 | 1380 | 350 | 600 | 19 | III | L | D | | | |
| SYUN-033-1980 | | SYUNIK | 033-B-b | J-38-033 | 39 | 18 | 0.5 | 46 | 23 | 21 | 1202 | 350 | 350 | 13 | III | L | D | | | |
| SYUN-033-1990 | | SYUNIK | Arajadzor | J-38-033 | 39 | 16 | 5.6 | 46 | 22 | 28 | 1017 | 400 | 750 | 26 | III | M | C | | | |
| SYUN-033-2000 | | SYUNIK | Bashkend | J-38-033 | 39 | 14 | 27 | 46 | 22 | 51 | 1219 | 250 | 550 | 13 | III | M | C | | | |
| SYUN-033-2010 | | SYUNIK | Bashkend | J-38-033 | 39 | 14 | 12 | 46 | 22 | 54 | 1220 | 150 | 350 | 6 | III | M | C | | | |
| SYUN-033-2020 | | SYUNIK | Bashkend | J-38-033 | 39 | 14 | 25 | 46 | 23 | 12 | 1095 | 200 | 450 | 8 | III | M | C | | | |
| SYUN-033-2030 | | SYUNIK | Kapan | J-38-033 | 39 | 12 | 13 | 46 | 22 | 2.7 | 955 | 250 | 400 | 11 | III | M | C | | | |
| SYUN-033-2040 | | SYUNIK | Kapan | J-38-033 | 39 | 12 | 7 | 46 | 22 | 28 | 933 | 150 | 300 | 5 | III | M | C | | | |
| SYUN-033-2050 | Kapan Manukyan | SYUNIK | Kapan | J-38-033 | 39 | 12 | 22 | 46 | 23 | 0.1 | 874 | 400 | 500 | 11 | III | M | C | | | |
| SYUN-033-2060 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 2.8 | 46 | 22 | 40 | 1109 | 180 | 500 | 17 | III | M | C | | | |
| SYUN-033-2070 | | SYUNIK | 033-B-c | J-38-033 | 39 | 10 | 27 | 46 | 21 | 58 | 1126 | 300 | 500 | 17 | III | L | D | | | |
| SYUN-033-2080 | | SYUNIK | 033-B-c | J-38-033 | 39 | 10 | 13 | 46 | 21 | 56 | 1213 | 300 | 400 | 14 | III | L | D | | | |
| SYUN-033-2090 | | SYUNIK | 033-D-b | J-38-033 | 39 | 8 | 5.7 | 46 | 22 | 26 | 1812 | 450 | 800 | 31 | III | L | D | | | |
| SYUN-033-2100 | | SYUNIK | 033-D-b | J-38-033 | 39 | 7 | 6.8 | 46 | 22 | 21 | 2095 | 150 | 500 | 7 | III | L | D | | | |
| SYUN-033-2110 | | SYUNIK | 033-D-b | J-38-033 | 39 | 6 | 52 | 46 | 21 | 59 | 2148 | 300 | 500 | 14 | III | L | D | | | |
| SYUN-033-2120 | | SYUNIK | 033-D-d | J-38-033 | 39 | 3 | 46 | 46 | 22 | 41 | 1672 | 750 | 700 | 41 | III | L | D | | | |
| SYUN-033-2130 | | SYUNIK | 033-D-d | J-38-033 | 39 | 2 | 14 | 46 | 22 | 54 | 1824 | 350 | 550 | 17 | III | L | D | | | |
| SYUN-033-2140 | | SYUNIK | 033-B-b | J-38-033 | 39 | 19 | 46 | 46 | 24 | 41 | 1495 | 100 | 100 | 1 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-033-2150 | | SYUNIK | 033-B-b | J-38-033 | 39 | 16 | 56 | 46 | 23 | 57 | 1175 | 250 | 400 | 10 | III | L | D | | | |
| SYUN-033-2160 | | SYUNIK | 033-B-b | J-38-033 | 39 | 16 | 58 | 46 | 24 | 9 | 1248 | 150 | 250 | 5 | III | L | D | | | |
| SYUN-033-2170 | | SYUNIK | 033-B-b | J-38-033 | 39 | 16 | 5.7 | 46 | 23 | 25 | 1059 | 350 | 500 | 15 | III | L | D | | | |
| SYUN-033-2180 | | SYUNIK | 033-B-b | J-38-033 | 39 | 15 | 31 | 46 | 23 | 26 | 1043 | 200 | 250 | 5 | III | L | D | | | |
| SYUN-033-2190 | | SYUNIK | Kapan | J-38-033 | 39 | 14 | 57 | 46 | 24 | 16 | 896 | 150 | 700 | 11 | III | M | C | | | |
| SYUN-033-2200 | | SYUNIK | Kapan | J-38-033 | 39 | 14 | 28 | 46 | 24 | 9.9 | 1057 | 150 | 300 | 5 | III | M | C | | | |
| SYUN-033-2210 | | SYUNIK | Kapan | J-38-033 | 39 | 14 | 28 | 46 | 24 | 24 | 988 | 200 | 300 | 6 | III | M | C | | | |
| SYUN-033-2220 | | SYUNIK | Kapan | J-38-033 | 39 | 14 | 5.2 | 46 | 23 | 33 | 970 | 100 | 200 | 3 | III | M | C | | | |
| SYUN-033-2221 | Kavart | SYUNIK | Kavart | J-38-33 | 39 | 14 | 17 | 46 | 24 | 5 | 1165 | 90 | 30 | 1 | III | M | C | | | |
| SYUN-033-2230 | | SYUNIK | Kapan | J-38-033 | 39 | 13 | 59 | 46 | 23 | 57 | 1071 | 250 | 500 | 13 | III | M | C | | | |
| SYUN-033-2240 | | SYUNIK | Kapan | J-38-033 | 39 | 13 | 51 | 46 | 23 | 34 | 956 | 400 | 500 | 19 | III | M | C | | | |
| SYUN-033-2250 | | SYUNIK | Kapan | J-38-033 | 39 | 13 | 34 | 46 | 23 | 44 | 919 | 250 | 400 | 9 | III | M | C | | | |
| SYUN-033-2260 | | SYUNIK | Kapan | J-38-033 | 39 | 13 | 23 | 46 | 23 | 53 | 865 | 200 | 1100 | 19 | III | M | C | | | |
| SYUN-033-2270 | Kapan Arpik district | SYUNIK | Kapan Arpik district | J-38-33 | 39 | 13 | 11 | 46 | 23 | 59 | 851 | 80 | 240 | 14 | I | H | A | | Houses,public buildings,road | High level risk from destruction of dwelling houses and other objects, life providing installations(2,500 persons) |
| SYUN-033-2280 | Kapan Shinaraneri str., School N10 | SYUNIK | Kapan Shinaraneri str., School N10 | J-38-33 | 39 | 11 | 54 | 46 | 23 | 36 | 897 | 180 | 500 | 6 | I | H | A | | | |
| SYUN-033-2290 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 54 | 46 | 24 | 32 | 866 | 250 | 800 | 20 | III | M | C | | | |
| SYUN-033-2300 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 24 | 46 | 24 | 12 | 988 | 100 | 350 | 4 | III | M | C | | | |
| SYUN-033-2310 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 29 | 46 | 24 | 40 | 891 | 350 | 300 | 9 | III | M | C | | | |
| SYUN-033-2320 | | SYUNIK | 033-D-b | J-38-033 | 39 | 8 | 10 | 46 | 23 | 29 | 1482 | 250 | 650 | 13 | III | L | D | | | |
| SYUN-033-2330 | | SYUNIK | 033-D-b | J-38-033 | 39 | 7 | 19 | 46 | 24 | 14 | 1569 | 350 | 800 | 27 | III | L | D | | | |
| SYUN-033-2340 | | SYUNIK | 033-D-b | J-38-033 | 39 | 5 | 55 | 46 | 23 | 45 | 2129 | 250 | 400 | 7 | III | L | D | | | |
| SYUN-033-2350 | | SYUNIK | 033-D-b | J-38-033 | 39 | 5 | 39 | 46 | 23 | 60 | 1997 | 350 | 500 | 13 | III | L | D | | | |
| SYUN-033-2360 | | SYUNIK | 033-D-d | J-38-033 | 39 | 3 | 45 | 46 | 23 | 42 | 1531 | 350 | 450 | 13 | III | L | D | | | |
| SYUN-033-2370 | | SYUNIK | Shabadin | J-38-033 | 39 | 17 | 56 | 46 | 25 | 15 | 1302 | 600 | 1500 | 64 | III | M | C | | | |
| SYUN-033-2380 | | SYUNIK | 033-B-b | J-38-033 | 39 | 17 | 0.9 | 46 | 26 | 0.9 | 1130 | 300 | 600 | 19 | III | L | D | | | |
| SYUN-033-2390 | | SYUNIK | 033-B-b | J-38-033 | 39 | 16 | 15 | 46 | 25 | 5.9 | 1032 | 200 | 550 | 10 | III | L | D | | | |
| SYUN-033-2400 | | SYUNIK | 033-B-b | J-38-033 | 39 | 15 | 11 | 46 | 24 | 48 | 952 | 300 | 700 | 17 | III | L | D | | | |
| SYUN-033-2410 | | SYUNIK | Shahumyan | J-38-033 | 39 | 13 | 43 | 46 | 25 | 31 | 857 | 300 | 500 | 9 | III | M | C | | | |
| SYUN-033-2420 | | SYUNIK | Barabatum | J-38-033 | 39 | 12 | 57 | 46 | 25 | 1.3 | 978 | 200 | 400 | 6 | III | M | C | | | |
| SYUN-033-2430 | Kapan Barbatum | SYUNIK | Kapan Barbatum | J-38-33 | 39 | 12 | 25 | 46 | 25 | 57 | 795 | 140 | 530 | 11 | II | H | B | | | |
| SYUN-033-2440 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 47 | 46 | 24 | 56 | 843 | 250 | 400 | 9 | III | M | C | | | |
| SYUN-033-2450 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 51 | 46 | 25 | 18 | 772 | 250 | 300 | 8 | III | M | C | | | |
| SYUN-033-2460 | | SYUNIK | Kapan | J-38-033 | 39 | 11 | 47 | 46 | 25 | 40 | 827 | 250 | 300 | 8 | III | M | C | | | |
| SYUN-033-2470 | Kapan Haru-tyunyan street | SYUNIK | Kapan Haru-tyunyan street | J-38-33 | 39 | 11 | 51 | 46 | 25 | 57 | 800 | 100 | 251 | 15 | II | H | B | | Railroad, road, houses, other | High risk on destruction of houses and other objects, state importance railway, lifelines for 1,500 persons |
| SYUN-033-2480 | Kapan Geghanush district | SYUNIK | Kapan Geghanush | J-38-33 | 39 | 10 | 37 | 46 | 25 | 16 | 915 | 40 | 300 | 5 | I | M | B | | | |
| SYUN-033-2490 | | SYUNIK | Kapan Geghanush | J-38-033 | 39 | 9 | 53 | 46 | 25 | 29 | 973 | 450 | 500 | 21 | III | M | C | | | |
| SYUN-033-2500 | | SYUNIK | 033-D-b | J-38-033 | 39 | 9 | 22 | 46 | 24 | 53 | 1131 | 350 | 900 | 25 | III | L | D | | | |
| SYUN-033-2510 | | SYUNIK | 033-D-b | J-38-033 | 39 | 9 | 1 | 46 | 25 | 1.4 | 1075 | 600 | 500 | 22 | III | L | D | | | |
| SYUN-033-2520 | | SYUNIK | 033-D-b | J-38-033 | 39 | 8 | 46 | 46 | 24 | 47 | 1129 | 400 | 350 | 12 | III | L | D | | | |
| SYUN-033-2530 | | SYUNIK | 033-D-b | J-38-033 | 39 | 9 | 5.3 | 46 | 25 | 28 | 1204 | 300 | 300 | 9 | III | L | D | | | |
| SYUN-033-2540 | | SYUNIK | 033-D-b | J-38-033 | 39 | 5 | 12 | 46 | 25 | 17 | 1817 | 300 | 500 | 14 | III | L | D | | | |
| SYUN-033-2550 | | SYUNIK | 033-D-d | J-38-033 | 39 | 3 | 17 | 46 | 25 | 30 | 1377 | 1150 | 950 | 88 | III | L | D | | | |
| SYUN-033-2560 | | SYUNIK | 033-D-d | J-38-033 | 39 | 2 | 52 | 46 | 24 | 54 | 1439 | 700 | 950 | 51 | III | L | D | | | |
| SYUN-033-2570 | | SYUNIK | 033-B-b | J-38-033 | 39 | 17 | 57 | 46 | 26 | 55 | 1309 | 250 | 550 | 13 | III | L | D | | | |
| SYUN-033-2580 | | SYUNIK | 033-B-b | J-38-033 | 39 | 17 | 21 | 46 | 27 | 6.1 | 1103 | 200 | 450 | 8 | III | L | D | | | |
| SYUN-033-2590 | | SYUNIK | 033-B-b | J-38-033 | 39 | 16 | 45 | 46 | 26 | 37 | 1044 | 200 | 700 | 13 | III | L | D | | | |
| SYUN-033-2600 | | SYUNIK | Sevakar | J-38-033 | 39 | 16 | 23 | 46 | 26 | 44 | 1049 | 200 | 150 | 3 | III | M | C | | | |
| SYUN-033-2610 | | SYUNIK | Chapni | J-38-033 | 39 | 16 | 36 | 46 | 27 | 24 | 1090 | 300 | 650 | 19 | III | M | C | | | |
| SYUN-033-2620 | | SYUNIK | Chapni | J-38-033 | 39 | 15 | 54 | 46 | 27 | 0.4 | 964 | 250 | 600 | 15 | III | M | C | | | |
| SYUN-033-2630 | | SYUNIK | 033-B-d | J-38-033 | 39 | 13 | 51 | 46 | 27 | 11 | 845 | 350 | 450 | 14 | III | L | D | | | |
| SYUN-033-2640 | | SYUNIK | 033-B-d | J-38-033 | 39 | 13 | 22 | 46 | 26 | 45 | 852 | 250 | 200 | 6 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-033-2650 | | SYUNIK | 033-B-d | J-38-033 | 39 | 12 | 19 | 46 | 26 | 29 | 743 | 150 | 150 | 4 | III | L | D | | | |
| SYUN-033-2660 | Chakaten | SYUNIK | Chakaten | J-38-33 | 39 | 8 | 60 | 46 | 26 | 30 | 1152 | 33 | 200 | 1 | I | M | B | | | |
| SYUN-033-2670 | | SYUNIK | 033-D-b | J-38-033 | 39 | 7 | 40 | 46 | 26 | 41 | 1341 | 300 | 350 | 10 | III | L | D | | | |
| SYUN-033-2680 | | SYUNIK | 033-D-b | J-38-033 | 39 | 6 | 3.8 | 46 | 26 | 30 | 1521 | 300 | 750 | 22 | III | L | D | | | |
| SYUN-033-2690 | | SYUNIK | 033-D-d | J-38-033 | 39 | 4 | 58 | 46 | 27 | 0.5 | 1274 | 1000 | 1000 | 81 | III | L | D | | | |
| SYUN-033-2700 | | SYUNIK | Tsav | J-38-033 | 39 | 2 | 54 | 46 | 27 | 17 | 1132 | 400 | 550 | 18 | III | M | C | | | |
| SYUN-033-2710 | | SYUNIK | 033-D-d | J-38-033 | 39 | 1 | 5.7 | 46 | 26 | 39 | 1748 | 250 | 550 | 12 | III | L | D | | | |
| SYUN-033-2720 | | SYUNIK | David-Bek | J-38-033 | 39 | 19 | 3.5 | 46 | 29 | 1.5 | 1295 | 600 | 1550 | 62 | III | M | C | | | |
| SYUN-033-2730 | | SYUNIK | David-Bek | J-38-033 | 39 | 18 | 21 | 46 | 28 | 25 | 1477 | 550 | 800 | 36 | III | M | C | | | |
| SYUN-033-2740 | | SYUNIK | Artsvanik | J-38-033 | 39 | 16 | 10 | 46 | 28 | 30 | 1200 | 200 | 400 | 9 | III | M | C | | | |
| SYUN-033-2750 | | SYUNIK | Artsvanik | J-38-033 | 39 | 15 | 36 | 46 | 28 | 23 | 1108 | 500 | 550 | 28 | III | M | C | | | |
| SYUN-033-2760 | | SYUNIK | Artsvanik | J-38-033 | 39 | 14 | 51 | 46 | 28 | 22 | 1008 | 250 | 1300 | 30 | III | M | C | | | |
| SYUN-033-2770 | | SYUNIK | Shikahogh | J-38-033 | 39 | 5 | 27 | 46 | 28 | 6.3 | 1103 | 600 | 600 | 31 | III | M | C | | | |
| SYUN-033-2780 | | SYUNIK | Tsav | J-38-033 | 39 | 3 | 12 | 46 | 27 | 24 | 1097 | 500 | 750 | 27 | III | M | C | | | |
| SYUN-033-2790 | | SYUNIK | Tsav | J-38-033 | 39 | 2 | 50 | 46 | 28 | 40 | 962 | 200 | 400 | 9 | III | M | C | | | |
| SYUN-033-2800 | | SYUNIK | 033-D-d | J-38-033 | 39 | 1 | 35 | 46 | 28 | 32 | 1065 | 200 | 650 | 13 | III | L | D | | | |
| SYUN-033-2810 | | SYUNIK | 033-D-d | J-38-033 | 39 | 1 | 15 | 46 | 28 | 32 | 1239 | 300 | 400 | 12 | III | L | D | | | |
| SYUN-033-2820 | | SYUNIK | 033-D-d | J-38-033 | 39 | 0 | 40 | 46 | 27 | 28 | 1592 | 300 | 1000 | 27 | III | L | D | | | |
| SYUN-033-2830 | | SYUNIK | Artsvanik | J-38-033 | 39 | 15 | 58 | 46 | 29 | 10 | 1447 | 150 | 300 | 8 | III | M | C | | | |
| SYUN-033-2840 | | SYUNIK | Syunik | J-38-033 | 39 | 12 | 43 | 46 | 28 | 56 | 835 | 1900 | 3100 | 576 | III | M | C | | | |
| SYUN-033-2850 | | SYUNIK | 033-D-b | J-38-033 | 39 | 8 | 6.5 | 46 | 29 | 20 | 810 | 1100 | 850 | 83 | III | L | D | | | |
| SYUN-033-2860 | | SYUNIK | 033-D-d | J-38-033 | 39 | 5 | 9.5 | 46 | 29 | 25 | 1029 | 250 | 600 | 15 | III | L | D | | | |
| SYUN-033-2870 | | SYUNIK | 033-D-d | J-38-033 | 39 | 4 | 48 | 46 | 29 | 31 | 1114 | 300 | 800 | 22 | III | L | D | | | |
| SYUN-033-2880 | | SYUNIK | 033-D-d | J-38-033 | 39 | 4 | 56 | 46 | 29 | 53 | 952 | 300 | 350 | 10 | III | L | D | | | |
| SYUN-033-2890 | | SYUNIK | 033-D-d | J-38-033 | 39 | 3 | 28 | 46 | 29 | 53 | 922 | 300 | 350 | 11 | III | L | D | | | |
| SYUN-033-2900 | | SYUNIK | 033-D-d | J-38-033 | 39 | 2 | 37 | 46 | 29 | 29 | 859 | 250 | 600 | 16 | III | L | D | | | |
| SYUN-033-2910 | | SYUNIK | 033-D-d | J-38-033 | 39 | 1 | 24 | 46 | 29 | 10 | 1009 | 500 | 800 | 40 | III | L | D | | | |
| SYUN-033-2920 | | SYUNIK | Shikahogh | J-38-033 | 39 | 5 | 49 | 46 | 28 | 47 | 1037 | 450 | 550 | 21 | III | M | C | | | |
| SYUN-033-2930 | Vachagan | SYUNIK | Vachagan | J-38-33 | 39 | 11 | 11 | 46 | 22 | 48 | 1073 | 150 | 430 | 11 | II | H | B | | | |
| SYUN-033-2940 | | SYUNIK | Kapan | J-38-033 | 39 | 12 | 39 | 46 | 25 | 5.9 | 920 | 350 | 550 | 15 | III | M | C | | | |
| SYUN-033-2950 | Kapan-Norashenik (2nd km of the road) | SYUNIK | Kapan Norashenik (2nd km of the road) | J-38-33 | 39 | 13 | 1 | 46 | 26 | 52 | 810 | 100 | 55 | 1 | I | M | B | | | |
| SYUN-034-0010 | | SYUNIK | 034-A-a | J-38-034 | 39 | 18 | 6.5 | 46 | 30 | 47 | 1288 | 400 | 1200 | 25 | III | L | D | | | |
| SYUN-034-0020 | | SYUNIK | Kaghnut | J-38-034 | 39 | 16 | 42 | 46 | 30 | 59 | 1416 | 500 | 1150 | 32 | III | M | C | | | |
| SYUN-034-0030 | | SYUNIK | Srashen | J-38-034 | 39 | 4 | 55 | 46 | 30 | 32 | 844 | 1200 | 1300 | 160 | III | M | C | | | |
| SYUN-034-0040 | | SYUNIK | Srashen | J-38-034 | 39 | 4 | 24 | 46 | 31 | 5.9 | 779 | 900 | 2100 | 106 | III | M | C | | | |
| SYUN-034-0050 | | SYUNIK | 034-C-c | J-38-034 | 39 | 2 | 56 | 46 | 31 | 18 | 834 | 500 | 500 | 14 | III | L | D | | | |
| SYUN-034-0060 | | SYUNIK | 034-C-c | J-38-034 | 39 | 2 | 40 | 46 | 30 | 24 | 817 | 550 | 600 | 25 | III | L | D | | | |
| SYUN-034-0070 | | SYUNIK | 034-C-c | J-38-034 | 39 | 2 | 34 | 46 | 30 | 58 | 838 | 300 | 500 | 13 | III | L | D | | | |
| SYUN-034-0080 | | SYUNIK | 034-C-c | J-38-034 | 39 | 1 | 1.6 | 46 | 30 | 21 | 1465 | 250 | 500 | 9 | III | L | D | | | |
| SYUN-034-0090 | Agarak New district | SYUNIK | Agarak | J-38-34 | 39 | 12 | 31 | 46 | 32 | 50 | 1020 | 380 | 110 | 1 | II | H | B | | | |
| SYUN-034-0100 | | SYUNIK | 034-C-c | J-38-034 | 39 | 3 | 15 | 46 | 31 | 43 | 829 | 750 | 750 | 37 | III | L | D | | | |
| SYUN-034-0110 | | SYUNIK | 034-C-c | J-38-034 | 39 | 0 | 58 | 46 | 31 | 37 | 1335 | 300 | 450 | 14 | III | L | D | | | |
| SYUN-034-0120 | | SYUNIK | 034-C-c | J-38-034 | 39 | 0 | 33 | 46 | 31 | 49 | 1484 | 250 | 400 | 13 | III | L | D | | | |
| SYUN-034-0130 | Uzhanis | SYUNIK | Uzhanis | J-38-34 | 39 | 14 | 1 | 46 | 32 | 24 | 1145 | 260 | 300 | 8 | II | H | B | | | |
| SYUN-034-0140 | | SYUNIK | Uzhanis | J-38-034 | 39 | 13 | 57 | 46 | 32 | 39 | 1139 | 300 | 650 | 16 | III | M | C | | | |
| SYUN-045-0010 | | SYUNIK | 045-A-a | J-38-045 | 38 | 58 | 5.2 | 46 | 7 | 32 | 2471 | 700 | 1600 | 72 | III | L | D | | | |
| SYUN-045-0020 | | SYUNIK | 045-A-b | J-38-045 | 38 | 59 | 34 | 46 | 9 | 33 | 1607 | 600 | 200 | 11 | III | L | D | | | |
| SYUN-045-0030 | | SYUNIK | Kuris | J-38-045 | 38 | 56 | 36 | 46 | 9 | 49 | 1650 | 650 | 1250 | 39 | III | M | C | | | |
| SYUN-045-0040 | | SYUNIK | Kuris | J-38-045 | 38 | 56 | 18 | 46 | 9 | 58 | 1623 | 350 | 1150 | 30 | III | M | C | | | |
| SYUN-045-0050 | | SYUNIK | Vagravar | J-38-045 | 38 | 57 | 32 | 46 | 11 | 13 | 1539 | 100 | 100 | 1 | III | M | C | | | |
| SYUN-045-0060 | | SYUNIK | Karchevan | J-38-045 | 38 | 53 | 12 | 46 | 10 | 46 | 1097 | 600 | 1700 | 41 | III | M | C | | | |
| SYUN-045-0070 | | SYUNIK | 045-B-b | J-38-045 | 38 | 52 | 6.7 | 46 | 11 | 13 | 723 | 500 | 1050 | 26 | III | L | D | | | |
| SYUN-045-0080 | | SYUNIK | 045-A-b | J-38-045 | 38 | 59 | 33 | 46 | 14 | 27 | 1854 | 450 | 750 | 22 | III | L | D | | | |
| SYUN-045-0090 | | SYUNIK | 045-B-a | J-38-045 | 38 | 57 | 20 | 46 | 15 | 20 | 1449 | 650 | 1150 | 30 | III | L | D | | | |
| SYUN-045-0100 | | SYUNIK | 045-B-a | J-38-045 | 38 | 59 | 53 | 46 | 17 | 46 | 1737 | 400 | 2000 | 50 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| SYUN-045-0110 | | SYUNIK | 045-B-a | J-38-045 | 38 | 58 | 30 | 46 | 18 | 6.5 | 1660 | 300 | 900 | 25 | III | L | D | | | |
| SYUN-045-0120 | | SYUNIK | 045-B-a | J-38-045 | 38 | 58 | 9.9 | 46 | 21 | 11 | 1235 | 100 | 100 | 1 | III | L | D | | | |
| SYUN-045-0130 | | SYUNIK | Shvanidzor | J-38-045 | 38 | 55 | 53 | 46 | 22 | 45 | 661 | 200 | 800 | 13 | III | M | C | | | |
| SYUN-045-0140 | | SYUNIK | Shvanidzor | J-38-045 | 38 | 55 | 52 | 46 | 23 | 6.7 | 734 | 400 | 950 | 19 | III | M | C | | | |
| SYUN-045-0150 | | SYUNIK | Nyuvadi | J-38-045 | 38 | 54 | 14 | 46 | 26 | 44 | 612 | 900 | 1400 | 80 | III | M | C | | | |
| SYUN-045-0160 | | SYUNIK | Nyuvadi | J-38-045 | 38 | 54 | 22 | 46 | 27 | 47 | 601 | 500 | 1600 | 59 | III | M | C | | | |
| SYUN-046-0010 | | SYUNIK | 046-A-c | J-38-046 | 38 | 53 | 25 | 46 | 30 | 14 | 545 | | | 28 | III | L | D | | | |
| SYUN-046-0020 | | SYUNIK | 046-A-c | J-38-046 | 38 | 53 | 44 | 46 | 31 | 23 | 480 | | | 55 | III | L | D | | | |
| TAVU-102-0010 | | TAVUSH | Archis | K-38-102 | 41 | 10 | 38 | 44 | 52 | 45 | 501 | 300 | 1000 | 30 | III | M | C | | | |
| TAVU-102-0020 | | TAVUSH | Ayrum | K-38-102 | 41 | 11 | 8.9 | 44 | 54 | 53 | 684 | 400 | 850 | 27 | III | M | C | | | |
| TAVU-102-0030 | Ltchkadzor-1 | TAVUSH | Ltchkadzor | K-38-102 | 41 | 10 | 32 | 44 | 54 | 24 | 709 | 210 | 80 | 11 | II | H | B | | | |
| TAVU-102-0031 | | TAVUSH | Lchkadzor | K-38-102 | 41 | 11 | 9.4 | 44 | 54 | 0.7 | 527 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-102-0032 | | TAVUSH | Lchkadzor | K-38-102 | 41 | 11 | 2.3 | 44 | 54 | 27 | 631 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-102-0033 | Ayrum | TAVUSH | Ayrum | K-38-102 | 41 | 12 | 45 | 44 | 54 | 26 | 500 | 300 | 150 | 3 | I | M | B | | | |
| TAVU-102-0040 | | TAVUSH | Hoktember | K-38-102 | 41 | 12 | 38 | 44 | 56 | 6 | 692 | 750 | 1050 | 56 | III | M | C | | | |
| TAVU-102-0050 | | TAVUSH | Hoktember | K-38-102 | 41 | 13 | 39 | 44 | 57 | 26 | 773 | 700 | 1000 | 59 | III | M | C | | | |
| TAVU-102-0060 | | TAVUSH | 102-D-d | K-38-102 | 41 | 4 | 14 | 44 | 57 | 53 | 1436 | 400 | 250 | 8 | III | L | D | | | |
| TAVU-102-0070 | Noyemberyan -1 | TAVUSH | Noyemberyan | K-38-102 | 41 | 10 | 24 | 44 | 59 | 26 | 911 | 400 | 660 | 19 | II | H | B | | | High risk on destruction of houses and other objects, threatens the roads and communications (4,500 persons) |
| TAVU-102-0071 | Noyemberyan -2 | TAVUSH | Noyemberyan | K-38-102 | 41 | 10 | 9 | 44 | 59 | 35 | 893 | 250 | 350 | 9 | II | H | B | | | |
| TAVU-102-0072 | | TAVUSH | Noyemberyan | K-38-102 | 41 | 10 | 1.8 | 44 | 59 | 41 | 869 | 250 | 500 | 7 | III | M | C | | | |
| TAVU-102-0080 | | TAVUSH | Noyemberyan | K-38-102 | 41 | 9 | 14 | 44 | 58 | 49 | 1009 | 800 | 850 | 50 | III | M | C | | | |
| TAVU-102-0090 | | TAVUSH | 102-D-b | K-38-102 | 41 | 6 | 51 | 44 | 59 | 21 | 1255 | 300 | 650 | 14 | III | L | D | | | |
| TAVU-102-0100 | | TAVUSH | 102-D-c | K-38-102 | 41 | 1 | 26 | 44 | 48 | 15 | 1684 | 850 | 2000 | 124 | III | L | D | | | |
| TAVU-102-0110 | | TAVUSH | 102-D-c | K-38-102 | 41 | 0 | 33 | 44 | 49 | 45 | 1596 | 250 | 600 | 12 | III | L | D | | | |
| TAVU-102-0120 | | TAVUSH | 102-D-c | K-38-102 | 41 | 0 | 24 | 44 | 51 | 7.1 | 1565 | 350 | 700 | 16 | III | L | D | | | |
| TAVU-102-0130 | | TAVUSH | 102-D-c | K-38-102 | 41 | 0 | 14 | 44 | 52 | 23 | 1494 | 600 | 600 | 31 | III | L | D | | | |
| TAVU-102-0140 | | TAVUSH | 102-D-d | K-38-102 | 41 | 1 | 14 | 44 | 54 | 10 | 1369 | 300 | 800 | 18 | III | L | D | | | |
| TAVU-102-0150 | | TAVUSH | 102-D-d | K-38-102 | 41 | 3 | 29 | 44 | 55 | 25 | 1576 | 600 | 650 | 35 | III | L | D | | | |
| TAVU-102-0160 | | TAVUSH | 102-D-d | K-38-102 | 41 | 1 | 19 | 44 | 55 | 42 | 1364 | 600 | 1300 | 67 | III | L | D | | | |
| TAVU-102-0170 | | TAVUSH | 102-D-d | K-38-102 | 41 | 0 | 58 | 44 | 54 | 53 | 1366 | 600 | 750 | 31 | III | L | D | | | |
| TAVU-103-0010 | | TAVUSH | Noyemberyan | K-38-103 | 41 | 9 | 24 | 45 | 0 | 18 | 1027 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-103-0020 | | TAVUSH | Dovegh | K-38-103 | 41 | 11 | 14 | 45 | 1 | 48 | 737 | 200 | 450 | 8 | III | M | C | | | |
| TAVU-103-0030 | | TAVUSH | Dovegh | K-38-103 | 41 | 10 | 48 | 45 | 2 | 33 | 814 | 250 | 500 | 10 | III | M | C | | | |
| TAVU-103-0040 | | TAVUSH | 103-C-a | K-38-103 | 41 | 9 | 55 | 45 | 1 | 53 | 927 | 400 | 700 | 21 | III | L | D | | | |
| TAVU-103-0050 | | TAVUSH | 103-C-a | K-38-103 | 41 | 9 | 52 | 45 | 3 | 10 | 883 | 350 | 600 | 17 | III | L | D | | | |
| TAVU-103-0060 | | TAVUSH | 103-C-a | K-38-103 | 41 | 9 | 38 | 45 | 3 | 19 | 940 | 900 | 250 | 20 | III | L | D | | | |
| TAVU-103-0070 | | TAVUSH | 103-C-a | K-38-103 | 41 | 8 | 59 | 45 | 4 | 2.5 | 1138 | 300 | 350 | 6 | III | L | D | | | |
| TAVU-103-0080 | | TAVUSH | 103-C-a | K-38-103 | 41 | 8 | 47 | 45 | 2 | 59 | 1046 | 250 | 450 | 10 | III | L | D | | | |
| TAVU-103-0090 | Baghanis | TAVUSH | Baghanis | K-38-103 | 41 | 6 | 25 | 45 | 3 | 6 | 935 | 200 | 300 | 9 | II | M | C | | | |
| TAVU-103-0100 | | TAVUSH | Voskepar | K-38-103 | 41 | 3 | 39 | 45 | 3 | 21 | 874 | 600 | 1600 | 73 | III | M | C | | | |
| TAVU-103-0110 | | TAVUSH | Voskepar | K-38-103 | 41 | 2 | 19 | 45 | 3 | 6.1 | 1144 | 300 | 400 | 10 | III | M | C | | | |
| TAVU-103-0120 | | TAVUSH | 103-C-c | K-38-103 | 41 | 1 | 5.5 | 45 | 4 | 11 | 1135 | 150 | 200 | 6 | III | L | D | | | |
| TAVU-103-0130 | | TAVUSH | 103-C-a | K-38-103 | 41 | 9 | 22 | 45 | 4 | 19 | 1177 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-103-0140 | | TAVUSH | 103-C-a | K-38-103 | 41 | 9 | 41 | 45 | 5 | 20 | 965 | 300 | 1000 | 27 | III | L | D | | | |
| TAVU-103-0150 | | TAVUSH | Voskevan | K-38-103 | 41 | 7 | 18 | 45 | 5 | 33 | 1123 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-103-0160 | | TAVUSH | 103-C-c | K-38-103 | 41 | 2 | 28 | 45 | 4 | 23 | 935 | 500 | 1800 | 78 | III | L | D | | | |
| TAVU-103-0170 | | TAVUSH | 103-C-c | K-38-103 | 41 | 0 | 26 | 45 | 5 | 5.8 | 1168 | 550 | 1700 | 85 | III | L | D | | | |
| TAVU-103-0180 | | TAVUSH | Shavarshavan | K-38-103 | 41 | 7 | 29 | 45 | 6 | 30 | 910 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-103-0190 | | TAVUSH | Tsakhkavan | K-38-103 | 41 | 1 | 58 | 45 | 6 | 16 | 928 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-103-0200 | | TAVUSH | Tsakhkavan | K-38-103 | 41 | 0 | 54 | 45 | 5 | 44 | 1051 | 200 | 400 | 10 | III | M | C | | | |
| TAVU-103-0210 | | TAVUSH | Tsakhkavan | K-38-103 | 41 | 1 | 39 | 45 | 7 | 7.5 | 842 | 900 | 1900 | 111 | III | M | C | | | |
| TAVU-103-0215 | Barekamavan-Dostlu | TAVUSH | Barekamavan-Dostlu | K-38-103 | 41 | 10 | 30 | 45 | 7 | 18 | 772 | 430 | 200 | 16 | I | M | B | | | |
| TAVU-103-0220 | | TAVUSH | Dostlu | K-38-103 | 41 | 9 | 57 | 45 | 7 | 25 | 1040 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-103-0230 | | TAVUSH | Dostlu | K-38-103 | 41 | 9 | 18 | 45 | 7 | 15 | 1067 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-103-0240 | | TAVUSH | Shavarshavan | K-38-103 | 41 | 7 | 10 | 45 | 7 | 39 | 919 | 100 | 100 | 1 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-103-0250 | Sevkar | TAVUSH | Sevkar | K-38-103 | 41 | 0 | 48 | 45 | 8 | 40 | 844 | 520 | 525 | 8 | I | M | B | | | (1,500 persons) |
| TAVU-103-0260 | | TAVUSH | | K-38-103 | 40 | 59 | 60 | 45 | 6 | 24 | 1326 | 102 | 1920 | 217 | III | L | D | | Monastery ,complex | Unique historical cultural importance complex /10th century/ |
| TAVU-103-0270 | | TAVUSH | 103-C-b | K-38-103 | 41 | 9 | 51 | 45 | 9 | 3.9 | 897 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-103-0280 | Berkaber | TAVUSH | Berkaber | K-38-103 | 41 | 3 | 30 | 45 | 8 | 51 | 639 | 120 | 200 | 1 | II | M | C | | | |
| TAVU-103-0290 | | TAVUSH | Sarigyukh | K-38-103 | 41 | 2 | 39 | 45 | 9 | 56 | 821 | 500 | 450 | 21 | III | M | C | | | |
| TAVU-103-0300 | | TAVUSH | Sevkar | K-38-103 | 41 | 0 | 6.9 | 45 | 9 | 1.1 | 851 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-114-0010 | | TAVUSH | 114-D-c | K-38-114 | 40 | 45 | 5.2 | 44 | 47 | 33 | 1628 | 350 | 250 | 7 | III | L | D | | | |
| TAVU-114-0015 | Jughtakvank | TAVUSH | Jughtakvank | K-38-103 | 40 | 45 | 32 | 44 | 48 | 13 | 1568 | 200 | 310 | 1 | II | M | C | | The object of risk is the middle age monastery, that is of cultural value. | |
| TAVU-114-0020 | | TAVUSH | 114-D-c | K-38-114 | 40 | 45 | 13 | 44 | 48 | 17 | 1425 | 600 | 500 | 26 | III | L | D | | | |
| TAVU-114-0030 | | TAVUSH | 114-D-c | K-38-114 | 40 | 44 | 49 | 44 | 48 | 20 | 1485 | 300 | 850 | 25 | III | L | D | | | |
| TAVU-114-0040 | | TAVUSH | 114-D-c | K-38-114 | 40 | 43 | 16 | 44 | 48 | 23 | 1478 | 500 | 700 | 23 | III | L | D | | | |
| TAVU-114-0050 | | TAVUSH | 114-D-c | K-38-114 | 40 | 40 | 7.4 | 44 | 47 | 19 | 2407 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-114-0060 | | TAVUSH | 114-D-c | K-38-114 | 40 | 41 | 24 | 44 | 48 | 27 | 1956 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-114-0070 | | TAVUSH | 114-D-c | K-38-114 | 40 | 40 | 10 | 44 | 48 | 38 | 2427 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-114-0080 | | TAVUSH | 114-D-a | K-38-114 | 40 | 47 | 27 | 44 | 49 | 28 | 2026 | 500 | 1500 | 66 | III | L | D | | | |
| TAVU-114-0090 | | TAVUSH | 114-D-a | K-38-114 | 40 | 46 | 37 | 44 | 49 | 29 | 1966 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-114-0100 | | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 6.3 | 44 | 48 | 48 | 1493 | 400 | 850 | 31 | III | M | C | | | |
| TAVU-114-0110 | | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 8.6 | 44 | 49 | 15 | 1480 | 500 | 1300 | 61 | III | M | C | | | |
| TAVU-114-0120 | | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 13 | 44 | 49 | 39 | 1389 | 650 | 700 | 40 | III | M | C | | | |
| TAVU-114-0130 | | TAVUSH | 114-D-a | K-38-114 | 40 | 47 | 16 | 44 | 50 | 29 | 1646 | 250 | 350 | 8 | III | L | D | | | |
| TAVU-114-0140 | | TAVUSH | Dilijan | K-38-114 | 40 | 46 | 13 | 44 | 50 | 19 | 1583 | 450 | 800 | 28 | III | M | C | | | |
| TAVU-114-0150 | | TAVUSH | Dilijan | K-38-114 | 40 | 46 | 3.4 | 44 | 51 | 19 | 1527 | 500 | 2200 | 86 | III | M | C | | | |
| TAVU-114-0160 | | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 18 | 44 | 50 | 50 | 1470 | 850 | 3900 | 256 | III | M | C | | | |
| TAVU-114-0170 | | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 5.7 | 44 | 50 | 31 | 1412 | 900 | 2300 | 173 | III | M | C | | | |
| TAVU-114-0180 | Diligen M-8 Road | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 17 | 44 | 50 | 11 | 1280 | 50 | 60 | 1 | I | M | B | | | |
| TAVU-114-0190 | | TAVUSH | Dilijan | K-38-114 | 40 | 43 | 2 | 44 | 50 | 53 | 1515 | 1000 | 900 | 65 | III | M | C | | | |
| TAVU-114-0200 | | TAVUSH | Dilijan | K-38-114 | 40 | 42 | 34 | 44 | 50 | 7.9 | 1619 | 500 | 300 | 13 | III | M | C | | | |
| TAVU-114-0210 | | TAVUSH | Dilijan | K-38-114 | 40 | 41 | 24 | 44 | 50 | 12 | 1724 | 450 | 800 | 27 | III | M | C | | | |
| TAVU-114-0220 | | TAVUSH | 114-D-c | K-38-114 | 40 | 40 | 44 | 44 | 50 | 34 | 1938 | 450 | 750 | 30 | III | L | D | | | |
| TAVU-114-0230 | | TAVUSH | 114-B-b | K-38-114 | 40 | 59 | 52 | 44 | 52 | 41 | 1550 | 750 | 800 | 63 | III | L | D | | | |
| TAVU-114-0240 | | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 56 | 44 | 52 | 36 | 1393 | 350 | 2000 | 68 | III | M | C | | | |
| TAVU-114-0250 | | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 44 | 44 | 51 | 51 | 1340 | 600 | 1250 | 53 | III | M | C | | | |
| TAVU-114-0260 | Dilijan-2 | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 38 | 44 | 52 | 33 | 1329 | 800 | 800 | 40 | II | H | B | | Central part of the town (offical buildings and houses) | |
| TAVU-114-0270 | | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 10 | 44 | 51 | 40 | 1295 | 150 | 450 | 8 | III | M | C | | | |
| TAVU-114-0280 | Dilijan-1 | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 12 | 44 | 52 | 10 | 1325 | 900 | 550 | 62 | II | H | B | | | High risk on destruction of houses and other objects, threatens the roads and communications(12,000 persons) |
| TAVU-114-0290 | | TAVUSH | Dilijan | K-38-114 | 40 | 42 | 57 | 44 | 52 | 8.9 | 1593 | 200 | 450 | 8 | III | M | C | | | |
| TAVU-114-0300 | | TAVUSH | Dilijan | K-38-114 | 40 | 41 | 1.7 | 44 | 51 | 38 | 1727 | 250 | 400 | 10 | III | M | C | | | |
| TAVU-114-0310 | | TAVUSH | 114-D-c | K-38-114 | 40 | 40 | 29 | 44 | 52 | 42 | 1905 | 200 | 300 | 9 | III | L | D | | | |
| TAVU-114-0320 | | TAVUSH | 114-D-b | K-38-114 | 40 | 49 | 3.1 | 44 | 52 | 58 | 1817 | 600 | 550 | 30 | III | L | D | | | |
| TAVU-114-0330 | Dilijan-3 | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 55 | 44 | 52 | 56 | 1299 | 1300 | 1300 | 101 | II | H | B | | | |
| TAVU-114-0340 | Dilijan-4 | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 14 | 44 | 53 | 32 | 1236 | 100 | 850 | 68 | II | H | B | | | |
| TAVU-114-0350 | | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 11 | 44 | 53 | 17 | 1610 | 300 | 800 | 22 | III | M | C | | | |
| TAVU-114-0360 | | TAVUSH | 114-B-b | K-38-114 | 40 | 47 | 30 | 44 | 54 | 46 | 1250 | 100 | 100 | 20 | III | L | D | | | |
| TAVU-114-0370 | | TAVUSH | 114-B-b | K-38-114 | 40 | 46 | 58 | 44 | 55 | 5.9 | 1166 | 250 | 600 | 49 | III | L | D | | | |
| TAVU-114-0380 | | TAVUSH | 114-B-b | K-38-114 | 40 | 46 | 51 | 44 | 55 | 40 | 1135 | 250 | 500 | 33 | III | L | D | | | |
| TAVU-114-0390 | | TAVUSH | 114-B-b | K-38-114 | 40 | 46 | 8.7 | 44 | 54 | 44 | 1308 | 200 | 650 | 18 | III | L | D | | | |
| TAVU-114-0400 | | TAVUSH | 114-B-d | K-38-114 | 40 | 45 | 56 | 44 | 54 | 39 | 1206 | 600 | 1350 | 33 | III | L | D | | | |
| TAVU-114-0410 | | TAVUSH | 114-B-d | K-38-114 | 40 | 45 | 13 | 44 | 54 | 53 | 1310 | 600 | 3400 | 93 | III | L | D | | | |
| TAVU-114-0420 | | TAVUSH | 114-B-d | K-38-114 | 40 | 45 | 20 | 44 | 55 | 21 | 1321 | 500 | 1700 | 49 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-114-0430 | | TAVUSH | Dilijan | K-38-114 | 40 | 45 | 37 | 44 | 55 | 31 | 1275 | 700 | 1600 | 73 | III | M | C | | | |
| TAVU-114-0440 | | TAVUSH | Dilijan | K-38-114 | 40 | 44 | 28 | 44 | 54 | 34 | 1525 | 400 | 500 | 17 | III | M | C | | | |
| TAVU-114-0450 | | TAVUSH | 114-D-d | K-38-114 | 40 | 41 | 43 | 44 | 54 | 36 | 2529 | 200 | 500 | 11 | III | L | D | | | |
| TAVU-114-0490 | | TAVUSH | Tekhut | K-38-114 | 40 | 56 | 58 | 44 | 56 | 34 | 1537 | 300 | 750 | 1 | III | M | C | | | |
| TAVU-114-0500 | | TAVUSH | Tekhut | K-38-114 | 40 | 55 | 15 | 44 | 56 | 16 | 1670 | 650 | 900 | 14 | III | M | C | | | |
| TAVU-114-0510 | | TAVUSH | Tekhut | K-38-114 | 40 | 55 | 26 | 44 | 57 | 11 | 1590 | 500 | 900 | 11 | III | M | C | | | |
| TAVU-114-0520 | | TAVUSH | Dilijan | K-38-114 | 40 | 54 | 38 | 44 | 56 | 6 | 1827 | 250 | 900 | 13 | III | M | C | | | |
| TAVU-114-0530 | | TAVUSH | Dilijan | K-38-114 | 40 | 52 | 28 | 44 | 55 | 52 | 1753 | 400 | 850 | 68 | III | M | C | | | |
| TAVU-114-0540 | | TAVUSH | Dilijan | K-38-114 | 40 | 52 | 7.1 | 44 | 56 | 50 | 1692 | 700 | 1550 | 173 | III | M | C | | | |
| TAVU-114-0550 | | TAVUSH | Dilijan | K-38-114 | 40 | 50 | 25 | 44 | 56 | 50 | 2278 | 450 | 1400 | 90 | III | M | C | | | |
| TAVU-114-0560 | | TAVUSH | Tekhut | K-38-114 | 40 | 46 | 46 | 44 | 56 | 18 | 1097 | 400 | 700 | 23 | III | M | C | | | |
| TAVU-114-0570 | | TAVUSH | 114-D-d | K-38-114 | 40 | 46 | 4 | 44 | 55 | 54 | 1297 | 150 | 300 | 1 | III | L | D | | | |
| TAVU-114-0580 | | TAVUSH | Tekhut | K-38-114 | 40 | 46 | 32 | 44 | 57 | 8.6 | 1099 | 100 | 100 | 25 | III | M | C | | | |
| TAVU-114-0590 | | TAVUSH | Tekhut | K-38-114 | 40 | 45 | 37 | 44 | 56 | 42 | 1424 | 400 | 650 | 1 | III | M | C | | | |
| TAVU-114-0600 | | TAVUSH | Tekhut | K-38-114 | 40 | 42 | 38 | 44 | 56 | 15 | 2262 | 100 | 100 | 10 | III | M | C | | | |
| TAVU-114-0610 | | TAVUSH | 114-D-d | K-38-114 | 40 | 42 | 22 | 44 | 55 | 53 | 2245 | 200 | 400 | 11 | III | L | D | | | |
| TAVU-114-0620 | | TAVUSH | 114-D-d | K-38-114 | 40 | 42 | 16 | 44 | 56 | 23 | 2079 | 250 | 450 | 6 | III | L | D | | | |
| TAVU-114-0630 | | TAVUSH | 114-D-d | K-38-114 | 40 | 42 | 4.3 | 44 | 56 | 20 | 2056 | 150 | 300 | 28 | III | L | D | | | |
| TAVU-114-0640 | | TAVUSH | 114-D-d | K-38-114 | 40 | 41 | 48 | 44 | 56 | 33 | 2003 | 400 | 700 | 24 | III | L | D | | | |
| TAVU-114-0650 | | TAVUSH | 114-D-d | K-38-114 | 40 | 41 | 43 | 44 | 56 | 41 | 1959 | 250 | 1000 | 7 | III | L | D | | | |
| TAVU-114-0660 | | TAVUSH | 114-D-d | K-38-114 | 40 | 41 | 4.3 | 44 | 55 | 38 | 2205 | 650 | 550 | 64 | III | L | D | | | |
| TAVU-114-0661 | | TAVUSH | 114-D-d | K-38-114 | 40 | 40 | 48 | 44 | 55 | 19 | 2168 | 500 | 700 | 29 | III | L | D | | | |
| TAVU-114-0662 | | TAVUSH | 114-D-d | K-38-114 | 40 | 40 | 32 | 44 | 56 | 47 | 1948 | 400 | 1050 | 36 | III | L | D | | | |
| TAVU-114-0670 | | TAVUSH | 114-B-b | K-38-114 | 40 | 56 | 29 | 44 | 57 | 24 | 1568 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-114-0680 | | TAVUSH | 114-B-b | K-38-114 | 40 | 59 | 13 | 44 | 58 | 29 | 1244 | 400 | 500 | 17 | III | L | D | | | |
| TAVU-114-0690 | | TAVUSH | 114-B-b | K-38-114 | 40 | 55 | 24 | 44 | 58 | 13 | 1686 | 700 | 900 | 57 | III | L | D | | | |
| TAVU-114-0700 | | TAVUSH | 114-B-d | K-38-114 | 40 | 52 | 47 | 44 | 57 | 50 | 1592 | 300 | 400 | 12 | III | L | D | | | |
| TAVU-114-0710 | | TAVUSH | 114-B-d | K-38-114 | 40 | 52 | 10 | 44 | 58 | 17 | 1667 | 800 | 3100 | 265 | III | L | D | | | |
| TAVU-114-0720 | | TAVUSH | 114-B-d | K-38-114 | 40 | 51 | 18 | 44 | 58 | 7.6 | 1892 | 800 | 1000 | 62 | III | L | D | | | |
| TAVU-114-0730 | | TAVUSH | 114-B-d | K-38-114 | 40 | 50 | 28 | 44 | 57 | 38 | 2293 | 300 | 600 | 18 | III | L | D | | | |
| TAVU-114-0740 | | TAVUSH | 114-D-b | K-38-114 | 40 | 49 | 5.6 | 44 | 57 | 24 | 1938 | 600 | 1150 | 66 | III | L | D | | | |
| TAVU-114-0750 | | TAVUSH | 114-D-b | K-38-114 | 40 | 48 | 42 | 44 | 57 | 50 | 1768 | 600 | 950 | 45 | III | L | D | | | |
| TAVU-114-0760 | | TAVUSH | Kuibishev | K-38-114 | 40 | 47 | 30 | 44 | 57 | 47 | 1344 | 200 | 450 | 9 | III | M | C | | | |
| TAVU-114-0770 | | TAVUSH | 114-D-b | K-38-114 | 40 | 47 | 0.9 | 44 | 58 | 5.3 | 1270 | | | 63 | III | L | D | | | |
| TAVU-114-0780 | | TAVUSH | Kuibishev | K-38-114 | 40 | 46 | 40 | 44 | 57 | 26 | 1097 | 100 | 200 | 4 | III | M | C | | | |
| TAVU-114-0790 | | TAVUSH | Kuibishev | K-38-114 | 40 | 46 | 12 | 44 | 57 | 54 | 1084 | 450 | 800 | 30 | III | M | C | | | |
| TAVU-114-0800 | Haghartsin (Ijevan-Hrazdan railroad, road 69th km) | TAVUSH | Haghartsin | K-38-114 | 40 | 46 | 15 | 44 | 58 | 27 | 1082 | 950 | 660 | 49 | II | H | B | | Railroad, road, Agstev river, houses | State importance railway and highway is threatened due to the closing of the Agstev River (2,000 persons) |
| TAVU-114-0810 | Parz lich | TAVUSH | Parz lich | K-38-114 | 40 | 45 | 4 | 44 | 57 | 47 | 1302 | 550 | 500 | 22 | I | M | B | | One of the famousest lakes in Armenia. | |
| TAVU-114-0820 | | TAVUSH | 114-D-d | K-38-114 | 40 | 44 | 46 | 44 | 58 | 9 | 1443 | 350 | 1000 | 33 | III | L | D | | | |
| TAVU-114-0830 | | TAVUSH | 114-D-d | K-38-114 | 40 | 41 | 41 | 44 | 57 | 7.7 | 2016 | 150 | 300 | 5 | III | L | D | | | |
| TAVU-114-0840 | | TAVUSH | 114-D-d | K-38-114 | 40 | 41 | 28 | 44 | 58 | 6 | 2096 | 300 | 700 | 19 | III | L | D | | | |
| TAVU-114-0850 | | TAVUSH | 114-D-d | K-38-114 | 40 | 40 | 34 | 44 | 57 | 14 | 1790 | 150 | 250 | 6 | III | L | D | | | |
| TAVU-114-0860 | | TAVUSH | 114-D-d | K-38-114 | 40 | 40 | 38 | 44 | 57 | 37 | 1834 | 300 | 300 | 9 | III | L | D | | | |
| TAVU-114-0870 | | TAVUSH | 114-B-b | K-38-114 | 40 | 57 | 32 | 44 | 59 | 33 | 1570 | 1100 | 450 | 42 | III | L | D | | | |
| TAVU-114-0880 | | TAVUSH | 114-B-b | K-38-114 | 40 | 56 | 6 | 44 | 59 | 14 | 1675 | 100 | 300 | 4 | III | L | D | | | |
| TAVU-114-0890 | | TAVUSH | 114-B-d | K-38-114 | 40 | 54 | 59 | 44 | 58 | 54 | 1535 | 150 | 150 | 2 | III | L | D | | | |
| TAVU-114-0900 | | TAVUSH | 114-B-d | K-38-114 | 40 | 54 | 60 | 44 | 59 | 0.9 | 1529 | 150 | 150 | 2 | III | L | D | | | |
| TAVU-114-0910 | | TAVUSH | 114-B-d | K-38-114 | 40 | 54 | 42 | 44 | 59 | 26 | 1513 | 150 | 400 | 7 | III | L | D | | | |
| TAVU-114-0920 | | TAVUSH | 114-B-d | K-38-114 | 40 | 54 | 34 | 44 | 59 | 38 | 1512 | 250 | 600 | 14 | III | L | D | | | |
| TAVU-114-0930 | | TAVUSH | 114-B-d | K-38-114 | 40 | 51 | 9 | 44 | 58 | 47 | 1855 | 1050 | 2300 | 180 | III | L | D | | | |
| TAVU-114-0940 | | TAVUSH | Kuibishev | K-38-114 | 40 | 47 | 7.5 | 44 | 59 | 14 | 1172 | 400 | 1400 | 47 | III | M | C | | | |
| TAVU-114-0950 | | TAVUSH | Kuibishev | K-38-114 | 40 | 45 | 41 | 44 | 58 | 50 | 1133 | 700 | 1200 | 67 | III | M | C | | | |
| TAVU-114-0960 | | TAVUSH | Gosh | K-38-114 | 40 | 44 | 12 | 44 | 59 | 14 | 1484 | 700 | 1300 | 78 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-114-0970 | Gosh | TAVUSH | Gosh | K-38-115 | 40 | 43 | 39 | 44 | 59 | 28 | 1367 | 240 | 400 | 42 | I | H | A | | | Historical cultural importance monument, high level risk from destruction of dwelling houses and |
| TAVU-114-0990 | | TAVUSH | Gosh | K-38-114 | 40 | 43 | 7.9 | 44 | 59 | 24 | 1459 | 700 | 1100 | 57 | III | M | C | | | |
| TAVU-114-1000 | | TAVUSH | 114-B-b | K-38-114 | 40 | 55 | 23 | 44 | 54 | 43 | 1720 | 350 | 700 | 21 | III | L | D | | | |
| TAVU-114-1010 | | TAVUSH | 114-B-b | K-38-114 | 40 | 54 | 59 | 44 | 55 | 12 | 1740 | 300 | 650 | 12 | III | L | D | | | |
| TAVU-114-1020 | | TAVUSH | 114-B-b | K-38-114 | 40 | 54 | 39 | 44 | 55 | 14 | 1734 | 400 | 450 | 15 | III | L | D | | | |
| TAVU-114-1030 | | TAVUSH | 114-B-b | K-38-114 | 40 | 54 | 28 | 44 | 53 | 59 | 1910 | 250 | 350 | 9 | III | L | D | | | |
| TAVU-114-1040 | | TAVUSH | 114-B-d | K-38-114 | 40 | 53 | 41 | 44 | 53 | 38 | 1838 | 500 | 1100 | 45 | III | L | D | | | |
| TAVU-114-1050 | | TAVUSH | 114-B-b | K-38-114 | 40 | 53 | 45 | 44 | 52 | 34 | 1819 | 250 | 200 | 3 | III | L | D | | | |
| TAVU-114-1060 | | TAVUSH | 114-B-d | K-38-114 | 40 | 53 | 35 | 44 | 54 | 18 | 1816 | 200 | 400 | 6 | III | L | D | | | |
| TAVU-114-1080 | | TAVUSH | 114-B-d | K-38-114 | 40 | 52 | 30 | 44 | 53 | 55 | 1830 | 300 | 400 | 14 | III | L | D | | | |
| TAVU-114-1090 | | TAVUSH | 114-B-d | K-38-114 | 40 | 52 | 35 | 44 | 54 | 44 | 1712 | 350 | 1000 | 32 | III | L | D | | | |
| TAVU-114-1100 | | TAVUSH | 114-B-d | K-38-114 | 40 | 51 | 32 | 44 | 52 | 54 | 1917 | 500 | 950 | 39 | III | L | D | | | |
| TAVU-114-1110 | | TAVUSH | 114-B-d | K-38-114 | 40 | 51 | 36 | 44 | 53 | 52 | 1853 | 700 | 1400 | 96 | III | L | D | | | |
| TAVU-114-1120 | | TAVUSH | 114-B-d | K-38-114 | 40 | 51 | 22 | 44 | 52 | 38 | 1928 | 500 | 1000 | 36 | III | L | D | | | |
| TAVU-114-1130 | | TAVUSH | 114-B-d | K-38-114 | 40 | 51 | 1 | 44 | 52 | 45 | 1945 | 400 | 900 | 31 | III | L | D | | | |
| TAVU-114-1140 | | TAVUSH | 114-B-d | K-38-114 | 40 | 50 | 31 | 44 | 52 | 14 | 2077 | 350 | 400 | 14 | III | L | D | | | |
| TAVU-114-1870 | | TAVUSH | 114-B-b | K-38-114 | 40 | 54 | 56 | 44 | 54 | 0.9 | 1795 | 150 | 200 | 3 | III | L | D | | | |
| TAVU-114-1970 | | TAVUSH | | | 40 | 52 | 48 | 44 | 55 | 8.2 | 1616 | | | 43 | III | L | D | | | |
| TAVU-115-0010 | Khashtarak | TAVUSH | Khashtarak | K-38-115 | 40 | 56 | 10 | 45 | 10 | 56 | 816 | 1000 | 1200 | 163 | II | H | B | | | |
| TAVU-115-0030 | | TAVUSH | Barhudarli | K-38-115 | 40 | 59 | 11 | 45 | 13 | 25 | 607 | 700 | 1000 | 37 | III | M | C | | | |
| TAVU-115-0040 | | TAVUSH | Ditavan | K-38-115 | 40 | 58 | 47 | 45 | 12 | 46 | 748 | 400 | 600 | 3 | III | M | C | | | |
| TAVU-115-0050 | Ditavan | TAVUSH | Ditavan | K-38-146 | 40 | 58 | 15 | 45 | 12 | 19 | 758 | 300 | 50 | 2 | II | H | B | Scarp regression possibility | 6ha displaced potential mass | |
| TAVU-115-0060 | | TAVUSH | Sharukar | K-38-115 | 40 | 53 | 18 | 45 | 0 | 45 | 1449 | 700 | 700 | 32 | III | M | C | | | |
| TAVU-115-0070 | | TAVUSH | Sharukar | K-38-115 | 40 | 53 | 30 | 45 | 1 | 25 | 1372 | 1300 | 1150 | 101 | III | M | C | | | |
| TAVU-115-0080 | Lusadzor | TAVUSH | Lusadzor | K-38-115 | 40 | 56 | 5 | 45 | 9 | 2 | 678 | 200 | 195 | 1 | II | M | C | | | |
| TAVU-115-0090 | | TAVUSH | Achajur | K-38-115 | 40 | 59 | 25 | 45 | 8 | 45 | 783 | 600 | 1300 | 39 | III | M | C | | | |
| TAVU-115-0100 | | TAVUSH | Achajur | K-38-115 | 40 | 59 | 9.1 | 45 | 9 | 3.7 | 740 | 550 | 1200 | 41 | III | M | C | | | |
| TAVU-115-0110 | | TAVUSH | Aknahpyur | K-38-115 | 40 | 57 | 28 | 45 | 9 | 54 | 595 | 800 | 1200 | 59 | III | M | C | | | |
| TAVU-115-0120 | | TAVUSH | Aknahpyur | K-38-115 | 40 | 56 | 52 | 45 | 9 | 29 | 639 | 2000 | 1600 | 172 | III | M | C | | | |
| TAVU-115-0130 | | TAVUSH | Enokavan | K-38-115 | 40 | 54 | 48 | 45 | 6 | 53 | 1053 | 550 | 1100 | 43 | III | M | C | | | |
| TAVU-115-0140 | Enokavan | TAVUSH | Enokavan | K-38-115 | 40 | 54 | 47 | 45 | 6 | 27 | 1158 | 900 | 580 | 31 | II | H | B | | | |
| TAVU-115-0150 | | TAVUSH | Gandzakar | K-38-115 | 40 | 51 | 23 | 45 | 10 | 2.6 | 943 | 1000 | 2700 | 163 | III | M | C | | | |
| TAVU-115-0160 | | TAVUSH | Gandzakar | K-38-115 | 40 | 51 | 7.1 | 45 | 8 | 60 | 907 | 1400 | 1700 | 149 | III | M | C | | | |
| TAVU-115-0170 | | TAVUSH | Gandzakar | K-38-115 | 40 | 50 | 32 | 45 | 10 | 1.8 | 1000 | 300 | 750 | 14 | III | M | C | | | |
| TAVU-115-0180 | | TAVUSH | Gandzakar | K-38-115 | 40 | 50 | 18 | 45 | 10 | 2.9 | 1006 | 300 | 800 | 9 | III | M | C | | | |
| TAVU-115-0190 | | TAVUSH | Gandzakar | K-38-115 | 40 | 49 | 59 | 45 | 9 | 46 | 979 | 400 | 400 | 9 | III | M | C | | | |
| TAVU-115-0200 | | TAVUSH | Gandzakar | K-38-115 | 40 | 50 | 3.5 | 45 | 8 | 53 | 1068 | 1900 | 2000 | 210 | III | M | C | | | |
| TAVU-115-0210 | Gandzakar | TAVUSH | Gandzakar | K-38-115 | 40 | 49 | 37 | 45 | 9 | 37 | 1025 | 250 | 600 | 56 | I | M | B | | | |
| TAVU-115-0220 | | TAVUSH | Gandzakar | K-38-115 | 40 | 49 | 39 | 45 | 10 | 9.2 | 1022 | 400 | 300 | 4 | III | M | C | | | |
| TAVU-115-0230 | | TAVUSH | Lusabats | K-38-115 | 40 | 52 | 10 | 45 | 10 | 24 | 1108 | 1000 | 1200 | 263 | III | M | C | | | |
| TAVU-115-0240 | | TAVUSH | Ijevan | K-38-115 | 40 | 53 | 11 | 45 | 10 | 7 | 843 | 1500 | 3000 | 239 | III | M | C | | | |
| TAVU-115-0260 | | TAVUSH | Getahovit | K-38-115 | 40 | 54 | 17 | 45 | 7 | 44 | 805 | 500 | 1200 | 51 | III | M | C | | | |
| TAVU-115-0270 | | TAVUSH | Getahovit | K-38-115 | 40 | 54 | 26 | 45 | 8 | 15 | 778 | 900 | 1500 | 92 | III | M | C | | | |
| TAVU-115-0271 | Getahovit1 | TAVUSH | Getahovit | K-38-115 | 40 | 53 | 51 | 45 | 8 | 12 | 756 | 450 | 200 | 5 | II | H | B | | Houses, roads, publick buildings | (500 persons) |
| TAVU-115-0272 | Getahovit2 | TAVUSH | Getahovit | K-38-115 | 40 | 53 | 49 | 45 | 8 | 27 | 718 | 430 | 290 | 4 | II | H | B | | Houses, roads, publick buildings | (500 persons) |
| TAVU-115-0280 | | TAVUSH | Lusahovit | K-38-115 | 40 | 54 | 52 | 45 | 11 | 27 | 949 | 550 | 750 | 20 | III | M | C | | | |
| TAVU-115-0290 | | TAVUSH | Aigehovit | K-38-115 | 40 | 58 | 1.2 | 45 | 15 | 6.6 | 819 | 600 | 1300 | 34 | III | M | C | | | |
| TAVU-115-0300 | | TAVUSH | Achajur | K-38-115 | 40 | 58 | 30 | 45 | 8 | 0 | 1027 | 600 | 1300 | 50 | III | M | C | | | |
| TAVU-115-0310 | Achajur | TAVUSH | Achajur | K-38-115 | 40 | 58 | 50 | 45 | 8 | 59 | 762 | 700 | 310 | 12 | II | H | B | | Houses,road, public buildings | High risk on destruction of houses and other objects (2,500 persons) |
| TAVU-115-0320 | | TAVUSH | Achajur | K-38-115 | 40 | 58 | 15 | 45 | 9 | 18 | 728 | 700 | 1100 | 36 | III | M | C | | | |
| TAVU-115-0321 | | TAVUSH | Aknakhpyur | K-38-115 | 40 | 57 | 51 | 45 | 9 | 17 | 757 | 250 | 600 | 10 | III | M | C | | | |
| TAVU-115-0322 | | TAVUSH | Aknakhpyur | K-38-115 | 40 | 57 | 39 | 45 | 9 | 7.2 | 880 | 100 | 100 | 1 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-115-0323 | Aknghbyur | TAVUSH | Aknghbyur | K-38-115 | 40 | 57 | 54 | 45 | 9 | 5 | 768 | 400 | 550 | 1 | II | H | B | | | |
| TAVU-115-0330 | | TAVUSH | Vazashen | K-38-115 | 40 | 59 | 11 | 45 | 17 | 22 | 962 | 1900 | 1800 | 173 | III | M | C | | | |
| TAVU-115-0340 | | TAVUSH | Vazashen | K-38-115 | 40 | 59 | 53 | 45 | 17 | 50 | 724 | 700 | 500 | 12 | III | M | C | | | |
| TAVU-115-0350 | Vazashen | TAVUSH | Vazashen | K-38-115 | 40 | 59 | 51 | 45 | 16 | 42 | 663 | 115 | 470 | 7 | II | H | B | | | |
| TAVU-115-0351 | | TAVUSH | Vazashen | K-38-115 | 40 | 59 | 30 | 45 | 16 | 39 | 701 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-0352 | | TAVUSH | Vazashen | K-38-115 | 40 | 59 | 50 | 45 | 16 | 56 | 725 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-0360 | | TAVUSH | Paravakar | K-38-115 | 40 | 58 | 31 | 45 | 22 | 12 | 755 | 1100 | 1550 | 75 | III | M | C | | | |
| TAVU-115-0370 | | TAVUSH | Paravakar | K-38-115 | 40 | 57 | 17 | 45 | 21 | 4.2 | 764 | 700 | 1500 | 60 | III | M | C | | | |
| TAVU-115-0380 | | TAVUSH | Varagavan | K-38-115 | 40 | 56 | 36 | 45 | 20 | 26 | 785 | 1700 | 1900 | 158 | III | L | D | | | |
| TAVU-115-0390 | | TAVUSH | Tsakhkavan | K-38-115 | 40 | 55 | 15 | 45 | 25 | 4.5 | 896 | 1300 | 3200 | 233 | III | L | D | | | |
| TAVU-115-0400 | | TAVUSH | Tovuz | K-38-115 | 40 | 55 | 11 | 45 | 25 | 51 | 803 | 750 | 1700 | 84 | III | M | C | | | |
| TAVU-115-0410 | | TAVUSH | Tovuz | K-38-115 | 40 | 54 | 53 | 45 | 23 | 51 | 937 | 550 | 900 | 19 | III | M | C | | | |
| TAVU-115-0420 | | TAVUSH | Tovuz | K-38-115 | 40 | 55 | 16 | 45 | 23 | 51 | 975 | 300 | 500 | 5 | III | M | C | | | |
| TAVU-115-0430 | | TAVUSH | Tovuz | K-38-115 | 40 | 55 | 26 | 45 | 23 | 37 | 991 | 350 | 400 | 4 | III | M | C | | | |
| TAVU-115-0440 | | TAVUSH | Tovuz | K-38-115 | 40 | 54 | 41 | 45 | 24 | 36 | 844 | 300 | 900 | 15 | III | M | C | | | |
| TAVU-115-0450 | | TAVUSH | Tovuz | K-38-115 | 40 | 55 | 47 | 45 | 27 | 21 | 730 | 1300 | 1900 | 147 | III | M | C | | | |
| TAVU-115-0460 | | TAVUSH | Aigepar | K-38-115 | 40 | 51 | 43 | 45 | 29 | 35 | 1020 | 1300 | 2000 | 164 | III | L | D | | | |
| TAVU-115-0470 | | TAVUSH | Choratan | K-38-115 | 40 | 51 | 9.9 | 45 | 29 | 36 | 1010 | 700 | 1300 | 43 | III | L | D | | | |
| TAVU-115-0480 | | TAVUSH | Choratan | K-38-115 | 40 | 52 | 46 | 45 | 27 | 27 | 1230 | 900 | 2150 | 75 | III | L | D | | | |
| TAVU-115-0490 | | TAVUSH | Norashen | K-38-115 | 40 | 52 | 44 | 45 | 28 | 0.3 | 1237 | 500 | 600 | 15 | III | L | D | | | |
| TAVU-115-0500 | | TAVUSH | Norashen | K-38-115 | 40 | 53 | 43 | 45 | 27 | 53 | 1009 | 1000 | 1200 | 37 | III | L | D | | | |
| TAVU-115-0510 | | TAVUSH | Norashen | K-38-115 | 40 | 53 | 59 | 45 | 28 | 37 | 877 | 600 | 400 | 10 | III | L | D | | | |
| TAVU-115-0520 | | TAVUSH | Mosesgekh | K-38-115 | 40 | 56 | 33 | 45 | 26 | 27 | 851 | 600 | 900 | 22 | III | L | D | | | |
| TAVU-115-0530 | | TAVUSH | Berd | K-38-115 | 40 | 51 | 51 | 45 | 24 | 17 | 1193 | 1800 | 1500 | 202 | III | L | D | | | |
| TAVU-115-0540 | | TAVUSH | Berd | K-38-115 | 40 | 52 | 20 | 45 | 24 | 34 | 1031 | 600 | 1800 | 66 | III | L | D | | | |
| TAVU-115-0550 | | TAVUSH | Berd | K-38-115 | 40 | 52 | 25 | 45 | 24 | 50 | 1061 | 400 | 700 | 15 | III | L | D | | | |
| TAVU-115-0560 | | TAVUSH | Berd | K-38-115 | 40 | 51 | 46 | 45 | 23 | 17 | 1078 | 750 | 900 | 22 | III | L | D | | | |
| TAVU-115-0570 | | TAVUSH | Berd | K-38-115 | 40 | 52 | 17 | 45 | 23 | 54 | 929 | 500 | 750 | 20 | III | L | D | | | |
| TAVU-115-0580 | | TAVUSH | Berd | K-38-115 | 40 | 52 | 32 | 45 | 23 | 49 | 924 | 150 | 600 | 5 | III | L | D | | | |
| TAVU-115-0590 | | TAVUSH | Berd | K-38-115 | 40 | 52 | 50 | 45 | 24 | 6.4 | 952 | 450 | 950 | 25 | III | L | D | | | |
| TAVU-115-0600 | | TAVUSH | Berd | K-38-115 | 40 | 54 | 11 | 45 | 20 | 39 | 1326 | 650 | 1000 | 32 | III | L | D | | | |
| TAVU-115-0610 | | TAVUSH | Chinchin | K-38-115 | 40 | 55 | 54 | 45 | 20 | 20 | 915 | 1800 | 2200 | 110 | III | L | D | | | |
| TAVU-115-0620 | Aygehovit | TAVUSH | Aygehovit | K-38-115 | 40 | 58 | 22 | 45 | 15 | 40 | 765 | 270 | 150 | 7 | I | M | B | | | |
| TAVU-115-0630 | | TAVUSH | Aigehovit | K-38-115 | 40 | 58 | 8.4 | 45 | 15 | 53 | 791 | 450 | 700 | 12 | III | L | D | | | |
| TAVU-115-0640 | | TAVUSH | Aigehovit | K-38-115 | 40 | 58 | 22 | 45 | 16 | 15 | 881 | 450 | 900 | 20 | III | L | D | | | |
| TAVU-115-0650 | | TAVUSH | Aigehovit | K-38-115 | 40 | 57 | 41 | 45 | 16 | 19 | 963 | 400 | 3100 | 52 | III | L | D | | | |
| TAVU-115-0660 | | TAVUSH | Aigehovit | K-38-115 | 40 | 58 | 59 | 45 | 15 | 43 | 700 | 500 | 400 | 6 | III | L | D | | | |
| TAVU-115-0670 | | TAVUSH | 115-B-a | K-38-115 | 40 | 59 | 18 | 45 | 19 | 2.3 | 914 | 700 | 1700 | 29 | III | L | D | | | |
| TAVU-115-0680 | | TAVUSH | 115-B-a | K-38-115 | 40 | 59 | 26 | 45 | 19 | 34 | 974 | 500 | 1000 | 19 | III | L | D | | | |
| TAVU-115-0690 | | TAVUSH | 115-B-a | K-38-115 | 40 | 59 | 25 | 45 | 20 | 48 | 955 | 400 | 700 | 5 | III | L | D | | | |
| TAVU-115-0700 | | TAVUSH | 115-B-a | K-38-115 | 40 | 58 | 26 | 45 | 20 | 26 | 921 | 400 | 600 | 8 | III | L | D | | | |
| TAVU-115-0710 | | TAVUSH | 115-B-b | K-38-115 | 40 | 58 | 21 | 45 | 24 | 52 | 825 | 600 | 600 | 19 | III | L | D | | | |
| TAVU-115-0720 | | TAVUSH | 115-B-b | K-38-115 | 40 | 57 | 40 | 45 | 27 | 20 | 859 | 300 | 1300 | 18 | III | L | D | | | |
| TAVU-115-0730 | | TAVUSH | 115-B-b | K-38-115 | 40 | 57 | 26 | 45 | 27 | 8 | 900 | 750 | 1500 | 51 | III | L | D | | | |
| TAVU-115-0740 | | TAVUSH | 115-B | K-38-115 | 40 | 57 | 23 | 45 | 22 | 32 | 749 | 500 | 850 | 25 | III | L | D | | | |
| TAVU-115-0750 | | TAVUSH | 115-B | K-38-115 | 40 | 57 | 6.9 | 45 | 23 | 55 | 852 | 450 | 950 | 24 | III | L | D | | | |
| TAVU-115-0760 | | TAVUSH | 115-B | K-38-115 | 40 | 56 | 46 | 45 | 22 | 48 | 911 | 500 | 1200 | 23 | III | L | D | | | |
| TAVU-115-0770 | | TAVUSH | 115-B | K-38-115 | 40 | 57 | 3.9 | 45 | 21 | 57 | 787 | 500 | 900 | 28 | III | L | D | | | |
| TAVU-115-0780 | | TAVUSH | 115-B | K-38-115 | 40 | 56 | 16 | 45 | 22 | 11 | 975 | 500 | 1500 | 35 | III | L | D | | | |
| TAVU-115-0790 | | TAVUSH | 115-B | K-38-115 | 40 | 55 | 49 | 45 | 22 | 4.6 | 1118 | 800 | 600 | 16 | III | L | D | | | |
| TAVU-115-0800 | | TAVUSH | Alibeili | K-38-115 | 40 | 56 | 19 | 45 | 28 | 54 | 663 | 650 | 1200 | 50 | III | M | C | | | |
| TAVU-115-0810 | | TAVUSH | Aigepar | K-38-115 | 40 | 54 | 49 | 45 | 26 | 56 | 862 | 1000 | 2000 | 136 | III | M | C | | | |
| TAVU-115-0820 | | TAVUSH | 115-B-c | K-38-115 | 40 | 51 | 11 | 45 | 26 | 6.1 | 1296 | 250 | 500 | 5 | III | L | D | | | |
| TAVU-115-0830 | | TAVUSH | 115-B-c | K-38-115 | 40 | 50 | 1.5 | 45 | 27 | 7.6 | 1153 | 300 | 500 | 3 | III | L | D | | | |
| TAVU-115-0840 | | TAVUSH | 115-B-c | K-38-115 | 40 | 54 | 41 | 45 | 26 | 17 | 801 | 400 | 1100 | 19 | III | L | D | | | |
| TAVU-115-0850 | | TAVUSH | 115-B-c | K-38-115 | 40 | 53 | 48 | 45 | 26 | 3.8 | 961 | 200 | 600 | 7 | III | L | D | | | |
| TAVU-115-0860 | | TAVUSH | 115-B-c | K-38-115 | 40 | 53 | 41 | 45 | 25 | 46 | 941 | 300 | 700 | 7 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-115-0870 | Berd | TAVUSH | Berd | K-38-115 | 40 | 52 | 36 | 45 | 22 | 47 | 991 | 200 | 230 | 381 | I | M | B | | | |
| TAVU-115-0880 | | TAVUSH | 115-B | K-38-115 | 40 | 56 | 9 | 45 | 19 | 28 | 836 | 500 | 600 | 17 | III | L | D | | | |
| TAVU-115-0890 | | TAVUSH | 115-B | K-38-115 | 40 | 56 | 0.9 | 45 | 18 | 36 | 914 | 400 | 950 | 17 | III | L | D | | | |
| TAVU-115-0900 | | TAVUSH | 115-B | K-38-115 | 40 | 55 | 50 | 45 | 17 | 18 | 1245 | 700 | 1900 | 44 | III | L | D | | | |
| TAVU-115-0910 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 38 | 45 | 17 | 11 | 1218 | 900 | 2700 | 155 | III | L | D | | | |
| TAVU-115-0920 | | TAVUSH | 115-B | K-38-115 | 40 | 55 | 43 | 45 | 19 | 35 | 899 | 800 | 1200 | 46 | III | L | D | | | |
| TAVU-115-0930 | | TAVUSH | 115-B | K-38-115 | 40 | 55 | 26 | 45 | 18 | 55 | 977 | 1300 | 1950 | 132 | III | L | D | | | |
| TAVU-115-0940 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 56 | 45 | 19 | 11 | 984 | 400 | 1300 | 22 | III | L | D | | | |
| TAVU-115-0950 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 39 | 45 | 19 | 0.2 | 1049 | 400 | 1300 | 29 | III | L | D | | | |
| TAVU-115-0960 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 32 | 45 | 18 | 23 | 1058 | 750 | 1400 | 50 | III | L | D | | | |
| TAVU-115-0970 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 60 | 45 | 17 | 42 | 1143 | 600 | 1300 | 29 | III | L | D | | | |
| TAVU-115-0980 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 46 | 45 | 17 | 6.6 | 1075 | 1300 | 1150 | 26 | III | L | D | | | |
| TAVU-115-0990 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 19 | 45 | 17 | 2.1 | 1134 | 500 | 1450 | 53 | III | L | D | | | |
| TAVU-115-1000 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 2.8 | 45 | 16 | 28 | 1310 | 600 | 1400 | 42 | III | L | D | | | |
| TAVU-115-1010 | | TAVUSH | 115-B | K-38-115 | 40 | 56 | 46 | 45 | 14 | 31 | 1449 | 250 | 400 | 3 | III | L | D | | | |
| TAVU-115-1020 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 39 | 45 | 14 | 18 | 1555 | 200 | 450 | 4 | III | L | D | | | |
| TAVU-115-1030 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 41 | 45 | 14 | 40 | 1522 | 250 | 500 | 6 | III | L | D | | | |
| TAVU-115-1040 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 39 | 45 | 15 | 21 | 1520 | 550 | 400 | 9 | III | L | D | | | |
| TAVU-115-1050 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 28 | 45 | 15 | 12 | 1509 | 400 | 600 | 8 | III | L | D | | | |
| TAVU-115-1060 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 51 | 45 | 14 | 54 | 1639 | 650 | 1100 | 35 | III | L | D | | | |
| TAVU-115-1070 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 16 | 45 | 14 | 59 | 1545 | 300 | 400 | 5 | III | L | D | | | |
| TAVU-115-1080 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 43 | 45 | 18 | 3.3 | 1196 | 500 | 1150 | 22 | III | L | D | | | |
| TAVU-115-1090 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 57 | 45 | 19 | 6.2 | 1305 | 450 | 850 | 13 | III | L | D | | | |
| TAVU-115-1100 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 11 | 45 | 19 | 50 | 1393 | 300 | 350 | 4 | III | L | D | | | |
| TAVU-115-1110 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 0.6 | 45 | 18 | 42 | 1368 | 350 | 900 | 13 | III | L | D | | | |
| TAVU-115-1120 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 8.3 | 45 | 20 | 14 | 1334 | 400 | 600 | 12 | III | L | D | | | |
| TAVU-115-1130 | | TAVUSH | 115-B | K-38-115 | 40 | 52 | 38 | 45 | 20 | 29 | 1367 | 400 | 700 | 13 | III | L | D | | | |
| TAVU-115-1140 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 0.1 | 45 | 17 | 25 | 1187 | 400 | 1150 | 22 | III | L | D | | | |
| TAVU-115-1150 | | TAVUSH | 115-B | K-38-115 | 40 | 52 | 40 | 45 | 17 | 25 | 1272 | 350 | 700 | 9 | III | L | D | | | |
| TAVU-115-1160 | | TAVUSH | 115-B | K-38-115 | 40 | 52 | 29 | 45 | 16 | 27 | 1376 | 300 | 1600 | 22 | III | L | D | | | |
| TAVU-115-1170 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 25 | 45 | 14 | 43 | 1587 | 400 | 800 | 6 | III | L | D | | | |
| TAVU-115-1180 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 3 | 45 | 15 | 8.2 | 1585 | 500 | 450 | 7 | III | L | D | | | |
| TAVU-115-1190 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 8 | 45 | 16 | 5.1 | 1388 | 500 | 1300 | 26 | III | L | D | | | |
| TAVU-115-1200 | | TAVUSH | 115-B | K-38-115 | 40 | 50 | 42 | 45 | 16 | 22 | 1289 | 700 | 950 | 19 | III | L | D | | | |
| TAVU-115-1210 | | TAVUSH | 115-B | K-38-115 | 40 | 49 | 41 | 45 | 15 | 12 | 1476 | 450 | 950 | 47 | III | L | D | | | |
| TAVU-115-1230 | | TAVUSH | 115-B | K-38-115 | 40 | 50 | 20 | 45 | 19 | 44 | 1489 | 400 | 1200 | 12 | III | L | D | | | |
| TAVU-115-1240 | | TAVUSH | 115-B | K-38-115 | 40 | 50 | 59 | 45 | 18 | 55 | 1572 | 600 | 1100 | 37 | III | L | D | | | |
| TAVU-115-1250 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 34 | 45 | 16 | 45 | 1271 | 750 | 1000 | 25 | III | L | D | | | |
| TAVU-115-1260 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 31 | 45 | 17 | 10 | 1355 | 350 | 1200 | 17 | III | L | D | | | |
| TAVU-115-1270 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 45 | 45 | 17 | 32 | 1314 | 500 | 700 | 10 | III | L | D | | | |
| TAVU-115-1280 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 30 | 45 | 17 | 48 | 1420 | 500 | 800 | 15 | III | L | D | | | |
| TAVU-115-1290 | | TAVUSH | 115-B | K-38-115 | 40 | 52 | 15 | 45 | 18 | 23 | 1449 | 300 | 750 | 10 | III | L | D | | | |
| TAVU-115-1300 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 50 | 45 | 18 | 28 | 1526 | 500 | 1300 | 20 | III | L | D | | | |
| TAVU-115-1310 | | TAVUSH | 115-B | K-38-115 | 40 | 52 | 5 | 45 | 19 | 10 | 1499 | 300 | 450 | 8 | III | L | D | | | |
| TAVU-115-1320 | | TAVUSH | 115-B | K-38-115 | 40 | 52 | 0.2 | 45 | 19 | 37 | 1546 | 150 | 450 | 3 | III | L | D | | | |
| TAVU-115-1325 | Navur | TAVUSH | Navur | K-38-115 | 40 | 52 | 11 | 45 | 20 | 4 | 1509 | 200 | 600 | 10 | II | H | B | | | |
| TAVU-115-1330 | | TAVUSH | 115-B | K-38-115 | 40 | 51 | 29 | 45 | 21 | 36 | 1240 | 300 | 500 | 2 | III | L | D | | | |
| TAVU-115-1340 | | TAVUSH | 115-B | K-38-115 | 40 | 49 | 54 | 45 | 21 | 7.3 | 1338 | 1700 | 1600 | 164 | III | L | D | | | |
| TAVU-115-1350 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 57 | 45 | 22 | 36 | 1002 | 350 | 400 | 32 | III | L | D | | | |
| TAVU-115-1360 | | TAVUSH | 115-B | K-38-115 | 40 | 54 | 17 | 45 | 23 | 26 | 930 | 500 | 1300 | 20 | III | L | D | | | |
| TAVU-115-1370 | | TAVUSH | 115-B | K-38-115 | 40 | 53 | 6.1 | 45 | 15 | 38 | 1506 | 200 | 550 | 7 | III | L | D | | | |
| TAVU-115-1380 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 44 | 45 | 0 | 15 | 1440 | 450 | 400 | 11 | III | L | D | | | |
| TAVU-115-1390 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 9.6 | 45 | 0 | 48 | 1654 | 600 | 400 | 15 | III | L | D | | | |
| TAVU-115-1400 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 8.5 | 45 | 1 | 42 | 1499 | 200 | 500 | 7 | III | L | D | | | |
| TAVU-115-1410 | | TAVUSH | 115-A-a | K-38-115 | 40 | 57 | 23 | 45 | 1 | 26 | 1488 | 350 | 800 | 14 | III | L | D | | | |
| TAVU-115-1420 | | TAVUSH | 115-A-a | K-38-115 | 40 | 59 | 4 | 45 | 2 | 48 | 1232 | 650 | 1000 | 35 | III | L | D | | | |
| TAVU-115-1430 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 44 | 45 | 2 | 42 | 1149 | 350 | 450 | 7 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-115-1440 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 44 | 45 | 3 | 22 | 1306 | 500 | 350 | 7 | III | L | D | | | |
| TAVU-115-1450 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 33 | 45 | 3 | 52 | 1502 | 600 | 500 | 15 | III | L | D | | | |
| TAVU-115-1460 | | TAVUSH | 115-A-a | K-38-115 | 40 | 58 | 4.1 | 45 | 3 | 20 | 1416 | 300 | 450 | 9 | III | L | D | | | |
| TAVU-115-1470 | | TAVUSH | 115-A-a | K-38-115 | 40 | 57 | 31 | 45 | 3 | 2.9 | 1528 | 1200 | 650 | 47 | III | L | D | | | |
| TAVU-115-1480 | | TAVUSH | 115-A-a | K-38-115 | 40 | 55 | 45 | 45 | 0 | 35 | 1838 | 800 | 700 | 26 | III | L | D | | | |
| TAVU-115-1490 | | TAVUSH | 115-A-a | K-38-115 | 40 | 55 | 56 | 45 | 3 | 9.9 | 1785 | 600 | 450 | 12 | III | L | D | | | |
| TAVU-115-1500 | Makaravank monastery | TAVUSH | Makaravank monastery | K-38-115 | 40 | 58 | 32 | 45 | 5 | 40 | 1459 | 102 | 1920 | 195 | I | M | B | | Monastery ,complex | Unique historical cultural importance complex /10th century/ |
| TAVU-115-1510 | | TAVUSH | 115-A-a | K-38-115 | 40 | 59 | 8.6 | 45 | 5 | 33 | 1438 | 500 | 900 | 27 | III | L | D | | | |
| TAVU-115-1520 | | TAVUSH | 115-A-a | K-38-115 | 40 | 59 | 59 | 45 | 8 | 3.5 | 897 | 300 | 650 | 10 | III | L | D | | | |
| TAVU-115-1530 | | TAVUSH | 115-A-a | K-38-115 | 40 | 54 | 34 | 45 | 0 | 45 | 1550 | 2850 | 1500 | 256 | III | L | D | | | |
| TAVU-115-1540 | | TAVUSH | 115-A-a | K-38-115 | 40 | 56 | 4.4 | 45 | 6 | 15 | 1105 | 700 | 500 | 19 | III | L | D | | | |
| TAVU-115-1550 | | TAVUSH | 115-A-a | K-38-115 | 40 | 55 | 59 | 45 | 7 | 4.8 | 1135 | 800 | 600 | 34 | III | L | D | | | |
| TAVU-115-1560 | | TAVUSH | 115-A-a | K-38-115 | 40 | 55 | 26 | 45 | 7 | 12 | 1018 | 900 | 1200 | 51 | III | L | D | | | |
| TAVU-115-1570 | | TAVUSH | Yenokavan | K-38-115 | 40 | 55 | 9.7 | 45 | 5 | 2.2 | 1336 | 1400 | 2900 | 226 | III | M | C | | | |
| TAVU-115-1580 | | TAVUSH | Yenokavan | K-38-115 | 40 | 53 | 36 | 45 | 5 | 46 | 1201 | 1850 | 4600 | 662 | III | M | C | | | |
| TAVU-115-1590 | | TAVUSH | Yenokavan | K-38-115 | 40 | 54 | 26 | 45 | 4 | 38 | 1074 | 1000 | 900 | 60 | III | M | C | | | |
| TAVU-115-1600 | | TAVUSH | Yenokavan | K-38-115 | 40 | 54 | 13 | 45 | 4 | 56 | 971 | 300 | 600 | 15 | III | M | C | | | |
| TAVU-115-1610 | | TAVUSH | Getahovit | K-38-115 | 40 | 53 | 33 | 45 | 6 | 48 | 1066 | 900 | 1750 | 61 | III | M | C | | | |
| TAVU-115-1620 | | TAVUSH | Getahovit | K-38-115 | 40 | 54 | 57 | 45 | 8 | 15 | 878 | 600 | 900 | 23 | III | M | C | | | |
| TAVU-115-1630 | | TAVUSH | Getahovit | K-38-115 | 40 | 54 | 56 | 45 | 9 | 12 | 666 | 1300 | 600 | 39 | III | M | C | | | |
| TAVU-115-1640 | | TAVUSH | Ditavan | K-38-115 | 40 | 58 | 9.9 | 45 | 11 | 47 | 703 | 700 | 500 | 16 | III | M | C | | | |
| TAVU-115-1650 | | TAVUSH | Ditavan | K-38-115 | 40 | 57 | 52 | 45 | 12 | 19 | 841 | 800 | 550 | 21 | III | M | C | | | |
| TAVU-115-1660 | | TAVUSH | Ditavan | K-38-115 | 40 | 57 | 30 | 45 | 11 | 30 | 819 | 950 | 1300 | 61 | III | M | C | | | |
| TAVU-115-1670 | | TAVUSH | Ditavan | K-38-115 | 40 | 57 | 31 | 45 | 12 | 0.7 | 898 | 500 | 1500 | 41 | III | M | C | | | |
| TAVU-115-1680 | | TAVUSH | Khashtarak | K-38-115 | 40 | 56 | 59 | 45 | 10 | 51 | 735 | 1250 | 2000 | 133 | III | M | C | | | |
| TAVU-115-1690 | | TAVUSH | Khashtarak | K-38-115 | 40 | 55 | 28 | 45 | 11 | 36 | 1030 | 600 | 1200 | 37 | III | M | C | | | |
| TAVU-115-1700 | | TAVUSH | Khashtarak | K-38-115 | 40 | 55 | 39 | 45 | 13 | 60 | 1597 | 400 | 900 | 16 | III | M | C | | | |
| TAVU-115-1710 | | TAVUSH | Khashtarak | K-38-115 | 40 | 55 | 41 | 45 | 14 | 34 | 1548 | 350 | 550 | 9 | III | M | C | | | |
| TAVU-115-1720 | | TAVUSH | Khashtarak | K-38-115 | 40 | 55 | 26 | 45 | 14 | 32 | 1588 | 300 | 350 | 5 | III | M | C | | | |
| TAVU-115-1730 | | TAVUSH | 115-A-c | K-38-115 | 40 | 50 | 53 | 45 | 1 | 24 | 1947 | 1000 | 500 | 27 | III | L | D | | | |
| TAVU-115-1740 | | TAVUSH | 115-A-c | K-38-115 | 40 | 51 | 6.7 | 45 | 1 | 46 | 1769 | 400 | 750 | 21 | III | L | D | | | |
| TAVU-115-1750 | | TAVUSH | 115-A-c | K-38-115 | 40 | 51 | 21 | 45 | 2 | 32 | 1619 | 750 | 600 | 10 | III | L | D | | | |
| TAVU-115-1760 | | TAVUSH | 115-A-c | K-38-115 | 40 | 50 | 12 | 45 | 1 | 33 | 1726 | 600 | 1500 | 53 | III | L | D | | | |
| TAVU-115-1770 | | TAVUSH | 115-A-c | K-38-115 | 40 | 50 | 17 | 45 | 2 | 4 | 1716 | 1150 | 800 | 104 | III | L | D | | | |
| TAVU-115-1780 | | TAVUSH | 115-A-c | K-38-115 | 40 | 51 | 24 | 45 | 4 | 7.7 | 1349 | 900 | 700 | 45 | III | L | D | | | |
| TAVU-115-1790 | | TAVUSH | 115-A-c | K-38-115 | 40 | 51 | 27 | 45 | 4 | 50 | 1159 | 750 | 1100 | 38 | III | L | D | | | |
| TAVU-115-1800 | | TAVUSH | 115-A-c | K-38-115 | 40 | 50 | 58 | 45 | 5 | 23 | 1096 | 900 | 600 | 29 | III | L | D | | | |
| TAVU-115-1810 | | TAVUSH | 115-A-c | K-38-115 | 40 | 52 | 6.2 | 45 | 4 | 39 | 1380 | 500 | 1000 | 24 | III | L | D | | | |
| TAVU-115-1820 | | TAVUSH | Ijevan | K-38-115 | 40 | 51 | 58 | 45 | 7 | 16 | 855 | 700 | 1000 | 41 | III | M | C | | | |
| TAVU-115-1830 | | TAVUSH | 115-A-c | K-38-115 | 40 | 52 | 44 | 45 | 0 | 57 | 1573 | 600 | 1900 | 72 | III | L | D | | | |
| TAVU-115-1840 | | TAVUSH | 115-A-c | K-38-115 | 40 | 52 | 56 | 45 | 2 | 6.5 | 1691 | 1000 | 750 | 45 | III | L | D | | | |
| TAVU-115-1850 | | TAVUSH | 115-A-c | K-38-115 | 40 | 52 | 38 | 45 | 2 | 8.7 | 1718 | 600 | 500 | 22 | III | L | D | | | |
| TAVU-115-1860 | | TAVUSH | 115-A-c | K-38-115 | 40 | 52 | 52 | 45 | 4 | 0.9 | 1789 | 1200 | 1300 | 102 | III | L | D | | | |
| TAVU-115-1870 | | TAVUSH | 115-A-c | K-38-115 | 40 | 53 | 47 | 45 | 3 | 19 | 1332 | 1050 | 1400 | 85 | III | L | D | | | |
| TAVU-115-1880 | | TAVUSH | 115-A-d | K-38-115 | 40 | 49 | 45 | 45 | 11 | 29 | 1334 | 400 | 450 | 10 | III | L | D | | | |
| TAVU-115-1890 | | TAVUSH | 115-A-d | K-38-115 | 40 | 50 | 25 | 45 | 12 | 20 | 1324 | 900 | 600 | 26 | III | L | D | | | |
| TAVU-115-1900 | | TAVUSH | 115-A-d | K-38-115 | 40 | 50 | 42 | 45 | 13 | 11 | 1420 | 300 | 400 | 5 | III | L | D | | | |
| TAVU-115-1910 | | TAVUSH | 115-A-d | K-38-115 | 40 | 52 | 49 | 45 | 13 | 59 | 1747 | 900 | 500 | 20 | III | L | D | | | |
| TAVU-115-1920 | | TAVUSH | 115-A-d | K-38-115 | 40 | 53 | 7.4 | 45 | 12 | 37 | 1614 | 1400 | 1600 | 113 | III | L | D | | | |
| TAVU-115-1930 | | TAVUSH | 115-A-d | K-38-115 | 40 | 53 | 35 | 45 | 14 | 21 | 1643 | 1300 | 550 | 21 | III | L | D | | | |
| TAVU-115-1940 | | TAVUSH | 115-A-d | K-38-115 | 40 | 53 | 18 | 45 | 11 | 31 | 1201 | 600 | 600 | 23 | III | L | D | | | |
| TAVU-115-1950 | | TAVUSH | 115-A-d | K-38-115 | 40 | 53 | 37 | 45 | 11 | 46 | 1180 | 900 | 700 | 12 | III | L | D | | | |
| TAVU-115-1960 | | TAVUSH | 115-A-d | K-38-115 | 40 | 54 | 29 | 45 | 13 | 54 | 1689 | 300 | 450 | 4 | III | L | D | | | |
| TAVU-115-1970 | | TAVUSH | Lusahovit | K-38-115 | 40 | 54 | 7.8 | 45 | 10 | 40 | 967 | 1400 | 1500 | 127 | III | M | C | | | |
| TAVU-115-1980 | | TAVUSH | Lusadzor | K-38-115 | 40 | 57 | 31 | 45 | 7 | 41 | 1119 | 500 | 950 | 21 | III | M | C | | | |
| TAVU-115-1990 | | TAVUSH | Lusadzor | K-38-115 | 40 | 57 | 9.7 | 45 | 7 | 49 | 1040 | 700 | 700 | 33 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-115-2000 | | TAVUSH | Lusadzor | K-38-115 | 40 | 56 | 56 | 45 | 8 | 9.9 | 892 | 450 | 600 | 15 | III | M | C | | | |
| TAVU-115-2010 | | TAVUSH | Lusadzor | K-38-115 | 40 | 55 | 42 | 45 | 9 | 1.1 | 644 | 600 | 800 | 26 | III | M | C | | | |
| TAVU-115-2020 | | TAVUSH | Lusadzor | K-38-115 | 40 | 55 | 24 | 45 | 9 | 10 | 636 | 750 | 600 | 20 | III | M | C | | | |
| TAVU-115-2040 | | TAVUSH | 115-D-a | K-38-115 | 40 | 49 | 30 | 45 | 18 | 44 | 1394 | 400 | 900 | 20 | III | L | D | | | |
| TAVU-115-2050 | | TAVUSH | 115-D-a | K-38-115 | 40 | 48 | 23 | 45 | 17 | 47 | 1491 | 1900 | 1850 | 175 | III | L | D | | | |
| TAVU-115-2060 | | TAVUSH | 115-D-a | K-38-115 | 40 | 47 | 54 | 45 | 19 | 13 | 1400 | 900 | 700 | 44 | III | L | D | | | |
| TAVU-115-2070 | | TAVUSH | 115-D-a | K-38-115 | 40 | 49 | 25 | 45 | 21 | 48 | 1379 | 750 | 700 | 29 | III | L | D | | | |
| TAVU-115-2080 | | TAVUSH | 115-D-a | K-38-115 | 40 | 47 | 2.2 | 45 | 20 | 5.8 | 1549 | 800 | 1100 | 39 | III | L | D | | | |
| TAVU-115-2090 | | TAVUSH | 115-D-c | K-38-115 | 40 | 44 | 46 | 45 | 15 | 26 | 2037 | 750 | 600 | 30 | III | L | D | | | |
| TAVU-115-2100 | | TAVUSH | 115-D-c | K-38-115 | 40 | 45 | 16 | 45 | 15 | 17 | 1857 | 350 | 400 | 8 | III | L | D | | | |
| TAVU-115-2120 | | TAVUSH | 115-D-c | K-38-115 | 40 | 43 | 10 | 45 | 17 | 22 | 2054 | 700 | 400 | 13 | III | L | D | | | |
| TAVU-115-2130 | | TAVUSH | 115-D-c | K-38-115 | 40 | 45 | 1.6 | 45 | 19 | 10 | 1536 | 500 | 400 | 8 | III | L | D | | | |
| TAVU-115-2140 | | TAVUSH | 115-D-d | K-38-115 | 40 | 45 | 40 | 45 | 21 | 49 | 1333 | 500 | 900 | 26 | III | L | D | | | |
| TAVU-115-2150 | | TAVUSH | 115-D-d | K-38-115 | 40 | 45 | 17 | 45 | 22 | 51 | 1237 | 800 | 650 | 33 | III | L | D | | | |
| TAVU-115-2160 | | TAVUSH | 115-D-d | K-38-115 | 40 | 44 | 47 | 45 | 22 | 37 | 1322 | 500 | 750 | 22 | III | L | D | | | |
| TAVU-115-2170 | | TAVUSH | 115-D-b | K-38-115 | 40 | 47 | 46 | 45 | 22 | 45 | 1407 | 800 | 1150 | 20 | III | L | D | | | |
| TAVU-115-2180 | | TAVUSH | 115-D-b | K-38-115 | 40 | 47 | 49 | 45 | 26 | 55 | 1145 | 400 | 500 | 10 | III | L | D | | | |
| TAVU-115-2190 | | TAVUSH | 115-D-b | K-38-115 | 40 | 47 | 37 | 45 | 27 | 5.9 | 1296 | 300 | 400 | 8 | III | L | D | | | |
| TAVU-115-2200 | | TAVUSH | 115-D-b | K-38-115 | 40 | 46 | 54 | 45 | 29 | 50 | 980 | 2050 | 1300 | 162 | III | L | D | | | |
| TAVU-115-2220 | | TAVUSH | 115-C-a | K-38-115 | 40 | 49 | 46 | 45 | 2 | 55 | 1310 | 350 | 850 | 11 | III | L | D | | | |
| TAVU-115-2230 | | TAVUSH | 115-C-a | K-38-115 | 40 | 49 | 18 | 45 | 2 | 53 | 1198 | 300 | 850 | 9 | III | L | D | | | |
| TAVU-115-2240 | | TAVUSH | 115-C-a | K-38-115 | 40 | 48 | 8.2 | 45 | 2 | 13 | 1270 | 300 | 600 | 10 | III | L | D | | | |
| TAVU-115-2250 | | TAVUSH | 115-C-a | K-38-115 | 40 | 47 | 55 | 45 | 2 | 45 | 1068 | 800 | 800 | 24 | III | L | D | | | |
| TAVU-115-2260 | Hovq | TAVUSH | Hovq | K-38-115 | 40 | 47 | 33 | 45 | 2 | 1 | 1197 | 1000 | 4400 | 628 | I | H | A | | | |
| TAVU-115-2270 | | TAVUSH | 115-C-a | K-38-115 | 40 | 47 | 34 | 45 | 4 | 25 | 904 | 650 | 1300 | 33 | III | L | D | | | |
| TAVU-115-2280 | | TAVUSH | 115-C-a | K-38-115 | 40 | 48 | 30 | 45 | 5 | 13 | 895 | 300 | 900 | 13 | III | L | D | | | |
| TAVU-115-2290 | | TAVUSH | 115-C-a | K-38-115 | 40 | 48 | 34 | 45 | 5 | 29 | 831 | 300 | 800 | 7 | III | L | D | | | |
| TAVU-115-2300 | | TAVUSH | 115-C-a | K-38-115 | 40 | 48 | 30 | 45 | 6 | 11 | 881 | 400 | 900 | 10 | III | L | D | | | |
| TAVU-115-2310 | | TAVUSH | 115-C-a | K-38-115 | 40 | 49 | 21 | 45 | 6 | 57 | 861 | 850 | 850 | 26 | III | L | D | | | |
| TAVU-115-2320 | | TAVUSH | 115-C-a | K-38-115 | 40 | 49 | 43 | 45 | 7 | 8.2 | 897 | 500 | 600 | 10 | III | L | D | | | |
| TAVU-115-2330 | | TAVUSH | 115-C-a | K-38-115 | 40 | 50 | 22 | 45 | 7 | 26 | 885 | 1150 | 300 | 84 | III | L | D | | | |
| TAVU-115-2340 | | TAVUSH | 115-C-a | K-38-115 | 40 | 45 | 52 | 45 | 3 | 39 | 1540 | 950 | 650 | 28 | III | L | D | | | |
| TAVU-115-2350 | | TAVUSH | 115-C-a | K-38-115 | 40 | 46 | 45 | 45 | 5 | 49 | 1560 | 550 | 800 | 18 | III | L | D | | | |
| TAVU-115-2360 | | TAVUSH | 115-C-a | K-38-115 | 40 | 46 | 46 | 45 | 6 | 59 | 1509 | 1000 | 1850 | 94 | III | L | D | | | |
| TAVU-115-2370 | | TAVUSH | 115-C-a | K-38-115 | 40 | 47 | 29 | 45 | 7 | 40 | 1325 | 900 | 800 | 30 | III | L | D | | | |
| TAVU-115-2380 | | TAVUSH | 115-C-a | K-38-115 | 40 | 47 | 2.2 | 45 | 7 | 35 | 1466 | 500 | 1000 | 16 | III | L | D | | | |
| TAVU-115-2400 | | TAVUSH | 115-C-a | K-38-115 | 40 | 47 | 26 | 45 | 8 | 22 | 1389 | 500 | 550 | 17 | III | L | D | | | |
| TAVU-115-2410 | | TAVUSH | 115-C-b | K-38-115 | 40 | 49 | 15 | 45 | 8 | 36 | 1073 | 1300 | 2100 | 146 | III | L | D | | | |
| TAVU-115-2440 | | TAVUSH | 115-C-b | K-38-115 | 40 | 49 | 18 | 45 | 9 | 19 | 1038 | 300 | 500 | 11 | III | L | D | | | |
| TAVU-115-2460 | | TAVUSH | 115-C-b | K-38-115 | 40 | 47 | 18 | 45 | 8 | 57 | 1675 | 1200 | 1800 | 155 | III | L | D | | | |
| TAVU-115-2470 | | TAVUSH | 115-C-b | K-38-115 | 40 | 47 | 38 | 45 | 9 | 53 | 1578 | 500 | 500 | 8 | III | L | D | | | |
| TAVU-115-2480 | | TAVUSH | 115-C-b | K-38-115 | 40 | 46 | 27 | 45 | 8 | 42 | 1700 | 400 | 1300 | 30 | III | L | D | | | |
| TAVU-115-2490 | | TAVUSH | 115-C-b | K-38-115 | 40 | 46 | 20 | 45 | 8 | 54 | 1720 | 350 | 1250 | 23 | III | L | D | | | |
| TAVU-115-2500 | | TAVUSH | 115-C-b | K-38-115 | 40 | 47 | 25 | 45 | 10 | 25 | 1789 | 500 | 1400 | 38 | III | L | D | | | |
| TAVU-115-2510 | | TAVUSH | 115-C-b | K-38-115 | 40 | 47 | 41 | 45 | 13 | 47 | 1576 | 300 | 1200 | 12 | III | L | D | | | |
| TAVU-115-2520 | | TAVUSH | 115-C-b | K-38-115 | 40 | 47 | 29 | 45 | 13 | 25 | 1625 | 550 | 1200 | 24 | III | L | D | | | |
| TAVU-115-2530 | | TAVUSH | 115-C-b | K-38-115 | 40 | 46 | 12 | 45 | 12 | 10 | 1847 | 400 | 700 | 10 | III | L | D | | | |
| TAVU-115-2540 | | TAVUSH | 115-C-b | K-38-115 | 40 | 45 | 59 | 45 | 13 | 20 | 1823 | 400 | 900 | 16 | III | L | D | | | |
| TAVU-115-2550 | | TAVUSH | 115-C-b | K-38-115 | 40 | 45 | 57 | 45 | 14 | 5 | 1861 | 500 | 400 | 12 | III | L | D | | | |
| TAVU-115-2560 | | TAVUSH | 115-C-a | K-38-115 | 40 | 45 | 37 | 45 | 1 | 8.8 | 934 | 600 | 900 | 13 | III | L | D | | | |
| TAVU-115-2570 | | TAVUSH | Samed Vurgun | K-38-115 | 40 | 46 | 27 | 45 | 1 | 31 | 894 | 300 | 700 | 12 | III | M | C | | | |
| TAVU-115-2580 | | TAVUSH | Gosh | K-38-115 | 40 | 44 | 15 | 45 | 0 | 40 | 1062 | 400 | 1100 | 19 | III | M | C | | | |
| TAVU-115-2590 | | TAVUSH | 115-C-c | K-38-115 | 40 | 44 | 5.5 | 45 | 1 | 53 | 1069 | 400 | 1300 | 28 | III | L | D | | | |
| TAVU-115-2600 | | TAVUSH | 115-C-c | K-38-115 | 40 | 44 | 14 | 45 | 3 | 15 | 1316 | 1200 | 2400 | 166 | III | L | D | | | |
| TAVU-115-2610 | | TAVUSH | 115-C-c | K-38-115 | 40 | 44 | 44 | 45 | 4 | 26 | 1689 | 700 | 1600 | 50 | III | L | D | | | |
| TAVU-115-2620 | | TAVUSH | Polad | K-38-115 | 40 | 43 | 40 | 45 | 2 | 49 | 1009 | 400 | 500 | 9 | III | M | C | | | |
| TAVU-115-2630 | | TAVUSH | Polad | K-38-115 | 40 | 43 | 30 | 45 | 3 | 3.1 | 1016 | 400 | 400 | 7 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-115-2640 | Khachardzan-Polad | TAVUSH | Khachardzan-Polad | K-38-114 | 40 | 42 | 53 | 45 | 2 | 57 | 1113 | 630 | 1450 | 113 | I | M | B | | A house is destroyed by the secondary movement. | |
| TAVU-115-2650 | | TAVUSH | Polad | K-38-115 | 40 | 42 | 40 | 45 | 3 | 55 | 1260 | 1200 | 2100 | 127 | III | M | C | | | |
| TAVU-115-2660 | | TAVUSH | Polad | K-38-115 | 40 | 43 | 21 | 45 | 4 | 15 | 1113 | 600 | 900 | 16 | III | M | C | | | |
| TAVU-115-2670 | | TAVUSH | Polad | K-38-115 | 40 | 44 | 6.3 | 45 | 4 | 36 | 1437 | 800 | 2100 | 88 | III | M | C | | | |
| TAVU-115-2680 | | TAVUSH | 115-C-c | K-38-115 | 40 | 40 | 24 | 45 | 0 | 38 | 1591 | 1600 | 1400 | 95 | III | L | D | | | |
| TAVU-115-2690 | | TAVUSH | 115-C-c | K-38-115 | 40 | 41 | 19 | 45 | 1 | 32 | 1299 | 500 | 1250 | 26 | III | L | D | | | |
| TAVU-115-2700 | | TAVUSH | 115-C-c | K-38-115 | 40 | 41 | 49 | 45 | 2 | 15 | 1293 | 700 | 1450 | 42 | III | L | D | | | |
| TAVU-115-2705 | | TAVUSH | 115-B-a | K-38-115 | 40 | 56 | 52 | 45 | 18 | 25 | 1024 | 700 | 1450 | 8 | III | L | D | | | |
| TAVU-115-2710 | | TAVUSH | 115-C-c | K-38-115 | 40 | 41 | 6.8 | 45 | 2 | 15 | 1485 | 2400 | 1800 | 294 | III | L | D | | | |
| TAVU-115-2715 | | TAVUSH | | | 40 | 51 | 0 | 45 | 10 | 60 | 1056 | | | 17 | III | L | D | | | |
| TAVU-115-2720 | | TAVUSH | 115-C-c | K-38-115 | 40 | 41 | 46 | 45 | 4 | 7 | 1474 | 800 | 950 | 32 | III | L | D | | | |
| TAVU-115-2730 | | TAVUSH | 115-C-c | K-38-115 | 40 | 40 | 56 | 45 | 4 | 12 | 1641 | 800 | 1000 | 37 | III | L | D | | | |
| TAVU-115-2830 | | TAVUSH | Salakh | K-38-115 | 40 | 43 | 31 | 45 | 6 | 15 | 1384 | 1100 | 1100 | 54 | III | M | C | | | |
| TAVU-115-2831 | | TAVUSH | Salakh | K-38-115 | 40 | 43 | 20 | 45 | 6 | 46 | 1390 | 600 | 500 | 24 | III | M | C | | | |
| TAVU-115-2832 | | TAVUSH | Karakaya | K-38-115 | 40 | 42 | 43 | 45 | 6 | 31 | 1364 | 700 | 1200 | 53 | III | M | C | | | |
| TAVU-115-2833 | | TAVUSH | Karakaya | K-38-115 | 40 | 42 | 39 | 45 | 5 | 58 | 1129 | 550 | 600 | 29 | III | M | C | | | |
| TAVU-115-2850 | | TAVUSH | Salakh | K-38-115 | 40 | 43 | 54 | 45 | 7 | 33 | 1763 | 800 | 2000 | 118 | III | M | C | | | |
| TAVU-115-2860 | | TAVUSH | Salakh | K-38-115 | 40 | 43 | 48 | 45 | 8 | 14 | 1850 | 450 | 1400 | 36 | III | M | C | | | |
| TAVU-115-2870 | | TAVUSH | Salakh | K-38-115 | 40 | 43 | 30 | 45 | 7 | 50 | 1654 | 500 | 650 | 19 | III | M | C | | | |
| TAVU-115-3060 | | TAVUSH | 115-C-d | K-38-115 | 40 | 44 | 13 | 45 | 12 | 18 | 2525 | 500 | 1050 | 29 | III | L | D | | | |
| TAVU-115-3070 | | TAVUSH | 115-C-d | K-38-115 | 40 | 44 | 52 | 45 | 12 | 3.1 | 2068 | 650 | 950 | 22 | III | L | D | | | |
| TAVU-115-3080 | | TAVUSH | 115-C-d | K-38-115 | 40 | 45 | 15 | 45 | 12 | 34 | 2109 | 500 | 150 | 5 | III | L | D | | | |
| TAVU-115-3090 | | TAVUSH | 115-C-d | K-38-115 | 40 | 45 | 11 | 45 | 13 | 1.4 | 2257 | 700 | 300 | 10 | III | L | D | | | |
| TAVU-115-3100 | | TAVUSH | 115-C-d | K-38-115 | 40 | 44 | 30 | 45 | 14 | 8.2 | 2254 | 150 | 400 | 3 | III | L | D | | | |
| TAVU-115-3110 | | TAVUSH | 115-C-d | K-38-115 | 40 | 44 | 39 | 45 | 14 | 26 | 2212 | 450 | 1300 | 31 | III | L | D | | | |
| TAVU-115-3120 | | TAVUSH | 115-C | K-38-115 | 40 | 44 | 40 | 45 | 6 | 47 | 1796 | 350 | 800 | 17 | III | L | D | | | |
| TAVU-115-3130 | | TAVUSH | 115-C | K-38-115 | 40 | 44 | 56 | 45 | 7 | 58 | 2016 | 600 | 800 | 27 | III | L | D | | | |
| TAVU-115-3140 | | TAVUSH | 115-C | K-38-115 | 40 | 45 | 26 | 45 | 9 | 5.9 | 1837 | 350 | 800 | 15 | III | L | D | | | |
| TAVU-115-3150 | | TAVUSH | Aigehovit | K-38-115 | 40 | 58 | 52 | 45 | 18 | 8 | 1059 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3160 | | TAVUSH | Aigehovit | K-38-115 | 40 | 58 | 3.4 | 45 | 16 | 34 | 879 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3170 | | TAVUSH | Aigehovit | K-38-115 | 40 | 57 | 40 | 45 | 17 | 38 | 1258 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3180 | | TAVUSH | 115-B-c | K-38-115 | 40 | 53 | 33 | 45 | 16 | 23 | 1460 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3190 | | TAVUSH | 115-B-c | K-38-115 | 40 | 53 | 15 | 45 | 18 | 26 | 1278 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3200 | | TAVUSH | 115-B-c | K-38-115 | 40 | 50 | 52 | 45 | 17 | 23 | 1635 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3210 | | TAVUSH | Paravakar | K-38-115 | 40 | 57 | 56 | 45 | 24 | 30 | 930 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3220 | | TAVUSH | Movsesgegh | K-38-115 | 40 | 54 | 54 | 45 | 28 | 43 | 880 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3225 | Mosesgegh | TAVUSH | Movsesgegh | K-38-115 | 40 | 54 | 19 | 45 | 29 | 28 | 824 | 180 | 275 | 1 | I | M | B | | | |
| TAVU-115-3230 | | TAVUSH | Norashen | K-38-115 | 40 | 53 | 16 | 45 | 29 | 19 | 1209 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3240 | | TAVUSH | Norashen | K-38-115 | 40 | 52 | 11 | 45 | 27 | 42 | 1262 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3250 | | TAVUSH | Artsvaberd | K-38-115 | 40 | 50 | 9.7 | 45 | 26 | 3 | 1339 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3260 | | TAVUSH | Artsvaberd | K-38-115 | 40 | 50 | 11 | 45 | 27 | 31 | 1169 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3265 | Artsvaberd | TAVUSH | Artsvaberd | K-38-115 | 40 | 50 | 49 | 45 | 28 | 24 | 1204 | 170 | 160 | 1 | I | M | B | | | |
| TAVU-115-3270 | | TAVUSH | Gosh | K-38-115 | 40 | 43 | 48 | 45 | 1 | 14 | 1298 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3280 | | TAVUSH | 115-C-b | K-38-115 | 40 | 47 | 49 | 45 | 11 | 23 | 1866 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3290 | | TAVUSH | 115-C-b | K-38-115 | 40 | 45 | 20 | 45 | 14 | 23 | 2121 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3300 | | TAVUSH | 115-D-c | K-38-115 | 40 | 44 | 38 | 45 | 15 | 14 | 2132 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3310 | | TAVUSH | 115-D-c | K-38-115 | 40 | 44 | 35 | 45 | 16 | 16 | 2283 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3320 | | TAVUSH | 115-D-c | K-38-115 | 40 | 45 | 19 | 45 | 16 | 39 | 2007 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3340 | | TAVUSH | 115-A-c | K-38-115 | 40 | 50 | 52 | 45 | 3 | 21 | 1637 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3350 | | TAVUSH | 115-A-c | K-38-115 | 40 | 50 | 5.1 | 45 | 4 | 59 | 1377 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3370 | | TAVUSH | Enokavan | K-38-115 | 40 | 55 | 18 | 45 | 6 | 8.7 | 1292 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3380 | | TAVUSH | Khashtarak | K-38-115 | 40 | 55 | 41 | 45 | 10 | 40 | 771 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3390 | | TAVUSH | Lusahovit | K-38-115 | 40 | 55 | 0.5 | 45 | 12 | 46 | 1668 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3400 | | TAVUSH | Khashtarak | K-38-115 | 40 | 57 | 0.6 | 45 | 13 | 37 | 1395 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3410 | | TAVUSH | Aigehovit | K-38-115 | 40 | 59 | 31 | 45 | 15 | 51 | 688 | 100 | 100 | 1 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| TAVU-115-3420 | | TAVUSH | Aigehovit | K-38-115 | 40 | 57 | 39 | 45 | 15 | 35 | 1021 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3430 | | TAVUSH | 115-D-a | K-38-115 | 40 | 48 | 43 | 45 | 20 | 53 | 1399 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3440 | | TAVUSH | 115-D-c | K-38-115 | 40 | 42 | 33 | 45 | 16 | 34 | 2695 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3450 | | TAVUSH | 115-D-c | K-38-115 | 40 | 43 | 59 | 45 | 18 | 49 | 1816 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3460 | | TAVUSH | 115-D-c | K-38-115 | 40 | 42 | 0.6 | 45 | 18 | 47 | 2337 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3470 | | TAVUSH | 115-D-c | K-38-115 | 40 | 44 | 42 | 45 | 20 | 29 | 1731 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3480 | | TAVUSH | 115-D-c | K-38-115 | 40 | 43 | 0.9 | 45 | 20 | 3.8 | 1669 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3500 | | TAVUSH | 115-D-d | K-38-115 | 40 | 44 | 20 | 45 | 24 | 6.8 | 1786 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3510 | | TAVUSH | 115-D-b | K-38-115 | 40 | 48 | 16 | 45 | 29 | 13 | 1125 | 100 | 100 | 1 | III | L | D | | | |
| TAVU-115-3520 | | TAVUSH | Aknakhpyur | K-38-115 | 40 | 58 | 11 | 45 | 9 | 52 | 640 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-115-3530 | | TAVUSH | 115-B-a | K-38-115 | 40 | 56 | 28 | 45 | 15 | 7.7 | 1512 | 300 | 500 | 12 | III | L | D | | | |
| TAVU-115-3540 | | TAVUSH | 115-C-a | K-38-115 | 40 | 49 | 36 | 45 | 0 | 47 | 1947 | 2150 | 1000 | 220 | III | L | D | | | |
| TAVU-115-3550 | | TAVUSH | 115-A-c | K-38-115 | 40 | 49 | 60 | 45 | 6 | 7.3 | 1024 | 300 | 350 | 9 | III | L | D | | | |
| TAVU-115-3560 | | TAVUSH | Ijevan | K-38-115 | 40 | 51 | 58 | 45 | 9 | 24 | 762 | 300 | 300 | 7 | III | M | C | | | |
| TAVU-115-3570 | | TAVUSH | 115-D-a | K-38-115 | 40 | 47 | 33 | 45 | 19 | 46 | 1489 | 250 | 250 | 6 | III | L | D | | | |
| TAVU-115-3580 | | TAVUSH | 115-D-c | K-38-115 | 40 | 42 | 9.3 | 45 | 20 | 26 | 1744 | 300 | 300 | 8 | III | L | D | | | |
| TAVU-115-3590 | | TAVUSH | 115-D-c | K-38-115 | 40 | 41 | 19 | 45 | 21 | 13 | 1684 | 1200 | 800 | 70 | III | L | D | | | |
| TAVU-115-3600 | | TAVUSH | 115-D-d | K-38-115 | 40 | 42 | 56 | 45 | 23 | 7.3 | 1549 | 500 | 550 | 24 | III | L | D | | | |
| TAVU-115-3610 | | TAVUSH | 115-D-b | K-38-115 | 40 | 45 | 28 | 45 | 27 | 59 | 1511 | 350 | 300 | 10 | III | L | D | | | |
| TAVU-115-3620 | | TAVUSH | 115-B-c | K-38-115 | 40 | 54 | 23 | 45 | 16 | 46 | 1204 | 250 | 350 | 9 | III | L | D | | | |
| TAVU-115-3630 | | TAVUSH | 115-B-c | K-38-115 | 40 | 52 | 18 | 45 | 16 | 40 | 1362 | 150 | 200 | 5 | III | L | D | | | |
| TAVU-115-3640 | | TAVUSH | 115-B-c | K-38-115 | 40 | 50 | 18 | 45 | 21 | 39 | 1231 | 200 | 200 | 3 | III | L | D | | | |
| TAVU-115-3650 | | TAVUSH | Navur | K-38-115 | 40 | 51 | 54 | 45 | 18 | 59 | 1466 | 200 | 300 | 6 | III | M | C | | | |
| TAVU-115-3660 | | TAVUSH | 115-D-b | K-38-115 | 40 | 43 | 22 | 45 | 0 | 39 | 1367 | 350 | 1100 | 26 | III | L | D | | | |
| TAVU-115-3670 | | TAVUSH | 115-D-b | K-38-115 | 40 | 40 | 43 | 45 | 3 | 9.9 | 1721 | 700 | 300 | 21 | III | L | D | | | |
| TAVU-115-3690 | | TAVUSH | 115-D-b | K-38-115 | 40 | 47 | 53 | 45 | 5 | 58 | 1012 | 200 | 250 | 5 | III | L | D | | | |
| TAVU-115-3720 | | TAVUSH | 115-B-c | K-38-115 | 40 | 54 | 2.8 | 45 | 17 | 10 | 1075 | 300 | 300 | 8 | III | L | D | | | |
| TAVU-115-3730 | | TAVUSH | Enokavan | K-38-115 | 40 | 54 | 42 | 45 | 7 | 23 | 970 | 450 | 900 | 36 | III | M | C | | | |
| TAVU-115-3770 | | TAVUSH | Chinchin | K-38-115 | 40 | 54 | 54 | 45 | 21 | 26 | 1335 | 600 | 700 | 30 | III | M | C | | | |
| TAVU-116-0010 | | TAVUSH | 116-A-c | K-38-116 | 40 | 52 | 41 | 45 | 30 | 31 | 925 | 250 | 400 | 7 | III | L | D | | | |
| TAVU-116-0020 | | TAVUSH | 116-A-c | K-38-116 | 40 | 51 | 2.5 | 45 | 30 | 2.4 | 1064 | 400 | 600 | 10 | III | L | D | | | |
| TAVU-116-0030 | | TAVUSH | 116-A-c | K-38-116 | 40 | 53 | 18 | 45 | 31 | 38 | 729 | 200 | 500 | 8 | III | L | D | | | |
| TAVU-116-0040 | | TAVUSH | Aygedzor | K-38-116 | 40 | 49 | 42 | 45 | 32 | 12 | 730 | 350 | 500 | 14 | III | M | C | | | |
| TAVU-116-0050 | | TAVUSH | Aygedzor | K-38-116 | 40 | 49 | 6 | 45 | 32 | 9.5 | 913 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-116-0060 | Aygedzor | TAVUSH | Aygedzor | K-38-116 | 40 | 49 | 54 | 45 | 32 | 58 | 797 | 200 | 500 | 11 | II | H | B | | | |
| TAVU-116-0070 | | TAVUSH | Aygedzor | K-38-116 | 40 | 49 | 29 | 45 | 33 | 36 | 1017 | 100 | 100 | 1 | III | M | C | | | |
| TAVU-116-0080 | | TAVUSH | Chinari | K-38-116 | 40 | 51 | 35 | 45 | 35 | 21 | 909 | 200 | 450 | 9 | III | M | C | | | |
| TAVU-116-0090 | | TAVUSH | Chinari | K-38-116 | 40 | 50 | 51 | 45 | 34 | 47 | 778 | 800 | 1350 | 58 | III | M | C | | | |
| TAVU-116-0100 | | TAVUSH | Chinari | K-38-116 | 40 | 50 | 39 | 45 | 35 | 18 | 875 | 650 | 2100 | 97 | III | M | C | | | |
| TAVU-116-0110 | | TAVUSH | Aigedzor | K-38-116 | 40 | 49 | 55 | 45 | 34 | 34 | 961 | 850 | 1300 | 58 | III | M | C | | | |
| TAVU-116-0120 | | TAVUSH | Chinari | K-38-116 | 40 | 50 | 47 | 45 | 35 | 47 | 907 | 250 | 600 | 11 | III | M | C | | | |
| TAVU-126-0010 | | TAVUSH | 126-B-a | K-38-126 | 40 | 39 | 38 | 44 | 49 | 17 | 2294 | 400 | 1350 | 54 | III | L | D | | | |
| TAVU-126-0020 | | TAVUSH | 126-B-a | K-38-126 | 40 | 38 | 49 | 44 | 51 | 10 | 2176 | 1750 | 1100 | 103 | III | L | D | | | |
| VAYO-007-0010 | | VAYOTS DZOR | Elpin | J-38-007 | 39 | 49 | 40 | 45 | 6 | 17 | 1904 | 350 | 1050 | 18 | III | M | C | | | |
| VAYO-007-0015 | | VAYOTS DZOR | Elpin | J-38-007 | 39 | 48 | 46 | 45 | 4 | 31 | 1790 | | | 58 | III | M | C | | | |
| VAYO-007-0020 | | VAYOTS DZOR | Elpin | J-38-007 | 39 | 49 | 13 | 45 | 6 | 57 | 1619 | 300 | 500 | 12 | III | M | C | | | |
| VAYO-007-0030 | | VAYOTS DZOR | 007-A-d | J-38-007 | 39 | 50 | 45 | 45 | 7 | 49 | 2147 | 250 | 600 | 15 | III | L | D | | | |
| VAYO-007-0035 | | VAYOTS DZOR | 007-A-d | J-38-007 | 39 | 50 | 50 | 45 | 6 | 41 | 2156 | | | 124 | III | L | D | | | |
| VAYO-007-0040 | | VAYOTS DZOR | 007-A-c | J-38-007 | 39 | 50 | 12 | 45 | 7 | 9.3 | 1945 | 300 | 400 | 12 | III | L | D | | | |
| VAYO-007-0050 | | VAYOTS DZOR | 007-C-a | J-38-007 | 39 | 49 | 49 | 45 | 7 | 20 | 1829 | 200 | 500 | 10 | III | L | D | | | |
| VAYO-007-0060 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 50 | 4.9 | 45 | 8 | 10 | 1808 | 150 | 300 | 4 | III | L | D | | | |
| VAYO-007-0070 | | VAYOTS DZOR | 007-C-a | J-38-007 | 39 | 49 | 28 | 45 | 7 | 26 | 1707 | 200 | 200 | 3 | III | L | D | | | |
| VAYO-007-0080 | | VAYOTS DZOR | 007-C-a | J-38-007 | 39 | 49 | 39 | 45 | 7 | 47 | 1750 | 200 | 350 | 6 | III | L | D | | | |
| VAYO-007-0090 | | VAYOTS DZOR | Elpin | J-38-007 | 39 | 48 | 33 | 45 | 7 | 12 | 1630 | 1200 | 2500 | 170 | III | M | C | | | |
| VAYO-007-0100 | | VAYOTS DZOR | Elpin | J-38-007 | 39 | 47 | 42 | 45 | 7 | 19 | 1459 | 450 | 800 | 28 | III | M | C | | | |
| VAYO-007-0110 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 47 | 46 | 45 | 8 | 19 | 1555 | 500 | 450 | 23 | III | L | D | | | |
| VAYO-007-0120 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 55 | 45 | 9 | 1.9 | 1903 | 500 | 700 | 32 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-007-0130 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 30 | 45 | 8 | 39 | 1778 | 500 | 900 | 38 | III | L | D | | | |
| VAYO-007-0140 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 9.4 | 45 | 8 | 25 | 1719 | 250 | 350 | 8 | III | L | D | | | |
| VAYO-007-0150 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 37 | 45 | 9 | 23 | 1856 | 200 | 200 | 5 | III | L | D | | | |
| VAYO-007-0160 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 47 | 35 | 45 | 9 | 9.1 | 1610 | 200 | 400 | 7 | III | L | D | | | |
| VAYO-007-0170 | Rind | VAYOTS DZOR | Rind | J-38-7 | 39 | 46 | 44 | 45 | 8 | 49 | 1377 | 700 | 2500 | 43 | II | M | C | | The landslide is distributed in the abandoned village. | |
| VAYO-007-0180 | | VAYOTS DZOR | Chiva | J-38-007 | 39 | 46 | 17 | 45 | 9 | 29 | 1252 | 500 | 750 | 34 | III | M | C | | | |
| VAYO-007-0190 | | VAYOTS DZOR | Chiva | J-38-007 | 39 | 45 | 25 | 45 | 8 | 53 | 1201 | 700 | 900 | 53 | III | M | C | | | |
| VAYO-007-0200 | | VAYOTS DZOR | 007-A-d | J-38-007 | 39 | 51 | 13 | 45 | 10 | 24 | 2311 | 550 | 800 | 33 | III | L | D | | | |
| VAYO-007-0210 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 46 | 23 | 45 | 10 | 34 | 1320 | 250 | 250 | 5 | III | M | C | | | |
| VAYO-007-0220 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 45 | 45 | 45 | 9 | 49 | 1225 | 700 | 1200 | 75 | III | M | C | | | |
| VAYO-007-0230 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 46 | 4.9 | 45 | 10 | 53 | 1270 | 300 | 400 | 9 | III | M | C | | | |
| VAYO-007-0240 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 45 | 52 | 45 | 11 | 6.6 | 1227 | 350 | 350 | 12 | III | M | C | | | |
| VAYO-007-0250 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 45 | 13 | 45 | 9 | 56 | 1175 | 300 | 450 | 19 | III | M | C | | | |
| VAYO-007-0260 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 45 | 10 | 45 | 10 | 10 | 1212 | 400 | 750 | 24 | III | M | C | | | |
| VAYO-007-0270 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 44 | 47 | 45 | 9 | 46 | 1120 | 300 | 400 | 10 | III | M | C | | | |
| VAYO-007-0280 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 44 | 37 | 45 | 10 | 0.2 | 1102 | 400 | 350 | 11 | III | M | C | | | |
| VAYO-007-0290 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 44 | 48 | 45 | 11 | 7.5 | 1168 | 350 | 850 | 13 | III | M | C | | | |
| VAYO-007-0300 | | VAYOTS DZOR | Hors | J-38-007 | 39 | 52 | 56 | 45 | 11 | 58 | 2194 | 1000 | 1800 | 119 | III | M | C | | | |
| VAYO-007-0310 | | VAYOTS DZOR | Hors | J-38-007 | 39 | 51 | 55 | 45 | 12 | 34 | 1993 | 1750 | 2850 | 362 | III | M | C | | | |
| VAYO-007-0320 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 58 | 45 | 11 | 38 | 2176 | 100 | 200 | 2 | III | L | D | | | |
| VAYO-007-0330 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 47 | 52 | 45 | 11 | 29 | 1818 | 500 | 800 | 34 | III | L | D | | | |
| VAYO-007-0340 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 48 | 6.6 | 45 | 12 | 35 | 1745 | 250 | 200 | 5 | III | L | D | | | |
| VAYO-007-0350 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 46 | 20 | 45 | 11 | 36 | 1350 | 1100 | 2000 | 171 | III | M | C | | | |
| VAYO-007-0360 | | VAYOTS DZOR | Aghavnadzor | J-38-007 | 39 | 47 | 4.2 | 45 | 12 | 31 | 1476 | 1200 | 400 | 42 | III | M | C | | | |
| VAYO-007-0370 | | VAYOTS DZOR | Aghavnadzor | J-38-007 | 39 | 46 | 16 | 45 | 12 | 26 | 1316 | 450 | 500 | 21 | III | M | C | | | |
| VAYO-007-0380 | | VAYOTS DZOR | Rind | J-38-007 | 39 | 45 | 44 | 45 | 12 | 15 | 1245 | 550 | 400 | 17 | III | M | C | | | |
| VAYO-007-0390 | | VAYOTS DZOR | Aghavnadzor | J-38-007 | 39 | 46 | 0.7 | 45 | 12 | 35 | 1339 | 200 | 400 | 10 | III | M | C | | | |
| VAYO-007-0400 | | VAYOTS DZOR | Hors | J-38-007 | 39 | 52 | 50 | 45 | 13 | 52 | 2017 | 500 | 650 | 24 | III | M | C | | | |
| VAYO-007-0410 | | VAYOTS DZOR | Hors | J-38-007 | 39 | 50 | 58 | 45 | 12 | 39 | 1948 | 200 | 400 | 8 | III | M | C | | | |
| VAYO-007-0420 | Hors | VAYOTS DZOR | Hors | J-38-7 | 39 | 51 | 4 | 45 | 13 | 27 | 2013 | 2310 | 3190 | 286 | II | H | B | | | |
| VAYO-007-0430 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 56 | 45 | 14 | 0.9 | 1939 | 200 | 450 | 7 | III | L | D | | | |
| VAYO-007-0440 | | VAYOTS DZOR | Aghavnadzor | J-38-007 | 39 | 47 | 8.7 | 45 | 13 | 11 | 1545 | 1150 | 1100 | 117 | III | M | C | | | |
| VAYO-007-0450 | | VAYOTS DZOR | Aghavnadzor | J-38-007 | 39 | 46 | 37 | 45 | 13 | 3.8 | 1462 | 450 | 300 | 15 | III | M | C | | | |
| VAYO-007-0460 | Amaghu | VAYOTS DZOR | Amaghu | J-38-7 | 39 | 41 | 14 | 45 | 12 | 59 | 1467 | 873 | 1411 | 72 | I | M | B | | | |
| VAYO-007-0465 | | VAYOTS DZOR | 007-C-d | J-38-007 | 39 | 41 | 33 | 45 | 12 | 42 | 1347 | 200 | 500 | 9 | III | L | D | | | |
| VAYO-007-0470 | | VAYOTS DZOR | 007-C-d | J-38-007 | 39 | 40 | 27 | 45 | 13 | 58 | 1779 | 350 | 500 | 17 | III | L | D | | | |
| VAYO-007-0480 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 56 | 36 | 45 | 14 | 12 | 2187 | 400 | 1150 | 40 | III | L | D | | | |
| VAYO-007-0490 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 56 | 52 | 45 | 14 | 45 | 2309 | 350 | 800 | 20 | III | L | D | | | |
| VAYO-007-0510 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 56 | 41 | 45 | 14 | 56 | 2267 | 100 | 300 | 3 | III | L | D | | | |
| VAYO-007-0520 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 55 | 60 | 45 | 13 | 59 | 2009 | 500 | 350 | 16 | III | L | D | | | |
| VAYO-007-0521 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 55 | 15 | 45 | 11 | 29 | 2422 | 400 | 400 | 14 | III | L | D | | | |
| VAYO-007-0522 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 54 | 14 | 45 | 12 | 15 | 2064 | 250 | 250 | 7 | III | L | D | | | |
| VAYO-007-0523 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 54 | 6.3 | 45 | 11 | 50 | 2240 | 300 | 300 | 10 | III | L | D | | | |
| VAYO-007-0524 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 53 | 38 | 45 | 10 | 37 | 2388 | 800 | 1600 | 113 | III | L | D | | | |
| VAYO-007-0530 | | VAYOTS DZOR | 007-A-b | J-38-007 | 39 | 56 | 4.6 | 45 | 14 | 34 | 1987 | 250 | 400 | 8 | III | L | D | | | |
| VAYO-007-0540 | | VAYOTS DZOR | Aghnidozar | J-38-007 | 39 | 54 | 48 | 45 | 15 | 12 | 1930 | 900 | 2400 | 136 | III | M | C | | | |
| VAYO-007-0545 | Aghanidozar M-10 Road 27km | VYOTS DZOR | Aghnidozar | J-38-7 | 39 | 55 | 15 | 45 | 14 | 19 | 1780 | 30 | 230 | 1 | I | M | B | | | |
| VAYO-007-0550 | | VAYOTS DZOR | Taratumb | J-38-007 | 39 | 53 | 19 | 45 | 14 | 19 | 1843 | 1000 | 900 | 79 | III | M | C | | | |
| VAYO-007-0570 | | VAYOTS DZOR | Hors | J-38-007 | 39 | 51 | 7.6 | 45 | 14 | 49 | 1810 | 1500 | 2700 | 286 | III | M | C | | | |
| VAYO-007-0580 | | VAYOTS DZOR | 007-B-c | J-38-007 | 39 | 50 | 12 | 45 | 15 | 10 | 1664 | 300 | 350 | 9 | III | L | D | | | |
| VAYO-007-0590 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 52 | 45 | 14 | 45 | 1840 | 150 | 300 | 4 | III | L | D | | | |
| VAYO-007-0600 | | VAYOTS DZOR | 007-C-b | J-38-007 | 39 | 49 | 50 | 45 | 14 | 58 | 1821 | 350 | 550 | 19 | III | L | D | | | |
| VAYO-007-0610 | | VAYOTS DZOR | 007-B-c | J-38-007 | 39 | 50 | 49 | 45 | 15 | 17 | 1667 | 200 | 250 | 4 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-007-0620 | Aghavanadzor-reservoir | VAYOTS DZOR | Aghavanadzor-reservoir | J-38-7 | 39 | 47 | 53 | 45 | 14 | 36 | 1671 | 570 | 812 | 28 | III | M | C | | | |
| VAYO-007-0630 | | VAYOTS DZOR | Aghnidozar | J-38-007 | 39 | 47 | 47 | 45 | 15 | 11 | 1581 | 450 | 600 | 25 | III | M | C | | | |
| VAYO-007-0640 | | VAYOTS DZOR | Aghnidozar | J-38-007 | 39 | 47 | 1.3 | 45 | 14 | 29 | 1507 | 950 | 1350 | 100 | III | M | C | | | |
| VAYO-007-0650 | | VAYOTS DZOR | Aghnidozar | J-38-007 | 39 | 46 | 23 | 45 | 15 | 2.9 | 1340 | 400 | 300 | 10 | III | M | C | | | |
| VAYO-007-0660 | | VAYOTS DZOR | Aghnidozar | J-38-007 | 39 | 46 | 8.8 | 45 | 14 | 38 | 1342 | 400 | 250 | 8 | III | M | C | | | |
| VAYO-007-0670 | | VAYOTS DZOR | Arpi | J-38-007 | 39 | 43 | 54 | 45 | 14 | 53 | 1130 | 350 | 350 | 10 | III | M | C | | | |
| VAYO-007-0700 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 50 | 45 | 16 | 40 | 2430 | 650 | 1100 | 37 | III | L | D | | | |
| VAYO-007-0710 | | VAYOTS DZOR | Karaglukh | J-38-007 | 39 | 55 | 0.3 | 45 | 16 | 21 | 2099 | 900 | 2100 | 147 | III | M | C | | | |
| VAYO-007-0720 | | VAYOTS DZOR | Karaglukh | J-38-007 | 39 | 53 | 38 | 45 | 16 | 51 | 1875 | 800 | 2200 | 129 | III | M | C | | | |
| VAYO-007-0730 | | VAYOTS DZOR | Sali | J-38-007 | 39 | 52 | 27 | 45 | 16 | 38 | 1584 | 800 | 1050 | 66 | III | M | C | | | |
| VAYO-007-0740 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 50 | 4.6 | 45 | 16 | 28 | 1738 | 450 | 900 | 35 | III | M | C | | | |
| VAYO-007-0750 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 49 | 12 | 45 | 16 | 3.8 | 1758 | 300 | 1000 | 34 | III | M | C | | | |
| VAYO-007-0760 | | VAYOTS DZOR | 007-D-a | J-38-007 | 39 | 48 | 47 | 45 | 15 | 28 | 1936 | 250 | 300 | 7 | III | L | D | | | |
| VAYO-007-0770 | | VAYOTS DZOR | 007-D-a | J-38-007 | 39 | 48 | 22 | 45 | 16 | 26 | 1606 | 450 | 500 | 23 | III | L | D | | | |
| VAYO-007-0780 | | VAYOTS DZOR | Arpi | J-38-007 | 39 | 43 | 32 | 45 | 15 | 47 | 1264 | 1100 | 2200 | 166 | III | M | C | | | |
| VAYO-007-0790 | | VAYOTS DZOR | Karaglukh | J-38-007 | 39 | 55 | 14 | 45 | 17 | 9.5 | 2110 | 450 | 650 | 22 | III | M | C | | | |
| VAYO-007-0800 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 40 | 45 | 18 | 5.7 | 2352 | 200 | 500 | 9 | III | L | D | | | |
| VAYO-007-0810 | | VAYOTS DZOR | Sali | J-38-007 | 39 | 52 | 34 | 45 | 17 | 43 | 1711 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-007-0820 | | VAYOTS DZOR | Sali | J-38-007 | 39 | 52 | 38 | 45 | 18 | 2.5 | 1816 | 600 | 1500 | 65 | III | M | C | | | |
| VAYO-007-0830 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 49 | 37 | 45 | 17 | 11 | 1550 | 200 | 200 | 5 | III | M | C | | | |
| VAYO-007-0840 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 49 | 13 | 45 | 17 | 6.9 | 1578 | 400 | 250 | 10 | III | M | C | | | |
| VAYO-007-0850 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 49 | 38 | 45 | 18 | 7.2 | 1338 | 250 | 350 | 6 | III | M | C | | | |
| VAYO-007-0860 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 48 | 45 | 45 | 16 | 58 | 1446 | 450 | 300 | 16 | III | M | C | | | |
| VAYO-007-0870 | | VAYOTS DZOR | 007-D-a | J-38-007 | 39 | 47 | 28 | 45 | 17 | 53 | 1311 | 550 | 1400 | 68 | III | L | D | | | |
| VAYO-007-0880 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 32 | 45 | 18 | 36 | 2442 | 1100 | 1700 | 148 | III | L | D | | | |
| VAYO-007-0890 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 8.8 | 45 | 18 | 31 | 2344 | 300 | 400 | 9 | III | L | D | | | |
| VAYO-007-0900 | | VAYOTS DZOR | 007-B-c | J-38-007 | 39 | 54 | 0.8 | 45 | 18 | 29 | 2208 | 600 | 1150 | 59 | III | L | D | | | |
| VAYO-007-0910 | | VAYOTS DZOR | Shatin | J-38-007 | 39 | 49 | 7.3 | 45 | 19 | 35 | 1594 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-007-0920 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 43 | 28 | 45 | 19 | 6.6 | 1271 | 600 | 1000 | 57 | III | L | D | | | |
| VAYO-007-0930 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 42 | 27 | 45 | 18 | 30 | 1663 | 300 | 500 | 10 | III | L | D | | | |
| VAYO-007-0940 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 42 | 12 | 45 | 18 | 27 | 1655 | 200 | 300 | 5 | III | L | D | | | |
| VAYO-007-0950 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 40 | 16 | 45 | 18 | 59 | 2032 | 600 | 350 | 18 | III | L | D | | | |
| VAYO-007-0960 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 55 | 45 | 20 | 18 | 2572 | 1900 | 1800 | 261 | III | L | D | | | |
| VAYO-007-0970 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 24 | 45 | 20 | 23 | 2467 | 1350 | 750 | 84 | III | L | D | | | |
| VAYO-007-0980 | | VAYOTS DZOR | Horbategh | J-38-007 | 39 | 53 | 59 | 45 | 19 | 49 | 2005 | 950 | 1950 | 149 | III | M | C | | | |
| VAYO-007-0990 | Horbategh | VAYOTS DZOR | Horbategh | J-38-7 | 39 | 53 | 12 | 45 | 20 | 20 | 1783 | 300 | 250 | 44 | II | H | B | | | |
| VAYO-007-1000 | | VAYOTS DZOR | Eghegis | J-38-007 | 39 | 52 | 55 | 45 | 20 | 49 | 1789 | 250 | 400 | 9 | III | M | C | | | |
| VAYO-007-1010 | Yghegnadzor Nravan district | VAYOTS DZOR | Yeghegnadzor Noravan district | J-38-7 | 39 | 45 | 17 | 45 | 20 | 36 | 1192 | 400 | 550 | 17 | III | M | C | | | |
| VAYO-007-1020 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 57 | 39 | 45 | 21 | 47 | 3197 | 250 | 300 | 7 | III | L | D | | | |
| VAYO-007-1030 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 56 | 44 | 45 | 21 | 37 | 2955 | 1100 | 350 | 40 | III | L | D | | | |
| VAYO-007-1040 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 29 | 45 | 21 | 34 | 2652 | 200 | 450 | 6 | III | L | D | | | |
| VAYO-007-1050 | | VAYOTS DZOR | 007-B-a | J-38-007 | 39 | 55 | 16 | 45 | 21 | 46 | 2642 | 500 | 750 | 29 | III | L | D | | | |
| VAYO-007-1060 | | VAYOTS DZOR | Horbategh | J-38-007 | 39 | 54 | 17 | 45 | 21 | 22 | 2222 | 550 | 850 | 41 | III | M | C | | | |
| VAYO-007-1070 | | VAYOTS DZOR | Horbategh | J-38-007 | 39 | 53 | 35 | 45 | 21 | 15 | 2154 | 500 | 1300 | 56 | III | M | C | | | |
| VAYO-007-1080 | | VAYOTS DZOR | Alayaz | J-38-007 | 39 | 52 | 42 | 45 | 22 | 14 | 1859 | 700 | 1950 | 128 | III | M | C | | | |
| VAYO-007-1090 | Agarakadzor | VAYOTS DZOR | Agarakadzor | J-38-7 | 39 | 44 | 3 | 45 | 21 | 2 | 1166 | 100 | 480 | 1 | I | H | A | | | |
| VAYO-007-1100 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 42 | 46 | 45 | 21 | 10 | 1283 | 150 | 150 | 4 | III | L | D | | | |
| VAYO-007-1110 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 41 | 2.3 | 45 | 21 | 23 | 1722 | 150 | 300 | 5 | III | L | D | | | |
| VAYO-007-1120 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 40 | 43 | 45 | 22 | 4.5 | 1892 | 350 | 700 | 22 | III | L | D | | | |
| VAYO-007-1130 | | VAYOTS DZOR | 007-B-c | J-38-007 | 39 | 54 | 5 | 45 | 22 | 45 | 2444 | 1000 | 1850 | 153 | III | L | D | | | |
| VAYO-007-1140 | | VAYOTS DZOR | Vernashen | J-38-007 | 39 | 48 | 50 | 45 | 23 | 24 | 2225 | 500 | 800 | 38 | III | M | C | | | |
| VAYO-007-1150 | | VAYOTS DZOR | 007-B-b | J-38-007 | 39 | 56 | 12 | 45 | 24 | 31 | 2922 | 450 | 600 | 21 | III | L | D | | | |
| VAYO-007-1160 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 54 | 23 | 45 | 25 | 8.3 | 2243 | 300 | 700 | 19 | III | L | D | | | |
| VAYO-007-1170 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 53 | 17 | 45 | 25 | 7.2 | 2007 | 900 | 1900 | 127 | III | L | D | | | |
| VAYO-007-1180 | | VAYOTS DZOR | Vernashen | J-38-007 | 39 | 47 | 58 | 45 | 23 | 57 | 1907 | 300 | 500 | 15 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-007-1190 | | VAYOTS DZOR | Malishka | J-38-007 | 39 | 45 | 9.5 | 45 | 25 | 0 | 1378 | 1000 | 1900 | 161 | III | M | C | | | |
| VAYO-007-1200 | | VAYOTS DZOR | Malishka | J-38-007 | 39 | 44 | 53 | 45 | 24 | 2.7 | 1304 | 200 | 300 | 6 | III | M | C | | | |
| VAYO-007-1210 | | VAYOTS DZOR | Malishka | J-38-007 | 39 | 44 | 10 | 45 | 24 | 49 | 1313 | 200 | 500 | 9 | III | M | C | | | |
| VAYO-007-1220 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 41 | 46 | 45 | 24 | 36 | 1490 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-007-1230 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 40 | 12 | 45 | 24 | 16 | 1717 | 150 | 150 | 3 | III | L | D | | | |
| VAYO-007-1240 | | VAYOTS DZOR | 007-B-b | J-38-007 | 39 | 56 | 43 | 45 | 25 | 44 | 3038 | 350 | 600 | 19 | III | L | D | | | |
| VAYO-007-1250 | | VAYOTS DZOR | 007-B-b | J-38-007 | 39 | 55 | 51 | 45 | 26 | 25 | 2682 | 300 | 400 | 8 | III | L | D | | | |
| VAYO-007-1260 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 54 | 45 | 45 | 25 | 48 | 2159 | 600 | 350 | 20 | III | L | D | | | |
| VAYO-007-1270 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 54 | 53 | 45 | 26 | 22 | 2158 | 500 | 250 | 11 | III | L | D | | | |
| VAYO-007-1280 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 54 | 19 | 45 | 26 | 2.8 | 2058 | 450 | 1050 | 41 | III | L | D | | | |
| VAYO-007-1290 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 53 | 42 | 45 | 26 | 4 | 2020 | 1350 | 1200 | 141 | III | L | D | | | |
| VAYO-007-1300 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 52 | 48 | 45 | 26 | 22 | 1773 | 300 | 450 | 12 | III | L | D | | | |
| VAYO-007-1310 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 52 | 3.2 | 45 | 25 | 33 | 1932 | 1400 | 2000 | 228 | III | L | D | | | |
| VAYO-007-1320 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 52 | 22 | 45 | 26 | 25 | 1778 | 300 | 400 | 10 | III | L | D | | | |
| VAYO-007-1330 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 50 | 33 | 45 | 26 | 6.9 | 2451 | 250 | 600 | 16 | III | L | D | | | |
| VAYO-007-1340 | | VAYOTS DZOR | 007-D-b | J-38-007 | 39 | 47 | 29 | 45 | 26 | 10 | 1788 | 1000 | 1900 | 156 | III | L | D | | | |
| VAYO-007-1350 | | VAYOTS DZOR | Malishka | J-38-007 | 39 | 44 | 42 | 45 | 26 | 5.2 | 1687 | 200 | 350 | 7 | III | M | C | | | |
| VAYO-007-1360 | | VAYOTS DZOR | Malishka | J-38-007 | 39 | 44 | 24 | 45 | 25 | 40 | 1541 | 400 | 750 | 27 | III | M | C | | | |
| VAYO-007-1370 | | VAYOTS DZOR | 007-B-b | J-38-007 | 39 | 58 | 11 | 45 | 26 | 48 | 3049 | 200 | 350 | 6 | III | L | D | | | |
| VAYO-007-1380 | | VAYOTS DZOR | 007-B-b | J-38-007 | 39 | 55 | 25 | 45 | 27 | 5.3 | 2546 | 250 | 450 | 10 | III | L | D | | | |
| VAYO-007-1390 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 54 | 6.3 | 45 | 27 | 6.9 | 2057 | 500 | 250 | 12 | III | L | D | | | |
| VAYO-007-1400 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 51 | 47 | 45 | 26 | 54 | 2084 | 1300 | 2300 | 227 | III | L | D | | | |
| VAYO-007-1405 | Goghatanik | VAYOTS DZOR | Goghatanik | J-38-7 | 39 | 52 | 33 | 45 | 27 | 12 | 1745 | 160 | 50 | 3 | II | H | B | | | |
| VAYO-007-1410 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 50 | 47 | 45 | 27 | 36 | 2259 | 1200 | 550 | 52 | III | L | D | | | |
| VAYO-007-1420 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 50 | 26 | 45 | 26 | 58 | 2317 | 350 | 200 | 6 | III | L | D | | | |
| VAYO-007-1430 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 50 | 0.4 | 45 | 27 | 32 | 2328 | 550 | 450 | 21 | III | L | D | | | |
| VAYO-007-1440 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 49 | 55 | 45 | 27 | 48 | 2320 | 250 | 400 | 9 | III | L | D | | | |
| VAYO-007-1450 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 49 | 40 | 45 | 26 | 54 | 2324 | 800 | 1400 | 83 | III | L | D | | | |
| VAYO-007-1460 | | VAYOTS DZOR | 007-D-b | J-38-007 | 39 | 49 | 15 | 45 | 27 | 10 | 2193 | 300 | 1000 | 29 | III | L | D | | | |
| VAYO-007-1470 | | VAYOTS DZOR | 007-D-b | J-38-007 | 39 | 48 | 52 | 45 | 26 | 54 | 2066 | 350 | 250 | 8 | III | L | D | | | |
| VAYO-007-1480 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 44 | 25 | 45 | 27 | 28 | 1673 | 1150 | 1400 | 137 | III | L | D | | | |
| VAYO-007-1490 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 43 | 24 | 45 | 27 | 18 | 1506 | 900 | 600 | 56 | III | L | D | | | |
| VAYO-007-1500 | | VAYOTS DZOR | Azizbekov | J-38-007 | 39 | 41 | 53 | 45 | 27 | 7.9 | 1273 | 500 | 400 | 19 | III | M | C | | | |
| VAYO-007-1510 | | VAYOTS DZOR | Goghtanik | J-38-007 | 39 | 52 | 59 | 45 | 28 | 51 | 1965 | 550 | 600 | 26 | III | M | C | | | |
| VAYO-007-1520 | | VAYOTS DZOR | Goghtanik | J-38-007 | 39 | 52 | 6.6 | 45 | 28 | 9.4 | 1959 | 2000 | 2100 | 447 | III | M | C | | | |
| VAYO-007-1530 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 51 | 32 | 45 | 29 | 12 | 2238 | 300 | 450 | 11 | III | L | D | | | |
| VAYO-007-1540 | | VAYOTS DZOR | 007-B-d | J-38-007 | 39 | 51 | 7.1 | 45 | 28 | 25 | 2202 | 300 | 500 | 13 | III | L | D | | | |
| VAYO-007-1550 | | VAYOTS DZOR | 007-D-b | J-38-007 | 39 | 49 | 53 | 45 | 28 | 16 | 2447 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-007-1560 | | VAYOTS DZOR | 007-D-b | J-38-007 | 39 | 45 | 47 | 45 | 28 | 49 | 1930 | 900 | 1700 | 125 | III | L | D | | | |
| VAYO-007-1570 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 44 | 3.4 | 45 | 28 | 36 | 1552 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-007-1580 | | VAYOTS DZOR | Vardahovit | J-38-007 | 39 | 54 | 3.4 | 45 | 29 | 45 | 2054 | 250 | 300 | 9 | III | M | C | | | |
| VAYO-007-1590 | Getap | VAYOTS DZOR | Getap | J-38-7 | 39 | 45 | 19 | 45 | 18 | 15 | 1160 | 200 | 300 | 36 | I | M | B | | | |
| VAYO-007-1600 | | VAYOTS DZOR | Getap | J-38-007 | 39 | 44 | 53 | 45 | 18 | 14 | 1124 | 650 | 800 | 27 | III | M | C | | | |
| VAYO-007-1610 | | VAYOTS DZOR | 007-D-c | J-38-007 | 39 | 42 | 9.1 | 45 | 21 | 1.6 | 1451 | 200 | 150 | 1 | III | L | D | | | |
| VAYO-007-1620 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 42 | 33 | 45 | 25 | 2.5 | 1253 | 800 | 1200 | 48 | III | L | D | | | |
| VAYO-007-1630 | | VAYOTS DZOR | 007-D-d | J-38-007 | 39 | 41 | 58 | 45 | 25 | 56 | 1356 | 1300 | 1500 | 93 | III | L | D | | | |
| VAYO-007-1640 | Vernashen | VAYOTS DZOR | Vernashen | J-38-7 | 39 | 47 | 41 | 45 | 22 | 0 | 1633 | 200 | 60 | 18 | I | M | B | | | |
| VAYO-007-1660 | Chiva | VAYOTS DZOR | Chiva | J-38-7 | 39 | 46 | 4 | 45 | 8 | 20 | 1256 | 320 | 410 | 44 | II | H | B | Peogressing | School, houses,roads | High risk on destruction of houses, school and other objects(2,000 |
| VAYO-008-0010 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 13 | 45 | 30 | 41 | 2277 | 700 | 1200 | 65 | III | L | D | | | |
| VAYO-008-0020 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 54 | 25 | 45 | 30 | 36 | 2378 | 1000 | 400 | 38 | III | L | D | | | |
| VAYO-008-0030 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 50 | 47 | 45 | 30 | 9.4 | 2298 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-008-0040 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 29 | 45 | 31 | 10 | 2289 | 300 | 900 | 26 | III | L | D | | | |
| VAYO-008-0050 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 15 | 45 | 31 | 18 | 2443 | 200 | 600 | 13 | III | L | D | | | |
| VAYO-008-0060 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 18 | 45 | 31 | 43 | 2518 | 300 | 500 | 15 | III | L | D | | | |
| VAYO-008-0070 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 54 | 15 | 45 | 31 | 44 | 2656 | 400 | 500 | 20 | III | L | D | | | |
| VAYO-008-0080 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 54 | 1.1 | 45 | 31 | 25 | 2638 | 200 | 500 | 11 | III | L | D | | | |
| VAYO-008-0090 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 53 | 29 | 45 | 32 | 0.2 | 2768 | 500 | 1000 | 24 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-008-0100 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 51 | 0.9 | 45 | 31 | 27 | 2177 | 300 | 400 | 13 | III | L | D | | | |
| VAYO-008-0110 | | VAYOTS DZOR | Karmrashen | J-38-008 | 39 | 48 | 48 | 45 | 30 | 56 | 2133 | 1500 | 2400 | 339 | III | M | C | | | |
| VAYO-008-0120 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 57 | 21 | 45 | 33 | 13 | 2483 | 600 | 500 | 26 | III | L | D | | | |
| VAYO-008-0130 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 44 | 45 | 32 | 57 | 2511 | 1300 | 600 | 67 | III | L | D | | | |
| VAYO-008-0140 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 29 | 45 | 32 | 19 | 2408 | 400 | 400 | 14 | III | L | D | | | |
| VAYO-008-0150 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 43 | 45 | 33 | 37 | 2602 | 300 | 1000 | 30 | III | L | D | | | |
| VAYO-008-0160 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 20 | 45 | 33 | 4 | 2647 | 1100 | 1300 | 90 | III | L | D | | | |
| VAYO-008-0170 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 58 | 45 | 32 | 28 | 2545 | 600 | 1900 | 89 | III | L | D | | | |
| VAYO-008-0180 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 54 | 54 | 45 | 32 | 59 | 2830 | 400 | 450 | 17 | III | L | D | | | |
| VAYO-008-0190 | | VAYOTS DZOR | Karmrashen | J-38-008 | 39 | 48 | 44 | 45 | 32 | 26 | 2075 | 400 | 400 | 14 | III | M | C | | | |
| VAYO-008-0200 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 57 | 28 | 45 | 33 | 45 | 2635 | 900 | 1600 | 92 | III | L | D | | | |
| VAYO-008-0210 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 38 | 45 | 35 | 3.1 | 3089 | 350 | 450 | 14 | III | L | D | | | |
| VAYO-008-0220 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 15 | 45 | 34 | 55 | 3077 | 400 | 500 | 11 | III | L | D | | | |
| VAYO-008-0230 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 21 | 45 | 34 | 39 | 2964 | 400 | 850 | 34 | III | L | D | | | |
| VAYO-008-0240 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 54 | 59 | 45 | 34 | 38 | 2933 | 300 | 550 | 14 | III | L | D | | | |
| VAYO-008-0250 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 57 | 12 | 45 | 35 | 31 | 3063 | 450 | 650 | 26 | III | L | D | | | |
| VAYO-008-0260 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 53 | 45 | 35 | 46 | 3161 | 800 | 500 | 34 | III | L | D | | | |
| VAYO-008-0270 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 53 | 55 | 45 | 35 | 28 | 3007 | 500 | 900 | 41 | III | L | D | | | |
| VAYO-008-0280 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 56 | 48 | 45 | 36 | 47 | 3155 | 850 | 1400 | 96 | III | L | D | | | |
| VAYO-008-0290 | | VAYOTS DZOR | 008-A-a | J-38-008 | 39 | 55 | 47 | 45 | 37 | 14 | 3130 | 400 | 900 | 32 | III | L | D | | | |
| VAYO-008-0300 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 51 | 43 | 45 | 37 | 28 | 2513 | 900 | 1900 | 131 | III | L | D | | | |
| VAYO-008-0310 | | VAYOTS DZOR | 008-A-c | J-38-008 | 39 | 50 | 51 | 45 | 37 | 13 | 2338 | 500 | 1200 | 41 | III | L | D | | | |
| VAYO-008-0320 | | VAYOTS DZOR | 008-C-a | J-38-008 | 39 | 49 | 23 | 45 | 37 | 22 | 2191 | 450 | 900 | 29 | III | L | D | | | |
| VAYO-008-0330 | | VAYOTS DZOR | 008-C-c | J-38-008 | 39 | 41 | 42 | 45 | 36 | 24 | 1700 | 500 | 700 | 31 | III | L | D | | | |
| VAYO-008-0340 | | VAYOTS DZOR | 008-C-c | J-38-008 | 39 | 42 | 19 | 45 | 37 | 29 | 1762 | 700 | 1100 | 85 | III | L | D | | | |
| VAYO-008-0350 | | VAYOTS DZOR | 008-C-c | J-38-008 | 39 | 41 | 4.9 | 45 | 36 | 26 | 1925 | 800 | 1700 | 141 | III | L | D | | | |
| VAYO-008-0360 | | VAYOTS DZOR | Gndevaz | J-38-008 | 39 | 45 | 46 | 45 | 38 | 58 | 2098 | 1100 | 3000 | 326 | III | M | C | | | |
| VAYO-008-0370 | | VAYOTS DZOR | Saravan | J-38-008 | 39 | 42 | 4 | 45 | 38 | 50 | 2009 | 2400 | 3500 | 560 | III | M | C | | | |
| VAYO-008-0371 | Saravan | VAYOTS DZOR | Saravan | J-38-8 | 39 | 43 | 11 | 45 | 38 | 60 | 1733 | 500 | 320 | 1 | II | H | B | | | |
| VAYO-008-0380 | | VAYOTS DZOR | Saravan | J-38-008 | 39 | 41 | 21 | 45 | 37 | 53 | 2161 | 500 | 350 | 20 | III | M | C | | | |
| VAYO-008-0390 | | VAYOTS DZOR | Kechut | J-38-008 | 39 | 47 | 8.5 | 45 | 39 | 57 | 2086 | 1000 | 2200 | 174 | III | M | C | | | |
| VAYO-008-0400 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 41 | 32 | 45 | 40 | 3.3 | 2080 | 2000 | 3400 | 508 | III | L | D | | | |
| VAYO-008-0401 | Ughedzor-Kochbek | VAYOTS DZOR | Ughedzor-Kochbek | J-38-8 | 39 | 41 | 26 | 45 | 40 | 51 | 2013 | 200 | 500 | 21 | II | M | C | | | |
| VAYO-008-0402 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 41 | 17 | 45 | 41 | 10 | 2096 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-008-0403 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 41 | 4.6 | 45 | 40 | 58 | 2058 | 200 | 500 | 10 | III | L | D | | | |
| VAYO-008-0404 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 40 | 58 | 45 | 41 | 28 | 2165 | 350 | 400 | 12 | III | L | D | | | |
| VAYO-008-0410 | | VAYOTS DZOR | Kechut | J-38-008 | 39 | 47 | 43 | 45 | 40 | 53 | 2060 | 700 | 2100 | 145 | III | M | C | | | |
| VAYO-008-0420 | | VAYOTS DZOR | Kechut | J-38-008 | 39 | 46 | 35 | 45 | 41 | 16 | 2430 | 1400 | 2150 | 221 | III | M | C | | | |
| VAYO-008-0430 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 45 | 12 | 45 | 41 | 33 | 2453 | 550 | 1150 | 25 | III | L | D | | | |
| VAYO-008-0440 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 43 | 32 | 45 | 41 | 39 | 2414 | 250 | 700 | 16 | III | L | D | | | |
| VAYO-008-0450 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 42 | 33 | 45 | 41 | 25 | 2159 | 1000 | 2750 | 288 | III | L | D | | | |
| VAYO-008-0460 | Sisian pass -road | VAYOTS DZOR | Sisian pass -road | K-38-21 | 39 | 42 | 5 | 45 | 42 | 57 | 2418 | 1100 | 5400 | 263 | I | M | B | | | |
| VAYO-008-0470 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 52 | 57 | 45 | 43 | 30 | 2257 | 300 | 400 | 13 | III | L | D | | | |
| VAYO-008-0480 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 52 | 28 | 45 | 43 | 26 | 2325 | 300 | 400 | 12 | III | L | D | | | |
| VAYO-008-0490 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 51 | 16 | 45 | 43 | 14 | 2307 | 800 | 350 | 25 | III | L | D | | | |
| VAYO-008-0500 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 50 | 57 | 45 | 42 | 27 | 2167 | 550 | 1200 | 60 | III | L | D | | | |
| VAYO-008-0510 | | VAYOTS DZOR | 008-C-b | J-38-008 | 39 | 48 | 54 | 45 | 42 | 20 | 2109 | 400 | 550 | 20 | III | L | D | | | |
| VAYO-008-0530 | | VAYOTS DZOR | 008-C-d | J-38-008 | 39 | 41 | 0.1 | 45 | 42 | 7.2 | 2293 | 700 | 1500 | 56 | III | L | D | | | |
| VAYO-008-0540 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 53 | 47 | 45 | 44 | 26 | 2562 | 2100 | 1700 | 293 | III | L | D | | | |
| VAYO-008-0550 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 51 | 37 | 45 | 44 | 51 | 2594 | 550 | 2200 | 76 | III | L | D | | | |
| VAYO-008-0560 | | VAYOTS DZOR | 008-A-d | J-38-008 | 39 | 56 | 11 | 45 | 44 | 56 | 2771 | 500 | 400 | 21 | III | L | D | | | |
| VAYO-008-0570 | | VAYOTS DZOR | 008-B-a | J-38-008 | 39 | 55 | 46 | 45 | 45 | 50 | 2907 | 1300 | 1250 | 113 | III | L | D | | | |
| VAYO-008-0580 | | VAYOTS DZOR | 008-B-a | J-38-008 | 39 | 55 | 31 | 45 | 45 | 25 | 2846 | 700 | 1300 | 68 | III | L | D | | | |
| VAYO-008-0590 | | VAYOTS DZOR | 008-B-a | J-38-008 | 39 | 54 | 55 | 45 | 45 | 32 | 2903 | 1500 | 4000 | 415 | III | L | D | | | |
| VAYO-008-0600 | | VAYOTS DZOR | 008-B-c | J-38-008 | 39 | 53 | 5.3 | 45 | 45 | 59 | 2851 | 1100 | 400 | 36 | III | L | D | | | |
| VAYO-008-0610 | | VAYOTS DZOR | 008-B-c | J-38-008 | 39 | 52 | 28 | 45 | 46 | 0.5 | 2832 | 500 | 2400 | 111 | III | L | D | | | |
| VAYO-008-0620 | | VAYOTS DZOR | 008-B-c | J-38-008 | 39 | 50 | 41 | 45 | 45 | 49 | 2740 | 300 | 400 | 10 | III | L | D | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-008-0630 | | VAYOTS DZOR | 008-B-a | J-38-008 | 39 | 55 | 37 | 45 | 46 | 33 | 2945 | 350 | 500 | 15 | III | L | D | | | |
| VAYO-008-0640 | | VAYOTS DZOR | 008-B-a | J-38-008 | 39 | 55 | 32 | 45 | 46 | 53 | 2946 | 350 | 900 | 25 | III | L | D | | | |
| VAYO-008-0650 | | VAYOTS DZOR | 008-B-a | J-38-008 | 39 | 55 | 21 | 45 | 47 | 26 | 2899 | 700 | 1650 | 81 | III | L | D | | | |
| VAYO-019-0010 | | VAYOTS DZOR | Khachik | J-38-019 | 39 | 37 | 58 | 45 | 11 | 40 | 1767 | 1400 | 3000 | 200 | III | M | C | | | |
| VAYO-019-0020 | | VAYOTS DZOR | Khachik | J-38-019 | 39 | 39 | 32 | 45 | 12 | 51 | 2180 | 1200 | 2900 | 222 | III | M | C | | | |
| VAYO-019-0025 | Khachik | VAYOTS DZOR | Khachilk | J-38-19 | 39 | 37 | 15 | 45 | 12 | 21 | 1819 | 150 | 400 | 16 | II | M | C | | | |
| VAYO-019-0030 | | VAYOTS DZOR | Khachik | J-38-019 | 39 | 37 | 42 | 45 | 13 | 10 | 2104 | 1200 | 4400 | 131 | III | M | C | | | |
| VAYO-019-0040 | | VAYOTS DZOR | Khachik | J-38-019 | 39 | 36 | 34 | 45 | 13 | 13 | 1978 | 350 | 700 | 15 | III | M | C | | | |
| VAYO-019-0050 | | VAYOTS DZOR | Khachik | J-38-019 | 39 | 36 | 24 | 45 | 13 | 17 | 1910 | 300 | 800 | 18 | III | M | C | | | |
| VAYO-019-0060 | | VAYOTS DZOR | 019-A-b | J-38-019 | 39 | 39 | 38 | 45 | 14 | 40 | 2244 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0070 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 39 | 11 | 45 | 15 | 18 | 2094 | 600 | 1100 | 25 | III | L | D | | | |
| VAYO-019-0080 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 55 | 45 | 16 | 23 | 2156 | 250 | 650 | 9 | III | L | D | | | |
| VAYO-019-0090 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 26 | 45 | 16 | 0.1 | 2311 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0100 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 37 | 16 | 45 | 16 | 11 | 2553 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0110 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 51 | 45 | 17 | 11 | 2372 | 700 | 950 | 1 | III | L | D | | | |
| VAYO-019-0120 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 56 | 45 | 17 | 53 | 2101 | 550 | 700 | 38 | III | L | D | | | |
| VAYO-019-0130 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 5.4 | 45 | 18 | 5.3 | 2293 | 600 | 1300 | 70 | III | L | D | | | |
| VAYO-019-0140 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 37 | 18 | 45 | 17 | 60 | 2511 | 400 | 700 | 26 | III | L | D | | | |
| VAYO-019-0150 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 37 | 8.2 | 45 | 17 | 46 | 2604 | 500 | 650 | 29 | III | L | D | | | |
| VAYO-019-0160 | Gnisik | VAYOTS DZOR | Gnisik | J-38-19 | 39 | 39 | 15 | 45 | 18 | 12 | 2099 | 300 | 1050 | 122 | II | M | C | | | |
| VAYO-019-0170 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 24 | 45 | 19 | 5.3 | 2252 | 900 | 900 | 64 | III | L | D | | | |
| VAYO-019-0180 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 9.6 | 45 | 18 | 46 | 2212 | 1000 | 1450 | 76 | III | L | D | | | |
| VAYO-019-0190 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 37 | 17 | 45 | 18 | 48 | 2465 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0200 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 36 | 48 | 45 | 18 | 54 | 2424 | 400 | 800 | 30 | III | L | D | | | |
| VAYO-019-0210 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 36 | 54 | 45 | 19 | 24 | 2265 | 450 | 250 | 10 | III | L | D | | | |
| VAYO-019-0220 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 36 | 21 | 45 | 19 | 28 | 2294 | 1150 | 650 | 61 | III | L | D | | | |
| VAYO-019-0230 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 39 | 38 | 45 | 20 | 8.9 | 1971 | 250 | 300 | 8 | III | L | D | | | |
| VAYO-019-0240 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 44 | 45 | 19 | 55 | 2218 | 400 | 900 | 25 | III | L | D | | | |
| VAYO-019-0250 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 36 | 50 | 45 | 20 | 28 | 2155 | 300 | 300 | 9 | III | L | D | | | |
| VAYO-019-0260 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 36 | 31 | 45 | 20 | 6.2 | 2150 | 500 | 850 | 31 | III | L | D | | | |
| VAYO-019-0270 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 34 | 51 | 45 | 20 | 37 | 1971 | 700 | 2100 | 82 | III | L | D | | | |
| VAYO-019-0280 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 39 | 30 | 45 | 21 | 25 | 2110 | 900 | 1250 | 73 | III | L | D | | | |
| VAYO-019-0290 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 38 | 39 | 45 | 21 | 15 | 2092 | 400 | 1050 | 19 | III | L | D | | | |
| VAYO-019-0300 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 37 | 47 | 45 | 20 | 58 | 2386 | 400 | 550 | 14 | III | L | D | | | |
| VAYO-019-0310 | | VAYOTS DZOR | 019-B-a | J-38-019 | 39 | 36 | 11 | 45 | 21 | 58 | 2036 | 350 | 500 | 10 | III | L | D | | | |
| VAYO-019-0320 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 33 | 51 | 45 | 21 | 47 | 1973 | 1350 | 4300 | 315 | III | M | C | | | |
| VAYO-019-0330 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 37 | 24 | 45 | 23 | 40 | 2067 | 550 | 550 | 23 | III | L | D | | | |
| VAYO-019-0340 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 36 | 17 | 45 | 23 | 44 | 1994 | 950 | 2050 | 151 | III | L | D | | | |
| VAYO-019-0350 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 35 | 18 | 45 | 22 | 56 | 1998 | 150 | 250 | 6 | III | L | D | | | |
| VAYO-019-0360 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 34 | 26 | 45 | 22 | 25 | 1759 | 500 | 800 | 50 | III | M | C | | | |
| VAYO-019-0370 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 33 | 34 | 45 | 22 | 44 | 1738 | 600 | 550 | 39 | III | M | C | | | |
| VAYO-019-0380 | | VAYOTS DZOR | 019-B-d | J-38-019 | 39 | 32 | 38 | 45 | 23 | 3.8 | 2026 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0390 | | VAYOTS DZOR | 019-B-d | J-38-019 | 39 | 32 | 35 | 45 | 23 | 29 | 1900 | 300 | 400 | 11 | III | L | D | | | |
| VAYO-019-0400 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 39 | 42 | 45 | 24 | 3 | 1898 | 400 | 800 | 16 | III | L | D | | | |
| VAYO-019-0410 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 38 | 26 | 45 | 24 | 53 | 1984 | 300 | 550 | 15 | III | L | D | | | |
| VAYO-019-0420 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 36 | 47 | 45 | 23 | 53 | 1975 | 650 | 500 | 24 | III | L | D | | | |
| VAYO-019-0430 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 35 | 50 | 45 | 24 | 18 | 1833 | 200 | 350 | 9 | III | L | D | | | |
| VAYO-019-0440 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 35 | 5.9 | 45 | 24 | 45 | 1891 | 1250 | 1250 | 95 | III | M | C | | | |
| VAYO-019-0450 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 32 | 49 | 45 | 24 | 5.4 | 1718 | 250 | 250 | 6 | III | M | C | | | |
| VAYO-019-0460 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 32 | 14 | 45 | 24 | 40 | 1656 | 1800 | 1650 | 155 | III | M | C | | | |
| VAYO-019-0470 | | VAYOTS DZOR | Azatek | J-38-019 | 39 | 39 | 41 | 45 | 25 | 27 | 1679 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-019-0471 | | VAYOTS DZOR | Azatek | J-38-019 | 39 | 39 | 23 | 45 | 25 | 58 | 1629 | 500 | 500 | 19 | III | M | C | | | |
| VAYO-019-0472 | Azatek | VAYOTS DZOR | Azatek | J-38-19 | 39 | 39 | 4 | 45 | 26 | 40 | 1578 | 720 | 1400 | 58 | II | M | C | | | |
| VAYO-019-0473 | | VAYOTS DZOR | Azatek | J-38-019 | 39 | 38 | 45 | 45 | 25 | 51 | 1712 | 300 | 350 | 6 | III | M | C | | | |
| VAYO-019-0480 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 37 | 59 | 45 | 25 | 43 | 1861 | 150 | 700 | 16 | III | L | D | | | |
| VAYO-019-0490 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 37 | 27 | 45 | 25 | 57 | 1964 | 300 | 750 | 17 | III | L | D | | | |
| VAYO-019-0500 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 33 | 57 | 45 | 25 | 37 | 1791 | 500 | 800 | 23 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-019-0510 | | VAYOTS DZOR | 019-B-d | J-38-019 | 39 | 31 | 57 | 45 | 25 | 40 | 1683 | 250 | 250 | 5 | III | L | D | | | |
| VAYO-019-0520 | | VAYOTS DZOR | 019-B-d | J-38-019 | 39 | 31 | 43 | 45 | 25 | 42 | 1645 | 200 | 300 | 8 | III | L | D | | | |
| VAYO-019-0530 | | VAYOTS DZOR | 019-B-d | J-38-019 | 39 | 31 | 44 | 45 | 25 | 55 | 1687 | 250 | 350 | 11 | III | L | D | | | |
| VAYO-019-0540 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 37 | 10 | 45 | 26 | 53 | 1920 | 150 | 350 | 9 | III | L | D | | | |
| VAYO-019-0550 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 36 | 53 | 45 | 27 | 31 | 1887 | 200 | 350 | 9 | III | L | D | | | |
| VAYO-019-0560 | | VAYOTS DZOR | Khndzorut | J-38-019 | 39 | 33 | 59 | 45 | 26 | 38 | 1799 | 1250 | 950 | 57 | III | M | C | | | |
| VAYO-019-0570 | | VAYOTS DZOR | 019-B-d | J-38-019 | 39 | 31 | 53 | 45 | 26 | 37 | 1846 | 900 | 1750 | 89 | III | L | D | | | |
| VAYO-019-0580 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 37 | 10 | 45 | 28 | 24 | 1816 | 650 | 950 | 34 | III | L | D | | | |
| VAYO-019-0590 | | VAYOTS DZOR | Bartsruni | J-38-019 | 39 | 30 | 42 | 45 | 28 | 36 | 1869 | 1400 | 500 | 62 | III | M | C | | | |
| VAYO-019-0600 | | VAYOTS DZOR | Bartsruni | J-38-019 | 39 | 30 | 19 | 45 | 28 | 27 | 1969 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-019-0610 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 39 | 26 | 45 | 29 | 38 | 1492 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0620 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 37 | 59 | 45 | 29 | 52 | 1652 | 100 | 100 | 1 | III | L | D | | | |
| VAYO-019-0630 | Martiros | VAYOTS DZOR | Martiros | J-38-19 | 39 | 35 | 57 | 45 | 29 | 33 | 1889 | 1100 | 2400 | 148 | I | H | A | | | |
| VAYO-019-0635 | | VAYOTS DZOR | 019-B-b | J-38-019 | 39 | 35 | 31 | 45 | 29 | 24 | 1926 | 300 | 1500 | 42 | III | L | D | | | |
| VAYO-019-0650 | | VAYOTS DZOR | Bartsruni | J-38-019 | 39 | 31 | 20 | 45 | 29 | 23 | 1968 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-020-0010 | | VAYOTS DZOR | Zaritap | J-38-020 | 39 | 38 | 13 | 45 | 30 | 4.2 | 1606 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-020-0020 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 35 | 60 | 45 | 30 | 40 | 1889 | 500 | 750 | 60 | III | M | C | | | |
| VAYO-020-0021 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 35 | 34 | 45 | 30 | 60 | 1939 | 300 | 600 | 13 | III | M | C | | | |
| VAYO-020-0030 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 34 | 39 | 45 | 30 | 37 | 2144 | 350 | 900 | 29 | III | M | C | | | |
| VAYO-020-0040 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 33 | 3.5 | 45 | 30 | 11 | 2188 | 400 | 1800 | 52 | III | L | D | | | |
| VAYO-020-0050 | Bardzruni upstream dam | VAYOTS DZOR | Bardzruni | J-38-20 | 39 | 31 | 57 | 45 | 31 | 17 | 2444 | 1000 | 2150 | 79 | I | M | B | | The risk on dam collapse, but not for the village | |
| VAYO-020-0060 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 31 | 23 | 45 | 30 | 30 | 2210 | 500 | 1400 | 45 | III | L | D | | | |
| VAYO-020-0070 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 39 | 45 | 45 | 31 | 56 | 1431 | 650 | 1000 | 43 | III | L | D | | | |
| VAYO-020-0080 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 39 | 26 | 45 | 31 | 59 | 1528 | 200 | 550 | 10 | III | L | D | | | |
| VAYO-020-0090 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 39 | 20 | 45 | 32 | 7 | 1557 | 300 | 700 | 16 | III | L | D | | | |
| VAYO-020-0095 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 38 | 54 | 45 | 32 | 34 | 1634 | 300 | 600 | 15 | III | L | D | | | |
| VAYO-020-0100 | | VAYOTS DZOR | Zaritap | J-38-020 | 39 | 38 | 29 | 45 | 30 | 52 | 1556 | 350 | 600 | 22 | III | M | C | | | |
| VAYO-020-0105 | Zaritap | VAYOTS DZOR | Zaritap | J-38-20 | 39 | 38 | 15 | 45 | 30 | 57 | 1572 | 200 | 450 | 1 | II | H | B | | | |
| VAYO-020-0110 | | VAYOTS DZOR | Zaritap | J-38-020 | 39 | 37 | 24 | 45 | 31 | 51 | 1900 | 1350 | 3950 | 304 | III | M | C | | | |
| VAYO-020-0120 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 36 | 35 | 45 | 30 | 55 | 1812 | 500 | 2200 | 70 | III | M | C | | | |
| VAYO-020-0130 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 36 | 12 | 45 | 31 | 59 | 2169 | 1000 | 500 | 41 | III | M | C | | | |
| VAYO-020-0140 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 35 | 54 | 45 | 31 | 14 | 1989 | 300 | 500 | 14 | III | M | C | | | |
| VAYO-020-0150 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 35 | 43 | 45 | 31 | 19 | 2008 | 250 | 500 | 12 | III | M | C | | | |
| VAYO-020-0160 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 34 | 53 | 45 | 31 | 10 | 2101 | 300 | 350 | 11 | III | M | C | | | |
| VAYO-020-0170 | | VAYOTS DZOR | Martiros | J-38-020 | 39 | 34 | 43 | 45 | 31 | 39 | 2292 | 550 | 1150 | 43 | III | M | C | | | |
| VAYO-020-0180 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 34 | 5.1 | 45 | 31 | 43 | 2441 | 500 | 1200 | 29 | III | L | D | | | |
| VAYO-020-0190 | | VAYOTS DZOR | Akhta | J-38-020 | 39 | 38 | 56 | 45 | 33 | 23 | 1531 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-020-0200 | | VAYOTS DZOR | Akhta | J-38-020 | 39 | 39 | 8.9 | 45 | 33 | 30 | 1549 | 250 | 500 | 8 | III | M | C | | | |
| VAYO-020-0210 | | VAYOTS DZOR | Akhta | J-38-020 | 39 | 38 | 39 | 45 | 33 | 3.5 | 1676 | 500 | 1600 | 43 | III | M | C | | | |
| VAYO-020-0220 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 37 | 21 | 45 | 33 | 1.1 | 2072 | 650 | 1600 | 87 | III | L | D | | | |
| VAYO-020-0230 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 34 | 30 | 45 | 32 | 20 | 2422 | 300 | 500 | 14 | III | L | D | | | |
| VAYO-020-0240 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 34 | 3.2 | 45 | 33 | 2.4 | 2633 | 500 | 2000 | 90 | III | L | D | | | |
| VAYO-020-0250 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 33 | 41 | 45 | 32 | 46 | 2779 | 600 | 600 | 21 | III | L | D | | | |
| VAYO-020-0260 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 33 | 25 | 45 | 32 | 14 | 2711 | 900 | 1700 | 70 | III | L | D | | | |
| VAYO-020-0280 | Akhta | VAYOTS DZOR | Akhta | J-38-20 | 39 | 38 | 47 | 45 | 34 | 14 | 1728 | 300 | 370 | 22 | I | M | B | | The village is abandoned | |
| VAYO-020-0290 | | VAYOTS DZOR | Akhta | J-38-020 | 39 | 38 | 15 | 45 | 34 | 13 | 1638 | 200 | 250 | 5 | III | M | C | | | |
| VAYO-020-0291 | | VAYOTS DZOR | Akhta | J-38-020 | 39 | 38 | 5.2 | 45 | 34 | 19 | 1670 | 150 | 250 | 5 | III | M | C | | | |
| VAYO-020-0300 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 37 | 47 | 45 | 33 | 43 | 1900 | 550 | 2300 | 98 | III | L | D | | | |
| VAYO-020-0320 | Gomk-Gomur | VAYOTS DZOR | Gomk-Gomur | J-38-20 | 39 | 37 | 31 | 45 | 34 | 24 | 1941 | 570 | 1100 | 46 | I | M | B | | Two families remain living | |
| VAYO-020-0321 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 37 | 54 | 45 | 34 | 52 | 1732 | 300 | 300 | 10 | III | L | D | | | |
| VAYO-020-0322 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 38 | 5 | 45 | 34 | 34 | 1704 | 150 | 250 | 6 | III | L | D | | | |
| VAYO-020-0323 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 37 | 41 | 45 | 35 | 6.9 | 1791 | 200 | 400 | 8 | III | L | D | | | |
| VAYO-020-0330 | | VAYOTS DZOR | 020-A-c | J-38-020 | 39 | 35 | 2.9 | 45 | 33 | 44 | 2577 | 1100 | 3300 | 195 | III | L | D | | | |
| VAYO-020-0340 | | VAYOTS DZOR | Artavan | J-38-020 | 39 | 39 | 23 | 45 | 36 | 2.5 | 1889 | 2300 | 1500 | 272 | III | M | C | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| VAYO-020-0350 | | VAYOTS DZOR | Kapuyt | J-38-020 | 39 | 37 | 14 | 45 | 35 | 11 | 1891 | 450 | 500 | 22 | III | M | C | | | |
| VAYO-020-0360 | | VAYOTS DZOR | Kapuyt | J-38-020 | 39 | 37 | 5.2 | 45 | 35 | 20 | 1912 | 400 | 1000 | 31 | III | M | C | | | |
| VAYO-020-0361 | Kapuyt | VAYOTS DZOR | Kapuyt | J-38-20 | 39 | 37 | 28 | 45 | 35 | 40 | 1934 | 380 | 480 | 11 | I | M | B | | | |
| VAYO-020-0362 | | VAYOTS DZOR | Kapuyt | J-38-020 | 39 | 37 | 42 | 45 | 35 | 45 | 1940 | 100 | 100 | 1 | III | M | C | | | |
| VAYO-020-0370 | | VAYOTS DZOR | Kapuyt | J-38-020 | 39 | 36 | 41 | 45 | 35 | 20 | 2035 | 550 | 1200 | 51 | III | M | C | | | |
| VAYO-020-0380 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 36 | 17 | 45 | 35 | 37 | 2135 | 350 | 850 | 25 | III | L | D | | | |
| VAYO-020-0390 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 36 | 29 | 45 | 35 | 58 | 1972 | 350 | 450 | 13 | III | L | D | | | |
| VAYO-020-0400 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 35 | 50 | 45 | 36 | 15 | 2164 | 500 | 1050 | 54 | III | L | D | | | |
| VAYO-020-0401 | | VAYOTS DZOR | 020-A-a | J-38-020 | 39 | 36 | 9.8 | 45 | 36 | 41 | 2164 | 250 | 700 | 18 | III | L | D | | | |
| VAYO-020-0410 | Aratavan-1 | VAYOTS DZOR | Aratavan | J-38-20 | 39 | 39 | 15 | 45 | 36 | 52 | 1887 | 600 | 500 | 39 | II | H | B | | | |
| VAYO-020-0420 | | VAYOTS DZOR | Aratavan | J-38-020 | 39 | 34 | 52 | 45 | 36 | 22 | 2414 | 1300 | 2300 | 84 | III | M | C | | | |
| VAYO-020-0430 | | VAYOTS DZOR | Aratavan | J-38-020 | 39 | 35 | 33 | 45 | 37 | 29 | 2252 | 500 | 700 | 20 | III | M | C | | | |
| VAYO-020-0440 | Aratavan-2 | VAYOTS DZOR | Aratavan | J-38-20 | 39 | 39 | 28 | 45 | 37 | 47 | 2072 | 3500 | 5650 | 1179 | II | M | C | | | |
| VAYO-020-0450 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 37 | 57 | 45 | 38 | 28 | 2170 | 400 | 600 | 16 | III | L | D | | | |
| VAYO-020-0460 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 37 | 25 | 45 | 38 | 52 | 2290 | 400 | 900 | 20 | III | L | D | | | |
| VAYO-020-0470 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 37 | 11 | 45 | 39 | 29 | 2404 | 500 | 800 | 31 | III | L | D | | | |
| VAYO-020-0480 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 39 | 27 | 45 | 41 | 46 | 2536 | 1200 | 400 | 52 | III | L | D | | | |
| VAYO-020-0490 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 38 | 47 | 45 | 41 | 49 | 2686 | 400 | 700 | 21 | III | L | D | | | |
| VAYO-020-0500 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 37 | 31 | 45 | 40 | 48 | 2761 | 600 | 900 | 32 | III | L | D | | | |
| VAYO-020-0510 | | VAYOTS DZOR | 020-A-b | J-38-020 | 39 | 35 | 53 | 45 | 40 | 19 | 2648 | 400 | 1200 | 25 | III | L | D | | | |
| YERE-137-0010 | | YEREVAN | Spandaryan | K-38-137 | 40 | 13 | 5.3 | 44 | 26 | 25 | 1107 | 200 | 250 | 7 | III | M | C | | | |
| YERE-138-0020 | | YEREVAN | 138-C-a | K-38-138 | 40 | 6 | 33 | 44 | 31 | 43 | 1023 | 800 | 400 | 22 | III | L | D | | | |
| YERE-138-0060 | Sari tag | YEREBAN | Sari tag streets N20,26,27 | K-38-138 | 40 | 9 | 37 | 44 | 32 | 11 | 1056 | 300 | 550 | 25 | II | H | B | | Houses,public buildings | (5,000 persons) |
| YERE-138-0070 | | YEREVAN | Verin Jrashen | K-38-138 | 40 | 7 | 50 | 44 | 34 | 27 | 1137 | 250 | 300 | 8 | III | M | C | | | |
| YERE-138-0080 | | YEREVAN | 138-C-a | K-38-138 | 40 | 7 | 39 | 44 | 33 | 56 | 1100 | 100 | 100 | 1 | III | L | D | | | |
| YERE-138-0082 | | YEREVAN | Villas | K-38-138 | 40 | 6 | 22 | 44 | 30 | 16 | 987 | 100 | 100 | 1 | III | M | C | | | |
| YERE-138-0083 | | YEREVAN | Villas | K-38-138 | 40 | 6 | 20 | 44 | 30 | 34 | 995 | 100 | 100 | 1 | III | M | C | | | |
| YERE-138-0084 | | YEREVAN | Villas | K-38-138 | 40 | 6 | 13 | 44 | 30 | 49 | 1026 | 100 | 100 | 1 | III | M | C | | | |
| YERE-138-0085 | Yerevan Chemical plant | YEREBAN | Chemical plant | K-38-138 | 40 | 6 | 19 | 44 | 31 | 24 | 1022 | 260 | 414 | 8 | I | M | B | Risk on air intake of the Nairit Plant,road 6(8) À, 2 water pipelines of 1000mm diameter, a private plant and | | |
| YERE-138-0086 | | YEREVAN | Nubarashen | K-38-138 | 40 | 5 | 53 | 44 | 31 | 57 | 1114 | 300 | 300 | 5 | III | M | C | | | |
| YERE-138-0087 | | YEREVAN | Nubarashen | K-38-138 | 40 | 6 | 19 | 44 | 32 | 8.5 | 1088 | 200 | 200 | 3 | III | M | C | | | |
| YERE-138-0088 | Yerevan bypass road | YEREBAN | By-pass road | K-38-138 | 40 | 6 | 13 | 44 | 32 | 47 | 1124 | 410 | 618 | 16 | I | M | B | | | |
| YERE-138-0089 | Yerevan hospital | YEREBAN | hospital | K-38-138 | 40 | 6 | 24 | 44 | 33 | 28 | 1136 | 400 | 472 | 23 | I | M | B | | | |
| YERE-138-0090 | Nubarashen graveyard | YEREBAN | Nubarashen | K-38-138 | 40 | 6 | 29 | 44 | 33 | 30 | 1131 | 699 | 290 | 11 | I | H | A | | Tombs road and other objects | Epidemic danger due to thumbs destruction, threatens the roundabout road and other communications. |
| YERE-138-0091 | | YEREVAN | Nubarashen | K-38-138 | 40 | 6 | 26 | 44 | 33 | 52 | 1200 | 300 | 300 | 7 | III | M | C | | | |
| YERE-138-0100 | | YEREVAN | 138-C-a | K-38-138 | 40 | 6 | 47 | 44 | 33 | 48 | 1151 | 300 | 700 | 20 | III | L | D | | | |
| YERE-138-0110 | | YEREVAN | Jrvej | K-38-138 | 40 | 10 | 16 | 44 | 34 | 47 | 1196 | 350 | 400 | 16 | III | M | C | | | |
| YERE-138-0120 | | YEREVAN | Jrvej | K-38-138 | 40 | 10 | 28 | 44 | 35 | 17 | 1245 | 500 | 500 | 21 | III | M | C | | | |
| YERE-138-0138 | | YEREVAN | 138-C-a | K-38-138 | 40 | 7 | 22 | 44 | 33 | 37 | 1114 | 300 | 400 | 10 | III | L | D | | | |
| YERE-138-0139 | Yerevan summer houses, and bypass road-1 | YEREBAN | summer houses and by-pass road | K-38-138 | 40 | 6 | 56 | 44 | 34 | 24 | 1202 | 390 | 1135 | 31 | I | M | B | | | |
| YERE-138-0140 | Yerevan summer houses and bypass road-2 | YEREBAN | summer houses and by-pass road | K-38-138 | 40 | 7 | 17 | 44 | 34 | 47 | 1229 | 650 | 830 | 45 | I | M | B | | | |

Form-1 List of Landslides

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Scale | | | Hazard Level | Risk Level | Priority Rank for Field Survey | Remark (Hazard) | Remark (Risk) | Remark (Reason for priority) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | | |
| | | Marz /Yerevan City | Community (If no community, describe the map code) | Map Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | | |
| YERE-138-0141 | Yerevan summer houses and bypass road-3 | YEREBAN | summer houses and by-pass road | K-38-138 | 40 | 7 | 36 | 44 | 34 | 20 | 1160 | 170 | 170 | 10 | I | M | B | | | |
| YERE-138-0142 | Yerevan summer houses and bypass road-4 | YEREBAN | summer houses and by-pass road | K-38-138 | 40 | 7 | 37 | 44 | 35 | 2 | 1237 | 680 | 1798.5 | 4 | I | M | B | | | |
| YERE-138-0143 | Yerevan summer houses and bypass road-5 | YEREBAN | summer houses and by-pass road | K-38-138 | 40 | 7 | 51 | 44 | 35 | 11 | 1247 | 462 | 818 | 88 | I | M | B | | | |
| YERE-138-0144 | | YEREVAN | 138-C-a | K-38-138 | 40 | 8 | 15 | 44 | 35 | 53 | 1289 | 700 | 500 | 32 | III | L | D | | | |
| YERE-138-0145 | | YEREVAN | 138-C-a | K-38-138 | 40 | 8 | 23 | 44 | 34 | 28 | 1110 | 100 | 100 | 1 | III | L | D | | | |
| YERE-138-0146 | | YEREVAN | 138-C-a | K-38-138 | 40 | 8 | 33 | 44 | 34 | 30 | 1122 | 200 | 400 | 8 | III | L | D | | | |
| YERE-138-0147 | | YEREVAN | 138-C-a | K-38-138 | 40 | 8 | 17 | 44 | 34 | 38 | 1131 | 150 | 300 | 4 | III | L | D | | | |
| YERE-138-0150 | | YEREVAN | Avan | K-38-138 | 40 | 13 | 2.4 | 44 | 35 | 42 | 1379 | 1100 | 1300 | 102 | III | M | C | | | |
| YERE-138-0160 | | YEREVAN | Jrvej | K-38-138 | 40 | 10 | 56 | 44 | 36 | 14 | 1334 | 100 | 100 | 1 | III | M | C | | | |
| YERE-138-0161 | | YEREVAN | Jrvej | K-38-138 | 40 | 11 | 2.2 | 44 | 36 | 28 | 1416 | 100 | 100 | 1 | III | M | C | | | |
| YERE-138-0170 | | YEREVAN | Jrvej | K-38-138 | 40 | 10 | 39 | 44 | 35 | 42 | 1295 | 400 | 300 | 10 | III | M | C | | | |
| YERE-138-0180 | | YEREVAN | Shorbulakh | K-38-138 | 40 | 9 | 34 | 44 | 35 | 54 | 1224 | 300 | 300 | 10 | III | M | C | | | |
| YERE-138-0200 | | YEREVAN | 138-C-a | K-38-138 | 40 | 11 | 21 | 44 | 37 | 38 | 1519 | 700 | 550 | 33 | III | L | D | | | |
| YERE-138-0210 | | YEREVAN | 138-C-a | K-38-138 | 40 | 6 | 45 | 44 | 36 | 59 | 1226 | 250 | 300 | 7 | III | L | D | | | |
| YERE-138-0220 | | YEREVAN | 138-C-a | K-38-138 | 40 | 6 | 55 | 44 | 37 | 5.5 | 1275 | 100 | 100 | 1 | III | L | D | | | |
| YERE-138-0230 | | YEREVAN | 138-C-b | K-38-138 | 40 | 7 | 57 | 44 | 37 | 33 | 1393 | 700 | 1100 | 68 | III | L | D | | | |
| YERE-138-0240 | | YEREVAN | 138-C-b | K-38-138 | 40 | 8 | 0.3 | 44 | 38 | 19 | 1426 | 650 | 850 | 55 | III | L | D | | | |
| YERE-138-0260 | | YEREVAN | 138-C-b | K-38-138 | 40 | 7 | 36 | 44 | 38 | 21 | 1391 | 550 | 750 | 40 | III | L | D | | | |
| YERE-138-0270 | | YEREVAN | 138-D-c | K-38-138 | 40 | 7 | 13 | 44 | 38 | 3.1 | 1314 | 300 | 400 | 10 | III | L | D | | | |

別添資料２　地すべり災害総合管理計画

**Republic of Armenia**
**Ministry of Emergency Situations**

# Landslide Disaster Management Project in the Republic of Armenia

# Landslide Disaster Management Plan

**October 2016**

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# Part 1 Basic Considerations

# Chapter 1 Basic considerations

## 1.1 Goal and direction of the Plan

This plan aims to reduce risks and damages of landslide disaster, through fulfillment of responsibility of all related bodies, taking adequate measures against landslide disaster with cooperation among related bodies. This plan pays attention to organizational framework (task sharing and collaboration), capacity development, and management of materials (financial resources)/ information.

Policy of this plan is to show the direction of measures for implementation of comprehensive landslide disaster management measures, through promoting risk reduction activities which include the formulation and implementation of plans, as well as defining framework of reconstruction and rehabilitation after the occurrence of landslide disaster.

The comprehensive landslide disaster management measures are based on the idea of "Promotion of comprehensive disaster management activities" which is applied for other natural disasters. The "Promotion of comprehensive disaster management activities" means that all the personnel and bodies autonomously and proactively promote the disaster management activities, based on plans, from several viewpoints mentioned below.

### (1) Long-sighted disaster management (setting ultimate goals)

To mitigate risks related to landslide disaster, landslide disaster management activities is promoted upon definition of ultimate goals, which are 1) Saving human lives, 2) Securing the livelihood of residents, 3) Maintaining social/ economic systems and 4) Maintaining the governance of the areas.

### (2) Overall disaster management (responsibilities shared under vertical and horizontal organization schemes as well as collaboration of activities by all stakeholders with a sense of ownership)

Landslide disaster management activities should be promoted by all the personnel and organizations. In order to facilitate landslide disaster management activities, it is necessary for all personnel/ organizations to clarify their own roles and to engage in activities with a sense of ownership through coordination with one another (See Figure 1.1).

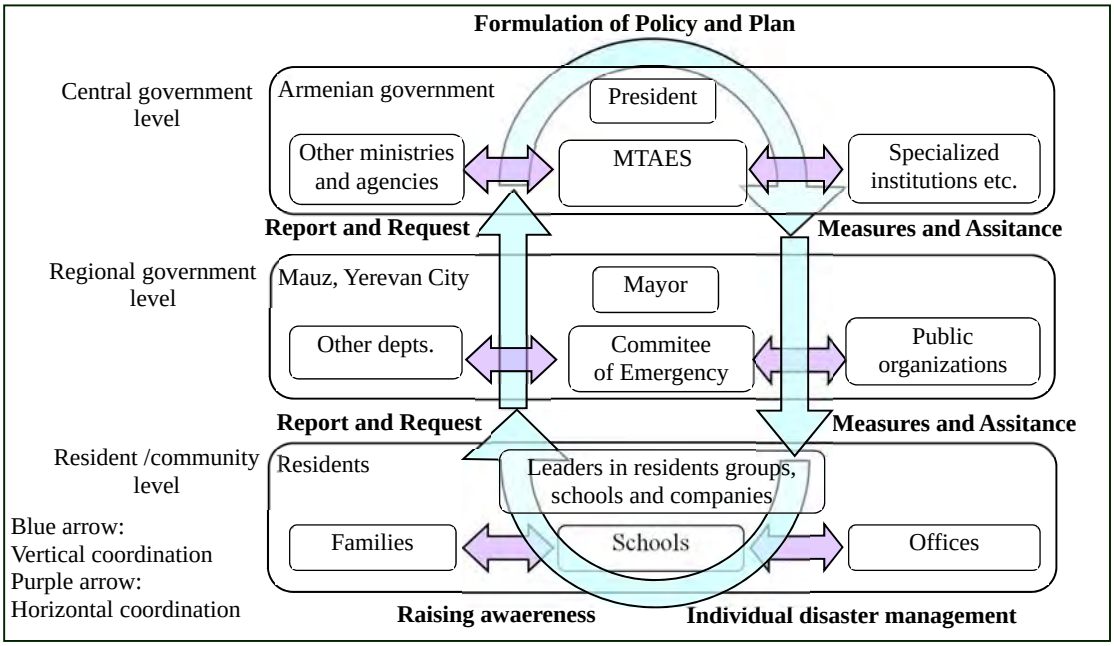



Figure 1.1 Collaboration of organizations in vertical and horizontal schemes

(3) Systematic disaster management (Sequencing activities within the disaster management cycle)

In order to reduce landslide disaster risks, it is important that activities on mitigation and preparedness for emergency response activities are initiated ahead of the occurrence. Emergency response immediately after the occurrence should be followed by subsequent rehabilitation/reconstruction activities. Furthermore, the rehabilitation/reconstruction should take a consistent approach for landslide-resistant development by not only recovering to the pre-landslide state but also linking with disaster mitigation and preparedness for future landslides (See Figures 1.2 and 1.3).

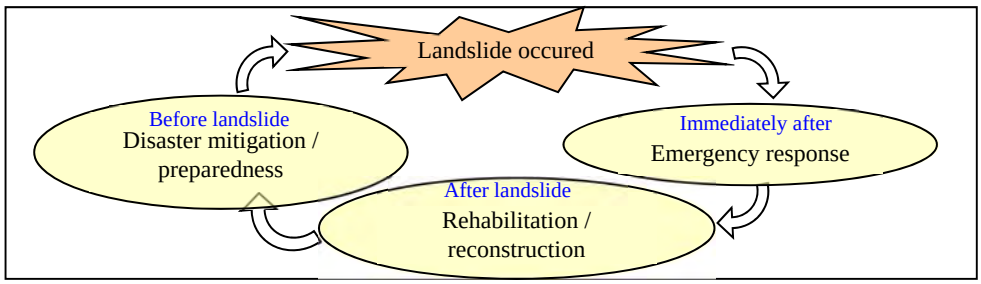



Figure 1.1.2 Concept disaster management cycle

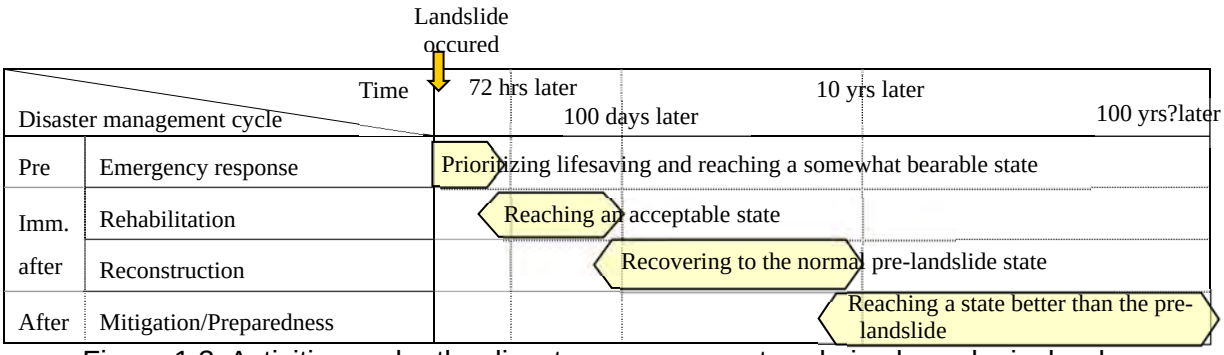



Figure 1.3 Activities under the disaster management cycle in chronological order

### (4) Specific/ efficient disaster management (activities upon risk awareness)

In order to efficiently implement disaster management activities, one needs to, upon learning hazard and vulnerability with local varieties primarily as well as risks, formulate a disaster management plan and implement measures accordingly to mitigate risks selected in consideration of importance, urgency and efficiency of response measures.

### (5) Precise and feasible disaster management (activities aligned with one's capacity and accumulation of activities)

Concerning landslide, it is necessary to carry out geological investigation, monitoring, analysis, ad evaluation for forecasting when, where, and how big the hazard/damage will occur, although landslide areas can be identified with geographic features and the past damages. In addition, it is necessary to carry out detailed investigation and monitoring to formulate and implement efficient measures. In Armenia, there are more than 1,300 important landslides which require measures in priority, but it is difficult to take sufficient measure in a short time. Thereby, realistic measures such as monitoring will be taken, based on demand of residents and financial aspect as well as possible level of risk assessment, although emergency response should be done to particular cases. Landslide disaster risks will be reduced with the accumulation of the feasible measures. Together with the implementation of measures, it is required to update the result of risk assessment and revise plans, based on the updating of assessment.

## 1.2 Priorities for the Plan

The priority mattes of this plan were set up as follows, considering issues.

a) Utilization and landslide disaster information, using landslide distribution maps and landslide inventory sheets

b) Promotion of monitoring for promotion of proactive measures and arrangement of basic data for hard measures

c) Raising awareness and autonomous disaster management activities of residents as well as promotion of assistance of central and local governments

d) Promotion of landslide measures, considering securing daily life of residents and economic activities of the area

e) Increase the efficiency of proactive measures through promotion of proper land use and activities of residents

f) Promotion of measure, paying attention to vulnerable people on disasters

Action plans will be drawn up for smooth and timely implement of measures associated with them.

## 1.4 Other considerations

### (1) Detailed plans

In order to implement adequate measures for each landslide area with regional characteristics, as well as promote collaboration activities with other related organization with clear allocation of tasks of each organization, it is necessary to formulate a detailed plan for the particular landslide area. The following organizations will formulate the detailed plan with mutual collaboration through discussion with MTAES, and the formulated plan is subject to approval of MTAES.

- Ministry having facilities and responsibility for the landslide area under its authority
- Institute and organization for disaster education, relating to landslide disaster management
- Community in the landslide area

### (2) Familiarizing with and updating the plan

Through annual review, necessary modifications should be made every year to this plan as well as detailed plans.

Educational/training activities including ones for informing members of their organizations of their roles will be provided in order to familiarize them with this plan and improve their skills related to landslide disaster management.

### (3) Basic responsibilities of risk management entities

Mitigation of landslide damage is based on the following basic concepts;

a) Individual residents shall engage in self-help activities under the concept of “You should be responsible for protecting your own safety and property”

b) The communities having risk of landslide disaster (mainly village administration) shall engage in mutual-help activities under the awareness of “You should be responsible for protecting life and solidarity of your community”.

c) Risk management organizations shall engage in public-help activities that assist self-help / mutual-help activities in order “to create much stronger community against landslides.”

Based on the above basic concepts, the landslide disaster management organizations/ communities/ residents shall fulfill respective responsibilities.

## 1.5 Structures and contents of the Plan

This plan consists of seven parts, which altogether have 37 chapters (see Table 1.4);

Part 1: Basic Considerations (Chapter 1 to Chapter 3) explains the concept of landslide disaster management as well as distribution and situation of landslides (inventory sheets)

Part 2: Mitigation Plan (Chapter 4 to Chapter 9) explains risk reduction activities, including development of resilient people and communities against landslide disaster as well as outline of mitigation measures.

Part 3: Preparedness Plan (Chapter 10 to Chapter 20) explains proactive measures such as monitoring, information management, and preparation for rescue/ evacuation/ other emergency response.

Part 4: Emergency Response Plan (Chapter 21 to Chapter 31) explains actual emergency response activities in time of landslide, considering degree of landslide activeness.

Part 5: Rehabilitation/Reconstruction Plan (Chapter 32 to Chapter 35) explains a framework of rehabilitation/ reconstruction plans formulated for creation of ever-more comfortable community, following the emergency response.

Part 6: Assistance Plan (Chapter 36) explains a plan for assistance activities conducted for landslide disasters in other areas.

Part 7: Action Plan explains the outline of implementation plans for important matters.

Table 1.5.1 Structures and contents of the Plan

| Structures | | Contents | |
|---|---|---|---|
| Part 1 | Basic Considerations | Chapter 1 | Basic consideration (Target, policy, and important issues) |
| | | Chapter 2 | Landslide disasters and overview the damages (Landslide distribution map and inventory sheets) |
| | | Chapter 3 | Basic responsibilities of risk management entities (Government, related organization, residents, and communities) |
| Part 2 | Mitigation Plan | Chapter 4 | Process for promoting proactive measures and supporting system for the promotion |
| | | Chapter 5 | Landslide-resistant human development (responsibility of residents, promotion of disaster education and autonomous activities) |
| | | Chapter 6 | Landslide-resistant community development (responsibility of community, proactive measure to be done by community) |
| | | Chapter 7 | Landslide-resistant regional Development (Land use and infrastructure development, considering landslide risk |
| | | Chapter 8 | Landslide countermeasure works and monitoring (selection, design, and installation) |
| | | Chapter 9 | Study and research on landslide phenomena and landslide disasters |
| Part 3 | Preparedness Plan | Chapter 10 | Process for promoting preparedness and assistance and supporting system for the promotion |
| | | Chapter 11 | Promoting preparedness by the residents and communities and supporting system |
| | | Chapter 12 | Processing monitoring data and strengthening monitoring system |
| | | Chapter 13 | Preparedness related to collection and transmission of information |
| | | Chapter 14 | Preparedness for urgent countermeasure works and detouring routes |
| | | Chapter 15 | Preparedness for warning, evacuation, and its guidance |
| | | Chapter 16 | Preparedness for security, traffic control, and urgent transportation |
| | | Chapter 17 | Preparedness for search and rescue |
| | | Chapter 18 | Preparedness for emergency medical care, health, drinking water, and food |
| | | Chapter 19 | Preparedness for tentative repairing of lifeline and infrastructure |
| | | Chapter 20 | Preparedness for temporary accommodation, relocation, livelihood |
| Part 4 | Emergency Response Plan | Chapter 21 | Basics on emergency response (stage of risk increase, stage of partial collapse and damages, stage of large-scale collapse and damages) |
| | | Chapter 22 | System and operation of emergency measures by stage and collaboration of related organizations |
| | | Chapter 23 | Strengthening monitoring |
| | | Chapter 24 | Collection and transmission of information on monitoring and damages |
| | | Chapter 25 | Implementation of emergency countermeasure works and detouring route |
| | | Chapter 26 | Warning, evacuation, and its guidance |
| | | Chapter 27 | Security, traffic control, and emergency transportation |
| | | Chapter 28 | Search and rescue |
| | | Chapter 29 | Emergency medical care, health, securing drinking water and food |
| | | Chapter 30 | Emergency repairing of lifeline and infrastructure |
| | | Chapter 31 | Tentative accommodation, relocation, and livelihood |
| Part 5 | Rehabilitation / Reconstruction Plan | Chapter 32 | Basic ideas for rehabilitation and reconstruction |
| | | Chapter 33 | Preparation of rehabilitation and reconstruction plan and its implementation system |
| | | Chapter 34 | Stabilization of life of residents |
| | | Chapter 35 | Regional reconstruction |
| Part 6 | Assistance Plan | Chapter 36 | Plan of assistance from outside of disaster areas |
| Part 7 | Action plan | | |

# Chapter 2 Overview and damage estimation

## 2.1 Outline of landslide

In JICA Study on landslide disaster, GIS database was created for 2,504 landslides as well as the area of deformed mass is 20 ha andr more, through interpretation of topographic maps and aerial photographs as well as site reconnaissance. Using the result, number of landslides of 1 ha and more was estimated to be 53,000, based on the relation between the area and number of landslide of 20 ha and more as shown in Table 2.1.

Table 2.1 Number and area of landslides in Armenia

| Area of landslide | number | Total area (ha) | Percentage of area in entire area of Armenia (%) |
|---|---|---|---|
| Number and area confirmed by landslide inventory survey | | | |
| 1000 ha or more | 7 | 42,428 | 1.4 |
| 100 ha or more | 276 | 68,442 | 2.3 |
| 50 ha or more | 582 | 89,678 | 3.0 |
| 20 ha or more | 1,296 | 111,780 | 3.8 |
| Number and area of landslides of 1 ha or more , estimated through relation between number and area of 2,504 landslides which identified in inventory survey | | | |
| 10 ha or more | 3,500 | 140,000 | 4.8 |
| 5 ha or more | 8,000 | 170,000 | 5.8 |
| 2 ha or more | 23,000 | 210,000 | 7.1 |
| 1 ha or more | 53,000 | 250,000 | 8.2 |

(Source: Final report of JICA Study)

## 2.2 Basic factors of landslide

### 2.2.1 Slope gradient

In general, few landslide is distributed in gentle slope areas from a viewpoint of geomorphology. On the areas of steep geomorphology, landslide is also not so frequent, since eluvial, diluvial formations on the slope move along the slope to the lower parts during time under the influence of different factors.. Such general tendency in distribution of landslide areas exists also in Armenia. In actual, many landslides are distributed on slopes with gradient between 15º to 30 º.

Table 2..2 Landslide distribution by slope gradient (source: Final report of JICA study)

| Slope gradient (degree; D) | Entire territory | | Landslide area | | | | Number of landslide in 100 ha* | Ration of landslide in entire territory(%)* |
|---|---|---|---|---|---|---|---|---|
| | Area (ha) | Ratio (%) | Number | Ratio (%) | Area (ha) | Ratio (%) | | |
| 0=<D<5 | 1,038,753 | 35.0 | 163 | 6.5 | 12,189 | 10.0 | 1.6 | 1.2 |
| 5=<D<10 | 599,896 | 20.2 | 584 | 23.3 | 39,573 | 32.6 | **9.7** | **6.6** |
| 10=<D<20 | 816,286 | 27.5 | 1,264 | 50.5 | 54,820 | 45.1 | **15.5** | **6.7** |
| 20=<D<30 | 439,804 | 14.8 | 451 | 18.0 | 13,672 | 11.2 | **10.3** | **3.1** |
| 30=<D<40 | 72,550 | 2.4 | 41 | 1.6 | 1,274 | 1.0 | 5.7 | 1.8 |
| D>=40 | 2,369 | 0.1 | 1 | 0.0 | 47 | 0.0 | 4.2 | 2.0 |
| Total | 2,969,658 | 100.0 | 2,504 | 100.0 | 121,575 | 100.0 | | |

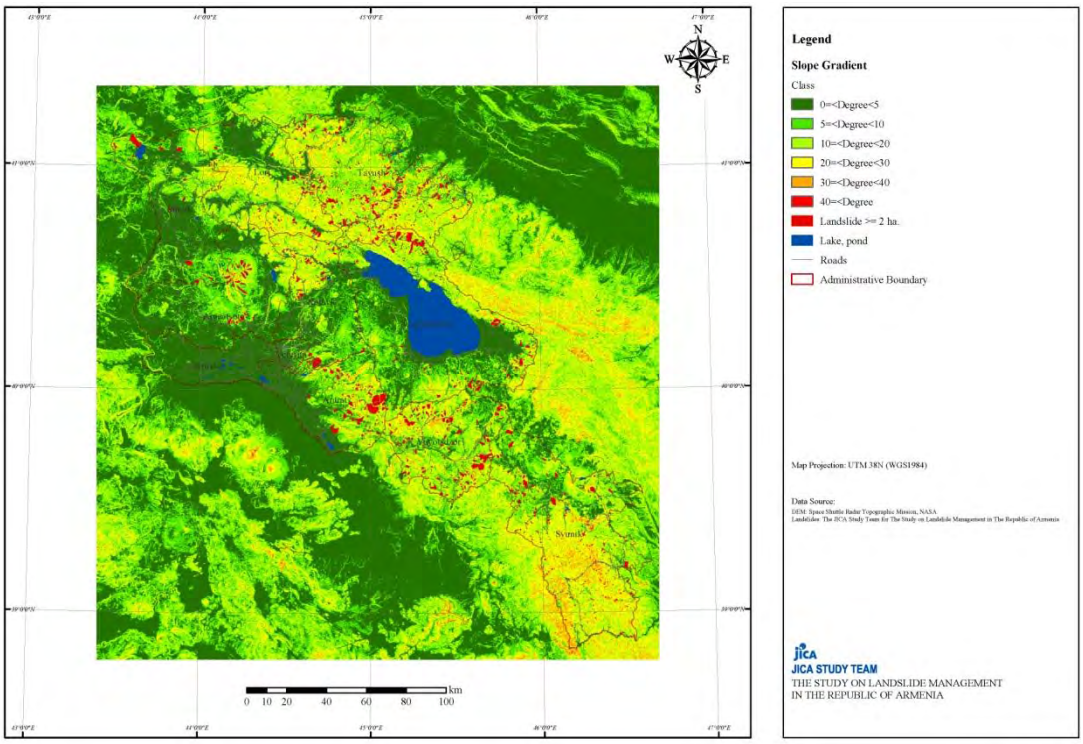



Figure 2.1 Slope gradient map with landslide distribution (Source: Final report of JICA study)

### 2.2.2 Variations of water level

In general, heightening of groundwater level is one of the importantfactors to cause landslide activity as follows.

- Due to the heightening of groundwater level, unit weight of soil mass increases and the ground mass becomes unstable when the space surrounding soil particles is filled with water. The part of the slope below the water level appears in hanging condition leading to the decrease of slope stability.
- Due to the heightening of groundwater level, when the soil mass becomes water saturated, pore pressure around sliding surface increases and shear strength of the sliding surface decreases, leading to the unstability of soil mass.
- In case that clay minerals with swelling nature are contained in sliding surface, the clay minerals are getting swelling with groundwater, which causes lowering of shear strength and instability of the soil mass.

Rapid increase of groundwater level is a trigger factor of landslide activity, high groundwater level is considered to be the basic factor to cause landslide. It is thereby, the areas where groundwater level can increase, landslide may occur.

### 2.2.3 Geological factors

Geological factor can be divided into several sub-factors, and the major sub-factors are geological clayey formations with high humidity and consistence, high crackedness because they are located in fault zone. The weak composition of clayey formations, the circumstance of having high humidity is conditioned by the diagenesis process of young clayey formations and endokinetic (occurred

together with the occurrence) fracturing and hydrothermal alteration in fault zones, etc. Favorable conditions for the occurrence of landslide phenomena can be schistosed plains or joint plains created through metamorphism and deformation of rocks and sedimentary process such as bedding plains and lamination. Because of the mentioned factors, soil or rock mass is getting weak, and thereby, the situation which landslide easily occurs is created.

The following tendency in geological factors is observed.

- Widely spread landslide phenomena in Armenia are mainly connected with clayey formations of young Quaternary age and Tertiary (Miocene) age subjected to weak diageneses (see Figure 2.2). In general, the geological factor can be said a basic factor to generate landslide easily.
- Among geological factors, the interrelation oflayers and dip slope is important. The area where a slope and bedding plain incline to same direction, is in a condition which landslide may occur relatively easily.
- In the zones of tectonic faults and dut to activation of volcanic processes, clay minerals are created and become favorable condition for the activation of landslide.
- Many active faults are distributed in Armenia, and the many parts of the fault zones are covered with young geology, and thereby, it seems that rocks of fractured due to fault activity in deep and highly confined condition are not widely distributed on the surface. It is thereby considered that landslide generated with fault fracture zones is not so prominent.

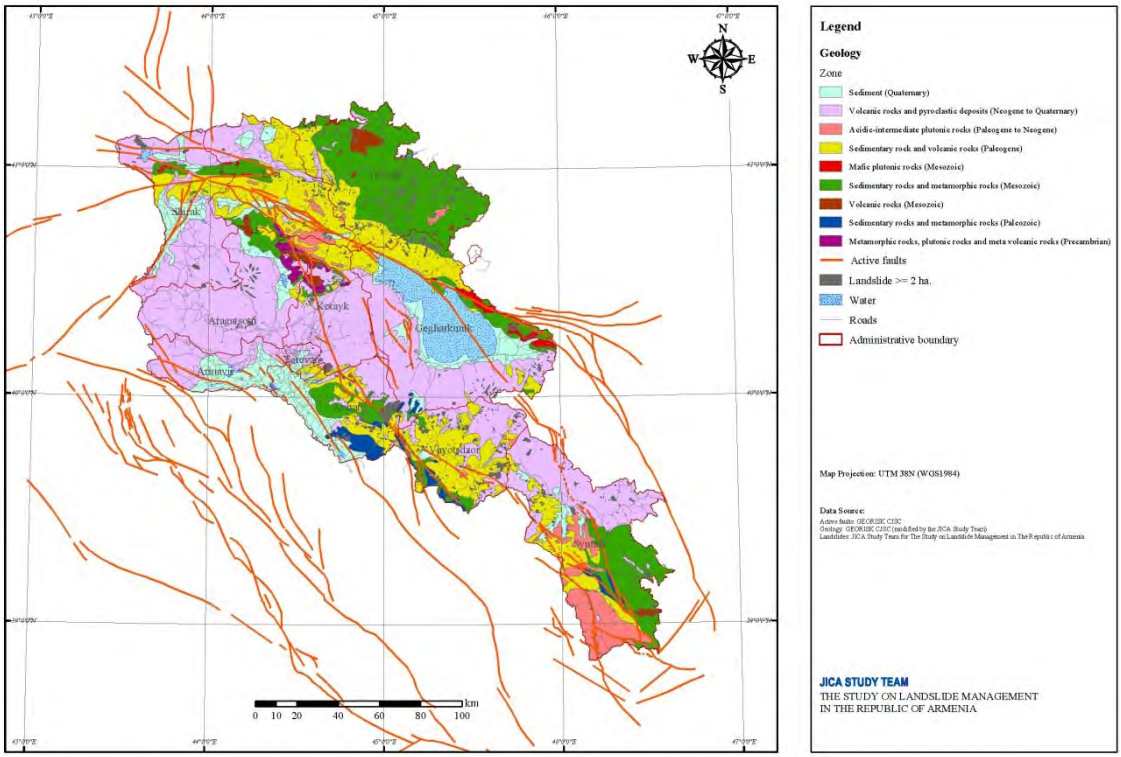



Figure 2.2 Geological map of Armenia (Source: Final report of JICA study)

### 2.2.4 Erosion of toe portion f landslide

Landslide is getting unstable when the toe portion of the landslide is eroded with river flow, etc. Among the landslides shown on the landslide distribution map, many landslides which river flows

on the toe portions, are considered that the erosion at toe portion is a possible trigger factor for the instability of the landslide (see Figure 2.4). Furthermore, there are areas where river courses seem to have been changed due to landslide activity, and instability of landslide seems to be getting serious due to the erosion of the toe portion.

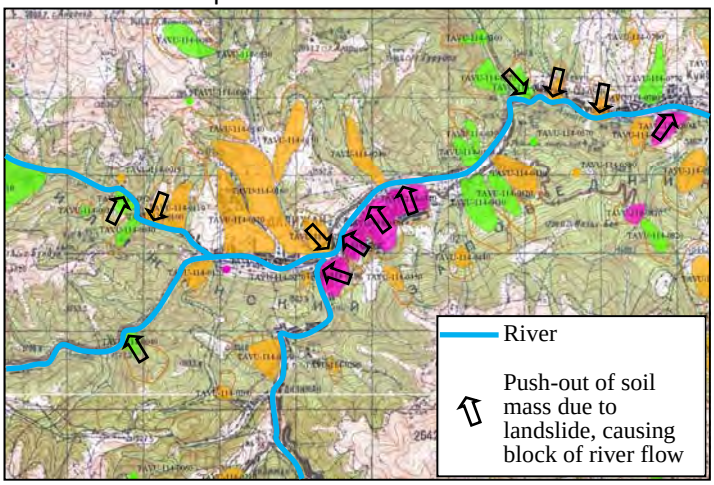



Figure 2.4 Landslide distribution map around Dilijan (Source: Final report of JICA study)

## 2.3 Trigger factors by human activity

There were cases that trigger factors by human activity caused activation of landslides. Similar to the erosion with river flow at toe portion, artificial excavation at the toe of landslide causes activation of the landslide. Similar to groundwater level increases with rain fall, water leakage from water pipes and spreading irrigation water etc. cause heightening of groundwater level, and which condition causes instability of landslide.

In the Haghastin landslide area, excavation of the toe of the landslide is a possible cause of the activation. In the Ayrum landslide, intentional water release for cattle from water pipeline is a highly possible cause.

## 2.4 Distribution and priority of landslides

Interpretation of aerial photographs has been done for identifying landslide features in the territory of Armenia, and 2,504 landslides have been identified, and the landslide areas are shown on landslide maps of 34 sheets for entire territory of Armenia (see Figure 2.5). For each landslide, priority is determined, based on degree of damage and importance of objects to be protected (see Table 2.3). For important 132 landslides, site reconnaissance has been done, and landslide inventory sheets have been prepared.

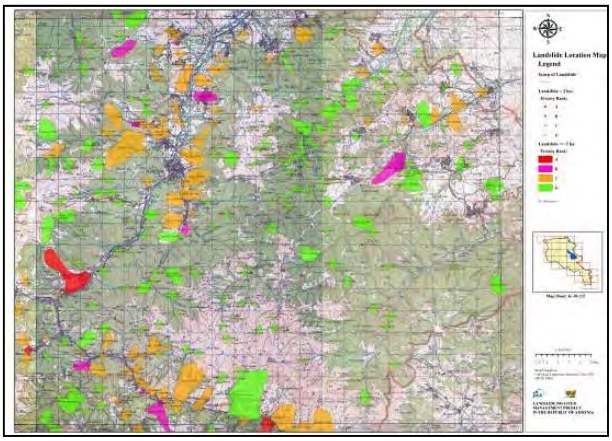


Figure 2.5 Landslide distribution map

Table 2.3 Priority of 2,504 landslides (Source: Final report of JICA study)

| | | Damage situation | | | Total |
|---|---|---|---|---|---|
| | | Damage reported (145) | | No damage report | |
| | | Level I | Level II | Level III | |
| Importance of objects to be protected | H | 12 | 45 | 0 | 57 |
| | M | 56 | 32 | 918 | 1,006 |
| | S | 0 | 0 | 1,441 | 1,441 |
| Total | | 68 | 77 | 2,359 | 2,504 |
| Percentage | | 3% | 3% | 94% | 100% |

Priority A
Priority B
Priority C

## 2.5 Landslide disaster

In Armenia, landslide disaster is one of major natural disasters, and damage to people's life and economic losses have been calculated to be 21,060 mil AMD as actual amount and 26,415 mil AMD as estimated amount, which is equivalent to 2.3% and 2.9% of state budget in 2012. High risk areas of landslide disaster occupy 233 communities (24%) in terms of houses, road of 240 km long (32%), and railway of 4.8 km long (0.5%). The followings are landslide disasters occurred in Armenia.

### 2.5.1 Ayrum landslide

On 2nd October 2011, large-scale landslide disaster occurred just beside of Interstate road M6 in Ayrum area in northern part of Armenia (about 12 km from Georgian border in road distance), resulting in damage to 35 vehicles on the road and human loss of 5 persons in the vehicles (see Figure 2.6). The result of investigation by IGS shows that a possible trigger factor is water release from pipeline for cattle and irrigation and its filtration to the ground. It took more than half an year for rehabilitation of the road, and the rehabilitation cost of facilities such as road and water supply without economic loss is calculated to be about 600 mil AMD.

Figure 2.6 Ayrum landslide, overall view before (left) and after (right), source: IGS report

### 2.5.2 Haghastin landslide

In Haghastin, landslide occurred in 1993 due to excavation for construction of railway to Azerbaijan. Furthermore, in 1996, excavation at the lower portion of the landslide for construction of station causes activation of the landslide, resulting in serious damage to residential houses, blockage of river flow, blockage of interstate road etc. Relocation of the residential houses (cost 114 mil AMD), relocation of the road from the right to left bank, and opening of river course have been done, but the railway construction is still suspended (see Figure 2.7).

Figure 2.7 Haghastin landslide

### 2.5.3 Dilijan landslide

At Dilijan, four landslides are distributed in the area including Dilijan City, and facilities and buildings in the city are damaged as shown in Figure 2.8. Drainage tunnel, constructed in soviet time and un-functioned due to collapse of the tunnel, has been repaired (cost of the 1st works is about 1.7 bil AMD). So far after the repairing works, damages seems to be reduced.

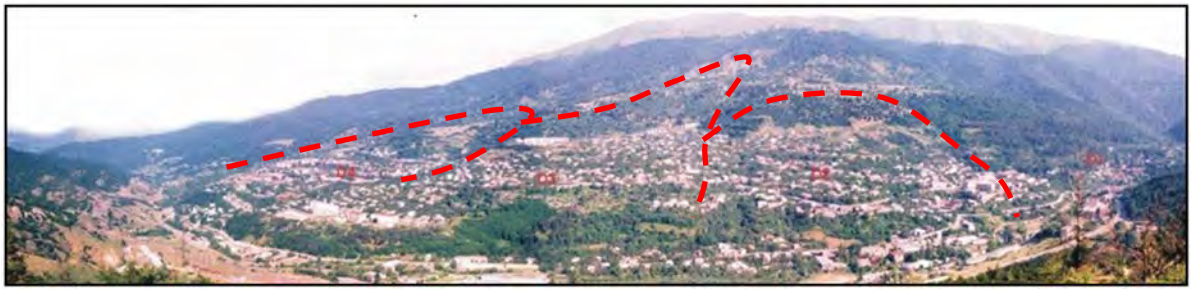


Figure 2.8 Overall view of Dilijan landslide

### 2.5.4 Hartunyan landslide in Kapan

At eastern area of Kapan City, landslide was activated in February 1995 and August 1997 and caused serious damages as shown in Figure 2.9. In 1995, 9 houses were destroyed due to slid soil mass and 9 persons were killed. Local road passing the lower portion of the landslide was covered and traffic was blocked with the soil. In 1997, collapsed soil reached to river.

The destroyed houses (damage level 5) together with surrounding 25 houses of damage level 4 received compensation from the Government and moved to Kapan City. The amount of the compensation was 580 mil AMD. 15 houses (damage level 3 to 4) still remain unmoved, however.

Figure 2.9 Overall view of KapanHartunyan landslide

### 2.5.5 Hovk landslide

Hovk landslide located between Dilijan City and Ijevan City causes damages to many houses and interstate road (see Figure 2.10). In 2004, a small block beside the road was activated, and caused damage to the road and blockage of traffic. Although the landslide is so large with length of more than 2 km and caused damage to road frequently, it is difficult to take measures for prevention or control of the movement, and thereby, relocation road was constructed as a measure with the construction cost about 100 mil AMD.

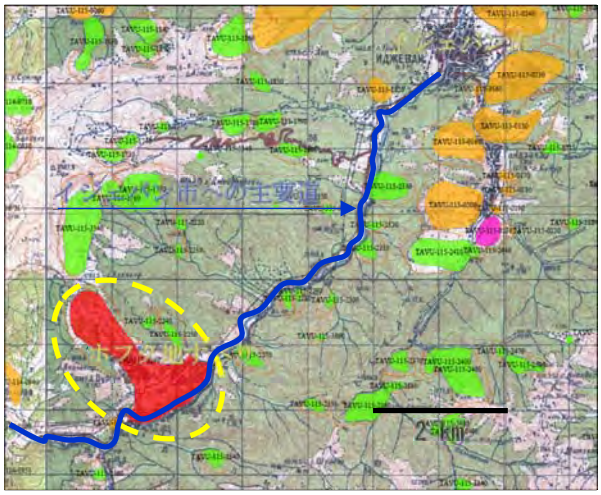



Figure 2.10 Location of Hovk landslide

# Chapter 3 Basic responsibilities of measure implementing entities

## 3.1 Fundamental principles

Disaster risk management is carried out in three levels; individual, community, and central/ local government (ministries, marzes, etc.) levels. The three-level of entities should fulfill activities shown in this Plan, under which all of them play the chief of role, toward achieving goal mentioned in Chapter 1.

On the concept of landslide disaster management in Armenia (hereinafter "the Concept), tasks are allocated to related ministries and organizations as shown in Table 3.1.

Table 3.1 Tasks allocated in the Concept

1) Government
- Approval of projects for landslide disaster management
- Allocating financial means for state-important landslide disaster measures
- Calculation and sharing of cost for region-important landslide disaster management measures
- Relocation measures for landslide areas and allocation of financial means for the measures

2) MTAES
- Identification, classification, and arrangement for implementation of measures as the authorized body
- Developing landslide database and consultation
- Analyzing monitoring data provided from related organizations and local government and control landslide
- Analyzing and damage estimation of structures in landslide areas
- Summarizing mid-term budget for landslide disaster measures and its submitting to Ministry of Finance
- Implementing landslide disaster measures, utilizing the results of above-mentioned work
- Coordination of landslide disaster management activities of local government
- Development of legal system for landslide disaster measures

3) MTC, MUD, MEN, MAg, MNP, and MCu
- Monitoring of facilities and areas under the jurisdiction, in case that the objects are affected by landslide
- Preparation of landslide inventory sheet of the above-mentioned facilities
- Investigation, design, and cost estimate at the most dangerous site and implementation of measures in collaboration with central and local government
- Investigation, analysis, inquest of project, and report to MTAES about landslides reported from marzes and local authorities
- Inquest on legislation necessary for the above-mentioned matters

Marz
- Reporting information from communities to responsible ministries
- Judging influence and necessity of measures of landslides
- Coordination of investigation and projects of measures
- Coordination of projects done with national budget
- Reporting about implemented measures and those results to responsible ministries
- Arranging budget for landslide measures, other than national budget

Community and city
- Providing landslide information to marz and responsible ministries
- Judging influence and necessity of measures of landslides
- Proposing necessary measures and its reporting to marz

- Coordination of measures done with national budget
- Reporting about implemented measures and those results to responsible ministries
- Arranging budget for landslide measures, other than national budget

## 3.2 Responsibilities of related ministries and Marz

In order to "create much stronger community against landslide disaster", related ministries and marzes should disseminate the contents of measures shown in this plan to residents and communities, and then, implement/promote activities for mitigation and preparedness, securing necessary budget. In case of occurrence of landslide disaster, the related ministries and marzes should carry out emergency response such as rescue, evacuation, medical care, so that damage should be minimized.

After suffering landslide damages, the related ministries and marzes should prepare detailed plans for rehabilitation and reconstruction, according to the actual damage situations, based on the outlines on the planning mentioned in this plan. In accordance with the detailed plans, rehabilitation activities will be done for prompt recovery to the situation before the landslide disaster, and then, reconstruction activities to be done in order "to create much stronger community against landslide disaster."

## 3.3 Responsibilities of communities

Community should carry out autonomously mutual activity on landslide disaster management for "create much stronger community against landslide disaster", in accordance with disaster management plan of the community, having guidance and assistance from central and local governments.

For smooth implementation of disaster management activities in ordinary time and emergency situation, community should enforce its emergency response group for overall coordination, collection and transmission of information such as deformation of buildings/facilities, disaster education/training, preparation for evacuation/ rescue, rehabilitation/ reconstruction of facilities, emergency medical care.

Community should coordinate and assist residents for promoting their autonomous disaster management activities, in accordance with disaster management plan of the community, approved by MTAES.

In case of activation of landslide disaster, the communities should carry out activities to protect life and properties of residents as well as protect the communities, so that damage in the communities to be minimized. After suffering landslide damage, the communities should autonomously contribute to formulating plans for rehabilitation/ reconstruction, and then, carry out autonomously rehabilitation/ reconstruction activities in order "to create much stronger community against landslide disaster", keeping solidarity of the communities.

## 3.4 Responsibilities of residents

In case of activation of landslide disaster, it is firstly necessary for each of residents to secure life and properly by his/her own effort. Just after the occurrence of landslide damage, it is possible to expect to have official assistant activities, such as rescue from damaged buildings, emergency medical care, etc. Therefore, it is necessary for each resident to secure own safety firstly, under the awareness of "You should protect your life and properties."

After suffering landslide disaster, residents should recognize his/her responsibility as a member of community and cooperate with community members, thinking much of mutual-help such as care of elders and vulnerable people, in order to recover/stabilize his/her daily life cycle and reconstruction of cycle of the community.

Residents should collaborate to formulate disaster management measures which central and local governments and related organizations carry out, in order "to create much stronger community against landslide disaster." and then, contribute to implementing the measures, such as participating autonomously the activities for the implementation.

# Part 2 Mitigation Plan

# Chapter 4 Promotion of mitigation measures

## 4.1 Role of MTAES and ministries for implementation of mitigation measures

Landslide movement is generally relatively slow. Even the cases of large-scale activation of landslide, it is common that small movement occurs. Thereby, it is important to clarify landslide movement adequately through monitoring, in order to reduce risks of landslide disasters. In parallel to or following to the monitoring, it is necessary to formulate plan, carry out education/ training, and implement mitigation measures. Roles of MTAES and the ministries for promotion of mitigation measures are as follows.

a) MTAES and the ministries manage activities and support to implement plans mentioned in this plan. The ministries assign departments and organizations to implementation of the plan. Then, the assigned departments and organizations formulate detailed annual plans, secure budget and assign personnel.

b) MTAES and the ministries appoint carry out monitoring for situation of implementation during the implementation the plan and provide instructions and assistance for smooth implementation.

c) Upon receiving reports on the implementation of detailed plans, MTAES and the ministries assesses the results, and incorporates them into planning and target setting for the next fiscal year.

## 4.2 Activities of MTAES and the ministries

The present plan is put into action after being approved by the Minister of MTAES. Following to the approval, MTAES and the ministries carry out the following activities. In addition, MTAES makes summary of the results as the authorized body. For steady implementation of measures, organizations in charge should be clearly mentioned in detailed plans.

a) Reviewing and coordinating annual detailed plans and budget proposal, and staff assignment plans, as well as direction of necessary revision and approval

b) Observation of intermediate results of implementation of detailed plans for the preparation of relevant instructions.

c) Observation of the results of implementation of the detailed plans after the end of reporting period and summarizing for the evaluation the results and inclusion in the plans of the next year aimed at providing assistance in designation of new measures.

# Chapter 5 Landslide-resistant human development

Development of human resource capable to response under the circumstances of natural disasters is a task of MTAES. It is necessary to implement measures aimed at enhancing capacity of servants of the administration and population able to promote mitigation activities and respond to emergency situations for risk reduction and elimination of consequences.

## 5.1 Role of residents

It is important to secure corresponding preparedness of population for avoiding disastrous consequences of disaster based on delivery of distinct knowledge on action in case of activation of landslide, based on the principle of "You should protect your life and properties".

Therefore, the population needs to previously carry out activities for mitigation of landslide disaster risk and preparedness for emergency situations by own initiation as shown in Table 5.1.

Table 5.1 Mitigation/ preparedness activities by residents

| | |
|---|---|
| Mitigation | 1. Work together for reinforcement of residents' association and participation in its activities<br>2. Repairing and reinforcement of residential houses<br>3. Controlling unnecessary use of water and proper drainage<br>4. Controlling modification of landscape and natural conditions such as large-scale excavation and tree cutting<br>5. Recognition of deformation by landslide (cracks and abnormal water flow) and reporting such conditions to community administration office, etc.<br>6. Expansion of availability of knowledge and information on measures of prevention of emergency situations and elimination of consequences |
| Preparedness | 7. Confirmation and registry of emergency contact numbers<br>8. Provision of articles of value, mobile radio, pocket lanterns, medicine and other staples<br>9. Allotment of duties among family members in case of disaster in advance; making decision of gathering place, communication means, order and routes of evacuation<br>10. Active participation in trainings and other measures, organized by MTAES and local communities<br>11. Provision of information to condominiums and other local bodies about those members of family, who need a special care |

Detail description of mitigation measures is given in Clause 5.2, and measures of preparedness to emergency situations in Chapter 11.

## 5.2 Promotion of autonomous disaster management activities of residents

### 5.2.1 Work together for reinforcement of residents' association and participation in its activities

For further enhancement of resident's activities for autonomous disaster management, MTAES provides assistance for disaster education and training as well as provision of equipment or tools for emergency response. Residents should understand the situation of community group on disaster management and actively incorporate the group activities.

### 5.2.2 Repairing and reinforcement of residential houses

In landslide areas, cracks develop on the walls and columns of houses. Since landslides are moving relatively slow, residents remain staying in the houses with surface repairing (covering the cracks with mortar). However, cracks may cause instability of structure of the houses, and accordingly, there is possible thread that houses may collapse suddenly with small movement. Consequently, it

is necessary to check the structural stability by an expert, whether the house is structurally weakened or not.

### 5.2.3 Controlling unnecessary use of water and proper drainage

As mentioned in Clause 2.2.2, heightening of groundwater level causes activation of landslide. The possible reason of the heightening of groundwater level is natural conditions such as rain fall and snow melt. Another reason is manmade one such as unintentional leakage of water from water supply pipes as well as intentional water release for cattle, irrigation, and prevention of freezing of water pipes. There are cases of landslide instability due to the latter reason. Thereby, it is necessary to control unnecessary use of much water use in landslide areas, and also, install proper surface drainage system to prevent the heightening of groundwater level due to filtration of used water to the ground.

## 5.3 Raising awareness of disaster management and dissemination of disaster information

### 5.3.1 Curriculums for staffs of administration

The most important task of MTAES is the protection of life, health and property of population during emergency situations, which requires provision of corresponding education of staffs of administration, aimed at increase of their awareness on measures of prevention of emergency situations and elimination of consequences and capability of confident action during emergency situations and making substantiate decisions.

The staffs of administration, involved in the field of emergency situations and civil defense, should pass theoretical and practical studies by 15 hours education programs in Crisis Management Academy of MTAES, including 9 hours of general lessons and 6 hours of lessons of specialization. The staffs of other sections of administration should participate in collective educational programs, periodically organized in administration, aimed at not only studying the main materials of measures of prevention of emergency situations and elimination of consequences, but also at familiarization of staffs with the order of organization of works of each section during emergency situations, duties of each staffs and possible models of behavior during abnormal situations.

Educational guidelines on the contents shown in Table 5.2 are carried out by the Crisis Management Academy of MTAES.

Table 5.2 The contents of disaster education for officials

| |
|---|
| 1. Basic knowledge of occurrence mechanisms and movement of landslides. |
| 2. Knowledge of landslide disaster measures currently implemented |
| 3. Daily preparations for landslide disaster |
| 4. Notification of evacuation shelters and evacuation methods in time of landslide |
| 5. Rescue / first aid methods |

### 5.3.2 Dissemination of information among population on measures of securing

preparedness during emergency situations

Emergency situations and civil defense section, by support of Crisis Management Academy, should organize works of increase of awareness and deliberate approach of population on securing preparedness to possible disasters through organization of distribution of propagandistic sheets, workshops, topical exhibition-fairs, together with active usage of potential of mass media. At the same time, it is necessary to pay special attention to the groups of vulnerable people, who have problems related to accessibility of information.

(1) Methods of dissemination of information

It is recommended to organize dissemination of information by the method given in Table 5.3.2.

Table 5.3.2 Methods of dissemination of information on measures of securing preparedness to emergency situations among population

| |
|---|
| 1. Meetings in administrative areas |
| 2. Instruction and provision of methodical assistance to persons and organizations, working at schools, condominiums and other entities |
| 3. Familiarizing population with hazard and risk maps |
| 4. Preparation and distribution of educational sheets, documentary films and other propagandistic materials |
| 5. Usage of potential of all kinds of mass media |
| 6. Organization of workshops, exhibition-fairs, installation of propagandistic boards |

(2) The contents of information

It is suggested to disseminate information among population with the following content.

a) Information on nature of landslide

Simple and accessible explanations on mechanisms of occurrence of landslide, nature of deformation due to landslide as well as understanding landslide distribution maps and landslide inventory sheets

b) On-going works of ES bodies for securing preparedness to landslide disaster

Familiarization of population with measures implemented by MTAES and other bodies, disaster management plan of each community

c) Preventive measures of securing personal security

Familiarization with measures of reduction of damages of possible disaster and securing personal preparedness to landslide (see Clauses 5.1., 5.2., and Chapter 11).

d) Installation of gathering points of population and shelters: evacuation order

Familiarizing population on gathering points of population and shelters, evacuation order by the use of evacuation maps, composed according to residential areas, and secure routes.

e) Order of traffic control in case of landslide disaster

Works, conducted by MTAES and public order service for familiarization with the rules of behavior of population (drivers, passengers) during natural disaster

f) Process of rescue and first medical aid

Direction and education by MTAES and Ministry of Healthcare, providing independent emergency medical aid of population until official assistance reaches to the population.

# Chapter 6 Landslide-resistant Community Development

## 6.1 Role of Community

Most of target communities of this plan, suffered with landslide disaster, are located in rural areas. In general, residents have relatively deep relationship each other, comparing to urban areas, and solidarity in communities is rather high. In addition, a resident's group for emergency response has been created in some communities, with assistance of MTAES, etc.

Communities should establish organizational framework for preparation against disasters, collaborating each other, under the concept of "create much stronger community against landslide disaster". In order to enhance awareness and capacity on disaster management in the community as well as individual community members, all member should carry out activities for mitigation and preparedness against landslide disasters, mentioned in Table 6.1. The detailed description/ explanation of the activities is on Clauses 6.2 to 6.7 for mitigation and Chapter 11 for preparedness.

Table 6.1 Mitigation/ preparedness activities by communities

| | |
|---|---|
| Mitigation | 1. Creation and enhancement of autonomous groups on disaster management<br>2. Formulation of a disaster management plan for each community<br>3. Collection, transmission, and reporting of information of landslide movement<br>4. Securing safety, repairing, and control of use of buildings and facilities of community property<br>5. Promotion of disaster education and training<br>6. Request for assistance and sharing its information and materials |
| Preparedness | 7. Stockpile of water, food, and daily necessaries and stockpile/ maintenance/ regular inspection of disaster management equipment<br>8. Creation of a list of community members, a list of people needing assistance, a contact list of disaster management organizations.<br>9. Creation of a disaster management map, preparation and notification of assistance facilities such as evacuation shelters<br>10. Preparation for protection/ assistance of community members and residents, especially vulnerable people<br>11. Improving the response capacity and giving advice on what to do in time of landslide disaster by disaster drills and seminars |

## 6.2 Creation and enhancement of autonomous groups on disaster management

In villages of Armenia, creation and enhancement of emergency response group is on –going. For the villages suffered by landslide disaster, the activity of the creation and enhancement should be continued and promoted, together with enhancing function of the group for the activities of mitigation and preparedness autonomously and with receiving assistance.

## 6.3 Formulation of a disaster management plan of community

Landslide-prone community should prepare own disaster management, aiming at reinforcing their capacity on disaster management (including mitigation), considering particular situation of each community. In the plan, organizational framework and financial sources should be clarified, in order to secure continual implementation of the measures mentioned in the plan. The plan should regularly be reviewed and updated. Contents to be covered in the plan are shown in Table 6.2.

Table 6.2 Contents to be covered in a disaster management plan of community

| |
|---|
| 1. Basic policy and purpose of the plan |
| 2. Outline of the community (population, number of buildings, land use, etc.) |
| 3. Outline of landslide and damages |
| 4. Internal organizational framework and tasks of emergency response group |
| 5. List of equipment/ materials to be prepared for disaster management and location of the storehouse |
| 6. Disaster management map, including list of evacuation points, particular risks in the community, disaster management resources |
| 7. Important issues and solution on disaster management |
| 8. Preparation for disaster management by community members |
| 9. Action plan and financial plan |
| 10. Contact addresses of local organizations related to disaster management |

## 6.4 Collection, transmission, and reporting of information of landslide movement

Landslide movement can be recognized with deformation and/or cracking of the ground, buildings, structures, woods, etc. as well as associated abnormal sound, abrupt water flow out, etc. Collecting those information is an indispensable first step of proper response to landslide disaster. Since residents aware firstly of the abnormality, community should entrench the system of information collection, dissemination it to other residents, report it to emergency response group as well as steadily carry out the activity.

In case that monitoring equipment has been installed, community should collect monitoring data, in corporation with regional rescue service.

## 6.5 Securing safety, repairing, and control of use of buildings and facilities of community property

In case that a community manages community road, water system, etc., safe of the buildings and facilities against landslide should be confirmed. Particularly for water facility, ground condition and strength of the facilities should be confirmed so that no leakage occurs, since water leakage causes activity of landslide.

In case that damage due to landslide affect to the facilities, quick repairing should be done, together with the reporting as mentioned the previous clause. Particularly about water leakage from water facilities should be stopped quickly to avoid activation of landslide.

In addition to control of traffic on damaged road and use of damaged buildings for safety, use of water facility should be controlled until stop of leakage.

## 6.6 Promotion of disaster education and training

Communities should promote disaster education to the residents through proactive co-organizing or cooperating for the organization, which State Crisis Management Academy etc. carries out. The purpose of the disaster education is mentioned in Table 6.3.

Table 6.3 Purpose of disaster education in communities

| |
|---|
| 1. Understanding basic points on landslide disaster and its management |
| 2. Raising awareness on disaster management |
| 3. Developing ability for proper judgment and action against landslide disasters |
| 4. Developing ability to contribute assisting other affected areas |

### (1) Promotion of disaster education in communities

Crisis Management State Academy carries out disaster management education to leaders of villages and emergency response groups, and then, the educated leaders carry out disaster education to community members on the purpose of dissemination of knowledge on disaster management. In the disaster education in communities, the leaders should carry out education to the members for raising awareness and leaning basic knowledge. In addition, specialized knowledge should be introduced by specialists invited.

### (2) Promotion of disaster education in schools

In schools, organizational framework for promotion of disaster education should be established, which mainly consists of staffs in charge of emergency management. The staffs for emergency management should prepare a plan of annual disaster education which covers all contents of the education, in cooperation with related organizations, considering age of pupils and characteristics of local situation. There is an obligatory curriculum for disaster education; one class in a week, for higher-age pupils in schools, and in this class, the contents on landslide disaster management should be enhanced.

## 6.7 Request for assistance and sharing its information and materials

Community should ask regional rescue service, Crisis Management Academy, MTAES, etc. for assistance for the activities mentioned above, if it is considered necessary. Items and contents provided through the assistance as well as materials and goods provided should be kept properly in the community and share with all residents.

## 6.8 Assistance and collaboration for promotion of disaster management activities of communities

### 6.8.1 Official assistance

For the promotion of disaster management activities of communities, assistance by city and republican governments is important as shown in Table 6.4.

Table 6.4 Assistance to communities done by governments

| | | Item of action | Major assistanting organization |
|---|---|---|---|
| Mitigation | 1 | Creation and enhancement of autonomous groups on disaster management | Ministry of Territorial Administration and Emergency Situations (RS) and marz |
| | 2 | Formulation of a disaster management plan for each community | Ministry of Territorial Administration and Emergency Situations (RS) and marz |
| | 3 | Collection, transmission, and reporting of information of landslide movement | Ministry of Territorial Administration and Emergency Situations (RS) and marz |
| | 4 | Securing safety, repairing, and control of use of buildings and facilities of community property | Ministry of Territorial Administration and Emergency Situations (RS), marz, and related |

| | | | |
|---|---|---|---|
| | | | ministries |
| | 5 | Promotion of disaster education and training | Ministry of Territorial Administration and Emergency Situations (Crisis Management State Academy) and marz |
| | 6 | Request for assistance and sharing its information and materials | Ministry of Territorial Administration and Emergency Situations (RS) and marz |

### 6.8.2 Creating safer villages, through collaboration among related bodies

Community should clarify task sharing and collaboration for promotion for creating stronger village against landslide disaster, through exchange information on measures to be implemented among related official organizations, NGOs, etc. For raising necessary awareness and promotion of cooperation, MTAES take the following measures.

a) Preparing occasion for official organizations, community, NGOs, etc. to discuss and agree about mutual assistance

b) Preparing and disseminating basic policy and plan for collaboration among official organizations, community, NGOs, etc. in landslide disaster management as well as promoting of understanding its importance

c) Organizing symposiums and lectures regarding creation of quake-resistant city

d) Organizing joint training on disaster management, with autonomous participating of residents, for the purpose of the promotion of collaboration among groups of volunteers and residents

d) Promoting collaboration activities through dissemination of good examples of collaborated activities among communities as well as introduction of enterprises that contribute to local society in disaster management activities

## 6.12 Preparation for reconstruction of economy and industry

### 6.12.1 Establishing and organizing a consociation in each kind of industry for information exchange for disaster management

Ministry of Territorial Administration and Emergency Situations should promote establishing and organizing a consociation in each kind of industry for information exchange in disaster management, for the acceleration of preparation against disaster in industrial field as well as for securing prompt reconstruction/ life support/ job opportunity after disasters.

### 6.12.2 Preparation of manuals on industrial disaster management for mid- to small-scale enterprises

Ministry of Territorial Administration and Emergency Situations should prepare manuals on industrial disaster management in each kind of industry, mainly for mid- to small-scale enterprises.

### 6.12.3 Installing industrial one-stop service centre

For assisting smooth recovery of businesses, Ministry of Territorial Administration and Emergency Situations should prepare for installing industrial one-stop service centers, which provide several services in one place such as provision of related information, consultation, administrative procedures, etc.

# Part 3 Preparedness Plan

# Chapter 10 Process for promoting preparedness and assistance and supporting system for the promotion

Preparedness for landslide disaster in this plan presupposes establishment of a system the actions of which will be targeted at prediction, prevention of landslide phenomena and reduction of the risk of the later as well as rapid response and liquidation of consequences in case of occurrence.

These systems can be established at different levels, i.e. at the level of state executive bodies (hereinafter referred to as ministries), at the level of state governing territorial bodies (hereinafter referred to as regional administrations) and at the level of communities.

The system must be a union of community authorities, population and organizations supported by the state executive and state governing bodies.

Taking into account the circumstance that the landslides as hazardous geological phenomena can seldom extend out of the territories of 2 and more communities, landslide disaster management is the priority task of the community. Based on the abovementioned, the issues of landslide disaster risk reduction and primary response must be regulated at the community level and by the forces and possibilities of the community. But in separate cases (except for the priority of population protection) landslides may threaten the infrastructures, cultural or other facilities of regional or republican importance. In this case landslide prevention measures in the territory of the community can be taken by ministries, regional administrations and organizations of republican importance (ArmRusgasprom, Electric Networks of Armenia, Armen Tel etc.) and by the means of latter focusing of population protection issues and then addressing the target of the treat.

The process of landslide disaster preparedness is conditioned by the operability of the abovementioned system, timely planning and implementation of preventive, preparation and response measures. Irrespective of the body in charge of landslide countermeasures, the major part of planning of landslide risk reduction and prevention measures refers to the community and is the immediate obligation of the community.

The community should independently plan and carry out the prevention and consequences reduction measures of landslides in its territory as well as plan landslide consequences liquidation and rapid recovery measures.

If the landslide countermeasures are within the competence of ministries and regional administrations and are taken by them and their means, later on during the planning of landslide countermeasures the maximum involvement of the community must be secured.

The measures of response to the occurred landslide and, then, rapid recovery of the damages caused must be mentioned in a separate section when planning the landslide countermeasures. The response part of the community plan must be developed and agreed with the territorial subdivision of MES of RA (hereinafter referred to as the authorized body) and the accident-recovery part – with the regional administration and/or ministries and organizations.

# Chapter 11 Promoting preparedness by the residents and communities and supporting system

Landslide countermeasures start in communities, the base of which are the actions and measures taken by each resident of the community aimed at:

1. Liquidation of factors causing landslides,
2. Liquidation of circumstances and factors contributing to the occurrence of landslides,
3. Litigation of possible consequences in case of occurrence of landslides.

Realizing the unfavorable impact of landslides on the economy, health and property, the heads and population of communities must autonomously follow and keep the elementary norms of prevention of landslide disaster and reduction of consequences.

It is necessary to form a primary group of landslide disaster management system in communities, i.e. landslide disaster management group at community level.

This group must think of and implement the landslide disaster management project of its community consisting of the two main parts:

1. Measures that must be carried out by each of the resident of the community aimed at landslide prevention and enhancement of preparedness,
2. Measures that must be carried out by the community aimed at landslide prevention and enhancement of preparedness.

In separate cases this project/plan of the community can include measures which are within the responsibility of regional administrations or state executive bodies or organizations of republican importance. However, even if the landslide prevention measures or landslide countermeasures are within the responsibility of regional administrations or state executive bodies or organizations of republican importance, the community administrations and any of the residents have their scope of activities to be carried out.

Landslide countermeasures dictates development of a number of administrative possibilities, especially development of possibilities of population, communities, schools, clear distribution of functions contributing to the harmonization of activities.

Everyday works for preparedness contribute to the solidarity of population and are essential for the enhancement of realized approached towards the implementation of landslide countermeasures.

Heads of communities, with/through territorial subdivision of MES of RA, must organize measures aimed at enhancement of population awareness by means of trainings, workshops, distribution of handouts.

Each community should work out its own landslide disaster management plan assuming a particular situation and aiming at strengthening their capacities of disaster management. The organizational framework and financial sources necessary for the implementation of measures must be clarified in the plan to secure the sustainable implementation of the measures mentioned in the plan.

While preparing the provisions of the project/plan of landslide countermeasures to be carried out by themselves, the communities and their residents should base on the risk map of their residential area.

These plans must be revised and updated periodically based on new information, changed basic situation and lessons learned from their activities.

The plan must consist of the following two main sections:

1. Measures aimed at prevention / reduction of impact of landslide disaster
2. Measures aimed at mitigation of landslide disaster consequences and rapid recovery.

The section on measures aimed at prevention / reduction of impact of landslide disaster must include measures targeted at reduction of possible development and activation of the landslide phenomena that has already occurred and liquidation of factors contributing to landslide activation. In this Section a separate and big attention must be paid to the issue of land use of the community as well as issues of rational dislocation lifeline systems, pre-school and education institutions and organizations.

The Section on measures aimed at mitigation of landslide disaster consequences and rapid recovery must include measures targeted at reduction of possible consequences and losses in case of activated/occurred landslide which, first of all, presupposes rational building and land use of the community.

Measures aimed at enhancement of rapid response capacities presuppose juxtaposing of organizational and financial measures targeted at enhancement of stability of lifeline system of the community and accumulation of material means necessary for rapid response as well as measures for evacuation and temporary distribution of homeless people.

# Chapter 12 Processing of monitoring data and strengthening of monitoring system

The processing of monitoring data and strengthening of monitoring system is the tool study of landslide movement and summarization of results stipulated by awareness of population and relevant specialists at all the levels of governing bodies and formation of certain stock of knowledge. It is considered to be constituent part of landslide prediction measures and presupposes a long and detailed preparation in terms of training, investigation, engineering and finances:

- working out and introduction of training programs for population starting from pre-school institutions up to the level of higher educational institutions;
- population awareness with the help of printed materials, radio and TV programs;
- education and training of relevant specialists of governing bodies at all the levels;
- knowing and study of the site;
- determination on the locations of installation of devices;
- allocation of financial means.

All these will let them understand what the landslides are, what are their causes, how they are expressed in the territory and how their activity can be measured starting from simple hand-made measuring tools up to modern digital equipment which will enable the receipt of real-time information in management centers.

# Chapter 13 Preparedness related to collection and transmission of information

The operative collection, analysis and transmission of accurate information about the damage is an important condition for response to emergency situations, particularly landslides.

The information received from operative groups of MES of RA, authorities of the community, ES services, population and other sources is arranged, the sizes of damage are periodically checked which creates conditions for the implementation of necessary measures of prompt response.

In case of necessity photos and videos are made which are necessary for the implementation of prompt response as well as provision of photo and video materials about the disaster.
The staffs of ES services dealing with damage estimations, with effective use of different communication means, periodically submit the collected information to MES of RA where, after the being analyzed, the following is carried out:

1. Estimation of forces and means,
2. Classification of works at site based on priority,
3. Provision of information to interested bodies for the effective organization of their works.

During the disaster information should periodically be provided to population about the development of events and their rules of behavior.

Population awareness on ES in carried out for:

1. Prevention of the occurrence of panic among population,
2. Effective organization of search operations, evacuation of population, material values and cattle,
3. Finding solutions to life-support issues of the affected population.

## Chapter 14 Preparedness for urgent countermeasure works and detouring routes

Landslide countermeasures can be divided into 3 groups which are implemented:

1. Beforehand,
2. During the activation of the landslide,
3. In the stage of liquidation of consequences.

The measures of the first group presuppose:

- installation of monitoring system,
- forming of certain rules of behavior of people living on slopes, introduction of a new culture of the way of living,
- awareness and mapping of hazards threatening the site,
- development of landslide management plans in advance,
- formation and training of primary groups of response to landslide disaster in communities.

The activities carried out by this group should consist of two main parts:

- measures to be carried out by each community resident aimed at landslide prevention and enhancement of preparedness,
- measures to be carried out the community aimed at landslide prevention and enhancement of preparedness.

The effective organization and implementation of the measures of the first group will restraint the further activations of landslide phenomena and in case of occurrence the consequences will be as mild as possible.

The development of landslide disaster management plans of communities will contribute to the development of administrative capacities, namely the development of the capacities of population, communities and schools, clarification of functions and harmonization of activities. The measures carried out in the stages of landslide activation and liquidation of consequences should also be reflected in plans. This section must include the measures aimed at reduction of possible consequences and losses in case of landslide activation which, first of all, presuppose rational construction and land use in the community. For this stage it is necessary to envisage the main and detouring routes of evacuation of population and material values, relocation places of the evacuated people and the solution to the primary life-support issues in plans.
Landslide disaster management plans of communities should be worked out as realistic as possible taking into account the forces and means of the community. The plans should be periodically tested and elaborated depending on the changes of situation at site.

## Chapter 15 Preparedness for warning, evacuation and its guidance

Warning of governing bodies and population is one of the most important functions of the State in the field of population protection in emergency situations.

For rapid and effective organization of warning all available means of communication are used, such as fixed and mobile phones, lines of direct communication, special radio communication means and electric sirens.

To have the warning carried out quickly and clearly in case of activation of a landslide it is necessary to carry out strengthening of communication and information systems, as well as introduction, development and organizational measures of real-time monitoring and warning systems.

For this purpose it is necessary to expand the monitoring systems, periodically check and update the warning means and lists, carry out checking of contact numbers and so on as well as:

1) Develop «911service
2) Introduce monitoring and its real-time warning systems
3) Improve databases, including the information reflected on maps
4) Develop crisis response regulations
5) Introduce computer systems for real-time evaluation of the situation

Population must be informed about the approaches of the RA Government and Regional Administrations aimed at response to emergency situations and mitigation of consequences as well as measures carried out on daily basis.

For the enhancement of warning preparedness of population it is necessary to carry out the following in advance:

1) Enhancement of conscientiousness of the society and population and promotion of autonomous activities of protection from disasters;
2) Publication of «Plan of reduction of disaster risks of the marz/community and action plan in emergency situations» as well as provision of information on the progress and results of measures envisaged by the plan to population.

The work with the public should be carried out through internet mass-media, newspapers and posters.

# Chapter 16 Preparedness for security, traffic control and emergency transportation

Measures aimed at providing the security must be reflected in the community plans. The measures include the provision of security of the road between the houses, evacuation routes, primary rescue and firefighting measures, provision of security of roads of access for medical assistance etc.

For the smooth implementation of evacuation, rescuing, assistance rendering, including medical, firefighting and other urgent measures it is necessary to designate the transportation routes for the mentioned measures beforehand.

For this purpose traffic by other means of transport by the designated routes is either limited or completely prohibited, except for the means of transport defined beforehand the traffic of which is allowed during emergency situations.
Prioritizing the security of the population the subdivision in charge of transport of the marz should plan the procedure of introduction of emergency transportation systems in advance which will define:

- The order of restriction of road transport traffic,
- Rules of behavior of drivers,
- The scopes of cooperation with the organization shaving heavy machinery,
- The order of collection and transmission of information about passable and impassable roads,
- The order of access of rescue, accident-recovery, medical and police forces,
- The order of classification of roads into different levels of strategic importance according to their significance.

## Chapter 17 Preparedness for search and rescue operations

It is necessary to immediately start search and rescue operations in the situation created due to landslide activation. For that purpose it is important to carry out the planning of these works in advance and keeping of forces involved in search and rescue operations in permanent ready situation.
Search and rescue operations in during the landslide disaster are similar to those carried out in seismic disaster, i.e. they consist of two stages, namely search and rescue operations, search of the affected and extrication from the collapses (buildings collapsed due to landslide), soil and debris mass, damaged vehicles.
Occurrence of secondary factors is also possible due to landslide – fire, domestic gas leakage, hazard of being affected by electricity and water etc.
Depending on the location and scale of landslide it is necessary to plan also the occurrence of large-scale accidents, since landslides can damage hydro-technical facilities, hazardous productions, tail reservoirs etc.
Taking into account the circumstance that most of the landslides registered in Armenia threaten the automobile roads, in the planning of and preparedness for search and rescue operations special attention must be paid to access roads for firefighting and rescue forces in the conditions of shortage of time and necessity of evacuation.
Based on the abovementioned it is necessary to pay special attention to the involvement of cranes, excavators, agricultural equipment and construction machinery in the measures aimed at enhancement of preparedness for search and rescue operations.
Target of search and rescue operations is population, particularly if information about their being alive or dead is missing, although during the landslide domestic animals can also be affected. During the landslide there is also a necessity to rescue cultural values.
For the enhancement of preparedness for search and rescue operations it is necessary to carry out parallel planning of firefighting and accident-recovery operations to eliminate the factors of secondary damage, since they may be of great hazard for the affected, jeopardize the rescuers lives or considerably hamper or slow down the rescue operations.

# Chapter 18 Preparedness for emergency medical care, health, drinking water and food

In case of a threat of the landslide the medical service of the marz establishes an information management system the task of which is to carry out collection of accurate information and exchange of the latter with hospitals, ambulances and other medical institutions. This system is one of the important sections of the action plan in emergency situations and disaster risk reduction of the marz/community.
The hospitals and field medical stations are equipped with necessary medical tools and medicaments in advance and staff is allocated.
The selection of the locations for setting up of the hospitals and field medical stations is carried out beforehand and population is informed about it.
The planning of emergency medical assistance for operative and urgent rendering of the first medical aid in emergency situations includes:

- Preparation of field medical stations,
- Allocation of obligations and organization of interoperation, strengthening of mobile medical subdivisions,
- Creation of materials and substances of medical assistance and collection of stocks,
- Involvement and training of doctors and medical staff.

Facilities rendering medical assistance are hospitals and field medical stations. The hospitals are large profile ones rendering medical assistance in usual conditions which are capable of carrying out big medical activity in emergency situations.

Field medical stations are the ones deployed in special medical tents and set up in free zones which render temporary medical assistance and must be planned in advance.

For the mobile medical units and other medical staffs to be able to properly carry out their activity in hospitals and field medical stations it is necessary to carry out allocation of activities and obligations in advance.

Field medical stations are asset up on the bases ambulance service of the marz where specialists allocated by hospitals can be involved.

In the plan of disaster risk reduction of marz/community and action plan in emergency situations (DRR and ES plan) the procedure of allocation of drinking water, food and staples for 3 days and provision to population (people deprived of personal stocks) must be organized.
The people in charge of the abovementioned must be clearly defined and the system /mechanism/ of operative obtainment, supply and distribution of drinking water and food must be planned in regional administrations and communities.

Besides, the system of rapid obtainment and supply of material means, construction materials and tools necessary for the liquidation of the consequences of ES should be organized.

# Chapter 19 Preparedness for tentative repairing of lifeline and infrastructure

As a result of destructions caused by landslide disaster utility, transport and telecommunication networks as well as anti-flood system usually get out of order leading to disturbance of vital activity of population and functioning of economic facilities.
The important facilities for the of vital activity of population and functioning of economic facilities are hydro-technical facilities, water purification stations, power stations and sub-stations, gas storages and gas regulating stations, communication retransmission and commutator systems.
For easing the damage caused to the mentioned facilities corresponding section must be developed in the landslide disaster management plans of communities. According to plans the recovery of the activity of every such facility must be assigned to the relevant specialized service of the field.

In-time and proper implementation of accident-recovery operations in every direction requires groups carrying out repair works on-site, provision of correct instructions based on prompt and accurate information about the progress of works aimed at liquidation of consequences of collapse and disaster.
The establishment of effective information exchange system is important for the organization of accident-recovery works and coordination of the activities of all the functioning forces and organizations. The system of smooth and accurate information exchange must be worked out beforehand.

# Chapter 20 Preparedness for temporary accommodation, relocation, livelihood

There must risk map included in DRR and ES plan with hazardous areas, locations of self-provision means, shelter and gathering places mentioned on it.

1. For the organized conduct of evacuation and creation of corresponding conditions the following preparatory measures are planned and implemented:

a. Development of the evacuation plan and documents attached to it,
b. The orders of evacuation implementation, use of firefighting alarm, use of territories as shelters,
c. Registration of population within the hazardous zone in case of occurrence of ES and determination of evacuation routes,
d. Planning and clarification of issues of comprehensive life-support issues of population in case of occurrence of ES,
e. Conduct of practical exercises to clarify and liquidate the identified shortcomings.

The scopes and order of interoperation with transport companies, territorial subdivisions of MES of RA and Police of RA and other interested subdivisions of the regional administration are defined in advance.

The relocation capacities of the population affected due to the landslide must be separately taken into account and stipulated and planned beforehand. Relocation should also be planned for two cases – landslide threat, i.e. in advance, and occurrence of landslide and capacity of complete recovery of the community. In separate cases, as a function of a landslide disaster management, relocation in rural community or separate parts of the city can be envisaged. These measures are included in mid-term development projects of marz or the republic.

Life-support issues (lifelines, such as electricity/hot water/sewerage and other public facilities) as well as recovery and organization of life-support in evacuation places are planned and envisaged.

The effectiveness of recovery works is secured by the decision on the priority order of life-support. In case of ES the order of implementation of specific measures are checked based on operative data on the real size of the damage:

- Main facilities of water supply, water removal and water distribution,
- Main pipelines,
- Dewatering lines,
- Main facilities of power generation, transmission and distribution,
- Main cables of electricity transmission,
- Other power supply cables and auxiliary facilities,
- Gas supply regulating stations, main pipelines,
- Branches of local network of gas supply.
- Other gas provision networks and auxiliary technical facilities,
- Main communication facilities,
- Sections of telecommunication network,
- Sections of local network.

# Part 4 Emergency Response Plan

# Chapter 21 Basics on emergency response (stage of risk increase, stage of partial collapse and damages, stage of large-scale collapse and damages)

Landslide disaster response is divided into three main stages: existence of risk of landslide activation, occurrence of partial collapses due to landslide activation and large-scale collapses.
A complex of measures must be envisaged in the DRR and ES plan of marz/community for these three stages. It is obvious that most of the measures will be repeated for all the three stages but the content, implementation order and fields of coverage of these measures will basically be different.
Thus, all three stages start from warning and information transmission. In the first case the source of information will be the data of monitoring devices or observations of population. In this case the information is transmitted to the chief of the community and territorial subdivision of RS after which preventive measures and those aimed at reduction of possible consequences are initiated according to the plan of marz/community.
In the second and third cases the transmission of the information of the chief of the community and territorial subdivision of RS will be done in the form of warning about the already occurred disaster after which search and rescue and accident-recovery operations will be taken by bodies in charge.

Evacuation and relocation options can be viewed for all the three cases and in the first case, when the disaster has not occurred yet but the possibility of occurrence of it /risk/ has increased, a number of measures to be carried out by the State are possible. The measures include:

- Detail geological study of the landslide site
- Development of complex of stabilization measures and implementation by state programs
- Discussion of issues on relocation of population and seeking of ways and financial sources for relocation

In case of partial collapse the issue of evacuation of the affected population arises for at least 3 days. After the liquidation of landslide consequences it will be possible to carry out detail study of the collapsed area to check the possibility of its further use. Then, depending on the scales of damages and collapses relocation or compensation issues may arise.

Similar approach should be taken in case of large-scale collapse, but here there may be some serious issues, such as:

- Search and rescue of people,
- Evacuation of physically unaffected population,
- Evacuation of domestic animals,
- Evacuation of material and cultural values,
- Implementation of urgent accident-recovery operations,
- Recovery activities,
- Long-term evacuation or relocation of population as well as regulation of employment issues in those areas,
- Management of soil and debris.

The abovementioned measures must be reflected in DRR and ES plans and for the third case they may be reflected only in landslide disaster management plan of the community. In case of large-scale collapse starting from intervention level ES will be classified as big and the responsibility for the response to the latter will be assumed by regional administrations or republican executive bodies/government.

# Chapter 22 System and operation of emergency measures by stage and collaboration of related organizations

Landslide disaster response system includes regional administrations with their subdivisions /transport, trade and food, medical, utilities and welfare, road construction etc./, community administrations, state executive bodies with their territorial subdivisions /MES, Police/, organizations of republican importance /ArmRusgasprom, Electric Networks of Armenia, communication operators, drinking and irrigation water organizations/.

Both in DRR and ES plan and landslide disaster management plan should clearly reflect the functions of bodies involved in the system, scopes of obligations and responsibilities and collaboration with each other. It is obvious that any measure of population protection in case of disaster appears in the scope of responsibility of several bodies and is carried out **jointly**.

Territorial subdivisions of ES and the authorities of the community are responsible for the warning although the role of population in warning should not be neglected. There may be cases when primary warning on the disaster is carried out by population and for such case the organization of training for population and teaching of rules of behavior is important to be able to act correctly with warning signals.

The main bodies in charge of search and rescue operations are MES subdivisions but here the existence of cooperation elements are essential, such as parallel implementation of accident-recovery operations, rendering of medical assistance to the identified affected people, the issues of cleaning of access roads, in-time supply of logistical materials for the search and rescue operations, provision of security in search and rescue operations.
The measures aimed at evacuation and relocation of population, with their content and scopes, are a subject of joint activity of several bodies. Although, according to the Legislation of the Republic of Armenia, territorial bodies /regional administrations/ and local self-governing bodies are in charge of evacuation, MES of RA the coordinating role here. Evacuation measures are carried out by several bodies – the evacuation itself is carried out by regional administrations and community administrations, the guidance of evacuation routes, protection of the affected territories and provision of security of the evacuation places are carried out by police, medical provision of the evacuees and control of sanitary-hygiene situation of territories are carried out by medical department, provision of means of transport is carried out the transport department, provision of passability of roads and recovery of bridges is done by road-construction organizations, utility system recovery issues are regulated by utility subdivisions, the issues of life-support of the evacuees are dealt with by the trade department and utility subdivisions.

## Chapter 23 Monitoring strengthening

The installation of monitoring system in landslide sites allows carrying out effective control over the development of landslide phenomena. The accuracy of monitoring results depends on the correct selection of the place of installation of the devices. For that end the location is studied, the sizes of landslide body, scarps, directions of movement of the toe part are clarified.

In landslide sites monitoring is carried out by both simple hand-made devices and modern digital measuring devices. Modern digital devices enable the implementation of more accurate measurements including in horizontal and vertical directions of the soil layer.

Strengthening of monitoring presupposes more frequent analysis of data which will enhance the effectiveness of response. The strengthening of monitoring will also contribute to the analysis of the measurement results on other hazardous phenomena contributing to landslide activation, such as amount of precipitations, thickness of snow layer. These works will enable prediction of further developments in larger time-period.

# Chapter 24 Collection and transmission of information on monitoring and damages

The collection and transmission of information on monitoring and damages presupposes tool study of landslide displacement, analysis of results and transmission of the information to all the interested state governing bodies and beneficiaries by different means of communication.

The transmission of information on prediction of landslides, their further activation and their consequences contains long and detailed organized educational, investigation, engineering and financial measures.

The implementation of these measures will enable more effective organization of response, prevention and consequence mitigation measures.

The information about the displacement of landslide body and damages caused can be collected using both simple hand-made tools, such as beams installed on slopes, tapes pasted on wall cracks and joints of bearing structures, and modern accurate electronic devices, such as surface and hole sensors.

Information collection and transmission works can be carried out with the efforts of landslide management groups established in communities.

The transmission of data to interested bodies from the modern accurate electronic devices installed on slopes, in case of availability of corresponding software, can be organized in real-time.

# Chapter 25 Implementation of emergency countermeasure works and detouring route

Landslide countermeasures must be reflected in landslide disaster management plans of the community which should be developed as realistic as possible taking into account the primary and secondary hazards threatening the community and resources, i.e. forces and means of the community. Plans should be periodically tested and elaborated depending on the identified shortcomings and changes of site situation.

As emergency landslide countermeasures the following must be carried out:

1. Trimming of slope
2. Collection and organized drainage of underground waters:
- Horizontal drainage,
- Underground drainage facilities,
- Horizontal drainage,
- Vertical drainage,
3. Regulation of surface flow:
- cisterns,
- ditches,
4. Slope protection in phytomeliorative way:
- turfing,
- seeding of greenery,
- tree planting,
5. Isolation of slope surface with impervious layer
6. Bank protection:
- Wave-like walls,
- Wave refractions of underground and on-ground waters,
- Covering of slope with slab,
- Stone-filling,
7. Mechanical resistance against soil masses:
- Retaining walls,
- Pile rows,
8. Improvement of physical-mechanical properties of soil:
9. Defining of a special regime:
- Restriction of construction works,
- Defining of a special regime of operation of constructions,
- Defining of a special regime of irrigation.

The mentioned emergency countermeasures are targeted at restraint of landslide phenomena.

It is necessary to carry out response, search and rescue, medical provision, evacuation, temporary shelter provision and public order maintenance activities.

For the effective organization and implementation of the abovementioned measures detouring routes out of the landslide prone areas should be prepared in communities located on landslide slopes. These measures, similar to other risk reduction measures, should be reflected in master plans of communities and 4-year development programs of communities.

## Chapter 26 Warning, evacuation and its guidance

The warning in case of occurrence of landslide will be carried out in 3 cases:

- case 1 – by means of activation of monitoring devices in case of threat and alarming by population when noticing certain changes,
- case 2 – by the chief of community when noticing certain changes,
- case 3 – in case of activation of landslide through activation of monitoring devices by means of alarming by population and community administration.

In all the cases the warning signal is transmitted according to plans in force or NCMC of MES or CMC of territorial subdivision of MES.

In case of threat or activation of landslide MES with its territorial subdivisions is the overall responsible and implementation body for the warning and carries out the warning of state governing bodies, regional administrations and responding subdivisions, whereas the chief of community is the immediate responsible person carrying out warning of population and governor. In case of activation of landslide CMC of territorial subdivision of MES carries out warning by 2 options:

- option 1 –when activation of landslide with partial collapses takes place warning is issued to MES subdivisions to carry out search and rescue and firefighting operations (if needed), accident-recovery services (depending on the parts of utility network damaged due to landslide), medical subdivisions in case if there are affected, police to maintain the public order and regulate the traffic and leading staff of the marz.
- option 2 – when a large-scale landslide takes place, besides the abovementioned bodies warning will be issued to also additional subdivisions of MES and evacuation bodies as well as bodies in charge of agriculture, culture etc.

In case of a large-scale disaster The Minister of ES reports to the Prime-Minister separately and by the decision of the latter warning of heads of executive bodies of RA can be carried out.

In case of a threat or occurrence of a large-scale landslide warning of population of the area is carried out. Warning of the population of adjacent areas is also carried out to avoid appearing in landslide zone and following the corresponding rules of behavior in case of activation of similar phenomena.

Each of the warned heads of bodies (Police, medical subdivision, evacuation body etc.) carries out warning of the staffs and forces under his subordination and brings them to readiness.

In case of occurrence of landslide it is necessary to envisage and carry out an evacuation to protect the life and health of population and avoid large-scale damages.

Decision on evacuation is made by the chairman of the committee of emergency situations (governor) or evacuation (deputy governor/chief of community). In separate cases decision on evacuation can be made by an official of MES of RA.

The order of the chairman of the committee of emergency situations or other chief on preparation and conduct of evacuation contains points the fulfillment of which secures the rapid and safe evacuation of population. When making a decision or issuing an order on evacuation the following should be taken into account:

- Reason requiring implementation of evacuation,
- Area where the evacuation is carried out from,
- Evacuation route,

- Evacuation location and its state of distribution,
- Other measures being carried out in parallel with evacuation measures, such as medical security, maintenance of public order and life-support

After receiving an order on the preparation and conduct of evacuation, they are getting ready to receive the evacuees in the temporary evacuation points which are defined beforehand in the DRR and ES or Landslide disaster management plans of the community.

People in charge in the evacuation point report to the evacuation committee about the number of evacuees as well as sick, injured among the evacuees and other important issues. The evacuation committee gathers all those reports, sums them up and report to the chairman of the evacuation committee.

The evacuation committee, cooperating with the firefighting-rescue detachments, police and other bodies, organizes the movement of evacuees by evacuation routes securing their quick and safe evacuation.

The evacuation committee gives a task to the heads of administrative districts for envisaging safe evacuation routes and assignment of people in charge of the dangerous sections of the evacuation routes and regulating the traffic.

The head of the administrative district, together with the territorial subdivision of MES, organizes the rendering of medical assistance to the aged, children, sick and other people during the evacuation.

The residents who have lost their flats as a result of disaster or cannot continue living there due to the damage caused to lifelines or similar reasons are also subject to evacuation.

Life-support issues of the evacuated population are organized by the regional administration in the evacuation places. In case of long evacuation (1 month and more) the issues of employment of population and the continuation of the education process of the students must be organized in evacuation places.

Depending on the scales of disaster and the damage caused by it a decision on the relocation of the population can be made. That decision is made by the Government of RA. In this case the issues of relocation of population, provision of population with houses/flats and the compensation of the latter are arranged by the Government of RA. The direct executors of the measure are the governors.

## Chapter 27 Security, traffic control, and emergency transportation

Prioritizing the population security, public order and transport services make efforts to establish public order and emergency transportation systems as well as carry out emergency public order maintenance, road traffic and emergency transportation measures promptly and clearly.

It is carried out for the following purposes:

- protection of lives, health and property of residents,
- prevention of crimes,
- keeping of traffic order and rules,
- maintenance of public order of emptied territories and evacuation places.

To carry out the abovementioned measures the data about the below-mentioned must be mentioned in plans:

- evacuation places, number of evacuees, necessity of dispatching of doctors and other medical staffs,
- damages caused to electric lines, gas and water pipelines and the perspectives of their recovery,
- assistance rendered to population.

The Police sets up interoperation and collaboration system with interested bodies and carries out the following activities:

- collection of necessary information and transmission thereof to the interested bodies,
- protection of disaster area where search and rescue and other urgent accident-recovery operations are being carried out, evacuation routes and places. Depending on the situation, the staffs of the RA Police provide comprehensive assistance to evacuation measures to have them carried out as smooth and unfailingly as possible. During evacuation a special attention is paid to the aged, invalids and people with special needs.

Traffic control measures are also defined by plans and are mainly carried jointly by MES, Police and Transport service, since in case of shortage to roads, the following is regulated:

- Access of rescue and firefighting forces to the disaster zone,
- Organization of evacuation,
- Access of medical and accident-recovery forces to the disaster zone,
- Protection of disaster zone,
- Provision with drinking water and food.

Taking into account the abovementioned conditions an emergency transportation plan is made separately including not only the abovementioned transportations but also other, such as envisaged (evacuation of the disabled, pregnant women, children and the aged, provision of staples, warm clothes and heating devices by means of transport, transportation of debris and soil as well as corps) and additional or non-envisaged the need for which may arise depending on the situation. That is why prompt involvement of additional means of transport or adjusting of the available ones are envisaged in the transport provision measures in the Landslide Disaster Management Plan.

# Chapter 28 Search and rescue

Based on the obtained information on the damages and collapses, the subdivisions envisaged for search and rescue, urgent accident-recovery and other urgent operations stipulated in DRR and ES as well as Landslide Disaster Management plans (hereinafter referred to as Plan) are brought to readiness. The Heads of territorial subdivisions of the RA Police, in the area of coverage of who the disaster took place, allocate the territories under protection among the foces dispatched and staffs and subdivisions of interested bodies functioning in that territory.

Starting from the moment of warning the search and rescue forces carry out permanent reconnaissance aimed at identification of secondary phenomena of hazardous territories as well as assist in transmission of information about the population protection and other rescuing activities.

Search and rescue and firefighting-rescue subdivisions of MES carry out:

- Identification of the affected,
- Identification of missing people,
- Rendering of assistance to the affected,
- Search and rescue operations for the extrication of the injured,
- Firefighting.

For the provision of smooth, prompt and unfailing implementation of search and rescue operations regional and community forces carry out:

- Cleaning of roads and access ways,
- Recovery of roads and ways if they are damaged,
- Medical assistance to the affected
- Accident-recovery operations liquidating the factors hampering the secondary factors and rescue operations.

Depending on the scales of disaster and destructions, number of available responding subdivisions and their equipped level, request for the involvement of forces from the neighboring marz or republican regional forces can be made for support.

It is assumed that there will be human losses during the disaster due to several factors at the same time. These factors include, first of all, collapses, then fires as well as emissions of gas or other toxic materials, damages caused of lifelines etc.

During search and rescue operations technical search devices are used (rescue dogs may be used).

In case of activation of landslide the effective period for search and rescue will be up to 3 days, that is why any measure should be taken by the community authorities to rescue people, warn the MES subdivisions promptly, take measures for the involvement of volunteers and population.

For the enhancement of the effectiveness of search and rescue operations it is necessary to establish ES management staff, information collection and transmission system and transport system according to Plans as well as develop a cooperation among interested bodies. The harmoniously functioning mechanism should enable the rapid organization of evacuation, first assistance measures, including urgent medical, search and rescue of the missing.

For saving the lives and health of population, the authorities of communities should carry out education of population aimed at both preparedness for landslide disaster and self-sufficiency (stock of at least 3-day water and staples) and basics of self-rescuing and mutual assistance.

# Chapter 29 Emergency medical care, health, securing drinking water and food

ES committee of marz should secure the implementation of evacuation, first assistance, including urgent medical assistance.

Medical and sanitary-epidemic services are established on the base of medical service of marz which carries out:

- Collection of information on the affected and injured
- Transportation of the medical staff to the disaster zone
- Transportation of the affected and injured
- Long-time provision of hygiene and sanitary conditions
- Rendering of psychological assistance (if needed)
- Request of assistance from other marzes
- Transportation of the injured and affected.

If it is difficult to render on-site assistance to some of the affected, the latter are taken to hospitals.

In case of landslide medical care is divided into several types:

- Triage of the affected, rendering of the first medical aid, transportation to hospitals
- Medical provision during evacuation measures and routes,
- Control of medical and sanitary-epidemic situation in evacuation places

The sanitary-epidemic service of marz secures the control over sanitary-epidemic situation in landslide area and evacuation places. If needed, the sanitary-epidemic service promptly identifies the damaged facilities and carries out sanitary treatment thereof with special materials and substances.

For rendering first medical assistance promptly and urgently in case of ES, planning of medical assistance includes the following:

In case occurrence of landslide disaster a big role is given to trade and utility subdivisions of regional administration because they have the task of provision with drinking water and food products. Drinking water and food products are provided not only to the affected population but also to the staffs of rescue, accident-recovery and other responding subdivisions involved in liquidation of disaster consequences.

The provision of the affected population with drinking water and food products is carried out in evacuation places in a centralized way. For that purpose the available stocks of the marz are used. In case of formation of marz stocks, the ES committee of marz applies to the Government of RA.

The issues of provision with drinking water and food products are planned in advance and are reflected in marz and community plans. The subdivisions in charge of provision with drinking water and food products should plan their actions jointly with transport services.

The provision of staffs of rescue, accident-recovery and other responding subdivisions involved in liquidation of disaster consequences with drinking water and food products is also carried out on a centralized basis but the difference is that the transportation of the drinking water and food products is carried out by their own means of transport.

## Chapter 30 Emergency repairing of lifeline and infrastructure

The utility, transport, telecommunication networks and anti-flood systems which have come out of order as a result of landslide disaster, leads to the disturbance of vital activity of population and activity of economic facilities.

Urgent rescue accident-recovery operations are carried out in those infrastructures for the liquidation of consequences according to plans worked out beforehand.

The urgent rescue accident-recovery operations are carried out in regional administrations and municipalities with the forces and means of subdivisions in charge of those fields, public rescue structures and emergency response teams of the mentioned infrastructures.

In terms of organization of accident-recovery operations, the coordination of the activities of emergency responding teams, public rescue structures and organizations is given to the Ministry of Emergency Situations of RA (MES of RA) which is the authorized state governing body in the field of landslide disaster management.

Within its competence, MES of RA provides the receipt, analysis of the information obtained by means of mobile management points, allocation of the information to the interested bodies and periodic preparation of reports on the progress of works aimed at population awareness for the organization of accident-recovery operations as well as coordination of the activities of all the functioning bodies and organizations.

# Chapter 31 Tentative accommodation, relocation, and livelihood

The evacuated population is relocated to the places stipulated in Landslide disaster management plan. If possible people are first evacuated to temporary relocation place (school or kindergarten) and then the population is taken to places planned beforehand. In separate cases (not in case of large-scale disaster, in case of low number of evacuees and possibility of rapid recovery of damaged areas and houses) the evacuees can stay in temporary relocation places (school or kindergarten).

In case of a large-scale landslide, after the completion of search and rescue operations, when detailed geological investigation in the landslide zone is carried out, a decision can be made on the relocation of population. The decision is made by the Government of RA by the recommendation of the governor.

Life-support measures are carried out throughout the whole evacuation process in the evacuation places of population which include:

- Provision with drinking water and food products
- Provision with staples, warm clothes
- Supply of heating, power and water
- Provision of security
- Control and maintenance of medical and sanitary-hygiene situation
- Provision of sewerage and garbage disposal

In case of long-term evacuation the issues of continuity of occupation and education process of evacuees are solved.

There are separate approaches in terms of population relocation the decision on which is made by the Government of RA after which land allocation is done.

In the allocated area population is provided with quickly constructed small houses or compensation (it is possible to allow the use of undamaged materials from their old houses) to build houses autonomously. However, the area allocated by the regional administration and community administration for relocation should be provided with life-support systems, such as roads, power, gas and water supply, sewerage, telecommunication, radio/TV.

The relocation area should be selected in a way as to enable the use of food products and life-support facilities such as food and non-food shops, medical ambulatories, hair salons etc. by population (before having similar facilities established in their territories as well).

別添資料３　ガイドライン

ガイドライン１（地すべり地形判読）

# Guideline on Identification of Landslide by Aerial Photograph Interpretation

## 1. General Provisions

This manual is used for identifying landslide potential areas by aerial photograph interpretation (API). API is considered to be an in-door study.

After the identification of a landslide feature, it is necessary to determine whether the landslide feature shows a real landslide or just a topographic feature created with other reasons, such as erosion traces, geologic or vegetation boundaries, by means of landslide inventory field reconnaissance..

The result of the API can be also used for assuming activeness of the landslide from a viewpoint of topographic features.

API is performed to recognize the visible structural elements of the landslide body and mapping. This work is a part of the landslide inventory survey that is important for filling in the Form 1 of Landslide Inventory.

API has an advantage of identifying the landslide sites over 1 ha or more landslide area which is important particularly in an initial stage of landslide disaster management.

## 2. Necessary Information and Tools for Interpretation of Landslide Features

- Topographic maps (with a scale of 1:100,000, 50,000, or 25,000)
- Stereo-paired aerial/satellite images (photographs) with a large scale
- Vegetation maps (prepared at a scale of 1:100,000)
- Geological map (prepared at a scale of 1:100,000)
- Slope (angle) map (prepared at a scale of 1:100,000)
- Landslide distribution maps of 2504 landslides prepared by JICA Study Team during 2004-2006 with a scale of 1:100,000 and Form 1 of the landslide inventory forms
- Stereographic Viewer
- Color pencils/pens

## 3. Aerial Photograph Interpretation and Delineation of Landslide Potential Areas

Delineation of landslide potential areas by interpreting aerial photographs is the first step to understand the landslide features and where they are potentially located.

The work of API is conducted with proper data and tools as follows.

The followings are to be interpreted by aerial photographs:

- the main (principal) scarp of the landslide potential area

- separate elements of the landslide body
- the displaced material
- separate blocks of landslide area
- direction of movement of each block

## 4. Structural Elements of Landslide Body

According to the nominal list (IAEG Reference book No. 41, pages 13-16) suggested for the landslide by the IAEG Commission of Landslide (1990), the schematic image and structural elements of the landslide body are mentioned in Figure 1. The names and definitions of the elements are mentioned in Table 1.

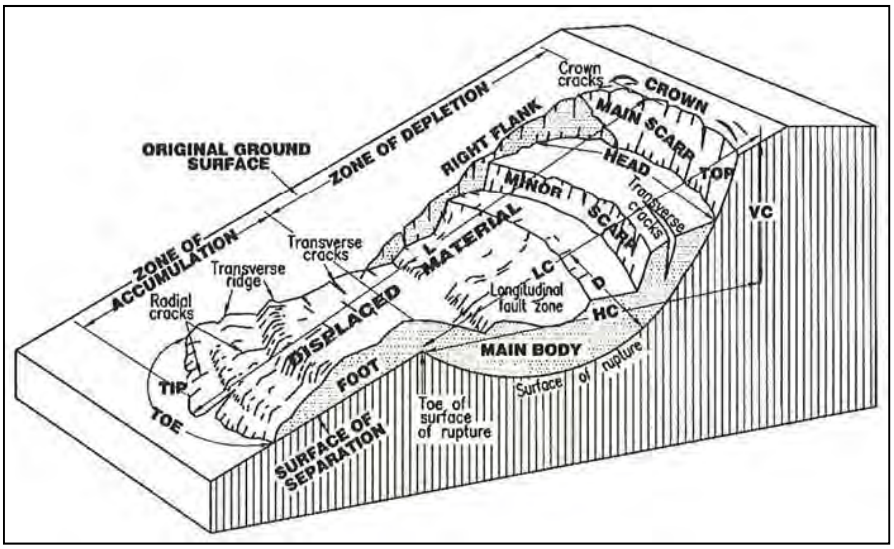



Figure 1

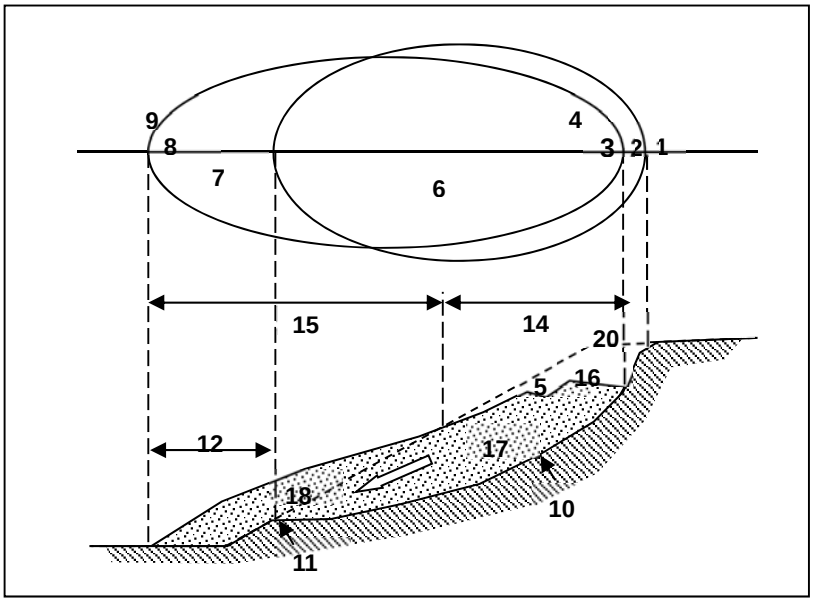



Figure 2

**Table 1**

| No. | Elements of landslide | Definition |
|---|---|---|
| 1 | Crown | Practically undisplaced material adjacent to highest parts of main scarp |
| 2 | Main Scarp | Steep surface on undisturbed ground at upper edge of landslide caused by movement of displaced material (13, stippled area) away from undisturbed ground; it is visible part of surface of rupture (10) |
| 3 | Top | Highest point of contact between displaced material (13) and main scarp (2) |
| 4 | Head | Upper parts of landslide along contact between displaced materials and main scarp |
| 5 | Minor Scarp | Steep surface on displaced material of landslide produced by differential movements within displaced material |
| 6 | Main Body | Part of displaced material of landslide that overlies surface of rupture between main scarp (2) and toe of surface of rupture (11) |
| 7 | Foot | Portion of landslide that has moved beyond toe of surface of rupture (11) and overlies original ground surface (20) |
| 8 | Tip | Point on toe (9) farthest from top (3) of landslide |
| 9 | Toe | Lower, usually curved margin of displaced material of a landslide, most distant from main scarp (2) |
| 10 | Surface of rupture | Surface that forms (or that has formed) lower boundary of displaced material (13) below original ground surface (20); mechanical idealization of surface of rupture is called slip surface |
| 11 | Toe of surface of rupture | Intersection (usually buried) between lower part of surface of rupture (10) of a landslide and original ground surface/ |
| 12 | Surface of separation | Part of original ground surface (20) now overlain by foot (7) of landslide |
| 13 | Displaced material | Material displaced from its original position on slope by movement in landslide; forms both depleted mass (17) and accumulation (18) |
| 14 | Zone of depletion | Area of landslide within which displaced material lies above original ground surface (20) |
| 15 | Zone of accumulation | Area of landslide within which displaced material lies above original ground surface (20) |
| 16 | Depletion | Volume bounded by main scarp (2), depleted mass (17), and original ground surface (20) |
| 17 | Depleted mass | Volume of displaced material that overlies above surface of rupture (10) but |

| | | |
|---|---|---|
| | | overlies original ground surface (20) |
| 18 | Accumulation | Volume of displaced material (13) that lies above original ground surface (20) |
| 19 | Flank | Undisplaced material adjacent to slides of surface of rapture; compass directions are preferable in describing flanks, but if left and right are used, they refer to flanks as viewed from crown |
| 20 | Original ground surface | Surface of slope that existed before landslide took place. |

## 5. Landslide Potential Area

The landslide is commonly or often seen in the following areas:

- A valley buried by deposits
- An area where thick collapsed deposits covers
- Topography of catchment area (water-collecting topography)
- At a foot of the slope
- A slope facing rivers
- A slope being attacked by water streams
- A slope composed of loosened or cracky rocks that is susceptible to erosion

## 6. Landslide Features

All or some of the following topographic features are identified as parts of a landslide feature.

- Horseshoe-shaped or rectangular scarp at the upper slope and a gently sloped - flat portion at the middle slope, and sometime accompanying separated small ridges
- Depressions, subsidence, fissures, etc.
- Ponds, bogs, and swamps lying in a constant pattern
- Flanks of the landslide having narrow valleys or fissures
- Area at the foot of a steep slope having uplifts or extrusions.
- Sharp bend in a road or a railroad, or the displacement of a structure
- Abnormal bend in a valley or a river, the area where the river becomes narrower

The schematic image of the topography of the landslide area is shown in Figure 3.

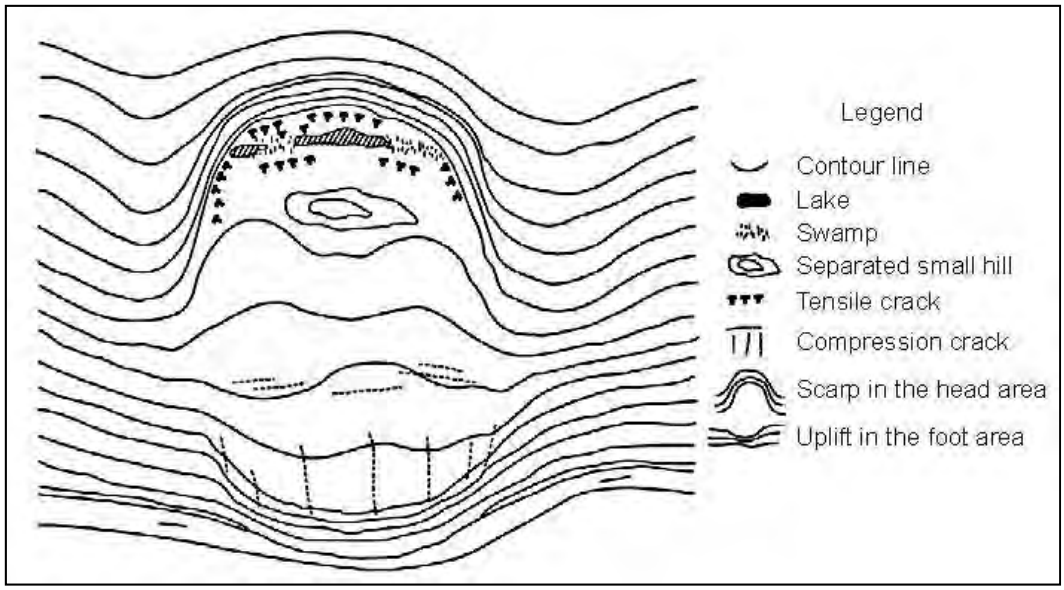



Figure 3

If a landslide feature is separated into several blocks, those should be delineated as shown in Figure 4.

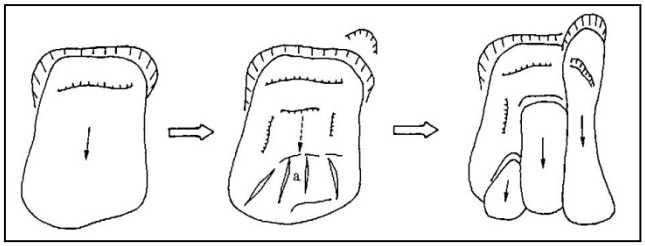


Figure 4

## 7. Preparation for Updating Landslide Distribution Map

The identified main scarp and the displaced material (the outline of the landslide feature) is drawn on the topographic map on a scale of 1:100,000. If the landslide feature is not shown on the existing landslide distribution map, information of the landslide should be described in Form 1 of landslide inventory sheet, following to “Manual on Landslide Inventory Form”, which is available in Appenix 1.

## 8. Landslide Activity Assessment by Aerial Photograph Interpretation

API is also useful for estimating the activity of the landslide.

Many researchers divide the process of development of the landslide into four stages: initial,

active, dismantling and extinction. Depending on the stage of the life cycle of the landslide, the topographic features and characteristic elements of the landslide change as shown in Figure 5.

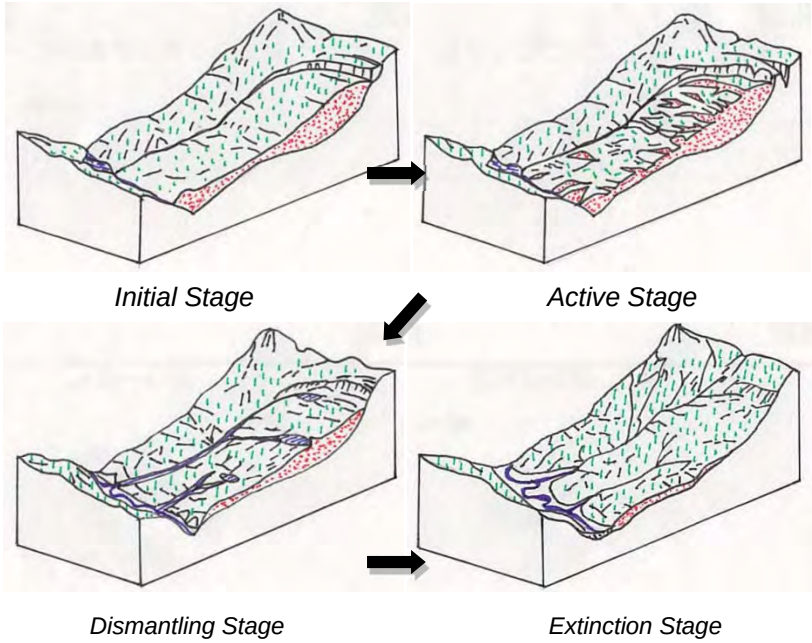



Figure 5

The activeness of landslide can be roughly assumed, based on the development stages and topographic features of landslide as shown in Table 2.

Table 2

| Activeness | Stages | Topographic Features |
|---|---|---|
| Moderate | Initial Stage | - the main scarp and the displaced mass can be recognized;<br>- small blocks cannot be recognized |
| High | Active Stage | - many cracks, steps, subsidiary scarps, small blocks, and other micro topography can be clearly seen on aerial photographs;<br>- slope failures may be seen at the foot portion of the landslide |
| Low | Dismantling Stage | - the main scarps or micro topography are not so clearly visible;<br>- the displaced material portion can be identified; gully erosion, water streams, or bogs may be often seen in/around the displaced material;<br>- the cliff of the main scarp are collapsed and debris deposits covers the main scarp;<br>- sometime slope failure at the foot of the landslide may be seen |
| None | Extinction Stage | - the landslide topography is not clearly seen;<br>- the whole landslide area is flattened |

ガイドライン 2（地すべり台帳作成）

# Guideline on Inventory of Landslide Sites

## 1. General Provisions

This manual is applied for the implementation of Landslide Inventory Survey. The landslide inventory survey (hereinafter referred to as the Survey) is usually carried out for collecting and arranging information at landslide areas judged to be in high priority among identified landslide areas, using Preliminary Information Sheet and aerial photograph interpretation. The Survey is conducted by an expert team including topographer-cartographer, geotechnical specialists and engineers, and it may be on contractual bases. The Survey is roughly divided into indoor study and field study.

## 2. Methodology of Survey

**1)** The indoor study consists of the following works.

- Collection of damage and information
- Aerial photograph interpretation and demarcation of landslide sites on topographic maps with the scale of 1:25 000, 1:50 000 or 1: 100 000

The potential active and/or non-active landslide areas can be identified as a result of interpretation of aerial photographs. The methodology of interpretation of aerial photographs is mentioned in the Manual of identification of landslides by means of interpretation of aerial photographs (Appendix 2). Together with damage information collected with Preliminary Information Sheet, priority landslides for field study will be selected.

As a result of the indoor study, the draft of the list of landslides (Form 1) and a landslide distribution map are prepared.

**2)** The field study is conducted for actual landslide areas, and/or areas judged to be high-risk (high-activity) in the indoor study. Detailed information of landslide potential areas is collected by the field study.

The information on landslide areas collected through the indoor and field studies is recorded on relevant landslide inventory forms (Form 2 to Form 7). The list of landslides and landslide distribution map should be finalized, based on the detailed information collected through the field study.

## 3. Prioritization of Landslides for Filed Study

Priorities for the field study are determined by considering hazard levels and damage levels through indoor study.

### Hazard

Based on aerial photograph interpretation, activeness of landslide potential areas is categorized based on the topographic features of landslide sites. In the Manual on Identification of Landslides by means of Aerial Photograph Interpretation (Appendix 2), there are four levels of activeness of the

landslide (see Table 2 of Appendix 2). The four levels on activeness correspond to hazard levels as shown in Table 1. Hazard condition (indicator) on the hazard levels are shown in Table 4 .

**Table 1**

| N/N | Activity of landslide | Hazard level |
|---|---|---|
| 1 | High | I |
| 2 | Moderate | II |
| 3 | Low | III |
| 4 | None | |

**Damages**

Damages due to landslides are evaluated based on the questionnaire survey. Damages on the following objects are checked with questionnaires:

1. Residential, public and industry buildings
2. Roads, and other transport means such as bridges, and railways
3. Life line facilities such as water, gas, electricity systems
4. Other facilities or properties such as agricultural land, grazing land, and forest
5. Other important objects such as cultural and historical places

For each object, condition of the damage shall be described in Preliminary Information Sheet (herein after the Sheet) as shown in Attachment 1. Based on the information described in the sheet, the area of the landslide should be confirmed through aerial photograph interpretation, in accordance with the Manual on Appendix 2. Together with damaged buildings and facilities described in the Sheet, number of undamaged buildings and facilities in the landslide areas should be counted as risky buildings and facilities. Based on the above-mentioned information, the list of landslides (Form 1 in Attachment 2) and Landslide Distribution Map (Attachment 3) should be updated.

### 3) Categorization of Priority Landslide Site

Areas having landslide potential are prioritized based on hazard levels and risk levels and are categorized into A, B, and C ranks. Rank A means the highest priority; Rank B is moderate priority, and Rank C means the lowest priority. Priority levels of landslide sites for field study are mentioned in Tables 2 to 4.

As a general rule, the field study of landslide areas categorized in Rank A should be conducted with precedence.

Landslide areas classified in Rank B should be investigated since then.

In the landslide area classified in Rank C, the field study should be conducted depending on the situation.

**Table 2**

| Hazard Level / Risk Level | I | II | III |
|---|---|---|---|
| H | A | A | B |
| M | A | B | C |
| L | B | C | C |

Inventory field study should be carried out in potential landslide sites with the following priority:

1) A: I-H, I-M ¨ II-H,
2) B: I-L, II-M ¨ II-L,
3) C: II-L, III-M ¨ III-L

**Hazard Level**

Hazard levels are divided into three (3) levels:

High - I level

Moderate - II level

Low – III level.

Table 4 below shows indicators of each hazard level.

**Table 3**

| Hazard Level | Hazard Condition (Indicators) |
|---|---|
| I | Damages are progressing |
| II | Damages were reported/recognized in the past, but effective countermeasures were not taken |
| III | Landslide configuration is recognized; bad damages were not reported/ recognized |

**Risk Level**

Risk levels are classified into three (3) levels that are H, M, and L.

Table 5 below shows indicators of each risk level.

**Table 4**

| Risk Level | Indicators of Risk Level (Risk Object & Environment Impact) |
|---|---|
| H | Many houses, public facilities, or important infrastructure<br>Landslide is causing serious environment impact |
| M | Some houses, public facilities, or important infrastructure have been damaged<br>Landslide is causing environment impact |
| L | Little damage has been caused to human activity or environment |

### 4) Filling in of Forms based on the Results of Field Study

The results of the field study shall be recorded in the following six (6) inventory forms (Forms 2 to 7) mentioned in Table 5. The blank forms and examples of the filling out the forms are shown in Attachments 2 and 4, respectively.

**Table 5**

| N/N | No. | Title |
|---|---|---|
| 1 | Form 1 | List of Landslides |
| 2 | Form 2 | Plan layout |
| 3 | Form 3 | Profile |
| 4 | Form 4 | Photograph |
| 5 | Form 5 | Landslide Condition |
| 6 | Form 6 | Damage Evaluation |
| 7 | Form 7 | Other information |

### 5) How to Count Landslides

A landslide often differentiates to some traveling bodies (landslide blocks) sliding in different directions (Figure 1). A landslide consisting of some blocks moving in the same direction should be counted as basically one landslide. If each block works towards a different direction, each block should be counted as a separate landslide.

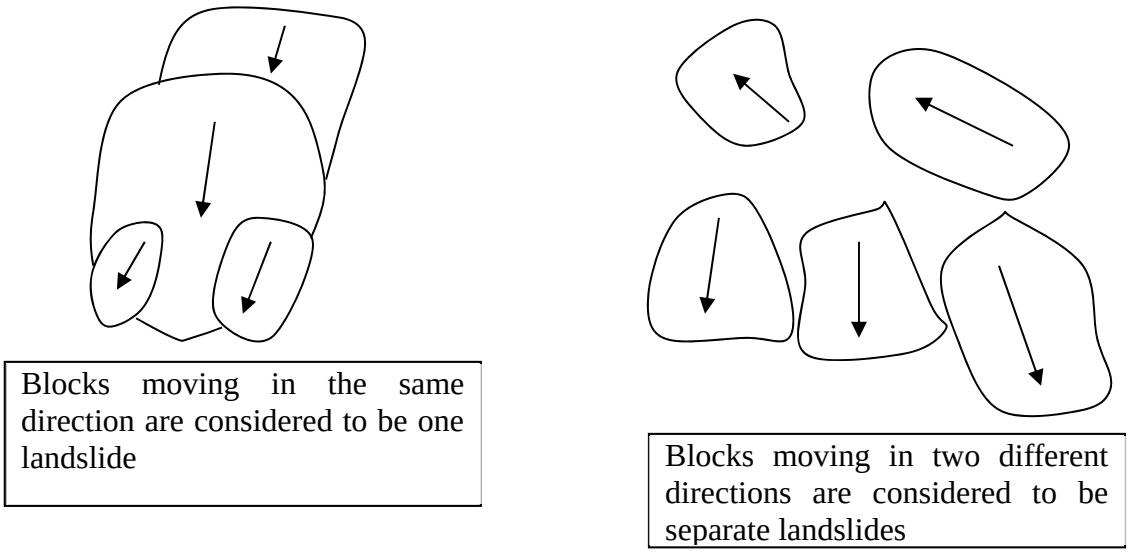



Figure 1

### 6) Forms for Recording Inventory Results

Inventory forms (Form 2 to Form 7) shall be filled up by the expert teams. Form 1 is completed or updated by interpreting aerial photographs, Form 2 to Form 6 are completed through the field study. Form 7 is filled up based on the monitoring data and other information.

Table 6 shows items to be recorded in each form of the Survey.

**Table 6**

| Form | Items to be Recorded | Implementation |
|---|---|---|
| 1 | General<br>(a) Landslide ID<br>(c) Landslide name<br>(d) Location (Marz, community, town/village/map index)<br>(e) Coordinates and altitude of the landslide center<br>(f) Scale<br>(g) Hazard level<br>(h) Risk level<br>(i) Priority rank for the field study,<br>(j) Remarks<br>(k) Existing priority list | The expert teams shall work for. |
| 2 | Plan: Plan of the area | |
| 3 | Profile: Longitudinal profile of the landslide | |
| 4 | Photograph:<br>Overall view and special features of the slope | |
| 5 | Landslide condition<br>Landslide type<br>Event (activation) history<br>Topographic and deformational features<br>Condition of bedrock and the displaced mass<br>Hydrological condition<br>Vegetation condition<br>Countermeasure condition | |
| 6 | Damage evaluation<br>Direct damages (casualty, buildings, roads and so on)<br>Indirect damages (ex. damage by traffic no thoroughfare)<br>Regional economic effect | |
| 7 | Other information<br>Available monitoring data etc. are registered. | |

### 7) Digitization of Field Study Results

The information collected/measured on landslide sites shall be input principally in the spreadsheet forms (Excel files) by computer. Asterisk (*) is input when there is no content that should be input in. Sketches (Forms 2), Profile (Form 3) and photographs (Form 4) shall be put in the spreads sheet form as scanned images.

### 8) Tools and Devices for Field Study

The following tools and devices are necessary for conducting the field study:

- Tape measures
- Altimeters
- Clinometers
- Cameras (Digital camera is recommended)
- Portable G.P.S devices
- Binoculars, etc.

## 4. Filling in Landslide Inventory Form

### Form 1: List of Landslides

### Landslide ID (F1-1 of Form1 in Appendix 3)

For the identification of the landslide site a separate identifying number (landslide ID) shall be given to each site which must consist of the following essential elements.

- Abbreviation (four Roman alphabetic characters) of the name of the marz
- Index number (three numeric characters) of the 1:100,000 topographic map
- Serial number (five numeric characters)

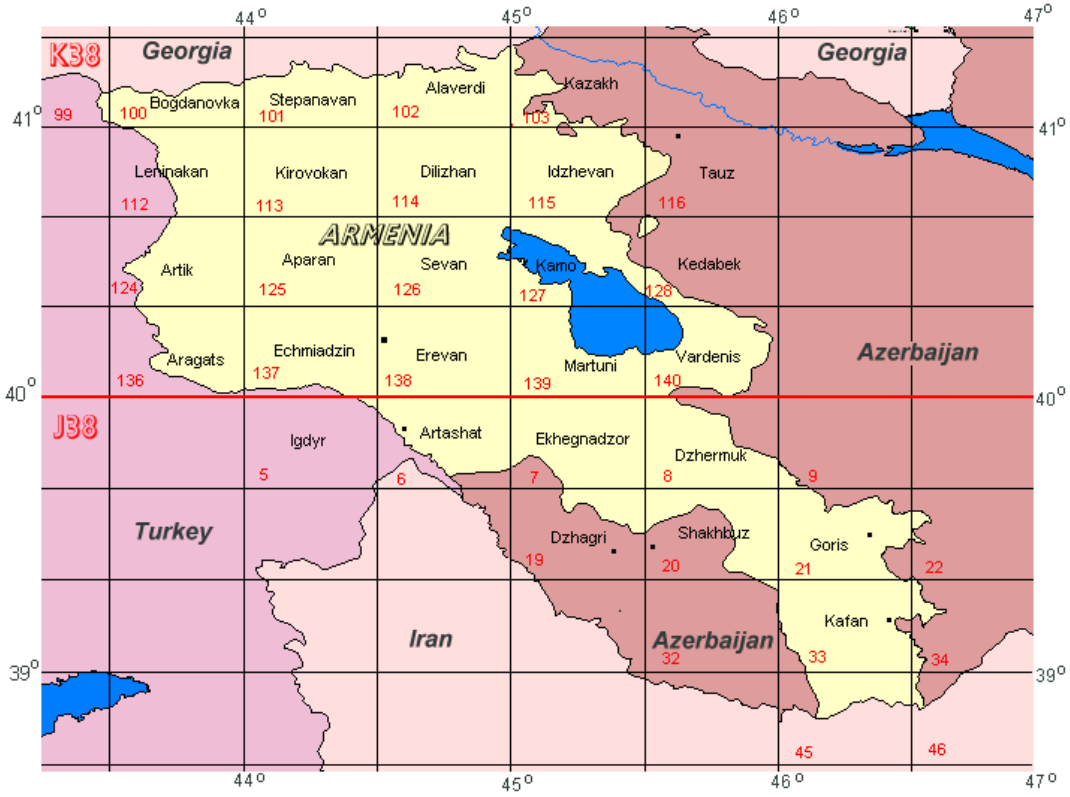
Each element is coupled by a hyphen.

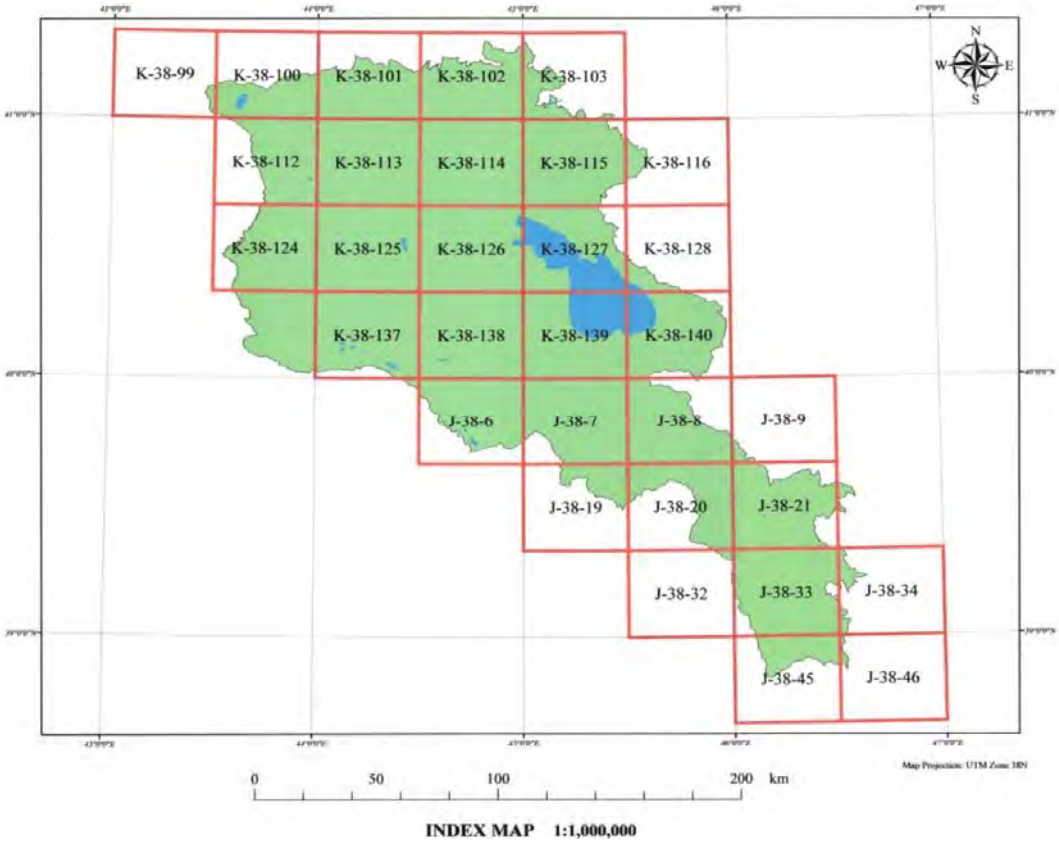
Abbreviated names of marzes and Yerevan city are mentioned in Table 7.

Figure 2 shows an index map for topographic maps with a scale of 1:100,000. The index number of a 1:100,000 topographic map is three numeric characters following K38 or J38.

**Table 7**

| Name of Marz and Yerevan city | Abbreviation Code | Regional Center City |
|---|---|---|
| YEREVAN | YERE | Yerevan |
| ARAGATSOTN | ARAG | Ashtarak |
| ARARAT | ARAR | Artashat |
| ARMAVIR | ARAM | Armavir |
| GEGHARKOUNIK | GEGH | Gavar |
| KOTAYK | KOTA | Hrazdan |
| LORI | LORI | Vanadzor |
| SHIRAK | SHIR | Gyumri |
| SYUNIK | SYUN | Kapan |
| TAVUSH | TAVU | Ijevan |
| VAYOTS DZOR | VAYO | Eghegnadzor |




INDEX MAP 1:1,000,000

**Figure 2**

### Landslide Name (F1-2)

It is preferable that the name of the landslide is derived from the name of the community or an important risk object in the landslide area.

### Location

The name of marz or Yerevan City where landslide is located shall be input. If the same landslide extends over two marzes, the name of the marz occupied more widely by the landslide is input into the record field.

### Community

The community name should be input.

### Settlement

The name of the settlement (city, town, or village) should be input.

### Map index code (F1-3)

Figure 2 shows map index codes of 1:100 000 scale topographic maps. A map index code shall be input such as K-38-007.

If one landslide extends over more than two topographic map sheets, the index code of the map occupied more widely by the landslide shall be input.

### Coordinates and altitude of the landslide (F1-4)

The central coordinates of the landslide is displayed by sexagesimal system. The unit of second is displayed to a hundredth. The central coordinates may be measured by portable GPS.

Central altitude (elevation) of a landslide site is displayed as the integer. The central altitude is understood by interpreting contour lines shown in the topographical map. Because altitude displayed by portable GPS is not so accurate, a value displayed by portable GPS can be used only if topographic maps with contour lines are not available.

### Elements and sizes of the landslide body (F1-5)

According to the nominal list (IAEG Reference book No. 41, pages 13-16) suggested for the landslide by the IAEG Commission of Landslide (1990), the names and definitions of the elements of the landslide body are mentioned in Table 8 in compliance with Figures 3 and 4, and dimension names are shown in Table 9 in compliance with Figure 5.

Dimensions are filled in as an integer.

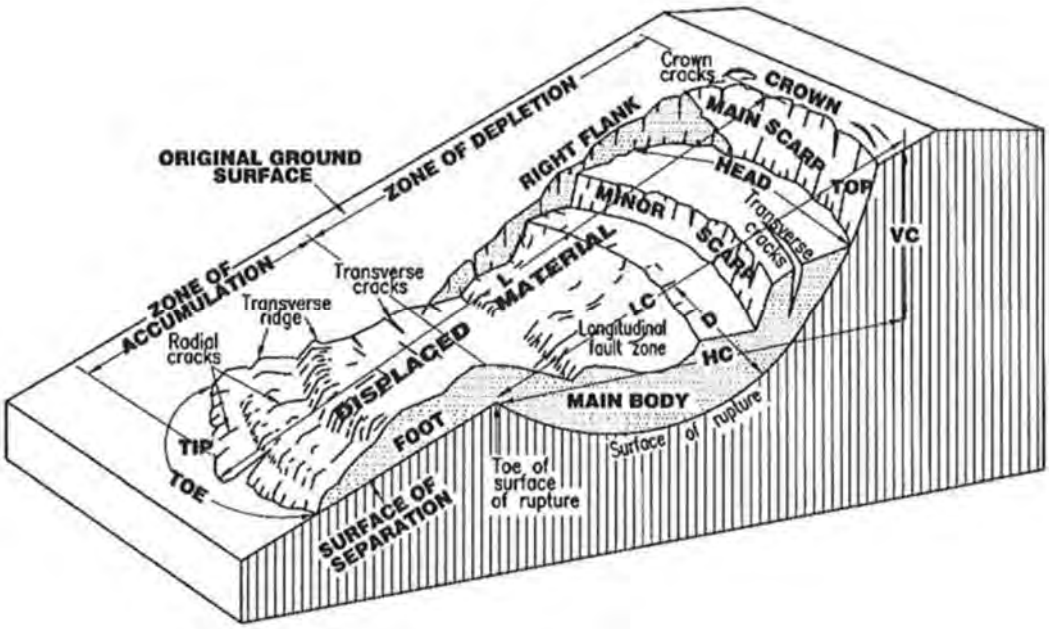



**Figure 3**

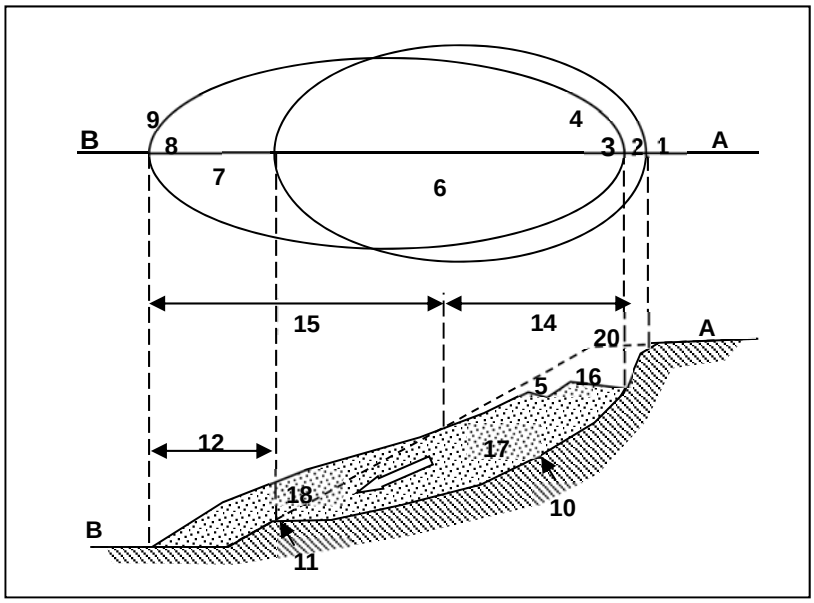



**Figure 4**

**Table 8**

| No. | Names of elements | Definition |
|---|---|---|
| 1 | Crown | Practically undisplaced material adjacent to highest parts of main scarp |
| 2 | Main Scarp | Steep surface on undisturbed ground at upper edge of landslide caused by movement of displaced material (13, stippled area) away from undisturbed ground; it is visible part of surface of rupture (10) |
| 3 | Top | Highest point of contact between displaced material (13) and main scarp (2) |
| 4 | Head | Upper parts of landslide along contact between displaced materials and main scarp |
| 5 | Minor Scarp | Steep surface on displaced material of landslide produced by differential movements within displaced material |
| 6 | Main Body | Part of displaced material of landslide that overlies surface of rupture between main scarp (2) and toe of surface of rupture (11) |
| 7 | Foot | Portion of landslide that has moved beyond toe of surface of rupture (11) and overlies original ground surface (20) |
| 8 | Tip | Point on toe (9) farthest from top (3) of landslide |
| 9 | Toe | Lower, usually curved margin of displaced material of a landslide, most distant from main scarp (2) |
| 10 | Surface of rupture | Surface that forms (or that has formed) lower boundary of displaced material (13) below original ground surface (20); mechanical idealization of surface of rupture is called slip surface |
| 11 | Toe of surface of rupture | Intersection (usually buried) between lower part of surface of rupture (10) of a landslide and original ground surface/ |
| 12 | Surface of separation | Part of original ground surface (20) now overlain by foot (7) of landslide |
| 13 | Displaced material | Material displaced from its original position on slope by movement in landslide; forms both depleted mass (17) and accumulation (18) |
| 14 | Zone of depletion | Area of landslide within which displaced material lies above original ground surface (20) |
| 15 | Zone of accumulation | Area of landslide within which displaced material lies above original ground surface (20) |
| 16 | Depletion | Volume bounded by main scarp (2), depleted mass (17), and original ground surface (20) |
| 17 | Depleted mass | Volume of displaced material that overlies above surface of rupture (10) but overlies original ground surface (20) |
| 18 | Accumulation | Volume of displaced material (13) that lies above original ground surface (20) |
| 19 | Flank | Undisplaced material adjacent to slides of surface of rapture; compass directions are preferable in describing flanks, but if left and right are used, they refer to flanks as viewed from crown |
| 20 | Original ground surface | Surface of slope that existed before landslide took place. |

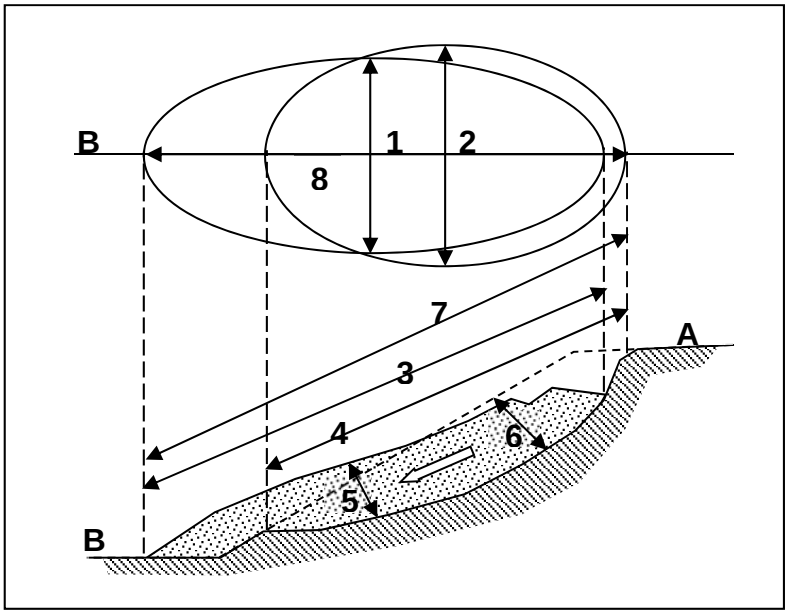



**Figure 5**

**Table 9**

| No. | Name | Definition |
|---|---|---|
| 1 | Width of displaced mass, Wd | Maximum breadth of displaced mass perpendicular to length, Ld |
| 2 | Width of surface of rupture, Wr | Maximum width between flanks of landslide perpendicular to length, Lr |
| 3 | Length of displaced mass, Ld | Minimum distance from tip to top |
| 4 | Length of surface of rupture, Lr | Minimum distance from toe of surface of rupture to crown |
| 5 | Depth of Displaced mass, Dd | Maximum depth of displaced mass measured perpendicular to plane containing Wd and Ld |
| 6 | Depth of surface of rupture, Dr | Maximum depth of surface of rupture below original ground surface measured perpendicular to plane containing Wr and Lr |
| 7 | Total Length, L | Minimum distance from tip of landslide through points on original |
| 8 | Length of center line, Lcl | Distance from crown to tip of landslide through points on original ground surface equidistant from lateral margins of surface of rupture and displaced material |

### Hazard level, risk level, priority rank for the inventory survey (F1-6)

These fields are filled in with brief description on hazard, risk and priority.

### 2) Form 2: Plan

**Title (F2-1)**

Landslide ID, Landslide Name, and the date of the field study shall be described.

### Plan (F2-2]

Plan-view sketch of the landslide site shall be illustrated in pencil or ink clearly. The sketch is scanned as digital images with a properly reduced sized and pasted on the spreadsheet of Form 2, which is adjusted for the A4 paper size.

Landslide sketch shall include the following basic information of the landslide in accordance with the legend shown in Appendix 4:

- Scale of the plan
- Magnetic direction
- Features of the landslide; the main scarp, the displaced material (mass), the top, the toe, surface ruptures, assumed further accumulation zones, etc,
- Risk objects such as houses and roads,
- Route of surface drainage and springs,
- Existing countermeasure, and
- Other useful information.

### Form 3: Profile

**Title (F3-1)**

Landslide ID, Landslide Name, and the date of the field study shall be described.

**Profile (F3-2)**

Landslide profile shall be illustrated in pencil or ink clearly. The profile shall be scanned as digital images with a properly reduced scale and pasted on the spreadsheet form adjusted for the A4 paper size.

Section line should run through the center of the displaced mass with the direction of displaced mass movement, from the crown of the landslide to the assumed further accumulation zone.

Landslide profile shall contain the following basic information of the landslide site in accordance with the legend of Attachment 4.

- Longitudinal existing surface line and original surface line
- Presumed surface of rupture
- Houses and important infrastructures on the section line
- Material types of bedrock and the displaced mass
- Geological structures (if data are available)
- Other useful information

## Form 4: Photograph

**Title (F4-1)**

Landslide ID, Landslide Name, and the date of the field study shall be described.

**Photographs (F4-2)**

Scanned photographs of the landslide shall be attached in Form 4 spreadsheet.

- General view of the landslide
- Landslide features such as condition of the main scarp, the toe and so on
- Available aerial photographs

Explanatory note shall be shown for each scene (photograph)

## Form 5: Landslide Condition

**Title (F5-1)**

Landslide ID, Landslide Name, and the date of the field study shall be described.

### Movement Type of Landslide Body (F5-2)

Movement of landslide bodies is classified into three major types: SLIDE, FLOW, and OTHERS. There are sub-categories in OTHERS, which are FALL, TOPPLE, and COMPLEX. Movement types of landslide body are described in Figures 6 to 8.

**Materials of landslide bodies** are classified into Rock and Soil. Completely weathered rocks are classified into SOIL as shown in Table 10.

Movement type of rocks or other item shall be recorded in accordance with the code table of Appendix 4.

**Table 10**

| Displaced mass material | Degree of weathering of rocks | Description (indicators) |
|---|---|---|
| **Rock** | **None** | No visible sign of rock material weathering/alternation |
| | **Slightly** | Discoloration on major discontinuity surface; rock material may be discolored and somewhat weaker than fresh rock |
| | **Moderately** | Less than half of the rock material is present either as a continuous framework or as core stones |
| | **Highly** | Most of rock material is decomposed, disintegrated to a soil, or both; original mass structure is largely intact |
| **Soil** | **Completely** | All rock material is converted to a soil; mass structure and material fabric are destroyed; a large change in volume has occurred , but soil has not been transported significantly |

### Event History (F5-3)

This item is filled, based on information given by the local government or residents.

### Topographic and deformational features (F5-4)

Information about the length, height, inclination of the landslide site, capacity of the displaced mass, scarp stretch and description of the cracks of the displaced mass must be filled in.

In case of equal to or more than 100 square meters dimension, it can be measured on the topographic map.

### Conditions of Base Rock and Displaced Mass location (F5-5)

The following items shall be filled in:

- Geologic age of base rock,
- Lithofacies
- Geological structure,
- Bedding dip,
- Weathering grade, and
- Alteration grade of rock composition.

When two and more lithofacies exist together, lithoface code of the large composition ratio shall be used from the left side using “ / “. (ex. m/k/b.)

### Hydrological condition (F5-6)

The following items shall be recorded.

- Number of spring points,
- Total amount of springs, and
- Total amount of surface water.

### Vegetation condition (F5-7)

The vegetation condition shall be filled by checking suitable category.

### Countermeasure condition (F5-8)

Types of existing countermeasure structures shall be filled in accordance with the code table. Effect of countermeasures shall be checked with proper evaluation items.

### Remark (F5-9)

The special note is described in the cell of remark.

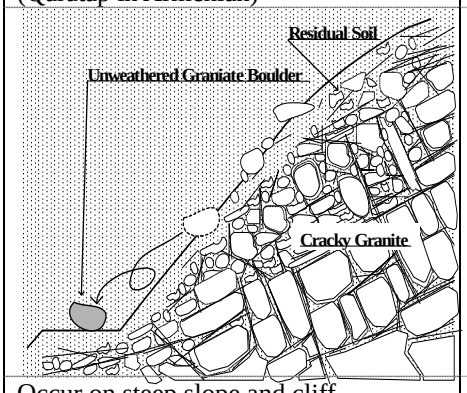
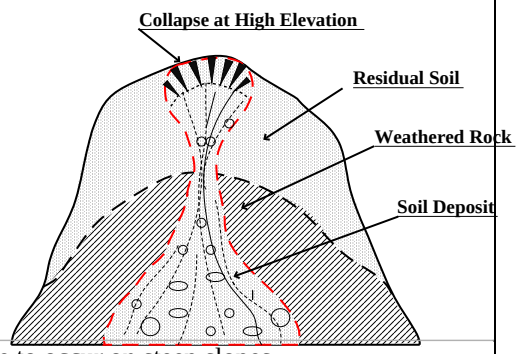
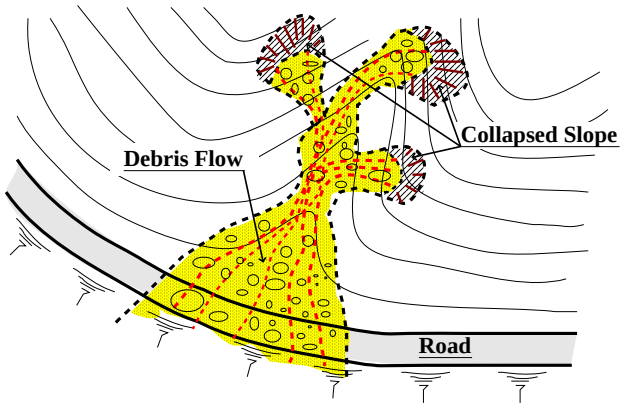
| Type of Movement | Type of Material | |
|---|---|---|
| | Rock | Soil |
| Fall | Rock Fall | Soil Fall |
| | (Qaratap in Armenian) | (Pluzum in Armenian) |
| |  |  |
| | Occur on steep slope and cliff<br>Falls occur due to gravity and are controlled by the distribution of joints<br>Size is generally less than 2 $m^3$.<br>Block toppling is included this type | Prone to occur on steep slopes<br>Mostly triggered by rainfall<br>Size is generally less than1,000 $m^3$ |
| **Flow** | Rock Flow | Soil Flow (Debris Flow, Mud Flow) |
| | (Selav in Armenian) | |
| |  | |
| | Rapid flow occurs in contributory areas that contain collapsible slopes. The movement velocity is rapid (**faster than 0.5mm/sec, 1.8m/hr**). It contains generally boulder, gravel, sand, silt and clay mixed with big amount of water. Dry debris avalanche is collapse of a volcano triggered by eruption or earthquake generally.<br>Generally, rock rapid flow flows is not occurred.<br>**Division of rapid flow is used when rapid flow is expected to occur intermittent at the current state. Division of flowslide is used when a deposit of past rapid flow may move slowly now and in the future.** | |

**Figure 6**

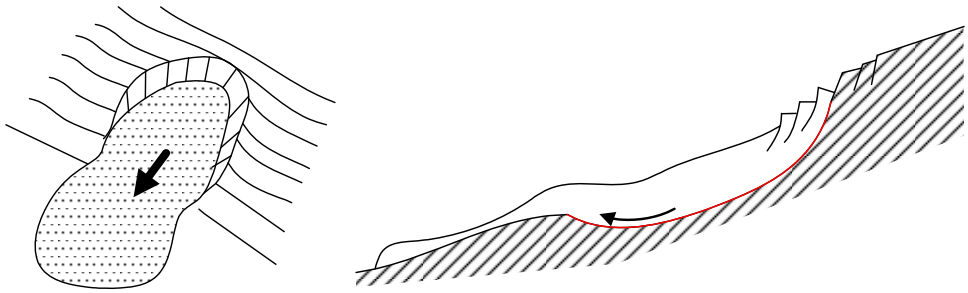
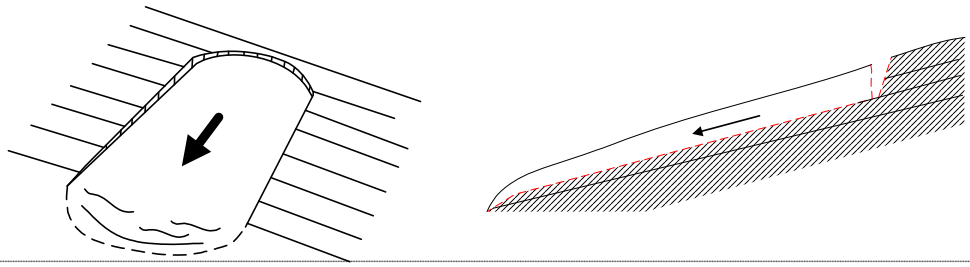
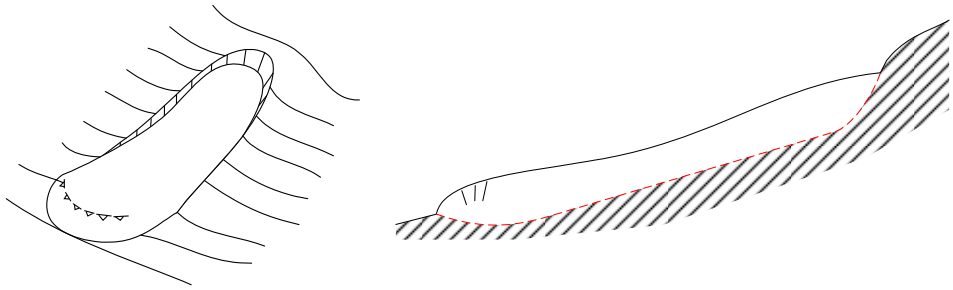
| Type of Movement | Type of Material | |
|---|---|---|
| | Rock | Soil |
| Landslide | (Sogank in Armenia) | |
| Rotational Slide | Rock Rotational Slide | Soil Rotational Slide |
| |  | |
| | Rotational slide is generally occurred in the debris and the earth, and it is not occurred in the rock. Rotational slides move along a surface of rapture that is curved and concave. The scarp below the crown of a rotational slide may be almost vertical and unsupported. Rotational slides in soils generally exhibit a ratio of depth of the surface of rupture (depth/length) are between 0.15 and 0.33 (Skemptom and Hutchinson 1969). | |
| Translational Slide | Rock Transitional Slide | Soil Transitional Slide |
| |  | |
| | In translational slides, the mass displaces along a planar or undulating surface of rapture, sliding out over the original ground surface. Only graben may occur in the head, scarp doesn't appear clearly at the early stage. Translational slides in soils exhibit a ratio of depth of the surface of rupture(depth/length) are typically less than 0.1 (Skemptom and Hutchinson 1969). A translated slide often indicates the presence of a weak layer or the boundary between weathered and un-weathered material. | |
| Compound slide (Intermediate between rotational and translational slide ) | Rock Compound slide | Soil Compound slide |
| |  | |
| | Compound slide is intermediate between rotational and translational slide.<br>Surface of rapture have steep main scarps. The toes of the surface of rapture may dip upslope. | |

**Figure 7**

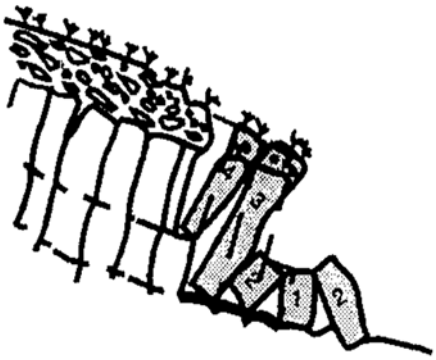
| Type of Movement | Type of Material | |
|---|---|---|
| | Rock | Soil |
| Topple | Rock Topple | Soil Topple |
| |  | |
| | Topples is the forward rotation out of the slope of mass of soil or rock about a point or axis below the centre of gravity of the displaced mass. Toppling is sometimes driven by gravity exerted by material upslope of the displaced mass and sometimes by water or ice in cracks in the mass" (Varnes, 1996) | |

**Figure 8**

## Form 6: Damage Evaluation

**Title (F6-1)**

Landslide ID, Landslide Name, and the date of the field study shall be described.

The damage evaluation is targeted for the "Risk Objects", which are divided into five categories:

- Buildings and constructions (dwellings, public and production buildings) (Form61);
- Transportation (roads, bridges, railways) (Form62);
- Infrastructure (gas, drinking water & sewerage, irrigation & drainage, rivers, energy & electricity, telephone lines) (Form63);
- Agriculture (crop land, grazing land, timber) (Form64); and
- Others (possible expenditure, demolition removal, monuments, population affected, others) (Form65).

The damages are divided into two groups:

Existing damages – those which already occurred up-to-date in the "Existing Landslide Zone (A)". **(F6-2)**

Potential damages – those which may occur in the next 50 years (if no prevention measures are implemented) in the: "Existing Landslide Zone (A)", "Assumed Further Accumulation Zone (B)", "Reservoir Zone of Landslide Dam (C)", and "The Flood Area (D) when landslide collapse". **(F6-3)**

Within each group, the expert team identifies the units of:

Direct damage – effects on property, immovable assets and inventories (by filling in the units, as given in the Form 6)

Indirect damage – effects on goods and services production flows, other costs induced by direct damage (by filling in the units or short description).

The direct damages for the construction are divided into six categories:

Category 0 – no damages at all;

Category I – buildings in good technical condition; inessential damages, which can be eliminated by current restoration works;

Category II – buildings in satisfactory technical condition; damages can be eliminated by restoration-reconstruction works;

Category III – buildings in unsatisfactory technical condition; damages can be eliminated by strengthening and reconstruction works;

Category IV – buildings in emergency condition; dangerous for further use – the habitants must be resettled; and

Category V – buildings partially or completely ruined; habitants resettled.

Examples to fill in the Landslide Inventor Forms 1 to7 are shown in Appendix 5.

When using this manual, it is recommended to use the tables of classification of slope gravitation

processes by D.J. Varnes and D.M. Cruden.

ガイドライン３（地すべり台帳フォーム）

## Form1 List of Landslide

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude | | | | | | | Displaced Mass Scale | | | Hazard Level | Risk Level | Remark (Hazard) | Remark (Risk) | Remark (Priority selection's reason) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Martz /Yerevan city | Community If no community un the landslide area, describe the map index | Map Index Code (1:100,000) | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | |
| | | | | | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| F1-1 | F1-2 | F1-3 | | | F1-4 | | | | | | | F1-5 | | | F1-6 | | | | |
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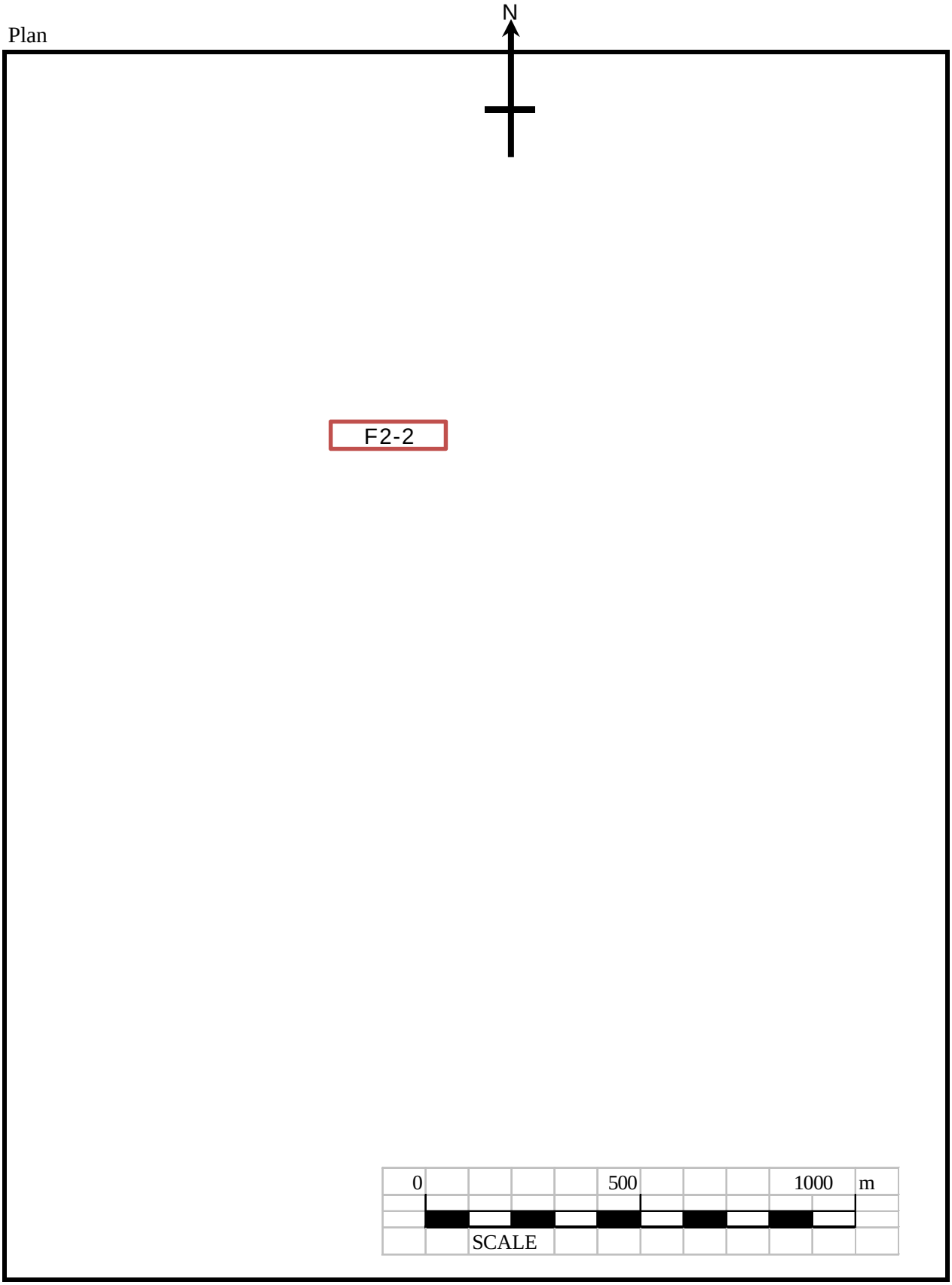
# Form2 Plan

| | |
|---|---|
| Landslide ID | |
| Landslide Name | F2-1 |
| Survey date | |

Plan



# Form3 Profile

| | | |
|---|---|---|
| Landslide ID | a | |
| Landslide Name | b | |
| Survey date | c | |

F3-1

Profile

F3-2

# Form4 Photograph

| | |
|---|---|
| Landslide ID | a |
| Landslide Name | b |
| Survey date | c |

F4-1

F4-2

# Form5 Landslide Condition

| | | | | |
|---|---|---|---|---|
| Landslide ID | F5-1 | | | |
| Landslide Name | | | | |
| Survey Date | | | | |
| **Slope Movement Type** | F5-2 | Remark | | |
| **Event History** | F5-3 | | | |
| Event Year/Date | Situation of Movement | | Situation of Damage | |
| | | | | |
| | | | | |
| | | | | |
| **Topographic & Deformation Features** | F5-4 | | | |
| | Total of Landslide | Crown | Main Scarp | Displaced Mass |
| Slope Length (m) | 0 | | | |
| Slope Height (m) | 0 | | | |
| Slope Gradient (degree) | | | | |
| Depth of Displaced Mass (m) | | | | |
| Direction of Displaced Mass Movement (degree: shows from the north clockwise) | | | | |
| Extension / Width (m) | | | | |
| Sub Scarp | | Exist/Not | | Exist/Not |
| Cracks | | Exist/Not | Exist/Not | Exist/Not |
| Depression | | Exist/Not | Exist/Not | Exist/Not |
| Ridges | | Exist/Not | Exist/Not | Exist/Not |
| Ownership of Land | Public/Private/Both | | | |
| Relation between Displaced Mass and River | Undercut slope/Channel shifting by displaced mass/Just approaching /No relation | | | |
| Ageing of Landslide Topography | Fresh/Forming of a terrace scarp in a landslide foot/Forming new stream in a landslide/ Landslide topography has subdued | | | |
| Remark | | | | |
| **Base Rock & Displaced Mass Conditio** | F5-5 | | | |
| | Crown | Main Scarp | Displaced Mass | |
| Age of Base Rock | | | | |
| Facies of Base Rock | | | | |
| Facies of Displaced Mass | | | | |
| Geological Structure | | | | |
| Bedding Dip | | | | |
| Weathering Grade of Base | | | | |
| Alteration Grade of Base | | | | |
| Remark | | | | |
| **Hydrological Condition** | F5-6 | | | |
| | Whole | Crown | Main Scarp | Displaced Mass |
| Number of Spring Point | 0 | | | |
| Total Amount of Spring (liter/minute) | 0 | | | |
| Total Amount of Surface Water | 0 | | | |
| Remark | | | | |
| **Vegetation Condition** | F5-7 | | | |
| | Crown | Main Scarp | Displaced Mass | |
| Condition | Bare land/Grass/Tree | Bare land/Grass/Tree | Bare land/Grass/Tree | |
| Remark | | | | |
| **Countermeasures** | F5-8 | | | |
| | Whole | | | |
| Kind of Countermeasures | | | | |
| Effect | Effective/Not effective | | | |
| Remark | | | | |
| **Remark** | F5-9 | | | |

## Form6-1 Damage Evaluation of Construction Sector

| | | |
|---|---|---|
| Landslide ID | a | F6-1 |
| Landslide Name | b | |
| Survey Date | c | |

| | | | Dwelling | | Hospitals | | Schools | | Public Buildings | | Industry Buildings | | Services Buildings | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ |
| Existing Damage | Direct Damage | Number of damaged buildings in each category in Zone (A), defined in "Building Damage Category Code" | | | | | | | | | | | | |
| | | Damage Category 0 | | | | | | | | | | | | |
| | | Damage Category I | | | | | | | | | | | | |
| | | Damage Category II | | | | | | | | | | | | |
| | | Damage Category III | | | | | | | | | | | | |
| | | Damage Category IV | | | | | | | | | | | | |
| | | Damage Category V | | | | | | | | | | | | |
| | Indirect Damage | Description (Needed cost besides guarantee expense to building owner. ex. need for infrastructure of settlement, time out of operation, production lost ) | | | | | | | | | | | | |

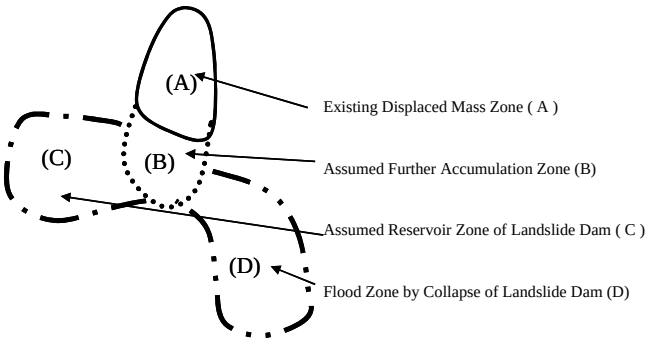
F6-2

| | | | Dwelling | | Hospitals | | Schools | | Public Buildings | | Industry Buildings | | Services Buildings | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ |
| Potential Damage | Direct Damage | Number of all risky objects in Zone A+B+C+D excluding existing category V | | | | | | | | | | | | |
| | Indirect Damage | Description (Needed cost besides guarantee expense to building owner. Ex. need for infrastructure of settlement, time out of operation, production lost ) | | | | | | | | | | | | |

F6-3

| | |
|---|---|
| Remark | |

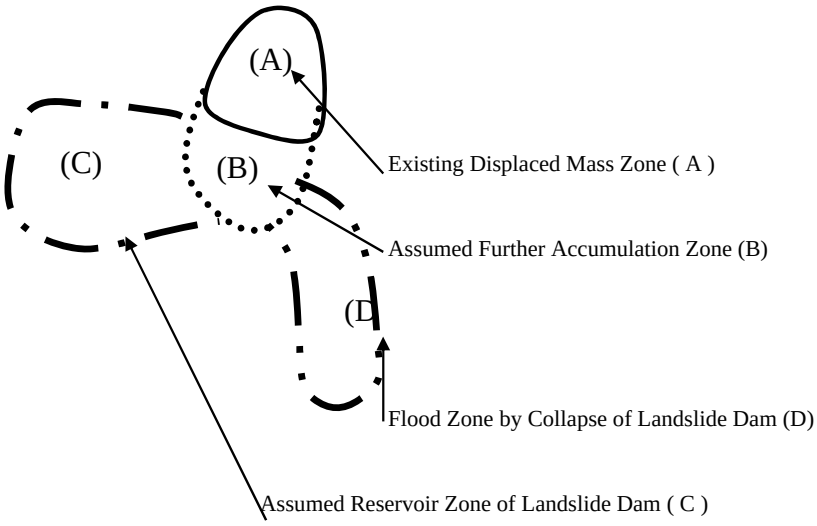
| Building Damage Category Code | |
|---|---|
| **0** | No damage at all |
| **I** | Buildings in good technical condition; inessential damages, which can be eliminated by current restoration works |
| **II** | Buildings in satisfactory technical condition; damages can be eliminated by restoration-reconstruction works |
| **III** | Buildings in unsatisfactory technical condition; damages can be eliminated by strengthening and reconstruction works |
| **IV** | Buildings in emergency condition; dangerous for further use – the habitants must be resettled |
| **V** | Buildings partially or completely ruined; habitants resettled |



## Form6-2 Damage Evaluation of Transportation Sector

| | | |
|---|---|---|
| Landslide ID | F6-1 | |
| Landslide Name | | |
| Survey Date | | |

| | | | Roads | | | | |
|---|---|---|---|---|---|---|---|
| | | | Gravel road m2 | Asphalt road m2 | Asphalt highways 2 lanes m2 | Bridges m2 | Railways m |
| Existing Damage | Direct Damage | Area(length and width) of partially or completely destoroied objects which do not function. | | F6-2 | | | |
| | Indirect Damage | Description (Location/ alternative road time out of operation/ numbers of people affected ) | | | | | |
| | | | Roads | | | | |
| | | | Gravel road m2 | Asphalt road m2 | Asphalt highways 2 lanes m2 | Bridges m2 | Railways m |
| Potential Damage | Direct Damage | Area (length and width) of all risky objects in Zone A+B+C+D excluding existing damaged objects ) | | F6-3 | | | |
| | Indirect Damage | Description (Location/ alternative road time out of operation/ numbers of people affected ) | | | | | |
| Remark | | | | | | | |



## Form6-3 Damage Evaluation of Infrastructure Sector

| | |
|---|---|
| Landslide ID | |
| Landslide Name | |
| Survey Date | |

F6-1

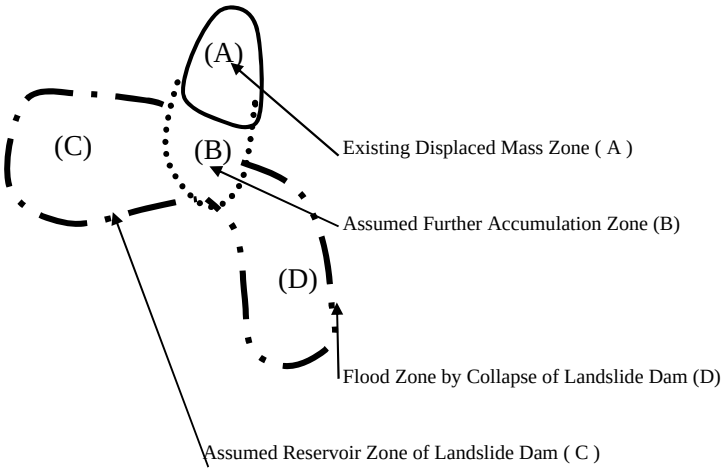
| | | | Gas System m | Water & Sewerage System m | Irrigation & Drainage System m | Rivers m | Energy & Electricity m | Telephone Lines m |
|---|---|---|---|---|---|---|---|---|
| Existing Damage | Direct Damage | Length of partially or completely destoroied objects which do not function. | | | | | | |
| | Indirect damage | Description (Location, assumed time out of operation, numbers of people affected) | | | | | | |

F6-2

| | | | Gas System m | Water & Sewerage System m | Irrigation & Drainage System m | Rivers m | Energy & Electricity m | Telephone Lines m |
|---|---|---|---|---|---|---|---|---|
| Potential Damage | Direct Damage | Length of all risky objects in Zone A+B+C+D excluding existing damaged objects | | | | | | |
| | Indirect Damage | Description (Location, alternative road time out of operation, numbers of people affected ) | | | | | | |

F6-3

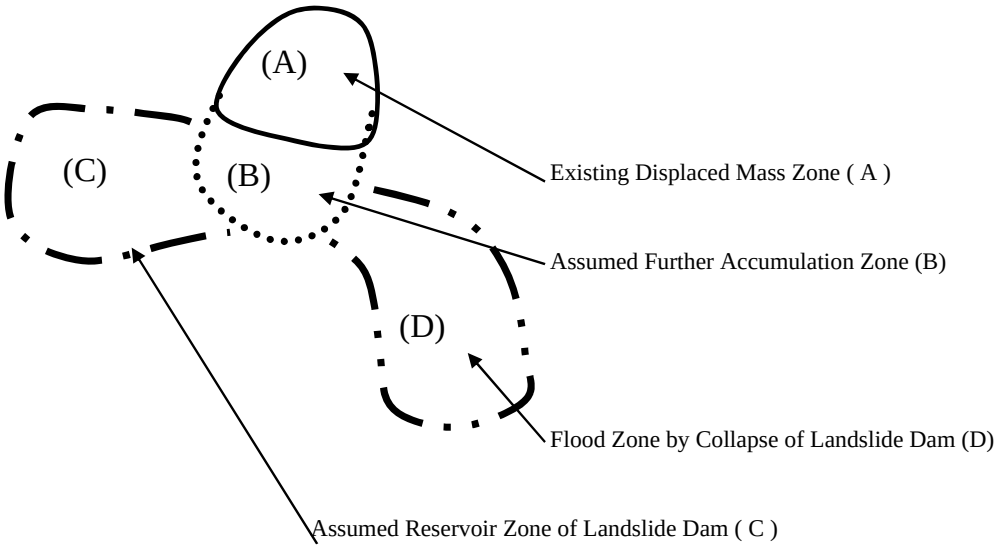
| | |
|---|---|
| Remark | |



## Form6-4 Damage Evaluation of Agriculture Sector

| | |
|---|---|
| Landslide ID | F6-1 |
| Landslide Name | |
| Survey Date | |

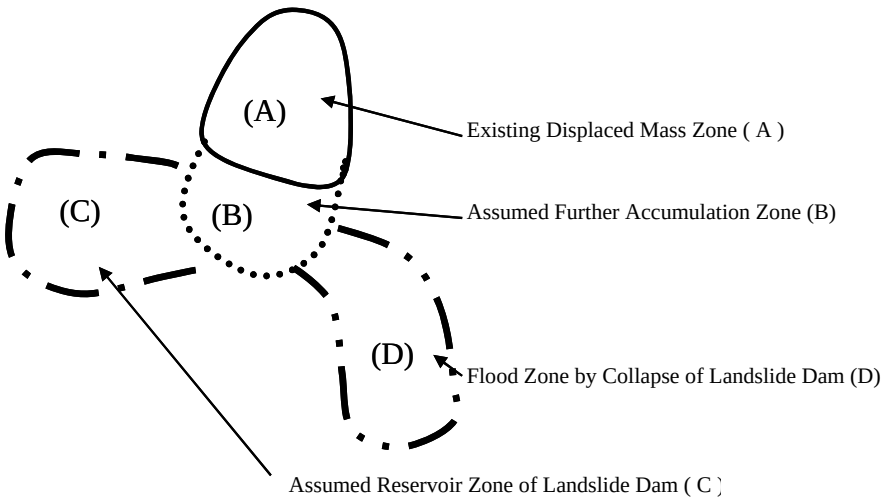
| | | | Crop Land ha | Grazing Land ha | Timber (wood production) ha |
|---|---|---|---|---|---|
| Existing Damage | Direct Damage | Area of partially or completely destoroied objects which do not function. | | | |
| | Indirect Damage | Description (Production lost) | | F6-2 | |
| | | | Crop Land ha | Grazing Land ha | Timber (wood production) ha |
| Potential Damage | Direct Damage | Area of all risky objects in Zone A+B+C+D excluding existing damaged objects | | | |
| | Indirect Damage | Description (Production Lost) | | F6-3 | |
| Remark | | | | | |



## Form6-5 Damage Evaluation of Others Sector

| | |
|---|---|
| Landslide ID | F6-1 |
| Landslide Name | |
| Survey Date | |

| | | | Emergency Expenditure AMD/year | Demolition Removal m3 | Monuments/ Remains name | Population Affected name | Others |
|---|---|---|---|---|---|---|---|
| Existing Damage | Direct Damage | Number of partially or completely destoroied objects which do not function. | | | | | |
| | Indirect Damage | Description (Location/assumed time out of operation/ numbers of people affected) | | F6-2 | | | |
| | | | Emergency Expenditure AMD/year | Demolition Removal m3 | Monuments/ Remains name | Population Affected name | Others |
| Potential Damage | Direct Damage | | | | | | |
| | Indirect Damage | | | F6-3 | | | |
| Remark | | | | | | | |



**Form7**

| | |
|---|---|
| Landslide ID | |
| Landslide Name | |
| Survey Date | |

ガイドライン 4（地すべり台帳コード）

# Code for Form-1

| Hazard Level Code | |
|---|---|
| | Activity of landslide potential area by aerial photograph interpretation (API) |
| I | High |
| II | Moderate |
| III | Low, none |

| Damage Level Code | |
|---|---|
| H | Damages are progressing;<br>Many houses, public facilities, or important infrastructure are exist |
| M | Damages were reported or recognized in the past;<br>Some houses, public facilities, or infrastructure are exist as risk objects. Landslide is causing serious environment impact |
| L | Damages have not been reported/recognized<br>Landslide is little relation with human activity |

| Priority Rank for Field Inventory Survey Code | | | |
|---|---|---|---|
| Hazard / Level | I | II | III |
| H | A | A | B |
| M | A | B | C |
| L | B | C | C |

# LEGEND of Form-2,3 (1/2)

**Geological and geographical feature**

1 Knick line

2 Scarps

3 Depression

4 Ridge

5 Cracks

6 Fault

7 Regression of Scarp

8 Compressinal Ridge

9 Block

10 Terras

11 Outcrop

12 Spring 20 l/min

13 20 l/min Surface Water

14 N50E Dip and Strike of beddings
Strike
30 Dip

15 N50E
Dip and Strike of cracks/joints
30

16 N50E Dip and Strike of Fault
30

**Hazard Zone**

Direction of displaced Mass Movement

(A) Existing Displaced Mass Zone ( A )

(B) Assumed Further Accumulation Zone (B)

(C) Assumed Reservoir Zone of Landslide Dam ( C )

(D) Flood Zone by Collapse of Landslide Dam (D)

**Risk Object**

D Dwelling House

P Public Facility

I (description) Industry & Services

GR Gravel Road

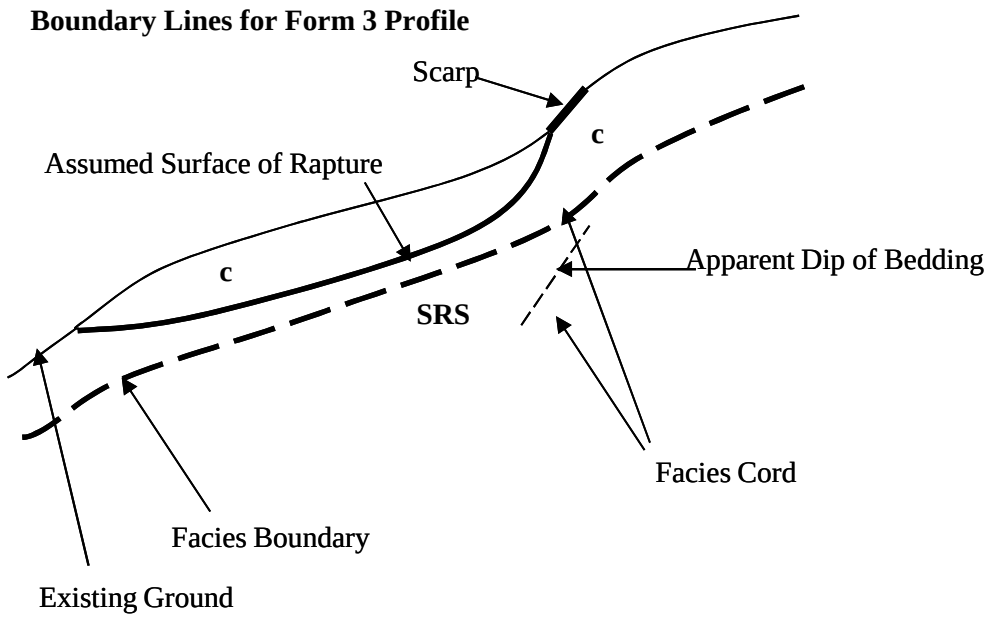
AR Asphalt roads

AH2 Asphalt highways,2 lanes

Other risk object shall be recorded by the letters.

# LEGEND of Form2,3 (2/2)

**Boundary Lines for Form 3 Profile**




**Facies Code: See Form 5 Code**

| Facies Code | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Surficial Deposit: s | | Bedrock Materials: R | | | | | | Primary code |
| Soils (s) | | Sedimentary rocks (SR) | | Igneous rocks (IR) | | Metamorphic rocks (MR) | | Secondary code |
| c | Cohesive soils | SRS | Sandy rocks | IRP | Plutonic rocks | MRS | Psamitic rocks | Tertiary code |
| sg | Incohesive soils | SRM | Clayey rocks | IRI | Intermediate rocks | MRP | Pelitic rocks | |
| | | SRC | Chemical rocks | IRV | Volcanic rocks | MRC | Chemical rocks | |
| o | Peat | SR | Others | | | | | |
| | Organic material | | Unknown | | | | | |
| Note: One of codes (primary, secondary, or terially) shall be used. | | | | ITF | Tuffaceous | | | |
| | | | | IR | Others | MO | Others | (Secondary code) |
| | | | | | Unknown | | Unknown | |

The rock name for other is shown in ( ).
supplementary description is showin in ( ).

## Code of Form-5 (1/2)

| Slope Movement Type Code | | | |
|---|---|---|---|
| Type of Material / Type of Movement | | Rock | Soil |
| Major Type | Sub Type | | |
| SLIDE (LANDSLIDES) (SL) | | R-SL | S-SL |
| FLOW (FL) | | R-FL | S-FL |
| OTHERS (O) | FALL(F) | R-O | S-O |
| | TOPPLE (T) | | |
| | COMPLEX (C) | | |

Note:
When the subtype of others is identified, put one of subcodes (F, T, L, or C); eg. in case of FALL, the slope movemen type code is R-OF or S-OF.

| Facies Code | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Surficial Deposit: s | | Bedrock Materials: R | | | | | | Primary code |
| Soils (s) | | Sedimentary rocks (SR) | | Igneous rocks (IR) | | Metamorphic rocks (MR) | | Secondary code |
| c | Cohesive soils | SRS | Sandy rocks | IRP | Plutonic | MRS | Psamitic rocks | Tertiary code |
| sg | Incohesive soils | SRM | Clayey rocks | IRI | Intermediate rocks | MRP | Pelitic rocks | |
| | | SRC | Chemical rocks | IRV | Volcanic | MRC | Chemical rocks | |
| o | Peat | SR | Others | | | | | |
| | Organic material | | Unknown | | | | | |
| Note: One of codes (primary, secondary, or terially) shall be used. | | | | ITF | Tuffaceous | | | |
| | | | | IR | Others | MO | Others | (Secondary code) |
| | | | | | Unknown | | Unknown | |

# Code of Form-5 (2/2)

| Degree of Weathering/Alternation | |
|---|---|
| Definition | Description |
| **None** | No visible sign of rock material weathering/Alternation |
| **Slightly** | Discoloration on major discontinuity surface; rock material may be discolored and somewhat weaker than fresh rock |
| **Moderately** | Less than half of the rock material is present either as a continuous framework or as core stones |
| **Highly** | Most of rock material is decomposed, disintegrated to a soil, or both; original mass structure is largely intact |
| **Completely** | All rock material is converted to a soil; mass structure and material fabric are destroyed; a large change in volume has occurred , but soil has not been transported significantly |

| Counter measures Code | |
|---|---|
| Landslides Control Measures | |
| **SDC** | Surface Drainage Control |
| **SG** | Shallow Groundwatre Control |
| **DG** | Deep Groundwatre Control |
| **OTH** | Others |
| Landslides Restraint Measures | |
| **PIL** | Piles |
| **SHA** | Large Diameter Cast-in-Place Shafts |
| **ANC** | Anchors |
| **WAL** | Retaining Walls |
| Others | |
| **OTH** | Others |
| **NOT** | Nothing |

ガイドライン５（地すべり台帳サンプル）

## Form-1 List of Landslide

| Landslide ID | Landslide Name | Location | | | Coordinate and Altitude of Landslide Center | | | | | | | Displaced Mass Scale | | | Hazard Level | Risk Level | Remark (Hazard) | Remark (Risk) | Remark (Priority selection's reason) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Latitude N | | | Longitude E | | | Altitude (m) | | | | | | | | |
| | | Martz /Yerevan city | Community If no community un the landslide area, describe the map index code) | Map Index Code (1:100,000) | Deg | Min | Sec | Deg | Min | Sec | Altitude (m) | Width (m) | Length (m) | Area (ha) | | | | | |
| SHIR-099-0010 | | SHIRAK | 099-D-b | K-38-099 | 41 | 5 | 56 | 43 | 28 | 7.2 | 2633 | 800 | 750 | 60 | III | L | | | |
| SHIR-099-0020 | | SHIRAK | 099-D-b | K-38-099 | 41 | 5 | 23 | 43 | 28 | 7.2 | 2573 | 700 | 850 | 56 | III | L | | | |
| SHIR-099-0030 | | SHIRAK | 099-D-d | K-38-099 | 41 | 4 | 54 | 43 | 28 | 39 | 2562 | 1000 | 1550 | 123 | III | L | | | |
| SHIR-100-0010 | | SHIRAK | 100-C-c | K-38-100 | 41 | 1 | 36 | 43 | 33 | 36 | 2388 | 750 | 2900 | 144 | III | L | | | |
| SHIR-100-0020 | | SHIRAK | 100-C-c | K-38-100 | 41 | 2 | 31 | 43 | 34 | 58 | 2105 | 800 | 2150 | 99 | III | L | | | |
| SHIR-100-0030 | | SHIRAK | Tsaghkut | K-38-100 | 41 | 6 | 43 | 43 | 35 | 45 | 2190 | 2600 | 7000 | 1881 | III | M | | | |
| SHIR-100-0040 | | SHIRAK | Gyolli | K-38-100 | 41 | 4 | 51 | 43 | 45 | 0.4 | 2164 | 1600 | 2700 | 250 | III | M | | | |
| SHIR-100-0050 | | SHIRAK | Ghazanchi | K-38-100 | 41 | 4 | 37 | 43 | 51 | 22 | 2121 | 1400 | 3300 | 414 | III | M | | | |
| SHIR-100-0060 | | SHIRAK | Karmravan | K-38-100 | 41 | 0 | 43 | 43 | 52 | 2.5 | 2013 | 300 | 400 | 9 | III | M | | | |
| SHIR-100-0070 | | SHIRAK | 100-D-b | K-38-100 | 41 | 9 | 43 | 43 | 55 | 58 | 2806 | 1200 | 4000 | 230 | III | L | | | |
| SHIR-100-0080 | | SHIRAK | 100-D-d | K-38-100 | 41 | 3 | 25 | 43 | 57 | 41 | 2652 | 200 | 300 | 6 | III | L | | | |
| SHIR-100-0090 | | SHIRAK | 100-D-d | K-38-100 | 41 | 0 | 5.6 | 43 | 58 | 49 | 2297 | 400 | 400 | 13 | III | L | | | |
| SHIR-101-0010 | | SHIRAK | 101-C-c | K-38-101 | 41 | 2 | 15 | 44 | 2 | 19 | 2280 | 350 | 800 | 26 | III | L | | | |
| SHIR-101-0020 | | SHIRAK | 101-C-c | K-38-101 | 41 | 0 | 26 | 44 | 2 | 18 | 2285 | 900 | 1300 | 99 | III | L | | | |
| SHIR-101-0030 | | SHIRAK | 101-C-c | K-38-101 | 41 | 0 | 37 | 44 | 2 | 56 | 2229 | 500 | 900 | 39 | III | L | | | |
| SHIR-101-0040 | | SHIRAK | 101-C-c | K-38-101 | 41 | 0 | 58 | 44 | 3 | 58 | 2258 | 1650 | 2200 | 40 | III | L | | | |
| SHIR-112-0010 | | SHIRAK | Gyumri | K-38-112 | 40 | 48 | 26 | 43 | 48 | 15 | 1548 | 3000 | 800 | 247 | III | M | | | |
| SHIR-112-0020 | Arapi | SHIRAK | Arapi | K-38-112 | 40 | 47 | 6 | 43 | 48 | 16 | 1484 | 440 | 220 | 5 | II | H | | | |
| SHIR-112-0021 | | SHIRAK | Arapi | K-38-112 | 40 | 46 | 58 | 43 | 48 | 24 | 1479 | 100 | 200 | 3 | III | M | | | |
| SHIR-112-0022 | | SHIRAK | Arapi | K-38-112 | 40 | 46 | 52 | 43 | 48 | 30 | 1475 | 100 | 200 | 3 | III | M | | | |
| SHIR-112-0030 | | SHIRAK | Vardakhpyur | K-38-112 | 40 | 57 | 56 | 43 | 54 | 19 | 2117 | 100 | 100 | 1 | III | M | | | |
| SHIR-112-0040 | | SHIRAK | Torosgyukh | K-38-112 | 40 | 56 | 34 | 43 | 53 | 27 | 1944 | 1250 | 2000 | 134 | III | M | | | |
| SHIR-112-0060 | | SHIRAK | Pokrashen | K-38-112 | 40 | 54 | 1.3 | 43 | 54 | 5.2 | 2020 | 400 | 850 | 13 | III | M | | | |
| SHIR-112-0070 | | SHIRAK | Karmrakar | K-38-112 | 40 | 51 | 28 | 43 | 53 | 22 | 1828 | 2000 | 1500 | 179 | III | M | | | |
| SHIR-112-0080 | | SHIRAK | 112-B-b | K-38-112 | 40 | 57 | 16 | 43 | 54 | 48 | 2084 | 100 | 100 | 1 | III | L | | | |
| SHIR-112-0090 | | SHIRAK | 112-B-b | K-38-112 | 40 | 56 | 11 | 43 | 55 | 26 | 2145 | 100 | 100 | 1 | III | L | | | |
| SHIR-112-0100 | | SHIRAK | Lernut | K-38-112 | 40 | 52 | 10 | 43 | 55 | 8.2 | 1878 | 300 | 850 | 13 | III | M | | | |
| | | | | | | | | | | | | | | | | | | | |
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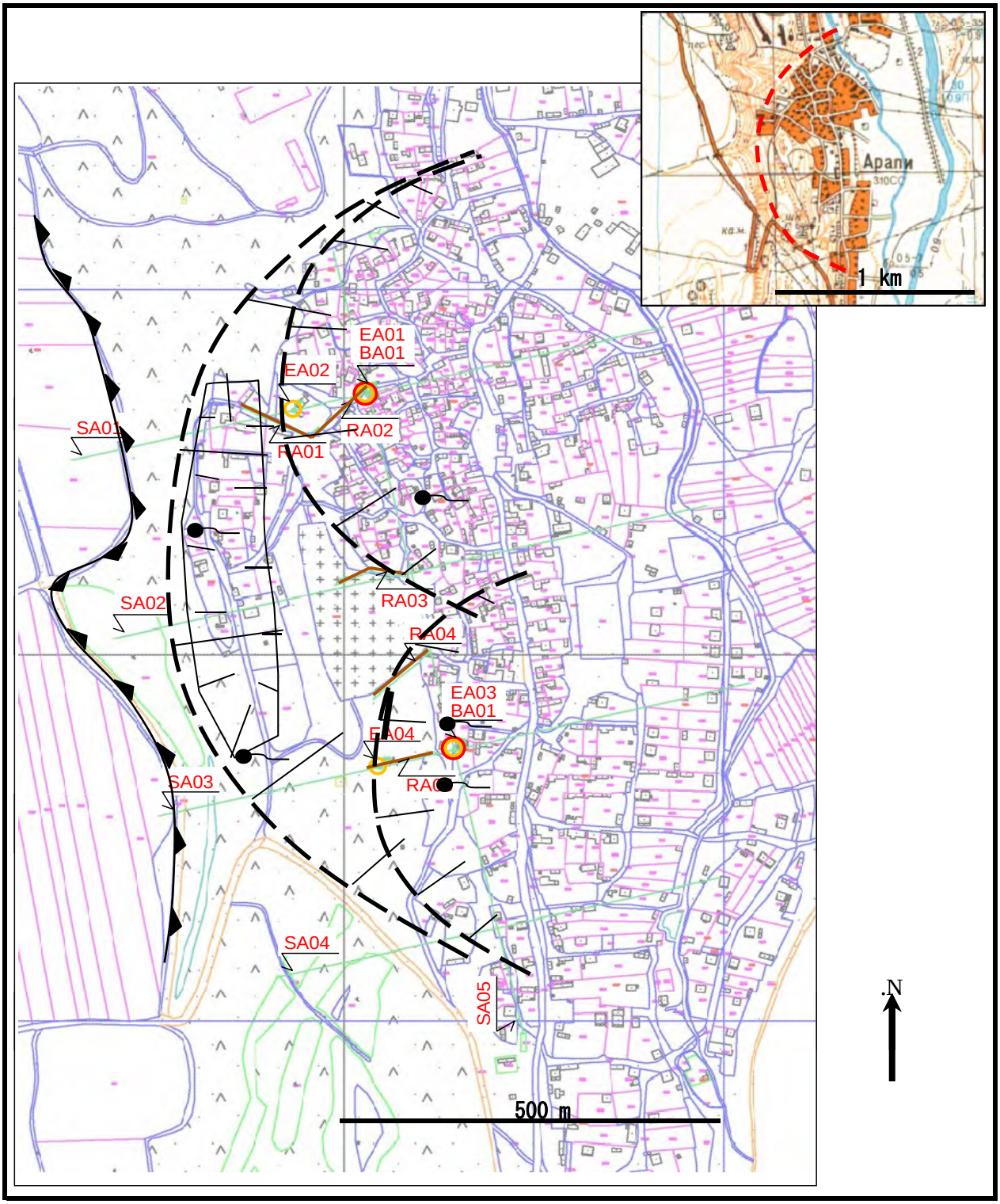
# Form2 Plan

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey date | 09/Jul/2004, 10/Dec/2014 |

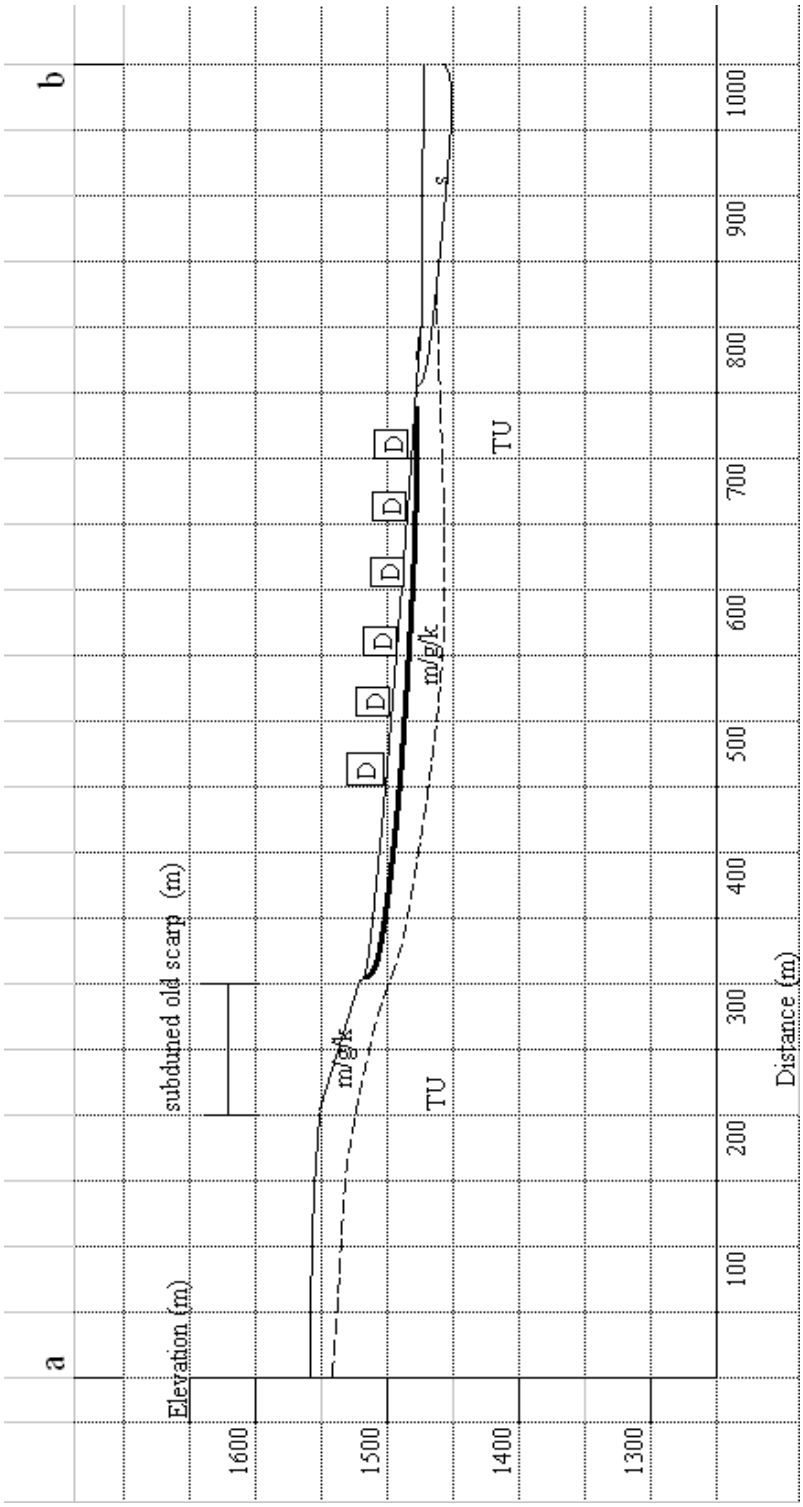
Plan



# Form3 Profile

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey date | 09/Jul/2004, 10/Dec/2014 |

Profile



# Form4 Photograph

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey date | 09/Jul/2004, 10/Dec/2014 |

General view of Arapi village
Taking the picture from east side river opposite bank

Sub scarp; 1.5m height, in the upper part of the displaced mass

Situation of damaged house

Deformation of retaining wall

Sub scarp; 1.5m height, in the upper part of the displaced mass

# Form5 Landslide Condition

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey Date | 09/Jul/2004, 10/Dec/2014 |

| | | | |
|---|---|---|---|
| **Slope Movement Type** | S-SL | Remark | |

**Event History**

| Event Year/Date | Situation of Movement | Situation of Damage |
|---|---|---|
| 1985-2004 | | Dowelling houses have damaged |
| 2004-2014 | New cracks appear on the ground | Cracks of houses have been increased and |
| | | |

**Topographic & Deformation Features**

| | Total of Landslide | Crown | Main Scarp | Displaced Mass |
|---|---|---|---|---|
| Slope Length (m) | 1000 (blocks of | | 600 | 1000 |
| Slope Height (m) | 60 | | 25 | 35 |
| Slope Gradient (degree) | | 3 | 20 | 5 |
| Depth of Displaced Mass (m) | | | | 10 |
| Direction of Displaced Mass Movement (degree: shows from the north clockwise) | | | | |
| Extension / Width (m) | | | 220 | 220 |
| Sub Scarp | | Exist/Not | Exist/Not | Exist/Not |
| Cracks | | Exist/Not | Exist/Not | Exist/Not |
| Depression | | Exist/Not | Exist/Not | Exist/Not |
| Ridges | | Exist/Not | Exist/Not | Exist/Not |
| Ownership of Land | Public/Private/Both | | | |
| Relation between Displaced Mass and River | Undercut slope/Channel shifting by displaced mass/Just approaching /No relation | | | |
| Ageing of Landslide Topography | Fresh/Forming of a terrace scarp in a landslide foot/Forming new stream in a landslide/ Landslide topography has subdued | | | |
| Remark | Main scarp has subduned. But fresh sub scarps are distebuted in the displaced mass. | | | |

**Base Rock & Displaced Mass Condition**

| | Crown | Main Scarp | Displaced Mass | |
|---|---|---|---|---|
| Age of Base Rock | NEO | NEO | NEO | |
| Facies of Base Rock | SRM | SRM | SRM | |
| Facies of Displaced Mass | | | m/g/k | |
| Geological Structure | Unknown | Unknown | Unknown | |
| Bedding Dip | Unknown | Unknown | Unknown | |
| Weathering Grade of Base | Slight | Slight | Slight | |
| Alteration Grade of Base | Slight? | Slight? | Slight? | |
| Remark | | | | |

**Hydrological Condition**

| | Whole | Crown | Main Scarp | Displaced Mass |
|---|---|---|---|---|
| Number of Spring Point | about 10 | 0 | 0 | 0 |
| Total Amount of Spring (liter/minute) | >10 | 0 | 0 | 0 |
| Total Amount of Surface Water | >10 | 0 | 0 | 0 |
| Remark | | | | |

**Vegetation Condition**

| | Crown | Main Scarp | Displaced Mass | |
|---|---|---|---|---|
| Condition | Bare land/Grass/Tree | Bare land/Grass/Tree | Bare land/Grass/Tree | |
| Remark | | | | |

**Countermeasures**

| | Whole |
|---|---|
| Kind of Countermeasures | NOT |
| Effect | Effective/Not effective |
| Remark | |

| | |
|---|---|
| **Remark** | |

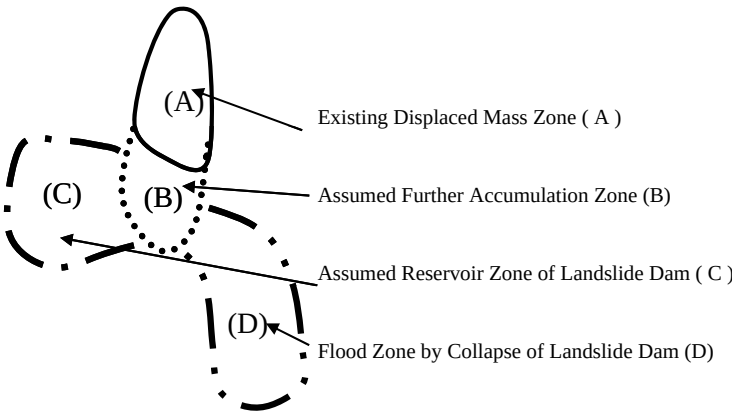
## Form6-1 Damage Evaluation of Construction Sector

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey Date | 09/Jul/2004, 10/Dec/2014 |

| | | | | Dwelling | | Hospitals | | Schools | | Public Buildin | | Industry Build | | Services Buildi | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ |
| Existing Damage | Direct Damage | Number of damaged buildings in each category in Zone (A), defined in "Building Damage Category Code" | Damage Category 0 | 395 | 100 | | | 1 | 250 | 3 | 580 | | | | |
| | | | Damage Category I | 100 | 100 | | | | | 1 | 300 | | | | |
| | | | Damage Category II | 41 | 100 | | | | | | | | | | |
| | | | Damage Category III | 20 | 100 | | | | | | | | | | |
| | | | Damage Category IV | 20 | 100 | | | | | | | | | | |
| | | | Damage Category V | 10 | 100 | | | | | | | | | | |
| | Indirect Damage | Description (Needed cost besides guarantee expense to building owner. ex. need for infrastructure of settlement, time out of operation, production lost ) | | | | | | | | | | | | | |

| | | | Dwelling | | Hospitals | | Schools | | Public Buildin | | Industry Build | | Services Buildi | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ | Nos. nos. | Average lot size $m^2$ |
| Potential Damage | Direct Damage | Number of all risky objects in Zone A+B+C+D excluding existing category V | 240 | 100 | | | | | | | | | | |
| | Indirect Damage | Description (Needed cost besides guarantee expense to building owner. Ex. need for infrastructure of settlement, time out of operation, production lost ) | | | | | | | | | | | | |
| Remark | | | | | | | | | | | | | | |

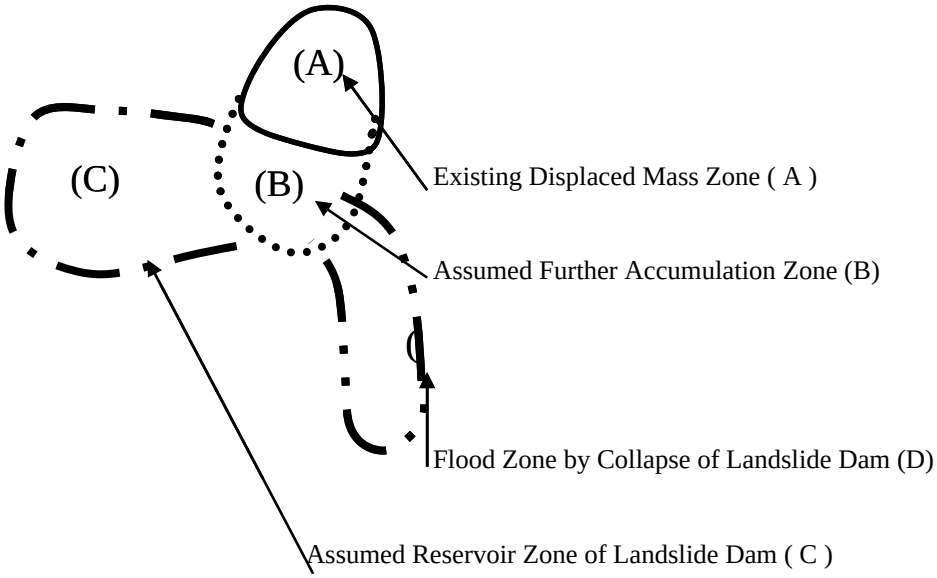
| Building Damage Category Code | |
|---|---|
| **0** | No damage at all |
| **I** | Buildings in good technical condition; inessential damages, which can be eliminated by current restoration works |
| **II** | Buildings in satisfactory technical condition; damages can be eliminated by restoration-reconstruction works |
| **III** | Buildings in unsatisfactory technical condition; damages can be eliminated by strengthening and reconstruction works |
| **IV** | Buildings in emergency condition; dangerous for further use – the habitants must be resettled |
| **V** | Buildings partially or completely ruined; habitants resettled |



## Form6-2 Damage Evaluation of Transportation Sector

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey Date | 09/Jul/2004, 10/Dec/2014 |

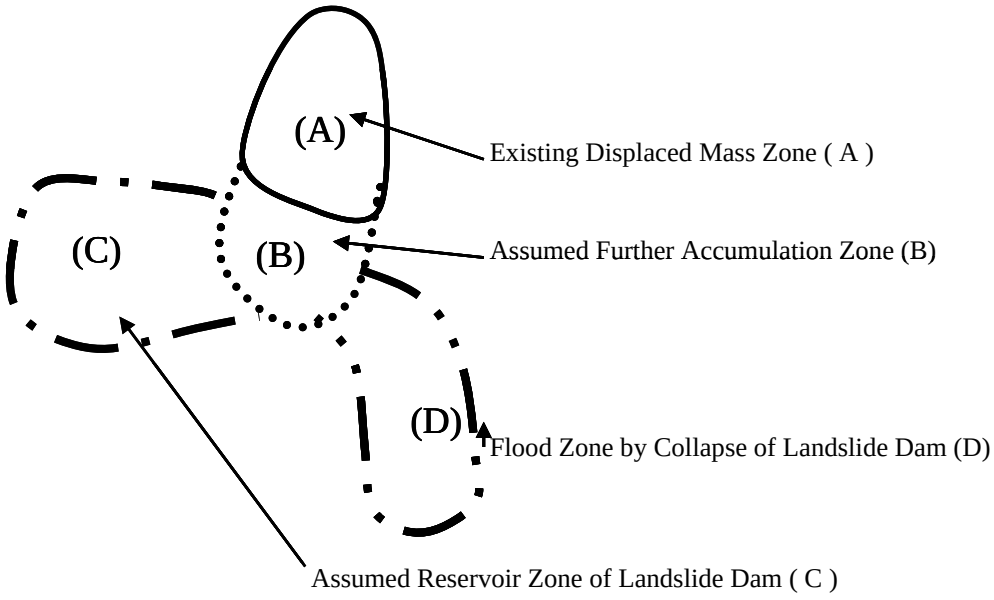
| | | | Roads | | | | |
|---|---|---|---|---|---|---|---|
| | | | Gravel road m2 | Asphalt road m2 | Asphalt highways 2 lanes m2 | Bridges m2 | Railways m |
| Existing Damage | Direct Damage | Area(length and width) of partially or completely destoroied objects which do not function. | 10000 | 1500 | | 200 | |
| | Indirect Damage | Description (Location/ alternative road time out of operation/ numbers of people affected ) | | | | | |
| | | | Roads | | | | |
| | | | Gravel road m2 | Asphalt road m2 | Asphalt highways 2 lanes m2 | Bridges m2 | Railways m |
| Potential Damage | Direct Damage | Area (length and width) of all risky objects in Zone A+B+C+D excluding existing damaged objects ) | 10000 | | | | |
| | Indirect Damage | Description (Location/ alternative road time out of operation/ numbers of people affected ) | | | | | |
| | Remark | | | | | | |



## Form6-5 Damage Evaluation of Others Sector

| | |
|---|---|
| Landslide ID | SHIR-112-0020 |
| Landslide Name | Arapi |
| Survey Date | 09/Jul/2004, 10/Dec/2014 |

| | | | Emergency Expenditure AMD/year | Demolition Removal m3 | Monuments/ Remains name | Population Affected name | Others |
|---|---|---|---|---|---|---|---|
| Existing Damage | Direct Damage | Number of partially or completely destoroied objects which do not function. | | | | 10 | |
| | Indirect Damage | Description (Location/assumed time out of operation/ numbers of people affected) | | | | | |
| | | | Emergency Expenditure AMD/year | Demolition Removal m3 | Monuments/ Remains name | Population Affected name | Others |
| Potential Damage | Direct Damage | | | | | 250 | |
| | Indirect Damage | | | | | | |
| | Remark | | | | | | |



**Form7**

| | |
|---|---|
| Landslide ID | |
| Landslide Name | |
| Survey Date | |

ガイドライン 6（地すべり調査）

# Manual on Landslide Investigation

## 1. General Provisions

Investigation of landslides is carried out for the purpose of clarifying land conditions in the landslide areas and planning/design of countermeasures. This manual describes the outline and methodology of the investigation.

Investigation of landslides is carried out in three stages as shown below.

1) Preliminary investigation
   - Literature investigation
   - Landform interpretation
2) Basic investigation
   - Site reconnaissance
   - Planning for detailed investigation
3) Detailed investigation
   - Preparation of topographic maps
   - Geological investigation
   - Landslide surface investigation
   - Ground displacement investigation
   - Groundwater investigation
   - Physical prospecting, etc.

In case that quick implementation of urgent measures is required, minimum investigation, such as landslide surface investigation and groundwater investigation, can be carried out, based on the area and activeness of landslide, clarified by site reconnaissance.

In case that countermeasure works are implemented urgently, information can be obtained from the installed structure, such as deformation of wall, discharge of drainage structures, etc., will provide further data for clarification of mechanism of the landslide and its movement. Thereby, the urgent countermeasure works can be considered as a part of investigation works for permanent countermeasures.

## 2. Preliminary investigation

### 2.1 Outline and purpose of preliminary investigation

Preliminary investigation is carried out, aiming at clarifying the general features such as landslide distribution, geological conditions, groundwater conditions, etc. in wide areas. The investigation consists of literature investigation and identification of landslide features by air-photos.

## 2.2 Literature investigation

Literature investigation aims to clarify landslide characteristics, by means of collecting information on geography, geology, climate, records of landslide.

Since landslide occurs in particular geography and geology, the above-mentioned information obtained through literature investigation is important for clarifying characteristics of occurrence and movement of landslide in the target area. Data to be collected in the literature investigation are as follows.

(1) Conditions on land such as geography and geology
   a) Topographic maps
   b) Air-photos
   c) Geological maps
   d) Landform classification maps and land use maps
   e) Others such as soil maps and existing geological reports

(2) Records of landslide disasters and literatures on landslide surrounding areas
   a) Records of implemented measures, reports on disasters, and report of geological investigation
   b) Academic research reports
   c) Date on distribution of settlement and land use
   d) Local history and newspapers

(3) Climate records
   a) Climate reports
   b) Observation records of climate stations

## 2.3 Landform interpretation

Landform interpretation aims at clarifying geomorphologic and geological features in wide areas, using air-photos and topographic maps.

Landslide features and geological weak zones are clarified, using topographic maps and air-photos. The landform interpretation is efficient for identifying landslide distribution in wide areas. Because landslide features have generally been created through repeated movement of landslide in the past, the landslide features are easy to be identified, as shown in Figure 1. Since some landslide features are similar to other geomorphologic features, such as volcani-clastic deposits at the margin of lave plateau and river terrace, it is necessary to confirm by site reconnaissance, whether the features are real landslide features or not. It is rather difficult to identify rock slide by landform interpretation, since the movement of rock slide is generally small for creation of particular landform. In some cases, it is possible to identify rock slide, based on distribution of geological weak zone.

In case that topographic maps with contour lines and air-photos for stereo observation are not available, any satellite images can be used for tentative, but not precise, alternative.

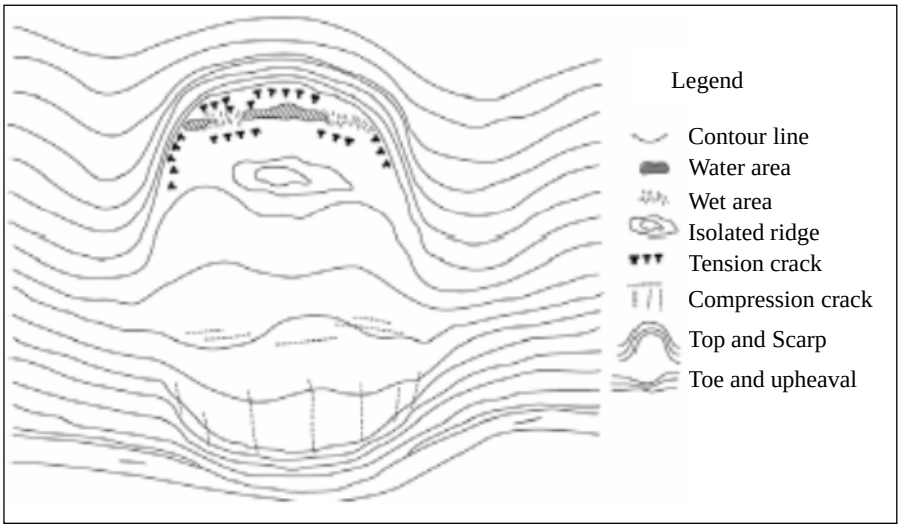


Figure 1 Typical plan of landslide features

Geology and geological structures are important factors for identification of landslide features. It is noted that there is high possibility of landslide in the following conditions.

1) Geology
   a) Mudstone and tuff of Neogene (Early Tertiary)
   b) Crystalline schist (green schist and black schist) and slate
   c) Green rocks
   d) Serpentine
   e) Hydro-thermal altered rocks
2) Geological structures
   a) Fracture zones along faults and tectonic lines
   b) Dip slopes
   c) Axes of anticline and syncline of folds
   d) Margin of igneous rocks and intrusive rocks
   e) Cap rocks (such as basalt, andesite, and volcani-clastic rocks)

Particular geomorphologic features for landform interpretation are as follows.

3) Geomorphology
   a) V-shape valley, cutting deep in an erosional plain
   b) Colluvial slopes with thick deposits and buried valley
   c) Slopes with small undulation inside the slopes and upheaval at the bottom, winding river courses being pushed with river side slopes, and sudden disappearance of river flow
   d) Undercut slopes by river flow
   e) Slopes beside winding river courses where erosion occurs
4) Micro-geomorphology
   a) Unequal interval of contour lines (narrower interval in upper portion of landslide, wider in middle, and narrower again in lower)
   b) Horse-shoe shaped scarp with gentle slopes or isolated small ridges in the lower portion

c) Depression areas, cracky areas as well as depression zones on ridges or hills
d) Alignment of ponds, lakes, wet lands
e) Small valley or crocks on the both side of a landslide
f) Depression on a ridge behind landslide
g) Bending of roads and railway, as well as displacement of structures
h) Abnormal bending of river course

# 3. Basic Investigation

## 3.1 Outline and purpose

Basic investigation is carried out for judging urgency and the preparation of emergency response plan, if necessary. It also aims to prepare detailed investigation plan, through confirmation of the area of the landslide and situation of the movement. The investigation is basically done by means of site reconnaissance.

## 3.2 Site reconnaissance

Site reconnaissance aims to prepare investigation plan and emergency response plan, through clarification of occurrence and mechanism of the landslide and the affected areas. Key issues of sire reconnaissance are (1) estimation of the area of landslide and dangerous area, (2) Geological conditions and geologic structures, (3) estimation of geological structures, based on micro-morphology and regional morphology, (4) estimation of groundwater condition, (5) estimation of mode of movement, (6) estimation of trigger factor, (7) forecasting future activation, and (8) forecasting further damages.

Points of site reconnaissance in each key issue are as follows.

### 3.2.1 Estimation of the area of landslide and dangerous area

Topographic maps should be obtained for the site reconnaissance, and topographic maps with contour lines are preferable. At site, observation of wide view of the landslide area should be done to clarify the general features and geomorphology of the landslide area, identified air-photo interpretation. Based on the above-mentioned observation and other phenomena such as cracks and deformation in landslide area, active landslide area, risky area, and objects to be protected will be estimated.

### 3.2.2 Geological investigation

For estimation of activeness and characteristics of landslide, investigation on geological component, grain size, lithology/ shape of gravels, color/ condition of clay, etc. is clarified. The area of landslide mass also be estimated, based on the investigation results.

Based on the observation result of outcrop of bedrock, stratigraphy, succession of strata, dip/strike can be estimated, and then, it is possible to estimate the characteristics of landslide from geo-tectonic view point. In case that faults or fracture zones are observed, it is important to clarify their influence, through assuming extension of the observed fault and fracture zones.

### 3.2.3 Geomorphologic investigation

In geomorphologic investigation, geologic structures and landslide features are estimated through micro-morphology and large-scale morphology.

### 3.2.4 Estimation of groundwater condition

In the investigation, water level is measured for ponds and discharge outflow of groundwater is measured for spring. By means of clarifying the relation between the water level/ discharge and rainfall, the source of groundwater, whether from deeper portion or shallower portion, can be estimated.

### 3.2.5 Estimation of mode of movement

The mode and direction of landslide is estimated, by means of investigation of micro-morphology, main cracks, side cracks, toe cracks, as well as deformation of roads, houses, other facilities, and woods (bending).

### 3.2.6 Estimation of trigger factor

Trigger factor is estimated, based on climate conditions, characteristics of movement, etc. The followings are possible trigger factors. Careful checking is required, since the combination of several factors may cause activation.

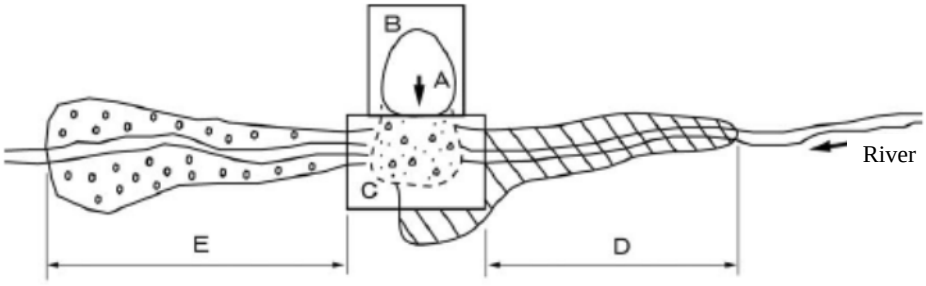
1) River erosion of the toe of landslide
2) Lasting rain or snow melting
3) Heavy rain
4) Soil removal at the toe of landslide and embankment at the top of landslide
5) Improper treatment of groundwater
6) Reservoir impounding
    a) Initial impounding
    b) rapid drawdown of the reservoir water level
7) Earthquake and volcanic activity

### 3.2.7 Estimation of future activation

It is actually difficult to estimate future activation by site reconnaissance only. In general, rock slide or weathered rock slide with uniform gradient of sliding surface shows high possibility of sliding.

### 3.2.8 Forecasting areas and degree of damages, due to activation of landslide

In case that the results of the above-mentioned investigation indicates high possibility of activation of landslide, it is necessary to for take immediate response (such as establishing warning and evacuation system), estimating area of possible damages. The possible damage area should be determined, paying attention to expansion of landslide area to the upper slope. It is also necessary to set up the possible damage area, in consideration of the possibility of occurrence of debris flow from the collapsed materials, creation of landslide dams, and inundation due to break of the landslide dams as shown in Figure 2.




A: landslide block
B: Slope, having same basic factor as that in A
C: Area of moved soil mass
D: Inundation area
E: Flooding area

| | |
|---|---|
| A+B | : Landslide dangerous area |
| A+B+C | : Landslide dangerous zone |
| A+B+C+D+E | : Possible damage area |

Figure 2 A possible damage area of landslide

### 3.2.9 Inquest on emergency measures

In case that the mechanism of occurrence and movement of landslide is clarified and activation is foreseen as a result of site reconnaissance, it is necessary to establish system of monitoring, evacuation, and emergency measures. Urgent investigation plan, including real-time monitoring system, will be prepared as necessary.

## 4. Detailed investigation

### 4.1 Outline and purpose

Detailed investigation is carried out for confirmation of the results of preliminary and basic investigation as well as clarification of mechanism of occurrence and movement. In the detailed investigation, (1) topographic survey, (2) geological investigation, (3) sliding surface investigation, (4) ground surface movement survey, (5) groundwater investigation, and (6) soil tests are carried out as necessary.

Since landslide analysis is usually carried out for each of landslide block, it is necessary to divide the landslide area into several moving blocks for the preparation of detailed investigation plan.

The issues to be clarified in the detailed investigation and investigation items are shown in Table 1. The contents shown in Table 1 should be estimated in preliminary and basic investigation stages, and the each investigation should be done, after the consideration of its necessity. Since the results of the detailed investigation are data for analysis of landslide mechanism, it is necessary to consider what kind of analysis will be done at the time of preparation of detailed investigation plan.

Table 2 shows standard of items and contents of the investigation. It is necessary to select proper investigation items, since the items differ for the cases such as some investigations have

been done or emergency measures are required.

Table 2.1 items and contents to be clarified in detailed investigation

| Issues to be clarified \ Items of detailed investigation | Topographic survey | Geological investigation | Sliding surface investigation | Ground movement investigation | Groundwater investigation | Soil tests | Environmental investigation |
|---|---|---|---|---|---|---|---|
| 1 Type of landslide, based on geomorphology, geology, etc. | O | O | | | | | |
| 2 Weak zones in terms of geologic structures | O | O | | | | | |
| 3 Dividing moving blocks and possible area of its expansion | O | | | O | | | |
| 4 Condition of each moving block | | | O | O | | | |
| 5 Area and volume of landslide mass | O | | O | | | | |
| 6 Shape and location of sliding surface | | O | O | | | | |
| 7 Distribution and flow situation of groundwater | | | | | O | | |
| 8 Parameters of mechanical properties, etc. | | O | | | | O | |
| 9 Environmental condition of landslide area | O | | | | | | O |

### 4.1.1 Dividing moving blocks

Landslide control plan is prepared for each moving block as a one mass, and analysis is done for each block in general. For the preparation of detailed plan, it is necessary to divide landslide area into several moving blocks, based on the results of preliminary and basic investigations.

Area of the moving blocks should be determined, considering geomorphology, geology, and foreseen damages. Moving blocks are identified, based on micro-geomorphology and condition of movement, and the unit of the block is the area surrounded by scarp and other tension cracks.

### 4.1.2 Setting up investigation line

A investigation line is set up in each block, which is base for setting up points for geological and groundwater investigations. In case of wide landslide, several investigation lines are set up.

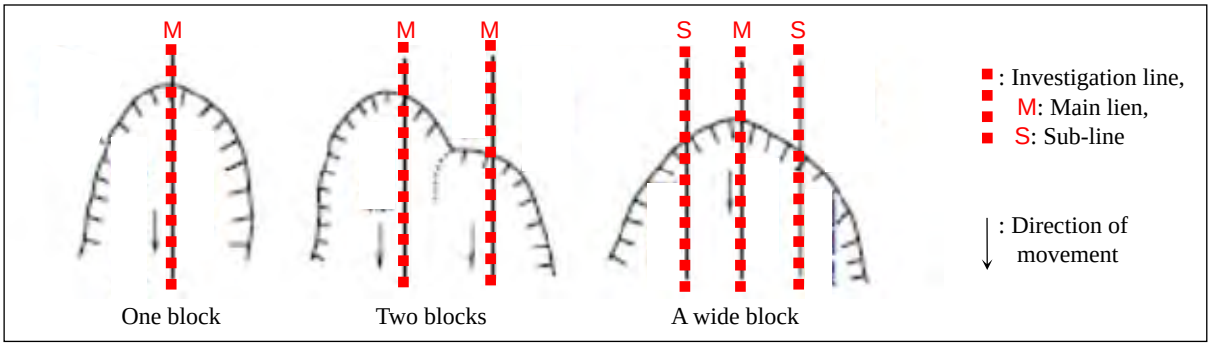



Figure 3 Setting up investigation lines

A main line is set up at a suitable location for clarification of geology, geological structures, groundwater distribution, and sliding surface. Since the section along main line is used for two-dimensional stability analysis, the main line should be set up in parallel to the direction of

landslide movement. In case that direction of movement is different between the upper and lower portion of a slope, the main line will be a broken line (combination of two straight lines).

In case that it is required to clarify lateral extension of geology and groundwater condition, sub line will be set up in parallel to the main line. In case that width of a landslide is 100 m or more, it will be considered to set up sub lines beside the main line with interval of about 50 m.

## 4.2 Topographic survey

Topographic survey is carried out for preparation of topographic maps. In order to identify a block in landslide, the scale of the topographic maps will be between 1/500 for a landslide of 200 m long, 1/1,000 to 1/3,000 for a landslide of more than 200 m long. For a very large landslide, topographic maps with smaller scale will be prepared, and detailed maps will be prepared for important parts. Objects to be shown on the topographic maps are as follow.

- houses, roads, other structures, river including small gully, collapsed areas, spring points, wetlands cracks, scarps, agricultural field, etc.

It is recommendable that the map covers wider area, including the past landslides, so that conditions of surrounding area and upper slopes can be clarified.

Since the topographic maps will be a base map, to be used for long time for planning of investigation and countermeasure works, the area and scale of the maps should be decided carefully. It should be noted that detailed geomorphologic features are not shown on topographic maps prepared from air-photos. Recently, topographic maps are prepared with a laser profiler, and there is a case that detailed geomorphologic features can be identified on the maps.

## 4.3 Geological investigation

Geological investigation is carried out for clarifying geology, soil properties, and conditions of sliding surface. The main component of geological investigation is drilling investigation, and seismic prospecting, electric prospecting, and natural radioactivity prospecting are conducted as necessary. Site reconnaissance is done again for further clarification of geology and geological structures in the landslide area as well as estimation of the depth and shape of sliding surface.

In geological investigation, the following issues to be clarified.

- Distribution of weak layers considered to have relation with landslide movement and sliding surface
- Strong layers which seem to have resistance force a or bearing capacity, which control the area of landslide movement

### 4.3.1 Drilling investigation

Drilling investigation is carried out to take samples directly from the ground for clarification of sliding surface, geology, and geological structures. Core samples are taken basically and the diameter of the drilling holes should be determined, considering excursion of the following investigation to be done in the drill hole.

a) Sliding surface investigation (Investigation with pipe strain gauge, hole inclinometer, and

hole extensometer as well as observation of wall of the hole with borehole camera/video)

b) Groundwater investigation (Measurement of groundwater level, groundwater tracing, pore pressure measurement, ground temperature measurement, pumping test, electric prospecting, other kinds of prospecting)

### (1) Arrangement and length of drilling investigation lines

Drilling investigation is planned basically at three holes in landslide area and one hole outside the landslide area on a main investigation line. For the small-scale landslide, the number of drilling holes can be reduced into two. Drilling is also carried out on sub lines with hole interval of 50 m to 100 m. Additional drilling is planned, in case of existence of fracture zones, complicated geological structures, or undulated shape of sliding surface. The length of one of the drilling holes will be long, in order to confirm the depth to stable bedrock.

In case that the thickness of landslide block cannot be estimated before the drilling investigation, the length of drill holes will be about 1/3 of width of the landslide block, and then, the length of succeeding holes will be adjusted, based on the results of the previous drilling.

Figure 4 shows an example of arrangement of drilling holes in landslide, consisting of several blocks. In many cases of small landslide drilling is carried out only on the main investigation line. In case of large landslide, drilling investigation takes more than one year in several stages. Analysis of landslide mechanism is carried out after the first stage drilling, and the investigation plan is accordingly adjusted. Consequently, drilling investigation is not always done as it is originally planned. The locations of drill holes should be determined in order to prepare reliable profiles, sections, contour map of sliding surface, contour map of groundwater, etc.

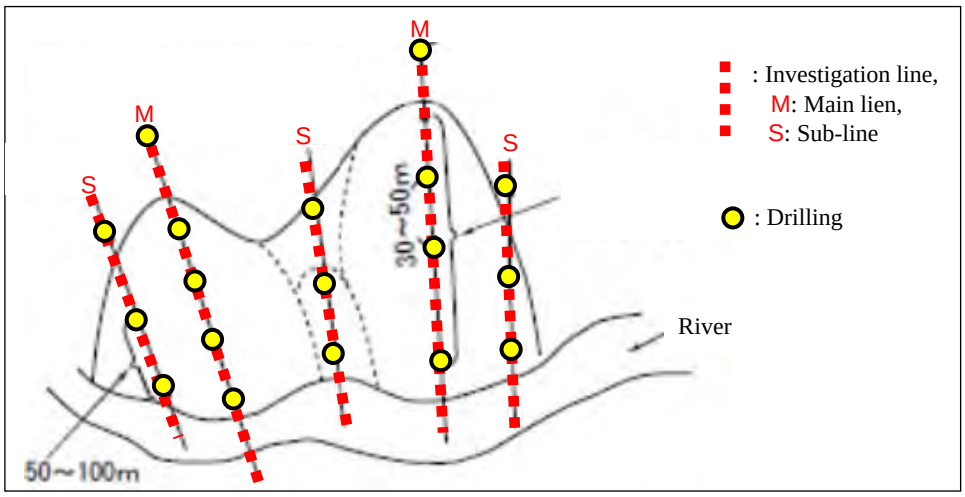



Figure 4 Arrangement of drilling holes

### (2) Processing the investigation data

In the data processing of drilling investigation, observation results necessary for clarifying the geology, soil conditions, sliding surface, are shown in drilling logs. Main items to be described in drilling logs are observation results of geology and soil conditions, records of drilling operation, groundwater level in the hole measured before/ after daily drilling works, and core recovery. For

the rocky sections of drilling cores, weathering condition, angle of cracks, angle of bedding/ schistosity, and density of cracks should be observed and recorded. Core observation should be done by experienced engineers. After arranging core samples in core boxes, core photographs should be taken with standard color chart. An example of format of drilling log is shown in Figure 5.

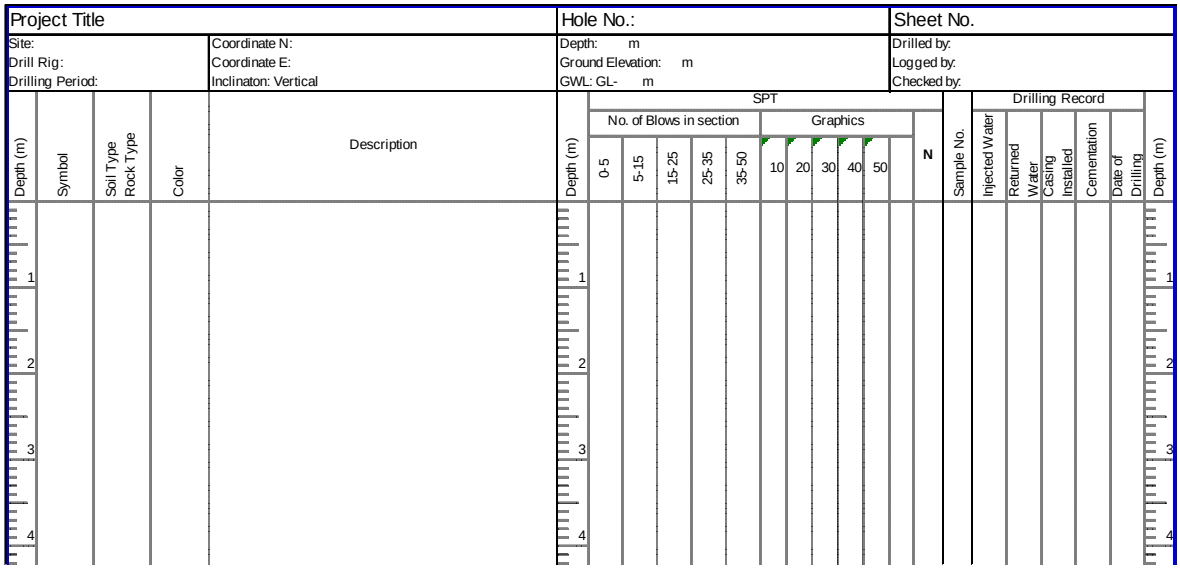



Figure 5 A format of drilling log

### (3) Investigations in drill holes

In the meantime of drilling operation, several tests in the hole are carried out at sections where casing pipes have not been installed. The list of tests is shown in Table 1. The test results are used for quantitative evaluation of properties of the ground for design of countermeasures, seepage analysis, stress/ strain analysis (FEM), etc.

Table 1 List of tests in drill holes

| | | |
|---|---|---|
| In-site test on the bottom of holes | Dynamic test | Standard penetration test, Large-scale penetration test |
| | Static test | Loading test, Vene shear test, Ring shear test |
| In-situ test on the wall of holes | Static test | Lateral loading test, Vane shear test |
| | Sliding surface investigation | Pipe strain meter, Inclinometer, Extensometer, Multi-layer extensometer, Creep well observation |
| Other in-situ tests | | Stress measurement, Electric conductivity measurement |
| Observation of walls of holes | | Borehole camera or video |
| Physical tests | Seismic velocity prospecting | P-wave prospecting, PS prospecting |
| | Electric prospecting | Electric conductivity prospecting, Spontaneous potential prospecting |
| | Radioactivity prospecting | Natural radioactivity prospecting, Density prospecting, neutron prospecting |
| | Others | Hole diameter measurement, Temperature measurement, Hole bending measurement |
| Groundwater measurement | Groundwater level/ pressure measurement | Water level measurement in holes, Pore pressure measurement |
| | In-situ permeability test | Auger method, Tube method, Piezometer method |
| | Pumping test | Single well method, Observation well method |
| | Groundwater test in rocks | Spring water pressure test, Lugeon test |
| | Others | Groundwater prospecting, Water quality test, Flow velocity and direction measurement |

### 4.3.2 Seismic prospecting

Seismic prospecting aims to clarify the distribution of geological layers, through measuring velocity of seismic wave in the layers. For landslide investigation, this prospecting is particularly useful to estimate distribution of geologic layers in large-scale landslide. However, weak layers intercalated in other layers can be detected by seismic prospecting, since the condition of the prospecting is that geologic layers are getting harder toward deeper depth.

There are following three groups of methods of seismic prospecting.

- Reflection method
- Refraction method
- Microtremor method

It is known that the following relation between seismic velocity and geology.

i) In general, geology with high velocity has high compression strength, and this tendency is prominent among same type of rocks.

ii) Weathered rocks show low velocity and intense weathering causes lower velocity.

iii) Intensely fracturing causes lower velocity.

iv) Lower consolidation causes lower velocity.

### 4.3.3 Natural radioactivity prospecting

Radioactive element such as uranium and elements of tritium series are contained in rocks in ground, and inert gases such as radon and thoron is created in the process of decay constant of the radioactive elements. The inert gases, which are also radioactive elements, are being dissipated to the ground, passing through faults and fracture zones. The areas where those dissipated gases are detected much, can be considered possible areas of faults or fracture zones.

### 4.3.4 Electric prospecting

Electric prospecting method are basically divided into two groups. One is electric conductivity method, which measures change of electric characteristic of the ground by means of generating artificial electric current. The other is spontaneous potential method, which measures naturally generated electric potential in the ground.

Although the electric conductivity method is used for landslide investigation in general, the measured electric characteristics are variable even in same layer, depending on water content. It is consequently difficult to judge the conditions of the layers only by the result of the prospecting, and thereby, it is necessary to evaluate the condition, together with other investigation results such as the result of drilling investigation.

## 4.4 Sliding surface investigation

Sliding surface investigation is carried out for identifying the surface through comprehensive checking of the results of drilling and measurement with pipe strain gauge, hole inclinometer, hole extensometer, multi-layer displacement meter, creep well, etc.

### 4.4.1 Identification in drilling investigation

**(1) Identification during drilling**

In the area of active landslide, the depth of sliding surface is detected with the situation that drilling hole is bending during drilling, friction is occurs at the same depth during insert and taking put of drilling core tube, and crescent-shape of core sample is taken.

**(2) Identification by drilling core observation**

Sliding surface is identified, based on observation of drilling core samples. The items to be observed are color, shape and interval of cracks, weathering, clayey fillers, etc. It is common that intense fracturing occurs at and around sliding surface. It is necessary to pay attention to such particular conditions as slickenside, striation, and inclusion of wooden pieces.

Figure 5 is an illustrated section, showing characteristics of soil. Sliding surface has become clayey, low permeable, and darkened, while moving mass consists of high permeable brownish materials. It is noted that above-mentioned characteristics are general one and variable in the location (whether it is in the upper portion or foot portion).

| Ground surface | Cracks | Groundwater level | Velocity of movement | Mode of movement | Color | Permeability | Alteration |
|---|---|---|---|---|---|---|---|
| Moving mass | Dense | | High | Rigid | Brownish | High | Oxidized |
| Sliding surface | Dense | | Moderate | Fluidic | Dark | Low | Reduced |
| Basement | Sparse | | No | Stable | Original | Non to low | Un-altered |

Figure 6 Characteristics of materials in landslide

Points to be checked for the identification of sliding surface by means of core sample observation are as follows.

1) Existence of weak clayey layer
2) The lower margin of debris deposits
3) The upper margin of weathered rocks or bedrock
4) Boundary of different type of rocks
5) Weak intercalation or fracture zone in rocks
6) Disturbance of sedimentary textures in sedimentary rocks
7) Relation between scale and form of landslide

### 4.4.2 Identification with sliding surface detecting pipe

The depth of sliding surface can be identified with the following way (see Figure 6).

- Just after a drilling hole is completed, a short pipe is installed into a drilling hole. After

some duration, the pipe is pulling up, and the pipe gets stuck at the depth of sliding surface.

- Furthermore, a short pipe installed into the hole and put down, and then, the pipe gets stuck at the depth of sliding surface.

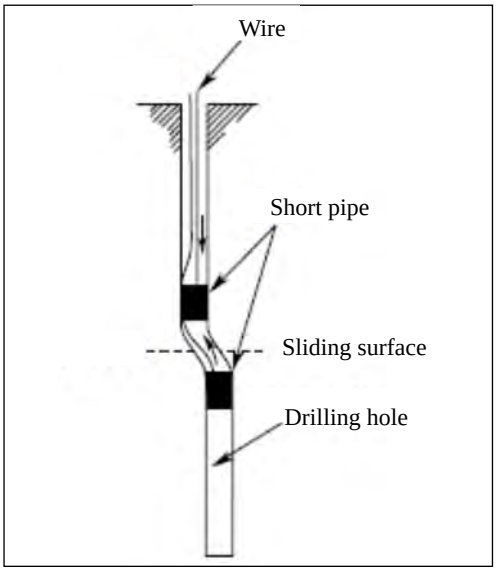



Figure 7 Identification of sliding surface with short pipes

### 4.4.3 Identification with pipe strain meter

With pipe strain meter, the deformation of the entire length of drilling hole can be detected, although the period of use of the strain meter is about 1 to 2 years. The pipe strain meter consists of 1-m PVC (Polyvinyl chloride) pipes with one or two set of two strain gauges put on opposite side of each 1-m pipe. A strain gauge is put on a PVC pipe at the side of direction of sliding, and another gauge put on the opposite side of the PVC pipe as shown in Figure 8. In case that the direction of sliding is not known, 4 gauges are put on a PVC pipe with intersection angle of 90 degrees.

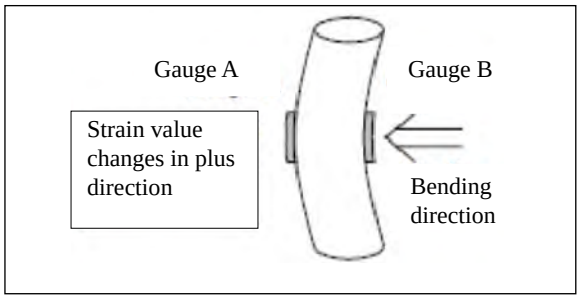



Figure 8 Closed view of strain meter

After installation of a strain meter into drilling hole, the space between the wall of drilling hole and the strain meter should be filled with sand or cement milk. Measurement is generally done once a week and the interval of the measurement can be adjusted to be shorter and longer, depending on the degree of movement.

After the installation of a strain meter, it takes time to fit the strain meter to the ground. In general, the measuring records are used for analysis after one week or more from the date of the installation. The records are processed and the result is shown on a graph of accumulated strain as

shown in Figure 9. Criteria for identification of sliding surface are shown in Table 4. In case that the result shows rather big value of strain without accumulation of strain, it is not judged to be sliding surface. On the other hand, the result of small strain value with accumulation of strain is judged to be possible sliding surface, requiring further continuation of the monitoring.

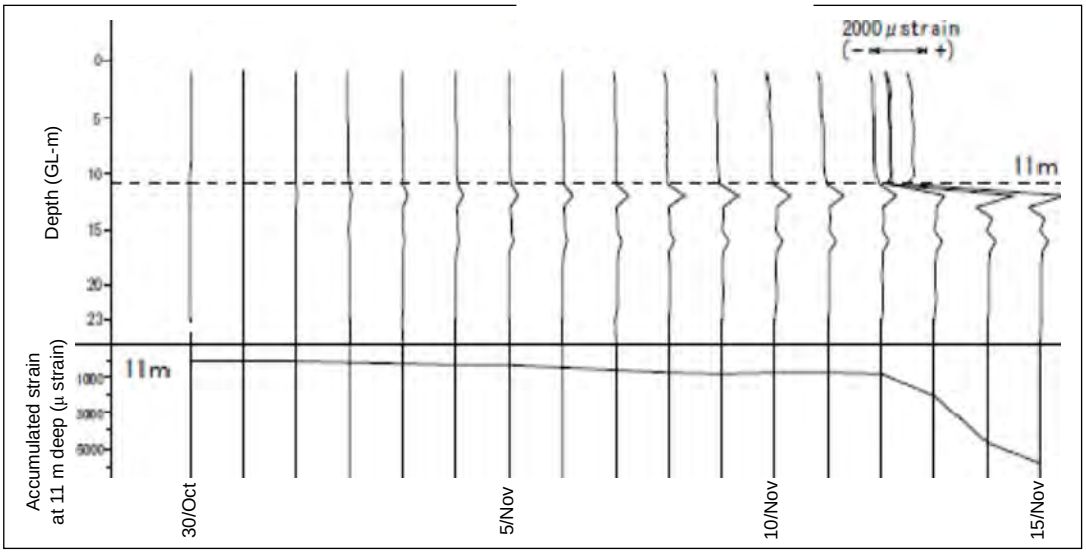



Figure 9 A graph of accumulated strain

Table 4 Criteria for identification of sliding surface by pipe strain measurement

| Accumulated strain (μ strain /month) | Degree of accumulation | Possibility of existence of sliding surface in geomorphologic and geological viewpoints | Judgment | Possible mode of sliding |
|---|---|---|---|---|
| 5,000 or more | Distinct | Exist | Sure | Active |
| 1,000 - 5,000 | Rather distinct | Exist | Almost sure | Slow or creep |
| 100 – 1,000 | Indistinct | Exist | Possible | Require further monitoring |
| 1,000 or more | No | No | No | Low possibility |

### 4.4.4 Identification by hole inclinometer

For measurement with a hole inclinometer, guide pipes with four lines of grooves are installed into a drill hole, and the hole inclinometer is put in the guide pipes and moved downward and upward for measurement of inclination of the guide pipes as shown in Figure 10. Although measurement is become impossible when bending of the pipes increase, it is possible to measure the bending of the pipes continuously in a hole. Figure 11 shows an example of graph of accumulated inclination.

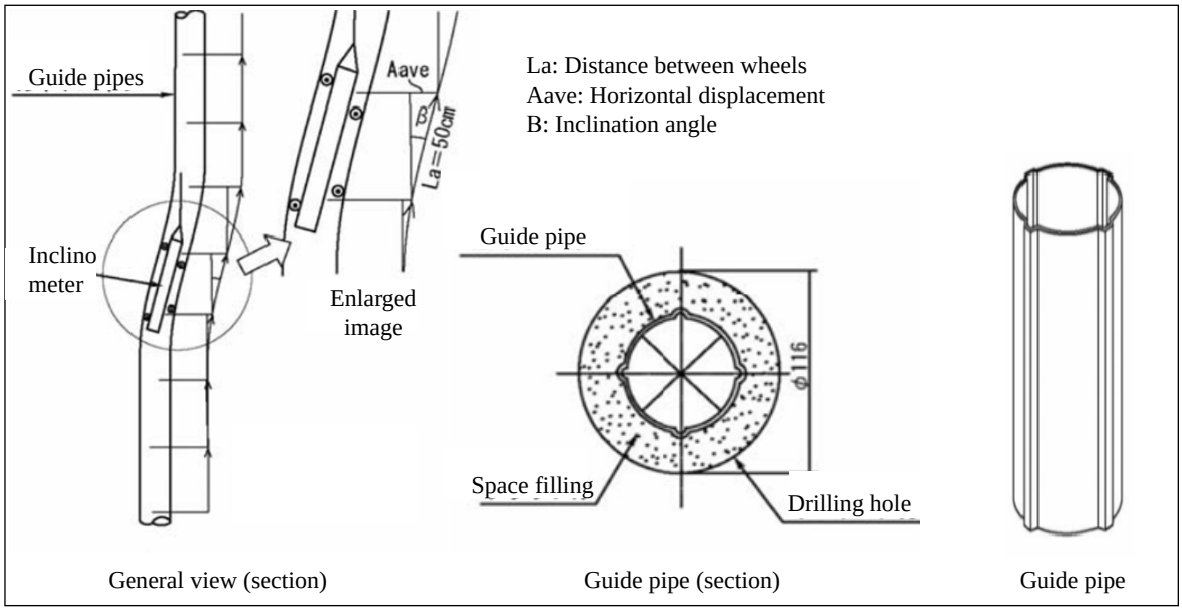



Figure 10 Inclinometer details

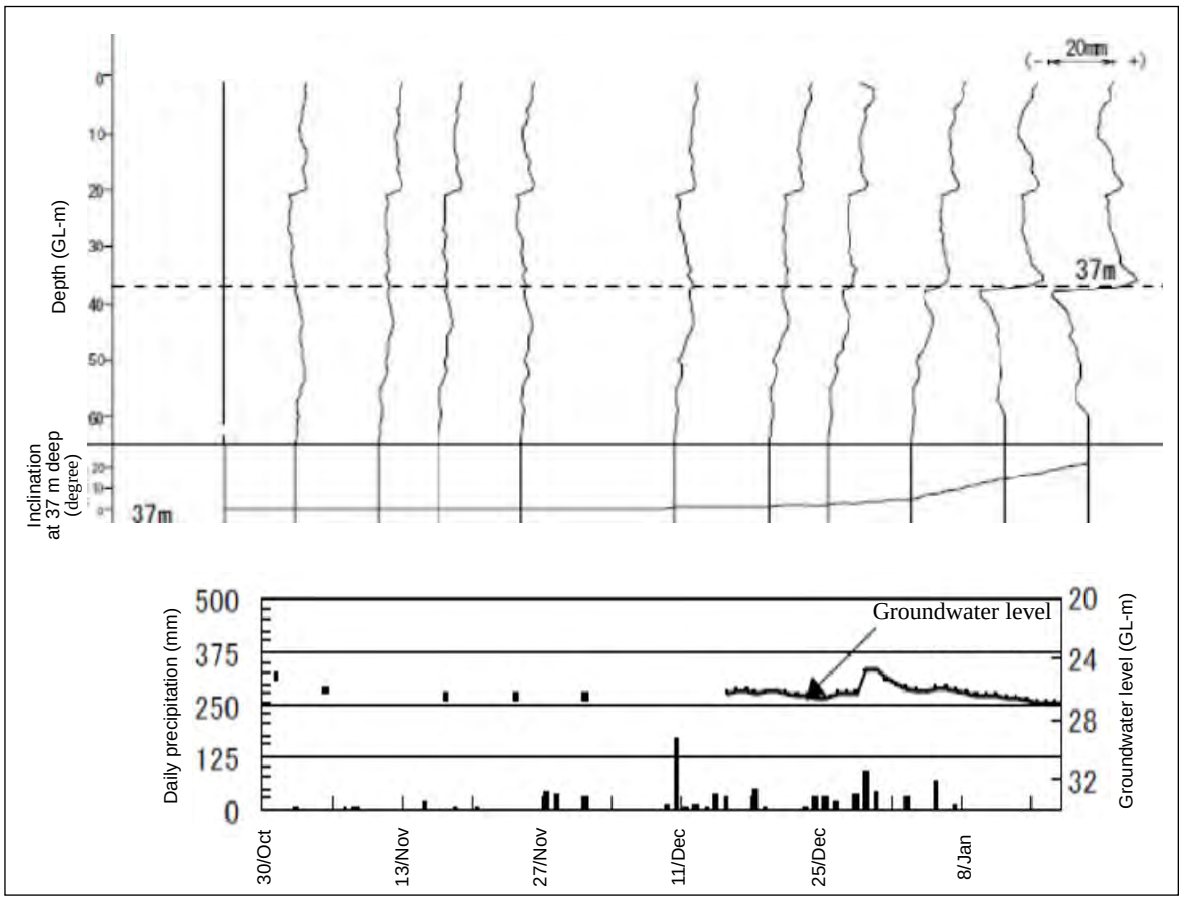



Figure 11 A graph of accumulated inclination

On the graph, the result is shown with the value of integral from the bottom of the hole. The identification of sliding surface is done, together with other measurement results. The sensor of the inclinometer may be affected with temperature in terms of accuracy, it is necessary that measurement should start after keeping the sensor in the hole for certain time until the temperature

of the sensor being the same as the temperature inside the hole.

### 4.4.5 Identification with hole extensometer

Hole extensometers measure the displacement of ground, setting wire at the upper portion and the power portion of sliding surface. In general, the wire is fixed at the bottom of a hole and connected with sensor on the ground as shown in Figure 12. A hole extensometer installed at around head of a landslide may detect compressive movement, due to subsiding of the ground.

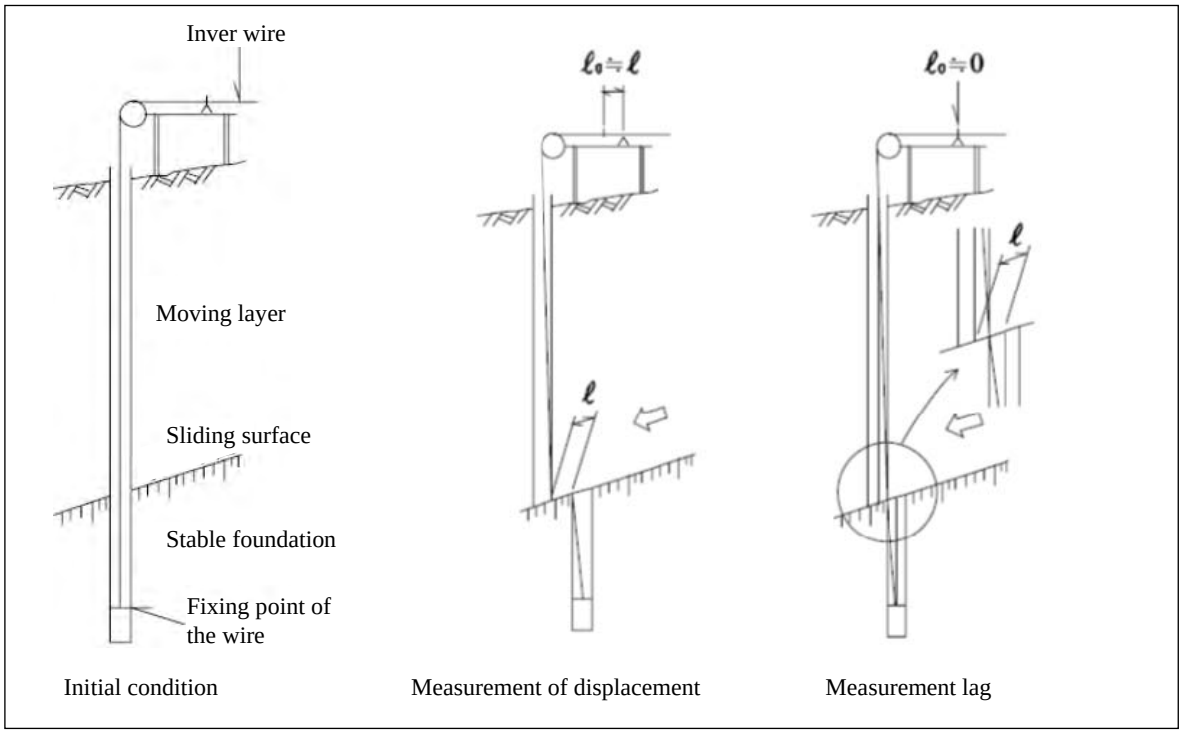



Figure 12 General features of hole extensometer

### 4.4.6 Identification of multi-layer extensometer

Multi-layer extensometer is applied for the cases that the depth of sliding surface is unsure, existence of several sliding surfaces, etc. Several pieces of wires are installed into a hole and fixed at several depths for the measurement by connecting the wires with a sensor on the ground as shown in Figure 13. The measuring box consists of a pair of pulleys and a scale for each wire, setting on a cradle for measurement of extension of each wire as shown in Figure 14.

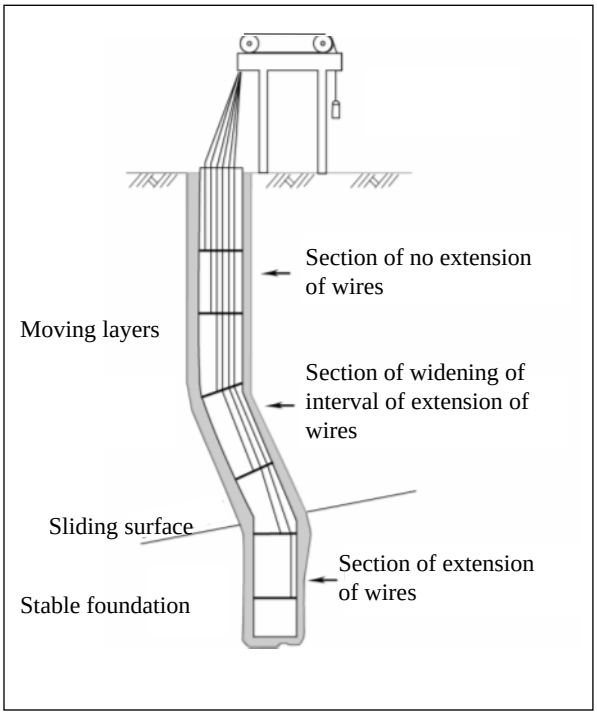



Figure 13 General feature of multi-layer extensometer

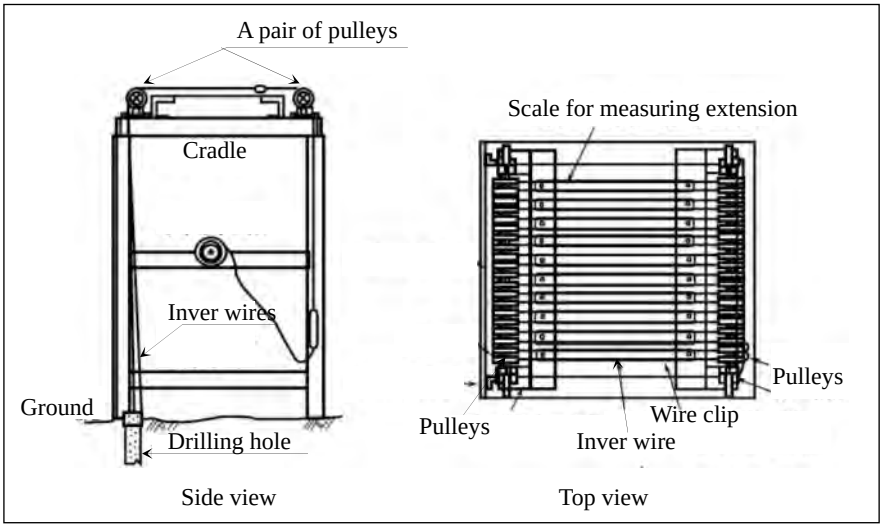



Figure 14 Measuring part of multi-layer extensometer

### 4.4.7 Identification with creep well

A dug well is constructed in landslide with lining of steels plates, up to the depth of stable foundation. After the completion of the well, bolts connecting the lining plates with the upper and lower plates are removed, so that cylindrical-shape lining plates of 10 cm to 50 cm high are isolated each other. The displacement along sliding surface can be detected as a gap between two cylindrical-shape lining plates as shown in Figure 15. Direct observation of sliding surface and sampling of materials of sliding surface are available in the creep well.

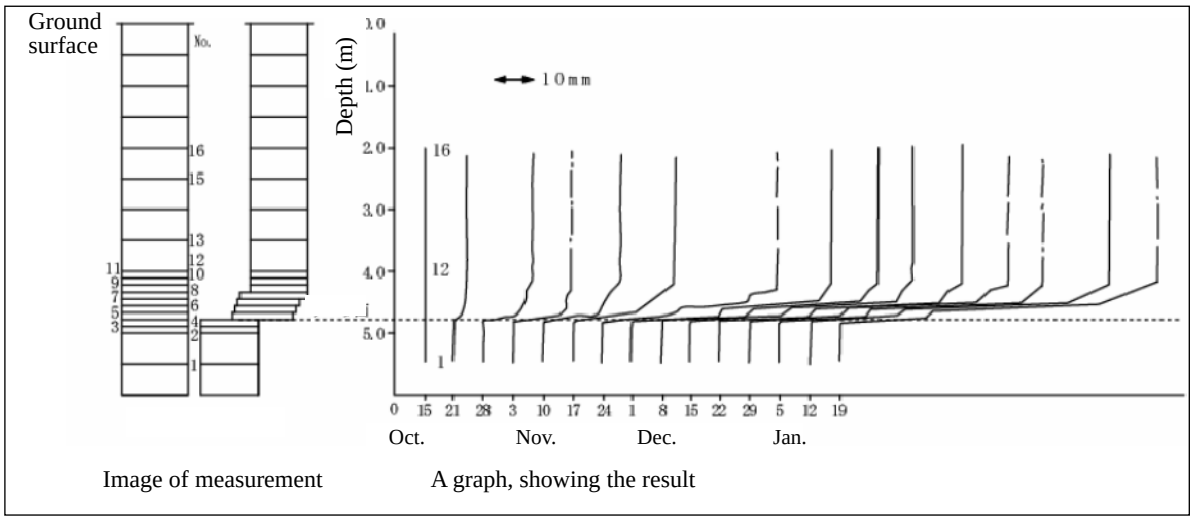



Figure 15 Image of measurement with creep well

### 4.4.8 Characteristics of measuring devices

The characteristics of measuring devices are shown in Table 7, although the values are standard ones and depend on particular products. A device with high precision and wide range may not be the best device, since duration of measurement, easiness of installation, durability, adverse effect of snow and temperature, price, etc. are important factors for adequate selection.

Table 7 Characteristic of measuring devices

| | Item for measurement | | | |
|---|---|---|---|---|
| | Location (depth) of sliding surface | | Displacement at the sliding surface | |
| | Distance among measuring points | Total thickness of layer of measurement | Degree of accuracy | The maximum measurable displacement o |
| Pipe strain meter | 1.0 m | about 50 m | (to be assumed indirectly) | |
| Hole inclinometer | 0.5 m | about 50 m | 1.0 m | about 10 cm |
| Hole extensometer | (Not measurable) | | - | about 200 cm |
| Multi-layer extensometer | 1.0 m | about 30 m | - | about 200 cm |
| Creep well | 0.1 m to 0.5 m | about 20 m | 10.0 mm | about 100 cm |

## 4.5 Ground surface movement survey

Ground surface movement survey aims to clarify the mechanism of occurrence and movement of landslide through measuring cracks, depression, upheaval, etc. on the ground with ground extensometer, ground inclinometer, ground survey, GPS survey, etc.

Objectives and method of the survey are as shown in Table 8.

Table 8 Objectives and method of ground surface survey

| | Survey | Ground inclinometer | Ground extensometer |
|---|---|---|---|
| Basic investigation and detailed investigation stages | - Clarification of area, direction, and distance of movement | - Clarification of area of movement | - Clarification of area of movement<br>- Clarification of situation of movement (relation with climate condition) |
| Implementation stage of countermeasure works | - Safety management<br>- Construction management<br>- Clarification of situation of movement | | |
| After implementation of countermeasure works | - Monitoring for maintenance | | |

### 4.5.1 Investigation with ground extensometer

Ground extensometer measures distance between two points on both side of a crack or step-like depression, developed by landslide movement. It is preferable to set up the two points on investigation line, parallel to the direction of movement. The ground extensometer automatically records the distance continuously. It is recommendable to measure for more than one year, in order to clarify relation between precipitation and landslide movement.

Figure 16 shows general feature of a ground extensometer. A stake for fixing the lower end of inver wire should have enough strength and it should be penetrated up to firm ground. The length of the inver wire is generally 15 m to 20 m. For the protection of the inver wire against wood branches, glasses, or other mattes, it is necessary to cover the wire with PVC pipes. If a scarp on the top of landslide is not clear, two or more sets of extensometers are installed along the main investigation line.

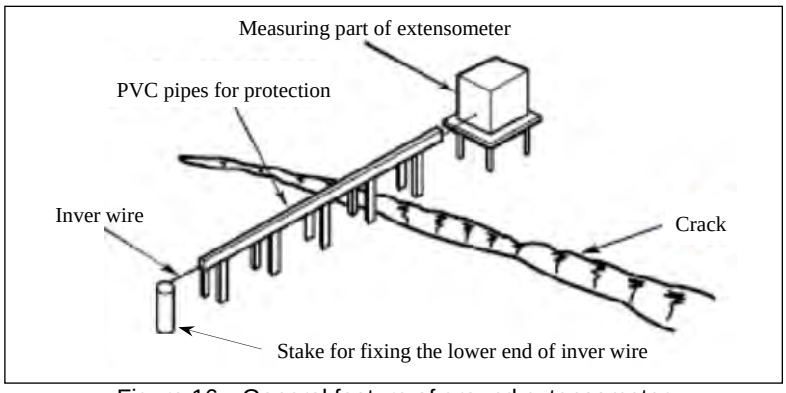



Figure 16 General feature of ground extensometer

The measuring records are processed and shown on a graph as shown in Figure 17.

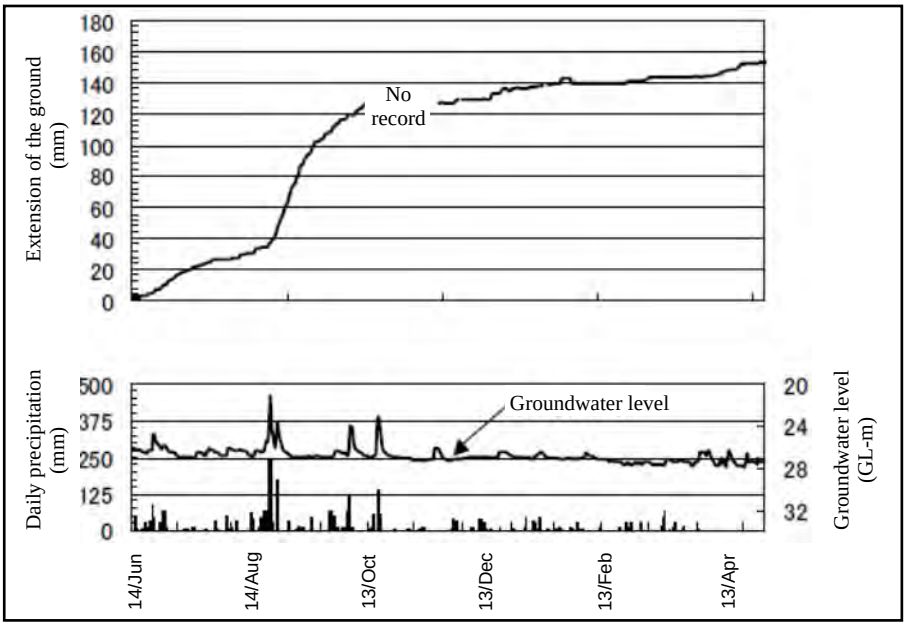



Figure 17 A graph of measuring result of ground extensometer with rain fall data

Criteria for identification of landslide are shown in Table 9.

Table 9　Criteria for identification of landslide

| Daily displacement (mm) | Accumulated displacement (mm) | Accumulation to one direction | Judgment | Possible mode of sliding |
|---|---|---|---|---|
| 1 or more | 10 or more | Distinct | Sure | Active (Surface or deep sliding) |
| 0.1 to 1 | 2 to 10 | Rather distinct | Almost sure | Slow (Earth or debris sliding) |
| 0.02 to 0.1 | 0.5 to 2 | Slight | Possible | Require further monitoring |
| 0.1 or more | None | None | No (Abnormal) | Partial movement, or others |

### 4.5.2　Investigation with ground inclinometer

Ground inclinometers are installed for measuring change of inclination of the ground due to landslide activity.　The inclinometers are usually set up at several points in landslide area and outside the area such as the upper slope on main investigation line, or both side of the landslide area, in order to detect expansion of the movement area.　The base of the inclinometer consists of concrete with piles, and a glass plate is set on the surface of base concrete as shown in Figure 18.

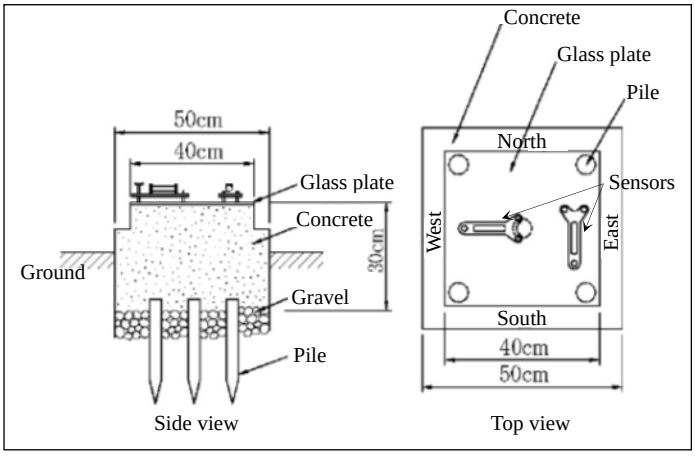



Figure 18　Feature of inclinometer

The measured records are processed and shown on a graph of accumulated inclination with daily precipitation as shown in Figure 19.　The accumulated inclination indicates landslide activity, and the activeness is evaluated in the criteria shown in Table 10.

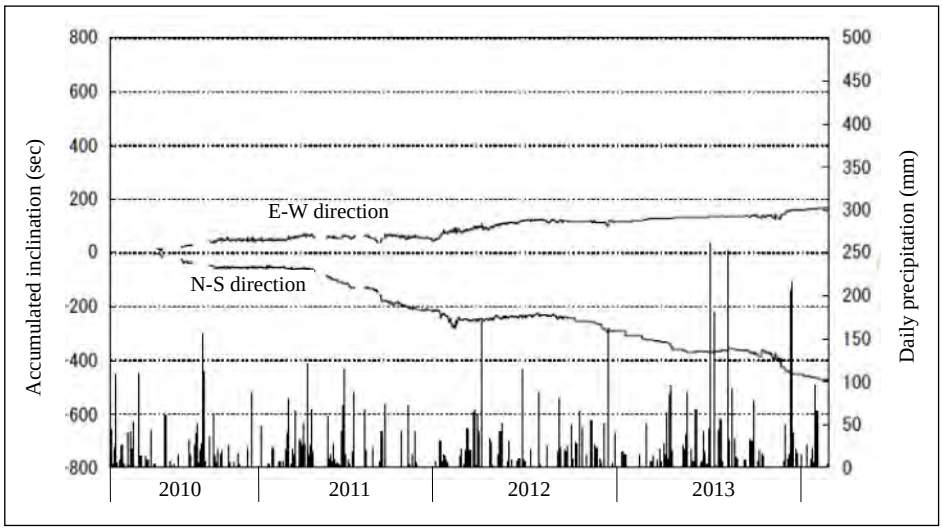



Figure 19　Result of measurement with ground inclinometer

Table 10　Criteria for identification of landslide

| Daily average inclination (sec) | Accumulated inclination (sec/month) | Tendency of accumulation | Relation between direction of inclination and geomorphology | Judgment | Possible mode of sliding |
|---|---|---|---|---|---|
| 5 or more | 100 or more | Distinct | Yes | Sure | Active |
| 1 to 5 | 20 to 100 | Rather distinct | Yes | Almost sure | Slow |
| 1 or less | 20 or less | Slight | Yes | Possible | Require further monitoring |
| 3 or more | None (Intermittent) | None | No | Abnormal | Partial movement, or others |

### 4.5.3　Investigation by ground survey

Ground survey is mainly carried out, in case that the direction of landslide is unsure or movement is intense.　Ground survey includes traverse survey with setting base points on stable ground, movement stake survey, triangular survey, and survey with air-photos.　Figure 20 shows the result of movement stake survey, which the direction and distance of movement can be clarified.

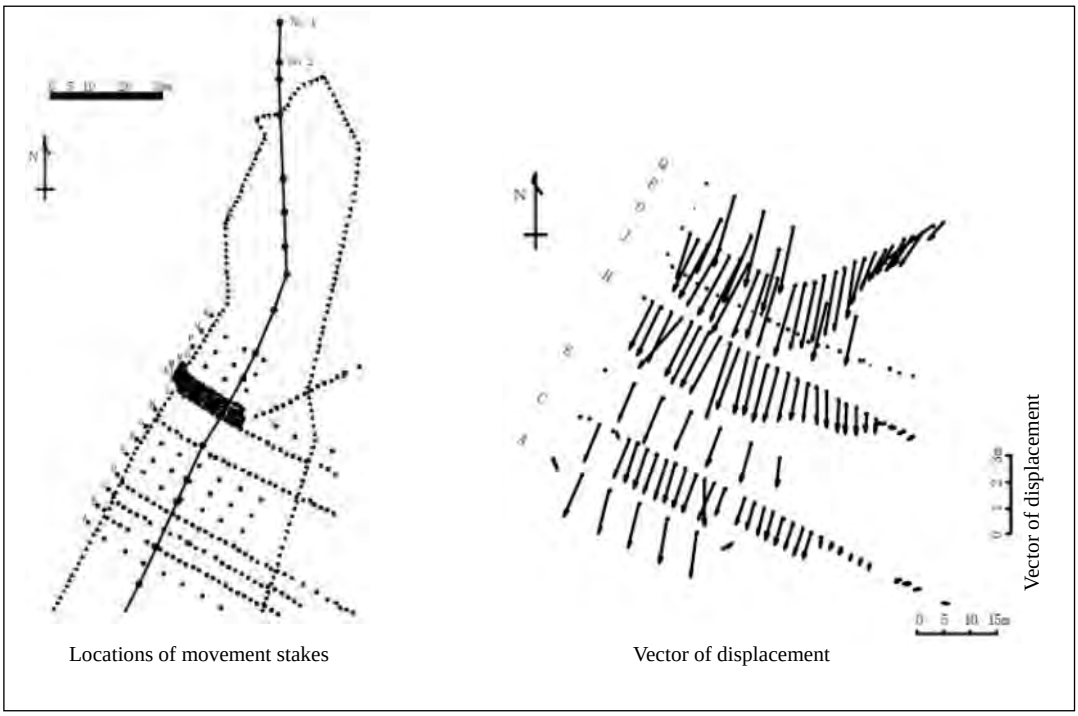



Figure 20　Result of movement stake survey

### 4.5.4　Investigation by GPS survey

GPS survey is mainly carried out, in case that the direction of landslide is unsure or landslide area is very wide.　The survey measures three-dimensional coordinates, using several satellite signals.　The survey system consists of space part, survey part, and control part as shown in Figure 21.　The benefit of the GPS survey is less influence of weather, night observation, long-time continuous observation, etc., although the accuracy is about 5 mm to 10 mm.　The accuracy is lowered, in case of less number of available satellites or limited/poor visibility of the space.　Although accuracy of the measurement at one time is low, it is possible to have general

trend of movement through continuous measurement.

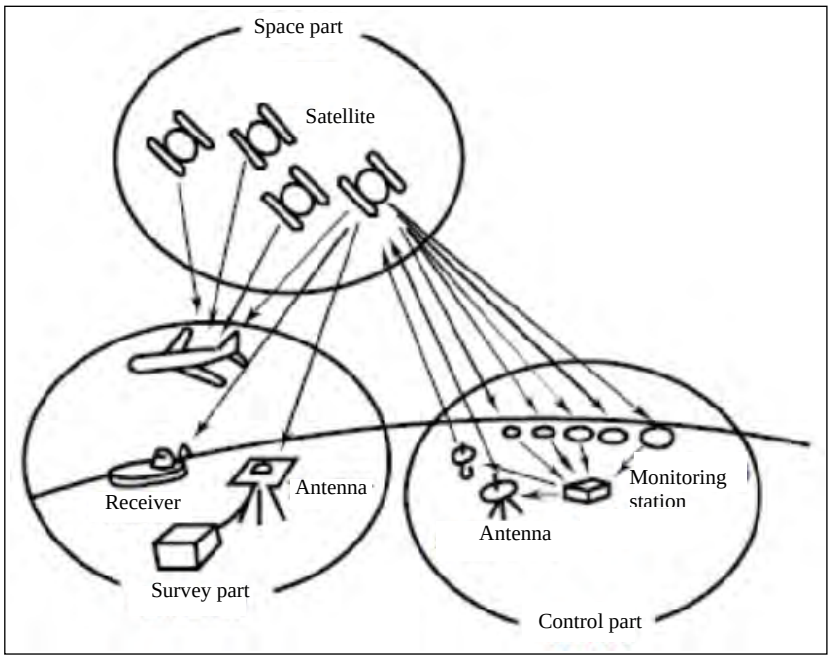



Figure 21 General feature of GPS survey

### 4.5.5 Investigation with other devices

#### (1) Investigation with optical fiber sensors

Since characteristics of optical beam, such as light intensity, frequency, and wave length, are changed, according to temperature, strain, bending, etc., optical fiber itself can be used as a sensor. Optical fiber sensors do not require power source and the durability of the sensors is high against lighting and electromagnetic wave, and thereby, the sensors are suitable for field measurement. Development of the optical fiber sensors for landslide measurement such as ground extensometers, ground inclinometers, pipe strain gauges, etc. is underway as shown in Figure 22. .

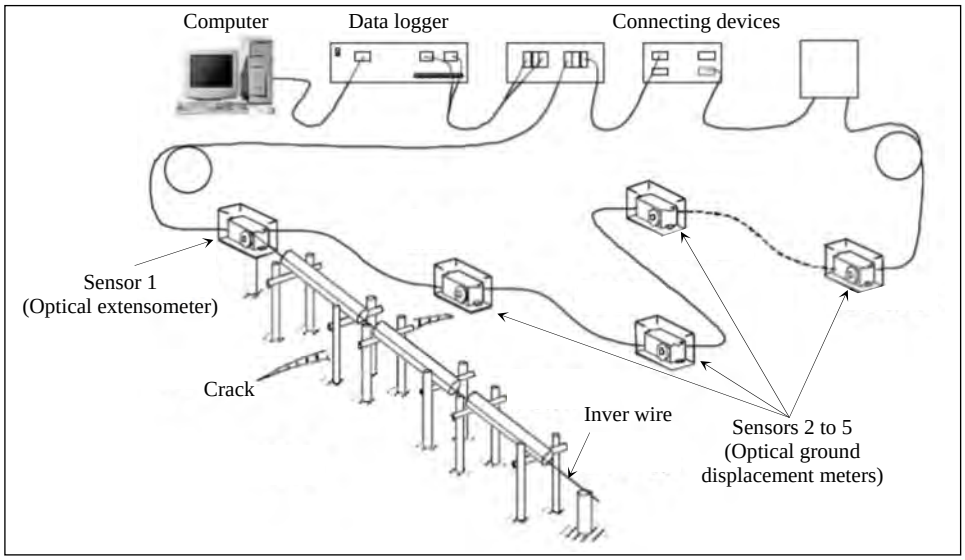



Figure 22 Optical extensometer and ground displacement meters

### (2) Investigation with a laser scanner

Survey with 3-dimentional a laser scanner is being in use for preparation of topographic maps and observation of movement in the areas of limited access.

The principle of the survey is the same as other electro-optical distance measurement such as total station, and the scanners are designed for scanning several thousands of survey points in a second with rotating mirror inside the device. It is possible to prepare topographic maps, based on the survey records. Calculation of displacement is also available, based on the survey records at control point and survey points as shown in Figure 23.

For the monitoring of landslide movement, electro-distance measurement in non-prism mode is also efficient.

It is noted that the surveying error is several mm for the survey distance of 100 m.

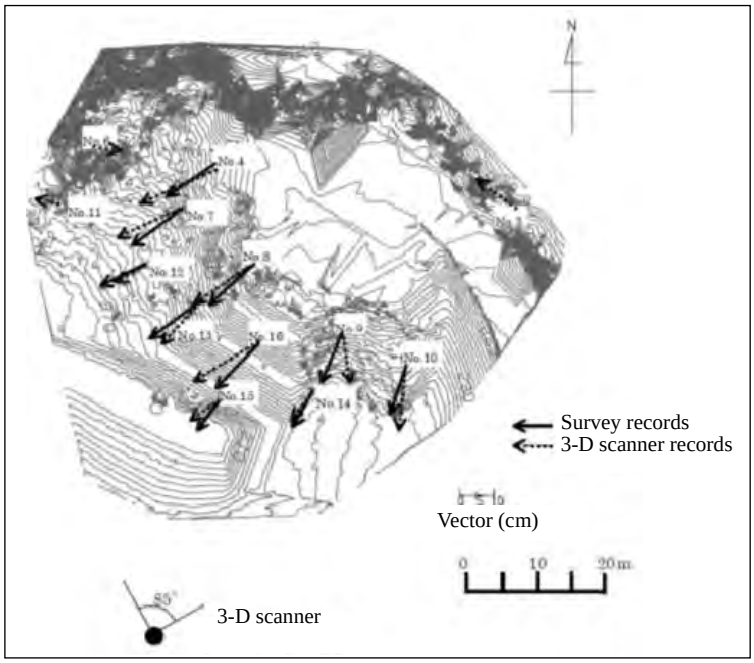



Figure 23 Measurement result of displacement with a laser scanner

## 4.6 Groundwater investigation

Groundwater investigation is carried out for clarifying the groundwater inflow path to landslide area, groundwater level/ flow direction, and pore pressure acting to sliding surface. The results are used for stability analysis as well as study/ design of countermeasure works.

Ground water investigation includes groundwater level measurement, pore pressure measurement, groundwater fluctuation measurement during drilling, groundwater logging, groundwater temperature measurement, flow direction/ velocity measurement in drill holes, groundwater tracing, electric prospecting, ground temperature logging, groundwater quality analysis, simple pumping test, etc. The measurement methods should be determined, based on the purpose of the investigation as shown in Table 10.

Table 10　Purpose and method of groundwater investigation

| Purpose (Issue to be clarify) | Investigation method |
|---|---|
| Pore pressure, acting to sliding surface | Pore pressure measurement, Groundwater level measurement |
| Relation between fluctuation of groundwater level and precipitation | Pore pressure measurement, Groundwater level measurement |
| Aquifer for groundwater flow | Groundwater logging, Simple pumping test |
| Flow path of groundwater | Groundwater tracing, Groundwater quality analysis |
| Groundwater level | Electric prospecting, Ground temperature logging, Groundwater temperature measurement, Groundwater quality analysis |
| Permeability of ground | Permeability test, Simple pumping test |

### 4.6.1　Pore pressure investigation

#### (1)　Groundwater level measurement

Groundwater level measurement is carried out for clarifying relation between precipitation and fluctuation of groundwater level and pore pressure acting to sliding surface, through measuring water level in drill holes.

For continuous measurement, automatic recording water level meter, whether float type or pressure type, is used as shown in Figure 24.

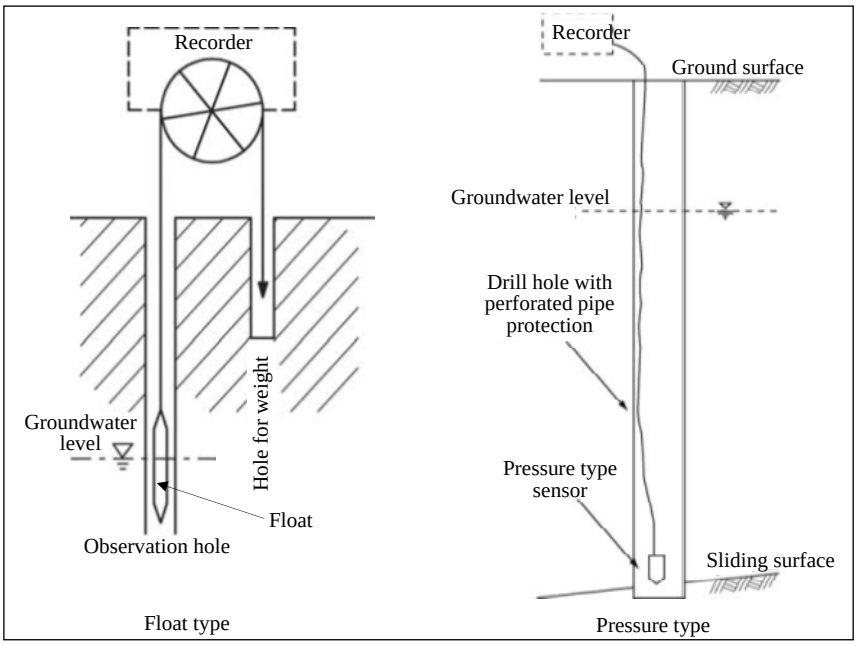



Figure 24　Groundwater level meters

The float type groundwater level meter does not function well, if balance between float and weight is uneven or friction between float and wall of the hole is big.　Since the fluctuation of groundwater level is rather small, it is important to keep the float on the groundwater level for proper measurement.

The pressure type is to measure water level with pressure meter installed near to the bottom of an observation hole.　Measured records are transferred through cable to a recorder on the ground. Periodic check is required to secure the function of the pressure meter, since it is affected with mud deposit on the bottom as well as deterioration of the sensor.

Since there is possibility to encounter several aquifers during drilling, it is necessary to observe and record conditions of groundwater such as spring, water loss, color of returned water, etc.

The result of measurement is processed and arranged, together with daily precipitation records and ground movement records, so that relation between groundwater level and other phenomena can be clarified.

**(2) Pore pressure measurement**

There are two kinds of pore pressure measurement. One is direct measurement by pore pressure meters installed to the depth of target aquifer, sealing the other sections with impermeable materials such as mortar with bentonite. Another is water level measurement in a hole which casing pipes with strainer section at the depth of the target aquifer. For both types of measurement, it is important to clarify sliding surface and aquifers, before the installation of the devices. In case that groundwater condition is complicated or many aquifers are identified, it is required to install a multi-layer type of pore pressure meter as shown in Figure 25. Figure 26 shows a graph of measurement results, together with rainfall data.

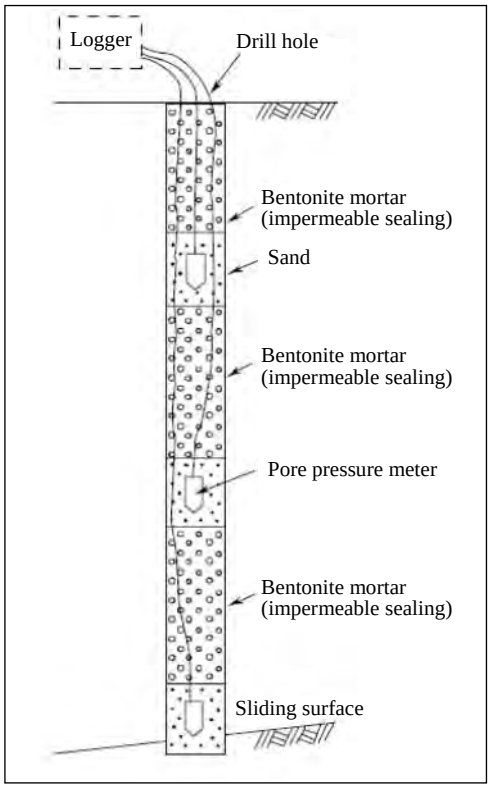



Figure 25 Buried type pore pressure meter (multi-layer type)

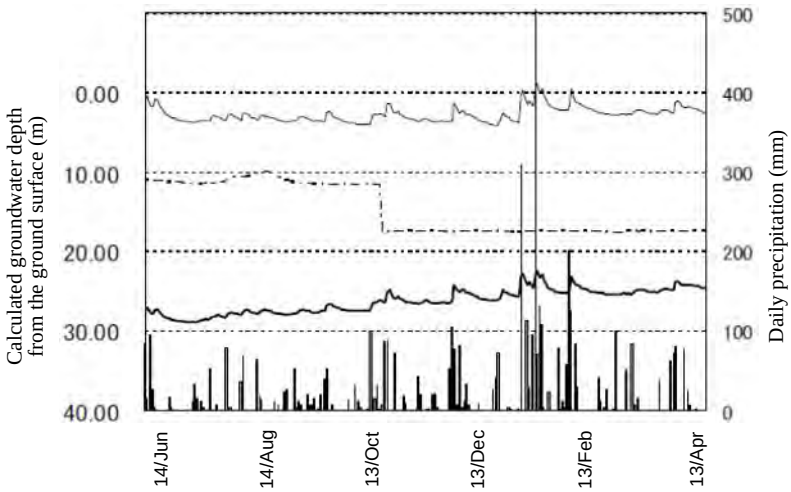


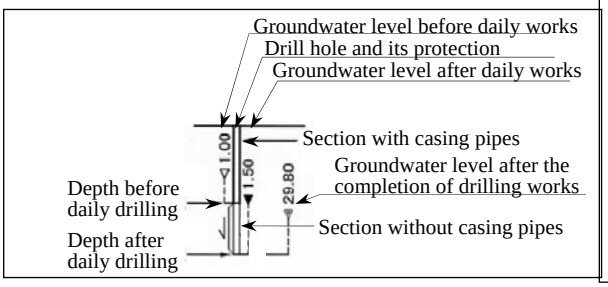

Figure 26 A graph showing results of pore pressure measurement

### 4.6.2 Groundwater distribution investigation

The following sub-clauses (a) to (e) are investigations, using drill holes, and (f) to (i) are special investigations.

**(1) Groundwater level measurement during drilling**

During drilling at landslide areas, casing pipes are installed into the hole in order to prevent collapse of the hole wall. In the hole, most of the sections are covered with casing pipes, except the bottom of the section. Particular condition of groundwater and aquifers (such as confined aquifers, permeable layers, and leakage layers) at the bottom of the hole can be clarified, by measuring and analyzing water level in the hole. The measurement is usually done before and after daily drilling works. Figure 27 shows a graph of groundwater fluctuation, together with drilling progress. This graph shows that groundwater level measured before daily works on 5th October is higher than that after the works, and indicates



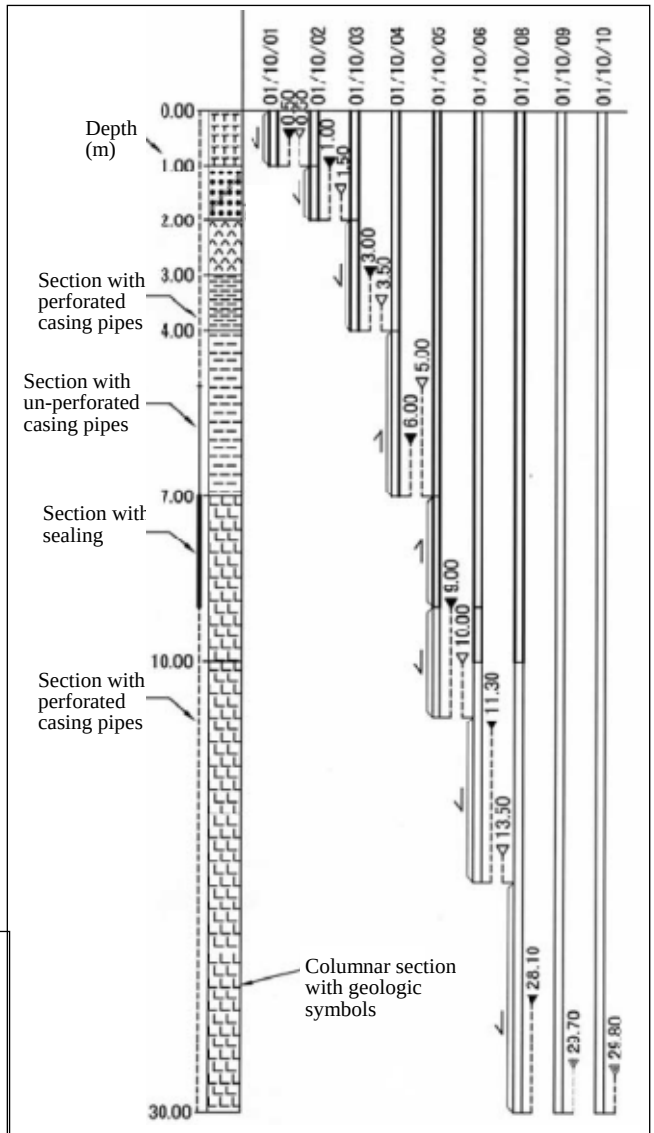




Figure 27 A graph showing groundwater fluctuation during drilling works

distribution of an aquifer at the depth between 4 m and 7 m.

**(2) Groundwater logging**

Groundwater logging is carried out for clarifying the depth of layers of groundwater flow and its flow conditions in drill holes.

The procedure of the logging is as follows.

1) Measuring initial electric conductivity of groundwater in a hole at 25 cm interval
2) Injecting salt water into the hole and mixing the salt water with the groundwater, so that electric conductivity is getting approximately 1/10 of the initial value.
3) Measuring electric conductivity of the mixed groundwater, immediately after the mixing.
4) Measuring electric conductivity of the mixed groundwater, after 10 min., 20 min., 30 min., 60 min., and more if necessary.

There are two types of measuring devices, multi-electrode type and single electrode type.

In case that sliding surface is high permeable, groundwater level draws down when the drill hole penetrates the sliding surface. In such case, groundwater logging is carried out several times during drilling, so that logging can be done before the penetration of sliding surface.

Figure 28 shows the results of the logging. Measured values of electric conductivity are shown as a graph in each time of measurement.

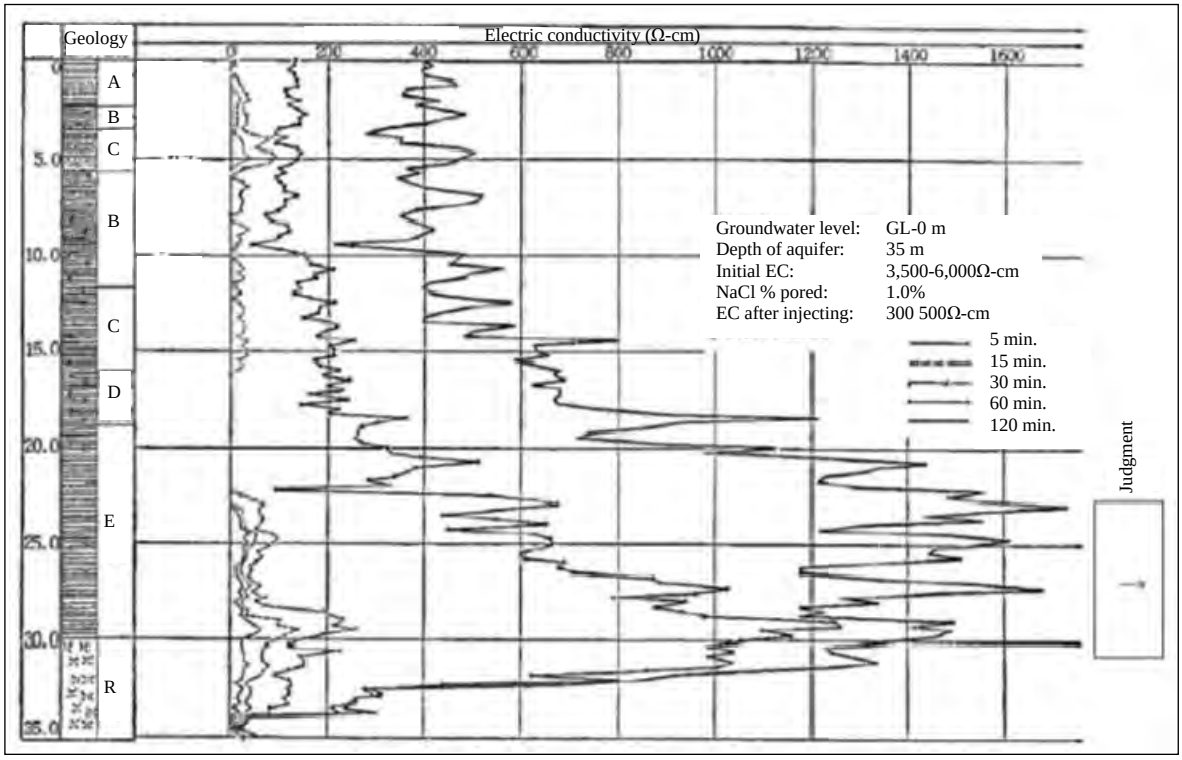



Figure 28 A graph of groundwater logging result

Using the graph of logging result, judgment about groundwater condition is done, referring the criteria shown in Table 11 and typical graphs of each condition shown in Figure 29.

Table 11　Judgment of groundwater condition

| Judgment | Symbol | Remark |
|---|---|---|
| Inflow | → | Graph shows shape (a) in Figure 29 |
| Up-flow | ↑ | Graph shows shape (b) in Figure 29 |
| Down-flow | ↓ | Graph shows shape (c) in Figure 29 |
| None | | No fluctuation in electric conductivity |
| None | | Other shapes of graph than that mentioned above |

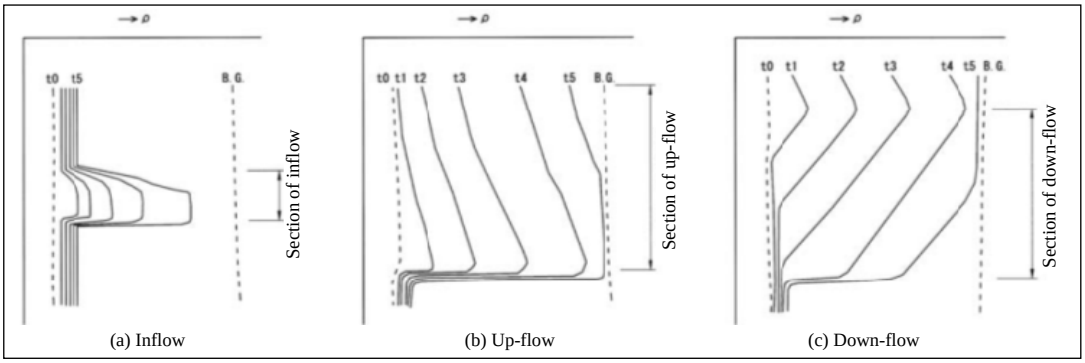



Figure 29　Typical shape of graphs of inflow, up-flow, and down-flow of groundwater

### (3)　Simple pumping test

Simple pumping test is carried out for clarifying aquifers, which groundwater flows, and permeability coefficient of the ground.

Usually, the test is carried out at the section of 3 m to 5 m long where no casing is installed. Groundwater in a hole is pumped up with a pump or bailer (simple water sampler) until the water level is constant.  After the pumping stops, the level of groundwater is measured during its recovering period.  Based on the time and groundwater level during recovering, permeability coefficient is calculated.

Permeability coefficient is an important parameter for groundwater analysis and usable result for analysis can be obtained by simple pumping test, even in the case that no usable result can be obtained by groundwater logging.

### (4)　Groundwater temperature logging

Groundwater temperature logging is carried out for clarifying aquifers, which groundwater flows, and condition of the flow.  For the test, heated water is injected into a drill hole, and the lowering of temperature of groundwater is measured with temperature gauges or multi-layer temperature sensor as shown in Figure 30.

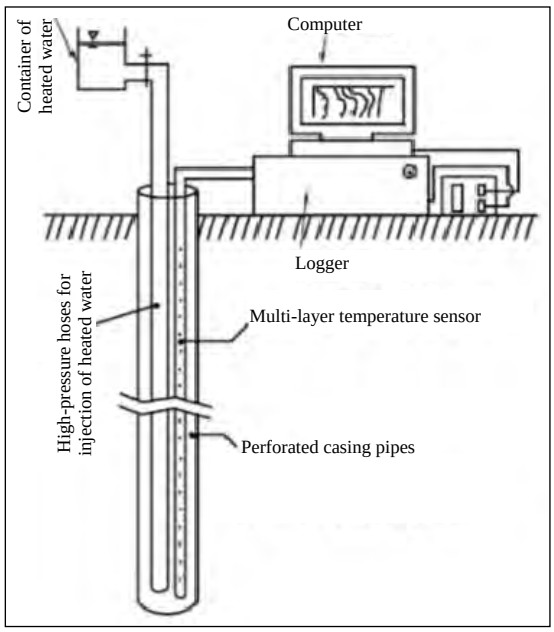



Figure 30　Multi-layer temperature meter

### (5) Flow direction and flow velocity measurement

The investigations for flow direction and flow velocity are as follows.

1) Direct measurement of flow velocity with propeller type of velocity meter
2) Observation of velocity and direction of groundwater mixed with tracer with borehole camera
3) Measurement of tracer materials with mechanical sensors

In case of low velocity of groundwater flow, the above-mentioned 1) and 2) are not applicable, since disturbance of flow cause inability of slow flow.

### (6) Groundwater tracing investigation

For groundwater tracing, tracer such as colored water or salt water (or water solution of other inorganic chemicals) is injected into a drill hole, and the tracer is detected at measuring points such as other drill holes, wells, spring points, or small rivers. For the detection of the tracer, background value of the tracer material at the measuring points should be measured before the injection of the tracer, so that comparison with the measured value is available after the injection.

The injecting point of tracer should be located at higher elevation. After the injection, much water is injected, so that filtration can be accelerated due to the water head.

It is recommendable to set up measuring points as much as possible around the injecting points. In case that aquifers in drill holes are distributed under the groundwater level, the tracer may not be detected, because the tracer spreads slowly and it is diluted. In such case, it is necessary to measure for detecting tracer at the depth of aquifers, referring to the result of groundwater logging. Sampling of groundwater at the depth of aquifers is recommendable. The sampling is done 0.5 hour, 1 hour, 2 hours, and 8 hours after the injection of tracer in the first day, and once a day in the second day for 20 days at least. The background data should be taken once a day for one week or more, before the injection of the tracer. If a measured value exceeds the maximum value of the background values after the injection, it can be judged that the tracer has reached the measuring point as shown in Figure 31.

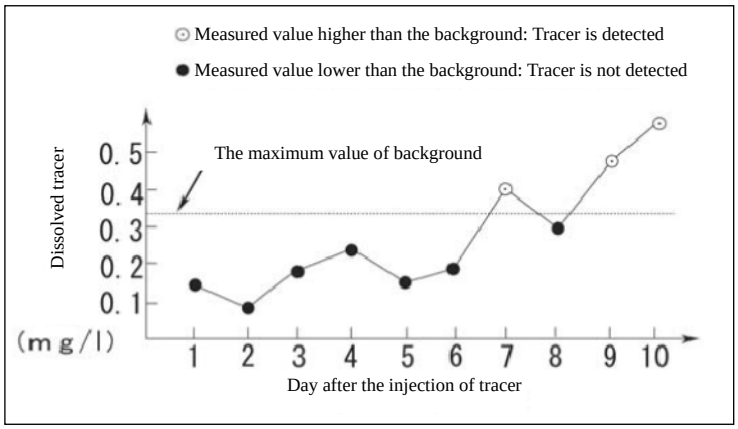



Figure 31 A graph for detection of tracer

Permeability coefficient can be roughly estimated, based on the distance from the injection hole to measuring point and arrival time, and the estimated permeability coefficient can be used for

design of countermeasure works such as groundwater dewatering works.

**(7) Electric prospecting**

Electric prospecting is carried out for clarifying regional groundwater distribution by electric conductivity method for the most cases.

Electric conductivity is controlled by composition of soil or rock, pore water associated with fracture zones and cracks, degree of saturation, conductivity of groundwater, clay minerals due to weathering and alteration, etc. Thereby, the characteristics of soil in landslide can be clarified by electric prospecting.

**(8) Ground temperature prospecting**

The result of long-term measurement of ground temperature shows that annual temperature of groundwater is stable and the annual fluctuation is about 2 degree, while ground temperature is fluctuated for 10 degree or more at the depth of 1 m. There is difference in temperature between ground surface and flowing ground water. It is consequently possible to estimate layers of groundwater flow, by means of measuring temperature in drill hole.

The measuring is carried out with thermistor type temperature sensors. The sensor is penetrated in ground at the bottom of a drill hole, and measurement is done after leaving the penetrated sensor for 5 min. to 10 min.

**(9) Water quality investigation**

Water quality investigation aims to estimate the flow route of groundwater and relation between groundwater and surface water by means of comparison of the characteristics. Groundwater is roughly divided into shallow groundwater and deep groundwater. Shallow groundwater springs up in short time after infiltration of rain water to the ground, while deep groundwater is retained in the ground for long time.

The content of shallow groundwater are similar to that of rain water, since retention period in the ground is short. The shallow groundwater is seen at thin landslide areas and the toe portions of large landslides. Deep groundwater contains several minerals due to dissolution of minerals during travelling in the ground, and which characteristics are seen spring water from joints, faults, and fracture zones in bedrock. Groundwater passed through the boundary zone between bedrock and soil cover, may show intermediate characteristics.

For water quality test, water samples of about one lit. is taken from springs, wells, drill holes, ponds, water courses, etc. The test items include temperature measured at site, pH, EC, Cl, $SO_4$, $SiO_2$, Ca, Mg, Na, and K.

## 4.7 Soil tests

Soil tests are carried out for clarifying the strength of sliding surface and physic-mechanical properties of the ground, necessary for stability analysis and design of countermeasure works. For the strength of sliding surface, single-plane shear test (box shear test), triaxial compression test,

ring shear test, etc. are carried out. For the strength of the ground, horizontal loading test in a drill hole and standard penetration test are carried out.

Shear strength includes peak shear strength, remolded shear strength, and residual shear strength. Although many studies have been done, there is no definite conclusion what kind of shear strength to be used for stability analysis. In addition, the actual shear strength is not the same in each part of one sliding surface, and thereby, the shear strength is obtained by inverse calculation for the most of cases. The result of soil tests is used as a referential value.

### 4.7.1 Physical tests

In landslide investigation, moisture content test, grain size analysis, Atterberg limits test (plastic and liquid limits test), wet density test, etc are carried out, mainly for materials taken from sliding surface.

Since physical tests can be carried out in shorter time, comparing with mechanical tests, the results can be used for the assumption of the depth of sliding surface.

### 4.7.2 Single-plane shear test

Single-plane shear test is one of direct shear tests, putting the test sample in a box, which is separated into the upper half part and the lower half part. After putting normal load, shear load is put a side of the upper box, so that the upper box is moved in horizontally. The test is carried put several times at different normal loads in order to obtain shear strength (cohesion; C and internal friction angle; φ).

### 4.7.3 Triaxial compression test

Triaxial compression test is carried out, compressing cylindrical-shape sample (3.5 cm to 5.0 cm in diameter and 8.0 cm to 12 cm in height) with confined pressure. Shear strength of the sample material is obtained as the results of several times of tests with different confined pressures.

### 4.7.4 Ring shear test

The apparatus of ring shear test is ring shape with the inner diameter of 6.0 cm to 10.0 cm, outer diameter of 10.0 cm to 12.0 cm, and height of 1.0 cm to 2.0 cm, and the test sample is put inside the ring as shown in Figure 32. Because the direction of shearing is in a circle, the test can be done with unlimited displacement in shear direction. It is useful to obtain residual shear strength by this test, and the shear strength of clayey material at a sliding surface of landslide with big movement, can be assumed with this result.

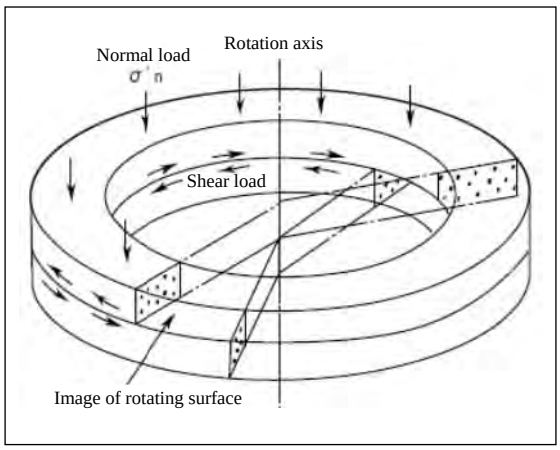


Figure 32 Apparatus of ring shear test

### 4.7.5 Samples and test methods

Table 12 shows forms of samples and test methods for shear strength to be obtains.

Peak strength is usually obtained by triaxial compression test with undisturbed samples. Repeated single-plane shear test and ring shear test are also available for peak strength.

Remolded strength is usually obtained by triaxial test with slurry samples. Repeated single-plane shear test and ring shear test with slurry or undisturbed samples are also available for remolded strength.

Residual strength is obtained by repeated single-plane shear test or ring shear test, but not triaxial compression test.

Although much realistic result can be obtained from samples taken from sliding surface, setting of the samples to apparatus is difficult.

Table 12 Form of samples and method of tests

| Strength / Sample | Peak strength | Remolded strength | Residual strength | Test method |
|---|---|---|---|---|
| Undisturbed | O, [CU] | ― | ― | Triaxial compression test |
| | Δ, CD, III | Δ, CD, II | Δ, CD, I | Repeated single-plane shear test |
| | Δ, CD, III | Δ, CD, II | Δ, CD, I | Ring shear test |
| Slurry | ― | O, [CU] | ― | Triaxial compression test |
| | ― | Δ, CD, III | Δ, CD, I | Repeated single-plane shear test |
| | ― | Δ, CD, III | Δ, CD, I | Ring shear test |
| Precut | ― | ― | ― | Triaxial compression test |
| | ― | ― | O, CD, II | Repeated single-plane shear test |
| | ― | ― | O, CD, II | Ring shear test |
| Samples taken from sliding surface | Δ, CD or [CU] | | | Triaxial compression test |
| | O, CD, II | | | Repeated single-plane shear test |
| | O, CD, II | | | Ring shear test |

Strength to be obtained
O: Obtainable
Δ: Obtainable in some cases
―: Not obtainable

Condition of test
[CU]: Compacted and un-drained (pore pressure measurement)
CD: Compacted and drained

Displacement of shear
I: Big
II: Rather big
III: Small

## 5. Analysis

Based on the results of preliminary, basic, and detailed investigations, analysis on the mechanism of occurrence and movement of landslide is carried out, and as the result, the block map and sections of the landslide are prepared.

Items to be analyzed and prepared are shown in Table 13.

Table 13 Items to be analyzed and prepared

| Items to be analyzed \ Investigation and tests for the analysis | | Preliminary investigation | Site reconnaissance | Topographic mapping | Geological investigation | Sliding surface investigation | Surface displacement investigation | Groundwater investigation | Soil tests |
|---|---|---|---|---|---|---|---|---|---|
| Landslide block map | Landslide block map | O | O | O | | | O | | |
| | Land use, facilities, etc. | O | O | | | | | | |
| | Characteristics of landslide features | | O | O | | | | | |
| | Locations of investigations and the results | | | | O | O | O | O | |
| | Contour map of sliding surface | | O | O | O | O | O | O | |
| Landslide sections | Geological sections | O | O | | O | | | | |
| | Groundwater distribution map | | O | | | | | | |
| | Land use, facilities, etc. | O | O | | | | | | |
| | Characteristics of landslide on section | | O | O | O | O | | | |
| | Locations of investigations and it results | | | | O | O | O | O | |
| Analysis on mechanism of landslide | | O | O | O | O | O | O | O | O |

## 5.1 Analysis on mechanism of landslide

Analysis on mechanism of landslide is carried out for aims to prepare the plan of countermeasures. The analysis includes clarification of basic factor and trigger factor of landslide activation, area and scale of landslide, shape and location of sliding surface, groundwater condition, etc. Landslide block maps and landslide sections are prepared as a result of the analysis.

### 5.1.1 Basic factor of landslide activation

Landslide area has originally in condition causing landslide in general. In the most of cases, the condition is natural condition, such as geomorphology, geology (soil), geologic structures, groundwater, etc.

### 5.1.2 Trigger factor of landslide activation

In the area, having the above-mentioned basic factor, landslide is activated with trigger factors. Natural trigger factors are heavy rain, snow melting, earthquake, river erosion, change of direction or level of groundwater, blockage of river flow, etc. Man-induced trigger factors are embankment on the head of landslide, excavation at the toe of landslide, impoundment at landslide area.

### 5.1.3 Area and scale of landslide

Based on the result of ground surface displacement investigation and other investigations, the area of landslide is determined and blocks in the landslide are identified, according to be situation of the movement. The direction and situation of the movement of each block is clarified, considering the relation with rain fall. The area and soil volume of each block are also clarified.

### 5.1.4 Shape and location of sliding surface

Based on the result of sliding surface investigation and other investigations, the shape and location (depth) of sliding surface are clarified, considering relation with geology and geologic

structures.

### 5.1.5 Groundwater

Based on the result of groundwater investigation and other investigations, the distribution of groundwater, fluctuation of groundwater level, direction of groundwater flow, classification in terms of water quality are clarified, considering relation with landslide activity.

## 5.2 Landslide block map

Landslide block map is prepared as a base map for analysis, based on the results of preliminary, basic, and detailed investigations as shown in Figure 33. Contour map of sliding surface is also prepared, if required. After study on countermeasure plan, the outline and main features of countermeasure works will be shown on the landslide block map.

## 5.3 Landslide section

Landslide section is prepared on the geological section along main investigation line on a scale of 1/200 to 1/500, describing estimated sliding surface, groundwater level, cracks. The geological section is prepared, based on the result of geological investigation, describing drill hole logs, geologic boundaries, etc. Landslide sections along sub investigation lines are prepared, if required.

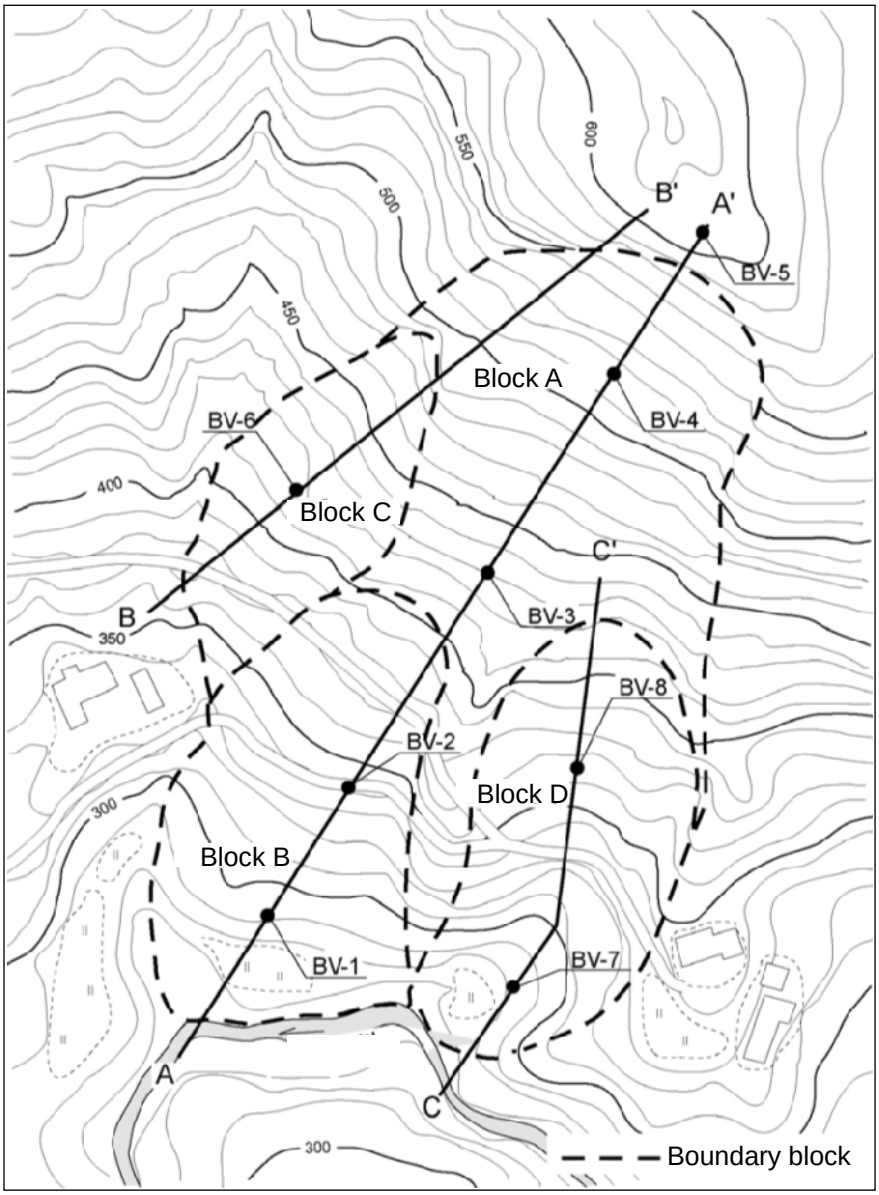



Figure 33 Landslide block map

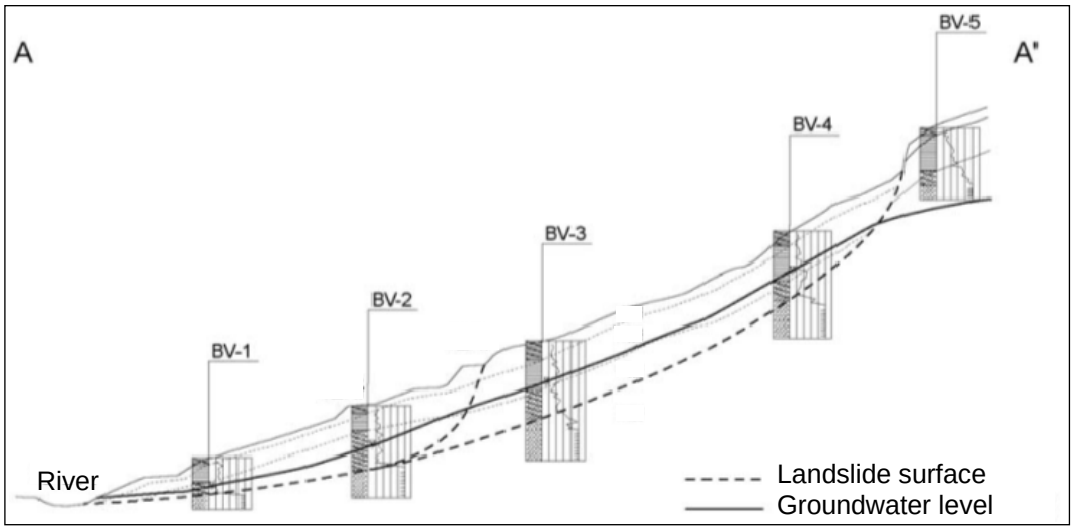



Figure 34 A geologic section along main investigation line

ガイドライン７（地すべり防災計画）

# Guideline on Planning of Landslide Measures

## 1. Planning of landslide disaster management

### 1.1 General provision

Landslide disaster management plan should be an efficient and comprehensive plan, combining hard measures and soft measures, based on the results of investigations. The plan to be prepared should be in conformity with environment and other regulations such as development plan.

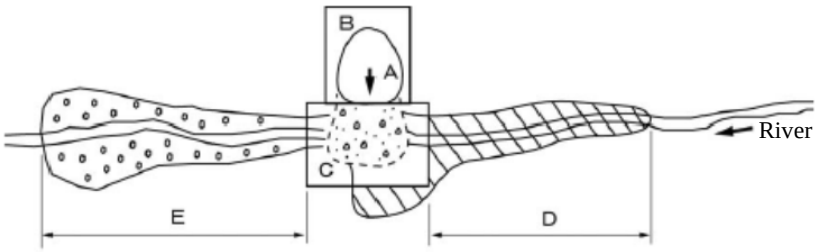
Landslide areas where countermeasure works is planned are rather wide, consisting of several active blocks, and thereby, it takes time until the completion of the countermeasure works. It is consequently necessary to formulate the disaster management plan, considering quick implementation of soft measures such as establishing warning and evacuation system.

The scale and content of the plan is determined, based on the condition of the landslide (geomorphology, geology, scale, activeness, etc.), importance of objects to be protected, urgency of the countermeasure works, cost-benefit comparison, etc.

### 1.2 Identification of objects to be protected

Objects to be protected are human life, residential houses, roads, Agricultural fields, public facilities, etc. The areas where the above-mentioned objects are located are divided into the followings (see Figure 1), considering possible damages due to abrupt movement of the landslide.

1) In the area of the landslide
2) The lower area of the landslide where landslide materials can be moved down
3) The upstream area where inundation with landslide dam is foreseen
4) The downstream area where flooding due to the collapse of the landslide dam




A: landslide block
B: Slope, having same basic factor as that in A
C: Area of moved soil mass
D: Inundation area
E: Flooding area

A+B : Landslide dangerous area
A+B+C : Landslide dangerous zone
A+B+C+D+E : Possible damage area

Figure 1 A possible damage area of landslide

The importance of the objects to be protected differs, due to actual situation such as the situation of usage and availability of alternative facilities.

## 1.3 Setting up design safety factor

Design safety factor is set up for planning and design of landslide countermeasure works. The safety factor of landslide in original condition before countermeasure works is set up to be 0.95 to 1.0, according to the condition of activeness. The design safety factor is set up to be 1.10 to 1.20, based on the mechanism of occurrence and movement of the landslide, importance of the object to be protected, and significance of foreseeable damages, etc. The design safety factor should be 1.05 or more, even for tentative measures. It is noted that design safety factor mentioned here is for determination of quantity of countermeasure works, not for securing stability of the slopes. The design safety factor is calculated value, based on experience, using shear strength (C and φ) obtained by means of inverse calculation.

## 1.4 Warning and evacuation measures

In order to reduce the damages of landslide disaster, it is necessary to promote measures on warning and evacuation for reducing human damages, together with countermeasure works. Since landslide movement is rather slow, warning and evacuation system can be applied, using the result of monitoring such as observation of deformation of the ground and measurement of displacement with extensometers and inclinometers.

The followings are important points for implementation of warning and evacuation system.

1) The target area, to be covered with the system is clarified.
   - Monitoring system
   - Area of landslide and affected areas
2) Timing of warning and evacuation is clarified.
3) Communication system for warning and evacuation is clarified.

## 1.5 Environmental consideration

Activation of landslide generally causes adverse effect of environment of the slopes, and it is necessary to minimize the activity from environmental view point. Although landslide countermeasure works prevents deterioration of habitat environment in the landslide area, adverse effects to environment are foreseen, such as removal of vegetation due to civil works and shrinking of ponds or lakes due to drainage works. It is necessary for planning, design of countermeasure works to pay attention to minimize impact to environment and restore environment.

The followings are points for environmental consideration in investigation, construction, and maintenance works.

### 1.5.1 Natural environment and landscape

- Large-scale soil removal and counterweight embankment cause big change in environment on the slopes. During the selection of type of countermeasure works, it is necessary to pay attention for restoration of natural environment such as planting vegetation.
- For the slope works, associated with landslide prevention works, should be carried out,

considering landscape and early recovery of vegetation.

- It is necessary to minimize impact to natural environment such as minimizing tree cutting and spread of muddy water during the construction works.

### 1.5.2 Living environment

- Landslide areas generally form gentle slopes, proving good place for living and cultivation, especially in mountainous area, and it is necessary to consider impact to the living environment.
- Landslide areas are generally rich in water, and residents use the water for living and cultivation. Especially for the drainage works, it is necessary to clarify the possible adverse effect of the works.
- Drained water can be used for several purposes such as irrigation, snow melting, drinking, etc. It is necessary to utilize the drained water, based on the demand of the residents.

## 2. Layout planning of landslide countermeasure facilities

### 2.1 General provision

Layout plan of landslide countermeasure facilities (including type, location, quantity, construction procedure of the facilities) is prepared for minimizing the risk, based on the landslide disaster management plan (see Chapter 1), considering scale and mechanism of the landslide, importance of objects to be protected, foreseeable damage, etc.

In general in a landslide area, there are several active blocks, affecting each other in terms of movement. The layout plan is prepared to stabilize entire area of the landslide, through increasing stability of each active blocks, considering priority of measures for each block, based on the area of blocks, relation among the blocks, stability of each block, location and importance of objects to be protected, etc. In case that overall features of landslide has not been clarified by the investigation, the layout plan will be revised, based on the result of investigation to be done later on.

After the completion of countermeasure works, it is necessary to confirm the effectiveness of the measures as it was planned by means of continuous monitoring of the movement of the landslide. Since there is possibility that the landslide activate intermittent, only at the time of abnormal climate such as heavy rain, sudden snow melting, etc., careful judgment is required about the effectiveness.

### 2.2 Slope stability analysis

For the layout planning, stability analysis on the section along main investigation line is carried out. Based on the result of the stability analysis, type and construction method of countermeasure works are determined.

There are two major methods for stability analysis; one is extreme equilibrium method which examines stability in stress extreme equilibrium and the other is stress analysis method which considers the stress and strain of soil.

The extreme equilibrium method is known as slice method, including Fellenius method (simplified method), Bishop method, Janbu method, Morgenstern-Price method. In addition to the above-mentioned two-dimension methods, tree-dimension methods are proposed, such as Hovland method, tree-dimension Janbu method, etc..

The stress analysis method is classified into finite element method, distinct element method, ridged spring model, etc., based on the modeling of discontinuous surface.

For the analysis, the most suitable method is used, considering characteristics of landslide area such as shape of landslide area, shape of sliding surface, type of movement, etc. The two-dimension simplified method is generally used, and design safety factor is set up, based on the results of calculation done.

The simplified method, called as Fellenius method or Swedish method, is explained as follows.

The method is originally used for circular slide and the safety factor is calculated as a ratio between rotational moment and resisting moment. The formula shown below is applied for non-circular slide for the calculation of balance of sliding force and resisting force as shown in Figure 2.

$$Fs = \frac{\sum(N-U)\cdot\tan\varphi' + c'\sum l}{\sum T}$$

*Fs*: Safety factor

*N*: Normal gravity force of a slice (kN/m) = $W\cos\theta$

*T*: Tangential gravity force of a slice (kN/m) = $W\sin\theta$

*U*: Pore pressure, acting to a slice (kN/m)

*l*: Length of sliding surface of a slice (m)

*c'*: Cohesion of sliding surface (kN/m$^2$)

*φ'*: Internal friction angle of sliding surface ( °)

*W*: Weight of a slice (kN/m)

*θ*: Angle of inclination of sliding surface ( °)

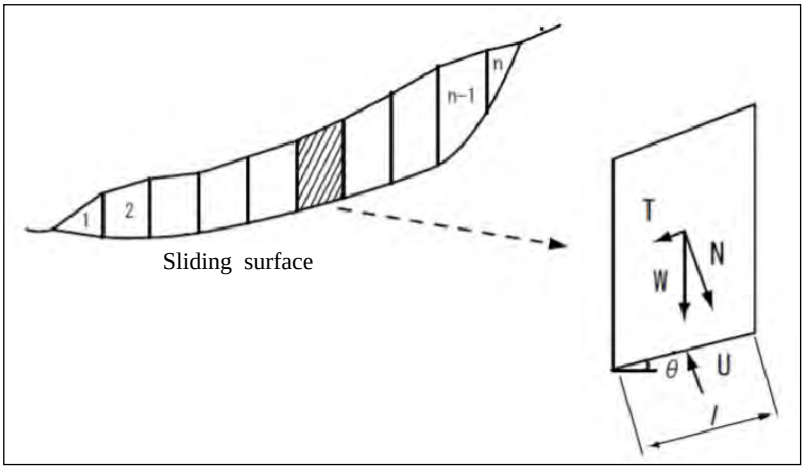



Figure 2 Illustration of simplified method

### 2.2.1 Strength parameters of soil

Strength parameters of soil for stability analysis (Cohesion; C' and internal friction angle; φ')

are set up with the following two methods.

1) Using the results of laboratory tests of materials of sliding surface
2) Using the calculation parameters with inverse calculation, based on assumed present safety factors

For the stability analysis with simplified method, the depth to sliding surface, unit weight, and pore pressure are set up, based on the results of investigations, and then, cohesion (C') and internal friction angle (φ') are calculated in the following way.

1) Setting up the present safety factor

   The present safety factor is set up as mentioned in sub-clause 1.3.
2) Estimation of cohesion (C')

   Cohesion (C') is set up the maximum thickness of the landslide mass as shown in Table 1, referring to the results of soil tests. In case that the thickness of a landslide mass is 25 m or more, C' is set up to be 25 kN/m$^2$ in general. In case that the maximum thickness is 5 m or less, the C' is set up with particular consideration, according to the site condition.

Table 1 The maximum thickness of landslide mass and cohesion for analysis

| The maximum thickness of landslide mass | Cohesion (C'; kN/m2) |
|---|---|
| 5 | 5 |
| 10 | 10 |
| 15 | 15 |
| 20 | 20 |
| 25 | 25 |

3) Inverse calculation of internal friction angle (φ')

   Internal friction angle is calculated with Formula 1 (see sub-clause 2.2), inputting the values set up in the above-mentioned 1) and 2).

   The unit weight of materials of landslide mass for the is generally set up to be 18 kN/m$^3$, referring to the results of soil tests.

The type, design, quantity, etc of countermeasure works are determined, so that design safety factor can be obtained by means of examination of safety factor, using the calculated values of C' and φ'.

### 2.2.2 Pore pressure

Pore pressure at the sliding surface is set up for the stability analysis. It is preferable to measure the pore pressure directly at the level of sliding surface with pore pressure meter, since mixed groundwater level is measured in a drill hole, in case of several aquifers exist in the hole.

In case that pore pressure of the level of sliding surface is not obtained, groundwater level can be used for the calculation. In this case, it is recommendable to measure the groundwater in the drill hole with casing pipes perforated at the level of sliding surface.

In general, The highest level among measured groundwater level is used for stability analysis. In case that groundwater is measured at the time of landslide movement, the measured level is used for inverse calculation for soil parameter (C' and φ').

In case of (N-U)<0 in Fellenius method, the calculation is done, setting (N-U)=0.

## 2.3 Selection of the type of countermeasure works

Based on the landslide management plan, the layout plan of landslide countermeasure facilities is prepared for control works, prevention works, or combined works of the both, considering the scale and mechanism of the landslide, importance of the objects to be protected, significance of foreseeable damages, economical feasibility of the type of measure, etc.

The landslide countermeasure works are divided into the following two major categories, according to the function.

- Control measure

  Control works aim at reducing or stabilizing landslide activity through improvement of balance between sliding force and resisting force, by means of modification of natural conditions such as morphology and groundwater conditions.
- Prevention works

  Prevention works aim at stabilizing a part or all of landslide activity through addition of resisting force, by means of installation of countermeasure structures.

Well-applied countermeasure works are shown in Figure 3.

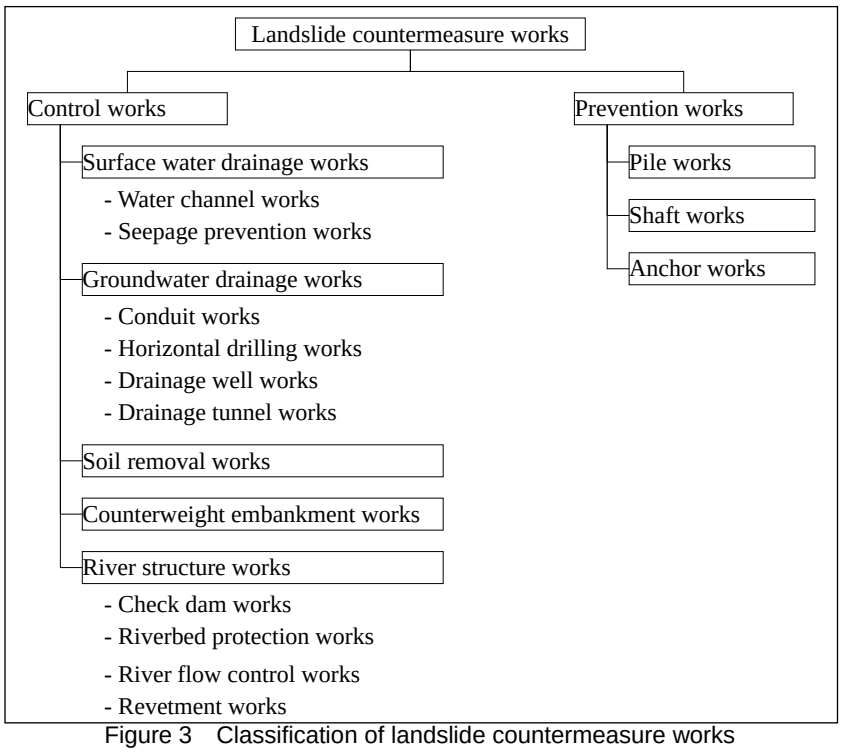



Figure 3 Classification of landslide countermeasure works

Points to be considered and examined for the selection of countermeasure works are as follows. Basically, the plan of countermeasure works is prepared, after the clarification of characteristics of landslide through investigation.

- Basic factors and trigger factor of the activation of landslide
- Relation among rain fall (snow melting), groundwater level, and landslide movement
- Morphology and geology

- The scale of landslide
- Mode and speed of landslide movement
- Objects to be protected
- Economic efficiency (the cost should include maintenance cost, in addition to construction cost)

Although the characteristics of landslide are variable in each site, consideration on the following point is important for the preparation of plan of countermeasure works.

### 2.3.1 Trigger factor of landslide (elimination of trigger factor)

Elimination of trigger is the most effective measure in general. For the most of cases on natural landslide, the trigger factor is the increase of groundwater inflow due to heavy rain, long-lasting rain, snow melting, etc. Consequently, surface water drainage works and groundwater drainage works are firstly to be considered.

On the other hand, the countermeasure of man-made landslide is to restore the modified conditions to original condition. In case that landslide occurs due to removal soil on the lower slopes and embankment on the upper slopes, countermeasure can be restoration to the original condition, which is a way of eliminate the trigger factor.

### 2.3.2 Reducing sliding force/ increasing resisting force

Typical countermeasure works for reducing sliding force are removal of soil from the upper portion of the landslide. This countermeasure works are generally effective and quick in terms of implementation. In case that another unstable mass or landslide block is distributed on the upper slopes of the area of soil removal, the removal may cause activation of another landslide on the upper slope. It is thereby required to carry out careful checking on the condition of the upper slopes is required, before applying soil removal works.

Typical countermeasure works for increasing resisting force are counterweight embankment and pile works. The former is effective measure, carried out at the toe portions of landslide. Anchor works are also applied for increasing resisting force.

### 2.3.3 Situation of landslide activity

For landslides moving fast, it is difficult to apply prevention works. Even if prevention works are applied, it is possible that the installed facilities are broken due to the landslide movement. In such cases, control measures are firstly applied to reduce the activity, such as removal of man-made trigger factors, groundwater drainage works, and horizontal drilling works, and then, prevention works will be applied, depending on the situation.

### 2.3.4 Scale of landslide

According to the scale of landslide, suitable types of countermeasure works are selected.

Among groundwater drainage works, horizontal drilling works may not applied for a large landslide, since it is not efficient to drill a long hole up to the sliding surface. For groundwater drainage in a large landslide, drainage well works or drainage tunnel works may be efficient and

economical.

Concerning prevention works, pile works may be applied for rather small landslide, while anchor works or shaft works for relatively large landslides.

### 2.3.5 Location of countermeasure works

The upper portion of a landslide block is generally in an area of tension, and open cracks develop in the area, and thereby, installation of groundwater drainage works and surface water drainage works are efficient. Installation of groundwater drainage works is also efficient to reduce inflow of groundwater from surrounding areas. Soil drainage works are also carried out on the upper portion of a landslide.

On the other hand, the lower portion of a landslide block is generally in an area of compression, and thereby, counterweight embankment works and prevention works are efficient in the area.

## 2.4 Planning of control works

### 2.4.1 Surface water drainage works

Surface water drainage works aims at reducing or preventing inflow of surface water into landslide area and reducing groundwater level in the landslide area. Surface water drainage works include water channel works and seepage prevention works, and one or both works are selected, based on the particular situations. Surface water drainage works are applied as an urgent measure, since construction of the facility can be done in rather short time. In case that the water channel works on the upper portion of a landslide, soil embankment for the facility should be minimized to avoid adverse effect on the stability of the landslide. Water channel works for preventing inflow of rain water should be planned stable areas, outside of the landslide area.

Although quantitative evaluation of the effectiveness of the surface water drainage works is not available, it is recommendable to apply surface water drainage works, together with other works. In case that there is close relation between rain fall and landslide activation, the surface water drainage works are an effective measure.

#### (1) Water channel works

Water channel works aims at reducing or preventing inflow of surface water, by means of collecting and dewatering the water to the outside of the landslide area. The water channel works are divided into water collecting channel works and dewatering channel works.

#### (a) Water collecting channel works

Water collecting channel works are usually planned on the landslide area in lateral direction to collect surface water efficiently. The channel is usually wide and shallow in depth, and it is connected to dewatering channel.

#### (b) Dewatering channel

Dewatering channel aims at transferring the collected water to the outside of the landslide area. The dimension of the section of the channel should be determined, based on the calculation of flow

capacity of the collected water. The dewatering channel is generally designed along valley-shape or convex-shape portions in the landslide area. Bottom sills should be installed at interval of 20 m to 30 m to avoid erosion with rapid flow and suction of materials from the ground. At the end points of the dewatering channel and junction of two channels, water catchment pits or bottom sills should be installed to prevent erosion.

**(2) Seepage prevention works**

As seepage prevention works, cracks developed on the ground by landslide are filled out with clay/ cement or covered with plastic sheets. For the prevention of seepage from cracks on ponds or water channels, covering with impermeable materials, diversion of the channels, etc. is planned.

### 2.4.2 Groundwater drainage works

Groundwater drainage works aim at lowering pore pressure of materials in landslide mass, by means of drainage of groundwater, flowing or infiltrating into the landslide area. The groundwater drainage works are divided into shallow groundwater drainage works and deep groundwater drainage works.

Target level for the lowering groundwater is determined, according to the type of countermeasure works and site conditions such as geomorphology, geology, soil, groundwater at particular landslide area. In case that there is no reference such as the result of groundwater analysis and records of groundwater lowering at surrounding areas, it is possible to use the values shown in Table 2. It is noted that the values in Table 2 are based on existing records of several cases which groundwater drainage works have been installed properly. It is thereby necessary to re-examine the works or increase the quantity of the works.

Table 2 Referential values of groundwater lowering

| Type of works | Referential value (m) |
|---|---|
| Horizontal drilling | 3 |
| Drainage well | 5 |
| Drainage tunnel | 8 |

**(1) Shallow groundwater drainage works**

**(a) Culvert works**

Culvert works aim at draining shallow groundwater and/or draining infiltrated rain water immediately. Especially, culvert works is effective and recommendable for low-permeable ground with much groundwater. The works are applicable for drainage of groundwater up to about 2 m deep.

**(b) Open channel and culvert works**

Open channel and culvert works are applied for draining both surface water and shallow groundwater. Open channels (surface water collecting channel) are sometimes broken by landslide movement, and culvert is functioning to drain the seepage water from the broken parts.

**(c) Horizontal drilling works**

Horizontal drilling is applied to drain groundwater which cannot be drained with culvert works. It is preferable to determine the diameter, length, and angle of the drill holes. The horizontal drilling works are usually planned at the areas where groundwater is concentrated, at the interval of end of holes to be 5 m to 10 m.

**(2) Deep groundwater drainage works**

**(a) Horizontal drilling works**

Horizontal drilling works are installed for draining deep groundwater at around sliding surface, faults, and fracture zones. The target of the works is aquifers, confirmed through investigation. In general, the interval of drill holes is planned to be 5 m to 10 and the length of the holes is determined, so that the holes penetrate sliding surface with additional length of 5 m to 10 m in stable ground.

**(b) Drainage well works**

Drainage well works are applied for draining deep groundwater. The works applied for intensive drainage of groundwater from deeper portions. In case that drainage of deep groundwater requires horizontal drilling of 50 m long or more, drainage well works may be applied, instead of the drilling works.

Usually, effective draining with the well is not expected, and draining groundwater is planned by means of horizontal drilling installed from the well.

The depth of the well is generally designed about 2 m above the sliding surface in order to avoid damage of landslide movement. For rather stable landslide, there is a case that the bottom of the well reaches to the sliding surface.

The locations and scale of the wells are determined effectiveness, safety during construction, easiness of maintenance. It is necessary to layout and design of the well, so that collected water can be drained with free flow. In case that draining with free flow is not possible, another well (relay well) will be designed for free flow drainage. The relay wells also are planned not to intersect sliding surface to secure stability of the wells.

In case that groundwater exists in several layers (aquifers), it is necessary to install horizontal drill at two or more levels for drainage from the target layers.

In case that the ground consists of soft materials and contains much groundwater, it is difficult to construct the wells, and thereby, another countermeasure works are applied. In case that movement of landslide is big, there is possibility that the constructed well are damaged or broken. It is recommendable not to construct the well in such area, from a viewpoint of maintenance of the wells as well as safety construction works. For this purpose, it is necessary to confirm geological condition and level of stable ground at the time of determination of the locations of wells.

In case of construction of two wells or more, the location and quantity of the wells should be determined, considering the length of horizontal drainage drill holes, effective areas of groundwater

lowering of each well, the present condition of groundwater, etc.

**(c) Drainage tunnel works**

Drainage tunnel works are applied for the case that drainage of groundwater is not effective with drainage wells and horizontal drilling works.

Drainage tunnel works aim at drain groundwater through drainage drill holes installed from the tunnel. The construction of the tunnel in the landslide mass is not done, and the tunnel is constructed apart from landslide surface with a minimum distance of two times as much as the tunnel diameter.

The drainage drill holes are installed from the tunnel wall in horizontal direction and upward.

**(3) Soil removal works**

Soil removal works aim at reducing weight or sliding force of the landslide mass, through removing soil on the upper parts of the landslide. In case that there is another landslide or unstable mass on the slopes above the target landslide, the soil removal works are not applied, since the removal may cause activation of the upper mass.

The amount of soil to be removed is determined, through stability analysis with clarified landslide surface. At the area of soil removal and dumping area of removed soil, measure for restoring natural condition such as panting will be carried out. The measure is also effective to prevent erosion of the area.

In case that the landslide movement is rather big and there is difficulty in safety works, unmanned construction machinery for the works will be applied.

Soil removal works require rather big financial means for excavation, transportation, and dumping of soil, and maintenance of the excavated slopes, and it sometimes takes time for land acquisition. On the other hand, lowering of function is rather small, comparing that due to clogging of drainage holes of horizontal drilling. The above-mentioned benefit and demerit should be taken into account for the selection of the optimum countermeasure works.

**(4) Counterweight embankment works**

Counterweight embankment works aim at increasing resisting force against sliding force of landslide, by means of embanking permeable soil at the toe portion of the landslide. The embankment plan should be prepared, considering stability of the embankment and surrounding area. In case that the toe portion of landslide is located on river course, relocation of river course and/or construction river bank protect are required.

It is usually much effective to apply counterweight embankment works, together with soil removal works, since removed soil can be used for embankment. In order to avoid increasing groundwater level behind the counterweight embankment, it is recommendable to install groundwater drainage works, together with counterweight embankment works.

The volume of soil to be embanked is obtained through stability analysis. On the area of the embankment, it is recommendable to apply tree planting for restore natural conditions and

landscape as well as prevention of erosion.

**(5) River structure works for erosion control**

River structure works aims at stabilization of the toe portion of landslide by means of protecting river bank and riverbed with the structures against erosion by river flow.

River structure works for erosion control include check dam works, riverbed protection works, river flow control works, and revetment works. Relocation of river course is also considered as a countermeasure.

The locations of the check dam, riverbed protection, etc. are basically in stable area outside of the landslide area and just on downstream of landslide area.

## 2.5 Planning of prevention works

Prevention works are planned for reducing and stabilizing a part or all of the landslide activity, increasing resisting force through installation of structures. The plan is prepared, based on effectiveness and cost of the countermeasure works. In the plan, layout of a suitable measure is shown, after selecting a single type of countermeasure works or a combination of several types of countermeasure works.

Prevention works are divided into the following two categories in terms of function of the countermeasure works.

- Works to provide direct resisting force against sliding force of landslide, with resisting force against shear force or bending force by means of installation of steel pipes or reinforced concrete into ground (Pile works and shaft works)
- Works to stabilize slope with tensile strength of tendon (steel material) installed into ground (Anchor works)

### 2.5.1 Pile works

Pile works usually consist of several steel piles, being aligned on lines right angle to the direction of sliding, so that increasing resisting force as one body of piles against sliding force. In case that landslide is active with movement of 1mm/day or more, the resisting force does not act as a one body and expected resisting force cannot be obtained, unless all the piles are installed at some time. In such case, installation of pile works should be done, after reducing the movement by means of other measures.

The location of the pile works should be in the lower half of the sliding mass and the pile should installed into stable and firm foundation with enough ground reaction

### 2.5.2 Shaft works

Shaft works aim at increasing resisting force by means of installation of shafts filled with reinforced concrete into ground up to the depth of sliding surface. The shaft works are applied to the cases that required resisting force cannot be obtained with pile works and the stable ground beneath the sliding surface is in good condition.

For the construction of shaft, the ground is excavated up to stable foundation with diameter of

2.5 m to 6.5 m. The excavated space is filled with reinforced concrete to make the shaft. During the construction of the shaft, careful attention on safety work is required. In order to make proper dewatering during the construction, it is necessary to clarify the groundwater and spring condition with geological investigation.

### 2.5.3 Anchor works

Anchor works aim at increasing stability with tension strength of tendon (steel bar, wire, etc.) which is installed from the ground and fixed with stable foundation below the sliding surface. It is expected that the anchor works increases normal stress to sliding surface, and accordingly, restraining force against shear force increases (tightening effect). The anchor works also is expected to provide tension force when the landslide mass is moving down (detention effect). The location of anchor works is determined, so that tightening and detention effects can be provided efficiently.

Due to landslide movement, load acting on the head of anchor on the ground increases. High-strength steel bars or wires of the anchor fixed to stable foundation transfer the load to stable ground, and consequently, anchor works provide reaction force as a united body to stabilize the landslide. The anchor works is a suitable countermeasure to be applied on steep slopes where ground reaction force cannot be obtained with pile works and shaft works. The anchor works can be installed in rather short time, comparing with time for installation of pile works and shaft works, and thereby, the anchor works is applied in the cases that urgent measures are required.

## 3. Safety measures during construction

There is a risk that landslide moves during the installation of countermeasures and endangers workers and machinery for the installation works. It is thereby necessary to prepare safety measures for the installation works and monitor the landslide activity during the installation works. For soil removal and embankment works in risky areas, unmanned construction machinery may be used.

ガイドライン８（地すべり応急対応計画）

# Manual on Emergency Response

## 1. General provision

In case that damage and/or deformation due to landslide are recognized, the following response is taken.

1) Clarification of the affected area and direction of landslide movement
2) Measurement of displacement and deformation
3) Mechanism of the activation of landslide
4) Estimation of the movement of the landslide mass
5) Examination on further expansion
6) Estimation of risky areas
7) Installation of monitoring devices and establishment of communication system

## 2. Investigation in emergency situations

### 2.1 Site reconnaissance

Site reconnaissance is carried out for the clarification of affected areas and measurement of displacement and deformation.

#### 2.1.1 Clarification of affected areas

In case that damage and/or deformation due to landslide are recognized, clarification of the affected areas and direction of landslide movement should be done at first by means of site reconnaissance. The site reconnaissance should be carried out properly, since the succeeding actions such as the estimation of mechanism, estimation of further movement and expansion, etc. will be based on the result of the site reconnaissance.

The area of the site reconnaissance is not only the affected area, but wider area, covering slopes behind and surrounding areas, since there is possibility that the affected area is a part of larger landslide. It is noted that safety of the site reconnaissance works is the first priority.

The points for the site reconnaissance are as follows.

**(1) Geomorphology**

The areas of existing landslides and collapses are clarified, mainly with observation of macro geomorphology. Observation of micro geomorphology is carried out for of estimation of the area of activated landslide.

It is recommendable to clarify general features of geomorphology at and around the affected area by means of interpretation of topographic maps. Observation of the broad view of the affected area is also recommendable for understanding macro geomorphology.

**(2) Geology and geologic structures**

For the estimation of the landslide area and conditions of moved mass, existing geological maps is used and geological conditions and geologic structures are clarified by means of observation of

outcrops.

**(3) Locations of damaged structures and ground deformation**

Deformation of houses and facilities can be found relatively easy, while it is rather difficult to find deformation of the ground such as cracks. It is thereby to carry out careful observation on the ground for the clarification of the affected area and estimation of the active landslide area.

Since deformation can be appeared on the upper portions and side of the active landslide, detailed observation on the areas is required. Distinct damage may occur only on the toe of the active landslide, and thereby, slopes on the higher elevation should be carefully observed to clarify the entire area of active landslide.

**(4) Spring**

Landslide areas are generally rick in spring water. In case that sliding surface forms an impermeable layer, spring sometimes can be seen at the toe of the landslide. Locations of spring points are one of the data for the estimation of the active landslide area.

### 2.1.2 Measurement of displacement and deformation

Ground extensometers are installed to clarify the displacement of the ground. In general, the ground extensometers are installed both sides of ground cracks. In case that ground cracks are not distinct or further development of cracks are foreseen, additional extensometers are installed on the upper slopes. In such cases, extensometers are installed both side of concave and convex knick lines as shown in Figure 1.

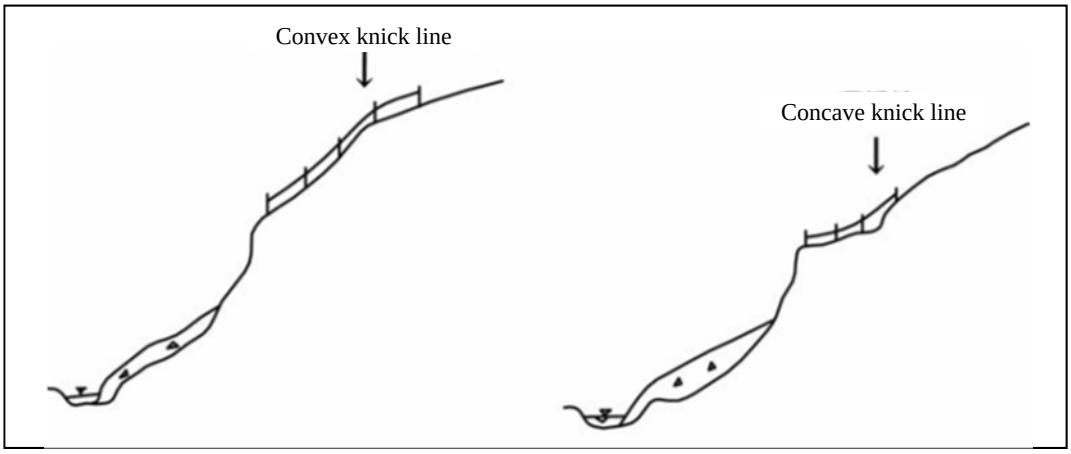



Figure 1 Location of ground extensometers

The results of measurement with ground extensometers can be used not only for the clarification of the area of movement, but also for the estimation of further movement of landslide mass and the warning and evacuation, as well as safety during construction of countermeasure facilities.

Interval of measurement of the ground extensometers is determined, according to the actual situations, and it is recommendable to use extensometers with measurement interval of 10 min. or less. Automatic recording type of ground extensometer is applicable to the risky areas where entry to the area is limited or prohibited. The automatic recording type is also applied for frequent

recording, mainly for warning and evacuation.

It is recommendable for the monitoring at the area of fast movement to set up survey points, considering the case that displacement exceeds measurable length with the extensometers.

Simple measurement with cleaved wooden plate can be applied for tentative measurement of displacement in both vertical and horizontal directions as shown in Figure 2. Distance measurement between two pins putting on both side of a crack is also applicable, especially for cracks developed on walls and columns in rooms. The above-mentioned tentative measurement is usually applied to the cases that measurement is required at many points or measurement before installation of measuring devices. Another type of measurement is that measurement by survey of survey pegs setting on a traverse line. Observation with a cameras is also applied, especially for deformation of slopes and facilities as well as condition of rivers, etc.

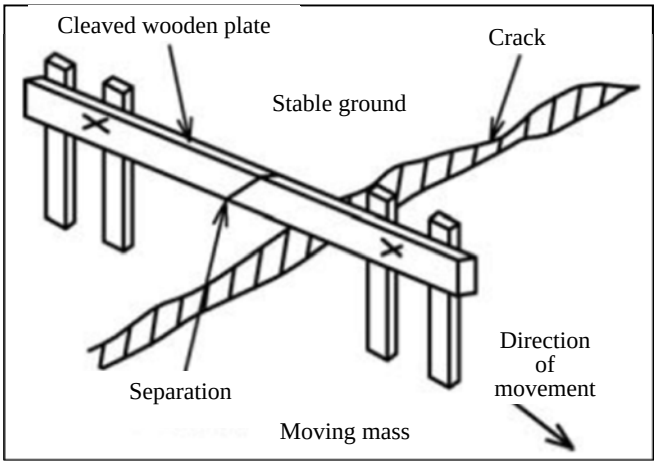



Figure 2 Measurement with a cleaved wooden plate

The location of measurement is decided, so that condition of movement can be clarified properly. For the purpose of clarifying the area of landslide and direction of movement, it is recommendable to install measurement devices at many locations. Hole inclinometers and hole extensometers also available for measuring displacement or deformation.

## 2.2 Estimation of further activity

Estimation of mechanism of activation is firstly carried out, and then, estimation of movement of landslide mass, examination on further expansion, and estimation of risky areas will be done.

### 2.2.1 Estimation of mechanism of activation

Estimation of mechanism of activation of landslide is an important step for estimation of movement of landslide mass. Basic factors such as geomorphology, geology, and geological structures are clarified, and examination on possibility on further expansion of the landslide is carried out. In parallel, the trigger factors for the activation is estimated for establishment of warning and evacuation system and planning of urgent measures. Key items to be clarified for the estimation of the mechanism are as follows.

1) Geomorphology

2) Geology and geological structures

3) Rain fall and groundwater condition

4) Human activities such as excavation and embankment

The above-mentioned items 1) and 2) are items relating to basic factor. Although clarifying the basic factor is important, it may not be completely done, when quick response is the most priority issue.

The above-mentioned 3) and 4) are items relating to trigger factor. Possible trigger factors are natural factors such as rain fall, snow melting, erosion on the toe of landslide, earthquake, etc. and artificial factors such as excavation, embankment, construction of reservoir, etc. It is so important to clarify the trigger factor, since it is efficient to plan and implement countermeasure works in order to eliminate adverse condition on the trigger factor.

### 2.2.2 Estimation of movement of landslide mass

Further movement of landslide mass is estimated, based on deformation occurred in the landslide area and geomorphologic conditions of the landslide area.

There is tendency that time interval from development of cracks to collapse of the slope is relatively long for landslides of plastic materials. It is also tendency that landslides with circular shape of sliding surface and big upheaval at the toe are not suddenly collapsed. On the other hand, landslides with open-end sliding surface in section and small landslides show tendency to be collapse easily. Heavy rain fall also contributes sudden collapse of landslides.

The followings show tendency of future movement in several conditions such as geomorphology.

1) Landslide fallen down (see Figure 3)

Stability of fallen down materials is rather high.

Scarp of the landslide is relatively high, and thereby, the upper slope behind the scarp is in danger of instability.

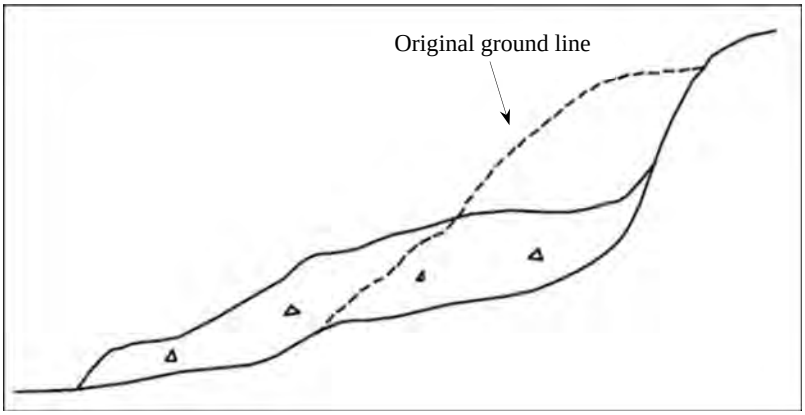



Figure 3 Section of landslide fallen down

2) Landslide with upheaval at the toe (see Figure 4)

The sliding surface seems to be almost horizontal or inclined to the hillside

When the mass moves, the moved mass is accumulated at the toe and the accumulated mass

will provide restraining force, and thereby, the movement is not accelerated.

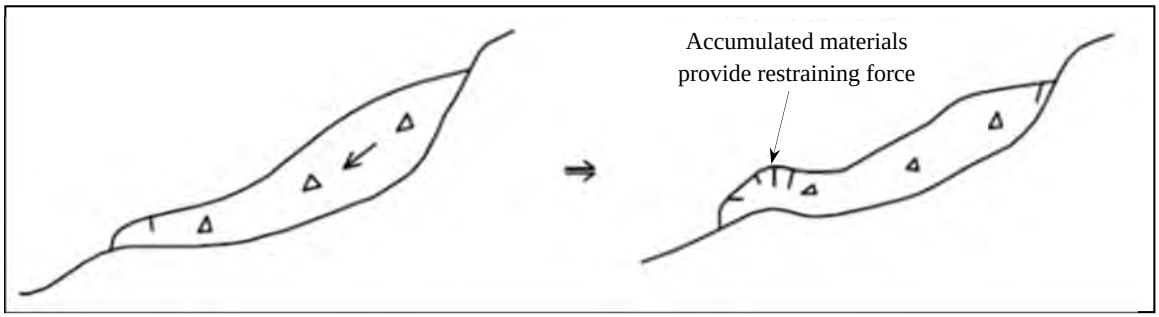



Figure 4　Section of landslide with upheaval at the toe

3) Landslide with a gentle slope on its toe (see Figure 5)

The landslide may be getting stable, because the moved mass is accumulated at the toe and the accumulated mass will provide restraining force.

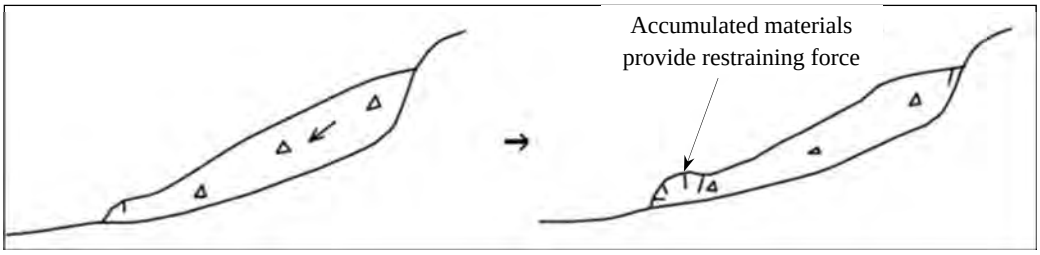



Figure 5　Section of landslide with a gentle slope on its toe

4) Landslide with a steep slope on its toe (see Figure 6)

Collapse at the toe continues and causes further instability of landslide.

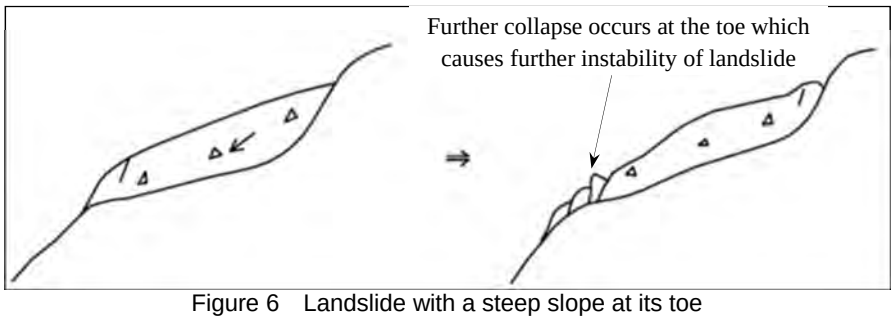



Figure 6　Landslide with a steep slope at its toe

The above figures and explanation are about general cases, and judgment on further movement should be done, based on the characteristics of particular site.　Especially in the area rich in groundwater, careful judgment is required, considering possibility of occurrence of debris flow.

In general, speed of movement increases suddenly, and thereby, there are cases that estimation of further collapse is available through monitoring the speed of movement.　In case that abnormal condition appears, measurement of cracks on the top of the slope is carried out for the estimation of timing of collapse.　For warning and evacuation warning siren system is added to the monitoring system.

### 2.2.3　Examination on further expansion

In case that landslide is further activated or landslide area expands, it is possible to cause serious

damage, and thereby, it is necessary to carry out careful examination on further expansion. The possible area of expansion is estimated, considering the following key points. It is recommendable to install monitoring devices such as ground extensometers to the area.

1) Geomorphology

   Existence of geomorphologic features of landslide, distribution of convex and concave knick lines, distribution of ridge and river courses, geomorphology of the toe area

2) Geology and geologic structures

   Distribution of faults, geological structures such as dip slopes

3) Others

   Location of area of deformation, kind of deformation (cracks, upheaval, etc.), change of displacement, distribution of spring points, condition of vegetation

### 2.2.4 Estimation of risky areas

For the estimation of possible area of further movement, existing records of the past disaster can be used. Based on the records, reachable area of landslide mass is limited in the area with length twice as much as the existing landslide length and width twice as much as the existing landslide width for about 95% of all cases. It is thereby recommendable to prepare draft of risky area as shown in Figure 7.

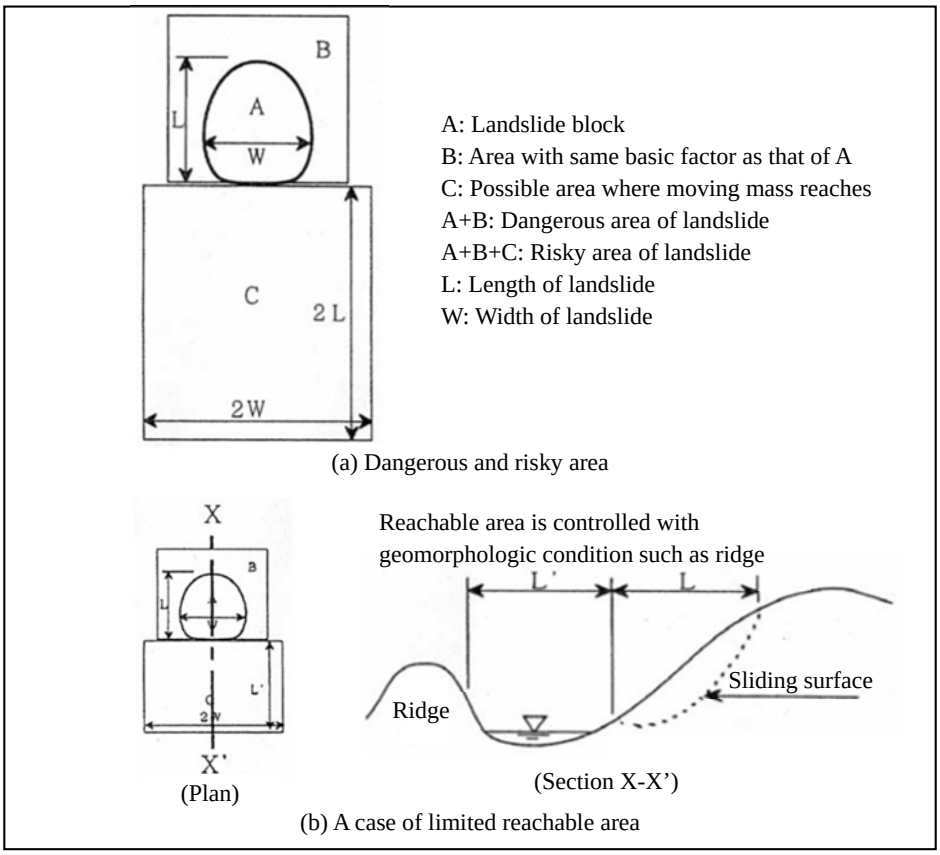



Figure 7 Reachable area of moving mass

In case that there is possibility of forming a landslide dam, possible inundation areas on the upstream and flood areas on the downstream should be determined for warning and evacuation.

## 3. Control criteria for emergency response

As a reference for establishing warning and evacuation system, control criteria for emergency response is set up, mainly based on monitoring data of extensometer.

Tables 1 to 3 show control criteria of existing landslides. The criteria were not the same, since the criteria set up, according to particular site condition. In general, the displacement of about 1 mm/day is for “Advisory” warning, about 10 mm/day is for “Caution”, and several mm to 10 mm/hour is for “Evacuation” or “Keep out”. The warning is issued not only with the measured value of displacement, but the accumulation of the displacement is also important and to be considered. It is necessary to set up the criteria carefully, referring to similar cases, some landslides are getting active suddenly.

For the cancellation warning, the same values of the criteria for warning are not used and the decision of cancellation requires confirmation of safe situations.

Table 1 The list of control criteria for existing landslides in designated areas

| No | Control criteria with ground inclinometer | | | | Other parameters | Remark |
|---|---|---|---|---|---|---|
| | Advisory | Caution | Evacuation | Keep out | | |
| 1 | - | 4 mm/H or 20 mm/D | - | - | Precipitation | Criteria is for site reconnaissance |
| 2 | 1 mm/D | 10 mm/D | 2 mm/H*2H<br>4 mm/H | 10 mm/H<br>S | Ground inclinometer (R)<br>Hole strain gauge (R) | |
| 3 | 1 mm/D | 10 mm/D | 2 mm/H*2H<br>4 mm/H | 10 mm/H<br>S | Ground inclinometer (R)<br>Hole strain gauge (R) | |
| 4 | 1 mm/D | 10 mm/D | 2 mm/H*2H<br>4 mm/H | 10 mm/H<br>S | | |
| 5 | 1 mm/D | 10 mm/D | 2 mm/H*2H<br>4 mm/H | 10 mm/H<br>S | Ground inclinometer (R) | |
| 6 | 1 mm/D | 10 mm/D | 2 mm/H*2H<br>4 mm/H | 10 mm/H<br>S | Ground inclinometer (R)<br>Hole strain gauge (R) | |
| 7 | 1 mm/D*7D | 12 – 17 mm/D | 2 mm/H*2H<br>4 mm/H | | Measurement should be done with multi-layer displacement meter | |
| 8 | 1 mm/D | 10 mm/D | 2 mm/H*2H<br>4 mm/H | 10 mm/H<br>S | | |
| 9 | | | 2- 4 mm/H | | Precipitation | |
| 10 | | | 4 mm/H | | Precipitation | |
| 11 | | | 1) 2 mm/H<br>2) 4 mm/H | | | 1) : for countermeasure works<br>2): for evacuation |
| 12 | | | 2 mm/H | | | Criteria is for site reconnaissance |
| 13 | 10 mm/D | 2 mm/H | 4 mm/H | | Precipitation | |
| 14 | | 4 mm/H<br>20 mm/D | | | Precipitation | Criteria for site reconnaissance |
| 15 | | 1 mm/D | | | Precipitation | Criteria for suspension of construction works |
| H: hour, D: day, *X: continuous for X duration, S: Decision by specialists | | | | | | |

Table 2 The list of control criteria for existing landslide at reservoir rims

| | Control criteria with ground inclinometer | | Other parameters | Remark |
|---|---|---|---|---|
| | Advisory | Suspension of impounding | | |
| 1 | 1 mm/D*3D(tension)<br>0.6 mm/D*3D(compression) | 3 mm/D*3D<br>S | Ground inclinometer | Criteria for trial impounding |
| 2 | 0.4 mm/D | - | Ground inclinometer<br>Inspection | Criteria for trial impounding |
| 3 | 1.2 mm/3D | S | Ground inclinometer<br>Inspection<br>Hole inclinometer | Criteria for trial impounding |
| 4 | - | 2 mm/H<br>10 mm/D | Inspection | Criteria for trial impounding |
| 5 | - | - | Ground inclinometer | Criteria for trial impounding |
| 6 | 0.4 mm/D*3D | 1 mm/D<br>S | Ground inclinometer<br>Inspection | Criteria for trial impounding |
| 7 | 4 mm/H | | | Landslide at reservoir rim |
| 8 | 1 mm/D | S | Ground inclinometer<br>Hole displacement meter | Criteria for trial impounding |
| 9 | 0.4 mm/D*3D | 1 mm/D | Ground inclinometer<br>Inspection | Criteria for trial impounding |
| H: hour, D: day, *X: continuous for X duration, S: Decision by specialists | | | | |

Table 3 The list of control criteria for road side slopes

| No | Control criteria with ground inclinometer | | | | Other parameters | Remark |
|---|---|---|---|---|---|---|
| | Advisory | Caution | Countermeasure | Road blockage | | |
| 1 | - | | - | 20 mm/D<br>4 mm/H<br>2 mm/H*2H | Inclinometer acceleration meter | Criteria during tunnel excavation |
| 2 | | | | | Hole displacement meter | |
| 3 | | 3 mm/H | | 4 mm/H | | |
| 4 | | 20 mm/D | | 4 mm/H | Precipitation | |
| 5 | 0.02 mm/D<br>0.5 mm/M | 0.1 mm/D<br>2 mm/M | 1 mm/D<br>10 mm/M | | | |
| 6 | 0.02 mm/D | 0.1 mm/D | 1 mm/D | | | |
| 7 | | | | 2 mm/H | | Site reconnaissance |
| 8 | | | | 2 mm/H | | Site reconnaissance |
| 9 | | | | 2 mm/H | | Site reconnaissance |
| 10 | | | | 4 mm/H | | Site reconnaissance |
| 11 | | | | 2 mm/H<br>10 mm/D | Precipitation | |
| 12 | | | | 10 mm/D | | Criteria during countermeasure works |
| 13 | | 4 mm/D | | A: 2 mm/H<br>10 mm/D<br>B: 4 mm/H<br>20 mm/D | Precipitation | Criteria during countermeasure works<br>A: Suspension of works at the toe area<br>B: Suspension of all works |
| 14 | | | | 10 mm/D | | Criteria during countermeasure works for suspension of the works |
| H: hour, D: day, M: month, *X: continuous for X duration, S: Decision by specialists | | | | | | |

## 4. Urgent measures

In case that landslide is getting active and houses/ facilities are threatened, urgent measures are

taken for establishment of warning and evacuation system as well as reducing the landslide activity. For the tentative stability measures, the design safety of 1.05 or more should be used.

For the reducing landslide activity, it is efficient to eliminate trigger factor of the landslide. In case that elimination of trigger factor is difficult due to geomorphologic condition or others, applicable measures will be taken in consideration of the situation of landslide movement and safety of the construction works.

The followings are key points about countermeasures applied in many cases.

**(1) Urgent surface water drainage works**

Inflow of surface water to the landslide area is prevented with urgent drainage with water channels in landslide area, relocation of water channel, installation of water channels surrounding the landslide area, etc. Infiltration of surface water to the ground on the landslide area is prevented with surface covers of plastic sheets, drainage of spring water, dewatering of water in ponds or lakes with open cannels.

**(2) Urgent groundwater drainage works**

For the urgent groundwater drainage, horizontal drilling is carried out from stable area, such as the outer side of landslide area and upper slopes behind the landslide. In case that entry to the landslide area is available, horizontal drainage drilling and/or vertical drilling with big diameter for dewatering of groundwater with pumps are effective measures.

**(3) Urgent soil removal works**

For the implementation of urgent soil removal works, it is necessary to check the stability and existence of another landslide blocks on the upper slopes from the target slopes of the removal works. In case that the target area of the works is in dangerous condition, it is considered to use unmanned construction machinery.

**(4) Urgent counterweight embankment works**

Urgent counterweight embankment is divided into temporary embankment and permanent embankment. The former embankment will be removed after completion of permanent measures. In case that embankment area reaches to river course, it is necessary to consider to apply prevention measure against river erosion. The embankment materials should be permeable materials, since embankment of low-permeable may cause increase groundwater level in the slopes behind the embankment.

Unmanned construction machinery will be considered for the works in dangerous areas.

**(5) Response on landslide dam**

In case that inundation on the upstream area and/or flooding on the downstream area are foreseeable, it is necessary to remove the moved mass or excavate the outlet channel of reserved water. Careful attention is required for the removal and excavation, since the activity may cause collapse or sliding of the moved mass. The works will be carried out with strict safety management

with ground extensometers. Unmanned construction machinery also be considered for the works.

In case that check dams have been constructed on the downstream course of the landslide dam, removal of the sediment in the check dams is an effective measure. Safety management of the sediment removal works is required, considering sudden outbreak of the landslide dam.

**(6) Scale of urgent countermeasure works**

Based on experience of landslide disasters, landslides were activated if safety factor decreased at 5% and stop the movement if safety factor increased at 5%.

ガイドライン９（地すべり対策工設計）

# Guideline on Design of Landslide Countermeasure Facilities

## 1. General provision

Landslide countermeasure facilities are designed for functional and safe facilities, based on the layout plan of landslide countermeasure facilities.

In the design, the durability of the facilities is important and the materials for the facilities are selected, considering the durability of the facilities. The aged deterioration of the function of the facilities is also to be considered. The construction cost of the facilities should include maintenance cost.

## 2. Design of control works

### 2.1 Surface water drainage works

Surface water drainage facilities in landslide area may be deformed due to the activity of the landslide, and thereby, the following points to should be considered in the design of the facilities.

- Flexibility: The facilities should function, even if the facilities are deformed on some level.
- Easy repairing: The facilities may be damaged due to landslide activity, and thereby, the facilities should be designed, considering easiness in repairing.

#### 2.1.1 Water channel works

Water channel facilities consist of water collecting parts and drainage parts. A layout of the facilities is shown in Figure 1. In addition to the facilities in landslide area, water channel facilities are installed, surrounding the area to prevent the inflow of surface water to the landslide area.

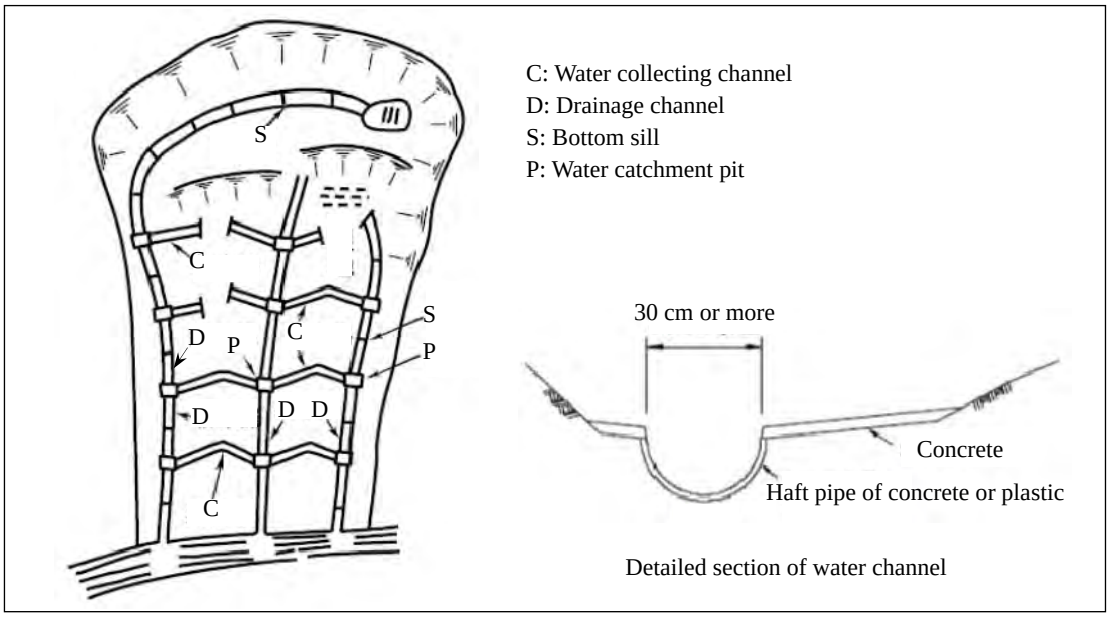



Figure 1 A layout of water channel facilities

Key points for the design of the channel facility are as follows.

1) The base of the channel is prepared with excavation but not with embankment for efficient

water drainage as shown on a detailed section in Figure 1. The layout of the channel is determined, so that the excavation for the channel can be minimized.

2) It is recommendable to make the section of the channel to be wider and shallower, considering maintenance of the channel facility. The diameter of the half pipe is 30 cm or more.
3) Base of the half pipe is filled with impervious materials such as compacted clayey materials or soil cement, in order to filtration of collected water through cracks of the pipes. Water catchment pits are installed at the junction of two channels and bending points of a channel. Both side of the channel is covered with concrete, soil cement, or asphalt to prevent erosion and water infiltration.
4) The dimension of the section of main channel is determined, based on estimated high-water discharge. For the estimation of the high-water discharge, exceedance probability of precipitation in 50 years will be used. The cross-section area of the channel is designed to be more than 120% of calculated high-water discharge, considering the possibility of sedimentation in the channel.
5) In case that water catchment pit is a hydraulic drop structure, the width of the pit is calculated with the following formulae (see Figure 2).

$$L = k\,(h_1 + t)$$

where,

$L$: Length of pit (m)

$k$: 2.5 – 3.0

$t$: Depth of water flow in upstream and downstream channels (m)

$h_1$: Relative height between the bottoms of upstream and downstream channels (m)

$h_2$: Depth of water in pit (0.2 m to 0.5 m)

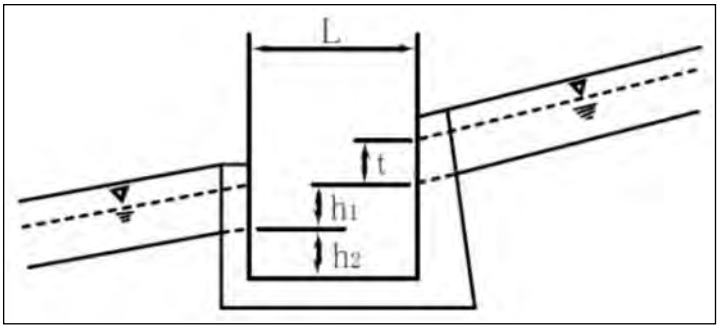



Figure 2 Section of water catchment pit

6) In case that a channel is installed in the area of high groundwater level, drainage culvert is also installed with the channel.
7) Figure 3 shows a standard design of water catchment pit and drop structure. The structures are located to be 20 m to 50 m interval.

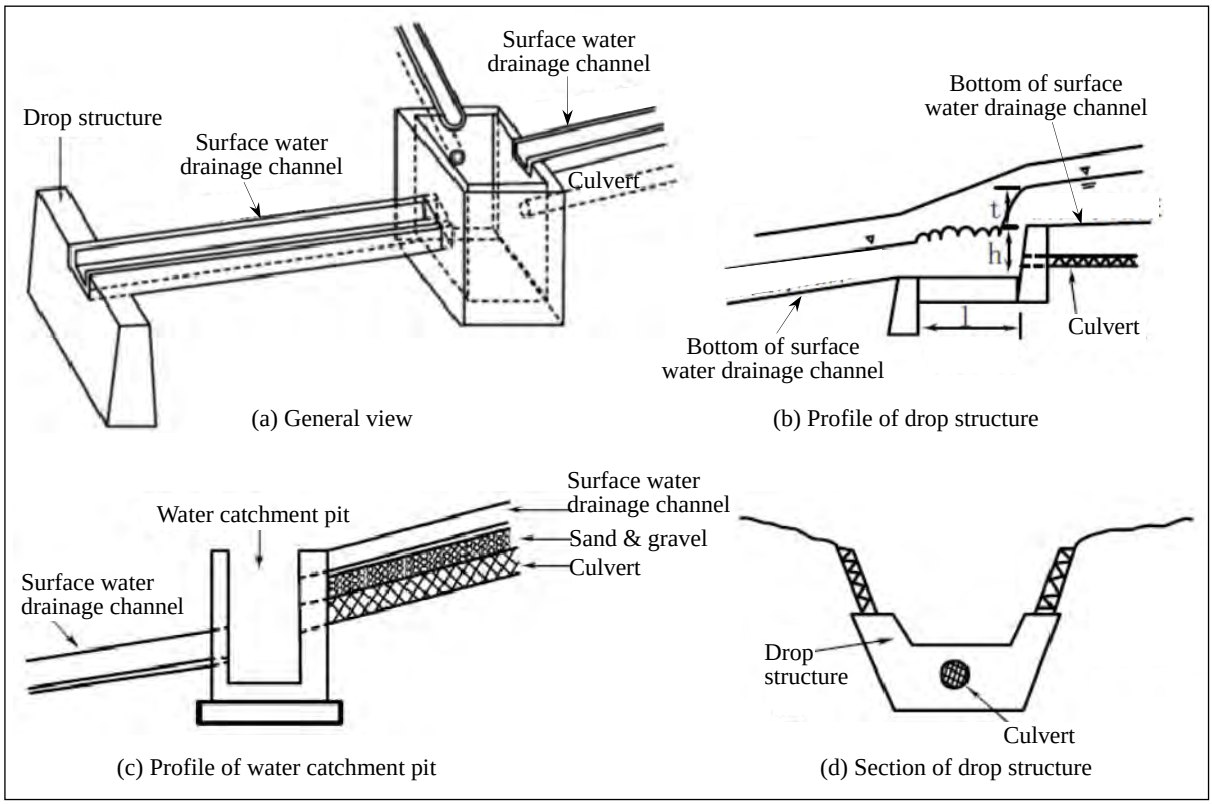



Figure 3 Standard design of water catchment pit and drop structure

8) Materials of the water channel are U-shape reinforced concrete, concrete half pipe, plastic half pipe, steel half pipe, etc. In case that deformation of the channel is foreseen, ductile pipes will be selected.
9) Concrete cover on the ground surface beside the channel is effective against erosion and infiltration as well as against grasses, which may turn down into the channel.
10) Regular inspection and necessary repairing of the facilities is required, since the facilities may be damaged due to movement of landslide.

### 2.1.2 Seepage prevention works

Seepage prevention works are mainly as follows.

1) Filling out works

   Cracks on the ground are filled with clayey materials, concrete, or soil cement. Since quick implementation is possible, the works can be applied as an urgent measure.

2) Plastic sheet cover works

   Cracks on the ground are covered with plastic sheets. Since quick implementation is possible, the works can be applied as an urgent works.

3) Seepage prevention works

   In case that seepage from pond or lakes occurs, the bottom of the ponds or lakes is covered with impervious materials such as asphalt.

## 2.2 Groundwater drainage works

For the design of groundwater drainage works, points to be considered are groundwater level, situation of landslide, safety and easiness of maintenance of the facilities, etc.

### 2.2.1 Shallow groundwater drainage works

#### (1) Culvert works

Points to be considered for the design of culvert works are as follows.

1) The layout of the culverts is determined, considering with the conditions of soil and groundwater.
2) The length of one piece of culvert is 20 m and it is to be straight. Water catchment pits are installed to avoid clogging of the culverts as well as re-infiltration of collected water to the ground from the culverts.
3) The depth of the culverts is about 2 m from the ground, and impervious sheets are put on the bottom (excavated surface). In order to prevent piping of the ground, drain filter is installed around the culvert as shown in Figure 4.
4) For effective ground water collecting, filter materials such as sand & gravel is filled between the culvert and buck-fill materials as shown in Figure 4.

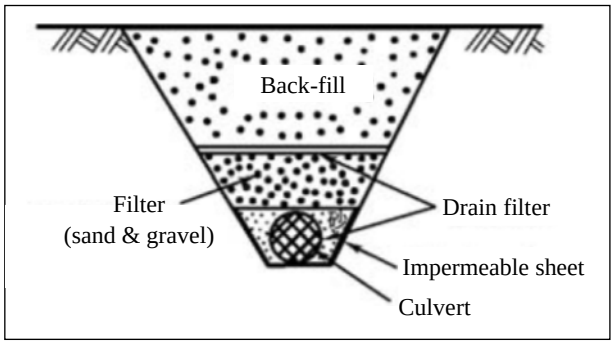



Figure 4 Typical section of culvert works

5) In case that surface water is also collected with the culvert works, the filter materials (sand & gravel) are filled up to the ground surface, instead of back-fill in Figure 4.
6) The material of the culvert is perforated pipe or gabion, which should be flexible and durable against deformation due to landslide movement. In case that the culvert works are installed on steep slopes, piles are installed to fix the culvert as shown in Figure 5.

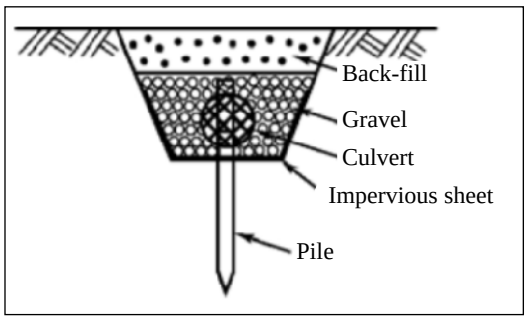



Figure 5 Culvert with pile for fixing

### (2) Open channel and culvert works

Key points for the design of open channel and culvert works are as follows see Figure 6).

1) The length of the channel and culvert should not be long, since there is possibility of re-infiltration. The length is determined, according to actual situation of particular site.
2) In general, collected groundwater with the facility is led to water catchment pits and drop structures, installed with an interval of 20 m long as shown in Figure 7.

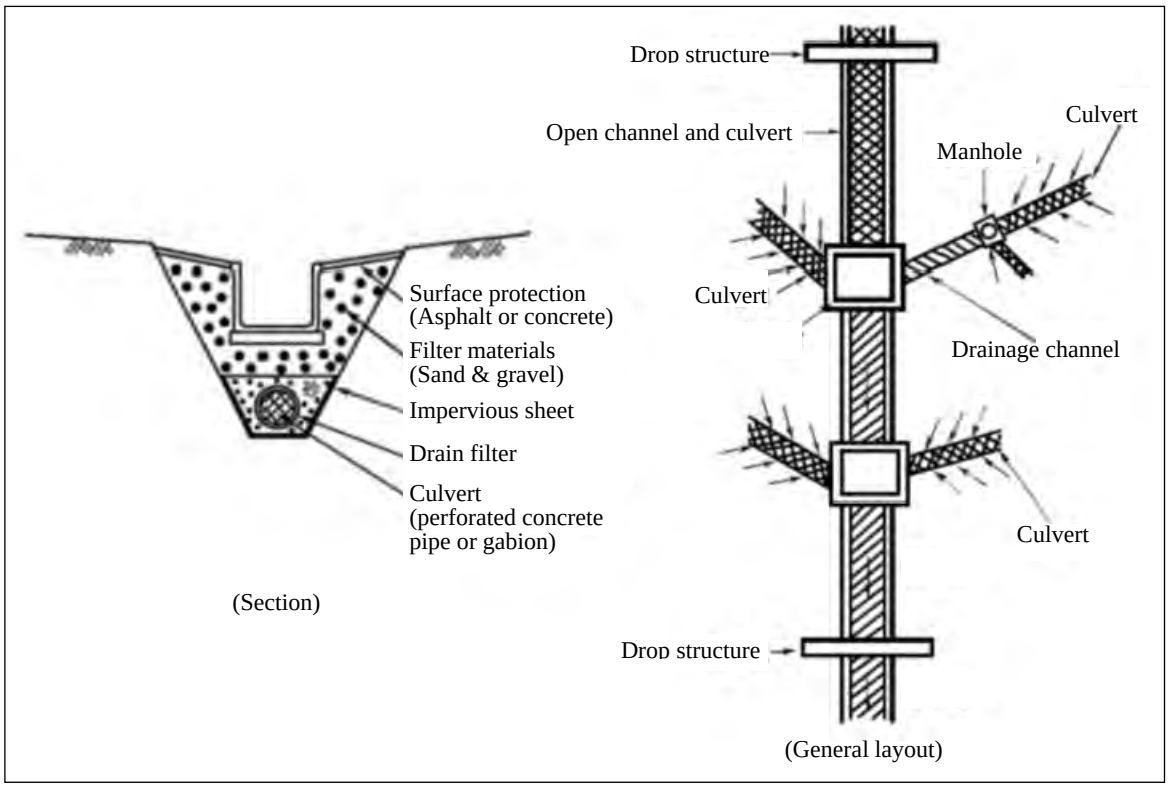



Figure 7 Section and layout of open channel and culvert structure

### (3) Horizontal drilling works

Figure 8 shows a section of horizontal drilling for drainage of groundwater.

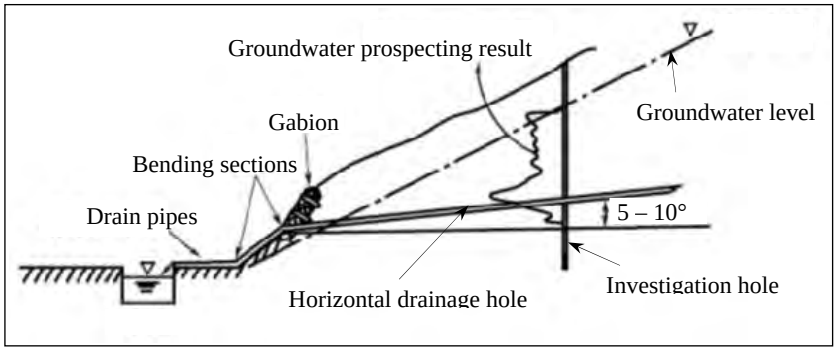



Figure 8

Key points for design of the horizontal drilling facilities are as follows.

1) Horizontal drilling holes are designed to penetrate the ground where shallow groundwater accumulated. The drilling holes are arranged to be radial or parallel pattern on plan with a

distance between front end edges of 5 m to 10 m as shown in Figure 9. The length of a hole is designed, so that the drilling hole extends up to stable foundation for 5 m to 10m after penetrating sliding surface.

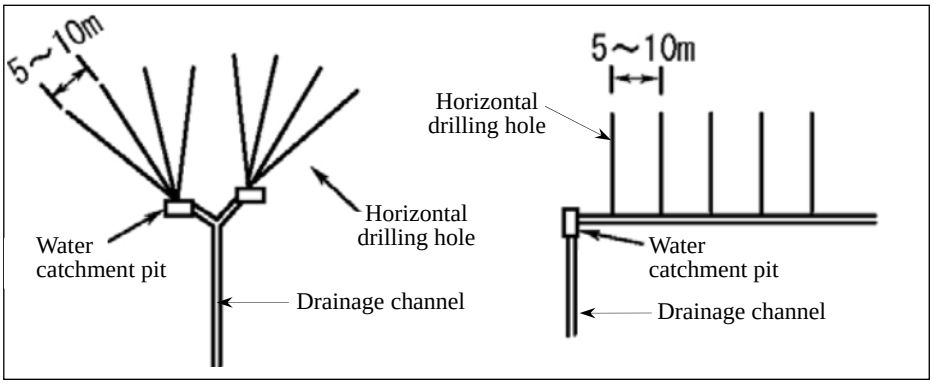



Figure 9 Arrangement of horizontal drilling holes

2) Collected groundwater is led to water catchment pits or drainage channel and transported to the outside of the landslide area.
3) The drilling holes are set up on the ground after removing loosened materials. In order to prevent erosion or collapse due to drained groundwater, surface protection is installed as shown in Figure 10.

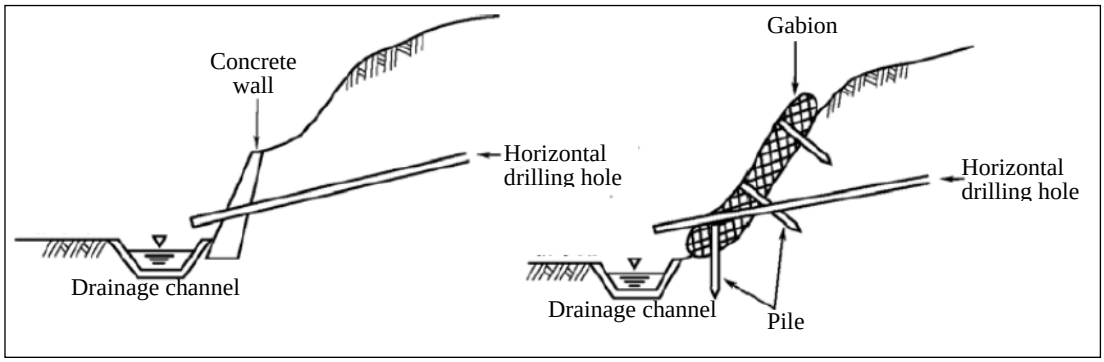



Figure 10

4) The inclination of the drilling holes is 5° to 10° upward, so that groundwater flows out by gravity.
5) The diameter of the holes is basically 66 mm, it is enlarged if the ground is low-permeable (clayey ground).
6) Pipes are installed in the hole to prevent the collapse of the hole. The inner diameter of the pipes is 40 mm or more, and the perforated pipes are installed to the sections of aquifers.
7) Groundwater discharge from the horizontal drilling hole should be confirmed or measured on a regular basis. In case that the discharge is reduced due to clogging, etc., flushing of the holes should be done.

### 2.2.2 Deep groundwater drainage works

#### (1) Horizontal drilling works

In addition to the key points mentioned in sub-clause 2.2.1 (3), key points for the design of deep

groundwater drainage drilling facilities are as follows.

1) The length of the horizontal drilling holes is about 50 m for drainage of groundwater from aquifers, and the diameter of the holes is 66 mm or more.
2) The inclination of the holes is basically 5° to 10° upward. In case of drainage from confined aquifers, drilling may be done downward, so that groundwater flows out as spring (pressured water flow).

**(2) Groundwater collecting well works**

Groundwater collecting well is installed at relatively stable ground, and groundwater collecting holes are installed from the wall of the well as shown in Figure 11. The location of the well is determined, according to geology and conditions of the ground through investigation.

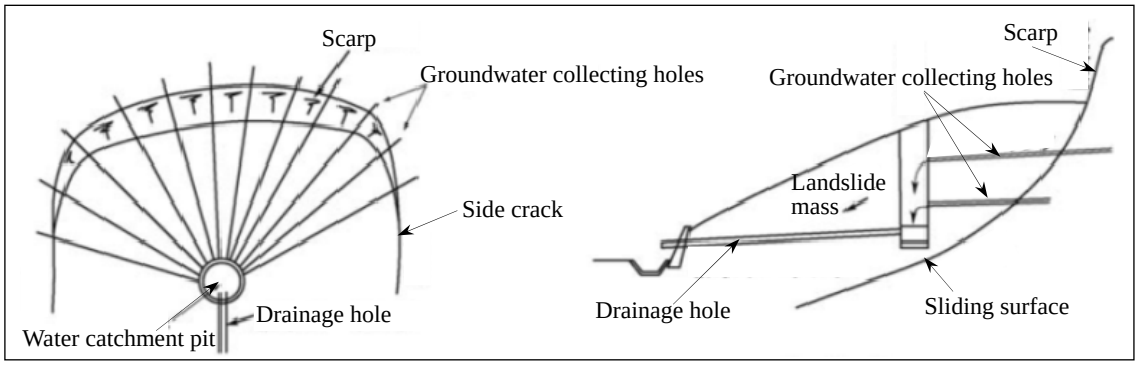



Figure 11 General view of groundwater collecting well

In case of the installation of wells at two locations or more due to wide distribution of groundwater, the locations should be properly arranged, considering the area of the groundwater lowering with a well and the length of groundwater collecting drill holes. Collection of groundwater is expected through groundwater collecting holes, while no groundwater outflow is expected from the wall of well.

During the excavation of the well, it is possible to observe the geology and soil condition of landslide as well as the depth and condition of the sliding surface. Undisturbed samples can also be taken during the excavation works. It is thereby desirable to utilize this opportunity for investigation purpose.

Since the materials of landslide mass is usually weathered and loosened, it is necessary to pay careful attention to safety of the construction works.

**(a) Depth of groundwater collecting well**

The depth of the well is basically as follows.

- For rather active landslide, the bottom of the well is at upper level than that of the sliding surface for 2 m or more, in order to avoid damage to the well due to the movement of the landslide.
- For relatively stable landslide, the bottom is in stable foundation, 2 m to 3 m lower than the level of sliding surface. In many cases of relatively stable landslide, the level of sliding surface and aquifers are not clearly identified, and thereby, the well is installed up to the

stable foundation for efficient drainage of groundwater.

It is recommendable to minimize the construction period of the well, especially in rather active landslide, since loosening of soil and increasing of earth pressure are foreseeable during construction.

**(b) Structure of groundwater collecting well**

Groundwater collecting well is cylindrical shape with diameter of 3.5 m to 4.0 m. The diameter will be larger, in case that the ground to be excavated consists of gravel, hard rocks, fractured rocks, etc., which makes drilling from the well difficult.

The inner space of the well is basically to be open for the maintenance of water collecting and drainage holes. In case of possibility of collapse of the well due to landslide movement, the inner space is filled with cobbles or boulders as a tentative measure.

In order to prevent infiltration of collected water to the ground, the bottom of the well is covered with concrete of about 50 cm thick.

The lining materials of the well is generally steel plates (liner plates) and reinforced concrete, and the materials will be selected, based on easiness of transportation and total costs, both for construction and maintenance.

At the upper end of the well structure on the ground, the liner plates or lining concrete will extend to be about 1 m higher than the ground level, covered with canopy, and surrounded with fences. A ladder or footsteps is installed inside the well to go down.

**i) Design of groundwater collecting well of steel plates**

Load to the well structure is considered to be earth pressure only, but not hydraulic pressure. The earth pressure is considered to be active earth pressure only, but earth pressure generated with landslide movement is not included, basically. If necessary, the pressure due to landslide movement can be considered to be added. In case that deformation of the well is foreseen, the well is reinforced with lateral struts and/or vertical stiffeners as shown in Figure 12. Uneven earth pressure is also considered for the design, if it is foreseen.

The thickness of lining materials is determined to secure strength against buckling, based on the maximum earth pressure ($P_{max}$) behind the lining.

$$q_A = \frac{3 \cdot E \cdot I}{f \cdot R^3} > P_{max}$$

where,

$q_A$: Allowable outer pressure around the lining of the well (kN/m$_2$)

$E$: Young' modulus (kN/m$_2$)

$I$: Moment of inertia of area for 1-m section (m$^4$/m)

$0.8I_0$: Effective moment of inertia is used for perforated lining

$I_0$: Moment of inertia is used for non-perforated lining

$f$: Safety factor (1.5 to 2.0)

$R$: Radius of the well (m)

$P_{max}$: The maximum earth pressure, acting to the well

The above-mentioned formula is for thin cylindrical lining with poison ration of zero, considering effect of corrugated steel plate. In case that the strength of the lining does not satisfy, reinforcement with H-shape steel bar is installed inside the lining.

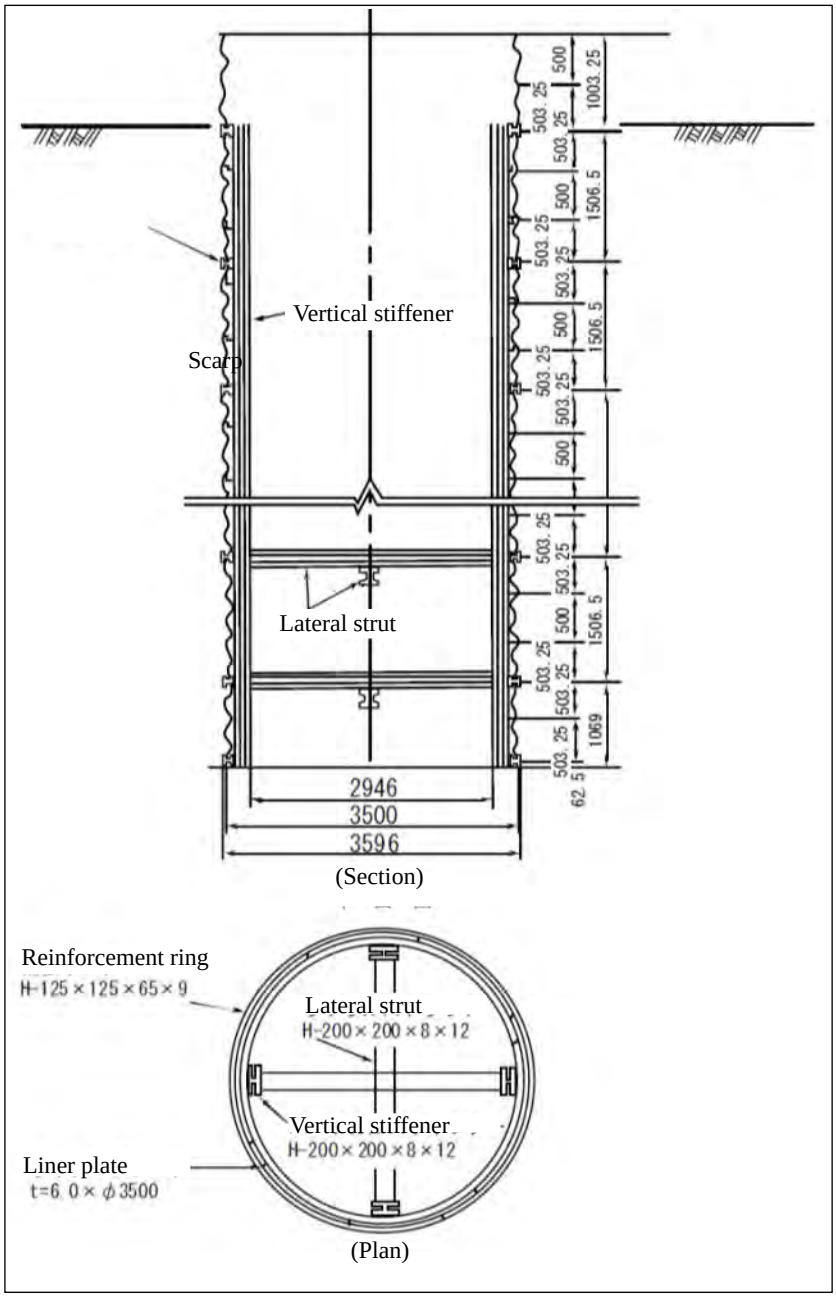



Figure 12 Groundwater collecting well with liner plates

For the calculation of the maximum earth pressure, Terzaghi's Formula and Rankine's Earth Pressure Theory, which arch-action of surrounding soil is taken into account, are used. In practical, it is considered that earth pressure does not act at shallow ground of 15 m deep or less, and earth pressure is considered as triangular distribution of static earth pressure as shown in the following formulae.

$P_h = k \cdot \gamma \cdot h$ $h$<15 m

$P_h = 15 \cdot k \cdot \gamma$ $h$=>15 m

where,

$P_h$: Earth pressure (kN/m$^2$)

$k$: Static earth coefficient (0.5)

$\gamma$: Unit weight of soil layer (kN/m$^3$)

$h$: Depth from ground surface (m)

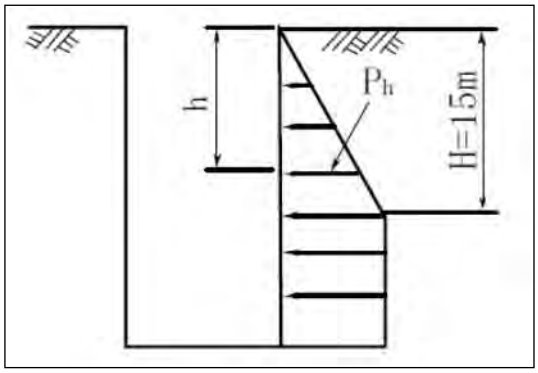



Figure 13 Earth pressure to the sidewall of a well

**ii) Design of groundwater collecting well with reinforced concrete**

This type of well is applied for the following cases.

- The well is subsided with its own weight, due of soft and homogeneous ground such as sand.
- The ground is subject to boiling or liquefaction due to high content of groundwater.
- The ground is subject to heaving such as soft clayey ground with confined groundwater pressure.

**(c) Drainage hole**

Drainage of collected groundwater is done basically through drainage holes by gravity flow. Drainage with pumps or other machinery is not recommended, since the suspension of drain due to machine trouble causes the increase of groundwater level and re-activation of the landslide. In addition, it should be considered that operation cost of the forced drainage is high.

The maximum length of the drainage holes is 80 m in general, and steel pipes are installed in the hole with the inner diameter of 80 mm to 100 mm. In case that much groundwater is collected, much large diameter of the pipes is used or an additional drainage hole is installed.

In case that the drainage hole becomes too long, a transmission well is installed, at about 70 m to 80 m from the groundwater collecting well, and both wells are connected with drainage holes.

The outlet of the drainage hole is generally located in the landslide area, and grained groundwater is led to the outside of landslide area through open channel. The ground slope around the outlet of drainage holes is protected against erosion with gabion, concrete wall, etc.

**(d) Groundwater collecting holes**

Groundwater collecting holes are installed, arranging in radically at one to several level in each layer of aquifer. The length of the hole is basically 50 m and extends to be 80 m to 100 m,

depending on the location of the target aquifer.

The details of the holes such as location, direction, interval, and number are determined, based on geology and groundwater conditions, clarified in investigation. The details should be adjusted, according to actual situations encountered during the construction. The pipes installed in the holes are perforated hard PVC pipes with the diameter of 40 mm or more.

**(3) Drainage tunnel works**

Drainage tunnel works are applied for large landslides with thick landslide mass, since groundwater collecting wells and drainage drilling is not applicable because of required depth is too much. Drainage tunnel works are also applied for landslide with big movement, since construction of wells and drill holes are difficult in active landslides.

The drainage tunnel is usually constructed in stable foundation to secure stability of the tunnel as shown in Figure 14, and groundwater is drained from groundwater collecting holes, installed from the tunnel or groundwater collecting wells, connected with the tunnel.

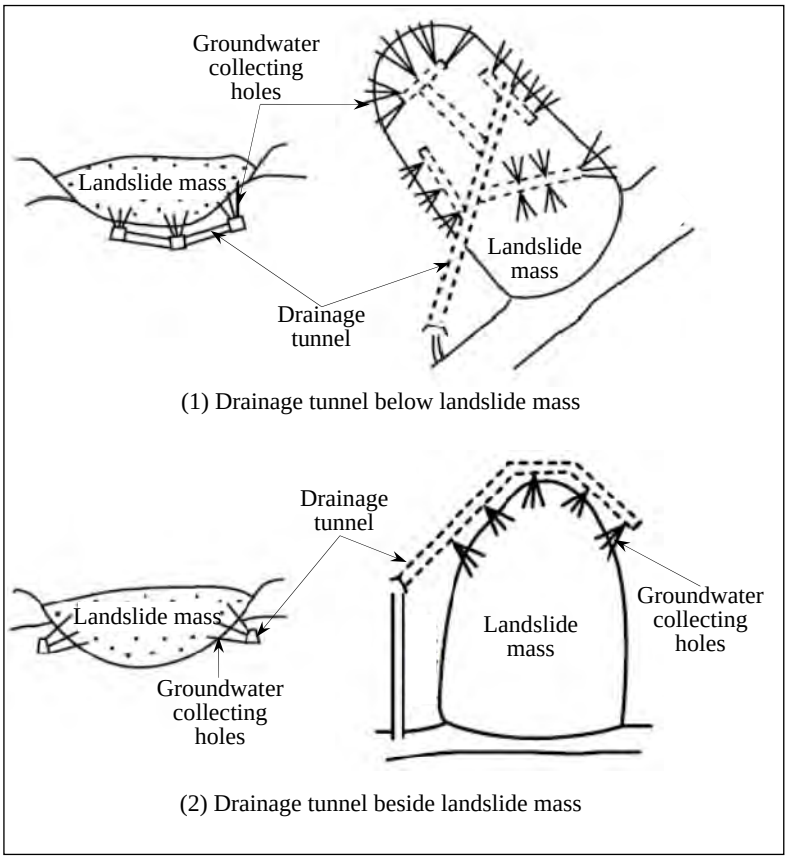



Figure 14 Drainage tunnel works

Key points for the design of drainage tunnels are as follows.

**(a) Layout of drainage tunnel**

Even though drainage tunnel is constructed in stable foundation, the foundation may be loosened around the landslide mass. It is thereby necessary to keep distance between the tunnel and sliding surface, twice of the tunnel diameter or more. On the plan, the tunnel is designed along scarp and side cracks, where accumulated groundwater can be efficiently drained. The

tunnel portals should be located on stable and firm ground.

**(b) Longitudinal gradient of drainage tunnel**

Drainage tunnel should be declined to the portal in order to drain the collected groundwater by gravity. The longitudinal gradient of the tunnel is generally 15/1,000 or less.

**(c) Design of drainage tunnel section**

The shapes of the tunnel section are variable such as horse-shoe, circular, semicircular, trapezoidal, rectangular, etc. as shown in Figure 15, depending on material to be used, construction method. The inside of the tunnel is protected with lining and basically open for maintenance. The dimension (size) of the tunnel is determined, considering workability and total cost (construction and maintenance cost). The lining materials are concrete, liner plates, corrugated pipes, etc.

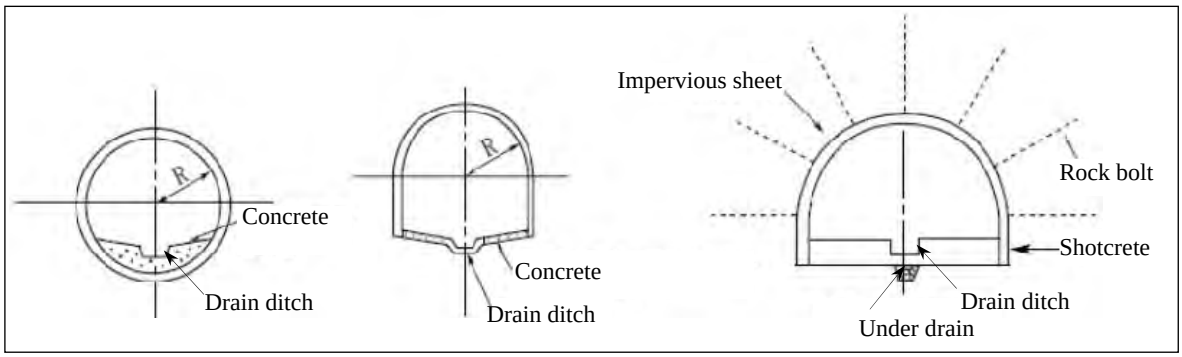



Figure 15 Sections of drainage tunnel

**(d) Emergency evacuation tunnel**

In case that the length of the tunnel exceeds 1,000 m long, it is necessary to construct shafts or inclined tunnels for emergency evacuation.

**(e) Collection of groundwater**

The function of groundwater drainage is basically expected through groundwater collecting holes, installed from the tunnel. The groundwater collecting holes is designed horizontal to upward in radial pattern. The details of the groundwater collecting holes are determined, considering the angle and length of the hole, distance to the target aquifer, length of intersecting section of the hole and the aquifer, etc. In the tunnel, chambers with larger space for drilling works are designed for efficient drilling works. The length of the holes and pipes to be installed in the holes are the same what explained in sub-clauses 2.2.1 (3) and 2.2.2 (1).

**(f) Drainage of collected groundwater**

On the invert of the tunnel, the same structure as groundwater drain channel is installed, in order to prevent re-infiltration of collected groundwater from the invert to the ground. In case that liner plates or corrugated pipes are used for the lining of the tunnel, there is possibility of leakage from loosened portions of joints or connecting bolts. To prevent leakage of collected groundwater to

the ground, drain ditch made of concrete is installed on the invert of the tunnel.

**(g) Earth pressure, acting to drainage tunnel**

Earth pressure, acting to the drainage tunnel is determined, considering geology, the inner area of the tunnel, construction method, type of lining, characteristics of the ground, etc. Table 1 shows references for the determination of earth pressure.

Table 1

| Condition of the ground | Height of earth load (m) | Remark |
|---|---|---|
| a) Hard and not deteriorated | 0 | In case of fall of rock pieces or rock-burst, tunnel support is installed. |
| b) Hard and layered or schistose | 0 – 0.5B | Simple tunnel support is installed. Load is irregularly changed. |
| c) Blocky with sparse joints | 0 – 0.25B | |
| d) Blocky with moderate joints | 0.25B – 0.35 ($B+H_t$) | No lateral pressure. |
| e) Blocky with dense joints | (0.35 – 1.10) ($B+H_t$) | No or small lateral pressure. |
| f) Fractured without chemical deterioration | 1.10 ($B+H_t$) | Considerable lateral pressure. |

(1) This table shows earth load, acting to arch-shape steel support, in case of earth cover of 1.5 ($B+H_t$) or more.
B: The width of tunnel section
$H_t$: The height of tunnel section
(2) The condition is that groundwater level is higher than the crown of the tunnel.
In case that groundwater level is lower than the tunnel level, the values for d) to f) can be reduced 50%.

**(h) Material of tunnel support**

Wooden or steel bars are used for tunnel support. In general, wooden support is used for the rock foundation or some cases that back-filling will be done in short time after the excavation. Steel bars are used for tunnel sections where earth pressure is acted or some cases that back-filling will be done in certain duration after the excavation. Recently, NATM (New Austrian Tunneling Method, using shotcrete and rock bolts) is applied.

**(4) Other methods**

Groundwater drainage with drilling holes of large diameter (300 mm to 600 mm) is applied, in case that damage to groundwater collecting pipes or clogging of perforated pipes is foreseen.

## 2.3 Soil removal works

Soil removal works is carried out at the higher slope in landslide mass for stabilization of landslide area. Based on stability analysis, the location and volume of removed soil, direct height and gradient of the excavated slope, etc. are determined.

Key points for the design of soil removal works are as follows.

### 2.3.1 Excavated slope

Figure 16 shows a typical section of soil removal works. The gradient and direct height of the excavated slope are determined, based on geological condition, etc., clarified in investigation, considering deterioration of the surface on the excavated slope in long term.

In case of soft rocks, the gradient of excavated slopes is 1:0.5 to 1:2.0 with berm of 1.0 m to 2.0 wide at an interval of direct height of about 7 m.

For sandy slopes, the gradient of excavated slopes is 1:1.0 to 1:1.5 with berm of 1.0 m to 2.0 m for each 5 m to 10 m direct height.

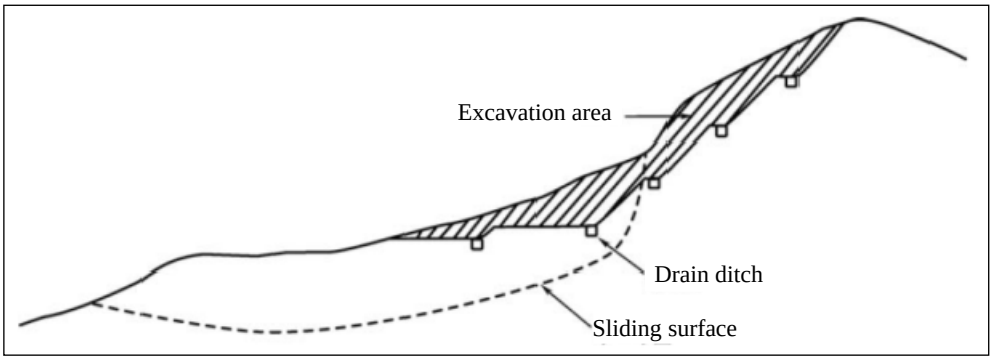



Figure 16 Typical cross section of excavated slope for soil removal works

### 2.3.2 Stability of slopes behind the target excavated slope

In case that the slopes located upper elevation of the target slope has possibility of instability, the excavation of the target slope may cause new landslide on the upper slopes. It is thereby required to clarify the stability of the slopes above the target slope before the application and detailed design of this works.

### 2.3.3 Protection of excavated slope

Excavated slopes are subject to softening and erosion due to rain fall and dry-wet repeating condition. It is thereby necessary to install drainage facilities such as drain ditches on berm.

In order to prevent erosion and weathering on the slope, protection with vegetation or structures is installed on the surface of the excavated slope: In case that erosion and weathering cannot be prevented with vegetation, the slope is protected with combined works among vegetation, masonry, retaining walls, shotcrete, etc.

## 2.4 Counterweight embankment works

Figure 17 shows general section of counterweight embankment.

Counterweight embankment works are designed for increasing resisting force against sliding force by means of embankment on the toe portion of a landslide. The area and volume of the embankment are determined through stability analysis.

For the design of the counterweight embankment, the stability of base of the embankment is checked, based on the existing investigation results. Since base of the embankment is loosened materials of landslide mass and soft materials around the landslide, it is possible that the materials are collapsed due to the weight of the embankment.

The height of the counterweight embankment and the gradient of embankment slope are determined, based on the soil properties of materials to be embanked and materials of the ground at the base. In general, the gradient of embanked slope is H:L = 1:1.5 to 1:2.0 with berm of 1.0 m to 2.0 m at each direct height of 5.0 m. It is required to install drain ditches on the berm.

Natural springs or horizontal drilling facilities are located at the toe of landslide mass, and

thereby, it is necessary not to disturb the outflow of groundwater with the counterweight embankment. In case that shallow aquifer is distributed in the counterweight embankment area, the outlet of the shallow aquifer may be closed due to the embankment. If the outlet is closed, the bank pressure to the embankment increases, and consequently, the embankment may become unstable. It is necessary to install drain behind the embankment, so that the outflow from shallow aquifer is secured.

Embanked slopes are subject to erosion and collapse due to rain fall, and thereby, the protection of the slopes is required. Planting works, gabion works, and flame works are applied for the protection, while rigid structures such as concrete pitching are not recommendable.

For the protection of the toe of the embanked slopes, gabion, concrete flame, block pitching walls, etc. are installed. In case that concrete gravity walls are applied, it is necessary to clarify the condition of the foundation, so that collapse or landslide should not occur due to the construction of the wall.

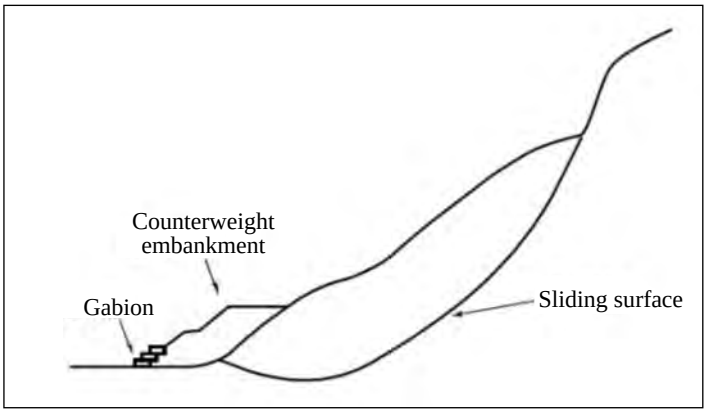



Figure 17 General section of counterweight embankment

## 2.5 Erosion control works with river structures

If the toe of a landslide is eroded, the landslide may become unstable and/or activated. In order to prevent such situations, river structures for erosion control are installed.

In case that river structures are installed on riverbed just downward of a landslide, sedimentation occurs at the toe of the landslide. It is expected that the river structure with sedimentation will be functioning as counterweight embankment as well as river erosion control. Key points of the design of the structures are as follows.

1) Excavation for the construction of the structures should be minimized, so that the excavation will not affect the stability of the landslide.
2) Groundwater drainage facilities may be installed with the river structures, in order to prevent raising groundwater level in the landslide mass.
3) In case that river structures are installed in active landslide area, the structure should be flexible one and safe against river flow.

## 3. Design of prevention works

### 3.1 Pile works

Pile works are designed for providing required deterrence force, considering geomorphology and geology of the landslide area.

In the design work, it is necessary to examine stability of the pile against its internal stress, when required deterrence force acts to the pile. Other matters to be examined are destruction due to movement of landslide mass on the upper slope, destruction of the foundation of the pile, and sliding-down of landslide materials through the space between two piles.

#### 3.1.1 Classification of piles by function

Preventive pile works can be classified into the follows, based on the function as show in Figure 18.

1) Bending pile

   Bending pile is designed on the condition that shear force and bending stress are acting to the pile, according to deformation of landslide mass. The bending pile is divided into wedge pile and deterrence pile.

   a) Wedge pile

      When pile is moved with landslide mass, the pipe is bending at the sliding surface. The design is based on shear force and bending stress on the condition that sliding force of landslide mass acts at the level of sliding surface.

   b) Deterrence pile

      In case that reaction of the ground cannot be expected, the pile is designed as a cantilever, on the condition that sliding force of landslide mass acts to the pile as distributed load or concentrated load.

2) Shear pile

   Shear pile is designed on the condition that landslide mass is not deformed during the movement (no bending force acts to the pile) and sliding force acts at sliding surface as concentrated force. The design is carried out, based on shear force only.

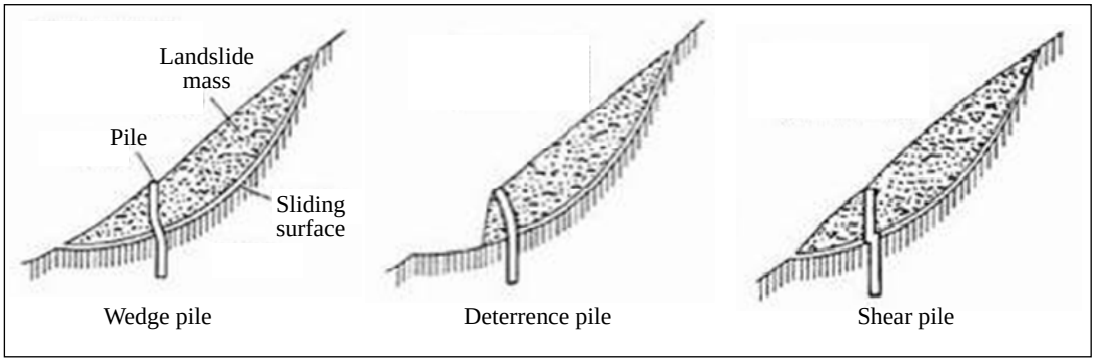



Figure 18 Illustrated section showing function of piles

### 3.1.2 Conditions of application of pile works

It is necessary to check applicable conditions of pile works. Many cases of past records show that thickness of moving mass is 20 m or less. The applicable conditions are as follows.

- Pile works are not applicable for soft ground
- The ground should not divided into small blocks by many cracks
- The construction can be done in stable situation

In the design, the pile is considered to be an elastic body and subgrade reaction is expectable, except for deterrence pile.

For the shear pile, it is necessary to check that flexural fracture of the pile does not occur.

### 3.1.3 Horizontal bearing force of pile

There are several formulae to calculate effect of pile. But, the calculated effect of pile is breakdown strength of landslide mass surrounding the pile on the condition that pile is rigid and has infinite strength. Actually, it is not possible that a pile has infinite strength. In practical way, the number of piles is calculated, based on realistic strength of pile, so that required deterrence force per unit width can be obtained.

The simple calculation of required deterrence force of pile per unit width (Pr; kN/m) is done with the following formulae.

$$P.Fs = \frac{\sum(W \cdot cos\theta - U) \cdot tan\,\varphi' + c' \cdot \sum l + Pr}{\sum W \cdot sin\theta}$$

$$Pr = P.Fs \cdot \sum W \cdot sin\theta - \sum(W \cdot cos\theta - U) \cdot tan\varphi' - c' \cdot \sum l$$

where,

*Pr*: Deterrence force of pile per unit width (kN/m)

*P.Fs*: Design safety factor

*W*: Weight of a slice

*U*: Pore pressure, acting to a slice (kN/m)

*l*: Length of sliding surface of a slice (m)

*θ*: Angle of inclination of sliding surface ( °)

*φ'*: Internal friction angle of sliding surface ( °)

*c'*: Cohesion of sliding surface (kN/m$^2$)

In case that pile works and other control works are combined, above-mentioned U, W, and I are reduced as much as the control works provide, and then, required deterrence force of pile is calculated.

### 3.1.4 Location of pile works

The location of pile works should be at compression area in the lower portion of sliding mass where the gradient of sliding surface is gentle. In addition, the thickness of moving mass is relatively thick at the location, so that passive destruction of the ground does not occur.

In case that the target area of countermeasure works is limited in the upper portion of a landslide,

the location of the pile may be at tension area where the gradient of the sliding surface is steep. In such case, the design should be done on the condition that subgrade reaction is not expected due to moving down of sliding mass at the lower portion of the pile.

The location of pile installed at compression area is basically determined in the following procedure (see Figure 19).

- On the critical section of the landslide, the landslide mass is divided in several slices.
- For each slice, sliding force (*Ti*) and deterrence force (*Ri*) is calculated with the formulae below.
- After accumulating *Ti* and *Ri* from the toe, and the location of the pile is determined in the area of slices which show "Σ *Ri*>Σ *Ti*".

$$Ti = Wi \cdot sin\theta i$$

$$Ri = (Wi \cdot cos\theta i - Ui) \cdot tan\,\varphi' + c' \cdot li$$

where,

*Ti*: Sliding force of a slice (kN/m)

*Ri*: Deterrence force of a slice (kN/m)

*Wi*: Weight of a slice (kN/m)

*Ui*: Pore pressure, acting to a slice (kN/m)

*li*: Length of sliding surface of a slice (m)

*θi*: Angle of inclination of sliding surface ( °)

*φ'*: Internal friction angle of sliding surface ( °)

*c'*: Cohesion of sliding surface (kN/m$^2$)

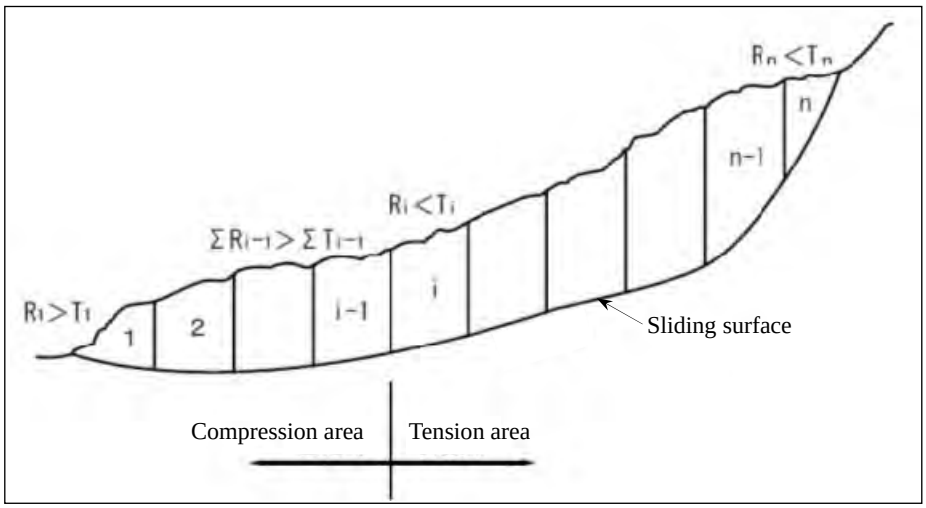



Figure 19 Compression and tension areas in landslide

Much reliable way of identification of compression and tension areas is based on actual measurement results of movement by means of installing ground extensometers continuously from the top to toe on the section.

Another check point for the determination of the location of the pile works at the toe of the landslide is to avoid passive destruction of the ground due to the weight of landslide mass at the

upper portion from the location of pile as shown in Figure 20.

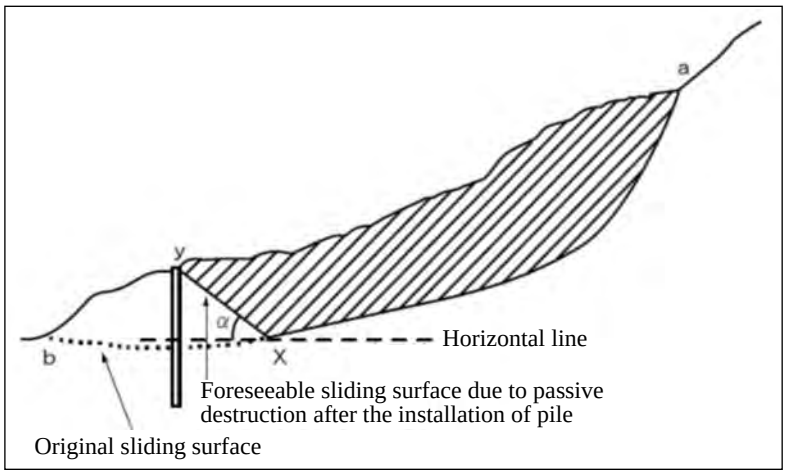



Figure 20 Passive destruction on the upper level of pile

In order to avoid the passive destruction, the location of pile is determined, based on the following formulae. At the location of the pile, "*P.Fs'* ≥ *P.Fs*" should be satisfied.

$$P.Fs = \frac{\sum\{(W_{ab} \cdot cos\theta - U_{ab}) \cdot tan\,\varphi' + c' \cdot l_{ab}\} + Pr}{\sum W_{ab} \cdot sin\theta}$$

where,

*P.Fs*: Safety factor along the original sliding surface after installation of pile [a b]

*Pr*: Deterrence force of pile per unit width (kN/m)

$W_{ab}$: Weight of a slice along the original sliding surface [a b] (kN/m)

$l_{ab}$: Length of sliding surface of a slice along the original sliding surface [a b] (m)

$U_{ab}$: Pore pressure, acting to a slice along the original sliding surface [a b] (kN/m)

$\theta$: Angle of inclination of the original sliding surface [a b] ( °)

$\varphi'$: Internal friction angle of the original sliding surface [a b] ( °)

$c'$: Cohesion of the original sliding surface [a b] (kN/m$^2$)

$$P.Fs' = \frac{\sum\{(W_{ax} \cdot cos\theta_{ax} - U_{ax}) \cdot tan\,\varphi'_{ax} + c'_{ax} \cdot l_{ax}\} + \sum\{(W_{xy} \cdot cos\theta_{xy} - U_{xy}) \cdot tan\,\varphi'_{xy} + c'_{xy} \cdot l_{xy}\}}{\sum W_{ax} \cdot sin\theta_{ax+} \sum W_{xy} \cdot sin\theta_{xy}}$$

where,

*P.Fs'*: Safety factor along the foreseeable sliding surface after installation of pile [a x y]

$W_{ax}$: Weight of a slice along the foreseeable sliding surface [a x] (kN/m)

$W_{xy}$: Weight of a slice along the foreseeable sliding surface [x y] (kN/m)

$l_{ax}$: Length of sliding surface of a slice along the foreseeable sliding surface [a x] (m)

$l_{xy}$: Length of sliding surface of a slice along the foreseeable sliding surface [x y] (m)

$U_{ax}$: Pore pressure, acting to a slice along the foreseeable sliding surface [a x] (kN/m)

$U_{xy}$: Pore pressure, acting to a slice along the foreseeable sliding surface [x y] (kN/m)

$\theta_{ax}$: Angle of inclination of the foreseeable sliding surface [a x] ( °)

$\theta_{xy}$: Angle of inclination of the foreseeable sliding surface [x y] ( °)

$c'_{ax}$: Cohesion of the foreseeable sliding surface [a x] (kN/m$^2$)

$c'_{xy}$: Cohesion of the foreseeable sliding surface [x y] (kN/m$^2$)

$\varphi'_{ax}$: Internal friction angle of the foreseeable sliding surface [a x] ( °)

$\varphi'_{xy}$: Internal friction angle of the foreseeable sliding surface [x y] ( °)

$$\alpha = 45° - \frac{\varphi'_{xy}}{2}$$

### 3.1.5 Type and strength of pile

The strength of steel material for pile should satisfy the design strength. The strength of steel materials is selected, according to acting load to the pile, whether allowable unit stress for temporary loading or allowable unit stress for sustained loading In case that the pile works is applied together with other control measures, allowable unit stress for temporary loading is used, basically. Table 2 shows referential design stress of steel materials.

Table 2 Design strength of pile

| Class | allowable unit stress for sustained loading (N/mm$^2$) | | allowable unit stress for temporary loading (N/mm$^2$) | |
|---|---|---|---|---|
| | Shearing | Bending | Shearing | Bending |
| STK400 or equivalent | 118 | 206 | 78 | 137 |
| SM490 or equivalent | 162 | 279 | 108 | 186 |

### 3.1.6 Layout of piles

Piles are arranged on a line at right angle to the direction of sliding at equal spaces.

The interval of the piles is determined, based on required deterrence force per unit width calculated. In actual, there is possibility that the foundation ground of the pile is loosened due to drilling and sliding-down of landslide materials through space between two piles, and thereby, the interval of piles is determined, referring to Table 3 and the maximum interval within 8 times as much as diameter of the pile.

It is noted that the minimum interval of piles is 1 m, in order to avoid damage to the foundation due to installation of the piles. In case that required interval of the pile in calculation is 1 m or less, the piles are arranged to be staggered pattern.

Table 3 Interval of piles

| Thickness of landslide mass at the point of pile | Interval of piles |
|---|---|
| 1 m – 10 m | 2.0 m or less |
| 10 m – 20 m | 3.0 m or less |
| 20 m or more | 4.0 m or less |

### 3.1.7 Depth of embedment of pile

The length of penetration of pile to foundation is determined, so that destruction of foundation does not occur due to earth pressure to the pile.

It is necessary to unite pile and foundation, by means of filling the space between the pile and foundation. For the filling, mortar grouting is carried out through grouting pipes installed

between the pile and wall of the hole.

### 3.2 Shaft works

Design of shaft is carried out to secure required deterrence force, considering geomorphology and geology at the target landslide area. In the design, shaft should be installed to stable foundation and the shaft should be stable in terms of internal stress under the required deterrence force. Other issues to be considered are passive destruction of the ground at the upper slope from the shaft, destruction of foundation, and sliding-down of landslide materials through space between two shafts. A general design of shaft works is shown in Figure 21.

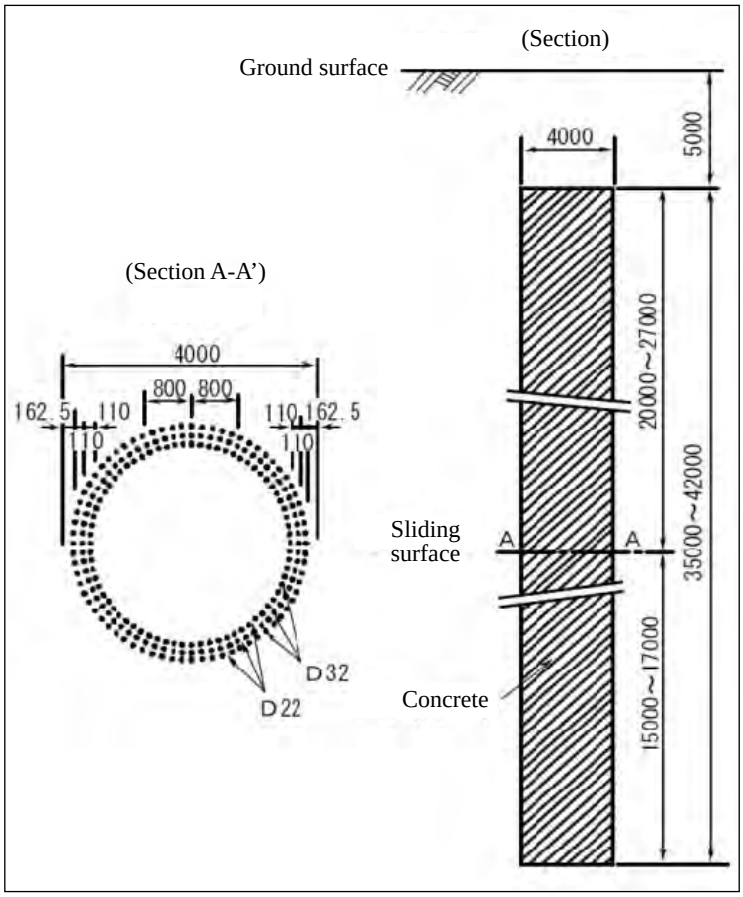



Figure 21 A general design of shaft works

Load to be borne by shaft is calculated with the same as that for pile.

Large diameter of structure like shaft is designed as bending pile or rigid pile which is not deformed. The design method is determined with the following formula.

$$\beta = \sqrt[4]{\frac{K \cdot d}{4 \cdot E \cdot I}} \Big/ l$$

where,

$K$: Modulus of subgrade reaction (kN/m$^3$)

$d$: External diameter of shaft (m)

$l$: Length of shaft penetrated in stable foundation (m)

$E$: Modulus of elasticity of shaft (kN/m$^2$)

$I$: Moment of inertia of area (m$^4$)

In case of $\beta \leq 2$, design is carried out for rigid pile

In case of $\beta > 2$, design is carried out for bending pile

The internal space of shaft is filled with reinforced concrete.

## 3.3 Anchor works

### 3.1.1. General

Anchor works comprise the following three components (see Figure 22).

1) Anchor head (including reaction structure)
2) Tensile part
3) Anchorage part (Anchor body and foundation for fixation)

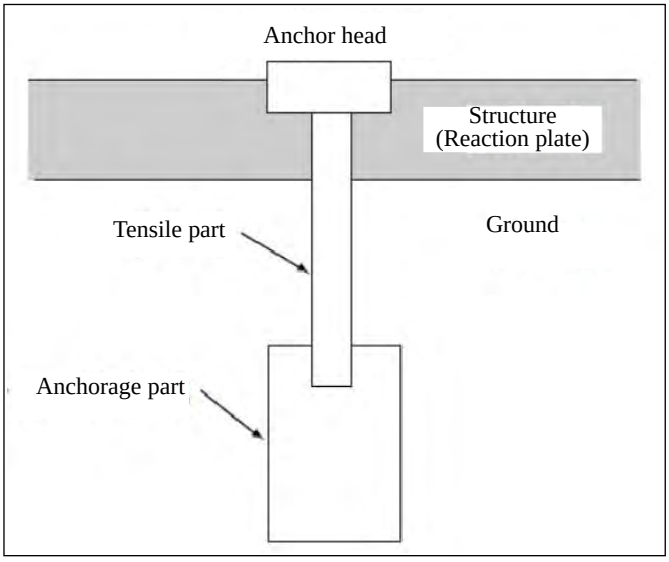



Figure 22 Components of anchor

Anchor works for a landslide countermeasure is carried out for stabilization by means of uniting landslide mass and stable foundation. Load acting to the anchor head is transferred to anchorage part in stable foundation through tensile part.

Design of anchor works is carried out for obtaining required deterrence force, securing stability of anchor its self against tensile force and foundation to which anchorage part is installed, considering geomorphologic and geological features of the target landslide area.

The design of anchor works such as the position of installation, position of anchorage part, installation pattern of anchors, inclination of the anchor, scale and structure of the anchor, etc., is determined carefully, considering geomorphology, geology, and situation of movement of the landslide.

Two major effects are expectable with anchor works as explained below.

1) Tightening effect

Resistance force against shear force is expected to increase, by means of increasing normal

stress with the anchor works as shown in Figure 23. The condition to produce the tightening effect is that the landslide mass is not compressed and deformed with compaction force, provided with the tensile force of the anchor. It is thereby difficult to expect tightening effect, if the landslide mass consists of clayey soft materials or loosened cracky weathered rocks. In addition, the effect can not be expected, if the sliding surface is located at deep portion.

2) Detaining effect

Detaining force against sliding force of landslide mass is expected with tangential component of force of anchor, when the landslide mass is moving down as shown in Figure 23. Anchor works are applied for landslides with big sliding force, utilizing restraining force of steel materials against tensile force.

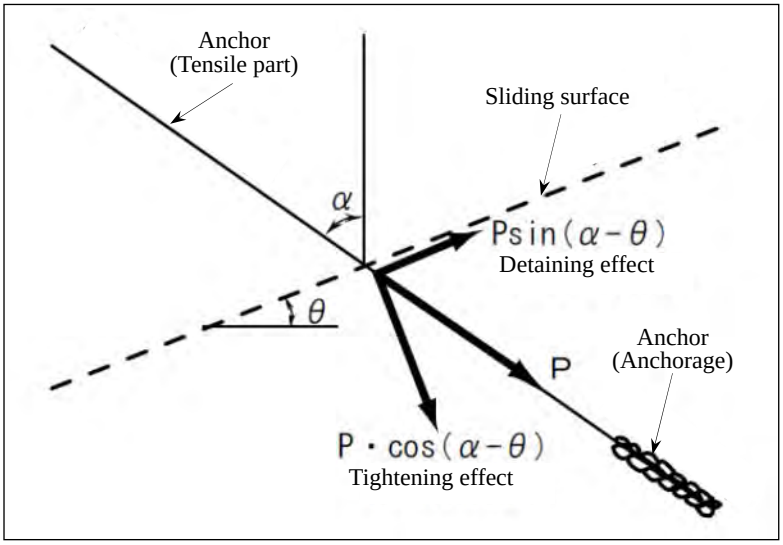



Figure 23 Function of anchor

Anchor works applied for landslide countermeasure is designed for the detaining force in many cases. During the design, it is necessary to select much effective function, considering the inclination of anchor, gradient/ depth of sliding surface, etc. It is possible to consider both effects in the design of anchor.

### 3.1.2 Calculation of required force of anchor

Required force of anchor is calculated for tightening effect and detaining effect, respectively, using the following formulae.

1) Required anchor force for tightening effect

$$P.Fs = \frac{\{(W \cdot cos\theta - U) + P \cdot cos(\alpha - \theta)\} \cdot tan\,\varphi' + c' \cdot \sum l}{\sum W \cdot sin\theta}$$

2) Required anchor force for detaining effect

$$P.Fs = \frac{\sum(W \cdot cos\theta - U) \cdot tan\,\varphi' + c' \cdot \sum l + P \cdot \sin(\alpha - \theta)}{\sum W \cdot sin\theta}$$

where,

*P.Fs*: Design safety factor

*W*: Weight of a slice (kN/m)

*U*: Pore pressure, acting to a slice (kN/m)

*P*: Required anchor force (kN/m)

*φ'*: Internal friction angle ( °)

*c'*: Cohesion (kN/m$^2$)

*l*: Length of sliding surface of a slice (m)

*θ*: Angle of inclination at the location of anchor ( °), see Figure 23

*α*: Angle of anchor ( °), see Figure 23

### 3.1.3 Location and arrangement pattern of anchor

The location where anchors are installed is determined, considering the stability of reaction structure, ground around the reaction structure, and ground of anchorage part. The position of anchorage part, direction/ inclination/ interval of anchors should be decided at the early stage of the design.

**(1) Location of anchor works**

In case that inclination of anchor is at right angle to sliding surface, the deterrence force of anchor is getting small and anchor is broken with share force of sliding mass. Therefore, the location of anchors should be determined carefully. In general, anchors are not installed at head portion of landslide.

**(2) Influence to other structure nearby**

In case that there is an underground structure such as tunnels, the location of anchor should be determined to avoid adverse influence to the existing structures.

**(3) Direction of anchor**

The direction of anchor should be the same direction as the direction of sliding.

**(4) Inclination of anchor**

The inclination of anchor is determined, not only by the calculation of the most efficient angle, but geomorphology, geology, condition of construction works, etc. Basically, the angle of inclination from -5° to +5° to horizontal line is not applied due to the difficulty in flushing of cuttings of drilling and bleeding problem of grout materials.

**(5) Interval of anchors**

The interval of anchors is determined, considering designed anchor force, diameter of anchor body, length of anchorage part of embedded section, etc.

### 3.1.4 Design of anchor

The details of design of anchor are provided in another part of manual.

### 3.1.5 Corrosion protection

Steel and other materials of anchors should be treated properly against corrosion for permanent use as shown Figure 24. Structure of anchor against rust should be determined, considering conditions of rusting during and after the construction. It is necessary to select anti-rust measure, based on the worst condition.

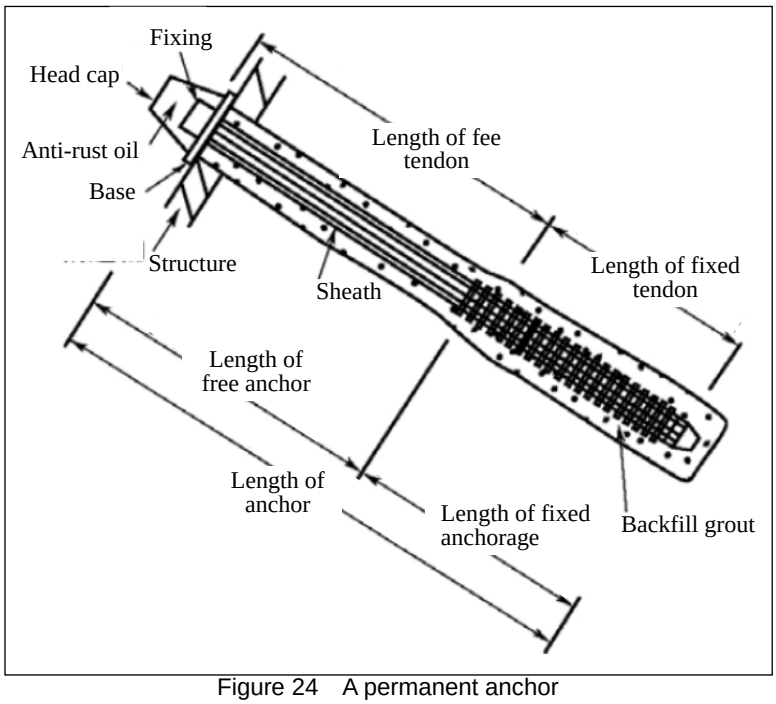



Figure 24 A permanent anchor

**(1) Corrosion protection of anchorage part**

Standard of corrosion protection of anchorage part is to cover the part with anti-corrosion materials with certain strength and thickness, together with filling the inside with grout, having anti-corrosion effect.

**(2) Corrosion protection of tensile part**

Standard of corrosion protection of tensile part is to cover the part with anti-corrosion materials with certain strength and thickness, together with filling the space between sheath and tendon with anti-corrosion materials such as anti-corrosion oil. In case that the tendon will be tensioned in future, the anti-corrosion materials should be flexible materials available for re-tensioning.

**(3) Corrosion protection of anchor head**

Standard of corrosion protection of anchor head is by the combination of protection cap (head cap) and anti-corrosion materials (anti-corrosion oil). The corrosion protection should be available for re-tensioning, if required.

### 3.1.6 Reaction plate

For anchor works for landslide measure, excavated slope is created for installation of reaction plate. It is necessary to pay attention to avoid activation of landslide by the excavation.

The reaction plate is a structure installed on slopes and designed to have enough strength against

tensile force of anchor. Reaction plate can be divided into isolated reaction plate and continuous reaction plate which is like frameworks on a slope. The selection of the type and design of the reaction plate are carried out, considering the condition of slop, dimension of the anchor, workability, economic efficiency, and maintenance as well as landscape. The isolated type of reaction plate is applied in many cases, since excavation for the installation of the isolated type is generally small.

**(1) Acting force to reaction plate**

Acting force to reaction plate is basically designed anchor force and its reaction force (subgrade reaction force). The allowable unit stress of materials of reaction plate (reinforced concrete) should be determined, based on the acting force.

**(2) Calculation of cross-section force**

Calculation of cross-section force is basically carried out with beam models. The condition of the calculation, whether subgrade reaction to be uniform load or anchor force to be concentrated load, is determined, considering the condition of the ground.

**(3) Re-vegetation of slope of reaction plate**

It is recommendable to make effort for re-vegetation of the slope where the reaction plate is installed, for erosion control and preservation of natural environment and landscape.

ガイドライン 10（対策工積算・発注）

積算発注ガイドライン

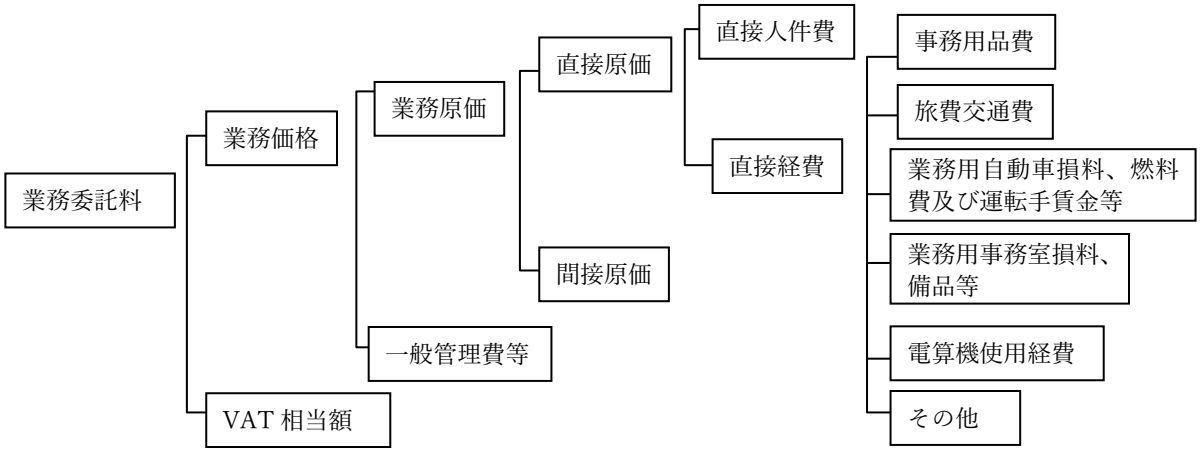
# 1.　業務全体の積算

## 1.1　適用範囲

この積算基準は、地すべり対策工事に係る積算業務を発注する場合に適用する。

## 1.2　業務委託料

### 1.2.1　業務委託料の構成




### 1.2.2　業務委託料構成費目の内容

(1)　直接原価

前掲の構成図に示す内容とする。

(2)　間接原価

当該業務担当部署の事務職員の人件費および福利厚生費，水道光熱費等の経費とする。

※その他原価は、直接経費（積上計上するものを除く）及び間接原価からなる。

(3)　一般管理費等

業務を処理する建設コンサルタント等における経費等のうち直接原価，間接原価以外の経費。 一般管理費等は一般管理費及び付加利益よりなる。

(4)　VAT 相当額

VAT相当額は、消費税及び地方消費税相当分を積算するものとする。

### 1.2.3　業務委託料の積算

#### (1) 業務委託料の積算方式

業務委託料は、次の方式により積算するものとする。

業務委託料 ＝（業務価格）＋（消費税相当額）

＝［（業務原価）＋（一般管理費等）］＋（消費税相当額）

＝［（直接人件費）＋（直接経費）＋（その他原価）］

＋（一般管理費等）＋（消費税相当額）

#### (2) 各構成費目の算定

1) 直接原価

i　直接人件費

業務に従事する者の基準日額については、５．標準歩掛による。

ii 直接経費

事務用品費、業務用自動車損料、燃料費及び運転手賃金、業務用事務室損料及び電算機使用経 費は業務遂行上特に必要で特記仕様書に明記した場合に計上する。

a.　事務用品費

特に必要がある場合に計上する。 なお、現場に必要な専門図書は、その他原価に含まれる。

b.　旅費交通費

発注者施設で業務を実施する場合であって、通勤により業務を行う場合は、出発基地から 業務場所までの交通費は原則として計上しない。ただし、滞在費が必要となる場合は適宜計上する。

c.　業務用自動車損料、燃料費及び運転手賃金

現地調査に業務用自動車を使用する場合、必要な自動車は次により積算する。

d.　業務用事務室損料、備品等

発注者施設を無償使用する場合は計上しないものとする。

e.　電算機使用経費

電算機リース料等が必要となるに計上するものとする。

f.　その他

電子成果品作成費が必要となる場合は、別途計上する。

1) その他原価

その他原価は、次式により算定した額の範囲内とする。　（その他原価）＝（直接人件費）×α／（１－α）　ただし、α は原価（直接経費の積上計上分を除く）に占めるその他原価の割合であり、３５％ とする。

2) 一般管理費等

一般管理費等は、次式により算定した額の範囲内とする。（一般管理費等）＝（業務原価）×β／（１－β） ただし、β は業務価格に占める一般管理費等の割合であり、３５％とする。

(1) 変更の取扱い

業務委託の変更は、次の各号に基づいて行うものとし、官積算書をもとにして次の式により算出する。

変更業務委託料＝変更積算金額×(直前の請負金額/直前の積算金額)

1) 直接人件費

業務内容（業務対象工事件数等）の変更に応じて変更する。

2) 直接経費

i. 業務用自動車損料、燃料費及び運転手賃金等

現地調査に業務用自動車を使用する場合において、調査箇所の増減、変更があった場合に変更を行うものとする。

ii. 旅費交通費

業務内容の変更に伴い当初設計の旅費交通費が変わる場合に変更する。

3) その他原価及び一般管理費等

直接人件費の変更に伴い変更を行う。

(2) その他

その他の業務委託料に関する算定については、必要に応じて、土木設計業務等標準積算基準及び同（ 参考資料）を参考とする。

## 1.3 業務内容

本業務の対象とする適用工種は以下の通りとする。

| 事業区分（Lv０） | 工事区分（Lv１） |
|---|---|
| 河川維持･修繕 | 河川維持、河川修繕 |
| 砂防･地すべり対策 | 砂防堰堤、流路、斜面対策 |
| 道路維持･修繕 | 道路維持、道路修繕、雪寒 |

・ 業務の実施にあたり調査職員と管理技術者は、業務全体の業務着手時及び業務完了時に業務の全体計画等について打合せを行うことを基本とし、必要に応じて業務の中間時打合せを行うことができるものとする。

・ 対象工事毎の業務着手時、中間時又は成果納入時には、必要に応じて打合せを行うことができるものとする。

・　対象工事毎の打合せについては、業務全体の業務着手時及び業務完了時の打合せと兼ねることができるものとする。

## 1.4 標準歩掛

### 1.4.1　積算方法

#### １）業務計画・現地調査

以下の歩掛を基本とする。

（単位；人日）

| | 技師(A) | 技師(C) | 備考 |
|---|---|---|---|
| 業 務 計 画 | １．４ | １．０ | １業務あたり |
| 現 地 調 査 | ０．５ | ０．５ | １回あたり |

※現地調査は、原則として標準歩掛を用いるが、現地が遠地にあるなどこれによりがたい場合は、 見積を徴収する。

#### ２）工事区分別

原則として、指名された入札参加者の全てより見積を徴収し、積算を実施するものとする。なお、見積の徴収については、次に示すものを基本とする。

○○○○（工事区分別）　　１工事（所要日数○○．○日）

| | 技師(A) | 技師(B) | 技師(C) | 技術員 | 備考 |
|---|---|---|---|---|---|
| 事発注図面及び数量総括 表（数量計算書）の作成 | | | | | |
| 積算資料作成 | | | | | |
| データ入力 | | | | | |
| 合計 | | | | | |

### 1.4.2　打合せ

#### １）業務全体計画等に関する打合せ

| | 技師(A) | 技術員 | 備考 |
|---|---|---|---|
| 着 手 時 | ０．５ | ０．５ | |
| 中 間 時 | ０．５ | ０．５ | 適 宜 |
| 業 務 完 了 時 | ０．５ | | |

#### ２）工事毎の打合せ

| | 技師(A) | 備考 |
|---|---|---|
| 打合せ | ０．５ | 対象工事毎に 打合せを行う 場合に計上 |

## 2.　業務の契約

### 2.1　入札・契約手続きの選定

入札・契約方式の選定にあたっては、アルメニア標準入札書を参考に、業務内容に応じた入札契約方式を選定する。

## 2.　地すべり対策工事（抑制工）の積算

### 3.1土工

#### 3.1.1　土量変化率等

土量の変化は次の３つの状態の土量に区分して考える。

1. 地山の土量……掘削すべき土量
2. ほぐした土量……運搬すべき土量
3. 締固め後の土量……出来上がりの盛土量

三つの状態の体積比を次式のように表わし，Ｌ及びＣを土量の変化率という。

Ｌ ＝(ほぐした土量（㎥)）/(地山の土量（㎥）)

Ｃ ＝(締固め後の土量（㎥）)/(地山の土量（㎥）)

| 分類名称<br>主要区分 | 変化率<br>L | 変化率<br>C | 1/C | L/C |
|---|---|---|---|---|
| レキ質土 | 1.20 | 0.90 | 1.11 | 1.33 |
| 砂質土及び砂 | 1.20 | 0.90 | 1.11 | 1.33 |
| 粘性土 | 1.25 | 0.90 | 1.11 | 1.39 |

(注)１．本表は体積（土量）より求めたＬ，Ｃである。

２．１／Ｃは「締固め後の土量」を地山に換算す る場合に使用す。

３．Ｌ／Ｃは「締固め後の土量」をほぐしたに換算 す。

#### 3.1.2　土工の施工概要

(1) 適用範囲

1)　掘削

・　一般的な土工

・　深さ 5mまでで一般的な積算を使うもの

2)　土砂等運搬

一般的な運搬

3)　整地

この国の

4)　路体（築堤 )盛土

一般的なもの

5)　路床盛土

一般的なもの

6)　押土(ルーズ)

土砂：距離　60m以上

岩石：”30”

7)　積込(ルーズ)

8)　人力積込

9)　転石破砕

道路，河川工事等の岩掘削に伴う転石破砕

10）土材料

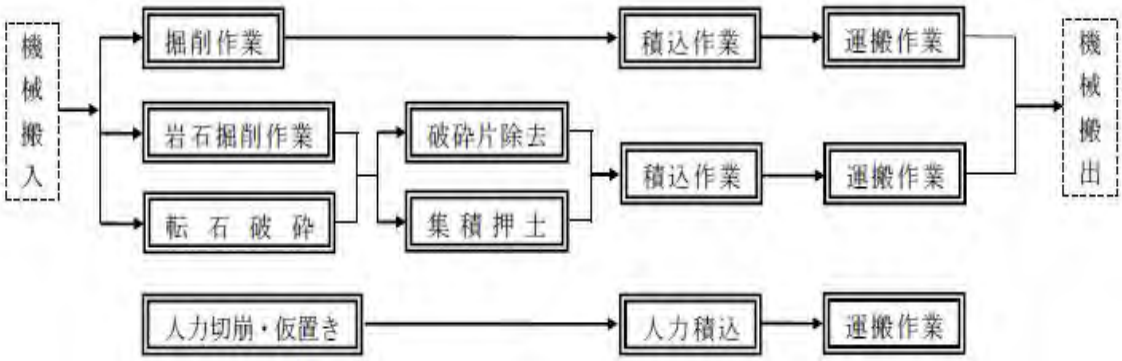
道路土工，河川等における材料現場渡し単価又は）を購入す合

11）残土等処分

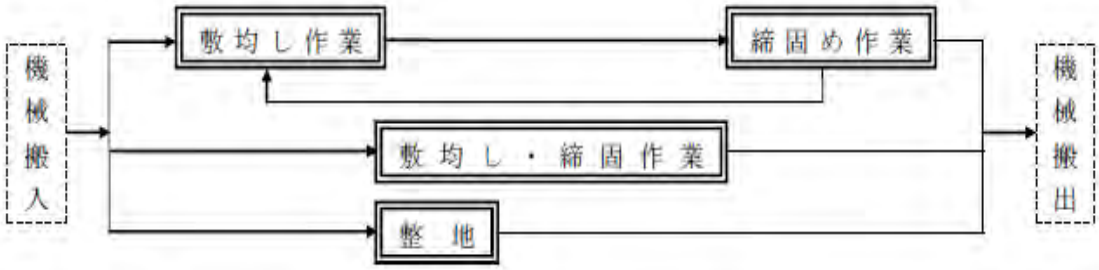
残土運搬された土砂等の残土の処分場での処分

## (2)　施工概要

### 1）施工フロー




### 2）「路体(築堤)盛土」，「路床盛土」，「整地」



### 3.1.3 法面工

(1) 適用範囲

本資料は，盛土法面整形工及び切土法面整形工に適用する。

土質がレキ，砂及び質土，粘性土 ，軟岩，硬岩の法面整形。

(2) 施工概要

1) 盛土法面整形工

法面表層部を締固め整形することを盛土法面整形工という。

2) 切土法面整形工

法面表層部を削取りながら整形することを切土法面整形工という。

### 3.1.4 軽量盛土工

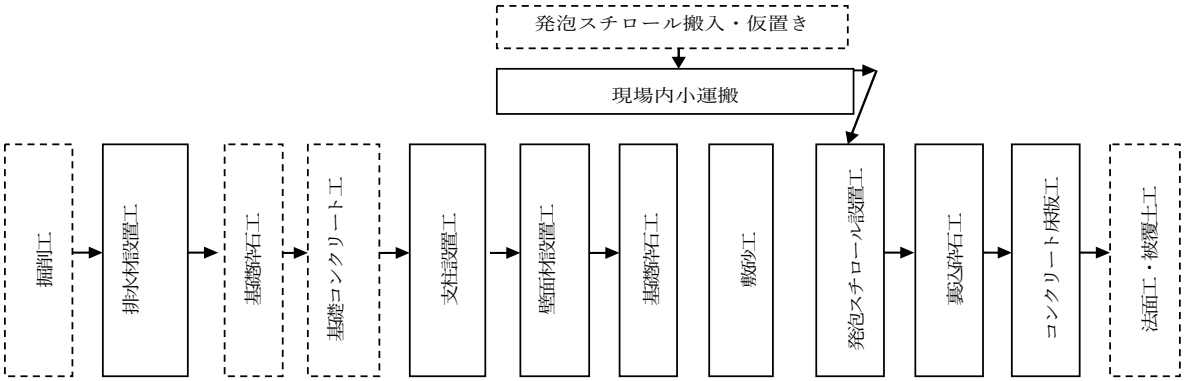
(1) 適用範囲

超軽量材としての発泡スチロール材を盛土，擁壁及び橋台等の抗土圧構造物の裏込め等に使用する発泡スチロール工を人力で施工する場合に適用する。

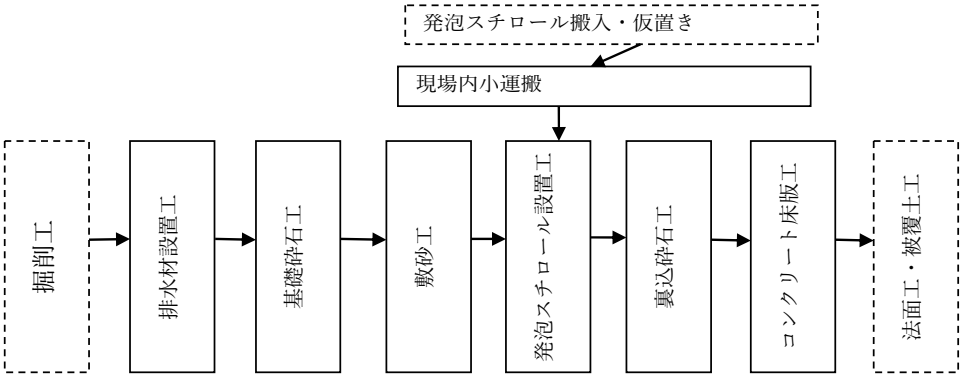
(2) 施工概要

施工フローは，下記を標準とする。

1) 壁面材設置工有り




2) 壁面材設置工なし



## 3.2　地下水排除工

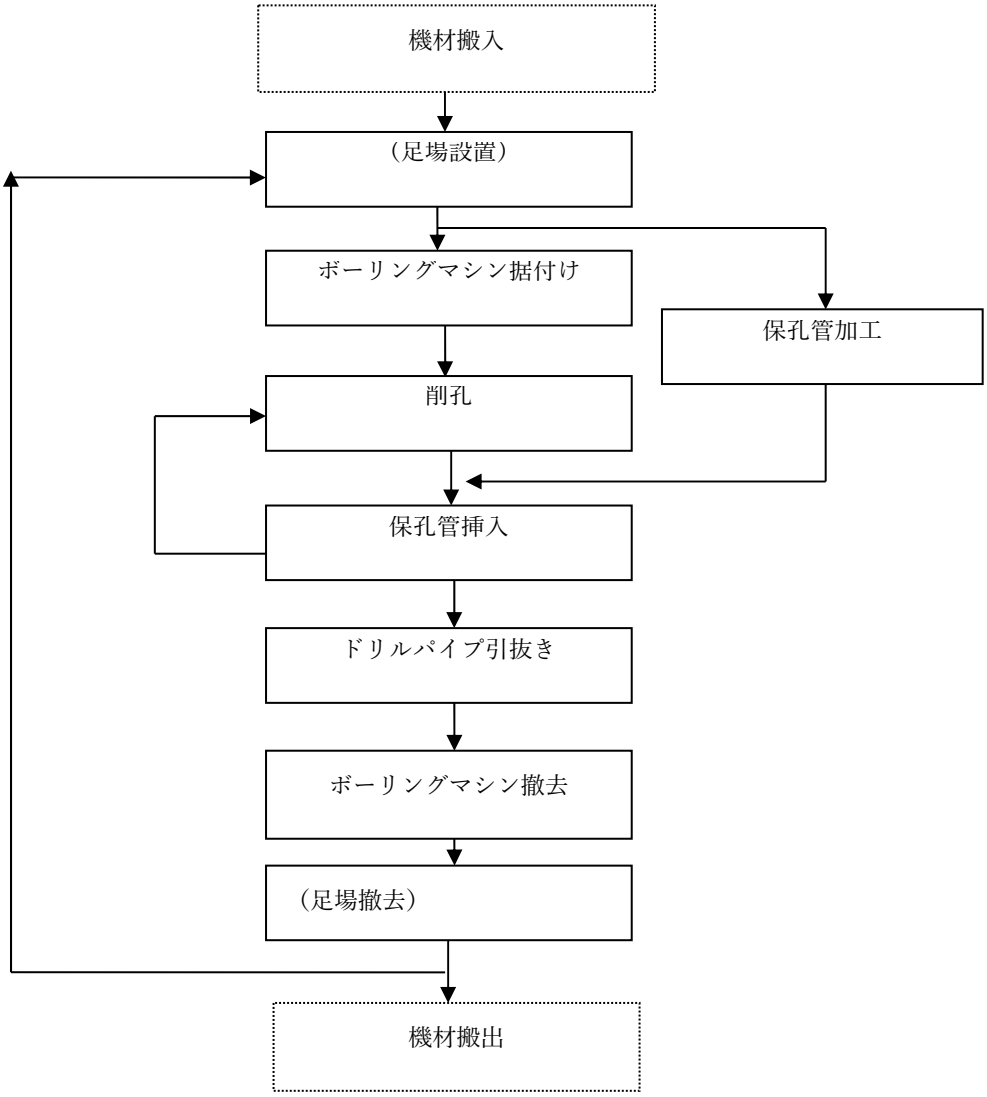
### 3.2.1　軽量盛土工集排水ボーリング工

(1) 適用範囲

本資料は，地表及び集水井内において，ロータリーパーッション式ボーリングマシン（二重管方式）にて集排水ボーリング工を施工するものであり，呼び径 90～135㎜，削孔長 80m以下，削孔角度は水平±10 度以内の作業に適用する。

(2) 施工概要

施工内容は，下記を標準とする。



(3) 施工歩掛

1) 機種の選定

機械・規格の選定は，次表を標準とする。

| 機械名 | 規格 | 単位 | 数量 | 適用 |
|---|---|---|---|---|
| ボーリングマシン | ロータリパーカッション式・スキッド型 55kW級 | 台 | 1 | |
| グラウトポンプ | 横型二連複動ピストン式 200ℓ／min | 〃 | 1 | |
| 工事用水中モータポンプ | 普通型（潜水ポンプ）口径 50mm，全揚程 30m | 〃 | 1 | （注）1 給水用 |
| 工事用水中モータポンプ | 普通型（潜水ポンプ）口径 50mm，全揚程 30m | 〃 | 1 | （注）1，2 排水用 |
| 発動発電機 | ディーゼルエンジン駆動・排出ガス対策型（第2次基準値） 125kVA | 〃 | 1 | （注）3 |

2) 削孔工

削孔工は，ボーリングマシンによる集排水孔の削孔作業に適用する。なお，土質毎に積上げを行うこととする。

3) 保孔管加工・挿入工

保孔管加工・挿入工は，保孔管の加工から孔内挿入までの作業に適用する。

4) 機械設置・撤去工

機械設置・撤去歩掛は，次表を標準とする。

| 施工場所 | | | 地表 | 集水井 |
|---|---|---|---|---|
| 名称 | 規格 | 単位 | | |
| 土木一般世話役 | | 人 | 0.9 | 3.1 |
| 特殊作業員 | | 〃 | 1.8 | 2.6 |
| とび工 | | 〃 | － | 1.7 |
| 普通作業員 | | 〃 | 1.8 | 6.0 |
| クローラクレーン賃料 | 油圧伸縮ジブ型・排出ガス対策型（第2次基準値） 4.9t吊 | 日 | 0.7 | 2.5 |
| 諸雑費率 | | % | － | 4 |

5) 足場工機械設置・撤去

足場設置・撤去歩掛は，次表を標準とする。

| 施工場所 | | | 地表 | |
|---|---|---|---|---|
| 名称 | 規格 | 単位 | 平地 | 傾斜地 |
| 土木一般世話役 | | 人 | 2.4 | 3.1 |
| とび工 | | 〃 | 2.4 | 3.1 |
| 普通作業員 | | 〃 | 4.7 | 6.2 |
| クローラクレーン賃料 | 油圧伸縮ジブ型・排出ガス対策型(第2次基準値) 4.9t吊 | 日 | 0.3 | 0.5 |
| 諸雑費率 | | % | 29 | 20 |

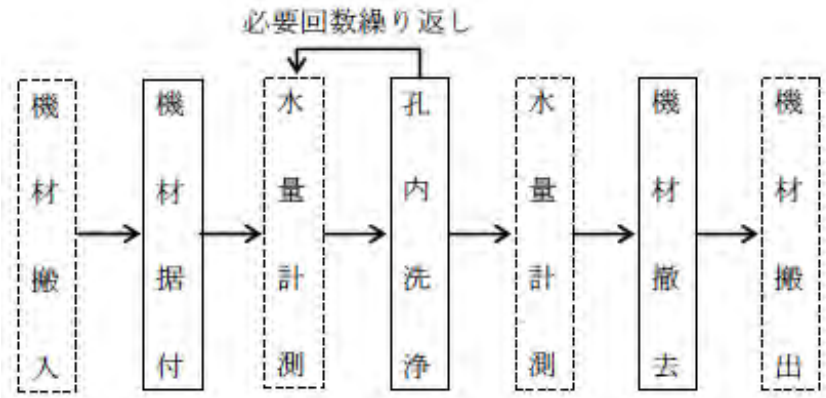
### 3.2.2 集排水ボーリング孔洗浄工

#### (1) 適用範囲

地すべり防止施設における横ボーリング孔及び集水井内での集排水ボーリング孔（φ30 mm～φ150mm，延長 130m以下／本）の高圧ポンプによる洗浄工に適用する。なお，洗浄工程数については，集水孔は４工程まで，排水孔は３工程までに適用する。

#### (2) 施工概要

施工フローは，下記を標準とする。




### 3.2.3 山腹水路工

#### (1) 適用範囲

本資料は地すべり防止施設及び急傾斜崩壊対策施設の水路工に適用する。各工種における適用範囲は以下のとおりとする。

1) 山腹集水路・排水路工，山腹明暗渠工，山腹暗渠工

- 機械据付

  プレキャストU形側溝の製品質量 100 kg／個を超え 450 kg／個以下に適用する。

- 人力据付

  プレキャストU形側溝，コルゲートフリューム，暗渠管の製品質量 100 kg／個以下に適用する。

2） 集水桝工

- 集水桝設置

  内空積１㎥／基以下の現場打ち集水桝の設置に適用する。

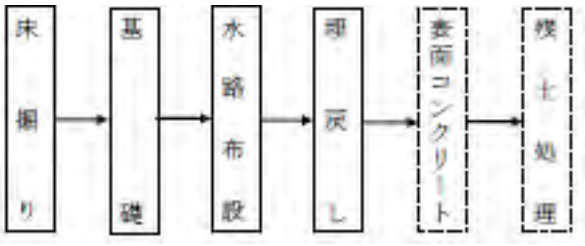
- プレキャスト集水桝据付

  プレキャスト集水桝の製品質量 150 kg／個を超え 1,700 kg／個以下の機械据付に適用する。

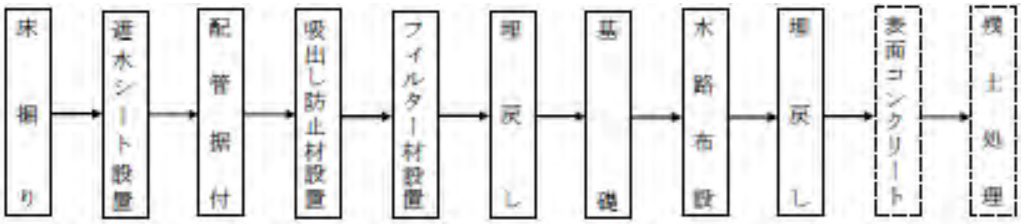
### (2) 施工概要

施工フローは下記を標準とする。

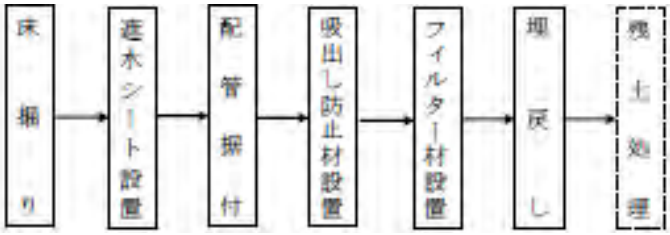
1） 山腹集水路・排水路の場合



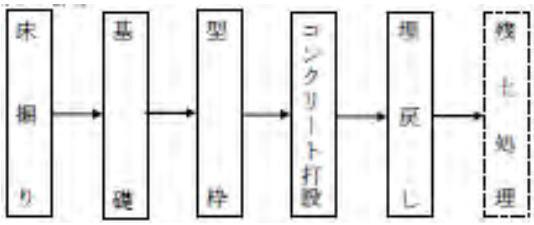

2） 山腹明暗渠の場合




3） 山腹暗渠の場合

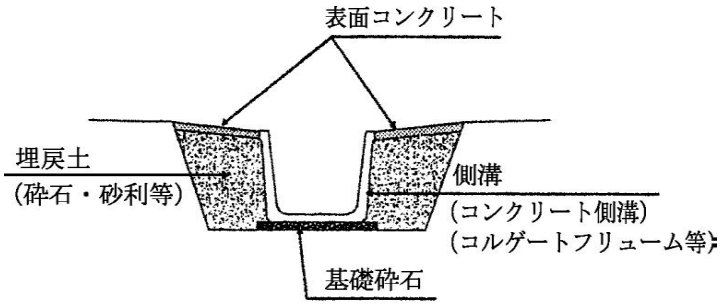



4） 集水升の場合

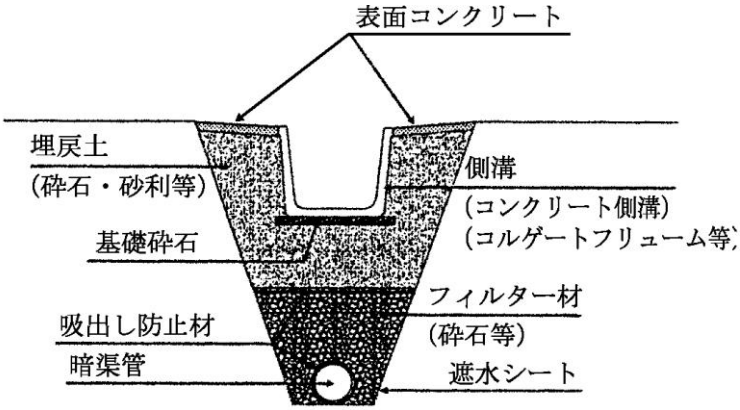


## (3) 山腹水路工構造概念図

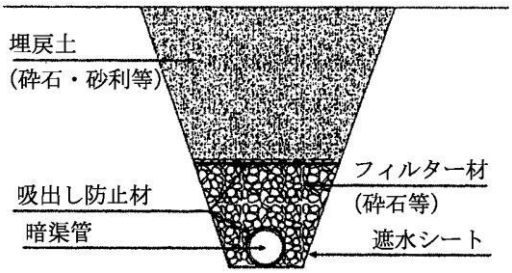
1) 山腹集排水路



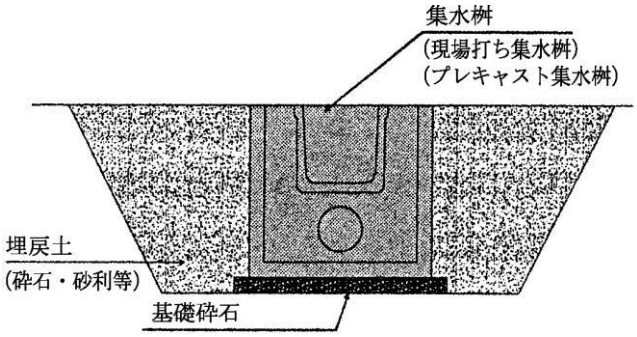

2) 山腹明暗渠




3) 山腹暗渠




4) 集水升



### 3.2.4　集水井工

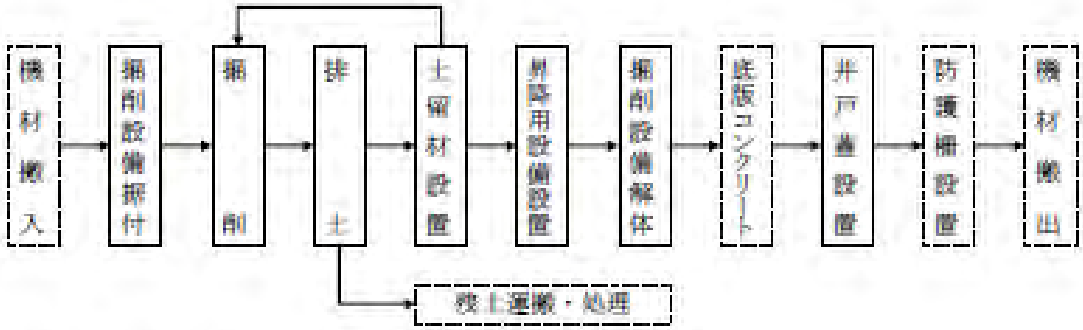
#### (1) ライナープレート土留工法

1) 適用範囲

人力併用機械掘削，ライナープレート土留工法による径 3.5mで深さ 40mまでの集水工に適用する。なお，径はライナープレートの公称径(ボルト穴間の径)とする。

2) 施工概要

施工フローは，下記を標準とする。



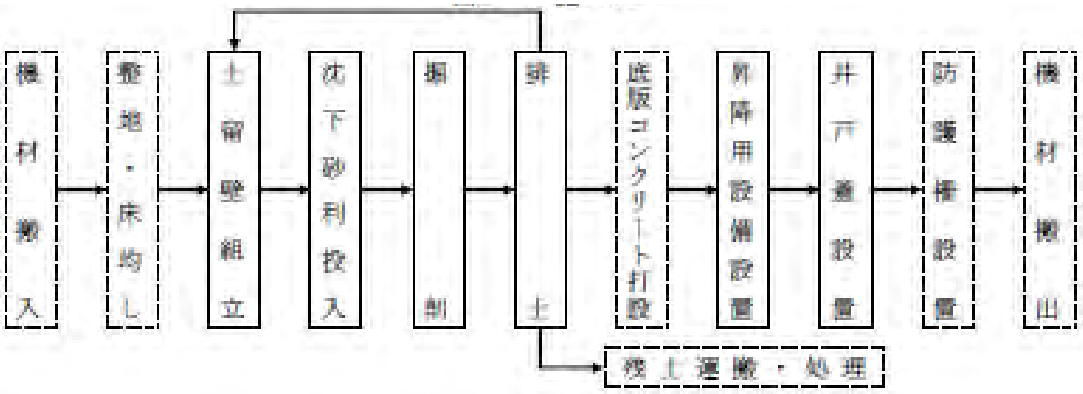

#### (2) プレキャスト土留工法

1) 適用範囲

本資料は，人力併用機械掘削，プレキャスト土留工法による公称径 3.5mで深さ 20m以下の集水井工の自沈方式に適用する。なお，セグメント方式の場合は別途考慮する。

2) 施工概要

施工フローは，下記を標準とする。



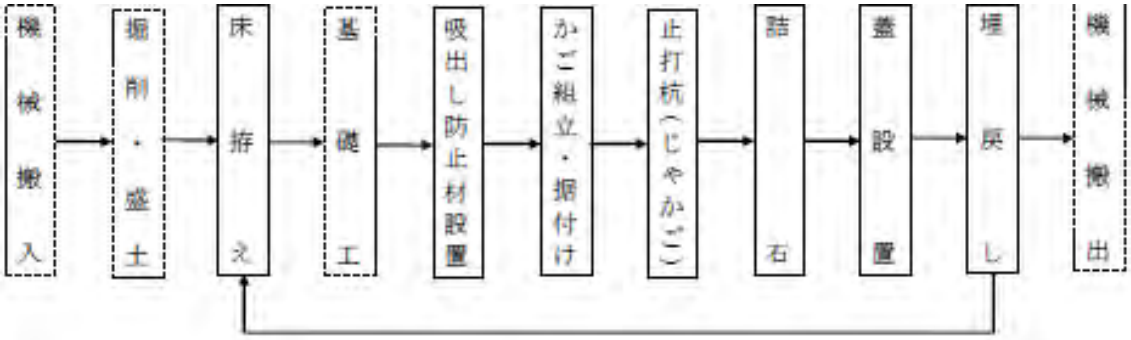
### 3.2.5　付帯工事　かごエ

1）適用範囲

本資料は，地すべり防止施設及び急傾斜崩壊対策施設におけるじゃかご（径45～60 cm）及びふとんかご（階段式，パネル式，高さ 40～100 cm，幅 120～200 cm）の施工に適用する。

2）施工概要

施工フローは，下記を標準とする。




## 4.　地すべり対策工事の積算（抑止工）

### 4.1　アンカーエ

### 4.1.1　ロータリーパーカッション式

(1)　適用範囲

本資料は，ロータリーパーカッション式ボーリングマシンにより削孔を行い，アンカー鋼材にて引張力を地盤に伝達し，長期に供用するグラウンドアンカー工法に適用する。

1）削孔（アンカー）

ボーリングマシンによるアンカー孔の削孔，ドリルパイプの引抜き，横移動作業なお，積算においては，土質ごとに積上げを行うこととする。

2）アンカー鋼材加工・組立・挿入・緊張・定着・頭部処理（アンカー）

アンカー鋼材の現地加工，組立から孔内挿入までの作業及び工場で組立・加工する場合のアンカー鋼材挿入作業。

緊張ジャッキで所定の緊張力（荷重）をかけ，クサビ及びナット等で定着及び頭部処理（頭部背面処理を含む）を行う作業

3）グラウト注入（アンカー）

アンカー孔内へのグラウト注入の作業

4）ボーリングマシン移設（アンカー）

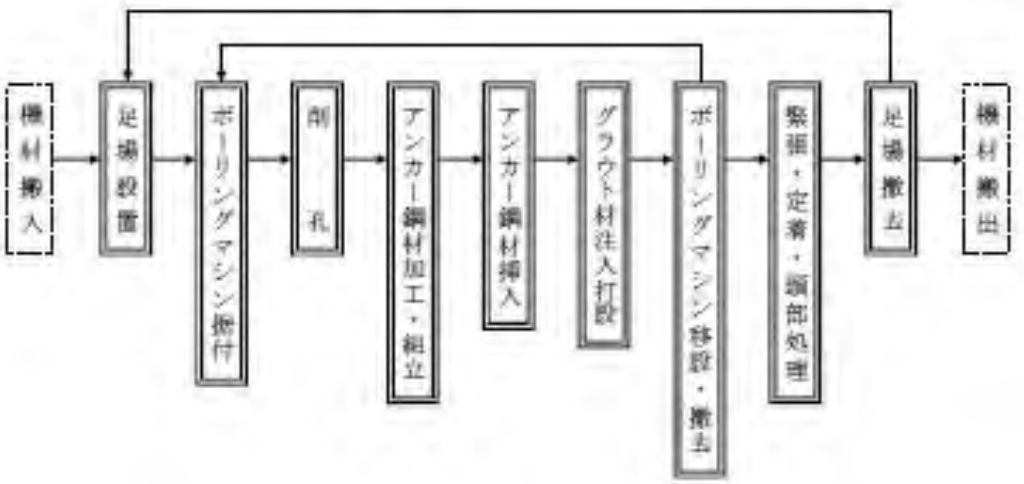
スキッド型ボーリングマシンの据付・撤去及び上下移動（移設）作業ただし，横移動は，削孔工に含む。

5）足場（アンカー）

スキッド型ボーリングマシン据付の架台となる足場材の設置及び撤去作業

(2) 施工概要

施工フローは，下記を標準とする。



ガイドライン 11（対策工維持・管理）

維持管理ガイドライン

# 1. 維持管理計画の作成

## 1.1 総説

地すべり対策施設を含む砂防関係施設の維持管理計画は、保全対象を守る観点から既存の砂防関係施設の健全度等を把握し、長期にわたりその機能及び性能を維持・確保することを目的として、維持、修繕、改築、更新の対策を的確に実施するための計画である。

地すべり対策施設は土砂災害防止の機能を有する重要な社会資本であり、果たしている役割は持続的に発揮させなければならない。

既存の砂防関係施設の機能低下を防止し、所定の機能及び性能を長期にわたり維持・確保し続ける

ために維持管理計画を策定し、着実に運用していくことは砂防関係施設の管理者等の重要な責務である。

維持管理計画の前提として、対象となる砂防関係施設について、その点検を通じて、機能及び性能の状況を的確に把握しておくことが重要であり、砂防関係施設の台帳を整備すると共に、経年的な点検の結果をもとにして評価を行い、維持、修繕、改築、更新などの対策を的確に実施していく必要がある。

維持管理計画は、こうした点検、評価、維持、修繕、改築、更新の具体計画の立案、実施等の一連のプロセスにより構成される。

## 1.2 用語の定義

<u>機能</u>
地すべり対策施設を含む砂防関係施設が土砂災害防止のために、有すべき施設の働きのこと。

<u>性能</u>
当該砂防関係施設が機能を発揮するために必要となる、構造上保持すべき強度、安定性等のこと。

<u>健全度</u>
有すべき機能及び性能に対して、当該砂防関係施設が有している程度のこと。

<u>点検</u>
砂防関係施設の機能や性能の低下などの状況を把握するために行う調査のこと。

<u>評価</u>
点検結果に基づき、砂防関係施設の健全度を的確に把握すること。

<u>維持</u>
砂防関係施設の機能や性能を確保するために行う軽微な作業のこと。

<u>修繕</u>
既存の砂防関係施設の機能や性能を確保、回復するために、損傷または劣化化前の状況に補修すること。

<u>改築</u>
砂防関係施設の機能や性能を確保、回復すると共に、さらにその向上を図ること。

更新
既存の砂防関係施設を用途廃止し、既存施設と同等の機能及び性能を有する施設を、既存施設の代替として新たに整備すること。

災害復旧
災害発生時に被災した施設の原形復旧を行うこと。砂防設備、地すべり防止施設、急傾斜地崩壊防止施設における、①維持、②修繕、③改築、④更新の例を以下に示す。

(1) 砂防設備の例
1) 維持 ：渓流保全工の簡易な除木、除草等。
2) 修繕 ：砂防堰堤の摩耗、欠損部の補修、前庭保護工等の洗掘の補修等。
3) 改築 ：修繕と併せて行う、一般的な方法に整合した砂防堰堤の腹付けやかさ上げ等。
4) 更新 ：既存堰堤と同等の新たな堰堤の整備等。

(2) 地すべり防止施設の例
1) 維持 ：孔内洗浄、水路工堆積土砂の撤去等
2) 修繕 ：水路の亀裂への間詰め、集水井貯水槽の亀裂への間詰め、
3) 腐食した集水井ライナープレートにRC セグメントを巻立等。
4) 改築 ：腐食した集水管を腐食しにくい材質への変更等。
5) 更新 ：集水管・排水管の再設置等。

(3) 急傾斜地崩壊防止施設の例
1) 維持 ：堆積土砂の撤去、除草等。
2) 修繕 ：吹付工背面の空洞へのモルタルなどの充填、吹付工の局部的な張り替え、擁壁の亀裂修復等。
3) 改築 ：土留め擁壁への腹付け、法面工の補強等。
4) 更新 ：擁壁の再設置等。

## 1.3 計画の策定基本方針

維持管理計画の策定にあたっては、施設点検等により機能の低下、性能の劣化状況を把握し、施設の健全度を評価するとともに、個々の砂防関係施設の上流地域及び周辺の荒廃状況、保全対象との位置関係、施設の重要度、過去の災害履歴など防災上の観点、対策に係るコスト等をよく勘案して対策の優先順位を検討する必要がある。

施設の点検データについては、現状の把握や将来の劣化の予測に役立つ貴重な情報であるため、継続的に記録・保存する必要がある。

## 1.4 地すべり対策施設に求められる機能及び性能

地すべり対策工に求められる機能と性能は以下のように分類される。

### (1) 地すべり防止施設の機能

① 抑制工：地すべりを抑制する機能
1) 地表水が地下浸透することを防止 ：水路工、浸透防止工
2) 地下水の排除で滑動力を軽減 ：地下水排除工（横ボーリング工、集水井工、
3) 排水トンネル工、地下水遮断工）
4) 頭部排土で滑動力を軽減 ：頭部排土工
5) 押え盛土で滑動への抵抗力を付加 ：押え盛土工
6) 河川・渓流の侵食を防止 ：えん堤工、床固め工、水制工、護岸工

② 抑止工：地すべりを抑止する機能

構造物による抑止力で滑動に抵抗 ：杭工、シャフト工、アンカー工

(2) 地すべり防止施設の性能

上に挙げたような計画上期待される機能を、個々の地すべり防止施設が発揮するためには、当該地すべり防止施設が、例えば必要となる構造物としての強度や規模など、構造上の規格すなわち設計された性能を保持している必要がある。

## 1.5 地すべり対策工の維持管理計画

### 1.5.1 維持管理計画

維持管理計画は、砂防関係施設を長期にわたり、その機能及び性能を維持・確保するため、設定された計画対象区域の既存の砂防関係施設について、

○ 計画対象区域における砂防関係施設維持管理計画策定方針
○ 日常的な維持の方針
○ 点検結果を踏まえた健全度の整理
○ 修繕、改築、更新の優先順位の検討と年次計画の策定
○ 経過観察の方法（調査・観測の方法とその留意点）
○ 対策工（修繕、改築、更新の方法）

などを取りまとめる

設定された計画対象区域の砂防関係施設を対象に、上記の各事項についてとりまとめることにより、点検結果に基づく健全度評価を踏まえた、個々の施設に対する、経過観察、対策実施の必要性を把握するとともに、防災上の観点等を総合的に勘案して対策の優先順位等を検討し、修繕、改築、更新の年次計画を策定する。なお、年次計画の策定までの作業フローを下図に示す。

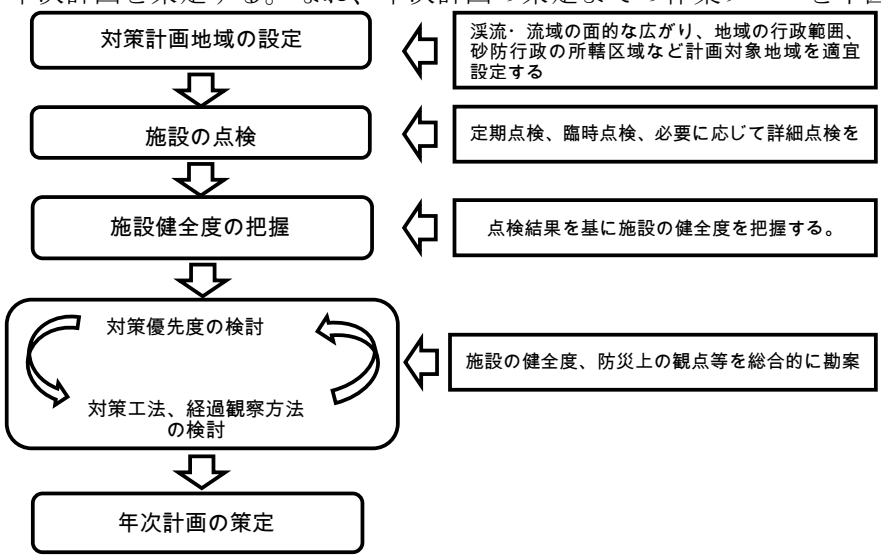



図 修繕、改築、更新の年次計画策定のフロー

### 1.5.2 計画対象区域における砂防関係施設の維持管理計画策定の方針

地すべり対策施設を含む砂防関係施設の現状を把握するためには施設の点検を適切な時期に実施する必要がある。

点検に際しては、砂防関係施設に求められる機能や性能について、その現状を的確に把握する必要があり、点検の結果、基礎の洗掘、水通し天端の摩耗等、構造物の安定性等の性能や機能に影響を及ぼす不具合が認められる場合あるいは、目視点検等では、機能や性能の低下、劣化の程度や原因の特定が困難な場合などには、必要に応じて詳細点検を実施する。

**計画対象区域における砂防関係施設の維持管理計画策定方針のとりまとめにあたっては、施設に関する台帳の整備状況や健全度等の概括的な分析とともに計画対象区域における保全対象の状況、荒廃状況、土砂の生産･流出特性、災害履歴、施設の整備状況等を踏まえ、行うものとする。**

### 1.5.3　日常的な維持の方針

維持管理計画においては、日常的な維持の方針を記述するものとする。 日常的な維持、又は施工中の管理に必要な費用については年度当初に確保しておくことが望ましい。

日常的な維持の例は、次のとおりであり、これらの実施方針について記載する。
（地すべり防止施設）
・水抜きボーリングの孔内洗浄
・地表水排水施設に堆積した崩土、塵芥等の除去

### 1.5.4　健全度の整理

維持管理計画においては、点検結果を踏まえて健全度の評価結果を整理するものとする。

健全度評価は損傷の程度等に応じて、対策方針を検討する目的で実施する。健全度は、各砂防設備の点検結果に基づいて、期待されている機能及び性能の観点から、現場状況を考慮したうえで総合的に評価する。

砂防関係施設の健全度評価

| 健全度 | 損傷等の程度 |
|---|---|
| 対策不要 | 当該施設に損傷等は発生していないか、軽微な損傷が発生しているものの、損傷等に伴う当該施設の機能の低下及び性能の劣化が認められず、対策の必要がない状態 |
| 経過観察 | 当該施設に損傷等が発生しているが、問題となる機能の低下及び性能の劣化が生じていない。この状況では対策を講じる必要はないが、将来対策を必要とするおそれがあるので、定期巡視点検や臨時点検等により、経過を観察する必要がある状態 |
| 要対策 | 当該施設に損傷等が発生しており、損傷等に伴い、当該施設の機能低下が生じている、あるいは当該施設の性能上の安定性や強度の低下が懸念される状態 |

### 1.5.5　優先順位検討と年次計画の策定

年次計画は、前項整理された健全度に加え、流域の荒廃状況、保全対象との位置関係、施設の重要度、過去の災害履歴、安定性等に関する現行基準との整合状況、対策を実施する際の施工性、環境への影響、コスト等を総合的に考慮し、とりまとめる。

計画の策定にあたっては10 年程度を目安として修繕、改築等の必要となる施設を抽出し、計画を立案する。なお、概ね５年経過時に点検結果、及び対策状況等を踏まえて必要に応じて計画を見直す。

砂防関係施設においては流域の荒廃状況が対策の優先順位の検討にあたって重要な項目となることから、点検にあたっては、施設そのものの健全度の把握のみでなく、周辺等の状況も合わせて把握する。

地すべり防止施設に関しては、施設点検結果のみでなく地すべり全体の安定性（周辺のクラックや地下水の状況）と併せて、検討することが望ましい。例えば、排水施設の目詰まりを確認した際には地下水位の推移、地盤および構造物のクラック等の状況等も併せて検討する。

### 1.5.6　経過観察方法（調査・観測の方法とその留意点）

健全度評価の結果、当該施設に損傷等が発生しているが、問題となる機能の低下及び性能の劣化が生じていない場合には、経過観察と判断される。経過観察と判断された施設に対しては、損傷等の原因を推定するとともに、点検の観察、観測方法を定め、どこまで機能低下が進行したら対策を実施するのか、また、点検の頻度についても事前に検討する。

また、定量的に把握が困難な損傷についても、同一位置・アングルにて撮影した写真を時系列で記録しておくなど、できる限り損傷の進行・変化が把握できるように記録する。

### 1.5.7　対策工法（修繕、改築、更新の方法）

検討に際しては、周辺の状況や損傷等の原因、対策に要するコスト、施工性、環境への影響などを総合的に検討し、対策工法の選定を行う。地すべり防止施設に関しては地すべりの状況を踏まえて対策を検討する。

なお、施設の有効活用として修繕等と併せて機能向上を図ることが考えられる。改築は、施設の機能や性能を回復させるだけでなく、さらにその向上を図ることであり、施設を用途廃止し、新たに施設を整備する更新においても、施設適地の活用の点から施設の機能の向上を図る場合がある。

## 2.　施設点検要領

### 2.1　総説

地すべり対策工は、出水や地震などによる損傷や、時間経過に伴う劣化が生じる。一方、対策工が立地する場の条件は、流水量の大小や土石流・崩壊の規模・頻度、地形・地質・土質など千差万別である。対策工の設置以降に、例えば、出水・地震等に伴う崩壊・土砂流出の発生や風倒木の発生により、対策工周辺の状況が変化することも多い。対策工の損傷はこのような周辺環境に大きく影響されるため、点検の際には対策工のみならず周辺状況についても把握する必要がある。

本要領は、今後必要となる定期点検や出水や地震等の発生後の臨時点検を的確に実施するために、対策工の機能維持に関する通達等を踏まえ、対策工の**機能維持**に向け、予防保全型管理を実施していくための点検、評価方法を定めたものである。

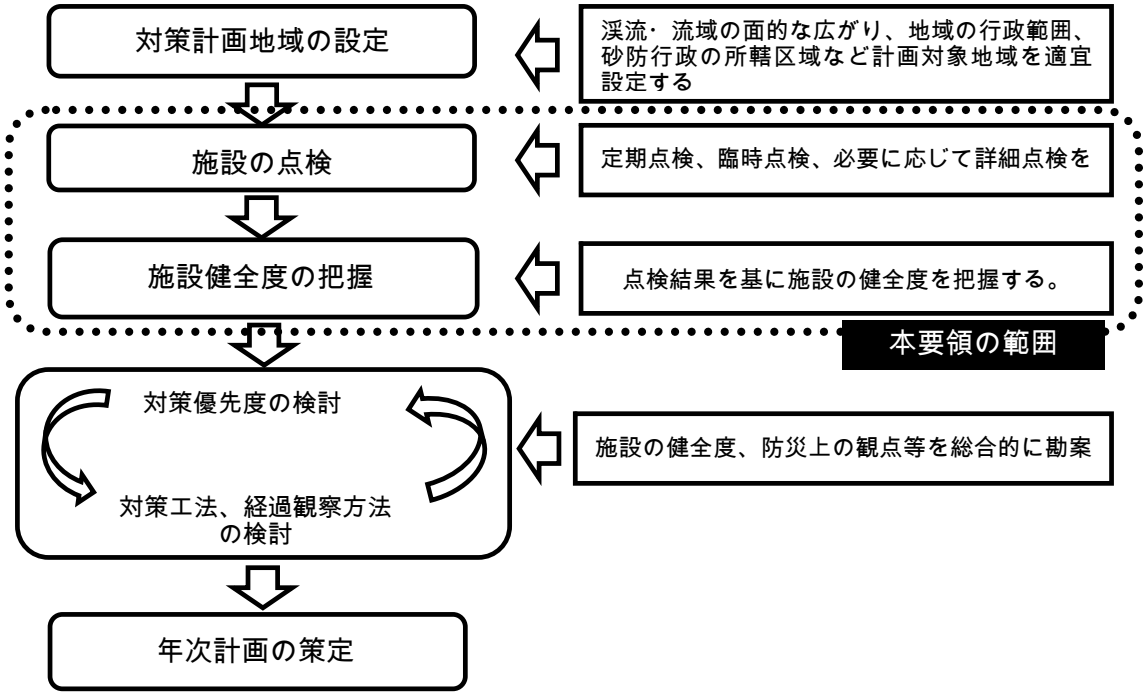
### 2.2　用語の定義

本要領で用いる用語の定義は以下による。

| 用 語 | 用 語 の 説 明 |
|---|---|
| 点 検 | 砂防関係施設の機能や性能の低下などの状況を把握するために行う調査のこと。点検は、定期点検(巡視を含む)、臨時点検及び詳細点検に分類する。 |
| 点検計画 | 施設の点検を的確かつ効率的に実施するための計画 |
| 定期点検<br>（巡視点検含む） | 計画的に定めた一定の時期や期間毎に、砂防関係施設の機能の低下や性能の劣化などの状況を把握するために行う調査のこと。 |
| 臨時点検 | 豪雨や地震発生時等の不定期に、砂防関係施設の機能の低下や性能の劣化などの状況を把握するために行う緊急的な調査のこと。 |
| 詳細点検 | 定期点検(巡視を含む)、臨時点検では得られないより詳細な情報を得るために実施する調査のこと。 |
| 性 能 | 砂防関係施設が機能を発揮するために必要となる、構造上保持すべき強度、安定性等のこと。 |
| 施設の健全度評価 | 定期点検及び必要に応じて実施する詳細点検等の結果に基づき、個々の砂防関係施設の構造や材料の特性を踏まえた上で、機能の低下、性能の劣化状況および施設周辺の状況を把握し、その程度に応じて、砂防関係施設の健全性を評価することをいう。健全度評価基準に基づき、健全度の区分は次の3種類とする。 |
| 健全度：A<br>( 対策不要) | 当該施設に損傷等は発生していないか、軽微な損傷が発生しているものの、損傷等に伴う当該施設の機能の低下及び性能の劣化が認められず、対策の必要がない状態。 |
| 健全度：B<br>( 経過観察) | 当該施設に損傷等が発生しているが、問題となる機能の低下及び性能の劣化が生じていない。現状では対策を講じる必要はないが、将来対策を必要とするおそれがあるので、定期点検や臨時点検等により、経過を観察する必要がある状態。 |
| 健全度：C<br>( 要対策) | 当該施設に損傷等が発生しており損傷等に伴い当該施設の機能低下が生じている、あるいは当該施設の性能上の安定性や強度の低下が懸念される状態。 |
| 部 位 | 構造や材料、位置によって区分される施設の構成パーツのことをいう。 |
| 部位の変状レベル | 砂防関係施設の点検対象とする、施設の各部位の変状の程度をいう。 |
| 変状レベル a | 当該部位に損傷等は発生していないか、軽微な損傷が発生しているものの、当該部位の性能の劣化が認められない状態をいう。 |
| 変状レベル b | 当該部位に損傷等が発生しているものの、現状では対策を講じる必要はないが、今後の損傷等の進行を確認するため、定期点検や臨時点検等により、経過を観察する必要がある状態をいう。 |
| 変状レベル c | 当該部位に損傷等が発生しており、当該部位の性能上の安定性や強度の低下が懸念される状態をいう。 |
| 劣 化 | 時間の経過に伴って進行する部材や材料の性能低下のこと。 |
| 損 傷 | 劣化以外の原因により生じた部材や材料の性能低下のこと(出水・斜面変動や地震等に伴って生じたひび割れや剥離・破損等をいう)。 |

### 2.3　適用範囲

本要領(案)は、下図のうち、破線で囲まれた「施設の点検」、「施設の健全度の把握」の方法について記述したものである。




## 2.4　点検及び健全度評価の手順

点検及び健全度評価は以下の手順に基づいて実施する。

1．定期点検及び臨時点検
2．詳細点検（必要に応じて）
3．部位単位の変状レベルの評価
4．施設周辺の状況の評価
5．施設（あるいは施設群）の健全度評価

## 2.5　施設の点検

### 2.5.1　点検の方法

#### (1)　点検計画

計画的かつ効率的な点検の実施が図られるよう、点検に関する次の基本的な事項をとりまとめた点検計画を策定する。

○対象区域(長寿命化ガイドラインに準ずる)
○対象区域内の点検対象施設(維持管理ガイドラインに準ずる)
○点検の方法
○点検の実施体制
○点検の実施時期

定期点検の計画的かつ効率的な実施によって、対策工に発生した「機能及び性能の変化状況」を的確に把握する必要があるため、点検計画を策定することを基本とする。また、臨時点検についても、定期点検と同様に、点検計画をあらかじめ策定しておく。

### (2) 点検の種類

点検は、施設の機能の低下状況の把握や、構造上の損傷の程度やその原因の特定を行うため実施す**るもので、具体的には、「定期点検」、「臨時点検」及び「詳細点検」の3種類に区分する。**

点検の種類と概要

| 点検の種類 | 目 的 | 実施時期(頻度) | 実施方法 |
|---|---|---|---|
| 点検の種類 | 施設状況及び施設に直接影響を与える周辺状況について点検する。 | 点検計画に基づき実施する。 | ・目視点検等を基本とする。<br>・点検結果は点検個票にそれぞれとりまとめる。<br>・施設の種類ごとに点検項目を定めるものとする。 |
| 臨時点検 | 出水や地震時などによる砂防関係施設の損傷の有無や程度及び施設に直接影響を与える周辺状況を把握、確認する。 | 出水時や地震時などの事象の発生直後の出来るだけ早い時期に実施する。 | 定期点検に準ずる。 |
| 詳細点検 | 定期点検や臨時点検ではその変状の程度や原因の把握が困難な場合に実施する。 | 必要に応じて実施する。 | 必要に応じその状況に適応した計測、打音、観察などの方法で確認するものとする。 |

### (3) 点検の実施体制

**点検は、現場での安全を考慮して複数名で行う。また、点検に必要な知識・技術を有した技術者が実施する。**

### (4) 点検の実施時期

定期点検は、施設の健全度、流域の荒廃状況、保全対象との位置関係、施設の重要度等を勘案して、適切に実施時期を設定する。

臨時点検は、原則として豪雨発生時や地震発生時などの、災害をもたらしかねない事象の発生直後の出来るだけ早い時期に実施する。

### (5) 点検の方法

点検の際には、以下の点に注意して実施する。

1)施設の異常の有無を目視確認し、記録することを原則とする。

2）写真撮影の実施を原則とする。撮影に際しては、前回調査時の写真等と比較して状況変化が把握できるよう、同じような撮影角度・範囲等で撮影する。状況の変化が、把握し易いよう、できるだけ定位置からの撮影を行う。

3）異常が認められた箇所における写真撮影では、変状の程度が分かるように、必要に応じてメジャー、ポール等を併用する。

4）異常の状況に応じて、目視だけでなく、ハンマー等の簡易な器具を用いて状況を確認する。

5）目視で発見した異常に関しては、その位置情報を含め、把握した状況を点検個票に記録する。

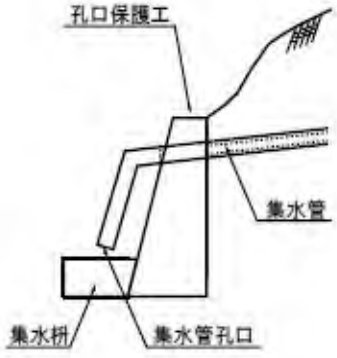
６）異常が確認された個所については、マーキングなど測定ポイントを明確にして、経過観察が容易となるようにしておく。また、詳細点検においては、異常個所の計測を行い、異常の程度に関して定量的な把握に努める。

７）点検にあたっては、設計時の図面や前回の点検調査票等を携行し、劣化・損傷の形態と程度、それらの進行経過を、施設機能維持の観点から確認する。

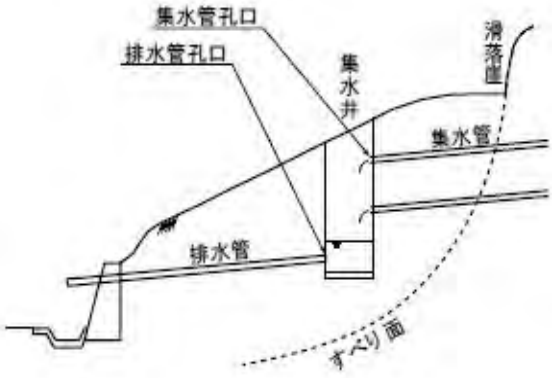
### 2.5.2　点検対象施設と点検箇所

地すべり対策工とは、杭工、シャフト工、アンカー工、地表水排除工、集水井工、横ボーリング工、排水トンネル工、のり面保護工、河川構造物等のほか、管理用道路も含むものとする。

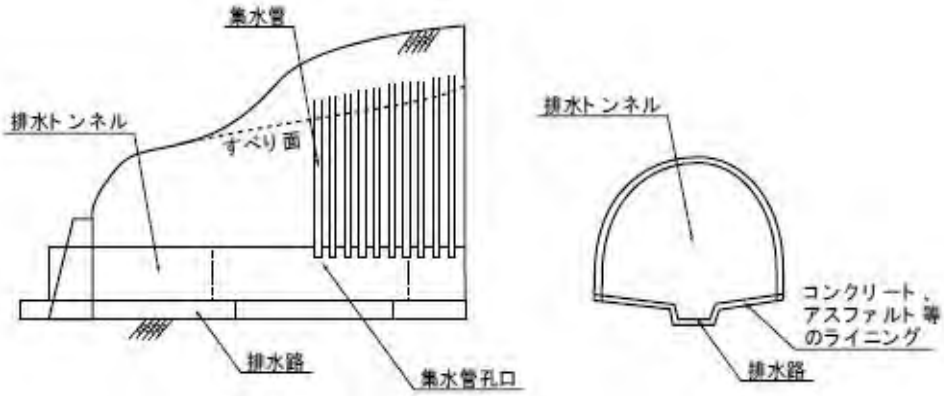
また、地すべり防止施設に直接影響を与える周辺状況についても点検の対象とする。



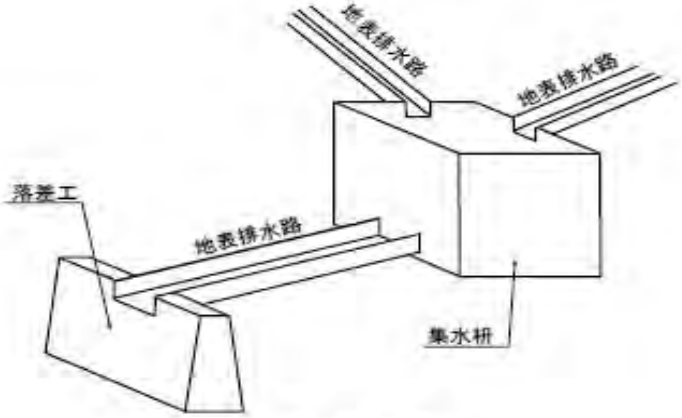

横ボーリング工の部位



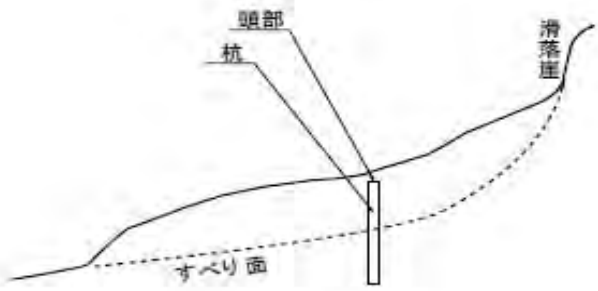

集水井工の部位



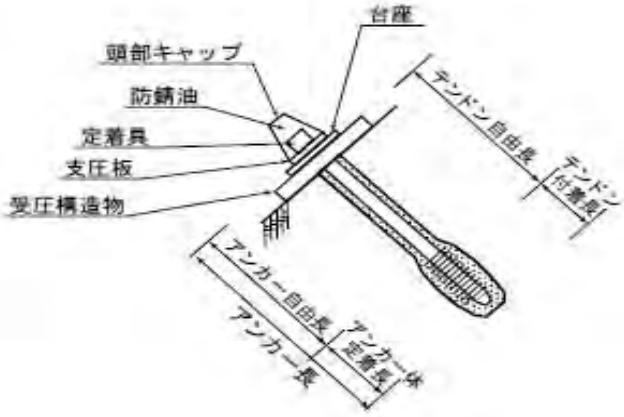

排水トンネル工の部位




水路工の部位




杭工の部位




アンカー工の部位

### 2.5.3　点検項目等

#### (1) 各施設に求められる機能と必要な性能

点検の際、対象とする部位に変状が認められた場合には、軽微であるかどうかを見極め、その変状を放置すると当該対策工の機能や性能にどのような影響を与えるかを考慮する。

施設に求められる機能と必要な性能の概略を、以下の表に示す。

地すべり防止施設

<table>
<tr><th>施設区分</th><th>求められる機能</th><th>必要な性能</th></tr>
<tr><td>水路工</td><td rowspan="7">地すべりを抑制する機能</td><td rowspan="8">地すべり防止施設の安定性、強度など構造上の性能</td></tr>
<tr><td>横ボーリング工</td></tr>
<tr><td>集水井工</td></tr>
<tr><td>排水トンネル工</td></tr>
<tr><td>排土工</td></tr>
<tr><td>押え盛土工</td></tr>
<tr><td>砂防堰提工、床固工、水制工、護岸工</td></tr>
<tr><td>杭工、シャフト工</td><td rowspan="2">地すべりを抑止する機能</td></tr>
<tr><td>アンカー工</td></tr>
<tr><td>管理用道路</td><td>地すべり防止施設に至る道路の安全を確保する機能</td><td>車両が安全に通行できるための路盤等の強度を保持していること</td></tr>
</table>

#### (2) 地すべり防止施設及び施設周辺状況等の点検

地すべり防止施設等の点検を行うにあたっては、劣化・腐食、損傷・変形等の原因とメカニズム、進行速度、機能や性能が低下した場合の問題点を推定しながら実施する。地すべり防止施設の機能や性能の低下の主な原因としては、経年劣化と地すべりの再滑動がある。このため、施設のみならず、周辺の状況についても点検の対象とする。

地すべり防止施設等の主な点検項目を、以下の表に示す。

<table>
<tr><th colspan="2">施設</th><th>部位</th><th>着目すべき損傷等</th><th>点検留意事項</th></tr>
<tr><td rowspan="4">抑制工</td><td rowspan="4">横ボーリング工</td><td rowspan="2">孔口保護工、集水枡</td><td>劣化・腐食、損傷・変形</td><td>目視点検によって可視部分の変状の有無を確認。<br>集水管からの排水状況（量）を記録することが望ましい。<br>経年変化による鋼製部材の腐食やコンクリート等部材の劣化の状況を確認。<br>地すべり活動等による孔口保護工や集水枡の損傷･変形の状況を確認。<br>目視点検によって可視部分の変状の有無を確認する<br>集水管からの排水状況（量）を記録することが望ましい。<br>経年変化による鋼製部材の腐食やコンクリート等部材の劣化の状況を確認する。<br>地すべり活動等による孔口保護工や集水枡の損傷･変形の状況を確認する。</td></tr>
<tr><td>土砂等の堆積</td><td>● 集水枡への土砂や植物遺骸等の堆積の状況を確認。</td></tr>
<tr><td rowspan="2">集水管（横ボーリング）</td><td>劣化・腐食、損傷・変形</td><td>● 経年変化による集水管の腐食（鋼製）や劣化（樹脂製）を確認<br>● 地すべり活動等による集水管の損傷・変形の状況を確認。</td></tr>
<tr><td>閉塞物の付着</td><td>● 集水管孔口への閉塞物（鉄細菌、泥、藻類）の付着状況を確認。</td></tr>
</table>

| | | 部位 | 着目すべき損傷等 | 点検留意事項 |
|---|---|---|---|---|
| 抑制工 | 集水井工 | 本体 | 劣化・腐食、損傷・変形 | 効果が大きく、重要な集水井については、内部に入って損傷や変形の位置、規模、変形の方向を記録する。内部への立ち入り点検は、酸欠や有毒ガス、転落等の危険があるので、安全を確認してから行う。<br>集水管からの排水状況（量）を記録することが望ましい。(上記は各部位に共通)<br>本体の損傷・変形の状況について、位置、規模、変形の方向を記録する。特に、クラックの位置、変形方向等は、力の加わり方を推測する重要な情報となるので適切に記録する。<br>経年変化による本体の腐食（鋼製部材）や劣化（コンクリート等部材）の状況について、位置、規模を記録する。 |
| | | 集水管 | 劣化・腐食、損傷・変形 | 経年変化による集水管の腐食（鋼製）や劣化（樹脂製）を確認<br>地すべり活動等による集水管の損傷・変形の状況を確認する。 |
| | | | 閉塞物の付着 | 集水管孔口への閉塞物（鉄細菌、泥、藻類）の付着状況を確認。 |
| | | 排水管 | 劣化・腐食、損傷・変形 | 経年変化による排水管の腐食（鋼製）や劣化（樹脂製）を確認。<br>地すべり活動等による排水管の損傷・変形の状況を確認する。<br>排水管の閉塞による湛水の有無を確認する。<br>排水管の呑口と吐口の水量を比較する等の方法で、排水管からの漏出の有無を確認できる。 |
| | | | 閉塞 | 集水管孔口への閉塞物（鉄細菌、泥、藻類）の付着状況を確認する。 |
| | | 安全施設（点検用階段、天蓋、進入防護柵、扉、鍵等) | 劣化・腐食、損傷・変形 | 施設の腐食・劣化、損傷・変形等の状況について確認する。 |
| | | 水路、集水枡、落差工 | 腐食・劣化、損傷・変形 | 目視点検によって可視部分の変状の有無を確認する。<br>経年変化による鋼製部材の腐食やコンクリート等部材の劣化の状況を確認する。<br>地すべり活動等による水路・集水枡・落差工の損傷・変形の状況を確認する。 |
| | | | 土砂等の堆積 | 水路・集水枡・落差工への土砂や植物遺骸等の堆積の状況を確認する。 |
| | 土工 | 排土斜面、押え盛土斜面 | 斜面の亀裂、段差、陥没、隆起、崩壊、はらみだし、湧水の有無 | 斜面の亀裂、段差、陥没、隆起、崩壊、はらみだし、湧水の有無などについて確認する。 |

| | 部位 | 着目すべき損傷等 | 点検留意事項 |
|---|---|---|---|
| 管理用道路 | 道路のり面保護工<br>排水処理施設 | のり面工、排水処理の状況等 | 管理用道路において車両で通行できる状態であるかを確認する。<br>管理用道路に設置された道路のり面の保護工、渓流横過部の横断溝渠、橋梁など横断排水施設及び路面の状況を確認する。<br>道路縦断排水が集中する地点周辺では、水路の侵食や斜面変動の有無に留意する。<br>管理用ゲート等の施錠設備などの保守点検が必要である。 |
| 施設周辺斜面 | 斜面変状 | 亀裂、段差、陥没、隆起、崩壊、はらみだし | 施設周辺斜面の変状等について目視で確認する。<br>例えば、新たな亀裂、段差、斜面崩落、湧水などの発生の有無、地すべり防止施設や当該地域内の道路、擁壁等土木構造物や立木の変状の有無や分構造物（土木構造 布状況、進行状況等について確認する。 |
| | 構造物（土木構造布状況、進行状況等について確認する。物、建築物等） | 亀裂、段差、ずれ、変形 | |
| | 湧水 | 湧水の状況の変化 | |

## 2.6　対策工の健全度評価

### 2.6.1　健全度評価の考え方

施設の健全度は、定期点検及び必要に応じて実施される詳細点検等の結果に基づき、部位ごとの変状レベルを評価した上で、流域や当該地すべり地等の施設周辺の状況も踏まえ、施設あるいは施設群全体について総合的に評価する。

部位または、部位グループ毎の変状レベルは a、b、c とするものとする。

個別施設の健全度の表記については、対策不要をA、経過観察をB、要対策をC とそれぞれ表現する。

部位あるいは部位グループの変状レベル評価と表記

| 変状度 | 損壊程度 | |
|---|---|---|
| a | 当該部位に損傷等は発生していないもしくは軽微な損傷が発生しているものの、損傷等に伴う当該部位の性能の劣化が認められず、対策の必要がない状態 | |
| b | 当該部位に損傷等が発生しているが、問題となる性能の劣化が生じていない。現状では対策を講じる必要はないが、今後の損傷等の進行を確認するため、定期巡視点検や臨時点検等により、経過を観察する必要がある状態 | |
| c | 当該部位に損傷等が発生しており、損傷等に伴い、当該部位の性能上の安定性や強度の低下が懸念される状態 | |

対策工の健全度評価と表記

| 健全度 | 損傷等の程度 | 表記 |
|---|---|---|
| 対策不要 | 当該対策工に損傷等は発生していないか、軽微な損傷が発生しているものの、損傷等に伴う当該対策工の機能の低下及び性能の劣化が認められず、対策の必要がない状態 | A |
| 経過観察 | 当該対策工に損傷等が発生しているが、問題となる機能の低下及び性能の劣化が生じていない。現状では対策を講じる必要はないが、将来対策を必要とするおそれがあるので、定期点検や臨時点検等により、経過を観察する必要がある状態 | B |
| 要対策 | 当該対策工に損傷等が発生しており、損傷等に伴い、機能低下が生じている、あるいは当該対策工の性能上の安定性や強度の低下が懸念される状態 | C |

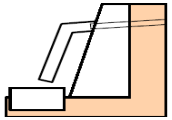
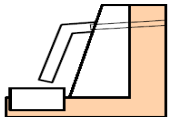
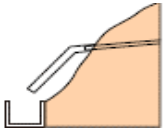
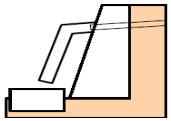
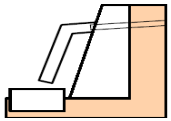
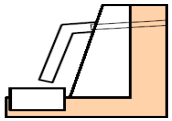
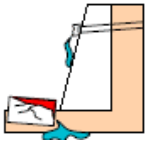
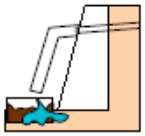
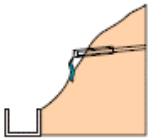
### 2.6.2　地すべり防止施設の健全度の評価

地すべり防止施設等の各部位の変状レベルの評価は、変状レベルに応じて次の通り評価する。

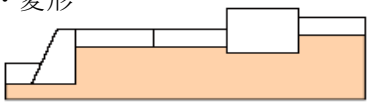
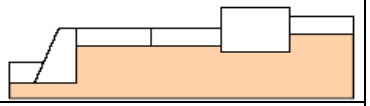
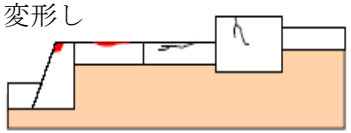
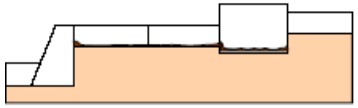
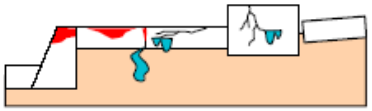
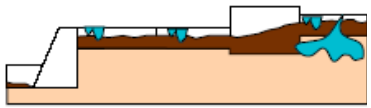
a. 異常なし、または軽微な損傷
b. 損傷があるが、機能・性能低下に至っていない
c. 機能・性能低下あり

地すべり防止施設等の各部位の変状レベルの評価基準は次の図を参考とする。

## 主な部位の変状レベルの評価基準（横ボーリング工）

| 変状レベル | | 変状レベル | | | |
|---|---|---|---|---|---|
| | | 孔口保護工・集水枡の劣化・腐食、損傷・変形 | 集水枡の土砂等の堆積 | 集水管の劣化・腐食、損傷・変形 | 集水管の閉塞物の付着 |
| a | 軽微な損傷 | • 変状なし<br>• 軽微な劣化・腐食、損傷・変形<br>  | • 土砂等の堆積なし<br>• 軽微な土砂等の堆積<br>  | • 変状なし<br>• 軽微な劣化・腐食、損傷・変形<br>  | • 閉塞物の付着なし<br>• 孔口に閉塞物が少量付着<br>• 地下水の排出が確認されている<br> |
| b | 損傷あるが、機能・性能低下に至っていない | • 一部が劣化・腐食、損傷・変形している（漏水はない状態）<br>  | • 一部に土砂等が堆積している（溢水はない状態）<br>  | • 一部の集水管が劣化・腐食、損傷・変形している<br>  | • 大半の集水管に閉塞物が付着（概ね孔口の25%以下）している<br>• 地下水の排出が確認されている<br> |
| c | 機能・性能低下あり | • 劣化・腐食、損傷・変形によって漏水している<br>  | • 劣化・腐食、損傷・変形によって漏水している<br>  | • 大半の集水管が劣化・腐食、損傷・変形している<br>  | • 大半の集水管に閉塞物が多量に付着（概ね孔口の25%以上）している<br>• 閉塞により地下水の排出が止まっていると考えられる<br> |
| 評価の観点 | | ・集水不能や集水した水の漏出・溢水は、地下水位の上昇を上昇させる要因となり、地すべりの安定性の低下につながる。<br>・地下水観測や地下水排除工の排水量観測のデータは、地下水排除工の健全度評価において有益な情報となる。 | | | |
| | | ・孔口保護工等の劣化・腐食、損傷・変形の進行は、横ボーリングの集水不能や集水した水の漏出を生じる恐れがある。 | ・集水枡の土砂等の堆積が進行すると、集水した水の溢水を生じる恐れがある。 | ・劣化・腐食、損傷・変形の進行は、横ボーリングの集水不能を生じる恐れがある。 | ・閉塞物によって集水管が閉塞すると、集水不能を生じる。 |
| 点検留意事項 | | ・目視点検によって可視部分の変状の有無を確認する。<br>・集水管からの排水状況（量）を記録することが望ましい。 | | | |
| | | ・経年変化による鋼製部材の腐食やコンクリート等部材の劣化の状況を確認する。<br>・地すべり活動等による孔口保護工や集水枡の損傷・変形の状況を確認する。 | ・集水枡への土砂や植物遺骸等の堆積の状況を確認する。 | ・経年変化による集水管の腐食（鋼製）や劣化（樹脂製）の状況を確認する。<br>・地すべり活動等による集水管の損傷・変形の状況を確認する。 | ・集水管孔口への閉塞物（鉄細菌、泥、藻類）の付着状況を確認する。 |

主な部位の変状レベルの評価基準（水路工）

| 変状レベル | | 水路工（水路、集水桝、落差工） | |
|---|---|---|---|
| | | 水路・集水枡・落差工の腐食・劣化、損傷・変形 | 水路・集水枡・落差工の土砂等の堆積 |
| a | 軽微な損傷 | ○　変状なし<br>○　軽微な腐食・劣化、損傷・変形<br>  | ○　変状なし<br>○　軽微な土砂等の堆積<br>  |
| b | 損傷あるが、機能・性能低下に至っていない | ○　一部が腐食・劣化、損傷・変形している<br>○　漏水はない状態<br>  | ○　一部に土砂等が堆積している<br>○　溢水はない状態<br>  |
| c | 機能・性能低下あり | ○　腐食・劣化、損傷・変形によって漏水している<br>  | ○　土砂等の堆積によって溢水している<br>  |
| 評価の観点 | | ・地すべり活動や水路側部の侵食等によって、水路等が破損・変形することがある。<br>・水路、集水桝、落差工の腐食・劣化、損傷・変形が進行すると、集水した水の漏出を生じる恐れがある。 | ・水路・集水枡・落差工の土砂等の堆積が進行すると、集水した水の溢水を生じる恐れがある。 |
| | | ・集水した水の漏出や溢水は、地下水位を上昇させる要因となり、地すべりの安定性の低下につながる。 | |
| 点検留意事項 | | ・目視点検によって可視部分の変状の有無を確認する。 | |
| | | ・経年変化による鋼製部材の腐食やコンクリート等部材の劣化の状況を確認する。<br>・地すべり活動等による水路・集水枡・落差工の損傷・変形の状況を確認する。 | ・水路・集水枡・落差工への土砂や植物遺骸等の堆積の状況を確認する。 |

### 2.6.3　部位の変状レベルの確認・記録及び現場状況等の把握

変状が認められた場合には、その変状の生じた位置、規模や特徴を把握し、写真撮影等含めて適切に記録する。

また、その変状の特性あるいは変状の進行度を把握することが必要である。さらに、原因あるいはメカニズムをおおよそ考察しておく。このため、変状を起こした部位の現場条件を把握し、その部位を構成する材料特性も踏まえた上で、その変状が今後どのように推移するかを可能な範囲で推測する。

変状は、その位置、規模(幅、長さ、深さ)や特徴を点検時におおまかに把握し、記録するとともに、あわせて写真撮影を必ず行う。

変状の特性(進行性か否か)、あるいは変状の進行度を見極めるためには、施工年度の確認、当該部位の既往の点検記録との照合が有効である。

地すべりに近接する斜面周辺に発生した亀裂、陥没、隆起、崩落、湧水等の変状の有無及び変状の発生した当該部位との位置関係などを確認しておく。

### 2.6.4　点検の視点

対策工の健全度評価に際しては、対策工の機能および性能が適切に維持されるかという視点が重要である。

地すべり対策工の健全度評価に際して、次のような視点を持って点検を実施し、施設の総合的な評価に反映させる。

地すべりや斜面崩壊による変状が構造物や施設周辺の斜面に出現しているかどうか、また、現在の施設を計画した際に想定された地すべりブロックの範囲、規模、運動方向等が現状で変化していないかを確認する。

過去の地すべり調査や観測データ等と比較した現在の対象地すべり地域の変動状況の確認。

地すべり防止施設等に地すべりの再滑動による変状が生じていることが確認された場合は、地すべり対策の実施も視野に入れた詳細調査を速やかな実施が必要となる。

### 2.6.5　健全度評価の留意点

健全度は施設の健全性を示すものであって、対策実施のための優先度評価とは異なることを認識した上で、砂防関係施設のそれぞれの機能及び性能の特性、設置された現場の条件等に留意して評価する。

健全度の総合評価の留意点を示す。

- 施設の維持管理は、施設の機能や性能が確保されているかという視点から検討する必要がある。確認された現象が技術的にみて、施設の機能や性能に影響するかという視点から健全度を評価する必要がある。
- 施設には、長年月を経過した施設が存在する。従って、施工年度からの経過年数、施設の改築等を踏まえて、劣化の進行について検討する必要がある。劣化のスピードが早いか否かを確認することは、健全度を評価する上で重要な要素である。
- 過去の施設の被災データは、施設の維持管理において参考となる有益な情報である
- 地すべり防止施設は、構造や構成材料の異なる工種が複雑に組み合わされている上に、抑制や抑止機能という、それぞれ異質の機能を組み合わせて地すべりの防止を計っているため、それぞれの施設の目的を理解し、健全度を評価するものとする。

・ 地すべり防止施設の部位ごとの変状レベル、各単体施設の変状レベルを評価した後に、それぞれの機能と位置関係や規模を考慮して、工種毎にグループにまとめ、グループ毎に健全度を評価してもよい。

別添資料４　地すべり地における水利用・土工に係わる運用則

# 地すべり地における行動と責任についての運用則

## 1.　地すべりの概要

本運用則の目的は、人為的な行為を制限することにより地すべりを防止し、損害を軽減するとともに、住民に適切な生活条件を提供することである。

地すべりは、アルメニア共和国において、開発と国民の生活や健康、公共、その他施設を脅かす深刻な要因となっている。

地すべりは、山麓付近に範囲で多く分布している。空中写真判読の結果、アルメニア国内では、2ha 以上の面積を有する地すべりが、2506 箇所で確認されている。

地すべり地の総面積は 1,216km2 で、アルメニア国の全領土の 4,1%を占める。地すべりは、全 960 のうち 233 のコミュニティーに損害をもたらし、280 の地すべりは、全 7400km のうち 240km（3,2%）の道路網を、10 の地すべりは全 870km のうち 4,8km（0,5%）の鉄道網の脅威となっている。

## 2.　地すべりの原因

地すべり変動は、地質構造、地層の分布状況、地下水変動、森林や草地の被覆率、地震、及び岩石の強度の低下や地すべりの発生につながる地形地質学的特徴を配慮しない人間の不注意な行為が原因となっている。

地すべり変動の原因は、自然的原因と人為的原因の 2 つのグループに区分される。

(1)　自然的原因
1) 地質構造
2) 急斜面
3) 水理学的条件（地下水、地表水の貯留）
4) 気候条件、豪雨、融雪など
5) 大地震、河川による不安定斜面の浸食等

(2)　人為的原因
1) 斜面の切土・盛土
2) 地すべり地での過大な荷重を伴う建設
3) 規制されていない不適切な灌漑
4) 不安定斜面の伐採

## 3. 地すべり地でのコミュニティーと住民の役割

(1) コミュニティーの役割

1) 地すべり地域での建設作業の管理と規制
2) 地すべり被害軽減を目的とする、地すべりを不安定化させる行為についての住民への通知、管理
3) 地すべり地域での灌漑作業の管理と規制、灌漑システムの適切な維持管理
4) 地すべり兆候が確認された場合の、関係機関への迅速な報告及び対応
5) 地すべり対策施設の維持管理

(2) 住民の役割

1) 建設工事中に斜面崩壊を引き起こす可能性のある斜面の掘削の禁止
2) 建設工事中及び構造物による斜面への過荷重の禁止
3) 灌漑作業を管理し、地下への灌漑水の浸透を抑制する。
   適切な水道管システムの導入による灌漑水の使用の適切化
4) 不安定斜面での伐採の禁止

## 4. 運用規定

(1) 運用則の適用範囲

本運用則の適用範囲は、別添の地すべり分布図に示される地域とする。また、上記以外の地域でも、専門家の意見に基づき MES が必要と判断する地域については適用できるものとする。

(2) 許可対象となる行為

第 3 条の内容に基づき、地すべり地域内でコミュニティー及び住民が以下の行為を実施する場合には、マルツの許可を必要とする。

① 切土、掘削：切土及び掘削の位置、高さ及び深さについての許可
② 盛土、土砂移動：盛土及び土砂移動の位置、高さ及び規模についての許可
③ 住宅及び構造物の建築：位置及び規模についての許可
④ 地すべり地外からの導水：位置、管径及び管材料についての許可
⑤ 地すべり地内での散水：散水量及び時期等についての許可
⑥ 伐採：伐採範囲、幹径等についての許可

(3) 許可の取り消し

専門家の意見に基づき MES が判断する場合には、第 4 条(2)の許可を取り消し、もしくは条件の変更、行為の中止及び原状回復を命ずることができる。

(4)　罰則

コミュニティー及び住民が、本運用則を違反した場合、責任（罰金・罰則）の対象となる。

(5)　非常事態状況下における MES の権限

地すべりの活発化により、周辺住民の人命を脅かす被害や公共インフラに甚大な損害を与える可能性があると判断される非常事態状況下において、MES は当該危険地域について、以下の権限を行使できるものとする。

① 危険地域内への立入制限及び立入禁止命令
② 危険地域内住民への避難勧告及び退去命令
③ 灌漑施設及び水道施設等の使用制限及び使用禁止命令
④ マルツ及びコミュニティーに対して、地すべりを安定化させるための応急対策工の実施命令
⑤ その他、上記以外において、専門家の指示に基づき人的被害及び公共損益を防止するために必要と判断される事項についての指示、命令

＜付録＞

１．地すべり分布図
２．地すべり兆候
３．許可基準の参考値
４．非常事態省の責任業務

**付録①　地すべり分布図**

別添

**付録②　地すべり兆候**

・家のドアや窓が動きにくくなる
・家の天井、床、壁のモルタルのひび割れ
・土壌表面、舗道、道路に徐々に亀裂が広がり、斜面の基部のはらみだし
・地下水の湧出
・構造物や木々の移動
・地すべりに伴う異音

付録③　許可基準の参考値

| 原因となる行為 | 許可の必要な行為 | 項目 | 許可基準の参考値 |
|---|---|---|---|
| 1. 地形改変 | 切土、掘削 | ・切土の規模（高さ） | ・垂直高さ 2m 以上となる切土は許可を必要とする |
| | | ・掘削の規模（深さ） | ・垂直深さ 2m 以上となる掘削は許可を必要とする |
| | | ・切土、掘削の位置 | ・地すべり末端部での切土及び掘削は避ける<br>・住居や地すべり施設等の構造物 5m 以内の切土及び掘削は避ける |
| | 盛土 | ・盛土の規模（高さ） | ・垂直高さ 5m 以上となる盛土は許可を必要とする |
| | | ・盛土の位置 | ・地すべり頭部での盛土は避ける<br>・地表水及び地下水を堰き止め増加させる可能性がある範囲での盛土は避ける |
| 2. 開発行為 | 住宅及び構造物の建築 | ・住宅及び構造物の位置 | ・地すべり頭部での住宅及び構造物の建築は避ける<br>・地すべり地内及び周辺での住宅及び構造物の建築は許可を必要とする |
| | | ・住宅及び構造物の規模（重量） | ・1m$^2$10t 以上となる施設及び工作物の新築及び改良は許可を必要とする |
| 3. 灌漑 | 地すべり地外からの導水 | ・導水管の位置 | ・地すべり変動の大きな場所への敷設は避ける |
| | | ・導水管径 | ・断面積 100cm$^2$（直径 10cm相当）以上の導水管の敷設は許可を必要とする |
| | | ・導水管材料 | ・鉄管、コンクリート管、その他漏水の可能性が少ない材料以外の使用は避ける |
| | 散水 | ・散水量 | ・ |
| | | ・散水時期 | ・豪雨時や融雪期の散水は避ける |
| 4. 伐採 | 伐採 | ・伐採範囲 | ・ |
| | | ・伐採木の幹径 | ・ |

※本表は、許可基準に関しての参考資料であり、地すべり状況に応じて使用の可否を判断するものとする。

## 付録④　非常事態省の責任業務：権限と能力

1) 緊急事態時に国民の安全と健康を守る
2) 緊急事故発生の調査
3) 緊急事態を予防と結果の排除、レスキュー、緊急救助、消火と緊急な事故復旧作業の組織と調整
4) 災害地内への立入り許可および監督機能の実施
5) 責務を確実にするために、法律で規定された範囲で、組織と市民のコミュニケーション手段、輸送手段およびその他の財産を自由に使用（事後に適切な補償を行う）。
6) 救助、緊急救助、緊急救助、消火活動その他の活動における住民への指示
7) 緊急事態の緊急予防、削減、排除の組織と実施のために、州の機関や地方の自治体、組織、市民に責務の割り当て
8) 緊急事態、救助、緊急救助、緊急救助、消防などの作業が行われるエリアですべての人に安全規則を守るよう要求、地域への進入の禁止
9) 組織は、緊急予防、削減と排除、民間防衛活動の組織と実施中に緊急事態救助隊省を支援しなければならない。
10) 国民は、緊急事態の結果から人口を守るための措置の実施に参加する義務があり、救助隊職員の指示をその指示に従わなければならない。

別添資料５　パイロット事業地区選定一覧表

List of Candidates of Pilot Project Areas

| No. | Name | Map | Inventory sheet | Altitude (m) | Width (m) | Length (m) | Area (ha) | Hazard | Risk | Priority | Houses damaged | Houses in risk | Other damages | Site visit | | Evaluation | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | Fin |
| 0 | Voghjaberd (Active blocks) | K-38-138 | KOTA-138-0160 | 1,570 | 1,913 | 2,906 | 287 | I | H | A | 150 | 250 | Main road etc. | 18/Aug | Too big, Partly very active, | A | B | B | A | |
| | | | | | | | | | | | | | | | Measures to be studied | 5 | 3 | 3 | 5 | 16 |
| 1 | Voghjaberd (whole area) | K-38-138 | KOTA-138-0160 | 1,570 | 1,913 | 2,906 | 287 | I | H | A | 150 | 250 | Main road etc. | 18/Aug | Too big, Partly very active, | A | C | B | D | |
| | | | | | | | | | | | | | | | Measures to be studied | 5 | 0 | 3 | -3 | 5 |
| 2 | Dilijan "Mets Tala" | K-38-114 | TAVU-114-0280 | 1,325 | 900 | 550 | 62 | II | H | B | 2,000 | 2,000 | | 22/Aug | Too big, Rather stable after | B | D | C | C | |
| | | | | | | | | | | | | | | | drainage tunnel renovated | 3 | -3 | 0 | 0 | 0 |
| 3 | Getahovit | K-38-115 | TAVU-115-0271 | 756 | 450 | 200 | 5 | II | H | B | 550 | ? | | 22/Aug | Good for pilot project, Very active | B | B | A | A | |
| | | | | | | | | | | | | | | | Serious damage to houses | 3 | 3 | 5 | 5 | 16 |
| 4 | Arapi | K-38-112 | SHIR-112-0020 | 1,484 | 440 | 220 | 5 | I | H | A | 200 | 600 | | 21/Aug | Good for pilot project, Very active | A | B | A | A | |
| | | | | | | | | | | | | | | | Serious damage to houses | 5 | 3 | 5 | 5 | 18 |
| 5 | Ayrum | K-38-102 | TAVU-102-0033 | 510 | 250 | 100 | 2 | I | M | B | 0 | 0 | | 22/Aug | No residential house, MTC be in charge | B | B | C | B | |
| | | | | | | | | | | | | | | | Measures will be taken in on-going project | 3 | 3 | 0 | 3 | 9 |
| 6 | Dilijan international school | K-38-114 | TAVU-114-0120 | 1,389 | 650 | 700 | 40 | III | M | C | ? | ? | | 22/Aug | Private property | C | C | C | B | |
| | | | | | | | | | | | | | | | Activeness still unknown (stable?) | 0 | 0 | 0 | 3 | 3 |
| 7 | Sisian-pass | J-38-008 | VAYO-008-0460 | 2,418 | 1,100 | 5,400 | 263 | I | M | B | 0 | 0 | Main road etc. | 19/Aug | Very active, No resients, | B | B | D | D | |
| | | | | | | | | | | | | | | | Main road seriouslyu damaged | 3 | 3 | -3 | -3 | 0 |
| 8 | Kapan (Manukyan) | J-38-033 | (SYUN-033-2050) | 874 | 300 | 500 | 10 | III | M | C | 0 | Apartment buildings | | 20/Aug | Very active | C | B | C | A | |
| | | | | | | | | | | | | | | | Measures to be studied | 0 | 3 | 0 | 5 | 8 |
| 9 | Hovq | K-38-115 | TAVU-115-2260 | 1,197 | 1,000 | 4,400 | 628 | I | H | A | 70 | ? | Main road etc. | 22/Aug | Too big | A | C | B | D | |
| | | | | | | | | | | | | | | | Relocation to be studied | 5 | 0 | 3 | -3 | 5 |
| 10 | Haghatsin | K-38-114 | TAVU-114-0800 | 1,082 | 950 | 660 | 49 | II | H | B | 17 | 17 | Main road etc. | 22/Aug | Too big | B | C | C | B | |
| | | | | | | | | | | | | | | | Long-term measure to be studied | 3 | 0 | 0 | 3 | 6 |

| Category | | Rank | | | |
|---|---|---|---|---|---|
| 1 | Priority (Seriousness of hazard and risk in the areas) | A | B | C | D |
| 2 | Possibility of applying countermeasures to other areas | High | Moderate | Fair | Poor |
| 3 | Cooperation and intention of residents and local managing staffs in the areas | Excellent | Good | Fair | Poor |
| 4 | Scale of active landslide (A; ha) | A<=1 | 1<A <=10 | 10<A <=100 | 100<A |
| Point | | 5 | 3 | 0 | -3 |