

Date of Submission	<u>16.08.2020</u>
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IPL Project Proposal Form 2020

(MAXIMUM: 3 PAGES IN LENGTH)

1. **Project Title:** Ukraine cultural heritage objects within landslide hazardous sites

2. **Main Project Fields**

(4) Mitigation, Preparedness and Recovery

A. Preparedness, B. Mitigation, C. Recovery

3. **Name of Project leader:** Oleksandr M. Trofymchuk, Grand Ph.D., Professor, Corresponding member of National Academy of Sciences of Ukraine

Affiliation: (office and position): Director, Institute of Telecommunications and Global Information Space of National Academy of Sciences of Ukraine

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Core members of the Project:

Iurii Kalyukh, Ph.D., Professor, Head of Department, State Research Institute of Building Constructions;
Olesij Lebid, Ph.D., Senior Researcher, Vice-Director, Institute of Telecommunications and Global Information Space of National Academy of Sciences of Ukraine;

Viktoria Berchun, Scientific Researcher, Institute of Telecommunications and Global Information Space of National Academy of Sciences of Ukraine

4. **Objectives:** The main goal is to certification of Ukraine cultural heritage objects within landslide hazardous sites: experimental and analytical research etc. on the example of the Kyiv-Pechersk Lavra. Objectives: develop of methodology for certification religious buildings of the Kyiv-Pechersk Lavra within landslide hazardous sites, certification of religious buildings of the Kyiv-Pechersk Lavra, data collection and processing, development of targeted database and preparation of report.

5. **Background Justification:** Ukraine has been a member of the "Landslides and Cultural & Natural Heritage" (LACUNHEN) thematic Network of the ICL since 2012 (head of the LACUNHEN is the Margottini C.). The purpose of the LACUNHEN - International Consortium on Landslides is to create a platform for scientists and practitioners who are ready to contribute to safeguarding relevant endangered Natural and Cultural Heritage sites. Within this view, landslides and more generally slope instabilities are an important factor endangering cultural heritage sites and its degradation and requires additional protection measures, creation of the monitoring and early warning systems, etc. More than 90% of the territory of Ukraine has complex ground conditions and about 120 000 sq. km of the Ukrainian territory are located in the zone with seismicity of natural origin with a magnitude varying from 6 to 9. Therefore, unpredictable changes of natural geological and man-made factors governing ground conditions may lead to dangerous deformation processes in the Ukraine heritage sites.

6. **Study Area:** The certification of religious buildings of the Kyiv-Pechersk Lavra within landslide

hazardous sites. Kyiv region.

7. **Project Duration:** January, 2021 – December 2023

8. **Resources necessary for the Project and their mobilization. Personnel, Facilities, and Budgets**
Personnel:

Project leader and 3 core members of the Project will represent 2 scientific institutions including Institute of Telecommunications and Global Information Space (ITGIS), Ukrainian State Research Institute of Building Constructions. 2 research assistants and 3 IT specialists, who are employees of the Institute of Telecommunications and Global Information Space, will also be involved in the Project implementation. It is planned to hire 2-3 local consultants.

Facilities: ITGIS will provide the office space, 9 PC and other facilities for the Project.

Budget: Project budget is 40000 Euro and includes wages of the Project team members and miscellaneous expenses.

9. **Project Description:**

Will be created method of certification and assessment of technical state of the Kyiv-Pechersk Lavra objects in hazardous landslide sites. The method includes: visual and vibrodynamic examination of Kyiv-Pechersk Lavra objects within landslide hazardous sites; development of calculation model and calculations; comparative analysis of experimental and estimated data; recommendations for the repair and restoration and further operation of Kyiv-Pechersk Lavra objects within landslide hazardous sites.

Will be conducted certification some of religious buildings of the Kyiv-Pechersk Lavra, data collection and processing, development of targeted database and preparation of report.

10. **Work Plan/Expected Results:**

Activity/month	1-6	6-12	13-18	19-24	25-30	31-35	35-36
Develop of methodology for certification religious buildings of the Kyiv-Pechersk Lavra							
Certification of some religious buildings of the Kyiv-Pechersk Lavra							
Data collection and processing							
Development of targeted database							
Preparation of report							

11. **Deliverables/Time Frame:**

The following deliverables is planned to be produced:

The methodology for certification religious buildings of the Kyiv-Pechersk Lavra - December 2021.

Certification of some religious buildings of the Kyiv-Pechersk Lavra - December 2023.

Data collection and processing– July 2023.

Targeted database - December 2023.

Final Project report – December 2023.

12. Project Beneficiaries:

Kyiv-Pechersk Lavra;

Kyiv Pechersk District local authority and Kyiv town State Administration;

Ministry of Environmental Protection;

Institutions of National Academy of Sciences of Ukraine;

Environmental NGOs.

13. References (Optional): (6 lines maximum; i.e. relevant publications)

1. TXT-tool 2.380-1.1: Monitoring and Early Warning System of the Building Constructions of the Livadia Palace, Ukraine / O. Trofymchuk, I. Kaliukh, O. Kliomenkov/ In book: Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools. - 2018. – P. 491-508.
2. Ivanik O., Kaliukh I., (2018) The monitoring and early warning system of the livadia palace building constructions placed on the active central livadia landslide system, Crimea, Ukraine. XII International Scientific Conference “Monitoring of Geological Processes and Ecological Condition of the Environment” 13–16 November 2018, Kyiv, Ukraine. // EarthDoc. – 2019.
3. Kaliukh I., Farenjuk G., Farenjuk I. (2018) Geotechnical issues of monitoring, calculation and engineering protection of landslide hazardous areas of Ukraine. In: Wu W., Yu HS. (eds) Proceedings of China-Europe Conference on Geotechnical Engineering. Springer Series in Geomechanics and Geoengineering. Springer, Cham
4. Vibrodinamic monitoring of pile foundation engineering on landslide hazardous site in dense urban development conditions / I. Kaliukh, O. Lebid, V. Dunin, Y. Berchun, S. Samoilenko // Ekologichna Bezpeka. – 2018. – № 2 (26). – C. 54-64.

Note: Please fill and submit this form **by 15 September 2020** to ICL Network

<icl-network@iclhq.org> and ICL secretariat <secretariat@iclhq.org>