

PIARC (World Road Association) Strategic Plan - 2024-2027

TECHNICAL COMMITTEE 4.3 – EARTHWORKS

Overview

TC 4.3 Earthworks worked on the resilience of Earth Structures during the 2022–2023 PIARC Work Cycle. We emphasised the need to manage these assets and schedule minor works and maintenance during the life cycle of all infrastructure. We identified that Earth Structures, although normally the largest part of the highway infrastructure, with greater impact from a natural hazard, also receive the least attention in terms of Asset Management. This explains the first output we want to focus on during this 2023-2027 PIARC work cycle. It will detail best practice of our members for earth structure asset management, with a case study report and full report.

The second output is based on the urgent need to reduce our impact on climate changes. Our TC will gather the main ideas to reduce greenhouse gases production during earthworks, from design to construction and maintenance with the aim of achieving net-zero, in a full report. From 2015, our Technical Committee drafted an Earthworks Manual, a useful document for LMIC or any country without any specific earthworks recommendations or guides. The remaining action is to complete production of the following four booklets:

- 2C – Earthworks Projects: including project design, geotechnical investigations, geometrical constraints, etc.
- 2D – Earthworks Realisation: describing earthworks material, planning quality and goals for both companies and contract managers, etc.
- 2F – Unpaved Roads: design and works.
- 2G – Innovative methods and techniques: the place and need for innovation in the future.

4.3.1 Earth structures asset management

Purpose: The purpose of this workstream is to compile a technical and practical document for infrastructure owners, focusing on maintenance, monitoring, inspection and minor works, they should develop specifically for Resilient Earth Structures.

Importance to roads agencies: This work is important to road agencies/road industry as Climate Change is having a priority impact on Earth Structures.

Audience: Stakeholders could use the results of this work. It should have a benefit on the cost of repairing earth structures considering a resilient and global strategy of maintenance, reducing numbers and/or intensity of unexpected events due to natural hazards.

Deliverables: Technical report, case studies, additions to the asset management online manual, seminar.

Background to TC's work on this topic: The background of this topic was discussed during 2020–2023 PIARC Cycle, in WG1 Resilience and WG2 Innovations.

Low and lower-middle income countries: LMIC should find recommendations for earth structures management, as well as HMIC.

Gender inclusion & diversity: Not relevant.

Potential duration: 3 years for the Case Studies - 4 years for the Full Report.

4.3.2 Earthworks Manual

Purpose: The purpose of this workstream is to continue drafting, and complete, the Earthworks Manual, booklets 2C-Earthworks Projects, 2D-Earthwork Realisation, 2F-Unpaved Roads and 2G-Innovation.

Importance to roads agencies: This work is important to road agencies/road industry in countries without a suitable in country guide or research institute in Geotechnical Engineering.

Audience: Stakeholder, private companies, consulting engineers in LMIC will use the results of this work.

Deliverables: Seminar, additions to the Earthworks Manual.

Background to TC's work on this topic: This work follows the previous PIARC work cycle since 2015. The existing Earthworks Manual is partly completed in the previous cycles in Genesis and preambles, General considerations, 2A-Materials, 2B-Treatment of materials and 2E-Environmental aspects.

Low and lower-middle income countries: LMIC are the main target audience and should find recommendations for earth structures design, building and management useful.

Gender inclusion & diversity: Not relevant.

Potential duration: 4 years.

4.3.3 De-carbonization of earthworks – construction and maintenance

Purpose: The purpose of this workstream is to identify the origin of the GHG emission in Earthworks, and the way the domain could reduce GHG, highlighting the best practice in decarbonisation techniques and/or innovation needs.

Importance to roads agencies: This work is important to road agencies/road industry that want to improve their practises and reduce their environmental impact.

Audience: Stakeholders, private companies, consulting engineers that want to reduce their environmental impact on climate change.

Deliverables: Survey, seminar, provide a paper to TC4.5 focused on Earthworks.

Background to TC's work on this topic: This topic is a new topic and should provide inputs for TC4.5 full report.

Low and lower-middle income countries: LMIC should be interested in these documents potentially if are considering a net zero carbon agenda as far as they are concerned by these topics.

Gender inclusion & diversity: Not relevant.

Potential duration: 2.5 years.