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DFI PROJECT FUND PROPOSAL 2021

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EFFC-DFI GUIDE TO WORKING PLATFORMS - FIELD RESEARCH

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1.0 INTRODUCTION

The European Federation of Foundation Contractors (EFFC) and The Deep Foundations Institute (DFI) have set up a Task Group to compile a Guide for Working Platforms.
<http://www.dfi.org/viewpub.asp?tid=TM-PLATFORMS>

The first edition of this Guide has been published in January 2020. The Guide has identified areas where knowledge is limited. The aim of the Guide is to provide reliable methods for design, testing and verification of working platforms for construction equipment, especially in the deep foundation industry where track loads can be excessive due to the nature of our operations. This proposal is intended to raise the interest of several technical committees within DFI.

2.0 PROPOSAL

Before the second edition of the guide can be published it is proposed to carry out a series of field research studies. This summary sets out the planned scope of these studies where funding is requested from DFI, EFFC and others. This research is also linked to ongoing academic research work in the US and Europe.

The research is proposed in three parts:

- 1) Perform field test on actual working platforms utilizing non-standard testing methods.
- 2) Measure actual track pressure for different equipment types on different platforms.
- 3) Compare available design methods with actual platform performance data to recommend practical design approaches (academic partner required).

It is intended that access to the platforms are made available by the members of both organizations and third parties. The field test will be performed by either the contractors themselves or by local independent testing agencies. The results will be reviewed by the working group and the academic partners. The data from the contractors will be treated in confidence. Sites will not be referred to by name, merely a number.

PART 1 of this Field Research Study:

Current practice does (almost never) provide any recommendation by the GEOR to the Owner or Prime Contractor for any platform design or construction. Available standards refer to roadway construction and general backfill requirements and are mostly based on proctor tests. Plate load test are sometimes required

as verification tool. The standard 300mm plate does not 'look' deep enough for our typical track width and 762mm plates require larger counterweights, which are not always available before equipment mobilization.

Plate load test results also vary a lot and do not identify soft spots from i.e. previous excavations or unknown buried utilities. (See Edition 1 of the EFFC-DFI Guide). Proofrolling as know alternative test for the entire platform is hard to quantify when 10,000+ psf capacity is required.

Most platforms today are designed by one party (if), constructed by a second party, and used by a third party. The third party is mostly the specialty subcontractor, who did not witness the construction and/or testing of the platform. Platforms also change their conditions during usage and weather impact, which will require additional investigation post construction. The EFFC-DFI working group has identified this problem as the most urgent topic for future research. We want to find out what the most suitable non-standard test is, which will help the industry (owner, engineer, GC and specialty contractor) to properly verify the actual platform capacity to provide a safe working environment throughout the entire construction duration.

We plan to investigate a series of non-standard field tests to supplement the commonly used Proctor and 762mm Plate Load Test for their suitability and practicability for a field application.

Non-Standard Testing Methods to review may include:

- Small Diameter (300mm) Plate Load Test
- Mini SPT sampler
- Dynamic Cone Penetrometers (various)
- Lightweight Deflectometer
- Ground Radar
- Proof Rolling
- Validated Integrated Compaction Monitoring (VICM)
- Helical Test Probe

The following issues will be investigated:

- How do Non-Standard tests correlate to existing Plate Load Test results?
- How practical and suitable are they for our purpose?
- Can they reliably characterize the quality of the installed working platform?
- How helpful are they to identify soft spots or poorly backfilled trenches?

PART 2 will investigate the actual track pressure using embedded earth pressure cells underneath equipment tracks. Load can either be applied by lifting available counterweights or measured directly during pile drilling using the onboard monitoring software. Strain in the platform or deflection of the platform shall be measured using horizontal inclinometers or fiber optic sensors.

PART 3 will be a desk study comparing the field measurements with available design methods. This desk study could be performed by one or more academic partners once additional funding for this scope is secured. Other funding sources like the National Science Foundation (NSF) should also be considered.

3.0 DELIVERABLES

Results from all field testing in the US as well as in Europe will be combined in one report and include all details about platform and subgrade composition. Findings and recommendations will be incorporated in edition 2 of the EFFC-DFI Guide to Working Platforms.

4.0 SCHEDULE

Since the research will heavily rely on suitable construction projects using a variety of working platforms, field testing will need to be spread out over a period of 1-2 years. It is planned to start reviewing available

non-standard tests in summer of 2021. All field testing shall be completed by end of 2022 and the final report shall be available by summer 2023.

5.0 ESTIMATED COST

The estimated cost of the field research for only PART 1 is summarized in the table below:

Activity in US and EU	Cost (US\$)
Non-Standard Testing Equipment Purchase (TBD)	30,000
On site testing of platforms by contractors (in kind contribution) – 10 sites	0
On site testing of platforms by consultant – 10 sites @ \$5,000	50,000
Shipping/Trucking of Test Equipment: 20 sites @ \$1,500	30,000
Contingency	10,000
TOTAL	120,000

6.0 REQUESTED FUNDING

Several contractors have already committed to help funding this research with their in-kind contribution. It is hoped that ADSC and PDCA as member of the “The Industry-Wide Working Platforms Working Group (WPWG)” will join this effort and help with a contribution. We would also hope that the EFFC would match the contribution of DFI.

We therefore kindly request US\$ 30,000 funding from DFI for only PART 1 of the research.

If EFFC, ADSC and PDCA will match this contribution with equal amounts of each \$30,000, the entire research for PART 1 of \$120,000 will be funded. If DFI’s contribution will not be matched, we kindly ask for \$60,000 and hope that EFFC would match DFI’s contribution.

PART 2 and 3 of the research will require funding from other sources and the involvement of an appropriate academic partner.

Attachment: Member list of current EFFC-DFI Working Group

EFFC-DFI Guide to Working Platforms_FRS Task Group Membes 2021-02

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