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EFFC/DFI Guide to working platforms - Second edition

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ABSTRACT: The importance of the stability of large and tall equipment when working on construction projects is undeniable. In addition to the obvious physical consequences, a drilling machine or crane toppling will certainly have an impact; it may lead to delays to the project, have reputational ramifications and result in civil claims or even criminal prosecution. A major cause of equipment instability is a poor site surface or Working Platform. This may be due to a lack of design, poor quality installation, or a lack of maintenance or inspection. Given the consequences of a machine falling over, most would agree that each of these aspects should be carried out thoroughly and by competent people, yet on many sites, in many countries, this is still not done. Providing an adequate platform is fundamental; however, there is also a demand to install economical solutions in terms of both cost efficiency and sustainability. The second edition to the *'EFFC/DFI Guide to Working Platforms'* is not intended to prescribe or dictate how working platforms should be managed; rather, it consolidates the experience from across the membership of the European Federation of Foundation Contractors (EFFC) and Deep Foundations Institute (DFI) to increase awareness of what can be achieved. In this, the second edition, more guidance on track loading as well as the design and testing of platforms is provided, which will promote a far better understanding of the issues that must be tackled.

KEYWORDS: Working Platforms, EFFC/DFI Guide, Safety, Design Methods, Field Testing, Track Pressure, Construction Machinery.

1 INTRODUCTION

Heavy construction machinery, including drilling rigs and pile drivers, typically exhibits significant mass, high centers of gravity, and limited track contact areas. These inherent characteristics considerably increase their risk of overturning, particularly when the underlying working platforms are inadequately designed or maintained. Overturning incidents represent severe risks within the construction industry, potentially resulting in serious or fatal injuries, substantial damage to machinery and adjacent structures, significant project delays, increased operational costs, and adverse impacts on corporate reputation. While the installation of safe platforms is a complex process, it is ultimately a necessary investment to reduce risks and ensure operational safety (De Waele, 2021).

A comprehensive analysis of 75 overturning incidents revealed that inadequate platform design or insufficient maintenance were primary causative factors (Hinzmann & Siewert, 2019). Additional contributing issues encompassed inadequate operator training, poor site coordination, ineffective communication, and compromised platform integrity due to contamination, softening caused by moisture, or insufficient maintenance practices.

Working platforms, whether reinforced or unreinforced, constitute complex, multi-layer systems characterized by distinct variations in stiffness and strength properties. This complexity necessitates sophisticated analytical design methods that surpass basic empirical approaches traditionally employed. Notably, the implementation of the BRE BR470 (2004) guidelines in the United Kingdom led to a significant reduction (approximately 50%) in overturning incidents shortly after adoption, demonstrating the effectiveness of structured design frameworks (Gildea et al., 2021).

Recognizing the need for enhanced safety standards, the European Federation of Foundation Contractors (EFFC) and the Deep Foundations Institute (DFI) convened an international task group to revise and improve their *'EFFC/DFI Guide to Working Platforms'*. The second edition, published in 2025 (EFFC/DFI 2025), specifically addresses three principal research domains: field testing methods (FRS#1), evaluation of ground pressure distributions beneath crawler tracks (FRS#2), and comprehensive analysis of calculation and design methods (FRS#3).

The Institute for Geotechnical Engineering at the University of Stuttgart contributed significantly to field testing research (FRS#1) and the advancement of platform design methods (FRS#3). Their research shows the critical importance of accurately defining essential geotechnical parameters, particularly the friction angle of granular materials and the shear strength of the underlying subsoil, for reliably determining appropriate platform thicknesses.

Presently, the absence of a globally unified standard for working platform design results in varied regional guidelines, often relying on oversimplified assumptions. In the European context, ground investigations must comply with EN 1997-2, and the impacts of construction operations must be calculated following EN 1997-1 and -3. In Austria, reference can be made to RVS 08.21.02 (2018), which provides practical guidance for the planning, verification, and maintenance of working platforms for geotechnical works. These simplified methods frequently fail to accurately represent actual stress distributions and complex, nonlinear interactions encountered in field conditions, consequently leading to underestimated loads and heightened risks of platform failures (Meißner et al., 1992; Kummeter, 2001; Moormann, 2018). In fact, studies show that the actual pressure distributions can be higher than predicted (Topolnicki et al., 2021).

Traditional calculation and design methods, such as Meyerhof's (1974) punching shear model and Terzaghi and Peck's (1948) bearing capacity theory, remain prevalent but possess significant limitations due to their simplifying assumptions. Research by Hanna & Meyerhof (1980) and Burd & Frydman (1997) has shown that the shear strength of the underlying cohesive soil plays a significant role. Recent developments advocate for more comprehensive methods that incorporate more geotechnical and geometrical parameters and, in some cases, the integration of geosynthetic reinforcements, although these approaches remain partially empirical and even sometimes product specific.

The revised *'EFFC/DFI Guide to Working Platforms'* responds to previous limitations by consolidating current research and practical experience into actionable recommendations and reliable analytical methods. Its purpose is to support safer, more consistent, and economically viable platform designs across construction and foundation engineering applications.

2 DESIGN STAGES

The design workflow in Figure 1 for working platforms consists of several key stages aimed at ensuring structural integrity and operational safety. The process begins with clearly defining the design task, including the machinery type, expected operational loads, and site environmental conditions. Detailed site investigations are essential to identify geotechnical risks such as weak soils or old foundations.

A load model is developed based on realistic equipment actions. Subsequently, essential geotechnical input parameters, such as soil strength and material stiffness, are identified, recognizing that different calculation methods may require distinct input parameters, such as peak or residual strength. These parameters feed into a calculation model, determining the platform-subsoil system's bearing capacity. Integrating a consistent safety concept requires that the selection of partial safety factors aligns with the underlying calculation method and its theoretical assumptions. Each design approach is based on specific failure mechanisms and boundary conditions; therefore, combining elements from different methods arbitrarily is technically unjustifiable. Final specifications, including dimensions, material types, and compaction methods, are established. Comprehensive in-situ tests, such as Plate Load Tests (PLT) or Dynamic Probing Light (DPL), confirm design accuracy and quality.

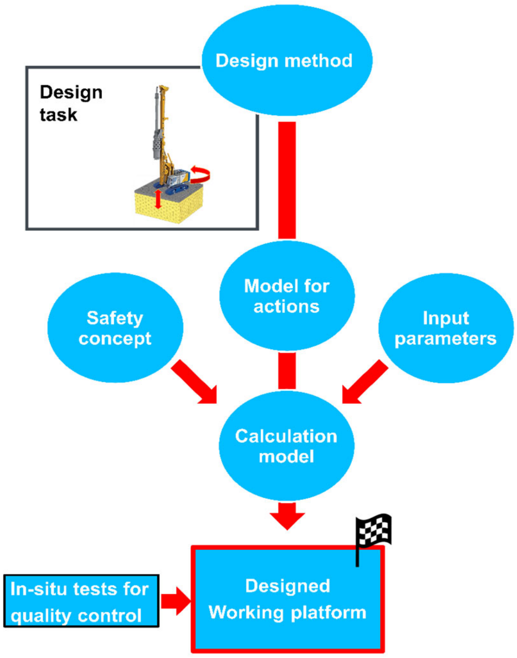

Figure 1. Workflow of design process for working platform.

3 FIELD TESTING AND VERIFICATION METHODS

The geotechnical verification of constructed working platforms plays a crucial role. Field testing under FRS#1 serves as a secondary control measure and is not intended to replace detailed site investigations, but rather to validate the platform's load-bearing capacity before and during the deployment of heavy machinery.

Four test methods have emerged as particularly suitable for in-situ verification: Dynamic Probing Light (DPL), the Panda®-Sonde, the Static Plate Load Test (PLT), and the Light Weight Deflectometer (LWD). Each of these methods was assessed based on ease of use, cost-effectiveness, portability, environmental robustness, and their potential to deliver meaningful geotechnical correlations.

Tests followed a uniform grid layout across all sites (Figure 2). The DPL, following EN ISO 22476-2, operated with a pneumatic hammer and a 5 cm² cone tip, capable of penetrating deeper layers. It is well-suited for dense soils but can be physically demanding. The Panda®-Sonde, operating with variable energy per NF P 94-105, excels in its precision, automated data recording, and flexibility, especially in softer materials. However, it requires experienced handling and is sensitive to coarse soil layers.

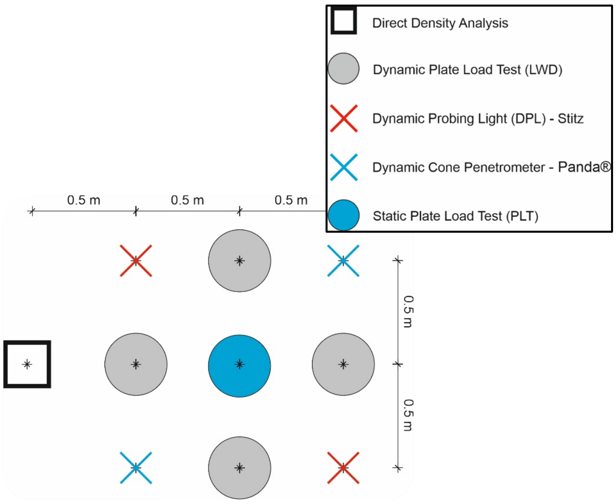

Figure 2. Test configuration per test location.

The Static Plate Load Test (PLT), performed according to DIN 18134, ASTM D1194-94, AASHTO T222 and ASTM D1196 provides a realistic simulation of loading scenarios, enabling direct assessment of load-deformation and bearing behaviour. While reliable, it requires significant time and equipment, including counterweights. The LWD, compliant with ASTM E2835 and TP BF-StB B 8.3, offers high test frequency and ease of use, but is limited in its depth sensitivity and requires calibration against PLT results.

The standardized field campaigns across over 40 construction sites in Europe, the UK, and the US revealed that the test results can vary significantly depending on local conditions and the test method used. This is attributable to differences in platform composition, subsoil heterogeneity, and procedural implementation. For instance, LWD and PLT results showed notable variance even when conducted in close proximity, highlighting the necessity for method-specific calibration (Figure 3).

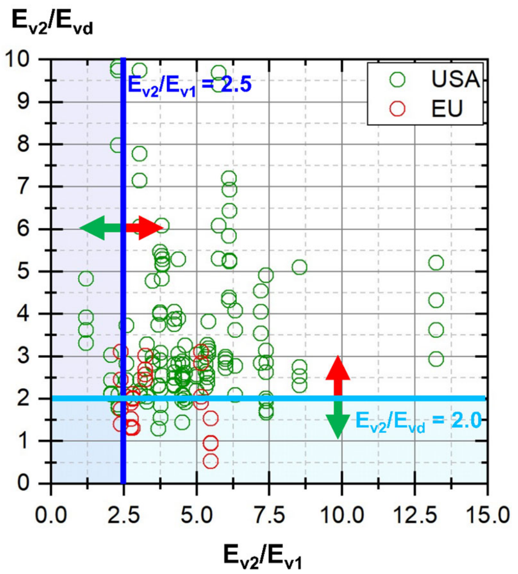

Figure 3. Deformation moduli correlation factors of PLT and LWD.

Generalized conversion factors between dynamic and static modulus values lack universal validity. For example, the often-assumed correlation factor of two, as recommended by ZTV E-StB or FGSV SoB-StB (2020) for compaction control, between the dynamic modulus (E_{vd}) from LWD and the reloading static modulus (E_{v2}) from PLT is not universally valid. In coarse gravel layers, deviations were observed, with E_{v2}/E_{vd} ratios exceeding four in some cases (Bräu & Vogt, 2020). Therefore, the calibration of E_{vd} values via PLT remains essential, notably in situations lacking both site-specific calibration and broadly recognised empirical standards. Threshold values such as $E_{v2} \geq 120$ MN/m², $E_{vd} \geq 60$ MN/m² and $E_{v2}/E_{v1} < 2.5$ serve as orientation benchmarks, although higher values may be appropriate for thick gravel structures.

The Panda®-Sonde and DPL demonstrated good correlation when applied appropriately, with the Panda® showing superior usability due to its automation and resolution. DPL can be seen as more robust. These results underscore the importance of selecting the appropriate testing method based on the expected material properties and required resolution.

4 GROUND PRESSURE & LOAD TRANSFER MODELS

Tracked drilling rigs and piling machines, particularly those with high centre-of-gravity configurations, impose ground pressures that vary markedly across their footprint, often concentrating at the track edges. These real distributions must be considered from the outset of the design process to avoid underestimating critical stresses affecting the final design for working platforms under construction machinery. Manufacturer data analyses show no direct correlation between equipment mass, borehole diameter, or excavation depth and the resulting contact stresses. This variability necessitates a project-specific evaluation of any operational changes, such as equipment configuration, tool dimensions, or application modes, during the design process.

Conventional load models often fail to reflect the complex and non-linear behaviour observed in the field. Differential settlements, pressure peaks at track edges, and stress redistribution are frequently underestimated or overlooked. EN 16228-1 remains a widely used standard, yet its assumptions are oversimplified and insufficient for accurate prediction of ground pressures under tracked equipment. Field data from distributed fibre optic sensing (DFOS) reveal substantial deviations between measured and theoretical load distributions (Faust, 2022). Studies by Moormann (2018) and Topolnicki et al. (2020) confirm that actual pressures are concentrated along the outer edges of crawler tracks, contradicting the idealised linear assumptions typically employed in design calculations.

To enable the use of these complex load patterns in practical engineering models, transformations into uniform load assumptions, e.g., using methods introduced by Meyerhof (1953), are commonly applied. However, this transformation process introduces systematic approximations at each transformation step. These errors can accumulate, leading to underestimation of platform thickness and bearing capacity. Figure 4 illustrates this chain of errors in transferring real track pressure distributions into simplified design models.

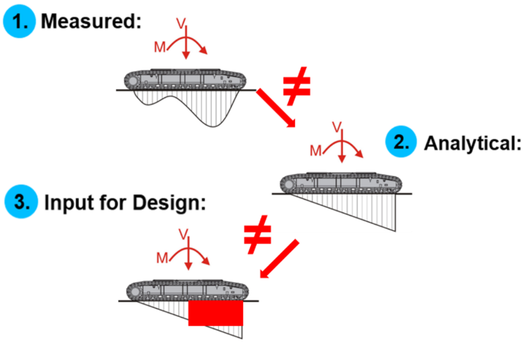

Figure 4. Track pressure approximation process.

A more accurate platform design requires moving beyond standardised load assumptions and accounting for the actual stress conditions observed in the field. This includes incorporating site-specific data, reflecting the spatially variable and non-uniform pressure patterns imposed by construction machinery.

5 COMPARATIVE ANALYSIS OF CALCULATION MODELS

To evaluate and compare the performance of existing calculation & design models, comparative calculations were conducted for unreinforced granular working platforms subjected to a standardized load case. The input parameters in this paper were selected to represent typical Kelly drilling scenarios: a crawler track width of 1.0 m, equivalent length of 1.7 m, and a uniform track pressure of 440 kN/m². The platform

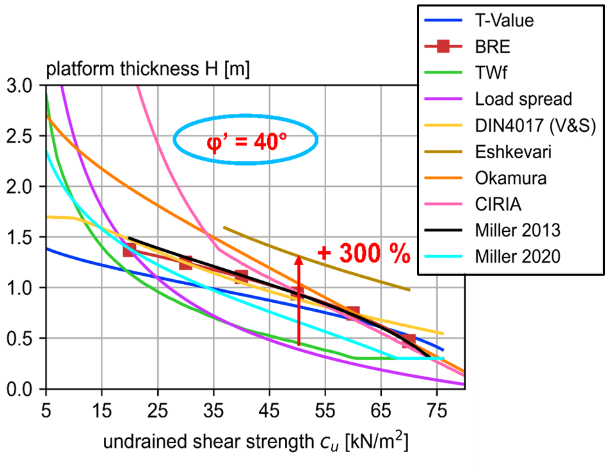

Figure 5. Platform thickness required for soft subsoil.

friction angle φ'ₖ was varied in the analysis to assess model sensitivity.

The models applied include BRE BR470 (2004), CIRIA SP123 (1996), TWf2024, and more recent approaches e.g. Lees & Ali (2024), which incorporate advanced considerations for loosely compacted sand.

Figure 5 presents the platform thickness calculated using characteristic input parameters based on a platform friction angle of φ'ₖ = 40°. Notable deviations in required thickness were observed, particularly at lower subgrade shear strengths and higher load intensities, consistent with findings by Schleeh & Moormann (2023).

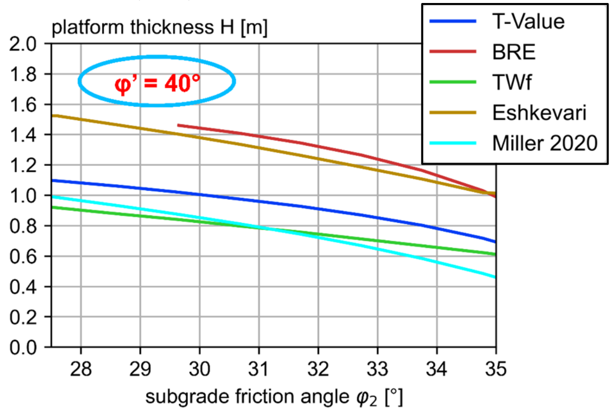

Figure 6. Platform thickness required for granular loose subsoil.

Figure 6 illustrates the required platform thickness for a working platform constructed on loosely compacted granular subsoil. The subgrade friction angle (φ_2) is varied, while the platform friction angle is consistently assumed to be 40°. The comparison clearly shows that the calculated platform thickness differs also significantly depending on the chosen design method for loose granular subsoil. The BRE approach, which is widely used in practice, yields conservative results across the range of φ_2 values. In contrast, the TWf method results in considerably thinner platform designs, but is less sensitive to the platform friction angle. It is therefore not possible to generally classify a specific method as conservative or progressive without considering the full set of input conditions.

Discrepancies can arise not only from the theoretical basis of each model but also from the differences in applied safety concepts. The partial safety factors applied in the BRE, CIRIA, and TWf methods are different. BRE, for example, adjusts γ_G and γ_Q for load case definitions, while CIRIA modifies soil strength parameters φ' and c_u for worst-case ULS design. In contrast, TWf applies Eurocode EC7-based combinations and separates partial factors by load type and material.

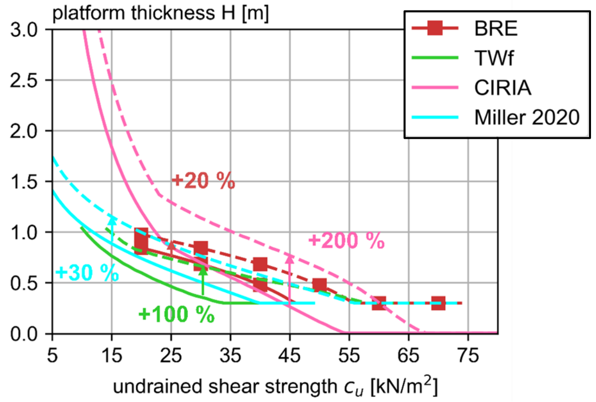

Figure 7. Characteristic (solid) vs. design (dashed).

Figure 7 illustrates the platform thickness requirements derived from different design methods, highlighting the sensitivity of the results to the applied safety concept. When using characteristic values, methods like TWf appear highly efficient, producing relatively low platform thicknesses. However, once design values and partial factors are consistently applied, these differences reduce significantly, occasionally resulting in TWf yielding more conservative results than expected. This demonstrates that method efficiency cannot be judged independently of the underlying safety concept. Mixing elements across methods leads to misleading conclusions.

Figure 8 presents selected results from a sensitivity analysis. Each curve represents a specific platform friction angle. Figure 8 shows that increasing φ'ₖ from 40° to 50° leads to reductions in required thicknesses by 48 % when using the BRE method, primarily due to its punching shear mechanism based on Meyerhof. Similar reductions exceeding 30 % are also observed for TWf in selected cases. In all design methods, the platform friction angle or the subgrade's shear strength acts as the governing input parameter. Consequently, precise determination of these properties, via suitable field and laboratory testing, is essential, not only to ensure safety, but also to achieve cost-effective and resource-efficient platform designs.

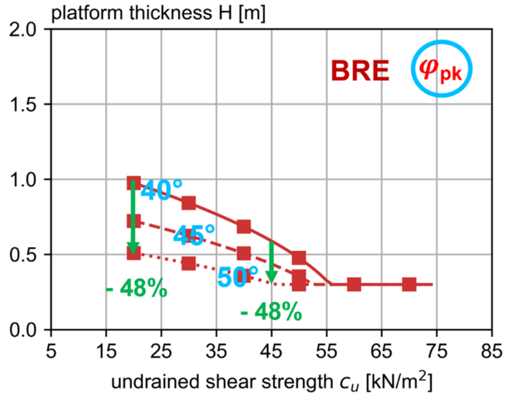

Figure 8. Platform thickness sensitivity.

However, the influence of φ′ is not universally dominant. As shown for TWf at low stress levels in the research reports of the University of Stuttgart, increasing φ′ from 35° to 50° results in virtually no change in the calculated platform thickness. These findings show that conclusions drawn from friction angle sensitivity must be interpreted in the context of the specific design method applied. Generalisation across all approaches is not valid.

A dedicated working group within the international DFI/EFFC expert team developed a comprehensive track pressure database comprising approximately 100 machine and operational mode scenarios. The dataset covers a wide range of manufacturers and incorporates multiple modelling approaches for estimating track pressures. As such, it reflects a broad spectrum of realistic loading conditions relevant to the design of temporary working platforms. Each machine scenario includes contact area and calculated track pressure values derived using four established modelling approaches: the EN 16228 method, the newly proposed EFFC/DFI method, the FPS spreadsheet (aligned with the BRE design method), and the simplified AUS approach. Detailed descriptions of these methods can be found in the official guide and supporting research reports by University of Stuttgart.

To evaluate the implications of the track pressure data on platform design, a reference case for Figure 9 was defined, assuming a subgrade shear strength of 20 kPa and a platform friction angle of 40°. For each machine-mode combination and modelling method, the required platform thickness was calculated using the BRE design approach. In Figure 9, each data point represents a single combination under one method. Colour intensity corresponds to machine weight (from light to dark), while red points indicate configurations that do not fulfil the geometric design criteria of the BRE method, particularly in cases where punching failure as described by Meyerhof (1974), implemented in BRE BR470 (2004), is not governing (high H/B ratios).

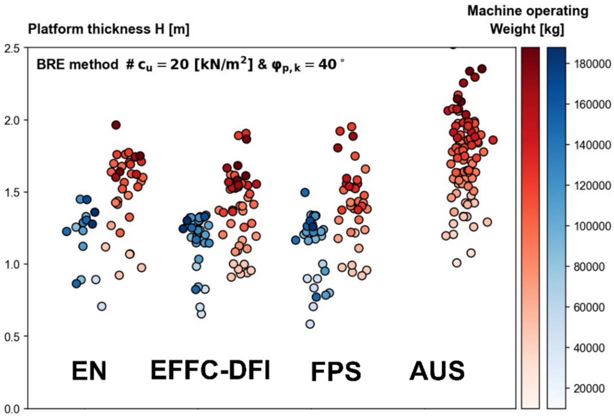

Figure 9. Platform thickness required for load case.

The visual analysis shows that for a friction angle of 40°, only a limited fraction of machine-mode combinations meets all BRE stability and deformation criteria. In some cases, fewer than 10 % of platform configurations are compliant, as illustrated by the sparsity of blue data points. This underlines the necessity of either using reinforced platform designs or high-quality granular materials with verified geotechnical properties to ensure sufficient bearing capacity for BRE criteria. Despite this, current design methods for reinforced working platforms remain highly simplified or are product specific. In practice, platform designs often rely on optimistic assumptions, most notably regarding friction angles, that are rarely validated. Although additional analyses using higher friction angles (e.g. 45° and 50°) are available and discussed in the University of Stuttgart report, the current figure focuses on the realistic base case with 40° internal friction. Sensitivity studies confirm that higher assumed friction angles can lead to significant reductions in required platform thicknesses and are often a prerequisite for any feasible design outcome.

Furthermore, this comparative calculation of the four pressure modelling methods reveals that the newly developed EFFC/DFI approach produces results in close agreement with those of the established EN and FPS methods. Further details can be found in the *'EFFC/DFI Guide to Working Platforms'*.

6 CONCLUSIONS

Overturning incidents not only pose serious risks to personnel and equipment, but also lead to project delays, financial losses, reputational damage, and potential legal consequences. The recently published second edition of the *'EFFC/DFI Guide to Working Platforms'* highlights the critical importance of a systematic and integrated approach to the design, verification, and maintenance of working platforms. Design outcomes are highly sensitive to input parameters such as φ' and c_u, and can vary significantly depending on the applied calculation model and safety concept. Therefore, accurate and conservative characterization of soil and platform material properties is essential. Target values for $\varphi_p > 40°$ or even 45° or more should only be used when supported by strict quality assurance and verified field data.

A combined use of field testing methods (e.g. PLT, LWD, DPL-5, PANDA®) is recommended, as no single method sufficiently captures the full range of relevant geotechnical behaviours. PLT remains the reference for load-deformation behaviour but is resource-intensive. LWD is effective for surface verification but requires calibration. DPL and PANDA® are portable and allow depth insights. Their complementary use increases confidence in design assumptions, enables site-specific calibration of material parameters and serves as platform thickness and compaction control.

The comparison of various calculation & design methods (BRE, CIRIA, TWf) reveals large discrepancies in required platform thicknesses, especially at low subgrade strengths and high pressures. These differences stem from varying theoretical assumptions and the different safety concepts. Methodological consistency is crucial, "pick and mix" strategies (e.g. combining BRE input with TWf safety factors) must be strictly avoided. Each method must be applied within its intended scope and safety concept.

Track pressure modelling represents a persistent source of uncertainty in working platform design. Measured ground pressure distributions deviate substantially from the simplified, linear assumptions typically adopted in engineering practice. While recent advances have enabled more realistic modelling, the translation of these complex pressure patterns into design-relevant load models remains highly simplified. This transformation step introduces significant approximation and remains a critical limitation of current design methods. Improved load transfer modelling and systematic field validation are therefore key areas for future research and development.

In summary, robust platform design requires:

- consistent application of validated calculation and design methods,
- reliable and conservative input parameters,
- strict QA/QC during testing, construction and operation
- support by the second edition of the EFFC/DFI Guide, which brings together expert knowledge from across the foundation industry to offer practical, non-prescriptive recommendations for all phases of the platform lifecycle.

Further research is needed to develop generalized models for reinforced platforms, integrate cyclic and transient loading effects, and improve track load transfer models for real platform behaviour under operational conditions.

7 REFERENCES

AASHTO T222. Standard method of test for nonrepetitive static plate load test of soils and flexible pavement components for use in evaluation and design of airport and highway pavements. AASHTO 1981. T222-81-UL.

ASTM D1194-94. Test method for bearing capacity of soil for static load and spread footing. Annual book of ASTM standards: Volume 04.08. October 2003.

ASTM D1196/D1196M − 21. Standard test method for nonrepetitive static plate tests of soils and flexible pavement components for use in evaluation and design of airport and highway pavements. Book of standards volume: 04.03.

ASTM E2835-21. Standard test method for measuring deflections using a portable impulse plate load test device. Annual book of ASTM standards: Volume 04.03. May 2021.

BRE Building Research Establishment (2004/2007). Working platforms for tracked plant: good practice guide to the design, installation, maintenance and repair of ground-supported working platforms (BR 470). IHS BRE Press, Bracknell, Berkshire, ISBN 186081 7009.

Bräu, G., Vogt, S. (2020). s/v-Wert beim dynamischen Plattendruckversuch. Bericht zum Forschungsprojekt 05.0187. Berichte der Bundesanstalt für Straßenwesen, Reihe S: Straßenbau (143).

Burd, H.J., Frydman, S. (1997). Bearing capacity of plane-strain footings on layered soils. Canadian Geotechnical Journal, No. 34, p. 241–253.

De Waele, J. (2021). Working platforms for specialty geo-construction. GeoStrata Magazine. Volume 25, Issue 3. American Society of Civil Engineers.

DIN 18134:2012-04. German Institute for Standardization. Soil - testing procedures and testing equipment - plate load test. Beuth-Verlag Berlin.

DIN 4017:2006-03. German Institute for Standardization. Soil - calculation of design bearing capacity of soil beneath shallow foundations. Beuth-Verlag Berlin.

EFFC/DFI (2020). Guide to working platforms, 1. edition. Joint EFFC/DFI Working Platforms Task Group.

EFFC/DFI (2025). Guide to working platforms, 2. edition. Joint EFFC/DFI Working Platforms Task Group.

EN 16228-1:2022-07. Drilling and foundation equipment - safety - part 1. common requirements. German version EN 16228-1:2014+A1:2021. Beuth-Verlag Berlin.

EN 1997-1:2022-10. Eurocode 7 - geotechnical design - part 1. general rules. English version prEN 1997-1:2022.

EN 1997-2:2022-10. Eurocode 7 - geotechnical design - part 2. ground properties. English version prEN 1997-2:2022.

EN ISO 22476-2:2012-03. Geotechnical investigation and testing - field testing - part 2: dynamic probing.

Eshkevari, S., Abbo, A., Kouretzis, G. (2018). Bearing capacity of strip footings on sand over clay. Canadian Geotechnical Journal, Nr. 56, p. 699-709.

Eshkevari, S., Abbo, A., Kouretzis, G. (2019). Bearing capacity of strip footings on layered sands. Computers and Geotechnics, Volume 114.

Faust, P., Hubbard, P., Soga, K. (2022). Field measurements of in-situ equipment track pressure and working platform deformation using earth pressure cells and fiber optics. DFI-EFFC International Conference on Deep Foundations and Ground Improvement, 2022 Berlin.

FGSV (2009). ZTV E-StB E. Additional technical conditions of contract and directives for earthworks in road construction. Edition 2009. FGSV. Köln.

FGSV (2020). SoB-StB 20. Zusätzliche Technische Vertragsbedingungen und Richtlinien für den Bau von Schichten ohne Bindemittel im Straßenbau. FGSV. Köln.

Gildea, P.A., Faust, P., Richards T.D. (2021). Working platforms for tracked piling plant - current worldwide practice and guidance for the USA. IFCEE EXPO 2021 – May 10-14.

Hanna, A.M., and Meyerhof, G.G. (1980). Design charts for ultimate bearing capacity for sands overlying clays. Canadian Geotechnical Journal, Vol. 17, No. 2, 300.

Hinzmann, U., Siewert, D. (2019). Verhinderung von Maschinenumstürzen im Spezialtiefbau. Pfahl-Symposium 2019, Mitteilung des Instituts für Grundbau und Bodenmechanik der Technischen Universität Braunschweig, S. 339-346.

Jewell, R.A. (1996). Soil reinforcement with geotextiles. Construction Industry Research and Information Association, London, CIRIA, Special Publication 123.

Kummeter, B. (2001). Bodenpressung unter Raupenkranen. Tiefbau 6/2001. BG BAU.

Larisch, M.D., Damen, R., Johnstone, G., Attewell, B. (2021). Temporary working platforms – technical guidance on New Zealand good practice. NZGS Symposium 2021, Good grounds for the future, New Zealand.

Lees, A. (2020). The bearing capacity of a granular layer on clay. ICE proceedings of the Institution of Civil Engineers - geotechnical engineering 173, pp. 1-24.

Lees, A., & Ali, A. (2024). The surface bearing capacity of a strong granular layer on weaker sand. ICE proceedings of the Institution of Civil Engineers - geotechnical engineering 2024 177:2, 158-168.

Meißner, H., Becker, A., Geib, S. (1992). Zur Bodendruckverteilung unter Raupenketten hoher Baumaschinen bei Schwerpunktwanderungen. Tiefbau, 8/1992. BG BAU.

Miller, K.S. (2013). Technical note on use of BR470 in soft clay. FPS. Federation of Piling Specialists.

Miller, K.S. (2020). A review of working platform design. Proceedings of the Piling 2020 Conference. Piling 2020. January 2021, 329-334.

Meyerhof, G.G. (1953). The bearing capacity of foundations under eccentric and inclined loads. Proceedings of 3rd International Conference on Soil Mechanics and Foundation Engineering, Zurich, vol 1, pp 440–445.

Meyerhof, G.G. (1974). Ultimate bearing capacity of footings on sand layer overlying clay. Canadian Geotechnical Journal, Vol. 11(2), pp. 223-229.

Moormann, C. (2018). Tragschichten für Arbeitsplattformen von mobilen Baumaschinen und für Kranstellflächen. AiF Forschungsnetzwerk Mittelstand – Abschlussbericht. IGF-Vorhaben NR. 18833 N/1 (Research report, in German).

NF P94-105. Grounds: investigation and testing measuring compaction quality. Method using variable energy dynamic penetrometer. Penetrometer calibration principle and method. Processing results. Interpretation. AFNOR. M. La Plaine Saint-Denis. France. 2012.

Okamura, M., Takemura, J., Kimura, T. (1998). Bearing capacity predictions of sand overlying clay based on limit equilibrium methods. Soils and Foundations 38(1), p. 181-194.

RVS 08.21.02. Platforms for geotechnical works. FSV – Austrian Society for Research on Road, Rail and Transport, August 2018. Vienna.

Schleeh, M., Moormann, Ch. (2023). Bearing capacity of un- and reinforced working platforms – verification of different design methods by model tests and field measurements. Proc. 17th Danube European Conference on Geotechnical Engineering (17DECGE) June 7-9, 2023, Bucharest, România.

Terzaghi, K., Peck, R.B. (1948). Soil mechanics in engineering practice. 1st ed. John Wiley and Sons, Inc., New York.

Temporary Works Forum (2024). Design of granular working platforms for construction plant. A guide to good practice. TWf2019: 02 – Revised November 2024. Temporary Works Forum. c/o Institution of Civil Engineers. London. England.

Topolnicki, M., Wäger, J., Schweizer, S., Koller, A., Brzozowski, T., Sołtys, G. (2021). Field test verification of ground bearing pressure under rig tracks and implications for working platform design. Ground Engineering 2021, pp. 26-38.

TP BF-StB Part B 8.3 E. Technical testing regulations for soil and rock in road construction. Part B 8.3. Dynamic plate load testing with the light drop-weight tester. FGSV-Nr.: 591/B 8.3 E.

Vrettos, C., Seibel, E. (2023). Durchstanzen von Fundamenten auf einer Sandschicht über Ton: Berechnungsverfahren und Erkenntnisse aus numerischen Parameterstudien. Geotechnik 46, H. 4, S. 220–236.