Revitalizing Design-Bid-Build for Tunnel Projects

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Introduction

The tremendous and unprecedented proliferation of tunnel projects in North America, coupled with increasing interest, utilization, and experience with diversified alternative delivery methods, provides the occasion to probe this question: **Are there any specific procurement and contractual respects in which the traditional Design-Bid-Build (DBB) method can be improved for the delivery of tunnel projects?**

The intent of this paper is not to compare or promote DBB relative to alternative delivery methods or to universally criticize or commend any particular delivery method. Rather, the objective of this paper is to constructively probe and advance ideas and opportunities to improve procurement and contractual practices in DBB, which should serve to promote that method as an effective and successful approach for Owners.

DBB Tunnel Projects: Opportunities for Improvement in Procurement and Contracting

The starting question of this discussion is: What are we trying to improve in the DBB method as traditionally utilized on tunnel projects? Alternative delivery methods, such as Conventional Design-Build, Progressive Design-Build, and Construction Manager/General Contractor (CM/GC), are intended to address and are implemented in the expectation that they will address perceived inherent shortcomings experienced in the DBB method.[1]

Those shortcomings derive from the independent and sequential nature of the design and construction processes in DBB and the prevalence of disputes arising out of the following principal sources:

+ Differing subsurface conditions
+ Imbalanced and ineffective risk allocation
+ Disagreements and misunderstandings as to the roles, responsibilities, and risks of project participants concerning

    (a) the adequacy, suitability, constructability, and compatibility of permanent works design in the expected and encountered subsurface conditions;

    (b) whether specifications are performance or design (prescriptive) in character, coupled with the differing risk and responsibility implications;

    (c) the achievability of performance requirements prescribed in the Contract Documents;

    (d) the appropriateness and suitability of the design and implementation of construction means/methods selections in the expected and encountered subsurface conditions; and

    (e) the contractual and commercial implications of modifications to planned design and construction methodological approaches due to subsurface conditions encountered during construction.[2]

These represent significant opportunities to improve DBB procurement and contracting practices on tunnel projects. Perceived inherent shortcomings of the DBB method on tunnel (and other major subsurface) projects, to a degree, have prompted an increased interest in and utilization of alternative delivery methods.

Owners are encouraged to consider these ideas and opportunities in evaluating and deciding as to delivery method selections on tunnel projects and, particularly, in procurement and contractual approaches in DBB.

For many traditionalists, the hallmarks of DBB delivery are Owner control over design, the independent and sequential nature of the design and construction processes, and the discrete contractual roles, responsibilities, and risk boundaries of project participants in those processes. In many respects, however, those characteristics contradict the levels of interaction and interdependence in design and construction processes required for effective risk allocation and delivery of tunnel projects, propelling the increasing utilization of early contractor involvement approaches to delivery of those projects. However, there are significant opportunities to revitalize DBB delivery on tunnel projects and allow for implementation of meaningful approaches to more flexible and adaptive interactions of design and construction processes while simultaneously achieving effective risk allocation. Realizing those opportunities is the essence of DBB revitalization.

These revitalization ideas are primarily directed at functionally aligning and bridging essential interactions and interdependencies between subsurface investigations and evaluations and the design and construction processes inherent in tunnel projects. These interactions among subsurface conditions, design, and construction methods are especially challenged in DBB by the independent and sequential nature of those activities and the discrete and independent roles and responsibilities of project participants.

Tunnels provide a most compelling context for the integration of design and construction processes. The fundamental

1 Hatem, D.J. 2023. Early contractor involvement: Rethinking and recalibrating delivery methods for subsurface projects. MG+M The Law Firm. Risk factors are relevant to selection of project delivery methods on infrastructure projects. Critical factors in the evaluation and selection of DBB are the scope and quality of geotechnical investigation and the constructability of design in the anticipated and encountered subsurface conditions. Tran, D. and Molenaar, K., 2012, Critical risk factors in project delivery method selection for highway projects, in H. Cai, A. Kandil, M. Hastak, and P.S. Dunston (Eds.), *Construction Research Congress 2012*, ASCE.

2 Hatem, D.J. 2025. Disputes on major subsurface projects: Sources, and the promise of early contractor involvement. MG+M The Law Firm.

challenge in the revitalization of DBB in tunnel projects centers on achieving more real-time alignment among (i) subsurface investigations and evaluations, (ii) design of permanent works, and (iii) the selection, design, and implementation of construction means/methods ("three essential factors"). The interactions and interdependencies among these three essential factors are inherent in virtually all complex major subsurface projects—their reconciliation is essential to constructible, effective risk allocation and successful delivery. Achieving reconciliation in a simultaneous, concerted, and collaborative manner is especially complicated in DBB by the fact that the activities that underlie these three essential factors are sequentially and independently performed by different project participants with minimal, if any, meaningful opportunity for real-time collaboration in a reconciliation process, especially prior to construction start. Perceived advantages of early contractor involvement approaches to alternative delivery of tunnel projects lie in their enhanced ability to maximize the opportunities for real-time and meaningful collaboration and transparency to achieve alignment among the three essential factors.

Procurement

Contractor Prequalification

Within legal constraints, consideration should be given to prequalifying Contractors using criteria relevant to project-specific factors, requirements, and expectations.[3] This is an important consideration given the number of disputes and failures on tunnel projects attributable to perceived deficient capabilities, experience, resources, and performance of the prime and specialty trade subcontractors. Equally important considerations are realistic Owner cost and schedule estimates, budgets, and contingencies, as well as the qualifications and experience of Owners and their Consulting Engineers in the planning, design, and delivery of tunnel projects.

Escrow Bid Document Requirements

Historically, Owners have underutilized Escrow Bid Document (EBD) requirements in DBB procurement and contractual risk allocation practices. The prescribed contents of EBDs should be conscientiously developed by the Owner's Engineer of Record (EOR) and other consultants to ensure that the bidder's submission will evidence and be supported by a prudent and realistic review and understanding of anticipated subsurface conditions and project-specific design and construction considerations. The EBD should also show that the bidder has planned for and priced the cost of achieving the project requirements in accordance with realistic and appropriate construction means and methods and equipment selections suitable to the reasonably anticipated subsurface conditions.

If properly defined and submitted, EBDs should provide an important—perhaps determinative—context for the evaluation and resolution of entitlement and quantum of post-award differing site conditions (DSC) and other disputes. As such, EBD requirements in procurement documents must be conscientiously aligned with risk allocation provisions in the (eventual) Contract Documents.

The procurement documents should require that the EBDs include a tender risk register demonstrating that the bidder has identified, assessed, planned for, and priced for subsurface condition risks indicated in the Contract Documents and baselined in the Geotechnical Baseline Report (GBR); that the bidder has planned to address those risks by its anticipated construction means/methods and other measures; and that the bidder has developed appropriate contingency plans to address the consequences of the materialization of those risks.[4]

The EBDs should also include specialized reports of independent consultants retained by the bidder. These reports should address the evaluation of subsurface conditions, including groundwater impacts during construction. In addition, EBDs should include quantity take-offs, anticipated production rates, and vendor proposals, such as those demonstrating the ability and suitability of the planned tunnel boring machine (TBM) utilization in anticipated subsurface conditions.

The contents of EBDs do not necessarily establish that the bidder's planning and pricing assumptions, contemplated construction means/methods and equipment selections, or interpretations or expectations as to subsurface conditions—based on indications in the Contract Documents, including baselines in the GBR—are objectively reasonable or in conformance with the requirements of the Contract Documents. Nor do EBD contents supersede the Contract Documents, including risk allocation terms.[5] The EBDs, however, should provide transparency regarding the bidder's pricing and planning bases and expectations contemporaneous with the bid so as to inform and provide an objectively reasonable baseline for the evaluation of any post-award disputes.

Consideration should be given to requirements that EBDs include reports of independent consultants retained by the bidder that contain detailed assessments as to (1) how the bidder's planned means, methods, and equipment selections will influence the behavior of physical subsurface conditions described in the GBR and Geotechnical Data report (GDR) ("behavioral conditions assessments"), and (2) the bidder's planned approach

3 Wilson, S.H. (ed.), 2019, Recommended Contract Practices for Underground Construction (2d ed.), SME, pp. 143-45; Del Nero, D., 2015, Contractor prequalification – an (in)effective risk management tool, *Tunnel Bus. Mag.*; ITA, 2023, Code of Practice (3d ed.).

4 ITA, *supra* note 3 at 9.5

5 Wilson, *supra* note 3 at pp. 166-67.

and contingency measures to achieve specific performance, outcome, or fit-for-purpose requirements (“performance requirements”) prescribed in the Contract Documents.

Explanation as to these two recommended EBD content requirements would be helpful.

+ EBDs: Behavioral Conditions Assessments Report

In DBB tunnel projects, a GBR typically is prepared by the Owner’s Consulting Engineer to define and articulate in objective terms baselines for certain anticipated subsurface conditions (physical and behavioral) that a Contractor is expected to encounter during construction.[6]

These baselines are intended to establish contractual risk allocation boundaries for subsurface conditions. The establishment of baselines derives from interpretations, assessments, and judgments concerning available data as to physical conditions *and* from predictions as to how those conditions will behave as a consequence of their interactions with the *assumed* means, methods, and equipment (selections, design, and operation) chosen and implemented by the successful bidder. Of course, in DBB, the actual and specific details as to the latter are not known by the Owner at the time of GBR preparation. Behavioral predictions articulated in the GBR typically are based on expectations and assumptions as to means, methods, and equipment choices that a Contractor reasonably may select, design, and implement.

It is possible that an Owner of a DBB tunnel project may design, provide criteria for, and prescribe or mandate specific construction means and methods; in that scenario, the Owner will have a more informed basis on which to reliably predict and baseline behavioral impacts and influences of these means and methods and their interaction with physical subsurface conditions. However, in most DBB procurements, the Contractor is conferred significant autonomy and discretion (and commensurate responsibility) for the selection, design, and implementation of construction means and methods.[7] The variability in approaches as to the latter could have important implications for and consequences as to the behavior of physical subsurface conditions and, thus, significantly impact the risk allocation balance established in the GBR.

The lack of opportunity in most DBB procurements for pre-award interactions and collaboration between the Owner and the bidders—i.e., the lack of early contractor involvement—elevates the risk that despite the clarity and objectivity of baselines defined in the GBR, post-award disputes may be generated due to the encountering of materially different behavior of physical subsurface conditions based on their interactions with the particular means, methods, and equipment selections of the Contractor, the latter of which may (significantly) differ from those *assumed* in the preparation of the GBR.[8] This situation will likely generate disputes as to whether the differences between the behavior of subsurface conditions *assumed* and baselined in the GBR and *actual* behavior are due to differing subsurface conditions or the Contractor’s chosen means, methods, or equipment, or potentially due to some combination of both factors.

A requirement that EBDs include a behavioral assessment report may reduce the potential or magnitude of and assist in the resolution of such disputes.[9]

This EBD requirement would provide documentation contemporaneous with bid submission evidencing bidder understandings and bid assumptions as to (a) alignment among baselines, subsurface risks, and its planned construction means/methods and (b) impacts of the latter on behavior of subsurface conditions reasonably expected to be encountered during construction.

As an alternative, or in addition to, the inclusion of this recommended EBD requirement, an Owner of a DBB

6 The principal practice guidelines for the development of GBRs all provide that GBRs typically address and baseline the anticipated behavior of physical subsurface conditions in response to interactions with construction means and methods. *See* Mellors, B., 2025, Contracting practices for tunneling and underground works, *Society of Constr. Law: Summer 2025*; Gomes, A. and Chapman, B., 2026, Integrating geotechnical baseline reports and risk management for effective risk allocation in underground construction, in E. Eberhardt, J.D. Aubertin, J. Habimana, et al. (Eds.). *Creating Communities Through Underground Infrastructure*, CRC Press, pp. 813-20.

7 Hatem, *supra* note 1; Mellors, *supra* note 6.

8 For discussion as to the benefits of Early Contractor Approaches in GBR preparation, see Varkani, R., Sidhu, A., and Khalifa, Z., 2026, Geotechnical uncertainty and risk allocation in underground projects: Lessons learned from three contract models, in E. Eberhardt, J.D. Aubertin, J. Habimana, et al. (Eds.). *Creating Communities Through Underground Infrastructure*, CRC Press, pp. 683-90.

9 The general lack of knowledge in DBB during GBR preparation as to the details of the actual means, methods, and equipment selections of the awarded contractor will have significant impacts and consequences on both effective risk allocation and project cost. As has been stated:

“. . . in DBB projects, GBRs are often more conservative and prescriptive. Their development timeline . . . generally aligns with 1) the advancement of detailed design, 2) staged geotechnical and field investigations and 3) re-assessment of risk allocation. Since design-related risks in DBB remain with the project owner, conflicts may arise between the contractor’s chosen means and methods and assumptions about ground behavior described in the GBR. Such discrepancies can lead to disputes, which are typically addressed through a Dispute Resolution Board as defined within the GBR.” Kondrachova, T., Evans, S., and DalCeggio, A., 2026, Geotechnical baseline report and progressive design build, stages and key objectives, in E. Eberhardt, J.D. Aubertin, J. Habimana, et al. (Eds.). *Creating Communities Through Underground Infrastructure*, CRC Press.

Similarly, it has been observed that joint development by Owner and Design-Builder of a GBR in progressive design-build “may allow for more favorable pricing by excluding high cost but low-probability ground risks. By contract, in traditional DBB the GBR is developed solely by the Owner’s design team and may be overly conservative by shifting all possible geotechnical risks, including low-probability and high-cost risks to the contractor, who must then account for those risks in his bid. *See* Parkes, J., Mariucci, B., and O’Donnell, T., 2026, Successful alternative delivery contracting for underground construction, *North American Tunneling*, pp. 771, 775.

tunnel project may adopt a "staged GBR development" process under which the Owner provides drafts of a GBR during pre-tender or procurement to bidders to elicit input and comments especially as related to GBR assumptions as to specific potential construction means and methods and their behavioral impact on baselined physical conditions.[10] The products of those inputs may then be considered by the Owner in modifying and developing potentially less conservative baselines in the GBR. However, it should be recognized that bidders may not be inclined to share those inputs in such a process due to perceived competitive considerations.[11] This observation is not intended to discourage industry outreaches during the DBB procurement process; rather, it is simply a comment on the realities that pragmatically constrain the generation and value of certain bidder inputs and proposal of innovative approaches, the disclosure of which in an open and competitive DBB procurement environment may compromise a bidder's distinctiveness, ingenuity, and perceived advantage.

+ EBDs: Performance Requirements Assessment Report

  In DBB tunnel projects, the Contract Documents may include specific performance requirements for completed works as to construction quality, capability, functionality and long-term durability, life cycle sustainability, and future expansion. These performance requirements may include—dependent upon tunnel type—structural and functional integrity, watertightness, protective systems, maintenance accessibility, retrofit and expansion capability, seismic standards, ventilation, and fire/safety standards.[12]

  The Contractor's failure or inability to comply with its contractual and warranty obligations to achieve these types of performance requirements in DBB tunnel projects often generates disputes and claims involving the following issues:

  - Were the performance requirements realistically achievable, or suitable in and compatible with the anticipated and encountered subsurface conditions?
  - Was the inability to achieve the performance requirements due to deficiencies in (a) Owner-furnished design, (b) Contractor means and methods, or (c) some combination of (a) and (b)?

  The EBDs should include a requirement for a report prepared by a consultant retained by the bidder assessing the achievability of the performance requirements (a) in the anticipated subsurface conditions, (b) utilizing the Owner-furnished design, and (c) assuming the implementation of specific construction means and methods planned to be implemented by the bidder if awarded the DBB contract. The inclusion of such a requirement should minimize post-award disputes as to the achievability of performance requirements and causes or reasons for failure or inability to meet those requirements.

  These EBD requirements would provide documentation contemporaneous with bid submission of the bidder's assessments and planning as to the suitability, appropriateness, and feasibility of achieving performance requirements.

Contractual

Risk Allocation: Subsurface Conditions Information Disclosure

Reasonable, fair, and balanced contractual risk allocation provisions for subsurface conditions on tunnel projects are essential for project success. Available data and other information should be disclosed to bidders and, in most instances, be encompassed in the definition of the Contract Documents with an expectation of reasonable Contractor reliance. While, in certain circumstances, it may be prudent to qualify or limit the accuracy of, completeness of, or other factors affecting the reliability of that information, use of disclaimers should be avoided or minimized and, if necessary, be clearly and specifically articulated and limited in scope and effect on risk allocation.

DSC Provisions

On most public projects, the terms of DSC provisions are prescribed and mandated by statutes and regulations. However, even within those legal constraints, there are meaningful opportunities to augment the standard DSC provisions in several important respects. For example, consider the following:

+ **EBDs**
  EBD requirements should be integrated into the DSC provision by mandating that the EBD contents are to be considered in the evaluation and determination of both DSC entitlement and quantum. Some Owners may elevate this requirement and render the EBDs as having determinative impact on DSC entitlement.

+ **Reasonable Reliance Upon Indications in Contract Documents**

10 *See* Gomes and Chapman, *supra* note 6.

11 *See* Parkes, Mariucci, and O'Donnell, *supra* note 9, p. 752.

12 *See* Kümzle, J. and Munfah, N., 2026, Fit-for-purpose obligations in underground construction, in E. Eberhardt, J.D. Aubertin, J. Habimana, et al. (Eds.), *Creating Communities Through Underground Infrastructure*, CRC Press, pp. 725-32; Duncan, C. and Hudon, S., 2018, Fitness for purpose obligations under international standard form contracts, *ICLR (2018)*; Dymond, T., Micarelli, C., and Goodwin, A.A., 2018, Design adequacy: Is it warranted?, *ICLR (2018)*; Charlett, D., 2017, Design-life or service life: What is the difference?, *ICLR (2017).*

DSC provisions may be augmented with requirements that the Contractor must identify the specific affirmative indications in the Contract Documents that were relied upon in planning for and pricing the bid and to demonstrate the objective and causal reliance upon those indications by explicit reference to the EBD contents. Contractors should be required to accept DSC risk if bid expectations were not objectively reasonable, were more optimistic than reasonably indicated in the Contract Documents, or were not supported by EBD contents.

+ **Geotechnical Baseline Reports**
  GBRs are frequently and appropriately utilized on tunnel projects.[13] Baselines stated in the GBR should be predicated on data, tests, and analyses typically included in the GDR and other reports and studies. There are potentially significant opportunities to improve GBR alignment and integration with DSC and other risk allocation provisions. In the DSC provision, explicit reference should be made to the GBR and its priority in the contractual hierarchy as the source of contract indications relevant to baseline conditions. It is important to recognize that GBRs reasonably are not expected to baseline all anticipated subsurface conditions or the behavior of those conditions due to interactions with the Contractor's selected means and methods.[14] The Contract Documents should explicitly state that the fact that a GBR does not baseline a particular condition does not imply, much less warrant, that the condition will not be encountered.[15] GBRs should contain clear, objectively articulated and realistic interpretations of data so as to provide a balanced framework for bidding, eventual contractual risk allocation, and dispute resolution. The purpose of the GBR is risk allocation, not the prescription or detailing of design or construction criteria or requirements. These admonitions as to GBR preparation and utilization are considered essential to effective risk allocation.[16]

+ **Causation**
  DSC claims often involve disputes about whether the alleged cost or time impacts are due to DSC or some other cause such as the Contractor's construction means/methods, equipment selection, operation, and maintenance and related issues. The DSC provision should explicitly require that any cost or time adjustment be caused by the claimed DSC.

+ **Equitable Adjustment Provisions**
  The DSC provisions should be aligned with relevant (more generic) contractual adjustment or variations provisions such as those addressing payment, unit prices, quantity variations, and time adjustments. In particular, quantity variation provisions should be conscientiously drafted to align with the equitable adjustment terms of the DSC provision, in order to avoid ambiguities in the interpretation and application of those provisions that may create redundant, inconsistent, or conflicting avenues for entitlement to, or measurement of, equitable adjustments arising from DSC.

Construction Means/Methods and Related Submittals

As a general matter, construction means/methods are the exclusive responsibility of the Contractor unless specifically designed, detailed, or prescriptively mandated by the Owner.[17] Effective and efficient tunnel construction necessarily depends upon the appropriate design and implementation of construction means/methods and equipment selections suitable for the reasonably expected subsurface conditions.[18] Failures to realistically assess the achievability and suitability of construction means/methods and equipment selections in the project-specific reasonably anticipated subsurface conditions have proved to be a major and frequent source of disputes on subsurface projects. Also, the failure to adequately assess permanent works design requirements relative to anticipated suitable subsurface conditions and construction means/methods—and their interactions, interdependencies, and influences upon each of them—is yet another major source of disputes in tunnel projects. In fact, those observations have been cited as reasons for interest in early contractor involvement delivery approaches, such as progressive design-build and CM/GC.[19]

In DBB tunnel projects, some of these concerns could be

13 Essex, R., 2022, Geotechnical baseline reports and the importance of reducing contractual uncertainty, *ASCE*; Davis, J., Essex, R., Farooq, I., and Drake, A., 2023, Geotechnical baseline reports: a guide to good practice (C807D), *CIRIA*.

14 Hatem, D.J., 2022, Should geotechnical baseline reports by the universal and exclusive contractual basis for subsurface conditions risk allocation?, *Tunnel Bus. Mag.*

15 *Id.*; Essex, 2022, *supra* note 13.

16 Essex, 2022, *supra* note 13.

17 Wilson, *supra* note 3 at p. 73. In DBB, there may be circumstances in which the Contractor's discretion in selection, design, and implementation of construction means/methods may need to be constrained; or in which the Owner or its EOR may have valuable input and thus should have a meaningful opportunity to be involved (to varying and appropriate degrees) in providing recommendations, criteria, and standards for the design of construction means/methods. In those situations, it is important that the respective roles, responsibilities, and risks of project participants be clearly defined and understood. *See* Reilly, J., 2021, TBM procurement and contract processes, *TunnelTalk* (eds.), 2010, *Megaprojects: Challenges and Recommended Practices*, ACEC, ¶ 6.4, pp. 520-538; Del Nero, D. et al., 2012, Means and methods, in M. Najafi (Ed.) *Trenchless Technology: Planning, Equipment & Methods*, (1st ed.), ¶ 3.4, McGraw-Hill; Del Nero, D., 2012, The means and methods dilemma, *Tunnel Bus. Mag.*; Brierley, G. and Hatem, D.J., 2022, Contractor submittals for tunneling projects, *Tunnel Bus. Mag.*; Tirolo Jr., V. and Almeraris, G., 2005, Suggested and prescriptive means and methods – Are they really in the owner's interest, in J.D. Hutton and W.D. Rogstad (Eds.), *Rapid Excavation and tunneling Conference: 2005 Proceedings*, SME.

18 Hatem, *supra* note 2.

19 Hatem, *supra* note 1; Hatem, *supra* note 2.

mitigated by increased use of detailed construction means/methods submittal requirements. Contract Documents would need to clearly define the scope of submittal reviews, and explicitly state that review and comments on those submittals do not result in responsibility of the Owner, its EOR, or other consultants for construction means/methods.[20] Use of methods statements improves transparency and mutual understanding in construction means/methods planning and execution, as well as the Contractor's evaluation relative to conformance with planning expectations included in EBDs.[21]

In the preceding discussion of EBDs, recommendations were provided for the inclusion of requirements for reports prepared by independent consultants retained by the bidders regarding "behavioral conditions assessments" and "performance requirements assessments." In addition, requirements for specific post-award methods and related submittals should be included in the Contract Documents that correspond to these EBD requirements. More specifically, those submittals should be required of the Contractor that describe and explicate (a) the anticipated behavior of ground conditions based on interaction with the specific construction means, methods, and equipment, and selections to be implemented by the Contractor; and (b) the Contractor's plan and approach, including contingency or other measures, to achieve specified performance requirements prescribed in the Contract Documents. The Contract Documents should clearly state that the Owner's and the EOR's review of those submittals will not relieve or otherwise diminish the Contractor's obligations to achieve the performance requirements.

These method statements and related submittals, upon Owner review and acceptance, may provide both informed and improved bases for the observation, monitoring, and measurement of means and methods field implementation relative to the contents of those submittals and, as such, reduce the potential for disputes arising out of disagreements as to whether costs, time impacts, or performance problems are due to means and methods or independently meritorious differing subsurface conditions, thereby maintaining the integrity and balance of contractual risk allocation approaches, especially those established in the GBR.

Contractor Design-Related Proposals or Involvement

Permanent works design conventionally has been considered the exclusive province of the Owner and its EOR in DBB. Recognition of the interactions and interdependencies among subsurface conditions, permanent works design, and construction means/methods raises the important question of whether the DBB method could be improved by contractual provisions that invite and encourage increased opportunities for (post-award) Contractor proposals for or other involvements in modifications to permanent works design, (e.g., value engineering proposals, substitutions, design delegation or alternative design submittals).

The answer is a qualified "yes," subject to clear understandings as to

> (a) the Owner's (and its EOR) limited and defined scope and role(s) in the review of the proposal;
>
> (b) clarity and consistency on any specified or delegated roles and responsibilities of the Contractor (and its EOR) for design modifications;
>
> (c) assigned responsibilities for any interfaces and coordination required between Contract Documents design and the Contractor-proposed design modifications; and
>
> (d) any significance of and implications in the Owner's acceptance of the Contractor's proposed design modifications on otherwise governing contractual risk allocation terms.[22]

In certain instances, a Contractor may propose design modifications in permanent work (e.g., segmental lining) to accommodate its construction means/methods approaches or equipment selections. In that context, it is important that contract terms clearly address design responsibility, risk allocation, and cost and schedule implications of those modifications.[23]

Observational Method

The importance of the observational method (OM) in underground design and construction is well-accepted, albeit underutilized, in DBB. The OM provides opportunities to reevaluate and validate anticipated subsurface conditions and planned design and construction approaches in the context of

20 Hatem and Corkum, *supra* note 17, at ¶ 5.1.4.

21 Brierley and Hatem, *supra* note 17.

22 Hatem and Corkum, *supra* note 17, at ¶ 5.1, 5.1.1–5.1.3. The failure to clearly define these understandings in DBB tunnel projects has produced disputes between Owners, Contractors, and their respective EORs. For example, *see Kiewit-Atkinson-Kenny, Joint Venture v. Massachusetts Water Resources Authority*, 2002 WL 31187691 (Mass. Superior Court, No. 011920 BLS, Sept. 3, 2002), Memorandum and Order (involving dispute as to whether the contractor merely proposed an "or equal" tunnel lining substitution system or an alternate design; if the former, the Owner retained design responsibility; if the latter, the Contractor assumed responsibility); *Guy F. Atkinson Construction Co.*, ENG BCA 6145, 98-1, BCA ¶ 29582 (ruling that a Contractor who provides an alternative design for the concrete tunnel liner, which was approved by the Owner, assumes responsibility for that design). Disputes arising out of design assist, substitutions, value engineering, proposals, and delegated design may be avoided in DBB by clear contractual provisions that define roles, responsibilities, and risks of the Contractor and Owner. *See* Hatem, D.J. and Gary, P., 2020, *Public-Private Partnerships and Design* (3d ed.), n. 208, ACEC; Heusinger, J.D., 2017, Ambiguity breeds conflict: The importance of defining "Design-assist" in the construction industry, *Journal of the American College of Constr. Lawyers*, 11(1), pp. 117-138.

23 The failure to address the design responsibility, risk allocation, and cost/time implications of design modifications results in otherwise avoidable disputes. *See Sehulster Tunnels/Pre-Con v. Traylor Bros., Inc./Obayashi Corp.*, 111 Cal. App. 4th 1328 (Cal. App. 4th Dist. 2003).

actual subsurface conditions encountered during construction.

There are intrinsic limitations and uncertainties associated with preconstruction subsurface investigations and judgmental evaluations of the data produced. During design development, reasonably probable parameters of variations in encountered subsurface conditions and the potential for design approach and construction method modifications should be anticipated, evaluated, and included in contingent planning.[24] Final design in subsurface projects is often more realistically considered as a *plan* that is subject to confirmation and validation during construction and is likely subject to modified approaches due to interactions of the ground and tunnel structure and construction means/methods, and the monitoring and assessments of those interactions.[25] Subsurface (physical and behavioral) conditions encountered during construction may necessitate modifications to planned design and construction approaches. Contracts should anticipate those modifications and provide a framework for risk allocation and cost/time adjustments.

It has been observed that the OM has been underutilized in all delivery methods, including DBB.[26]

The challenges to effective OM implementation in DBB traditionally arise from how those modifications impact adjustments to cost, time, and contractual and commercial risk allocation terms; the degree of contractual flexibility of effectuating those adjustments; and whether adjustments in those terms are warranted (and, if so, on what bases). These implementation challenges have resulted in significant disputes on DBB projects.[27]

DBB contractual pricing and risk allocation approaches have been noted to constrain the utilization of the OM.[28] Generally, and to a significant extent, DBB lacks the requisite collaborative framework that supports more receptive and adaptative contractual approaches—approaches that allow planned design and construction means/methods approaches to be evaluated during construction and that anticipate required modifications arising from reasonably anticipated and probable parameters of variations in encountered subsurface conditions.

As discussed, DBB is based on commercial and contractual structures that result in intolerances to, inflexibility in, and resistance to modifications in planned design and construction approaches. As has been observed:

> In the design-bid-build contracts, there is typically a separation between the designer and the contractor, which may create obstacles to modifying the design during construction and, consequently, a barrier to the use of the observational method. Similar problems may arise in a design-and-build contract if the client keeps the right to approve all modifications of the design and has no incentives to do so. This separation can lead to disputes and confrontation between the actors involved. This must be avoided when implementing the observational method, where high-quality communication and cooperation are essential.[29]

Receptivity to the OM in DBB is confronted by constraints, as noted by Powderham and O'Brien:

> "Under a conventional [DBB] contract, a contractor bids on a project based on a fixed design specified in the contract documents and on the premise that it will be built as designed. The introduction of the OM within such a contract immediately presents commercial risks from the need to allow design changes during construction. Such risks tend to fall predominantly upon the contractor who can consequently be exposed to the double disadvantage of less return but more ownership of the design. Risk allocation is reasonably well defined in a conventional [DBB] contract where most of the design risk is taken by

24 Brierley, G.S., 1998, Subsurface investigations and geotechnical report preparation in D.J. Hatem (Ed.), *Subsurface Conditions: Risk Management for Design and Construction Management Professionals*, Wiley.

25 Antiga, A. and De Luca N., 2015, Observational approaches in tunneling: some thoughts, *ITA WTC 2015 Congress*.

26 Hatem, *supra* note 2; Powderham, A., 2004, The Observational Method – Learning from Projects, *Int'l Conf. on Case Histories in Geotechnical Engineering*; other sources by D.J. Hatem; Kadefors, A. and Brochner, J., 2008, The Observational Method for underground excavations: contracts and collaboration, SveBeFo Rapport K28, *Swedish Rock Engineering Research*, Stockholm; Powderham, A., 2004, The observational method – Learning from projects, *International Conference on Case Histories in Geotechnical Engineering* (8), Scholars' Mine; Tidlund, M., Spross, J., and Larsson, S., 2022, Observational Method as risk management tool: the Hvalfjorour Tunnel Project, Iceland, in *Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards* 17(2), Taylor & Francis 2023.

27 Hatem, *supra* note 1, and sources cited in footnotes 26M, 27A, and 28D therein; Effective utilization of the OM approach requires clear and mutual understandings in any delivery method of the respective roles, responsibilities, and risks of all project participants. The Supreme Court of New South Wales decision in *Theiss Pty Ltd. & John Holland Pty Ltd. v. Parsons Brinckerhoff Australia Pty Ltd.* (2016) NSWSC 173—which involved a dispute arising out of the OM approach on a DB project—demonstrates the importance of that admonition. This aspect of the *Theiss* decision is discussed in M. Graham, 2016, Theiss Pty Ltd and John Holland Pty Ltd v. Parsons Brinckerhoff Australia Pty Ltd [2016] NSWSC 173, *Kreisson Constr.*, https://kreisson.com.au/theiss-pty-ltd-john-holland-pty-ltd-v-parsons-brinckerhoff-australia-pty-ltd-2016-nswsc-173/ and Burman, B. et al., 2018, Lane Cove Tunnel Collapse and Sinkhole, A Forensic Review – 3: The Legal Aftermath, *Australian Geomechanics Journal*, 53(4), pp. 51-57 (Dec. 2018). As discussed in this paper, Early Contractor Involvement (ECI) increases the opportunities for more transparent understandings as to roles, responsibilities, and risks that enhance OM utilization. The importance of clarity and accountability in the delineation and assignment of design responsibility in the OM approach is addressed in Clark, P., 2024, Improvements to the observational method in New South Wales Road Tunnel construction, in H. Khabbaz et al. (Eds.), *Geotechnical Lessons Learnt – Building and Transport Infrastructure Projects, Lecture Notes in Civil Engineering*, Springer, pp. 121-138.

28 Powderham, A.J. and O'Brien, A.H., 2021, *The Observational Method in Civil Engineering: Minimising Risk, Maximising Economy* (1st ed.), CRC Press, ¶ 14.2; O'Brien, T. and Patterson, R., (2026, Mar. 17), *What does the Observational Method need to succeed?* [Conference presentation], BGA Conference on the Observational Method.

29 Tidlund, M., 2021, Geotechnical risk management using the observational method (PhD dissertation, KTH Royal Inst. of Tech., Dept. Civ. & Arch. Eng.), ¶ 4.7, 4.7.1.

> the client and most of the construction risk is carried by the contractor."[30]

To some extent, underutilization of the OM in DBB has been attributed to the failure to include in Contract Documents (a) contingencies as to design or other modifications due to probable ranges or parameters of material variations between reasonably anticipated (as defined in Contract Documents) and actually encountered subsurface conditions, and (b) unit pricing or other agreed methods to facilitate and manage cost and time adjustments necessitated by the occurrence of those contingencies.[31] For example, the cost and time impacts resulting from work performance and materials quantities increases that may be required due to design or other modifications triggered by the OM should and could be addressed in the Contract Documents by unit price and allowance provisions. In tunneling, pre-excavation probing and grouting ahead of TBM progression could be a good candidate for such an approach.[32] Addressing these considerations in DBB Contract Documents provides a significant opportunity for improvement. The flexible contracting approach embodied in NEC4 Engineering and Construction Contracts facilitates risk allocation and commercial (payment and quantities measurements) adjustments that may be required in the implementation of the observational approach on DBB tunnel projects. Under that approach, bidders may be required to submit methods of data collection regarding variations in encountered conditions and characterization methods to be utilized during construction that correspond with baselines contained in a GBR.[33]

The independent and sequential character of the design and construction processes in DBB presents challenges and complications in the implementation of the OM. Why? From procurement and contracting perspectives, Owner-furnished design is expected to be final and complete at the point of construction contract award, and the Contractor has a reasonable right to expect that the contract document design upon which it bases its bid will be suitable for construction. The OM inherently recognizes the reality that Contract Document design may not be final and complete (i.e., it will need to be validated during construction and may need to be modified based on encountered subsurface conditions). That reality may appear to contradict the fixed price and standardized risk allocation procurement and contractual regimes underlying the DBB method. The potential of design modification raises several questions: Who bears the risk, cost, and schedule consequences of those modifications? How do and should contract provisions allow for variations in risk allocation, terms, and cost and schedule adjustments due to such modifications? Do and should Contract Documents contemplate and contingently provide for those variations and modifications due to reasonably defined parameters of potential design revisions?[34]

In an excellent ASCE paper, C. Farnsworth observed:

> Effective risk analysis and development of recommended strategies regarding the observational approach to construction are essentially the same thing and require the expertise of the same parties. Since there is typically not a construction expert involved during the design phase of a DBB project, the DBB delivery framework simply lacks the ability to provide effective risk analysis and likewise observational approach strategies … [T]his can affect the constructability of the design within the context of significant change.[35]

Farnsworth recommended that the implementation of the OM in DBB could be improved by including explicit provisions in Contract Documents regarding anticipated probable ranges of encountered subsurface conditions and their design and construction means/methods implications and by providing for particular contingent design modifications based on those encountered subsurface conditions, including provisions to address any potentially indicated risk allocation and cost and schedule adjustments due to those modifications.[36] As to the preconstruction reporting of subsurface conditions, Farnsworth recommended that investigation and ground conditions classifications and parameters "be communicated more in terms of risk and variance, rather than just a standard geotechnical data report."[37] Potential and contingent design modifications

30 Powderham and O'Brien, *supra* note 28 at pp. 327-29. CIRIA has established a committee to develop an updated guidance document for the use of the OM, with an expected publication date in 2027. *See* CIRIA P3295 Observational Method Update.

31 The implementation, during construction, of extensive instrumentation and monitoring is an important component of the observational method. *See* Bauer, G. and Courtland, S., 2016, Employing a unique procurement process for the City of Ottawa Combined Sewage Storage Tunnel, *SME*.

32 *See* di Prisco, C. et al., 2022, Assessment of excavation-related hazard and design of mitigation measures, § 10.3, in E. Bilotta, R. Casale, C. Giulio di Prisco, et al. (Eds.) *Handbook on Tunnels and Underground Works, Volume 1: Concept – Basic Principles of Design*. CRC Press, pp. 297-98.

33 Gomes, A., Ertl, H., Marulanda, A., Neuenschwander, M., and Newns, B., 2025, ITA Guidelines for the preparation of the GBR for the NEC4 engineering and construction contracts – Options B and D with bill of quantities, *Tunneling and Underground Space Technology* 163; NEC-ITA, 2025, NEC-ITA Guidance on NEC and Underground Works.

34 Contractual terms to facilitate adjustments in price and risk allocation due to design modifications implemented in the OM are explored in A. Antiga, M. Chiorboli, and N. DeLuca's "The potential for use of the observational method in tunnel lump sum contracts." *See* Antiga, A., Chiorboli, M., and DeLuca, N., 2019, The potential for use of the observational method in tunnel lump sum contracts, in Peila, Viggiani, and Celestino (Eds.) *Tunnels and Underground Cities: Engineering and Innovation meet Archaeology, Architecture, and Art*. Taylor & Francis, pp. 4360–62. The authors recommend that these contractual terms be aligned with baselines defined in a GBR.

35 Farnsworth, C., 2016, Challenges with managing risk when using the observational method of construction with design-bid-build delivery in J. Perdomo-Rivera, A. Gonzáles-Quevedo, C. López del Puerto, et al. (Eds.), *Construction Research Congress 2016*, ASCE, pp. 2740, 2745.

36 *Id*. at 2747.

37 *Id*. at 2748.

should be defined in Contract Documents, derivative of and correlated with reasonably predicated probable ranges of specified variations in encountered subsurface conditions from those assumed as the basis of initial design assumptions.

Farnsworth summarized his recommendations as follows:

> "The use of the observational method of construction is a useful technique for projects that lend themselves to change. If the potential for change is great and the geotechnical risk is high, using this technique with design-bid-build project delivery becomes more difficult, as demonstrated with the Provo Canyon widening project. Alternative project delivery methods are more favorable for utilizing the observational method, allowing more effective risk sharing across design and construction. However, for future use with design-bid-build delivery, the following lessons should be incorporated: 1) the observational method needs to be explicitly implemented during the design phase, including developing the potential risk and response; 2) all parties must understand the use of the observational method, and it should be clearly communicated in the contract documents, especially the plans for response; 3) appropriately incorporate a risk analysis and risk management plan, beginning in design and extending through construction; 4) provide clear contract documents, especially with regard to differentiating soil and rock conditions; 5) utilize a strong approach for communicating uncertainty; and 6) ensure that the backup plans can be incorporated within the construction sequencing, staging and phasing plans."[38]

Performance Specifications

In DBB tunnel projects, performance specifications are frequently utilized by Owners to require an end result in design or construction objectives while not prescribing the details of achieving that objective.[39]

Disputes on subsurface projects often arise from disagreements as to whether a contractual provision is a performance specification—that is, a specification requiring achievement of a particular performance objective or result and delegating responsibility and risk for design and other execution details to the Contractor—or a design specification detailing, in a prescriptive and mandatory manner, the design or other specific requirements that a Contractor must follow to achieve a particular performance or other result, with explicit or implied responsibility of the Owner for the adequacy of that specification.[40] In many disputes, the focus is whether the particular specifications are, in reality, purely performance specifications or, in contrast, actually either "design specifications" or "hybrid specifications" that prescribe design details or other requirements that significantly constrain the Contractor's discretion and ability to achieve the defined objectives.[41] The risk of these disputes may be significantly mitigated in DBB tunnel projects through more conscientious and precise articulation of specifications intended to be purely performance-based.[42]

Interface Roles, Responsibilities, and Risks

Tunnel contracts are at times procured and contracted as a component of other independent scope contract packages, such as stations and systems packages. Disputes frequently arise as to the respective roles, responsibilities, and risks among the various individual contract packages especially as to scope and work involving interfaces, coordination, and interdependencies among the design and construction of those packages. Inevitably, the Owner and its Consultant team are implicated and drawn into those disputes.

There are significant opportunities to improve DBB clarity in the definition, allocation, and management of these interface risks. The importance of effectively and proactively addressing these risks is especially important in the context of megaprojects—a designation appropriate for the characterization of most tunnel projects.[43]

Risk Management and Insurance Programs

Tunnel projects pose significant complexities and risks for all participants due to the inherent uncertainties associated with subsurface conditions and the efficacies and suitability of planned design and construction approaches when conditions actually encountered materially differ from those reasonably anticipated in the design and construction means/methods planning. Interfaces and interdependencies among subsurface conditions, permanent works design, and construction means/methods heighten the potential and consequences of the materialization of those risks.

The megaproject characteristics of tunnel projects further

38 *Id.* at 2749. CIRIA 1999, ¶ 6.2.2 contains similar recommendations to improve OM utilization on DBB projects.

39 Loulakis, M., 2013, Legal Aspects of Performance-Based Specifications for Highway Construction and Maintenance Contracts, *Legal Research Digest 61*, NCHRP, III(C).

40 *See* No. 61, VIII, B; *Fruin-Colnon Corp. v. Niagara Frontier Transp. Auth.*, 585 N.Y.S. 2d 248 (App. Div. 1992); Hatem and Gary, *supra* note 22 at ¶ 12.3; Hatem, *supra* note 1; Hatem *supra* note 2.

41 *See PCL Constr. Servs. v. U.S.*, 47 Fed. Cl. 745 (2000).

42 Under a performance specification approach, the Contractor is required to retain a qualified design professional to prepare and stamp the delegated design. *See* Downey, T., Edden, K., McAndrew, S., et al., 2019, Tunneling contracting practice: One owner's state of the art, in C.D. Hebert and S.W. Hoffman (Eds.) *Rapid Excavation and Tunneling Conference: 2019 Proceedings*, SME; Brierley, G. and Corkum, D., 2018, Procurement of and contracting for underground construction projects in North America, in L. Falco, S. Dube, A. Kerr, et al. (Eds.) *North American Tunneling 2024 Proceedings*, SME.

43 Munfah, N., 2025, Avoiding and resolving multi-party disputes arising from multidisciplinary underground projects, in S. Sadek and B. Hagan (Eds.) *Rapid Excavation and Tunneling Conference 2025 Proceedings*, SME, pp. 54; Kondrachova, T. and Gaspari, G.M., 2021, Design build and design-bid-build – What is most efficient?, *Canadian Tunneling*, Sept. 2021.

elevate risk concerns.[44] Never before have there been more infrastructure megaprojects in various stages of study, planning, design, procurement, and construction.

Certainly, not all risks are transferable to coverages under insurance policies. Robust project-specific risk management programs are, therefore, essential.[45] Many underwriters evaluate the insurability of risk on tunnel projects based on assessments of project-specific risk management programs proactively prescribed and implemented by the Owner.[46] In DBB tunnel projects, it is critically important that insurance requirements and programs be conscientiously developed and monitored through project execution.

The underwriting of project-specific insurance on a tunnel project is, to say the least, a challenging process. Traditional underwriting approaches, which focus on (a) the capabilities, qualifications, and experience of the project participants and (b) the technical challenges posed by the project, are necessary and appropriate. However, the focus in the underwriting needs to be broader and more flexible, pragmatic, and continuous in nature.

More specifically, the underwriting process should take into account the project-specific risk factors involved in the tunnel project. As such, the focus of underwriting should include an assessment of

(a) the Owner's funding availability;

(b) project planning and managing approaches, capabilities, and experience;

(c) the extent to which project cost estimates and schedules have been subjected to a rigorous and independent validation and evaluation;

(d) the extent to which risk will be reevaluated as the project progresses, and cost estimates and schedules revised to take into account those risk factors and other developments;

(e) the roles and responsibilities of the various project participants and the extent to which those roles and responsibilities may transform or evolve over the duration of the project;

(f) the reasonableness of proposed risk allocation among the project participants and the insurance coverage implications of those risk allocation decisions; and

(g) the appropriateness of the Owner's delivery method and the contractual practices, including risk allocation approaches, that the latter intends to utilize in the implementation of the selected delivery method.

While all these factors should be understood and evaluated in the initial underwriting process and continuously monitored over the relatively long duration of a tunnel project, those factors and considerations and their potential impact on liability exposure are dynamic and likely to evolve. As such, prudent underwriting must be both dynamic and continuous in nature so as to provide periodic opportunities for the identification and evaluation of the liability risk implications of that evolution. Accordingly, some professional liability and other insurers providing project-specific and wrap-up coverage on tunnel projects have developed underwriting approaches designed to allow for periodic evaluation of the variability and evolution of dynamic risk factors that may impact liability risk or other relevant exposures.[47]

44 Hatem and Corkum, *supra* note 17 at Chapters 14-18; Kondrachova and Gaspari, *supra* note 43.

45 *See, e.g.*, ITA, *supra* note 3; Mellors, *supra* note 6, pp. 30-41.

46 ITA, *supra* note 3; DAUB – Working Group, 2022, Recommendations for Project Risk Management in Underground Construction, *ITA-AITES*; Tunnels & Tunneling, 2023, The insurer's role in project risk management; Konstantis, T. and Towers, A., 2023, Tunnel and underground works: Managing insurance particulars in a well-structured and risk-averse environment, in Anagnostou, Bernardos, and Marinos (Eds.), *Expanding Underground. Knowledge and Passion to Make a Positive Impact on the World*, Taylor Francis; Wilson, *supra* note 3 at Ch. 13.

47 Hatem and Corkum, *supra* note 17, Chapter 18, ¶ 1.0, 2.0, pp. 595-62, and sources cited in footnotes 18-23 therein; Hatem and Gary, *supra* note 22, at Chapter 12, ¶ 12.6.2; Hatem, D.J., 2012, Recalibrating and improving design-build on public infrastructure projects, *ABA Forum on the Construction Industry*; Dix, A., 2010, Insurance and the code – where are we now? *Tunneling Journal*, Aug/Sept. 2010; Dix, A., 2010, Tunneling – the insurers' perspective, *Tunneling Journal*, Oct/Nov. 2010; Konstantis and Towers, *supra* note 46; DAUB, *supra* note 46.

Procurement and Contracting Approach Modifications in DBB Subsurface Projects: A Case Study

A recent decision of the Armed Services Board of Contract Appeals, *Appeals of Skanska USA Civil Southeast, Inc.*, ASBCA Nos. 61220, 61347 (April 3, 2025) (*Skanska*), demonstrates a number of the primary sources of disputes in DBB subsurface projects. Skanska entered into a fixed-price DBB contract with the Department of the Navy for the demolition of two existing piers at the Norfolk Naval Shipyard. Skanska claimed that it incurred costs arising from the removal of the interior timber bearing piles that were buried in soil. Skanska based entitlement for its claim on defective specifications (prepared by the Navy's EOR) and DSC. The board denied entitlement on both grounds.

Relevant Background

The project solicitation included a complete and final design of permanent works prepared by the Navy's EOR. The successful Contractor was required to retain a licensed engineer to design the means, methods, and procedures for demolition of the existing piers and pile extraction. During procurement, the EOR met with three prospective contractors, including Skanska, early in design development to solicit input on the project and the construction approach to pier demolition and pile extraction. There was also a site visit during procurement; however, the interior bearing piles supporting the piers were not visible or able to be inspected because the piles were under the piers and obscured behind concrete sheet piles.

Each bidder was required to submit a Technical Approach with a “narrative that describes the construction means and methods” for demolition of the existing piers. Skanska submitted its Technical Proposal highlighting its prior experience with projects at the subject Norfolk Naval Shipyard and that included a detailed sequence of construction and methodology for pier demolition prepared by a Skanska engineer. During proposal evaluation, the Navy identified as a strength of the Skanska Technical Approach its inclusion of several alternatives for pier demolition dependent upon potential construction issues encountered, particularly pertaining to methods for removing piles.

The Navy awarded the Contract to Skanska, and the Technical Approach was incorporated into the Contract. The Contract included a standard DSC clause.

The Contract required Skanska to design a complete demolition procedure and submit a demolition plan (the "Demo Plan") that:

+ Was based on information contained in the drawings, specifications, reference drawings, geotechnical data report, and hazardous materials reports
+ Was prepared and sealed by a licensed professional engineer
+ Was approved by the Contracting Officer prior to commencement of work

The board ruled that the Contract requirements for the Demo Plan constituted a performance specification.

The Contract required Skanska to completely extract and demolish all piles, and included requirements for handling, transportation, and disposal of hazardous waste. During design, the Navy’s EOR was unable to definitively determine from the historical documents whether the timber piles were treated with creosote. As such, a note on a Contract Demolition Drawing (the "Drawing") stated that all piles “shall be assumed to be creosote treated.” Creosote-treated materials must be disposed of as hazardous waste.

Proposed Change Orders (PCOs) and Request for Equitable Adjustment (REA)

Skanska requested an equitable adjustment and time extension PCOs on the basis that the interior bearing piles were not treated with creosote, and that as a result conventional extraction methods had proven unsuccessful as the pile tops were rotten and broke off with minimal force. Skanska contended that this situation resulted from a changed condition and that it would need to develop alternative methods to extract the interior timber piles. The Navy rejected the PCOs. While acknowledging that the piles were not creosote-treated, the Navy disagreed that creosote-treated piles had an indefinite lifespan.

Skanska then submitted an REA claiming additional cost and delays on the basis that the lack of creosote treatment constituted DSC or a defective design specification and, in either case, the Navy was responsible.

The Navy rejected the REA, and Skanska appealed to the board.

More specifically, Skanska contended on appeal that it was entitled to prevail due to either DSC or because the Navy’s specifications were defective “because they mistakenly instruct bidders to assume that the timber piles had been treated with creosote; and that because the piles were assumed to be so treated Skanska anticipated that the timber piles would be in sound condition and, as such, accordingly planned and priced its means and methods."[48] Skanska claimed that the defective specifications breached the Navy’s implied warranty obligation to Skanska that satisfactory performance would result from adherence to the specifications. Alternatively, and additionally, Skanska contended that the lack of creosote treatment constituted Type 1 DSC in that the interior piles differed materially from what the Contract indicated. (*Note: Skanska asserted other contentions including impossibility of performance and Type II DSC*).

48 The combination of DSC and defective design/specifications claims occurs on many subsurface projects. Hatem and Gary, *supra* note 22 at ¶ 12.4.3.

The Board's Decision

The board ruled that neither the defective design (or specification) nor DSC claims had merit.

- **Defective Design Specification Claim**
  The board ruled that since both the defective design specification claim and DSC claim were based on the Navy's instruction in the Contract Documents to assume that the timber piles were creosote-treated, the two claims are so intertwined that they constitute a single claim and collapse into and are governed by the specific contractual remedy provided for DSC. *(Note: The board's ruling on this point is well-supported by established judicial precedent)*.[49]

  The board ruled that the contractual requirements regarding the Demo Plan obligating Skanska to exercise ingenuity in its approach to demolition work and pile removal were a performance specification, *not* a design specification. The requirements did not prescribe how Skanska should extract the timber piles—rather, they required Skanska to select and design the methods that it planned to use and to submit the Technical Approach and Demo Plan describing the removal methods that it planned to use. The alternative methods presented by Skanska were noted as a strength in the Navy's evaluation and selection of Skanska. For those reasons, the board ruled that the contractual requirements did not provide the basis for an implied warranty by the Navy as to methods of pile removal.

- **DSC Claim**
  The board rejected Skanska's Type I DSC claim, which was premised on the contention that the interior bearing piles were not creosote-treated and that the as-encountered conditions of those piles differed materially from the indications in the Contract (i.e., the instruction that the contractor must assume that the piles were creosote-treated).

  The board ruled that the required assumption was one of several notes on the Drawing (produced by the Navy as part of the Contract) regarding disposal of potentially hazardous contaminants encountered during demolition. The notes were provided in the context of disposal and were intended to put Skanska on notice that various components of the timber structure may contain creosote, requiring special handling and disposal.

  The board based its denial of Type 1 DSC on the following grounds:

  - The actual conditions of the piles should have been reasonably foreseeable to Skanska based on its prior knowledge and experience at the project site, information contained in as-built drawings and general knowledge, and the expectation that the piles would be degraded due to their prolonged exposure to conditions under the pier.
  - Skanska bid the project based on performance specifications, and Skanska was responsible for the design of alternative methods of pile extraction suitable and appropriate in the reasonably expected conditions. Skanska's Technical Approach submittal (a Contract Document) evidenced that Skanska was aware of and accepted those obligations and was an important consideration in the Navy's evaluation and selection of Skanska.
  - The board stated that "Skanska knew or should have known that the bearing piles were untreated." The board questioned Skanska's asserted reliance upon the note regarding instructed assumption as to creosote, as that note was provided in the context of proper disposal, not representations or as an indication of anticipated site conditions.
  - The board concluded that the totality of the evidence failed to establish that the encountered pile conditions were materially different from those reasonably indicated in the Contract Documents.

Commentary[50]

In tunnel and other major subsurface projects utilizing the DBB method, disputes typically arise out of DSC, alleged defective design (or specifications), Owner breaches of implied warranty obligations, and disagreements as to whether contract requirements are

49 Hatem and Gary, *supra* note 22 at ¶ 12.4.3.

50 The board's decision in *Skanska* is the subject of commentary in other sources. *See, e.g.*, 49 No. 15 Construction Contracts Law Report NL 2 (Jul. 25, 2025); ¶ 97,237 Skanska Usa Civil Southeast, Inc., Cont. Cas.Fed. (CCH) P 97237 (Apr. 3, 2025); 46 No. 6 Construction Litigation Reporter NL 3 (Jun. 2025); ASBCA, 25-1 BCA ¶ 38,804 *Skanska Usa Civil Southeast, Inc.*, Cont. App. Dec. P 38804 (Apr. 3, 2025).

design specifications or performance specifications. The *Skanska* case involved all these diverse dispute sources.

The procurement process on the project allowed for Contractor-proposer input regarding design and required a Technical Approach to be submitted as part of the proposal. This process allowed the Navy's EOR to solicit and obtain input from the proposers on their demolition design and contemplated alternative design and implementation approaches, means, methods, and procedures of pile extraction. The technical submittal of the awarded Contractor became part of the Contract Documents.

Although the delivery method was fixed-price DBB, the procurement process as summarized above allowed for some of the advantages of early contractor involvement approaches.[51] The Technical Approach submittal also served as an important and probative contractual "baseline" in evaluating and determining Skanska's Type 1 DSC claim. It was particularly relevant in assessing the reasonableness of Skanska's reliance upon contract indications, the reasonable foreseeability of the encountered conditions, and the contemplation that alternate extraction methods may be required based on those conditions. This evaluation was especially significant in the context of Skanska's planned pile extraction methodologies, as defined in the Technical Approach. In the latter respect, the Technical Approach somewhat functioned akin to an EBD as well as a Contract Document.

Skanska demonstrates that by utilizing the DBB delivery method—with modest variations in conventional DBB procurement and contracting practices—Owners may obtain the benefit of Contractor input and technical submittals during design development, improve clarity in risk allocation, and thereby facilitate dispute resolution. While it is unrealistic to expect all disputes to be eliminated, the respective understandings and expectations—including contemplated construction means, methods, and procedures—may be more transparent and objectively defined at the point of contract formation in DBB.

51 Hatem *supra* note 2.

Conclusion

Certainly, no delivery method is proven—or expected—to be a panacea. Success in all methods requires conscientious and disciplined project-specific focus and prudent planning, budgeting, and procurement practices, as well as fair contractual risk allocation, effective risk management programs, and adequate and aligned insurance support.

Early contractor involvement delivery methods alternative to DBB have, in their own respects, spawned off-ramp and other challenges in their implementation on tunnel projects.[52]

The current procurement environment provides a context and opportunity to investigate whether the DBB method may be meaningfully revitalized in a manner that improves its utilization on tunnel projects by addressing the traditionally perceived shortcomings in that method. Certainly, it is recognized that some of these improvements may need to be legally authorized by procurement laws at the state and federal levels.

Recognizing all of that, there are meaningful and constructive opportunities to revitalize DBB delivery on tunnel projects, and this paper is intended to advance some ideas for industry discussion and consideration. Some of these ideas may be considered by some as controversial or, at a minimum, unconventional, untested, or experimental. Those responses are understood, but are not reasons to avoid or deter constructive thought and discussion about the recalibration of DBB on tunnel projects or the venturing into uncharted courses.

52 Goodfellow, B., 2025, Designing with moving goalposts, *North American Tunneling*, June/July 2025; Goodfellow, B., 2025, Building while the goalposts move, *North American Tunneling*, Oct./Nov. 2025; Bart Silicon Valley Phase II Extension Independent Peer Review, Final Report (Sept. 25, 2025); Spillane, R., 2025, A long wait for Calgary's green line: What went wrong?, *Outpost Recruitment*. *See also* Kondrachova and Gaspari, *supra* note 43; Hatem *supra* note 2; ACEC Design-Build Steering Committee: Progress design-build research.

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