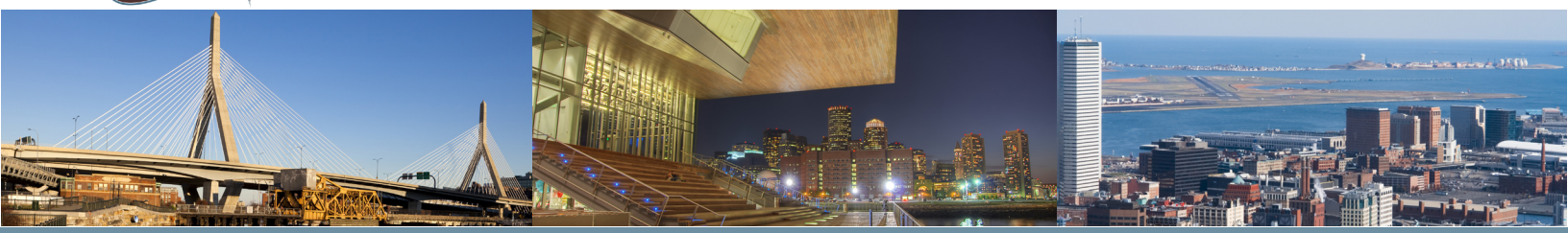

Recalibrating and Improving Design-Build on Public Infrastructure Projects

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Introduction

By all accounts, Design-Build ("DB") has become the delivery method of choice for most owners of public infrastructure projects ("PIPs") such as highways, rails, bridges, tunnels, airports and other projects. While DB delivery of PIPs is, beyond doubt, here to stay, contractors and consulting engineers (and other design professionals) involved in PIPs have experienced substantial financial losses and unacceptable levels of imbalanced risk transfer and liability exposures on a prevalent basis. The root causes of these experiences need to be corrected and DB delivery recalibrated and improved on PIPs, especially given the positive momentum for new PIPs with billions of dollars in federal funding available for such projects under the Infrastructure, Investment, and Jobs Act enacted in 2021 ("IIJA").

In the past several years, the signs and signals, if not alarms, that something is seriously veering off the tracks in DB delivery on major PIPs have become increasingly evident from the comments, decisions, and actions of a number of diverse and important constituencies in the construction, design, and insurance industries. The root causes of many of the negative experiences and trends on those DB projects arise out of certain owner procurement and contractual practices that are adversely, albeit differentially, impacting contractors, consulting engineers, and their professional liability insurers; and resulting in their (suspended or permanent) withdrawal from participation in DB PIPs. Those experiences and trends need to be urgently corrected, and certain DB procurement and contractual practices recalibrated.

Critical Questions and Challenges: Multi-Dimensional Perspectives

This paper will discuss the following critical questions:

- What are the adverse experiences and their causes on DB PIPs, who are they impacting, and why?
- Why is correcting those experiences important to the future viability and continued promise and sustainability of DB delivery on PIPs?
- What can and should be done, and when, to address those negative experiences and to recalibrate and improve DB on major PIPs?

Before discussing these questions, it is important to address why DB PIPs have presented issues and concerns while other DB project types have, for the most part, not produced similar adverse experiences, or at least not to the same degree. In general, PIPs tend to involve more design, construction, and cost uncertainties and other risks for the private sector participants than, for example, those presented in a vertical (building) DB project. Also, a significant majority of PIPs involve multiple stakeholders who could influence the design development process and constructability approaches and, hence, the cost and time of performance by the DB Team. By definition, PIPs involve public owners,

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while many other DB projects are sponsored by private sector owners. Finally, several PIPs may fairly be characterized as "megaprojects" which are inherently more complex and involve elevated risks for all project participants[1].

I. Construction Contractors

Major construction contractors are exiting the North American DB (and public-private partnership, or "P3") public infrastructure project market[2]. Those contractors point to the significant and substantial risks of committing to a fixed (or guaranteed maximum) price during procurement adequate to undertake and encompass responsibility for furnishing the required final design and construction of a major and complex public infrastructure project, and consequent substantial financial losses. These challenges and risks particularly derive from several critical uncertainties and unknowns at the point required for fixed price and risk allocation commitments under many owner procurement and contractual protocols.

A 2021 study conducted by Travelers Insurance Company, entitled "Travelers Infrastructure Study, A 17-year Deep Dive Into Heavy Civil Projects in North America (2021)" ("Travelers Study") amply confirms that contractors typically have sustained significant financial losses on PIPs[3].

For the most part, the issue is not lack of clarity, project scope, or boundaries. Those aspects are typically sufficiently communicated and understood. Rather, the problems derive from inadequate opportunities for realistic understandings of ultimate owner requirements and failures in the clarity, consistency, and timeliness of input by the owner and other stakeholders regarding expectations and requirements governing both final design and construction methodologies[4]. The number and varying interests of stakeholders – beyond the project owner – who likely will have significant post-GMP influence in the definition, development, and approval of those expectations and requirements as realized in the design development process and construction execution - adds yet further uncertainty when their expectations do not align or coincide with reasonable assumptions underlying the design-builder's fixed price commitment. Those stakeholders have no contractual relationships with or obligations to the design-builder, but the nature and timeliness of their inputs on design and construction approaches as well as the owners' pragmatic efforts to accommodate these stakeholders preferences, may have material impacts on design-builder cost, schedule, and performance obligations

Contractors also point to imbalanced risk allocation terms embodied in DB contracts. Those terms transfer substantial risk to the design-builder beyond the risks typically allocated to a contractor in Design-Bid-Build deliveries ("DBB"), or allocate risks that are not within the reasonable ability of the design-builder to control or manage[5]. Further, the practice of some owners to mandate compliance with highly detailed and overly-prescriptive design criteria or standards may impose substantial risk on the design-builder while simultaneously reducing the latter's ability to exercise independent professional judgment and adequate discretion and control in the design development and optimization process.

The basic issues are as follows:

- During the Proposal Phase, can the DB Team **realistically** understand and **competitively** price on a fixed basis all of the components required to design and construct the project in compliance with owner requirements and expectations?
- Can the DB Team **realistically** assess, accept, tolerate, and manage the significant degree of risk contractually allocated to it?

From the perspective of the contractor, as design-builder, these uncertainties, unknowns, and risks are, for the most part, beyond the reasonable ability of the design-builder to control and manage, especially within the constraints of fixed-price and imbalanced risk allocation contractual terms. In that environment, not losing money or, at best, breaking-even are the realistic goals that, in many instances, define "success."

II. Consulting Engineers[6]

Consulting engineers involved in DB PIPs point to the marginalization and commoditization in their roles in the design development process; their limited-service scope; barely sustainable compensation level; frequent and substantial payment withholdings and backcharges; and significant and substantial professional liability risk exposure arising out of "cost overrun" claims asserted by design-builders against them. Many of the same uncertainties, unknowns, and risks perceived (and experienced) by design-builders as adversely impacting them typically provide the underlying platform, motivation, and generating mechanism for many design-builder professional liability claims against their consulting engineer subconsultants[7].

Professional Liability Claims Experience for Consulting Engineers in DB PIPs

The more substantial design-builder professional liability claims asserted against consulting engineers on DB PIPs involve allegations that the conceptual or preliminary design prepared by the consulting engineer subconsultant during the time-compressed project procurement process was inadequate to allow the design-builder to realistically price in its proposal the reasonably expected and realistic post-DB Contract award final design and construction cost. The design-builder typically further alleges that because it has contractually committed to a fixed price with the owner, it has no recourse to an equitable adjustment from the latter. Absent a contractual equitable adjustment from the owner and bound to its fixed price commitment, the design-builder will seek a remedy in the form of a "cost overrun" professional negligence claim against the consulting engineer due to the latter's alleged deficient proposal phase conceptual or preliminary design upon which the design-builder based its proposal phase pricing (at least in part).

Design-Builder "cost overrun" professional liability claims represent:

- The most **frequent** source of professional liability claims by design-builders against consulting engineers
- The source of the most **severe** professional liability claims by design-builders against consulting engineers

A typical "cost overrun" professional liability claim against consulting engineers in DB is based on allegations that the consulting engineer's conceptual or preliminary proposal phase design or studies, investigations, or recommendations did not meet the standard of care, resulting in "cost overruns" in final design and construction that the design-builder cannot recover under the terms of the prime DB Contract with the owner.

These professional liability claims are typically governed by the negligence-based standard of care formulation generally relevant to the evaluation and reasoned determination of most professional liability claims[8]. As a general matter, under that standard, a design professional is required to exercise reasonable care under the relevant circumstances. Applying that standard to a conventional professional liability claim against a design professional alleging deficiencies in the preparation or quality of a **final** design intended as suitable for construction is a fairly familiar and understood evaluative exercise.

But how is and should the professional standard of care be applied in the context of a design-builder's professional liability "cost overrun" claim against a consulting engineer alleging deficiencies in merely **conceptual** or **preliminary** design prepared by the latter during the time-compressed proposal phase of a DB PIP? There are few, if any, relevant, recognized and accepted industry standards that inform that evaluation. Standard of care expert opinions significantly vary. Legal precedent is sparse, to say the least, and naturally predicated on project-specific factors and circumstances. What are the relevant factors and circumstances that may be considered in the application of the standard of care to a design-builder's "cost overrun" professional liability claim against a consulting engineer? Some of the relevant factors and circumstances include:

- The consulting engineer's scope of services during the proposal phase;
- The design management role of the design-builder;
- The distribution and delegation of design responsibilities among various project participants in addition to the consulting engineer (i.e., interface and coordination roles and responsibilities) and who are not directly subcontracted to the consulting engineer;
- The limited information available during the proposal phase;
- The limited reliance rights of DB proposers upon owner-furnished reference/indicative design or other information;
- The limited purpose of the consulting engineer's services during the proposed phase[9];
- The expectation of a need for substantial post-award:
  - Investigations and studies that will inform and influence design development, potentially at variance from proposal phase conceptions
  - Interdisciplinary design interfaces and development
  - Review, comment, and input from the owner and other project stakeholders in the design development and review process;
- Development and refinement of the design-builder's construction means, methods, procedures, and sequences;
- The expectation that the design-builder will realistically (a) price the cost of design and

construction and (b) include in its pricing reasonable contingency for cost and time impacts associated with design development, and design evolution and revisions, not caused by standard of care departures;

- The compressed time within which proposal phase services are performed;
- The directions or other controls, prescriptions, mandatory criteria, and standards or other constraints directed or imposed by the design builder during the proposal phase; and
- The programmatic influence of competitive and market conditions on the design-builder's realistic assessments of risk pricing and contingency considerations.

Suffice to say, precise predications as to the application of the professional standard of care in the context of design-builder "cost overrun" claims are highly variable and dependent on the relevant project-specific factors and circumstances and, hence, inherently judgmental.

Design builder professional liability claims against consulting engineers are typically combined with payment withholding and backcharges imposed by the design-builder upon the consulting engineer, further challenging and exacerbating the consulting engineer's ability to successfully perform in accordance with required contractual and professional performance standards and schedule expectations.

I. Professional Liability Insurers

Owners, design-builders, and consulting engineers involved in DB PIPs critically depend upon dedicated, or project-specific, professional liability insurance ("PSPL") coverage for claims and liabilities due to standard of care departures of design-builders and their consulting engineers. PSPL coverage has historically been provided by specialty professional liability insurers. PSPL, rightfully so, has been considered an essential component of an effective risk allocation and management program for design and related professional liability exposures on major infrastructure projects in all delivery approaches, but especially DB projects, given the unification of design and construction risk and the responsibility assigned to the design-builder[10].

The significant losses experienced by the limited class of specialized insurers providing PSPL attributable to design-builder "cost overrun" professional liability claims against consulting engineers have been severe, leading some of the more responsible and longstanding PSPL insurers to cease or suspend underwriting PSPL coverage on DB (and P3) PIPs in North America. The problems posed by this trend are serious and, in the opinion of this author, are not likely to significantly improve in the months ahead, resulting in adverse consequences for all project participants in DB (and P3) infrastructure projects[11]. The limited availability and capacity of PSPL coverage is especially problematic – and the concerns more acute – given the anticipated volume of DB (and P3) PIPs on the horizon (especially those of a megaproject character) driven by billions in funding availability and authorizations under the IIJA.

A Path Forward: Multi-Dimensional Perspectives

The issues and concerns discussed in the preceding section are multi-dimensional in character and produce adverse experiences for private sector participants in DB PIPs. The correction of those experiences and their causes is important to the future viability and continued promise and sustainability of DB delivery on PIPs.

The potential solution to these concerns – as with the concerns themselves – are multi-dimensional. A collaborative, integrated, and constructive approach to address these concerns should be promptly initiated among contractors, design professionals, owners, professional liability insurers, and surety companies.

I. Re-alignment of Procurement and Contractual Practices: Confronting Project Cost and Risk Realities

The success of DB delivery in the public infrastructure context significantly depends upon the ability of owners to choose from a relatively robust and diverse group of qualified and experienced DB teams, resulting from a procurement and selection process that emphasizes qualifications-based selection among a sufficient population of excellent competing DB teams.

Clearly, the exit of major contractors and consulting engineers from the DB project arena significantly detracts from the owner's ability to achieve those procurement strategies and objectives. The previously discussed negative experiences of contractors and consulting engineers are, by no means, confined to a limited segment of large contractors and consulting engineering firms. Middle and small-

er sized firms are also adversely affected. Those firms serve in lower-tier positions on large-scale DB projects and may also serve in a prime (or multi-prime) position on small-scale DB projects.

There are multi-dimensional concerns presented by the problematic prevailing DB procurement and contractual practices in public infrastructure projects. At root, these concerns principally derive from mandates that a fixed price be contractually committed prior to sufficient clarity and comprehension of the expectations as to what is required of the DB team in the final design and construction approaches. Those concerns are exacerbated by the aggressive and imbalanced risk allocation obligations of the design-builder and the unqualified flow down of those prime DB contract terms to the consulting engineer. Further, in a highly competitive procurement environment, DB proposers often engage in aggressive pricing and do not include in their proposal pricing adequate contingencies for the unknowns and risks in project final design and construction approaches[12].

The cumulative effect of these concerning practices and dynamics often produces both serious financial losses for design-builders and substantial professional liability "cost overrun" claims asserted by the latter against their consulting engineers, as well as the negative financial and reputational impacts to those firms participating in DB PIPs. As a direct consequence, professional liability insurers, especially those underwriting PSPL, have experienced significant losses, resulting in significant reductions in availability and capacity in the PSPL market.

II. Project Cost and Risk Realities

At root, the principal concerns with DB approaches on PIPs primarily and predominantly arise out of unrealistic expectations of project participants as to the actual and inherent project cost ("project cost") and risks necessary to be reasonably assessed and factored in the design and construct a project that meets the owner's ultimate requirements. Simply put, the realistic project cost is not captured in the fixed-price award. Some project participants – more than others – have the ability and opportunity to develop reasonable estimates for that project cost, to identify and assess the relevant design and construction costs, and to evaluate, control, and manage relevant risk variables and factors.

Many of the design-builder "cost overrun" claims against consulting engineers in PIPs derive from failures to adequately, reasonably, and realistically estimate and assess project cost and risk during the proposal phase. Some of those failures may be attributable to strategic and competitive factors and influences in the procurement process. However, it appears that those failures are significantly due to the inability of the majority of design-builder proposers to adequately define and reasonably predict during procurement all of the relevant design and construction considerations, costs, and risks inherent and necessary to assess and price in order to achieve the owner's ultimate requirements. On megaprojects, the risks of unrealistic project cost and overly optimistic risk assessments are elevated[13].

For the most part, design-builder "cost overrun" claims against consulting engineers are not genuinely attributable to fault, negligence, misrepresentation, or other wrongful conduct of most – and perhaps all – project participants. Rather, these claims derive and drive from the failure or inability to capture in the DB Contract a realistic fixed price basis to encompass the design and construction scope and cost, and associated risks inherent in delivering a project that meets the Owner's ultimate design and constructability requirements. Viewed in this context, the very foundation or predicate of a professional negligence claim against the consulting engineer for "cost overruns" is fundamentally flawed and misdirected.

In DB, there is an important intersection between (a) project cost and (b) expectations as to design adequacy. In DBB, the owner typically owes an implied warranty obligation to the contractor; more specifically, the owner impliedly warrants that the final design that it provides to the contractor is suitable and constructible for the project. The owner, in DBB, will (should) typically budget for the cost adjustments required to compensate the contractor as a result of the owner's breach of that implied warranty obligation. In the latter circumstance, the owner may be able to recover those costs from its design professional who prepared the defective design, but typically only if the owner proves that the design professional failed to meet the professional standard of care. Put another way, not all design defects are due to standard of care departures and there are certain costs due to design defects that ultimately will be the owner's implied warranty obligation and financial responsibility, for which owners should prudently plan and fund contingency.

In DB, since the design-builder is responsible for the final design

(and its constructability), the design-builder contractually undertakes the cost, schedule, and other risks attributable to design defects that do not result from the design professional's departure from the standard of care. Design-builders, like owners in DBB, should prudently plan and fund contingency for non-negligent design defects.

In DB PIPs, the cost and schedule impacts of defective design not resulting from the consulting engineer's standard of care departures are an inherent and reasonably expected component of the design-builder's pricing and contingencies. Perfection is not the standard reasonably expected of the consulting engineer; and professional liability insurance is not intended to indemnify design-builder claims against consulting engineers for the design-builder's commercial and contractual risks not attributable to the consulting engineer's standard of care departures[14].

The root causes of the problems in DB delivery in PIPs derive from certain procurement and contractual practices of owners requiring design-builder commitment to a fixed-price prior to possessing sufficient knowledge pertinent to (eventual) final design and construction approaches and a reasonable opportunity to identify and evaluate project risks. These problems are exacerbated by imbalanced risk allocation provisions in the prime DB contract, the explicit terms or implications of which typically flow down to the consulting engineer.

The overarching question is **when** can sufficient understanding of design and construction approaches reasonably and realistically be known in a manner to adequately and realistically inform commitments as to contractual pricing and risk allocation terms.

On complex DB infrastructure projects (and especially megaprojects), it is neither realistic, reasonable, nor fair to expect that such an understanding can or should be known or knowable at the time of DB contract execution. The Travelers Study provides compelling data to support that conclusion.

The acute problems associated with procurement and contractual practices in DB PIPs that (a) require a fixed price at the time of initial DB contract award and (b) mandate imbalanced risk allocation terms, need to be corrected and a more sensible path forward developed. In general, the solution should allow for deferral of contractual commitments as to final price and risk allocation terms until the design-builder has had a reasonable opportunity to understand the required design and construction approaches, and the site, subsurface, and other relevant conditions and constraints (physical and political) in which those approaches will materialize[15].

III. Progressive Design-Build

Progressive DB ("PDB") is a significant step in the right direction to correct some of these root causes and resultant problems in conventional DB PIPs. PDB has the attribute of early contractor involvement in the design development process[16]. Early contractor involvement in PDB provides meaningful and significant opportunities to achieve risk allocation balance. Meaningful involvement, interaction and collaboration among the design-builder in PDB, and the owner, on DB PIPs should serve to improve their mutual understandings and transparencies of risk perceptions, and positively influence pricing and contingency realism and balanced risk allocation. Pricing, contingency, and contractual risk allocation should also be better informed by that interaction and collaboration[17].

PDB generally involves a process in which contractual commitments as to fixed cost and risk allocation terms are deferred by the owner and design-builder until at least approximately sixty percent of design development has been achieved[18]. PDB and other related procurement and contractual approaches that defer price and other contractual commitments until design has been significantly developed have been embraced and increasingly utilized outside the U.S. These approaches are intended to address problems associated with fixed prices and imbalanced risk allocation in conventional DB[19]. The Metrolinx and Infrastructure Ontario project sponsors for the multi-billion dollar GO Rail Expansion program (Greater Toronto and Hamilton Region) have recently executed a contract based on the PDB approach. Under that approach, the project sponsors and private sector team will collaboratively participate in a two-year collaborative process to progress design development prior to finalization of scope, risk allocation, price, and schedule for the project[20].

IV. PSPL Insurance Solutions on DB PIPs

There are equally serious and acute problems relating to the continued availability of PSPL Insurance – consequent to the fixed price and imbalanced risk allocation root causes – that need to be urgently addressed. Perhaps even more significantly and concerning, the unavailability or limited available capacity of PSPL will necessarily result in a more dominant and front-line reliance of consult-

ing engineers on their practice (or corporate, standard) professional liability insurance to address professional liability risk, and to defend and indemnify design-builder claims on a primary and more direct, imminent and heightened excess exposure basis[21]. Thus, diminished availability, or non-availability of PSPL insurance will have a cascading effect on practice professional liability insurers, predictably resulting in higher deductibles, higher premiums, and, probably, lower available coverage limits and potential "DB" exclusions in practice insurance.

The unavailability of PSPL and the limited capacity and available coverage amounts offered by the PSPL insurers will result in the need for design-builders and their consulting engineers to intensify requirements for contractual limits of liability (in significantly lower amounts than customarily and conventionally considered acceptable) and other contractual risk allocation protective terms.

Reliance upon practice, or regular corporate, professional liability insurance policies as a "substitute" for PSPL is not prudent and such reliance may well produce a cascading effect of withdrawal or significant reductions in the availability and capacity of the practice professional liability insurance market to provide adequate coverage for consulting engineers involved in PIPs[22].

The effective and long-term solution to these problems, conjunctively and essentially, depends upon correction of the underlying procurement and contractual root causes and the implementation of improved, correlative underwriting practices. Guidelines to improve the balancing of risk allocation in DB (and P3) projects should be developed that adequately, realistically, and equitably account for the clearly defined respective roles and responsibilities of the owner, design-builder, and consulting engineer[23]. Those guidelines may provide the foundation for enhanced underwriting of PSPL coverage. There is constructive and encouraging precedent for the development and implementation of improved and balanced risk allocation in procurement and contractual practices as a predicate and foundation mechanism to address serious reservations and withdrawals in insurance capacity on subsurface projects. That precedent resulted from a collaborative effort among owners, contractors, consulting engineers, and insurers, culminating in the promulgation of A Code of Tunnel Practice for Risk Management of Tunnel Works[24].

A similar constructive and collaborative effort should be undertaken to address the fixed price and imbalanced risk allocation issues – and consequent professional liability insurance market withdrawals and reduced capacity issues – in DB PIPs.

PSPL insurance is essential to effective and efficient risk allocation and risk management on DB PIP projects. The continued availability of PSPL insurance, with reasonably appropriate coverage terms and limits, is currently in peril and distress. Once predicate and foundational corrections occur relative to the root causes, a holistic, recalibrated solution that embraces realistic and improved approaches to underwriting of PSPL insurance should be promptly implemented by the PSPL professional liability insurance market.

Conclusion

The effective analysis and balanced resolution of these concerns requires candid, realistic, and diligent discussion among all relevant stakeholders, with potentially divergent interests. There should be a common and mutual interest in realizing an industry (owners, contractors, design professionals, insurers, and surety companies –) that can succeed and thrive as they all work together to deliver important public projects. The financial losses of contractors, and their withdrawal from the DB PIP market, as well as the current lack of capacity and the escalating cost of the limited PSPL coverage available, cumulatively represent a crisis as well as an alarm that the current DB approach being employed by owners on PIPs is neither working nor sustainable, nor in the best short-or long term interests of all parties. That approach, which favors owners at the expense of other parties, is neither fair nor sustainable and is destined to negatively impact the future success and promise of the DB delivery method on PIPs and the financial well-being of private sector project participants. The discussion needs to commence in earnest and progress diligently.

There are several issues to discuss and, undoubtedly, different perspectives among relevant stakeholders on those issues.

Some owners may perceive the progressive DB approach - of deferring contractual commitments as to final pricing and risk allocation terms until a point after initial contract award - as exposing them to either increased project costs or cost overrun exposures, or risk allocation terms that are less favorable than what they have achieved and are achieving presently in DB infrastructure projects. Also, some owners may contend that fixed price and aggressive risk trans-

fer approaches in conventional and prevailing DB procurement and contractual approaches have worked well for them; and, at least to this point, there is no discernable or compelling reason for any modification in those approaches.

The question is whether these or related perceptions and contentions are sound, fair, sensible, or even sustainable in the long term, as evidenced by the recent and likely continued withdrawal of major contractors, consulting engineers, and their professional liability insurers from DB PIPs due to the procurement and contractual fixed price and associated imbalanced risk allocation terms.

There is a compelling and present need to reassess the fixed price and imbalanced risk allocation approaches prevailing in many DB PIP procurements. These concerns are all the more intensified as infrastructure projects become even more complex, procurement periods even more contracted, and the need for such projects even more demanding.

The experience of the past amply demonstrates the advisability of balanced risk allocation; and the promise of success in the future for the design and construction industry vitally depends upon it. Disregarding or minimizing the longer-term significance of specific contractor, consulting engineer, and professional liability insurer withdrawal from the DB arena is not reflective of a sound or a prudent owner programmatic approach. The underwriting of PSPL insurance on DB PIPs was never conceived or intended to substitute or worse, compensate or indemnify, for claims derived from primarily commercial risks associated with inherent project costs due to design deficiencies (or otherwise) unrelated to standard of care departures and motivated by either aggressive and unrealistic bid pricing and inadequate contingencies, or imprudent and imbalanced risk allocation between owners and design-builders[25].

Equally important are the corollary problems for all project participants stemming from professional liability insurers' increasing (temporary or permanent) withdrawal from offering adequate, or any, PSPL coverage on DB (and P3) infrastructure projects. This trend is genuinely and seriously concerning and in desperate need of an immediate solution.

It is time – beyond time – for DB delivery in the public infrastructure context to be recalibrated and improved.

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Endnotes

[1] For discussion of megaprojects and professional liability risk, see D.J. Hatem & D. Corkum eds., *Megaprojects: Challenges and Recommended Practices*, Chapter 18 (ACEC 2010); and D.J. Hatem & P. Gary eds., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Ch. 12, ¶12.5 Washington: American Council of Engineering Companies (3d ed., 2020); D.J. Hatem, Megaprojects: Professional Liability Risk and Project-Specific Professional Liability Insurance, ABA Forum on the Construction Industry, (American Bar Association, 2012).

[2] See T. Schleifer, S*eeking A Fix to the Fixed-Price Conundrum*, ENG. NEWS-REC. (Nov. 18, 2019); T. Schleifer, Commentary, *Contractors and Design-Build: Let's End Risk-Shift Madness*, ENG. NEWS REC. (March 2/9, 2020); Jamie Peterson, *What is Wrong with Design-Build Contracting,* Under Constr. (Winter 2019); Constr. Super Conf. (December 16-18). Some of the concerning implications for consulting engineers of this development are discussed in D.J. Hatem, *Letter to the Editor*, published in ENG. NEWS-REC. (December 16, 2019).

[3] See *Study Finds Design-Builder Profit Shortfall on Big Infrastructure Projects*, ENG. NEWS. REC. (August 24, 2021) The findings reported in Travelers Study are confirmed in other studies. See. Sharkey,J., Greenham, P., et al *The Health of the Australian Construction Industry University of Melbourne* (September, 2020); Ryan, P., Duffield, C.F, Contract Performance on Megaprojects- Avoiding the Pitfalls (15th Engineering Project Organization Conference June 5th- 7th 2017); Terrill, M., Emslie, O., and Fox, L. *Megabang for Megabucks: Driving a harder bargain on megaprojects*. Grattan Institute. (2021).

[4] For an excellent article discussing issues and concerns in the use of design-build for urban subsurface projects, see R. Drake, W. Hansmire, Getting Metro Owners the Best Value from Their Major Underground Projects, 2020 Proceedings, North American Tunneling, Society for Mining, Metallurgy and Exploration, PP. 256 – 262 (raising issues as to concerns as to use of DB on urban subsurface projects, such as limitations in use of performance specifications; and the premium cost to the owner of transferring substantial design, and construction and subsurface conditions risk to the design-builder).

[5] D.J. Hatem & P. Gary, ed., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Chapter 12, Washington: American Council of Engineering Companies (3d ed., 2020); D.J. Hatem, *Improving Risk Allocation on Design-Build Subsurface Projects*, TUNNEL. BUSINESS. MAGAZINE., (June 2020)

[6] This Paper will focus on Consulting Engineers who serve as subconsultants to Contractor-led Design-Build. There are independent, but important and generally less elevated, professional liability concerns for Design Professionals who are under contract with the Project Owner for limited preliminary, conceptual or bridging design on DB/P3 projects. See D.J. Hatem and P. Gary, eds., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers* Ch. 12, ¶12.4.4, Washington: American Council of Engineering Companies (3d ed., 2020).

[7] See D.J. Hatem & P. Gary, ed., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Chapter 12, $12.4, Risk Allocation and Professional Liability Issues for Consulting Engineers on P3 and DB Projects, Washington: American Council of Engineering Companies (3d ed., 2020).

[8] The professional standard of care has been articulated by the Supreme Judicial Court in Klein v. Catalano, 386 Mass. 701, 718 (1982). "As a general rule, '[a]n architect's efficiency in preparing plans and specifications is tested by the rule of ordinary and reasonable skill usually exercised by one of that profession . . . [I]n the absence of a special agreement he does not imply or guaranty a perfect plan or satisfactory result. . . .' Architects, doctors, engineers, attorneys and others deal in somewhat inexact sciences and are continually called upon to exercise their skilled judgment in order to anticipate and provide for random factors which are incapable of precise measurement. The indeterminable nature of these factors makes it impossible for professional service people to gauge them with complete accuracy in every instance. . . . Because of the inescapable possibility of error which inheres in these services, the law has traditionally required, not perfect results, but rather the exercise of that skill and judgment which can be reasonably expected from similarly situated professionals."

This standard may be heightened by contractual terms or warranties elevating the performance standard to perfection or near-perfection.

[9] Many design-builder professional liability claims involving proposal phase services of the consulting engineer arise out of apparent misunderstandings as to the purpose, expectations, and scope of the consulting engineer's conceptual/preliminary design deliverables and the Technical Proposal. Is the consulting engineer's proposal phase design intended to:

01. Demonstrate an understanding of the owner's technical and Project Agreement requirements ("Project Requirements")?

02. Demonstrate to the owner the ability of the DB Team to produce, if awarded the DB Contract, a design capable of achieving in the final design for construction the Owner's Project Requirements?

03. Provide the design-builder with a reliable basis to realistically estimate the price of delivering a final design and construction compliant with the owner's project requirements?

04. Produce a level of design detail suitable for final design development and to adequately inform construction methodologies?

05. Develop a preliminary level of design development that following award can be progressed on a "straight-line" basis to detail a final design consistent with that preliminary design?

Most consulting engineers agree with (1) and (2), but take serious exception to (3), (4) and (5) as expressions of realistic or reasonable expectations in typical DB procurements. That said, contractual terms may be relevant in assessing those expectations. Also, while contract terms may provide part of the explanation, often actual conduct and communications of the parties during the proposal phase contradict contractual scope boundaries, or other limited obligations, and influence expectations and/or create ambiguities as to these points, thereby complicating dispute resolution. The parties should develop clear boundaries, parameters and basis of bid/design documents and risk matrices, all intended to mitigate these misunderstandings.

[10] See D.J. Hatem & D. Corkum eds., *Megaprojects: Challenges and Recommended Practices*, Chapter 18 (ACEC 2010); and D.J. Hatem & P. Gary eds., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Ch. 12, ¶12.6 Washington: American Council of Engineering Companies (3d ed., 2020); D.J. Hatem, Megaprojects: Professional Liability Risk and Project-Specific Professional Liability Insurance, ABA Forum on the Construction Industry, (American Bar Association, 2012).

[11] The causes, impacts and implications of withdrawal in PSPL capacity on PIPs is addressed in detail in D.J. Hatem, PC, *Project-Specific Professional Liability Insurance on Design-Build and Public-Private Partnership Projects in North America: A Path Forward* (Donovan Hatem LLP, May 3, 2022).

[12] Owner preferences, unwarranted intrusion/interference, opaque contractual interim design submittal processes and procedures, and delays in the design review process, create disputes between owners and design-builders that eventually lead to consequent design-builder professional liability claims

mis-directed at Design Professionals. These types of impacts should be compensated by the Owner through contract modifications.

13 See note 1 supra.

14 See 3 *Bruner & O'Connor on Construction Law* ¶9.8.2; Penzel Construction Co., Inc. v. Jackson R-2 School District, 544 S.W. 3d 214, 228 (Mo. Ct. App. 2017); D.J. Hatem & P. Gary, ed., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Chapter 12, $12.4.2, Washington: American Council of Engineering Companies (3d ed., 2020).

15 As to subsurface conditions risk, in particular see D.J. Hatem & P. Gary, ed., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Chapter 12, $12.3.2, Washington: American Council of Engineering Companies (3d ed., 2020); D.J. Hatem, *Improving Risk Allocation on Design-Build Subsurface Projects*, TUNNEL. BUSINESS. MAGAZINE, (June 2020); A. Stephenson, N. Suhadolnik, "*Getting Risk Right" Risk Allocation for Ground Conditions in Major Subsurface Projects*, 39 THE INT. CONS. L.R.,. (2022).

16 See Progressive Design-Build Agreement, DBIA Document No. 544 (2019). There are several excellent sources that discuss the utilization of PDB and CM/GC generally, see M.C. Loulakis, *A Look at Progressive Design-Build in the Water Sector* (June 4, 2013); J. T. Folden, C*onstruction Management at Risk and Progressive Design-Build*, Maryland Dept. of Trans; D.D. Gransberg and K. Molenaar, *Critical Comparison of Progressive Design-Build and Construction Manager/General Contractor Project Delivery Methods*, Trans. Res. Rec. (2019); J. Reilly & R.A. Sage, *Benefits and Challenges of Implementing Construction Manager/General Contractor Project Delivery: The View From the Field*, Chapter 3; *Alternative Procurement & Contracting for Megaprojects*; and D.D..Gransberg & K.R. Molenaar, *Critical Comparison of Progressive Design-Build and Construction Manager/General Contractor Project Delivery Methods*, Trans. Res. Rec. (2019); A. Cho, *Transportation World Eyes Benefits of Progressive Design-Build*, ENG. NEWS. REC., (April 11, 2022). PDB is a form of collaborative project delivery. Other forms include alliancing and integrated project delivery. See D.A. de Groot, H.W. Ashcraft, G. Jacobson & J. Potter-Davey, *Collaborative Contracting in Construction: Curing What Ails Us?* (SCL-NA Inaugural Conference, 2022).

Other sources more particularly focus on the application and advantages of PDB in the specific context of tunneling and other major subsurface projects. See I.G. Castro-Nova, G.M. Gad & D.D. Gransberg, *Assessment of State Agencies' Practices in Managing Geotechnical Risk in Design-Build Projects*, TRANS. RES. REC. (2017); R. Gould, J. Murray & D. Elbin, *Benefits and Challenges of Progressive Design-Build Procurement – Atlanta Plane Train Project*, North American Tunneling 2022 Proceedings, pp. 209-218; C. del Puerto, D. Gransberg, M. Loulakis, *Contractual Approaches to Address Geotechnical Uncertainty in Design-Build Public Transportation Projects*, J. LEG. AFF. DISPUTE RESOLUT. ENG. CONSTR. 2017.9(i), ASCE; Transportation Research Board, *Guidelines for Managing Geotechnical Risks in Design-Build Projects*, NCHRP Research Report. 884 (September, 2018); R, Essex, D. Hatem, J. Reilly,. Alternative Delivery Drives Alternative Risk Allocation Methods (North American Tunneling Conference, Washington, D.C., 24-27 June, 2018); D.J. Hatem, *Subsurface Conditions and Design Adequacy Risk Allocation in Design Build: Dynamics, Interactions and Interdependencies*, TUNNEL BUSINESS MAGAZINE, October 2018; D.J. Hatem, *Rethinking and Recalibrating Design-Build*, DEC. 2020 DES. AND CONS. MNG. REP.; Donovan Hatem LLP; D.J. Hatem, Design-Build: Recalibrating Procurement and Contractual Approaches, (George A. Fox Conference, May 10, 2022); I.G. Castro-Nova, *Geotechnical Risk Decision Tools for Alternative Project Delivery Method Selection*, Iowa St. U. (2016).; D.D. Gransberg & B. Cetin, *Subsurface Risk Management Tools for Alternative Project Delivery*, (ASCE Geo-Congress, 2020); *I-70 Twin Tunnels Risk Assessment and Project Delivery Selection*, Colorado Dep't of Trans. Innovative Contracting Advisory Committee,(2011); M. Fowler, M. Keleman, C. Fischer, M. Hogan & S. Kim, *I-70 Twin Tunnels Widening Using Drill and Blast Under CM/GC Contract*, SOC'Y FOR MINING, METALLURGY AND EXPLORATION INC (2015); J. O'Carroll, A. Thompson & T. Kwialkowski, *A Study in the Use of Design-Build for Tunnel Projects*; S.V. Stockhausen, E. L.D. Sibley and D. Penrice, *Progressive Design-Build – Is it Coming to a Project Near You?*; D. Pelletier, J. Willhite, A. Thompson, B. DiFiore, J. Wallace, CM/GC Delivery Method For Federally-Procured Projects: A Case Study on the Independent Cost Estimating Process, SOC'Y FOR MINING, METALLURGY & EXPLORATION, 2020 Proceedings, North American Tunneling, pp. 249-255; N. Sokol, M. Jaeger, J. Sucilsky, *Progressive Design-Build in Silicon Valley*, Society for Mining, Metallurgy & Exploration, 2020 Proceedings, North American Tunneling, pp. 273-281.

17 It is generally recognized that the advantages of PDB particularly on subsurface infrastructure projects, include the ability of the owner team and DB or contractor Team to be better informed and aligned as to both perceptions and realities of critical risk variables and contingencies – such as those involving evaluation of subsurface conditions and assessments as to final design feasibility and approach – prior to reaching contractual commitments on price and risk allocation terms. See D.J. Hatem, *Improving Risk Allocation on Design-Build Subsurface Projects*, TUNNEL BUSINESS MAGAZINE, June. 2020; C.B. Farnsworth, R.O. Warr, J.E. Weidman, & D. M. Hutchings, *Effects of CM/GC Project Delivery on Managing Process Risk in Transportation Construction*, J. CONSTR. ENG. MANAGE. (2016); D.Q. Tran & K.R. Molenaar, *Risk-Based Project Delivery Selection Model for Highway Design and Construction*, J. CONSTR. ENG. MANAGE. (2015); I.G. Castro-Nova, G.M. Gad, A. Touran, B. Cetin and D.D. Gransberg, *Evaluating the Influence of Differing Geotechnical Risk Perceptions on Design-Build Highway Projects*, 4 ASCE-ASME J. of Risk and Uncertainty in Eng. Systems. (2018); D.D. Gransberg, *Construction Manager – General Contractor Project Delivery*, TR NEWS 285, March-April 2013, at 10; N. Munfah, *Controlling Tunneling Project Risk Implemented by Alternative Delivery*, TUNNELING ONLINE.COM, (Oct. 17, 2019), https://tunnelingonline.com/controlling-tunneling-project-risk-implemented-by-alternative-delivery/; S. R. Kramer, *Using Alternative Delivery Methods to Increase Competitiveness on Tunnel Projects* (August 14, 2017); Nat'l Cooperative Highway Res. Program, Guide for Design Management on Design-Build and Construction Manager/General Contractor Projects (787. 2016); Nat'l Cooperative Highway Res. Program, National Cooperative of Highway Research Program Synthesis 429 *Geotechnical Information Practices in Design-Build Projects*,(2016); NCHRP, NCHRP Res. Rep. 884 Guidelines for Managing Geotechnical Risks in Design-Build Projects,(2019); and S. Briglia & M.C. Loulakis, G*eotechnical Risk Allocation on Design-Build Construction Projects: The Apple Doesn't Fall Far From the Tree*, 11 J. OF THE AMERICAN COLLEGE OF CONSTR. LAWYERS, (Sept. 2017); D. Mast, P. Nicholas, Alternative Delivery For Tunnels, TUNNEL BUSINESS MAGAZINE, December 2020, at 16.

There are other approaches to defer final price and risk allocation commitments in DB until the design-builder has had adequate time to evaluate relevant project factors and conditions. The Virginia DOT "scope validation" approach relating to the pricing and risk for subsurface conditions work, is noteworthy in this regard. Under that approach, the design-builder has a period of time following a limited notice to proceed within which to validate its pricing and risk assessments as to subsurface conditions prior to making final contractual commitments. See AASHTO Guide for Design-Build Procurement, p. 33 (2008); Guidelines for Managing Geotechnical Risks in Design-Build Projects, National Academies Press, Appendix C. p. 8 (2018); D.J. Hatem & P. Gary eds., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers,* Ch. 12, ¶12.2.3, p. 460, Washington: American Council of Engineering Companies (3d ed., 2020). For an excellent discussion of contractual and procurement approaches to managing risk or major subsurface projects, see M. Loulakis & D. Gransberg, *Managing the Risk of Subsurface Conditions*, NATIONAL ACADEMY OF CONSTRUCTION, February 22, 2022.

18 See D. J. Hatem, *Improving Risk Allocation on Design-Build Subsurface Projects*, TUNNEL BUSINESS MAGAZINE, June 2020; D.J. Hatem, *Rethinking and Recalibrating Design-Build*, DESIGN AND CONSTRUCTION MANAGEMENT REPORTER (Donovan Hatem LLP, December 2020). PDB is gaining acceptance in certain infrastructure projects. A. Cho, *Transportation World Eyes Benefits of Progressive Design-Build*, ENGINEERING NEWS RECORD (4-11-22).

19 See e.g., Tom Rousakis, Erin Roberts, Andre Koncewicz, *Collaborative Contracting in North America Infrastructure*, Ernst & Young Global Limited, Jun. 17,2021,https://www.ey.com/en_us/strategy-transactions/collaborative-contracting-can-help-infrastructure-projects ; V. Bortsova, *Centrality of Price*

in New Zealand Procurement: Time for Change, SOCY. OF CONS. LAW N Z. (2021); T. Richards, H. Bolland, B. Bradstreet, Buildability Risk Allocation and Mitigation, (9th Int'l Society of Construction Law Conference, October 2021); J. Forsey, M. Weatherall, J. Kehoe, Perfect Procurement, (9th Int'l Society of Construction Law Conference, October 2021).

20 See *Partner Selected for GO Rail Expansion On-Corridor Works Project*, (April 19, 2022), https://www.infrastructureontario.ca/Partner-Selected-RER-GO-Regional-Express-Rail-Corridor/.

21 D.J. Hatem, *Changing Professional Liability Practice Insurers; Perils for Consulting Engineers Involved in Design-Build Projects*, DESIGN AND CONSTRUCTION MANAGEMENT PROFESSIONAL LIABILITY REPORTER (Donovan Hatem LLP,) (May 2019).

22 See D.J. Hatem, *Project-Specific Professional Liability Insurance on Design-Build and Public-Private Partnership Projects in North America: A Path Forward*, pp. 14-15, 24, Donovan Hatem LLP (May 3, 2022).

23 See D.J. Hatem & P. Gary, ed., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Chapter 12, $12.1.5, Risk Allocation and Professional Liability Issues for Consulting Engineers on P3 and DB Projects, Washington: American Council of Engineering Companies (3d ed., 2020). A third edition of the code will be published in the Fall of 2022.

24 The cause of, and potential solutions to, the PSPL crisis on DB PIPs is discussed in greater detail in D.J. Hatem, *Project-Specific Professional Liability Insurance on Design-Build and Public-Private Partnership Projects in North America: A Path Forward*, Donovan Hatem LLP (May 3, 2022). The Code is discussed in more detail in §12.6.2, pp. 670-71 (and accompanying footnote 389, pp. 672-74), in D.J. Hatem & P. Gary, ed., *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers*, Chapter 12, Washington: American Council of Engineering Companies (3d ed., 2020). For further discussion of the Code, see D.J. Hatem & D. Corkum, eds., *Megaprojects: Challenges and Recommended Practices* (American Council of Engineering Cos., 2010), ch. 18, ¶2.0, pp. 597-602. The availability of adequate insurance and surety capacities in P3 projects is essential to securing financing commitments of financiers and investors. The preceding sources discuss the critical importance of professional liability insurance capacity to comply with financier and investor insurance limits and other requirements. As to similar discussion relating to availability of adequate surety bonding capacity, see D. Mast, P. Nicholas, Alternative Delivery For Tunnels, TUNNEL BUSINESS MAGAZINE, December 2020. The potential applicability of a Code approach to addressing the current PSPL crisis in PIPs is discussed in D.J. Hatem, Project-Specific Professional Liability Insurance on Design-Build and Public-Private Partnership Projects in North America: A Path Forward, pp. 27-28 and Appendix C, for more detailed discussion (May 3, 2022).

25 Stated affirmatively, professional liability insurance is intended to provide coverage for claims and liabilities to the extent caused by breach of professional standard of care by the consulting engineer. The exposures resulting from design-builder's "cost overrun" claims in the accompanying text represent business or commercial risk beyond that coverage scope. See K. Collier, Solving the Quandary of Designer Quantity Risk in Alternative Project Delivery with Insurance, 22 UNDER CONSTRUCTION, AMERICAN BAR ASSOCIATION, CONSTRUCTION LAW FORUM (2020).