Liability Exposure and Indemnity for Architecture and Engineering Professionals Acting as Independent Consultants or Design Subcontractors

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Abstract: Given the multiple approaches currently used by owners for the procurement of construction projects, design professionals end up undertaking their design and other related services either as independent consultants appointed by owners or as subcontractors acting under design-builders. The objective of this paper is to investigate the types and extents of the professional liabilities inherent in assuming either of these two contrasting capacities for rendering the contracted deliverables. The research methodology included (a) investigating the various types of professional liabilities and their associated indemnity coverages that can be procured by designers or contractors, (b) reviewing industry-reported cases involving designers being sued under tort law, and (c) developing the construct under which the involved liabilities may be encountered. It is concluded that the risks of the designer being sued under tort law, which have for long been realized to otherwise exist whenever contractors can prove the foreseeable harm resulting from the negligence of owner-appointed designers, seem to continue to prevail when these designers act as design subcontractors under a design-build (DB) environment. This is also in relation to designers' negligence, but now pertaining to the duties they are expected to instead owe to owners. The findings also revealed that such risks may be of different magnitudes and may have varying likelihoods of being encountered owing to the various DB operational variations. **DOI: 10.1061/(ASCE)LA.1943-4170.0000306.**

Introduction

Under a project organizational structure in which design and construction services are undertaken as separate scopes by separate entities [e.g., design-bid-build (DBB) approach], the architecture and engineering (A/E) design consultant maintains a direct contract with the owner and assumes an independent role throughout the project. This system is traditionally known for the inherent quasi-adversarial relationship between the designer and the contractor. Alternatively, under other structures such as those where the design consultant is to operate directly under a design-build (DB) contractor, an engineering-procurement-construction (EPC) contractor, or a build-operate-transfer (BOT) concessionaire, the design consultant is no more in direct contact or contract with the owner and—as such—assumes a different role and status, a design subcontractor to the main contractor.

Owners opt for DB for the biggest advantage of dealing with a single source of responsibility for design and construction, the increased risk that the DB approach allows to be transferred to the design-builder, the opportunity to fast track the design-construction process, and the ability to take advantage of the contractor's construction expertise in the design phase. However, DB is characterized by an inherent culture clash; that is, while designers traditionally believe they must protect (1) owners from contractors cutting corners and overpricing changes, and (2) the integrity of their design rather than solving contractors' cost issues, contractors believe that designers overdesign everything and expect them to cover up design flaws (McGreevy et al. 2005). Contractors, when in control over the design process and the designers' compensation, are likely to influence them to exercise shortcuts in order to lower cost, instead of seeking value engineering design (McGreevy et al. 2005). Undoubtedly, DB does not change the fundamental role of the designer with respect to developing the design and preparing the construction documents. However, most other aspects of DB are likely to be different for the designer. The designer's lack of independence in a DB setup may create problems due to the potential pressure exercised by the builder on the A/E in order to focus on construction costs; this may downplay the owner's needs, materials quality, and long-term maintenance considerations (Brierley et al. 2010). On the one hand, the dynamics of the legal relationship between the design-builder and the A/E in the DB setting are observed to be far different than the dynamics of the relationship between owners and designers on traditional DBB projects (Staak 2012). On the other hand, it is argued that DB creates some unique challenges for the A/E; while some are consistent with those of the DBB approach, others differ and involve some practical challenges and associated impacts on its role, thereby affecting the level of assumed risks (Staak 2012).

Tort actions are third-party liability actions, related to malpractice, and are not as limited in scope as contract actions may be (Jensen and Land 1983). Singh (2003) views tort as harm and damages as harm that is measurable in monetary terms. In the context of construction projects, delays, contract changes, and

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Note. This manuscript was submitted on September 27, 2018; approved on January 29, 2019; published online on June 18, 2019. Discussion period open until November 18, 2019; separate discussions must be submitted for individual papers. This paper is part of the ***Journal of Legal Affairs and Dispute Resolution in Engineering and Construction***, © ASCE, ISSN 1943-4162.

defective performance can cause potential physical and/or economic harm to the owner, the contractor, or even to the users (Singh 2003). However, to prevail in tort, negligence must be proven to have occurred, and that it was the contributing cause of the loss or damage (Jensen and Land 1983; Bakos and Hake 1987; Day 1993; Singh and Sakamoto 2001; Caine and Thomas 2013).

Historically, courts started to abandon the privity requirement in the 1950s, thus holding A/Es liable to third parties. When coupled with the liability crisis in the mid-1980s, the exposure to professional liability became, and continues to be, a concern for A/E professionals, and it has since been addressed extensively (White 1959; Earley 1977; Jensen and Land 1983; Holland 1985; Bakos and Hake 1987; Horne 1990; Lunch 1990; Day 1993; Stein and Hiss 2003; Caine and Thomas 2013). For instance, the exposure of the A/E to intentional tort liability when assuming the role of a judge on disputes was addressed by Stein and Hiss (2003). Conversely, the exposure to unintentional tort liability in the A/E's role as a designer was later presented by Caine and Thomas (2013).

It becomes evident that A/E professionals are susceptible to different forms of professional liabilities, depending on the roles and responsibilities assumed by them in connection with the rendering of design and other related services. However, the relevant body of knowledge seems to be lacking work that can provide designers with a clear mapping of liability exposures stemming from the different services furnished by them under different capacities.

Research Scope and Methodology

A/E professionals can be held liable for issues adjudged to pertain to their rendered design services, irrespective of the adopted project organizational structure variation (Kalach et al. 2018). The objective of this paper is to investigate the types and extents of the professional liabilities inherent in the A/E assuming either of the two contrasting capacities, an independent consultant or a design subcontractor, for rendering the contracted deliverables. The adopted methodology involves a number of interrelated steps, as shown in Fig. 1.

The first step in this research involved a literature review that was undertaken in two stages. Because the research aimed at the generation of holistic perspectives and new frameworks that can help better understand and describe the liability exposure of A/E professionals under the previously mentioned capacities, an integrative approach was adopted for reviewing and synthesizing the representative literature that was encountered. To this end, Stage 1 of this research study consisted of a literature review on the various types of professional liabilities on a construction project along with the associated insurance coverages. This resulted in (a) identifying the different areas of liabilities that are carried by construction professionals according to the various assumed roles, and (b) highlighting the different elements of tort liability in contrast to contractual liabilities. In Stage 2, a thorough review of the relevant literature, complemented with a structured review of case

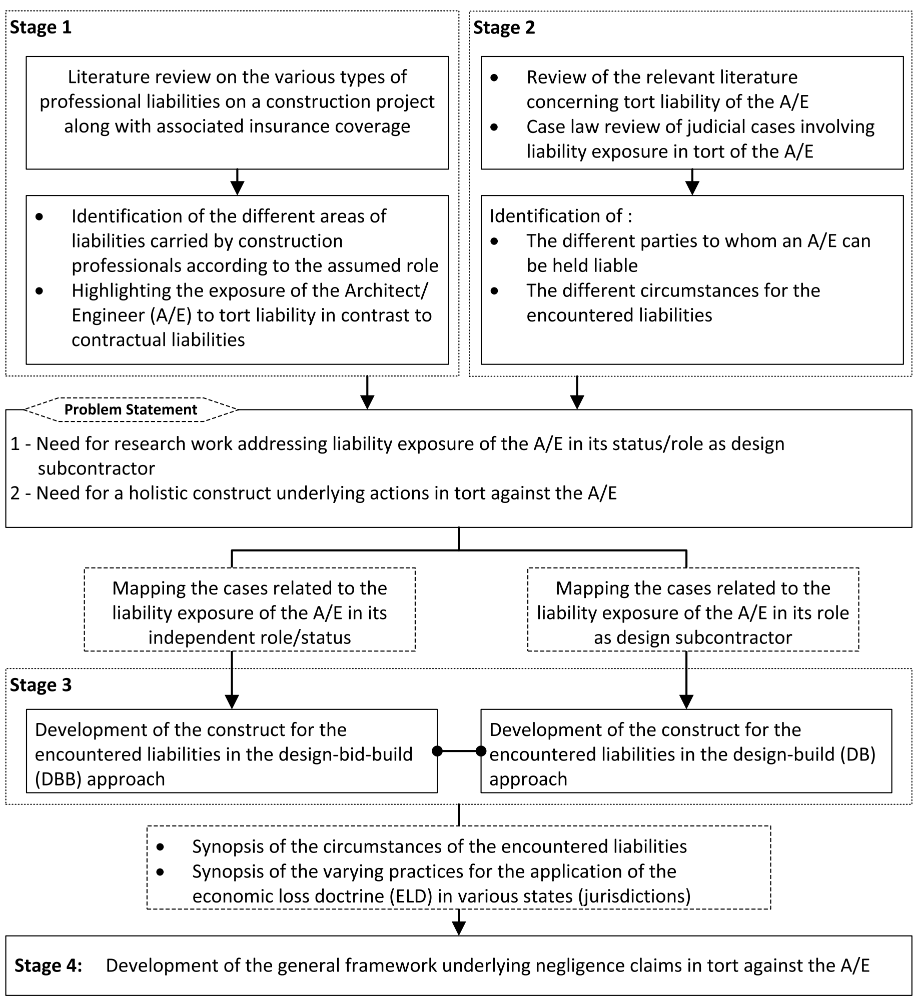

Fig. 1. Research methodology.

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law involving liability exposure in tort of A/E professionals, was carried out. While it was found that the recovery in tort for physical damages and injuries [i.e., bodily injuries (BIs) and property damage (PD)] is relatively straightforward, the recovery of economic damages (EDs) is subject to the application of the economic loss doctrine (ELD) and the varying practices in different jurisdictions. That is, Stage 2 resulted in the identification of (a) the different parties to whom an A/E can be held liable, and (b) the different circumstances for the encountered liabilities. Stages 1 and 2 triggered the need for (a) research work addressing tort liability exposure of the A/E in its status and role as a design subcontractor, and (b) a holistic construct underlying negligence claims in tort against the A/E. To this end, several cases that were found to touch on claims for ED were fully scrutinized and relied upon to serve the purpose of either (a) shedding light on the liability exposure of the A/E in its independent role or in its role as a design subcontractor, or (b) supporting a recognized exception to the application of the ELD. Consequently, at Stage 3 two constructs for the encountered liabilities were developed: one mapping the cases for the DBB setting and one mapping the cases for the DB setting. Finally, as informed by a synopsis of the circumstances of the encountered liabilities, along with the varying practices for the application of the ELD that may be adopted by the various states (jurisdictions), a general framework underlying negligence claims against the A/E was accordingly presented (Stage 4). Depending on the type of damages suffered and the possible identity of the claimant (in the case of ED), which varies according to the project delivery method in place (i.e., DBB or DB), the framework encompasses the different deduced constructs reflecting the different paths and possibilities for a negligence claim against the A/E to prevail or fail.

Professional Liabilities Carried by Design and Construction Professionals

Professional liabilities arise from errors and omissions in providing professional services. However, when these actions or inactions

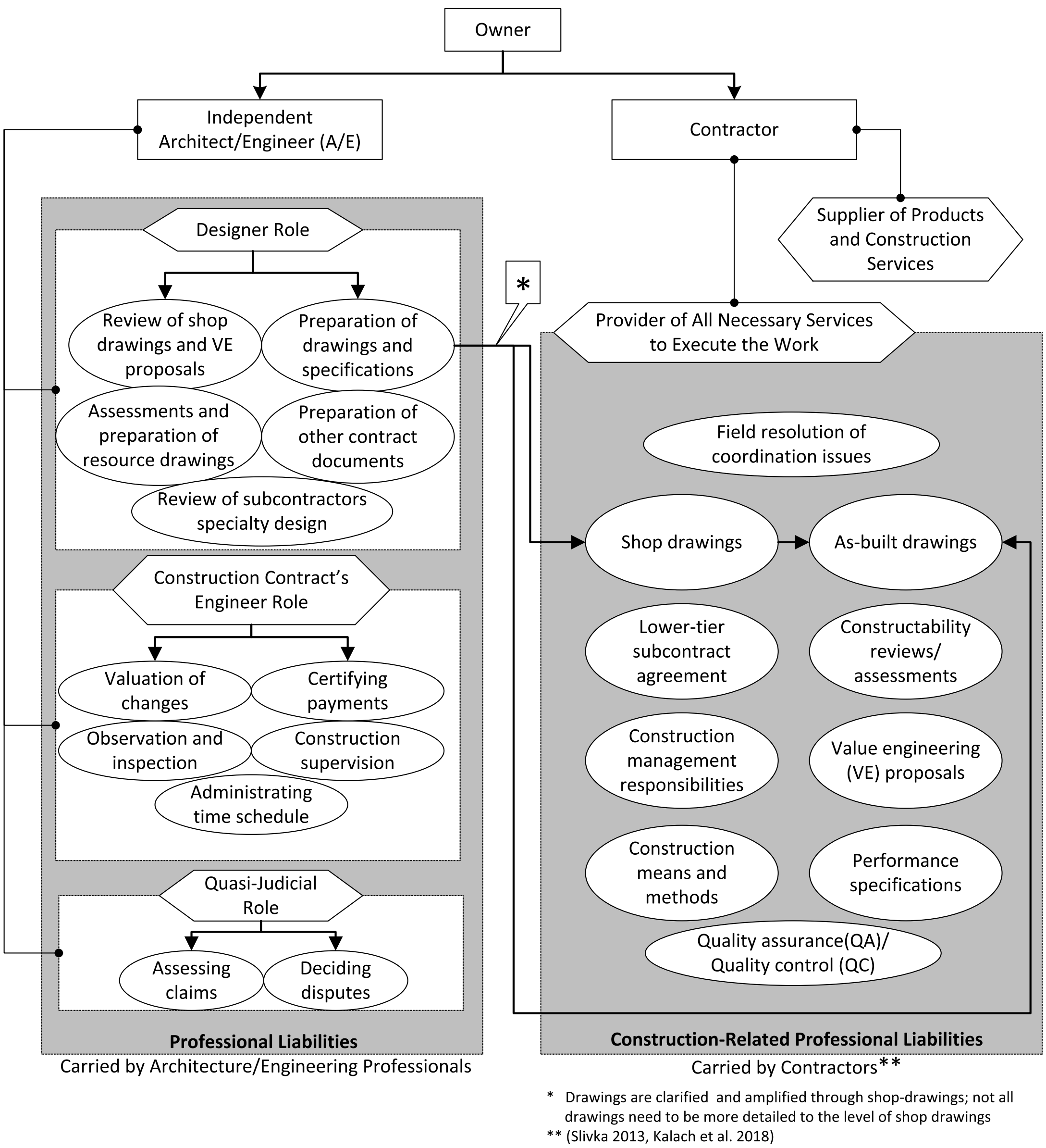

Fig. 2. Professional liabilities carried by construction professionals in the DBB setting.

occur, they do not always constitute negligence. Negligence is as such defined as the "failure, through a preventable error or omission, to practice within the prevailing standard of care" (ASCE Committee on Professional Practice 2004). In other words, it is the failure to meet the level of skill and care ordinarily achieved by members of the same profession and in similar circumstances (ASCE Committee on Professional Practice 2004). In the context of construction projects, A/E professionals, as well as contractors, can be exposed to risks in relation to the different services they provide, as shown in Fig. 2. For instance, A/E professionals acting as independent consultants are traditionally in charge of (a) preparing drawings and specifications in their role as designers, (b) administrating the construction contract and providing technical supervision for the construction work in their role as the construction contract's engineer, and (c) assessing claims and/or deciding on disputes when exercising such quasi-judicial roles.

Alternatively, contractors are required to perform all necessary preparatory steps that may be required for the proper execution of the work [e.g., field resolution of coordination issues, construction means and methods (CMM)] in addition to supplying products and construction services. Therefore, they are exposed to risks from construction-related professional services (Slivka 2013; Kalach et al. 2018). On the one hand, construction-related professional risks are overshadowed by the design risks, although the former risks may impact the project extremely (Slivka 2013). On the other hand, it is argued that the degree of exposure to any of this combined collection of risks varies depending on the delivery approach used, which defines the scope of each party's services and the corresponding degree of liability exposure (Slivka 2013; Kalach et al. 2018). Therefore, the following section discusses the implications on liabilities due to the changing role of the designer from being an independent consultant in the DBB approach to a design subcontractor in the DB delivery approach.

Design Professional Status or Role: Implications on Liabilities

The level of responsibility for carrying out design services and the liability exposure associated with it may differ depending on the project delivery method. For instance, when addressing the construction safety concept in their designs, A/E professionals may have an increased liability exposure to injured workers (Gambatese 1998; Behm 2005). Designers, under a DBB setting, are generally not responsible for construction safety, and as such construction contracts clearly place the burden of such responsibilities on the contractor (Gambatese 1998; Behm 2005). However, it is argued that under the DB approach, this concept may gain momentum (Behm 2005). Moreover, Brierley et al. (2010) discusses the dramatic impact on the nature and emphasis of the design professional's service effort resulting from the identity change of the client (contractor rather than owner) in a DB setting. That is, designers may have to (a) accept interaction from the contractor's side during the development of the design, (b) be involved in constructability reviews and analyses of CMM, and (c) eliminate defensive detailing due to pressure exercised by the design-builder in order to meet deadlines. That is, a design subcontractor in a DB setting could be assigned to carry out, or assist in carrying out, any of the aforesaid construction-related professional services on behalf of the lead design-builder, as illustrated in Fig. 3. As design subcontractors, their duties to the builder are manifested through (a) their involvement in the DB proposals (Staak 2012), (b) the usual preparation of drawings and specifications, and (c) the review of other subcontractors' designs due to delegating design to specialty subcontractors (Brierley et al. 2010). Designing for construction safety is shown as a dotted oval in order to indicate that this service is not typically undertaken; however, it may well be required. That is, as design subcontractors, A/E professionals may have a greater—and sometimes different—scope of responsibilities compared to those on a

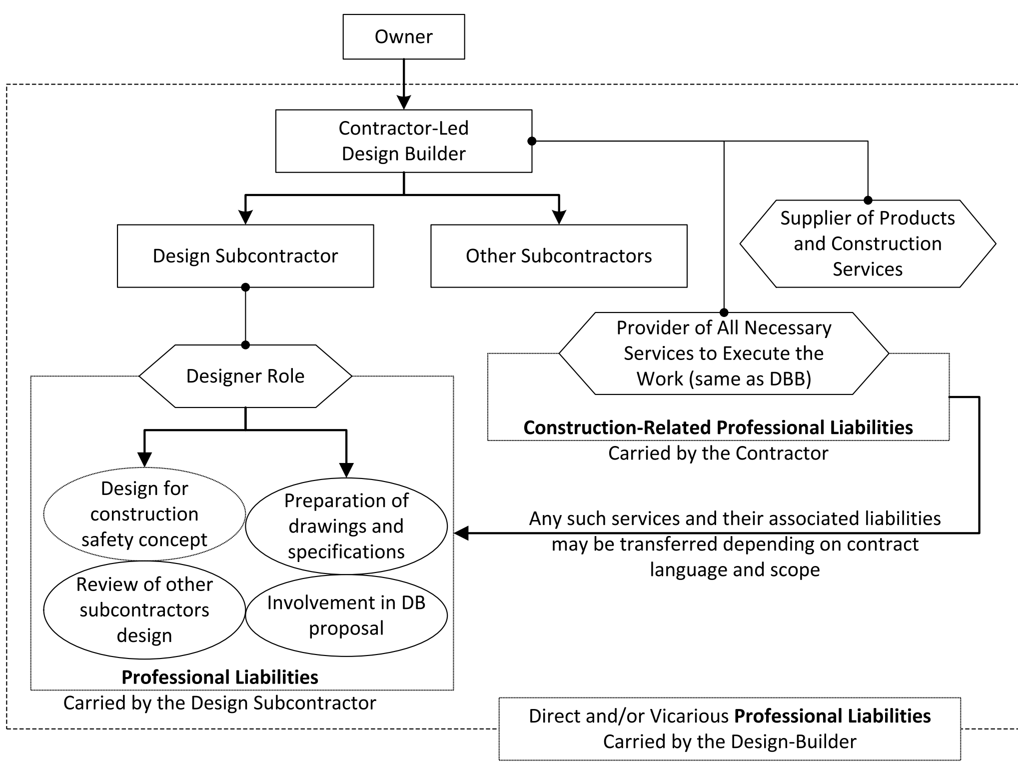

Fig. 3. Professional liabilities carried by construction professionals in the DB setting.

traditional project, a situation that may lead to an increased liability exposure (Brierley et al. 2010; Stipanowich 2015).

Furthermore, the design-builder who is the ultimate carrier of risks through the prime design-build agreement carries direct and/or vicarious liability for the performed professional services (i.e., liability for professional services performed by or on behalf of the design-builder). To this end, limitations of liability as well as indemnification contract clauses are used by the project participants as part of a risk-allocation strategy (Ittmann et al. 2013; Aiken et al. 2018). Yet, Hutchens (1992) argues that such clauses are often not carefully constructed to meet the legal definition of clear and unequivocal, and therefore professional malpractice risk reduction is not achieved. Moreover, where it is possible to draft limitation of liability clauses that apply to tort claims in addition to contract claims, such clauses do not apply to tort lawsuits brought by third parties. Therefore, the A/E's best defense against such lawsuits is to have comprehensive insurance coverage. Nevertheless, it is argued that such a protection is not really a defense at all; rather, it only represents a good business practice (Ittmann et al. 2013).

Professional Liability Indemnity

Professional liability indemnity (PLI) is a means for providing protection against claims for errors and omissions (E&O) in providing professional services. By involving the insurance company early in the process, potential claims can be settled quickly at much less cost than defending a formal claim in courts (Horne 1990). These errors and omissions may result in third-party BI and/or PD as well as EDs, such as costly time delays, budget overruns, and rework (Muse 2000; Taylor 2012). While claims for BI and/or PD may well be encountered, EDs are reported to be the most common losses giving rise to professional liability claims against A/E professionals working on construction projects (Taylor 2012). Alternative project delivery systems, including DB, blur the lines of responsibilities between design and construction. However, the design consultant, regardless of which project organizational structure variation is adopted, is liable for its rendered design services (Kalach et al. 2018). Kalach et al. (2018) investigated the different types of insurance policies that can be procured for indemnifying against professional liabilities in construction projects and identified the different possible options for risk mitigation. For instance, the designer's practice professional liability indemnity (DPPLI) and the contractor's professional liability (CPrL) policy are among many other identified types of PLI focusing on the project's design and engineering risks. On the other hand, it is customary that contractors seek commercial general liability (CGL) coverage. However, such CGL policies are occurrence based and do not cover damages stemming from the failure to render professionally related services. In contrast, the PLI-type policies are claim-made policies and cover EDs in addition to BI and PD arising from negligent design errors and omissions (Kalach et al. 2018).

Liability Exposure of A/E Professionals in Contract and in Tort

Through the terms of the contract, liabilities can be created, allocated, mitigated, or avoided (Schinnerer n.d.). Similarly, the parties use such terms to allocate their rights and responsibilities as well as their risks and rewards. Likewise, contracts help resolve claims and disputes if, and when, they occur. On the other hand, design professionals are also concerned with tort law issues that can be categorized into two types: (a) unintentional tort (i.e., negligence), and (b) intentional tort (i.e., intentional misrepresentation, defamation, and intentional interference with contractual or business relationships) (Schinnerer n.d.).

Moreover, where the parties to the contract are known and their duties agreed upon between them, in tort duties are then "imposed by law" (*Maudlin v. Sheffer*). As such, design professionals can be held liable under tort law to "anyone to whom they owed a duty to act with reasonable professional skill and care" (Schinnerer n.d.). The latter duties are either "imposed by a valid statutory enactment of the legislature or … imposed by a recognized common law principle declared in the reported decisions of the appellate courts of the State or jurisdiction involved" (*Maudlin v. Sheffer*). To have a viable negligence claim against the A/E, four elements must be proved: (a) the existence of a legal duty owed to the claimant, (b) the breach of that duty, (c) the proximate cause satisfied, and (d) the availability of actual damages suffered (Caine and Thomas 2013). Alternatively, to assert a breach of contract claim, the plaintiff must (a) establish that it was in direct privity with the design professional who failed to perform according to the contract (without having a legal excuse for doing so), or (b) be a third-party beneficiary under the contract (Hale n.d.; Holub n.d.; Caplicki 2006). The latter is when one who is not a party to the contract proves that the contract was made for their sole benefit and therefore becomes entitled to sue for a breach of contract (Hale n.d.; Holub n.d.). For example, a project's owner may require being named as a third-party beneficiary in the A/E's contracts with engineering subconsultants in a DBB project or in an A/E's contract with the design-builder on a DB project (Holub n.d.).

While parties to the contract have a legal venue to sue the A/E under a breach of contract claim, the A/E's performance of the contract is generally dominated by the standard of care. However, the general rule to differentiate between actions in contract and actions in tort is as stated in *Maudlin v. Sheffer*:

> Generally, a mere breach of a valid contract amounting to no more than a failure to perform in accordance with its terms does not constitute a tort or authorize the aggrieved party to elect whether he will proceed [in contract or in tort] …. Accordingly, under the foregoing authorities, if there is no liability except that arising out of a breach of the express terms of the contract, the action must be in contract, and an action in tort cannot be maintained …. Thus, if a contract imposes a legal duty upon a party thereto, which duty exists apart from the specific obligation of the contract, the neglect of that duty is a tort founded upon a contract …. In such a case the liability arises out of the breach of duty incident to and created by the contract, but is only dependent upon the contract to the extent necessary to raise the duty …. So, it is well settled, under the foregoing authorities and others which could be cited, that in some cases the plaintiff may have an election to sue for a breach of contract or for damages in tort.

Moreover, a breach of duty can constitute both negligence and breach of contract; but, should a party sue for both tort and contract for the same set of facts, it is only entitled to recover on the basis of one theory (Ittmann et al. 2013). When seeking to recover damages resulting from a breach of a duty, either in contract or in tort, a plaintiff usually asks for monetary damages from the defendant (Singh and Sakamoto 2001). Compensatory or actual damages are as such awarded. These are intended to fully compensate the injured party for the actual sustained loss (Schinnerer n.d.) and to reinstate the plaintiff to the same financial position it had before the breach occurred (Singh and Sakamoto 2001). But, in the case of intentional tort, i.e., where the defendant is liable for failing to act in good faith and/or impartially, punitive—on top

Table 1. Liabilities of A/E professionals in contract and in tort

Elements	Contract law	Tort law
Type of liability	Contractual liability: created or allocated by the terms of a valid contract	Unintentional tort: negligence Intentional tort: intentional or fraudulent misrepresentation; tortuous interference with contract; and defamation
Characteristics of the duty	Agreed upon explicitly or impliedly through contract terms Owed to party or third party beneficiary in a contract	Imposed by law Owed to party and nonparty to the contract
Type of breach	Breach of a contractual duty	Breach of a duty of care
Recovery of damages	Compensatory damages	Unintentional tort: compensatory damages Intentional tort: possibility for punitive damages, on top of compensatory damages

of compensatory—damages may be awarded (Lunch 1990; Stein and Hiss 2003). To this end, Table 1 summarizes the main elements of tort law and contract law.

Negligent Tort Liability Exposure for Incurred Physical Damages

In general, tort liability is limited to situations where the negligent act causes physical harm to "some person or tangible thing other than the building itself that is under construction" (Singh and Sakamoto 2001). As such, one interpretation of the economic loss doctrine states that only personal injury and property damage are compensable in tort, and when economic damages are suffered, the contract will define the remedy, if any. For instance, the court in *Municipality of Anchorage v. Integrated Concepts and Research Corporation* held that

> Under Alaska law, tort-based claims that seek only a recovery for economic losses are generally precluded by the economic loss doctrine. But when the action seeks damages for personal injury or property damage, the economic loss doctrine does not apply and such damages may be recoverable. The line between property damage and economic loss is at times difficult to discern. Under Alaska law, damage to "other property" that is separate and distinct from the defective product is recoverable in tort. In addition, the Alaska Supreme Court has held that a party may recover for damage to the defective product itself when the loss occurs under dangerous circumstances that created a significant risk of personal injury or property damage.

Depending on the circumstances, when bodily or personal injury occurs as a result of an A/E's negligence, it can be sued by any party to whom it owes a duty of care. To this end, five cases related to BI are summarized in Table 2.

These cases were selected to shed light on the viability of such claims. The case code assigned to each case is not intended to give any significance for the case, nor is it placed in order; rather it is a random number given by the authors in order to keep a record (for the case in question) in the full database of the reviewed cases. For instance, an A/E owes a duty to (a) a third party in inspecting the contractor's work for compliance with the design drawings (Case C6), and (b) a third-party injured worker in reviewing shop drawings and assuring that the design intent is met (Case C11). In contrast, the A/E (a) has no duty to warn about dangerous

Table 2. Summary of cases related to liability exposure for incurred physical damages

Case code	Plaintiff	Liability exposure in relation to	Court's citation
C4	Third party, member of the public	Environmental conditions	*Sharon Reeser v. NGK North American, Inc.* The court held that only if the engineer has expressly undertaken a duty to protect the public and performed it negligently will the court find that the engineer owes a duty to the public.
C5	Third party, user of the facility	Construction administration services (failure to report construction defect)	*Black + Vernooy Architects v. Smith* The court held that even though the plaintiff was a foreseeable user of the facility that likely would be injured from the defective work, there was no independent duty of care owed. The court reasoned that because the A/E's contract did not give it control over the contractor who did the work, there is no such duty owed.
C6	Third party, employee of the airport facility	Inspection of contractor's work for compliance with design drawings	*LeBlanc v. Logan Hilton* The court held that the consultant owed an independent duty of care to the electrician to comply with its contractual obligations to the owner.
C11	Third-party injured worker	Shop drawing reviews	*Jerome A. Jaeger v. Henningson, Durham & Richardson, Inc.* The court held that the A/E was negligent and owed the plaintiff a duty to exercise a standard of care in approving the shop drawings to assure that the design intent was met. The plaintiff recovered damages for his injuries.
C12	Third-party injured worker	Construction means and methods	*Glenn C. Waggoner v. W & W Steel Company* The court held that "because the contractor, not the architect, was required under the contract to supervise the job and employ all reasonable safety precautions, the architects cannot be held liable for injuries sustained as a result of an unsafe construction procedure."

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environmental conditions unless it expressly undertakes such duty (Case C4), and (b) cannot be held liable for unsafe construction procedures (Case C12). In Case C5, although the court first held that the A/E could be liable to the plaintiff who sustained permanent injuries due to defective construction work that the A/E failed to report during its construction administration services, it withdrew this on reconsideration, thus rendering judgment in favor of the A/E (Holland 2013). The court's reconsideration was based on the contract between the A/E and the owner [using the American Institute of Architects (AIA) standard form of agreement] having expressly provided that the A/E shall not be involved in either CMMs or safety precautions. Instead, the agreement explained that those obligations are solely those of the contractor. This case emphasizes the importance of using standard contract documents due to their appropriate language used for specifying the scope of services, the standard of care, and the various responsibilities of the parties involved. As such, the possibility for physical damage to be recoverable in tort depends on whether or not the A/E contractually had a duty to prevent such losses. While the designer's duties to the public do not differ whether in a DBB or in a DB project (Staak 2012), the DB approach creates the potential for the A/E being involved in construction-related professional services. As such, the greater the involvement of the A/E in CMM- or safety-related services, the greater the exposure will be to BI and PD professional liability claims (Brierley et al. 2010).

Negligent Tort Liability Exposure for Incurred Economic Damages

Whether recovery of EDs in tort is barred by the ELD or allowed based on a recognized exception to the rule is an issue that is treated differently between states (jurisdictions) (Caplicki 2010; Terwilliger 2015; Scanlan and Hatfield 2018). For instance, courts enforcing the ELD to bar recovery in tort for EDs aim to preserve the boundaries between contract law and tort law; this interpretation argues that claims for purely EDs are matters of contract law and cannot be recovered in tort. For instance, as stated by the Washington Supreme Court in *Berschauer/Phillips Const. Co. v. Seattle School Dist. No. 1*: "The economic loss rule marks the fundamental boundary between the law of contracts, which is designed to enforce expectations created by agreement, and the law of torts[,] which is designed to protect citizens and their property by imposing a duty of reasonable care on others."

Among the states applying this interpretation of the rule are Nevada (Caplicki 2010; Scanlan and Hatfield 2018) and Wyoming as in the case of *Excel Constr., Inc. v. HKM Eng'g, Inc.*, holding that "The Court continues to believe that parties to a construction contract have the opportunity to allocate the economic risks associated with the work, and that they do not need the special protections of tort law to shield them from losses arising from risks, including negligence of a design professional, which are inherent in performance of the contract."

The rationale behind adopting such interpretation, as discussed by Terwilliger (2015), is that parties to a contract are better equipped to assess risks thereof and can agree on many ways as to how to handle claims for economic losses. As such, a party to a contract should not be able to recover in tort what it was unable to bargain for in contract. Another observation of the rule, which totally contradicts the previous one, is that recovery of EDs in tort is allowed only if privity exists. However, this interpretation has been the most criticized for its weakness because it contradicts the reason for having a contract that defines and limits the liability if a breach occurs (Terwilliger 2015). Other jurisdictions recognized the unfairness and inequitable results of strictly applying the rule to innocent parties who suffer EDs; as such, and as expressed in the case of *Mid-Western Electric Inc. v. DeWild Grant Reckert & Assocs. Co.*, the Supreme Court of South Dakota stated "To deny a plaintiff his day in court would, in effect, be condoning a professional's right to do his or her job negligently with impunity as far as innocent parties who suffer economic loss. We agree the time has come to extend to plaintiff's recovery for economic damage due to professional negligence."

Accordingly, in such jurisdictions courts have steadily abandoned the doctrine of privity and started to recognize exceptions to the ELD, the presence of which would imply a duty to protect third parties from EDs. For instance, the foreseeability exception is characterized by the ability to foresee that a particular injury will result from the negligent actions of the A/E (Jensen and Land 1983; Caine and Thomas 2013; Scanlan and Hatfield 2018). However, as stated in *Ossining Sch. v. Anderson*, "Courts have long struggled to define the ambit of duty or limits of liability for negligence, which in theory could be endless. While much of this struggle has been couched in the rhetoric of foreseeability of harm, under some circumstances foreseeability has appeared particularly inadequate for defining the scope of potential liability. In negligent misrepresentation cases especially, what is objectively foreseeable injury may be vast and unbounded, wholly disproportionate to a defendant's undertaking or wrongdoing . . ."

That is, parties became allowed to sue in tort even with the absence of a direct contractual relationship based on the negligent misrepresentation exception (Caine and Thomas 2013). This exception, which is characterized by the justifiable reliance on professional judgment as stated in the § 552 Restatement of Torts (2D) (Jensen and Land 1983; Russell 2016; Scanlan and Hatfield 2018), provides that a professional who "supplies false information for the guidance of others in their business transactions is subject to liability for pecuniary loss caused to them by their justifiable reliance upon the information, if he fails to exercise reasonable care or competence in obtaining or communicating the information" (American Law Institute 1977). Other exceptions are (a) special relationship (Caine and Thomas 2013; Scanlan and Hatfield 2018); (b) fraudulent misrepresentation, which is characterized by the intent to mislead the plaintiff (Jensen and Land 1983; Scanlan and Hatfield 2018); (c) tortious interference with contract (Stein and Hiss 2003; Scanlan and Hatfield 2018); and (d) defamation (Stein and Hiss 2003). A variation in Washington law to the ELD applied in most states, the independent duty doctrine, allows tort actions to proceed only when the tort duties arise independently of the terms of the contract (Rhodes 2014). States like Georgia, South Carolina, and Virginia were found to be moving toward an independent tort analysis; that is, to prove negligence, a plaintiff must allege facts beyond and independent of a breach of contract that amounts to an independent tort (Scanlan and Hatfield 2018).

In construction projects, when delays or cost overruns occur, project participants may seek to recover their losses in tort by alleging defects in the design, interferences with the contract in performing construction contract administration work, and the like whenever they lack remedy in contract. However, as previously discussed, liability exposure and the circumstances for the encountered liabilities of the A/E differ according to its role as an independent consultant or a design subcontractor. To this end, through emphasizing the recognized exceptions to the application of the ELD (in the reviewed industry-reported cases), the following sections provide the constructs for the encountered liabilities of the A/E in the DBB and the DB project delivery approaches, respectively. These constructs were developed by mapping the several cases that were found to be touching on claims for EDs and serving

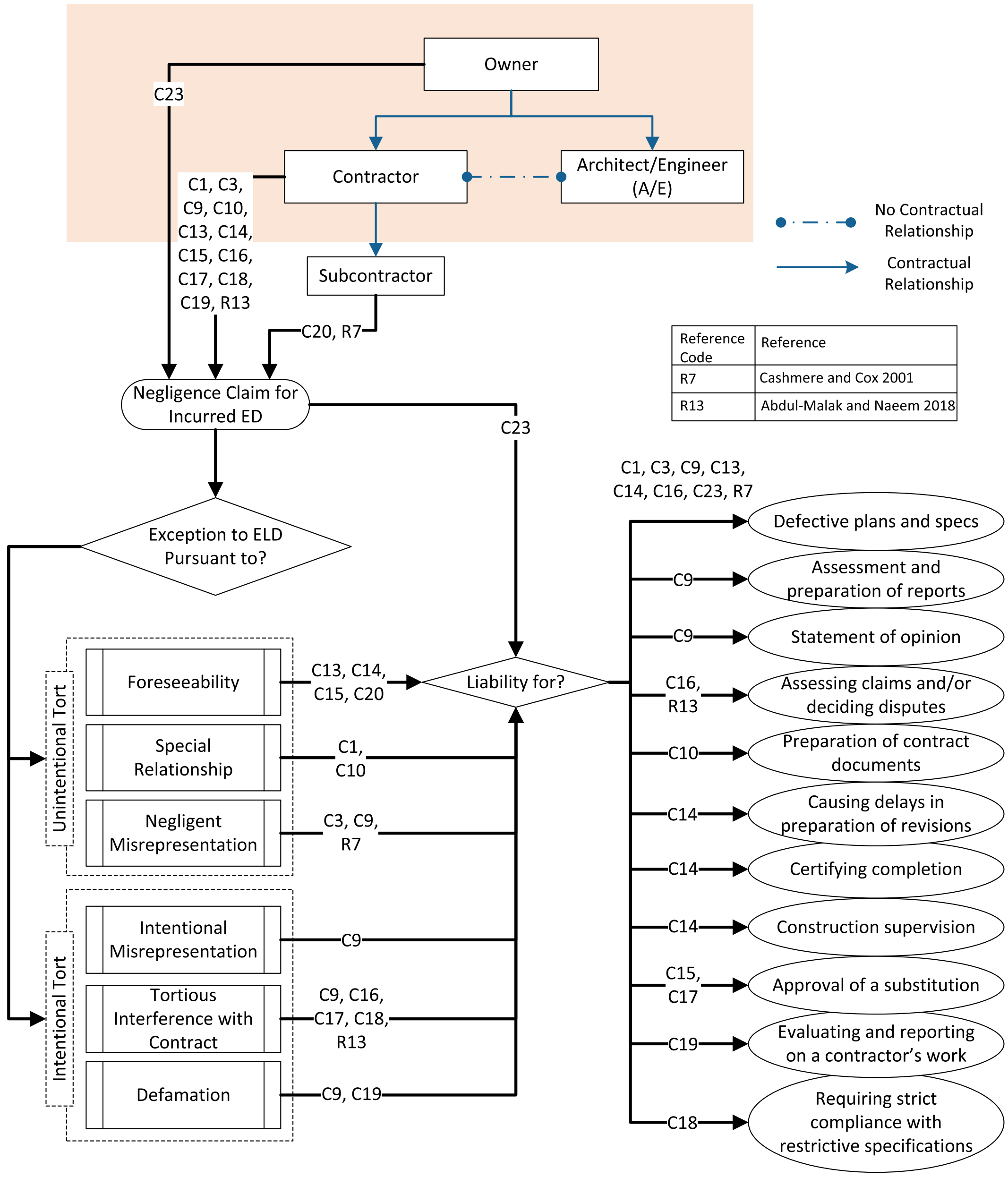

Fig. 4. Liability exposure for incurred economic damages in the DBB setting.

the purpose of either (a) shedding light on the liability exposure of the A/E in its independent role or in its role as a design subcontractor, or (b) supporting a recognized exception to the application of the ELD.

Liability Exposure for the Independent A/E Professional: Developing the Construct for DBB

This section provides the construct developed for the encountered liabilities of the A/E in tort when acting as an independent consultant. As such, Fig. 4 presents the main project participants in the DBB setting. The abbreviations (coding) used in the figure represent either a case denoted by C or a reference denoted by R. Table 3 presents a summary for each case and is therefore to be read in conjunction with Fig. 4. For each case, it includes the reference coding, the liability exposure of the A/E, the highlighted exception to the ELD, and the court's citation. That is, negligence claims against A/E professionals could be asserted by the contractor, any subcontractor, or even by the owner. However, it all depends on the circumstances of the case (i.e., availability of a recognized exception to the ELD) for a tort remedy to be available.

As for the unintentional tort, the foreseeability exception, as cited in Cases C13, C14, and C15, presented a liability exposure to the general contractor for (a) defective design (C13, C14), (b) causing delays in preparation of corrected plans and specifications (C14), (c) failing to award the general contractor the certificate upon the completion of the building (C14), (d) negligence in the supervision and control of the contractor (C14), and (e) approval of a substitution when dealing with the "or equal" clause (C15). While some courts continue to focus on the foreseeability analysis, others resort to (a) the negligent misrepresentation theory (C3, C9), thereby focusing on the justifiable reliance of the general contractor on the defective design provided by the A/E and explicitly adopting § 552 Restatement of Torts (2D); or (b) finding some sort of a special relationship (C1, C10), otherwise called intimate nexus, in

Table 3. Summary of cases related to economic damages in DBB

Case code	Liability exposure in relation to	Exception to ELD	Court's citation
C1	Negligence in preparation of plans and specifications	Special relationship	*Eastern Steel Constructors, Inc. v. City of Salem* The court held that a design professional "owes a duty of care to a contractor, who has been employed by the same project owner as the design professional and who has relied upon the design professional's work product in carrying out his or her obligations to the owner, notwithstanding the absence of privity of contract between the contractor and the design professional, due to the special relationship that exists between the two . . . . Consequently, the contractor may, upon proper proof, recover purely economic damages in an action alleging professional negligence on the part of the design professional."
C3	False and misleading specifications	Negligent misrepresentation	*Bilt-Rite Contractors, Inc. v. The Architectural Studio* "There is no requirement of privity in this state to maintain an action in tort. Rather, an action in negligence may be maintained upon the plaintiff's showing that the defendant owed a duty to him, that the duty was breached, and that the breach proximately caused an injury which resulted in actual damages." "(1) this Court should formally adopt Section 552 of the Restatement (Second), which we have cited with approval in the past, as applied by those jurisdictions in the architect/contractor scenario; (2) there is no requirement of privity in order to recover under Section 552; and (3) the economic loss rule does not bar recovery in such a case."
C9	Defective design and negligence in reporting the soil conditions at the work site	Intentional misrepresentation; tortious interference with contract; negligent misrepresentation; and defamation	*Ric-Man Construction, Inc. v. Neyer, Tiseo & Hindo, Ltd.* A claim for intentional misrepresentation "requires a showing of an intentional or malicious conduct." "Ric-Man agreed that its intentional misrepresentation claim failed as a matter of law." "To maintain a cause of action for tortious interference, the plaintiff must establish that the defendant was a 'third party' to the contract rather than an agent of one of the parties acting within the scope of its authority as an agent . . . an agent who acts solely for its own benefit and not for the benefit of the principal may be liable for tortious interference with contract." "In a negligent misrepresentation action, the plaintiff must prove that a party justifiably relied to his detriment on information provided without reasonable care by one who owed the relying party a duty of care." "To further describe a claim for negligent misrepresentation, this Court has relied on the Restatement Torts, 2d, § 552." "A statement of opinion is not automatically shielded from an action for defamation . . . a statement of opinion that can be proven to be false may be defamatory because it may harm the subject's reputation or deter others from associating with the subject."
C10	Professional negligence and negligent misrepresentation in relation to supplying false information to prospective bidders and failing to establish a reasonable contract duration	Special relationship	*Balfour Beatty Infrastructure, Inc. v. Rummel Klepper & Kahl, LLP* "As a matter of law, in the absence of privity, death, personal injury, property damage, or the risk of death or serious personal injury, no duty of care in tort runs from an engineer or architect to a contractor for purely economic losses on a public construction project. In reaching this holding, we determine that Maryland does not expand the 'intimate nexus' test to include extra-contractual concepts of duty for the recovery of solely economic losses in public construction cases."
C13	Plans and specifications substantially in error	Foreseeability	*Donnelly Construction Co. v. Oberg/Hunt/Gilleland* "Design professionals are liable for foreseeable injuries to foreseeable victims which proximately result from their negligent performance of their professional services." "Design professionals have a duty to use ordinary skill, care, and diligence in rendering their professional services . . . . When they are called upon to provide plans and specifications for a particular job, they must use their skill and care to provide plans and specifications which are sufficient and adequate . . . . This duty extends to those with whom the design professional is in privity . . . and to those with whom he or she is not."

Table 3. (*Continued*.)

Case code	Liability exposure in relation to	Exception to ELD	Court's citation
C14	Preparation of plans and specifications; causing delays in preparation of corrected plans and specifications; failing to award the general contractor the certificate upon the completion of the building; negligence in the supervision and control over the contractor	Foreseeability	*A. R. Moyer, Inc. v. Graham* The court held that a "third party general contractor, who may foreseeably be injured or sustained an economic loss proximately caused by the negligent performance of a contractual duty of an architect, has a cause of action against the alleged negligent architect, notwithstanding absence of privity" and that "each of the conditions would present a cause of action: (a) supervising architect or engineer is negligent in preparation of plans and specifications; (b) the supervising architect or engineer negligently causes delays in preparation of corrected plans and specifications; (c) the supervising architect or engineer negligently prepared and negligently supervised corrected plans and specifications; (d) the supervising architect or engineer negligently failed to award an architect's certificate upon completion of the project; (e) the architect or engineer was negligent in exercise of supervision and control of contractor . . . "
C15	Approval of a substitution	Foreseeability	*Waldor Pump v. Orr-Schelen-Mayeron & Associates, Inc.* The court held that "Courts in other jurisdictions have recognized a tort duty between design professionals and contractors when the harm to the particular plaintiff was foreseeable. We find it foreseeable that Waldor Pump and other subcontractors, who were bound to follow the specifications prepared by [the engineering firm], could be harmed by [the engineering firm's] negligent drafting or interpretation of the specifications. Therefore, [the engineering firm] owed a duty to Waldor Pump to reasonably draft and interpret the project's specifications."
C16	Errors in plans and specifications; assessing claims and deciding on disputes	Tortious interference with contract	*Lundgren v. Freeman* The court based its decision on whether the architect acted in bad faith and with bias toward the owner when deciding to terminate the contractor from the job. Therefore, the contractor's claim against the architect for interference with the contract was not dismissed.
C17	Bad faith in inducing the owner to terminate the construction contract due to the substitution of "an approved equal" product	Tortious interference with contract	*Dehnert v. Arrow Sprinklers, Inc*. The elements of tort of intentional interference with contractual relations as identified by the court are "(1) the existence of a valid contractual relationship; (2) knowledge of the contractual relationship on the part of the interferor; (3) intentional and improper interference inducing or otherwise causing a breach or termination of the relationship; and (4) resultant damage to the party whose relationship has been disrupted."
C18	Bad faith in asking for a strict compliance with allegedly unnecessarily restrictive specifications	Tortious interference with contract	*Waldinger Corp. v. CRS Group Engineers, Inc.* The court held that "if an architect induces a breach of contract not to further its principal's best interests but with the intent to harm the other party to its principal's contract or to further its personal goals, the architect is liable for tortious interference with the contract." The court held that if the mechanical contractor could produce evidence that the A/E insisted on strict compliance with the specifications in order to harm the subcontractor or to further their own personal goals, the A/E would be liable for the costs incurred by the mechanical contractor to procure substitute performance.
C19	Bad faith in evaluating and reporting on a contractor's work	Defamation	*Quality Granite Construction Co., Inc. v. Hurst-Rosche Engineers, Inc.* As per the court,"[w]ords are considered defamatory *per se* if they: (1) impute commission of a criminal offense; (2) impute infection with a loathsome communicable disease; (3) impute inability to perform or want of integrity in the discharge of duties of office or employment; or (4) prejudice a party, or impute lack of ability, in his trade, profession or business." The court held that "numbers three and four of the defamation *per se* categories are implicated . . . [W]e do not believe that the letter could reasonably be construed as a simple attempt to resolve a contract dispute. It clearly accused the plaintiffs of professional incompetence." The court ruled against the engineering company for defamation and awarded the general contractor punitive damages.

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Table 3. (*Continued*.)

Case code	Liability exposure in relation to	Exception to ELD	Court's citation
C20	Performance of his contract with the owner	Foreseeability	*Davidson and Jones, Inc. v. New Hanover County* "an architect in the absence of privity of contract may be sued by a general contractor or the subcontractors working on a construction project for economic loss foreseeably resulting from breach of an architect's common law duty of due care in the performance of his contract with the owner"
C23	Design deficiencies	Implied warranty	*Skidmore, Owings, & Merrill v. Intrawest I Limited Partnership* This case is construction manager at risk and not DBB. The court held that "where a person holds himself out as qualified to furnish, and does furnish, specifications for a construction project, he thereby impliedly warrants their sufficiency for the purpose in view."

order to prove the existence of a duty owed. That is, in Case C1, the court held that a design professional owes a duty of care to a contractor who relied upon the design prepared by the A/E due to the special relationship that exists between the two. However, in Case C10, the court held that in the absence of privity, no duty of care in tort runs from the A/E to the contractor for EDs. In reaching its decision, the court argued that the intimate nexus test, used for establishing privity of contract under certain circumstances, does not apply to public construction contracts, and the ELD was therefore applied to bar the contractor's claim.

Alternatively, negligence claims could be asserted by third parties under an intentional tort liability. For instance, a claim for intentional misrepresentation "requires a showing of an intentional or malicious conduct," as cited in Case C9. In view of the foreseeable financial harm that may result from hindering the progression of the claim in accordance with the stipulated dispute resolution mechanism, coupled with an owed duty to provide a response to the claim in question, the engineer's challenged authority (i.e., allegedly coerced by the owner not to respond) would be regarded as a cause for justifying a lawsuit in tort against the A/E (R13), under a tortious interference with contract exception. Cases C9, C16, C17, and C18 can be visited to further clarify how to maintain a cause of action in tort under this exception. As for the defamation exception, it is clarified in Cases C9 and C19; these cases presented a liability exposure due to (a) a statement of opinion (C9), and (b) the A/E acting in bad faith when evaluating and reporting on the contractor's work (C19).

As for the legal duties owed to a subcontractor, they could be identical to those owed to general contractors (Staak 2012). For instance, despite the lack of privity, an excavation subcontractor was allowed to bring a negligent misrepresentation claim directly against the owner's engineering firm for defective design (R7). Moreover, Case C20 provides that the same analysis concerning foreseeability that is applied to allow a subcontractor's negligence claim against the A/E.

Owners may have a claim against the A/E for negligent design documents using breach of contract claims, negligence, or a hybrid of the two (Hale n.d.). For instance, if the owner could satisfy the definition of justifiable reliance (Holub n.d.), it may have a claim for negligent misrepresentation under either inadequate plans or improper preparation of reports (e.g., soil reports). Moreover, courts have found that payment certifications are for the benefit of the owner, and it is foreseeable (Hale n.d.) for the A/E that negligently certified payments would harm the owner. This is also supported by Fletcher (2014) stating that the A/E is liable to the employer in case of an overvaluation of the work and to the contractor for an undervaluation. As for Case C23, the A/E provided drawings to the owner as being 90% complete allowing the at risk construction manager (CM) to provide the guaranteed maximum price (GMP) accordingly. During construction, substantial changes due to major drawing defects were encountered, increasing project cost and delaying completion. Evidence showed that the drawings used for the purpose of establishing the GMP were way below a 90% completion, thus allowing recovery of damages by the owner under a breach of an implied warranty claim (Terrill 1998).

Liability Exposure for the A/E Design Subcontractor: Developing the Construct for DB

This section provides the construct developed for the encountered liabilities of the A/E in tort when acting as a design subcontractor (Fig. 5). While it provides instances where the A/E is exposed to tort liabilities to the design-builder and other subcontractors, the main purpose is also to highlight the liability exposure of the A/E in pertinence to the duties that are expected to be instead owed to owners. Table 4 presents a summary for each of the relevant encountered cases and is therefore to be read in conjunction with Fig. 5. The design criteria consultant (DCC) is appointed by the owner to provide the criteria and requirements upon which the design-builder submits its proposal. Furthermore, the role of such a design professional is normally extended to include overseeing the conformity by the design-builder thereto.

The main difference between this construct and that of DBB is that the two ELD exceptions of tortious interference with contract and defamation are not included because they were not supported by any of the encountered case law or reviewed references. In addition, informed by the previous cases touching on these matters, but in the DBB setting, it was inferred by analogy that these are not reasonably viable under the DB setting. The rationale behind such an exclusion is that the third element of intentional interference with contract, as listed previously in Case C17 (Table 3), is not sustainable since in DB the A/E is not in a position to bring the contractor to terminate the contract with the owner. Moreover, a design subcontractor to the design-builder will not logically attempt to harm the reputation of the owner or deter others from associating with the owner as in Cases C9 or C19 (Table 3). Another difference between this construct and that of DBB is the addition of the agency theory. This theory, appearing in Case C24, essentially treats the designer and the builder "as one cohesive group, with each [therefore being] liable under the contract." This was explained by Terrill (1998) and further extended by Staak (2012) to view the designer and the builder as partners.

As for the unintentional tort category in the DB context, A/E professionals have a duty of care to owners based on special relationship factors (Castro 2009) or if "the bond between them [is] so close as to be the functional equivalent of contractual privity"

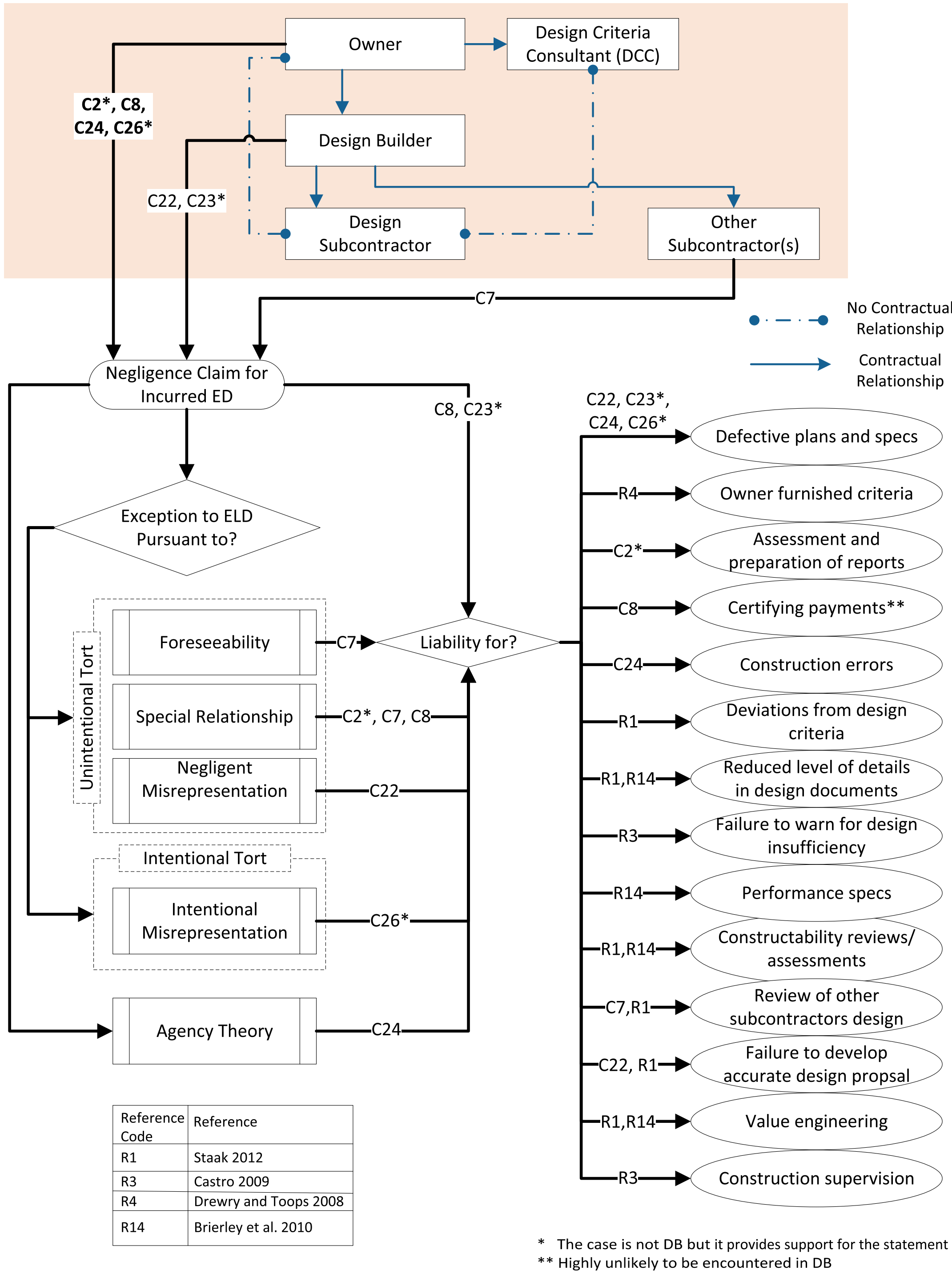

Fig. 5. Liability exposure for incurred economic damages in the DB setting.

(Gumaer 2017). For instance, in Case C2, the owner was allowed to make a claim against the design subcontractor of its directly contracted designer because of negligence in the structural assessment of an existing facility. Therefore, although the case applied to a DBB setting, it can be by analogy applicable to the DB setting, thereby allowing an owner to claim against the design subcontractor of the design-builder instead.

Cases C7 and C8 were also found to support the special relationship exception; however, certifying payments for the design-builder is highly unlikely to be the design subcontractor's duty in DB (C8), and Case C7 involved liability exposure to another subcontractor (rather than to the owner). Furthermore, the foreseeability of harm exception is considered as one of the factors used by courts to assess whether there is a duty owed to owners based on the special relationship factors (Castro 2009). These factors could be visited in Case C7 (Table 4).

Moreover, the negligent misrepresentation exception manifests through the owner's justifiable reliance on the designer's recommendations, "[t]o the extent [that] the owner relies on these recommendations in defining its [p]roject [c]riteria and thereafter [contracts] with the design-builder" (Staak 2012). This is supported by Gumaer (2017), arguing that a design professional is well aware

Table 4. Summary of cases related to economic damages in DB

Case code	Plaintiff	Liability exposure in relation to	Theory of liability	Court's citation
C2	Owner claims against the designer subconsultant of its contracted designer	Negligence in structural assessment of existing facility	Special relationship	*Ossining Sch. v. Anderson* This project is DBB. The court held that "in negligent misrepresentation cases, which produce only economic injury, [a plaintiff not in privity of contract with the defendant, to state a cause of action, it] requires that the underlying relationship between the parties be one of contract or the bond between them so close as to be the functional equivalent of contractual privity."
C7	Subcontractor	Negligence in properly inspecting the subcontractor's design prior to approvals	Special relationship and foreseeability	*US, Penn Air Control, Inc. v. Bilbro Constr. Co., Inc.* "In this case, there is no contractual privity or applicable statute, therefore Alpha must allege facts which establish the existence of a "special relationship" giving rise to a legal duty of care." "To assess whether there is a special relationship in the absence of privity of contract, California courts balance six factors: (1) the extent to which the transaction was intended to affect the plaintiff (2) the foreseeability of harm to the plaintiff (3) the degree of certainty that the plaintiff suffered injury (4) the closeness of the connection between the defendant's conduct and the injury suffered (5) the moral blame attached to the defendant's conduct, and (6) the policy of preventing future harm."
C8	Owner	Negligence in reviewing and certifying payment applications	Independent duty and special relationship	*Auburn Hills Tax Increment Finance Authority v. Haussman Construction Co.* "Determining whether a duty arises separately and distinctly from the contractual agreement … generally does not necessarily involve reading the contract, noting the obligations required by it, and determining whether the plaintiff's injury was contemplated by the contract … rather, the test is to determine whether a defendant owes a noncontracting, third-party plaintiff a legal duty apart from the defendant's contractual obligations to another… Therefore, whether a particular defendant owes any duty at all to a particular plaintiff in tort is generally determined without regard to the obligations contained within the contract … Michigan courts recognize that a separate and distinct duty to support a cause of action in tort can arise by statute, or by a number of preexisting tort principles, including duties imposed because of a special relationship between the parties, and the generally recognized common-law duty to use due care in undertakings."
C22	Design-builder	Failure to develop accurate design-build proposal; deficiencies in the final design	Negligent misrepresentation	*C. L. Maddox, Inc. v. Benham Group* As summarized in Terrill (1998) and Staak (2012), the designer was found liable for breaching an implied warranty regarding the sufficiency of its design to enable the contractor to adequately price the project in its design-build proposal to the owner. The court noted that the designer understood that the design builder would be relying on its preliminary design and quantity information to price the work and that this reliance is justified.
C24	Owner	Design and construction errors	Agency theory	*Kishwaukee Community Health Services Center v. Hospital Building & Equipment Company* The court held that the contractor and the designer were hired "as one cohesive group, with each liable under the contract" allowing the owner's suit under an agency theory, equating the designer and the design-builder to partners (much like a joint venture arrangement). Therefore, the A/E was held liable not only for design errors but also for construction errors.
C26	Owner claims against the specialty subcontractor	Fraudulent misrepresentations (convinced the owner to install a different type of system known to have a poor success record)	Fraudulent misrepresentation	*Aiken County v. B. S. P. Div. of Envirotech Corp.* "In order to recover in an action for fraud and deceit, based upon misrepresentation, the following elements must be shown by clear, cogent and convincing evidence: (1) a representation; (2) its falsity; (3) its materialty; (4) either knowledge of its falsity or a reckless disregard of its truth or falsity; (5) intent that the representation be acted upon; (6) the hearer's ignorance of its falsity; (7) the hearer's reliance on its truth; (8) the hearer's right to rely thereon; (9) the hearer's consequent and proximate injury. Failure to prove any one of the foregoing elements is fatal to recovery."

that the owner will be relying on the adequacy of its professional services. As such, this should establish a sufficient relationship between the owner and the designer to allow a potential liability under negligent misrepresentation and/or special relationship exceptions. For instance, a failure to develop an accurate DB proposal and deficiencies in the final design (Case C22) exposed the design subcontractor to liability to the design-builder under a breach of an implied warranty; however, it is included under the negligent misrepresentation exception due the justifiable reliance recognized by the court.

As for the intentional misrepresentation theory, the elements that must be proven to recover damages using such an exception are cited in Case C26. The case involved an owner claiming against the specialty subcontractor for fraudulently convincing the owner to install a system with a poor success record. Moreover, and by reference to Fig. 5, it is shown that a design subcontractor is found to be exposed to liability in tort to the owner resulting from (a) performance specifications (R14), (b) owner-furnished criteria (R4), (c) the failure to warn or disclose design insufficiency or design deficiency (R3), (d) negligent supervision whenever assuming supervision duties (R3), (e) deviating from the project criteria (R1), (f) negligent review of other subcontractors' designs (R1), and (g) the involvement in negotiations leading to the award of the design-build contract (R1). The involvement in preaward activities (e.g., input, advice, or recommendation) can expose the A/E to liabilities to both the design-builder and the owner. For instance, any advice or recommendation given by the designer to the design-builder, or sometimes to the owner, is well understood to be justifiably relied upon by them. Therefore, should any problem occur if this advice proves to be incorrect, it would be the grounds for a negligence claim (Staak 2012). To the extent the owner asserts claims for negligent design, this most likely implies a pass-through claim against the design subcontractor (Staak 2012). Moreover, in their capacities as design subcontractors, A/E professionals should be cautious of the inherent conflict of interest. For instance, time pressure by the builder could prevent the A/E from devoting sufficient time for the design that would otherwise be afforded in the DBB setting. Consequently, owners may allege inferior quality of the design (Stipanowich 2015).

Typical DB contracts place responsibility for the accuracy of the initial design on the design-builder, and builders will therefore have little recourse against the owner for deficient design. A lack of recourse could be translated by a higher risk of claims by the design-builder against its A/E subcontractor (Brierley et al. 2010; Stipanowich 2015). As such, the frequency of claims asserted by design-builders against their designers for negligent design is an indication of the increased risks designers accept when designing directly for the builder (Staak 2012). For instance, the builder's CMM, constructability review and assessment, and value engineering services are activities that often drive design solutions in a DB setting (Brierley et al. 2010; Staak 2012). Of paramount importance is the issue of potentially eliminating defensive detailing when producing design drawings, particularly if coupled with the probable increased reliance on informal communication, both of which are practices observed by Brierley et al. (2010) in DB. On the one hand, reducing details in the design documents is likely to have undesirable effects when things go wrong; these are translated by a higher risk of encountering claims if field mistakes are made (Staak 2012). On the other hand, design drawings are an important source of evidence in courts (Yousefi et al. 2010; Philips-Ryder et al. 2013; Zillante et al. 2014). Therefore, reducing unnecessary details in the plans may only be exercised with caution and without drastically compromising the design documentation quality.

Framework Underlying Negligence Claims in Tort

Based on a synopsis of the circumstances of the encountered liabilities, along with the varying practices for the application of the ELD in the various states (jurisdictions), a general framework underlying negligence claims against the A/E is presented in Fig. 6 (to be read in conjunction with Table 5). Depending on the type of damages suffered and the possible identity of the claimant (in the case of EDs), which varies according to the project delivery method in place (i.e., DBB or DB), the framework encompasses the different deduced constructs reflecting the different paths and possibilities for a negligence claim against the A/E to prevail or fail. For instance, if physical damages occur as a result of a breach of a duty owed, courts readily find liability, the ELD is not applied, and the A/E is therefore sued for negligence.

On the other hand, if purely EDs occur, recovery of damages will be subject to one of the four deduced constructs. For instance, under Construct 1, if damages are solely economic, the ELD is strictly applied to bar recovery in tort. As such, EDs are only recovered in contract by the parties or a third-party beneficiary, if any. Under the second construct, EDs are recovered in contract and in tort whenever privity exists (direct privity or a third-party beneficiary); however, recovery for third parties is denied. As for the jurisdictions that apply an independent duty analysis, presented under Construct 3, if the duty owed is beyond and independent of a breach of contract and amounts to an independent tort, EDs could be recovered in tort. Under Construct 4, which has been thoroughly discussed throughout the paper, a case-by-case analysis is conducted. As such, the concerned jurisdiction should at least recognize any of the exceptions to the rule; should claimants prove that their claim satisfies at least one recognized exception, a duty would be owed. A third-party beneficiary clause for the benefit of the owner, properly drafted in the design agreement between the contractor and the designer in a DB setting, will give the owner a direct right of action against the designer (McGreevy et al. 2005). As for contractors, it is highly unlikely for them to be named as beneficiaries. Engineers should make sure to have their contracts with owners in the DBB approach clear from third-party beneficiaries (Caplicki 2006). Finally, since courts treat the recovery for EDs and the application of the ELD differently in different states, it is of paramount importance for the different project participants to understand how construction law principles (e.g., ELD application) operate in the states where they conduct their businesses.

Implication of DB Operational Variations on Liability Exposure

Although the design-builder is responsible for the design in a DB setting, the owner will inevitability be required to provide some design input. Operational variation refers to the proportion of this design input provided by owners before engaging the design-builder. On the one hand, "the extent of design information to be provided is an unsettled debate, which involves consideration of design liability" (Chan and Yu 2005), particularly that there is no such bright line separating the design performed by the owner from the more detailed design performed by the design-builder (Brierley et al. 2010). On the other hand, many contract documents are not clear as to "whether the owner's preliminary design is a limitation placed upon the design-builder" (Castro 2009). Therefore, in DB, the risks of the A/E to be sued in tort law may be of different magnitudes and may have varying likelihoods of being encountered owing to the various DB operational variations related to initial design input by owners. For instance, due to the multiplicity of terms and concepts used, a systematic classification framework for DB

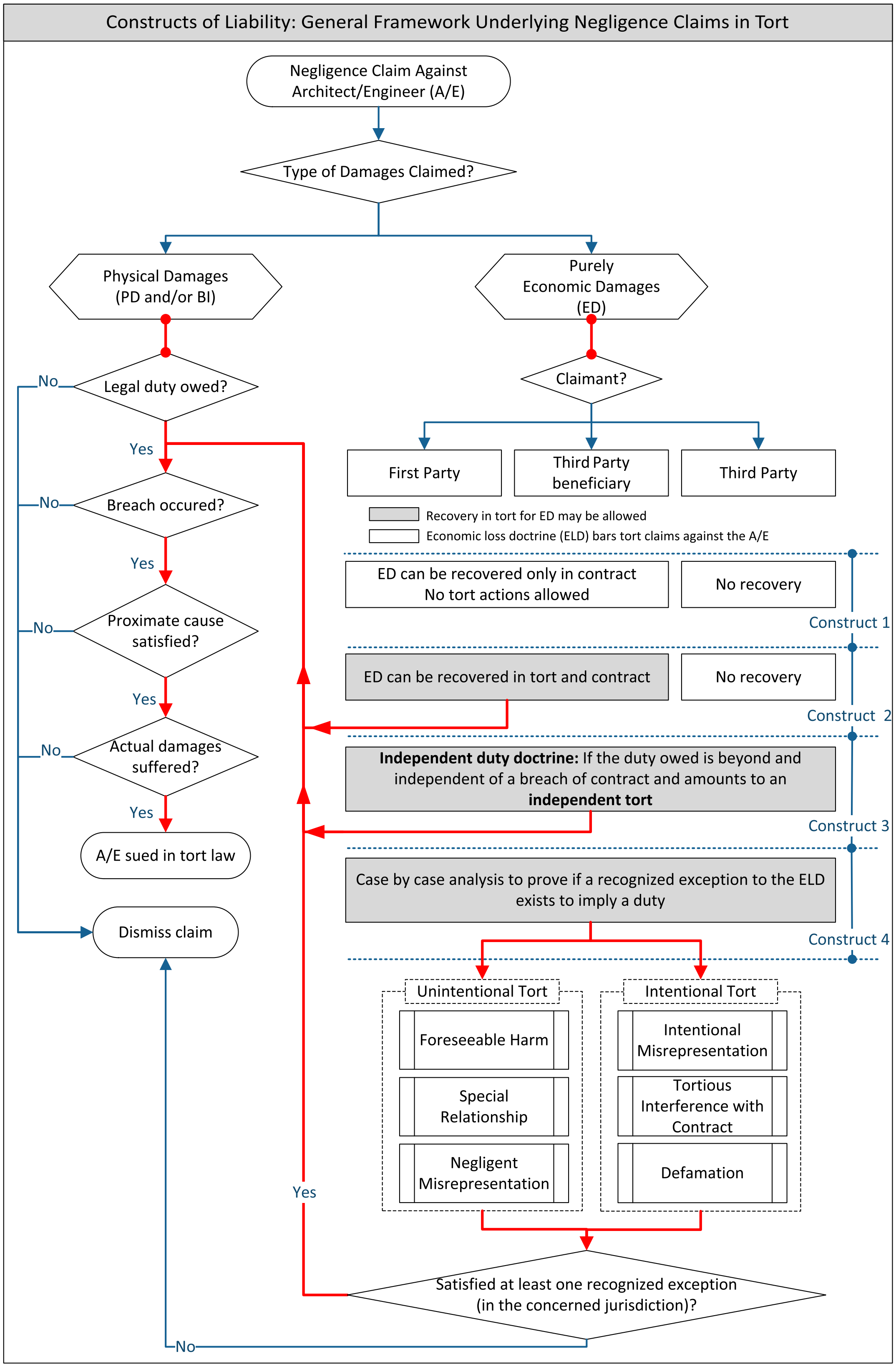

Fig. 6. General framework underlying negligence claims in tort.

variants based on their operational attributes was established by Xia et al. (2012). Among four classification rules adopted, the proportion of design completed by the owner was considered the most fundamental one. For the purpose of emphasizing the magnitude of shared liability resulting from this splitting of design effort between the owner's A/E and the contractor's A/E, three classes of operational variations are adopted. For instance, Class A refers to design criteria (DC) design-build where the owner only provides

Table 5. Parties identification depending on the project delivery approach

Project delivery approach	Design agreement	First party	Third party	Third-party beneficiary
DBB	Owner–A/E	Owner	Contractor	Contractor[a]
DB	Design-builder–A/E	Design-builder	Owner	Owner[b]

[a]Highly unlikely to be named as beneficiary in the design agreement.
[b]Likely to be either named as or implied to be a beneficiary in the design agreement.

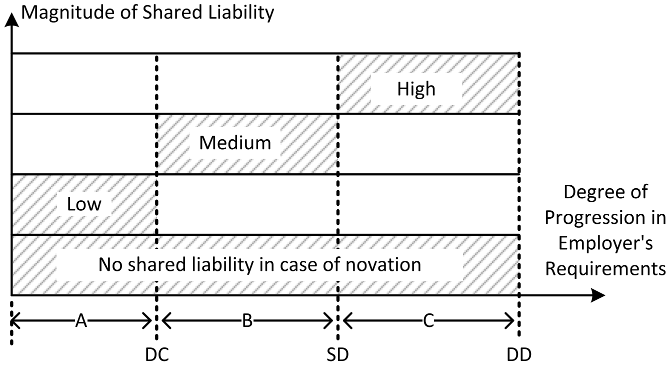

Fig. 7. Magnitudes of shared liability according to the DB operational variations.

DC for the project. Class B refers to the enhanced design-build where the owner's A/E develops the design to a point where significant facility programming is determined, usually through schematic design (SD). Class C refers to the develop-and-construct or the bridging variation, where the design performed by the owner's A/E usually extends through design development (DD). As such, based on the presented definition of each class of the DB variants, the conceptualization proposed in Fig. 7 classifies these variants according to the magnitude of shared liability, expected to be encountered according to the increased or decreased proportion of design undertaken by each party (i.e., owner or design-builder).

Moreover, the novation design-build is also a DB operational variation and corresponds to instances where the owner's A/E agreement is novated to the design-builder after completing a certain percentage of the design (Xia et al. 2012); sharing of liability would not therefore be expected to prevail under such a variation.

Recommendations and Conclusions

This paper investigated the types and extents of professional liability exposure of A/E professionals when assuming either of two contrasting capacities, i.e., an independent consultant or a design subcontractor, when rendering the contracted deliverables. To this end, it was found that when negligence claims are asserted against A/E professionals due to incurred physical damages, the ELD does not apply, and courts therefore readily find liability. However, being a design subcontractor presents some implications on the liability exposure. For instance, with fast-track construction, the design-builder may significantly control the design process owing to the demands and priorities of the construction schedule. In addition, the DB approach creates the potential for the A/E to be involved in construction-related professional services. The greater the involvement of the A/E in CMM- or safety-related designs, the greater the exposure will be to BI and PD professional liability claims.

Alternatively, when ED occurs, recovery in tort is subject to the applicability of the ELD. As such, and depending on what jurisdiction governs the case, tort remedies may well be available to third parties. However, liability exposure of the A/E professionals will differ depending on the assumed capacity (i.e., independent or design subcontractor) on a specific project. For instance, in the construct developed for the encountered liabilities in DBB, it clearly appears that A/E professionals are exposed to tort liabilities in relation to their role as designers. Moreover, meddling with the engineer's contract administration role, or failing to act in good faith and with impartiality in their quasi-judicial role, seems to expose them to intentional tort liabilities.

The increasing popularity of opting for alternative project delivery methods makes it crucial for the different project participants to understand their roles and the interplay among their direct or inherently different relationships. While active participation in contract negotiations is critical to risk mitigation, favorable terms in the design agreement with the design-build contractor seem to not be effective in limiting owners' claims. The work also suggested that such risks may be of different magnitudes and may have varying likelihoods of being encountered owing to the various DB operational variations.

While the deduced constructs help in providing some insights as to the recovery of damages in tort pursuant to the different interpretations and observations of the exceptions to the ELD, construction professionals are advised to educate themselves on the law in the locality of the project. Understanding if the concerned jurisdiction (at the project locality) strictly applies the ELD and, as such, bars tort claims against A/E professionals for ED, or recognizes any exception to the rule, thus allowing such claims, is key to understanding and weighing the risks undertaken on any project. Failure to account for the different exceptions to the ELD will result in a failure to weigh the potential risks on a project. To conclude, in order to minimize the potential liability exposure, A/E professionals are advised not to compromise on design documentation quality, which is argued to be important evidence in courts.

Acknowledgments

The authors would like to acknowledge the generous endowed doctoral research funding granted by the Maroun Semaan Faculty of Engineering and Architecture at the American University of Beirut in support of this research.

Disclaimer

None of the statements, recommendations, and conclusions contained in this article are intended (and should not be construed or relied upon) to serve as a legal advice. Such synthesis rather aims to generally alert A/E professionals as to the potential risks associated with the various roles undertaken in the delivery of a construction project and encourage the early mitigation of such risks through preventive actions. Early engagement of a qualified legal counsel along with a wise selection of a reputable insurance carrier, to better assess and properly account for the risks associated with contractual provisions and tort liability exposure through a comprehensive procured insurance, is highly encouraged as a way of indemnifying against such liabilities.

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