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Liability of Engineer for Defective Design

Emil F. Sos, Jr.*

THE PRACTICE OF "PROFESSIONAL ENGINEERING" in the United States is governed by licensing statutes in all fifty states and the District of Columbia. Liability for incompetency is only indirectly affected by these statutes. The statutes do have an effect on the contractual relationships of the engineer and most states¹ make a violation of the licensing sections a misdemeanor, punishable by fine and/or imprisonment.²

The impact of the statutes on the contractual relationship will be explored first. Contracts concerned with professional services by an unlicensed practitioner are generally held to be void.³ There are two groups of cases in which this principle applies. One is the case where the hiring party wishes to avoid the contract,⁴ and the other, where the unlicensed individual wishes to collect for services rendered and the defendant uses the lack of a license as a defense to the contract action.⁵ The contract situation is summarized in *Corpus Juris*⁶ as follows:

Where a license or certificate is required by statute as a requisite for one practicing a particular profession an agreement of a professional character without such license or certificate is ordinarily held illegal and void. This is true, for example, of an agreement made by an unlicensed or uncertified physician, an attorney at law, a conveyancer, an engineer, or a school teacher.

The Licensing Requirement

The license required by the state law does elevate, to some degree, the level of competency necessary to practice "professional engineering." The licensing statutes, besides the specific educational and experience requirements, have two other provisions worth noting. In thirty-two jurisdictions professional engineers may form corporations⁷ to practice

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¹ 37 States make the violation a misdemeanor, and 14 indicate that a penalty is attached to any violation.

² The most common penalty being a fine of \$500 and/or imprisonment not to exceed 90 days.

³ Some jurisdictions, for example Mo. Ann. Stat. § 327-260, specifically state that the contract is void.

⁴ *Fanning v. College of Steubenville*, 31 Ohio Op. 2d 497, 197 N.E. 2d 457 (1961).

⁵ *Wedgewood v. Jorgens*, 190 Mich. 620, 157 N.W. 360 (1916); *Norton v. Imperial Realty Co.*, 133 Tenn. 681, 182 S.W. 230 (1916); *Beecher v. Perry Fruit Co.*, 49 Ind. App. 184, 97 N.E. 23 (1912); *Perlitch v. Simmom*, 150 N.Y.S. 695 (1914).

⁶ 13 *Corpus Juris* 423.

⁷ For examples of such provisions see: Colo. Rev. Stat. Ann. § 51-1-18; Fla. Stat. Ann. § 471.06; Pa. Stat. Ann. § 63-153. For jurisdictions not allowing corporate practice see N.Y. Ed. Law § 7209; Ohio Rev. Code § 4733.16.

engineering, providing one of the officers or the responsible individual in charge is licensed. Under these statutes the officer or individual in charge is liable for any incompetency of subordinates. Another item of interest is the listing of exceptions to the licensing requirements by eighteen jurisdictions⁸ for services provided by engineers solely for their manufacturing company.⁹ In essence, this exception allows the practice of engineering without a license by a substantial number of engineers. Neither of the above two provisions are common to the professional practice of medicine and law.

The effect of the licensing requirement on the level of competency is explained by the New York Court in *Brown v. Shyne*¹⁰ as follows:

Proper formulation of general standards of preliminary education and proper examination of the particular applicant should serve to raise the standard of skill and care generally possessed by members of the profession in this state; but, the license to practice medicine confers no additional skill upon the practitioner, nor does it confer immunity from physical injury upon a patient if the practitioner fails to exercise care.

The same reasoning used by the New York Court in the field of medicine can find a parallel in the field of engineering. The level of competence is raised by the requirements of the statute; however, the liability for incompetency does not depend upon the presence or absence of a "professional engineering" license.

The liability for incompetency is judged on the individual's performance, because the most competent, licensed practitioner can be negligent¹¹ and the unlicensed practitioner can be most competent.¹²

The New York Court in *Brown v. Shyne*¹³ states the purpose of the medical license statute, which by analogy, as to purpose, can be applied to the engineering statute as follows:

The purpose of the statute is to protect the public against unfounded assumption of skill by one who undertakes to prescribe for or treat disease. In order to show that the plaintiff has been injured by the defendant's breach of the statutory duty proof must be given that the defendant in such treatment did not exercise the care and skill which would have been exercised by qualified practitioners within

⁸ For examples of the provision see N.C. Gen. Stat. § 89-12(8), Pa. Stat. Ann. § 63-152(f).

⁹ Although eighteen jurisdictions specifically state the exceptions, the remaining jurisdictions allow the practice of engineering solely for manufacturing corporations.

¹⁰ 242 N.Y. 176, 151 N.E. 198 (1926).

¹¹ For a comparison between incompetence and negligence see 65 Corpus Juris Secundum 451.

¹² *Brown v. Shyne*, *supra* n. 10, at 199, "Even a skilled and learned practitioner who is not licensed commits an offense against the state; but against such practitioner the statute was not intended to protect, for no protection was needed, and neglect to obtain a license results in no injury to the patient and therefore, no private wrong."

¹³ *Supra* n. 10, at 199.

the state and that such lack of skill and care caused the injury. Failure to obtain a license as required by law gives rise to no remedy if it has caused no injury.¹⁴

Before going on to the liability of the professional engineer, it may be worth noting an Ohio case¹⁵ which speaks of the licensing statute and the profession of engineering. An Ohio surveyor¹⁶ was sued on a contract for his professional services and pleaded as a defense the Statute of Limitations for malpractice. The court disallowed the application of the malpractice statute and stated:

It is obvious that engineering is a licensed profession in the layman's use of the word profession, but nowhere does the law bring that profession within the benefits or handicaps afforded law and medicine in defining the extent to which the word malpractice may be interpreted in a statute of limitations. It is the opinion of this Court that the conduct complained of may be a breach of contract but, cannot be construed as malpractice and, therefore, the one year statute of limitations does not apply.¹⁷

By implication the legislatures of at least two states disagree with the Lower Ohio Court. The legislature of Florida states that "malpractice" is a reason for revoking an engineer's license¹⁸ and, North Carolina authorizes its Board of Engineering Examiners to determine the "charges of malpractice."¹⁹

The Engineer's Liability

Professor Bell's comment concerning the liability of architects and engineers aptly describes the pre-1960 liability of this professional group as follows:

Our Courts have erected a protective legal structure around architects and engineers which has been sufficient at least in the past to shelter members of those two professions from any extensive liability for their misconduct. However, it would seem that this legal structure was erected on an unfirm foundation and cracks are appearing in the wall so that occasionally architects and engineers have been held legally responsible for their errors.²⁰

¹⁴ Accord, *Hardy v. Dahl*, 210 N.C. 530, 187 S.E. 788 (1936); *Janssen v. Mulder*, 232 Mich. 183, 205 N.W. 159 (1925); and, *Willet v. Rowekamp*, 134 O.S. 285, 16 N.E. 2d 457 (1938) where the court cites *Brown v. Shyne* (*supra* n. 10) with approval and goes on to state: "Failure to procure a license does not in itself give rise to any right of recovery . . . but only subjects the defendant to the penalty prescribed by the statute.

¹⁵ *Wishnek v. Gulla*, 67 Ohio Abs. 49, 114 N.E. 2d 914 (1953).

¹⁶ Surveyors and Engineer are covered by the same sections of the Ohio Rev. Code §§ 4733.01 to .25 and 4733.99.

¹⁷ *Wishnek v. Gulla*, *supra* n. 15 at 52, 53, 114 N.E. 2d at 917.

¹⁸ Fla. Stat. Ann. § 471.26.

¹⁹ N.C. Gen. Stat. § 89-9.

²⁰ Bell, *Professional Negligence of Architects and Engineers*, 12 Vand. L. Rev. 711 ().

Approximately four years after Professor Bell's article appeared, the Supreme Court of Alabama handed down a decision which serves to widen the field of contractual liability for professional engineers. In language usually associated with the sale of goods, the Court held a civil engineering firm to "impliedly warrant the sufficiency and adequacy of the plans and specifications to reasonably accomplish the purpose for which they were intended. . . ." ²¹

The engineering firm was to design and specify a drainage system for a subdivision. The plans and specifications did not provide what amounted to adequate drainage and the plaintiff filed suit based on the implied warranties of the contract for professional services. In the court's opinion, it distinguishes the professional services in this case from those of physicians, attorneys, and architects stating that in those professions there are too many elements of judgment to be dealt with, thereby negating any expectation of implied warranty.

The Alabama court reasons that the elements involved in the drainage survey are ascertainable to the point that it is reasonable and just for a person to expect a specific result. Quoting the Court in part:

It is our opinion that an engineering survey of drainage requirements of a tract of land to be developed as a subdivision on which dwellings are to be erected as here presented is not entailed with unknown or uncontrollable topographical or landscape conditions as would prevent a drainage survey if properly made with reasonable skill and diligence by a qualified civil engineer, from being reasonably accurate by the proper use of instruments and known formulas accepted and used by the civil engineering profession. Certainly a contracting party has a right to expect the survey to be done with reasonable accuracy chargeable to the profession and should not be dependent in his efforts to recover damages on an allegation of negligence or unskillful and imprudent work. ²²

In holding the engineering firm to a warranty of a reasonable result, the court relies upon the scientific certainties involved in the work of making a drainage survey. This same principle of scientific certainty could be applied with equal force to the architect who designs trusses, ²³ the engineer who specifies pilings, ²⁴ or the surveyor who is to set boundaries. ²⁵

With the engineering ability demonstrated in the space program, perhaps the courts and the public will demand a higher standard of

²¹ *Broyles et al. v. Brown Engineering Co., Inc.*, 275 Ala. 35, 151 So. 2d 767, 770 (1963).

²² *Id.* at 772.

²³ For a contra holding on implied warranty see *Audlane Lumber v. D. E. Britt & Assoc., Inc.*, 168 So. 2d 333 (Fla. App. 1964).

²⁴ *Pittman Const. Co. v. City of New Orleans*, 178 So. 2d 312 (La. App. 1965).

²⁵ *Taft v. Rutherford*, 66 Wash. 256, 119 P. 740 (1911). For examples of pleading of negligence of engineers, see *Oleck, Negligence Forms of Pleading*, 556, 1068 (1957 rev. ed.).

performance from the engineering profession. The demands may be such that a lack of negligence will no longer suffice to shelter the profession.

Perhaps one of the most recent developments in the liability of engineers and architects is that of responsible supervision of the methods used by contractors. The Illinois Supreme Court in *Miller et al. v. DeWitt et al.*²⁶ held the architectural firm liable for injuries received by the contractor's employees. The plaintiffs were injured when a gymnasium roof collapsed due to the inadequate shoring of trusses.

The contract between the school district and architects contained the usual clauses in the standard form contract published by the American Institute of Architects.²⁷ Generally, the clauses concerned with supervision have been construed to mean "that the general duty to 'supervise the work' merely creates a duty to see that the building when constructed meets the plans and specifications contracted for."²⁸

The Illinois Court did not construe the form contract used by this architectural firm in the manner previously followed. The Court reasoned that since the architect or engineer had the right to stop the work, they had a corresponding duty to the plaintiffs to effect such a stoppage if an unsafe condition was apparent or should have been apparent.²⁹

The plaintiffs' complaint charged two counts of common law negligence:

(c)—Negligently and carelessly failed to oversee and inspect the scaffolding as used to determine whether or not it was safe to use.

(d)—Otherwise negligently and carelessly failed to apply to the work aforesaid the degree of skill which would customarily be brought to such work by competent architects in and about this community.³⁰

In commenting on the duty and its breach by the architects, the Court stated:

Here it appears that the shoring and removal of part of the old gymnasium roof was a major part of the entire remodeling operation and one that involved obvious hazards. We think that the shoring operation was of such importance that the jury could find from the evidence that the architects were guilty of negligence in failing to inspect and watch over the shoring operation.³¹

The *Miller* case was first decided by the Illinois Supreme Court in March of 1966 against recovery by the plaintiffs. The Court granted a

²⁶ 37 Ill. 2d 273, 226 N.E. 2d 630 (1967).

²⁷ American Institute of Architects, Document No. A-201.

²⁸ *Day v. National United States Radiator*, 241 La. 288, 128 So. 2d 660 (1961); *Garden City Floral Co. v. Hunt*, 126 Mont. 537, 255 P. 2d 352 (1953); *Clinton v. Boehm*, 124 N.Y.S. 789, 139 App. Div. 73 (1910).

²⁹ *Erhart v. Hummonds*, 232 Ark. 133, 334 S.W. 2d 869 (1960).

³⁰ *Miller et al. v. DeWitt et al.*, *supra* n. 26, at 638.

³¹ *Id.* at 639.

rehearing and the above opinion was handed down in January, 1967, rehearing denied March 27, 1967. The Illinois Architectural Society in an amicus curiae brief opposed liability on the negligent supervision of the contractors methods basis. Engineers and architects normally have not been responsible for the contractors methods; their primary responsibility has been to assure conformity of the finished structure or building to the detailed plans and specifications.

This additional liability of the architect or engineer may add to the ever increasing cost of construction as pointed out by Justice House in his dissenting opinion. Quoting in part from the dissent:

Liability of architects as imposed here is economically unsound—The huge construction industry in this country has functioned very well without the imposition of liability upon architects and engineers who design, but do not build, structures and other facilities. I see no justification for extending the common law to place liability on architects.³²

Perhaps the justification lies in the severe injuries possible by not specifying shoring in a situation where extreme bodily injury is reasonably foreseeable and workmen's compensation may be inadequate. In this case the defendants engineer admitted that no detailed calculations of the loads, which were to be placed on the shoring, were made specifically, that no method was recommended, and in fact that there was not a representative of the firm at the site while this part of the operation was underway.

Under these circumstances, the majority view seems to be the equitable position. To allow architects and engineers to escape liability, when they are the very persons to whom contractors look to for approval because of their superior technical knowledge, would leave the construction worker and innocent bystanders at the discretion of contractors, who although concerned with safety, are also motivated by economics and completion dates.

Negligence—Primary Basis of Liability

Prior to the decisions in the Broyles³³ case and the Miller³⁴ case and, still in many jurisdictions today, the engineer has been held liable for negligence only. The often cited³⁵ case for the definition of the duty owed by the engineer is *Cowles v. City of Minneapolis*.³⁶ Cowles sought to collect his fee for engineering services and the City refused payment on the grounds that that which was contracted for, had not been

³² *Id.* at 643.

³³ *Supra* n. 21.

³⁴ *Supra* n. 26.

³⁵ Prosser, *Law of Torts*, 164 (3rd ed. 1964); Bell, *op. cit. supra* n. 20; Pastorelli v. Associated Engineers, 176 F. Supp. 159 (D.C., R.I. 1959).

³⁶ 128 Minn. 452, 151 N.W. 184 (1915).

achieved. The Court found that Cowles performed his duties without negligence and awarded payment of his fee. In the opinion the Court defines the duty³⁷ as follows:

The plaintiff was an engineer and was employed as such. In performing the work which he undertook, it was his duty to exercise such care, skill and diligence as men engaged in that profession ordinarily exercise under like circumstances. He was not an insurer that the contractor would perform his work properly in all respects, but, it was his duty to exercise reasonable care to see that they did so.³⁸

Some of the few instances in which engineers have been held liable for negligence are in the following general areas: design and materials,³⁹ supervision,⁴⁰ cost estimating,⁴¹ and approval of progress payments.⁴² The engineers in *Scott v. Potomac Insurance Company*⁴³ were held accountable for neglecting to compensate for the difference in expansion coefficients when they substituted a special iron pipe for the originally planned copper piping. In *Bloomsburg Mills v. Sandoni*⁴⁴ the engineer specified an insulating material which proved to be inadequate for the special application. Faulty designs, such as forgetting to specify railings on balconies and porches has caused litigation involving engineers.⁴⁵

There are two areas of liability associated with construction cost in which the engineer is active and can be held liable for his errors. The first is the negligent approval of progress payments to a building contractor. In *Correy v. Eastman*⁴⁶ the architect negligently gave his approval for a progress payment for work not yet performed. The contractor subsequently went bankrupt and the court allowed the owner to recover from the architect. An associated area of liability is that of negligently estimating the initial cost of structures or projects.⁴⁷

³⁷ For a definition of the architect's duty see, *Bayshore Development Co. v. Bonfoey*, 75 Fla. 455, 78 So. 507 (1918).

³⁸ *Cowles v. City of Minneapolis*, *supra* n. 36.

³⁹ *Bloomsburg Mills, Inc. v. Sandoni Const. Co.*, 401 Pa. 358, 164 A. 2d 201 (1960); *Scott v. Potomac Ins. Co. of D.C.*, 217 Or. 323, 341 P. 2d 1083 (1959).

⁴⁰ *Pastorelli v. Associated Engineers*, *supra* n. 35, *Miller et al. v. DeWitt et al.*, *supra* n. 26.

⁴¹ *Beachman v. Greenville County*, 218 S.C. 181, 62 S.E. 2d 92 (1950); *Laning v. School District*, 190 Or. 358, 224 P. 2d 923 (1950); *Zeliff v. Sabatino*, 15 N.J. 70, 104 A. 2d 54 (1954); *Capital Hotel Co. v. Rittenberry*, 41 S.W. 2d 697 (Tex. Civ. App. 1931).

⁴² *Corey v. Eastman*, 166 Mass. 279, 44 N.E. 217 (1896); *Bump v. McGrannahan*, 61 Ind. App. 136, 111 N.E. 640 (1916).

⁴³ *Supra* n. 39.

⁴⁴ *Supra* n. 39.

⁴⁵ *Inman v. Binghamton Housing Authority*, 164 N.Y. 2d 699, 143 N.E. 2d 896 (1957); *Montijo v. Swift*, 219 C.A. 2d 351, 33 Cal. Rptr. 133 (1963).

⁴⁶ *Supra* n. 42.

⁴⁷ *Supra* n. 41.

The area of supervision may, as indicated in *Miller v. DeWitt*,⁴⁸ cause much litigation in the future, since the engineer or architect is generally retained to supervise the construction activity. In *Pastorelli v. Associated Engineers*,⁴⁹ a heating duct fell from the ceiling fifteen months after the work was completed and turned over to the owner. The defendant engineer's negligence was based upon the fact that he did not witness or make an inspection of the attaching of the duct work.

One of the defenses made by the engineer is the plea of acceptance of the engineering plans by the owner⁵⁰ or a responsible corporate officer.⁵¹ In neither of the above two instances was the plea successful. In dismissing the "acceptance of plans" argument in *Bloomsburg Mills v. Sandoni*⁵² the court said:

. . . the fact that a responsible officer of the plaintiff corporation approved the plans did not excuse the defendants from the exercise of ordinary and reasonable skill in providing plans that were adequate.⁵³

The passage of extended periods of time⁵⁴ and the lack of privity of contract⁵⁵ have been equally unsuccessful as defenses against engineering error. The rationale for not accepting privity of contract or the acceptance of the building or structure by the owner, is that third party rights should not be subject to the agreement between the engineer and owner.⁵⁶

As pointed out earlier in this article, a substantial number of engineers, both licensed and unlicensed, are employed by corporations. Although this group is not engaged in the construction of buildings, bridges, or highways, their work affects the public health and safety⁵⁷ as much, if not more than their licensed colleagues in the consulting engineering business.

Corporate engineers are becoming concerned with the growing field of product liability which began with *MacPherson v. Buick*.⁵⁸ Examples

⁴⁸ *Supra* n. 26.

⁴⁹ *Supra* n. 35.

⁵⁰ *Supra* n. 45.

⁵¹ *Supra* n. 39.

⁵² *Ibid.*

⁵³ *Id.* at 203.

⁵⁴ *Hale v. DePoali*, 33 Cal. 2d 288, 201 P. 2d 1 (1948).

⁵⁵ *Supra* n. 45.

⁵⁶ *Bell, op. cit. supra* n. 20.

⁵⁷ Licensing statutes are based upon the right of the state to specify laws for the protection of their citizens. For cases holding these statutes constitutional see: *People ex rel. Laist v. Lower*, 251 Ill. 527, 96 N.E. 346 (1911); *Ex parte McManus*, 151 Cal. 331, 90 P. 702 (1907); *Burke v. Memphis*, 94 Tenn. 692, 30 S.W. 742 (1895).

⁵⁸ 217 N.Y. 382, 111 N.E. 1050 (1916).

of this concern are the increasing number of articles published in engineering periodicals.⁵⁹

In an excerpt from one of the articles⁶⁰ the following question is posed: "Will the engineering designer in the future be personally liable for a design that causes injury or loss? Some authorities including some insurance companies, think this is a possibility. At least one company thinks it will be writing malpractice insurance for engineers, including those employed by manufacturers, in the foreseeable future. One authority in the field predicts that at least some insurers will soon be inserting clauses in product liability policies that eliminate coverage of product design itself."

Chances are, however, that most of the corporate engineers will be shielded from liability. One prominent Ohio attorney, noted for his work in the products design liability area, points out, "the corporate structure of marketing, manufacturing, and engineering often dictate what the ultimate design will be, thereby removing authority and responsibility from the design engineer. In addition to this there is the problem of collectability, the usually solvent corporations and the questionable engineer."⁶¹

Conclusions

Although the chances of individual corporate engineers being held liable for faulty products is slight, the forces at work in the product liability area should bring about some long needed changes. Not the least of these changes should be a requirement that corporate engineers, or at a minimum their responsible supervisors or directors, obtain a professional engineering license.

The present decision making structure of corporations concerning both new and existing products will probably undergo subtle and informal changes. The manager of the engineering section will soon tire of testifying in product liability cases concerned with faulty designs which were substantially altered by the marketing or manufacturing functions. He should also become equally tired of the distorted advertising on products he has designed.

The corporate engineer is presently being called upon as the individual responsible for the product; his main problem is that he does not

⁵⁹ The following series of articles are published in *Product Engineering*, published by McGraw Hill: Kolb, The Price of Faulty Design Gets Steeper Everyday, 37 Product Eng. 34 (Aug. 1, 1966); Design For Safety, 36 Product Eng. 123 (Sept. 13, 1965); Just How Safe Are You, 36 Product Eng. 68 (Aug. 16, 1965); Explosion-Proof Design, 36 Product Eng. 68 (Feb. 1, 1965); Let The Manufacturer Beware, 34 Product Eng. 99 (Dec. 9, 1963).

⁶⁰ Kolb, *supra* n. 59, at 39.

⁶¹ Quote from interview of Craig Spangenberg, Esq. (of Cleveland) by the author, January, 1969.

have the accompanying authority or control over the product. As time goes on, it is very likely that the necessary authority and control will be placed with the engineer so that he can take steps to stem the tide of consumer injury.

Unlike his colleague the corporate engineer, the consultant engineer's individual legal status is presently undergoing changes as evidenced by the decisions in the *Broyles*⁶² and the *Miller*⁶³ cases. The reasoning in both cases is sound and should be adopted by many jurisdictions.

The reasoning of the *Miller*⁶⁴ case was such that the individual with supervisory authority including the authority to stop the work should be legally responsible for injury caused by his failure to specify and supervise. In view of the consultant engineer's expertise in the construction field, it seems only proper that he be held legally responsible for injuries he could have prevented.

The *Broyles*⁶⁵ case was based on the implied warranty of the engineering plans (i.e. the engineering services) to accomplish the specified result. As the instruments and background knowledge of the engineering world continue to develop, the unknown and uncontrollable factors involved in engineering projects decrease proportionately. With this decrease, the courts should increase the engineer's liability based upon the success or failure of the engineering project, the fruits of the engineer's services.

⁶² *Supra* n. 21.

⁶³ *Supra* n. 26.

⁶⁴ *Ibid.*

⁶⁵ *Supra* n. 21.