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## *Building Up to an Awful Let-Down*

Robert J. Knorr\*

**E**NGINEERING IS THE SECOND OLDEST PROFESSION in the world. The first man to trim a broken tree limb for use as a club was an engineer. More specifically, as early as the year 2250 B. C. written laws governed this profession. The first known written Building Code was part of the Code of Hammurabi, King of Babylonia.<sup>1</sup> This enlightening code proves how high the standards were set for the engineer even in the early stages of our civilization.

He who held himself out as an engineer—and every builder was a combination of architect-engineer and builder—had to be *perfect* in his work, *or else*. . . . Error was not tolerated; and if it occurred, severe penalties, including death, were inflicted. For those who doubt this statement, a few rules from Hammurabi's Building Code are set forth:

"228. If a builder build a house for a man and complete it (that man), shall give him two shekels of silver per sar (approx. 12 sq. ft.) of house as his wage.

"229. If a builder build a house for a man and do not make its construction firm, and the house collapse and cause the death of the owner of the house, that builder shall be put to death.

"230. If it cause the death of a son of the owner of the house, they shall put to death a son of that builder.

"231. If it cause the death of a slave of the owner of the house, he shall give to the owner of the house a slave of equal value.

"232. If it destroy property, he shall restore whatever it destroyed, and because he did not make the house which he built firm and it collapsed, he shall rebuild the house which collapsed from his own property (i.e., at his own expense).

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<sup>1</sup> Harper, *Code of Hammurabi, King of Babylonia about 2250 B. C.*, University of Chicago Press, 1904.

"233. If a builder build a house for a man and do not make its construction meet the requirements and a wall fall in, that builder shall strengthen that wall at his own expense."

The sacrificial days of 2250 B. C. are past, but liability for error or fault continues. Who shall bear it, today—the architect, engineer, contractor, or the owner?

### Definitions

While the builder, under the Hammurabi code, was architect, engineer and contractor, a pronounced distinction is present today among the three designations. Today the engineers, architects and contractors form separate castes, which contend with each other for primacy. This rivalry has long existed. Until World War II little was done to bring the architectural and engineering professions together, while at the same time assuring the cooperation of the contractor. The H. K. Ferguson Company of Cleveland, Ohio, has been a leader in the amalgamation process. This modern firm includes, under one roof, architects, engineers and construction men—all skilled in their professions. Only such a combination of skills can provide reasonable assurance that a modern structure, with all the complexities of modern requirements, will comply with all state and local laws for safety and health. Nothing less will suffice, today, to make certain that a modern construction project will produce a building which is designed, engineered and warranted to be suitable for the use for which it was intended.

In modern construction, theoretically the duties, liabilities and warranties of those involved in a construction project ordinarily are broken down thus: The *owner* agrees to furnish the funds; the *architect-engineer* contracts to furnish experience, know-how, design, engineering plans, specifications, and supervision to assure the owner that he will receive what he requires and pays for; while the *contractor* agrees to furnish skilled labor, and proper material for the job.

However, in actual practice, especially where the owner engages one firm to furnish the architectural drawings, specifications and supervision; another to do the necessary engineering design of the structural elements of the building; and still another to construct it, the theory breaks down. The contractor, made sensitive by bitter experience, looks with a doubting and justifiably jaundiced eye upon the architect and/or engineer who supplies the drawings and specifications which he must follow

to the letter, be they in fact reliable or not. The reasons for his suspicious view can be appreciated by putting oneself in the place of a contractor for a minute, and reading the following extracts from a contract as though through the eyes of a contractor.

Here are several typical (not as fanciful as they seem) sections of the "General Conditions" prepared by "Alphonse le Architecte," as they appear to the contractor. Note that they are strikingly reminiscent of the Code of Hammurabi, to the contractor's eye:

"1. *Interpretation:*

"a. The drawings and specifications are to be taken together. Anything shown on the drawings and not mentioned in the specifications, and anything mentioned in the specifications and not shown on the drawings, is to be considered as both shown and specified. Anything wanted by the Architect, or any of his friends, or by anyone except the Contractor, shall be considered as shown and specified, implied and required, and shall be provided by the Contractor, without expense to anybody but himself.

"b. If the work has been done without expense to the Contractor, the work shall be taken down and done over until the expense is satisfactory to the Architect.

"2. *Plans:*

"a. The drawings are to be considered diagrammatic and are to be followed only where space conditions make it possible to avoid so doing.

"b. Anything that is forgotten or omitted from the plans and specifications but which is necessary and required for the comfort and convenience of the owner, whether he thought of it before or after the execution of the contract, shall be provided by the Contractor to the satisfaction of everybody—except the Contractor—and in full accord with the evident intent and meaning of the specifications, without cost to anybody but the Contractor.

"c. Anything that is right on the Drawings is to be considered right; anything that is wrong shall be discovered by the Contractor, and shall be made right without informing on the Architect or indicating it on the bills.

"3. *Rules and Regulations:*

"a. The work throughout shall comply with all rules, regulations, caprices and whims of all City, County, State, National

and International Departments, Bureaus and Officials, having or not having jurisdiction.

"4. Any evidence of satisfaction on the part of the Contractor shall be considered as just cause for withholding final payment."—Selah.

\* \* \* \* \*

The engineer-contractor has been known to read well into the above "General Conditions" before realizing the "joker," as its wording and intent follow very closely the actual make-up of such clauses as prepared by the American Institute of Architects.

With the advent of the architect-engineer combination, we may expect a general trend towards a more realistic sharing of responsibility. However, this trend will be very slow until more engineers with construction experience join the ranks of the architects-engineers. These "construction wise" engineers will help to revise radically the American Institute of Architect's contract and General Conditions forms, into something more equitable to the contractor.

For the purposes of this article, the architect-engineer will be considered as a member of one unified profession, even though engineers today still, in fact, often consider architects to be dreamers. This opinion is more readily understood when one examines such architects' principles as the *Design Creed of the Architect*:<sup>2</sup>

### 11 Step Design Creed\*

1. General Considerations.
2. Inspiration.
3. Development.
4. Commodity.
5. Delight.
6. Firmness.
7. Economy.
8. Site Selection.
9. Site Planning.
10. Site Details.
11. Engineering Design.

<sup>2</sup> Architectural Practice, Chap. 3, p. 36 (Reinhold Publ., N. Y., 1947).

\* (Ed. comment: I thought he was joking, until he assured me that this actually is the Architect's serious check-list. The fifth item particularly intrigued the editors).

These *principal steps* could easily be confused with a check list that might run through a fellow's mind while viewing Mamie Van Doren or Jane Russell on television.

But, abandoning levity, we note that, without tongue in cheek, the courts make the following distinction between architects and engineers:

"An 'architect' is defined as one who, skilled in the art of architecture, designs buildings, determining the disposition of both their interior and exterior spaces, together with structural embellishments of each, and generally supervises their erection; while a 'civil engineer' is one whose field is that of structures, particularly foundations; and who designs and supervises construction of bridges, great buildings, etc."<sup>3</sup>

### 1957 Construction Levels

Today, our Nation is experiencing the greatest building boom in its history. The prospect for the next five years is for a continuation of the boom. In 1956 the planning boards of consulting engineers, architect-engineers and architects were flooded with new *heavy* construction projects, which rolled off the boards for completion within ten to twelve months. Investors poured eight billion dollars into the design of these projects.<sup>4</sup> This figure does not represent the total construction picture, however, because included in it are only those projects handled by architectural-engineering partnerships doing a volume greater than \$100,000 in new business per year. *Residential* and *light commercial* design projects in 1956 swelled that volume by 36½ million dollars.<sup>5</sup>

The increased work load, brought about by this phenomenal building boom, brought with it the cry "Engineers and Architects Needed." In desperation, these partnerships were and still are forced to employ inexperienced personnel, and to delegate to novices more responsibility in the design, planning and supervision of construction than was true in the past.

Inexperience is the mother of mistakes! A wider margin for error is mathematically inevitable today in view of the present tremendous and hurried building program. As a result there seems to be a forecast of "rain and thunderstorms," and the trend is towards placing the blame for architect-engineer mistakes

<sup>3</sup> Rabinowitz v. Hurwitz Mintz Furn. Co., 19 La. App. 811, 133 S. 498, 499 (1931).

<sup>4</sup> 158 Engineering News-Record (8) 70 (Feb. 21, 1957).

<sup>5</sup> 8 House and Home, 49 (Aug. 1957).

where it belongs—on the architect-engineer rather than on the owner in a great many instances. To whom can the owner, or an injured third party, appeal?

Let us examine a few sources from which aid might come.

### State Codes Governing Licensing of Engineers-Architects

The injured party is afforded little help from state codes governing licensing of architects-engineers. Paragraph after paragraph is devoted to the creation of boards of examiners, education requirements, and the like. On the other hand, the sections defining liability are limited usually to one obscure sentence, saying merely that the board may *revoke the license of*, and *fine* (usually a nominal sum) an architect-engineer "who has been found guilty by the board of any deceit, misrepresentation, violation of contract, fraud or gross incompetence in his practice."<sup>6</sup>

### Professional Societies

The professional societies themselves do little more. For instance, Article VI of the Constitution of The American Institute of Architects, Document 177, § 11, states: "The architect *endeavors* to guard the owner against defects and deficiencies in the work of contractors (over whom he has supervision) . . ."

### State Codes and City Ordinances

State codes and city ordinances, which to some extent control architects-engineers in the design of construction, spell out the specifications for materials to be used, and seem to attempt to require that construction conform to the highest safety and health measures. Generally, however, deviation from the prescribed regulations by the architect-engineer is not negligence per se. The codes are merely rules of thumb, which can be broken merely by eliminating certain specifications from architect-engineer drawings before they are presented for approval to the Building Commissions. Vague references and lack of details on drawings are the rule, not the exception. In eliminating these details the architect-engineer will say that he assumes that the contractor is familiar with the building code, and that even though he (the architect-engineer) does not include certain items on his drawings and specifications, the contractor is obligated to

<sup>6</sup> Calif. Code, Art. 5, § 6775 c.

take cognizance of the omissions and to supply the absent information.

### Court Decisions

The law, generally, has not afforded clear redress to the owner, contractor, or persons who reasonably may be expected to be injured through the "mistake" of the architect-engineer. The courts have given various reasons for this lack of certainty of remedy.

The majority rule regarding architect-engineer-contractor liability to injured third persons is an example of the "hey-day" which these professions are enjoying.

Even though the courts, in the subjoined decisions, did not specifically refer to architects-engineers, the latter are impliedly included in the general rule, in the light of recent court decisions which appear in the final paragraphs of this article. The majority rule today is stated in the case of *Ford v. Sturgis*:<sup>7</sup>

"Generally negligence of a contractor in constructing building will not render him liable to third persons in consequence thereof, after work has been completed and accepted (by the owner)."

A stronger statement of the rule is contained in *Salliotte v. King Bridge Co.*:<sup>8</sup>

"There is no rule under which a third person may recover damages against a builder or contractor for an injury sustained by reason of defective construction, if the thing constructed is not inherently and necessarily dangerous, when the injury did not occur until after the builder or contractor had parted with the possession and title. The liability of the builder or contractor for defective construction is to the person with whom he was under contractual relations, and a stranger can hold him liable after he has parted with possession only under exceptional circumstances."

How long can this harsh rule continue before the courts will throw stare decisis to the winds and become courageous enough to recognize the unfair burden it places on the owner?

<sup>7</sup> 14 F. 2d 253 (D. C. Cir., 1926); 52 A. L. R. 619. See also, 13 A. L. R. 2d 191 (1950); *City of Sherman v. Simms*, 143 Tex. 115, 183 S. W. 2d 415 (1944); *Curtis v. Somerset*, 140 Pa. 70, 21 A. 244 (1891).

<sup>8</sup> 122 F. 378 (C. C. A. 6, Mich., 1903), 58 C. C. A. 466, 469; 65 L. R. A. 620.



### Design Errors

Many errors in design are detected before damage is done. Sheer luck governs many discoveries of this type. The following examples are merely typical:

Recently, a contract was let for the construction of a manufacturing building, based on plans and specifications prepared by an architect-engineer. According to the terms of the contract, the architect-engineer agreed to serve the owner in the capacity of consultant on the job site. The owner was to act as his own inspector. When the building was completed, it would house 1200 employees per working shift. Your author acted as area superintendent for the contractor.

During the late stages of construction, after electrical and mechanical distribution mains had been run, it was noted, on a day when the temperature was in the high 90's, that there was a considerable belly in the overhead process steam main. This main was supported by saddles hung from the building's structural steel. The mechanical sub-contractor informed the author that the main was installed according to plans and specifications, but that the design had erroneously placed line anchors on both sides of an expansion loop which was concurrent with a building expansion joint. One anchor was adjacent to the loop, while the other was some distance from it. The defect was not apparent to the eye. It was corrected by the contractor before the system became "live" however, thereby preventing possible injury to persons or property resulting from a rupture of the main.

There are few technicians who are not aware of the fact that chemical acids and bases are not compatible. Yet only a year ago, the contractor for a large industrial plant in northwestern Ohio discovered, before the plant was put into operation, that although the process piping had been installed exactly according to the architect-engineer specifications and drawings, it was possible for an operator of the facilities to open and close valves in the bypass systems, thereby raising deadly danger of spilling hot acid into a storage tank which was to be used for waste alkalines only.

The resulting explosion would have been similar to detonating ten tons of TNT in the face of the operators, to say nothing of the personal injury and property damage to others that the blast would have produced. Fortunately, again, this did not happen. The miracle discovery came about only because one employee, diligent in analyzing the costs involved in additional work, while checking and marking the lines in the system in color

as he went along, became aware of a valve common to both systems.

"The law imposes on persons performing architectural, engineering, and other professional and skilled services the obligation to exercise a reasonable degree of care, skill and ability, which generally is taken and considered to be such a degree of care and skill as, under similar conditions and like surrounding circumstances, is ordinarily employed in their respective professions."<sup>9</sup>

Certainly the above examples fall somewhat short of the required degree of care and skill. In fact, the deadly negligence of the architect-engineer is startlingly obvious.

The law has dealt severely with owners. The contractor has had his share of personal injury suits. But, the law has spoken very softly and carried a powder puff for punishment in dealing with architects-engineers.

Despite the majority rule, by which contractors and architects-engineers have been generally absolved from liability after the owner accepted the building, modern progress hardly can fail much longer to influence the thinking of the courts towards a more intelligent and enlightened view regarding architect-engineer liability. The most encouraging recent examples of more just and realistic legal rules are to be found in the cases of *Inman v. Binghampton Housing Authority*<sup>10</sup> and *Hanna v. Fletcher*,<sup>11</sup> *Russell v. Whitcomb*,<sup>12</sup> and in writings of such men as Prosser.<sup>13</sup>

### The Enlightened Trend

Notwithstanding the generally prevailing rule that a contractor, architect or engineer has no liability after acceptance by the owner, there is a marked tendency in the courts today to hold them liable somehow. Often the courts base their newer opinions on the case of *MacPherson v. Buick*,<sup>14</sup> even though the

<sup>9</sup> *Porter v. Davey Tree-Expert Co.*, 34 Ga. App. 355, 129 S. E. 557 (1925); and see, *Block v. Happ*, 144 Ga. 145, 86 S. E. 316 (1915).

<sup>10</sup> 1 App. Div. (N. Y.) 2d 559; 152 N. Y. S. 2d 79 (1956); *Moran v. Pittsburgh-Des Moines Steel Co.*, 166 F. 2d 908 (C. C. A., Pa.) (1948). See also, *Restatement of Torts*, § 385 (1934); Prosser on Torts, 519 (2d ed., 1955); *Beinhocker v. Barnes Dev. Co.*, 296 N. Y. 925, 73 N. E. 2d 41 (1947).

<sup>11</sup> 231 F. 2d 469 (C. A. D. C., 1956).

<sup>12</sup> 121 A. 2d 781 (N. H., 1956).

<sup>13</sup> Prosser on Torts, 514 (2d ed., 1955).

<sup>14</sup> 217 N. Y. 382, 111 N. E. 1050 (1916); Prosser on Torts, 497 et seq. (2d ed., 1955).

*MacPherson* doctrine originally applied only to cases involving chattels.

### General Rule Regarding Chattels

“. . . A contractor, manufacturer, vendor or furnisher of an article is not liable to third parties who have no contractual relations with him, for negligence in the construction, manufacture or sale of such article.”<sup>15</sup>

From this ancient general rule the courts departed with an exception stated in the *MacPherson* case:<sup>16</sup>

“The liability of a manufacturer for injuries caused by a defectively constructed automobile, if danger was to be reasonably expected therefrom, attached regardless of whether the danger was inherent or only imminent . . . Where an automobile manufacturer knew that the car which he sold would be used by persons other than the buyer, and the ultimate buyer of the car was injured when a wheel, made of defective wood and defectively constructed collapsed, the manufacturer was liable for the injuries.”

The *Inman*,<sup>17</sup> *Hanna*,<sup>18</sup> and *Russell*<sup>19</sup> cases have now extended the rule in the *MacPherson* case to include real property. In the *Inman* case, the plaintiff, an infant, fell from the back porch of an apartment leased by his parents, and was severely injured. The architect who had designed the dwelling, the builder, and the housing authority through which it was leased, all were joined as defendants. The plaintiff claimed, in his petition, that faulty design and construction of the building had created a condition dangerous for those who used it. The complaints against the builder and the architect were dismissed by the trial court. The decision was reversed on appeal. A further appeal was granted, however.

In handing down the final decision the high appellate court said: “We can see no logic in the assertion that because one is affixed to real estate and the other is a movable chattel that there must be a difference in principle so far as liability to third parties is concerned. We think the common viewpoint is that such a

<sup>15</sup> Prosser on Torts, 497 et seq. (2d ed., 1955).

<sup>16</sup> Above, n. 14.

<sup>17</sup> Above, n. 10.

<sup>18</sup> Above, n. 10, n. 11.

<sup>19</sup> Above, n. 10, n. 12.

distinction has become outmoded in our complex industrial society. The imminence of the danger should be the test and not the classification of the object from which the danger emanates."

The second courageous court to apply the *MacPherson* doctrine to real property was the District of Columbia Court of Appeals in the case of *Hanna v. Fletcher*.<sup>20</sup> Circuit Judge Fahy, in his opinion, said:

"The bridge described in the *MacPherson* case between the manufacture of an article and its third party user, not in privity of contract with the manufacturer, is the same as that between a landlord, contractor, or repairman and the tenant of the premises repaired; for in each case negligent conditions often may be expected to result in injury to one reasonably foreseen as a probable user."

New Hampshire was close on the heels of the Federal Court in rendering a decision which might give impetus to a complete change in thinking where liability of an architect-engineer, contractor or owner is involved. In the case of *Russell v. Whitcomb*,<sup>21</sup> the court adopted the view propounded by Prosser that "independent building and construction contractors should be held to a general standard of reasonable care for the protection of third parties who may be foreseeably endangered by the contractor's negligence even after acceptance of the work."

It should be noted that the courts have stressed "foreseeability" and the imminence of danger, rather than the classification of the object in rendering their decisions.

Heretofore the courts have advanced many theories in denying recovery to the injured party. First and foremost was the lack of privity of contract between the injured third party and the contractor or architect-engineer. Too, the courts reasoned that the intervening negligence of the owner in accepting the work defeated recovery, because after acceptance of the building, the negligent builder was powerless to right his wrong.<sup>22</sup> But it is obvious that inspection after completion seldom will reveal hidden defects. Surely not everything that glitters is gold.

### Prognosis

If the law in the *Inman* case becomes the majority rule, the architect-engineer firms will be forced to take a long overdue,

<sup>20</sup> Above, n. 10, n. 11.

<sup>21</sup> Above, n. 10, n. 12.

<sup>22</sup> *Wood v. Sloan*, 20 N. M. 127, 148 P. 507 (1915); *Mayor, City of Albany v. Cunliff*, 2 N. Y. 165 (1849).

new look at their organizations. If we depart for a moment from our original premise of considering the architect-engineer as one, and we consider the independent architect as still (as he is) a dominant figure in the construction world, we are chilled to learn that of the total firms practicing solely architecture, 71% employ less than five people. More alarming is the fact that 85% have less than 10 people in their organizations.<sup>23</sup>

It is simply impossible for firms of such small size to possess the overall knowledge and experience that now is necessary in our complex modern construction world. Lack of sufficient man-hours alone will make hardly feasible the detailed design, checking of calculations and the careful preparation of drawings and specifications for construction which are necessary precautions to protect architects' firms from liability. It is probable that these small groups will be forced to unite both architectural and engineering personnel possessing broad knowledge of construction design, under one roof, for sheer self-preservation. Here is one case where bigness is a practical necessity, not merely a profitable aggregation of power.

The magnitude of design errors that can slip through even the most thoroughly competent architect-engineer firm is shocking. And these are the errors which result in law suits. If this is so even in only one area—design—think of the gruesome possibilities of inadequate supervision, and of other shortcomings.

The honeymoon must soon be over for the architect-engineer, if public welfare counts for anything. At least so say the construction men. We must do as we are told—but are entitled (and so are the owners) to be told *right*. Anyhow, none of us in the construction business has a "spare slave of equal value" to award to injured plaintiffs.

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<sup>23</sup> 158 Engineering News-Record (21) 43 (May 23, 1957).