

CONSTRUCTION LAW FOR ENGINEERS AND CONTRACTORS

I. Project Delivery Methods

A. Fast Track

In the traditional project, an owner selects an architect or engineer to design plans and specifications. The design professionals analyze the owner's needs and develop design concepts. They then prepare design development drawings, and then construction drawings. Once the design has been fully completed and the construction drawings finished and reviewed by the owner, the project is advertised for bids. Contractors pick up the bid solicitation materials and review a full set of plans and specifications to prepare a bid proposal. If the contractor's price is acceptable, the owner will sign a contract with the contractor and construction can then begin.

In contrast, with fast track construction, the contractor is selected early in the process -- long before the plans and specifications are complete, and sometimes before the design has even begun. The contractor assists with design development and submits a price proposal before the drawings are complete. Usually, the contractor provides a guaranteed maximum cost, including the contractor's fee, and perhaps some contingencies and allowances. Construction starts well before the construction drawings are finished. The designers focus first on the site work, and foundation. While the contractor is moving dirt, and constructing the foundation, the designers prepare drawings for the rest of the project. Some of the design may even be design build (more on that later). As construction progresses, the designers struggle to keep ahead of the contractor. If all goes well, the fast tracked project will complete in much less time than the traditional project.

The principal advantage of fast track construction is time. The project starts well before the

completion of the design and may even finish shortly after the last drawing is released. If all goes well, a project that is fast tracked may complete before the construction contract is even signed on a traditional project. For those projects where time is real money, fast tracking is an option. If a manufacturing plant is needed yesterday, and construction has not yet begun, fast tracking may be viable. In the 1970's when inflation was out of control, fast tracking helped to avoid some of the price increases.

Fast tracking also allows the contractor an early opportunity to provide design input and value engineering. The relationship between the parties should be less confrontational since the contractor is usually not bound to a fixed lump sum price.

However, fast tracking is not cheap and has considerable risks. New drawings arrive about every day. There may be coordination problems between drawings, or with existing construction. The contractor is not always able to construct exactly what is shown on the drawings due to field or existing conditions. When the contractor makes changes, the changes need to be immediately communicated to and coordinated with the designer.

B. Multiple Primes

Well into the 1800's, the primary approach to construction was the "master builder" who not only designed the project, but also constructed it. For most of this century, however, construction projects have been managed jointly by the triumvirate of the owner, designer, and general contractor. Under this approach, the contractor and designer typically exercised day to day control, although the owner has at least nominal control, thanks to the power of its purse. (Remember the Golden Rule: He who has the gold makes the rules.) This traditional approach involved a single prime contractor

who contracted directly with the owner. The general contractor then signed subcontracts with key trade contractors (electrical, mechanical, plumbing, etc.), and acted as the site manager during construction. *See* Figure 1. The general contractor answered for the quality, cost, and timeliness of the work. The general contractor also assumed responsibility for site safety.

The designer traditionally observed the construction to verify general conformance with the plans and specifications and the other contract documents. The designer also visited the site to determine the percentage of completion and to assess the propriety of the contractor's applications for payment.

In a multiple prime arrangement, the owner hires various prime contractors (usually, the trade contractors, electrical, mechanical, plumbing, etc.) to perform and control the different portions of the work. There is no general contractor. Each prime contractor is independently responsible to the owner for the cost, timeliness, and quality of the work under its respective contract. The owner acts as its own general contractor or hires a construction manager to control the project. *See* Figure 2. Under this approach, the various prime contracts must clearly define responsibilities for construction, supervision of the work, site safety, and contract administration, since accountability for the whole of the work is now fragmented among several entities.

If the owner is not a sophisticated and effective manager, retaining multiple primes is an accident waiting to happen. Coordination problems are bound to arise if the work of each trade contractor is not scheduled appropriately. If the trade contractors mobilize only to discover that the project has not progressed sufficiently to accommodate them, or that another trade has had to disturb their work to do their own, there may be significant delay and disruption claims, and massive

litigation. For example, in *Maintenance Corp. v. Rutgers*, 90 N.J. 223, 447 A.2d 906 (1982), the owner's contracts with each of several primes stated that time was of the essence. When delays occurred, and complex litigation began, the court held that each prime contractor was an intended beneficiary of the owner's contracts with the other primes and had standing to sue the others for delay damages. The single biggest winners there were the lawyers.

Choosing multiple primes may save a substantial amount of money. Typically, the general contractor marks up the costs of its subcontractors and materials. This markup covers the general contractor's administration costs and some of its risks. Often, in negotiating the subcontract prices (known in the trade as "buying out the subcontracts"), the general contractor will reap considerable savings over its estimated costs. With multiple primes, the owner benefits directly from any savings on subcontract buyout, and avoids the general contractor's markup on subcontracts and materials.

C. Design/Build

While the design build concept is not new, its expansive use is a recent phenomenon. The Texas Education Code, §41.031, now allows schools to make widespread use of design building. Section 41.031 permits schools to avoid competitive bidding for school construction projects by contracting for a design built school. There are several variations of the design build concept, but the two main approaches are the Design Build Team, and Sole Design Builder.

1. Design Build Team

Under the Design Build Team approach, an architect or engineer and a contractor join forces to form a joint venture to design and build a project. The team negotiates with an owner or submits a competitive proposal for both the project's design and construction. An advantage of this approach

is the early involvement of the general contractor in the design phase. Having the contractor involved early allows for better coordination with the designer and among the various aspects of the design. The contractor and designer are motivated to work and play well together since they are team members. This can also be a disadvantage. The designer no longer is principally the owner's agent, and is partners with the contractor. This disadvantage can also be an advantage if the owner makes both designer and contractor responsible for the ultimate project. The owner can then look to the team if anything is amiss, and avoid finger pointing between designer and contractor.

2. Sole Design Builder

Under this approach, one firm contracts with the owner to be responsible for both the design and construction of the project. That firm then retains design expertise and construction capability suitable for the project. An advantage is a greater turn key approach with one firm responsible for the entire project. Another advantage is the firm's ability to specialize in particular projects, like schools. Building a great number of a particular type of project gains the firm a verifiable track record. The owner can inspect prior projects for imagination, form, and function. A disadvantage is the lack of independent and critical analysis from separate design and construction firms. This disadvantage has less impact if the owner has some expertise and can capably review the design and construction of the project.

3. Design Build Developer

With this approach, the owner contracts with a commercial developer, who usually lacks the credentials of a designer or a contractor. This approach is suitable for the owner who has little or no construction experience, and owns few other projects. The design build developer can supply the

expertise to oversee the design and construction of projects for those owners who lack the necessary in-house staff. This way the owner can retain the experience necessary to develop the project properly, from selection of designer and contractor to handling of governmental permits and other matters. This form of design building is often used for build to suit projects.

4. Advantages

The principal advantage of design building is that the owner can hold one party accountable for the design and construction of the entire project. With the traditional approach, responsibility is not always clear. A single point of contact relieves the owner of the need to coordinate the designer with the contractor, a primary cause of construction disputes and cost overruns. Design building may reduce the management time that the owner would ordinarily expend on the project. While the owner must still have a designated construction representative to review the project construction, the representative's time is not consumed with handling the communications and conflicts that arise between the designer and contractor.

Design building should result in a lower overall cost and a faster completion of the construction project. A design builder with the responsibility for all of the project is often willing to charge the owner a lower fee than the combined fee for the architect/engineer and contractor under the traditional approach. The design build approach is better suited for fast track construction. As the design unfolds in a fast track project, communication between the designer and contractor is crucial. With a design builder, communication is facilitated and the design and construction is better coordinated.

5. Pitfalls for Design Building

The principal pitfall of design building can be the design builder's weakness in anticipating the owner's needs for the project. Intense consultation and communication with the owner before the project design begins is incredibly important. Some design builders will move into an owner's existing projects for a lengthy period to assess and evaluate the efficiency and functionality of the project, consulting with the owner on a daily basis to discover and resolve problems. These consultations should involve the owner's lower management and persons actually performing the owner's work. Otherwise, the owner may not even mention critical aspects of its operations, figuring that they were obvious. The owner may have developed improvements or have unique situations for which the design builder needs to account. For example, the owner may have handicapped workers who perform certain tasks. The design builder needs to ensure access for the handicapped workers. Time spent observing the owner's operations would have shown this need.

Under the traditional method of construction, the designer owes the owner (the designer's client) a clear duty to exercise professional judgment in a manner that gives the owner the best project for the most reasonable price. The design builder has this same responsibility since it has agreed to design the project. Performing this duty in a successful and impartial manner, however, may be at odds with the design builder's motivation to cheapen the construction, regardless of impact on the owner's needs. If the designer is an employee of the design builder, the design builder is in a position to direct a design decision that in the judgment of the designer does not best serve the owner's interest. There is an inherent conflict between the designer's duty to the owner and to his employer. The design builder should have safeguards to ensure that the designer will act in the

owner's best interest, even if the design builder insists on something else. In other words, there must be mechanism in place so that the designer still owes an independent duty to the owner. In entering into a design build contract, the owner must make the parties recognize the potential conflict the designer faces and acknowledge the independent duty the designer owes to the owner, regardless of actual employer.

The design build approach also eliminates the checks and balances present when the designer and contractor are separate. Under the traditional approach, the designer will closely examine a contractor's performance to determine whether it meets specifications and justifies payment. Contractors, on the other hand, may suggest value-engineering proposals if the design is too costly to construct. While the owner may pay more to separate design and construction responsibilities, many owners believe that these controls are worth the price.

Another risk the owner faces is that the owner must rely solely on the design builder for compensation if the project is not successful. Some owners prefer having multiple parties -- architect, engineer, and trade contractors -- potentially liable for damages. Multiple parties tend to create a larger pool of funds, especially if the insurance carriers and bonding companies of the parties are included.

6. Pricing

Often, a design built project will be priced by a guaranteed maximum. With a guaranteed maximum price, the design builder must deliver the project at or under the guaranteed price. The contract should have a savings clause, with the owner benefitting from some or most of the savings. This should entice the design builder to use its experience, imagination, and creativity to benefit both

parties.

The design builder may submit a lump sum price, or negotiate a price with the owner. The design builder may be one of several interested in performing the work. The owner may take competitive bids or proposals or negotiate with the bidders before or after the bids or proposals.

D. Construction Management

The presence of a construction manager fundamentally changes the allocation of control on a project. The role of a construction manager is a relatively recent development, and allows great variability. Generally, the construction manager assumes most (but not all) of the job site management and administrative duties that would otherwise be performed by either the designer or a general contractor. These duties include conducting thorough site inspections as the work progresses, issuing or initiating certificates for payment, monitoring compliance with the construction schedule and revising the schedule when needed, participating in the change order process, monitoring compliance with environmental and safety laws and regulations, arranging for inspections by public officials, and coordinating the work of multiple primes and/or specialty trades.

A construction manager's official duties are defined by its agreement with the owner. However, because the construction manager's contract language has not been well tested by the courts, there is no telling what "official" duties may be imposed if the contract is not clear.

In *Gibson v. Heiman*, 261 Ark. 236, 547 S.W.2d 111 (1977), the Arkansas Supreme Court was faced with a construction management contract which it found to be ambiguous because it did not list or define the construction manager's duties. The court ruled that the manager must be viewed as the owner's representative during construction -- a duty typically reserved for the design

professional. Because the court concluded that the construction manager had not fully performed its contractual duty to represent the owner's interests, it held that the manager could not recover the balance due under the contract.

The benefits of hiring a construction manager include better overall coordination of the work and greater attention to cost and schedule control. However, the presence of a construction manager does not always simplify project management. Published form construction management contracts still envision a design professional with some role in the project during construction, and the owner still having at least some nominal control. Although the use of a construction manager may improve coordination, it also increases the potential for fragmented control by adding another "controlling" participant.

E. Construction Manager/General Contractor

The construction manager's scope of duties may vary considerably. The construction manager may or may not guarantee the cost of construction. With a construction cost guarantee, the construction manager usually issues a guaranteed maximum cost similar to that submitted by a general contractor. If the construction manager has guaranteed the cost, the construction manager is considered to be "at risk" for the construction cost. With the construction manager at risk, it will often contract as the owner's agent with the various trade contractors. *See* Figure 3. This arrangement provides the construction manager with control sufficient to accept the risk of the guaranteed cost. In return, the owner saves the markup of the general contractor on the subcontractors and materials.

For greater control over project scheduling and coordination, the owner may retain a general

contractor as well as a construction manager. *See* Figure 4. With this arrangement, the general contractor retains subcontractors and oversees the purchases of materials, as usual. The construction manager acts as the owner’s agent during the project. The construction manager coordinates the scheduling and monitors the change order, and payment application process. The construction manager enforces the contract terms, and acts as an arbiter of the contract documents. The general contractor reports to the construction manager in the general course of the project.

II. Licensing Design Services Firms

A. General Contractors

Texas does not require general contractors to be licensed. Texas does mandate the licensure of design professionals, such as engineers and architects.

B. Engineers

Engineers must be registered by the Texas Board of Professional Engineers (“PE Board”) and the procedures set out under the Texas Engineering Practice Act (Texas Occupations Code §§1001.0001, et seq. (“Engineering Practice Act”)).

The PE Board is charged with enforcing the Engineering Practice Act. Under the Engineering Practice Act, an “engineer” is defined as “a person licensed to engage in the practice of engineering in this state.” Texas Occupations Code §1001.002(2).

The “practice of engineering” means

the performance of or an offer or attempt to perform any public or private service or creative work, the adequate performance of which

requires engineering education, training, and experience in applying special knowledge or judgment of the mathematical, physical, or engineering sciences to that service or creative work.

Id. §1001.003(b).

The practice of engineering includes:

(1) consultation, investigation, evaluation, analysis, planning, engineering for program management, providing an expert engineering opinion or testimony, engineering for testing or evaluating materials for construction or other engineering use, and mapping;

(2) design, conceptual design, or conceptual design coordination of engineering works or systems;

(3) development or optimization of plans and specifications for engineering works or systems;

(4) planning the use or alteration of land or water or the design or analysis of works or systems for the use or alteration of land or water;

(5) responsible charge of engineering teaching or the teaching of engineering;

(6) performing an engineering survey or study;

(7) engineering for construction, alteration, or repair of real

property;

(8) engineering for preparation of an operating or maintenance manual;

(9) engineering for review of the construction or installation of engineered works to monitor compliance with drawings or specifications;

(10) a service, design, analysis, or other work performed for a public or private entity in connection with a utility, structure, building, machine, equipment, process, system, work, project, or industrial or consumer product or equipment of a mechanical, electrical, electronic, chemical, hydraulic, pneumatic, geotechnical, or thermal nature; or

(11) any other professional service necessary for the planning, progress, or completion of an engineering service.

Id. §1001.003(c)).

C. Architects

Architects are registered by the Texas Board of Architectural Examiners (“Architectural Board”), and are required to register under Texas Occupational Code §§1051.001, et seq. The term "Architect" is defined as “a person registered under this chapter to engage in the practice of architecture”.

The term "Practice of architecture" is defined as

a service or creative work applying the art and science of developing design concepts, planning for functional relationships and intended uses, and establishing the form, appearance, aesthetics, and construction details for the construction, enlargement, or alteration of a building or environs intended for human use or occupancy, the proper application of which requires education, training, and experience in those matters.

The term includes:

- (A) establishing and documenting the form, aesthetics, materials, and construction technology for a building, group of buildings, or environs intended to be constructed or altered;
- (B) preparing, or supervising and controlling the preparation of, the architectural plans and specifications that include all integrated building systems and construction details, unless otherwise permitted under Section 1051.606(a)(4);
- (c) observing the construction, modification, or alteration of work to evaluate conformance with architectural plans and specifications described in Paragraph (B) for any building, group of buildings, or environs requiring an architect;
- (D) programming for construction projects, including identification of economic, legal, and natural constraints and determination of the scope and spatial relationship of functional elements;
- (E) recommending and overseeing appropriate construction project delivery systems;

- (F) consulting, investigating, and analyzing the design, form, aesthetics, materials, and construction technology used for the construction, enlargement, or alteration of a building or environs and providing expert opinion and testimony as necessary;
- (G) research to expand the knowledge base of the profession of architecture, including publishing or presenting findings in professional forums; and
- (H) teaching, administering, and developing pedagogical theory in academic settings offering architectural education.

Tex.Occup.Code §1051.001.

Engineering or architectural firms must themselves be registered with their respective oversight boards. For example, the Engineering Practice Act provides:

A business entity, including sole proprietorship, firm, partnership, or corporation, may not engage in the practice of engineering unless:

- (1) the business entity is registered with the board;
- and
- (2) the practice is carried on only by engineers.

Tex.Occup.Code §1001.405(b).

III. Liability and Risk Management Issues

A. Implied Contract Obligations

Courts will not generally make contracts for the parties. However, if the words of the contract provide a basis for implying additional terms or conditions, the court may add such terms

and conditions. Before a court will add an additional term or condition, the court will determine from the contract either that (1) the implied term was so clearly contemplated by the parties that they deemed it unnecessary to express it, or (2) it is necessary to imply a term or condition to give effect to the purposes of the contract as a whole.

In construction contracts, there is an implied obligation on the owner not to delay or obstruct the contractor in performing the work to be done. The owner can violate this implied duty by not furnishing the necessary materials, easements, rights of way, or services on a timely basis.

The contractor has an obligation of good and workmanlike performance. This obligation does not require perfect work, just work which is acceptable in the industry and under the circumstances. However, this warranty becomes confused when the contractor blames a poor performance on defects in the plans or specifications. Courts may require an experienced contractor to detect and avoid the defects.

If the contractor is constructing a residence, the contractor will have a warranty of habitability, which means that the structure is liveable. In *Evans v. J. Stiles Inc.*, 689 S.W.2d 399 (Tex. 1985), the Texas Supreme Court held that the builder and seller of a new home impliedly warranted both the workmanship and habitability of the home. In *Gupta v. Ritter Homes Inc.*, 646 S.W.2d 168 (Tex. 1983), the court held that the builder/vendor's implied warranty of both workmanship and habitability extended to a subsequent purchaser of the home.

If the contractor has reason to know of the purpose for which a structure or project is to be built, the contractor may owe an implied duty of fitness for a particular purpose. In other words, the

structure or project must function as intended. This duty is particularly important in a design-build situation, where the design-builder is satisfying the owner's needs for a specific structure or project.

The owner's failure to provide adequate plans and specifications can violate an implied obligation to the contractor. However, Texas courts are mixed on the extent of this duty. The Texas Supreme Court in *Longeran v. San Antonio Loan & Trust Co.*, 101 Tex. 63, 104 S.W. 1061 (1907), clearly held that the owner does not warrant the sufficiency of the plans and specifications and is not liable for any defects in them. Two Houston Court of Appeals cases demonstrate the confusion since then.

In *Emerald Forest Utility District v. Simonson Construction Co.*, 679 S.W.2d 51 (Tex.App. -- Houston [14th Dist.] 1985, writ ref'd n.r.e.), the court cited the *Longeran* case and denied a contractor's claims from defective plans and specifications. A different panel of judges in *Shintech v. Group Constructors Inc.*, 688 S.W.2d 144 (Tex.App. -- Houston [14th Dist.] 1985, no writ), rejected the contention that the contractor always assumed the risk of defective plans and specifications. The *Shintech* court held that when the contract was silent, the owner warranted the sufficiency of the plans and specifications for the project.

There is no implied duty of good faith in performing a contract in Texas. The Texas Supreme Court so held in *English v. Fischer*, 660 S.W.2d 521 (Tex. 1983), where it refused to hold that "in every contract there is an implied covenant that neither party will do anything which injures the right of the other party to receive benefits of the agreement."

The case *City of San Antonio v. Forgy*, 769 S.W.2d 293 (Tex.App. -- San Antonio 1989, writ denied), illustrates the problem with no duty of good faith. There, a metal casing around a water well

ruptured, and the contractor had to drill a second well at considerable expense. During discovery in the ensuing suit, the contractor found out that the City's engineer knew before hand that the casing was undersized and was likely to rupture. Despite the City's prior knowledge that the casing would fail, the court refused to impose a duty of good faith on the City in its dealings with the contractor.

In theory, a contractor or owner may disclaim or limit the effect of an implied warranty. In theory, an express warranty should displace an implied warranty. In *Vaughn Building Corp. v. Austin Co.*, 620 S.W.2d 678 (Tex.Civ.App. -- Dallas 1981), *aff'd*, 643 S.W.2d 113 (Tex. 1982), a roofer contended that its one year express warranty demonstrated that the parties intended to displace any implied warranties. The court of appeals held, however, that to disclaim an implied warranty, the parties must expressly state that an express warranty does so. The Supreme Court affirmed the case on interpretation of the express warranty, but did not reach the question of whether the mere existence of an express warranty replaces an implied warranty.

The Texas Supreme Court in *Melody Homes Manufacturing Co. v. Barnes*, 741 S.W.2d 349 (Tex. 1987), held that the parties may not waive or disclaim an implied warranty to perform repairs in a good and workmanlike manner. The Texas Deceptive Trade Practices --Consumer Protection Act ("DTPA"), Texas Business and Commerce Code Sections 17.41, et seq., voids most waivers by a consumer of the DTPA's provisions as being contrary to public policy. The DTPA does allow waivers under certain specified circumstances, which involve the retention of legal counsel and large transactions.

B. Differing Site Conditions

Differing site conditions are essentially conditions which differ in some degree from that which the parties expected. One way of managing differing site conditions is to include a differing site conditions clause in the contract. Differing site conditions clauses seek to allocate equitably an unknown risk between the owner and the contractor. In theory, this equitable apportionment should minimize costs to the owner because it allows the contractor to remove this contingency from its bid. The owner avoids overpayment on the majority of projects and is required to pay for differing site conditions only when they occur.

Despite the theory supporting inclusion, there are good reasons not to include a differing site conditions clause in the contract. Those owners who do not often build may not generate the experience sufficient to realize the cost savings of contractor's removal of the differing site conditions risk. An owner who rarely engages in construction may be more concerned with the potential for a catastrophic cost overrun than the incrementally higher construction cost that the differing site conditions clause may cause. Second, some owners, particularly public owners, have limited funds for the construction of a project. Substantially increasing the project budget to accommodate a changed condition may be impractical. Third, placing the risk on the contractor provides the contractor with an incentive to minimize the financial effect of the discovered condition. If the contract has a differing site conditions clause, the contractor may see the changed condition as an opportunity to recoup other losses on the project at the owner's expense. Finally, in a competitive market, empirical evidence indicates that contractors do not quantify the risk of differing

site conditions and may undervalue the risk. Under these conditions, elimination of the differing site conditions clause benefits the owner at little or no cost.

Federal Government contracts contain a standard provision relating to differing site conditions, which takes precedence over any contrary language in the contract. These standard provisions are often included in federally funded work for states and local governments. The federal provision recognizes two types of differing site conditions. A Type I claim provides for an equitable adjustment if the conditions encountered differ materially from those indicated in the contract. Although the representation of the conditions need not be explicit, the contract documents must provide sufficient grounds to justify a bidder's expectation of latent conditions materially different from those actually encountered.

When the contract documents do not contain affirmative misrepresentations as to anticipated conditions, a contractor's right to a contract adjustment may nonetheless arise from unusual physical conditions differing materially from those ordinarily encountered in work of the character provided in the contract. These claims are generally referred to as Type II claims.

The federal differing site conditions clause is listed in the Code of Federal Regulations, 48 C.F.R. §52.236-2 (1991), as follows:

(a) The Contractor shall promptly, and before such conditions are disturbed, give a written notice to the Contracting Officer of: (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in this contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the written notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or of the time required for,

performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed unless the Contractor has given the written notice required; provided, however, the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

The 1987 edition of the American Institute of Architects (AIA) Document A201, General Conditions for the Contract for Construction, contains a differing site conditions clause similar to the federal model.

Having a differing site conditions clause in the contract does not exempt the contractor from inspecting the site. Courts have found an implied obligation that a contractor make at least a minimal inspection of the site to familiarize itself with the property. Most contracts today include an express “site inspection clause” obligating the contractor to inspect and familiarize itself with the conditions at the site. The AIA A201 General Conditions has such an inspection provision, and directs the contractor to verify field conditions and measurements before commencing construction.

When the contract has a site inspection clause, and the contractor unreasonably fails to inspect the site, the contractor may be foreclosed from invoking the terms of the differing site conditions clause. If, however, the contractor makes a reasonable inspection of the site, yet fails to discover the differing site condition, the two clauses may conflict.

The courts have resolved the conflict by applying a standard of reasonableness. The contractor is obligated to discover conditions apparent through a reasonable investigation. The

contractor is not obligated to discover hidden conditions, which do not surface through a reasonable investigation. The contractor is also not required to perform burdensome, extensive, or detailed tests or analyses. If the investigation is constrained by weather conditions, site conditions, or time in the contracting process, the contractor will be only required to perform an investigation that is reasonable under the circumstances.

A disclaimer or reliance clause may limit the effectiveness of a differing site conditions clause. These clauses typically state that information received from the project owner is provided solely for informational purposes and that the owner does not warrant the accuracy or sufficiency of the information provided. The objective of the provision is to render unreasonable any reliance by the contractor on owner-provided information which characterizes the condition of the property.

Courts have reached a variety of results on the effect of disclaimer provisions. Some courts have held that a disclaimer effectively precluded a contractor from arguing that reliance on the owner-provided information was reasonable. See, *J.E. Brenneman Co. v. Commonwealth Department of Transportation*, 56 Pa. 210, 424 A.2d 592 (1981); *Zurn Engineers v. State of California*, 69 Cal.App.3d 798, 138 Cal.Rptr. 478, *cert. denied*, 434 U.S. 985 (1977). In order to be effective, such clauses should provide that the information was not warranted and that the contractor has not relied on the information. These provisions are most effective when combined with a site inspection clause.

In *Brown-McKee, Inc. v. Western Beep, Inc.*, 538 S.W.2d 840 (Tex.Civ.App. -- Amarillo 1976, writ ref'd n.r.e.), the contractor had no notice of a hard rock formation immediately below the ground surface. However, the contractor's claim for a differing site condition was denied due to a

broad disclaimer of subsurface conditions in the contract. The court held that with that clause, the contractor would have to prove deception or bad faith on the part of the owner or show that the owner had withheld material information that it had a duty to disclose.

In *Millgard Corp. V. McKee/Mays*, 49 F.3d 1070 (5th Cir. 1995), the contract disclaimed a particular soil borings report. Although the contract also contained a differing site conditions provision, the court held that the subcontractor could not rely on the soil borings report to support its claim since the report had been specifically disclaimed.

Other courts have held that disclaimer clauses do not preclude reliance on information received from the owner. The situations in which courts have allowed contractors to rely on information received from the owner despite a disclaimer clause may be grouped in three categories. First, cases hold that reliance was permissible because the contractor performed a reasonable investigation that confirmed or supported the information received from the owner. Second, cases hold that reliance was justified because the owner intended that the contractor rely on the information in preparing a bid. Third, cases hold that reliance was justified because the circumstances did not allow sufficient time for the contractor to conduct an adequate independent investigation. The cumulative effect of these limitations is that a contractor may rely on information received from the owner except when relatively simple inquiries might have revealed contrary conditions.

C. Exculpatory Clauses

1. Indemnity

If the owner requires indemnity for its own negligent acts, the owner cannot subtly demand it. Indemnity for one's own negligence must be expressly stated in the contract. In *Ethyl Corp. v. Daniel Construction Co.*, 725 S.W.2d 705 (Tex. 1987), the Texas Supreme Court announced the express negligence doctrine to avoid confusion in the interpretation and enforcement of indemnity provisions. Unless the owner writes the indemnity provision in clear black and white language, the contractor will not have to indemnify the owner for the owner's own negligence.

The standard AIA language like ¶3.18 in the A201 General Conditions will not satisfy the express negligence doctrine, since it does not mention the owner's negligence.

In *Atlantic Richfield Co. v. Petroleum Personnel, Inc.*, 768 S.W.2d 724 (Tex. 1989), the Texas Supreme Court upheld the following language as satisfying the express negligence doctrine:

Contractor [PPI] agrees to hold harmless and unconditionally indemnify COMPANY [ARCO] against and for all liability, cost, expenses, claims and damages which [ARCO] may at any time suffer or sustain or become liable for any reason of any accidents, damages or injuries either to the persons or property or both, of [PPI], or of the workmen of either party, or of any other parties, or to the property of [ARCO], in any matter arising from the work performed hereunder, including but not limited to any negligent act or omission of [ARCO], its officers, agents or employees.

In *Dresser Industries v. Page Petroleum Co.*, 853 S.W.2d 505 (Tex. 1993), the Supreme Court stressed that an indemnity agreement must be conspicuous enough to provide "fair notice" of its term. To provide "fair notice," an indemnity provision must be apparent to a reasonable person. A notation on the face of the contract which draws attention to the provision, such as all capital letters or contrasting type or color is sufficient.

In *Fisk Electric Co. v. Constructors & Associates*, 888 S.W.2d 813 (Tex. 1994), the court held that if an indemnity provision does not initially satisfy the express negligence doctrine, an indemnitor has no duty to indemnify another for their attorney's fees even if the other were later found not to be negligent.

The Texas Civil Practice & Remedies Code §130.002 invalidates a provision which attempts to have a contractor indemnify an architect or engineer for liability and damage for personal injury, property damage, and expenses arising from the design professional's negligence in preparing plans or specifications or in contract administration.

If the owner has required the contractor to indemnify the owner for the owner's own negligence, the contractor should secure sufficient liability insurance to cover the risk. If the contractor cannot obtain such insurance, the contractor should seriously consider qualifying its bid or not bidding at all. A Texas court has held that an agreement to cover a party's negligence also covers the party's gross negligence, which could result in punitive damage award in millions of dollars.

2. No Damages for Delay

Ordinarily, Owner is responsible for delays the owner causes to the contractor. For example, the owner may be responsible for obtaining rights of way on a project. If the owner does not obtain the rights of way in a timely manner and delays the work, the owner can be liable for the contractor's extra costs.

In *Anderson Development Corp. v. Coastal States Gathering Co.*, 543 S.W.2d 402 (Tex.Civ.App. -- Houston [14th Dist.] 1976, writ ref'd n.r.e.), the owner was to obtain the rights of

way for the work. The parties had planned to do the work in the dry summer months. Because the owner failed to obtain the rights of way before the summer, the contractor had to perform the work in the fall in between rain storms. As a result, the work was performed sporadically as weather permitted and cost significantly more. The contractor did not complete work until three months after the scheduled completion date. The contractor successfully sued to recover its extra costs.

In *Board of Regents of the University of Texas v. S&G Construction Co.*, 529 S.W.2d 90 (Tex.Civ.App. -- Austin 1975, writ ref'd n.r.e.), the owner failed to provide proper plans and specifications. The work was delayed while the job was redesigned on a daily basis. The contractor incurred almost \$900,000 in extra costs as a result of the massive number of changes. The contractor successfully sued to recover the extra money. The court reasoned that the owner had caused the delays and increased the costs, and should pay for them.

With a no damages for delay clause, however, the owner can disclaim responsibility for the contractor's extra costs arising from delays on project. Texas courts have upheld the no damages for delay disclaimer.

In *City of Houston v. RF Ball Construction Co.*, 570 S.W.2d 75 (Tex.Civ.App. -- Houston [14th Dist.] 1978, writ ref'd n.r.e.), the contractor received several hundred change orders and almost 900 design clarifications radically altering the plans and specifications for the project. The large number of changes was later held not to be within the contemplation of the parties when the project began. As a result of all the changes, the contractor incurred \$3 million in extra cost not including the direct costs of performing all the extra work. The contractor sued to recover the indirect costs of delay, disruption, general hindrance, and inefficiency.

However, the contract contained a variation of the no damages for delay clause, which precluded recovery for extra indirect costs for changes and modifications to the contract.

There are exceptions to enforcement of the no damages for delay clause. In general, the no damages for delay clause will not be enforced if the delays that occurred were not contemplated when the contract was signed. The contractor's delay claim will not be barred if the delays were caused by the owner's active interference, bad faith, or intentional misconduct. If the owner abandons the contract, the owner can be liable for delay damages regardless of the no damages for delay clause. Finally, if the owner materially misrepresents site conditions or conceals material site conditions information, the owner may be liable for delays the contractor sustains.

3. Disclaimers of Liability

Disclaimers of liability may come in many flavors. One example is the no damages for delay clause discussed above. The owner may disclaim liability for defects in the plans or specifications, or for the availability of materials. The owner may disclaim liability for extra costs that the contractor incurs for any of a variety of specified reasons. For example, the owner may require the contractor to assume the risk that regulatory authorities may change regulations on the handling of aspects of the work, with the owner disclaiming any responsibility for the extra costs of such changes.

The parties may disclaim liability for special, incidental, indirect and consequential damages arising from some cause or other or from a breach in the contract. To demonstrate, say the owner agrees to pay the contractor \$1 million for the project. The contractor then buys an expensive machine for the project. The owner does not pay on schedule. Without the payment, the contractor

cannot make payments on the equipment and the bank repossesses it. The loss of the equipment is a special or consequential damage. If the owner disclaims special or consequential damages, the contractor will have no claim against the owner for loss of the equipment.

4. Limitations of Liability

The assumption of risk should have a value. For example, to limit risk, a party may buy insurance. The value of that risk then becomes the cost of the insurance. To avoid the high costs of risk, the parties may agree to a method of limiting liability.

(a) Liability Limited to Amount of Compensation

One method of limiting liability is to cap a party's liability to a set amount or a percentage of some amount. For example, the parties may agree to limit the liability of the contractor to the amount of its contractor's fee for the project. This will allow the contractor to quantify the risk of liability to the owner, and to remove a contingency for the liability from its price. In theory, the owner then receives the benefit of a lower price in return for a definable value of liability for the contractor.

(b) Liability Limited to Insurance Proceeds

An alternative way of limiting liability is to limit the liability to the amount of insurance proceeds. Risk has a cost. Purchasing insurance allocates the cost and defines the amount of risk. Again, the owner may receive a lower price, as the contractor deletes a contingency for the risk now covered by insurance. If the owner protests the amount of insurance is too low, the contractor can ask the owner to set the amount of insurance at a higher figure, with the contractor passing along to the owner the cost of the higher insurance.

(c) Liability Limited to a Set Amount

Another way to define the risk is to limit the amount of liability to a set amount, which may be more or less than the contractor's fee. Here, the parties agree that in the event of a claim by the owner against the contractor, the contractor's liability is limited to \$10,000, or some other agreeable figure. Again, the advantage is that the risk is defined and may be deleted as a contingency, saving costs for both parties.

(d) Limitation of Liability on a Comparative Negligence Basis

The parties may agree to limit liability to the percentage fault that one party bears for the problem. For example, the contractor may limit its liability to the owner to the percentage share that the contractor's negligence or fault bears to the total negligence of the owner, other contractors, the architect/engineer, and all other negligent parties. This limitation in the contract tends to reduce the owner's expectations of recovery from the contractor and may lead to an earlier resolution or settlement of the dispute.

D. Extras and Changes

1. Scope of Work

The scope of work is simply the listing of what work a contractor is to perform for a construction project. Ideally, the scope of work is set out in the contract or an attachment to the contract. Although simple enough in concept, the devil is in the details. Defining the scope of work may require listing not only what the contractor is to do, but also what it is not to do. For example, if the contractor is to install a dishwasher, is it also to furnish the dishwasher?

Owners and architects and engineers often define the scope of work by not only as what is listed but also by what is reasonably implied for the work. That definition can lead to disputes. For example, if the plans show that the contractor is to install the dishwasher, the owner may then argue that it may be reasonably implied that the contractor is also to furnish the dishwasher. The contractor may contend that the dishwasher is “NIC” not in contract.

Disputes over the scope of work can often be avoided during the bid phase by submitting a request for information or clarification to the architect, engineer or owner. The owner, architect or engineer may then issue an addendum to the bid solicitation to clarify the scope of work.

Once the parties know the scope of work, they are better prepared to tell if the scope has been changed.

2. Constructive Changes

“Constructive” is a legal word of art. “Constructive” in this context means that you must pretend that something is when it isn’t. A “constructive change” is a change to the scope of work which generally only one side recognizes. For example, say an owner has delayed progress by not providing a right of way to the contractor. Without a right of way, the contractor cannot readily work on a particular site. (If the contractor tries to work on that site without the right of way, he may face shotgun justice from the resident.) Unless the owner then extends the contract time, the contractor will be faced with doing the same amount of work but in less actual working day. If the contractor asks for an extension of time for the delay, and the owner denies the extension, the contractor may contend that the contract time has been constructively changed because the contractor has had to do

the same amount of work in less time. In this instance, the contractor would argue that it has been constructively accelerated.

3. Pricing

The pricing of extras and changes is often problematic. The owner and design professional are sensitive to increases in the contract amount. The owner may question why the designer did not already include the change in the initial design. The designer may be defensive for the oversight. The contractor may have overlooked an item which was necessary for the project but not explicitly set out in the plans and specifications. The contractor possibly should have questioned the omission during the bid solicitation.

In pricing the change, the contract terms control if they address the matter. Often, the contract or owner call for unit prices from the contractor's bid to price the change. For example, if the owner has to add a manhole for a sewer project, and the contractor's bid has a unit price for manholes, the owner will pay the additional unit price.

In practice, this unit price from the bid approach seems equitable, but in reality may not be so. If the contractor bids just a few of an item, and lists a high price for so few, adding a great number at the high price will be unfair to the owner. Conversely, if the contractor has a low unit price for many of an item, and the owner deletes most of them, charging the low unit price will be unfair to the contractor. Some contracts have provisions on changes in numbers of units just to address this problem.

If there are no unit prices for the item, the parties often negotiate the additional cost. The contractor will submit a proposal and the owner will accept or dicker over the price. If the parties

are unable to agree on a price, the owner may order the contractor to perform the work on a time and materials basis. The contractor must segregate the amount of labor time and materials it invests in the change. Alternatively, the owner may order that the work be performed as per a force account provision in the contract, which specifies how the contractor will be paid.

No matter how payment for the change is structured, the contractor should account for its costs for the change separately from its base contract costs, by charging the change costs to a change order account cost code. That way, the contractor can verify its costs should any questions later arise, and determine its costs for the base contract for a profitability analysis.

4. Written Change Orders, Exceptions and Reservations of Rights

Most contracts require written change orders to authorize changes (especially payment for changes) in the work. If the contractor proceeds with the work without a written change order, the owner may later claim that the change was not authorized. Many contracts even have a provision which prohibits oral modifications or changes to the contract. These no oral modifications attempt to preclude the contractor from relying on the owner's or designer's field inspector's oral authorization for a change.

In *DH Overmyer Co. v. Harrison*, 453 S.W.2d 368 (Tex.Civ.App. -- El Paso 1970), the court stated that:

It is the general rule that a stipulation, in a private building or construction contract, that changes, alterations or deviations must be ordered in writing, is valid and binding upon the parties and, therefore, so long as such a provision remains in effect, no recovery can be had for the alterations done without a written order in compliance therewith.

Few rules are absolute, however, and the no payment without written change order rule is one riddled with exceptions. The most common exceptions are the theories of quantum meruit, waiver, breach of contract, and oral agreement.

(a). Quantum Meruit

Quantum meruit is an equitable remedy which permits a contractor to recover the reasonable value of labor, services, and materials it provides for a project. Quantum meruit is not applicable when there is a specific contract provision covering the work in question. Determining whether the work is covered by a contract provision is the crucial analysis for quantum meruit. The Texas Supreme Court examined this issue in *Black Lake Pipe Line Co. v. Union Construction Co.*, 538 S.W.2d 80, 86 (Tex. 1976):

We begin with the premise that the right to recover in quantum meruit is based upon a promise implied by law to pay for beneficial services rendered and knowingly accepted. If a valid express contract covering the subject matter exists there can be no recovery upon a contract implied by law. However, the existence of an express contract does not preclude recovery in quantum meruit for the reasonable value of services rendered and accepted which are not covered by the contract.

Generally, quantum meruit relief is available where for work performed outside the scope of the original contract. Determining what work is outside the scope of the original contract can be tricky, and depends on the precise wording of the contract documents. In *Rheiner v. Varner*, 627 S.W.2d 459 (Tex.App. -- Tyler 1981), the owner sued the general contractor for indemnity for a judgment that a subcontractor secured against the owner based on quantum meruit. In denying relief for the owner, the court found that the owner had directly benefitted from the work and would be unjustly enriched if it forced the general contractor to pay for the work.

In *Angroson Inc. v. Independent Communications, Inc.*, 711 S.W.2d 268 (Tex.App. -- Dallas 1986, writ ref'd n.r.e.), a contractor contracted with an agent of a mall lessee to finish out retail space in the mall. The agent was not authorized to sign the contract, however, and the lessee refused to make full payment. The contractor sued in quantum meruit for its work. The court noted that a contractor cannot recover in quantum meruit when the work for which recovery is sought is covered by a valid contract. Finding that there was no valid contract (the agent was not authorized to sign it), the court allowed a quantum meruit recovery. The court stated that the elements of proof for quantum meruit are:

1. Valuable services were rendered or materials furnished
2. For the person sought to be charged
3. Which services and materials were accepted by the person sought to be charged, used and enjoyed by him
4. Under such circumstances as reasonably notified the person sought to be charged that the plaintiff in performing such services was expecting to be paid by the person sought to be charged.

The court also held that the contractor could recover attorney's fees for quantum meruit under the Texas Civil Practices and Remedies Code.

Quantum meruit is an equitable remedy, which means that the person seeking such relief must have been fair in its dealings. In *Truly v. Austin*, 744 S.W.2d 934 (Tex. 1988), a shopping center developer sued for quantum meruit against joint ventures for services provided in the construction of the shopping center. The Texas Supreme Court held that the developer was not entitled to quantum meruit because when the developer had breached its contract, it prevented itself from completing its own work, causing the value of its services to evaporate. The court declared that

a party seeking equitable relief like a quantum meruit recovery must come into court with clean hands.

(b). Waiver

The most frequently used exception is waiver. If the owner has orally directed that work be done, the owner has probably waived the written change order requirement. Waiver has been defined by one court as:

A waiver takes place where one dispenses with the performance of something which he has a right to exact, and occurs where one in possession of any right, whether conferred by law or by contract, with full knowledge of the material facts, does or forbears to do something the doing of which is inconsistent with the right or his intention to rely upon. Waiver, of course, is a matter or question of intention.

A waiver, involving as it does the idea of intention, may be express or implied. Waiver may be shown by such conduct as will warrant the inference of the relinquishment of a known right.

Nixon Construction Co. v. Downs, 441 S.W.2d 284, 286 (Tex.Civ.App. -- Houston [1st Dist.] 1969).

In *Travis-Williamson County Water Control & Improvement District No. 1 v. Page*, 358 S.W.2d 158 (Tex.Civ.App. -- Austin 1962), *reversed on other grounds*, the contractor proved that the owner's engineer orally ordered extra work to be done and that the owner accepted the benefit of the work. In *Texas Construction Association, Inc. v. Balli*, 558 S.W.2d 513 (Tex.Civ.App. -- Corpus Christi 1977), a subcontractor successfully proved that it had been specifically ordered to install certain equipment and that it was orally promised that it would be paid extra for the equipment. The court found that a reasonable person would have believed that payment would be made, notwithstanding the contractual requirement for a written change order.

In another case, a contractor instructed a subcontractor to perform certain work. The parties argued whether the work was within the subcontractor's scope of work. The contractor specifically told the subcontractor that the subcontractor would not be paid extra for the work. The court held that the subcontractor's failure to obtain a written change order was fatal to its recovery. *Chambless v. JJ Fritch*, 336 S.W.2d 200 (Tex.Civ.App. -- Dallas 1960, writ ref'd n.r.e.). Here, the subcontractor probably should have proceeded with the work under a written protest that the work was extra to its subcontract, reserving its rights to complain later about the cost.

(c). Breach of Contract

If the owner breaches its obligations to the contractor, the contractor may argue that the written change order requirement has been forgiven. In *Board of Regents of University of Texas v. S&G Construction Co.*, 529 S.W.2d 90 (Tex.Civ.App. -- Austin 1975, writ ref'd n.r.e.), the plans and specifications for the project were so defective that they had to be re-engineered on a daily basis. The contractor sought additional compensation. The owner refused to pay since the contractor had not submitted claims for extra work and received change orders. The court held that the contractor could recover without written change orders since the owner had breached the contract by failing to provide the plans and specifications necessary for the completion of the project.

In *North Harris v. Fleetwood Construction Co.*, 604 S.W.2d 247 (Tex.Civ.App. -- Houston [14th Dist.] 1980, writ ref'd n.r.e.), the contractor encountered a differing site condition and notified the architect as it was contractually required to do. The owner ignored the differing site condition and directed the contractor to continue to work. The contractor complied and incurred considerable additional expense without seeking a change order for the extra work. When the contractor sued for

the extra cost, the owner contended that the contractor had failed to follow the contract by not seeking a change order. The court found for the contractor and held that the owner's failure to acknowledge the differing site condition was a breach of contract on its part, which waived the niceties of the contractual change order procedure.

(d). Oral Contract

Under this theory, the parties modify or supplement the original contract (which required written change orders for extra work) with one which does not. The same facts may give rise either to a quantum meruit or oral contract recovery, if the work has been discussed but the owner has failed to pay. The main difference between the two theories is that the measure of recovery for quantum meruit is the reasonable value of labor and material provided, while the measure for oral contract is the agreed upon price or an amount set out in the original contract for changes. See, *University State Bank v. Gifford Hill Concrete Corp.*, 431 S.W.2d 561, 574 (Tex.Civ.App. -- Fort Worth 1968, writ ref'd n.r.e.); and *Union Building Corp. v. J&J Building & Maintenance*, 578 S.W.2d 519, 521-22 (Tex.Civ.App. -- Houston [14th Dist.] 1979, writ ref'd n.r.e.).

(e). Promissory Estoppel

Promissory estoppel is an equitable, non-contractual remedy available when a contractor detrimentally relies on promises made by the owner or designer under circumstances where the owner reasonably should have foreseen that the representations would have induced such reliance. For example, say an owner directs the contractor to proceed with extra work with a promise that a change order will be issued, the contractor then does the work, and no change order is issued. The owner would have induced reliance by the contractor in performing the work. The contractor would

be able to enforce the owner's promise of a change order under the doctrine of promissory estoppel. Promissory estoppel is similar to waiver, except the proof necessary for the former are slightly easier.

E. TIME

1. Project Scheduling and Types

Contractors stand a better chance of staying solvent if they profit from each project. Profits come from maximizing revenue while minimizing cost. Once a contract is signed, the revenue figure is set. The contractor must then focus on cost. In controlling cost, contractors quickly learn that time is money. Contractors pay for labor whether or not the labor is productive. If the contractor's laborers are idle while waiting for access to a work area, the contractor still must pay the laborers, although the laborers are performing no productive work. If the plumbers are in the way of the electricians, the electricians will not be able to work, but will still expect to be paid, if only for their standby time.

To control costs, the scheduling of activities is of the utmost importance. Scheduling must flow in a logical, systematic and efficient manner. The various activities must be coordinated and analyzed for scheduling impact. For example, the electrical wiring must be placed in the walls before the sheet rock is installed. The boxes for the electrical receptacles must be installed before the electricians leave, and the sheet rockers start. Otherwise, the electricians may have to cut open perfectly fine sheet rock to install wiring, or the sheet rockers may have to standby while the electrician completes an area. Either way, costs increase.

The most common method of construction scheduling is the bar chart. The bar chart is sometimes called a Gantt Chart. Henry L. Gantt developed the method in the early 1900's. Bar

charts are both easy to use and understand. All of the construction activities are listed along the left column of the chart, with horizontal bars drawn for the time of each of the activities. The time bars indicate when the work will start, how long it will take, and over what periods the work will occur.

The simpleness of the bar chart limits its usefulness. The bar chart generally has no indication as to the interrelationship or interdependence of the activities. Usually, the number of activities shown are limited, with very little detail for specific items of work. Since it is not usually computerized, the bar chart is not readily updated or revised. There generally is no audit trail for updates or revisions.

A more precise method of scheduling is the Critical Path Method, also known as CPM. CPM got its start in the late 1950's. DuPont and Remington Rand developed a technique called Critical Path Planning and Scheduling (CPPS) at about the time the Navy Department and Lockheed developed a Project Evaluation and Review Technique (PERT) for the Polaris project. Modifications of those methods lead to the Critical Path Method of Construction Scheduling.

There are two parts to a CPM schedule -- a logic diagram or network and the schedule itself. The logic diagram is usually hand drawn in the form of an arrow network, a precedence method diagram, or a similar technique to depict graphically the interrelationship and interdependence of each and every construction activity. The arrow network uses small circles, called nodes, and arrows to number and identify an event or activity. All events and activities are assigned to the schedule, with durations assigned for each activity. The links between the events and activities are also noted on the schedule. Once all activities and their durations and logical restraints are shown, there are many different paths from the start of the project to completion. The scheduler can then examine

all of the different paths leading from start to finish of the project, and sum the duration times for each activity on each path. The longest duration path is by definition the critical path. The importance of the critical path is that if any activity on the critical path takes one extra day to complete, the project will be delayed by one day.

In a CPM schedule, many of the activities are not on the critical path. If an activity is not on the critical path, then its activity may be lengthened without extending the duration of the project. In other words, if the activity takes an extra day to complete, the delay will not affect the completion date. The number of days that these non-critical activities can be extended with delaying the project is called float. Often, the owner and contractor battle over who owns the float. If the owner owns the float, the owner can make changes or delay non-critical activities without affecting the completion date, and without incurring any delay charges from the contractor.

In *Dawson Construction Co.*, 75-2 B.C.A. (CCH) ¶11,563 (1975), the General Services Board of Contract Appeals allowed the government to use all of the schedule float without having to grant a time extension to the contractor. However, in *Natkin & Co. v. George A. Fuller Co.*, 347 F.Supp. 17 (W.D. Mo. 1972), the court held that float could not be freely used by the owner for changes. While there is debate as to whether the owner and contractor can each use the float cooperatively to expedite project completion, the contractor should own the float. The owner provides fixed start and end dates, and expects the contractor to comply. The contractor then has the obligation to complete within that time and can do so by appropriately managing its activities during the project. If the bid is a lump sum or guaranteed maximum cost, the contractor should have the

unrestricted use of float time to use its labor and equipment as the contractor best sees fit. That way, the contractor can minimize its costs and maximize its profits (and pay its lawyers).

2. Types of Delay

Delay is the increase in time required for completion of a project beyond that originally contemplated by the parties at the time they entered the construction contract. Delays usually result in additional cost for both the owner and contractor. Delays become especially important when the contract stipulates that time is of the essence. There are several species of delay.

(a). Excusable Delay

Excusable delay is delay which excuses the contractor's obligation to complete on time by extending the time for contractual performance. A contractor who fails to perform within the contract time, when the contract specifies that time is of the essence, may be liable to the owner for resulting damages and for the contractor's own increased costs of performance. The contractor may be liable for unforeseen delays without any of its own fault unless the delays result from a legal impossibility or commercial impracticability. "It is well-established . . . that supervening circumstances making the performance of a promise more difficult and expensive than originally anticipated is not enough to excuse the promisor." *Barnard-Curtiss Co. v. United States*, 301 F.2d 909, 912 (Ct.Cl. 1962).

The construction contract may by its own terms absolve the contractor of responsibility to the owner for certain kinds of delay. Excusable delay may arise from causes not expressly addressed in the contract. For a delay not specifically contemplated in the contract to be excused, it normally will fall within one or both of the following categories: (1) the delay to the contractor was caused

by the owner or one for whom the owner is responsible; or (2) the risk of the delay was not expressly or impliedly assumed by either party to the contract.

Owner interference is the usual culprit for compensable delays as well as excusable delays. With a compensable delay, the contractor may recover its resulting increased costs from the owner. All compensable delays are also excusable delays. However, not all excusable delays are also compensable delays.

(i) Acts of God

Typical acts of God which will excuse resulting delay include earthquakes, tornadoes, hurricanes, and floods. Fire may also be an act of God as long as the fire did not result from the contractor's negligence.

(ii) Labor Problems

Delays caused by labor disputes are normally excusable. However, such delays may not be excused if the dispute was foreseeable, or if it was brought about by the contractor's own bad faith labor negotiations. Delays from a general labor shortages or the unavailability of skilled personnel are generally not excusable. Likewise, delays from the loss or unavailability of key supervisory or administrative personnel are not excusable unless they were caused by the owner.

(iii) Acts of the Government

Delays caused by wartime or other emergency restrictions, priority allocations, supervening legislation, or other regulations are excusable. A court order which delays the project is likewise an act of the government which excuses late completion.

(iv) Acts of the Public Enemy

Acts of foreign powers which result in wartime restrictions are a valid basis for excusable delays. Criminal acts may also prompt excusable delays.

(v) Other Excusable Delays

Other circumstances may give rise to excusable delays. If the contractor encounters an unforeseen subsurface condition, the contractor may be entitled to a time extension even where it is not entitled to additional compensation.

(b). Contractor Caused Delay

The contractor is liable for delay damages for unexcused delays. The contractor should be given time extensions for all excusable delays before calculating days of delay. If the contractor abandons the project or is terminated, the amount of chargeable delay is calculated by estimating the reasonable period of time for the work to be completed after the contractor left the project. If the contract does not contain a liquidated damages provision, the owner may recover actual damages resulting from the delay. The measure of damages may be the value of loss of use of the project for the duration of the delay, or some other expenses caused by the delay. Loss of use may be lost income from rental or profits from the use of the project. The owner may recover the additional interest payments it made on construction financing during the delay.

(i) Liquidated Damages

Construction contracts often provide for a fixed sum of dollars per day that the contractor must pay for each day of delay. This liquidated damages provision is enforceable only if the stipulated amount is a reasonable approximation of the probable loss that will be caused by delayed performance and if the damage caused by the delay is difficult or impossible to determine. *Stewart*

v. Basey, 245 S.W.2d 484 (Tex. 1952). This test of enforceability is applied by viewing the circumstances as the parties perceived them at the time the contract was made, not when the contract was completed or the damages occurred.

In *Loggins Construction Co. v. Stephen F. Austin State University*, 543 S.W.2d 682 (Tex.Civ.App. -- Tyler 1976, writ ref'd n.r.e.), the contractor agreed to construct a stadium within a certain time. The contract listed liquidated damages of \$250 for each day of delay beyond the completion date. The owner stipulated that the purpose of the clause was to entice the contractor to complete the stadium as quickly as possible under pain of paying the liquidated sum of money. The court held that the liquidated damages provision was an unenforceable penalty. There was no showing that the liquidated damage provision was intended by the parties to constitute any sort of an estimate of losses that could actually be sustained by the owner in case of delayed performance. Even if the intention of the parties was considered, the court found that the liquidated amount bore no reasonable relationship to the harm actually caused by the delayed performance. While the owner's actual damages did not exceed \$6,500, the owner withheld \$39,500 in liquidated damages.

(c). Owner Caused Delay

Most contractor claims for delay are based on the common law principle that the parties to a contract have a mutual obligation not to hinder or interfere with the other's performance. Events beyond the owner's control, however, and for which the owner has neither expressly nor impliedly assumed responsibility, will not support a claim for delay damages. For example, in *Banks Construction Co. v. United States*, 364 F.2d 357 (Ct.Cl. 1966), the contractor was delayed due to a flooded job site. The owner controlled drainage ditches which were inadequate to carry away the

extraordinary rainfall. The court held that the owner had no obligation to upgrade the ditches, since the owner could not anticipate and was not at fault for the extraordinary rainfall.

The time is of the essence clause imposes on the owner an obligation not to hinder or interfere with the contractor's performance, and entitles the contractor to expect that the owner will cooperate fully with the contractor's efforts to complete on time.

(i) Delayed or Restricted Site Access

Construction contracts usually require that the contractor commence performance on a specified date or promptly on issuance of a notice to proceed. Courts hold that the specification of a starting date or the issuance of a notice to proceed constitutes an implied warranty that the project site is prepared and available for performance of the work in accordance with the contract documents, and that the owner is liable to the contractor for damages resulting from a breach of this warranty. See *Plymouth Housing Authority v. Town of Plymouth*, 401 Mass. 503, 517 N.E.2d 470 (1988)(where housing authority contracted for new building, authority was liable for delay where documents selling the parcel were silent as to when old buildings were to be removed). But compare *M.J. Sheridan & Son v. Seminole Pipeline*, 731 S.W.2d 620 (Tex.App. -- 1987)(because hiring company did not represent that it had obtained or would obtain rights of way, hiring company did not breach its contract for failing to provide construction company with a pipeline easement in reasonable time).

(ii) Failure to Coordinate

If the owner reserves the right to retain separate prime contractors for the site, the owner may be liable for failing to properly coordinate the additional prime contractors. In the absence of an

agreement to the contrary, the party in the best position to reduce a risk of loss should bear that risk. For this reason, the owner on a multi-prime project normally has an obligation to coordinate and control the operations of all contractors to avoid unreasonable disruption of, or interference with, the operations of any one contractor. The prime contractor owes the same duty to its subcontractors. *Guerini Stone Co. v. P.J. Carlin Construction Co.*, 248 U.S. 334, 39 S.Ct. 102, 63 L.Ed. 275 (1919).

(iii) Defective Plans and Specifications

United States v. Spearin, 248 U.S. 132 (1918), held that when an owner supplies a contractor with detailed plans and specifications, and requires that the contractor follow the plans and specifications, the owner impliedly warrants that those plans are suitable for the intended purpose. If the court finds that such a warranty exists, delays resulting from a breach of this warranty are compensable delays. (See the discussion above in Section II (A) on the confused state of Texas law on an owner's implied warranties for plans and specifications.)

(iv) Changes in the Work

If the owner makes changes in the work, the contractor can request additional time for such work. If the work does not affect the critical path, the contractor may not be entitled to an extension of contract time. The owner may be responsible for compensating the contractor for its loss of float if such damages can be quantified. If the owner refuses to pay for the contractor's loss of float, the contractor can reserve its rights to additional compensation for delay or impact costs from the owner-directed change. If the owner has directed an excessive number of changes, the contractor may also request damages for the resulting delays and disruptions. *H.T.C. Corp. v. Olds*, 486 P.2d 463 (Colo.App. 1971).

(v) Delays in Shop Drawing Approvals or in Making Changes

The contractor usually must submit for the owner's review shop drawings detailing the specifics of what or how the contractor plans to build particular components of the project. The owner or its design professional usually has to approve, disapprove, or comment on the shop drawings before the contractor is authorized to proceed with the work. If the owner or its design professional do not timely review and respond to the shop drawings, the contractor may have a claim for an unreasonable delay in shop drawing review.

Similarly, if the owner delays in making changes or selections, the contractor may have a claim for the unreasonable length of time.

(vi) Failure to Make Timely Progress Payments

An unjustified refusal to make timely progress payments warrants abandonment of the contract by the aggrieved party. A contractor who justifiably terminates performance before completion because of the owner's wrongful refusal to make payment is not entitled to recover lost profits on uncompleted work, unless the owner also prevented completion of the work. If the contractor continues working despite the owner's wrongful failure to make timely payments, the contractor will be entitled to recover delay damages which proximately result from the delays in payment.