

## The ins and outs of construction contracts

Industrial construction projects are becoming larger and more complex, with shorter schedules.<sup>1</sup> To meet these challenging requirements, such construction projects are often executed by multiple entities located in different countries that may have different business objectives.<sup>2</sup> Engineering and design may be carried out in one country with low-cost labor, while fabrication may be done in another country that has cheap material costs. Orchestrating such a complex arrangement under a tight budget and a demanding schedule is accomplished by using construction contracts.

A construction contract between the project owner and various suppliers is a vital instrument that ensures that the interests of each party are protected, and risks associated with the project are carefully managed. A construction contract is a legally binding instrument that must be clearly understood by all concerned parties at the outset. This article describes the main types of construction contracts and the key elements of a construction contract, including scope, schedule, cost, risk and dispute resolution. Understanding these elements will provide a clear and consistent understanding of the rights and responsibilities of each party.

**Types of contracts.** It is useful to understand how the owner/operator relates to a construction contractor or subcontractor. FIG. 1. shows the relationships in a typical contract structure hierarchy. The main types of contracts are: lump sum, reimbursable time and material, unit price, and cost plus.

As discussed in a previous article<sup>3</sup>, there is no single perfect contract type for every situation. The choice depends on the technical capabilities of each party, the degree to which each party can manage risk, and the project's critical success factors.

**Lump sum.** A lump sum contract is suitable when the scope of the project is well-defined and a reasonable amount of engineering design has been completed. Such a contract is helpful to minimize risk for the project owner. This is the most common type of contract. In some instances, the owner will put guaranteed maximum price language to minimize cost risk/exposure. In this instance, the contractor is capped on the total value of the contract and has limited avenues to pursue with the owner in recouping any additional project costs that are incurred.

**Reimbursable.** Reimbursable contracts are based on previously agreed time and material (T&M) rates for labor, material and equipment rental. These contracts are suitable when time is of the essence, the project scope is not fully defined, and the engineering design is not complete. Such a contract must be managed by the owner with highly qualified people. An owner will sometimes add a "not to exceed (NTE)" stipulation in the contract language to set a maximum limit on the cost and as-

sociated effort of the contractor. The contractor is obligated to halt its activity once the NTE value is met and will need to discuss any additional work efforts with the owner before proceeding further on the job.

**Unit price.** A unit price contract is based on precise costs to carry out well-defined tasks. The rates are influenced by project requirements and job site conditions (e.g., welding at-grade as opposed to elevation). A typical job could have hundreds of unit rates, which is challenging to organize and manage. However, once unit rates have been agreed to, this contract type is easy to manage since the only variable is the quantity of components. Of course, quality must also be managed. These contracts spread risk between the owner and contractor and are most appropriate when there are repetitive tasks on a certain project.

**Cost plus.** This contract is based on the payment of actual costs (labor, material and equipment) plus an agreed-upon fee (an actual stated fee amount or a percentage) that is used to cover the contractor's overhead and profit. Cost plus contracts are used when the scope has not been clearly defined. While similar to a T&M-type contract, there are enough differences in a cost plus arrangement. The contractor needs to provide enough supporting detail on all costs incurred, which provides the owner with some insight on the contractor's business activities. However, with a T&M contract, there is not much incentive for the contractor to find the most cost-effective means of executing the scope, as it will receive a profit and overhead regardless of any cost.

**Contract components.** An infinite variety of projects exists depending on location, size, scope and schedule. Likewise, there is an infinite variety of commercial contracts. It is important to have all the relevant documents as exhibits attached to a contract. This avoids any sort of confusion on what is covered

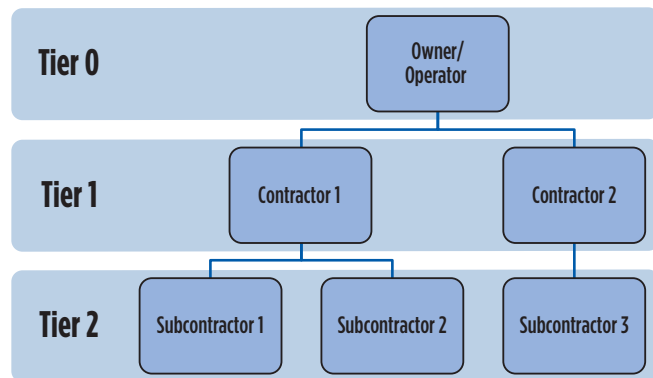


FIG. 1. Typical contract structure.

in the contract. This section will review the critical areas of a construction contract.

**Scope of work.** The scope of work defines the project. Such a description includes a clear definition of the work that must be accomplished by the contractor. Typically, the owner defines the scope of work. Scope defines the exact location of the project and the prevailing environmental and climatic conditions. Depending on how much engineering has been completed, the scope should include a heat and material balance, piping and instrumentation diagram (P&ID), equipment list and equipment layout. Construction materials and line sizes should be clearly specified. Any restriction on sourcing materials from certain countries should also be clearly described. The split between the activities of the owner, such as securing permits, and those of the contractor is important to avoid confusion. A project administration function should be defined, including how payments will be issued and the process for changes.

**Schedule.** A scope of work is meaningful if it is associated with a detailed schedule. A clear timetable should be included, which includes dates from issuance of a purchase order to project substantial completion and startup.

**Cost considerations.** Several cost considerations include:

- **Price**—The contract price defines the total amount of money being contracted. This should be in the same document as the scope of work. Possible additions or deductions to the contract price should be clearly specified. It is also important to describe how the money is going to be paid to the contractor, whether it is on a monthly basis or progress payments based on achieving well-defined milestones. This section should also specify what percentage of money may be retained on the contractor's invoices. In addition, depending on project scope, complexity and criticality of completion time, there may be liquidated damages language included to provide the owner with assurance that the project will be completed as agreed to, and some financial relief will be provided by the contractor in case the date is not met. Typical payment terms are net 30 d from invoice. At present, it is not uncommon for owners to ask for net 60 d or even net 90 d. While such a clause is possible, it adds an additional burden to the cash flow of the contractor. The contractor is acting like the 'bank' for the owner.
- **Warranty**—A warranty is a commitment by the subcontractor that it will remedy, without additional charge, deficiencies in its material and workmanship during an agreed period—typically 1 yr after installation. A warranty that is spelled out in writing in a construction contract is called an "explicit warranty." In addition, there are certain implicit warranties recognized in a construction contract unless they are explicitly excluded. When subcontractors are employed, the term of the subcontractor's warranty should match that of the main contractor.
- **Insurance**—A construction company usually must have the following types of insurance to manage risk: general liability insurance, commercial auto insurance, license bonds/permit bonds, workers' compensation insurance and umbrella insurance.

General liability insurance is for injury and property

damage. This insurance is essential in today's litigious environment. Typically, the contractor is best positioned to manage a safe jobsite. Subcontractors must carry their own insurance, which should match the insurance of the main contractor. Otherwise, significant gaps in coverage can result. If there is a valid claim against a policy, there can be an increase in the premium. Hence, it is in everyone's interest to maintain a safe work environment. Completing jobs on time, being responsible and keeping a solid business operation lead to smaller premiums and deductibles in the insurance policy.

- **Payment bonds**—The owner may require the contractor to have payment and/or performance bonds. This provides the owner with assurances that a contractor will pay all vendors and subcontractors associated with the project. A performance bond provides assurance that the project will be completed in a timely manner, with high quality. While bonds are obtained from an insurance company, they are different from insurance. If the owner makes a claim against the contractor for either payment or performance issues, the bonding agent will settle the claim with the owner and seek reimbursement of the claim from the contractor. A bond must be paid for by the contractor. Conversely, an insurance claim must be paid by the insurance company.

**Risk.** The following are instances of risks on a project:

- **Force majeure**—This is an event that cannot have been reasonably foreseen. Such an event would prevent the contractor from completing their task on schedule. It also has cost implications. Certainly, the word 'reasonably' is open to interpretation. For example, delays due to snow in December in Chicago can be reasonably foreseen. However, it is not reasonable to expect such delays in Houston. Some common force majeure events include fire, weather and labor disputes. A contract must clearly specify whether there is provision for additional schedule and compensation due to *force majeure*.
- **Limitation of liability**—Liability can be limited or excluded by having a clear clause in the contract. Indemnification is also used to limit liability. These provisions are state-specific and must be carefully examined.
- **Liquidated damages**—Liquidated damages is a term to compensate the owner for delays due to the contractor. It is specified based in terms of dollars/wk up to a certain maximum value. Typically, liquidated damages are tied to lost profit for the period in question. Liquidated damages need to be clearly understood and specified, as they represent a large exposure to the contractor.
- **Termination**—Termination by the owner can be at will or due to a cause. In the case of "at will," the owner will be required to compensate the contractor for all expenses incurred up to that point, including a reasonable markup. Termination at cause can be due to a failure of the contractor to perform. This can be due to quality, safety and/or skill level of workers. Likewise, a contractor can terminate the contract if the owner has not paid undisputed amounts. The range of reasons for a contractor to terminate a contract are very limited.

**Disputes.** Construction companies like to avoid disputes with their customers.<sup>4,5</sup> However, for anyone with experience in this industry, it is common knowledge that disputes happen. For example, incidents can happen regarding miscommunication on scope or schedule, mistakes in estimating, late ordering of long lead items and failure to adequately deploy necessary resources onsite. These mistakes are bound to happen eventually, since human beings are not infallible. Disputes can be minimized by having good paperwork administration, rigorous prequalification of project participants, sound quality management practices and having a risk mitigation plan. Large, complex projects have hundreds of documents that are relevant. Key documents should be attached to the contract. If this is not possible, and conflicting information is presented in different documents, then a clear order of precedence must be established. This describes which document applies in the event of a dispute.

The mark of a superior contractor is how it deals with disputes. The best approach is to sit down face-to-face, in a non-emotional environment, to examine the facts and figures, without any finger-pointing. In such a problem-solving environment, both parties should find the best solution and resolve the issues among themselves. When this is not possible, a contract will specify that third-party arbitration is the remedy. As a last resort, the contract usually specifies the governing law. Typically, this is defined by the state in which the owner is located or where the project is being executed. It may be noted that governing law is different from the jurisdiction state. Jurisdiction refers to where

a dispute will be resolved. Companies can also have an arbitration clause, which happens prior to filing a legal claim, which is costly and time-consuming for all parties.

**Takeaway.** Success in a construction project can be ensured by having a well-defined construction contract. This ensures that the interests of each party are appropriately protected, and risks associated with the project are carefully managed. A construction contract is a legally binding instrument that must be clearly understood by all concerned parties from the outset. A good construction contract should include scope, schedule, cost, risk and dispute resolution, thereby providing a clear and consistent understanding of the rights and responsibilities of each party. **HP**

#### REFERENCES

Complete References available online at [www.HydrocarbonProcessing.com](http://www.HydrocarbonProcessing.com).



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