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A SURETY'S GUIDE FOR EVALUATING CONSTRUCTION CLAIMS

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When faced with an impending default termination it is often necessary for a surety to evaluate potential construction claims before deciding the proper course among its options for completion of the Project. Decisions concerning the most cost effective means to complete the work should include an analysis of the construction costs associated with particular claim events. Also, the salvage value of outstanding claims may dictate the extent of the surety's involvement with the project and with the principal.

With an understanding of how to quantify construction claims, a bond claim analyst is better able to evaluate the claims being advanced by its principal; mitigate costs to complete; assist its claim consultant toward developing a pricing methodology that will properly track costs incurred and yield the most defendable conclusion; and identify and quantify claims from the books and records.

I. METHODS OF CALCULATION

A. Overview

In addition to establishing the entitlement for the claim event, the contractor also bears the burden of proving both the existence and the amount of damages incurred. The general rule is that the injured party must establish the extent of its damages with "reasonable certainty." Several methods of calculating construction contract damages have been accepted by the courts and administrative boards considering those claims. The method of calculation most effectively utilized is generally determined by the nature of the damages sought and the quality and detail of the contractor's project records. The sufficiency of the contractor's books and records are discussed below in relation to the actual cost pricing method. As a threshold matter, however, it is necessary to consider what types of damages claims are permitted by the contract before determining how best to quantify them.

As a general rule, the basic aim of the courts in awarding breach of contract damages is to place the aggrieved party in the same financial position in which it would have been had the contract been fully performed. This often requires recovery of both the losses incurred by the contractor and the gains prevented as a result of the breach. Contract damages, however, are limited to those damages that are a "foreseeable result" of the breach at the time of contracting. This principle has given rise to two distinct categories of damages:

1. "**general damages**" are those which naturally arise from the breach; and

2. "**consequential damages**" are those which may not naturally flow from the breach but which were reasonably in the contemplation of the parties at the time of contracting. Examples of consequential damages commonly articulated by courts include lost future work, certain lost profits, diminution in the value of business, and certain interest costs.

Notably, when the Government materially breaches its contractual obligations, only limited types of consequential damages may be recovered. Generally, for Federal contracts,

loss of bonding capacity, lost profits on other contracts, and losses on future contracts are deemed too remote and speculative for a contractor to recover. Rhen v. United States, 17 Cl. Ct. 140 (1989); Cox & Palmer, ASBCA No. 37328, 89-3 BCA ¶ 22,197 (1989); Land Movers, ENGBCA No. 5656, 91-1 BCA ¶ 23,317 (1990).

B. Actual Cost Method

The most accurate and accepted method of quantifying damages is by the use of definite calculations based on actual historic cost records that have been regularly maintained as costs are incurred. As there is a direct correlation between the type and specificity of supporting data and the ability to cost effectively maximize claim recovery, a bond analyst in a claims scenario should become immediately familiar with the contractor's record keeping practices. When reviewing a contractor's cost control system to determine its usefulness in quantifying claims, a bond analyst should determine whether or not the following cost controls were implemented and maintained by the principal.

1. Jobsite cost ledger. A well maintained job cost ledger records actual costs in as many separate cost accounts as the nature of the project will practically permit grouped by like categories or divisions of work. For use as a management tool, the job cost ledger should include a cost comparison between the bid amount and cost incurred on a percentage of completion basis.

Equipment costs and labor costs should be assigned into each task or function for which they are expended. At a minimum, equipment costs should be separated by equipment type.

2. Updated Project Schedules. The project record should include updated schedules demonstrating the critical path to completion, long lead items, available float and the estimated completion date. Here it is important to discern whether or not the schedule is a means of managing the job or just a payment mechanism for estimating percentage completion.

3. Corporate Financial Statements. For quantification purposes, corporate financial statements are necessary to discern the principal's historic home office operating costs as well as to calculate the home office overhead losses for inclusion in a delay claim.

4. Fixed Asset Register. This document will record the acquisition cost and depreciation on all capital expenditures that may be necessary for calculations of actual equipment costs.

5. Subcontractor Change Order/Control Log Lien Releases. This basic cost control report should present any changes in cost (additions or backcharges) or time (time extensions or deletions) so that costs for work not performed by the principal can be accurately gauged, payment history ascertained and bond losses anticipated.

C. Total Cost Method

A less favored method of calculating damages is the total cost method. Evidentiary

prerequisites must be met before this methodology will be accepted by courts and/or boards. Where actions by the owner clearly cause damages to the contractor but the amount of those damages are not possible to precisely define, the courts have reluctantly awarded damages calculated by this method. See e.g. J.F. Allen Co. v. United States, 25 Cl. Ct. 312 (1992); WRB Corp. v. United States, 183 Ct. Cl. 409 (1968). The most basic application of this damages method is calculated by subtracting the original estimated cost of performing the entire project (bid) from the total actual cost of performance. An obvious shortcoming of this generalized approach is that it does not distinguish between the various factors causing damage. Rather, the difference between actual cost and the estimated cost of the entire project is assumed to be the result of owner-caused problems. Further, the total cost method assumes that the original estimate of the work as well as the actual costs are reasonable. The total cost method is best applied when the problems of causation and the reasonableness of the original estimate are addressed.

D. Modified Total Cost Method

This method attempts to address the problems inherent in the total cost method. Under this approach, the original bid estimate and the actual cost of performance are adjusted by the contractor to eliminate any inaccuracies in the original bid and any actual costs which are not the responsibility of the owner. This refinement of the original estimate and actual costs generally involves a segregation of the work activities that are impacted by the claim from those which are unaffected.

The contractor may refine the modified total cost calculation further by engaging an independent expert to address the reasonableness of the contractor's original bid and/or the costs for performing the impacted work.

E. Jury Verdict

Where the existence of damages is clearly established, uncertainty as to the exact amount should not preclude recovery. Under the jury verdict approach, a reasonable approximation of the damages incurred by the contractor is derived from all of the types of proof available including any actual cost data, accounting records, estimates by expert witnesses, and calculations from similar projects. The test is whether the evidence adduced is sufficient to enable the court or board to make a fair and reasonable approximation of the damages incurred. Notably, the court or board will examine whether the absence of proof is justifiable when considering the application of the jury verdict method. See e.g. Joseph Pickard's Sons Co. v. United States, 532 F.2d 739 (Ct. Cl. 1976); WRB Corp. v. United States, 183 Ct. Cl. 409 (1968).

II. RECOVERING DIRECT COSTS

This cost category includes increases in labor, material and equipment costs allocable to a specific job and not necessarily a function of extended or suspended performance.

A. Direct Labor Costs

1. Calculating Additional Labor Costs

a. Additional Labor Hours -- When additional labor hours are expended in performance of a contract due to the owner's interference, acceleration, or directive to perform work outside the scope of the contract, a contractor is entitled to recover its direct labor costs caused by such actions. Where records are properly segregated and prepared, the computation is simple: the number of additional hours expended is multiplied by the appropriate wage rates and mark-up percentages. If the direct costs associated with the change event are not clearly segregable, then issues of proof should be considered in light of the methods of calculation discussed above.

b. Applicable wage rates -- When additional labor hours are carefully segregated by date and craft or class, the appropriate wage rate can easily be determined by reference to existing union contracts or payroll records. If precise accounts are not maintained, an analysis must be performed to allocate the additional hours to the periods in which the delay or change occurred and apply the rates in effect during that period.

c. Labor Markups -- in addition to each dollar of wages paid, a contractor incurs other employee-related costs referred to as labor markups. The appropriate markup percentage is determined by dividing the cost of employee-related expenses by the total labor cost of the contract. Another alternative is to base this calculation on a distinct period when work was impacted, i.e., six months etc. Be careful to consider all employee-related expenses when paid. Certain costs, such as insurance, are paid quarterly or otherwise and may not be recorded until several months later. This labor markup percentage is then applied to the additional labor wages paid and results in the total additional direct labor costs. Common markup costs include taxes and insurance (e.g., FICA, FUI and SUI, Workmen's Compensation) and Union fringes and/or Employee Health or Retirement Benefits.

d. Additional supervision -- As a basic rule, direct labor cost items for supervision include those employees who are assigned on a day-to-day basis as field supervisors on the project in question. Preferably, employees who are involved on several jobs should have time cards allocating their work hours among projects if they are going to be charged as a direct cost. Alternatively, personnel such as managers, engineers, and estimators are included in overhead computations. When considering this direct cost component, be careful not to "double-count" with overhead damages sought elsewhere.

e. Small tools -- the method of calculating the cost of small tools is to divide total labor cost or direct man-hours into the total small tools cost (and depending on the nature of the project, possibly safety and protective wear). The quotient is then converted to the percentage small tools bear to labor.

2. Loss of Efficiency Damages

While every contractor formulates bids for projects based upon estimates or assumptions concerning the productivity of its labor force, oftentimes these assumptions are disturbed through no fault of the contractor. For example, alterations to the work schedule made by the owner often result in a loss of efficiency to the contractor's workforce. Delays, changes, extra work orders, out-of-sequence work and acceleration or deceleration orders can disrupt work continuity and impact anticipated labor productivity. Although a contractor's losses in this regard are often dramatic, loss of labor productivity can be difficult to document and accurately quantify. Lost productivity damages, are properly understood as a category of direct cost losses and do not need to be presented as delay damages. Consequently, lost productivity damages resulting from owner disruptions can be sought despite a "no damages for delay clause" under the theory that the contractor's method and manner of performance has been changed and is recoverable under the changes clause.

An understanding of labor productivity losses is also extremely important from a "forward pricing" prospective so that when confronted with the decision of how to best complete a project, a bond analyst can best appreciate the impact of available options (e.g., overtime, shift work, man loading, etc.)

a. Events Generally Recognized as Causing a Loss of Labor Productivity

When the following adversities, which are risks normally assumed by the contractor, are encountered as a result of owner-caused changes, acceleration directives, disruptions or delays, the resultant damages due to losses of productivity are recoverable:

(i) Weather -- when a contractor is forced by owner delays to perform in a season different from the one scheduled or to perform a greater amount of work than originally scheduled in an adverse season, any decline in efficiency will entitle a contractor to compensation.

(ii) Overtime – several industry studies have concluded that when field construction operations are scheduled on an overtime basis, productivity is adversely affected.

(iii) Multiple or Larger Crews Than Originally Anticipated -- here, inefficiency can result from crowding, diluted supervision, lack of engineering support or diminishing the level of crew experience.

(iv) Stacking of Trades -- many trades required to work together in an area when it is not large enough to accommodate these activities will result in labor inefficiency.

(v) Site Access Restrictions -- circumstances that inhibit a contractor's access to its work area often result in labor productivity losses. These losses can include those costs associated with the "idling" of its work force or the lost labor hours caused by the work force's efforts to overcome site access limitation.

(vi) Out-of-sequence Performance -- a common cause of labor inefficiency is work performed in a manner out of sequence with the contractor's original schedule. A contractor has a right to perform according to a reasonable plan of operations and can recover for the loss of efficiency caused by disruption to his schedule. Here, care must be taken to provide the causal connection between nonsequential performance and loss of productivity.

(vii) Change Orders – change orders can have a negative impact on labor productivity because they often force a contractor to alter its plan for completing its scope of work, resulting in a need for additional supervision or a reduction in learning or experience curve gains.

b. Calculating Productivity Loss

Accurately quantifying labor productivity losses is one of the more difficult aspects of claim quantification. When deciding on a methodology to recover costs already incurred, it is important to at least consider an impact analysis measuring actual costs. While there is no set method for calculating loss of labor efficiency, the courts and boards appear weary of methods of proof that do not compare the contractor's normal productivity to actual productivity rates experienced when performing the changed work. Likewise, satisfactory settlements are facilitated by use of a methodology based on actual productivity rates experienced on that job. Nevertheless, a variety of methods of calculation have been developed and accepted by the boards and courts:

(i) "Measured Mile Approach" or "Differential Method"

- **Comparison of Similar Work Activities During the Same Project** -- this analysis compares similar activities on the same project on an impacted and nonimpacted basis. It constitutes the most accepted calculation for lost labor productivity. Relatedly, learning curve and/or experience curve theory demonstrates that production rates for construction crews will increase over time as the same task is repeated. Therefore, if the non-impacted work activities used for your baseline are during the early stages of the work, consideration should be given to the impact the lack of "learning or experience" curve had in understating base-line assessments.

- **Comparison to Similar Contracts** -- in many situations, there may not be a "normal" productivity period for the impacted work activity on the same job. If a non-impacted period cannot be identified on the same job, the impacted actual productivity rate is contrasted with the "should have been" productivity rates for similar non-impacted work. It may not be enough, however, to simply estimate the expected productivity rate. This rate should be supported by evidence other than mere observation and experience. For example, a contractor may produce evidence of productivity rates for similar work on other contracts. Alternatively, a careful and detailed explanation of a contractor's estimated labor costs may convince a court or board to award the difference between the estimate and the actual increased costs as compensation for loss of productivity.

(ii) Learning and Experience Curves

Learning curve or experience curve theory demonstrates that production rates for construction crews will increase over time as the same task is repeated. The application of experience or learning curves to evaluate productivity rates has long been recognized by the courts as well as the federal government. See Harrison Western/Franki Denys, ENGBCA No. 5577, 90-3 BCA 1 22,991 (1990); Sierracin/Sylmar, ASBCA No. 27531 et al., 85-1 BCA 1 17,875 (1985) ; DCAA Audit Manual, Appendix F, F-000 Improvement Curve Analysis Techniques (Jan. 1990) (describing the procedures that government auditors follow to evaluate learning curves and their effect on productivity). Marvin Gates and Amerigo Scarpa are widely recognized for their evaluations of experience or learning curves in the construction industry. In a study published by the American Society of Civil Engineers, Gates and Scarpa present detailed procedures and mathematical equations for application of the experience curve to construction-related productivity levels. Marvin Gates & Amerigo Scarpa, Learning and Experience Curves, American Society of Civil Engineers' Journal of the Construction Division, 79 (March 1972).

(iii) Industry Studies on Labor Productivity

When either estimating anticipated costs of a claim (forward pricing) or quantifying losses incurred, industry studies can provide a reference for measuring labor inefficiency. Several trade groups and organizations have performed studies regarding the effects certain conditions have on productivity rates. Examples of productivity studies that have gained recognition in pricing construction claims include:

- **Modification Impact Evaluation Guide (COE)**

The Modification Impact Evaluation Guide is a document developed by the Corps of Engineers designed to assist government personnel in the analysis and evaluation of Project-specific scheduling issues and contractor claims for delays and labor productivity losses. With respect to labor productivity, the Guide addresses issues such as disruption of planned sequencing, crowding, acceleration and overtime impacts. Modification Impact Evaluation Guide, Department of the Army, Office of the Chief of Engineers (July 1979).

The Guide includes several graphs that a contractor can easily utilize in quantifying a claim for loss of labor productivity associated with crowding, acceleration and scheduled overtime.

- **A Roundtable Report – Scheduled Overtime Effect on Construction Projects**

This Report, commonly referred to as the "Business Roundtable Report," was prepared in 1980 in an effort by a cross-section of the construction industry to formally document statistical information concerning the effects of scheduled overtime on labor productivity. The report identified several foreseeable consequences arising from the scheduling of overtime for extended periods on construction projects including disruptions created by unwilling or poorly qualified craft workers, increased absenteeism and increased fatigue among the work force.

Scheduled Overtime Effect On Construction, The Business Roundtable (Nov. 1980).

The report also identified several management alternatives intended to avoid the negative impacts to labor productivity associated with scheduled overtime. These alternatives included:

- employment of additional shifts;
- Use of additional crews to provide scheduled time off without work interruption (i.e., 14 days on, 7 days off); and
- periodic shutdowns over weekends and holidays.

The report also includes several useful tables and graphs designed to assist contractors in evaluating the anticipated cost impact associated with labor productivity losses due to scheduled overtime.

- **Mechanical Contractors Association Management Methods Bulletin**

The MCA Management Methods Bulletin No. 58, entitled "Factors Affecting Productivity," identifies a variety of factors that can negatively impact labor productivity and affixes an estimated inefficiency percentage that varies with the severity of the actual event. Mechanical Contractors Association, Factors Affecting Productivity, Management Methods, Bulletin No. 58 (Jan. 1996).

- **The Leonard Study**

Prepared by Charles A. Leonard, this study quantifies the negative effect cumulative change orders have on the contractor's labor productivity on the unchanged work. Leonard found that where change order hours exceeded 10-15% of earned base contract labor hours, a contractor would incur labor productivity losses on the remaining work. Leonard also developed several graphs that can be utilized by contractors to predict the labor productivity impact to base contract work associated with the occurrence of project changes where those changes constitute more than 10-15% of the base contract labor hours. Charles A. Leonard, The Effects of Change Orders On Productivity, August 1988.

It should be noted, however, that these types of proofs are oftentimes challenged by owners as imprecise due to their generalized treatment of claim events. Consequently, use of industry studies and estimating rates should be supported by other credible evidence or corroborated by expert testimony concerning efficiency losses.

B. Material Costs

Material cost claims are less common than labor, equipment and other types of cost claims because, excepting major change orders, the material required to complete a project is less subject to change. Although delays and interferences could easily double or triple the labor and equipment hours needed to perform the work, the permanent material quantities

often remain the same. In fact, substantial material overruns on a project are so infrequent that it is a useful first test of the validity of the claim. If a contract has substantial labor, equipment, and material overruns, there is a strong possibility that the contractor simply underestimated the scope of work. On the other hand, substantial labor and equipment overruns without a corresponding overrun in material are indicative of an accurate estimate and some outside interference to contract performance. The two most common reasons for material claims are owner-directed changes and defective specifications.

1. Calculating Additional Material Quantities

As with any other claim item, the best method of proving additional quantities is to maintain accurate records of actual materials used. If this is not done, it is also possible to show the quantities provided for in the original contract drawings and compare that to the actual quantities used. If no drawings are available, the contractor's original estimate for a quantity of material can be compared to the actual quantity verified by purchase orders, delivery tickets, and/or other purchasing documents.

2. Computing Additional Material Costs

Like material quantities, actual material costs are fairly simple to calculate and prove. If additional quantities are purchased, an invoice from the supplier and proof that it was paid will establish the costs. Also note that a contractor is also entitled to the cost of transporting additional material to the job site. A final element of material cost to be considered in your claim is sales or use tax. A related cost, which is not strictly a material cost, is the additional cost of handling (e.g., storage costs) or procuring materials that is also recoverable.

C. Equipment Costs

1. Determining Additional Usage

The first step in calculating additional equipment costs is to establish the number of additional "equipment hours" expended or, additional hours equipment was employed on the project. These additional hours can be segregated into general categories: (a) original equipment which was used longer than anticipated; (b) additional equipment required; or (c) a combination of both (a) and (b). Another equipment cost factor to be considered is the severity of operating conditions.

In many cases, it is also necessary to distinguish between the number of additional hours the equipment actually worked and the additional time it was assigned to a contract, but remained idle. As discussed below, the reason for this distinction is that different hourly rates can apply for operating and idle equipment.

The number of additional equipment hours can be calculated in several ways:

a. **Recording Additional Hours** -- the most preferable manner, of course, is to record the actual number of hours that various items of equipment were employed because of the claim situation. In this regard, a daily equipment usage log, indicating where each item of equipment on the project was used each day, is the best source data to support a claim.

b. **Productivity of Equipment and Quantity of Work** -- if no contemporaneous records of equipment usage are maintained, it is possible to determine the number of additional equipment hours based on the quantity of extra work performed and the typical productivity of the equipment.

c. **Additional Contract Time** -- in a delay/disruption claim, there are several ways of calculating the number of additional equipment hours.

(i) The first and easiest method of calculating additional equipment hours in a delay claim is to assume that each piece of equipment on the job, or on a particular segment of the job, was used for a full work day for each additional day of contract performance. The underlying assumption to this approach is that equipment, once assigned to a project, is chargeable to that project until reassigned.

(ii) A second method of calculating additional equipment hours in a delay/disruption claim is to correlate equipment hours to the additional labor hours expended. Once the ratio between labor hours and equipment usage is developed, the total labor hours are divided by the amount of labor hours that are equivalent to one equipment hour.

d. **Labor Inefficiency/Equipment** – As equipment must be run by a contractor's labor force in many instances, a claim event impacting labor productivity will make equipment use less efficient as well. If labor inefficiency impacts equipment usage, the same percentage of loss of labor efficiency should be applicable to equipment costs.

e. **Modified Total Usage** -- the final method of calculating additional equipment time is the modified total cost approach. In this method, the equipment anticipated for the work is compared to the actual equipment usage. Employing this approach, it is extremely important to first identify a particular segment of the work that has been impacted. Next, the contractor must segregate the items of equipment assigned to that segment of the work and the period of time they worked. The additional equipment hours would be the difference between the actual and the anticipated (bid) usage for each item.

2. **Cost of Equipment**

Once the number of additional equipment hours has been determined, it is necessary to multiply those hours by an appropriate equipment rate. Due to the sophisticated accounting required to accurately quantify the actual costs of owning and operating equipment, determining the contractor's actual equipment rate is often difficult. Equipment ownership costs include, among other things, depreciation, interest, overhaul, repair, property taxes, storage and insurance, and overhead. Operating costs include fuel, oil, grease, tires, and repair costs.

Each of these costs should be considered if a full recovery is to be obtained.

In some cases, the problem of selecting an appropriate equipment rate is avoided where the parties agree upon a schedule of equipment rates as part of their contract. In other instances, the contract may refer to a compilation of equipment rates prepared by trade associations or industry groups.

When pricing additional labor costs, care should be taken not to double-count certain equipment operating labor hours that may be included in rates provided by equipment pricing guides, such as mechanics or equipment supervision costs.

a. Equipment Pricing Guides

If contract rates have not been adopted by the parties, equipment pricing guides can be referred to when preparing and proving construction claims. Examples of often-used equipment pricing guides include the following: (a) the Associated General Contractors' of America ("AGC"), Contractor's Equipment Cost Guide; (b) Dataquest, Inc.'s Rental Rate Blue Book for Construction Equipment; and (c) the United States Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule (Corps Schedule), Regions I-X.

Each of these equipment-pricing guides, through varying methodologies and assumptions, provide standard equipment rates based on average ownership and operating expenses. For example, the basic information provided in the AGC Manual includes the following:

(i) Equipment specifications (model, year, capacity, etc.);

(ii) Approximate base price (for new and discontinued\models);

(iii) Economic life expressed in hours;

(iv) Average annual use hours;

(v) Depreciation as hourly ownership expense;

(vi) Hourly indirect equipment ownership expenses (or cost of facilities capital);

(vii) Hourly repair and preventative maintenance expenses (including labor, parts, tires, etc.);

(viii) Hourly fuel and lubrication expenses;

(ix) Combined ownership and operating expenses based upon items (v) through (viii), above (monthly, weekly, daily, and hourly).

The basic data provided in these equipment rate manuals are based on average use conditions, and guidance is given therein for adapting the basic data to situations that may arise on a construction project such as severe operating conditions, multiple shift operations, and standby time.

b. Establishing Rates for Standby Claims

Establishing equipment rates for use in a standby claim presents particular concerns that should be addressed. Certain equipment costs associated with ownership may continue to accrue even in the absence of actual equipment usage (e.g., depreciation, insurance, taxes, and cost of facilities capital). Operation costs, however, do not accrue while equipment is idle. Consequently, standard rates based on average use should be adjusted when presenting a standby claim. Normally, standby is limited to eight hours per day and no more than 40 hours per week.

c. Pricing Equipment on a Federal Government Contract

Since the implementation of the Federal Acquisition Regulations (FAR) on April 1, 1984, Federal Government Agencies have favored the use of the United States Army Corps of Engineer's Construction Equipment Ownership and Operating Expense Schedule, Regions I through X for pricing equipment claims. Although the FAR specifically refers to the Corps' schedule, it is left to the discretion of the individual agency to determine which rate schedule to utilize. The FAR also recognizes that such predetermined schedules do not customarily include cost for labor, mobilization and demobilization, overhead and profit. Therefore, these costs should be separately accounted for and presented as part of the contractor's claim.

A significant difference between the Corps' schedule and the AGC manual, discussed above, is that the former provides hourly equipment rates under three operating conditions -- average, difficult, and severe, and the latter only provides rates for average operating conditions, while allowing for certain adjustments. The Corps' schedule further departs from the AGC manual in that the Corps' schedule specifically addresses standby costs. The AGC manual does not provide a standby rate, leaving it to the discretion of the contractor whether to charge the full hourly rate or a portion thereof. The Corps' schedule, however, limits recovery of standby costs to the hourly costs of facility capital plus one-half of the hourly depreciation rate. Standby time cannot exceed forty hours per week, and the actual operating time during a week will be credited against the forty-hour maximum standby allowance.

d. Pricing Equipment Using Industry Rates

Another source for pricing equipment costs is by reference to those rates recommended by various segments of the construction industry. Of particular interest, the National Electrical Contractors' Association publishes a Tool and Equipment Rental Schedule.

D. Other Direct Costs

In addition to the three basic direct cost categories already discussed (labor, materials, and equipment), a contractor also incurs other costs directly chargeable to the project that are recoverable when increased as a result of an owner-caused change or delay. These other direct costs are costs for goods or services benefiting a particular project which increase as the scope of work increases or the job is delayed. These costs primarily consist of supplies, insurance, and bond premiums.

1. Supplies

Supplies are items and expendable materials which are needed to perform the work but which are not incorporated into the final physical structure. Wood and nails used to construct concrete forms are common examples of supplies. If the contractor is required to provide supplies in excess of its reasonable anticipation, because of some act of the owner, it is entitled to the additional cost. Additional supplies can be quantified by comparing the supplies the contractor reasonably expected to consume, pursuant to its original work plan, and the supplies actually used.

2. Insurance

Another large cost factor on almost all construction contracts is insurance. When a contractor is required to perform additional work, especially when the owner has delayed the work, the contractor is typically required to obtain additional insurance coverage or extend or renew existing policies. These additional insurance costs are almost always recoverable.

3. Bond Premiums

The cost of the bonds to the contractor is usually a percentage of the bond's face value that comports with the contract amount. It is the practice of bonding companies to recompute this bond premium at the end of contract performance. As the premiums are computed on a percentage of contract value, any increase in value will increase the bond premium. Consequently, these costs have been allowed by the courts and boards. Also, additional recovery may be sought for extended premium costs incurred on delayed projects.

4. Claim Preparation Costs

The costs of preparing proposals or requests for equitable adjustments necessitated by owner-directed changes, delays, interferences, or conditions have been found to be recoverable on federal contracts. This should include consulting costs reasonably incurred.

E. OVERHEAD RATES

Overhead costs are a necessary element of damages in a construction claim if losses are to be recouped. These "indirect costs" can be expressed as a percentage markup to the direct costs resulting from owner changes and/or interferences. It should be noted that percentage overhead claims are not the same as extended overhead claims resulting from delays. It is possible to claim both extended overhead and a percentage of overhead on the

same claim so long as appropriate adjustments are made to prevent any double counting.

1. Jobsite Overhead/General Condition Costs

Jobsite or field overhead/general condition costs consist of costs incurred on a particular project site that cannot be reasonably allocated to any direct item of work. Typical costs include both project supervisory and clerical salaries, office equipment and supplies, utilities, telephone costs, postage, and the like, as well as sanitation facilities, transportation, rental and maintenance of automobiles and pickup trucks, and incidental jobsite personnel costs. The jobsite overhead is computed by dividing the total indirect costs at the site by the total direct job costs. A word of caution, courts and auditors often examine overhead calculations to ensure that the charges are not duplicated in other items in the claim or have not previously been compensated for through change orders. For example, to the extent jobsite overhead is recovered for extra work that also comprises part of an extended performance claim, appropriate credits must be given for amounts recovered.

2. Home Office Overhead

Home office overhead, which arises out of overall company management, is well recognized as a recoverable cost. An overhead rate is normally expressed as a percentage of the contractor's direct costs over a period of time. The rate is calculated by dividing the total company direct contract costs into the total home office overhead costs and applying the resulting percentage to the total claimed direct and jobsite overhead costs. As in the case of jobsite overhead, if the extended overhead is also being claimed, the claimed amount must be subtracted from the overhead pool before computing the percentage rate.

3. Profit

Profit is generally recoverable except for instances when the work is suspended. If the contract does not provide an established rate of profit, the percentage mark-up should reflect the nature of the work and the risks inherent therein. Ten percent has been generally recognized as acceptable. Profit is not applied to the bond and claim preparation costs.

III. DELAY DAMAGES

A. Basis of Delay Damages

The contractor is entitled to the increased costs resulting from certain owner-caused delays or disruptions that impact contract performance. Compensable delays should be distinguished from noncompensable delay or excusable delays, e.g., weather-caused delays, for which a contractor may be entitled to a time extension but not its indirect costs caused by the delay. The basis of the right to claim delay damages may be either an express contractual provision or an implied covenant of noninterference with the other party's work.

1. Proof of Delay

The evidentiary prerequisites to establishing a delay claim are as follows:

a. that an act or failure to act by the other party or its authorized representative caused delay to the contractor;

b. that such delay was for an indefinite duration; and

c. that this delay was the cause of the contractor's increased costs. Melka Marine, Inc. v. United States, 187 F.3d 1370 (Fed. Cir. 1999). Thus, before proving the damages incurred, a contractor must first establish that it was delayed and the extent of that delay.

2. Schedule Analysis

Preparation of a schedule analysis is necessary in order to establish the causal connection between owner-caused delays and disruptions and the contractor's extended performance costs. Boards and courts deciding contractors' delay claims have recognized that a critical path method (CPM) analysis can effectively segregate and identify responsibility for delay. A comparison of the contractor's "as-planned" and "as-built" schedules for the work can quickly identify areas of extended performance, which is an essential step to identifying causes of a loss. The more detailed a schedule is, the more precisely the effects of project delays and disruptions will appear. A detailed as-built schedule will highlight areas of out-of-sequence work, delays, acceleration, stacking of trades, and the impact of these disruptions.

a. Collapsed As-built Approach

A contractor's delay claim can be quantified through use of the "collapsed as-built" approach. Here, all owner-caused delays and disruptions are identified on the contractor's as-built schedule. These owner-caused delays and disruptions are then collapsed-out of the as-built schedule to produce the contractor's "should have been" work schedule or, put another way, the contractor's achievable schedule but for owner-caused delays and disruptions. Notably, only owner-caused delays and disruptions which impact the critical path will, when collapsed out, result in a shorter duration "should have been" schedule. The reasonableness of this final "should have been" schedule is then established through comparison to the contractor's original as-planned schedule. Upon concluding this process, delay days are ascertained by comparing the contractor's as-built schedule to the contractor's "should have been" work schedule.

b. Alternative Methods of Schedule Analysis

In addition to the collapsed as-built approach, there are several other methods of schedule analysis used to quantify delay damages. Two often-used alternatives are the window/snap shot approach and the time-impact approach. Set forth below are the analytical steps to follow with respect to each method:

(i) Window/Snap Shot Approach

- update schedule prior to delay occurrence
- quantify duration of delay period (estimated or actual duration)

- insert delay into schedule update with appropriate logic
- calculate impact of delay (revised completion date minus original update completion date)
- repeat process for all delays

.

(ii) Time Impact Approach

- update schedule prior to delay occurrence
- update schedule after delay occurrence
- identify impacted path, choose impacted activity
- calculate impact of delay (post delay update completion date minus pre-delay update completion date)
- compare impact of delay to impacted activity for causal link
- repeat process for all delays

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3. Concurrent Delays

Some of the most difficult claims a contractor can make are for owner-caused delays or disruption arising during periods when there were concurrent delays by the contractor or other sources outside of the owner's control. Under such circumstances, if responsibility cannot be apportioned, delays are considered excusable but not compensable. In these instances, for the contractor to recover, it must be able to show that the delay or disruption for which the claim is made was the actual cause of its extended performance. Thus, the contractor must identify the critical path activities throughout the project and establish that the causes of delay affecting the critical path were attributable to the owner.

B. Pricing Delay Claims

1. Escalation Costs

Perhaps the most obvious type of delay damage is escalation for labor, material and supplies. Escalation is the additional cost incurred because labor is performed and/or materials and supplies are purchased at a later, more expensive, time period than initially contemplated.

a. Labor Escalation

There are three elements necessary to prove labor escalation: (1) an anticipated manloading schedule; (2) an actual manloading schedule; and (3) the wage rates actually paid over the life of the project and the time periods during which those rates were paid. The first and second elements, the anticipated and actual manloading schedules, are elementary in concept, but frequently difficult to plot. Many contractors prepare an anticipated manloading schedule at the time of bid or prior to the start of work. If there is no anticipated manloading schedule, an after the fact manloading schedule needs to be prepared from the original contract schedule. It should allocate the number of men needed to complete each activity on the schedule. The total labor force should then be plotted on a time/labor force chart on a monthly or weekly basis. The actual manloading schedule is prepared from the contractor's

daily reports, payroll records or other comparable documents. This information is then plotted as actual manloading data on the same time/labor force graph as the anticipated schedule.

A problem which arises in preparing anticipated and actual manloading curves is that the anticipated and actual numbers of manhours are almost never the same. It is important to remember that a labor escalation claim is only for the increase in wage rates on hours actually worked; it does not contemplate the recovery of the cost difference between the total anticipated and the total actual manhours. In order to correct this problem the anticipated manloading curve must be adjusted to reflect the actual manloading hours expended in accordance with the actual manloading curve.

The third element of labor escalation is the wage rate. Obviously the contractor can only recover when manpower is being expended, not only in a later, but also in a more expensive period than was originally anticipated. Therefore, it is necessary to determine the anticipated wage rate(s) for the contract performance period and the actual rates. On union contracts, both the anticipated and actual wage rates are easy to determine. On nonunion projects, the contractor's task is more difficult, at least for the anticipated rates that must be based on original project estimates. For the actual rates, the contractor should use averages ascertained from the payroll records. Since most delay/escalation claims also include some additional hours worked for which the contractor is entitled to additional compensation, it is important to avoid duplication. In this regard, all hours for which the contractor has been paid its actual costs incurred must be subtracted from the computation.

Once the manhour allocation has been completed and the wage rates established, the actual computation is quite simple. It is simply necessary to multiply the manhours by the appropriate wage rates on both the anticipated and actual schedules and subtract the difference.

2. Material and Supply Escalation

In addition to having labor costs rise before performance is complete, a delayed contractor may also face higher material and supply prices. A preliminary step to recovering material and supply escalation is to establish that each item could not have been purchased during the anticipated contract period. An example of how an owner delay or disruption could have delayed the purchase of materials until after a price increase is when defective specifications prevented the contractor from purchasing the materials at an earlier date. Another reason might be limited storage space on the project site.

When quantifying the material escalation costs, it is best to present item-by-item documentation as to all price increases through purchase orders, invoices and the contractor's jobsite records. Certain items, however, such as concrete or steel may have set escalation clauses in the purchase orders themselves. Otherwise, certain material escalation costs can be calculated by using price indices available in industry publications.

3. Extended Performance Costs

Usually the most significant aspect of delay-caused expense is the cost of continuing work on a project over a longer time period than first anticipated.

a. **Idle Labor**. The cost of having to maintain a workforce, despite not being able to utilize it, is recoverable. This cost is recoverable, however, only if the labor could not be discharged without risk of later unavailability or could not be switched to another interim project without unnecessary expense.

b. **Idle Equipment**. In a delay claim, reimbursement for unused equipment may also be obtained. Additional equipment hours must first be calculated and then multiplied by the appropriate rate.

c. **Jobsite Overhead/General Conditions**. When performance on a project is delayed, the contractor often continues to incur expenses at the jobsite even in the absence of productive work. Bills for items such as supervision, office space, storage, utilities and telephone service continue to accrue. All of these costs are time-related and are recoverable. To figure the amount of extended jobsite overhead, a total of all the time-related or fixed costs incurred at the jobsite must be determined. The components previously mentioned are usually reflected as specific line items in project cost records, so this calculation is usually not difficult. This total is then divided by the number of days over which the costs were accrued to arrive at a daily jobsite overhead rate. The daily jobsite overhead rate is then multiplied by the number of delay days to arrive at the claim amount. Care should be taken when adding up jobsite overhead that double recovery does not result by including some of the claimed expenses in the overall home office overhead claim amount.

d. **Home Office Overhead**. Home office overhead is defined by courts and boards as those costs expended for the good of the business as a whole, and which usually accrue as a function of time (or fixed indirect costs). Put another way, home office overhead are those time-related costs that are not directly attributable to a particular project. Although courts and boards have permitted contractors to recover costs associated with home office overhead arising from delay, they have struggled with determining the proper evidentiary prerequisites for recovery and the method of calculating such losses.

(i) Quantifying Home Office Overhead Losses.

Recovery of home office overhead costs is complicated by the fact that these losses can only be established by approximation. By definition, home office overhead expenses are undifferentiated costs spread among many projects, and accepted accounting methods do not lend themselves to allocating these costs with precision. Contractors bid work with home office overhead figured as a percentage of direct costs, and owner-caused delay/disruption often results in an interruption in the contractor's stream of direct costs. Then, the question becomes how to recapture home office overhead dollars the contractor was forced to carry without the anticipated stream of direct costs, and related revenue to cover the costs.

The courts and boards which have closely examined contractors' extended performance

claims have drawn a distinction between home office overhead costs. Extended home office overhead costs have been defined as an increase in home office overhead attributable to an extension in the time of performance. Alternatively, unabsorbed or under absorbed home office overhead costs have been defined as home office overhead expenses needlessly consumed by an idle or partially idle contractor. Here, the reduced activity project does not absorb its share of home office overhead costs and the rate of allocation of home office overhead costs to other projects increases.

(ii) Establishing the Home Office Overhead Pool

Guidance for which types of selected costs can be properly included in the home office overhead pool can be found in the Department of Defense, Defense Contract Audit Agency Manual (See e.g., § 31.205 Selected Costs). Costs that are generally determined to be "allowable" as home office overhead costs are the following:

- weekly payroll costs
- Davis-Bacon reports
- W-2/required tax forms
- home office salaries (executive and clerical)
- dues and subscription costs
- mortgages/rents
- travel costs
- phones/photocopying/office supplies
- insurance
- property taxes
- professional fees and trade licenses
- employee recruitment/training
- depreciation

Costs that are generally determined to be "unallowable" include:

- general advertising costs (note however that certain particular advertising costs arising from requirements of the contract are allowable including, recruitment of personnel and disposing surplus materials)
- entertainment costs
- recovery of bad debts
- contributions/donations
- interest

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(iii) Evidentiary Prerequisites to Recovery

Generally, in order to succeed in recovering additional home office overhead costs, the contractor must establish that: (1) owner-caused delay occurred; (2) the contractor remained on "standby" during the delay period. The focus here is on the fact that the owner-caused delay resulted in a reduction in the contractor's anticipated stream of direct costs and not necessarily the idleness of the contractor's work force; and (3) the contractor was unable to take on other work or otherwise mitigate its damages during the delay period. Cases have held that a contractor can meet its burden of proof in this regard by establishing that the delay

period was "of an uncertain duration." Melka Marine, Inc. v. United States, 187 F.3d 1370 (Fed. Cir. 1999). The burden then shifts to the owner to present rebuttal evidence or argument showing that the contractor did not, or should not have, suffered a loss because it was able to reduce home office overhead losses attributable to owner-caused delay by reducing its overhead or obtaining other work.

(iv) Calculating Home Office Overhead

The most widely recognized formula for calculating home office overhead costs is the Eichleay Formula. The Eichleay Formula is expressed as follows:

1.	Contract Billings Total billings for actual performance period	X	Total overhead for performance period	=	allocable overhead
2.	Allocable overhead Days of Performance	=	Daily Contract over-head		
3.	Daily contract overhead	x	Number of Days of Delay	=	Amount recoverable

This formula allows for the allocation of home office overhead costs to a particular project based on its percentage comparison to all work performed during that period on a revenue basis.

IV. CONCLUSION

The best damages are those never incurred. Understanding the construction costs associated with a claim event and how these costs must be presented for recovery provide a bond claim analyst with invaluable budget management insight when making decisions affecting project completion. The next best losses are those quickly recovered without expensive litigation. Understanding the rigor of proving construction damages will prepare the bond analyst to assist the principal/completion contractor in setting up their books and records so that losses can be thoroughly documented and powerfully presented.

Finally, learning how to identify claim events, track costs and quantify losses will provide the bond analyst a means of maximizing salvage when disputes are unavoidable.