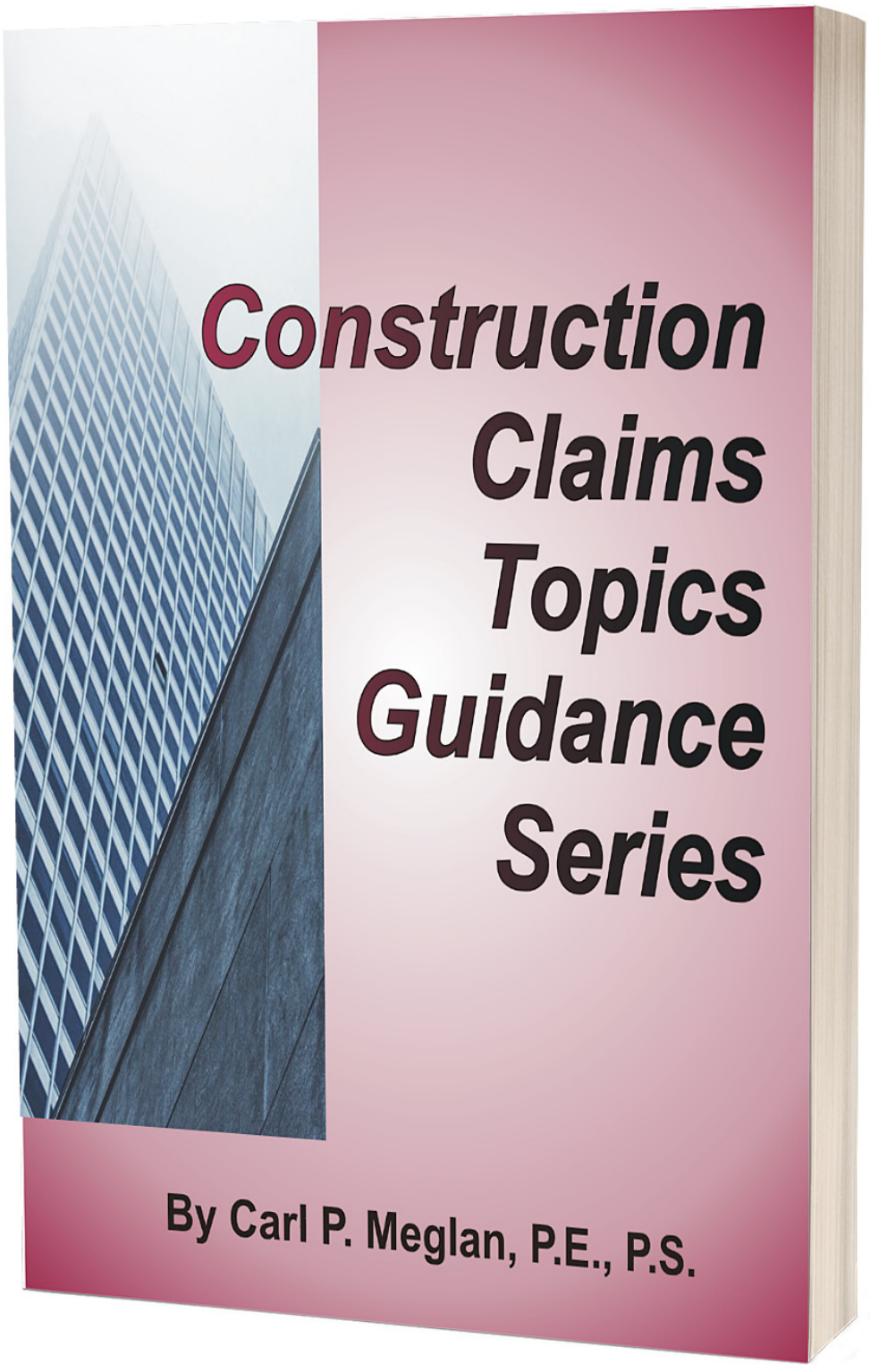

PREFACE

For more than a century, applied science and engineering have created major avenues for advancements in building and roadway construction, materials testing, and project delivery methods. Beyond technological achievement, however, three elements remain basic to the success of any construction project — cost, quality, and schedule. All three elements are mutual, and all three must be carefully executed to produce satisfying results. Still, even the best-planned projects can encounter challenging obstacles or disputes, often threatening the successful completion of a contract or increasing risk due to unresolved issues.

Before his recent passing, Carl P. Meglan, P.E., P.S. (1937-2018), author of the *Construction Claims Topics Guidance Series*, brought more than 40 years of engineering experience to the forefront of dispute and claims resolution. He specialized in the risk management practices that are vital in today's construction marketplace. As a notable benchmark, he provided mediation or arbitration services for the American Arbitration Association on nearly 120 construction claims cases addressing more than $7 billion worth of projects across the United States. Combined with training in construction forensics and organizational leadership, Meglan's professional reach extended to more than 200 projects in both the public and private sectors. His construction expertise encompassed a wide array of engineering projects, including dams, sewers, and water and waste treatment facilities; streets and highways; tunnels, bridges, and airports; educational institutions; hospitals and health care facilities; prisons; warehouses, office complexes, and retail malls; power plants and marine, mining, and industrial facilities; and athletic complexes.

Risk is an inherent element in all successful businesses and industries, particularly construction, but avoiding risk totally may not be all that prudent, according to Meglan. One could lose a substantial share of marketplace potential. He pointed out that what consultants call risk avoidance is actually the practice of not placing one's self in jeopardy or harm's way by exposure to unnecessary liability. This is generally accomplished through carefully structured contract documents and reliable insurance underwriters. Equally important, though, Meglan emphasized, is having a defined risk mitigation plan in place *before* a construction claim or project dispute arises. Hopefully, this *Construction Claims Topics Guidance Series* will assist in that challenge.

DISCLAIMER

Construction Claims Topics serve as guidance documents only and are written for the expressed purpose of helping construction industry executives and supervisors learn better ways of identifying the sources and causes of construction claims and preventing disputes. For exact interpretations on matters of law, always consult with expert legal counsel.

Construction Claims Topics Guidance Series

Productivity and Efficiency Losses Due to Trade Stacking and Area Crowding

Loss of Efficiency and Productivity Due to Effects of Weather

Contract Conditions vs. Scheduling Provisions and Specifications Requiring Owner/Designer/CM Approval

A Primer on As-Bid, As-Planned, and As-Built Construction Schedules

Quantifying Extra Costs for Delay-Shifted Labor, Materials, and Equipment

Beware of No-Damages-for-Delays Clauses

Major Types of Contractor Delays Encountered on Construction Projects

Construction Progress and Coordination Meetings and Minutes

The "Measured Mile" Proof of Lost Productivity and Damages

Construction Changes Are Not Always in Writing Nor Are They Always Obvious

Bad Faith- and Fraud-Caused Construction Claims and Disputes

Lost Labor Efficiency Caused by Overtime Fatigue

Productivity and Efficiency Losses Due to Shift Work

The Eichleay Formula (Extended Home Office Overhead Cost Allocation)

Productivity and Efficiency Losses Caused by Unplanned, Out-of-Sequence Work

The Difference Between a Construction Arbitration and a Construction Lawsuit

Proving Entitlements for Delay Damages Not Attributed to the Contractor

Lost Productivity and Efficiency Caused by Oversized or Undersized Work Crews

Claims — Final Payments — Warranty Work

Consequential or "Extra" Damages in Construction Claims and Disputes

Unforeseen, Latent Site Conditions

Efficiency and Productivity Losses Due to Labor Shortages and Lack of Skilled Labor and Supervision

Published and Widely Circulated Construction Law Case Citations

Binding/Nonbinding Arbitration Clauses

Schedules: Why Use Activity "Numbers" When You Can Use Words?

Contractual Terminations for Default

What Is a Construction Forensics Expert?

Notices: Why Daily Construction Record Reports and Schedules Are So Important

Change Order and Contract Modification Reservation-of-Rights Clauses

Failures of Implied Warranties of Design

Construction Scheduling Notes

Timely Professional Assistance Yields Big Benefits and Fewer Worries

Lost Productivity/Efficiency Checklist

How NOT to Convert a Change Order or Extra Work into a Claim

"Sticking It to the Other Guy" — The Art and Science of Transferring Risk

Partnering: An Old Idea Whose New Day Has Definitely Arrived

Proof of Contractual Entitlements and Calculation of Damages Incurred Due to Non-Contractor-Caused Delays

Guidelines for Construction Contracting with the Federal Government: Part I

Guidelines for Construction Contracting with the Federal Government: Part II

Construction Productivity: Daily Construction Record Reports

Government Fraud and Bad Faith Conduct Significantly Change the Damages Recovery Picture

Reimbursement Exclusions to the Equal Access to Justice Act

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Productivity and Efficiency Losses Due To Trade Stacking and Area Crowding

Trade Stacking

This practice is commonly found on delayed building projects that have been accelerated to a contract-specified completion date. Trade stacking is a phenomenon that involves the tightening of serial operations of a number of different follow-on trades or the conversion of serial operations to parallel operations for those trades.

The idea is to schedule more tradesmen into areas of the building(s), concurrently or very tightly behind each other, to rough-out and finish the building(s) in the least amount of time without causing serious disruption between those trades in the process.

Unfortunately, tighter serial operations or parallel operations usually *do* cause serious delays or disruptions in the work of some or all the trades involved. It is not uncommon to have plumbers, electricians, drywall installers, carpenters, HVAC workers, block masons, glazers, and ironworkers (to name a few) working on the same floor of a high-rise building, all trying to move their materials, equipment, tools, and tradesmen onto the floor with the same lift or hoist, and all trying to sequence themselves so their work is done correctly in the scheduled order.

Under normal circumstances, one to three trades usually work on a floor at one time. In a trade-stacked environment, all the rough-in trades would probably be on the same floor at the same time, and all the finish trades would probably be on the floor or two below them at one time. The idea is to finish out floors for punch-out and occupancy as quickly as possible. As long as the trade stacking and logistics flow are both well coordinated, the effort may work. The key word is *coordination*.

Because the owner is the one who usually orders trade stacking, the burden of accurate and thorough coordination falls on the owner or the owner's construction manager or design professional in the absence of a CM.

Instead, what usually happens is that a CM or design professional orders all trades involved to "coordinate their work with each other so as not to interfere with or disrupt each other." After that, a "hands-off" attitude usually prevails on the part of the CM or design professional. When that happens, the *ordered* coordination between trades becomes mythical or illusionary at best, and rather substantial productivity and efficiency losses occur in all or most of the trades.

Trade stacking can be accomplished without efficiency losses if an owner is savvy enough to appoint a "king" or "traffic director," order its CM or design professional to do so, or hire one. These individuals supervise all coordination efforts and oversee that each trade has ample, uncrowded space to work in and that the logistics system is there to support the work.

Efficiency losses caused by trade stacking are often mistaken as losses caused by overtime fatigue, area

crowing, shift work, etc., because those efficiency loss operations or situations usually accompany owner-ordered trade stacking.

Proving that trade stacking has occurred is a relatively simple matter. However, quantifying what the efficiency losses and consequential damages are in dollars on a trade-by-trade basis is not that simple. Moreover, those losses often get commingled with other efficiency losses and their resulting damages.

To make matters more complicated, the owner, CM, or design professional sometimes institutes a back-charging system that attempts to pass the losses from trade to trade or among contractors and subcontractors. Back-charging attempts to levy the cost of one trade's suffered interferences, disruptions, and other matters on the party who is *allegedly responsible* for the delays.

The back-charge is *not valid* if the original as-planned schedule showed adequate, large sequences of work areas between the trades, in contrast to the subsequent after-the-delay(s)-occurred schedule showing trade stacking as the new schedule "norm."

The best way to deal with trade stacking and any resulting losses is to stay ahead of them through careful documentation and quantifying. That requires extra clerical personnel and their accurate preparation of daily construction record reports.

Area Crowding

This practice usually results from *parallel trade stacking*, though not always. The efficiency losses caused by cramming too many different trades into a common area are usually quantified with trade stacking efficiency losses because they're almost impossible to separate.

Another form of area crowding is caused by attempting to overload or overstaff one or more trades in a single area in order to hustle the completion of work and get back on the original as-planned schedule by shortening schedule activity durations (performance time of the activity or operation from start to finish). Efficiency losses from this form of area crowding often get compounded with crew oversizing efficiency losses and may be commingled with efficiency losses attributed to overtime fatigue, shift work, or trade stacking.

Some contractors, in a trade-stacked, crowded work environment elect to use *measured mile* methodologies to quantify efficiency losses from work delays or interferences, lumping *together* all noncontractor causes and their resulting efficiency losses into one cost or damage figure. Other contractors utilize *total cost* or *modified total cost* methodologies to quantify all losses suffered in an area, on a floor, or perhaps on the whole project.

As a final reminder, efficiency losses due to area crowding are best avoided by not letting project areas or floors become too crowded with workers. As in trade stacking, a king or traffic director can eliminate the problems. Again, the key to preventing problems is coordination—hands-on, on-the-spot direction and assistance to physically avoid building project delays.

# # #

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Loss of Efficiency and Productivity Due to Effects of Weather

The weather — everybody watches it, talks about it, but nobody does anything about it, or so it's said. But in the construction industry, that's not really the case. Most contractors take careful notice of local and regional weather patterns, the norms and trends, and schedule their construction projects accordingly. As-planned construction schedules, prepared between the time of estimating and the project's startup, are almost always "weather sensitive" and are prepared to take advantage of favorable seasonal, local, or regional weather patterns and avoid the unfavorable ones.

Thus, when a project doesn't start on time (as scheduled or promised by the owner at bid time) or is delayed after it starts, weather may become an all-important factor in reducing *planned productivity and efficiency*. It's much more than the occasional abnormal or unusual weather conditions encountered on a construction project. Those things "happen," and most construction contracts allow excusable delay time extensions — but no money — for them on a day-added-for-a-day-lost basis.

What virtually no construction contract recognizes or addresses is the shifting of entire portions of a construction project's work into weather conditions that are wholly unsuitable to that type of work. When the shift occurs, the contractor incurs enormous losses in the number of extra manhours spent, additional costs, and further delays of the project and work.

The following types of weather disrupt, delay, and create efficiency and productivity losses:

Low Temperatures and Wind Chill (Cold Weather)

Worker efficiency and productivity drop as the temperature drops. The combination of low temperatures and high, sustained winds creates a combined effect known as "wind chill." Workers who perform manual labor and move frequently from place to place are severely effected by this factor. Under extreme wind chill conditions, efficiency and productivity can drop 50 percent or greater.

The best way to quantify efficiency losses due to wind chill is by comparing productivity from wind chill-effected work periods to that measured during normal work periods, thereby determining the difference.

In the absence of productivity measurements from daily construction record reports, the second best method for quantifying wind chill efficiency losses is by applying tabular and formula data developed by the U.S. Army Corps of Engineers' Cold Weather Region Research Laboratory to project labor and equipment costs.

Use of USCOE's methodologies only requires payroll (manhours) data and weather data (available from the NOAA weather station closest to the project), sorted by date. The data for payroll, temperature, and wind are entered into a spreadsheet program by date, which then uses the USCOE methodologies to calculate the weather inefficiencies and their costs. The costs for protection from cold weather work are also considered a loss factor.

High Temperatures and Humidity (Hot Weather)

Just as labor efficiency and productivity decline in cold weather, similar losses also occur when temperatures rise above 85°F to 100°F and beyond. The inefficiencies are quantified and claimed by actual measurement of productivity (units produced divided by manhours expended) in hot weather (high temperatures) and comparing that measurement with normal weather (moderate temperatures) productivity and then claiming the difference.

The combined effects of high temperatures *and* high humidity levels must also be considered. A 90°F work day with a 15 percent humidity level may have relatively little effect on efficiency, while an 85°F work day with 95 percent humidity may be very detrimental to productivity.

Since most contractors plan projects for warmer weather in the temperate regions of the U.S., they generally do not have cause or reason to claim hot weather efficiency losses. But even in the Southwest and Western arid regions (desert regions) and in the Southern Gulf Coast regions, contractors usually don't employ manual labor on very hot days or during those daily hours when it's the hottest and the inefficiencies are the greatest. However, when forced to work in those conditions as a result of delays, disruptions, or interferences, the consequential efficiency losses can be claimed. Hot weather protection and safety "extras" are also claimable.

Wind-Only Effects

In some areas, high winds, irrespective of normal temperatures and ranges, can cause unusually high efficiency losses. For instance, blowing dust and sand can cause severe labor efficiency losses and destroy sensitive equipment and machinery.

High winds are also a severe cause of inefficiency on structural steel erection projects, particularly high-rise structures. Every ironworker knows the old saying (paraphrased): "One hand for me and one hand for the company — until the wind blows — then it's both hands for me and forget the company!"

In summary, the key to weather-related claims is entitlement — whether the work shifted through the actions or behavior of others into inefficiency and productivity losses due to unsuitable weather conditions — and, if so, how the losses can be quantified in terms of costs (damages).

A clause in a construction contract that attempts to allocate the effects of all but "abnormal or unusual" weather conditions to the contractor does not excuse an owner, construction manager, or design professional from responsibility for damages caused by bad weather conditions encountered during time periods when the contractor hadn't scheduled work to be done, but was forced into it by noncontractor-caused delays.

Planning *around* bad weather is something most contractors do very well when they bid and schedule a project. But being *pushed* into bad weather is something no contractor can accommodate without added cost. However, the consequential effects *can* be determined, and the costs are payable by the party that did the pushing.

# # #

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Contract Conditions vs. Scheduling Provisions Requiring Owner/Designer/CM Approval

Most construction contract General Conditions or Supplemental General Conditions state that the contractor is solely responsible for methods, means, sequence, and procedures of construction. These contract documents also state that the owner, design professional, and construction manager are not responsible for methods, means, etc., of construction.

Some construction contracts *also* require the contractor to prepare detailed construction schedules, have such schedules approved and or amended by the owner/designer/CM, have them updated periodically (usually monthly), and have the updates approved by the owner/designer/CM.

Schedules are the very essence of construction methods, means, etc., especially if they are required to be cost- and manhour-loaded.

The occasional ambiguities in a construction contract or the arising conflicts between contractual clauses or contractual circumstances are *always* decided by an "order of precedence" clause in the contract. Absent such a clause, the conflicts between methods, means, etc., clauses and scheduling clauses are always decided or construed *against* the party that wrote them (usually the owner).

Most designer-prepared construction contracts, specifications, or plans contain clauses making the design professional the "impartial interpreter" of those documents in the event of ambiguities and/or conflicts between clauses.

However, when faced with a methods, means, etc., of construction assignment to a contractor-only clause(s) that conflicts with an "approval of changes" role being assigned to the owner/designer/CM in the scheduling clause(s), the design professional has a *serious* conflict of interest and cannot impartially interpret such conflicts.

Massive lawsuits or arbitrations often result when these types of conflicts arise because, ultimately, the final impartial interpretation of the contract *has to be made* by a judge or an arbitrator, not someone on the owner's payroll or a paid agent.

The question one must ask is whether the owner, design professional, or CM has the right to approve and/or change the contractor's schedule when the contract prohibits owner/designer/CM responsibility for construction methods, means, etc., which is precisely what a construction schedule illustrates and details.

The bottom line? Construction contract interpretation is not a task to be performed by amateurs.

# # #

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A Primer on As-Bid, As-Planned, and As-Built Construction Schedules

Every business enterprise needs a benchmark by which its success or failure can be accurately measured on a timely basis. The closer to the actual events, the better. Budgets and accounting systems that compare planned expenses and revenue to actual expenses and revenue are an effective way of monitoring results — after the facts and events have already occurred.

Schedules (defined as planned performance sequences) are an excellent way of measuring future results. Plus, they lend themselves quite well to both "what if" and cause-and-effect scenarios. Also, when cost- and resource-loaded, schedules often predict results that are later indicated in the accounting records on a planned-budget-versus-actual-cost basis.

With today's easy-to-learn-and-operate computer systems and the many useful scheduling software packages that are available, preparing accurate prebid and preconstruction (as-bid and as-planned) schedules — called *critical path method* or CPM schedules — is actually easier to accomplish in less time than the more traditional *bar chart* schedules.

There are two basic types of CPM schedules. The first, which is the oldest and most outdated, is called an *arrow-on-node diagram*. An AOND's activities are defined by two nodes or circles with distinct identifying numbers or symbols, connected by a line and arrow showing performance direction:

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An activity is defined as a distinct part of the project or scope of work that can be identified and quantified in terms of the following: the quantity of work to be performed to complete the activity; the resources required to perform the activity (manhours, materials, equipment, etc.); the expected revenue to be obtained by performing the activity; and the time duration of the activity's performance, usually in days.

AONDs are very awkward to work with on computers because they double the quantity of the activity identification system (two numbers or symbols per activity instead of one), with each activity carrying a beginning number or symbol (I- node) and an ending number or symbol (J-node). Tying one particular activity to another is done by either connecting the two activities together with a "dummy" line and arrow (I-node to I-node, I-node to J-node, J-node to I-node, or J-node to J-node) or by assigning a common I-node or J-node to the two activities. If you're confused at this point, then you're beginning to understand why AOND-style CPM schedules are *not* the best of the two primary choices available.

The second, and more preferable option, is the *precedence diagram method* of CPM scheduling. This system assigns one distinct number or symbol to each activity and allows the scheduler to specify the preceding activities (predecessors) and the succeeding activities (successors). PDM-style CPM schedules have all the advantages of an AOND schedule, but with half the numbering requirements necessary to

identify an activity and more interactivity-connecting (ties between activities) advantages.

Without causing any further confusion, let it simply be stated that with a PDM schedule, you can specify predecessor *and* successor activities in the following ways:

- Finish-to-start, with or without a time lag (finish one activity before starting another).
- Start-to-start, with or without a time lag (start one activity with the start of another).
- Finish-to-finish, with or without a time lag (finish one activity with the finish of another).
- Start-to-finish, with or without a time lag (finish one activity after or with the start of another).

In practice, there are actually eight ways to tie two activities together — four ways on either end —when you use PDM scheduling, and you can note a time lead or time lag as you choose.

The main advantage of a PDM-style CPM schedule is that it has no dummy activities to monitor or track, activities of which are not "real" except for the fact that they tie or connect separate activities together in a logical sequence or dependency known as "relationships."

In the end, the bottom-line difference is that it's much easier to make a more exact PDM schedule, modeled on what the builder or contractor actually intends to do. And graphically (plotting), it's much easier to understand, too, although sometimes there can be so many activities and relationships noted on the schedule, that it appears to be a confusing mass of lines.

Professional CPM schedulers are notorious for their abilities to confuse even the most rational people with their endless strings of jargon and buzz words, some of which have just been introduced to you.

To add to the complexity, the construction industry is replete with people trained in the 1960s and 1970s who "live and die" with ANOD-style CPM schedules, not accepting any substitutes that don't have nice, neat circles containing numbers and lines with arrows connecting those numbered circles. PDM schedules have no numbered circles, and their lines with arrows connect only solid bars (activities), and not always "just at the ends" of the bars, either. It is understandable that people trained to work with ANOD schedules find them hard to accept.

Now that you have the background, here's the real advantage PDM schedules have over ANOD schedules. A PDM schedule is simply a bar chart with connecting lines and arrows that shows which bars are tied to other bars, logically. Briefly explained, if you can draw a bar chart, then you can draft a PDM schedule, probably on the computer. You can toss the pens, pencils, straight edges, etc. You don't need them. With a computer, some scheduling software, and a good printer or plotter, you're in the scheduling business.

In fact, any contractor who doesn't do prebid or preconstruction PDM schedules to get a firm grip on the realities of a construction project is missing an easy opportunity to master the project, up front. But more than that, the prebid or preconstruction PDM schedule is proof-positive of precisely what is planned and intended by the contractor when a project is bid or before it starts.

Later, when unforeseen delays, interferences, shutdowns, change orders, work sequence changes, and a host of other noncontractor-caused problems are encountered, the effects of those unplanned, unforeseen events can be readily noted by adding them to the PDM schedule as they occur. An after-the-fact, actually performed schedule is called an *as-built schedule*.

As-built schedules, when compared to as-bid or as-planned schedules, provide what attorneys refer to as *entitlement arguments,* documented proof for the payment of monetary damages. Without any as-bid, as-planned, and as-built schedules, there are no entitlement proofs and, thus, there can be no damages due the contractor for hours, days, weeks, months, and even years wasted on what was perceived to be a clean, money-making project until all the problems began.

Schedules are not the only way to prove entitlements for damages, but they are miles ahead of whatever is in second place. And besides, with a good PDM schedule, a contractor can do some advance planning, procure for a viable construction project, and assure that it runs smoothly and systematically as well or better than planned or bid. That's what PDM schedules are designed for, but their secondary use as entitlement proofs for claims damages isn't a bad alternative, either, when problems arise.

# # #

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Quantifying Extra Costs for Delay-Shifted Labor, Materials, and Equipment

When a construction project (or segments of a project) is delayed, escalations in normal wages, fringe benefits, payroll taxes, insurance, equipment rental rates, and prices for materials may occur between the time period when project services are bid and planned and when they are actually performed.

As-planned schedules, when compared with as-built schedules and daily construction record reports, usually identify the exact time periods when work on a project "should have" occurred versus when it actually occurred. That's why schedules and construction activity reports are so important.

Once the as-built time period has been compared with the as-bid and as-planned time period, two sets of very specific start-and-finish dates are obtained. Prevailing and utilized wage, fringe benefit, tax, insurance, rental, and material rates and prices are then made into a checklist and analyzed.

Differences in these costs are then determined and multiplied times the hours worked or quantities used. The process usually requires extensive use of electronic spreadsheets to list or log hours, quantities, rates, and value differences and extend them to total extra cost figures. What seems like pennies, nickels, dimes, and quarters at first usually ends up being thousands of dollars when finally totaled.

Also, remember that the time involved in totaling and doing a spreadsheet is considered a valid delay claim cost.

Although the following example dates back to the Desert Shield campaign and ensuing Gulf War of the early 1990s, it well illustrates how a strange or unusual delay can still result in added project costs:

A three-month project comprising a large amount of diesel- and gasoline-powered heavy equipment was to begin May 1, 1990, and finish July 31, 1990. The owner delayed the start of the project until August 15, 1990; subsequently, it was completed on November 15, 1990, before the onset of inclement weather. There were no rate escalations in equipment rentals, wages, fringe benefits, payroll taxes, or insurance. When the project was completed, the contractor's ac-

counting staff noticed that the actual fuel costs greatly exceeded the bid fuel costs. A quick check of per gallon diesel and gasoline prices with the company's fuel supplier revealed that the "Saddam Hussein" fuel escalation effects had cost the company thousands of dollars in increased fuel costs. As a result, the owner was billed for the difference between the pre- and post-August 4, 1990, fuel prices.

# # #

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Beware of No-Damages-for-Delay Clauses

No-damages-for-delay clauses are almost always enforced by the courts and arbitrators, except in the following cases:

■ When there is *active* (willful or purposeful) owner interference or disruption.

■ Where the delays that occurred were never contemplated by *both* the owner and the contractor. (It's difficult to prove "contemplation.")

■ Where there is "bad faith" (difficult to prove) or fraud (*very* difficult to prove) on the part of the owner. Both bad faith and fraud are carefully defined legally and are almost never decided by purely factual considerations. The facts have to match the legal definitions.

■ Where there are unreasonably long delays. Remember, however, the words "unreasonable" and "long" are relative in terms of legal interpretation.

A contract containing a no-damages-for-delay clause should be contingently bid at a premium price and based on the contractor's prior experience with the owner. No "prior experience" should give enough reason for a no-bid decision.

For further details and explanations, see *Construction Claim Topics*, "Proving Entitlements for Delay Damages Not Attributed to the Contractor."

# # #

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Major Types of Contractor Delays Encountered on Construction Projects

Owner Caused

- Failure to award a contract and/or issue a notice to proceed within the bid document's specified schedule or other reasonable time period.
- Failure to disclose *all* known existing site conditions and circumstances the contractor is *likely* to encounter on the project.
- Inaccurately prepared or incomplete plans and specifications offered by the owner for the contractor to bid upon.
- Failure to warn of and/or coordinate separate prime contracts and contractors in the same work areas.
- Failure to administer and interpret the contract documents on a timely and reasonable basis.
- Change orders or extra work (additions, deletions, and modifications), which, if largely simultaneous or of a serial nature, usually cause delays beyond their apparent localized or singular effects.
- Failure to make timely payments as specified in the contract documents, which often causes the contractor and its subcontractors to reduce manpower to remain solvent.
- Interferences with the contractor's planned methods, means, sequences, and procedures of construction.
- Bad faith and/or fraudulent owner conduct toward the contractor.
- Failure to furnish owner-promised-and-supplied materials on a timely basis.
- Failure to provide access or rights of way to the contractor on a timely basis.

Design Professional Caused

- Poor or faulty plans and specifications and/or failure to correct the same on a timely and reasonable basis.
- Specified or planned facilities or services that are either impossible for the contractor to perform or do not function as intended when completed, even though built as planned and specified.
- Designer-specified, single supplier items for which:
  - The only specified supplier no longer exists.
  - The only specified supplier is not qualified or capable of providing.
  - The only specified supplier furnishes faulty or defective materials.
- Failure to accept a contractor-offered, bonafide "or equal" substitution, as allowed by the contract documents.
- Designer approvals of contract-specified contractor submittals that result in:
  - Unreasonable time delays by the designer dur ing the approval process.
  - Rejections of submittals that should have been "approved as noted."
  - Rejection of submittals that clearly satisfy the intent and language of the specifications.
  - Abuses of aesthetic and artistic "license" and choice by the designer.
  - Attempts to "approve" items not requiring ap proval.

- Failure to coordinate and administer the contract and project when such duties are contractually assigned to the design professional.
- Refusal or failure to correctly interpret the plans and specifications in a timely, fair, and unbiased manner.
- Designer interference with or disruption of the contractor's planned methods, means, sequences, and procedures of construction.
- Faulty, incorrect, or excessive inspection of contractor-performed work in place. (Observation is *not* inspection, as *only* inspectors, *not* designers, have the authority to stop or fault work.)
- Failure to approve or untimely approval of legitimate, contract-specified, contractor pay requests.
- Attempts to change, modify, or circumvent contractor-prepared, contract-specified construction schedules.
- Failure to initiate timely processing of and/or approval of valid contractor-prepared or submitted change orders and extra work requests.
- Bad faith in addressing intentional interference or fraudulent dealing with the contractor.
- Ordering removal of contractor personnel and/or supervision from the project without any justifiable cause.
- Direct dealing with the contractor's subcontractors and suppliers without the contractor's approval or knowledge.

Construction Manager (Owner Hired) Caused

Same as owner and design professional plus the following:

- Failure to coordinate between owner, design professional, contractor, and/or other prime contractors.

Other Prime Contractors Caused

- Failure to perform in a timely and/or correct manner the operations or work that logically precedes the contractor's work.
- Failure to cooperate with and coordinate schedules and plans with the contractor in areas of combined operations, simultaneous, or serially performed work.
- Failure to disclose changes and extra work that affect the contractor's work.
- Bankruptcy and/or default termination.

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Construction Progress and Coordination Meetings and Minutes

Most construction projects and their governing contract documents require periodic progress and coordination meetings. The frequency of these events is usually monthly or weekly, depending upon the complexity of the project, proximity to other construction work and facilities, the number of prime and subcontractors, or the maintenance of existing facilities and operations.

P & C meetings can be valuable and useful management tools when scheduled, structured, and conducted correctly. When they aren't, they can become "gripe sessions," or worse, sources for harmful friction and bad relationships.

To be fully effective and constructive, P & C meetings must:

■ ***Always be scheduled for the same day of the week or month and the same time of day.*** For example, consider scheduling the meeting the last Thursday of the month or every Thursday of the week at 2:00 p.m. local time. Never vary the day of the week or the time of day during the life of the project. This allows everyone to mark off his or her calendar far enough in advance and helps ensure full attendance.

■ ***Designate a coordinator or facilitator in advance.*** This person is responsible for organizing the agenda, providing notice of the agenda to expected attendees, coordinating and leading the meeting, and afterwards, preparing the meeting minutes. It is the primary responsibility of the meeting coordinator to expedite, facilitate, and move the meeting quickly through the agenda. In summary, it's known as advance knowledge, careful planning, and detailed follow through.

■ ***Be tape recorded so that accurate minutes can be prepared and distributed within 24 hours after the meeting.*** Should a question arise regarding the accuracy of the minutes, the tape recording is there to confirm or refute. Retain all tapes and store them in a safe location until all contractors and subcontractors have received final payment checks and all warranties on work and equipment have expired. Tape recordings are *not* intended to make everyone "tell the truth" or to cover or protect anyone. They are a simple, straightforward way of ensuring accuracy.

■ ***Give first priority to matters of discussion and resolution that involve everyone attending the meeting.*** Then set the rest of the agenda so attendees may leave when their part of the meeting is completed. Keeping people in a room while discussing specifics that don't concern them is bad business management. P & C meetings conducted that way are almost always poorly attended.

■ ***Address the "big" problems and coordination items first.*** The others will get handled in a smaller, less formal forum where there are fewer *expensive parties* involved. Time is money. Management and supervision personnel are expensive and generally bill by the hour.

■ ***Result in fast, accurate reports of progress made to date, including all contractor discussions aimed at properly coordinating work that will occur between scheduled P & C meetings.*** When attention is focused on project work performance, with special emphasis on current and impending problems, and commitments are made by all project parties involved to address these items, the P & C meeting is over until next time.

■ ***Have tape transcriptions initially done in outline form and distributed to all attending parties.*** Then, in more detail later, transcribe all important matters, discussions, and decisions and have them keyed-in for word processing, reproduction, and distribution. Remember, the leader or coordinator should *not* pass judgment on what is important but should rely on the attendees to provide that on tape. When attendees see their problems and coordination matters accurately reported, they will provide better and more accurate agenda items for future meetings. Leaders and coordinators can secure trust and confidence from others by being fair, truthful, and, above all, sincerely helpful.

Perhaps most important of all, P & C meetings are not designed to adjudicate or negotiate disputes, claims, and changes. To handle those matters, call a separate meeting involving the disputing parties. Don't fix or assign blame for problems; instead, find *solutions* to problems. Let the players and participants speak on their own behalf.

# # #

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Meglan, Meglan & Company, Limited
Columbus, Ohio

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CONSTRUCTION
Claims Topics

The 'Measured Mile' Proof of Lost Productivity and Damages

When a contractor is faced with delays, interferences, disruptions, or any combination of the three caused by noncontractor entities — owners, design professionals, construction managers, or subcontractors — the effects (damages) are sometimes very difficult to quantify or measure.

However, those contractors who keep accurate track of manpower, the utilization of equipment and materials, and the units of work produced on a time-measured basis (productivity) have a *powerful* methodology available for quantifying damages — the "measured mile."

By comparing productivity obtained during unimpaired periods of time with productivity obtained during periods of delay, interference, or disruption—and recording the differences — an accurate measurement of the real damages caused by a delay can be determined.

The units of work being produced must be similar, and the skill of the labor trades being used and the types of equipment utilized must also be similar in nature.

Given these similarities, the drop in production during identical time periods is simply attributed to the one variable — a delay, interference, or disruption — caused by others or a changed condition or situation.

Units of production can be as large as identical buildings or as small as the number of wire ties placed for identical reinforcing steel configurations. All that is required is for the compared units to be the same or very similar.

For those who wish to read the legal basis for this method of calculating damages caused by delays, disruptions, or interferences, the case of *Hercules v. May Company* in the 8th Federal Circuit Court of Appeals (Missouri) is most instructive and enlightening, particularly the appellate court justices' comments about the apparent accuracy of the methodology.

# # #

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CONSTRUCTION
Claims Topics

Construction Changes Are Not Always in Writing, Nor Are They Always Obvious

If you've been in the construction profession for a while, you've probably seen more than one "horror story." In fact, the following two examples of construction changes, based on *real* construction projects, were actually experienced by clients of **Meglan, Meglan & Company, Limited**.

Example 1

The owner and/or its agent on the construction project causes the contractor to be delayed, orders the contractor to perform changes in the work for which it grants *money only*, and actively interferes with the contractor's method of performance on a portion of the work. Despite these interferences or obstacles, no extension of completion time is granted by the owner.

Without a time extension, the contractor is required to complete the project on time or be subject to damages — *actual* damages if the contract does not specify *liquidated* damages — paid to the owner. The contractor proceeds to accelerate performance and completes on time.

If the contractor notified the owner and/or its agent on the project's acceleration to complete on time, the cost of the acceleration effort is due and payable to the contractor by the owner. However, quantifying the cost is the contractor's responsibility.

Example 2

The owner hires a design firm to design its project, prepare the construction plans, specifications, and contract, and then administer the bidding and awarding of the construction contract and performance of the actual construction as the owner's agent on the project.

During the bidding and award of the contract, the design professional let the project on time, but then failed to award the contract to the successful contractor until 100 days beyond the time stated for award in the bidding instructions. The contractor accepts the award but attaches a written 100-day delay notice in letter form to the signed contract.

The design professional rejects the delay notification amid the objections of the contractor and issues a notice to proceed 60 additional days after the contractor submitted its signed contract and delay notice and then orders the contractor to commence work on the project. The contractor sends another notice of delay letter to the design professional, claiming the original 100-day delay and an additional 60 days. The contractor begins work on the notice to proceed date.

Within a few days after the NTP date, the contractor discovers numerous and serious plan errors, omissions, and conflicts between the specifications and the plans. Each E&O, ambiguity, or conflict is questioned, in writing by the contractor and sent to the design professional as a request for information.

The design professional, after considerable lapses of time, responds in writing, either correcting the E&O

or clarifying the conflict or ambiguity. In some instances, the design professional orders an "engineering hold" on a portion of the contractor's work, pending its written, later decision(s). Interpretations and decisions — when finally issued by the design professional — are always in favor of the owner, not the contractor. Consequently, the contractor protests in writing each decision delay, engineering hold, and owner-biased decision.

Frustrated with the contractor's barrage of written protests and notices, the design professional orders its project inspectors to "tighten up" on the contractor. They do, resulting in many portions of the con-tractor's work being rejected, ordered removed, or changed by the design professional through its inspectors.

The design professional's inspectors, equally frustrated with further contractor written protests of "over inspection," try to help move the project along by directing the contractor's personnel in their work so that it will "pass" inspection. The contractor issues more protests in writing.

The project is completed a year late, costing the contractor 40 percent more than its bid. The design professional recommends that the owner assess 365 days worth of liquidated damages against the contractor for "late completion." The owner assesses the damages and withholds them from the contractor's payment(s).

Every described event in this example is a "construction change" for which the contractor is entitled to both time and money. Detailing the causes, the time due, and the money owed is the contractor's responsibility on an event-by-event basis.

# # #

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CONSTRUCTION
Claims Topics

Bad Faith- and Fraud-Caused Construction Claims and Disputes

Bad faith and *fraud* are legal terms that are succinctly defined according to legal statutes. Claims asserting bad faith or fraud can only be won when the facts and circumstances comply with legal definitions exactly and precisely.

Meglan, Meglan and Company, Limited, is not a law firm, but it does often work with attorneys on small and large construction disputes, claims litigations, and arbitrations. Here is a layman's explanation of these two serious causes of construction disputes and claims.

Bad faith occurrences on construction projects generally involve one party to a construction contract or its designated agent(s) misinterpreting contract language and provisions in such a way that few decisions, if any, are *ever* made in the other party's favor. Bad faith can also occur when one party or its agent(s) continually requires the other party to provide "ridiculously or outrageously" detailed proofs of extras, changes, etc., and then rejects the proofs and continues to demand even more detailed presentations.

Another example of bad faith conduct is when one party or its agent(s) deals *directly* with employees, subcontractors, or suppliers of the other party, without the other party's consent or knowledge.

And sometimes, bad faith is encountered in a sort of "no, that's wrong"or "that's not right, try again" situation where one party is trying faithfully to perform and satisfy the contract, plans, and specifications, and the other party is being obstructive or obtuse with regard to that faithful and sincere performance. Again, remember, if you want further legal interpretations, you should contact legal counsel.

Fraud is quite different from bad faith or bad faith dealing. Promises made in writing that were known by the party making them to have been false when they were issued, which induced another party to rely on those promises and suffer resulting damages, constitute a form of fraud or fraudulent behavior.

A statement in writing such as, "We've got the funding problem solved now. The bank has just signed the construction loan and agreed to pay your first three draws," when, in fact, the bank has not signed the loan nor approved the draws, is fraud. If the contractor continues to work and perform on the project because of the written statement — the inducement to continue work being false — then the writer of the statement is guilty of fraud.

There are any number of factual situations that can constitute fraud. For instance, suppose that an engineer specifies a complex piece of equipment for a project, which is only available from one supplier. Suppose, also, that the supplier informs the engineer well in advance to the project's bidding that the specified equipment is not going to function as planned or designed, but the engineer continues forward anyway. The project is bid and the contractor eventually in-

stalls the equipment, trying to get it to work. It doesn't. The engineer refuses, in writing, to approve payment to the contractor for the nonfunctioning equipment. The engineer also writes the contractor a letter, stating that he knows of no reason why the equipment should not function as designed.

Later, after a long period of nonpayment, the contractor discovers the true facts and sues for fraud. The contractor relied on the engineer's equipment design, which the engineer *knew* before bids were taken would not and could not work. The engineer further aggravated the matter by insisting the contractor make the equipment work, and by forcing the contractor, as a consequence, to spend large sums of money toward that effort, while at the same time denying payment to the contractor for the work done. The engineer's conduct is fraudulent.

Here's another example of what a layman calls a combination of "governmental fraud" and "superior knowledge." In this case, all pertinent knowledge regarding the project to be bid must be disclosed by the government at the time of bidding if it's pertinent to the contractor's performance of its project services, if the government is aware of the facts, and whether the government could have disclosed the facts at the time of the bid, but didn't.

A subcontractor quotes a large dam's core trench drilling and grouting operation to a large general contractor prior to the time bids are to be submitted to the government. The GC is the successful low bidder. The subcontractor is the successful low bidder to the GC. The government signs a contract with the GC, and the sub signs a contract with the GC. Work starts, and then almost a year into the job, the subcontractor receives a request for proposal from the GC, who has received the same from the government.

The RFP increases the scope of the sub's drilling and grouting work by more than 100 percent and includes a significant amount of "extra work" outside the original contract's provisions, which the government has already ordered the GC and its sub to partially perform. The sub goes ahead and performs a significant portion of the extra work — work that is far more difficult to perform than the work originally contracted — at the original bid prices. In fact, it's the subcontractor's memos and letters to the GC that finally causes the government to discontinue its apparent apathy and issue an RFP to the GC.

Since a significant portion of the extra work was already "in the ground," the sub reviewed its actual and projected costs, and then priced both the completed and proposed extra work based on its experience in performing the extra work already completed. The government balked at the prices — offering its own substitute costs — and stalled for another five months before agreeing to the sub's costs for the extra work.

Meanwhile, the drilling and grouting work continued on the original contract work and the "new" extra work, all paid for at the originally bid contract prices. The government demanded a *force account*-style accounting for the extra work already performed, after some 16 months of performance of the extra work by the sub. Unfortunately for the government, it never precisely identified the extra work as to location, and it never directed the GC or its sub to segregate costs between the original contract work and the extra work. Segregated force account-style proofs of actual costs are thus an impossibility.

Seventeen months into the drilling, grouting, and dam construction, the GC and government agreed on drilling and grouting prices from that point forward (about 40 percent of the combined original contract work plus extra work yet to be done). For the first time, the subcontractor, which finished its work, made a profit instead of incurring a loss. The government then demanded an accounting and segregation of the first 60 percent of the combined original contract and extra work, and then threatened not to pay for the extra work priced at the original contract estimates if the sub didn't immediately account for its actual cost to perform the extra work.

In the course of the claim negotiations, the subcontractor's attorney served a Freedom of Information Act request on the government and then examined its records. Documents were discovered indicating that the government *knew* of the 100 percent-plus increase in drilling and grouting quantities long before the sub started drilling and grouting — and probably knew of them before the project was bid. The records showed very clearly that the government's engineers and geologists had made a decision to greatly increase the size (width) of the dam core for safety's sake and because more impervious dam core material had been found near the site prior to the bid date.

Meanwhile, with the contract and subcontract completed, the sub and GC still couldn't settle accounts

with the government for very obvious reasons. They prepared an extensively detailed, multiple part claim for the partially unpaid extra work and its consequential effects upon the sub's project costs. The claim included acceleration costs to perform the original contract work *plus* the extra work within the contractually specified time frame and performance period. *The government had not previously granted a time extension, despite doubling of the drilling and grouting work*.

The claimants, which included both extended project and home office overhead costs, presented their claim. The government promised expeditious processing, and then almost immediately thereafter, demanded a government audit of the subcontractor's books by the Inspector General's Office. Finally, 10 to 11 months after the claim had been presented, the government held a negotiation meeting and made an offer — based on its poorly performed audit — that was substantially less than the consequential damages in millions of dollars the GC and subcontractor had claimed.

As noted earlier, what has just been described is a combination of superior knowledge contract breaches, coupled with governmental fraud. The fraud was clear and evident because the government, via its employees, *purposely withheld* all information about the expanded dam core from the GC and sub. Why? Because the huge increase in drilling and grouting quantities the project required would probably have caused a contract rebid situation, costing the government much lost time and money. But perhaps more importantly, if the real facts were ever divulged, some or all of the government employees involved might have been fired.

The preceding examples are, of course, fictitious — arrived at by **Meglan, Meglan & Company, Limited,** for purposes of illustration.

Still, from the examples provided, one can see that fraud can occur in many forms, both large and small, simple and complex. The facts involved in fraud can sometimes be surprising and very complex due to efforts made to conceal the fraudulent behavior. Governmental fraud is extremely difficult to prove, and the damages it causes are even more difficult to collect because of laws and regulations that shield both the government and its employees.

As a final comment, contract issues regarding bad faith and fraud require *early* involvement of an attorney. In the last example given, it was the attorney's Freedom of Information Act request that uncovered the fraud.

# # #

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Meglan, Meglan & Company, Limited
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CONSTRUCTION
Claims Topics

Lost Labor Efficiency Caused By Overtime Fatigue

When most contractors are forced by delays, disruptions, or interferences to work their labor force on an overtime schedule, they usually see only the premium wages and burden paid as the "extra cost."

Only about one contractor in 10 is thoroughly familiar with the *real* added cost of working manual labor forces on an extended overtime schedule. What is worse, only about one owner or owner's design professional in 100, maybe 50, recognizes and understands the problem.

A manual laborer who works 50 hours per week can be anywhere from five percent to 35 percent less efficient and productive than a manual laborer who works a 40-hour week. Whether the inefficiency is five percent or 35 percent, or something in between, it is a direct result of the number of *consecutive* 50-hour weeks the manual laborer actually works.

For a 60-hour week, the manual labor inefficiency rate and range rises to 10 percent to 50 percent, when compared to a 40-hour week.

The most important thing to remember is when a manual laborer works overtime on a scheduled, consecutive basis week after week, that worker's efficiency steadily declines each successive week, beginning from week one and continuing through week 10 where it usually, but not always, reaches its lowest level and stays there in weeks 11, 12, and beyond. A 70- or 80-hour manual labor work week, when worked on a consecutive weeks basis, is an absolute productivity disaster!

A second important thing to note about a manual laborer working in an overtime mode for many consecutive weeks is the fact that *all* of the hours worked are affected by the overtime hours worked. Working 50 hours a week doesn't just cause a manual laborer to work 10 inefficient hours per week. All 50 hours are antiproductive.

Thus, by the time the 50-hour week has been worked for four consecutive weeks, the increased production of 10 extra work hours performed per week is negated completely by the 20 percent in lost efficiency caused by overtime fatigue:

50 hours – 40 hours = 10 hours (gain)
50 hours x 20% = 10 hours (loss)

From a cost standpoint, the premium wages and burden paid on 10 hours of overtime worked per week in the fourth week is also an absolute loss. The bottom line is that consecutive weeks of overtime work for manual labor is a bad idea, especially beyond the third consecutive week worked.

Several years ago, **Meglan, Meglan & Company, Limited,** was asked to study a concrete form operation that was over budget more than 100 percent. After examining the payroll and productivity records, a *linear regression analysis* was conducted using the

average overtime hours worked per week per worker and the average hourly productivity per worker as the two variables. The results were interesting but somewhat inconclusive.

Then, a third variable was added — the number of consecutive weeks of high overtime hours per week worked. A *multiple regression analysis* was conducted. Here's a summary of the findings:

For a 40-hour week, the average manual laborer placed 10.4 square feet of concrete forms per hour, complete in place and ready to pour. After seven 84-hour work weeks (seven consecutive days of work at 12 hours per day), the average manual laborer placed 3.3 square feet of concrete forms per hour, complete in place and ready to pour. That's a 70 percent loss of productivity! To label the results as "inefficient" is a major understatement.

Moreover, through 10 weeks of seven-day work weeks (12-hour work days), the owner and its construction manager were threatening to terminate the contractor if it dared to give its work crew a day off or cut back the overtime.

The ironic part of this story is that it's true, and that *both* the owner and the CM were members and participants in The Business Roundtable's Construction Industry Cost Effectiveness Project. This effort was led by a credible task group that was one of the first to quantify overtime fatigue losses and warn the construction industry and users of the massive efficiency losses caused by working too many consecutive weeks of scheduled overtime.

For more information on the effects of scheduled overtime on manual labor productivity, contact BRT's Construction Division, the Mechanical Contractors Association of America, or other major national trade associations. These organizations have excellent study reports on productivity issues, supported with tabular and graphical statistics.

# # #

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CONSTRUCTION ClaimsTopics

Productivity and Efficiency Losses Due to Shift Work

One of the ways owners and contractors accelerate construction project work to make up for delays is to employ two or more shifts per day on key or critical activities that will enable the entire project to be completed on time or ahead of schedule.

Because of the major losses in efficiency due to fatigue that can result when a contractor works large amounts of scheduled overtime, shifting or shift work is a viable — but not always productive — alternative. Working key tradesmen and support labor on a two- or three-shift-per-day basis requires some advance consideration of these factors:

- Are there a sufficient number of highly skilled tradesmen available in the area to staff a two- or three-shift-per-day operation?
- Will those tradesmen, assuming their availability, be willing to work "off-hour" shifts? If so, at what sort of premium or shift differential wage?
- If sufficient numbers of highly skilled tradesmen are not available locally, what will it cost to bring in skilled tradesmen or "travelers" from other regions of the state or U.S.?
- What are the best start and stop times for a two- and three-shift day?
- If two shifts are worked, is it better to work each shift five eight-hour days per week or four 10-hour days per week?
- Are sufficient management personnel (superintendents, foremen, subforemen, or pushers) available to staff the extra shifts?
- Can the payroll clerk, clerk of the works, project manager, and/or project engineer "keep up with" the extra shifts, manpower, production, etc., or will they need additional help from the home office to keep accurate records and complete the work?
- Will spare parts and extra tools, supplies, and materials have to be stocked to assure their availability for the off-hour shifts when most stores and suppliers are closed?
- How will the hand-off of work between shifts be managed so there is steady work flow, allowing the succeeding shift's tradesmen to continue where their counterparts left off on the preceding shift?
- Can the contractor afford to fund the cash flow required for a double- or triple-shifting effort?
- Will lighting and special safety precautions be necessary to handle shifts that operate wholly or partially during night-time hours? If so, what are the additional costs?

No doubt, there will be other matters for consideration, based on special situations, local labor practices, etc. Many of the items listed above can and do contribute to extra costs, in addition to small to medium-size inefficiencies and productivity losses. Likewise, some items could result in cost savings, such as more efficient use of the same equipment, charged at fixed daily rates (16 hours, 20 hours, or 24 hours worth of use for a standard eight-hour-day amortization or rental cost). Equipment maintenance and wear are, of course, proportionate with the number of hours worked per day, not the number of days worked per week.

Shift efficiency losses witnessed in the past on two-shift-per-day operations include higher second-shift pay rates and scales — where more money is paid for the same or less work is accomplished — and between-shift hand-off inefficiencies. The latter usually comprises a half-hour on the front and back ends of each shift to locate tools and

equipment or figure out where the other shift left off and what needs to be done first.

Other efficiency losses include costs for setting up lighting systems and maintaining them for second shifts and for stocking tools, supplies, and materials that would normally be just-in-time delivered, unloaded, and placed.

It is imperative that productivity measurements be kept *separately* for each shift worked so they can be compared to determine efficiency losses and their causes, where possible and feasible. Please note that shifting will often cause efficiency losses during the day or normal shift when compared to daytime-only scheduled work without any shifting. Thus, a comparison between daytime-only productivity and that of a two-shift work schedule should be made, where possible and feasible.

The decision to work four 10-hour days or five eight-hour days per week per shift is one that requires the past experience of management and a knowledge of tradesmen preferences. If local union rules dictate overtime pay for all hours worked beyond eight hours per day, the 10-hour-shift schedule is definitely *not* cost efficient and should be avoided. If that's not the case, the three-day weekend can be very attractive to many tradesmen, resulting in more satisfied and better-skilled tradesmen being secured.

On the down side, there could be some efficiency loss in the ninth and 10th hours of a 10-hour-shift period. It requires careful monitoring. On the positive side, there's two fewer breaks, one less lunch period, and one less start-and-stop period for a 10-hour, four-day operation as compared to a regular eight-hour, five-day work schedule.

Shift efficiency losses noted in the past on three eight-hour-shifts-per-day operations include higher second-shift pay rates and still higher third-shift pay rates. Also, when closely examined, the no-between-shift "down" periods and paid lunch breaks result in each shift actually working six-and-a-half to seven hours, but getting paid for eight hours. The efficiency losses can range from 12.5 percent to 18.75 percent per shift. It's real and unavoidable!

Three eight-hour shifts per day is *not* a good idea, unless there is some practical or essential reason for using them. However, they are certainly more efficient than a 50-, 60- or 70-hour work week requiring overtime pay, but far less efficient than a 40-hour, single-shift operation.

If an accelerated schedule and operation is necessary, using a two-shift-per-day, 40-hour-per-week-per-shift work schedule is far more efficient than using a 50- or 60-hour-per-week, single-shift overtime work schedule after the fourth or third consecutive week worked, respectively. When shifting is not possible or feasible, overtime work weeks should not exceed four in a row for a 50-hour work week and should not exceed three in a row for 60-hour work weeks. Working more than 60 hours weekly is highly inefficient, beginning with the second week.

In closing, it's important to note that the previous comments may not apply to nonmanual labor or personnel, such as equipment operators who *ride* equipment or stand and watch equipment all day long. *Safety,* however, may be the major factor in these operations.

Also, anyone who's had long-term experience in the construction industry, particularly with both skilled and unskilled tradesmen, knows that 50- and 60-hour scheduled overtime and work weeks often draw the "very best" to a project. Why? Because most skilled tradesmen desiring high weekly pay opportunities are willing to leave their current job and move ahead to the overtime project. When the word gets around, a scheduled overtime project and its contractor can usually secure some of the most qualified tradesmen whose normal efficiencies and productivity are very high.

This phenomenon tends to offset overtime fatigue loss-es *for a while*. In such situations, the overtime schedule can be worked for four to six weeks without serious efficiency losses, compared to a 40-hour work week. It's a "gut call" that only good project supervision can make.

# # #

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CONSTRUCTION
Claims Topics

The Eichleay Formula (Extended Home Office Overhead Cost Allocation)

Construction projects that are bid on a lump sum basis — and certain other types of projects — and have both a fixed start date and completion date are usually cost impacted by noncontractor delay-caused late completions. Home office overhead costs increase as performance time increases. The Eichleay Formula was used in a 1960 Board of Contract Appeals case and upheld by a U.S. Circuit Court of Appeals as a valid method for quantifying and determining a contractor's extended home office overhead costs caused by noncontractor delay(s). Eichleay utilizes three steps in its calculation:

$$\frac{\text{Contract Billings}}{\text{Total Billings for Actual Contract Period}} \times \text{Total Overhead Incurred During Contract Period} = \text{Overhead Allocable to the Contract}$$

$$\frac{\text{Allocable Overhead}}{\text{Actual Days of Contract Performance}} = \text{Overhead Allocable to Contract per Day}$$

Daily Overhead x Number of Days of Delay = Extended or Unabsorbed Overhead

A modified version of Eichleay has been utilized that substitutes *labor costs* or *direct costs* for contract billings. It is best to use billings (revenues) since this methodology has the court's stamp of approval and has been upheld on appeal. The Eichleay Formula is not universally accepted in all jurisdictions. Consult an attorney or an attorney in the state where the affected construction project is located before utilizing Eichleay for claiming extended performance costs.

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CONSTRUCTION
Claims Topics

Productivity and Efficiency Losses Caused By Unplanned, Out-of-Sequence Work

Most construction project schedules are prepared with definite, logical work sequences that require one trade, craft, or subcontractor to perform its work after another has completed its services. The work sequence is usually structured so that the skilled labor can perform its work in the fastest and most efficient manner. All tradesmen, craftsmen, and subcontractors expect to be given the most optimum work sequence. Those who prepare construction schedules know this and schedule work activities accordingly.

When an owner, a general contractor, another prime contractor, a construction manager, or a design professional directly causes or orders a change in the work sequence, one or more trades, crafts, or subcontractors usually experience *severe* productivity and efficiency losses and incur unnecessary additional costs due to delays, disruptions, or interferences not normally experienced. These costs are chargeable to the party or entity that caused or ordered the change in the as-planned work schedule.

The proof of sequence changes (out-of-sequence work) lies in a comparison of the as-planned, scheduled sequence with the as-built, as-performed sequence. Contractors and subcontractors who don't have as-planned and as-built schedules seldom prove out-of-sequence work claims, thereby failing to collect damages for the losses they incurred.

Proving and collecting for out-of-sequence work losses is one of the primary reasons why every construction project and every contractor should have an as-planned schedule or, at the very least, provide inputs into someone else's schedules. Similarly, proving and collecting for out-of-sequence work losses is also the basic reason why as-built schedules are maintained by "updating" as-planned schedules.

Moreover, maintaining daily construction record reports is how good contractors monitor what's being done where, when, how, and by whom, in addition to tracking what they're producing in terms of completed work units and whether that productivity is above average, average, or below average as compared to as-planned conditions and performance.

Examples of Out-of-Sequence Work

■ An overhead fire sprinkler system subcontractor generally installs its system off of a rolling scaffold after the concrete floor is placed, finished, and cured. The as-planned construction schedule shows the concrete floor placed *before* the sprinkler system is installed. In fact, the fire protection system installation is shown on the schedule as an activity that is tied to the end of the floor placement and curing activity.

In this example, the floor placement is delayed. The fire protection system subcontractor is ordered to begin placing the overhead sprinklers without the smooth, finished floor in place. Because of the disruption, two step ladders have to be used in place of one rolling scaffold. Instead of one ground worker and one aerial worker, there are now two of each,

doing the *same* work, though not nearly as quickly and efficiently. Consequently, the subcontractor has a legitimate claim for lost efficiency due to out-of-sequence work.

■ A construction project consisting of two eight-story, cast-in-place office buildings features many hand-laid concrete block walls on each of the eight floors of the two buildings and in an atrium section between them.

In this example, the cast-in-place concrete contractor is late in placing the columns, beams, and floors. The general contractor refuses to enclose the building with tarpaulins and heat it when the subcontractor who's installing siding on the buildings cannot get the work completed by winter. The unenclosed, unheated floors prevent the masonry subcontractor from installing its concrete block walls on most of the upper floors until warmer spring weather arrives. The electrical subcontractor, who usually works with the masonry subcontractor, inserting electrical conduit in partially completed concrete block walls, works all winter installing conduit on every upper floor in both buildings before the masonry contractor can lay the first block.

In the spring, the masonry subcontractor has to "cut in" around all the conduit to bury it in the walls, wasting manhours and a large amount of concrete block in the process. As a result, the masonry subcontractor has an out-of-sequence work claim and is due damages from the general contractor.

# # #

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Claims Topics

The Difference Between a Construction Arbitration and a Construction Lawsuit

Today's construction contract disputes are handled very differently than they were, say, 20 or 30 years ago. The root cause of that difference is the heavy case load of criminal and civil lawsuits now flowing through the courts.

Moreover, today's judges and the court system cannot afford to have one, solitary, very complex lawsuit tie up weeks on the legal dockets. Normally, construction lawsuits *are* very complex. They require large amounts of time to present to a judge and/or jury.

A number of years ago, a process called *binding arbitration* was instituted as a viable, quicker, and, often less costly alternative to a lawsuit. As this process grew and became popular, it became an attractive legal alternative for the construction industry and its many players, so much so, that a separate set of binding arbitration rules were developed specifically for construction industry disputes.

Today, the American Arbitration Association, headquartered in New York City, with regional offices across the U.S., publishes a set of *Construction Industry Arbitration Rules* that provide the structure and guidance for construction arbitrations. More importantly, AAA provides a "tribunal" of neutral construction-experienced arbitrators, available for parties involved in serious construction contract disputes.

Unlike most lawsuit jurors, construction arbitrators are generally those who have experience in the industry and/or construction law. And, unlike a juror, a construction arbitrator is given the task of determining both the facts of a construction dispute *and* the applicable legal principles and limitations. The construction industry arbitrator is, for all practical purposes, both the juror and judge.

Large construction arbitrations (those involving more than $100,000 in dispute) are assigned three construction arbitrators, forming a panel. The panel of arbitrators is governed and directed by a chairman, selected from one of the three on the panel. With some notable exceptions (discussed in other *Construction Claims Topics*), arbitrators are mutually selected by the parties involved in the construction dispute.

The arbitrator selection process, when delegated to those involved in the dispute, is a swift, binding, and permanent process. The filer of an arbitration request or demand is called a "claimant." The party or parties upon whom the arbitration request or demand is filed is called the "respondent(s)." The filing and mutual choosing of arbitrator(s) is measured in days, not months, and it's all done by mail. Should one of the parties to the dispute fail to respond to the arbitrator selection requests, it is likely that the other party will secure *all* of their arbitrator selections.

As one might expect, the arbitrator selection process is not an exercise for amateurs! Because the process moves quickly and the arbitrator(s) are being selected as both juror(s) and judge, choosing the wrong arbi-

trator(s) can have devastating effects on the final outcome — the arbitrator's award — in a construction arbitration. Also, as stated previously, failure to select arbitrator(s) on the part of either the claimant or respondent *usually* leaves the remaining party as the sole selector.

Unlike lawsuits and court procedures, arbitrations are mostly conducted informally. The presentation methodologies are determined by the arbitrating parties and the arbitrators. Generally, the claimant presents its case through witness testimony before the arbitrator(s). Witness questioning is conducted by the claimant's counsel or representative, the latter of whom doesn't have to be an attorney, although retaining one is advisable.

After each of the claimant's witnesses has been questioned by the claimant's side, the respondent's counsel or representative usually then questions the claimant's witnesses. After both parties have exhausted their questioning, the arbitrator(s) may choose to pose additional questions to the witnesses.

Most arbitrators in construction arbitrations do, in fact, formulate their own questions for the witnesses. Jurors in a courtroom system are prohibited from questioning witnesses and/or conducting any independent investigations. Arbitrators, however, may ask what they wish and investigate whatever they chose to examine.

Finally, after claimant has finished with its witnesses, respondents present their witnesses and case to the arbitrator(s) and the whole process of questioning is repeated.

In summary, the major difference between lawsuits and arbitrations is the experience, duties, and independence of the arbitrator(s).

# # #

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Proving Entitlements for Delay Damages Not Attributed to the Contractor

Of all the problems encountered by contractors on construction projects, delays are the most serious and costly.

Excusable delays are those for which the construction contract allows the contractor additional time equal to the time consumed by the delay.

Compensable delays are those for which the construction contract allows the contractor additional monies equal to the monies lost by the contractor due to the delay (during and afterward).

Excusable, compensable delays are those for which the construction contract allows the contractor both additional time and monies equal to the time consumed and monies lost by the contractor due to the delay (during and afterward).

A contract that contains a no-damages-for-delays clause is one that allows the contractor neither time nor money for delays, regardless of who caused them. There are exceptions, however (see *Construction Claims Topic* "Beware of No-Damages-for-Delay Clauses"). In the absence of a such as clause, the contractor will usually be compensated for delays by the owner, if:

- The contractor can prove conclusively that the delay actually occurred;
- The contractor can prove conclusively that the delay was not contractor-caused or attributed to its subcontractors or suppliers; and
- The contractor can accurately quantify both the time and money lost because of the delay.

The first two provisions are the *legal entitlement proofs* of damages for delays; the third is the calculation of damages resulting from the legal entitlements. As a benchmark, the only truly effective ways for a contractor to prove legal entitlement to delay damages are to:

■ ***Prepare and submit a reasonable, accurate, and detailed construction schedule, either with the bid or quotation or submitting it prior to starting construction on the project.*** Original, as-planned schedules that don't show dependencies and relationships between the various work tasks to be performed by the contractor, its subcontractors, and accompanying trades are almost worthless in proving the exact effects of delays that later occurred.

■ ***Prepare and submit cost estimates for as-bid man-hours, labor, equipment utilization, and materials prior to the start of construction.*** These estimates should be included in the schedule described above and should be accurately itemized for the various schedule activities.

■ ***Regularly submit daily construction record reports to the owner once construction begins.*** These daily records should contain a listing of all schedule activities worked on a specific day, including the manpower and trades, materials, and equipment utilized for each activity being performed. Work stoppages and delays encountered by the contractor should also be listed by all schedule activities directly or indirectly affected. A written description of the nature and extent of the work stoppage or delay in hours and minutes should be provided. For example, if equipment and manpower

are idled, that occurrence should be accurately described according to the number of hours and minutes they were idled. If manpower and equipment had to be transferred to another schedule activity because of the work stoppage or delay, the time and money lost in shutting down and starting up again on a different task should be quantified in writing.

■ ***Maintain productivity records on a routine basis for all construction schedule activities being performed.*** Where possible, this should be included in the daily construction record reports. Delays often have hidden effects on construction productivity that are not readily apparent until the actual productivity rates are carefully examined. Time and cost records are worthless unless an accurate measure of what was being produced is recorded simultaneously.

The preceding four practices provide a basis for accurately comparing as-bid expectations with as-performed realities. If followed correctly, these practices should help detail the causes (entitlements) of even a minor delay. However, major delays or a series of minor, consecutive delays have other, less obvious and often more expensive effects on both time and cost. Some of these effects include:

- Under utilization of project and home office overhead;
- Increased scheduling and modification costs;
- Failure to meet contract completion dates, resulting in extended overhead costs, hindrances to the bonding capacity (inability to maintain efficient work loads for the manpower and equipment available), and work being "pushed" into inclement weather or off-seasons;
- Owner failure to grant time extensions due to delays, followed by enforcement of or the threat to enforce liquidated damages for late completion;
- Constructive acceleration by the contractor to avoid enforcement activities;
- Low morale of workers and significant productivity loss due to stop-start construction operations and the inability to perform scheduled work in a logical and efficient sequence; and
- Owner-ordered acceleration to complete on time, in spite of major delays.

Many books and smaller publications have been written about construction delays and their resulting accelerations in scheduling and work—constructive or ordered. **Meglan, Meglan & Company, Limited,** recommends *Construction Delay Claims* by Bramble and Callahan. While this book is a legal text, it is very understandable from a layman's perspective.

There are numerous consulting firms that specialize in assisting contractors, owners, or both in preparing delay claims and acceleration claims. Many contractors and owners retain these firms to assist in the scheduling and record-keeping process detailed earlier. Others dedicate a specific individual to the task, assigning that person the responsibility of maintaining schedules and records on a day-to-day basis throughout the construction contract performance period.

The most effective scheduling and record-keeping methodologies are computerized and should be compatible with similar operating systems and software for optimum use. For example, databases, schedules, spreadsheets, accounting, and graphics software programs are generally compatible with each other and can easily exchange data electronically.

The ability to prepare accurate schedules on a computer, print meaningful reports from these schedules, plot easily understood schedule diagrams or flow charts, and maintain them from day to day on an as-built basis is the very essence of proving both entitlement to damages caused by delays and then collecting those damages. There is no substitute for keeping detailed contemporaneous schedules and records.

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Lost Productivity and Efficiency Caused By Oversized or Undersized Work Crews

An owner's favorite solution for construction projects that are delayed, disrupted, or interfered with and, consequently, are behind schedule, is to add more workers to get more accomplished.

Sometimes their solution proves successful, but more often it fails, for a variety of reasons. One of these is crew "oversizing."

Good contractors and their supervisors pay close attention to work crew size and makeup, and structure them to yield maximum results (production) and minimum labor cost and manhours. Some of the more advanced construction firms utilize field record-keeping (daily construction record reports or DCRRs) and time and motion studies to determine their optimum crew makeup and size.

When an owner, an owner's construction manager, or an owner's design professional starts dictating and ordering manpower increases that specifically increase crew size and its makeup or "mix," great inefficiencies can result. Of course, a similar contractor-ordered effort of its own workforce or a subcontractor's workforce will yield the same inefficiencies.

Contractors or subcontractors who are involuntarily ordered or forced by owners, CMs, design professionals, or general contractors to alter crew makeup and size are generally entitled to reimbursements for the resulting efficiency (productivity) losses if they can prove they were ordered to do it and that productivity losses resulted.

DCRRs that document the occurrence of such orders when given orally and list manpower utilization by work crews and their resulting productivity are the best way to compare and document such matters for later change order requests or claims. There is no substitute for good record-keeping. And for record-keeping to prove and quantify the losses incurred, it must have been in effect long before the order to increase crew makeup and size was given. This organized record of prior productivity levels allows an accurate comparison to be made.

A second, sometimes not-so-obvious work crew makeup and size issue is "undersizing" and missing key tradesmen. Just as oversizing can cause productivity or efficiency losses, undersizing can have the same or worse effects.

In general, the principal causes of undersized crews revolve around nonpayment issues. An owner who delays payment to a contractor or a contractor who delays payment to a subcontractor can unknowingly harm that contractor's or subcontractor's work crew productivity by forcing payroll reductions (manpower layoffs) to contain costs through matching and equalizing cash flows.

For many years, the Army Corps of Engineers has been warning U.S. Environmental Protection Agency

grant recipients that nonpayment, late payment, or underpayment of their contractors and subcontractors may entitle those parties to more than just interest on the monies owed if they can prove the effects and quantify the losses.

Proof and quantification are, again, established by accurately keeping DCRRs. There is no substitute for good, accurate, and thorough record-keeping. None!

# # #

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Claims – Final Payments – Warranty Work

Acceptance of *final payment* per the final payment clause in most construction contracts usually bars any further payments to — or claims by — the contractor after the contractor accepts the final payment check.

Additionally, most construction contracts contain a warranty or guarantee clause that is *not* terminated by acceptance of final payment by the contractor. For example, faulty or failed work and equipment must be repaired or replaced by the contractor after final payment, prior to the expiration of the warranty or guarantee period, and at no additional cost to the owner.

Warranty or guarantee periods usually cover one to two years and can extend one to two years past the time of receipt of final payment by a contractor.

Contractors who have additional claims pending for money, time, or both, should never accept a final payment from an owner without counsel from a construction attorney.

Similarly, contractors who receive demands to perform *extensive* warranty work should seek expert legal advice. There are many valid exceptions to demands for "repairs or fixes" under warranty or guarantee periods.

Always remember, final payment and warranty/guarantee requests require correct actions and responses to protect contract rights.

# # #

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Consequential or 'Extra' Damages in Construction Claims and Disputes

Although **Meglan, Meglan & Company, Limited,** is not a legal firm, it still gets heavily involved with construction law attorneys and their clients, whether they be owners, contractors, subcontractors, suppliers, construction managers, engineers, or architects. Consequently, as a reader of *Construction Claims Topics*, you might appreciate a layman's translation of how to proceed in proving and collecting on the resulting consequences of a serious construction contract breach or dispute.

Stated simply, you and your company have to demonstrate and prove through an unbroken chain of incontrovertible facts that the construction contract breach(s) unilaterally imposed caused you and/or your company serious additional harm and damages over and above those alleged and sought due to the contract breach(s) by the other party.

The most prevalent of consequential damages claims is often referred to as an "interference with business" claim. The interference has to be *intentional, purposeful,* and *willful* — not accidental — in nature. That is to say, you have to tell the other party in writing that its acts or failures to act, in accordance with the contract provisions, are causing serious damage to you and your business (the entire business and its abilities to perform on all contracts, not just this one) and then have the breaching party continue its breach unabated.

Written notice of the *onset* of such consequential events is an absolute requirement. A written detailing of the *exact* consequences being suffered to the offending party is usually a good practice. Sometimes, these written details will cause those breaching the contract to correct the matter immediately, halting even the possibility of having to ultimately pay for consequential damages.

Once the serious interference-with-business allegation is made in writing and the notice and facts of the alleged interference are succinctly described in writing or otherwise, the monkey is now on the back of the offending party. If they do nothing to mitigate, alleviate, stop, or correct the situation and the resulting consequences, then it's on to the next step. This involves gathering legal, financial, and other verification of the damages being experienced and start the process of showing, conclusively and without doubt, that the damage would not have been suffered but for the intentional acts or failures to act by the offending or breaching party. If that all sounds simple, you need to pay closer attention.

You have to be able to *conclusively* prove that the willful, intentional, and continuing actions or inactions of the other party in breach of its contract are the *sole* cause of the additional consequential damages suffered by you and/or your company.

Most people have heard of the "beyond a reasonable doubt" standard for a jury returning a guilty verdict in a criminal trial. The standard for awarding consequential damages is that tough and more. Remember, simple breach of contract awards are governed by "preponderance of the evidence available" standards. Generally, 51 percent to 75 percent of the evidence in favor will net an award for damages, but not if the damages sought are "consequential."

So what are consequential damages? Some refer to them as off-site "ripple damages." Here's a partial list:

■ ***Loss of bonding capacity and, therefore, the ability to bid and earn additional profits.*** Obviously, if unbonded projects are available to bid, that won't fly. And even if they're not available, then there's still the problem of showing in writing through witnesses, depositions, testimony, documents, etc., that serious and earnest attempts were made to bid and obtain bonded projects, including the securing of both bid and performance bonds for those projects.

■ ***Inability to pay reasonable and normal costs, expenses, and invoices on other jobs or projects, coupled with creditor or lender refusals to extend further loans and credit, and a consequential shutdown, slowdown, or inefficient operation of the other projects.*** You have to prove that serious, willful, and continual nonpayments or unpaid extra costs due to changes, delays, etc., caused the "conditions" that drained the company of cash or credit. A normal recession or "crunch" (cash, business, bidding, or credit) simultaneously occurring during the breaches of the contract is *not* good news. The crunch may be deemed the real cause, not the breaches of the contract. Additionally, you can't incur another "sour job" or serious breach of contract situation on a separate project underway at the same time, including another project that was bid too low to "roll" cash.

■ ***Forced sale of (or pledging to secure loans backed by) company assets at below-market value to secure necessary cash and/or credit or lender repossession of secured loan-pledged assets.*** The comments noted above apply here, also.

■ ***Loss of key personnel (supervisory and skilled tradesmen) in both the field and home office.*** Again, the comments noted above apply.

■ ***Loss of insurance coverages due to nonpayment of premiums — and normally covered loss occurrences that are now not covered.***

■ ***Unusually high interest rates and fees paid to secure high-risk loans and capital infusion.*** Usury or high-interest rate loans are not legal in most states, so this one probably won't get much consideration from a court.

■ ***Subcontracted work that deals 100 percent with another contractor who charges a fee of 10 percent or more to back and bond the project, even though that contractor does no actual work on the project—and you do it all.*** This practice has become quite prevalent in the Southwest in recent years. The bond fee *can* be considered a consequential damage.

■ ***Special situations and losses that tie directly back to the willful and continuing breach(s) of the contract.*** The key and operative word is *directly*.

In laymen's terms, consequential damages are a real pill to serve up and get a judge, jury, arbitrator, or panel of arbitrators to swallow. It has been done, but not very often.

However, if consequential damages are being suffered and the contract breaches are continuing unabated or worsening by the day (nonpayment being the chief culprit above all others), a well-thought-out but simple letter stating that the breaches are seriously interfering with the ongoing operation of your company is a wise move. Send it certified (return receipt requested), and then watch what happens. Also, be sure you contact your attorney as you're drafting the letter so he or she can assist you during the process and thereafter.

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Unforeseen, Latent Site Conditions

Some contracts — but not many — contain provisions that define unforeseen, latent (hidden) site conditions and the procedures required for dealing with them as to notification, solutions, and payment. Such conditions are usually defined as either *Type I* or *Type II*.

Type I is a condition not shown or improperly shown on project plans that substantially alters the prebid anticipated performance of the contractor (delays, reduced productivity, impossibility of performance, suspension of work, extra work to fix or solve, etc.). These unforeseen site conditions are fairly straightforward and relatively easy to prove via plans, specifications, or prebid information versus what was actually encountered.

Type II is a condition not normally found in the performance of work of the type shown and specified in the contract and/or is not normally contemplated by a reasonably prudent contractor in bidding the work as planned and specified in the contract. These unforeseen site conditions are very subjective, hard to document, and difficult to validate in that they require proving what is considered *normal* to a *reasonable* contractor when bidding the project.

For instance, for every contractor who considers an encountered condition abnormal, there's another who regards the same condition as normal. Consequently, contractors who encounter what they consider a Type II site condition will line up a handful of other contractors who favor their viewpoint, while owners will have his handful of contractors with the opposite viewpoint.

Most federal or federally funded construction contracts contain unforeseen, latent site condition clauses (Types I *and* II). Most other construction contracts do not.

Unforeseen, latent site condition clauses are desirable in any construction contract containing: large amounts of excavation; large numbers of underground facilities such as trenching for piping; and rehabilitation of any existing facility, regardless of the type of facility.

Contractors who bid projects containing large quantities of work described above *must* include contingencies (money) in their bids for that work if the contract and its specifications contain no unforeseen, latent site condition clauses. Why? The absence of the clauses in the contract means the contractor is "at risk" for the cost of dealing with potential adverse consequences.

While there have been instances where a contractor has been paid for dealing with unbid, unforeseen, la-

tent site conditions despite the fact that the contract was silent on the matter, the payment was usually obtained through very expensive arbitration and/or litigation proceedings.

Knowledgeable, reputable owners and their design professionals and construction managers include unforeseen, latent site condition clauses in their contracts and then deal with such problems on an equitable adjustment basis if and when they are encountered.

# # #

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Efficiency and Productivity Losses Due to Labor Shortages and Lack of Skilled Labor and Supervision

It's no secret that good contractors schedule their pricing and bidding on project work with local labor availability carefully taken into account. It's also well known that every good contractor has a loyal cadre of skilled workers and a matching set of supervisors who know those skilled workers and their capabilities quite well.

It's a further recognized fact that when work on a construction project is delayed, interfered with, or suspended and the skilled labor force and/or supervision assigned to the project is laid off or moved to another project, those originally assigned to the project often do not return to it later. Thus, after the disruptions have run their course and work resumes, the labor force and its supervision that finish the project are *not* the same people the contractor relied upon for bid productivity figures and labor costs.

There are many contractors who, after having experienced delays, interferences, or suspensions on a project and then resuming a full schedule of work, notice that labor cost budgets are now exceeding what had previously been on target or better than the as-bid figures. The contractor in this situation is never quite sure what the problem is, but the fact that there *is* a problem is very evident, based on the labor costs exceeding the budget.

To prove losses of efficiency and productivity, a contractor has to have accurate bid-estimate records indicating *who* was to be assigned to the project (key skilled labor personnel and supervision) and then have the records (payroll data) showing these people initially working on the project and producing per the bid estimates or better, prior to the onset of the disruptions to the work. The payroll data available for the period after the disruptions has to show a different set of workers and supervisors on the project. And lower productivity and higher per unit labor costs must also be proven.

Very few owners, construction managers, architects, and/or engineers believe this situation is a genuine problem and, more importantly, few of them will ever admit that claims based on this lost efficiency and productivity problem are, in fact, due the contractor.

A secondary version of the problem has to do with a contractor attempting to start a project late in the construction season, when all the skilled labor force has already been employed and put to work elsewhere. This up-front project start-delay problem is particularly severe with union contractors who rely on union hiring halls. By mid- to late spring, the hiring hall "benches" have usually been cleared, leaving few good craftsmen and tradesmen available.

Contractors who get caught in this up-front delay trap will often schedule 48- to 60-hour work weeks for the project's most critical (not readily available) skilled trades in an effort to "bribe or steal" good workers away from other contractors. The extra eight to 20 hours a week worth of time-and-a-half pay usually provides the inducement necessary to attract the good tradesmen.

However, working many consecutive 48- to 60-hour weeks and paying a time-and-a-half premium for eight to 20 hours a week to offset project delays is in itself a "loser" due to lost productivity and efficiency caused by overtime labor fatigue and additional premium wage costs. For even though as-bid/as-quoted productivity can be achieved in the first two to three weeks of accelerated labor scheduling, productivity then steadily drops, compounded by the premium wage costs.

Getting an owner to pay for such methodologies and losses because of a delay in the start of a project is very difficult. Generally, this proves more successful if the contractor notifies the owner of the potential labor shortage that the delay *may* cause, and informs the owner about the scheduled overtime necessary to attract good skilled tradesmen when the project starts later than planned.

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Published and Widely Circulated Construction Law Case Citations

For the past several years, the construction industry has been provided a wealth of construction case law citations and seminars. Some of them are offered as a service to clients and prospective clients by law firms and, specifically, construction law practitioners, usually in the form of multiple-page news documents. Other citations and summaries can be purchased from law textbook publishers in response to a veritable barrage of "Order Now . . . We'll Bill You Later" advertisements.

What a construction practitioner has to be very conscious of is the fact that the law cases cited in these publications may or may not be applicable to:

- The geo-political area or region where the construction practitioner normally bids and builds projects;
- The contract documents the construction practitioner usually encounters on his or her projects; or
- The existing set of facts and contemporaneous documents that exist on a specific project.

Over reliance upon construction case law citations without careful consideration of the above has gotten more than one construction professional into difficulty later.

When in doubt, contact a *local* attorney or law firm experienced in construction law before you rely on something you read in a publication of any type. It also makes good sense to hire a local construction attorney to do some preliminary work if you're confronted with a particularly strange or unusual set of contract documents on a project you're bidding or thinking about bidding. Some national law firms also serve this function because they have attorneys licensed in local areas.

Meglan, Meglan & Company, Limited, which works with many attorneys throughout most of the U.S. during the course of its construction claims and disputes consulting practice, has learned that construction law varies widely depending upon:

- The state or region of the country where the construction project is located;
- The forum (court, etc.) in which a construction litigation or arbitration is filed; and
- The contents of the construction contract, which may specify both the applicable law and forum to be used in resolving a construction claim or dispute.

Although it's always a good idea to keep current on general legal trends in the construction industry, don't rely solely on these trends. For example, the Eichleay Formula has been widely publicized as a legally well-founded methodology for determining extended project performance damages (home office overhead allocations for a delay claim). Unfortunately, there are more than a few states where Eichleay is not recognized by most of their courts.

Another example is the "no-damages-for-delay" clause. Several states prohibit their use in public construction contracts; others almost religiously uphold such contract clauses in their courts. Yet another example are contract clauses for prebid site investigations and unforeseen latent site conditions. They, too, vary in legal interpretation from state to state.

When in doubt or faced with an unusual or unfamiliar construction contract, consult your attorney or a legal authority counsel in the locale where the construction project is underway. Local and state bar associations maintain lists of qualified attorneys by practice specialties, such as construction law, and are generally very helpful in such situations.

One final point: construction contracts and disputes are one of the most formidable and complex of all contract law areas. A large number of construction professionals and trade associations have voiced considerable dismay over the legal profession's intrusion on the construction industry. What is often overlooked is the fact that the parties to a construction contract have far more impact on whether there will be unresolved disputes and claims than the attorneys do. Construction is typically a people-oriented enterprise. Sadly, it becomes a paper- and legal-oriented business when the people involved forget their ethics, morals, and sense of fair play.

# # #

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Binding/Nonbinding Arbitration Clauses

Construction contracts *can* contain arbitration clauses specifying that disputes shall be settled by arbitration. The section of a contract containing remedy clauses is where such an arbitration clause is usually found.

Nonbinding arbitration clauses are deceptive and basically unenforceable. If the word "nonbinding" appears in an arbitration clause, the dispute will almost always find its way to a courtroom through litigation.

Most arbitration clauses require arbitration in accordance with the American Arbitration Association's "Rules of Construction Arbitration." These rules specify *binding* arbitration, which is fully and legally enforceable in a court of law once an award is made by the arbitrator(s).

In arbitration, as in litigation, there are definite procedures and rules, though, perhaps, not as many nor nearly as rigid. Arbitration should *never* be undertaken and presented by nonexperienced, nonlegal trained individuals. In short, arbitration is not a game for amateurs.

Unlike courtroom-based legal proceedings (lawsuits), arbitrations are unique, usually flexible, and can range from mildly to very informal in their presentation. Arbitrators act as both judge (determiners of applicable law) and jury (finders of fact). Also, arbitration does not require formal *discovery* proceedings (exchanges of documents, depositions, etc.) prior to the final presentation of the dispute to the arbitrator. Thus, the cost savings are substantial as compared to lawsuits.

Most arbitrations are filed, heard, and decided in the form of a written award in a year or less — usually less. Lawsuits seldom conclude in less than a year. Often it takes two or more years to file, present, and conclude a lawsuit.

Either party to a contract can insert an arbitration clause into a contract prior to the final formal signing of the contract. Public construction contracts, however, are usually not negotiable as to terms, conditions, and content. General contractor or subcontractor construction contracts, on the other hand, have the flexibility to insert arbitration clauses for either or both parties.

The arbitration process almost always allows the parties to chose an arbitrator. Larger cases generally require three arbitrators. Arbitrators are usually experienced construction professionals, such as contractors, subcontractors, construction managers/administrators, owners, engineers, or architects, or are experienced construction attorneys.

There is only one *best practice* for choosing an arbitrator or a panel of arbitrators. However, because the methodology works so well, **Meglan, Meglan & Company, Limited,** is not going to reveal the practice in this document. That is a benefit reserved for clients or associates.

Selecting an attorney for an arbitration is something that should be done very carefully. The secret to that process lies in *experience*. Asking someone who knows which attorneys have arbitration experience —

construction arbitration experience in particular — is a good first move.

As a point of emphasis, to be effective, arbitration must be *binding* upon all arbitrating parties. Mediation, on the other hand, by definition, is nonbinding. Parties seeking an enforceable, binding decision should *never* mediate a dispute. It's also not usually advisable to attempt mediating a dispute that is in binding arbitration if you are the party with most or all of the factual evidence and exhibits. Many defending parties and their counsel use mediation as a form of discovery so they can determine exactly what they will face in an arbitration.

To date, **Meglan, Meglan & Company, Limited,** has not encountered an arbitrator who has ever *exactly divided* a final decision between the arbitrating parties. There's almost always a clear winner and loser.

# # #

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Claims Topics

Schedules: Why Use Activity 'Numbers' When You Can Use Words?

Since the late 1950s and early 1960s, construction experts and construction schedulers have been creating critical path method (CPM) schedules with *numbered activities or nodes* and an accompanying *activity description* for each number.

The practice began as a matter of absolute necessity and practicality because the computer of the '50s and '60s (before Sputnik and U.S. space program advancements in microprocessors) couldn't deal with letters (alpha characters), just numbers (numeric characters), or so we were told. That's not quite true. The old computers were alpha-numeric "smart." They just weren't very fast in handling alpha characters when it came to sorting and selecting. Consequently, everything was assigned a number rather than a series of letters (words or data).

The beginning activity in a construction schedule was identified as 1 or 100 or 1000, and it was understood that such a number designated the first or *starting* activity. In the 1980s, at the beginning of the microprocessor revolution, some ingenious scheduler started naming the first activity "Start" instead of 1, 100, or 1000. Obviously, there was no need for an activity description. The computer understood it; the scheduler understood it; and, more importantly, so did *everyone* else.

That same scheduler then went on with a similar creative genius streak and named the activity for Excavate Building as "Excav Bldg." Pour Footers was named "Pour Ftrs." Place Walls was named "Place Wls," and so on. But there was not one single numbered activity in the entire CPM schedule. And, because they weren't necessary, there were no activity descriptions printed on the schedule. Instead, the number became a word, an abbreviation, or two words or abbreviations that clearly stated each activity.

Meglan, Meglan & Company, Limited, has done some fairly complex schedules that used the word or abbreviation systems instead of numbers — and they worked. They were easily understood by superintendents, foremen, carpenters, ironworkers, laborers, etc., which eliminated expensive time spent in translation.

If your company uses modified bar charts schedules and is still *numbering* the bars on the chart, try using words. You'll be amazed how fast and easy a sched-

ule is read and understood when its activities are identified with words instead of numbers. There are some excellent computer software programs on the market today that can help you with these scheduling tasks.

As a final suggestion, if the scheduling activity is Pour Floor Number 1, try using "Pour Flr #1" for an activity "number." An activity description that follows a number like that is redundant. If there are three buildings on the project, identified as Buildings A, B, and C, then name the scheduling activity of Pour Floor Number 1 of A Building as "Pour Flr #1A" or "Pour Flr #A1" (your choice).

# # #

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Contractual Terminations for Default

All government contracts contain contractual language that allows the government to terminate a contractor for "defaulting the contract," or what's more commonly called breaching a contract.

Termination for default clauses exist in all federal construction contracts and are specifically referenced in the government's *Federal Acquisition Regulations*. T-4-D clauses in state, county, town, township, borough, city, and quasi-public organization construction contracts are usually found in the General Conditions section of a contract document. The T-4-D clause is also found in the General Conditions section of private construction contracts utilizing AIA, EJCDC, and other standard form contract documents.

T-4-D clauses differ from contract to contract, but most, if not all, allow an owner to terminate a contractor for failure to progress the project (and, therefore, not completing the contract) in a timely manner. Generally, default termination clauses contain a "cure notice" provision.

A cure notice is a formal, written notice, from the owner to the contractor, advising that the contractor will be terminated for default if it does not — usually within a specified number of work days or calendar days — improve its performance of the contract (more labor on the project, more materials put in place, etc.) and visibly show that the contract will be completed on time or nearly so, based on a higher level of performance.

Most owners will also request a completion schedule from the contractor that shows exactly and precisely how and when it proposes to remedy its lagging performance and complete the contract and project in a timely manner.

If the "cure period" expires without a response from the contractor, or without *sufficient* response from the contractor, or without visible improvement in work progress, most owners will then issue a T-4-D notice or letter that orders the contractor to cease work on the project.

T-4-D notices and cure notices are not generally issued by owners to contractors who are attempting to faithfully perform their contracts — even under adverse or unusual circumstances. Such notices are usually given only when a contractor abandons both the project and contract (no laborers present, subcontractors unpaid and liening the project, and progress halted).

However, for every *usual* situation and circumstance, there are notable and usually serious exceptions. T-4-Ds issued by an owner after a cure notice has been issued and its specified time period has expired are *almost always* determined to be wrongful default terminations if one or more of the following conditions existed when the T-4-D was issued:

■ The contractor provided a completion schedule prior to the end of the cure period and/or *significantly* increased its performance on the project within the cure period.

■ The contractor was not being paid by the owner for work it had already completed, resulting in seri-

ous hindrance to the contractor and its subcontractors and suppliers.

■ The contractor's progress had previously been hindered, disrupted, interfered with, or delayed by the owner, the owner's representatives and agents, other prime contractors hired by the owner, or by other contractually specified "excusable" delays such as natural or man-made disasters, acts of war, etc.

■ The contractor encountered major changes in the contract-specified work, (or several, compounding minor changes that effect the same results), without owner-initiated change orders, modifications, or reimbursements being issued to the contractor on a timely and reasonable basis.

■ The contractor was subjected to active, intentional, and continuous harassment by the owner or owner's agent and its forces, such as over zealous inspection and/or wrongful rejection of completed work.

■ T-4-D and cure notices issued after the owner had "beneficially occupied" and begun utilizing the project or significant portions of it.

The preceding list is by no means complete. The damages that can be caused to the ongoing business operations of a contractor who has been wrongfully terminated on a project are usually large and recoverable, if they can be quantified and proven to have occurred because of the wrongful termination.

# # #

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What Is a Construction Forensics Expert?

In a few words, a construction forensics expert is the Sherlock Holmes of the construction industry.

A CFE's problem-solving, cause-and-effect investigations have been little known and even less understood by an industry that has had the largest segment of the U.S. gross national product for the last 50 years.

Within the construction industry, the CFE is often wrongly billed as a "have gun, will travel" troupe. Far from having or holding the "smoking gun," the CFE is the "detective" who finds the smoking gun and figures out who used it and why on a construction project that's gone sour and become very unprofitable, late, or both.

At times, the CFE is positively Holmeslike, relying partly on intuition, partly on logic, and always on the facts. The CFE is even sometimes prone to using the old Holmes lingo:

"It's elementary. . . . Don't forget the basics. . . . Use simple logic. . . .You have to use deductive reasoning to put the puzzle together. . . . Not seeing just the 'trees,' but being able to also see the forest!"

When on the witness stand in a complex construction litigation or arbitration matter, the CFE's role is to show technical information to a judge, jury, or arbitrator without bias. As long as a CFE does everything humanly possible to assess the facts and the puzzle, he or she should never, from an ethical standpoint, care what the final outcome is — win, lose, or draw. The CFE is, after all, an expert hired to determine only the facts and truth.

When a CFE's objectivity, reasoning, or investigative techniques become slanted and one-sided, he or she ceases being an expert and, instead, becomes an advocate, much like counsel for the party that hired the CFE.

Judges, juries, and arbitrators have a sixth sense when it comes to advocacy testimony versus genuine expert testimony. They are seldom impressed by an expert-turned-advocate. It is therefore the CFE's sole duty to maintain expert credibility, regardless of counsel's efforts to elicit an advocacy stance — and often in spite of it.

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Notices: Why Daily Construction Record Reports and Schedules Are So Important

Contractors seldom, if ever, have notice problems if they routinely prepare both a daily construction record report (DCRR) and detailed original construction schedule, systematically updating (as-built) them on at least a monthly basis and then providing copies to the owner or owner's project representative.

These two sets of contractor-authored-and-generated documents provide a detailed history of the daily activities on a construction project in a regular and highly efficient manner. However, the history is of limited value if it is not quickly communicated to *all* of the parties to the construction contract.

Establishing responsibility for who prepares DCRRs and schedules and how copies are routinely transmitted to the appropriate parties and their personnel should be the very *first* actions taken by a contractor's project management team before actual construction commences. DCRRs constitute an accurate daily accounting of:

- What work is being done where;
- Who is doing the work with what materials, tools, and equipment;
- What specific quantity of work is being accomplished (in measured units in place);
- What problems (delays, hindrances, disruptions, and interferences) are being experienced and who is causing them;
- What the current status of critical submittals and approvals is;
- What changes have been encountered or ordered;
- What errors, omissions, and redundancies were encountered in the project plans and specifications; and
- What the weather and other conditions were for the entire day on the project.

Original schedules and subsequent updated, as-built schedules provide an accurate, comprehensive picture of what was planned versus what has actually occurred on a construction project.

Bar chart (Gant) schedules lack sufficient details to provide the comparative pictures of a project's progress or lack of, except for the fact that the project is on schedule, early or late. They never show dependencies and seldom show responsibilities. Also, bar charts don't provide planned versus actual: total usage of resources (labor, material, and equipment); earned total revenues and cash flow; and resources, revenues, and costs by work item or activity.

Precedence schedules routinely depict and track all project items and factors and, more importantly, provide instant, daily snapshots — precisely dated and quantified — of progress or lack of such on the schedule update. Those snapshots provide a permanent, stored record of construction project activities and items, revenues, costs, resources, and cash flow for quick comparison to the similar as-planned data.

More significantly, however, DCCRs and precedence schedules keep the owner informed of the contractor's

progress and success, while simultaneously notifying the owner of actual or potential changes, problems, delays, hindrances, disruptions, or interferences.

These two sets of contemporaneously contractor-prepared documents generally satisfy *every* contractual notice, provision, or clause that would bar a contractor from successfully recovering extra costs and/or time for changes (recognized or constructive), delays, hindrances, disruptions, or interferences that are not caused by the contractor and/or are not the responsibility of the contractor as to either cost or time, or both.

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Change Order and Contract Modification Reservation-of-Rights Clauses

When a contractor or subcontractor signs a change order, modification of contract, supplemental agreement to a contract, or an equitable adjustment to a contract, the signature usually acknowledges that *full accord and satisfaction* is being received in both time and money for the cost *and the effects* of the change or modification.

Most construction professionals view a change or modification as only the direct cost of the labor, materials, and equipment required for the prescribed work, plus reasonable overhead and profit, which is usually specified in the changes or modifications clauses of the contract.

Often overlooked or ignored is the impact of a change or modification on the original contracted work, the original construction schedule and, possibly, the schedule's projected completion date, which may have been earlier than the contract-specified completion date.

Also ignored are the *accumulative* or *serial* effects of consecutive changes or modifications, all connected together or in parallel sequencing. Making numerous changes or modifications in an original contract, its plans, and specifications may cause serious interferences, hindrances, or delays in the efficient performance of some or all of the originally bid, fixed-priced work. The accumulative effects usually don't become apparent until there have already been many change orders or modifications to the contract, mutually agreed to and signed by both the owner and the contractor and, consequently, by the contractor and its subcontractors.

Usually at the time each contract change order or modification was signed, both parties were considering only the added items of work and their respective costs as described in the change order or modification being addressed.

Unfortunately, the original construction contract generally portrays a very different viewpoint through legally crafted language, one that encompasses or incorporates all of the effects of the change or modification upon the entire contract into the change order, thereby modifying the contract price and, occasionally, the contract time.

Once signed by all parties to the contract, the change order or modification is final. Its price affords *only* the amount due and payable for the change or modification *and all of its effects*, whether or not foreseen and contemplated by the signatory parties. The only way of preventing change order work and its unforeseen effects (delays in the performance of scheduled construction activities) from being nonreimbursable is to reserve the right to cost and price them later.

The following brief *reservation-of-rights clauses* can be inserted into a change order or modification of contract, thus preventing unforeseen additional costs from becoming nonreimbursed or barred by the change or modification agreement:

■ The amount(s) set forth in this change order are for full reimbursement for the direct cost of all labor, material, and equipment necessary to perform the work described in this change order. All rights are reserved and not accorded or satisfied by this change order regarding any additional time required or costs incurred to perform any and all other work of the contract (including other change orders) caused by this change order.

■ All rights are reserved and not accorded or satisfied with regard to additional impact costs and time that this change order may cause to other contract work, other change orders included.

■ Changes to and effects upon construction schedules, the original performance time, costs, methods, means, sequences, and procedures of construction of all other contract work, and all other contract change orders are not a part of this change order. All rights are reserved and not accorded or satisfied regarding such changes and effects.

■ This change order may cause unforeseen and uncontemplated delays, hindrances, interferences with and/or disruptions to the original contract work and/or to other change order work. The costs of those delays, hindrances, disruptions and interferences, both in time and in money, are not a part of this change order, and the right to such additional costs and time is specifically reserved and not accorded or satisfied by this change order.

■ This change order does not surrender any right the contractor may have under any clause or provision of the contract for entitlements to additional cost reimbursements and time extensions (damages) this change order and its specified work may cause to any and all work not specifically described and set forth in this change order.

■ The parties agree that this change order describes any and all additional work to be performed, and that it enumerates the *direct costs of performance* of that additional work. Extended performance costs, overhead, profit, and the costs of inefficiencies caused to other work are not a part of this change order, and all rights to such additional costs if incurred, and additional time if required, are reserved.

■ This proposal/change order request includes only the direct costs of this work. The subcontractor (contractor) reserves the right to make a later claim for an extension of time and for all indirect impact costs caused by or resulting from this proposal/change order request.

Specific construction contracts and their projects often require specifically and carefully worded reservation-of-rights clauses to correctly preserve the right to claim entitlements to additional costs and time extensions caused by a change order or modification to the contract. *It is always wise to enlist the services of an experienced construction contract law attorney or law firm in drafting a reservation-of-rights clause that can be inserted into all of the changes or modifications to such a contract or agreement*.

Some astute contractors include the following language in their quotation for a change order or modification of contract pricing proposal:

This change order/modification of contract pricing proposal includes *only* the direct costs of all labor, material, and equipment required to perform the work described in the change order/modification of contract pricing request, plus 15 percent added to cover the cost of project and home office overhead necessary and required to administer and supervise the work described, and 10 percent profit on the sum of those direct costs and overhead costs. This priced proposal does not cover any alterations of, delays to, interferences with, hindrances to, and/or interruptions of original contract work items or other change order/modification of contract work items contained in other separate proposals.

Further, the effects of the work set forth in this proposal upon previously prepared and planned schedules and methods, means, sequences, and procedures of construction and the final comple-

tion date(s) of the project are *not* priced in this proposal, nor is an extension of time to complete the contract included in this proposal.

All of these impacts will be determined after the quoted change order/modification of contract, all other changes/modifications, and the original contract work are completed.

This proposal also contains the actual labor costs incurred and expended to take off, cost, price, and quote the proposal and then negotiate and execute the formal, final change order/modification of contract, including outside consulting fees, management fees, and legal and accounting fees and charges where and when used. Full documentation of all takeoffs, costing, and pricing is included with this change order/modification of contract proposal. All direct, documented actual costs and prices are *not* negotiable.

This change order/modification of contract may, in the alternative, be performed by *cost-plus, force account* methodologies with all parties witnessing the work and its costs and documenting them in writing, each day the changed work is being performed.

# # #

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Failures of Implied Warranties of Design

When a contractor, subcontractor, or material supplier provides a lump sum or unit price bid quotation based upon owner-furnished contract documents, those documents are presumed to be accurate in all respects and instances.

Generally, or almost without exception, contract documents include the project plans (drawings) and specifications. The general conditions of the contract — and sometimes the supplemental general conditions, too — usually define the contract documents as including both the plans and specifications.

Virtually every court, contract appeals board, arbitrator, or arbitration panel has upheld the *doctrine of implied warranty of design* or the presumed and implied correctness of the original, as-bid, set of project plans and specifications on firm-priced, hard-dollar construction contracts.

These include both lump sum-bid construction contracts *and* unit priced-bid, estimated quantity-based, extended-to-final lump sum construction contracts.

If, during the performance of the construction contract, plan and specification errors and omissions are encountered by the contractor, subcontractors, or material suppliers, *or* if the designs set forth in the plans and specifications are impossible to construct *at any cost*, the owner's implied warranty of design is considered to have failed (either in part or completely), depending upon the nature, number, and severity of the E&O and their consequences upon the progress and cost of the project.

Most design professional-prepared contract documents (plans and specifications, primarily) contain standard E&O discovery and remedy sections, usually in the General Conditions or Supplemental General Conditions of the contract. These sections require the contractor to notify the owner and/or owner's project representative in writing of any design E&O *when encountered by the contractor*. Correction of the plans and/or specifications then becomes the sole responsibility of the owner.

Resultant revisions to or changes in the plans and specifications and, where applicable, the time and/or sequences of performance of the project, then must be estimated, priced, and quoted to the owner as valid change order requests, modifications of contract, equitable adjustments to the contract, or changes to the contract. If not agreed to by the owner and contractor, they become claims under the disputes and remedy clauses of the contract.

Serious and numerous E&O in the as-bid plans and specifications can often cause lengthy suspensions of work on all or portions of the project and, in extreme cases, can lead to termination of the contract, usually for the convenience of the owner. When any failure of an owner's implied warranty of design is encountered, the contractor must:

- Provide written notice of the failure(s) to the owner and, sometimes, the design professional;
- Seek plan and/or specification revisions from the owner and, sometimes, the design professional, to correct the failure(s); and

- Accurately and fully estimate, price, and quote all subsequent owner-provided plan and specification revisions that allege to correct the failure(s).

Most contractors, subcontractors, and/or material suppliers overlook the costs of the *effects* of failures of an owner's implied warranty of design upon their individual activities and total construction project methods, sequences, and procedures, which includes the original project schedule. Those effects are usually the most serious and costly, especially if the owner and/or design professional takes a long time to revise the plans and specifications, during which, work on the project is halted due to the pending revisions.

# # #

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Construction Scheduling Notes

The following are some brief comments and general rule of practice for construction scheduling:

■ Scheduling consultants are most correctly and efficiently utilized by contractors when they are hired to *teach* the contractor's personnel how to accurately prepare a construction schedule for a specific construction project. If the scheduling consultant does not follow through in this teaching capacity (instructing personnel on how to schedule subsequent projects, unassisted by outside professionals), the full value of the fees paid by the contractor to the consultant is not being obtained.

■ Construction schedules are an integral part of the construction process. They *force* project managers and supervisors to think the job through, thoroughly, before they attempt to procure a project and then build it. Schedules are tools, just like hammers, saws, trowels, etc. They are *not* just exhibits for later litigation and arbitration; they are the creative, constructive, logical thought processes of the person or persons who have been delegated the responsibility of building a construction project. If schedules are not prepared responsibly, the building of the project will not proceed accordingly to the assigned timetable and budget.

■ Once prepared and submitted, construction schedules are not necessarily "cast in stone." Good project managers and supervisors will always think of better, more cost-effective, and faster ways to accomplish segments of a construction project as the tasks approach the performance stage. There's nothing wrong with modifying a construction schedule, so long as the change improves performance, not hinders it.

■ The *real* secondary value of a construction schedule lies in its ability to depict performance and procurement necessities within a very complex picture (and report) made up of many small units. If considered as a road map of sorts, the construction schedule is the beginning of project management knowledge and wisdom. And, just as there are many routes one can drive to get from New York to Los Angeles, there are also many routes or ways to schedule a construction project. Only one route is the shortest, although it may not necessarily be the quickest due to traffic signs, directional signals, safety controls, etc. Other routes may take less time but cost substantially more. Weighing time against cost is a key consideration in construction scheduling.

■ Beware of outside interferences and *approval requirements* in construction scheduling. Some owners, construction managers, and design professionals will constantly attempt to change a contractor's construction schedule. The methods, means, procedures, and sequences of a construction project are almost always the *responsibility* of the contractor. A schedule is, above all else, a statement of a contractor's *intended* and *planned* road map for project completion, as noted previously. When noncontractor personnel begin altering a construction schedule in very specific and detailed ways, they may well be accepting *project responsibility* for the end results in terms of time and costs.

Meglan, Meglan & Company, Limited was once reminded by an old and respected friend — a vice president and operations manager for one of the world's largest high-rise building constructors — that the construction industry has not necessarily become better and faster in recent years because of the use of scheduling systems. He cited the fact that numerous large and complex high-rise buildings were built more quickly in the early part of the 20th century (1900 to 1929, principally) than similar structures are built today. These buildings still stand, and some of them were constructed for much less (in terms of constant dollars) than it would cost to build them today.

As said earlier, a construction schedule is a tool, and like any tool, it can be made incorrectly and used incorrectly. The real secret to good construction schedules lies in the skill, involvement, responsibility, and thoroughness of the preparer.

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Timely Professional Assistance Yields Big Benefits and Fewer Worries

Owners, construction managers, design professionals, contractors, subcontractors, and suppliers who balk at or hesitate in getting professional assistance on problem construction projects often suffer that same fate a homeowner experiences when the fire department is called "a bit too late." Granted, the pros are eventually called and show up . . . to tend the smoldering embers and ashes.

Meglan, Meglan & Company, Limited, is often called in late on a problem, more than 80 percent of the time, in fact. Sometimes, the distress call is heard even after a project is completed. Anyone in the medical profession will tell you that trying to save dying patients and performing post mortems is not what they're really all about, *professionally*, nor is this company.

Communication; keeping accurate and thorough records; maintaining plans, schedule, and budgets; and solving problems while they're in their infancy are the very essence of good construction project management. Since **Meglan, Meglan & Company, Limited,** teaches the techniques, methodologies, and skilled habits necessary to perform all those tasks well, its services are better utilized at the beginning of a construction project. Part of that mission includes:

- Teaching clients to *communicate quietly* in a routine, unoffensive manner but still get all the bases covered and cross home plate — standing up.
- Teaching clients to facilitate meaningful project meetings that report actual progress and planned future progress, coordinate work that needs to be done between meetings, and identify problems and propose solutions for them.
- Teaching clients the value and purpose behind written communications, including when to write memos and letters — and when *not* to.
- Implementing visible, project-based incentive or reward systems for outstanding (profitable) performance as a vehicle for increasing productivity.
- Establishing proactive public relations efforts that inform and recognize project team achievement.
- Maintaining *realistic* general and home office supervision of a project and its progress.

The first point noted above, communicating quietly, is not only the most fun and rewarding to teach, it's also the most challenging. Why? Because it requires instructing clients on matters that are often considered "uncharted territory" in their past experiences, something they may be little apprehensive about.

Some of these areas include setting up project accounting budgets and schedules that are compatible with each other forwards and backwards, and establishing reporting and record-keeping systems that enter pertinent information into daily construction record reports that can be provided to the owner, construction manager, and/or design professional — serving as the basis for updating accounting records and schedules.

Setting up project accounting budgets and schedules that "mesh" should follow these criteria:

- Budget cost, resource, and revenue items must match the original as-planned project schedule activities, including identical codes in both the schedule activities and accounting system;

- Resource and cost accounts loaded in an original as-planned schedule activity have to match that activity's *measurable* work units and be discretely identified in the accounting system;
- Comparisons of periodic (daily, weekly, or monthly) budget versus actual resource, cost, and revenue schedule activity must be established and regularly monitored; and,
- Budgeted as-bid productivity versus actual as-built productivity must be accurately monitored and compared daily, weekly, or monthly.

Establishing and maintaining comparisons and updates and of periodic as-planned schedule activity versus as-built schedule activity includes making as-built logic changes, inserting actual start and finish dates, inserting activity work suspension data, and inserting delay activities and other important project tracking data. An important part of the maintenance process for all periodic updates and comparisons of budget, cost, and schedule activities is *creating backups* of all work that can archived for future use and reference. Two backups are preferred, with one stored in a bank vault or safe deposit box.

Of course, extrapolating information and systematically reporting all pertinent facts to the owner, construction manager, and/or design professional is one of the "quiet ways" of communicating potential cost overruns, revenue shortfalls, and productivity declines or losses on a project to the appropriate people. Documents furnished to the project team should include: a series of monthly updated as-built schedule tabular reports; a set of monthly updated as-built schedule plots; and a set of resource, cost, and revenue reports and plots (tabular and graphical) that compare original as-planned cost, revenue, and resource levels with current actual as-built and to-be-built projections.

If the owner, CM, and/or design professional have sophisticated computer capability, the contractor should furnish them both the scheduling software and backup disks containing all pertinent documentation. The electronic backups become official "notices" of all delays, disruptions, interferences, work suspensions, and all other matters requiring written notice under the contract documents.

Claims and disputes professionals are often viewed *incorrectly* as the "real trouble makers" of the construction industry. The most probable reasons and causes of that viewpoint appear to be:

- Poor project record-keeping that is later identified by the professional in a "claims" environment;
- Poor cost accounting and scheduling data that do not match or coordinate with each other, later identified by the professional in a claims environment;
- Poorly written, incomplete, or absent notices for delays, disruptions, interferences, and work suspensions, later identified by the professional in a claims environment; and
- High professional fees and costs to prepare and present construction claims.

Construction industry stakeholders often voice highly critical comments about the motivation, services, and fee structures of attorneys, accountants, and construction claims and disputes professionals, including expert witnesses in scheduling, productivity, entitlement, and damages. What *never* or *rarely* gets mentioned is the poor or nonexistent state of project record-keeping, communications, and coordination that makes the utilization of outside experts and consultants a necessity!

The real fact of the matter is that most construction projects that are potentially troublesome or problem-infested are identifiable prior to the bid date, *if they are carefully examined by knowledgeable professionals before they are bid*. That is the realistic time to call in professional help.

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Lost Efficiency/Productivity Checklist

Causes:

- ❑ Excessive overtime hours worked (overtime fatigue).
- ❑ Shifting and shift losses: paid overlaps between shifts; paid lunch periods; night shift artificial lighting inefficiencies; handoff losses.
- ❑ Crew size inefficiencies: too large or too small.
- ❑ Trade stacking and area crowding: different trades bolstering each other; too many trades/laborers crammed into too small a work area; excess materials and equipment in the way of workers.
- ❑ Out of sequence work: access problems or inefficiencies; removing and replacing finished work of others; unable to get materials/equipment to work sites; damage and repair of completed work in place.
- ❑ Weather effects: excess wind; excess precipitation; low temperatures and wind chill; high temperatures; heat exhaustion and fatigue.
- ❑ Trade labor unavailability and/or lowered availability of highly skilled, high productivity tradesmen.
- ❑ Over inspection-caused trade labor inefficiencies and morale problems.
- ❑ Excess supervision to stay abreast of labor force and prevent/lower inefficiencies.
- ❑ Nonpayment or slow payment; foot dragging and trade shutdowns; low morale; supervision inefficiencies caused by no payment or slow payment.
- ❑ Traveler's inefficiencies: early quits and late starts to get to/from home; moving and travel expenses; staying-away-from-home effects. (A "traveler" is a tradesman or craftsman imported from another area of the state or country to compensate for labor shortages.)
- ❑ High employee turnover and absenteeism; multiple and excessive learning curve periods for job and work familiarization; uncoordinated crew operations due to not having worked together as a team.
- ❑ Stopping/starting; excess moves; demobilization and remobilization; idle or waiting time.
- ❑ Use-local-labor-only contract clause-caused inefficiencies; local labor inefficient; local subcontractors not qualified to do the work.

See other *Construction Claims Topics* for specific descriptions of the above causes of lost efficiency and productivity — and the ways they are measured and quantified into actual damages. While the causes cited involve *labor*, keep in mind the fact that *equipment* is used inefficiently when labor is used inefficiently. They work in tandem. However inefficient a labor force becomes, the equipment that labor force uses becomes just as inefficient.

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How NOT to Convert a Change Order Or Extra Work into a Claim

First, don't immediately notify the owner or the owner's project representative that you have encountered a change, an unforeseen latent site condition, a delay, a disruption in your work caused by others, or that a revision in the plans or specifications will cost you more time and money to perform. Wait until some convenient time a few months later to deliver the "bad news."

Second, don't prepare a written daily construction record report that details all work performed, including quantities, manpower, equipment, and materials used each day and all problems (delays, disruptions, unforeseen conditions, etc.) encountered each day. And, more importantly, don't give a copy of the report to the owner until weeks after you get around to preparing it.

Third, write lots of "unfriendly" letters to the owner about all the damages, extras, and miscellaneous tasks that he or she is causing you to perform, but don't be specific as to their nature, cause, or cost. During a busy construction job, nobody has time or wants to be bothered with specifics. Vague, insulting letters are what's needed to "shape everyone up."

Fourth, when you discover an error, omission, or a conflict in the plans or specifications, ignore it and just "fix" it however you please. Don't notify the architect or engineer or even the owner. They'd probably stop the work anyway, until they got it resolved. And nobody wants the work stopped!

Fifth, don't submit written requests for information to the owner when the plans or specifications are unclear. Guess what the owner would want done and do it that way — especially if it's the cheapest way.

Sixth, always agree with the owner, architect, engineer, etc., that all change orders and extras should be "finalized" when the job's done and the owner has moved in.

Finally, seventh, never hold progress meetings with the owner and your subcontractors and never keep minutes of such meetings if the owner forces you to conduct them.

If you follow these seven, simple guidelines, every extra, change order, delay, disruption, unforeseen site condition, etc., will end up being a claim when the

job is completed, and you'll collect on less than half of the ones you can remember and submit for payment after a nice, long lawsuit or arbitration.

Failure is *no accident*. It takes purposeful misplanning and poor decision making to act in an ill-timed and less-than-positive manner!

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'Sticking It to the Other Guy' – The Art And Science of Transferring Risk

In 1989, the National Association of Attorneys General prepared and circulated a draft of proposed model construction contracts and was lambasted by just about every stakeholder in the construction industry. The draft documents were finally withdrawn, *supposedly*, dying a quick death. The essence and substance of NAAG's model contract documents were nearly *total risk transference* from the owner to the contractor and, in some areas, to the design professional.

Circulation of the NAAG draft model was quite extensive. It reached virtually all states attorneys general and their staff attorneys, and most city, county, town, township, and other political subdivision legal departments and outside legal counseling firms.

Because of this circulation, the more stringent risk transfer clauses of the model contracts are showing up in increasing numbers in more and more public construction contracts. In short, the NAAG model construction contract documents are not dead at all but are living quietly in political subdivisions across the U.S.

Moreover, even some federal agencies have creatively attempted to use them in construction project plans and specifications in an effort to overwrite or negate federal contracting and acquisition regulations. So far, the attempts to federalize the NAAG model documents appear to be ill conceived and poorly advised legally, but the troubles they can cause on a federal construction project are unbelievable.

Here are a few of the risk transfers from owner to contractor or design professional the NAAG documents espoused:

■ **Design Errors and Omissions:** Contractor recovery for them must be made directly from the design professional. The secondary issue is destruction of the design professional's privity of contract defenses. For example, from 1988 until 1991, the Ohio Attorney General's Office advised all state construction user agencies to deny design E&O-based construction claims, which they systematically did in Administrative Article 8 hearings with a passion and, which in most cases, were summarily reversed in court.

■ **Other Prime Contractor Caused Delays:** Contractor recovery for them must be made directly from the other prime contractor on the project who caused the delay. The secondary issue here is destruction of the multiple prime contractors' privity of contract defenses. For example, the Ohio Attorney General's Office inserted and supported this language in many state contracts from at least 1988 to early 1991. In most cases, the language is still being used in some manner.

■ **No Damages for Delays:** The contractor is denied *any* owner-paid monetary damages for delays, disruptions, interferences and/or suspensions of work, regardless of who caused them, and some contracts even attempt to deny time extensions for them. In fact, many state and local public construction contracts are still being bid containing this provision.

Few, if any, of the political subdivisions that inserted the risk transfer clause in their public construction contracts from 1988 to the present have removed it, thus far.

And the list continues. Attorneys and law firms specializing in construction law have been attempting to warn their clients of the *extreme legal consequences* and *high added costs* of NAAG's proposed and recommended model construction contract clauses. Such clauses in public construction contracts are always offered on a take-it or don't-bid-it basis, since any modification of the bid and contract documents by the contractor generally renders the bid "informal," thereby earning it an immediate rejection.

As a final example of what happens when a public owner inserts a large number of risk transferring clauses into its contracts, simply look at the City of Columbus (Ohio) Division of Sewerage and Drainage contracts for the Southerly Waste Water Treatment Plant (Project 88). From 1986 through 1988, many contractors bid contracts for Project 88 and performed them under "unusual" contract documents language that had many similarities to some of NAAG's model contract provisions. Generally, these contractors were not a contented lot once they were faced with the realities of the contract language and a very tough-minded owner's construction management team that gave little ground, if any, concerning the contract language. In late 1988 and early 1989, the agency attempted to let its first post Southerly Waste Water Treatment Plant contract *containing the same risk transfer clauses*. There were two bidders, and both greatly exceeded over the owner's estimate.

Stories like this exist all across the U.S. Contractors need to remember the old P. T. Barnum adage pertaining to fools — and remember it well. Any contractor who is willing to accept virtually all the risk on a construction project in exchange for the same old, traditional bidding and pricing methodologies, fits P. T.'s profile of "there's one born every minute."

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Partnering: An Old Idea Whose New Day Has Definitely Arrived

Coming from a company that deals mostly in construction disputes and claims, this *Construction Claims Topic* may appear to run counter to the "bread and butter" business of **Meglan, Meglan & Company, Limited,** especially because of the firm's extensive experience in alternate dispute resolution methods such as arbitration and mediation. Nevertheless, one has to often wonder why so many owners, contractors, subcontractors, suppliers, and design professionals in the construction industry can't settle their differences more timely and equitably, using *neutrals* to help where necessary.

Partnering is not new, nor is it unique. In fact, it has been an integral part of construction in some form or another stretching back thousands of years. In modern times, the partnering concept has been very prevalent in sectors of the private commercial and industrial construction markets.

Perhaps the most notable example comes from the late 1970s and early 1980s when The Business Roundtable's Construction Industry Cost Effectiveness Project issued 23 reports and a summary document, appropriately called *More Construction for the Money*. To implement the CICE Project's more than 200 specific recommendations, BRT encouraged contractor participation in local Construction User Group meetings. While BRT members didn't refer to their contractor participants as "partners," they were, in essence, involved in partnering. What's more important is the fact the process actually worked.

Through the CICE Project recommendations, owners and contractors had a specific, printed agenda to guide them throughout the construction process. They discussed it, focused on implementing it, and made it work through mutual discussions, questioning, resolution, and, finally, acceptance by all parties to the construction process.

The key to successful partnering in construction revolves around these basics:

- Honesty in all matters on all occasions by all parties to the process;
- Trust between each party and in each other's motives and actions;
- Willingness to openly discuss and, more importantly, *resolve* any dispute or difference of opinion, preferably at an early stage of the disagreement;
- Shared desire to quickly resolve any issue or dispute in a *win-win* manner, if at all possible;
- Shared desire to submit all unresolved matters to a mediation or arbitration process (based on a pre-agreement between partners regarding the selection of neutrals who would mediate or arbitrate a dispute) that commences quickly and progresses steadily to a final decision and resolution;
- Full acceptance (binding) of the final decision in a dispute resolution — whether negotiated, mediated, or arbitrated — followed by timely actions to implement the decision and, thus, end the dispute thereafter; and

- Resolute actions taken by all parties to a dispute to assure that the same or a similar dispute does not reoccur in the future on the same project.

From a business perspective, **Meglan, Meglan & Company, Limited,** loves the partnering process. It allows the practice of disputes and claims prevention in a real-time environment with honest, sincere people who are committed in trying to understand opposing positions and in reviewing as many of the available facts pertaining to a problem and its cause.

Partnering begins with the consensus that the construction process involves one party assuming ownership of a desired facility correctly built by another party striving to produce that facility as planned and specified, while making a reasonable profit (a return on investment). The construction process must also instill a sense of both pride and accomplishment in the professionals and trades whose labor and expertise achieved the final result.

It should also be pointed out that design professionals who prepare the plans and specifications for constructed facilities *must* be an integral part of any partnering program. All too often, both owner and contractor alike arbitrarily assign fault or blame to the design professional's efforts or performance as the root cause of a construction dispute.

Recognition on the part of both the owner and contractor — and *all* members of their construction team — that there never has been, nor ever will be, a "perfect" set of plans and specifications is the *beginning of all wisdom* in the resolution of construction disputes. The culmination of the process revolves around quick discovery, identification, and correction of these inevitable errors and omissions at a fair price (cost plus actual overhead plus a reasonable profit) so that no real and lasting harm is done to any of the parties. Recognition of the "time is money" truism by *all* partners is the key.

Additionally, some serious cooperation between owner, design professional, and contractor — with emphasis on quick decision making — *must* enter any value engineering process, where and when it is a part of a construction contract.

The ultimate partnering tool could very well be *total quality management*, if uniformly adopted by owners, design professionals, contractors, subcontractors, and suppliers. *Zero-defecting* an industry that is noted for its "defects" and cost overruns has several obstacles, but the job is not impossible if all partners cooperate in helping each other implement TQM and Z-D principles and goals.

The old adage, "If you can afford to do it *twice*, you can certainly afford to do it *right the first time*," is what TQM and Z-D are all about. But, it takes team effort and cooperation among the partners for it to succeed.

In summary, **Meglan, Meglan & Company, Limited,** likes the idea of honest people trusting each other in an attempt to resolve problems before they escalate into major disputes. That concept, coupled with TQM, could make the public and private construction industries in the U.S. the best and most competitive in the world due to the greatly reduced costs of capital and infrastructure. A committed team effort has always been the hallmark of genuine competitors.

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Proof of Contractual Entitlements And Calculation of Damages Due to Noncontractor-Caused Delays

The key to the financial success of any construction firm on any project is attaining or improving the as-planned, as-bid productivity of its labor component of that plan or bid. When events occur that lower both planned and actual productivity, and those events are *not* caused by the actions of the contractor, the contractor has a contractual right to reimbursement for the resulting productivity losses, if the precipitating events are factually tied to the losses and can be quantified.

The contractor also has a duty to mitigate or reduce any losses incurred, if, where, and when possible. This responsibility is based on a normal, reasonable standard and effort exerted, and does not imply or require extraordinary or unusual effort.

In general, productivity losses are *very* difficult to quantify on most construction projects within most organizations. The primary reason for this arises from the fact that most contractors measure productivity daily, weekly, monthly, or on a per project basis. This makes accurate comparisons of productivity measurements virtually impossible on an hourly basis or for anything less than one day, one week, one month, or one project.

Coupled with this long-period-measurement phenomena is a labor force distrust or suspicion of any attempts by management to institute a per hour performance measurement system that would identify the units of work being produced for each and every hour of labor expended, or in simpler terms, productivity. Overcoming this apprehension and/or preventing outright falsification of recorded hourly production by labor force personnel is a major problem in the construction industry.

The construction industry's other major production measurement obstacle relates to a lack of sufficient amounts of the same or similar work units to measure. Work units often vary significantly from one part of the project to another and cannot be easily measured and compared.

Despite these real and apparent problems, the measurement of production units (and therefore, productivity, when divided by the hours of labor used to produce them) is almost always possible on a *representative sample* or *lead/major item basis*, if set up correctly. Unfortunately, most project management and supervisory personnel do not *think* that way. Most of them are completely task- or operation-oriented and tend to think in terms of start-and-finish milestones, ignoring the events in between.

Secondly, management and supervisory shortcomings in optimizing crew sizes, providing correct equipment and tools and, stocking materials well in advance of their use tend to contribute toward a resistance to short-period-productivity measurement, since such

measurements would, undoubtedly, pinpoint these problems and the lack of management/supervision causing them.

For short-period-production units and productivity measurement to work, a concerted effort has to be made to make both labor and management/supervision *comfortable* with the process. The best way to accomplish and establish a comfort level is to assure all concerned that they will *not* be punished for shortfalls, but instead, invited to analyze them and assist with improving results that satisfy the as-planned and as-bid levels, or at the very least, provide input to the estimating and bidding team personnel when the as-planned, as-bid productivity levels are clearly unrealistic or unreasonable.

Most seasoned, experienced construction organizations price *known* minor inefficiencies into their estimates, bids, or quotations. Items such as startup and shutdown inefficiencies, new task or personnel learning curves, equipment and tool breakdowns or failures, coffee breaks and rest periods, and routine moves (setups and tear-downs) should be an integral part of all construction bidding and pricing methodologies. Those firms that don't recognize or address them don't stay in business very long.

All the foregoing is a prelude to the science and art of correctly identifying entitlements and quantifying productivity losses resulting from noncontractor-initiated delays, disruptions, interferences, or hindrances imposed upon reasonable, everyday construction productivity.

When a routine, systematic rhythm of work is interrupted, slowed, or hindered due to factors not caused by the contractor, the resulting drop in the units of work being produced is often dramatic, if not foretelling. A seemingly minor error in a construction plan detail can cause a complete halt to work while an answer is sought to correct or clarify the matter and then resume work. Lacking an immediate response, the involved work must be skipped over, abandoned, or guessed at and, perhaps, done incorrectly.

If an error is serious enough to cause a suspension of work, resulting in moving the labor force, equipment, tools, and materials to another part of the project, the additional time required to move out of and then back into the effected area, can result in hours of unproductive time expended for an entire crew, supervision, and the hastily assembled extra help to make the moves. This is further compounded by of the cost of a double set of startup and shutdown events and a new set of new work area learning curves. Very few owners — and even fewer design professionals —understand the seriousness of such events in terms of lost productivity.

One small, unexpected event in a routine eight-hour workday can cause the loss of one to four hours of normal construction productivity, resulting in a highly unprofitable day for an entire construction crew, or in simpler terms, a serious monetary loss for the contractor. Workers and supervisory staff continue to be paid their normal hourly wages, but the quantity of work being produced drops precipitously, and so does the payment that will be made for work completed in place (revenue).

In one high court trial, an expert witness was questioned extensively about a 300 percent increase beyond the as-bid manhours required to install a large quantity, single item of work. The trial judge had difficulty believing that the continuous moving of the contractor's (plaintiff) workforces from floor to floor in a random manner — initiated by the owner and worsened by other separate prime contractors who constantly failed to complete the work preceding the plaintiff's — could possibly cause a 300 percent increase in labor costs for the contractor.

The owner's defense counsel attempted persistently to imply that the extra costs and productivity losses were caused by coffee breaks, lack of worker experience and supervision, and a host of other factors the contractor was responsible for. Fortunately, the contractor had performed another similar, though somewhat larger project, for the same owner. On that job, the other prime contractors and the owner's project administrative personnel established and maintained an efficient, floor-by-floor, area-by-area work schedule that was widely circulated among all prime contractors and understood. That project resulted in as-bid and as-planned labor costs and productivity and, consequently, a profit, being attained by the contractor.

But on the contractor's project now before the court, the contractor kept no hourly, daily, or weekly measurements of production (units of work completed in place). The only measure of production available

appeared on the monthly pay estimate or request, broken down into a "schedule of values." The contractor did, however, maintain a daily accounting of labor hours worked on the various "value" items, thus making a monthly productivity calculation possible. By comparing one project against the other, a general productivity picture could be drawn or graphed.

However, what was *neither practical nor possible* to chart or identify were the specific by-the-hour, by-the-day, or even by-the-week "productivity disasters," especially those involved in the 300 percent labor overrun on one of the largest quantity work items on the contractor's schedule of values.

The only way a construction firm can *ever conclusively prove* serious losses in its productivity as being caused by other than the contractor is by properly documenting the events caused by delays, disruptions, interferences, and /or hindrances and the *resulting* production slowdowns or stoppages. Doing that systematically and efficiently requires a trained management, supervisory, and labor force that cooperates in getting the necessary data recorded *when and where the events take place*. Nothing else works.

Generally, with such a logging system in place and after several discussions with those causing the problems, both the problems and their root causes cease rather quickly once the recorded documentation is presented.

The best way to avoid construction project claims and disputes is to be thoroughly prepared to handle them on a factual, event-by-event, cost-by-cost basis. Facts and proof built on good record-keeping and closely monitored productivity figures have no substitute or alternative. The often-heard accusations that contractors who keep such productivity records are "claims minded" or "claims oriented" are, at worst, patently ridiculous and false and, at best, a form of both professional jealousy and extreme flattery.

There's an old saying in the legal profession that goes like this: "If you don't have the facts on your side, pound on the law. If you don't have the law on your side, pound on the facts. If you have neither the facts nor the law on your side, pound on the table, the floor, the walls, and everything and everyone in sight."

The existence of "claims accusations" is living proof of that old legal tale — and the fact that it is both alive and well in the construction industry today!

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Guidelines for Construction Contracting With the Federal Government: Part I

Takeoffs-Costing-Pricing-Estimating-Bidding

The first step is to secure a copy of all the contract documents: plans, specifications, all addenda, and copies of the current *Federal Acquisition Regulations*, *Veterans Administration Regulations*, etc. Then carefully read, review, and tab them before starting the costing, pricing, estimating, and bidding process.

Takeoff plans (quantities), indeterminate measurements, and dimensions should *not* be scaled from the plans. Fax a request for information to the designated government representative requesting accurate measurements and dimensions. This also applies to missing elevation (vertical) dimensions. Read all plan notes and make sure they don't conflict with *FAR*, *VAR*, or any other federal regulations. If they do, fax an RFI to the government representative for clarification.

Also, be sure to check for any plan-depicted conflicts with utilities or existing structures. Again, if they're not addressed by the plans and specs, fax an RFI to the government representative, and then visit the site and make a reasonable, visual inspection.

Use an acceptable estimating and takeoff system (preferably computerized) that is compatible with the item and/or schedule of value system you plan to use for pay requisition purposes. Make sure the estimating and takeoff system is also compatible with your cost accounting methodology and planned work sequence (activities) schedule for the project.

It is an absolute *must* to have the ability to accurately compare bid takeoffs, estimates, costs, and final bid prices with later-developed project pay estimate schedules of values or pay items; a later-established job cost accounting system (budget/bid versus actual costs and resource use); and later-prepared schedules and activities.

Accurate cross comparisons of bid data versus pay estimate data versus job-cost record data versus schedule activities and their projected earned revenues and budgeted costs and resources (materials, equipment, labor manhours, etc.) is the surest way of proving change orders and obtaining entitlements and damages.

If bid breakdowns do not compare with pay estimates, job costing, and scheduling activity breakdowns, proving government-caused or responsible as-bid versus actual differences in costs, resources, and time is nearly impossible.

Total project costs versus bid-styled claims (total cost claims) are generally rejected by government contracting officers. Don't solely rely on them to collect change order and claims monies. They can, however, be utilized as a ceiling or maximum.

Make certain that all takeoffs, costs, prices, and bid items are broken down into:

- Labor (manhours, wage rates, fringes and benefits, insurance, payroll taxes, etc.);
- Materials and equipment (hourly equipment rates and operating costs);
- Overhead (project and home office); and
- Profit or markup for each component of the bid.

The above items will later become a pay estimate or schedule of values, a job-costing system, and an original as-bid schedule activity. Making sure that all three elements are identical with the bid item breakdown is *essential*. Take the extra time required when bidding a federal project to preplan the bid breakdown so that it will fit into a matching, accurate pay estimate schedule of values, a job-costing system, and an original as-bid schedule activity.

Computerized bidding software is only worthwhile if it can later be used to mesh with pay estimates, job costs, and schedules. Examples of such matching systems are Timberline Bidding, Accounting, and Job Costing software and the Primavera Project Planner and Primavision Scheduling System, which also accepts downloads from Timberline software for item/activity costs, revenues, and resources.

When bidding a federal construction contract, one needs to keep in mind that 20 percent of all final contract revenues paid to contractors are "extras," added to the contract through modification, changes, equitable adjustments, and claims.

Further, *FAR*, *VAR*, and other regulations recognize changes or modifications made by the government (or those for which the government is responsible) to a contractor's original as-bid schedule. All federal construction contracts require the submission of this as-bid schedule, in addition to periodic revisions or updates of the schedule as the project progresses or is delayed.

Government-mandated Office of Management and Budget scheduling forms leave *much* to be desired regarding detail, clarity, or definition. As a remedy, contractor substitution of a cost-loaded, revenue-loaded, and resource-loaded Primavera schedule — with bid items, cost accounting, schedule activities, and pay estimates matched to the original schedule activities using the precedence diagram method — *is acceptable* to all federal contracting officers and their agencies. The OMB scheduling form is *not* mandatory if the contractor has something better to offer.

The list of contractors performing federal projects who have been given a "cure notice," followed by a "termination for default notice" when they fail to produce a revised schedule within the cure period's time limit, grows daily. Having bid and cost systems, plus a pay estimate-matched, updated monthly schedule that is submitted to the government, stops most contracting officers from issuing the cure notice in the first place. This is especially the case if the schedule is as-built and updated to show why and how the project "got behind" the original schedule, and how or why that was the responsibility of or caused by the government.

Bidding and performing fixed-priced, time-is-of-the-essence construction contracts for the federal government is both an art and a science — and much different from any other construction contract bid and performance scenario. Having accurate, comparable, and compatible bidding, pay requisitioning, job costing, and scheduling systems in place prior to bidding is the secret to successful federal construction contracting.

Be sure to add about two percent to four percent to the bid for outside consulting and legal assistance — not less than two percent nor more than four percent. The addition is necessary on most federal contracts to cover those costs incurred in the change order, modification of contract, equitable adjustments, and claims process prior to any litigation. Pre-litigation, outside legal and consulting costs are *not* reimbursed by the federal government, except in cases of government fraud. This change in federal policy, mandated by the federal courts, occurred in late 1991.

(See Part II of the *Construction Claims Topics* series on federal construction contracting, pertaining to post bid-to-project startup basics.)

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Guidelines for Construction Contracting With the Federal Government: Part II

Post Bid Date-Award-Preconstruction Meeting-Notice to Proceed

As soon as the formal bid letting has been held and the contractor's submittal has been read as the low bid, the contractor's labor, material, and performance bonding capacity is reduced by the amount of the bid price of the low-bid contract amount.

The contractor should *immediately* secure a letter from its bonding company stating precisely how much remaining bondable bidding capacity the contractor has remaining as of the date of the successful low-bid federal contract. A letter from the agent representing the surety/bonding company will suffice, particularly if he or she is the "attorney in fact" on the submitted bid bond. The rationale behind this request has to do with possible later suspensions of work and/or terminations for the convenience of the federal government on the successfully low-bid contract.

Moreover, impaired or "locked-up" contractor bonding capacity claims for lost profits and under absorbed or unabsorbed home office overhead rely heavily upon proof of full surety/bonding capacity being reached because of the successfully low-bid federal contract. It's usually a simple task to secure a letter that attests to attaining full surety/bond capacity, if the letter is promptly requested after the letting date. If the bonding capacity is less than 100 percent utilized, both the dollar capacity and utilized capacity should be stated in the surety/bonding agent's letter to the contractor.

There's no substitute for maintaining a good, permanent relationship between the contractor and its surety/bond company and agent so that *routine* requests for letters and other documents can be easily processed. A successful, long-term relationship with the *same* company and agent makes the process of routinely requesting documentation virtually effortless.

The *award of contract* should be made by the federal government within the time period specified in the bid solicitation documents—published and distributed by the government to prospective bidders prior to the letting date. If the award is made within the specified period, all is well. In the event the award of the contract is not made within the specified period, the government will generally request a "time extension" of the bid. It's important to note that a contractor and its surety *have no obligation to extend the bid-date-to-award-date time period beyond that originally specified in writing by the government*.

When the government does request a time extension in writing, the contractor has the right to add delay costs and damages to its low-bid contract price. If these are indeterminate when the government requests the extension, the contractor can grant the extension, reserving the right to any and all later-determined costs and damages. Unfortunately, many contractors *routinely* and *mistakenly* grant extensions when requested by the government without adding delay damages and costs and/or reserving rights to them. The government *is not entitled* to any extension without additional costs.

Before any successful, low bidder grants a bid date-to-contract award date extension, that contractor should carefully examine its bid labor, material prices, and construction schedule to determine that neither set of as-bid prices and scheduled performance periods are not impacted by the extension being requested by the government. Wage and material price escalations, if any, can be easily determined through a few telephone calls to subcontractors and suppliers and by checking union wage agreements. However, be sure not to overlook fringe benefits, payroll taxes and insurance rates, either.

The impact upon schedules and performance periods is another, more difficult matter to determine. If the original as-bid schedule was "tight," dependent upon on a prompt start and finish of key, seasonal weather activities under favorable conditions, an extension could push these activities into unfavorable weather or cause the contractor to accelerate that portion of the work to complete it under good weather conditions.

Also to be considered is the possibility of later, unexpected or abnormal weather effects on weather-dependent activities of the original as-bid schedule. Because, if not for the extension of the bid date-to-contract award date period, those activities would never have been impacted. When there is any doubt or even a remote possibility of such impacts, the extension should be granted *with a reservation of rights to all damages arising from the extension*. To repeat, the government *is not* entitled to a *no-cost* extension. The contractor, however, *is* entitled to cost/price the extension and/or reserve its right to do so later when all the consequential events, costs, and facts are determinable.

The formal, written *notice to proceed* is usually issued by the government on the same date the contract is awarded or very shortly thereafter. If the NTP date is not granted in writing to the contractor in concert with or shortly after the award of the contract, the contractor should notify the government in writing that it is being unduly delayed and impacted by the government's failure to issue an NTP and specify a date when the work will begin.

Delayed NTPs have the same effects on prices, costs, and schedules that are explained in the preceding discussion on contract award extensions, regardless of the government's reasons or explanations for the delays. Again, the government is *not entitled* to delay the NTP, but if it does, the contractor *is entitled* to additional impact costs, damages, and/or time, depending on the circumstances and a formal set of proven facts.

More than one contractor who's successfully low-bid a government contract has been faced with *both* an extended award period and a delayed NTP. Combined, they can be costly and detrimental to a profitable construction project. Granting a no-cost award extension that is followed by a delayed NTP has been the source of major losses to some contractors on federal projects. The first delay often leads to the second! The best policy is always to "just say no" or price/cost the extension request.

# # #

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CONSTRUCTION
Claims Topics

Construction Productivity: Daily Construction Record Reports

Increased productivity should be the ultimate goal of every good field supervisor because profits are always earned in the field and counted in the office, not vice versa.

Poor field supervision is the cause of more than 50 percent of all internal productivity losses. The rest of the internal productivity losses are spread over a dozen or more other causes.

Externally, though, the largest productivity losses are caused by owners, construction managers, designers, and in the case of subcontractors or multiple prime contractors, the general contractors. These productivity losses result from failures to coordinate the project and all its contractors and their personnel.

The second largest cause of external productivity losses is procrastination—the failure to make an "almost not bad" decision immediately, while waiting around to make a "perfect" one. So, what's the answer?

Do something! Lead, follow, or get out of the way!

Knowing that productivity losses (lost labor efficiencies) are occurring, where they are occurring, requires intelligent and watchful supervision and a proven system or systems for measuring productivity.

The accurate use and completion of daily construction record reports (DCRRs) and their distribution to the right parties are the most essential part of the productivity measurement process. Recording all the cost elements of production, what is being produced, and the revenue it generates for the company are the most integral part — the "how much" part — of those reports.

The second most important part of the reports is the "why" part, a commentary on the losses that the cost and production figures are indicating.

Without timely DCRRs done by the actual supervisor in charge of the manpower and resources being utilized, it is impossible to determine the extent and the causes of day-to-day, hour-by-hour losses of efficiency and, therefore, revenue and profits.

The profit margins on most construction projects are so slim that a 15- to 30-minute loss of labor productivity is sufficient enough to wipe out a day's profit on that operation. An hour's loss takes care of both overhead and profit. In fact, even a minor oversight, such as failing to get the correct materials to a crew for just 30 to 60 minutes kills the profit and, probably, the overhead for the entire day. The same is true of a 30- to 60-minute encounter with an unforeseen site condition, a plan error or omission, or another contractor blocking the work area. Down time is a profit killer!

On the plus side, the correct selection of equipment, work crew size, and support personnel can be the cause of significant productivity increases. Most construction takeoffs and bidding are done using *aver-*

age or industry standard productivity figures and local job cost projections. An excellent supervisor — general foreman or superintendent — can and does pick very compatible, highly efficient workers and empowers them to continually produce more than the bid industry standard figures indicate.

The key is supervision. Every good supervisor records the day's successes and failures on the DCRR so the successes can be tracked later and carefully duplicated, and that the documented failures, too, can be carefully avoided later.

Reporting what and how much was produced and exactly what (labor, equipment, and materials) produced it, together with a commentary about the problems — and successes — encountered, is the essence of a consistent supervisor's DCRR.

Remember, consistent success is never an accident. It is the result of careful planning and detailed follow through, including the recording of how it was accomplished.

# # #

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CONSTRUCTION
ClaimsTopics

Government Fraud and Bad Faith Conduct Significantly Change the Damages Recovery Picture

From the time **Meglan, Meglan & Company, Limited,** began its construction consulting and claims/dispute management practice in 1981, contractors and their respective attorneys have asked repeatedly why this company believes it can help them with their government contract problems, claims, and disputes. The answer is never easy to communicate, even with a 15-minute telephone conversation. To better address this question, factual case-by-case information started being compiled in 1992 that specifically documents what this company has accomplished, including the claims awards and settlements it has helped contractors (whose names are not revealed without permission) to recover on government construction contracts.

From that early documentation, **Meglan, Meglan & Company, Limited,** has briefly summarized three claims cases that deal with a common construction contract problem in federal, state, and local government — disputes, claims, and damages caused by *government bad faith and fraud*.

Case 1 Synopsis

Project Reference: Contractor in Bryan, Texas v. U.S. Air Force (Kelly Air Force Base, Texas).
Work/Services: Replace/install steam lines.
Contract Amount: $779,000 (October 1990).
Claim/Dispute Settlement: $275,000 (August 1992).
Description: Settlement after the contractor forced 1-4-C decision by the USAF contracting officer due to fraud/bad faith government conduct (superior knowledge, unforeseen site conditions, defective plans and specifications, *and revisions of same*). Dispute involved an entire series of bad faith and fraudulent acts by Air Force base facility engineers that were concealed from *both* the contractor and federal contracting officer.

Case 2 Synopsis

Project Reference: Subcontractor from New Jersey and Pittsburgh, Pennsylvania v. General Contractor from Bellevue, Washington, and the U. S. Department of Interior, Bureau of Reclamation, Phoenix, Arizona.
Work/Services: Waddell Dam core blanket/curtain grouting.
Contract Amount: $4.1 million (October 1988).
Claim/Dispute Settlement: $780,000 plus interest; final contract sum paid with claim totaled $6.1 million (July 1991).
Description: Claim/dispute settlement involved concealment of superior knowledge by government of 125 percent pre-bid blanket grouting increase and government bad faith and fraudulent negotiation of 125 percent blanket grout increased costs, coupled with large general contractor's pro-government and anti-subcontractor negotiating stance. Government "stonewalled" the subcontractor for an entire year before taking any action on the increases, and then attempted to intimidate the sub with the GC's help.

Case 3 Synopsis

Project Reference: General Contractor in Stamford, Connecticut, v. U.S. Postal Service, Stamford, Connecticut.
Work/Services: General mail and vehicle maintenance facilities.
Contract Amount: $13.6 million (September 1988); $16.2 million at completion without claim.
Claim/Dispute Settlement: $5.05 million recovery through mediation (June 1991).
Description: Government and its construction manager caused decision delays on unforeseen site conditions (rock, water, and wet and/or hard soils). Following more delays in gaining design professional approval, the government issues an acceleration order to complete the project on time after more than seven months of delays, disruption, interference, and hindrance; trade stacking; out-of-sequence work; outside construction work pushed into winter weather; overtime fatigue-caused lost productivity at premium and regular wages; government fraud and bad faith-negotiating of claims. Government then attempted financial destruction of contractor to avoid claim payment/settlement to general contractor and 43 subcontractors, not including suppliers.

Although more than a decade old, these three cases still illustrate quite well the unlawful conduct on the part of the government's employees and agents in attempting to defraud contractors of rightful contract modifications and claim settlements. This construction contract problem is so common that it's generally overlooked or taken for granted.

When employees or agents of the government attempt to conceal legitimate claim entitlement documents in an effort to enhance the government's bargaining position or to protect the guilty (government employees and agents) and punish the innocent (contractors and their personnel), the rules are changed for claims and disputes negotiations, arbitrations, mediations, and litigations — often drastically — and the damages awarded rise significantly.

Few, if any, government contracts, standard specifications publications, or sets of regulations specifically address fraudulent and bad faith conduct caused by the government or within its responsible charge. Apparently or ethically, it's not supposed to occur, so it's not discussed much or written about by the government. Thus, when fraud and/or bad faith do occur, there are no standard rules and regulations in place to guide any of those victimized.

Each year, many contractors performing government construction projects are summarily denied equitable adjustments to their contract time and costs by government contracting officers and their administrators, who have either concealed fraud and bad faith conduct or have had it concealed from them by subordinates, outside consultants, or agents to the government.

To the credit of the ethical conduct of many contracting officers and their administrators, the contractor *always* has an opportunity to get a fair and unbiased hearing before someone who respects due process when it comes to doing what's morally right, ethical, and legal. However, "finding" that someone is often the real challenge. In the extreme, that individual ends up being a federal claims court judge or other court judge, but usually it doesn't have to go that distance.

Discovering and revealing fraudulent or bad faith behavior and conduct of the government and then quantifying any consequential damages, additional costs, etc., is a tedious and exacting process that few contractors and their staffs are capable of pursuing while attempting to manage a government construction contract that is "mysteriously" going sour. The mystery generally gets solved when the Freedom of Information Act requests from the contractor start shoring-up the documents that prove bad faith and/or fraud.

Concealing mistakes, errors and omissions, conflicts, redundancies, superior knowledge, gross misrepresentations, outright lies, and other contract breaches is something that a few government organizations,

their employees, and agents do almost without thinking about it. Note the reference to "a few," those who give all other government employees a bad name or poor reputation, which is a real shame in itself.

Uncovering hidden or concealed events and documents is something **Meglan, Meglan & Company, Limited,** does by thinking, investigating, and carefully probing in very systematic ways. The earlier this company is involved, the more thorough its work and *results*.

# # #

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CONSTRUCTION
Claims Topics

Reimbursement Exclusions to the Equal Access to Justice Act

When Congress passed the Equal Access to Justice Act (EAJA), it placed contractors doing federal work on an equitable basis with the federal government, if they earned gross annual company revenues of $7.5 million or less.

In late 1991, in the case of *Levernier Construction, Inc. v. United States* (947F-2nd 497 Fed. Cir. 1991), the federal judiciary partially negated the intent of Congress, giving federal contracting officers yet another way to economically punish federal contractors for daring to request full compensation for government-caused additional costs and time.

The decision of the Federal Circuit Court in *Levernier* denies a contractor doing federal work the right to collect prelitigation consultant and legal fees incurred in proving entitlements to contract modifications and claims (damages) and in calculating the actual costs of the damages. The federal contracting officer, on the other hand, who has virtually unlimited taxpayer-financed resources, can enlist the aid of free, in-house engineering and architectural services, estimating and legal services, and then simply overpower the contractor with its in-house experts.

Congress certainly never intended such a result, a fact that any contractor can easily determine by contacting his or her representative or senator.

One solution to the problem for any contractor doing less than $7.5 million worth of annual business is to sue for relief to initiate the civil action litigation process, thus making outside consultant and legal fees fall *within* the litigation period. Getting the federal courts and/or contract appeals boards involved early in a contract dispute is not an easy task, but it's also not impossible. Good attorneys experienced in construction law know how to do that.

A second solution is to build the costs for outside consultant and legal services into every contract modification negotiated on a modification-by-modification basis. The costs incurred to prepare a modification of contract are *not* "normal" overhead costs and, consequently, must be stated as direct costs incurred in the modification of contract proposal.

The third and final solution is the inclusion of a contingency percentage markup fee in all federal contract bids to cover the costs of preparing contract modifications — almost certain and always extensive. Average contract modifications to federal contracts are running more than 20 percent. By adding 10 percent of that 20 percent figure (two percent) to the original contract bid, the costs of necessary outside consultant and attorney fees are covered.

Denying small contractors (those with annual gross revenues less than $7.5 million) equal access to expert and professional consulting and legal services to counter the overpowering effects of a federal contract administration bureaucracy is yet another unconscionable judicial act in a string of similar anti-

contractor biases and regulatory constraints. Equal access to professional assistance on poorly drafted or administered federal construction contracts is an absolute necessity if a small contractor expects to obtain all its cost reimbursements from a federal contracting officer.

The following text is excerpted from an article containing *Levernier* case information:

EAJA Does Not Cover Consultants Fees Incurred Before Court Action

A federal contractor employed attorneys and a consultant to prosecute a claim for equitable adjustment before a federal contracting officer, who awarded only part of the claim. During the contractor's appeal to the Claims Court, the government settled the claim. The contractor then sought and received judgment from the Claims Court for attorney's, paralegal's, and consultant's fees. The Federal Circuit reversed as to the consultant's fees only, finding that the administrative claims process before the contracting officer was not a "civil action" as intended by the Equal Access to Justice Act. Even though the consultant's work was "the critical aid that facilitated the successful resolution" by settlement, the contractor employed the consultant too soon and, therefore, had to bear the expenses without reimbursement.

# # #

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