

# **ESTIMATING CHANGE ORDERS, COST OR OPPORTUNITY?**

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A discussion about change orders should properly begin with some thought about why change orders are so prevalent and what, if anything, can be done to help in bringing about an environment in which they are no longer necessary or, are, at worst, minimized. This assumes a philosophical backdrop of construction in heaven, but it may be instructive.

Certain classes of change orders are necessary and beneficial. These involve owner-induced changes to keep the facility under construction as up to date as possible in a technologically changing environment, and which are anticipated by the owner as a natural part of the development of facilities. Those types are ideally priced by a construction team, which is also accustomed to building facilities in which change is natural and expected. Both parties, along with a design team of similar experience and expectation, approach such a project dealing with change orders as an everyday part of the process, not something unusual or adversarial.

Such projects are not the norm, however. Often change orders, or potential change orders, are viewed as an intrusion into the normal building process, the responsibility for which must be laid at the doorstep of one of the members of the construction team, who then is expected to pay for "fixing" whatever is wrong. If there must be a change and there is a cost associated with it, the owner will often take the position that the designer did not properly design the facility, having known what the owner's budget is during design, and therefore the owner will not pay for a change. The designer may take the position that the owner did not properly communicate its intent or that the construction team is not acting in good faith by pricing the change at a multiple of what it is really worth. The contractor may believe that the owner and designer are trying to force their errors upon the construction team, and thereby are acting in bad faith themselves.

Let's back out of this picture and examine the big picture of the construction process today. Let's use as a benchmark of our examination a single concept, not that the situation is so simply analyzed, but that this single one may bring the most light to a heated subject. That concept is competition.

We normally think of competition with regard to construction projects in terms of that between members of the construction team. But this is of course not the only competition present in the process at all.

Begin with the owner and ask, with whom is the owner in competition? For a privately or publicly owned company, the answer may be obvious - other firms in the same business. For the governmental or institutional organization the answer may not be as obvious, but a bit of thought may reveal that a particular firm or organization is in competition with others in the same organization, for example, branches of government trying to get funding for their own projects, or institutions of higher learning trying to show themselves leaders in the medical or science or humanities field and so competing with other institutions of like purpose. Or consider different departments of the same institution, say the science and athletics departments of a major university, competing for the same facility construction dollars from this year's budget.

It is important to understand that virtually all owners or users of the facilities the construction industry builds are themselves in competition with some other entity for their construction dollar.

Likewise, it is important to see that design firms are in the same type of competitive environment. This may be easier to understand, but it is not always fully appreciated. Perhaps in days of old owners selected design firms solely on the basis of presentation, concept, and experience. This is rarely the case in the present day. While these facets of the selection process are considered, along with them, and perhaps the most important of them, is the design fee proposed. And just as many contractors argue that margins now are less than they were 20 years ago, so will designers argue that design fees are now less than they were 20 years ago.

Both of the arguments may well be true, but the contractor often fails to consider what lower fees mean to the design team. Many designers, in calculating the cost of design for a project have developed, analogous to the contractor's historical cost records, historical cost records for design. The costs are often expressed in a unit like man-hours/page of documents. A designer will also be able to determine fairly closely how many pages will be required to represent the current project's working drawing design. Total number of pages multiplied by hours/page multiplied by the factor a designer must have on his base wage hour to cover overhead and fee, equals total design fee.

If the designer calculates that this cost to be 7% of the projected cost of the project using the methodology above, and the owner, based upon the designer's competition, is unwilling to pay over 5%, the designer is faced with a dilemma. One answer to that dilemma is to accept the 5% fee, recognize that there are only a certain number of hours that fee will allow, and produce a set of documents that is commensurate with that number of hours. Perhaps the documents will not answer all the construction questions, but it will probably be less costly for the designer to answer the questions the construction team raises than to answer all possible questions in the original documents. This may not be, in the eyes of the contractor, the best perspective for the designer to have, but given the competitive circumstances of the designer, it is understandable.

The competitive pressures on the contractor are well recognized by those in the industry and need no lengthy exposition here. It suffices to say that they are pervasive and unrelenting.

All of the foregoing is prologue to say that changes are, in today's environment, inevitable; that is, unless one happens upon that rare project in which the owner engages the services of the design team to completely design a facility and compensates the team for a complete design, in which the contractors are allowed, nay encouraged, to do a complete job and make a fair profit, and in which the number of changes, through the cooperation of all the parties, is held to an absolute minimum, identified and resolved quickly and fairly for all parties, and everyone has respect for everyone else. Perhaps we see these once in our construction lifetimes.

How to bring about more of the projects constructed in heaven is a subject for another time, and it is well worth pursuing by all the members of the construction team, because not only does it make for better, more cost effective projects, it is also a lot more fun to work on.

An equally closely related subject, claims (or change orders gone bad) is also one for another time. A claim has a lawyerly ring to it, and is usually the result of a change order, or series of change orders, which could not be resolved by the parties of the first part, that is, those involved every day with the construction of the facility. A claim might properly be called a failed change order.

We want to deal with the recognition, preparation, and presentation of change orders.

## RECOGNITION

How does one recognize a condition which gives rise to a change order? While the answers to this question may seem stunningly obvious in theory, they must not be so obvious in practice, because the question of change orders is as notable for the lack of presentation of proper change orders as it is for the presentation of inflated or bogus ones. This may be so because those responsible for representing a company's interest recognize change but decide to forgo pursuing compensation for the change for a host of perfectly rational reasons - the tried and true "give and take" of construction. This is the highest and best reason available for not pursuing change orders, a true spirit of cooperation on the jobsite, the reason for which projects finish as well as they do.

In spite of the foregoing, many change orders are not pursued because they are not recognized. Why is this so? Probably the foremost reason is that the company's front line staff, those in the field, are not adequately trained to recognize the change. They may not be as well versed in the construction documents as they ought, not only those which deal directly with their work, but those on the periphery of their work. Many subcontractor's field supervisory personnel have never seen a copy of the contract between their firm and the general contractor, do not have an in-depth knowledge of the project specifications, especially the general conditions portions, and prepare for tomorrow's work after work is complete today. In the grossest terms, how could such employees recognize a change when they do not fully know what their work is?

Related to this lack of knowledge of contractual obligations and scope of work is a more subtle but equally pervasive cause of lack of change recognition — it may be called a lack of interest of management in training supervisory staff in matters other than pushing work. That is to say, the supervisory training which does take place revolves around how to put the widget in place faster, as opposed to the more mundane matters of record-keeping, specifications and contract review and study, etc. A supervisor who cannot put the work in place effectively is short-lived. Those who remain are viewed as valuable because they can put the work in place and short shrift is made of training them in other aspects of their jobs, including the recognition of, not to mention

preparation and presentation of change orders. This situation to the contrary, is it not these very staff who are in the best position to recognize changed conditions and react most quickly to them?

The remedy for these conditions is training. By training we mean organized, in-depth, "classroom," ongoing training. Perhaps it is a one day seminar on changes recognition, record-keeping, etc., conducted by in-house staff or someone brought in; perhaps the training includes project management staff, and emphasizes ongoing, thorough review of possible changes. Perhaps it includes a project start-up meeting where among other things, the specs, plans, contract, etc. are thoroughly reviewed, including the potential for change orders. Certainly, the company's estimator will want to identify potential changes as a part of bid preparation and bidding strategy. Perhaps it involves periodic, in-depth reviews of the job where one of the standard questions addressed is the status of change orders and potential change orders. All of these, as part of a written and effective management plan, will aid immeasurably in recognizing potential changes and thereby potential change orders.

## PREPARATION

Once we recognize a potential change, how do we prepare it for submittal?

The importance of meticulous preparation cannot be overstated. The first impression created by a request for a change order is absolutely critical to the entire process. Shoddily prepared change order requests will almost universally produce the same response, derision and/or anger, leaving the distinct impression that the presenter does not know what it is doing. Perhaps the greatest failing of initial change order requests is that they do not provide nearly adequate documentation, so that a rational person can decide the merit of the claim on the submittal alone. If documentation is provided, it is usually that which is most favorable to the contractor, with none favorable to the other side. The most widely practiced procedure in this area is to adequately describe and price added work while not doing so for deductive work. If the entity reviewing the change order request discovers such omissions, it is extremely difficult for the submitting company to maintain the reviewer's trust, both for the change under consideration and for any that might arise in the future.

Another equally common failure is to use one set of prices for bidding and another set for change orders, the second being substantially higher than the first, without adequate, or indeed, any justification. Many change order proposals are prepared in this way, with the result again of having the reviewer lose trust in the contractor.

A third failure is that the general contractor simply passes through a subcontractor's change request data, not having reviewed it. Again, credibility is lost. It is important for the contractor to both thoroughly review the sub bidder's prices it receives and to demonstrate that it has done so.

Perhaps the best way to overcome these problems is to do the reverse of the situation described above. The scope of work should be accurate and complete. It should be described and presented in the same level of detail as the contractor prepared its own detail estimate for the project as a whole. The same pricing structure should be used, and if it is not, variances should be noted, in detail, along with their justification.

For example, if the productivity included in the original estimate is more than that provided for the same item of work in the change, a note explaining the variance should be provided. It may be, for example, that the original quantity of a work item was 10,000, all of which is done, while the change will have 1000, which must be done anew, with its concomitant new learning curve, etc. As an aside, it is equally as poor performance to fail to use pricing different from that used in the original bid if the conditions under which the work will be done demand it.

In addition to the above, no change order request which involves the work of a subcontractor, should be submitted without careful review and critique. The general contractor representative should be as familiar with this change as it is its own. The critique should include that for the items mentioned above regarding quantity survey, pricing structure, and explanatory notes. One way to demonstrate the level of the general contractor's review is to include a sub bidder's quote, which has been manually changed by the general contractor, and to allow the changes to show on the submittal.

Two items which are often overlooked by those in the construction team are the effect of the change upon general conditions, and upon the project schedule. These are often difficult to determine, but are nonetheless real. Here the original estimate schedule and general conditions are critical in proving the case, because before expecting to collect more general conditions, the contractor must show what his original bid included. Again, the documentation should clearly set out the original, how it is now changed, and what costs are added because of the change.

Another item often overlooked in change order preparation is the affect the change will have on surrounding work and schedule. Is adjacent work impacted? Does the change entail rescheduling adjacent work so that it is less efficient than before? If so, these impacts must be quantified and priced.

The contractor must not overlook, as well, the cost of preparing the change order. Change orders take time, and if the time or staff is not anticipated in the original bid, it, too, should be quantified and priced.

## PRESENTATION

Once the change is properly prepared, it is usually forwarded to the Owner's representative, there to fall into a great black hole, it sometimes seems. It is easy to think that once the change proposal is submitted, the bulk of the work is done; however, in some ways, the process of

submittal may be the most important part of the entire process.

The contractor should take a carefully reasoned pro-active approach to change request submittal. A great deal of time, effort, and trouble and be saved thereby. A submittal meeting should be requested, at which the contractor and all parties having an interest in the change order should formally present the change. The presentation will include the scope of the change, how the quantities were derived, the basis for the pricing used, and the rationale for the impacts seen. The presentation should be detailed, as detailed as is the change itself, and should include visual aids to assist the reviewer in understanding its content. The submittal meeting should be viewed as a marketing meeting, helping the contractor to justify the change and therefore "sell" it. Remember, first impressions are important, and that is nowhere as true as in change orders.

The foundation for the entire change order process is, of course, adequate record keeping. Changes involve the original estimate, plans and specifications, contracts, correspondence, meeting minutes, daily reports, and other such documents. Lack of such records has doomed many a legitimate change order request, and their importance cannot be overstated.

A change order is not an opportunity to prospect for gold in the project. Neither is it an opportunity for the owner or designer to put two pounds of project into a one pound bag. Either of those attitudes, when discovered, as they will surely be, will lead to attitudes among other team members, which may result in substantial cost increases for everyone involved. Unresolved or inequitable changes lead to claims, and claims often lead to little satisfaction for anyone involved, save the legal profession.

## CHANGE ORDER AIDS

There are many resource materials available to assist in educating the construction team in recognizing, preparing, and presenting change orders. One of the best is Contractor's Guide to Change Orders, by Andrew M. Civitello, Jr., published by Prentice-Hall, Inc., Englewood Cliffs, New Jersey. Mr. Civitello takes a very aggressive posture to the subject, and includes not only checklists, but also sample letters to consider for the various situations encountered along the way. The Change Order Research Checklist, the Change Order Discovery Checklist, and the sample forms and letters below are his.

These checklists may be used and/or modified to your company's specific needs as an aid in the development or improvement of a change order policy.

## CHANGE ORDER RESEARCH CHECKLIST

- A. CONTRACT
  - 1. Form of contract:

- (a) Adhesion
    - (b) Negotiated
  - 2. Is the subcontract scope of work:
    - (a) Owner defined?
    - (b) Contractor defined?
  - 3. Does contract language exist defining the situation?
  - 4. If A.3. is yes, can it be opposed with contract law ?
  - 5. Can trade practice be used by you or the owner to stretch an interpretation?
  - 6. Are rules of precedence clearly stated in the General Conditions??
- B. SPECIFICATIONS
- 1. Does a specification section exist?
  - 2. If B.1 is yes:
    - (a) Is it complete?
    - (b) Is it subject to more than one reasonable interpretation?
    - (c) Can it be deemed to fall into any "per plans and specs" trade or subcontract?
    - (d) Can the work be done precisely as specified?
  - 3. If B. 1. is no, does General Conditions boilerplate exist that:
    - (a) Clearly describes the work?
    - (b) Might be used by your opponent to strain an interpretation?
  - 4. Does more than one specification exist?
  - 5. If B.4 is yes,
    - (a) Are they included in different sections?
    - (b) Do conflicts exist between the requirements of each?
    - (c) Does one make any more sense than the other?
  - 6. Are there references to industry standard specs?
  - 7. If B.6 is yes:
    - (a) Do they contain precise material descriptions (as opposed simply to design criteria)?
    - (b) Do they conflict in any way with other stated (specified) requirements?
- C. PLANS
- 1. Do any specific notes exist related to work?
  - 2. Do general notes exist that might be used to strain an interpretation (boilerplate)?
  - 3. If C. 2 or C. 3 is yes, do they conflict with the requirements included in the respective specification section?
  - 4. Are specific details included?
  - 5. If C.4. is yes:
    - (a) Have you checked all cuts and references to details, elevations, plans, specs, etc.?
    - (b) Is all relevant information included?
    - (c) Do conflicts exist between any items of C.5.a?.

- (d) Are they subject to more than one reasonable interpretation?
- 6. Have shop drawings been approved that differ from specified requirements?
- 7. If C.6. is yes:
  - (a) Were the differences clearly highlighted and understood at the time of approval?
  - (b) Are the differences subject to more than one reasonable interpretation?
  - (c) Are errors or omissions evident?
  - (d) Have they been properly coordinated with all other parts of the work?
  - (e) Have all "by others" and "not by" notes been addressed?
- 8. Has the job been fast-tracked?
- 9. If C.7 is yes, do the dates on the current documents match those originally included in the contract?
- 10. If C.8 is no, are there significant differences?

D. SITE

- 1. Should the work have been apparent in a prebid site investigation?
- 2. Are the changed conditions the result of owner or architect nondisclosure?
- 3. Are the conditions the result of some previously undetectable latent (hidden) condition(s)?
- 4. Is the site information given in the plans:
  - (a) Accurate?
  - (b) Complete?
- 5. Are any site conditions different now from those at the time of bid?

E. SUPPORTING DOCUMENTS

- 1. Is the changed work included in the Schedule of Values?
- 2. If E. 1 is yes, did whoever prepared the schedule have a justification for it?
- 3. If E.2. is yes, can it be credibly dismissed in any way?
- 4. Are there any prior discussions, meeting minutes, letters, quotes, etc., that confirmed that extra cost will or will not be applicable?

F. ADMINISTRATION

- 1. Date of discovery.
- 2. Company and person responsible for first identification.
- 3. Persons notified:           Date:  
  Date:  
  Date:
- 4. Have all circumstances of discovery been recorded?
- 5. Has all relevant documentation been assembled?
  - (a) Field reports.

- (b) Letters and transmittals.
  - (c) Telephone logs and miscellaneous notes.
  - (d) Material invoices and payroll records.
  - (e) Meeting minutes.
6. Are before-during-after photographs necessary? If so, have they been arranged?
  7. Have all relevant plans, sketches, surveys, diagrams, etc., been assembled?
  8. Has the schedule impact been analyzed?
    - (a) Has interference occurred? Date:
    - (b) If not, what is the date of anticipated interference? Date:
    - (c) How many extra days can be assigned to the change?
  9. What is the date that change order approval is required before the schedule is affected? Date: -/-/
  10. Have all trade contractors and suppliers even remotely effected been advised of the change?
  11. If E.10 is yes, have all cost changes (adds and deducts) been assembled?
  12. If E.11 is yes:
    - (a) Does each positively indicate that the schedule is or is not affected (and by how much)?
    - (b) Is each properly broken down to allow meaningful evaluation?
    - (c) Does each have all substantiating documents attached?

## CHANGE ORDER DISCOVERY CHECKLIST

### A. RE-DESIGN

1. Adjacent Properties
  - a. Have all properties adjacent to the site perimeter been reviewed in detail?
  - b. Are there:
    - Seasonal watercourses?
    - Heavy traffic patterns?
    - Other independent construction activities?
    - Other
    - Other
2. Boring (Subsurface) Data
  - a. Are boring depths inconsistent?
  - b. Are boring locations erratic or unusual?
  - c. Are boring locations relevant to construction:
    - Are borings provided outside the area?
    - Are gaps left within the building area?
  - d. What time of year were the borings taken?
3. Building Code Compliance

- a. Have any violations of the building codes been observed by any building official when the building permit was applied for?
  - b. Do any portions of the design appear out of the ordinary?
    - Headroom?
    - Entrances/exits?
    - Handicap provisions?
    - Fire separations?
    - Lighting?
    - Ventilation?
    - Other
    - Other
4. Easements/Rights of Way
- a. Are there designated easements?
  - b. If so, will they adversely affect your operation?
  - c. Do local traffic patterns restrict access?
  - d. Are there parking areas, traffic patterns, business, etc., at the contract limit line that will restrict operations in any way?
  - e. If the answer to 4. a is yes, do you know all conditions?
  - f. If a restriction to your operation is evident, has your estimate accommodated it in some way?
  - g. If the answer to 4.f is no, should a reasonable prebid site investigation have disclosed the condition?
5. Inland Wetland Approvals
- a. Does any portion of the site encroach on inland wetlands?
  - b. If so, are all appropriate approvals in place?
  - c. If required approvals are not apparent, have you requested the confirming information from the owner?
6. Interference of Utilities Not Properly Shown
- a. Have the characteristics of all existing utilities been verified with each respective company?
  - b. Has each company representative reviewed the details with you at the site?
  - c. Is anything different from that represented on the plans?
  - d. Are the current utility charges for the various tie-ins the same as those given at the time of bid?
7. Plan Approvals (Building Permit)
- a. Has the building permit been applied for at the earliest possible time?
  - b. Were there any problems?
  - c. Were any notes or corrections made on the plans?
  - d. Has the permit been delayed in any way?

- e. Is a permit required (and a Certificate of Occupancy necessary) for temporary field offices?
8. Temporary Utilities Availability Within Contract Limit Lines
- a. Have you confirmed the anticipated conditions at the time of bid?
  - b. Are conditions adequate?
  - c. Are site conditions now different?
    - Are additional telephone/power poles needed?
    - Is power available at all (without generating equipment)?
    - Is previously anticipated use of existing facilities now prevented?
    - Is temporary heat and protection now required due to owner-caused delay?
    - Is water available in sufficient amounts for construction?

**B. THE CONTRACT AND BID DOCUMENTS**

- 1. Award Date
  - a. Has an extension in the contract award date been requested?
  - b. If so, is there any basis upon which to ask for an increase in the contract sum?
    - Will acceleration be necessary?
    - Will a portion of the project now be placed into winter conditions as a result of the start-up delay?
  - c. Do you have the strength to now require more favorable contract terms:
    - Is your bid substantially lower than the next bidder's?
    - Can you complete the facility in less time than your competitors?
    - Were you involved in design development?
    - Is the owner tied to you in any way?
- 2. Named Subcontracts
  - a. Are there owner-selected subcontracts on the project?
  - b. Does any disclaimer exist that limits the owner's liability for subcontractor selection?
  - c. Are the subcontract agreements themselves owner defined?
  - d. Is any specific procedure in place to resolve disputes between two owner-defined subcontracts?
  - e. Will the owner in fact make decisions (or will there be constant attempts to drop the responsibility on the general contractor)?
- 3. (Price/Bid) Allowances
  - a. Are there allowances anywhere in the contract?
  - b. If so, have all allowance items been bid or rebid yet?
  - c. Have or will all allowance items been awarded in time to prevent schedule interruption?
- 4. (Contract) Time

- a. Did the first schedule draft drastically exceed the allowed contract time?
- b. Did subsequent schedule drafts incorporate unusual or excessive compression and accelerations?
- c. Did any long-lead-time purchases dramatically exceed the originally anticipated deliveries?
- d. If so, were they for specified items?
- e. Had the contract award date been extended?
- f. Had the site start date been extended for an owner-caused reason?
- g. If the answer to either 4.d or 4. e is yes, was the schedule logic affected?
- h. Did extra work result?
- i. Can clear cause-effect relationships be demonstrated to justify more contract time?

C. PLANS AND SPECIFICATIONS

- 1. "As Indicated"
  - a. Are notes without specific references common (such as "As Indicated..... See Specs," "See Plans," and so on)?
  - b. Have you taken the time to research each one to confirm that completing details do in fact exist?
  - c. If so, have you discovered incomplete, conflicting, or missing references?
  - d. If so, have you cataloged each instance for individual consideration?
- 2. Ceiling Spaces (Conflicts)
  - a. Is there a contract clause clearly noting the sub or trade contractor to be responsible for coordination of their work?
  - b. Have all areas of potential conflict in the ceilings been properly coordinated:
    - Is there enough room to pitch all pipe?
    - Do pitched lines miss all steel and concrete beams?
    - Can all ducts pass below beams at all locations shown?
    - Do too many items occupy the same space in any area?
    - If so, can enough space be made, or can anything be moved?
    - Are there large ducts shown to cross large beams and/or other significant obstructions?

Will all light fixtures fit in the remaining spaces Height? Plan?  
 Are there elaborate architectural, structural, or special shapes continuing into the ceiling?  
 If so, do other building systems or equipment penetrate any part of them?  
 If so, have you confirmed the actual size of everything?
- 3. Changed Existing Conditions
  - a. Has the estimate been reviewed for:
    - All sitework considerations?

- Any interferences with existing structures?
  - Any noted conditions of existing structures?
  - Locations, extent, makeup, and conditions of existing utilities?
  - Traffic patterns and site access?
  - Anticipated storage and staging areas?
  - Parking and security arrangements?
  - b. Have the estimators involved met with you at the site to review all items in (a)?
  - c. Have any changes between conditions existing now and those existing at the time of bid become apparent?
4. Column and Beam Locations
- a. Have the structural drawings been reviewed in detail:
    - Are column layouts erratic or unusual?
    - Are there any unusually long spans requiring relatively large structural members?
    - Are there unusual shapes, angles, slopes, or connections?
    - Are elevation changes strained or confusing?
    - Are beam sizes all different (with different ceiling spaces below them)?
    - Have the locations of all large beams been reviewed?
    - Are there unusual designs?
    - If so, is enough information included for proper shop drawing preparation the first time around?
  - b. After reviewing the architectural, plumbing, H.V.A.C., and electrical plans:
    - Are listed column line dimensions between all designs consistent?
    - Are there large ducts shown crossing large beams?
    - Are there light fixtures in the areas of large ducts?
    - Does the sprinkler main cross large beams, ducts, or light fixtures?
    - Do random spot-checks of architectural dimension strings reveal any discrepancies?
5. Design Change Telltales
- a. Are there a large number of apparent last-minute design changes? Are there:
    - Different styles of type or handwriting in the specifications?
    - Incomplete erasures?
    - Out-of-sequence reference marks or inserted pages in the specifications?
    - Different handwriting on the plans?
    - Different use of language for the same or similar remarks?
6. Design Discipline Interfaces
- a. Has any review to this point revealed any problems at the points where design disciplines cross each other?
7. Duplications of Design

- a. Have any duplications been observed?
- b. If so:
  - Is each description complete?
  - Are the descriptions in different specification sections with different contractors involved?
  - Are the duplications included in the same specification?
  - Is the same work specified twice?
  - Is any of the available options preferred?
- c. In a review of relevant contracts, plans, and specifications:
  - Are any or all contracts of an adhesion format?
  - Are any subcontractors owner selected?
  - Are the affected subcontracts "per plans and specs"?
  - Are there modifications to any contract?
  - Are the rules of precedence outlined in the specification?
  - Are all affected plans noted to be the responsibility of the affected subcontractors)?
  - Does the descriptions of work included in the affected and related specification sections help your case?
- d. Objectively analyze each duplication:
  - Have all the reasons why each subcontractor should and should not have carried the work in their bids been considered?
  - Should any contractor aware of the work have reasonably construed it to be included by another trade?
  - Did anyone request clarification from the owner prior to bid? If so, Is the request and/or response documented?
- 8. Is each duplication clear and complete In itself?
  - a. Is there a preferred solution:
    - Does any solution involve your own time or money?
    - Are the dollar estimates of each solution a consideration?
    - Is the timing of any solution particularly good or bad?
    - Is any potentially affected contractor more Inclined to accept the extra work?
    - Does any solution make more sense?
  - b. Do grounds exist to convince the owner that duplicated work Is In fact not included anywhere?
- 9. "Fat" Specifications
  - a. Does a review of the documents reveal;
    - An unusually fat "front end"?
    - Extensive duplication in the general provisions?
    - Long and/or labored descriptions and instructions?

- "Catch-all" phrases and boilerplate not specifically applying to project conditions?
10. Finish Schedule vs. Specification Index
    - a. In a comparison of the Finish Schedule to the Specification Index:
      - Is each Item accounted for?
      - Is each item included only once?
  11. Inadequate Level of Detail/Missing Details
    - a. If enough design Information has not been originally provided:
      - Will the architect respond now with the complete information?
      - Is it confirmed in writing?
      - Are there any additional cost implications?
  12. Light Fixture Locations
    - a. In overlaying the lighting plans on the reflected ceiling plans, are there conflicts in:
      - Ceiling light fixtures?
      - Emergency lights?
      - Soffit lights?
      - Exit lights?
      - Undercabinet lights?
    - b. In overlaying the architectural plans, are there conflicts in walls, soffits, or cabinets?
    - c. In overlaying the H.V.A.C. plans:
      - Are there conflicts in register, grille, and diffuser locations?
      - Are equipment actual sizes accommodated?
      - Does everything miss the lights?
    - d. In overlaying the sprinkler plans:
      - Do the heads miss the lights?
      - Do the heads fall in the center or quarter center of the ceiling tile?
      - Is there an architectural pattern in the ceiling tile that will change location preference?
    - e. In overlaying the electrical plans:
      - Do the smoke detectors miss the lights (and everything else)?
  13. Match Lines and Plan Orientations
    - a. Are match lines present?
    - b. If so:
      - Are they necessary?
      - Are they in the same location every time?
      - Do they include the same information?
      - Is anything missing?
      - Are they complete and to the same extent on every plan?

- c. Is the north arrow in the same place on each drawing?
  - d. Are the orientations the same for each plan?
14. Mechanical, Electrical, and N.I.C. Equipment
- a. Are differences highlighted in all approval submissions?
  - b. Has the Letter to Subcontractors Regarding Equipment Coordination been sent?
  - c. Has the Letter to the Architect Regarding Contract Equipment Coordination been sent ?
  - d. Has the Letter to the Owner Regarding N.I.C. Equipment Coordination been sent?
15. Numerous Details and Dimension Strings
- a. Have repeated designs been observed?
  - b. Are there many instances of multiple dimension strings?
  - c. If so, have spot-checks uncovered errors?
16. Performance and Procedure Specifications
- a. Are there any instances in which both the performance and procedure specifications occur for the same item?
  - b. If so:
    - Are they mutually exclusive?
    - Can they be made to be compatible?
    - Is one or the other more expensive?
    - Is one preferred over the other?
    - Has one been included in the Schedule of Values?
    - Is it cost-prohibitive to accomplish both?
    - Is time or material availability a factor?
    - Is one more complete or otherwise more appropriate?
  - c. Is one preferred over the other?
  - d. Have all the details and arguments supporting your position been assembled?
17. Proprietary Restrictions (Public)
- a. Does the specification being considered:
    - Name fewer than three acceptable suppliers?
    - Include the words "or equal"?
  - b. Do you intend to use an "equal" product?
  - c. If so, does the owner want a credit change order?
  - d. If so, have you considered a Sample Letter to the Owner Regarding Equal to Proprietary Item?
  - e. Has the Owner rejected your "equal" submission?
  - f. If so, have you considered a Sample Letter to the Owner Regarding Rejection of Equal to Proprietary Item?

18. Specification Section "Scopes"

- a. Does the design coordination process appear to have been done correctly?
- b. Are specific cross-references included?
- c. Does the Scope section appear to be complete?

D. SITE

1. Grades, Elevations, and Contours

- a. Has the entire site been photographed before any work has begun?
- b. Have the existing grades been spot-checked for accuracy?
- c. If so, have any discrepancies been discovered?
  
- d. If so, has a detailed check been arranged?
- e. Have the locations of existing telephone, water, sewer, fuel tanks and lines, and gas lines been verified?
- f. Have the manholes been opened to spot-check actual pipe invert elevations?
- g. Have the locations of telephone poles, street signs, pole guys, and any other construction been checked to avoid interference with site improvements?
- h. Have the actual horizontal distances among telephone poles, light poles, manholes, drainage structures, etc., been checked for accuracy?
- i. Have any discrepancies discovered been documented in the most accurate and unquestionable manner available?