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As-Built Surveys

Most, if not all, construction contracts require the contractor to produce as-built drawings. However, little information is found in industry literature about construction as-builts and the as-built survey process.

In addition, the work scope often changes over the course of the construction project. Beyond executing the change in the field, changes need to be documented to show what was actually constructed. Hence, the owner usually requires a final record to show all changes or, more specifically, any change that modifies the tangible portions of the completed work. The end product of this effort is what the industry terms as-built drawings, or more simply, “asbuilts.”

As-builts are an important part of a contractor’s work scope. Unfortunately, they are often overlooked by both the CM and contractor until the end of the project, when they are needed. They are important for those who use the finished product, as they provide a legacy of what was actually built. This legacy becomes more important, as we continue to build on top of old work, land ownership changes, or for public works, as employees familiar with what was built are replaced over time by attrition.

These factors often make it necessary, or at least a good source of verification, to have a separate firm conduct field surveys to obtain existing conditions documentation, or, as-builts.

Coast 2 Coast is involved with many phases of documenting as-built measurements, one occasion being when an existing structure or work site is surveyed to produce drawings from scratch. In this process, technicians take field measurements of building floor plans, site improvements or topography, and then electronically draft the information to CAD standards. Construction as-builts discussed here are contract documents revised during construction and submitted by the contractor for review and approval by the CM either monthly or after final completion of newly constructed work.

Before considering some changes to the way as-builts are done, one should first define exactly what purposes they serve and explain some of the problems associated with them.

Purpose

Construction as-builts are used to show the finished condition of the work as it was actually constructed and accepted. The as-built documentation is a usual and important requirement of construction contracts, and the process requires that any change that modifies the original design be incorporated by drafting the change upon one set of contract documents earmarked just for that purpose.

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Four Roles of As-Builts

1) The first role of as-builts is to serve as a one-stop repository of all directed changes. Hence, the general contractor and all his subcontractors are, theoretically at least, working from the same up-to-date documents as the work progresses. The contractor is expected to update the records as the work progresses and to do so in a timely fashion in order to make them useable for all construction parties.

2) The second role is, post construction, as a contractor's certified record attesting to what was built. Thereafter the drawings can be used by the owner or operator as a reference over the working life of the improvement. This enables the user to locate hidden features and troubleshoot problems, and provides a tool to plan for changes or expansion. The owner can also use them as documents upon which to record subsequent minor modifications made by or for the owner. With all these ongoing uses, the owner considers as-built drawings to be a living document.

3) For their third role, as-builts eventually become demolition drawings when improvements are no longer needed. They can be modified, repackaged, reproduced and included in a new contract, saving the owner the cost of developing new drawings. As demolition drawings, as-builts will have been used over the complete life cycle of the facility. The repackaged demolition drawings can also be used to see what was *not* demolished, and those drawings live as part of the next contract.

4) The fourth and last role of as-builts is for land-use history. They serve as a record of what was. The information they provide can pay dividends during subsequent land uses. For example, during construction, if an unforeseen object is encountered, as-built research might show that the object could be a structure left over from three previous land uses that erroneously was thought to have been removed. As-builts become the last testament to what once existed.

More Benefits

Accurate existing condition documentation has hidden benefits for both parties of a construction contract. If changes are properly drafted and referenced, as-builts can allow for checks and balances against work not billed or deletions not credited.

Problems

Some contractors do an excellent job of providing quality as-constructed records. These contractors are the minority. The remainder do mediocre work at best – their work is sloppy, incomplete, or illegible, with documents stapled to drawings and other related shortcomings. A few contractors have been known to submit contract drawings as as-builts without a making any notations on them. When contractors do not provide an acceptable set of documents, one must ask why.

Lack of motivation, the perception of not being reimbursed, the fact that too many contracting parties are responsible for providing as-built information and differing expectations are reasons why as-builts rarely meet the mark. The remainder of this paper addresses some new approaches to combat these problems.

With these considerations in mind, the only definite way to ensure your building's existing conditions measurements is for Coast 2 Coast to conduct field surveys and produce complete documentation. However, once obtained, there are solutions to guide these materials into full lifecycle usage, with proper updates and expectations shared by everyone involved.

Solutions

Set a Standard

- Generally, what is known about as-builts in most organizations is what is learned by word of mouth, example and by trial and error. A properly written standard can be the basis for education, a standardization of methods and minimum acceptable results, and an aid to contract enforcement. Otherwise, each job will continue to be based only on the typically brief project specification and the CM will continue to struggle with contractors over as-builts. The following lists topics that could be included and issues that should be addressed in an industry standard:

- Case law– Explain how courts and arbiters have ruled.

- Discuss what designers need to know to facilitate the as-built process.

- Address the CM's obligation to discuss as-built requirements and its importance at pre-bid, partnering and preconstruction meetings.

- Provide direction as to which contract documents should be used to record as-built information. These may be (full-sized) plans, specifications and, depending on the type of contract and the needs of the owner, fabrication drawings, concrete lift drawings, pipe spool drawings and contractor-provided designs.

- List all documents that could be the sources for as-built information. Address how they are collected.

- Identify the required person responsible for as-builts in each organization that makes up the construction team (contractor/subcontractor/CM/engineer). Define the role and authority of each in the process.

- Address how the as-builts will be protected from loss or abuse.

- Drafting Standards.

- Address how to incorporate a change made that was not appurtenant to the work scope. This would be when the owner uses the current construction contract to do other work that was not finished by a prior contract, or when the owner used the current contract to get unrelated work done.

- For revised drawings that are issued during the course of the construction, should as-built information be carried forward to the revised drawing and the old revision removed?

- Explain the monthly review process. Explain who reviews the as-builts and whether a subcontractor's documentation should be reviewed.

- Prepare model specifications that CMs can propose depending on the project delivery method, the nature of the work and client needs. The CM can then tailor the specification based on the specific requirements of the project.

A comprehensive standard is best presented in manual format. An optimistic goal would be to produce a general, useable and a widely accepted manual for use across the entire construction industry. All or part of the manual could apply to a particular construction contract depending on the needs of the owner and CM – the portions that do apply can be specified in the construction contract. As-built requirements unique to a project or its owner, and not addressed in the manual, could always be addressed in project specifications.

Conclusions

As-builts provide important information that is needed during construction and later for future projects. They serve as a foundation upon which to record all changes, directed or otherwise, made during the work so that the contractor's staff can quickly obtain information about any design change. After construction, as-builts serve the owner as ready reference information about what was actually built. They can also serve as demolition drawings and as records of land use.