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Product Substitutions

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Introduction

As defined in Division 01 of the specifications, substitutions are changes in products, equipment and methods of construction from those that are specified.

Almost any form of project delivery—Design-Bid-Build, Construction Management (CM-at-risk or advisor), Design-Build—can have product substitutions. For the sake of simplicity, this paper will primarily address the architect’s role in the substitution review process for Design-Bid-Build (DBB), noting where appropriate how the role might change in other delivery methods.

The substitution of a product for a specified one is normally considered an issue during the bidding and construction phases. However, planning for substitutions, understanding that they are sometimes unavoidable, and developing a process for evaluating them need to start at the very beginning of the project. And by “beginning,” we are talking about before the architect signs the contract with the owner.

Contract Negotiations

The Owner-Architect agreement needs to address the architect’s role in evaluating substitution requests, whether it is a basic service or an additional service. If the contract is an out-of-the-box AIA B201-2007, *Standard Form of Agreement*

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Between Owner and Architect, this issue is fairly clear: Section 3.5.2.3 states that, for competitively bid projects, the “Architect shall consider requests for substitutions, if the Bidding Documents permit substitutions, and shall prepare and distribute addenda identifying approved substitutions to all prospective bidders.” For negotiated proposals, the language in section 3.5.3.3 is similar, except instead of “prospective bidders,” it says “prospective contractors.” In both cases, this is identified as a basic service.

During the Construction Contract Administration (CCA) phase, substitution evaluation is described, in section 4.3.2, as one of six Additional Services the architect will provide to avoid construction delays, provided that the owner is notified with reasonable promptness and is given an explanation of the facts and circumstances of the situation. The owner is given the opportunity to accept or reject the additional service request, on a case-by-case basis.

More often than not, the actual Owner-Architect agreement will be either a modified version of B201 or a custom agreement developed by the owner. In either case, the architect needs to make sure that construction phase substitution evaluation is identified as an additional service. If substitution evaluation is included as a basic service, then the architect’s fee should be adjusted to account for the anticipated additional effort during CCA (the true extent and magnitude of which is often difficult to predict).

Project Design

To some extent, the likelihood of substitutions being requested during bidding and construction can be mitigated by careful material and product selections during the design phases. This can start by setting and following project team design goals. Before any design effort begins, the architect should lead a visioning and goal-setting session that includes the owner’s decision-makers, consultants (architect’s and owner’s), construction manager/advisor (if any), and other major stakeholders in the project. One of the results of this goal-setting session is establishing the level of quality of materials and systems, in terms of durability and performance. All material selections made by the design team should then be consistent with those project goals.

As the design team develops the project’s design, selections of products, materials and systems need to be documented, with particular emphasis on aesthetic qualities and performance characteristics. This will give the project specifier enough information to identify products, materials and systems that are comparable to the ones selected.

Project Documentation

Well-written specifications can perform two roles in minimizing the likelihood of substitutions during bidding and construction. First, by providing a sufficient number of acceptable options for each product, material and system, there should be fewer reasons for the contractor to propose a substitution. Second, by defining the desired aesthetic and performance criteria, and including that information in the specifications, the evaluation of proposed substitutions is made easier—for both the architect and the contractor.

There are four basic ways of specifying products:

1. **Descriptive:** All the material qualities of the product are specifically called out. To use the example of a window, the drawings show a double-hung window and call it out as wood. A descriptive specification might say that it's to be made of factory-primed, preservative-treated, knot-free Ponderosa pine, kiln-dried to 6%-12%, and provided with insulating glass, rust-free metal hardware and weather-stripping. Based on this specification, any double-hung wood window the contractor provides that satisfies these criteria will meet the specified design intent. With a purely descriptive specification, the actual product manufacturers are not identified; if the contractor proposes the unspecified Manufacturer X, it does not need to be a substitution request, unless one of the specified characteristics is not met. Provided that the descriptive spec does not include contradictory criteria (e.g., there is no double-hung wood window made of Ponderosa pine on the market), there are few reasons for the contractor to request a substitution. On the other hand, the designers cannot prefer one manufacturer over another, since manufacturers are not specified. A descriptive specification might be written where the law does not allow manufacturers or products to be named, but the products can be described in sufficient detail so that only the preferred manufacturers will qualify.
2. **Performance:** The only characteristics that are specified are performance criteria. In our double-hung wood window example, the specs would call out the design wind load (per ASTM E330), the maximum air infiltration (per ASTM E283), the maximum water infiltration (per ASTM E547), and the structural performance (per ASTM E330). This leaves the contractor free to submit a window made of any kind of wood, as long as

- it meets the specified criteria. As with the descriptive method, the designers have no control over the actual products. A possible substitution request under this specifications method might be to reduce one or more of the performance criteria, perhaps because the criteria cannot be achieved in any available product.
3. Reference Standards: In this type of specification, the criteria might be that the window be Grade 40 (Light Commercial), meeting NWWD I.S.2. In this case, the contractor has far more leeway in choosing the window product for the project. Because the reference standards typically include material and performance criteria that are widely used throughout the industry, the need for proposing substitutions is minimal. However, the designers have little control over which window is actually used.
 4. Proprietary: The specifier explicitly identifies one or more acceptable manufacturers, with the exact series and model numbers of the desired products. In this case, the designers have stated exactly what they want; any other product will need to be a substitution. With this type of specification, a possible reason for a substitution request is that the specified product is no longer available. Note that there are two types of proprietary specifications: “closed,” which do not permit substitutions, and “open,” which allow for comparable products.
 - a. The closed proprietary specification can identify one product, or list several that are acceptable. In either case, substitutions are not allowed.
 - b. In the open proprietary spec, the named product indicates the level of quality and other characteristics desired.

In reality, it's not unusual for the specification of a product to be some form of hybrid of two or more of these types. To reduce the likelihood of excessive substitution requests being submitted, the specifier needs to ensure that (a) the spec is not contradictory (e.g., specifying a manufacturer that has no products that meet a specified performance criterion); (b) no characteristics are specified that cannot be achieved in any available product; and (c) the products specified are still available at the time of bidding. As can be seen, the more control the designers want in the selection of products, the more likely that substitution requests, valid or not, will be submitted.

The “ground rules” for legitimate substitution requests are made clear in two places: for the Bidding Phase, in the Instructions for Procurement (see below); and for the Construction Phase, in Division 01, Section 01 25 00- Product Substitution Procedures.

Division 01 of the specifications covers the general requirements that apply to all the sections in Divisions 02 through 49. Section 01 25 00- Product Substitution Procedures establishes the administrative procedures for submitting substitution requests, and identifies the conditions under which a request may be considered by the design team and the owner. Essentially, there are two legitimate reasons for a contractor submitting a substitution request: for cause, such as product unavailability, and for convenience, where there may be an advantage to the owner by making the change. We will talk more about these later.

Section 01 25 00 specifies when a substitution request may be submitted. In the case of Substitutions for Convenience, a time period following the execution of the contract (usually 30–60 days) may be specified; or a time period before the substituted product is scheduled to be installed (again, 30–60 days). Or Substitutions for Convenience may simply not be allowed.

Since, by definition, there should be a reason for Substitutions for Cause, they cannot be disallowed. But time limits can still apply; for example, Section 01 25 00 can require that Substitutions for Cause be submitted 15 days before the scheduled preparation of related submittals.

An important part of Section 01 25 00 is the Substitution Request Form. This is a form that the contractor must fill out for each request for substitution, for either cause or convenience. This form must include, at a minimum:

- Information, such as location, contacts and reputation, about the proposed manufacturer
- The specification section affected by the substitution
- Information, such as model number, color chart, or installation instructions, about the proposed new product
- An itemized comparison of the proposed new product with the specified one
- Any impact on the construction cost or schedule as a result of the substitution
- A list of built projects for which the product has been used

- A statement from the manufacturer that the product is appropriate for use in the project, and that the quality of the product, its serviceability and its warranty are comparable or better than that of the specified product
- Statements by the contractor and the installer that they will coordinate the proposed product with other components and systems; that they waive claims for costs due to the substitution that may later become known; that the stated costs related to the substitution are complete, but don't include design fees by the design team; and that the proposed product is consistent with the requirements of the contract documents
- If the project is intended to be LEED certified, information assuring the design team that the proposed product will satisfy the USGBC LEED requirements in the same way as the specified product. This can include amount of recycled materials, location of the plant or source materials, VOC content, or any of several dozen possible characteristics.

Substitution Request Forms typically are, and should be, fairly lengthy documents, for a couple of reasons. First, there is a lot of information required in order for the design team to be able to make a reasonable evaluation of the proposed substitution. The burden of proof that the proposed product is comparable with the specified one rests with the contractor; if the design team does not have enough information to make the evaluation, the request can be rejected. Second, substitution requests should not be taken lightly; therefore, the effort to make the request should be significant. It's important that the effort is by the contractor. It is not the architect's role, even as an additional service, to do the contractor's job of providing the information.

Bidding and Negotiation

The Instructions for Procurement should identify the last date for submitting substitution requests and refer to Section 01 25 00 for the procedures and documentation required for a request to be considered. The date should be determined to allow for the following to occur before the bid opening:

1. The design team has enough time to give the request the appropriate evaluation.
2. If the substitution is approved, and it results in changes in the bid documents, the design team has enough time to make thorough and

coordinated changes, which are then issued to all bidders in an addendum.

3. The bidders have sufficient time to consider the approved substitution and make the appropriate revisions to their bids.

AIA Document A701, *Instructions to Bidders*, says that bidders can submit substitution requests up to ten day before the receipt of bids. The design team and the owner can opt to make that longer if they feel ten days may not be enough time. Alternatively, if there is a concern by the design team that a hasty review of a proposed substitution may result in uncoordinated documents, the Instruction to Bidders may stipulate that substitution requests will only be considered for a period of time (usually 30–60 days) after the execution of the contract.

Attached to the Instruction to Bidders should be the Procurement Substitution Procedures. This will differ from Section 01 25 00 in the contract documents in several important ways. First, the bidder does not have to identify the expected cost savings or schedule reduction for the proposed substitution; these will be reflected in the final bid amount and proposed construction duration. Second, the owner does not need to approve the substitution; the architect's acceptance is sufficient (although it is advisable to keep the owner informed). And third, both the bidding contractor and the bidding subcontractor requesting the substitution need to sign the Substitution Request Form. Substitution requests during bidding should only be submitted by bidding contractors; requests submitted directly by bidding subcontractors should be rejected.

Construction Contract Administration

When is a change a substitution? According to AIA Document 201, “except in the case of minor changes in the Work authorized by the Architect . . . the Contractor may make substitutions only with the consent of the Owner, after evaluation of the Architect and in accordance with a Change Order or Construction Change Directive.” Note that a substitution is a modification to the contract and, as such, needs the appropriate contractual methods for change.

So, when is a “change” not a substitution? This depends on how the product was specified. Non-restrictive specifications, which can include any of the four specification methods discussed above, are often required for projects funded by federal, state or local agencies. For instance, if only one product is specified in a non-restrictive proprietary spec, that product establishes the type, function, dimensions, appearance and standard of quality, but the contractor is not limited to using only that product. The contractor may submit, as part of the normal submittal

process, a comparable product. The design team will make the evaluation of the proposed product's equivalency to the specified one as part of its submittal review. If the product is deemed as equivalent, its use does not constitute a modification to the contract, and it is not a substitution.

Related to this is the term "or equal." Federal, state or local agencies often require this term to avoid closed proprietary specifications. Like the description of the open proprietary specifications above, "or equal" allows the contractor to submit, in the normal submittal process, products that are comparable to the named product(s). This also is not a substitution.

Now let's look at what happens when a substitution is requested. The first question is how the request is submitted. There is only one way to submit a substitution request: by following the procedures described in section 01 25 00, which includes completing and submitting the Substitution Request Form. Submittals, RFIs, OAC meetings, or any other form of CCA communication are not acceptable for submitting substitution requests. In this, the design team needs to be ever watchful. It is very easy to overlook what appears to be a harmless request in an RFI, only to find that there are major implications later on. For example, an RFI may ask if the wall thickness of conduit penetrating a floor slab can be reduced. The electrical engineer sees no problem and responds affirmatively. The architect returns the RFI to the contractor with the engineer's response. Weeks later, the inspector stops the contractor from pouring the floor slab, noting that the thinner-walled conduit doesn't comply with the required UL-tested assembly. This is a good—and real-life—example of a seemingly small decision having large impacts on the project.

So let's say the contractor has submitted the Substitution Request Form. The next question is, is this a Substitution for Cause or for Convenience? If it's for convenience, is a substitution allowed? If the product is specified in a closed proprietary specification, no substitutions, other than for cause, may be allowed. If it is allowed, has the substitution request been submitted timely, or is it later than the specified time period? If it's too late, it can be rejected for that reason alone. Let's say that it is a Substitution for Convenience, and that it's been submitted within the specified time period. What is the reason for the substitution? According to Section 01 25 00, a Substitution for Convenience must have some demonstrable advantage to the owner. This advantage could be, for example, reduced cost, earlier occupancy, better quality, or support of local business. While the contractor can share in the advantage (e.g., the contractor's costs can be reduced as well as the owner's), the advantage cannot be exclusively the contractor's.

What if it's a Substitution for Cause? Section 01 25 10 identifies several legitimate reasons for this: the product may no longer be available, the specified warranty

may not be available, regulatory requirements may have changed, or project conditions, such as concealed conditions, may be different from what was known at the time the contract was executed. The design team must determine if the “cause” is truly legitimate, or if it’s the result of the contractor not properly scheduling the work. For instance, if a particular stone is specified, and it is well known that there is a minimum lead time of six months for quarrying, fabricating and shipping the stone to the site, the contractor cannot wait until three months before the scheduled installation to make a substitution request, claiming that the stone cannot be delivered on time. In this case, the design team can recommend that the owner reject the request, and require that the contractor do whatever is necessary to have the stone on site on time.

Now let’s say that the substitution request, whether it’s for cause or convenience, is considered legitimate by the design team. The next step is the evaluation of the proposed new product. (Actually, the next step is for the architect to notify the owner that the substitution request has been submitted, and that the evaluation of it may constitute an additional service; we’ll discuss this more later.) Using the filled-out Substitution Request Form, the design team needs to determine the following:

- The Substitution Request Form is completely filled out.
- The proposed substitution is consistent with the intent of the contract documents and will produce the intended results.
- The proposed substitution provides sustainable design characteristics that the specified product provided.
- The proposed substitution will not adversely impact the contractor’s schedule.
- The proposed substitution meets the requirements of the authorities having jurisdiction (AHJ). In some jurisdictions, it may be prudent to review the proposed product with the AHJ during the evaluation.
- The proposed substitution is compatible and has been coordinated with other portions of the work.
- The proposed substitution’s warranty is comparable to, or better than, the warranty of the specified product.
- The proposed substitution will not adversely affect the work of other contractors (if there are any).

If there is not enough information on the request form for the design team to determine all of the above, or if it's clear that one or more of the conditions are not met, the form should be returned with no action, stating that it is not in compliance with the requirements of the contract documents. It is then up to the contractor to (a) revise and resubmit the form, (b) submit a different substitution product that does meet the required conditions, or (c) abandon the substitution process (if it's a Substitution for Cause, this may not be an option).

If the design team determines that the proposed substitution satisfies the requirements of the contract documents, the next step is to forward the request to the owner, with a recommendation for approval (note that it is the owner, not the architect, who approves substitution requests). The design team should also determine the design fees associated with the substitution. These fees should consider all of the following: the time spent evaluating the substitution, any time required to change the documents if the substitution is approved, any time required for additional submittal review or site observation, and additional time needed for reviewing the contractor's as-built documents. The fees should be submitted to the owner with the recommendation to approve the substitution.

In determining whether to approve the substitution, the owner needs to evaluate the impact on the project's cost, schedule and quality. If the substitution is supposed to result in a cost savings, are the savings significantly more than the additional design fees? If the schedule is impacted, is it justified? Finally, does the owner agree with the design team's evaluation of the proposed product? If the answer to these questions is "yes," then the owner notifies the architect that the substitution is approved, and to initiate the contract change process.

The change process due to an approved substitution is no different than for any other change to the contract. If the substitution constitutes a minor change to the work, an ASI issued by the architect is sufficient to direct the contractor to proceed with the change. If the change is more substantial, then either a Construction Change Directive or a Change Order is the right tool to change the contract. Note that the Change Order in this case could be to reduce the cost of the project (mostly likely with a Substitution for Convenience), to increase the cost (possible if it's a Substitution for Cause), or to have no change in the cost.

Alternative Delivery Methods

Everything that has been said so far assumes the "traditional" Design-Bid-Build method. Substitutions can be requested on other methods of delivery, but the architect's role is often different—sometime very different—from the D-B-B method.

Construction Manager–Constructor (CM_C)

In this delivery method, where a CM_C typically negotiates a guaranteed maximum price based on less-than-complete design documents, the architect's role is the same as with D-B-B. However, since, in most cases, the CM_C has been on the project from the early design phases, many “substitutions” are actually proposed and evaluated as part of the design process, with the CM_C bringing their construction knowledge and expertise to the assistance of the design team. With the CM_C approach, it is possible to minimize the likelihood of substitution requests during the construction phase.

Construction Manager–Advisor (CM_A)

With this method, the CM_A often acts as the owner's representative. However, the role of the CM_A can vary widely from project to project. It is not unusual for the CM_A to take on some of the usual responsibilities of the architect, such as change order reviews. In most cases, substitution evaluation will still reside with the architect. It's important that the Owner–Architect agreement is coordinated with the Owner–Construction Manager–Advisor agreement, so there is no conflict between the architect's scope and the CM_A's.

Design-Build (D-B)

With Design-Build, since the architect is contractually bound to the contractor rather than to the owner, the need for substitution evaluation is significantly reduced. However, in at least one situation, it may still be necessary: For projects contractually required to be LEED certified, the contractor may want the architect to review substitutions proposed by a subcontractor, in order to ensure that the new product does not jeopardize the certification.

Project Close-out

So . . . the substitution has been approved, the change order processed, and the work completed. Is that it? Not quite. As part of normal project close-out procedures, the design team needs to ensure that the warranty is received, the contractor's as-built documents appropriately reflect the change, and the relevant owner's manuals are submitted. To repeat what was stated in the introduction, the substitution process starts at the beginning of the project, and isn't over until Final Payment.

Conclusion

Product substitutions are a normal part of construction; few projects get built without at least one substitution request being submitted (if not approved). But the architect must manage the process to ensure that only substitutions that truly benefit the owner or are for a legitimate cause are submitted, that the rules for requesting substitution are clearly described, and that the design team is appropriately compensated for the additional services. Properly managed, approved substitutions can, by lowering the construction cost, shortening the construction schedule, or improving the quality, even result in a better project.

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