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DESIGN-BUILD vs. CONTRACTOR-DESIGNED MEP

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DESIGN-BUILD

Design-Build is a project delivery method that provides the Owner with a single point of responsibility for both design and construction. Instead of the traditional method of design-bid-build – in which the Owner hires a Design Professional to prepare Construction Documents and separately hires the General Contractor to build – Design-Build allows the Owner to contract with a single entity for the design and construction of the project, typically for a guaranteed cost of construction.

The Design-Build entity can assume various forms. It may be a joint venture or partnership between a Contractor and Design Professional. The entity may be a single company that offers both design and construction services. Or, the Contractor may have the lead role as the Design-Builder and hire the Design Professional as a Subconsultant. Or, a Design Professional may head up the Design-Build entity and hire the Contractor as a Subconsultant.

CONTRACTOR-DESIGNED MEP

For this project delivery method, the Owner limits the Architect's scope of work, requesting that he provide only outline specifications describing concepts and quality level for the proposed design of Mechanical (HVAC and Plumbing) and Electrical systems, thus requiring the MEP Subcontractors to design the systems. This concept may work on some smaller projects (retail tenant renovation work in an existing strip center or office tenant renovation in an existing building where MEP systems exist and are only being slightly modified); but on larger projects, especially new structures, it causes problems.

Codes/Construction Documents

The International Building Codes, which Pennsylvania has adopted, now require complete MEP Construction Documents prepared by a Registered Design Professional on all projects.* This means the MEP Subcontractors will be required to hire Registered Engineers to provide these documents or drawings (very few MEP Subcontractors have in-house engineering capabilities). There is a cost associated with this work, even if it is hid in-house. We actually have had the MEP Subcontractors hire our Engineers to complete the project drawings.

* International Building Code 106.1
International Mechanical Code 106.3.1
International Electrical Code 503.1

The Building Codes, especially the newer International Energy Conservation Code established for buildings, greatly affect the overall project. We are now relying on an MEP Subcontractor's Engineer to design a system to meet the latest Code requirements. The Architect must make assumptions on the energy efficiency of the building's shell, which the MEP Subcontractor's Engineer must follow (or revise during the construction phase).

Who is responsible for providing the required Energy Code "COMcheck" paperwork? This is a Code-compliance document, portions of which are filled out by the Architect, Mechanical and Electrical Engineers.

CONTRACTOR-DESIGNED MEP (continued)

Schedule

Today's permit process requires Engineered MEP drawings. Waiting until bidding is complete and the selected MEP Subcontractor finishes the MEP drawings and submits them for permits could delay the project (i.e., underground utilities are usually installed with the foundations).

The Bid

If you get separate mechanical and electrical bids based on outline specifications, are you sure these MEP Subcontractors are on the same page (i.e., did the Electrical Subcontractor plan for four rooftop units and did he provide the correct wire size to these units?).

Are you open to 'extras,' or did both Mechanical and Electrical Subcontractors add in extra dollars to cover possible changes/additions?

Coordination

Without MEP Engineers on board during the Construction Document Phase (or Engineers with whom to consult), the Architect is required to estimate the size of utility rooms, shaft sizes, equipment loads, steel for rooftop units, etc.

Who coordinates the MEP Subcontractor's Design Engineers? This can be done by the General Contractor; but as the MEP design needs to be coordinated with the Architect's, this work will probably fall back onto the Architect, who will request an additional fee for this work.

Once the MEP Subcontractor's Design Engineers actually lay out the systems, there may be additional work required to accommodate their approach to the project or equipment. This adds to the design fees and opens the General Contractor to possible 'extras' (i.e., the Architect assumes two large rooftop units, shafts, etc., and the MEP Subcontractor uses four smaller units, requiring more steel support work and additional shafts).

Equipment Selection

HVAC Equipment: The Mechanical Subcontractor selects the units, diffusers and grilles that meet the Contractor's budget without the Owner's input. The Contract has already been awarded; and if the Owner wants something different, he is open to an extra.

Plumbing Fixtures

The Plumbing Subcontractor selects the plumbing fixtures based on the Contractor's budget without the Owner's input. The Contract has already been awarded; and if the Owner wants something different, he is open to an extra.

Electrical Fixtures

The Electrical Subcontractor selects the light fixtures. Obviously, lighting and light fixtures can have a major design impact on a project; and lighting levels are controlled by Code, making design efficiency of lighting fixtures critical. Do you really want to leave this all up to the Electrical Subcontractor without the Owner's and/or Architect's input?

Coordination with Utility Companies

Waiting until the appropriate MEP Subcontractor is on board to size utilities and work with the utility companies (i.e., order transformers) may delay the project.

CONTRACTOR-DESIGNED MEP (continued)

Contract Administration

If the Architect's Engineers are in any way required to review the MEP Subcontractor's work, then they accept liability. In accepting this liability, it will be necessary for them to check all the MEP Subcontractor's Design Engineer's calculations and, obviously, there will be a fee associated with this additional work. The Owner is now paying twice for the same work. There must be complete separation of the Architect and MEP Subcontractor's Design Engineers (if that is really possible).

Liability – Where does it fall?

This becomes a major issue – who is ultimately liable for the building's MEP design? If the Architect is required to bind the MEP Subcontractors' MEP drawings with his Construction drawings and submit them as one complete "Permit Set," then, by law, the Architect is liable for the MEP design. If this is the case, the Architect will be required to have his Engineers check all design load calculations, equipment sizes and overall design layout. Thus, the Architect will add fees to cover this work and associated liability. Now the Owner is paying twice for the same work.

Separation of Liability

To separate liability, the Owner will be required to sign a Waiver of Liability indemnifying the Architect and agreeing to defend him in any lawsuits.

In addition, the Architect's Construction Documents (drawings) must be filed separately for permits with the understanding that MEP Construction Documents (plans) stamped by a Registered Engineer will be filed separately and are not the responsibility of the Architect. This process must be approved by the Municipality reviewing the plans.

MEP's Liability

If the MEP Engineers work for the MEP Subcontractor who works for the General Contractor, who is liable for mistakes of the MEP Subcontractor (i.e., undersized ductwork)? Does the MEP Subcontractor's Engineer have Liability Insurance? Can the Owner "reach" the MEP Subcontractor's Engineer if he has no contractual relationship with him?

Warranty

The General Contractor usually offers a one-year warranty with his work. Does this include the MEP Subcontractor's design work?

SUGGESTED APPROACH

We suggest we follow the Integrated Project Delivery (IPD) System, wherein the Contractor is brought on board early in the design process (at least by the end of Design Development); and he and his Subcontractors work with the Architect's MEP Engineers to finalize the design concepts and budgets. The Architect's MEP Engineers then produce the final Construction Documents (permit drawings).