هيئة كفاءة الإنفاق والمشروعات الحكومية
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Project Construction As-Built Drawings Procedure

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1.0 PURPOSE

The purpose of this procedure is to define standards and responsibilities for the preparation, submission, acceptance, safekeeping and use of As-Built drawings of completed construction work and their maintenance and revision.

This procedure applies to works performed under all Government construction projects executed throughout the Kingdom of Saudi Arabia.

For the purposes of the Construction Management Procedures the Project Management Company is the Entity Project Management Organization (EPMO) appointed by the Entity and references prefixed with "Site", such as Site Construction Department, Site Engineering Department, represent the Project Management Company at Project level, on construction sites.

2.0 SCOPE

As-Built drawings will be a deliverable at the completion of every construction project, showing the exact location of a designed or field run installation or documenting items not shown in detail on drawings where that detail is required for future or follow-on activities.

As-Built drawings shall not be used to document items installed outside the requirements of Engineering Department drawings, specifications, or contract requirements, i.e., where Field Change Documents (FCDs) or Design Change Notices (DCNs) should be generated.

Note: DCNs or other Site Engineering Department issued documents are generally incorporated into the As-Built by the Engineering Department as updated drawing revisions.

3.0 DEFINITIONS

Definitions	Description
As-Built	An As-Built drawing is a document that depicts, pictorially or in text, the final as-constructed state. It will confirm variations to a design drawing or project technical document.
Check survey	Geometric (or other) survey of completed works for the verification of As-Built drawings and records.
Red Line Drawing	Working drawing depicting the current changes from design drawings of "in-progress" works. Red Line drawings will generally form the basis of the of As-Built drawing submission.
Entity Project Management Organization (EPMO)	An Entity Project Management Organization, this is an integrated team that comprises the Entity and its PMC responsible for managing all the Entity's projects.
Enterprise Content Management System (ECMS)	An information management and collaboration platform for managing and controlling program documents and records.
Site Contracts Department	Department within the Project Management Company that is responsible for administering Contracts.
Site Construction Department	Department within the Project Management Company that is responsible for Construction activities/operations.
Site Engineering Department	Department within the Project Management Company that is responsible for Engineering or design activities/operations.
Field Change Document (FCD)	A document used to make a change to an issued design document. Once approved, it is a valid design document.
Design Change Notice (DCN)	A set of technical documents intended to be either added to a conformed contract or to replace specified parts of a conformed contract. All DCNs are initiated by the Project Management Company Engineering Department and executed by a Design Contractor, referred to as Architect/Engineer A/E.
EPC	Engineering, Procurement and Construction
3D model	Three Dimensional model
2D CAD	Two dimensional Computer-aided Design

4.0 REFERENCES

1. EPM-KCC-PR-000003-Project Construction Completion and Turnover Procedure
2. EPM-KCE-PR-000003-Project Construction Field Change Document Procedure
3. EOM-ZP0-PR-000004 - Operations and Maintenance - Projects Interface

5.0 RESPONSIBILITIES

5.1 Construction Contractor

The Construction Contractor is responsible to progressively prepare the As-Built drawings as construction progresses and issue completed packages to the Project Management Engineering Department for review.

5.2 Site Document Control

Document Control is responsible for transmitting contract drawings to the relevant Construction Contractors and recording approved As-Built drawings in the Enterprise Content Management System (ECMS).

5.3 Site Construction Department

The Site Construction Department is responsible for ensuring that the requirements of this procedure are properly implemented and that the Site Engineering Department provides technical support for confirming that As-Built Drawings are the correct reflection of constructed works.

Note: For Construction Contractors that are not familiar with the As-built Drawing process, the Project Management Company (Engineering / Construction Departments) will review, assist and train the Construction Contractors in this process

5.4 Asset and Facility Management Department

The Asset & Facility Department is responsible for ensuring that FCDs are not impacting the operation and maintenance requirements. Full consideration shall be given to the asset reliability and life cycle cost

6.0 PROCESS/INSTRUCTIONS

6.1 General Requirements

The Construction Contractor is required by contract to prepare and submit As-Built drawings.

The Construction Contractor shall record all As-Built information on the latest revision of each original drawing issued for construction. As-Built drawings should accurately represent the final condition of completed work, obtained by actual site measurements and observations.

As-Built drawings shall also include additional drawings, or other information, which provide a clear, concise record of the permanent works. Approved Field Change Documents (FCDs), Design Change Notices (DCNs) and other applicable documents, should be the basis for updating the contract design drawings.

The labelling and quality shall be in-line with the Project Management / Site Engineering Department requirements.

6.2 Method and Timing of Submission

6.2.1 Progressive Maintenance

For all construction contracts, the Site Construction Department is responsible for ensuring that adequate As-Built drawings are progressively maintained by the Construction Contractor on site. This may be done, for example, by marking an additional set of prints in red ink as work proceeds. These drawings are often referred to as “Red Line drawings”. The production of the red line drawings should be undertaken regularly

to ensure that current information is both accurate and immediately available. It is not unusual for red line drawings to be produced on a daily basis.

The objective is to have a steady flow of updated information onto drawings on a continuing basis as portions of work are completed rather than submission of all information at the completion of the work when key staff may have left site.

Progressive development of As-Built drawings or Red Line drawings, also provides a single source of reference for the latest site configuration. This is important when design changes are being considered, to ensure the design activity does not over-lap creating potential clashes or conflict performance requirements.

6.2.2 Method

To support the development of the As-Built drawings the Construction Contractor shall be issued editable versions of the latest contract drawings. All As-Built changes to the editable versions of the drawings shall be circled and highlighted to indicate the changes. No other changes shall be made to the drawings by the Construction Contractor.

The timing of such issue will vary from project to project depending on the ongoing design development, magnitude of change requiring Drawing Change Notices (DCN's), the number of drawings to be Red Lined and the ability of the Construction Contractor to prepare drawings as 3D models / 2D CAD drawings / hand prepared mark-ups.

The Asset and Facility Management Department shall request and receive final design documentation and as-built drawings in the desired format and in accordance with the planned delivery time and as per Asset Management Software (AMS) data entry requirements.

Note: this should be undertaken as early as possible to support the progressive maintenance of the As-Built drawings.

The method used to prepare the As-Built drawings shall be specified within the Contract and confirmed at the pre-construction 'kick-off' meeting. The following shall apply for each format:

Distributed Engineering Model – Construction Contractors shall be provided with editing access to the suite of models at contract commencement. The Construction Contractor will update the models as works progress and assign properties to define the objects as "As-Built". This methodology would be applicable to works that are contracted as Engineering, Procurement and Construction (EPC) or (Design and Build) to a single contractor.

Standalone 3D model / 2D CAD – The Site Construction Department shall define the timing for model / drawing submission to the Construction Contractor. This shall be not less than 6 weeks or per the Contract from any planned completion of any section of the Works. Site Document Control shall issue, by transmittal, all latest versions of applicable contract drawings for each relevant section of the works. The Site Contracts Department shall confirm the issue of each drawing package by letter. The Construction Contractor shall update each As-Built drawing electronically to Document Control for distribution and review.

Hand prepared Red Line drawings – The Construction Contractor shall hand mark-up hard copy versions of the contract drawings. The red line drawing mark-ups will be transmitted to Document Control for distribution and review.

6.2.3 In-Progress Verification

During construction, the Site Construction Department shall progressively verify the accuracy of As-Built information being recorded through regular check of Works progress and audits of the in-progress As-Built drawings. In-progress verification should be undertaken on a weekly basis as a minimum.

For works requiring a high degree of accuracy, e.g. interface points with adjacent construction projects, in particular below ground utilities or foundations, it may be necessary to undertake a geometric check survey of in progress works. This should be undertaken by a specialist survey contractor.

Unacceptable variations between the checks and the As-Built information shall be addressed with the Construction Contractor and brought to the attention of the Contracts Department.

6.2.4 Submission

The Construction Contractor shall submit a complete package of As-Built drawings for a section of the Works once complete. The drawing package shall be transmitted to Document Control. As-Built drawings submission shall not be made less than 7days, or as defined in the Contract, prior to any planned notification of Initial Acceptance.

6.3 Acceptance

6.3.1 Review

The Site Construction Department shall review the Construction Contractor's As-Built information for adequacy, completeness and drafting standards. They shall be returned to the Construction Contractor for correction, if necessary, prior to acceptance.

The Asset and Facility Management Department shall request and receive final design documentation and as-built drawings in the desired format and in accordance with the planned delivery time and as per Asset Management Software (AMS) data entry requirements.

When drawings are confirmed acceptable by the Site Construction Department, they shall be signed by:

Distributed Engineering Model – revising the model to an X0 revision.

3D model/2D CAD drawings – revising the drawing to an X0 revision and noting the Site Construction Department acceptance by adding the appropriate initials in the drawing title

Hand prepared Red Line drawings – revising the drawing to an X0 revision and signing the drawing title block

All As-Builts drawings shall be submitted to the Site Engineering Department for their review and sign offs.

6.3.2 Check Surveys

As part of the As-Built review and contract close-out procedure, prior to Initial Acceptance Inspection, the Site Construction Department, shall verify the As-Built locations of surface and underground utilities, where accessible, by means of check surveys. Check surveys shall cover approximately 10% of the constructed utilities and shall be used to verify and accept As-Built drawings prior to initial acceptance of the facility.

6.3.3 Transmittal / Distribution

Approved As-Built Drawings shall be sent to the Document Control Department mobilized on site to upload the required documents on ECMS, in which they can be made available for follow-up on construction activities or future operations, provided that the department or entity responsible for expansion or planning is the owner of the drawings, hence no changes shall be made until after the owner's approval or until the drawings are referred to the Operations and Maintenance Contractor. Until then, the Contractor shall be responsible for updating and authenticating the drawings from the owner.

7.0 ATTACHMENTS

Not Applicable