

**SAN FRANCISCO PUBLIC UTILITIES COMMISSION
INFRASTRUCTURE CONSTRUCTION
MANAGEMENT PROCEDURES**

SECTION: SFPUC INFRASTRUCTURE CONSTRUCTION MANAGEMENT	APPROVED: 
PROCEDURE NO: 004	DATE: 6/7/2019
TITLE: RECORD DOCUMENTS AND DRAWINGS CONTROL	REVISION: 1

1.0 Policy

Record Documents shall be maintained to reflect the as-built condition of the site after construction is completed.

This SFPUC Infrastructure CM Procedure applies to all personnel working on the SFPUC Infrastructure projects during construction to the extent that their work is affected by this CM Procedure and does not conflict with specific SFPUC policies or the Contract under which the Work is executed.

2.0 Description

This SFPUC Infrastructure CM Procedure specifies the process by which record information is collected and documented in Construction Drawings at completion of the project, and the way in which the Final Project Record Documents are produced, certified and archived.

3.0 Definitions

3.1 Record Shop Drawings

Record Shop Drawings consist of the Contractor's approved proposed installation and equipment details based on field conditions and requirements, and considered and/or acknowledged as Record Drawings, provided the Contractor has stamped them "Record" and submitted them as such.

3.2 Conformed Construction Drawings

Conformed Construction Drawings are issued for construction by the Project Engineer (PE), incorporating all changes to bid drawings via addenda during the bid period. Conformed Construction Drawings shall be stamped by the PE "Issued for Construction".

3.3 Interim Contractor Record Drawings

Interim Contractor Record Drawings are Construction Drawings issued to and used by the Contractor during construction to red-line and document changes or variations between designed and final as-constructed conditions.

3.4 Final Contractor Record Documents

Final Contractor Record Documents are the record documents, including contract drawings, specifications, shop drawings, submittals, Requests for Information (RFIs), Change Orders, Field Orders, etc., certified by the Contractor and RE, at the completion of the project, representing the site and all conditions as constructed at completion of the project.

3.5 Final Project As-Built Drawings

Final Project As-Built Drawings are AutoCAD files of conformed documents incorporating all the field condition changes and conditions as described in the Final Contractor Record Documents. The PE certifies that Conformed Construction Drawings were correctly transcribed to the Final Project As-Built Drawings and the changes were previously approved by the PE.

3.6 Drawing Register

The Drawing Register is a log of the drawings. The Drawing Register groups the drawings by Drawing Set (for specific purpose) and sorts them by Drawing Number, listing the Drawing Number, latest Revision Number, Title, project work area, discipline and dates received or sent.

3.7 Construction Management Information System (CMIS)

The CMIS is an on-line management tool for the processing of contract documents based on established SFPUC Infrastructure CM Business Processes. It serves as a tool for effective storage and retrieval of various documents generated during a construction project.

4.0 Responsibilities

4.1 Resident Engineer (RE)

The RE is responsible for ensuring control of all project and contract documentation and for the periodic review of Interim Contractor Record Drawings to ensure that they are current, accurate and complete. The RE is responsible for reviewing and certifying the Final Contractor Record Documents as a precedent to award of Final Completion.

4.2 Office Engineer

The OE is responsible for overseeing the maintenance of Interim Contractor Record Drawings and other related documents by performing monthly document audits to ensure that the Contractor is properly updating and reflecting accurate record information in accordance with the

Contract. The OE coordinates with the Construction Inspectors and the Lead Construction Inspector and is responsible for documenting revisions to project documents (e.g., RFIs, Request for Substitution (RFS) and Contract Modifications) on the Construction Drawings at the CM team job site offices. The Construction Drawings at the CM team job site office shall be used as a basis to review the Interim Contractor Record Drawings on a monthly basis.

4.3 Construction Inspector

The Construction Inspectors are responsible for documenting field conditions in their discipline on the Construction Drawings at the CM team job site offices on a routine basis. Record information shall be collected from the Contractor's representative, from field observations, or from other work progress surveillance services. Each Construction Inspector shall compare the Interim Contractor Record Drawings to the redlines in the Construction Inspector's field drawings and discrepancies shall be reported to the Lead Construction Inspector.

4.4 Lead Construction Inspector

The Lead Construction Inspector shall verify that the Interim Contractor Record Drawings accurately reflect the as-constructed conditions and installations from responses to RFIs, RFSs, and other Contract modifications on a monthly basis as a condition to authorize Progress Payments.

4.5 Project Engineer (PE)/Engineer of Record

The PE may be the Engineer of Record. The Engineer of Record is the discipline engineer who was responsible for the production of the respective Contract Construction Documents. The Engineer of Record is responsible for finalizing the Final Project As-Built Drawings and transmitting the Final Project As-Built Drawings to Engineering Archives.

4.6 Contractor

The Contractor shall maintain in an accurate, indexed and easily accessible manner both at the Contractor's job site offices and at an offsite location an orderly, clean, complete, accurately marked, up-to-date set of Interim Contractor Record Drawings that accurately indicate all site conditions as detailed in Section 5.0. The Interim Contractor Record Drawings shall contain a complete history of the drawings, including all revisions due to Contract modifications and shall be clearly marked to record accurately the Work as actually constructed, including changes, adjustments and other information relevant to the Work. The Contractor shall identify a staff member to be responsible for maintaining and updating the Interim Contractor Record Drawings.

The Contractor's Superintendent shall meet with the Construction Inspectors as required to identify and provide information regarding any changed project conditions, locations, configurations, and any other changes or deviations that vary from the details represented on the

Construction Drawings, including buried or concealed construction and utility features that are revealed during the course of construction.

The Contractor's Project Manager (PM) shall meet with the RE at least once per month to verify all such changes. The Contractor shall also be responsible for updating all O&M Manuals before close-out of the Contract with any record conditions including, but not limited to wiring schematics, panel drawings, control logic, and other items required for trouble shooting, repair, and maintenance of the equipment.

The Contractor's PM shall certify and submit the Final Contractor Record Documents at the completion of the project. The Contractor is not responsible for maintenance of the Drawing Register in CMIS.

5.0 Implementation

5.1 Contractor's Maintenance of Interim Contractor Record Drawings

During the course of the project, the Contractor shall maintain the Interim Contractor Record Drawings to show all current field conditions.

- 5.1.1 The Contractor shall designate a staff member to be responsible for updating and maintaining the Interim Contractor Record Drawings
- 5.1.2 The Contractor shall maintain accurately marked, up-to-date Interim Contractor Record Drawings to document work actually installed and conditions encountered during the entire progress of the work; these drawings shall be made available to the RE at any time.
- 5.1.3 The Contractor shall update the Interim Contractor Record Drawings not more than five (5) working days after changes in the work are made.
- 5.1.4 The Interim Contractor Record Drawings shall be kept in a safe place and protected from damage. The Contractor shall store Interim Contractor Record Drawings apart from documents used for performing the work in a secure off-site location as well as in the Contractor's site office so that the Interim Contractor Record Drawings can be accurately reconstructed in the event of loss.
- 5.1.5 Drawings in the form of addenda or revisions due to a change of the Contract Documents shall be inserted into the Contractor's Interim Record Drawings in front of the prior revision sheet. The prior revision sheet shall be stamped "OBSOLETE" with the date of the stamp and the signature of the drawing custodian; the title block shall be crossed out and a redline note shall be added under the page number: "See Revision No. (latest revision number)". Any redline markups on the old sheet need not be transferred to the addenda if the old sheet remains in the record set. All obsolete drawings shall be retained until after the Final Contractor Record Documents have been certified.

- 5.1.6 The Contractor shall accurately record on the Interim Contractor Record Drawings all site conditions, measurements, dimensions, locations of utilities, all changes made by clarifications, RFIs, Change Orders, Field Orders, and other modifications to the Contract Documents and details as approved by the RE.
- 5.1.7 All lines and notations on the up-to-date Interim Contractor Record Drawings shall be neat, accurate, legible, and capable of being scanned into PDF format (or other electronic media file format as specified in Technical Specification Section 01 78 39 of the project's Contract Documents) such that copies made from the scanned files are as legible as the original. Mark-ups shall be made with a fine tip, red ink pen or dark red pencil and include but not be limited to the following:
- Field changes or adjustments in the final location or in the final dimensions or details of the Contract work relative to actual existing site conditions.
 - Changes resulting from Requests for Information.
 - Changes made by Change Order work.
 - Changes made by Field Order work.
 - Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to visible and accessible features of the Work.
 - Details not included on the original Contract Drawings but incorporated into the work by reference to approved shop drawings, product data, samples, calculations or other submittals.
 - Location of items imbedded in concrete such as conduits, cables, junction boxes, piping, re-bar, etc.
 - Measured depths of foundations in relation to finish main floor datum.
 - Measured locations of internal utilities and appurtenances, referenced to visible and accessible locations features of the Work.
 - Location (to within 1-inch) of the centerline of each run of conduits, circuits, piping, ducts and similar items which are shown schematically on the drawings, but where the final physical arrangement is determined by field conditions.
 - Other applicable technical information.
- 5.1.8 The Interim Contractor Record Documents shall be prepared as follows:
- Make mark-ups using a dark red pencil or pen so that the mark-ups can be clearly seen when photocopied or scanned. Mark-

up corresponding details and sections in addition to the mark-ups in plan view.

- Clearly mark changes on drawings by note as required. Changes made in narrative or reference to a Change Order or RFI without marking the actual drawing are not acceptable.
- Date all entries, calling attention to the entry by a “cloud” drawn around the area or areas affected. If mark-ups are a result of an approved change such as a Change Order or RFI, write the reference to these documents in the clouded area.
- Record for each piece of equipment incorporated into the Work the manufacturer, trade name, catalog number, model number, serial number, date of installation, and supplier of each product and equipment item incorporated into the Work.
- No paper shall be affixed to the back of the drawings. Do not include papers for explanations or comments since all mark-ups are to be complete and self-explanatory.
- Permanent papers affixed to drawings, which modify the drawings, shall be securely stapled to the drawings and shall not obstruct information unless intentional. Tape or glue is acceptable only where stapling is not possible.
- Drawings which are revised and issued as a result of a Change Order or RFI shall be inserted into the Interim Contractor Record documents and all marks on the old sheet shall be transferred to the new sheet.
- If permanent additions to a drawing cannot fit on the drawing, the original drawing shall be labeled “Sheet 1 of 2,” and the additions shall be placed on a new drawing sheet with an identical title block as the original drawing except that the title block shall be labeled “Sheet 2 of 2”.
- All lines and leaders shall be straight.
- All text shall be done in printed capital letters.
- All markups shall be dated and signed by the Contractor staff making the change.
- Redline corrections should be done using white correction fluid or correction tape (“White-out”).
- Redlines shall show enough detail and information to allow the Engineer of Record to correctly interpret the changes.
- References to other construction documents shall be indicated by redline.

5.1.9 Special attention shall be given to the precise location and depth of buried pipes if they are installed differently than shown on the Conformed Construction Drawings (if different by plus or minus 6-

inches), or which are not indicated on the Conformed Construction Drawings. Buried or concealed construction and utility features that are discovered during the course of construction shall also be recorded in the Interim Contractor Record Drawings.

- 5.1.10 When the piping schedule in the Conformed Construction Drawings provides a list of piping material from which the Contractor may choose, the Contractor shall specify on the piping schedule the type of pipe material selected and installed.
- 5.1.11 All markups that are supported by other contract documents shall reference the number of the RFI, RFS, VECP, Change Order, or Field Order.
- 5.1.12 Shop drawings, sketches, addenda or other related record documents that cannot be properly attached to the Record Documents should be stored in a file cabinet in the Contractor's job site office until they are transferred to the Interim Contractor Record Drawings.
- 5.1.13 All equipment tags that are determined via the submittal process shall be redlined on the Interim Contractor Record Drawings. This paragraph applies specially to pipeline projects.

5.2 Office Engineer Duties

During the project, the OE shall perform an on-site audit of the Interim Contractor Record Drawings once per month as part of the progress payment process.

- 5.2.1 The audit may entail interviews with the Contractor, the RE, and Construction Inspectors and shall include the inspection of all Interim Contractor Record Drawings for completeness and accuracy. The OE shall also inspect storage of the Contractor's contract documents for security.
- 5.2.2 To complete an audit, the OE shall prepare a Record Audit Report evaluating a project's compliance with the Record procedure.
- 5.2.3 A copy of each Record Audit Report shall be sent to the Contractor, RE and the Construction Manager.
- 5.2.4 The RE shall use the Record Audit Report as a tool to correct and enhance project documentation.
- 5.2.5 The OE shall direct the Contractor to provide detailed sketches to supplement the Interim Contractor Record Drawings, as necessary to fully indicate the work as actually constructed. In the case of those drawings which specify detail requirements for equipment to be assembled and wired in the factory, the Interim Contractor Record Drawings shall be updated by indicating those portions which are superseded by Change Order drawings or final shop drawings.

5.2.6 The OE shall coordinate with the Construction Inspector when measurements are updated. Measurements to the center of pipe must be taken at the time the pipe is installed or discovered and prior to it being backfilled.

5.2.7 The OE shall reference section 5.1 to understand the process which the Contractor must follow in the maintenance of the Interim Contractor Record Drawings.

5.3 Construction Inspector and Lead Construction Inspector Duties

Construction Inspectors and/or Lead Construction Inspectors shall maintain their own set of Record Drawings, redlined to reflect their findings. Construction Inspectors shall coordinate with the Lead Construction Inspector and the OE to monitor the accuracy of the Interim Contractor Record Drawing as a prerequisite of their monthly payment application. These drawings shall follow the process outlined in Section 5.1.7 and 5.1.8 of this Procedure.

5.4 Closeout and Completion

The Contractor is required to maintain all the Project Record Documents as outlined in Contract Specification 01 78 39.

At Closeout and Completion, the Contractor is required to submit the Final Record Documents, which include all the shop drawings, construction drawings, and any submittals, RFIs, change orders, or any other documents associated with the construction. These Contractor requirements are:

5.4.1 Prior to Final Completion, the Contractor shall prepare Final Contractor Record Documents by transposing all information from the updated Interim Contractor Record Drawings. The Interim Contractor Record Drawings shall conform to the standards delineated in Section 5.0. On every sheet, the Contractor will affix the stamp shown in Attachment 004-4, and wet-sign and print the Contractor's company name and date in the appropriate spaces on the stamp. The Contractor transmits as a Submittal the following documents to the RE for review following the procedures defined for Submittals:

- Original set of Final Contractor Record Documents
- Shop Drawings
- Features Call-out Sheet (for pipelines only)
- Any other related record document, e.g., certificates and documentation of test results required by the Technical Specifications

5.4.2 The Final Contractor Record Documents must be certified by the RE by wet-signing and dating each document with the certification stamp shown in the Attachments. This process requires 15 working days for the City to perform this certification.

- 5.4.3 If the Final Contractor Record Documents do not meet the approval of the RE or if the drawings have deteriorated so that they are no longer suitable for use as documentation, the Contractor may request, at the Contractor's expense, that the City provide replacements. The Contractor must designate the Plan Number and Revision Number of each drawing to be provided.
- 5.4.4 The Contractor shall furnish the following:
- If noted in Specification Section 01 78 39, AutoCAD files in one or more DVDs.
 - One full size original set of the "Final Contractor Record Documents," including the certification stamp to be signed by the Contractor and RE.
 - Electronically scanned files of the certified Final Record Documents in color and in PDF format at 300 dpi resolution.
 - A full-size set of drawings printed from the AutoCAD files with the stamp "Certified that the Final Contractor Record Documents have been correctly transcribed into AutoCAD" on each sheet. Contractor shall sign the stamp and have his name printed below his signature.
- 5.4.5 The RE reviews the set of Final Project As-Built Drawings (printed AutoCAD files) to ensure high quality and to provide uniformity throughout all projects. Conformed Documents shall conform to the standards set forth in the Attachments of this Procedure. If the revised Final Project As-Built Drawings are acceptable, the RE notifies the Project Engineer and sends the Final Contractor Record Documents to the ADCS for filing in the Project hardcopy files.
- 5.4.6 The OE transmits the Final Contractor Record Documents set and Final Project As-Built Drawings set (AutoCAD files and certified drawings printed from the AutoCAD files) to the PE.
- 5.4.7 The PE checks the Final Project As-Built Drawings in AutoCAD with the Final Contractor Record Documents and revises the AutoCAD files as needed.
- 5.4.8 The PE produces a set of the Final Project As-Built Drawings if the AutoCAD files were revised and certifies the Final Project As-Built Drawings by affixing the stamp shown in the Attachments, signing and dating the hardcopy drawings. The PE transmits the certified Final Project As-Built Drawings to the Engineering Archives for archiving.
- 5.4.9 The PE transmits to the RE a half size print of the certified Final Project As-Built Drawings and CD/DVDs containing the scanned (.pdf) files.
- 5.4.10 The ADCS attaches the scanned (.pdf) certified Final Project As-Built Drawings to the drawing records in CMIS, and files the half size hardcopy prints in the Project hardcopy files.

6.0 Other Procedural Requirements

The procedures for the submittal and processing for review and approval of the Contractor Final Record Documents follow the procedures for Submittals, described in CM Procedure No. 005, Submittals.

Procedures for receiving, transmitting and control of project documentation are defined in CM Procedure No. 003, Project Document and Correspondence Control.

7.0 References

7.1 Technical Specifications

Section 00 72 00 General Conditions

Section 01 78 39 Project Record Documents

7.2 SFPUC Infrastructure CM Procedures

No. 003 Project Documents and Correspondence Control

No. 005 Submittals

No. 007 Request for Information (RFI)

No. 010 Applications for Payment

No. 011 Construction Change Management

7.3 Others

Infrastructure Division Procedure Manual PD 4.05

8.0 Attachments

004 - 1 Record Documents Audit Report - Form

004 - 2 Conformed Record Document Standards - Review Checklist

004 - 3 Transmittal - Form

004 - 4 Certification of Contractor Record Documents by Contractor and Resident Engineer

004 - 5 Certification of Contractor Final Record Documents by Engineer

004 - 6 Revision Control Log

**Attachment 004 – 1
Record Documents Audit Report - Form**

Insert Program Logo Here	San Francisco Public Utilities Commission (Insert Project Construction Manager Name Office Address and Contact Information Here)	Insert Program Logo Here																
<p>CONTRACT NO: _____ AUDIT DATE: _____</p> <p>CONTRACT DESCRIPTION: _____ LAST AUDIT: _____</p> <p>RECORD SPEC. REFERENCE: _____</p> <p>CONSTRUCTION MANAGER: _____</p> <p>PRIME CONTRACTOR: _____</p>																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:40%;">DESCRIPTION</th> <th style="width:60%;">CHECKED</th> </tr> </thead> <tbody> <tr> <td>The Record Documents Are Being Maintained for Designated Areas and All Disciplines</td> <td></td> </tr> <tr> <td>Record Documents Show Sufficient Detail</td> <td></td> </tr> <tr> <td>Addendums Are Being Incorporated into Record Documents</td> <td></td> </tr> <tr> <td>RFI's and RFS's Are Being Incorporated into Record Documents</td> <td></td> </tr> <tr> <td>Change /Field Orders Are Incorporated into Record Documents</td> <td></td> </tr> <tr> <td>All Record Document Records Show Progress from Last Audit</td> <td></td> </tr> <tr> <td>All Record Document Records Are Being Properly Stored and Filed</td> <td></td> </tr> </tbody> </table>		DESCRIPTION	CHECKED	The Record Documents Are Being Maintained for Designated Areas and All Disciplines		Record Documents Show Sufficient Detail		Addendums Are Being Incorporated into Record Documents		RFI's and RFS's Are Being Incorporated into Record Documents		Change /Field Orders Are Incorporated into Record Documents		All Record Document Records Show Progress from Last Audit		All Record Document Records Are Being Properly Stored and Filed		
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<p>COMMENTS:</p> <p>CORRECTIONS:</p> <p>RECOMMENDATIONS:</p>																		
		<p>_____ <Name> Office Engineer</p>																
<p>cc: Resident Engineer, Senior CM</p>																		

Attachment 004 – 2
Conformed Record Document Standards
Review Checklist

Prior to transmitting the Final Project As-Built Drawings to the PE, RE reviews the drawings to check the following:

1. Revision clouds and triangles DO NOT appear on Record Documents.	
2. The title block of all pages indicate “ Interim Contractor Record Documents or Final Contractor Record Documents.	
3. The title block of all pages must have a revision number of “1”.	
4. All of the redline data in the Contractor’s Final Record Documents are incorporated.	
5. There are no missing sheets.	
6. All of the sheets of the original Contract Drawings are included in the back-check set.	
7. The drawing index is correct. All drawings/plans are listed in the index by both drawing number and plan number.	
8. All old images are removed from the Contractor Final Record Document set and replaced by images of current facilities.	
9. All text boxes for equipment manufacturer name and model number are filled in.	
10. No objects that are shown to be demolished in the Contract Drawings appear in the Final Contractor Record Documents. (note hatch marks, shading, old text, etc.)	
11. No references to “Existing (E)” or “New (N)” objects in the drawings.	

**Attachment 004 – 3
Transmittal - Form**

Insert Program Logo Here	SAN FRANCISCO PUBLIC UTILITIES COMMISSION <insert Program title here>	Insert Program Logo Here														
CONTRACT NAME: TO: FROM:		NO: DATE: REF:														
WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:														
<input type="checkbox"/> Shop Drawings	<input type="checkbox"/> Approval	<input type="checkbox"/> Approved as Submitted														
<input type="checkbox"/> Letter	<input type="checkbox"/> Your Use	<input type="checkbox"/> Approved as Noted														
<input type="checkbox"/> Prints	<input type="checkbox"/> As Requested	<input type="checkbox"/> Returned After Loan														
<input type="checkbox"/> Change Order	<input type="checkbox"/> Review and Comment	<input type="checkbox"/> Resubmit														
<input type="checkbox"/> Plans		<input type="checkbox"/> Submit														
<input type="checkbox"/> Samples	SENT VIA:	<input type="checkbox"/> Returned														
<input type="checkbox"/> Specifications	<input type="checkbox"/> Attached	<input type="checkbox"/> Returned for Corrections														
<input type="checkbox"/> Other:	<input type="checkbox"/> Separate Cover Via:	<input type="checkbox"/> Due Date:														
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<div style="text-align: right; margin-top: 20px;"> Signed: _____ </div>																

**Attachment 004 – 4
Certification of Contractor Record Documents
by Contractor and Resident Engineer**

**Certified that these Final Contractor's
Record Documents
represent the facilities as constructed**

Contractor Site Representative Date

Contractor Company Name

City Representative Date

**Attachment 004 – 5
Certification of Contractor Final Record Documents
by Engineer**

**Certified that the
Final Contractor's
Project Record Documents, provided by the
Project Construction Manager, have been
correctly transcribed into AutoCAD**

**Attachment 004 - 6
Revision Control Log**

Revision No.	Revision Date	What changed?
Rev 1	6/7/19	<ul style="list-style-type: none">• Minor format changes• Attachments - revised• Revision Control Log - updated
Rev 0	11/14/16	Signed