

***1. General***

Design and Build team including Consultant(s) shall provide Project Progress and Closeout Information Deliverables (hereafter referred to as Deliverables) as outlined below. Final Payment shall not be approved until all Deliverables are received and are verified to meet contract requirements.

***2. Deliverables***

The Design/Builder (including Subs and/or Consultants) shall furnish all data, documents/files and drawings customarily required or expressly required herein within the phases described below but no later than final Project Closeout. Deliverables shall include, but are not limited, to the following:

- a. Design Development (DD)**
  - a. Preliminary Room Layout & Numbering Plan for Caltech review, adjustment (as required) and approval.
- b. Construction Documents Phase (CD)**
  - a. Final Room Layout & Numbering Plan for Caltech review, adjustment (as required) and approval.
- c. Construction Phase**
  - a. Submittals with Detailed Equipment Specifications & Product Data/Manuals
  - b. Preliminary Maintainable Assets Worksheet(s) (see Section 3 below for more information; template provided by Caltech)
- d. Project Commissioning**
  - a. Updated Maintainable Assets Worksheet (see Section 3 below for more information; template provided by Caltech)
- e. Prior to Project Closeout**
  - a. Deliverables Index Worksheet listing all closeout deliverable files AND all associated electronic files in PDF, Word, or Excel. The Index Worksheet Template provided by Caltech (see Section 6 for details)
  - b. Detailed and comprehensive as-built drawings depicting actual field conditions
  - c. Final Maintainable Assets Worksheet (see Section 3)
  - d. Operations and maintenance manuals (as installed)
  - e. Warranties
  - f. Specifications and guidelines
  - g. Site and soil surveys
  - h. Structural calculations
  - i. Shop drawings
  - j. Air balance reports
  - k. Contact list of sub-contractors

- i. List of finishes and vendors on the below items:
  - i. Paints
  - ii. Carpets
  - iii. Wall Base
  - iv. Ceiling Tiles
  - v. Resilient Flooring
- m. Other specialty documents or drawings included in scope
- n. Commissioning reports/logs including equipment calibration details and set points (note for projects over 1M this should be generated with the project’s Commissioning Data Authority)
- o. “System Service Spreadsheet” indicating a list of equipment servicing multiple rooms throughout a project indicating the specific rooms that each equipment serves (this may include, but not limited to, equipment such as air handling units, lighting controls, central vac., etc.).
- p. Consultants/designers are to create and deliver all panel schedules within the Caltech provided Excel template file attached in Appendix xx. These shall be linked to/referenced within the AutoCAD drawing set where appropriate.

### ***3. Maintainable Asset Worksheet Specifications***

Early in the project, CALTECH will work with the Design and Build Team to fully specify the list of Maintainable Assets that will be for acceptable closeout.

The Design/Builder shall furnish CALTECH a Maintainable Asset Worksheet in excel format for all building components and equipment assets requiring periodic maintenance by the CALTECH Facilities Management department.

The data provided by the Design/Builder shall include data fields to be specified by CALTECH.

The preliminary Maintainable Assets Worksheet shall be provided to CALTECH during the CD Phase and updated/finalized prior to project closeout as outlined in section 2 above. This worksheet shall be submitted to CALTECH using the e-Builder application. The final submittal of this file will notify the responsible Facilities Management person, who will review and validate the completeness of this data submittal. After CALTECH review, the submittal will either be approved or rejected with an explanation of changes required to the

Worksheet.

**4. Deliverables Documents/Files Naming & Segmentation Convention:**

Design/Builder shall furnish CALTECH a copy of all closeout deliverables that they or their Subs and/or Consultants produced following the Naming and Segmentation guidelines below:

- a. File names shall produce a properly sorted set of electronic documents (e.g. MEP drawings 01~23, O&M manual sections A~Z, CSI codes, etc., or combination of various systems as appropriate).
- b. File naming of individual documents/files when delivered in two different file formats (e.g. PDF & CAD) shall be identical (or significantly similar) to its equivalent document/file allowing easy cross reference and verification of closeout deliverable completeness.
- c. AutoCAD files shall have layer names and file names based on AIA standard recommendations or similar;
- d. All deliverables shall be provided as separate documents/files segmented by trade and/or equipment/product type (e.g. light fixtures, lighting controls, air balance report, individual equipment manuals, BMS control systems, etc.);
- e. Deliverables shall be segmented (where practical) into separate files isolating operations from maintenance documents (e.g. end user operating instructions vs. maintenance crew repair/reference information).

**5. Deliverables Documents/Files Formatting:**

Design/Builder shall furnish CALTECH a copy of all closeout deliverables that they or their Subs and/or Consultants produced in each of the following formats:

- a. Electronic copy of all documents/files in either PDF or MS Office Word/Excel file type (also listed on the Deliverables Index Worksheet) using the current software release currently in use by CALTECH;
- b. Electronic copy of all documents/files in their original software application format used to create each file (e.g. CAD, BIM, etc.);
- c. Paper copies in original document size, or smaller (if requested by CALTECH);
- d. AutoCAD files shall be delivered in the current release of AutoCAD used by CALTECH and shall have all external reference files bound within each drawing file (e.g. binding of x-refs, image files, etc.);
- e. Each closeout document/file delivered shall not exceed ~15Mb (preferably less) without written approval by CALTECH PM.

**6. Deliverables Index Worksheet Submittal Process**

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The Design/Builder (including Subs and/or Consultants) shall complete a Deliverables Index Worksheet, provided and formatted by Caltech uniquely for each project, which shall list all Deliverables documents/files being turned over to Caltech as outlined within section Z1070.70.

All documents/files listed on the Final Deliverables Index Worksheet, along with all associated files must be provided in PDF or MS Word/Excel file formats (or other file formats approved by CIT PM), as outlined within section Z1070.70. All documents shall be uploaded into Caltech's e-Builder system within the appropriate folders (e.g. 12 Final Closeout / Deliverables...) or (if approved by Caltech PM) delivered on CD/DVD.

The Deliverables Index Worksheet will include (when available and applicable) updated master space locations and maintainable assets. As such, the Deliverables Index Worksheet is typically created and delivered to the GC/Consultant AFTER the space database locations and Maintainable Assets Worksheet has been received, approved, and uploaded into Caltech's IWMS.

Upon submission to CALTECH, responsible Facilities individuals (e.g. PM, Operations, Maintenance, etc.), will review and validate the completeness and accuracy of this submittal. After review, the document submittal will either be approved or rejected with an explanation of updates/changes required.

The Deliverable Index Worksheet provided by Caltech will include the following data fields (or similar):

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Document Data Field	Required Y/N/Auto	Column data Type	Column Description
Row #	Y	Manual	Sequential list of rows in table
Source Doc File Name	Y	Manual	Electronic file name
Doc File Format	Y	Manual	File format attached to Excel Worksheet
Doc Description / Title	Y	Manual	Short doc description / title
Sheet # / Section #	Y	Manual	
Total # of Sheets / Sections in Set	Y	Manual	
Revision #	Y	Manual	
Cattech Project #	Y	Manual	
Authoring Vendor / Consultant	Y	Manual	
Discipline	Y	List Field	
Disc Code	Auto	Auto Fill	
Sub-Discipline	N	List Field	
Doc Class & Sub-Class	Y	List Field	
Doc Class	Auto	Auto Fill	
Doc Class Code	Auto	Auto Fill	
Doc Sub-Class	Auto	Auto Fill	
Doc Sub-Class Code	Auto	Auto Fill	
Location: Bldg, Fl, Rm (Primary)	Y	List Field	Indicate PRIMARY Bldg, Floor, Room (May be ALL or NA)
Asset / Equip #	N	List Field	
Asset / Equip Name	Auto	Auto Fill	
OmniClass Code	N	List Field	
OmniClass Description	Auto	Auto Fill	
Document Status	Y	List Field	Default to N/A
Document Phase	Y	List Field	Typically "CONSTRUCTION-AS-BUILT"
Notes / Keyword	N	Manual	Used for Search/Filter/Grouping
Memo	N	Manual	

**7. Spare Parts & Materials:**

Builder shall provide Caltech products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections. Deliver to Project site and place in location as directed by Facilities Design and Construction Project Manager; provide transmittal listing the products provided prior to final payment.

**a. Materials and items requiring spare parts and extra quantities:**

- i. Door hardware
- ii. Ceramic, stone and porcelain tile (1 percent of quantity installed)
- iii. Wood Flooring (1 percent of quantity installed)
- iv. Resilient Flooring (including Linoleum): 10 linear feet for every 500 linear feet or fraction thereof of quantity installed; in roll form and in full roll width for sheet flooring
- v. Acoustical Ceiling Panels and Suspension System: 2 percent of quantity installed
- vi. Paint: specifications only

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- vii. Carpet (including Carpet Tile): 2 percent of quantity installed (but not less than 5 sq. yd.) Provide full-size units of carpet tile; full-width rolls for broad-loom carpet.
- viii. Access Flooring (including Panels, Pedestals, and Stringers): 1 percent of quantity installed. Provide full-size panels.
- ix. Resilient Base and Accessories: 10 linear feet for every 500 linear feet or fraction thereof, of quantity installed.
- x. Wallcoverings: 5 linear yards of quantity installed, in full roll width.