



GUIDELINE

**ASHRAE Addendum a
to ASHRAE Guideline 1.4-2019**

Public Review Draft

Proposed Addendum a to Guideline 1.4-2019, Preparing Systems Manuals for Facilities

**First Public Review (February 2024)
(Draft shows Proposed Changes to Current Guideline)**

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(This foreword is not part of this guideline. It is merely informative and does not contain requirements necessary for conformance to the guideline.)

FOREWORD

This proposed addendum expands or revises specified sections of Guideline 1.4 as follows:

- *Adds additional content to Section 4.1 that more fully details the information and documentation required when preparing a comprehensive Systems Manual*
- *Revises Section 4.3.2, Part 1 – “Executive Summary” to include new subsections 1.1, “Copy of Preliminary Cx Report” and 1.2, “Copy of Final Cx Report. Identity abbreviations have been added to Section 4.3.2, Parts 2.1 and 2.2*
- *Expands and clarifies portions of Section 4.4*
- *Adds clarifying language to the final sentence of Section 7.1*
- *Adds a new Section 12, “Disaster Preparedness”*

Note: This addendum makes proposed changes to the current guideline. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current guideline are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.

Addendum a to Guideline 1.4-2019

Modify Section 4 as follows. The remainder of Section 4 remains unchanged.

4. SYSTEMS MANUAL CONTENT AND ORGANIZATION

4.1 Introduction. The Systems Manual contains information on the Owner’s initial and current facility and project requirements, and documentation of building design and construction, along with testing and training documentation, operational requirements, and maintenance information for the use of building occupants, operators, and maintenance staff, and for optimization of the facility performance over its useful life.

The format and content of the Systems Manual provided in this guideline can be effectively used in both new construction and for assembling a Systems Manual for an existing building, even if the building is not commissioned.

Developing a new Systems Manual (or revising an existing Systems Manual) entails gathering all information relating to the systems, assemblies, and Cx, and incorporating it into a usable information resource, with indexes and cross-references. This resource should include (if available):

- original Owner’s Project Requirements (OPR)
- Current Facility Requirements (CFR) documents
- Basis of Design (BoD)
- current project final Cx Plan
- Cx Process Report
- manufacturer installation manuals
- manufacturer operations and maintenance (O&M) manuals
- system schematics
- sequence of operation
- verified record drawings
- test results
- current Facility Guide.

Original construction information should be retained and revised as needed to provide a complete and current set of information and instructions. This information is edited and organized to focus on key systems (roofing, walls, fire alarm, chilled water, hot water, lighting, power, etc.) in the building. Coordination with O&M personnel in developing and revising standard formats and divisions (shops) is undertaken to simplify future Systems Manual development and revisions.

It is intended that the Systems Manual be assembled in electronic format to facilitate access and reduce storage requirements; the electronic format will also reduce the possibility of loss of information. For Systems Manuals assembled in hard copy format, the larger documents, such as record drawings, specifications, submittals, and O&M documents, can be stored in secure locations, with these locations referenced in the Systems Manual. The Systems Manual should also include the development of periodic maintenance and information for insertion into a computerized maintenance management system (CMMS), including equipment make and model information, checking requirements, maintenance requirements, and troubleshooting items.

The entity responsible for developing or revising the Systems Manual should include all items involved in the project and capture the system and assembly data in either an electronic or printed format. Additionally, printed spare parts lists, operations, service, maintenance, and repair manuals may be provided. This entity (e.g., the Owner, contractor, design professional, other) should have the skills of design, construction, and operations required to develop or revise a comprehensive Systems Manual. The Cx Provider (CxP) should be responsible for verifying the development of the Systems Manual.

[...]

4.3 Systems Manual Documentation Organization

[...]

- 4.3.2 The Systems Manual should be organized as follows. The six major documentation assembly subjects are labeled as “Parts” of the Systems Manual in this guideline. These headings may also be called *sections*, *chapters*, *divisions*, or another term that is compatible with the project documentation requirements.

Part 1. Executive Summary

1.1 Copy of Preliminary Cx Report

1.2 Copy of Final Cx Report

Part 2. Facility Design and Construction

2.1 Owner’s Project Requirements (OPR)

2.2 Basis of Design Requirements (BoD)

[...]

4.4 Sources and Content of the Document in the Systems Manual

Part 1. Executive Summary

The executive summary contains an overview of the building design, construction, and operational requirements. The information is intended to provide general guidance on the intended operation, performance, and maintenance of the building in conformance to the Owner’s Project Requirements and/or Current and Facility Requirements (CFR). The original and renovation Design Teams and their contact information is also provided to facilitate information transfer on original designs and maintenance and optimization.

Part 2. Facility Design and Construction

2.1 Owner’s Project Requirements (OPR)/Current Facility Requirements (CFR): *Insert final copy of OPR/CFR developed and revised during the project and Cx. This provides the operations and maintenance (O&M) staff, as well as future owners, the information on the original intent for the design and use of the facility.*

2.2 Basis of Design (BoD): *Insert final copy of BoD document if one is available, or developed during the Cx, and any other design information developed during the project and Cx. This provides the O&M staff, as well as future owners, the information on the original design of the facility.*

- 2.3 Construction/Project Record Documents: *Insert final program and design documents and insert or describe locations of record drawings and documents. Digitized Systems Manuals can also contain copies of the record documents and minimize the loss of these documents.*

[...]

Part 4. Facility Operations

- 4.1 Facility Guide (Operating Plan, Building and Equipment Operating Schedules, Set Points and Ranges, Sequences of Operation, Limitations, and Emergency Procedures Actions)
- *Insert a copy of the completed facility operating plan with explanations of the intended use and operation of the facility.*
 - *Insert a copy of the final commissioned sequences of operation for all operating equipment.*
 - *Insert a copy of final commissioned set points of all equipment with operational adjustments. Include the set-point normal intended ranges and limitations.*
 - *Insert a copy of routine building operations maintenance requirements.*
 - *Insert a copy of emergency shutdown procedures and locations of applicable controls.*

Note: The following items should be added to the Systems Manual and/or revised when required by the OPR/CFR, or where available.

[...]

Part 6. Cx Progress Report

- 6.1 Executive Summary: *Insert the executive summary.*
- 6.2 Cx Plan(s): *Insert the final Cx Plan and completed Cx report with evaluation and testing forms and records for each building and system.*
- 6.3 Cx Design and Submittal Review Reports: *Insert a copy of the Cx design and submittal review reports.*
- 6.4 Testing Reports, Permits, Inspections
- *Insert completed Cx Progress Report with documents and verification and testing forms and records for each building and system and assembly included in the Cx. This creates a record of all required testing contained in the commissioning sections of the project contract documents and performed during the project.*
 - *Insert manufacturers', testing agencies', and contractors' reports.*
 - *Insert installers' and Cx Provider's (CxP) completed validation checklists. This provides a record of installation checks and observations for future reference.*
 - *Insert installers' and CxP's completed functional performance checklists of assemblies, equipment, and integrated systems. This provides a record of performance checks and observations for future reference.*
 - *Insert relevant commissioned system and assemblies test reports.*

[...]

7. DESIGN AND INVESTIGATION PHASE FUNCTIONS

- 7.1 Introduction.** During the Design Phase for new projects or the Investigation Phase of existing buildings, the Systems Manual requirements are inserted and detailed in the project requirements, documentation, and contracts. This information provides the Commissioning Provider (CxP) Team, contractors, operators and maintenance personnel with specific instruction in the assembly and use of the Systems Manual.

[...]

12. DISASTER PREPAREDNESS

- 12.1** The facility owner may decide that a plan be prepared, to address natural or man-made disasters that would

require the facility to be evacuated and shut down for an unknown length of time. The plan would normally be prepared by the Owner's Design Team, Cx Provider, or a combination of both parties. The Design Team should address operation of the facility's mechanical, plumbing, electrical, and safety systems during shutdown and then detail an orderly and safe reopening when it is determined, by health and safety authorities, that the disaster has passed, and the facility can be returned to its designed mode of operation for occupants.