

# UNIFIED FACILITIES CRITERIA (UFC)

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## UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS) FORMAT STANDARD



## UNIFIED FACILITIES CRITERIA (UFC)

### UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS) FORMAT STANDARD

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U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER CENTER

Record of Changes (changes are indicated by \1\ ... /1/)

Change No.	Date	Location
<u>1</u>	<u>4/1/2017</u>	<u>Addition of corrosion control requirements and Sustainability Reporting submittals. Clarified text paragraphs, notes to the designer, tailoring, and Operation and Maintenance Data and Manuals.</u>

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This UFC supersedes UFC 1-300-02, dated 1 September 2004, with Changes 1-4.

## FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with [USD \(AT&L\) Memorandum](#) dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate. All construction outside of the United States is also governed by Status of Forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA.) Therefore, the acquisition team must ensure compliance with the most stringent of the UFC, the SOFA, the HNFA, and the BIA, as applicable.

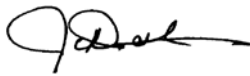
UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Civil Engineer Center (AFCEC) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: [Criteria Change Request](#). The form is also accessible from the Internet sites listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide web site <http://dod.wbdg.org/>.

Refer to UFC 1-200-01, DoD Building Code (*General Building Requirements*), for implementation of new issuances on projects.

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**UNIFIED FACILITIES CRITERIA (UFC)**  
**REVISION SUMMARY SHEET**

**Document:** UFC 1-300-02, *UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS) FORMAT STANDARD*

**Superseding:** UFC 1-300-02, dated 1 September 2004, with Changes 1-4

**Description of Changes:**

- This document is a complete update to UFC 1-300-02, establishing criteria and standards for development and preparation of UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS).

**Reasons for Changes:**

- Further unify requirements for preparation of the UFGS.
- Comply with CSI Masterformat 2012.
- Coordinate with enhancements to SpecsIntact software capabilities.

**Impact:**

- There are negligible cost impacts.

**Unification Issues:**

- Submittal processes for Army, Navy and Air Force are not unified. Thus, designations after the submittal items in the Submittal Article are different for the Army, Navy, and Air Force. The Army uses the Resident Management System (RMS) to automatically track and manage submittal items, while the Navy and Air Force do not. The methodology used in a project is dependent on who the construction agent is for the project, as defined in DoDD 4270.5. Design-Build (D-B) procedures are different for each DoD Component; thus, this UFC only addresses D-B as necessary for the Submittal Article. Requirements for each Component are provided in separate criteria.
- Processes for submittal of project specifications packages by each DoD Component are not unified due to differences among organizational, operational and administrative structure and processes.

## TABLE OF CONTENTS

	<u>Page</u>
<b>CHAPTER 1 INTRODUCTION .....</b>	<b>1</b>
<b>1-1 PURPOSE AND SCOPE.....</b>	<b>1</b>
<b>1-2 APPLICABILITY.....</b>	<b>1</b>
<b>1-3 REFERENCES.....</b>	<b>1</b>
<b>1-4 CONTENT AND FORMAT.....</b>	<b>3</b>
1-4.1 Content Guidance.....	3
1-4.2 Editing UFGS for Projects.....	3
1-4.3 Notes in UFGS.....	3
1-4.4 Tailoring in UFGS.....	4
<b>CHAPTER 2 UFGS REQUIREMENTS .....</b>	<b>5</b>
<b>2-1 UFGS SECTION ORGANIZATION.....</b>	<b>5</b>
2-1.1 Construction Specifications Institute (CSI).....	5
2-1.2 Table of Contents (TOC).....	5
2-1.3 Attachments.....	5
<b>2-2 FORMAT.....</b>	<b>5</b>
2-2.1 Electronic File Format.....	6
2-2.2 Section Numbering.....	6
2-2.3 Part and Subpart Numbering.....	6
2-2.4 Subpart Titles.....	7
2-2.5 Text Paragraphs Within Parts and Subparts.....	7
2-2.6 Notes to the Designer.....	7
2-2.7 Units of Measure (English or Metric).....	7
2-2.8 Reference Publications.....	8
2-2.9 Cross References.....	8
2-2.10 Brackets.....	8
2-2.11 Tailoring Options.....	9
2-2.12 Submittal Items.....	9
<b>2-3 WRITING STYLE.....</b>	<b>12</b>
2-3.1 Mood, Tense, and Voice.....	13

2-3.2	Abbreviations and Acronyms. ....	13
2-3.3	Units. ....	13
2-3.4	Terminology. ....	13
2-3.5	Symbols. ....	14
2-3.6	Pronouns. ....	14
2-3.7	Capitalization. ....	15
2-3.8	Brand Name Specifications. ....	15
2-3.9	“Brand Name or Equal” Specifications. ....	15
2-3.10	Warranty Clauses. ....	15
2-3.11	Contract Clauses. ....	16
2-3.12	Specifying New Items. ....	16
<b>2-4</b>	<b>TABLES AND FORMS. ....</b>	<b>16</b>
2-4.1	Formatted Tables. ....	17
2-4.2	Forms, Hyperlinks and URLs. ....	17
<b>2-5</b>	<b>MODIFICATIONS. ....</b>	<b>17</b>
2-5.1	Clerical Repairs. ....	17
2-5.2	Change. ....	17
2-5.3	Revision. ....	17
2-5.4	Superseding Dates. ....	18
<b>2-6</b>	<b>UFGS APPROVAL. ....</b>	<b>18</b>
<b>APPENDIX A UFGS ORGANIZATION GUIDANCE. ....</b>		<b>19</b>

**TABLES**

<b>Table 2-1</b>	<b>Parts and Subpart Numbering. ....</b>	<b>7</b>
<b>Table 2-2</b>	<b>Symbols. ....</b>	<b>14</b>
<b>Table A-1</b>	<b>Examples of Numeric Format. ....</b>	<b>19</b>

## CHAPTER 1 INTRODUCTION

### 1-1 PURPOSE AND SCOPE.

This UFC provides guidance for the preparation of Unified Facilities Guide Specifications (UFGS). The Services under the auspices of the Tri-Service Engineering Senior Executive Panel (ESEP) publish the UFGS. A definition of the ESEP is contained in MIL-STD-3007. Tri-Service committees called Discipline Working Groups (DWG) prepare the UFGS. Publication of UFGS is only by electronic media available from the distribution sources indicated in the Foreword of this UFC. UFGS are not proprietary and are available at no cost to the user.

### 1-2 APPLICABILITY.

This UFC applies to all Tri-Service elements and Contractors preparing UFGS. Requirements referencing Army, Navy, or Air Force only are applicable where that DoD Component is the construction agent as defined in DoDD 4270.5, and responsible for the preparation of the construction contract drawings and specifications as the designated design and construction agent in executing Military Construction Program responsibilities.

### 1-3 REFERENCES.

References used in this UFC are:

- ASTM SI-10, *American National Standard for Use of the International System of Units (SI)*, <http://www.astm.org>
- ISO 9223, *Corrosivity of Atmospheres – Classification, Determination, and Estimation*, International Organization for Standardization (ISO), <http://www.iso.org/1/>
- DoD Directive 4270.5, *Military Construction*, 5 February 2005, <http://www.dtic.mil/whs/directives/corres/pdf/427005p.pdf> .
- MIL-STD-3007F, *Department of Defense Standard Practice: Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications*, 13 December 2006, *Defense Standardization Program*, <http://www.wbdg.org/FFC/FEDMIL/std3007f.pdf>.
- *MasterFormat® 2012 Update: Master List of Numbers & Titles for the Construction Industry*, Construction Specifications Institute, <http://www.csinet.org/Main-Menu-Category/CSI-Store/6.aspx>

- *SectionFormat™/PageFormat™, The Recommended Format for Construction Specifications Sections*, 2009, Construction Specifications Institute, <http://www.csinet.org/Main-Menu-Category/CSI-Store/6.aspx>
- *The CSI Project Delivery Practice Guide*, 2011, Construction Specifications Institute, <http://www.csinet.org/Main-Menu-Category/CSI-Store/15>
- *The CSI Construction Specifications Practice Guide*, 2011, Construction Specifications Institute, <http://www.csinet.org/Main-Menu-Category/CSI-Store/15>
- *SpecsIntact Quick Start Guide Traditional*, 9 September 2009, National Aeronautics and Space Administration (NASA), <http://si.ksc.nasa.gov/PDF/LearningGuides/QSGuide.pdf>
- *SpecsIntact Quick Start Guide Numeric*, 15 June 2011, National Aeronautics and Space Administration (NASA), <http://si.ksc.nasa.gov/PDF/LearningGuides/QSGuideNumeric.pdf>
- *SpecsIntact Quick Start Guide Alphanumeric*, 15 June 2011, National Aeronautics and Space Administration (NASA), <http://si.ksc.nasa.gov/PDF/LearningGuides/QSGuideAlphanumeric.pdf>
- FAR Clause 52.211-6 *Brand Name or Equal*; General Services Administration (GSA), [http://www.acquisition.gov/far/current/html/52\\_207\\_211.html](http://www.acquisition.gov/far/current/html/52_207_211.html)
- UFC 1-300-09N, *NAVY and MARINE CORPS Design Procedures*, Tri-Service Engineering Senior Executive Panel, <http://dod.wbdg.org/11>
- UFGS 01 33 00, *Submittal Procedures*, Tri-Service Engineering Senior Executive Panel, <http://dod.wbdg.org>
- UFGS 01 33 29, *Sustainability Reporting*, Tri-Service Engineering Senior Executive Panel, <http://dod.wbdg.org>
- UFGS 01 78 23, *Operation and Maintenance Data*, Tri-Service Engineering Senior Executive Panel, <http://dod.wbdg.org>
- UFGS 01 78 24.00 10, *Operation and Maintenance Data Requirements*, Tri-Service Engineering Senior Executive Panel, <http://dod.wbdg.org>
- UFGS 01 78 24.00 20, *Facility Electronic Operation and Maintenance Support Information (eOMSI)*, Tri-Service Engineering Senior Executive Panel, <http://dod.wbdg.org/11>



## 1-4 CONTENT AND FORMAT.

UFGS are for the purpose of translating design criteria into construction requirements that have been coordinated with industry, thereby providing requirements for specifiers to incorporate into construction Contracts. Each DWG is responsible for the technical content, format, and overall quality of their UFGS. This UFC establishes the general content and appearance of UFGS publications. The UFGS format is based on the Construction Specifications Institute (CSI) *SectionFormat™* and is designed to be used with SpecsIntact software. An example layout of UFGS is included in Appendix A, and SpecsIntact software includes an electronic template in the proper format.

### 1-4.1 Content Guidance.

Since UFGS are a basis for construction Contract documents, write the UFGS in a manner that will facilitate use on the job and **avoid** misinterpretations **that** may lead to legal complications. **Reference** non-Government standards to the greatest extent **possible** and **avoid** repeating the requirements of commercially available criteria and standards. UFGS are broad in their applicability and non-geographical in technical content. In general, requirements or restrictions for specific localities should not be included in UFGS; however, requirements or limitations for various climatic or operating conditions are appropriate.

**Provide** bracketed or tailored options, and Notes to the Designer, in the UFGS sections when the selection of a material, component, or system for corrosion prevention, life cycle cost effectiveness, or durability depends on the location, application, conditions, or atmospheric and chemical environment. In the notes, provide direction on identifying and selecting those variables. Use ISO 9223 and Environmental Severity Classification (ESC) factors, to help specify when to use materials, coatings, and other design elements in a given project location or atmospheric environment. Additionally, provide direction on what item to use based on other relative criteria such as soil corrosivity, ultraviolet exposure, solar radiation, biological, or other factors causing deterioration of a material or its properties because of a reaction of that material with its chemical environment. **!**

### 1-4.2 Editing UFGS for Projects.

**Edit** UFGS sections for each project to meet project-specific and locality requirements and restrictions. UFGS provide requirements for the minimum level of quality, and must not be edited for projects to provide a lesser quality than the minimum level within the UFGS. **!**

### 1-4.3 Notes in UFGS.

Notes in the UFGS provide **directions** and criteria to the designers in choosing options and alternatives available in the pertinent subpart and to identify when tailoring options are present.

**1-4.4 Tailoring in UFGS.**

Tailoring options in the UFGS allow pre-editing of information such as materials, methods, and agency or regional requirements in the creation of the project specification. /1/

## CHAPTER 2 UFGS REQUIREMENTS

### 2-1 UFGS SECTION ORGANIZATION.

\This paragraph describes the organization of a UFGS section. **/**

#### 2-1.1 Construction Specifications Institute (CSI).

CSI prescribes the use of three parts in each section, and further recommends that a consistent sequence of subject matter be maintained within each PART. These recommendations are included in Appendix A and must be followed to the extent practical in UFGS. Insert the text “Not used.” when a PART has no content.

#### 2-1.2 Table of Contents (TOC).

\SpecsIntact has two options for printing the Table of Contents using the Process and Print/Publish function: 1.) For the entire project or master, and 2.) For the section. The project or master TOC is printed as a separate document. The section TOC is printed within the section when the “Combine Sections and Section TOC” is selected. **/** For instructions, refer to the *SpecsIntact Quick Start Guide, Process & Print/Publish Settings* in Chapter 5. \

#### 2-1.3 Attachments.

Section attachments (i.e. Appendices, Figures, Forms) can be listed in the section table of contents by the using the attachment tag, <ATT>, around the attachment title in the section text. Full instructions are provided in the *SpecsIntact Quick Start Guide*. **/**

##### 2-1.3.1 Appendices.

Attaching appendices to a UFGS section is rarely necessary. Create a simple appendix at the end of a section in SpecsIntact when necessary for project specifications. In exception, a complex appendix may be a separate PDF file and manually inserted into the final electronic PDF file for the project specification.

##### 2-1.3.2 Figures.

Do not include figures in UFGS sections. When a project requires a figure in the specification, attach PDF figures to the final electronic specification PDF file.

### 2-2 FORMAT.

\Use of SpecsIntact software and the UFGS database is mandatory. SpecsIntact includes a UFGS section template that complies with this UFC and can be used as a starting point for preparing new UFGS sections. **/**

### **2-2.1 Electronic File Format.**

The section 1 template assures that page layout, banners, notes, text paragraphs, tables, fonts, page numbers, headers, and other basic elements of a UFGS are consistent within each UFGS document and within the UFGS system. SpecsIntact files are Extensible Markup Language (XML) format with the extension SEC. SpecsIntact will also publish UFGS in Adobe Acrobat (PDF extension) and Microsoft Word (DOC extension) formats. Download SpecsIntact from the SpecsIntact web site (<http://specsintact.ksc.nasa.gov/Index.shtml>), and download the PDF *SpecsIntact Quick Start Guide* which provides instructions for its use.

The most current version of UFGS is available from the Whole Building Design Guide DOD web page (<http://www.wbdg.org/ccb/ufgs>). Individual sections are available in both PDF and SEC formats. The entire UFGS Master is available in SEC format in a zipped file with the extension ZIP.

### **2-2.2 Section Numbering.**

Each UFGS carries an identifying document or section number and title in accordance with the CSI MasterFormat® 2012 Update Numbers & Titles (or latest version). If a number listed in the reference is used, then use the exact title as listed.

UFGS with the 5th level designator denote UFGS on the same subjects: "10" for Army, "20" for Navy, "30" for Air Force, and "40" for NASA (e.g., 31 41 16.11 10). These 5th level designators facilitate management of specifications and provide identification within WBDG, the Internet, and the SpecsIntact systems.

### **2-2.3 Part and Subpart Numbering.**

Number Parts and subparts (paragraph and subparagraphs) within the UFGS in accordance with the SpecsIntact numeric system described in *SpecsIntact Quick Start Guide Numeric*. Each Part and subpart down to the sixth level is numbered as shown in Table 2-1.

**Table 2-1 Parts and Subpart Numbering**

<b>Parts and Subpart Numbering</b>
PART 1 GENERAL (Part Level)
1.1 ARTICLE (1st Level)
1.1.1 Paragraph (2nd Level)
1.1.1.1 Subparagraph (3rd Level)
1.1.1.1.1 Subparagraph (4th Level)
1.1.1.1.1.1 Subparagraph (5th Level)
1.1.1.1.1.1.1 Subparagraph (6th Level)

**2-2.4 Subpart Titles.**

Each numbered subpart must have a title; uppercase for the first level (ARTICLE) and title case for the lower level subparts as shown above. **/1\**

**2-2.5 Text Paragraphs Within Parts and Subparts.**

Use no more than two untitled text paragraphs within a part or subpart.

**2-2.6 Notes to the Designer.**

Provide notes between the subpart title and text paragraph. Use notes to indicate when to use the paragraph, how to choose bracketed items, and to indicate what tailoring tags are in the text paragraph. Provide the note itself within tailoring tags if the note only applies if the tailoring option is selected; thus, the note will be deleted if the tailoring option is not selected. **/1/**

**2-2.7 Units of Measure (English or Metric).**

**/1\**For UFGS Masters provide measurements in both English and Metric units, with Metric units first. The format is <MET> 50 mm</MET><ENG> 2 inches</ENG> with a space before the measurement within the tags and no space between tags. Provide conversions in accordance with ASTM SI 10 or industry practice or standard. Do not use parenthesis to show both English and Metric units.

For projects, select either English or Metric units when setting up the Job. **/1/**

## **2-2.8 Reference Publications.**

All references in the UFGS section subparts are also listed in the section paragraph "REFERENCES." In the UFGS, the reference identifier (RID) for the reference must appear and be tagged in the reference paragraph and at all occurrences in the text using the SpecsIntact software. /1/1\

### **2-2.8.1 Standards Organizations.**

/1/ Identify standards producing organizations cited in the paragraph with the acronym in the Unified Master Reference List (UMRL) or provide an appropriate acronym if the Data Base Manager has assigned none. If there are conflicting acronyms, use the acronym approved by the database manager. Where dual acronyms may be used to identify the standards-producing organization and an underwriting organization, such as ANSI/IEEE, use the issuing organization only, IEEE in this case. The RID must consist of the organization acronym and publication number as stated in the UMRL. \1\

### **2-2.8.2 Reference Dates and Titles.**

/1/ Use the most current reference standard in the UFGS unless specific reason exists to cite an earlier version of the standard. The reference title must consist of the year of publication in parenthesis followed by the title as stated in the UMRL. \1\ Separate the date of a reference revision (R), change (C), or similar edition (e.g. editions, errata), from the original date with a semi-colon (2009; R 2010; C 2011: errata 2012), and exactly as it appears in the UMRL /1/. Use the UMRL in conjunction with the SpecsIntact software to automatically update the standards referenced in the UFGS. Use industry reference standards to the maximum extent possible for products and their installation to reduce the written text in the body of the UFGS. \1\

### **2-2.8.3 Quoting Reference Standards.**

/1/ Do not quote or repeat portions of the referenced standard in the text of the guide specifications unless it is necessary to improve clarity and readability.

## **2-2.9 Cross References.**

Avoid cross-referencing other specification sections and paragraphs in other sections or in the same section. When a section cross-reference is necessary, the format is Section <SRF>01 23 40</SRF> MISCELLANEOUS (where MISCELLANEOUS is the full Section title). When necessary to reference paragraphs within the same section, reference by paragraph title, not by paragraph number, e.g., paragraph EQUIPMENT. Paragraphs automatically renumber after changes, but paragraph titles do not change.

## **2-2.10 Brackets.**

Use brackets for choices of two or more items, and for blanks requiring designer input. In addition, brackets may be used to identify text that may not be applicable to all projects, for example, regional requirements, agency requirements, or non-standard

technical requirements. If the same bracketed choices are used more than one time in the UFGS section, consider tailoring. Consider using brackets or tailoring, but not both.

¶ Organize bracketed options in the order of the most commonly used item first (i.e. [galvanized steel] [stainless steel]). ¶ Provide brackets around five blank underscored characters ([\_\_\_\_]) to indicate the designer is to provide wording. ¶ Unless the bracketed choices are known industry practices, provide a Note to the Designer to assist in the editing of the bracketed items or filling in the blank. Provide a space between bracketed items; an example follows: Provide [galvanized steel] [stainless steel] enclosure. ¶

### **2-2.11 Tailoring Options.**

¶ Use tailoring options to pre-edit project specification sections. Master UFGS writers must reconcile agency differences to the greatest extent possible to avoid the need for tailoring options. When tailoring is used, provide a Note to the Designer to indicate what tailoring is in the text and the criteria for choosing the tailored option. For clarity of viewing a section outside of SpecsIntact, provide tailored items as part of a complete sentence, rather than items within a sentence (i.e. “<TAI OPT>Use galvanized steel.</TAI> <TAI OPT>Use stainless steel.</TAI>” instead of “Use <TAI OPT>galvanized </TAI><TAI>stainless </TAI>steel.” ¶

### **2-2.12 Submittal Items.**

¶ Format submittals within the submittal article as shown in Appendix A. Capitalize the first letter of each word, using title case. Text is not permitted within the submittal article (for instance, text following the submittal to describe its contents).

List the submittal items in the Submittal Article in the order that they appear in the section. Double-space submittal items. ¶

#### **2-2.12.1 Submittal Item Descriptions.**

Section 01 33 00 SUBMITTAL PROCEDURES contains general requirements for each submittal description number, e.g. SD-01, SD-02. UFGS authors must compare the requirements of each submittal item in a technical section to the item descriptions provided in Section 01 33 00 Submittal Descriptions paragraph. ¶¶

#### **2-2.12.2 Submittal Items Tagged In the Section Subpart Text.**

Each submittal item listed in the SUBMITTALS article of the UFGS section must also appear in one principal subpart text of the section other than the SUBMITTALS article, exactly as listed in the SUBMITTALS article, ¶ with the exception of the case (not case-sensitive), and must be appropriately tagged using the SpecsIntact software. Provide detailed description of the submittal item and requirements in the section subpart text. Do not repeat information already provided in UFGS 01 33 00. ¶ Take care to assure the submittal item tagged in the text reflects the verifiable requirements for that

submittal item. Do not list multiple submittal items separated by commas within submittal tags (i.e. <SUB>Item 1, Item 2</SUB>). Commas are field separators in the submittal register data file and commas within submittal tags will cause problems when imported into the Resident Management System (RMS) or Excel spreadsheets.

### **2-2.12.3 Government Approvals of Submittals.**

When a "G" follows a submittal item, it indicates Government approval is required for that item. Only use a "G" in submittal tags for items deemed sufficiently critical, complex, or aesthetically significant to merit approval by the Government. Submittal items not designated with a "G" are for information only (FIO) or approved by the Contractor QC System, depending on terminology used by the agency. The following examples show the two acceptable formats for submittals items in the UFGS, one with a G for a critical submittal and one without. **1\** Submittals are enclosed within <ITM> tags within the submittal article. **1/**

Critical:

<SUB>Fire Hydrants</SUB>; <SUB>G<TAI OPT=ARMY>[, [\_\_\_\_]]</TAI></SUB>

FIO (no classification):

<SUB>Fire Hydrants</SUB>

### **2-2.12.4 Submittal Item Reviewers.**

#### **2-2.12.4.1 Army.**

For Army only, the brackets following a "G" on a submittal item indicate a specific Government reviewer and approval is required for that item. Navy, Air Force and NASA do not typically use codes following the "G" in their projects. For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may follow the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office.

#### **2-2.12.4.2 Navy.**

Do not use the brackets following the "G." For projects, edit UFGS 01 33 00 SUBMITTAL PROCEDURES, paragraph FORWARDING SUBMITTALS REQUIRING GOVERNMENT APPROVAL, to designate who approves Government Approved submittals.



## **2-2.12.5 Design-Build Submittals for Design After Award.**

### **2-2.12.5.1 Army.**

For Army only, when a "D" follows a submittal item, it indicates Designer of Record Approval (DA) is required for that item. When a "C" follows a submittal item, it indicates Government Conformance Review of Design (CR) is required for that item. When an "R" follows a submittal item, it indicates both a Designer of Record Approval and Government Conformance Review (DA/CR) is required for that item. When an "A" follows a submittal item, it indicates both a Designer of Record Approval and Government Approval (DA/GA) is required for that item.

### **2-2.12.5.2 Navy.**

Comply with ~~1/FC 1-300-09N1\~~ and contract documents.

## **2-2.12.6 Submittals for Sustainability Reporting.**

~~1\~~Use an "S" following a submittal item to designate Sustainability submittals required by UFGS 01 33 29, which are compiled by the Construction Contractor into the electronic Sustainability Notebook. Provide these "S" submittal items only under SD-11 Closeout Submittals. Unlike a whole product submittal, these submittals are intended to only provide and highlight the information required to validate compliance with Sustainability Reporting Requirements. An example of a Sustainability submittal follows:

SD-11 Closeout Submittals

<SUB>Recycled Content of Insulation</SUB>; <SUB>S</SUB>

## **2-2.12.7 Operation and Maintenance Data.**

### **2-2.12.7.1 Operation and Maintenance Data Packages.**

Data packages are provided for a complete assembly, and specified in the technical sections. Use UFGS 01 78 23, Operations and Maintenance Data, paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES to choose which data package to specify. Create a submittal item for that package in the SUBMITTALS paragraph under SD-10 Operation and Maintenance Data. Annotate the data package type after the submittal item, and as shown in the example below. The data package required depends on the complexity of the system; package complexity increases from Data Package 1 to Data Package 5. Generally, technical specifications with complex equipment or systems that contain commissioned or energized moving parts (i.e. Fire Protection, Mechanical, and Electrical systems), require a Data Package submittal. A detailed description of the contents of the data packages are described in UFGS 01 78 23, paragraph TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES. If additional or detailed content is required in the data package, add that information into the section's subpart text where the submittal item is specified. An

example showing the submittal item in SD -10, and text describing additional or detailed content of the package within a subparagraph of the section, follows:

Example:

“1.3 <TTL>SUBMITTALS</TTL>

<SUB>SD-10 Operation and Maintenance Data</SUB>

<SUB>Electrical Systems</SUB>, Data Package 5; G

<SUB>Metering</SUB>, Data Package 5; G

1.5.1 <TTL><SUB>Electrical Systems</SUB>

Provide operation and maintenance manuals for electrical systems in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA that provide basic data relating to the design, operation, and maintenance of the electrical distribution system for the building. Include the following:

- a. Single line diagram of the "as-built" building electrical system.
- b. Schematic diagram of electrical control system (other than HVAC, covered elsewhere).
- c. Manufacturers' operating and maintenance manuals on active electrical equipment.”

#### **2-2.12.7.2 Operation and Maintenance Manuals.**

Operation and Maintenance (O&M) Data Packages, when required by the technical UFGS sections, are assembled into Operation and Maintenance (O&M) Manuals for the project. The requirements and format of the O&M Manuals are provided in UFGS 01 78 23. Additional O&M Manual requirements for the Army are provided in UFGS 01 78 24.00 10, and additional requirements for the Navy are provided in UFGS 01 78 24.00 20. //

#### **2-3 WRITING STYLE.**

Write in a direct, active voice with simple, concise sentences as much as possible. Avoid ambiguous, indefinite terms such as "too short" or "relatively simple." UFGS should supplement the dimensions, sizes, and relationships shown on the drawings with requirements for materials, installation, and other non-graphic requirements. Define what applies in lieu of using "applicable" or other indefinite wording. Do not use "and/or"; do not use the virgule (/) to substitute for "and" or "or." Do not use "etc."; use "e.g.," "for instance," or "such as." Do not use "as shown on the drawings" as this phrase is frequently overlooked by the project specification writer or editor; if used in the text and the item is not shown on the drawings, then the item is not specified.

### **2-3.1 Mood, Tense, and Voice.**

Project specifications are directed to the construction Contractor. Do not use the term "the Contractor shall." The Contractor is responsible for performing the work as shown and specified; therefore, there is no reason to use the phrase. In general, use the imperative mood (e.g., Install equipment) except when clarity requires the use of the indicative mood (e.g., equipment must). Avoid the use of "shall" and "must;" if use cannot be avoided, use "must" instead of "shall" unless it changes the meaning of the sentence. The term "will" indicates Contract requirements performed by the Government. Specify execution of alternatives with guidance. Use "may" only when specifying discretionary Government options. Do not use the word "should" in the specification text for mandatory requirements as "should" implies a recommendation. "Should" may be in the Notes to indicate desirable procedures that are advisory in nature. Do not use the term "furnish" unless only delivery of material to the site is required. Use "provide" to mean "furnish and install." Do not use the word "per" but use "in accordance with" instead.

Speak only to the Contractor, not the subcontractor, supplier or manufacturer. The Contractor cannot be directed through the manufacturer or supplier or vice versa. Stating "the manufacturer must provide," could be interpreted as simply informing the Contractor that a party other than the Contractor is responsible, comparable to "the Government will provide." Likewise, there is usually no reason to differentiate between actions expected of the "Contractor" and the Contractor's various suppliers, to attempt to do so borders closely on an assignment of work. Do not use the specification to instruct the Contracting Officer.

### **2-3.2 Abbreviations and Acronyms.**

Use of abbreviations and acronyms must follow the practices within the discipline involved. At the first use, write out the term completely and follow with the abbreviation or acronym in parentheses. Use abbreviations for units such as psi, cfm, and kW, and be consistent in their use.

### **2-3.3 Units.**

Spell out numbers under 10, except units of time and measurement, and use numerals for numbers 10 and above. Always present dimensions as numerals, but always spell out "one" and "zero" when used singly. Do not repeat a spelled-out number with a numeral in parentheses.

### **2-3.4 Terminology.**

Avoid the use of colloquial terms or jargon. For example, do not use "bulkhead" for wall, "deck" for floor, or "head" for toilet. Eliminate redundant and superfluous wording such as "conforming to," "all," and "type." Do not use indefinite items such as "etc.," "any," and "and/or." Do not use vague words and phrases or escape clauses such as "in this specification," "as may be required," "as necessary," "an

approved type," "as approved/directed/determined by the Contracting Officer," "first class workmanship," "securely," "thoroughly," "suitable," "properly," "good working order," "neatly," "carefully," and "installed in a neat and workmanlike manner." Avoid the use of long, compound or hyphenated words such as "hereinbefore" and "hereinafter."

### 2-3.5 Symbols.

Because of potential problems, do not use the symbols \1\shown in Table 2-2/1/ in the UFGS:

**Table 2-2 Symbols**

Symbol	For
'	foot
"	inch
#	pound
%	percent
°	degree
+	plus
-	minus
+/-	plus or minus
•	by
/	per
@	at

However, feet and inch symbols are acceptable when both are in a dimension (e.g. 8'-8") and in tables. Avoid or minimize the use of parentheses and quotation marks. \1\1/Spell out such items.

### 2-3.6 Pronouns.

Avoid the use of pronouns "he," "his," "this," "they," "their," "who," "it," and "which." \1\Use pronouns /1/sparingly if at all; it is usually better to repeat the noun.

**2-3.7 Capitalization.**

Capitalize "Contractor," "Contracting Officer," "Government," and "Contract" in specifications. Use the term "Contracting Officer" \1\; do not use terms such as /1/ "Officer in Charge of Construction," "Contracting Officer Representative," or "Government Representative."

**2-3.8 Brand Name Specifications.**

Do not use brand name or restrictive requirements unless it is conclusively established that no substitute will serve the purpose. Use of brand name items is prohibited unless formal written approval is obtained from a Level One Contracting Officer. \1\Follow agency FAR requirements on acceptable number of manufacturers or suppliers capable of supplying the product, that precludes the product from being considered a brand name. /1/ If use of brand name is authorized, provide a cost estimate in relation to the total project cost \1\to the Government, /1/ specify the brand name item by manufacturer's name and catalog number, followed by the phrase: "notwithstanding any other provision of the Contract, no other product will be acceptable." This statement is necessary to override the Contract clause that permits substitution of any supposedly equal product unless such language is used.

Any specification section that contains brand name items must include a notice to that effect on the first page of the section. Place the following above the section number and title at the top of the first page of the section:

\*\*\*\*\*

**This Specification Contains Brand Name Products.**

\*\*\*\*\*

The use of brand name items has been the subject of many Contract claims. Project designers and specifiers must be aware of the restriction on the specification of brand name items and take special precautions to avoid their use unless formal written approval is obtained.

**2-3.9 "Brand Name or Equal" Specifications.**

Refer to FAR Clause 52.211-6 Brand Name or Equal. \1\Do not/1/ use "Brand Name or Equal,"\1\ unless approved by the Contracting Officer. If allowed to/1/ specify an item as "brand name or equal," provide salient characteristics of the brand name items \1\in the UFGS, /1/ to determine equality.

**2-3.10 Warranty Clauses.**

Ordinarily, do not include warranty clauses in the UFGS. A warranty clause is any provision that modifies terms of the normal 1-year warranty required by the Contract

clause. There are two classes of exceptions. First, in rare instances, it is acceptable to extend the period of the warranty based on the judgment of the author, if the industry routinely provides such extended periods of warranty and the unusually complex nature of the product makes the provision cost effective on a life-cycle basis, or if UFGS suggest the extension. Second, it is possible to add terms to a warranty, but only in the rarest of circumstances and with written approval from an appropriate authority or when UFGS indicate such an extension has been reviewed and approved by a Level 1 Contracting Officer.

### **2-3.11 Contract Clauses.**

Do not repeat the Contract clauses in UFGS. The Contract clauses in the Contract contain requirements, which affect the general conduct of the work in the Contract. If these are randomly modified within the specifications, it may weaken or void the Contract clauses.

### **2-3.12 Specifying New Items.**

From time-to-time, requests are made to consider the use of materials that are relatively new. While the Government encourages innovative solutions, manage risk appropriately. Take care in specifying items that have not gained widespread acceptance and use. Usually, service records of new materials do not exist. It is therefore necessary to base performance on laboratory tests. These tests:

- Must have been made under the conditions of actual use,
- Must have been conducted by a reputable, independent laboratory, and
- Must have factual documentation sufficient to support evaluation of the material

Most manufacturers will furnish all requested information about a product and answer all reasonable questions. The manufacturer may also provide a suggested, competitive, generic type specification section that may be edited for the UFGS. Ensure the item specified is not a brand name.

## **2-4 TABLES AND FORMS.**

Tables and forms developed with SpecsIntact may be included within the UFGS section. Otherwise, provide tables, figures and forms that cannot be included in the UFGS section file on a web site for download, i.e. UFGS GRAPHICS, INCLUDING TABLES <http://www.wbdg.org/> Provide instructions to the designer in the UFGS notes to download and append to the end of section in the final electronic PDF file. Otherwise, provide the hyperlink URL for the Contractor to download.

#### **2-4.1 Formatted Tables.**

Formatted tables in UFGS are restricted to the portrait format. The table text font will be the same as used for the section text. Notes may contain tables.

#### **2-4.2 Forms, Hyperlinks and URLs.**

Provide instructions in the notes to verify that all forms, hyperlinks and URLs in the UFGS are valid and current before publishing the project specifications.

### **2-5 MODIFICATIONS.**

#### **2-5.1 Clerical Repairs.**

V1V1/A clerical repair consists of non-technical modifications to the specification section. The modifications are administrative in nature such as typo corrections, update of the references, spacing corrections, tagging, conformance with CSI and formatting standards. Do not document clerical repairs in the section banner, Change List or Revision List.

#### **2-5.2 Change.**

A Change consists of technical modifications to a specific aspect or subject of the specification section. The modifications are often associated with resolution of a criteria change request (CCR). A Change only addresses the specific issue without a review of the entire specification section. Note the most recent Change in the section banner; however, do not revise the section date. Provide the nature of the changes to the Database Managers to incorporate in the Change List. V1Use the following format in the section banner to indicate a change:

Example:

**USACE / NAVFAC / AFCESA / NASA**

**UFGS-08 34 73 (November 2009)  
Change 2 – 08/16**

**Preparing Activity: NASA**

-----  
**Superseding  
UFGS-08 34 73 (October 2006) /1/**

#### **2-5.3 Revision.**

A Revision is an updating of various requirements in a UFGS and republication of the UFGS with a revised date and a superseded section date. A Revision could also be a complete rewrite or refresh of the UFGS section. Provide the nature of the revisions to the Database Managers to incorporate in the Revision List.

## 2-5.4 Superseding Dates.

If there is a Revision to the section, change the date in the Section Header (Banner) to reflect the current release month and year. The previous section number/date will become the Superseding section number/date.

Example:

<b>USACE / NAVFAC / AFCESA / NASA</b>	<b>UFGS-08 34 73 (November 2009)</b>
	-----
<b>Preparing Activity: NASA</b>	<b>Superseding</b> <b>UFGS-08 34 73 (October 2006)</b>

If a section number change has occurred, the previous section number / date will become the Superseding section number / date.

Example:

<b>USACE / NAVFAC / AFCESA / NASA</b>	<b>UFGS-08 34 73.00 40 (November 2009)</b>
	-----
<b>Preparing Activity: NASA</b>	<b>Superseding</b> <b>UFGS-08 34 73 (August 2009)</b>

Change Section Date below the Section Title to the current Release Date

Example:

<DTE>11/09</DTE>

## 2-6 UFGS APPROVAL.

Coordinate UFGS for approval in accordance with MIL-STD-3007F. DWG technical representatives must review each UFGS. When appropriate, extend the opportunity for review to major commands, facility users, and private industry. Preparing activities must coordinate new and changed UFGS within their agency and with their counterparts in the other agencies. Upon completion, submit new and revised UFGS to the Technical Proponent for final review and approval. Changes to UFGS are subject to coordination and approval of the other agencies whenever the change affects the technical content of the UFGS. However, the Preparing Activity is always obligated to consider and resolve requests from other agencies for changes to UFGS.



## APPENDIX A UFGS ORGANIZATION GUIDANCE

The following guidance is based on the paragraph titles and sequence recommended in the CSI SectionFormat™ Outline. This format has been adopted by the agencies supporting the SpecsIntact software. Use this arrangement to the extent applicable in the preparation of UFGS by eliminating paragraphs which do not apply, and adding additional paragraphs as necessary. It is important that UFGS authors understand that the paragraphs listed below are not mandatory. Use only those paragraphs that are applicable to the specified subject, and add any applicable requirements not listed. It is important to follow the sequence of information provided herein even when adjusting the paragraph titles to fit the specified subject matter.

Paragraph and subparagraph numbering to the third level must have titles and be completely numeric. Below the paragraph or subparagraph level, titles are optional and list and item tags may be used with an alternating alpha-numeric designation. This format will not translate to the Alphanumeric format and will not automatically renumber. For example:

**Table A-1 Examples of Numeric Format**

Numeric without Tags	Numeric with Tags (highlighted in red)
PART 1 GENERAL (Part Level)	<PRT =1> <TTL>PART 1 GENERAL</TTL>
1.1 ARTICLE (1st Level)	\1<SPT =1.1>1.1 <TTL>ARTICLE</TTL>
1.1.1 Paragraph (2nd Level)	<SPT =1.1.1>1.1.1 <TTL>Paragraph</TTL>
1.1.1.1 Subparagraph (3rd Level)	<SPT =1.1.1.1>1.1.1.1 <TTL>Subparagraph</TTL>
a. Example	<LST INDENT=-0.33>a. Example</LST>
(1) Example	<ITM INDENT=-0.33>(1) Example</ITM>
(a) Example	<ITM>(a) Example</ITM>
1. Example	<ITM INDENT=0.33>1. Example</ITM>
\1.1.1.1.1 Subparagraph	<SPT =1.1.1.1>1.1.1.1 <TTL>Subparagraph</TTL>
1.1.1.1.1.1 Subparagraph	<SPT =1.1.1.1.1>1.1.1.1.1 <TTL>Subparagraph</TTL>
/1/(Do not use ITM progression beyond this level.)	</SPT =1.1.1.1.1></SPT =1.1.1.1>/1/</SPT =1.1.1.1></SPT =1.1.1></SPT =1.1>

Refer to the *SpecsIntact Quick Start Guide Numeric* for instructions for how to tag paragraphs using the SpecsIntact software.

## **PART 1 GENERAL**

### **1.1 UNIT PRICES**

Specify measurement and payment requirements for work subject to extreme variation in estimated quantity when unit price bidding is required. Do not use this paragraph for guide specifications covering building components or for other construction features when quantities can be reasonably calculated from information included in the Contract.

### **1.2 REFERENCES**

List only the publications cited in the text of the guide specification in this paragraph by organization, designation, date, and title. Reference the publications in the text by basic designation (Reference Identifier (RID)) only.

### **1.3 DEFINITIONS**

Only use this paragraph to define terms used in the specification section that are not defined by a commercial or Government standard and to provide a common interpretation of a term for Contractual purposes.

### **1.4 ADMINISTRATIVE REQUIREMENTS**

Use this paragraph to categorize the requirements as related to the specific section when more than one of the subordinate titles is required. Omit this when only one of the subordinate titles is required and use the subordinate title as a primary paragraph title.

#### **1.4.1 Pre-Installation Meetings**

Specify requirements for meetings to coordinate the work or to sequence related work for sensitive and complex items in this paragraph.

#### **1.4.2 Sequencing**

Specify requirements for coordinating work done in sequence with, or at the same time as, work in another section. Specify the particular sequence of events here.

#### **1.4.3 Scheduling**

Specify requirements for coordinating work that requires unusual scheduling with work in other sections. Specify the particular schedule of events here.

### **1.5 SUBMITTALS**

Limit Submittals to those necessary for adequate quality control. Organize submittal requirements using the following eleven classifications:

- SD-01 Preconstruction Submittals
- SD-02 Shop Drawings
- SD-03 Product Data
- SD-04 Samples
- SD-05 Design Data
- SD-06 Test Reports
- SD-07 Certificates
- SD-08 Manufacturer's Instructions
- SD-09 Manufacturer's Field Reports
- SD-10 Operation and Maintenance Data
- SD-11 Closeout Submittals

#### 1.5.1 Example: Submittal Item Format shown with Tags

<LST><SUB>SD-03 Product Data</SUB></LST>

<ITM><SUB>Submittal Item</SUB>; <SUB>G<TAI OPT=ARMY>[, [\_\_\_\_]]</TAI></ITM>

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

Categorize maintenance materials requiring no action other than confirmation of receipt under an explanatory heading.

##### 1.6.1 Spare Parts

Specify extra stock materials and items provided for Government use in facility operation, maintenance, and repair. Identify the type and quantity here, but include the actual characteristics of the materials in Part 2. Include items that might be difficult to obtain because of color or pattern match, or spare parts needed to ensure continued operation of critical equipment. Identify the items, state the quantities required, and indicate delivery to whom, when, and where.

#### 1.7 QUALITY CONTROL

##### 1.7.1 Regulatory Requirements

This paragraph includes obligations for compliance with specific code requirements for Contractor-designed items such as wood trusses, labeling such as Underwriters Laboratory, Inc., and requirements of public authorities such as state highway departments.

#### 1.7.2 Qualifications

This paragraph includes statements of qualifications for Contractor designers, manufacturers, fabricators, welders, installers, and applicators of products and completed work.

### 1.8 DELIVERY, STORAGE, AND HANDLING

This paragraph includes the necessary requirements on packing and shipping, acceptance at site, and storage and protection.

### 1.9 PROJECT/SITE CONDITIONS

#### 1.9.1 Environmental Requirements

This paragraph establishes any physical or environmental limitations or criteria. Such conditions might include temperature, weather, humidity, ventilation, and illumination required for proper installation or application.

#### 1.9.2 Existing Conditions

This paragraph includes statements or references to documents where information may be found pertaining to such items as existing structures or geophysical reports.

### 1.10 WARRANTY

This paragraph describes special or extended (more than one year) warranty or bond covering the conformance and performance of the work of the section. A thorough understanding of warranties is necessary to develop this paragraph.

## PART 2 PRODUCTS

### 2.1 SYSTEM DESCRIPTION

Describe performance or design requirements and tolerances of a complete system in this paragraph. Limit descriptions to composite and operational properties to the extent necessary to link multiple components of a system together, and to interface with other systems.

#### 2.1.1 Design Requirements

Design requirements may include criteria for structural, thermal, acoustical, or other properties. State required tolerances here only as they apply to the performance of the

complete system. Include tolerances of fabrication and installation in their respective paragraphs under Part 1.

#### 2.1.2 Performance Requirements

Performance requirements may include criteria for structural, thermal, acoustical, or other properties. State required tolerances here only as they apply to the performance of the complete system. Include tolerances of fabrication and installation in their respective paragraphs under Part 2.

### 2.2 ASSEMBLY [OR] FABRICATION

This paragraph describes items that must be shop manufactured, fabricated, or assembled before delivery to the site.

#### 2.2.1 Factory Assembly

This paragraph states factory assembly as a result.

#### 2.2.2 Shop Fabrication

This paragraph states shop fabrication as a result, but may include statements of required methods, trial or permanent assembly of equipment and components away from the construction site.

#### 2.2.3 Tolerances

Specify allowable variations from specified requirements here.

#### 2.2.4 Finishes

Specify any shop or factory finishing requirements here.

### 2.3 MANUFACTURED UNITS

This paragraph provides statements describing a complete manufactured unit, usually a standard catalog item. Statements may include descriptive requirements for the materials, specific fabrication, finishes, and function. Use separate paragraphs for each different item when appropriate. The name used for the manufactured unit must be consistent throughout the guide specification.

### 2.4 EQUIPMENT

This paragraph provides statements describing the function, operation, and other specific requirements of equipment installed in the work. Use separate paragraphs for each different item when appropriate.

## 2.5 COMPONENTS

This paragraph provides statements describing the specific components of a system, manufactured unit, or type of equipment installed in the work. Use separate paragraphs for each different item when appropriate.

## 2.6 MATERIALS

Identify the material, system, assembly, or product furnished. Independently incorporate Materials specified here into the work under PART 3 EXECUTION. Consistently use the name for the material throughout the guide specification. Omit this paragraph when the materials can be included with the description of a particular manufactured unit, equipment, component, or accessory.

## 2.7 MIXES

This paragraph provides proportions and procedures for mixing materials. Mixing is the preparation of materials for use and considered to be part of the manufacturing process even when this work done onsite. This paragraph is required for products such as asphaltic concrete, portland cement, concrete, mortar, and plaster.

## 2.8 ACCESSORIES

Provide requirements for subordinate or secondary items that aid and assist primary products specified above or are necessary for preparation or installation of those items. This paragraph should not include basic options available for manufactured units and equipment.

## 2.9 TESTS, INSPECTIONS, AND VERIFICATIONS

Specify tests, inspections, or verifications of products required at the source here, i.e., plant, mill, factory, or shop.

## PART 3 EXECUTION

### 3.1 EXAMINATION

Specify the act of physically determining that conditions are acceptable to receive the primary products of the section. Specify requirements for verifying suitability of conditions for installation here. Specify requirements for verifying the absence of defects or errors that would cause defective installation or application of products, or cause latent defects in workmanship and function, here.

### 3.2 PREPARATION

This paragraph covers actions required to physically prepare the surface, area, or site to incorporate the primary products of the section.

### 3.2.1 Protection

This paragraph specifies requirements for protecting the surrounding areas and surfaces.

### 3.2.2 Surface Preparation

This paragraph describes preparatory work required prior to installation, application, or erection of primary products.

## 3.3 ERECTION

This paragraph covers actions required to accomplish a specified unit of work in the section, and may include requirements necessary for installation of products furnished under other sections. If products are to be installed according to manufacturer's instructions, then the manufacturer's instructions should be a required submittal as evidence of those requirements. Separate paragraphs for each different item, as appropriate, may be used. The names of the products or the type of work may be incorporated into the paragraph titles, in which case the wording should reflect the generic product or terminology used throughout the Contract documents.

## 3.4 INSTALLATION

This paragraph may be used when more appropriate than paragraph ERECTION.

## 3.5 APPLICATION

This paragraph may be used when more appropriate than paragraph ERECTION.

### 3.5.1 Special Techniques

This paragraph describes special procedures for incorporating products. These procedures may include spacing, patterns, or unique treatments. The wording of the paragraph title should reflect the subject matter.

### 3.5.2 Interface with Other Products

This paragraph provides descriptions specific to compatibility and transition to other materials. This may include incorporating accessories, anchorage, and any special separation or bonding.

### 3.5.3 Tolerances

This paragraph covers allowable variations in application thickness or from indicated locations.

### 3.6 FIELD QUALITY CONTROL

#### 3.6.1 Tests

This paragraph defines the tests required for installed or completed work. These tests are different and separate from those required for materials and products prior to installation or application.

#### 3.6.2 Inspection

This paragraph defines the inspections required for installed or completed work. These inspections are different and separate from those required for materials and products prior to installation or application.

#### 3.6.3 Manufacturer Field Service

This paragraph covers specific requirements when manufacturers are to provide field quality control with onsite personnel for instruction or supervision of the installation or application of their products, or for startup or demonstration.

### 3.7 SYSTEM STARTUP

This paragraph lists actions applicable to the startup of operational systems and equipment.

### 3.8 ADJUSTING AND CLEANING

This paragraph provides final actions to prepare installed equipment or other completed work to properly function or perform.

### 3.9 CLOSEOUT ACTIVITIES

This paragraph covers requirements for demonstrating, instructing, and training owner's personnel on sequence of operations, general facility operation, and facility maintenance procedures.

#### 3.9.1 Demonstration

This paragraph covers requirements of the installer or manufacturer to demonstrate the proper operation of equipment.

#### 3.9.2 Training

This paragraph covers requirements of the installer or manufacturer to train the Owner's personnel in the operation and maintenance of equipment for ongoing facility management and maintenance.



### 3.10 PROTECTION

This paragraph includes provisions for protecting installed work prior to acceptance of the project. Protection of surrounding areas and surfaces during application or installation is included in paragraph PREPARATION. Include only statements unique to the particular section.

### 3.11 MAINTENANCE

This paragraph covers provisions for maintenance as applicable to critical systems, equipment, and Storm Water Pollution Protection Plan (SWPPP) landscaping. Service agreements, if not paid in advance, should be separate from the construction agreement to avoid delaying the final payment and holding the contract open for extended periods.

### 3.12 SCHEDULES

This paragraph includes schedules that indicate where to put what or provides other coordinating data. Schedules are sometimes placed here in the specification section rather than on the drawings. (Only the format for a schedule would normally be included in a UFGS.)

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