

Table 1: Unified Facilities Criteria (UFC) Containing CPC Related Guidance ¹ (Update 13 October 2021 as a resource linked from the CPC Source – Criteria Page (<http://www.wbdg.org/ffc/dod/cpc-source/criteria>))

DOC. NUMBER	TITLE	DESCRIPTION
UFC 1-200-01	<i>General Building Requirements</i>	<p>This UFC provides general building requirements, establishes the use of consensus building codes and standards, identifies key core UFC, and identifies unique military criteria and applies to the design and construction of new and renovated Government-owned facilities for the Department of Defense (DoD). The use of UFC 1-300-02 is required. The “Corrosion Prevention and Control Requirements” Chapter provides an extensive discussion on CPC to include definitions, design requirements and considerations and the use of “Environmental Severity Classification” (ESC) (see also Appendix for ESC Classifications for DOD Locations).</p> <p>Keywords: Corrosion, Corrosion Prevention and Control (CPC), Corrosivity, Splash, Bacteria, Mold, Mildew, Biological, Environmental Severity Classification (ESC), Life Cycle, Corrosion Prone Locations, Rusting, Degradation, Cathodic Protection, Deterioration, Costings, Durable, Alkali-Silica, Carbonation, ICCET, High-humidity, Design Geometries, Ultra-violet (uV), Splash Zones</p>
UFC 1-300-02	<i>Unified Facilities Guide Specifications (UFGS) Format Standard</i>	<p>Provides guidance for the preparation of Unified Facilities Guide Specifications (UFGS). Content Guidance: “\1\Provide bracketed or tailored options for corrosion prevention, life cycle cost effectiveness, or durability depends on the location, application, conditions, or atmospheric and chemical environment 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.” Use International Organization for Standardization (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.</p> <p>Keywords: Corrosion, Environmental Severity Classification (ESC), Life Cycle Cost Effectiveness</p>
UFC 3-110-03	<i>Roofing</i>	<p>Explains procedures for applying roofing manual and technical bulletins to the design of Military projects. For roofs >15KSF provide Registered Roof Consultant (RRC) or PE/RA deriving principal income from roofing design on QC staff of DB or DBB team. Requires</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>ESC considerations and delineates corrosion issues and prevention in roofing systems.</p> <p>Keywords: Corrosion, Rust, Deterioration, Mold, Mildew, Coating, Preservation, UV Degradation & Radiation, Environmental Severity Classification (ESC)</p>
UFC 3-101-01	<i>Architecture</i>	<p>Provides CPC and ESC guidance for architectural systems. See Change Record of Changes Summaries Section for specific details of recently added references. Highlights reasons to address corrosion and the impacts on total ownership costs. Provides specific direction on materials related to corrosion. Invokes UFC 1-200-01. The humidity conditions must also be considered during design; humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C, and 5C (as identified in ASHRAE 90.1).</p> <p>Keywords: Mold, Mildew, Environmental Severity Classification (ESC), Corrosion, Prevention, Deterioration, Rot, Humidity, Coatings, Life-cycle, Deterioration, Degradation, Durable, Rust, uV</p>
UFC 3-190-06	<i>Protective Coatings and Paints</i>	<p>Provides requirements and technical guidance for the effective use of paint-type coatings to protect common materials such as metal, concrete, pavements, gypsum board and wooden structures at military activities from deterioration. This UFC applies to all Navy, Air Force, and Army service elements and contractors. Requires paints and coatings that are durable and minimize the need for preventative and corrective maintenance over the expected service life of the component or system. Note that this is a significant update from previous versions. Different materials will be used based on local environmental conditions (See UFC 1-200-01 as required in the UFC). Corrosive environments, which require additional corrosion protection, are those project locations which have an Environmental Severity Classification (ESC) of C3, C4 or C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C, and 5C (as identified in ASHRAE 90.1). Defines coating systems for specific uses.</p> <p>Keywords: Corrosion, Cathodic Protection, Rust, Deterioration, Mold, Mildew, Coating, Photodegradation, uV</p>
UFC 3-230-01	<i>Water Storage, Distribution, & Transmission</i>	<p>Provides requirements for typical storage, distribution and transmission systems for domestic water, fire protection and non-potable water for the DoD. Describes corrosion control issues and risks. Addresses Cathodic Protection, and the application of AWWA guidelines related to Corrosion. Invokes UFC 1-200-01.</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>Keywords: Corrosion, Cathodic Protection, Coatings, Rust, Ultraviolet Degradation, Life-cycle</p>
UFC 3-230-02	<i>Operations and Maintenance of Water Supply Systems</i>	<p>Provides technical guidance for operating and maintaining water supplies, treatment plants, storage facilities, and distribution systems at military installations. Applies to all personnel who are responsible for operation and maintenance fixed- base water systems. Provides insights into corrosion impacts, actions for prevention and control within the water supply system and components. CPC maintenance recommendations are included within this UFC.</p> <p>Keywords: Corrosion, Cathodic Protection, Rust, Coating, Pitting</p>
UFC 3-230-03	<i>Water Treatment</i>	<p>Provides requirements for typical water treatment systems for the DoD. These minimum technical requirements are based on UFC 1-200-01. Where other statutory or regulatory requirements are referenced in the contract, the more stringent requirement must be met. Corrosion requirements are addressed.</p> <p>Keywords: Corrosion, Cathodic Protection, Corrosion, Corrosion Control Treatment</p>
UFC 3-240-01	<i>Wastewater Collection</i>	<p>Provides requirements for typical wastewater collection systems for the DoD. These minimum technical requirements are based on UFC 1-200-01. Where other statutory or regulatory requirements are referenced in the contract, the more stringent requirement must be met. Addresses soil corrosivity and materials utilized in wastewater collection systems. Corrosion requirements are addressed.</p> <p>Keywords: Corrosion, Cathodic Protection, Coating</p>
UFC 3-240-13FN	<i>Operation and Maintenance: Industrial Water Treatment</i>	<p>Provides an overview of industrial water treatment operations and management. Includes an extensive description and discussion of corrosion.</p> <p>Keywords: Corrosion, Cathodic Protection, Rust, Mildew, Coating, Pitting</p>
UFC 3-270-08	<i>Pavement Maintenance Management</i>	<p>“The purpose of this manual is to describe a pavement maintenance management system (PAVER) for use at military installations.” There are extensive references to spalling in concrete.</p> <p>Keywords: Deterioration, Life-cycle, Spalling</p>

DOC. NUMBER	TITLE	DESCRIPTION
UFC 3-301-01	<i>Structural Engineering</i>	<p>Requires use of ESC in design considerations and actions and defines and delineates corrosion risks in structures. Discusses specific material use and restrictions. Refers to UFC 1-200-01 requirements. Steel Structures in Corrosive Environments must “use designs that minimize the impact of corrosion.”</p> <p>Keywords: Corrosion, Environmental Severity Classification (ESC), Corrosion, Prevention, Deterioration, Humidity, Coatings, Life-cycle, Deterioration, Degradation, Durability, Sun Exposure, Mold, Mildew</p>
UFC 3-401-01	<i>Mechanical Engineering</i>	<p>This UFC is the core document for the mechanical discipline. Intended as a reference for all mechanical work and is organized to provide the top-level minimum mandatory mechanical design and analysis requirements and refers to other criteria as appropriate. A pending update to this UFC will incorporate Environmental Severity Classification requirements as required in UFC 1-200-01.</p> <p>Keywords: Deterioration, degradation, mold, corrosive environments, protection, life cycle</p>
UFC 3-430-01FA	<i>Heating and Cooling Distribution Systems</i>	<p>Contains TI 810-32 <i>Heating and Cooling Distribution Systems</i>. Provides guidance and criteria for the design and construction of heating and cooling distribution systems and supplements information in the "Notes to the Designer" of the guide specifications. Covers multiple CPC topics such as corrosion-resistant materials, internal corrosion, cathodic protection, and others.</p> <p>Keywords: Corrosion, Cathodic Protection, Coating, Mold, Degradation</p>
UFC 3-430-08N	<i>Central Heating Plants</i>	<p>Contains MIL-HDBK-1003/6 <i>Central Heating Plants</i>. Provides criteria for designing steam and high temperature water central and individual heating plants. Covers many different CPC topics including economizer corrosion controls. General corrosion prevention requirements are addressed.</p> <p>Keywords: Corrosion, Cathodic Protection, Deterioration, Coating, Pitting</p>
UFC 3-460-01	<i>Design: Petroleum Fuel Facilities</i>	<p>Addresses corrosion design issues to include impacts of ethanol, hazards related to corrosion, certification issues and tank size, CP for above and underground tanks, pipelines and structures, corrosion on underground submerged piping systems, and corrosion resources, guidance and references. Soils shall have a minimum electrical</p>

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		<p>resistance of 35,000 ohm–cm. Foundation material should be neutral or alkaline with a pH greater than 7, a chloride concentration less than 300 ppm, and a sulfate concentration less than 150 ppm as specified by DoD Standard Design AW 78-24-27. The UFC 3-460-01 requires the services of a (NACE)-certified Corrosion Specialist, Cathodic Protection Specialist or a registered professional Corrosion Engineer to perform all CP design and testing.</p> <p>Keywords: Corrosion, Corrosion Protection, Coatings, Cathodic Protection, Rust, Life-cycle, Degraded</p>
UFC 3-410-01	<i>HVAC Systems</i>	<p>This UFC provides requirements and guidance in the design of heating, ventilating, and air-conditioning (HVAC) systems, together with the criteria for selecting HVAC materials and equipment. It includes ESC requirements for corrosive and humid environments, where design detailing, and the use of materials, systems, components and coatings selections that are durable and minimize preventative and corrective maintenance over the life cycle are to be made. ASHRAE climate zone impact requirements are delineated.</p> <p>Keywords: ESC, corrosion, ASHRAE, climate zone impacts, humid, equipment room air conditioning, degradation, paint, coating, environmental, weather</p>
UFC 3-420-01	<i>Plumbing Systems</i>	<p>This UFC provides guidance in the design of plumbing systems, together with the criteria for selecting plumbing materials, fixtures, and equipment and is applicable to all elements of the Department of Defense (DoD) charged with planning military construction. The “<i>Environmental Severity and Humid Locations</i>” section states that “In corrosive and humid environments, provide design detailing, and use materials, systems, components, and coatings that are durable and minimize the need for preventative and corrective maintenance over the expected service life of the component or system.” ESC requirements are identified.</p> <p>Keywords: ESC, corrosion, cathodic protection, ASHRAE, climate, humid, paint, coatings, environmental, weather</p>
UFC 3-460-03	<i>Operation and Maintenance: Maintenance of Petroleum Systems</i>	<p>This manual emphasizes preventive maintenance to avoid system shutdowns, prevent fuel contamination, and decrease fire, safety, and health hazards. There are many references to corrosion & cathodic protection and systems to be protected and considered. Provides guidance on corrosion-related inspections for specific system locations, pitting corrosion impacts, and CP systems.</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>Keywords: Cathodic, Cathodic Protection, Coating, Pitting, Galvanic</p>
<p>UFC 3-501-01</p>	<p><i>Electrical Engineering</i></p>	<p>Provides technical requirements for general aspects of the electrical design of projects. Provides electrical engineering design and analysis criteria for design-build and design bid build projects. Provides top level minimum mandatory electrical requirements and refers to other UFCs. Addresses some corrosion related requirements. Incorporates ESC requirements as referenced in UFC 1-200-01. The section on <i>Corrosive and High Humidity Areas</i> provides a lengthy explanation of corrosion related requirements invoking ASHRAE requirements as well. Specific materials are delineated.</p> <p>Keywords: Corrosion, Cathodic Protection, ASHRAE, paint, environmental, weather, humid, corrosion resistant, weatherproof enclosures, stainless steel, aluminum, ESC, environmental severity</p>
<p>UFC 3-530-01</p>	<p><i>Interior and Exterior Lighting Systems and Controls</i></p>	<p>This UFC provides requirements for the design of interior and exterior lighting systems and controls based on the Illuminating Engineering Society of North America’s (IES) Lighting Handbook Reference and Application, 10th Edition (hereafter called IES Lighting Handbook), Energy Policy Act of 2005, and current recommended practices. See the section on <i>Environmental Severity and Humid Locations</i>. In corrosive and humid environments, provide design details, and use materials, systems, components, and coatings that are durable and minimize the need for preventative and corrective maintenance over the expected service life of the component or system. Invokes UFC 1-200-01 requirements.</p> <p>Keywords: Corrosion, ASHRAE, coatings, environmental, humid and humidity, ESC, environmental severity</p>
<p>UFC 3-550-01</p>	<p><i>Exterior Electrical Power Distribution</i></p>	<p>This UFC provides policy and guidance for design criteria and standards for electrical power and distribution systems. The information provided here must be utilized by electrical engineers in the development of the plans, specifications, calculations, and Design/Build Request for Proposals (RFP) and must serve as the minimum electrical design requirements. It is applicable to the traditional electrical services customary for Design-Bid-Build construction contracts and for Design-Build construction contracts. Project conditions may dictate the need for a design that exceeds these</p>

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		<p>minimum requirements. The section on “<i>Environmental Severity and Humid Locations</i>” requires that “In corrosive and humid environments, provide design detailing, and use materials, systems, components, and coatings that are durable and minimize the need for preventative and corrective maintenance over the expected service life of the component or system.” It invokes “UFC 1-200-01 and identifies corrosive environments and humid locations requiring special attention.”</p> <p>Keywords: Corrosion, ESC, environmental severity classification, coatings, environmental, humid and humidity, corrosion prevention</p>
UFC 3-570-01	<i>Cathodic Protection</i>	<p>Note that compliance with this UFC is mandatory for DoD facilities. Provides general & specific design guidance for cathodic protection systems. The UFC provides the minimum design requirements, and must be utilized in the development of plans, specifications, calculations, and Design/Build Request for Proposals (RFP). Intended to be used in the design and construction of cathodic protection systems for the purpose of mitigation of corrosion of buried or submerged metallic structures. Delineates requirements for NACE CP & Corrosion Specialist certifications and support. Addresses corrosion related Commissioning (Cx) support.</p> <p>Keywords: Corrosion, Cathodic Protection, Coating, Pitting, Galvanic Anode, Impressed Current Systems</p>
UFC 3-570-06	<i>Operation and Maintenance: Cathodic Protection Systems</i>	<p>Provides guidance for inspection, operation, and maintenance of CP systems and should be used by field personnel to perform scheduled inspections and preventive maintenance, and to troubleshoot and repair defects.</p> <p>Keywords: Cathodic, Cathodic Protection, Rust, Coating, Pitting</p>
UFC 3-600-01	<i>Fire Protection Engineering for Facilities</i>	<p>Establishes fire protection engineering policy and criteria for DOD components. Requires services of a QFPE for design of the project and the oversight of the AHJ (Military Service or Defense Component FPE). See the UFC for additional qualifications, experience and certification requirements. Must “provide appropriate corrosion protection based on pipe material and corrosive properties of the water supply and earth.”</p> <p>Keywords: Cathodic, Cathodic Protection, Degradation, Coating</p>

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UFC 4-150-02	<i>Dockside Utilities for Ship Service</i>	<p>Provides design criteria and guidance in the design of utility systems for piers, wharves, and drydocks and addresses corrosion . Criteria covers Type I Piers (Fueling, Ammunition, and Supply); Type II Piers (General Purpose Piers); and Type III Piers (Repair Piers.) Utilities covered include steam, compressed air, salt or non-potable water, potable water, oily waste/waste oil (OWWO) or petroleum, oil and lubricants (POL), CHT, electric power, and telecommunications. Requires qualified corrosion engineer that is NACE certified.</p> <p>Keywords: Corrosion, Cathodic Protection, Rust, Degradation, Coating, Preservation, Pitting</p>
UFC 4-150-07	<i>Operation and Maintenance: Maintenance of Waterfront Facilities</i>	<p>Provides guidance for the inspection, maintenance, and repair of waterfront structures and related facilities. Also used as a reference for planning, estimating, and performing technical maintenance and repair work. Includes extensive corrosion references and guidance.</p> <p>Keywords: Corrosion, Cathodic Protection, Rust, Degradation, Coating, Preservation, Pitting</p>
UFC 4-151-10	<i>General Criteria for Waterfront Construction</i>	<p>Contains general criteria for the design of piling, deck, and substructure framing and bracing, and hardware and fittings for waterfront construction. Unless indicated otherwise, these criteria also apply to the design of offshore structures. Includes extensive corrosion references and guidance include concrete reinforcing and steel members.</p> <p>Keywords: Corrosion, Cathodic Protection, Coating</p>
UFC 4-152-01	<i>Design: Piers and Wharves</i>	<p>Contains descriptions and design criteria for pier and wharf construction, including subsidiary, contiguous, and auxiliary structures. Provides corrosion guidance in design such as prestressed concrete, support chains, and ferrous metal hardware,</p> <p>Keywords: Corrosion, Cathodic Protection, Deterioration, Coating</p>
UFC 4-159-01N	<i>Design: Hyperbaric Facilities</i>	<p>General guidance relating to the design of hyperbaric facilities is presented for use by experienced engineers and architects and members of the Navy Diving Community who require information in this very specialized area. Design guidance is provided on pressure chambers and vessels, appurtenances, foundations piping systems, life support systems, wet pots, fire protection systems, electrical systems, communication systems, control systems, system cleaning, lubricants,</p>

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		<p>sealants, and materials. There is extensive corrosion guidance provided.</p> <p>Keywords: Corrosion, Coatings</p>
<p>UFC 4-211-02</p>	<p><i>Aircraft Corrosion Control and Paint Facilities</i></p>	<p>Provides requirements for evaluating, planning, programming, and designing Aircraft Corrosion Control and Paint Facilities (ACCPFs). The information in this UFC applies to the design of all new construction projects, to include additions, alterations, and renovation projects in the continental United States (CONUS) and outside the continental US (OCONUS).</p> <p>Keywords: Corrosion</p>
<p>UFC 4-440-01</p>	<p><i>Warehouses and Storage Facilities</i></p>	<p>Addresses use of corrosion resistant materials. Provides guidance for Corrosion Protection guidance in Heating, Ventilation and Air Conditioning (HVAC) Systems.</p> <p>Keywords: Corrosion, Coating, Durable, Life-cycle</p>
<p>UFC 4-750-07</p>	<p><i>Recreational Aquatic Facilities</i></p>	<p>Provides technical criteria and requirements for planning, designing, and constructing natatoria and outdoor aquatic facilities for recreational use. Alteration and renovation projects should update existing facilities to meet this criteria within budgetary constraints. This UFC is intended to promote innovative designs that are functional, economical, safe, aesthetically pleasing, and meet the expectations for modern aquatic facilities. Each design should satisfy the unique requirements of each Installation and at the same time be compatible with the local environment and specific site conditions. Addresses corrosion, micro-climates and invokes UFC 1-200-01.</p> <p>Keywords: Corrosion, Sacrificial Anodes, Micro-Climate, UV-Resistant, Deterioration, Mildew</p>

¹Note that there may be additional UFCs that include corrosion related requirements. These requirements may include ESC and ASHRAE humidity considerations. Including every UFC document makes this listing cumbersome and duplicative of the UFC master list. Criteria management is a dynamic process and changes occur all of the time; this listing is provided as an awareness and education tool to help the designer develop responsible and life cycle effective component designs. It is not intended to take the place of researching and including the appropriate identification of design requirements.