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# UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2014

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## SECTION 03 51 01

### PRECAST ROOF DECKS

01/08

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NOTE: This guide specification covers the requirements for precast roof decking.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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## PART 1 GENERAL

### 1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically

be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

#### ASTM INTERNATIONAL (ASTM)

ASTM D1037 (2012) Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

ASTM E84 (2014) Standard Test Method for Surface Burning Characteristics of Building Materials

#### U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-310-04 (2013) Seismic Design for Buildings

### 1.2 SYSTEM DESCRIPTION

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NOTE: Because there is a limited number of manufacturers of these units, there are no national standards governing the design or manufacture of these units. Designer should consult manufacturers' literature for additional information.

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Roof decking units shall be factory-produced items of a firm specializing in precast roof decking. Design of the roof decking shall be for the load conditions and spans indicated and any additional load imposed by openings; work of other trades; and all loading and restraining conditions from fabrication, handling, and erection. Deflection shall not exceed  $L/240$  of span. Submit detail drawings showing roof decking installation, including framing at all openings for support of roof units. The detail drawings shall be accompanied by setting details, design calculations showing that the roof decking installation meets material and design requirements, a descriptive list of materials, and the manufacturer's current printed installation instructions.

### 1.3 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of

the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following 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. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

An "S" following a submittal item indicates that the submittal is required for the Sustainability Notebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REQUIREMENTS.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REQUIREMENTS. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

Installation[; G][; G, [\_\_\_\_]]  
Roof Decking[; G][; G, [\_\_\_\_]]

#### 1.4 DELIVERY, STORAGE, AND, HANDLING

Precast units shall be stored off the ground and protected from weather, marring, damage, or overload. Adequate ventilation shall be provided to prevent condensation. Temporary plank walkways or platforms shall be provided for distributing the weight of materials that are required to be placed upon or transported over the roof decking.

### PART 2 PRODUCTS

#### 2.1 DECK UNITS

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NOTE: Type of units specified will be limited by design requirements. Thickness and other dimensions, if essential to the design, will be indicated. Cement-fiber deck units are available with foam insulation attached. If roof is to be insulated, the use of these units should be

**investigated.**

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Fabrication of roof deck units shall be under plant controlled conditions. Provide openings for mechanical and utility systems and for architectural purposes as indicated. Special shapes shall be fabricated as indicated or required. Surfaces to receive subsequent application shall be suitable for the purpose intended and free of any coatings that would interfere with adhesion or bond. Surfaces showing as exposed ceilings shall be white as manufactured or factory-primed painted to provide a light reflection of 60 percent.

**2.1.1 Concrete Decking**

Concrete deck units shall be fabricated of portland cement and aggregate, reinforced to resist the loads specified. Metal edge members, if furnished with units, shall be galvanized or galvanized and factory painted. Nailable concrete slabs shall be capable of accepting roofing nails without shattering or spalling. Nonnailable concrete slabs shall be either cellular or aggregate concrete, flat or channel in shape.

**2.1.2 Structural Cement-Fiber Roof Decking**

Structural cement-fiber roof decking shall be shaped under pressure to required dimensions from a mixture of wood fibers and cementitious materials in proportions to produce deck units meeting the loading conditions specified. Exterior surfaces shall be suitable for applying roof. Metal edge members, if furnished with units, shall be galvanized. Flame spread shall not exceed 25 and smoke developed rating shall not exceed 50 when tested in accordance with [ASTM E84](#). Linear variation with change in moisture content, both linear and transverse, shall not be more than 0.2 percent when tested in accordance with [ASTM D1037](#).

**2.2 STRUCTURAL STEEL SUBPURLINS**

Steel for structural subpurlin members, if required, shall conform to [the manufacturer's standard] [\_\_\_\_\_].

**2.3 ANCHORAGE**

Fasteners shall be of steel, zinc-coated or equivalent protective metallic coatings.

**2.4 JOINT MATERIAL**

Joint material shall be high-melting-point asphaltic mastic, grout, mortar, or lightweight concrete. Joints at hips and ridges may be filled with wood blocking, single thickness, structural grade, pressure-preservative treated.

**PART 3 EXECUTION****3.1 INSTALLATION**

Installation shall be in accordance with the submitted and approved detail drawings. Installation of equipment required by other trades shall be accomplished as the work progresses if required by the design. Field-cut openings for utilities penetrations shall be accomplished in accordance with the manufacturer's recommendations. Roof deck shall be straight and true, and when laid in place must present a flat, level surface suitable

for application of roofing. All roof decking units shall bear on at least two structural framing members with a 25 mm 1 inch minimum bearing. Any cantilever plank shall not exceed the design span. Installation shall require a minimum of cutting. Cutting, where required, shall be at a true angle to the top of the unit. All units shall be made to fit around openings and projections, valleys, walls, and curbs, so that cut ends occur on supports and in a manner that will not damage the units. When roof deck units are welded to steel supports, welds and damaged galvanized coatings shall be cleaned and coated with zinc-rich paint. No attachment for carrying loads shall be made directly to the roof decking or subpurlins.

### 3.1.1 Subpurlins

Subpurlins shall be aligned to the required spacing and shall bear evenly on structural framing members. End bearings shall be a minimum of 25 mm 1 inch. Subpurlin ends shall have at least 3 mm 1/8 inch clearance to allow for expansion. Subpurlins shall be welded to each structural framing member at every point of crossing, over supporting member with a 19 mm 3/4 inch long fillet weld on alternate sides of the flange except at ends, where both sides shall be welded.

### 3.1.2 Joint Treatment

Job-mixed materials shall be screeded to true, even surfaces and protected until sufficiently hardened to withstand traffic and freezing temperatures. Topside joints between precast concrete units other than metal-edge units shall be filled with portland cement grout or asphaltic mastic. Joints at hips and ridges shall be filled with the specified joint material finished in true planes with tops of units and with surfaces to receive roofing.

## 3.2 CLEANING AND PROTECTION

The complete decking shall be kept clean and free of damaged or defaced units, and left ready to receive roofing. The installed roof decking units shall be protected from damage by weather and construction operations by a temporary cover until application of roofing.

## 3.3 SPECIAL INSPECTION AND TESTING FOR SEISMIC-RESISTING SYSTEMS

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**NOTE:** Include this paragraph only when special inspection and testing for seismic-resisting systems is required by Appendix 11A of ASCE 7.

This paragraph will be applicable to both new buildings designed according to UFC 3-310-04 SEISMIC DESIGN FOR BUILDINGS and to existing building seismic rehabilitation designs.

The designer must indicate on the drawings all locations and all features for which special inspection and testing is required in accordance with UFC 3-310-04 and Appendix 11A of ASCE 7. This includes indicating the locations of all structural components and connections requiring inspection.

Add any additional requirements as necessary.

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Special inspections and testing for seismic-resisting systems and components shall be done in accordance with **UFC 3-310-04** and Section **01 45 35** SPECIAL INSPECTIONS.

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