



US Army Corps  
of Engineers®

Engineer Research and  
Development Center

# Facility Composer

## Technology



*Facility Composer* is a suite of criteria/requirement-based facility modeling tools that integrate customer-specific criteria with a life-cycle facility model and commercial tools. The primary focus of the system is to:

- provide a method to effectively and innovatively create, specify, and track planning and design criteria and requirements
- provide support for architectural programming and project specific criteria/requirements specification during interactive planning charrettes
- support the creative and analytical aspects of architectural conceptual design involving the creation of solutions from specified criteria in an intuitive 3D design environment.

*Facility Composer* includes a life-cycle facility model based on industry standards, integration with libraries of customer-specific criteria, and a flexible architecture that supports commercially-available design and analysis tools. Its core functionality addresses three critical building design areas: (1) creating an architectural program, (2) creating a programmatic facility design, and (3) selecting project specific criteria and requirements. Primary tools in the *Facility Composer* application suite include:

- *Requirements Composer*, a web-based facility criteria and requirement library development and management tool. *Facility Composer* relies on a customizable building or facility-specific library of functions, criteria, and requirements from which the architectural program is developed. This library is essentially a template for beginning a new facility project. Those authorized to use this tool can add new architectural functions and update criteria. *Requirements Composer* will then export the criteria library in an XML-based format for use by the *Planning Composer*.
- *Planning Composer*, used to develop a facility “architectural” program and to add and set project specific criteria. It assists in developing traditional information such as the total project area and allocation of area to specific architectural functions such as circulation and offices. The *Planning Composer* interface is generated according to the XML library downloaded from *Requirements Composer*. It contains discipline-specific such as requirements for structural, electrical, HVAC, lighting, and plumbing. The level of detail in the architectural program varies from project to project, and can be specified as such in the system. Used during a planning charrette, it can also be used as a check list for participants to go through to ensure that all facility standards are met.
- *Layout Composer* supports the creation of programmatic facility designs. *Layout Composer* works in conjunction with Bentley’s *MicroStation Platform ver 8* and uses the programmed area and criteria established in *Planning Composer* as a point of reference and comparison during design. In this phase, the architect determines how many stories are needed and which functions work on which stories (blocking and stacking). The planner can explore conceptual alternatives to find an overall best solution.
- Various discipline-specific *Design Wizards*, which provide an ideal way to flexibly integrate government off-the-shelf (GOTS) or commercial off-the-shelf (COTS) engineering tools. This allows *Facility Composer* to take advantage of COTS functionality without locking the users into a specific set of tools.

## Problem

In traditional and design-build processes, much work is delegated to design and design/build contractors who work in relative isolation from each other. Consequently, linkage between initial design criteria and building spaces or other project elements

(site, building, story, etc.) may be lost. Failure to meet initial design criteria or criteria changes lengthens the review, resulting in “design by review” as changes are made or re-introduced late in the process, slowing the project and increasing its cost.

**Expected Cost To Implement**

*Requirements Composer* is a platform-independent web-based application, and requires a web browser. *Planning Composer* is also platform-independent. The current version of *Layout Composer* requires a licensed standalone version of Bentley Systems Inc.’s *MicroStation* (Version 8). Minimum technical requirements for *MicroStation* are: (1) an Intel Pentium- or AMD Athlon-based PC or workstation with (2) a Windows® operating system (Microsoft® Windows® 2000, Windows® XP, Windows® NT 4, Windows® 98, or Windows® ME), (3) 128 MB RAM, (4) 200 MB free hard disk space, (5) Mouse or digitizing tablet, (6) a supported graphics card, and (7) Microsoft® Internet Explorer ver. 5 or later.

*Planning Composer* and *Layout Composer* are available for download through the Internet free of charge. A user-id and password are needed to use *Requirements Composer*. Contact the ERDC POC below for help in obtaining login information. Additional costs—which will vary based on user needs—are implicit in the training and labor required to define and build the required criteria and requirements base.

**Benefits/Savings**

*Facility Composer* helps maintain the vital link between building criteria and spaces, or other project elements (site, building, story, etc.) by:

1. ensuring that standard facility criteria and requirements are the basis for all facility designs
2. providing a consistent basis for development of DD1391s or other customer-specific approval process
3. incorporating reliable lessons-learned and simplifying distribution and integration of new criteria and requirements, e.g., as requirements that better implement sustainable design principles are developed, they are added to an organization’s standard library for use in subsequent projects
4. helping to support other types of design and analysis later in the facility life cycle (structural, energy, electrical, etc.) through consistent data exchange using industry standard modeling format
5. helping to ensure that the initial design meets corporate criteria, shortening the review process and avoiding “design by review,” resulting in cost and time savings by reducing user changes late in the design process or during construction.

**Status**

*Facility Composer* is currently ready for its first release. The U.S. Department of State, the U.S. Army Reserve, and the Assistant Chief of Staff for Installation Management (ACSIM) are currently funding pilot tests of the software.

**ERDC POC**

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**Distribution Sources**

*Facility Composer* is available for free download through the Internet at the *Facility Composer* web site, at URL: <http://fc.cecer.army.mil/bc/download.jsp>

**Available Documentation**

Software tutorials and a User Manual are available for download from the listed Distribution Source.

**Available Training**

Software tutorials and training materials are available through the *Facility Composer* web site.

**Available Support**

Online support and troubleshooting help are available through the listed Distribution Source, at URL: <http://fc.cecer.army.mil/bc/support.jsp>