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Hanford Waste Treatment Plant completes concrete design for largest facility

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Richland, Wash. -- The Hanford Waste Treatment Plant Project, also known as the “Vit Plant,” recently issued the final design detailing the structural concrete for the Pretreatment Facility. The final drawing represents the completion of the facility’s concrete floors and results from more than 15,000 pages of calculations and 500 other drawings. These calculations and drawings provide the details that enable crews to construct the massive concrete structure.

“Completing the structural concrete design for the Pretreatment Facility--the largest Vit Plant facility--is the culmination of more than 500 Vit Plant engineers’ and designers’ working over several years,” Tom Patterson, manager of engineering at the Vit Plant, said. “It is an important milestone that enables us to fully support the Vit Plant’s construction schedule.”

The Pretreatment Facility structural concrete design includes calculations and drawings that are upheld to the highest nuclear safety and quality standards. Every inch of concrete design--wall or floor--underwent extensive review to ensure it met all regulations and requirements.

When complete, the Pretreatment Facility will be composed of 113,000 cubic yards of concrete and approximately 20,000 tons of steel. It will include five concrete floor elevations, which start at ground level and extend to 98 feet above ground. A single concrete floor ranges from 1 to 8 feet thick and spans 40 to 50 feet, depending on its location within the facility.

Each floor is reinforced with a complex rebar grid, composed of more than one-inch-thick rebar. Many of the floors are also supported by structural steel.

“Thanks to the hard work of the Vit Plant engineers and designers, design of the Pretreatment Facility is more than 75 percent complete, and we are steadily progressing toward Vit Plant construction complete in 2016, commissioning in 2019 and full operations in 2022,” Wahed Abdul, federal area project manager, said.

The Pretreatment Facility walls will reach a total height of 109 feet when finished. Steel columns and roof trusses will extend beyond the walls to an overall height of 120 feet, and the emissions stack will reach nearly 200 feet.

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When complete, the Pretreatment Facility will be composed of 113,000 cubic yards of concrete and more than 20,700 tons of steel. (Photo 2 of 2)

Bechtel National, Inc. is designing and building the world's largest radioactive waste treatment plant for the U.S. Department of Energy at the Hanford Site in southeastern Washington state. The \$12.2 billion Waste Treatment and Immobilization Plant, also known as the "Vit Plant," will immobilize the radioactive liquid waste currently stored in 177 underground tanks using a process called "vitrification."

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Vitrification involves blending the waste with molten glass and heating it to high temperatures. The mixture is then poured into stainless steel canisters. In this glass form, the waste is stable and impervious to the environment, and its radioactivity will dissipate over hundreds to thousands of years.

The Vit Plant will cover 65 acres with four nuclear facilities -- Pretreatment, Low-Activity Waste Vitrification, High-Level Waste Vitrification and Analytical Laboratory -- as well as operations and maintenance buildings, utilities and office space.

Construction of the Vit Plant began in 2001 and is more than 60 percent complete. The project is scheduled to complete construction in 2016; will reach commissioning in 2019 and achieve full operations in 2022.

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