

F-22 Radar Cross-Section Facility Hill Air Force Base Utah



US Army Corps of Engineers Protects Sensitive F-22 Radar Facility with Hycrete Waterproofing and Corrosion Protection

Structure:	Below-grade turntable pit and tunnel
Application:	Pit slab and walls, tunnel slab and walls
Owner:	United States Air Force
General Contractor:	Okland Construction
Architect:	AECOM
Engineer:	US Army Corps of Engineers, Vector Engineers
Ready Mix Provider:	Jack B. Parson Companies
Concrete Testing Agency:	Intermountain Testing Services

“Using Hycrete saved us time and money. Instead of installing an expensive water drainage system we added Hycrete W1000 to our concrete. The structure is dry and we have the added benefit of corrosion and sulfate protection in our concrete.”

Anthony Joseph, Construction Control Representative,
US Army Corps of Engineers, Sacramento District

Introduction

The U.S. Army Corps of Engineers is overseeing the construction of the F-22 Radar Cross-Section (RCS) Imaging Facility at Hill Air Force Base. The facility is designed to enable testing and maintenance of the F-22 Raptor’s radar capabilities. The project includes a turntable pit designed to support the F-22 as well as a connecting tunnel housing mechanical equipment.

Challenge

The turntable pit and tunnel will house sensitive mechanical equipment for supporting and testing the F-22. The pit is 42.5 feet deep and 44 feet in diameter and is in the water table. Before pouring the tunnel walls, running water was visible in the tunnel. In addition, a soil analysis indicates the presence of chlorides and sulfates in the Hill AFB soil. As such, it is critical that the structure is water-tight and the concrete is protected from the ingress of chlorides and sulfates.



Tunnel wall (with low-strength fill) in the water table before pouring concrete wall.

“The project is in the water table and before placing the concrete walls running water was visible in the tunnel and pit. Hycrete has produced a dry structure even in the areas with running water.”

Jason Bartschi, Civil Quality Control, Okland Construction

SUMMARY OF BENEFITS:

- Waterproofing protection in conjunction with an exterior membrane system
- Moisture vapor protection; reduced humidity in sensitive interior spaces
- Corrosion protection; enhanced concrete life from dual protection mechanism
- Sulfate protection; enhanced concrete and structural durability
- Reduced maintenance

“Hycrete not only waterproofed the structure, it also provided corrosion protection in the same technology – a unique benefit not offered by alternative technologies.”

Wells Holmes, Project Engineer, Vector Engineers

Solution

Hycrete was added to the concrete to waterproof the pit and tunnel and protect the interior space from water and moisture vapor and the concrete from the ingress of damaging chlorides and sulfates. Hycrete W1000 admixture shuts down capillary absorption of water and dissolved salts, providing lasting protection to the concrete structure.

Hycrete W1000 reduces absorption in concrete and moisture vapor transmission through concrete. In the event that water finds a way around the applied membrane system and to the surface of the concrete, absorption of water and deleterious elements such as chlorides and sulfates will be reduced, and interior humidity-related issues will be mitigated due to reduced moisture vapor transmission. Using Hycrete enhances concrete durability, reduces risk of water damage water-related problems such as mold and mildew, and saves time associated with reductions in required maintenance.



Pit wall cast with Hycrete W1000 admixture

Result

The facility is dry and the sensitive interior space and equipment is protected from damaging water and moisture vapor and related problems such as mold and mildew. Also, the concrete has long-term protection from chlorides, sulfates, and other damaging elements. Hycrete has been shown to extend the life of concrete in similar conditions by as many as 50 years compared to alternative solutions. Finally, using Hycrete reduces maintenance requirements, saving the owner time and money.

