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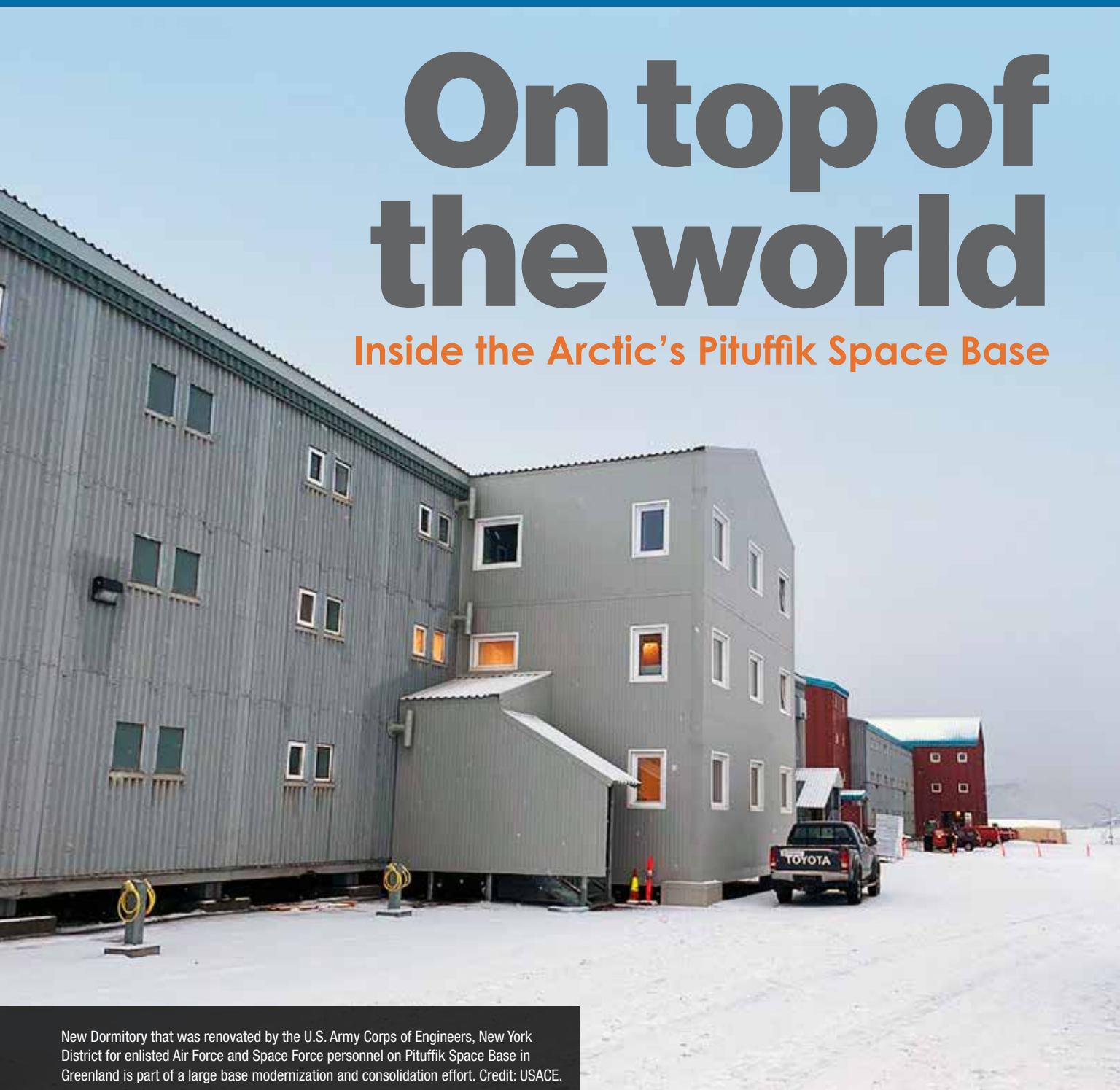
Inside the Arctic's Pituffik Space Base



New Dormitory that was renovated by the U.S. Army Corps of Engineers, New York District for enlisted Air Force and Space Force personnel on Pituffik Space Base in Greenland is part of a large base modernization and consolidation effort. Credit: USACE.

On top of the world

Inside the Arctic's Pituffik Space Base

By JoAnne Castagna

The Thule Air Base in the Arctic recently was renamed Pituffik Space Base. The new name recognizes the Native people of the region and their support of the installation that performs national security for the United States. Performing this critical mission are Airmen and Guardians who must live and work in this harsh and remote environment. To support them, the US Army Corps of Engineers, New York District constructs essential structures on the base to keep them safe and their morale up during a challenging tour-of-duty.

Panoramic image of Pituffik Space Base in Greenland from the top of a nearby mountain. Taken in 2019. CREDIT: JoAnne Castagna, Public Affairs.

It is clear that on every level, the mission at Pituffik Space Base is about supporting people—the natives, the Airmen and Guardians and, ultimately, the citizens of the US. The Army Corps has been a part of this support all along. Recently, it renovated a dormitory for the Airmen and Guardians as part of a larger effort to consolidate and modernize the base.

Pituffik Space Base—pronounced bee-doo-FEEK—is the US' military's northern-most installation, located in the northwestern corner of Greenland, a province of Denmark, in a coastal valley 750 miles north of the Arctic Circle and 947 miles south of the North Pole. The base is operated by the 821st Space Base Group, which hosts the 12th Space Warning Squadron and the 23rd Space Operations Squadron Detachment 1. Their mission is to perform missile warning, space surveillance, and satellite command and control for the US.

The building is energy-efficient and has LED lights, automatic light switches, energy-efficient windows, and the building is tied into the base's hot water district heating system the Army Corps upgraded.

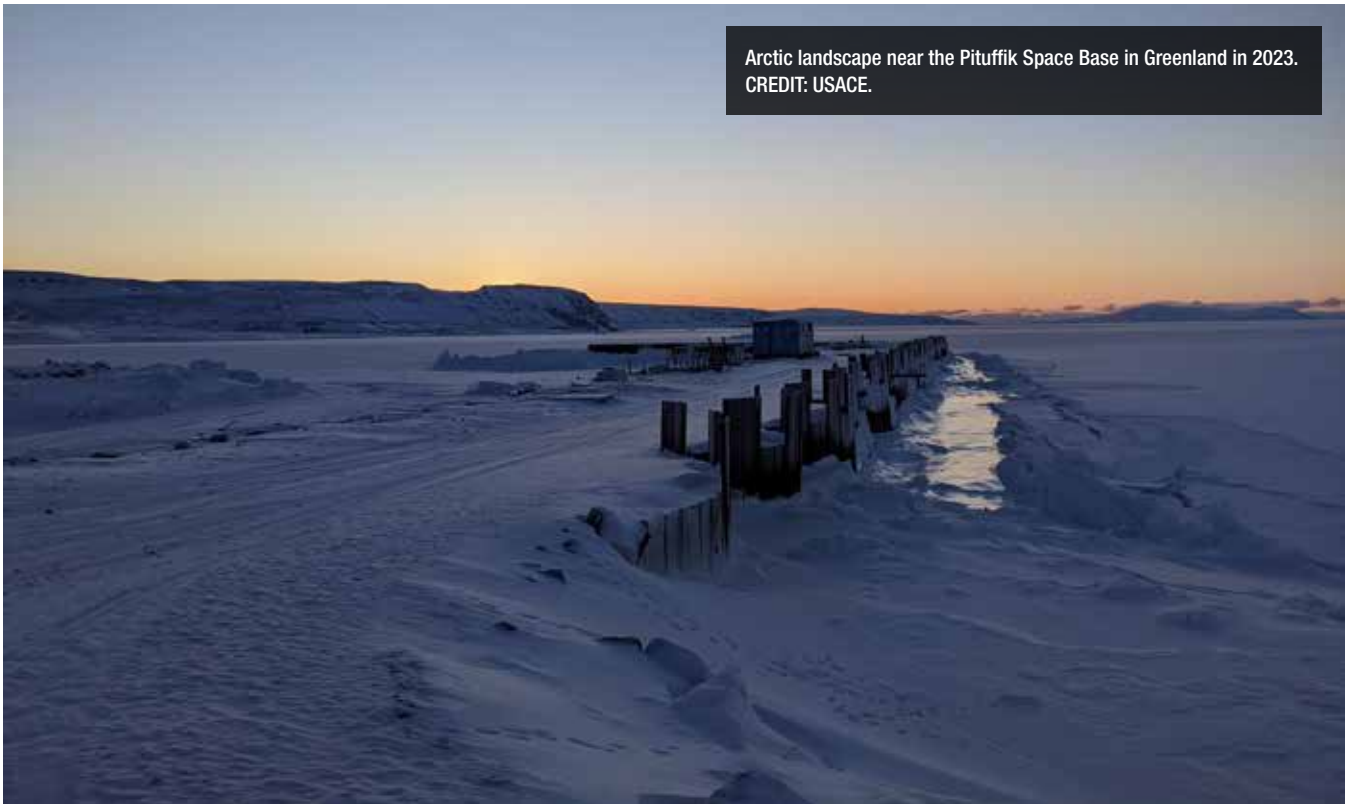
Performing this mission are approximately 650 men and women, which include 200 active-duty US Air Force and Space Force personnel or Guardians, and Canadian, Danish and Greenlandic civilian contractors who live and work on the base. Service men and women have been on the base since the 1950s performing different missions over the years.

Throughout this entire time the Army Corps has supported the base's mission through the construction of structures, including a medical center, an aircraft runway with surrounding apron and taxiways, and many dormitories.

The Army Corps performs this construction in a harsh Arctic environment, and it has years of experience doing this (See sidebar, "Construction Challenges in the Arctic"). Many of the original buildings from the 1950s were spread out over the large base and had become severely weather-worn and energy inefficient.

On a mission

Several years ago, the US Air Force started a mission to cut the agency's energy consumption by 40%, not only to save energy, but also to save taxpayers money and sustain the base's readiness. The Army



Arctic landscape near the Pituffik Space Base in Greenland in 2023. CREDIT: USACE.

Waterways around Pituffik Space Base in Greenland. Taken in 2019. Credit: JoAnne Castagna, Public Affairs.

Corps was called upon to consolidate and modernize the base. It did this in partnership with two Army Corps agencies that have expertise in performing construction in an Arctic environment—the Cold Regions Research & Engineering Lab and the US Army Corps of Engineers Engineer Research & Development Center.

This work has included upgrading the base's heating system, demolishing 31 old buildings, building new structures closer together to the base's essential services such as the airfield and hangars, dining facility and hospital, and renovating dormitories and 636 existing dormitory rooms.

Recently, the Army Corps completed renovation of one of these dormitories for enlisted Air Force and Space Force personnel. "This new dormitory will help to provide Airmen and Guardians with the quality of life they deserve on a difficult assignment to Pituffik Space Base in the Arctic Circle," says former New York District Commander Col. Matthew Luzzatto. "Pituffik's remoteness and harsh climate restricts all personnel assigned there to live on base, which is why it's so important to provide top notch housing facilities."

The dormitory was renovated by Contractor MT Højgaard Gronland, of Denmark, under the Army Corps' supervision. The three-story dormitory was built in the 1950s and the structure was substandard and out of compliance with Air Force Standards. The building was energy-inefficient and was gang-latrine style with small rooms, a common bathroom and kitchen space, limited laundry capacity and lacked a fire suppression system.

Stella Marco, project manager, New York District, US Army Corps of Engineers, the former project manager for this project says gang-latrine style dorms do not provide any privacy. "When a person stayed at Pituffik in a gang-latrine type of building they were assigned an individual room that contained the amenities of a bed, television, desk, and a closet. However, all showers and toilet areas were located down a hall, in one area, that would require the guest to walk down through a public hallway to use."

In contrast, this renovation changed the dormitory from a gang-latrine building to one with private studios for 54 Airmen and Guardians.

The building's roof and walls were repaired, and the inside was gutted out to create 18 studios on each floor. The studios consist of a living room, kitchen, bedroom, bathroom, and entry way, providing the servicemembers with privacy, rest and personal well-being needed in such a harsh

and remote location. The Airmen and Guardians also have shared space that includes a common kitchen and dining room where they can relax and socialize.

The building is energy-efficient and has LED lights, automatic light switches, energy-efficient windows, and the building is tied into the base's hot water district heating system the Army Corps upgraded.

Brian Packowski, project manager, New York District, US Army Corps of Engineers, currently manages the project. He says that providing Airmen and Guardians modern dormitories is important for their safety and morale in this harsh and remote part of the world. "In Pituffik, there are extreme cold and deadly snowstorms that can keep them in their dorms for long periods of time. There are also months out of the year when they're in complete darkness and months of constant sunlight. I'll never forget my first-time landing there and experiencing the sun never setting. My stays are short compared to what these Airmen must do. It's an honor to support them and the critical mission they perform for the United States."

The Army Corps' consolidation and modernization work on Pituffik Space Base continues. Upcoming projects include the renovation of another dormitory and further upgrades to the base's heating system. ■

Construction Challenges in the Arctic

Arctic construction can be challenging due to severe weather and limited daylight, which requires the use of unique building materials, techniques, and fast paced construction. Construction takes place during the summer and autumn months when the temperature is a "balmy" 40 degrees Fahrenheit.

There also is sufficient daylight during these seasons. Because of Pituffik's proximity to the North Pole, the region has 24-hours of sunlight March-August, and 24-hours of darkness or what is called "Polar Night" from October-January. The warmer temperatures make it possible to break up the iced shipping lanes. This allows cargo ships into ports supplied with fuel and construction materials.

Building materials include concrete foundations, insulated steel and metal walls, roof panels and prefabricated parts so that the workers can perform construction rapidly.

When workers begin construction on a new building, they start with an elevated Arctic foundation. Most of northern Greenland is covered with permafrost, which is permanently frozen ground—ranging from 6 to 1,600 feet in depth.

If a building is not constructed off of the ground, the heat from the building can melt the permafrost, making the ground unstable and causing the building to sink. Buildings are elevated 3 feet from the ground with the use of spread footings that go down about 10 feet deep and concrete columns that come up and support the floor system above the ground.

As construction progresses and winter rolls around with temps as low as minus 30 degrees Fahrenheit, workers must complete the outer shell of the building and begin interior construction. This work includes constructing mechanical, electrical, plumbing and fire protection systems that are designed to withstand extreme frigid sub-zero temperatures.

Dr. JoAnne Castagna is a Public Affairs Specialist and Writer for the U.S. Army Corps of Engineers, New York District. She can be contacted at joanne.castagna@usace.army.mil.