TYPE B-3 FINAL

Basis of Design

Repair B403 for Cyber

Project Number PBXP222050

Prepared for

179th Civil Engineering Squadron
Ohio Air National Guard
Mansfield Lahm ANG Base

May 2026

Jacobs

Jacobs

Repair B403 for Cyber

Mansfield Air National Guard Base, OH

PREPARED FOR:	Ohio Air National Guard
PREPARED BY:	Jacobs Engineering
DATE:	May 2026
PROJECT NUMBER:	FA877006 (Jacobs), PBXP222050 (ANG)
REVISION NO.:	Type B-3 Design

Project Description

Scope: This project is to construct a data processing facility to meet mission requirements. Facilities will be designed as permanent construction in accordance with Department of Defense (DoD) Unified Facilities Criteria (UFC) 1-200-01 - General Building Requirements, UFC 1-200-02 - High Performance and Sustainable Building Requirements, and other UFC applicable to the mission and building requirements. This facility shall be compatible with applicable DoD, Air Force, mission-specific, and base design standards. In addition, local materials and construction techniques shall be used, where cost effective. This project shall comply with DoD antiterrorism (A/T) requirements pursuant to the UFC.

Floor Plans: Jacobs prepared the as-built drawings for existing conditions at B403. The base provided concept sketches showing space requirements in the facility.

Number of Occupants: Per the SOW, the occupancy is 10 Full Time, 15 UTA. Jacobs understands a higher occupancy is desired and will design to fit as many occupants as possible.

Hours of Operations: 24 Hours

Room Info & Special Requirements: The scope of this project is to renovate an existing facility, not to exceed 6,200 square feet, for the new cyber mission. Activities in the facility include administrative, data processing, and data analysis.

Sustainability Goal: This project is registered with the Green Business Certification, Inc (GBCI) and will obtain sustainability certification for Guiding Principles (GP).

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Project Site Description

Site Description: Access to the installation is by way of Harrington Memorial Road. The proposed site is the existing facility adjacent to the Fuels Systems Maintenance (Building 409) and south of the existing Taxiway Alpha and Runway 5-23.

1. Base Standards: Provided by the Base Civil Engineer.
2. Existing Utilities:
    a. Natural Gas Distribution Pipe: 3 inch
    b. Water Distribution Mains: 8 inch
    c. Sanitary Sewer Pipelines: 6 inch
    d. Buried Electrical
    e. Buried Communications
3. Existing Topographic Survey: Not included in project; existing grades shown from as-built drawings
4. Existing Soil Borings: Available in Geotechnical Report
5. Traffic, parking, fencing, etc: Area map provided
6. Known Environmental Restrictions: None

Site Plan: Jacobs prepared the existing site plan at B403

Utility Plan: Jacobs prepared the existing utility site plans at B403

Architectural Treatment: The project will comply with base architectural standards and compliment other modern facilities on the base.

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Repair B403 for Cyber

Mansfield Air National Guard Base, OH

PREPARED FOR:	Ohio Air National Guard
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DATE:	December 2025
PROJECT NUMBER:	FA877006 (Jacobs), PBXP222050 (ANG)
REVISION NO.:	Type B-3 Design

1.0 Introduction

The 179th Cyberspace Wing requires data processing and operational space to support initial operating capability of a new Cyber Warfare mission. Building 403 was undergoing a construction project in 2021 to expand the building and provide corrosion control capabilities. The new cyber warfare mission was announced during construction, and the project was descoped to include only the building shell and stub-ins for utilities. This project will modify the existing space in Building 403 to provide secure administration and training spaces, a conference room, and a server room for the new mission. The design will provide supporting infrastructure and backup power.

References to sensitive or secure information are omitted from this document.

2.0 Codes & Standards

Codes and standards in effect on 26 Feb 2025 are the governing codes for this project.

2.1 Air National Guard

- ANGETL 24-02 Air National Guard Design Objectives and Procedures
- ANGETL 15-01-01 Sustainable Design, Development, and Resource Conservation
- ANGETL 24-01-03 Fire Protection Design Guidance
- ANGETL 15-01-04 Mechanical Engineering
- ANGETL 24-01-05 Electrical and Communications Engineering
- ANGETL 24-01-07 Airfield and Vehicle Pavement Design Guidance

2.2 Unified Facilities Criteria

- UFC 1-200-01 DoD Building Code
- UFC 1-200-02 High Performance and Sustainable Building Requirements
- UFC 3-101-01 Architecture

- UFC 3-110-03 Roofing
- UFC 3-201-01 Civil Engineering
- UFC 3-210-10 Low Impact Development
- UFC 3-250-04 Standard Practice for Concrete Pavements
- UFC 3-301-01 Structural Engineering
- UFC 3-400-02 Design Engineering Weather Data
- UFC 3-401-01 Mechanical Engineering
- UFC 3-410-01 Heating, Ventilating, and Air Conditioning Systems
- UFC 3-410-02 Direct Digital Control for HVAC and Other Building Control Systems
- UFC 3-420-01 Plumbing Systems
- UFC 3-501-01 Electrical Engineering
- UFC 3-520-01 Interior Electrical Systems
- UFC 3-530-01 Interior and Exterior Lighting Systems
- UFC 3-575-01 Lightning and Static Electricity Protection Systems
- UFC 3-580-01 Information and Communications Technology Infrastructure Planning and Design
- UFC 3-600-01 Fire Protection Engineering for Facilities
- UFC 3-740-05 Construction Cost Estimating
- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- UFC 4-010-05 [Secure Area] Planning, Design, and Construction
- UFC 4-010-06 Cybersecurity of Facility-Related Control Systems
- UFC 4-021-01 Design and O&M: Mass Notification System

2.3 General Codes & Standards

- International Building Code (IBC)
- ANSI Z359.18-2017 Safety Requirements for Anchorage Connectors for Active Fall Protection Systems
- Architectural Barriers Act (ABA) Standards

2.4 Civil Codes

- EISA 438 Stormwater Management for Federal Facilities

2.5 Structural Codes

- ASCE 7 Minimum Design Loads for Buildings and Other Structures
- ACI 318 Building Code Requirements for Structural Concrete
- TMS 402/602 Building Code Requirements and Specifications for Masonry Structures

- ACI 530 Building Code Requirements for Masonry Structures
- AISC 360 Specification for Structural Steel Buildings

2.6 Fire Protection Codes

- NFPA 1 Fire Code
- NFPA 10 - Standard For Portable Fire Extinguishers
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 24 Standard for the installation of Private Fire Service Mains and Appurtenances
- NFPA 70 National Electrical Code
- NFPA 72 National Fire Alarm and Signaling Code
- NFPA 80 Standard for Fire Door and Other Opening Protectives
- NFPA 90A Installation of Air Conditioning and Ventilating Systems
- NFPA 101 Life Safety Code
- NFPA 220 Standard on Types of Building Construction
- TSFPEWG G 3-600-01.01-18
- NFPA 241 Safeguards During Construction
- NFPA 291 Recommended Practice for Fire Flow Testing and Marking Hydrants

2.7 Mechanical and Plumbing Codes

- International Mechanical Code
- International Plumbing Code
- ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality
- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
- NFPA 54 National Fuel Gas Code
- NFPA 90A Installation of Air Conditioning and Ventilating Systems

2.8 Electrical Codes

- NFPA 70 National Electrical Code (NEC)
- Illuminating Engineering Society (IES) Recommended Practices
- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
- NFPA 780 Standard for the Installation of Lightning Protection Systems
- NFPA 101 Life Safety Code

2.9 Communication Codes

- TIA-568.1-D Generic Telecommunications Cabling for Customer Premises

- TIA-568.3-D Standard Optical Fiber Cabling and Components
- TIA-568.C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standards

3.0 Demolition

3.1 Civil Demolition

Site demolition will be limited to removal of segments of concrete sidewalks and aprons, fencing portions of asphalt pavement and gravel surfacing supporting utility installation and access to building entrances as required.

3.2 Structural Demolition

Structural demolition will be limited to the extent possible. Selective demolition of portions of walls and slabs to accommodate openings and penetrations will be required.

3.3 Architecture & Interiors Demolition

The demolition scope outlined here focuses on modifications to the exterior and interior of a building. These modifications include changes to existing openings, and removal of specific elements like doors, windows, and walls.

Exterior: There are numerous existing openings within the building perimeter that will be removed and infilled with concrete masonry units (CMU) and vertical metal panels to match the look of the existing facade. Those openings consist of; two existing overhead sectional doors, one existing roll-up door, three single size doors, one double size door, two existing aluminum window systems and numerous metal louvers. At the main entry of the building the existing double door will be removed and partially infilled in preparation for a new sound rated single size hollow metal door and frame.

Interior: Portions of existing CMU walls will be removed to accommodate new door and framed openings. There are two existing overhead sectional doors that will be removed and infilled. Around where the original existing restroom was planned to go there are two existing partial-height CMU walls that will be removed to accommodate new restroom construction.

These modifications aim to enhance the building's functionality, security, and aesthetic appeal while ensuring compliance with relevant building codes and standards.

3.4 Fire Protection Demolition

The existing fire alarm system will be removed and replaced.

The existing partial sprinkler system will be removed. The existing fire riser location will be cut and filled, and a new fire riser connection will be piped to a new location.

3.5 Mechanical Demolition

Most of the mechanical equipment in the building was demolished during the previous project. The remaining HVAC equipment serving B403 including a makeup air unit on the roof and a gas-fired unit heater will be demolished.

The sanitary service lines in the slab and overhead vent service shall remain for the new plumbing fixture connection. Existing natural gas will be demolished back to the main entry service and capped. New domestic water service to the fixtures is anticipated.

3.6 Electrical Demolition

The existing 500kVA utility transformer located next to building 500 will be demolished. This transformer supplies power to both Building 500 and Building 403. The new Building 403 loads in addition to the existing Building 500 loads have exceeded 500kVA.

The existing underground conduits and conductors are too small to reuse for the larger building service that is required. The underground secondary conduits will be abandoned in place or demolished where required for site work or equipment installation. The secondary conductors between the existing transformer and the Building 403 electrical room will be demolished. The primary feeder to the existing 500kVA transformer will be reconnected to the new pad-mount transformer in the same location. The Building 500 secondary conductors will be re-terminated to the new pad-mount transformer.

The existing electrical equipment located in the Building 403 electrical room will be demolished. This equipment includes a service-entrance panel, meter, current transformer (CT) cabinet, dry-type transformer, and a panelboard. The existing electrical equipment is not sized adequately for the new, larger building loads. Existing electrical equipment located within the building footprint will be demolished including, but not limited to, lighting, controls, disconnects, receptacles, junction boxes, conduits, and conductors.

3.7 Communications Demolition

The existing wall-field of plywood and wall-mounted equipment will be removed. The existing communications cabling will be relocated to service the new Telecommunications Entrance Facility (TEF). The 24 strands of Single-Mode fiber will be removed to the closest maintenance hole and marked for future use. (2) 4-inch conduits service the building from an adjacent maintenance hole south of the building and will also be removed. All communications equipment will be removed from the building.

4.0 Civil Design

4.1 Site Location and Improvements

The site is on the western edge of the Base off the flightline with Building 500 to the south and Building 409 to the north and Building 408 to the southeast. It is accessed off Mustang Road to the east, and most parking is aggregate surfacing southeast of the building. A concrete apron is in front of the roll up doors and a concrete sidewalk wraps the building to the north around to the mechanical yard on the western side of the building. No topographic survey was conducted for this project.

No new parking will be installed in this project. Portions of sidewalk will be demolished for the new ramps at the exterior doors (north, west, and east sides of the building) and to facilitate the new mechanical and electrical equipment. New segments of sidewalk will be installed to provide continuous access around the building. The sidewalks will tie into existing grades and meet ABA slope requirements. The existing asphalt pavement will be sawcut to provide space for the mechanical equipment yard north of the main entrance. Minor pavement patching is required to connect asphalt pavement to the concrete sidewalks along the northeastern side of the building.

The folding antennae tower will be installed on top of the existing flight line pavement to the southeast of existing Building 500. The perimeter fence will be rerouted around it and tied back into the existing fence.

West of the building towards the flightline is sod as well as to the southwest of the building towards Building 500. A below grade stormwater infiltration chamber was installed during construction of the previous project. It will remain in place. Landscaping will only be required as incidental to construction and to restore areas to match existing. Aggregate surfacing will be restored where new trenching is required and to restore areas around equipment pads.

New bollards will be provided in the aggregate surfacing to protect the existing hydrant to the south of the building.

4.2 Utilities

The building currently has utility stub outs for domestic water, fire water, sanitary sewer, gas, and power installed into the building. A new electrical service will be provided from a new pad-mount transformer near Building 500 to the electrical room Southeast of the electrical room, two heat pumps will be installed along the building in the sidewalk. Further to the southeast, a new generator, transfer switch, cabinet and meter will be installed on a pad in the new concrete sidewalk. Five condensing units will be installed in the footprint of the former concrete apron near the double door entrance on a concrete pad. A concrete equipment pad and enclosure will house the mechanical equipment to the north of the main entrance. Three condensing units will be placed adjacent to the building on concrete equipment pads at the rear of the building near the southwest corner. New communication lines will be supplied to the building. Communication lines will also be fed to the antennae tower. Advantor is the base standard, and a new conduit to the facility from a nearby vault east of the building will be required.

4.3 EISA 438

Per the Environmental Protection Agency (EPA), Federal projects under Section 438 of the Energy Independence and Security Act (EISA); any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. As a result, the project is designed to conform to the EISA 438 requirements. However, EISA requirements were met when the building was first constructed and the infiltration gallery collecting roof run off was built to the west of the building. As a result, no further improvements were required with this building's renovation.

4.4 Accessibility

Exterior doors will be made accessible as required for ABA compliance. Ramps will be installed at the main entrance and at any emergency egress door where raised flooring occurs. If ramps block circulation to other doors along the sidewalk small panels of concrete sidewalk will be installed to provide circulation. The door and ramp at the Telecommunications Entrance Facility (TEF) is designed to meet ABA compliance however it is not intended for this area to be an accessible form of egress. The ramp and door are used for moving of servers and other equipment only.

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