Hangar 1 Rehabilitation Project
Consulting Parties Presentation

June 3, 2020
Hangar 1 Rehabilitation Project, Consulting Parties
Presentation Agenda

- Consulting Parties Presentation Intro
- Rehabilitation Project Introduction
- Rehabilitation Approach and Goals
- Exterior Reclad Approach, Shenandoah Plaza
- Exterior Reclad Approach, Airfield
- Interior Rehabilitation Approach
- Interior Illumination Rehabilitation Approach
- Building Performance: Daylighting and Glare
- Comparative Images: Historic and Proposed
- Comments and Questions
Project Introduction
Naval Air Station Sunnyvale, CA Historic District

- Listed in the NRHP 1994
- Listing includes Shenandoah Plaza Campus and Hangars 1-3
- Expanded District boundary, 2013
Hangar 1, Buildings 032 and 033

- Hangar 1: 1933
- Buildings 032 and 033: 1934
Hangar 1 Rehabilitation Approach and Goals
Project Scope / Areas of Consideration

Secretary of the Interiors Standards Conformance

Hangar 1
- Abatement
- Seismic strengthening
- Re-clad
- Interior Improvements
- Infrastructure Improvements and Limited Site Work

B032 and 033
- Repair and Maintenance
Abatement
Structural Strengthening Approach

**Intent:** The design intent is to maintain loads that were historically present.

**Structural condition assessment:** Where no distress is evident and if the dead and live loads will not exceed those historically present, the structure may be deemed adequate.

**Proposed rehabilitation action:** Where loads exceed those historically present the provisions of CEBC Section 403 for Alterations would apply.

**estimated number of members to be strengthened:** approximately 4,200 out of 56,500

**projected percentage of members to be strengthened:** >1%
Proposed Typical Strengthening Detail: Double Angle

CONCEPTUAL STRUCTURAL STRENGTHENING

EXISTING CONDITION

PROPOSED STRENGTHENING

REPLACE RIVETS W/ BOLTS

REPLACE RIVETS W/ BOLTS

ADDED REINFORCING ANGLES

# MEMBER TYPE  ESTIMATED COUNT  % STRENGTHENED

13,200 TOTAL  650  5%
The Project will replicate, as closely as possible, the overall visual characteristics of the original cladding.
Original Hangar 1 Performance Deficiencies for Potential Future Tenant Uses

Performance deficiencies of original systems whose replication would risk damage to historic fabric and impede operational capability sufficient for potential future tenant uses.

Thermal performance and condensation:
Uninsulated roof systems

Occupant experience:
High solar heat gain @ West windows

Ventilation openings:
Insufficient for primarily human occupation

Water air permeability:
BUR and Mansard Roof

Interior illumination:
Low daylighting level and point glare

Thermal:
Consistently low temps, especially in mornings

Acoustics:
High transmission from exterior / high reverberation at interior
Hangar 1 Performance Improvements for Potential Future Tenant Uses

**Ventilation openings:**
- Intake and exhaust at roof, at existing window openings

**Water air permeability:**
- Membrane roofing over steel decking
- Built to purpose low slope roofing system

**Occupant experience:**
- More and better-distributed daylighting

**Thermal:**
- Larger window openings, targeted morning solar heat gain

**Acoustics:**
- Improved facade performance

Performance improvements including adequate waterproofing, tempered interior, and daylighting to help conserve historic fabric, and to improve interior environment for potential future tenant uses.
The following content was redacted from this public posting:

Areas of Archaeological Sensitivity
Hangar 1
Ground Disturbance

- Disturbance exterior and adjacent to Hangar primarily shallow (~0 - 2 feet deep)
- Deep disturbance (~2 - 8 feet deep) almost entirely within Hangar interior, at previously disturbed locations
Hangar 1 Exterior Reclad Approach, Shenandoah Plaza
The original fenestration pattern will be retained, and window openings will remain in their original locations and sizes.
The original fenestration pattern will be retained, and window openings will remain in their original locations and sizes.
Typical Original Metal V-Beam Wall Siding Details

Typical Original V-Beam
Horizontal Joint

Typical Original V-Beam Vertical Joint
The new aluminum wall siding will retain the shape and profile of the original.
Original Mansard Siding Details

Original Typical Mansard Detail

Side Lap Nailed & Lead Washers 10 Cms.

End Lap Nails & Lead Washers Each Corr

Lap Detail for Mansard
Proposed Typical Mansard Siding Details

New Mansard siding will be a sheet standing seam product with the seam size and spacing reflecting a similar character to the original with a smooth surface and regular pattern of seams
Comparison of Original and Proposed Mansard Siding Profiles
Hangar 1 Exterior Reclad Approach, Airfield
Proposed View from Airfield Side

Airfield side historic openings will be retained within an expanded window area. An architectural metal louver system is designed to visually integrate the enlarged glazed opening with the surrounding profiled metal panels in order to minimize visual impact, and which becomes less visible as the view becomes more oblique.
Proposed View from Airfield Side

Oblique views conceal the expanded window area behind the architectural metal louver system.
Proposed View from Airfield Side

Oblique views conceal the expanded window area behind the architectural metal louver system.
The louver system will consist of a perforated V-Beam extrusion so that the expanded glass area is not typically visible from the exterior, and the size, shape, and pattern of the historic windows will remain visible.
Proposed View from Airfield Side
Hangar 1 Interior Rehabilitation Approach
Interior Rehabilitation / Occupiable Upgrades Approach

Original arrangement of interior spaces:
Central volume flanked by office and shop spaces

Proposed arrangement of interior spaces:
Central volume flanked by office and shop spaces
Interior Rehabilitation Approach / Occupiable Upgrades Approach

- Grid of utility (power, mechanical piping, data and comms) distribution trenching provides utility access for all “Neighborhoods”
- Rehabilitated aviation door provides access for vehicles, small aircraft
- Reconfigured stairs at six (6) locations
- New electrical / comms rooms at six (6) locations
- Existing fabric features to remain
- New electrical / fire riser rooms at four (4) locations
- New entry vestibule / toilet rooms at four (4) locations
- Rehabilitation clamshell doors provide access for extremely large objects
- Configuration of open central volume flanked by functional spaces and mezzanine preserves intact Character
Typical Entrance Core

To maintain the overall visual effect of the hangar’s interior, new entries will be located at building sides with structural frame exposed, as it was historically.
New cast-in-place concrete cores containing building services will be constructed at multiple locations along the east and west sides of the building, under the mezzanine/level two; equipment will be screened from view by walls and/or parapets.
Rehabilitated Stair

Stairs will be reconstructed and reconfigured to provide required clearances and railings, using similar concrete and metal fabrications in similar locations as the originals, with finish colors easily distinguished from historic fabric.
Hangar 1 Interior Illumination Rehabilitation Approach
Interior Lighting

The original interior lighting scheme of Hangar 1 was designed to illuminate the cylindrical hull of the USS Macon from all sides. To provide illumination necessary for occupancy and maintenance, artificial illumination will be directed toward the ground floor surface.
Hangar 1 Historic View: Interior
Proposed Interior View: Lighting

The historic interior lighting layout will be recreated with new, utilitarian, industrial-style fixtures in sizes and designs similar to the originals, located within reach of catwalks in a pattern to recall the historic layout.
Hangar 1 Building Performance: Daylighting and Glare
Hangar 1 Historic View: Interior
Openings at the Tier Three windows on the airfield (east) side of Hangar 1 will be enlarged for two reasons: (1) to increase solar heat gain in the building interior in the morning, which will help prevent recurrence of the past condensation issues; and (2) to provide additional natural light for future new uses, and (3) to reduce point glare.
Hangar 1 Comparative Images, Historic and Proposed
Hangar 1 Historic View: Shenandoah Plaza
Proposed Shenandoah Plaza View
In-ground aesthetic uplighting will be installed around the perimeter of the building to wash the walls, and fixtures concealed on the monitor will wash the roof.
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Hangar 1 Historic View: Profiled metal panel
Proposed Metal Siding Panels

Shenandoah Plaza facade

Airfield facade
Proposed Airfield View
Hangar 1 HABS View: Airfield Facade
Proposed Airfield View
Hangar 1 Historic View: Shenandoah Plaza
Proposed View from Shenandoah Plaza
Hangar 1 Historic View: Shenandoah Plaza
Proposed View from Shenandoah Plaza
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