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INTERNATIONAL
Airside Office Park
100 Airside Drive
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Basis of Design
PREFINAL DESIGN SUBMISSION
Building (Design Package 2 – DP2)

Volume One

P1338 MEF SIMULATION TRAINING BUILDING
MCB Camp Lejeune, NC

RQ / WM Jordan JV

Contract No. N40085-20-C-0059

JUNE 2021

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CHAPTER 1 – GENERAL OVERVIEW

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in two Design Packages.
   (1) P1338 Early Site Civil Design Package – which will include the Site work, Foundations, and Geotechnical work
   (2) P1338 Building Design Package – which will include the design of Architectural, Interiors, Structural, Building Enclosures, and Remaining Work, as well as design of Furniture/Equipment

ii) List all design packages
   (1) DP1 – P1338 Early Site Civil Design Package
   (2) DP2 – P1338 Building Design Package

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.

ii) The Scope of Work is to provide the design for the following building located at the northeast corner of McHugh Boulevard and Cross Street at Marine Corps Base (MCB) Camp Lejeune, North Carolina.

iii) P1338F - II MEF Simulation/Training Center Replacement, one-story building consisting of (53,400) gross square feet square to provide the following functions:
   (a) a new building with open secret storage space, containing multiple configurable simulation training classrooms, and configurable First Integrated Rehearsal Environment (FIRE) classrooms;
   (b) Ready Room / Auditorium
   (c) audio/visual, computer and server room equipment spaces;
   (d) offices and spaces for personnel and administrative support;
   (e) Storage/shipping/receiving area
   (f) impervious and pervious outdoor training areas;
   (g) gazebo;
   (h) parking,
   (i) Development of a greenfield site on the northeast corner of McHugh Boulevard and Cross Street

(j) Stormwater management features to comply with Government LID requirements and state stormwater management permit requirements.
(k) Site utility connections
(l) Demolition of existing Buildings 125, 125A, 127 and H13
(m) Removal of existing mobile Buildings 125B and 125C.

iv) Phasing – no phasing planned
v) Future Expansion – no future expansion planned

2) REFERENCES

a) Design-Build Request for Proposal Hurricane Florence Recovery Training and Storage Facilities, Marine Corps Base Camp Lejeune, North Carolina, Solicitation Number N4008519R9253 (Phases 1 and 2)

i) Parts 1 through 6 (See RFP Table of Contents for specific sections)
ii) Specific Attachments (See RFP Table of Contents for specific attachments) including, but not limited to:
(1) Camp Lejeune Base Exterior Architectural Plan
(2) Investigation and Remediation Waste Management Plan
(3) USMC Finding of No Significant Impact for the Environmental Assessment for Demolition of Historic Properties
(4) Camp Lejeune Mechanical Design Guidance
(5) Camp Lejeune Specifications
- 07 31 13 Asphalt Roof Shingles
- 07 52 00 Modified Bituminous Membrane
- 07 61 15.00 20 Aluminum Stand Seam
- 08 33 23 Roll Up Doors
- 08 91 00 Wall Louvers
- 09 67 23.13 Epoxy Flooring
- 10 14 00.20 Interior Signage
- 10 14 00.20a MCBLNC Signs Standards Graphics
- 10 22 13 Wire Mesh Partitions
- 11 24 24 Roof Fall Protection
- 23 09 23.13
- 28 31 76 Interior Fire Alarm and Mass Notification System
- 33 71 01.00 22 Overhead Transmission and Distribution
- 33 71 02.00 22 Underground Electrical Distribution

(6) Water and Electrical Meter Information
(7) MCB Electrical Policies & Criteria
(8) Mass Notification to Basewide

(9) Life Cycle Cost Analysis Report (Will be Provided by the Government)
(10) Performance Assessment Plan
(11) Permits Record of Decision (PROD)
(12) Best Value Determination Guidelines (Enclosure 1)
(13) Best Value Determination Guidelines (Enclosure 2)
(14) Project Sign Details
(15) Open Burning of Vegetative Debris
(16) Numbered Attachments and Descriptions
1. Demolition Drawings
2. Existing Site and Building Photographs
3. As-Built Drawings for Demolition Buildings
4. Site Utility Drawings for Demolition
5. Hazardous Materials Report
6. Site Utility Maps
7. Site OSP Telecom Pathways Map
8. Site Bubble Diagrams
9. Topographic Drawings
10. Geotechnical Report
11. Hydrant Flow Tests
12. NEPA DM
13. Site Approval Form
14. DD-1354 Transfer and Acceptance of DoD Real Property
15. Disposal of DoN Real Property Form
16. FF&E and A/V Cost Forms

iii) Order of Precedence - Solicitation
(1) Standard Form 1442, Price Schedule, and Davis Bacon Wage Rates.
(2) Part 1 - Contract Clauses.
(3) Part 2 - General Requirements.
(4) Part 3 - Project Program Requirements
(5) Part 6 - Attachments (excluding Concept Drawings)
(6) Part 5 - Prescriptive Specifications exclusive of performance specifications.
(7) Part 4 - Performance Specifications exclusive of prescriptive specifications.
(8) Part 6 - Attachments (Concept Drawings).
(9) Within Part 3 - Project Program Requirements Section 5.0 ROOM REQUIREMENTS provides detailed requirements on a room by room basis that further defines requirements that are in addition to the ENGINEERING SYSTEMS REQUIREMENTS SECTION.

iv) Order of Precedence - Design

Any portions of the proposal or final design that exceed the requirements of the solicitation.

(1) Any portion of the proposal that exceeds the final design.
(2) Any portion of the final design that exceeds the proposal.
(3) Where portions within either the proposal or the final design conflict, the portion that most exceeds the requirements of the solicitation has precedence.

b) Building Codes

i) International Building Code (IBC), 2018, as modified by UFC 1-200-01
ii) International Mechanical Code (IMC), 2018, as modified by UFC criteria
iii) International Plumbing Code (IPC), 2018, as modified by UFC criteria
iv) NFPA 101, Life Safety Code

c) Unified Facilities Criteria

i) FC 1-300-09N, Navy and Marine Corps Design Procedures, with Change 4, 14 Jun 18
ii) UFC 1-200-01, DoD Building Code (General Building Requirements), 08 Oct 19
iii) UFC 1-200-02, High Performance and Sustainable Building Requirements, with Change 4, 01 Oct 19
iv) UFC 2-000-05N, Facility Planning Criteria for Navy/Marine Corps Shore Installations
v) UFC 3-101-01, Architecture, with Change 5, 25 Sept 19
vi) UFC 3-120-10, Interior Design, 16 May 18
vii) UFC 3-201-01, Civil Engineering, with Change 2, 01 Jul 19
viii) UFC 3-201-02, Landscape Architecture, with Change 1, 01 Nov 09
ix) UFC 3-210-10, Low Impact Development, with Change 3, 01 Mar 20
x) UFC 3-220-01, Geotechnical Engineering, 01 Nov 12
xi) UFC 3-220-05, Dewatering and Groundwater Control, 16 Jan 04
xii) UFC 3-230-01, Water Storage and Distribution, with Change 1, 01 Oct 18
xiii) UFC 3-230-02, O&M, Water Supply Systems, 10 Dec 19
xiv) UFC 3-240-01, Wastewater Collection, with Change 2, 01 Jan 19
xv) UFC 3-240-02, Domestic Wastewater Treatment, with Change 1, 01 Jan 19
xvi) UFC 3-250-01, Pavement Design for Roads and Parking Areas, 14 Nov 16
xvii) UFC 3-250-04, Standard Practice for Concrete Pavements, with Change 2, 29 Jul 09
xviii) UFC 3-250-11, Soil Stabilization for Pavements, 16 Jan 04
xix) UFC 3-270-01, O&M Manual, Asphalt and Concrete Pavement Maintenance and Repair, 21 Feb 18
xx) UFC 3-270-08, Pavement Maintenance Management, 16 Jan 04
xxi) UFC 3-301-01, Structural Engineering, 01 Oct 19
xxii) UFC 3-320-06A, Concrete Floor Slabs on Grade Subjected to Heavy Loads, 01 Mar 05.
xxiii) UFC 3-401-01, Mechanical Engineering, with Change 1, 01 Oct 15

xxiv) UFC 3-410-01, Heating, Ventilating and Air Conditioning Systems, with Change 5, 01 Nov 19
xxv) UFC 3-410-02, Direct Digital Control for HVAC and Other Building Control Systems, Change 1, 02 Mar 20
xxvi) UFC 3-420-01, Plumbing Systems, with Change 11, 01 Nov 19
xxvii) UFC 3-450-01, Noise and Vibration Control, 15 May 03
xxviii) UFC 3-501-01, Electrical Engineering, with Change 1, 01 Nov 19
xxix) UFC 3-520-01, Interior Electrical Systems, with Change 1, 20 Mar 19
xxx) UFC 3-520-05, Stationary Battery Areas, with Change 2, 09 Sep 20
xxxi) UFC 3-530-01, Interior and Exterior Lighting Systems and Controls, with Change 4, 01 Nov 19
xxxii) UFC 3-540-01, Engine-Generator Systems for Backup Power Applications, with Change 2, 05 Nov 19
xxxiii) UFC 3-550-01, Exterior Electrical Power Distribution, with Change 3, 01 Nov 19
xxxiv) UFC 3-560-01, Electrical Safety, O&M, with Change 2, 31 Oct 19
xxxv) UFC 3-575-01, Lightning and Static Electricity Protection Systems, 01 Jul 12
xxxvi) UFC 3-580-01, Telecommunications Interior Infrastructure Planning and Design, with Change 1, 01 Jun 16
xxxvii) UFC 3-600-01, Fire Protection Engineering for Facilities, with Change 4, 07 Feb 20
xxxviii) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, 12 Dec 18
xxxix) UFC 4-010-06 Cybersecurity of Facility Related Control Systems with Change 1, 18 Jan 17
xl) UFC 4-021-01, Design and O&M: Mass Notification Systems, with Change 1, 01 Jan 10
xli) UFC 4-021-02, Electronic Security Systems, with Change 1, 11 Sept 19
xlii) UFC 4-023-03, DoD Design of Buildings to Resist Progressive Collapse, Change 3, 01 Nov 16
xliii) Other referenced UFC or Facility Specific FC's, see discipline specific sections.

d) Other Referenced Documents

i) ABA Accessibility Standard for Department of Defense Facilities (2010)
ii) ASTM F2248, Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass
iii) ANSI/ASHRAE/IESNA Standard 90.1-2010 (ASHRAE 90.1), Energy Standards for Buildings Except Low Rise Residential Buildings, 2010
iv) ANSI/ASHRAE/USGBC/IES Standard 189.1-2011 (ASHRAE 189.1), Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, 2011
v) ASME A17.1 Edition 2010 – Safety Code for Elevators and Escalators
vi) MCB Camp Lejeune, North Carolina Public Works Division, Design Branch Electrical Policies & Criteria, 4 Feb 2020.

vii) Camp Lejeune Mechanical Design Guidance, 01 Jul 17
viii) MCB Camp Lejeune Base Exterior Architectural Plan (BEAP), 2010
ix) Specification 27 10 00 Building Telecommunications Cabling System, 27 Jun 17
x) Specification 33 82 00 Telecommunications Outside Plant, 19 Jun 17
xi) Marine Corps Physical Security Program Manual, 28 Sep 09
xii) Tri-Services Electrical Working Group (TSEWG)
(1) TSEWG TP-1, Electrical Calculation Examples
(2) TSEWG TP-2, Capacitors for Power Factor Correction
(3) TSEWG TP-3, Surge Protector Performance and Evaluation Criteria
(4) TSEWG TP-4, Stationary Battery and Charger Sizing
(5) TSEWG TP-5, Interior Transformer Ratings and Installation
(6) TSEWG TP-6, Low-Voltage Breaker Interrupting Ratings
(7) TSEWG TP-7, Protection System Design
(8) TSEWG TP-8, Equipment Enclosures and Hazardous Locations
(9) TSEWG TP-9, Automatic Transfer Equipment
(10) TSEWG TP-10, Arc Flash Levels for Fused Voltage Inputs to Electricity Meters
(11) TSEWG TP-11, UFC 3-500-10N Best Practices
(12) TSEWG TP-12, UFC 3-500-10N Appendices
(13) TSEWG TP-13, UFC 3-501-03N Load Demand Analyses
(14) TSEWG TP-15, Arc Flash Calculations and Detailed Arc Flash Warning Labels
(15) TSEWG TP-19, Static Uninterruptible Power supply (UPS)

3) CRITERIA

a) Special Considerations

i) To be further developed during design, as applicable

4) DESIGN APPROACH

a) Special Considerations

i) To be further developed during design, as applicable

End of Section

5) ATTACHED DISCIPLINE SPECIFIC SECTIONS

a) Civil

b) Structural

c) Architectural

d) Interior Design

e) Fire Protection Design and Life Safety

f) Plumbing Design

g) Mechanical Design

h) Electrical Design

i) Telecommunications/Low Voltage Systems Design

j) Sustainable Design

k) AT/FP

l) Cybersecurity

m) Hazardous Materials

n) Audio-Visual

CHAPTER 2 – CIVIL

1) SCOPE SUMMARY

A) Design Package

i) The site for the P1338 II MEF Simulation/Training Center is located on a heavily wooded area on the northeast corner of McHugh Boulevard and Birch Street. Work includes a training center, two outdoor training areas, and two parking lots. Sitework includes clearing and grubbing, sidewalks, signage, stormwater management, 8 tall ornamental fence with a 24' wide double swing gate, a 24' wide sliding cantilever gate, and a man swing gate, asphalt paving, access drives, emergency vehicle access drive, concrete pads, and dumpster enclosure. The finished floor elevations will be approximately +18' above the FEMA Base Flood Elevation.

B) Project Objectives

i) The site is approximately 19.2 acres, heavily wooded with site elevations ranging from 24 feet down to 6 feet. The site generally drains from the west to east There is an existing ditch running along the northeast side of McHugh Blvd. with a high point that send drainage northwest and southeast. A second ditch on the northeast side of Birch St. combines the first ditch. The ditch runs to the northeast to flow into a larger drainage draw that ultimately drains to Wallace Creek.

ii) The Scope of Work is to provide the civil design for the following building located at the northeast corner of McHugh Boulevard and Birch Street.

iii) Improvements to be constructed

(1) P1338F II MEF Simulation/Training Center consisting of approximately 53,443 gross square feet square.

2) REFERENCES

A) Design-Build Request for Proposal Hurricane Florence Recovery Training and Storage Facilities, Marine Corps Base Camp Lejeune, North Carolina, Solicitation Number N4008519R9253 (Phases 1 and 2)

i) Specific Sections

ii) Specific Attachments

B) Building Codes

i) International Building Code 2018 (as modified per UFC 1-200-01)

C) United Facilities Criteria

i) FC 1-300-09N, Navy and Marine Corps Design Procedures
ii) UFC 3-201-01, Civil Engineering
iii) UFC 3-210-10, Low Impact Developments
iv) UFC 3-220-01, Geotechnical Engineering
v) UFC 3-220-04FA, Backfill for Subsurface Structures
vi) UFC 3-220-05, Dewatering and Groundwater Control
vii) UFC 3-220-08FA, Engineering Use of Geotextiles
viii) UFC 3-250-01, Pavement Design for Roads and Parking Areas
ix) UFC 3-250-09FA, Aggregate Surface Roads & Airfields Areas
x) UFC 3-600-01, Fire Protection Engineering for Facilities
xi) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
xii) UFC 4-021-01, Design and O&M: Mass Notification Systems

D) Other Referenced Documents

i) BEAP, Camp Lejeune Base Exterior Architectural Plan
ii) EISA Section 438, Energy Independence Security Act
iii) NCDEQ, BMP Handbook and SEC Manual
iv) NCDOT, Roadway Standard Construction Drawings
v) NCDOT, Standard Specifications
vi) SDDCTEA, Bulletin 19-02 Parking Safety
vii) SDDCTEA, Pamphlet 55-17, Better Military Traffic Engineering
viii) USACE, United States Corps of Engineers, 404 General Permit

3) CRITERIA and APPROACH

A) AT/FP Analysis

i) Building Structure Type: Primary construction consist of cast-in-place bearing wall structures with interior structural steel framing. The facility is considered an inhabited building.
ii) The site is configured to meet UFC 4-010-01 DoD Minimum Antiterrorism Standards for buildings and Marine Corps Order 5530.14A. The 2018 edition of UFC 4-010-01 requires a minimum standoff distance of 20'.
iii) The facility is within the installation perimeter. The installation perimeter is more than 50 feet from the closest corner of the facility.
iv) Setbacks for Parking: Facility unobstructed space is 33 feet. Roadways and parking are not allowed withing the unobstructed space per the RFP. RFP preference is an 82 feet setback from facility to parking areas.

v) Fencing and access control: Gate provided outside the unobstructed space for mechanical room access drive and around the staff POV parking area. The training area and staff parking areas are also separated by fencing.
vi) Supplementary features (soft ATFP): Site features, furnishing, plantings, etc. are provided in accordance with UFC 04-010-01. There are no other site development features for soft ATFP.

B) Future Considerations

i) Phasing: No phasing is part of this project.
ii) Future Expansion: There are no future expansions indicated in the RFP.
iii) Adjacent development: There are no adjacent developments indicated in the RFP.

C) Survey

i) Existing Topographical Survey was completed by SEPI Engineering & Construction on January 11, 2021
ii) Boundary Survey: None
iii) Easements, Setbacks, and Restrictions: None identified with the survey or RFP documents.
iv) Underground Utility Location: Utilities shown are from survey field observation.
v) Wetlands and Flood Survey
   (1) Wetlands Delineation: None indicated but are expected adjacent to the limits of the project limits.
   (2) Flood Elevations: FEMA Flood Elevation is 2.0.
vi) Unexploded Ordnance (UXO)
   (1) There is no known unexploded ordinance within the project limits per the RFP.

D) Geotechnical Survey

i) A Preliminary Geotechnical Site Characterization Report, dated 27 February 2020, was provided in the RFP.
   (1) Soil types and engineering properties: The site consist primarily of two interlayered strata: Stratum A –very loose to very dense, clayey, silty, clean, and cemented sand (sc, sm, sp), and Stratum B – very soft to stiff, silty, sandy lean, lean, and fat clay (cl-ml, cl, ch).
   (2) Soil erosion index: None indicated in report.
   (3) Buildings: Please refer to the Geotechnical Report for additional information.
   (4) Infiltration at SWM Structures: Please refer to the Geotechnical Report for additional information.
   (5) Surface Paving criteria: See section f.ii of this narrative.
   (6) Site Walls: None
   (7) Ground Resistance and Corrosiveness: None indicated in report.
   (8) Karst Topography: None indicated in report.

ii) A Final Geotechnical Site Characterization Report, dated 20 January 2021, Updated 3 March 2021, was provided in the RFP.
   (1) Initial groundwater was recorded at the boring locations and the initial groundwater table was measured to occur at depths ranging from 5.0 to 10.0 feet below existing grades (at the boring locations).
      (a) Perched groundwater may be encountered at the project site, specifically in the vicinity of boring B-1.
   (2) Based on borings, it is estimated that a cut from 2 to 24 inches in depth will be required to be remove the topsoil material.
   (3) Suitable select fill material should contain less than 25% by weight of fines (GW, GP, GM, GP-GM, SW, SP, SM, SW-SM, and SP-SM), have a liquid limit less than 20 and plastic limit less than 6, and should be free of rubble, organics, clay, debris, and other unsuitable material.
   (4) Select fill should be compacted to a dry density of at least 95% of the Modified Proctor maximum dry density (maximum 10-inch loose lifts).
   (5) Backfill material in utility trenches should consist of select fill and be compacted to at least 95% of Modified Proctor maximum dry density (4 to 6 inch loose lifts).

E) Hazards

i) Radon: Zone 3 per EPA Radon Risk Map for North Carolina
   (1) Low potential for Radon (less than 2 pCi/L)
ii) Abandoned mines or other subsidence issues: None found
iii) On-site contamination/Observation Wells: None indicated in the RFP

F) Vehicles

i) Vehicle Counts, types, circulation routes and Loadings
   (1) Staff parking lot located inside security fence
      (a) 96 POV stalls
      (b) 2 ADA accessible stalls
      (c) 1 ADA van accessible stall
   (2) POV parking lot located northwest of staff parking lot
      (a) 293 POV stalls
      (b) 2 ADA accessible stalls
      (c) 2 van accessible stalls
ii) Pavement Design, Slopes, Thickness, Curbs
   (1) Concrete Sidewalk Pavement Section
      (a) 4 inches – 3,000 PSI compressive strength Portland cement concrete
   (2) Light Duty Asphalt Pavement Section
      (a) 2 inches NCDOT Surface Course (S-9.5B or S-9.5C), 8 inches NCDOT aggregate base course (NCDOT Type ABC, compacted to a dry density of at least 100% of the Modified Proctor maximum dry density – ASTM D 1557). The subgrade must be

firm, stable, and compactable (natural and/or select fill) should be compacted to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D 698).

(3) Heavy Duty Asphalt Pavement Section
   (a) 2 inches NCDOT Surface Course (S-9.5B or S-9.5C), 3 inches NCDOT Intermediate Course (I-19.0B), 8 inches NCDOT aggregate base course (NCDOT Type ABC, compacted to a dry density of at least 100% of the Modified Proctor maximum dry density – ASTM D 1557). The subgrade must be firm, stable, and compactable (natural and/or select fill) should be compacted to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D 698).

(4) Dumpster/Equipment Pad
   (a) 8 inches – 5,000 PSI compressive strength Portland cement concrete, #4 bars at 12 inches on-center each way, 4" aggregate base course (NCDOT Type ABC, compacted to a dry density of at least 100% of the Modified Proctor maximum dry density – ASTM D 1557). The subgrade must be firm, stable, and compactable and lined with Geogrid (natural and/or select fill) should be compacted to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D 698).

(5) Training Area Rigid:
   (a) 10 inches – 5,000 PSI compressive strength Portland cement concrete, #4 bars at 12 inches on-center each way, 6" aggregate base course (NCDOT Type ABC, compacted to a dry density of at least 100% of the Modified Proctor maximum dry density – ASTM D 1557). The subgrade must be firm, stable, and compactable and lined with Geogrid (natural and/or select fill) should be compacted to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D 698).

(6) Loading Dock Rigid:
   (a) 8 inches – 5,000 PSI compressive strength Portland cement concrete, #4 bars at 12 inches on-center each way, 6" aggregate base course (NCDOT Type ABC, compacted to a dry density of at least 100% of the Modified Proctor maximum dry density – ASTM D 1557). The subgrade must be firm, stable, and compactable and lined with Geogrid (natural and/or select fill) should be compacted to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D 698).

iii) Site Triangle at entrances/exists: Analysis to be included with traffic study.

iv) Fire Truck Access: Facility will be accessible from McHugh Boulevard and meet the requirements of UFC 3-600-01.

v) Traffic Study: A traffic investigation report is required
   (1) Traffic count to determine current conditions for traffic and flow.
   (2) Origins and destinations study to determine circulation to and from the site.
   (3) Traffic signal warrant study must be conducted for the access driveway.
   (4) Speed study must be conducted on Birch Street, particularly for westbound traffic to the intersection with McHugh Boulevard to address sight distance issues caused by road curvature.

vi) ADA Accessibility: An accessible route is provided from the four (4) accessible stalls in the staff parking lot and the seven (7) accessible stall in the POV lot to the northwest.

vii) Access to Buildings: Access to the facility will be from both McHugh Boulevard and the intersection of McHugh Boulevard and Birch Street.

G) Security

i) Fencing
   (1) Height, type, top of fence security
      (a) 8’ tall ornamental security fence – Primary Fence
   (2) Knox Boxes: A knox box will be provided to the MOV lane at the gated entrance.

ii) Gates
   (1) Operation Type
      (a) 3 - 24’ wide double swing gate to allow access to the training area and rear of the facility.
      (b) 2 arm gates
   (2) Vehicle Resistance: None required
   (3) Gate Access Requirements: None required

H) Utilities

i) Water Service
   (1) Service Provider and Contact
      (a) Government owned.
      (b) Public Works Division, Operations Branch, 910-451-0869
   (2) System Sizing Estimate
      (a) 10-inch waterline loop
      (b) 3-inch water service lateral off the loop to the facility
      (c) For underground applications, utilize ductile iron or PVC piping for water mains 12 inches (300 mm) in diameter and less. Utilize ductile iron piping for water mains deeper than 10 feet (3.0 m) or larger than 12 inches (300 mm) in diameter.
   (3) Tie-in Point
      (a) Connect to existing 8-inch water main along east side of McHugh Boulevard.
   (4) Pressure and Flow
      (a) Minimum working pressure of 150 psi
   (5) Back Flow Device:
      (a) Yes, required per Safe Drinking Water Act

ii) Fire Water Service
   (1) Service Provider and Contact
      (a) Government owned
      (b) Public Works Division, Operations Branch, 910-451-0869

(2) System Sizing Estimate
  (a) 6-inches
(3) Adequate to meet fire protection needs: Yes
(4) Tie-in Point
  (a) Connect to 10-inch water line loop
(5) Pressure and Flow
  (a) See Fire Protection Section
(6) Fire Hydrants
  (a) Per UFC 3-600-01 Fire Protection Engineering for Facilities
    (i) At least one hydrant must be located within 150 ft of the fire department connection.
    (ii) All parts of the facility exterior must be within 350 feet of a hydrant with consideration given to accessibility and obstructions.
    (iii) Hydrants are to be dry barrel configuration.

iii) Sanitary Service
(1) Service Provider and Contact
  (a) Government owned
  (b) Public Works Division, Operations Branch, 910-451-0869
(2) System Sizing Estimate
  (a) 4-inch PVC service lateral
(3) Tie-in Point
  (a) Connect to existing sanitary sewer manhole 035 located on the west side of McHugh Boulevard.
(4) Interceptors (Oil, Sediment, Grease, Lint)
  (a) None

iv) Natural Gas
(1) Service Provider and Contact
  (a) Piedmont Natural Gas (PNG)
  (b) Michael Lilly, Commercial and Residential Sales Specialist
    (i) michael.lilly@duke-energy.com
    (ii) 252-808-7292
  (c) Bobby Gurganus, PNG Construction
    (i) bobby.gurganus@duke-energy.com
    (ii) 252-670-9613
(2) Contractor must provide PNG projected loads for mechanical equipment to size gas meters
  (a) PNG must be notified 6 months prior to in-service date to install new laterals and meters.

v) Assume existing gas main line pressure is less than 2 psi (to be verified with provider).
(1) 1-1/4 inch P.E. gas lateral.

vi) Electrical Service
  (1) See Electrical Narrative
vii) Communications
  (1) See Telecommunications Narrative

I) Site Grading and Storm Drainage

i) Provide positive drainage away from the buildings, roadways, and parking lots. Ensure that the grading and associated stormwater runoff do not adversely affect surrounding sites.
  (1) Finished ground around facility is sloped at 5% for a minimum of 10 feet away from facility.
  (2) Grading next to building is a minimum of 6 inches below finished floor.
    (a) Finished floor elevation is approximately 18 feet above the FEMA Flood Elevation.
ii) Cut and Fill balance vs. import or export site
  (1) The site's direct cut to fill is currently estimated to be:
    (a) Cut = 25,000 cy
    (b) Fill = 33,300 cy
    (c) Balance = 8,300 cy fill
iii) Special considerations for grading of the site, soil conditioning, undercut, removal of bad soils, remediation activities: None
iv) Water from Building Roofs piped or splash blocks
  (1) Stormwater from Building roof to be piped into adjacent stormwater features.
v) Storm water management shall be designed in accordance with UFC 3-210-10, Low Impact Development (LID), Section 438 of the Energy Independence and Security Act (EISA), and the FC 1-300-09N Navy and Marine Corps Design Procedures.
  (1) EISA 438 requires a zero runoff from the 95th percentile storm event.
    (a) The runoff from the 95th percentile storm is treated through the wet pond design. The existing site has a relatively shallow groundwater table as well as clay soils that prevent the infiltration of runoff into the substrate. Please refer to the infiltration test results provided in the Geotechnical Report for additional information.
    (b) Other LIDs such as bioretention with underdrains or infiltration based LIDs were not feasible at this location as the minimum 2 feet of separation between the bottom of the facility and the top of seasonal high water table required by the NC DEQ stormwater manual could not be obtained at this location.
vi) The site conditions will result in an increase of the Built Upon Area (BUA)
  (1) Quantity control will be required in accordance with NCDEQ.
    (a) The site's main control feature is a wet pond that is adequately designed to contain and treat the design volume of runoff in accordance with the NCDEQ wet pond design.
  (2) Quality control will be required in accordance with NCDEQ.

(a) The site's main control feature is a wet pond that is adequately designed to contain and treat the design volume of runoff in accordance with the NCDEQ wet pond design.

(3) There is no existing stormwater permit for the site.

vii) Stormwater Analysis results: See Appendix C

viii) Stormwater collection and conveyance

(1) Minimum Pipe size (15" for new)

(a) Storm inlets and RCP pipe to collect and convey stormwater.

(2) Minimum Ditch Slopes

(a) 0.5%

J) Permitting

i) All permitting information must be sent to Camp Lejeune Environmental for submission to NCDEQ.

ii) EISA Section 438 – Low Impact Design

(1) Coordinate through Water Quality Manager, EQB at 910-451-9518 or

(2) Public Works Division, Operations Branch at 910-451-0869

iii) Erosion and Sediment Control Plan / Stormwater Permit

(1) Applicable for disturbances of 1 or more acres of land

(2) Coordinate stormwater requirements with Water Quality Manager, EQB at 910-451-9518

(3) To coordinate permit application, contact Public Works Division, Design Branch at 910-451-2213

iv) Wastewater extension permit and wastewater flow acceptance form

(1) Coordinate request through Wastewater Foreman at 910-451-7190, ext. 232 or

(2) Water-Wastewater General Foreman at 910-451-7190 ext. 222

v) For any discharges of non-contact cooling water, cooling tower blowdown or boiler blowdown, under the NCG500000 general permit is required.

(1) Coordinate with Water Quality, EQB at 910-451-9518

vi) Water Supply: Installation/testing of backflow prevention devices

(1) Coordinate with Water Quality Manager, EQB, at 910-451-9518 or

(2) Public Works Division, Operations Branch at 910-451-0869.

K) Special Systems

i) Site Retaining walls: None

ii) Site Structures

(1) Electrical Pedestal, see Electrical Narrative

(2) Data Pedestal, see Telecommunications Narrative

iii) Frost Heave Prevention at SD structures and Pavement at Building Doors

L) LEED (Discuss only those that apply)

i) Prerequisite 1 Construction Activity Pollution Prevention
ii) SS1 Site Selection
iii) SS2 Development Density and Community Connectivity
iv) SS3 Brownfield Redevelopment
v) SS4.1 Alternative Transportation – Public Transit Access
vi) SS4.2 Alternative Transportation – Bicycle Storage and Changing Rooms
vii) SS4.3 Alternate Transportation – Low Emitting and Fuel Efficient Vehicles
viii) SS4.4 Alternate Transportation – Parking Capacity
ix) SS5.1 Site Development – Protect or Restore Habitat
x) SS5.2 Site Development - Maximize Open Space
xi) SS6.1 Stormwater Design - Quantity Control
xii) SS6.2 Stormwater Design – Quality Control
xiii) SS7.1 Heat Island Effect – Nonroof
xiv) SS8 Light Pollution Reduction
xv) WE1 Water Efficient Landscaping
xvi) Any Innovation in Design or Regional Priority Credits

M) End of Section

4) APPENDICES

B) GEOTECHNICAL ANALYSIS

C) CIVIL DATA/CALCULATIONS

C1) Erosion and Sediment and Stormwater Control Plan

C2) Sanitary Sewer Analysis

C3) Waterline Analysis

C4) Traffic Study

CHAPTER 3 – LANDSCAPE ARCHITECTURE

1) SCOPE SUMMARY

a) Design Package

i) The Landscape Architecture design will be part of the DP-1 Fasttrack Site package

b) Project Objectives

i) The site is approximately 13 acres, heavily wooded with site elevations ranging from 24 feet down to 6 feet. The site generally drains from the west to east There is an existing ditch running along the northeast side of McHugh Blvd. with a high point that send drainage northwest and southeast. A second ditch on the northeast side of Birch St. combines the first ditch. The ditch runs to the northeast to flow into a larger drainage draw that ultimately drains to Wallace Creek.
ii) The Scope of Work is to provide the landscape architectural design for the following building located at the northeast corner of McHugh Boulevard and Birch Street.
iii) Improvements to be constructed
(1) P1338F II MEF Simulation/Training Center

2) REFERENCES

a) RFP Title (Conformed Set should be listed)

i) G2050 – Landscaping
ii) G204003 – Exterior Furnishings
iii) G205004 – Seeding, Sprigging, and Sodding
iv) G205005 - Plantings

b) Building Codes

i) International Building Code 2018 (as modified per UFC 1-200-01)

c) United Facilities Criteria

i) UFC 1-300-09N Navy and Marine Corps Design Procedures
ii) UFC 3-201-01 Landscape Architecture
iii) UFC 3-210-10, Low Impact Developments

iv) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
v) Other referenced UFC or Facility Specific FC's

d) Other Referenced Documents

i) Camp Lejeune Base Exterior Architectural Plan (BEAP), 2010
ii) AASHTO
iii) ASTM
iv) ANSI Z60.1
v) Manufacturers Design Standard

3) CRITERIA and APPROACH

a) AT/FP Analysis

i) Refer to Chapter 14 for AT/FP analysis information.

b) Landscape

i) Site planning and overall layout of facility will be reflected in the civil design.

ii) General - Proposed plant materials will match and/or complement the adjacent facilities to create a cohesive campus feel. Planting will consist of turf and trees to provide a quality, functional and visually appealing landscape program that remains low maintenance and drought tolerant. In addition, the landscape will comply with all applicable antiterrorism, force protection and physical security requirements.

iii) Shade - Shade will be provided in parking areas by providing trees around the perimeter and within parking islands. Trees within the parking lot are placed to provide space from proposed light poles. Street tree plantings will be provided along McHugh Boulevard. Shade will be provided at picnic areas by a simple structure with standing seam roof to match the main facilities.

iv) Site Furnishings – Site furnishings such as benches trash receptacles will be provided at outdoor seating areas, and be in conformance with the BEAP. Receptacles will comply with Standard 2 Unobstructed Space of UFC 4-010-01 and will be anchored to concrete pads. Bike racks will be provided to support 5% of the FTE, and can be divided into more than one location.

v) Plant selection - All plant material selections shall be chosen from BEAP. Trees that have proven successful in adjacent facilities shall be given priority for species selection.

vi) Parking areas will be screened with trees and shrubs to reduce visual impact from adjacent roadways.

vii) All turf areas will be sodded with Centipede Sod. Any temporary erosion control methods involving seeding, seed will be approved by the Natural Resources office prior to construction operations.

viii) A 50,000 sf grass training space will be provided with grass-pave to support emergency vehicles and turf areas for communication tents.

ix) Plant Quantities – Trees will be provided for the project at the rate of 1 tree per 1,000 square foot of landscape area.

(1) Shade Trees will be 3” caliper, 14-16 feet tall

(2) Flowering trees will be 2” caliper, 8-10 feet tall.

x) All planting will have a one year establishment, maintenance and guarantee period that will commence on the date that the inspection by the Contracting Officer shows that all landscaping under the contract has been satisfactorily installed.

xi) Mechanical equipment / dumpster screening shall be provided on 3 sides of all new equipment.

xii) Planting beds and maintenance strips shall be edged with a 6” wide by 12” deep concrete flush curb.

xiii) Organic mulch for plantings shall be 3” depth of hardwood bark over weed control fabric. Mineral mulch shall be 3” depth of 3-5 inch river stone over weed control fabric.

xiv) Bioretention facilities will be surrounded with a 6 foot strip of Centipede sod.

c) Sustainability

i) Please refer to Chapter 12 for sustainable design information.

End of Section

CHAPTER 4 – STRUCTURAL

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in one Design Package.

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.
ii) The Scope of Work is to provide the structural design for the following building located at MCB Camp Lejeune, North Carolina.
iii) MEF Simulation / Training Center consisting of single story 53,400 gross square feet space to provide a modern training/education environment that facilitates training from the individual marine through Marine Air Ground Task Force (MAGTF) and Joint Coalition level staffs.

2) REFERENCES

a) Building Codes

i) International Building Code 2018 (as modified per UFC 1-200-01)

b) United Facilities Criteria

i) UFC 1-200-01, General Building Requirements
ii) UFC 3-301-01, Structural Engineering
iii) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings

c) Other Referenced Documents

i) Physical Security ---
ii) ASCE 7-16: Minimum Design Loads for Buildings
iii) ACI 318-14: Building Code Requirements for
iv) Reinforced Concrete
v) ACI 301-10: Specifications for Structural Concrete for Buildings
vi) ACI 315-04: Details and Detailing of Concrete Reinforcement

vii) ACI 530-11: Building Code Requirements for Masonry Structures
viii) AISC Manual of Steel Construction (15th Edition)
ix) AISC 360-16 Specification for Structural Steel Buildings

3) CRITERIA

a) Loads

i) Live Loads
(1) Slab-on-grade = 100 psf
(2) Raised Access Floor = 100 psf (self-weight = 10 psf)
(3) Storage Light = 125 psf
(4) Mechanical Room = 125 psf
(5) Roof = 20 psf

ii) Wind Loads
Ultimate Wind Speed = 151 Based upon risk Category = III due to number of occupants in the classrooms when all the partitions open up.
(1) Kd = 0.85
(2) Ke = 1.0
(3) Kzt = 1.0
(4) Gust Factor = 0.85
(5) Exposure Category = C

iii) Seismic Loads
(1) Seismic Importance Factor = 1.25 based upon Risk Category III
(2) Ss = 0.115g
(3) S1 = 0.055g
(4) Site Class = D
(5) Sds = 0.123g
(6) Sd1 = 0.088g
(7) Seismic Design Category = B

iv) Snow Loads
(1) Ground Snow Load = 10 PSF, Note Risk Category = III

v) AT/FP Requirements
(1) ATFP Standoff Distances – Minimum construction requirements apply as no directly ATFP threat was identified in the RFP for design.

b) Geotechnical Considerations

i) Project has site has poor soils and will require a deep foundation system in order to support the building loads
ii) Frost Depth = 0 inches
iii) Based upon geotechnical analysis, the maximum resulting total post construction settlement of the proposed pile-supported building foundations should not exceed ½". The differential settlements are expected to result in foundation and slab angular distortions of less than 1/500.

c) Serviceability

i) Roof Deflections
   (1) L/180 Total
   (2) L/240 Live
   (3) Note – Deflection of framing supporting folding partitions has been limited in order to work with proposed equipment supplied.

d) Other Referenced Documents

i) Physical Security ---
ii) ASCE 7-16: Minimum Design Loads for Buildings
iii) ACI 318-14: Building Code Requirements for
iv) Reinforced Concrete
v) ACI 301-10: Specifications for Structural Concrete for Buildings
vi) ACI 315-04: Details and Detailing of Concrete Reinforcement
vii) AISC Manual of Steel Construction (15th Edition)
viii) AISC 360-16 Specification for Structural Steel Buildings

4) DESIGN APPROACH

a) Delegated Engineered Systems

i) Tilt-up concrete components
ii) Cold-formed steel metal framing and pre-fabricated components
iii) Seismic anchorage of equipment

b) Gravity Load Resisting Systems

i) Roof – Steel filler beam framing supported on steel girders support on steel columns or load bearing tilt-up wall. All roof framing will support primed metal deck. At the open classroom

areas, structural steel truss framing will be used to span the longer distances and support the folding partitions. Trusses are comprised of angle framing and WT construction. Angle framing will hang to down from the bottom of the truss to a secondary WT in order to provide the Contractor with adjustment of the folder partition system. Similar at the beam framing conditions where folding partitions are required, angle framing will be provided to support the panels. Both the angle framing hung from structure, and the trusses will be braced laterally with kickers to the roof diaphragm.

ii) Exterior Walls – Precast tilt-up concrete wall system
(1) ATFP Compliance

c) Lateral Load Resisting Systems

i) Diaphragm – Metal deck at roof to transfer lateral loads to the lateral force resisting system
ii) Lateral Resisting System – Comprised of reinforced tilt-up concrete shearwalls and braced bay. Note, building expansion joint provided given size of the building. Shear wall and braced bay are provided on each side of the joint to provide stability for that end of the building.

d) Foundation Systems

i) Based upon the geotechnical recommendations, foundation will consist of timber piles, reinforced grade beams and pile caps to support all load bearing walls and steel columns. Pile allowable capacities are anticipated to be 20 tons compression, 8 tons tension, and 2 tons lateral. Note, column reactions are small in comparison to P-3 pile and pile capacity. But for stability purposes, P-3 caps and configurations were used for support of the steel columns at the interior of the building.

e) Slab-on Grade Design

i) The first-floor slab shall primarily be a 5” slab-on-grade, over 4” depth of porous fill, over a vapor retarder. Concrete for the slab shall be 28-day minimum compressive strength (f’c) of 3,500 psi and will be reinforced with welded wire fabric. The slab shall be jointed in accordance with ACI recommendations and mild reinforcing bars may be added at various locations to minimize the occurrence of slab cracks. Reentrant corner bars will be added at hard corners. A topping slab will be provided above the main slab at the corridors. Topping slab shall be a 4” slab-on-grade, over structural foam, over a vapor retarder. Concrete for the slab shall be 28-day minimum compressive strength (f’c) of 3,500 psi and will be reinforced with welded wire fabric.

f) Windows

i) ATFP Compliance – Minimum construction requirements apply as no direct ATFP threat identified in the RFP to design too.

5) APPENDICES

a) Calculations

End of Section

CHAPTER 5 – Architectural Design

1) SCOPE SUMMARY

a) Design Package

i) The project consists of a one-story training facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST). The facility will be constructed on a greenfield site that will include parking, outdoor training areas, and a new building with open secret storage space, containing multiple configurable simulation training classrooms, configurable First Integrated Rehearsal Environment (FIRE) classrooms, audio/visual, computer and server room equipment spaces, and spaces for personnel and administrative support. These functions will be relocated from several separate existing buildings and consolidated into the new training facility. Facility.

b) Project Objectives

i) Consolidation of multiple program areas under one roof. This includes personnel, equipment, and virtual simulation requirements.
ii) Increase efficiencies of these respective training exercises, offering considerable reductions in the cost of servers, various networking requirement, military support staff, and contractor support.
iii) Consolidation of multiple functional aspects of building 125, the Deployable Virtual Training Environment (DVTE) at Building 127, and the CAST at Building H13 into a new state-of-the-art training facility

2) REFERENCES

a) Project Program II MEF Simulation/Training Facility

i) Parts 1 & 2 – Project Description, Project Objectives
ii) 4.0 Building Requirements
iii) 5.0 Room Requirements
iv) 6.0 Engineering Systems Requirements
  (a) A10 – Foundations
  (b) B10 – Superstructure
  (c) B20 – Exterior Enclosure
  (d) B30 – Roofing
  (e) C10 – Interior Construction
  (f) C20 – Stairs
  (g) C30 – Interior Finishes

b) Building Codes and UFC Criteria

- MCB Camp Lejeune Base Exterior Architectural Plan (BEAP), 2010
- Specification 27 10 00 Building Telecommunications Cabling System, 27 Jun 17
- Specification 33 82 00 Telecommunications Outside Plant, 19 Jun 17 Marine Corps Criteria
- Marine Corps Physical Security Program Manual, 28 Sep 09 Facilities Criteria
- FC 1-300-09N, Navy and Marine Corps Design Procedures, with Change 4, 14 Jun 18
- UFC 1-200-01, DoD Building Code (General Building Requirements), 08 Oct 19
- UFC 1-200-02, High Performance and Sustainable Building Requirements, with Change 4, 01 Oct 19
- UFC 2-000-05N, Facility Planning Criteria for Navy/Marine Corps Shore Installations
- UFC 3-101-01, Architecture, with Change 5, 25 Sept 19
- UFC 3-210-10, Low Impact Development, with Change 1, 01 Feb 16
- UFC 3-600-01, Fire Protection Engineering for Facilities, with Change 3, 10 May 19
- UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, 12 Dec 18
- International Building Code (IBC), 2018, as modified by UFC 1-200-01
- International Mechanical Code (IMC), 2018, as modified by UFC criteria
- International Plumbing Code (IPC), 2018, as modified by UFC criteria

3) CRITERIA

a) General Overview

The general purpose of this project is to replace existing damaged buildings with a consolidated into new state-of-the-art facility. The new building will provide a space for all training functions under one roof and satisfy the tenant's needs and requirements to adequately conduct their day-to-day operations.

The new II MEF combined training facility will house the II MEF Simulation Center and II MEF CAST. The new facility will provide flexible training rooms. The new building will improve student and staff efficiency and allow for necessary computer and networking connectivity. Its main function is to create a wide spectrum of training venues using computer-based simulations for individual and small units; to combined arms integration using current generation simulations. The new facility will also include administrative functions directly related to the new combined training facility.

b) Sustainable Design

i) This project is subject to sustainable design criteria and is required to meet the requirements of the Guiding Principles for Sustainable Federal Buildings (HPSB). Sustainable principles will be integrated into the design, development and construction of the project in accordance with Executive Order 13834 and other applicable laws and Executive Orders. The project to comply with sustainability requirements identified in Part 2 Section 01 33 29.05 20, Sustainability Reporting for Design-Build. The Sustainable Third-Party Certification requirement for this project will be met.

4) GROSS AREA SUMMARY

GROSS AREA SUMMARY

NO.	ROOM NAME	PROGRAM AREA	ACTUAL AREA	PERCENT +/-	COMMENT
100	ENTRY WS	181	96	-47.0%	
101	BRIEF/ DEBRIEF	592	580	-2.0%	
102	BRIEF/ DEBRIEF	592	580	-2.0%	
103A	FIRE STORAGE	595	696	17.0%	
104A	FIRE ROOM	405	409	1.0%	
104B	FIRE ROOM	405	411	1.5%	
104C	FIRE ROOM	405	397	-2.0%	
105	LIBRARY / FILE ST	1026	897	-12.6%	
106	NCOIC/ SUPPLY CLERK	348	329	-5.5%	
107	SIM OPERATOR	1229	993	-19.2%	
108	ADMIN BREAK	360	361	0.3%	
109	SIM ANALYST	1050	1276	21.5%	
110	MOTHER'S ROOM	77	69	-10.4%	
110A	STOR.		63	N/A	
111	OIC	153	160	4.6%	
112	DEP DIR	108	149	38.0%	
113	SITE MGR	117	150	28.2%	
114	DIR	159	163	2.5%	
115	COMM	176	149	-15.3%	*528 all telecom*
116	ELEC	100	137	37.0%	*620 all electrical*
118	JAN	74	48	-35.1%	
200A	SIMULATION CLASSROOM	1565	1491	-4.7%	
200B	SIMULATION CLASSROOM	1565	1533	-2.0%	
200C	SIMULATION CLASSROOM	1110	968	-12.8%	
201	AUDITORIUM/ READY RM	1675	1591	-5.0%	
202	EXERCISE CONTROL	1270	1614	27.1%	
203	STOR.	1114	1042	-6.5%	
204	JAN.	75	57	-24.0%	
205	PLOT / LAM	127	134	5.5%	
206	BREAK ROOM	685	677	-1.2%	
207	EXERCISE CONTROL	295	295	0.0%	As Debrief #4
208	COMM	176	180	2.3%	*528 all telecom*
209	BRIEF/ DEBRIEF	295	287	-2.7%	
300A	SIMULATION CLASSROOM	1565	1467	-6.3%	
300B	SIMULATION CLASSROOM	1565	1482	-5.3%	
300C	SIMULATION CLASSROOM	1565	1474	-5.8%	
300X	SIMULATION CLASSROOM	1565	1498	-4.3%	
300Y	SIMULATION CLASSROOM	1565	1509	-3.6%	
300Z	SIMULATION CLASSROOM	1565	1501	-4.1%	
301A	SIMULATION CLASSROOM	1565	1500	-4.2%	
301B	SIMULATION CLASSROOM	1565	1489	-4.9%	
302	SERVER ADMIN	445	453	1.8%	
303A	SECURE WS	147	170	15.6%	

303B	SECURE VTC	429	417	-2.8%	
304A	SIM CONTROL (SERVER ROOM)	1564	1546	-1.2%	
304B	SIM CONTROL SECURE COMM (VAU	358	359	0.3%	
305	COMM	176	150	-14.8%	*528 all telecom*
306	ELEC	100	150	50.0%	*620 all electrical*
400	MECHANICAL	*2512*	2029	-19.2%	*3220 all mechanical*
401	MECH (HOT)	*708*	910	28.5%	*3220 all mechanical*
402	STORAGE/ SHIPPING/ RECEVING	2033	2035	0.1%	
403	ELEC	420	442	5.2%	*620 all electrical*
C011	COR		637	N/A	
C012	COR		420	N/A	
C013	COR		549	N/A	
C014	COR		386	N/A	
C016	COR		418	N/A	
C020	COR		1115	N/A	
C021	COR		541	N/A	
C022	COR		593	N/A	
C023	COR		229	N/A	
C030	COR		970	N/A	
C031	COR		552	N/A	
C032	COR		62	N/A	
C034	COR		1356	N/A	
G010	WOMEN -		303	N/A	Admin
G011	MEN		312	N/A	Admin
G012	UNISEX		66	N/A	Admin
G020	UNISEX		64	N/A	Admin
	HEADS ADMIN	893	745	-16.6%	1065 w entry element
G021	MUD	194	214	N/A	
G022	W. SHWR		72	N/A	
G023	M. SHWR		72	N/A	
G024	WOMEN		212	N/A	
G025	MEN		232	N/A	
	HEADS SIMULATION	990	588	-40.6%	794 w entry elements
L010	LOBBY/VEST	1026	998	-2.7%	
	TOTAL GROSS BUILDING AREA (SF):		**53038**		

	ENTRANCE CANOPIES	295	403	36.6%	at half calculation
	MAIN ENTRY		384		
	WEST ENTRY		231		
	NORTH ENTRY		26		
	SHIPPING CANOPY		165		

TOTAL PROJECT AREA (SF):	**53441**

TOTAL RFP ALLOWABLE AREA (SF):	53443

5) DESIGN APPROACH – Architectural Design

a) Exterior:

i) **Construction Type:** Type IIB construction, designed to current codes and applicable criteria as defined by the RFP

ii) **Architectural Style**: The design follows the BEAP and matches the Georgian or Colonial Revival architectural style. The proposed building massing and the aesthetics will be compatible with vernacular architecture. The exterior envelope will provide the desired brick appearance.

(a) Colors of all building elements will be provided in accordance with BEAP color scheme for Hadnot Point

(b) 3:12 sloped hip roof forms.

(c) WALLS: All exterior walls will be tilt-up insulated panels, erected over slab-on-grade and insulated to ASHRAE minimum with 30% improvement.

(d) At the building's base, a water table will be provided and light color jack arch elements above windows will supplement the Georgian style.

(e) A precast entryway will define the main glazed aluminum entry doors. Main entries will provide overhangs with columns and articulation, matching the Georgian style. These projecting entries will include gable roof forms and will be painted white to contrast the building main color of red brick.

iii) **Air/vapor barrier:** The tilt up wall concrete and rigid insulation will form the main barrier for the exterior walls. Special care will be used to develop the sealant between panels to maintain the barrier. The tilt up panel will be sealed at the metal roof deck with closed cell spray foam. This will ensure the continuity of the air/vapor barrier at eaves where water and air penetrations are most common. The roof will have an air/vapor barrier membrane to maintain the envelope over the rooftop.

iv) **Roofing:** Standing seam metal roof (SSMR) will be provided over the entire building. SSMR panels will be installed over the air/vapor barrier and gypsum sheathing installed over rigid insulation on metal deck. Prefinished metal gutters and downspouts will be used for water drainage.

v) **Windows:** Windows will be thermally broken aluminum windows that will meet the ATFP requirements. They will be fixed, tinted, and insulated glazing. Windows in the secure hallway will have visual access blocked for security purposes.

vi) **Exterior Doors:** Extra heavy duty, 4'-0" wide exterior doors will be insulated hollow metal, factory primed, and field painted to achieve the desired aesthetics.

vii) **Accessories:** Mechanical louvers will be drainable, prefinished aluminum. Gutters and downspouts will be prefinished metal and will terminate in the cast iron boots, for underground stormwater management system.

b) Exterior Assemblies

i) Roof (R-31.82): Standing Seam Metal Roof.

ii) Type A Exterior Wall (R-10.17 Mass wall): 4 1/2" concrete, 2" rigid insulation, 4 ¾" concrete, ½" mortar and 2" polished CMU veneer.

iii) Type B Exterior Wall (R-9.46 Mass wall): 4 1/2" concrete, 2" rigid insulation, 4 ¾" concrete.

iv) Type C Exterior Wall (R-16.04 Mass wall): 4 1/2" concrete, 2" rigid insulation, 4 ¾" concrete, 3 5/8" Metal stud w/ R-11 batt. between studs and 5/8" gypsum board finish.

v) Windows:

(1) Concrete window sill sloped to drain away from window

(2) Solid Surface sill at interior
(3) Insulated, argon filled glazing

c) Interior:

i) **Walls:** The interior layout will be achieved with mostly metal stud partitions. Steel columns will provide structural support for the roof above. Where specifically required by the finish schedule, concrete masonry (CMU) partitions will be provided. At the corridors where polished face CMU is required as the finish, our design provides the veneer approach where the 4" CMU veneer terminates above the ceiling and the back-up stud wall is providing the required free, smoke, and/or sound rating.

(a) Where required, STC 45 or STC 50 partitions will be provided full height to deck above. All penetrations will be sealed to ensure continuity of the sound separation.

ii) Flooring: At the Simulator Classrooms a 24" raised access flooring will be provided over recessed slab. In the Auditorium, a sloped floor will be provided in support of the assembly function with staggered, fixed auditorium seating. At two entry vestibules, a recessed walk-of mat will be provided.

iii) Doors: The Simulator Classrooms, Auditorium, Exercise Control, Simulation Admin, Server Admin, and fire rooms will be 4'-0" wide, flush wood doors, extra heavy duty at classrooms, head, and breakrooms, and heavy duty at other occupied spaces. In unoccupied areas, doors will be hollow metal, painted, with Level 4 and physical performance level A.

iv) Ceilings: The majority of spaces will have 24"x24" suspended acoustical ceiling panels. At Simulator Classrooms, gypsum board header at folding partitions will be provided to add visual interest. The main lobby will include a gypsum board ceiling with a vaulted form. In mud, head, and shower areas, all gypsum partitions and ceilings will be moisture resistant.

d) Specialty: Ceiling mounted folding partitions inside the Simulator Classrooms and fire rooms will provide sound rating to match wall requirements and include integral communicating/ egress door.

e) Floors

i) Floor finishes will be selected for durability and ease of maintenance.
ii) Recessed walk-off mat with 100% solution dyed carpet insert to be provided at building entrances.
iii) Raised access floor will be provided in rooms as listed in the room requirements.
iv) Restrooms will consist of 12" x 12" rectified porcelain tile with matching 6"H cove tile base with flat top and bottom edge or stainless-steel transition between floor and wall tile with 3/16" max width epoxy grout.

f) Window Treatments

i) Windows will receive manual roller shades with full-length cords for easy operation. Shades will be mounted within the window recesses.
ii) Window stools will be a solid surface material.

g) Doors

i) Doors will be stained wood with hollow metal painted door frames.
ii) See Chapter 5 – Architectural Design Analysis for specific door information.

h) ADA & ABA Accessibility

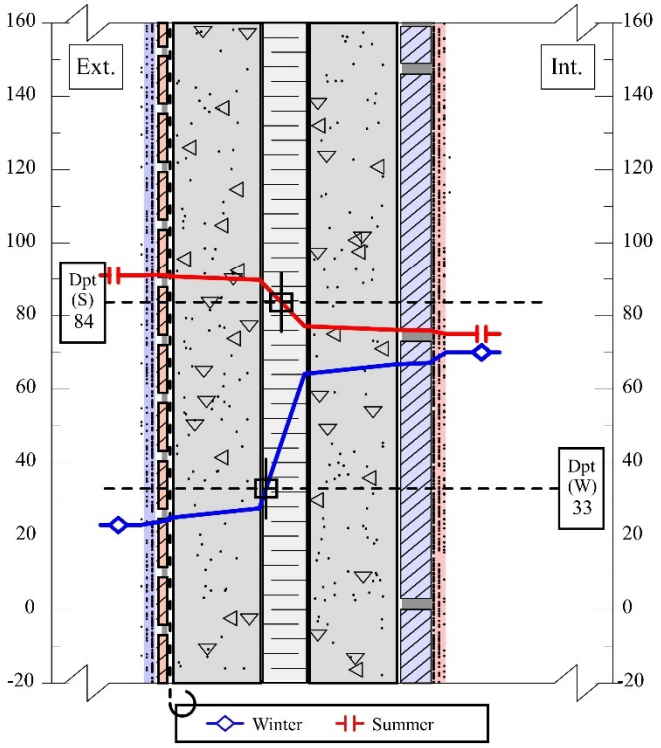
i) The building will be designed to incorporate accessible spaces throughout including the use all spaces.

6) Exterior Assembly Analysis.

R VALUE ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND TEMPERATURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank
Wall Type	A
Option	

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)	70	23	75	91
RH (%)	25	69	50	77
DPT (°F)	33	15	56	84

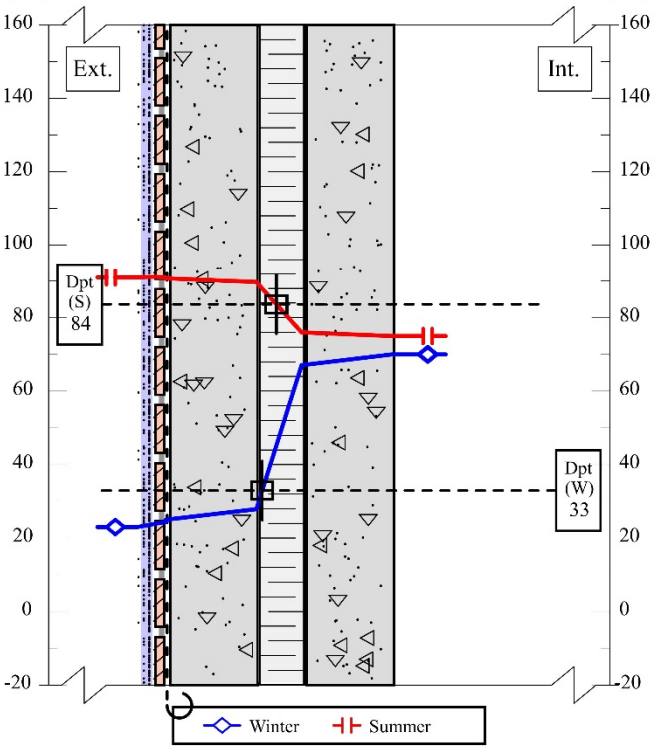
MICHAEL BAKER JR.
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Generic Material	Manufacturer	Model No.	Thick (in.)	RVal (R)	W.Temp. (°F)	S.Temp. (°F)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.75	0.17	23.8	91.1
2	brick, facing, 1/2 in.	No Recor...	Generic...	0.50	0.12	24.3	90.9
3	poly film, (4mil)	No Recor...	Generic...	0.00	0.12	24.9	90.7
4	concrete wall, 4 in.	No Recor...	Generic...	4.00	0.58	27.5	89.8
5	rigid ins.,(expand.), 2 in.	No Recor...	Generic...	2.00	7.90	64.1	77.1
6	concrete wall, 4 in.	No Recor...	Generic...	4.00	0.58	66.7	76.1
7	stone, granite, 1-1/2 in.	No Recor...	Generic...	1.50	0.07	67.1	76.0
8	air film (int), 3/4 in.	No Recor...	Generic...	0.75	0.64	70.0	75.0
				12.00	10.17	(23.0)	(91.4)

R VALUE ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND TEMPERATURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank
Wall Type	B
Option	

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)	70	23	75	91
RH (%)	25	69	50	77
DPT (°F)	33	15	56	84

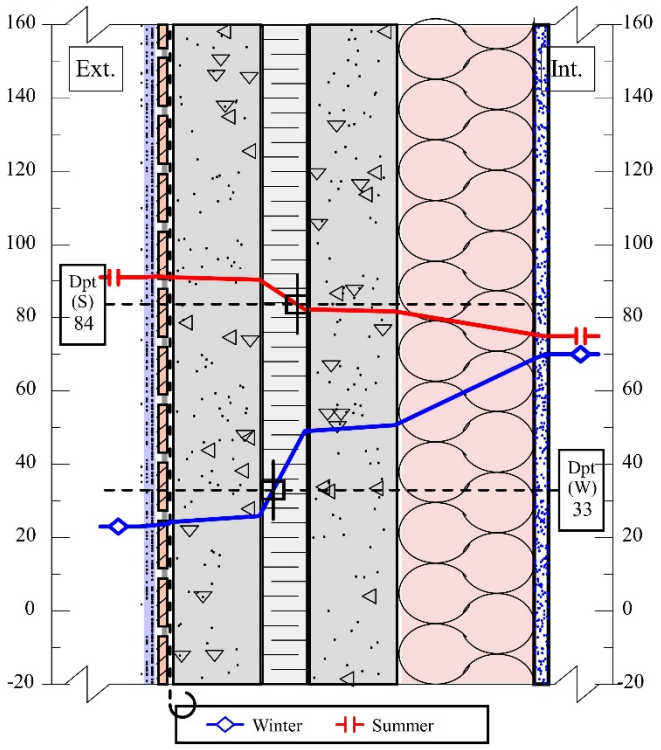
MICHAEL BAKER JR.
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Generic Material	Manufacturer	Model No.	Thick (in.)	RVal (R)	W.Temp. (°F)	S.Temp. (°F)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.75	0.17	23.9	91.1
2	brick, facing, 1/2 in.	No Recor...	Generic...	0.50	0.12	24.4	90.9
3	poly film, (4mil)	No Recor...	Generic...	0.00	0.12	25.0	90.7
4	concrete wall, 4 in.	No Recor...	Generic...	4.00	0.58	27.9	89.7
5	rigid ins.,(expand.), 2 in.	No Recor...	Generic...	2.00	7.90	67.1	76.0
6	concrete wall, 4 in.	No Recor...	Generic...	4.00	0.58	70.0	75.0
	Total or (Layer 0)			10.50	9.46	(23.0)	(91.4)

R VALUE ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND TEMPERATURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank
Wall Type	C
Option	

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)	70	23	75	91
RH (%)	25	69	50	77
DPT (°F)	33	15	56	84

MICHAEL
BAKER JR.

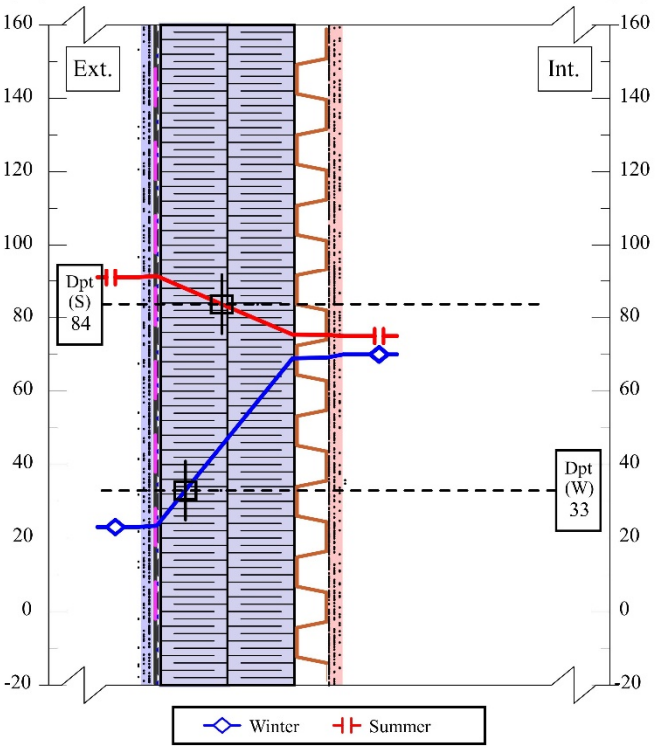
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Generic Material	Manufacturer	Model No.	Thick (in.)	RVal (R)	W.Temp. (°F)	S.Temp. (°F)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.75	0.17	23.5	91.2
2	brick, facing, 1/2 in.	No Recor...	Generic...	0.50	0.12	23.8	91.1
3	poly film, (4mil)	No Recor...	Generic...	0.00	0.12	24.2	91.0
4	concrete wall, 4 in.	No Recor...	Generic...	4.00	0.58	25.9	90.4
5	rigid ins.,(expand.), 2 in.	No Recor...	Generic...	2.00	7.90	49.0	82.3
6	concrete wall, 4 in.	No Recor...	Generic...	4.00	0.58	50.7	81.7
7	steel stud, 3-1/2 in.	No Recor...	Generic...	3.50	6.00	68.3	75.6
8	gypsum bd., 5/8 in., (#1)	No Recor...	Generic...	0.63	0.57	70.0	75.0
				17.13	16.04	(23.0)	(91.4)

R VALUE ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND TEMPERATURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank

ROOF A Option

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)	70	23	75	91
RH (%)	25	69	50	77
DPT (°F)	33	15	56	84

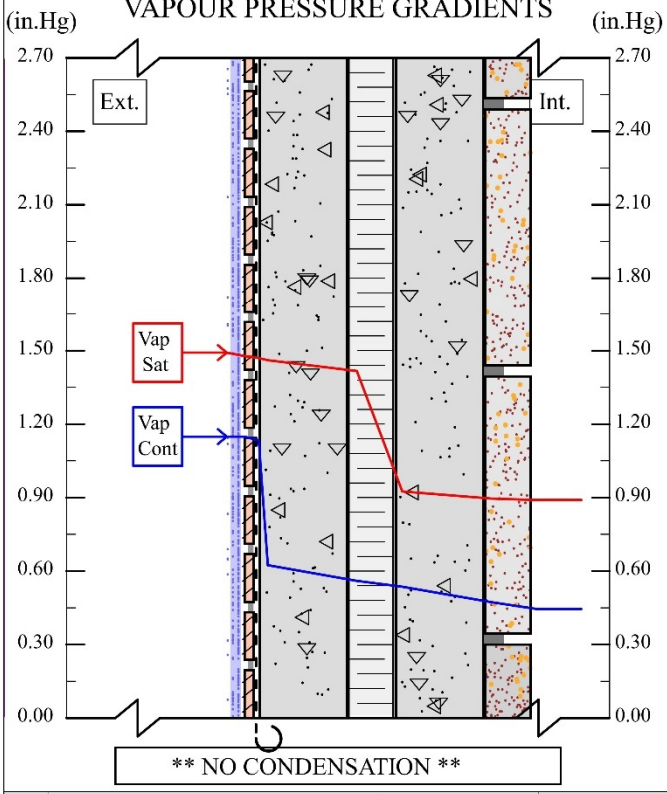
MICHAEL BAKER JR.
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Generic Material	Manufacturer	Model No.	Thick (in.)	RVal (R)	W.Temp. (°F)	S.Temp. (°F)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.75	0.17	23.3	91.3
2	sheet steel, 24 ga.	No Recor...	Generic...	0.02	0.01	23.3	91.3
3	membrane (#1), .080 in.	No Recor...	Generic...	0.08	0.07	23.4	91.3
4	rigid ins.,(extru.), 3 in.	No Recor...	Generic...	3.00	15.41	46.1	83.3
5	rigid ins.,(extru.), 3 in.	No Recor...	Generic...	3.00	15.41	68.9	75.4
6	steel clad.(unvntd), 1-1/2 in.	No Recor...	Generic...	1.50	0.12	69.1	75.3
7	air film (int), 3/4 in.	No Recor...	Generic...	0.75	0.64	70.0	75.0
	Total or (Layer 0)			7.60	31.82	(23.0)	(91.4)

CONDENSATION ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND VAPOUR PRESSURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank
Wall Type	A
Option	

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)			75	91
RH (%)			50	77
DPT (°F)			56	84

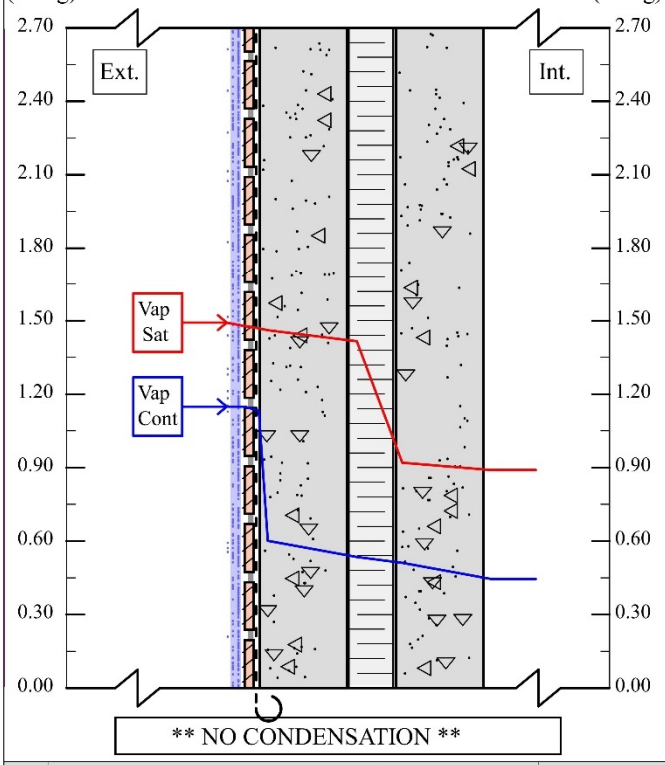
MICHAEL
BAKER JR.
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Material	Manufacturer	Model No.	Rvap (1/M)	Temp (°F)	VapSat (in.Hg)	VapCont (in.Hg)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.001	90.7	1.455	1.131
2	brick, facing, 1/2 in.	No Recor...	Generic...	0.358	90.5	1.447	1.115
3	poly film, (4mil)	No Recor...	Generic...	11.443	90.3	1.438	0.614
4	concrete wall, 4 in.	No Recor...	Generic...	1.430	89.4	1.395	0.551
5	rigid ins.,(expand.), 2 in.	No Recor...	Generic...	0.515	76.2	0.911	0.528
6	concrete wall, 4 in.	No Recor...	Generic...	1.430	75.2	0.882	0.466
7	stone, sandstone, 2 in.	No Recor...	Generic...	0.636	75.0	0.876	0.438
8							
9							
10							
11							
12							
	TOTAL or (Layer 0)			15.878	(91.0)	(1.469)	(1.131)

CONDENSATION ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND VAPOUR PRESSURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank
Wall Type	B
Option	

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)			75	91
RH (%)			50	77
DPT (°F)			56	84

MICHAEL BAKER JR.

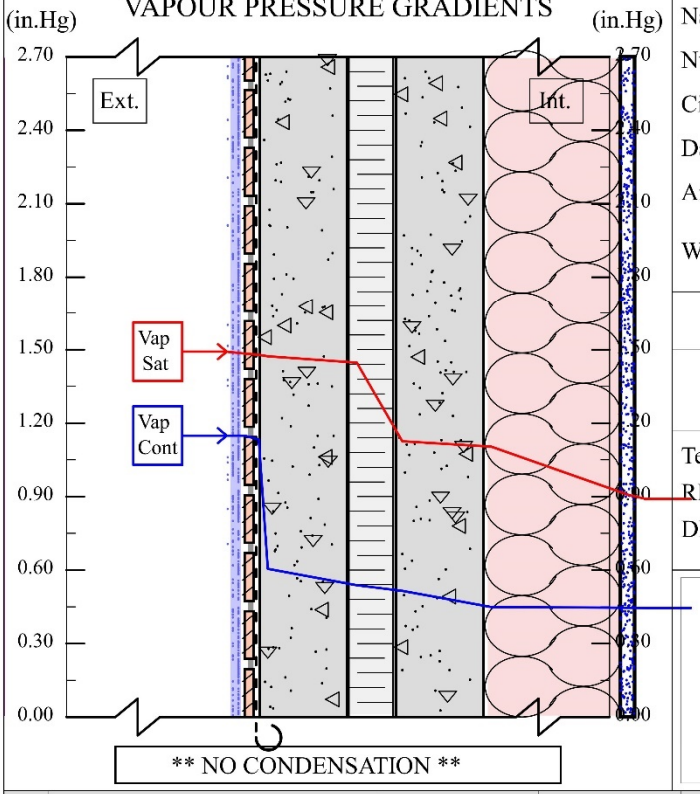
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Material	Manufacturer	Model No.	Rvap (1/M)	Temp (°F)	VapSat (in.Hg)	VapCont (in.Hg)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.001	90.7	1.455	1.131
2	brick, facing, 1/2 in.	No Recor...	Generic...	0.358	90.5	1.446	1.114
3	poly film, (4mil)	No Recor...	Generic...	11.443	90.3	1.438	0.592
4	concrete wall, 4 in.	No Recor...	Generic...	1.430	89.3	1.394	0.527
5	rigid ins.,(expand.), 2 in.	No Recor...	Generic...	0.515	76.0	0.905	0.503
6	concrete wall, 4 in.	No Recor...	Generic...	1.430	75.0	0.876	0.438
7							
8							
9							
10							
11							
12							
	TOTAL or (Layer 0)			15.240	(91.0)	(1.469)	(1.131)

CONDENSATION ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND VAPOUR PRESSURE GRADIENTS



PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank
Wall Type	C
Option	

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)			75	91
RH (%)			50	77
DPT (°F)			56	84

MICHAEL BAKER JR.

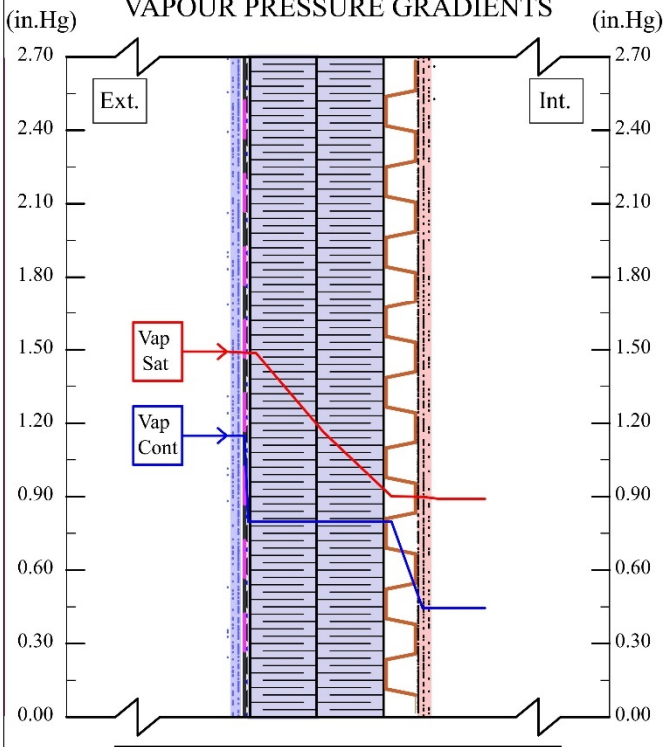
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Material	Manufacturer	Model No.	Rvap (1/M)	Temp (°F)	VapSat (in.Hg)	VapCont (in.Hg)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.001	90.8	1.461	1.131
2	brick, facing, 1/2 in.	No Recor...	Generic...	0.358	90.7	1.456	1.115
3	poly film, (4mil)	No Recor...	Generic...	11.443	90.6	1.450	0.595
4	concrete wall, 4 in.	No Recor...	Generic...	1.430	90.0	1.424	0.530
5	rigid ins.,(expand.), 2 in.	No Recor...	Generic...	0.515	82.1	1.108	0.507
6	concrete wall, 4 in.	No Recor...	Generic...	1.430	81.6	1.087	0.442
7	steel stud, 3-1/2 in.	No Recor...	Generic...	0.057	75.6	0.893	0.439
8	gypsum bd., 5/8 in., (#1)	No Recor...	Generic...	0.033	75.0	0.876	0.438
9							
10							
11							
12							
	TOTAL or (Layer 0)			15.331	(91.0)	(1.469)	(1.131)

CONDENSATION ANALYSIS

The Heat, Air and Moisture Building Science Toolbox - V.1B-E/U (14)

WALL SECTION AND VAPOUR PRESSURE GRADIENTS



** NO CONDENSATION **

PROJECT

Name	P1338 MEF SIM
Number	180780
City	Wilmington, NC
Date	2/23/2021
Analysis by:	Wayne Frank

ROOF A Option

CLIMATIC CONDITIONS

	Winter		Summer	
	Int.	Ext.	Int.	Ext.
Temp (°F)			75	91
RH (%)			50	77
DPT (°F)			56	84

MICHAEL BAKER JR.

100 AIRSIDE DRIVE
MOON TOWNSHIP, PA, USA, 15108

	Material	Manufacturer	Model No.	Rvap (1/M)	Temp (°F)	VapSat (in.Hg)	VapCont (in.Hg)
1	air film (ext), 3/4 in.	No Recor...	Generic...	0.001	90.9	1.465	1.131
2	sheet steel, 24 ga.	No Recor...	Generic...	5664.133	90.9	1.464	0.785
3	membrane (#1), .080 in.	No Recor...	Generic...	21.190	90.9	1.463	0.784
4	rigid ins.,(extru.), 3 in.	No Recor...	Generic...	2.601	83.1	1.144	0.784
5	rigid ins.,(extru.), 3 in.	No Recor...	Generic...	2.601	75.4	0.887	0.784
6	steel clad.(unvntd), 1-1/2 in.	No Recor...	Generic...	5664.133	75.3	0.885	0.438
7	air film (int), 3/4 in.	No Recor...	Generic...	0.001	75.0	0.876	0.438
8							
9							
10							
11							
12							
	TOTAL or (Layer 0)			11,401.600	(91.0)	(1.469)	(1.131)

End of Section

CHAPTER 6 – INTERIOR DESIGN

1) SCOPE SUMMARY

a) Design Package

i) The Comprehensive Interior Design (CID) package consists of an integrated palette of finishes spanning Structural Interior Design (SID) building elements and Furniture, Fixtures and Equipment (FF&E). This package includes materials that are selected for durability and longevity as well as aesthetics appropriate to the building's primary functions. The Furniture, Fixtures and Equipment provides a flexible and adaptable space for the II MEF Simulation/Training Facility.

b) Project Objectives

i) The Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.
ii) The Scope of Work provides interior design for the One story II MEF Simulation/Training Facility located at Camp Lejeune, consisting of (54,443) square feet.

2) REFERENCES

a) Project Program II MEF Simulation/Training Facility

i) Parts 1-5 – C10 Interior Construction, C30 Interior Finishes, E20 Furnishings
ii) RFP

b) Building Codes

i) See Chapter 5 – Architectural Design Analysis

c) Unified Facilities Criteria

i) UFC 1-300-09N, Navy and Marine Corp Design Procedures, with Change 4
ii) UFC 1-200-02 High Performance and Sustainable Building Requirements, with Change 4
iii) UFC 1-200-1 Design, General Building Requirements
iv) UFC 3-120-10 Interior Design
v) UFC 3-120-01 Design: Sign Standards with Change 3

3) CRITERIA

a) Interior Environment

i) The building interior finishes are mindfully selected to include products that are durable, low maintenance and environmentally friendly.
ii) The facility is a one-story design with areas that require acoustically rated designs. These spaces include the Classified Simulation Rooms, Brief/Debrief Room, Exercise Control Room, Fire Rooms, Ready Room/Auditorium, Secure VTC Room, Secure Workstation Vault, Simulation Control Rooms, Simulation Control Vault and Simulation Operator. This is accomplished through STC rated partitions and high NRC acoustical ceiling tiles.
iii) The building is inherently accessible and includes a barrier free environment. Furnishings are arranged to create clear paths in main travel areas, high traffic areas and office spaces. Barrier free transitions are used where flooring materials change. Signage is designed in accordance with UFC 3-120-01 Sign Standards and NAVFAC guidelines. Text height and visual contrast of signage content is included in the design.

b) Sustainable Design

i) Through the use of durable products which contain low VOC emissions and high recycled content when possible, the interior of the II MEF Simulation/Training Facility is designed as a healthy and comfortable space for the building occupants and guests.

4) DESIGN APPROACH - Interior Finishes

a) Aesthetics

i) Material finish palette 3 was selected to provide a neutral base palette with timeless accents of warm grey and blue that will enrich the spaces. Dark finishes and ceiling are used in the fire rooms only. A mixture of two different carpet styles are used in the simulation classrooms and the administrative office areas. Polished concrete masonry unit walls protect the main corridors with poured terrazzo flooring and a terrazzo accents in key areas. The DOR, NAVFAC and the Activity developed an integrated interior/exterior appearance.

b) Restrooms

i) Restrooms include floor mounted, overhead-braced, solid plastic HDPE toilet and urinal partitions in a complimentary color to the wall and floor tile and also the solid surface counter with integral sinks.

c) Floors

i) Floor finishes are selected for durability and ease of maintenance.
ii) Recessed walk-off mat with 100% solution dyed carpet insert are provided at building entrances.
iii) Raised access floor is provided in rooms as listed in the room requirements.
iv) Restrooms consist of 12” x 12” rectified porcelain tile stainless-steel transition between floor and wall tile with 3/16” max width epoxy grout.

d) Window Treatments

i) Windows receive manually operated double-roller sunscreen & room darkening shades at exterior windows. Shades are mounted within the window recesses.
ii) Window stools are solid surface material.

e) Doors

i) Doors are stained wood with hollow metal painted door frames.
ii) See Chapter 5 – Architectural Design Analysis for specific door information.

f) Interior Walls

i) Restroom walls have porcelain tile to the finished ceiling with stainless steel edge protection at inside and outside corners.
ii) Walls are painted with a high performance, low VOC paint as indicated in the Room Requirements Sheets.
iii) Classroom walls receive markerboards and tackboards on two sides of the rooms.
iv) Exposed corners receive protective corner guards where indicated on drawings.
v) Stainless-steel wall panel at mop sinks in janitor closets on wet walls.
vi) Continuous roll rubber cove base is provided in rooms as listed in the room requirements.

g) Interior Ceilings

i) Ceiling finishes primarily consist of high NRC acoustical ceiling panels and GWB ceiling painted with low VOC paint.
ii) Restrooms receive epoxy, moisture resistant, low VOC paint.
iii) Painted exposed structure as indicated on drawings.

h) Signage and Wayfinding

i) Comprehensive signage and wayfinding system is incorporated into the project; signage including directional, room identification and notification messages are in accordance with the RFP prescriptive signage specification and signage standards for SSTD-1. These take precedence over the UFC 3-120-01 Sign Standards and NAVFAC guidelines.

5) DESIGN APPROACH – Furniture and Equipment

a) Aesthetics

i) The DOR develops furniture selections and space layouts efficiently using floor space, providing flexible environments for different group functions, and maximizing the number of seats. Furniture selections are aesthetically driven by the Structural Interior Design for a pleasant and well-coordinated interior environment.

b) Furniture

i) Rooms are furnished per the Room Requirements Sheets and in-depth interviews with the Activity / Users. Various FF&E items are provided as indicated and include, but are not limited to, office workstations, desking, task seating, guest seating, office storage, classroom tables and conference furniture.

ii) The furniture, fixtures, and equipment (FF&E Package) are designed under this contract. The procurement and installation of the FF&E Package is provided under a planned contract modification.
iii) The FF&E package follows the Best Value Determination process.

c) Equipment

i) Equipment is coordinated throughout the space and includes TV brackets and break room equipment.
ii) Markerboards and bulletin boards are provided as part of the Construction Contract.

d) Artwork

i) Artwork includes graphics and the Activity Logo to add interest. A command board will also be provided. Size and location is designed appropriately.
ii) Artwork scope is determined in interviews with the Activity / Users and is included in the FF&E package.

End of Section

CHAPTER 7 – FIRE PROTECTION

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in two Design Packages.

(1) Design Package 1 (DP-1) includes demolition, site civil, foundations and underground utilities for the project.
(2) Design Package 2 (DP-2) includes the building architecture, superstructure and building systems design to include mechanical, electrical, plumbing, fire protection and telecommunications.

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.
ii) The Scope of Work is to provide the fire protection design for the following building located at Camp Lejeune.
(1) P1338 II MEF Simulation/Training Center consisting of a 53,441 square foot, one-story facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST) with open secret storage space, multiple configurable simulation training classrooms, configurable First Integrated Rehearsal Environment (FIRE) classrooms, audio/visual, computer and server room equipment spaces and spaces for personnel and administrative support.
iii) Phasing – No phasing requirements exist for Fire Protection.
iv) Future Expansion – No future expansion is anticipated.

2) REFERENCES

a) RFP Solicitation N40085-19R-9253

i) Parts 1-5 – D40 Fire Protection – D4010, D4020, D4040, D4090
ii) Part 6, Attachment 5 – Specification 28 31 76 Interior Fire Alarm and Mass Notification System
iii) Part 6, Attachment 8 – Mass Notification to Basewide
iv) Part 6.1, Attachment 11 – Hydrant Flow Test

b) Building Codes

i) International Building Code 2018 (as modified per UFC 1-200-01)

c) Unified Facilities Criteria

i) UFC 1-200-01, DoD Building Code, 08 October 2019
ii) UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings, 12 December 2018
iii) UFC 3-600-01, Fire Protection Engineering for Facilities, with Change 3, 10 May 2019
iv) UFC 4-021-01, Design and O&M: Mass Notification Systems, with Change 1, January 2010
v) FC 1-300-09N, Navy and Marine Corps Design Procedures, with Change 4, 14 June 2018
vi) Other referenced UFC or Facility Specific FC's

d) Other Referenced Documents

i) NFPA 10, 2018 Edition – Standard for Portable Fire Extinguishers
ii) NFPA 13, 2019 Edition - Standard for the Installation of Sprinkler Systems
iii) NFPA 24, 2019 Edition – Standard for the Installation of Private Fire Service Mains and Their Appurtenances
iv) NFPA 72, 2019 Edition - National Fire Alarm and Signaling Code
v) NFPA 90A, 2018 Edition – Standard for the Installation of Air-Conditioning & Ventilating Systems
vi) NFPA 101, 2018 Edition - Life Safety Code
vii) Manufacturers Design Standards

3) CRITERIA

a) Life Safety and Building Code Analysis.

i) The life safety and code analysis is provided in Chapter 13 of the design analysis.

b) Site Conditions

i) Water Supply
(1) A hydrant flow test was conducted on December 3, 2020. The flow test results indicate a static pressure of 72 psi and a residual pressure of 66 psi at 846 gpm. Preliminary hydraulic calculations indicate that a fire pump and water tank are not required to meet the fire suppression demand of the facility. A new waterflow test will be conducted in accordance with NFPA 291 within 6 months of the final calculations for the design of the new fire sprinkler systems.

4) DESIGN APPROACH

a) Building Analysis

i) The facility is approximately 53,441 square feet in area, one story in height, of non-combustible construction, Type IIB. Refer to Chapter 13 of this Design Analysis for the building Life Safety requirements.

b) Site Analysis

i) Water Supply
   (1) Preliminary hydrant flow test data in the RFP indicated the following:
   Pressure Hydrant: 72 psi (static)
   66 psi (residual)
   Flow Hydrant: 846 gpm

ii) Fire Department and Fire Department (Emergency) Vehicle Access Requirements
   (1) The building will be provided with fire department (emergency) vehicle access in accordance with UFC 3-600-01.
   (2) The building will be provided with at least one means of all-weather ground access to allow emergency vehicles unimpeded access to the building.
   (3) The all-weather ground access will be paved, start from the road, and terminate no farther than 33 feet from each building.

iii) Fire Hydrant locations
   (1) All parts of each building will be located within 350 feet of a fire hydrant.
   (2) Fire hydrants will be located such that they are within 150 feet of the fire department connection for the building.

iv) Backflow Preventer
   (1) A reduced pressure zone backflow preventer with a forward flow test connection will be provided on the incoming sprinkler service. The backflow preventer will be located inside of the sprinkler riser room and the test connection will be flush mounted on the exterior wall of the riser room. The test header will be sized to provide full design flow with one 2 1/2” hose connection for every 250 gpm of anticipated flow of the fire sprinkler system.

v) Fire Department Connection
   (1) A 5-inch with 30-degree elbow Storz-type fire department connection will be provided with suitable all-weather ground access surface for any apparatus within 150 feet of connection.

vi) Post Indicator Valve
   (1) A Post Indicator Valve (PIV) will be provided for the sprinkler system and will be located a distance from the building equal to the height of the building plus fifteen feet. The PIV

will be provided with a lock and chain to be coordinated with the base fire department. Bollards will be provided if the location of the PIV is subject to vehicular damage.

vii) Underground Fire Service Lines
   (1) A new water supply from the existing underground system will be provided to supply the new risers for the facility. The sprinkler service line will be ductile iron.

viii) Knox Box
   (1) A Knox box will be provided at the building entrance. The final location shall be approved by the fire department.

c) Fire Alarm and Mass Notification System

i) The facility will be provided with a fully addressable, intelligent, combination fire alarm and mass notification system in accordance with UFC 3-600-01, UFC 4-021-01 and NFPA 72. The system will be capable of providing notification of alarm, supervisory and trouble conditions, alerting the occupants, summoning aid and emergency control functions.
   (1) The FMCP shall be a Simplex, Notifier, or Fire-lite and include a fire reporting system, compatible with the existing receiving and reporting systems.
   (2) The FMCP shall be provided with a 24-volt D.C. battery backup & recharging system sized to meet system requirements in accordance with NFPA 72.
   (3) The FMCP back-up battery shall be capable of operating the system under standby load for a minimum of 48 hours followed by an alarm condition for a period of 15 minutesat maximum connected load or 60 minutes of mass notification at the maximum connected load immediately upon loss of power, whichever is greater.
   (4) Each NAC and SLC shall include a 25% spare capacity for future modifications.

ii) The system will also include a digital alarm communicator transmitter(DACT), mass notification radio transceiver, subpanels, notification appliance circuit (NAC) panels, local operating console, power supplies, initiating devices, notification appliances, conduit, wire, fittings, and all accessories required to provide a complete operating system.
   (1) All fire alarms, supervisory alarms and trouble conditions must be transmitted to the Sur-Gard System III Multi-platform Digital Telephone Receiver.
   (2) Provide a point reporting digital alarm communicator transmitter utilizing two CAT 6 UTP cables inside one-inch conduit from the FMCP to the telephone equipment room.
   (3) Space, antenna, conduit, cable, pull strings, shall be provided for a government provided TRX-401 mass notification transceiver.
   (4) The FA/MNS system will be initiated from devices consisting of pull stations, photoelectric area smoke detectors located as required by code (building is fully sprinklered), duct mounted smoke detectors, vane type sprinkler flow switches, and valve supervisory tamper switches. Remote test stations will be provided for inaccessible detecting devices.
   (5) HVAC interlocks will be provided in the FMCP to shutdown selectedventilation equipment upon fire alarm activation via duct detectors.

(6) Carbon monoxide (CO) detection will be provided in areas where fossil fuels are burned.
(7) The notification system will consist speakers, strobes, and combination speaker/strobes.
(8) Provide ceiling mounted notification appliances where a suspended ceiling is provided.
(9) Exterior speakers will be weatherproof "bull horn" style.
(10) A single visual ABA rated strobe, clear color, marked "Alert", will be utilized for both the fire alarm and mass notification systems.
(11) LED Text notifications displays will be provided over (or adjacent to) each substantial means of egress from the building.

iii) Server rooms will be provided with very early warning air aspirating smoke detection in accordance with UFC 3-600-01 Section 4-11.3.
(1) Air sampling network will be designed to monitor total room/zone concentration of smoke.
(2) The detector must provide no less than three distinct alarm threshold levels (Alert, Action, Fire) and must alert equipment operators at every level of detection.
(a) Alarm Level 1 (Alert) will initiate a local alarm condition at a constantly attended location in the building.
(b) Alarm Level 2 (Action) will initiate a supervisory condition at the building FMCP, which transmits a supervisory condition to the Installation Fire Department.
(c) Level 3 (Alarm) will initiate a general building fire alarm condition at the FMCP, which transmits the fire alarm condition to the Installation Fire Department.
(3) The detection system must will be installed in the following locations; ceiling level within the server room, beneath raised access flooring where the subfloor area contains cables, in the exhaust/return air stream where aisle containment systems are used, and in the return air stream where the above ceiling area is used as a return air plenum.

iv) Initiating and notification circuits will use class B wiring.
(1) Wiring for signaling line circuits will be minimum #16 AWG twisted pair with shielded jacket and wiring for notification appliances will be #14 AWG minimum per NFPA 72.
(2) Conduit for all fire alarm system will be minimum ¾ inch.
(3) Provide all fire alarm circuits in Electrical Metallic Tubing (EMT) or Intermediate Metal Conduit (IMC).
(4) All raceways will be factory painted red.
(5) Provide raceways listed for installation in wet locations. Wet locations are considered any location within a 5 ft radius of fire suppression equipment and as defined by NFPA 70.
(6) Flexible Metallic Conduit (FMC) will not exceed 6 feet and will only be permitted for connections from junction boxes to field devices.
(7) Provide duct seal inside all conduits that penetrate exterior walls per NFPA 70.

v) A single mass notification local operating console will be provided at the primary entrance vestibule.

vi) A steel, locking, cabinet will be provided for the document cabinet and parts box cabinet. Both will be located adjacent to the FMCP.

vii) An LCD remote annunciator panel will be provided for the system and located near the main entrance FA/MNS panel. Remote annunciator will be capable of control functions the same as the FMCP. Control functions must be accessible only by user code or secured behind a locked panel.

viii) A laminated building floor plan (22" by 34") indicating location of the FMCP, LOC, remote power supply panels, and all initiating devices will be mounted at the main entrance of the building, adjacent to the annunciator.

ix) A factory-trained instructor will be provided to teach a five-day technical training classroom instruction for at least five Government personnel at Camp Lejeune. The technical training will include classroom instruction as well as hands-on programming, troubleshooting and diagnostics exercises.

x) Three laptops will be provided for the government's retention. Laptops will be Windows 10 based and include system software, special connecting cable(s), proprietary equipment necessary for the maintenance, testing and reprogramming of the fire alarm equipment and system.

d) Fire Suppression

i) The facility will be provided with a complete automatic wet pipe sprinkler system throughout in accordance with UFC 3-600-01, including but not limited to Chapter 9, Section 9-7 and NFPA 13. Server rooms will be protected in accordance with Chapter 4-11.4 of UFC 3-600-01. Clean agent fire suppression systems will not be required for protection of the server rooms.

(1) All equipment, piping, and other fire suppression components will be UL Listed and/or FM Approved for fire protection service.

(2) All wall penetrations will be sleeved. All floor penetrations will be provided with thrust rods.

(3) A control valve assembly will be provided for the fire sprinkler riser, with a check valve, vane-type water flow switch, and inspector's test connection to a drain.

(a) The size of the facility requires a minimum of two sprinkler risers.

(4) Sprinkler pipe will be black steel pipe as permitted by NFPA 13. Schedule 40 pipe will be used for all piping two inches or less in diameter.

(5) The wet pipe sprinkler systems will include pressure relief and air venting on each system in accordance with NFPA 13.

(6) All valves, tamper switches, waterflow switches and gauges will be installed so that each item is readily accessible and no higher than five feet above the finished floor.

(7) Quick-response, recessed or concealed sprinklers with ordinary temperature rating will be provided in areas with finished ceilings.
(8) Quick-response, upright sprinklers with ordinary temperature rating will be provided in areas with exposed ceilings. Higher temperature ratings will be used where required by NFPA 13. Sprinkler guards will be installed on sprinklers susceptible to damage and sprinklers less than 8 feet above the finished floor.
(9) Sprinkler protection for server rooms will be in accordance with UFC 3-600-01, Section 4-11.4.
    (a) Quick-response, concealed sprinklers with white cover plates will be provided in server rooms with finished ceilings.
    (b) Quick-response, upright sprinklers with sprinkler guards will be provided in server rooms with unfinished ceilings.
(10) The use of flexible sprinkler hose and mechanical-T outlets shall be prohibited.
(11) The system will be designed in accordance with the light and ordinary hazard design densities of UFC 3-600-01.

ii) Preliminary Hydraulic calculations are provided in Appendix H.

e) Standpipe System

i) A standpipe system is not required for this facility.

f) Fire Extinguishers

i) Fire extinguishers will be provided throughout the facility as required by NFPA 101 and in accordance with NFPA 10. Semi-recessed fire extinguisher cabinets will be provided in finished, occupied areas. Fire extinguisher wall brackets will be provided in unfinished areas. Clean agent fire extinguishers utilizing FE 13 fire extinguishing agent will be provided for the server rooms adjacent to the primary egress door.

End of Section

CHAPTER 8 – PLUMBING

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in two (2) Design Packages
   (1) P1338 Early Site Civil Design Package – which will include the Master Site Plan, Demolition, Site work, and Geotechnical work
   (2) P1338 Building Design Package – which will include the design of Foundation, Structural, Building Enclosures, and Remaining Work, as well as design of Furniture/Equipment

i) List all design packages
   (1) DP1 – P1338 Early Site Civil Design Package
   (2) DP2 – P1338 Building Design Package

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.

ii) The Scope of Work is to provide the plumbing design for the following buildings located at Camp Lejeune.
   (1) P1338 II MEF Simulation/Training Center, (one-story) consisting of 53,400 gross square feet square to provide the following functions
      (a) Training facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST) with open secret storage space, containing multiple configurable simulation training classrooms, configurable First Integrated Rehearsal Environment (FIRE) classrooms, audio/visual, computer and server room equipment spaces and spaces for personnel and administrative support.

iii) Phasing – no phasing planned

iv) Future Expansion – no future expansion planned

2) REFERENCES

a) Design-Build Request for Proposal Hurricane Florence Recovery Training and Storage Facilities, Marine Corps Base Camp Lejeune, North Carolina, Solicitation Number N4008519R9253 (Phases 1 and 2)

i) Specific Sections – D20 Plumbing – P1338, G30 Site Civil/Mechanical Utilities – P1338, Section 5 Room Requirements – P1338
ii) Specific Attachments

b) Building Codes

i) International Plumbing Code 2018 (as modified per UFC 3-420-01)

c) Unified Facilities Criteria

i) UFC 1-200-01, General Building Requirements, 08 Oct 19
ii) UFC 1-200-02, High Performance and Sustainable Building Requirements, with Change 4, 01 Oct 19
iii) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, 12 Dec 18
iv) UFC 3-401-01, Mechanical Engineering, with Change 1, 01 Oct 15
v) UFC 3-420-01, Plumbing Systems, with Change 10, 26 Oct 15
vi) Other referenced UFC or Facility Specific FC's

d) Other Referenced Documents

i) ANSI/ASHRAE/IESNA Standard 90.1-2010 (ASHRAE 90.1), Energy Standards for Buildings Except Low Rise Residential Buildings, 2010
ii) ANSI/ASHRAE/USGBC/IES Standard 189.1-2011 (ASHRAE 189.1), Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, 2011
iii) American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) Handbook Series, including the latest editions of the following:
    (a) Fundamentals
    (b) HVAC Applications
    (c) HVAC Systems and Equipment
    (d) Refrigeration
iv) Manufacturers Design Standard for Pump and Expansion Tank Sizing
v) ASSE 1017 (2009) , Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems.
vi) ASSE 1070 (2004), Performance Requirements for Water Limiting Devices.
vii) PDI WH 201 (2010) Water Hammer Arresters.
viii) ABA Accessibility Standard for Department of Defense Facilities (2015).
ix) Camp Lejeune Mechanical Design Guidance, 01 Jul 17.

3) CRITERIA

a) Design Conditions

i) Building population (number of males and number of females).

(1) Refer to Architectural Narrative for building occupancy.

ii) Plumbing fixture determination, listing quantity and types of fixtures
(1) Refer to Architectural Narrative for fixture quantity

iii) Rainfall Rates
(1) Per 2018 IPC Appendix B the rainfall rate is 4.2 inches per hour.

iv) Supply Water Temperature
(1) Based upon information by the United States Geological Survey, the average ground water temperature is 62° F.

v) Hot Water Supply Temperature
(1) Domestic hot water will be stored at 140° F to prevent the growth of Legionella bacteria. Hot water will be distributed at 120° F and mixed down at fixture per IPC requirements.

b) Occupancy Hours of Operation

i) Hours and operation for student instruction are from 0700 to 1700, Monday through Friday. Instructors and other administrative staff will have access to the facility 24 hours per day, 7 days a week.

c) Site Conditions

i) Water Flow and Pressure
(1) A fire hydrant flow test was performed indicating the following flow data, Static Pressure: 72 psig, Residual Pressure: 66 psig, flow rate 846 gpm.

ii) Natural Gas Flow and Pressure
(1) A natural gas service main, including meter, will be provided to the exterior of the building at the mechanical room site by Piedmont Natural Gas. Natural gas size and pressure will be coordinated with Piedmont Natural Gas. It is assumed that the base natural gas main line has a pressure of 2 psi at the point of connection.

iii) Sanitary Connections
(1) A new sanitary sewer main will be extended to the site.

d) Plumbing Design Issues

i) Accessibility to Equipment
(1) Facility shall meet ABA requirements. ABA/ADA compliant plumbing fixtures shall be provided where indicated on the drawings.

ii) Insulation
(1) Domestic cold water piping will be insulated for condensation.
(2) Domestic hot water, and domestic hot water return will be insulated for thermal heat loss.
(3) Exposed water supply and drainage piping below handicapped accessible lavatories shall be insulated in accordance with ADA-ABA requirements.

iii) Identification

(1) Piping will be identified per ANSI requirements.
(2) Equipment will be identified with engraved and laminated plastic nameplates or black lamicoid sheets with white lettering.
(3) Valves will be provided with tags and indexed to a master index.

iv) Sound and Vibration Control
(1) Water hammer arrestors will be provided to minimize noise and vibration in the domestic water systems, in accordance with the International Plumbing Code and PDI Standard WH-201.
(a) Access panels will be provided for water hammer arrestors, where required.

v) Pipe Velocity
(1) The domestic water piping shall be designed with a maximum velocity of 8 FPS.

e) Safety Considerations

i) Scald Protection
(1) In accordance with the 2018 IPC, hot water to hand washing sinks shall be supplied through a water temperature limiting device, conforming to ASSE 1070, to limit the water temperature to 110° F.

ii) Emergency Fixtures
(1) No emergency fixtures are required.

f) Special Systems

g) Energy and Water Reduction Compliance

i) Meet ASHRAE 189.1 Building Water Use Reduction

4) DESIGN APPROACH

a) Fixture Counts Required

i) The determination of the types and quantities of plumbing fixtures is described in the Architectural narrative

b) Fire Protection Water Service

i) The fire protection service main, beyond 5’-0” from the exterior wall will be described in the Civil narrative.
ii) The fire protection main will enter the building in the Mechanical Room and be routed up through floor slab with flanged connection 12” above finished floor. The incoming Fire Protection mains shall be restrained in accordance with NFPA.
iii) The fire protection piping from the flanged connection will be described in the Fire Protection narrative.

c) Water Distribution

i) The domestic water service main, beyond 5'-0" from the exterior wall will be described in the Civil narrative.
ii) The domestic water main will enter the building in the Mechanical Room and be routed up through floor slab. Domestic water service main to include main shut-off valve, strainer, water meter and reduced zone (RPZ) backflow preventer.
iii) Make-up water lines for Mechanical HVAC equipment will be provided with reduced zone (RPZ) backflow preventer
iv) Fixture units for cold and hot water piping are as follows:
    (1) Cold water: 340.75 WSFU
    (2) Hot water: 67.25 WSFU
    (3) Total: 363.30 WSFU.
v) Hose Bibbs will be provided in the mechanical rooms and within 25 ft of all exterior equipment with coils. Wall hydrates will be located along the building exterior such that all points along the perimeter can be reached with a 100-foot-long hose.

d) Service Hot Water System

i) Natural gas fired, low-NOx, condensing storage type water heater with hot water recirculation system.
ii) Water heater, recirculation pump and master mixing valve to be located in the building Mech (Hot) room.
iii) Two, 90 Gallon, 199 MBH, water heaters will be provided to supply domestic hot water. Equipment will be located on a 4'-0"x10'-0", 4" high, housekeeping pad.

e) Sanitary System

i) Fixture units for drainage and venting piping.
    (1) 204 DFU's
ii) One 4" sanitary lateral will be routed to the building for the sanitary sewer main.

f) Natural Gas

i) Meter shall be located at the building exterior, near the Mech (Hot) room.
ii) Natural gas main was sized based on information supplied from the utility provided that the natural gas main line has a pressure of 2 psi at the point of connection.
iii) Building Estimated Natural Gas load:
    (1) 1835 MBH

g) Piping Systems

i) Materials

(1) Sanitary Waste and Vent Piping
  (a) Below ground sanitary waste piping shall be Sch. 40 PVC, per RFI WMJ-00029.
  (b) Above ground sanitary waste and vent piping shall be Sch. 40 PVC, per RFI WMJ-00029.
(2) Fire Protection Service
  (a) The underground fire protection service shall be ductile iron pipe with mechanical joints.
(3) Domestic Water Service
  (a) Refer to Civil Narrative for piping from service main to 5'-0" of the building.
  (b) Below grade water service piping shall be PVC C-900. Underground piping larger that 4" shall be ductile iron mechanical joint conforming to AWWA C151 factory wrapped.
(4) Domestic Water Distribution (cold, hot, and hot return)
  (a) Aboveground water piping shall be ASTM B88 Type L hard drawn copper with ASTM B16.22 wrought copper fittings and solder joints.
  (b) Belowground trap primer piping shall be Copper Type K soft drawn.
(5) Natural Gas
  (a) Below ground service piping and aboveground pipe to building side of meter shall be provided by Piedmont.
  (b) Aboveground gas piping 2 inches and smaller shall be Schedule 40 black steel with threaded fittings. Aboveground gas piping 2 ½ inches and larger shall be Schedule 40 black steel with welded fittings.

h) Plumbing Fixtures

i) General
  (1) Plumbing fixtures shall be provided in accordance with ADA-ABA.
  (2) Plumbing fixtures where applicable shall be of an ultra-low flow design to provide for high water efficiency.

ii) Water Closets
  (1) Floor mounted, vitreous china, hard-wired, sensor operated flush valve with manual operation button. Maximum of 1.28 GPF, siphon jet, elongated bowl type with white open seat.

iii) Urinals
  (1) Wall hung, back outlet, vitreous china, hard-wired, sensor operated flush valve with manual operation button. Maximum of 0.5 GPF, washout type.

iv) Lavatories
  (1) Solid surface lavatory integral with solid surface countertop. Hard-wired sensor operated mixing faucet with automatic control and battery backup. Aerator rated at 0.5 GPM.
  (2) Temperature limiting valve, complying with ASSE 1070.

v) Sinks

(1) Brushed stainless steel undermount sink with swivel faucet.
(2) Provided in pantry/break areas.

vi) Service Sink
(1) Provided in mudroom area.

vii) Mop Sink
(1) Provided in Janitor's Closet

viii) Showers
(1) Solid Surface shower surround and base.
(2) Surface mount faucet and spray head with prefabricated stainless steel mount and enclosure panel, temperature compensating valve with metal stem handle and integral service stops.
(3) Low flow type shower, 2.0 GPM. Stationary shower head with flow control and institutional bracket.

ix) Electric Water Cooler
(1) Wall hung, duel height unit with bottle filler.
(2) Provide wall recess or side walls.

x) Outlet box
(1) Provide recessed water-outlet boxes for ice and coffee makers.

xi) Floor Drains
(1) Provide in mechanical rooms, restrooms, break rooms, in proximity to emergency fixtures and overhead doors and in plumbing chase area

xii) Floor Sinks
(1) Provided at water service entrance and to receive condensate from air handling units and CRAC Units.

xiii) Wall Hydrants/Hose Bibbs
(1) Wall hydrants with integral vacuum breaker and locking cover provide along building exterior such that all points along perimeter can be reach with a 100-foot hose.
(2) Hose bibb with non-removeable vacuum breaker back flow preventers shall be provided in the mechanical room.

i) Plumbing System Controls

i) Water Meter
(1) Compatible with the Itron 100W encoded radio transmitter (ERT).
(2) Communicate with Itron's Advanced Meter Reading (AMR) and/or Advanced Metering Infrastructure (AMI) technology at the base.

ii) Gas Meter
(1) Tie into the Building Automation System (BAS) and the existing Advanced Metering Infrastructure (AMI) metering system.

j) Energy Conservation

i) Compliance Forms

k) End of Section

5) APPENDICES

a) Fixture units for drainage, venting, cold and hot water piping.

b) Water System Sizing Calculations

c) Sanitary System Calculations

d) Hot Water System Demand, Storage, Recovery Calculation

e) Equipment Sizing Calculations

i) Pumps.

CHAPTER 9 – MECHANICAL

1) SCOPE SUMMARY

a) Design Package

i) The project Mechanical (HVAC) Design is provided in one Design Package "DP-2" (Design Package 2). No pertinent HVAC design is contained within DP-1 (Critical Path Design Package 1) which relates to Early Site / Foundations issues only.

b) Project Objectives

i) This Mechanical Design Analysis (Chapter 9) provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.

ii) The Scope of Work contained within this section is to provide background to the mechanical (HVAC) design for the P-1338 MEF Simulation Training Building. Other design efforts within the Hurricane Florence MILCON program / Package 3: MCAB Camp Lejeune (Buildings P1512 & P1527) are provided separately as separate design package deliverables.

(1) The P-1338F II MEF Simulation/Training Center (replacement) project consists of a single story building consisting of roughly 53,400 gross square feet square to provide the following functions:

(a) Non-Secure Side operations consisting of:
- (i) Private offices
- (ii) SIM Analyst and Operation Open/Shared Workspaces
- (iii) Library/File Storage Area
- (iv) Storage/Shipping-Receiving Areas
- (v) Restroom/Shower/Locker & Janitor Closet spaces
- (vi) Break Room
- (vii) Mechanical Room (AHU's and Chilled Water equipment)
- (viii) Mechanical Room (Hot) – Boilers, Water Heaters, Gas fired Equipment
- (ix) Elec & Comm

(b) Secure Side Operations/Training Areas consisting of:
- (i) 12 large classroom areas
- (ii) Auditorium
- (iii) Restroom/Shower/Locker & Janitor Closet spaces
- (iv) Break Room

(v) Plotting/Laminating Room
(vi) Raised floor Server Room
(vii) Main Building Electrical Room
(viii) Entry Lobby and access control areas
(ix) Brief/Debrief conference rooms

iii) Phasing: This project entails no specific identified construction phasing requirements.
iv) Future Expansion: No provisions have been identified requiring consideration for future expansion of the building or requisite capacity of central mechanical systems.

2) REFERENCES

a) N-400-8520D0034 Design Build Hurricane Florence Recovery MILCON Package 3, Training and Storage Facilities, MCB Camp Lejeune NC.

i) Part 3, Chapter 1 Project Description – P1338F II MEF Simulation/Training Center Replacement
ii) Part 3, Chapter 5 – Room Requirements
iii) Part 3, Chapter 6 ESR D30 – HVAC (and all associated D30 subparts)
iv) Part 4, Performance Technical Specifications, subpart 4.4 D30 HVAC
v) Part 5, Prescriptive Specifications, in particular:
(1) 08 91 00 Metal Wall Louvers
(2) 23 05 93.00 22, 23 09 13.00 22 & 23 09 23.02 22 DDC Controls Specifications (BACnet)
(3) 23 24 00 Hydronic Pipe Cleaning and Flushing Procedures
(4) 25 05 11 Cybersecurity for Facility Related Control Systems

b) Building Codes

i) International Mechanical Code 2018 (as modified per UFC 1-201-01)
ii) NFPA 101, Life Safety Code
iii) National Fire Protection Association (NFPA) Codes

c) United Facilities Criteria

i) UFC 1-200-01, DoD Building Code - (8 October 2019)
ii) UFC 1-200-02, High Performance and Sustainable Building Requirements - (Change 04, 01 October 2019)
iii) UFC 3-101-01, Architecture – (Change 5, 25 September 2019)
iv) UFC 3-400-02, Design: Engineering Weather Data – (20 September 2018)
v) UFC 3-401-01, Mechanical Engineering – (Change 1, October 2015)
vi) UFC 3-410-01, Heating, Ventilating, and Air Conditioning Systems – (Change 6, 30 March 2020)

vii) UFC 3-410-02, Direct Digital Control for HVAC and other Building Control Systems – (18, July 2018)
viii) UFC 3-450-01 – Noise and Vibration Control – (15 May 2013)
ix) UFC 3-580-01 – Telecommunications Interior Infrastructure Planning and Design – (Change 1, 01 June 2016)
x) UFC 3-600-01 Fire Protection Engineering for Facilities – (Change 4, 7 February 2020)
xi) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings – (12 December 2018)
xii) UFC 4-010-06 – Cybersecurity of Facility-Related Control Systems - (Change 1, 18 January 2017)
xiii) UFC 4-211-01 – Aircraft Maintenance Hangars – (Change 2, 18 May 2020)

d) Other Referenced Documents

i) American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) Handbook Series, including the latest editions of the following:
    (a) Fundamentals
    (b) HVAC Applications
    (c) HVAC Systems and Equipment
    (d) Refrigeration
ii) ANSI/ASHARE Standard 90.1-2013, Energy Standard for Buildings Except Low-Rise Residential Buildings
iii) ANSI/ASHRAE Standard 62.1-2010, Ventilation for Acceptable Indoor Air Quality
iv) ASTM – American Society for Testing and Materials
v) ASHRAE TC 9.9 / TIA-569-D
vi) Camp Lejeune Mechanical Design Guidance - (01 July 2017)
vii) NFPA 90A – 2018 Edition – Standard for the Installation of Air-Conditioning & Ventilating Systems
viii) Sheet Metal and Air Condition Contractors National Association (SMACNA)
ix) American Conference of Government Industrial Hygienists (ACGIH), Industrial Ventilation Manual

3) CRITERIA

a) Design Conditions

i) Outside Conditions: Summer: 91°F DB / 79°F WB, Winter: 26°F DB
ii) Outside Design Condition for Air Cooled Equipment: 95°F DB
iii) Inside Conditions (Heated and Cooled Areas): Summer: 78°F DB / 50% RH, Winter: 68°F DB
iv) Inside Conditions (Heated and Ventilated areas): Summer: +10° above ambient, Winter: 55°F DB

v) Inside Conditions (Comm/IT Rooms): Summer: 78°F DB / 55°F Dew Point, Winter: NA
vi) Inside Conditions (Heating & Ventilating –Mechanical Rooms with Heat Producing Equipment): Summer: +10° above ambient, Winter: 55°F DB
vii) Inside Conditions (Cold Mechanical Rooms): Summer: N/A DB / 55°F Dew Point, Winter: 55°F DB
viii) For Unoccupied Mode (Night Setback): Summer: 5°F DB higher than cooling conditions but no higher than 85°F DB. Winter: 10°F DB lower than indoor heating conditions but no lower than 55°F DB.
ix) Occupiable spaces shall be provided with thermostats and temperature sensors with occupant adjustment control range of +/- 3°F.

a) Occupancy Hours of Operation

i) In accordance with the RFP, the simulation training center is occupied primarily during daytime hours by students in training spaces and administrative staff in administrative departments. Hours for energy modeling/load calculations shall be based on 7 am – 6pm operation.

b) Mechanical Systems Redundancy Considerations

i) Equipment Redundancy:
(1) Chillers: In accordance with the RFP requirements, 2 chillers shall be provided with each chiller providing/serving 50% of the building peak cooling requirements.
(2) Boilers: Boiler are provided in accordance with the RFP ESR D3020 requirements. Heating requirements indicate a total heating hot water demand of approximately 963 MBH; serving this load with boilers having a maximum input of 399 MBH per RFP requirements (~387 MBH output) will required a quantity of 3 boilers to accomplish the RFP requirement of "where more than two boilers are required to meet size limitations, size each boiler for 1/N of the total load, where "N" is the total number of boilers.
(3) Pumping Systems:
(a) Hot water distribution (secondary) pumping is being provided with two VFD driven pumps, with each sized at 100% of the building load for pumping redundancy.
(b) Chilled water distribution**: As discussed at the DD Review meeting, based on the limited distribution of CHW (only 2 AHU's and 3 CRAC units are served), a constant flow primary only system has been provided with constant flow pumping provided by a single pump (with a fully redundant pump). Refer to piping diagram on drawings.
(4) CRAC Units: CRAC units for the SIM Control Server Room will be provided in an "N+1" fashion to provide redundancy/service to the room via a shared raised floor distribution system with floor tiles generally employing a "hot aisle/cold aisle" approach for

conditioning of the room. The N+1 service will be met with 3 CRAC units (each sized at 50% of the room load).

c) Site Conditions

i) Gas and electric will be the source of thermal energy. Gas will be used for most of the building heating.
ii) Radon control is not part of the scope of work of this project.
iii) Seismic / ATFP Control

(1) Review of ASCE 7-16 Seismic Requirements:

(a) The building is located within the Seismic Design Category B geographic region.

(b) The project is not a "Risk Category IV" structure.

(c) Mechanical systems (ductwork, piping, etc.) described within this portion of the design analysis relative to general HVAC systems have an importance factor of 1.0.

(d) ASCE 7-16 section 13.1.4, Exemption #4 exempts Mechanical and Electrical Components in Design Category B from the requirements for Seismic Design covered by this chapter of the ASCE.

(e) Mechanical equipment will still be provided with ATFP bracing as required in accordance with UFC 4-010-01 Standard 19 which requires the design of all equipment mountings to resist forces of 0.5 times the equipment weight in any horizontal direction and 1.5 times the equipment weight in the downward direction. A detail for this bracing is provided on the mechanical detail sheets (M-500 series).

d) Envelope Requirements

i) "U" Factor Summary and Calculations – (refer to Architecture Design Analysis)
ii) Dew Point Analysis (refer to Architecture Design Analysis)
iii) Outdoor air shall be provided through a wall mounted intake louver located 10' above grade.

e) HVAC Design Issues

i) Accessibility to Equipment: Mechanical room layout and roll up door size and configuration have been coordinated to allow for installation and removal/replacement of all equipment without impacting or requiring removal of any other equipment to achieve access, etc. In accordance with agreed direction received at the DD review meeting the Mechanical room has been swapped with the warehouse room with the mechanical room now in the northwest corner of the facility. AHU's have been arranged such that they straddle the roll up door opening with their required service access areas. The larger AHU-2 consists of two

main parts (an AHU with cooling coil, heating coil, plenum fan wall) and a ERV section. These sections are adjoined in the room, but separate components, likewise the large AHU-2 main section is comprised of multiple shipping splits such that removal/replacement can be facilitated.

ii) Many spaces (Simulation classrooms, Auditorium space, etc. have a required ceiling height of 12' per the RFP room datasheets. The arrangement and configuration of these spaces is such that locating VAV terminal units outside of these areas is infeasible/impractical. Therefore, VAV boxes will be located above the 12' ceilings when necessary. The UFC 3-410-01 para 3-7.10 criteria for "When Installing VAV terminals at heights in excess of 12 feet …." Shall be followed (VAV boxes are not fan powered and therefore do not consume power defining them as an "appliance" under the provisions of IMC 306).

iii) Sound and Vibration Control: AHU's will be provided with internal spring/vibration isolation for fans.

f) Life Safety Considerations

i) Duct smoke detectors will be installed in the air distribution system as required by IMC and NFPA requirements for any supply or return air systems greater than 2,000 cfm airflow.

ii) Fire dampers will be determined as design progresses in accordance with NFPA 90A – 2018 Edition. Currently the Life Safety plans do not indicate any 2-hour rated walls so no fire dampers have been located.

iii) ATFP shutdown switches have been indicated on plans per UFC 4-010-01 requirements.

g) Special Systems

i) Server room, Raised floor distribution system: The room has been determined to have a total cooling requirement of approximately 30 tons based on the various discussions and information provided, and it is being served with either (3) 15-ton CRAC units to provide the required N+1 redundancy. With the CHW system being constant flow to 3-way valves at the devices, in order to avoid excess flow, additional 2-way isolation control valves have been provided to limit flow to the 2 active units. The units then have manufacturer provided 3-way valves to modulate flow to the coils.

ii) Comm Rooms: Comm (IT) rooms will be provided with split DX units independent of the building central (Chilled water / VAV Air Handling) unit systems. Some filtered/conditioned supply air will be provided to these spaces to provide positive pressurization.

iii) Mechanical (hot): The hot mechanical room containing gas fired equipment is provided with hydronic heating via a unit heater and ventilation-based summer cooling to prevent the space from exceeding 10°F above outdoor ambient. In accordance with the RFP requirements this space will be provided with a supply fan and relief louver such that the space is not pulled under a negative pressure. This requirement is likely a legacy requirement based on the installation needs of natural draft fuel fired equipment within

such rooms not being tolerant of negative room pressures. However, with the installed systems being sealed combustion with combustion intake vents and flues directly vented to the outdoors this approach may not necessarily be required or in the best interest of the design as outdoor is being 'pushed' inside the envelope of the building and extra care will need to be taken in maintaining the air barrier pocket cut out of the building envelope by this space.

iv) Mechanical (Cold): Mechanical room containing the air handlers and chilled water handling hydronic systems will be heated and dehumidified only (no forced ventilation with outside air) to minimize any potential condensation issues associated with insulation vapor barriers, pipe hangars, etc. that may be below the outside air dewpoint. Hydronic heating to maintain winter temperature will be provided along with a dehumidifier to maintain low humidity levels.

v) Electrical Rooms: Electrical rooms will be provided with ventilation cooling and electric heating. Electric heat will be provided to prevent any water (hydronic) services from needing to enter the space. From a LCCA perspective, the actual operation of such electric heat will be extremely limited.

4) DESIGN APPROACH

a) Life Cycle Cost Analysis Considerations

i) In accordance with RFP, LCCA to be provided by Govt.; Design shall follow the prescriptive HVAC design requirements of the RFP.

b) Heating

i) Hydronic heating system shall be provided consisting of boilers and pumps in accordance with the RFP requirements. While variable primary boiler flow was investigated, with the small boilers in modular fashion as provided, the boiler IOM, recommendation / preferred practice is to provide boiler circulator with each boiler per manufacturer.

ii) Boilers and associated hot water pumps will be located in the "hot" mechanical room.

iii) Hot water will be pumped to heating coils in Variable Air Volume (VAV) Air Handling Units (AHUs), VAV box reheat coils, and Hot Water Unit Heaters (HUHs). The hot water piping will serve the equipment in a reverse return configuration with constant volume primary and variable secondary pumps. Each boiler will contain a primary pump and there will be two secondary pumps - one operating and one standby.

c) Cooling System

i) Hydronic Chilled water system shall consist of 2 chillers each at 50% of load, with a constant flow chilled water system serving 3-way valves at the limited quantity of cooling coils within the facility.

ii) Central Air handling equipment conveying cold air, and chilled water pumps and associated chilled water piping accessories and appurtenances shall be contained within the main mechanical room which will be heated and dehumidified only.
iii) Chilled water will be pumped to cooling coils in AHUs.
iv) Emergency chiller connections consisting of isolation valves and blind flanges has been provided.
v) Telecomm rooms shall be cooled with SSHPs or SSAC units allowing for separate zoning and independence from the central building mechanical systems.

d) Ventilation System

i) Ventilation will be provided through energy recovery sections within each of the 2 primary air handlers. Outside air rates will be constant in accordance with ASHRAE 62.1 Multizone calculations.
ii) CO2 sensor control in high density spaces will not be provided in accordance with meeting discussion/direction from the CDW. Space occupancy sensors will allow the VAV boxes to go to full shut off operation (vs. minimum scheduled flowrates) when the room is unoccupied. This has been applied to the majority of boxes where a single “occupied zone” is served by the box, in some instances this is not being used such as multiple private offices on a common box, etc.

e) Exhaust system

i) Restroom/bathroom exhaust for the non-secure building side is roughly equivalent to the outside air requirements for this side of the building and will be routed through the exhaust system of the AHU’s energy recovery ventilator for pre-conditioning of the associated outdoor airstream.
ii) Restroom/bathroom exhaust for the secure side of the building is considerably lower than the anticipated outdoor air requirement for this area. Thus, exhaust will be directly removed from these spaces via an exhaust fan terminating into an exhaust louver. Due to the high OA rates an associated building relief air need exists which will be used to exchange heat with the incoming outdoor airstream at the AHU-2 unit.
iii) Combustion Exhaust Systems from the boilers and water heating systems in the “hot” mechanical room will be vented in proximity to the exhaust louvers from this space. 30’ separation between exhaust flues/general exhaust and outdoor air intakes will be maintained in accordance with UFC 3-410-01 best practice requirements. With the revision of mechanical room location since the DD, the intake louver is now on an opposite facing wall from any exhausts in addition to maintaining the separation distance.

f) HVAC Systems

i) The ductwork shall be sized using industry standard friction rates and velocities. Ductwork shall be insulated as required. Volume control dampers shall be provided at supply and return branch ductwork take-off locations. Flexible duct shall be insulated metallic and limited to 5'-0" spans.
ii) Ducted returns for each zone shall be provided per UFC 3-410-01.
iii) Diffusers, registers, and grilles will be utilized for air circulation.
iv) Flat oval or round ductwork shall be used for medium pressure primary supply air upstream of VAV boxes.

g) Piping Systems

i) Condensate Piping
ii) Refrigerant Piping
iii) Hydronic Heating Hot Water Piping
iv) Hydronic Chilled Water Piping
v) Pipe Velocity / Pressure Drop: Hydronic chilled water and hydronic heating piping will be sized for a maximum of 4' head loss per 100' pipe run & maximum velocity of 8 feet per second.

h) HVAC Controls (per RFP)

i) A complete BACnet control system shall be provided in accordance with all RFP requirements and standard LeJeune specifications provided within the RFP.
ii) Minimum Control Points – per RFP and UFC 3-410-01
iii) Special Alarms and Special Control Points– per RFP and UFC 3-410-01
iv) ATFP Shutdown, Locations, Dampers – in accordance with UFC 4-010-01.
v) Provide meters, monitored by the DDC System for all meters and the Advanced Metering Infrastructure (AMI) System for the gas meter, on gas and water mains as well as on HVAC and process subsystems. Meters for electrical utilities will be provided as well. See Electrical Design Analysis for more detail on electrical meters.

i) End of Section

5) Appendices

a) Appendix J – Mechanical Calculations and Cutsheets

b) Appendix P – Energy Analysis

Energy model comparing design solution (as prescribed by RFP and govt LCCA) against an ASHRAE 90.1-2013 baseline model for UFC 1-200-02 compliance confirmation is included in appendix P. Note that in accordance with UFC 1-200-02 design energy is required ultimately to be of a "system to achieve an energy consumption level at the highest level of energy efficiency that is LCCE (Life Cycle Cost Effective), and the system parameters have been prescribed by the RFP – so the energy analysis will simply be a run to show results of the modeling exercise, not a design decision making tool/process.

CHAPTER 10 – ELECTRICAL

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in One Design Package.

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.

ii) The Scope of Work is demolition of existing buildings and to provide the electrical design of the MEF Simulation/Training Center at MCB Camp Lejeune, Jacksonville, NC. The electrical scope includes:

(1) Demolition of existing buildings No. 125, 125A, 127, H13, and prefabricated trailers 125B and 125C. Electrical demolition will involve the removal or existing electrical services and equipment back to the utility main point of connection.

(2) Providing new service entrance feeders from the existing overhead electrical power system at PP1 on either McHugh Boulevard or Birch Street. Connection point location will be coordinated with Camp Lejeune Public Works Department.

(3) Providing a new pad mounted transformer to feed the new main service entrance switchboard. Included features of transformer per the RFP.

(4) Providing a new main service entrance switchboard in the main electrical room to serve the building. Circuit breaker shall be of ampacity and interrupting capacity as required.

(5) Providing a step-down 225kVA 480V-208/120V transformer and an 800A 208Y/120V distribution panelboard to power the pedestal loads at the outdoor training area.

(a) The 208Y/120V step-down transformer will have NEMA 4X enclosure and will be fed from the main switchboard. Both the step-down transformer and panelboard will be installed on a concrete pad located adjacent to the loads. Pedestal mounted or equipment mounted disconnect will provide primary protection of the step-down transformer.

(6) Providing a diesel engine generator to provide standby power to the MEF Simulation/Training Center building.

(7) Providing an Emergency Power Off (EPO) System to disconnect electrical power to CRAC Units and UPS's.

(8) Providing additional panelboards and circuit breakers as required.

(9) Providing a digital meter to monitor the total power usage at the MV Pad-Mounted Distribution Transformer. Monitored output will report to and be compatible with the existing Camp Lejeune Advanced Metering Infrastructure (AMI).

(10) Providing a complete lightning protection system with a UL Lightning Protection Inspection Certificate certified to UL 96A.

(11) Providing a complete grounding system in accordance with the RFP and any applicable codes or standards.

(12) Providing a complete LED lighting system consisting of exit and emergency lighting and area lighting, include manual wall stations, occupancy sensors, vacancy sensors, and dimming switches.

(13) Providing LED site lighting for parking lot, building exteriors, and security lighting. LED exterior luminaires, poles, and foundations will be provided in accordance with the Camp Lejeune Electrical Policies and Camp Lejeune Base Exterior Architectural Plan.

iii) Future Expansion – Providing a minimum of 15 percent spare circuit and load capacity at all levels of the power distribution system including any stand-by power systems.

2) REFERENCES

a) P1338F: MEF Simulation/Training Center Replacement, 180780

i) Part 1, Part 2, Part 3, Part 4, Part 5, and Part 6 (Sections D50 and G40)
ii) Amendments 003-020

b) Building Codes

i) International Building Code 2018 (as modified per UFC 1-200-01)
ii) National Electrical Code 2017 – NFPA 70
iii) Standards for the Installation of Lightning Protection Systems 2017 – NFPA 780

c) Unified Facilities Criteria

i) UFC 1-200-01, General Building Requirements
ii) UFC 1-200-02, High Performance and Sustainable Building Requirements:
iii) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
iv) UFC 3-501-01, Electrical Engineering
v) UFC 3-550-01, Exterior Electrical Power Distribution
vi) UFC 3-520-01, Interior Electrical Systems
vii) UFC 3-530-01, Design: Interior and Exterior Lighting and Controls
viii) UFC 3-575-01, Lightning and Static Electricity Protection Systems
ix) Other referenced UFC or Facility Specific FC's

d) Other Referenced Documents

i) ANSI/ASHRAE/IESNA Standard 90.1-2013 (ASHRAE 90.1), Energy Standards for Buildings Except Low Rise Residential Buildings, 2013
ii) ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 (ASHRAE 189.1), Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, 2014
iii) IEEE C2, National Electrical Safety Code (NESC) 2017, for distribution outside of buildings
iv) Manufacturer's Recommendations

3) CRITERIA

a) Design Conditions

i) Typical Receptacle Loads will not be controlled by occupancy sensors per response to RFI WMJ-00020.
ii) Equipment Loads – Providing dedicated circuits to ancillary office equipment such as printers, faxes, plotters shredders and water coolers. In general, providing dedicated circuits for equipment requiring 8 full load amperes (FLA) or higher.
iii) Grounding Requirements
   (1) New grounding system for all systems as required.
   (2) Grounding system for the facility electrical and telecommunications systems will be complete and tested to meet the requirements of NFPA 70 and NFPA 780.
   (3) Providing grounding conductor with all circuits and feeders. Conduits cannot be used as the sole grounding conductor. Multiple circuits in a conduit may share a grounding conductor.
iv) Conditioned Power Requirements – No special requirements for this project.
v) UPS requirements – Instead of a Central UPS system as required in the RFP, per response to RFI WMJ-00047, Government Furnished UPS's will be used for Server Room Racks.
vi) Lightning Flash Density – No special requirements for this project.

b) Occupancy Hours of Operation

i) Training Center – Intermittent Occupancy

c) Redundancy/Future Considerations

i) Equipment Redundancy – No redundant equipment for the project.
ii) Phasing – The project will be constructed in one phase.
iii) Future Expansion – Provide a minimum of 15 percent spare circuit and load capacity at all levels of the power distribution system including any stand-by power systems.

d) Site Conditions

i) Source of Power Energy – Electric service originates from an overhead electrical system at PP1 on Birch Street or McHugh Boulevard

e) Standby Power and Emergency Load Requirements

i) Diesel engine generator set to provide standby power to the MEF Simulation/Training Center building.
ii) Diesel engine generator will provide eight hours of standby power.
iii) Diesel engine generator will support all building loads by providing one automatic transfer switch for building electrical system in accordance with applicable codes. The RFP does not require the ATS to be located outside of the building. Per response to RFI WMJ-00016, the ATS will be located outside of the building close to the generator for maintenance.
iv) RFP does not require a second breaker for generator testing. Per response to RFI WMJ-00017, the diesel engine generator will be equipped with a second circuit breaker, interlocked with the generator main breaker for load bank testing. The breaker will be equipped with female CAM-LOK connections on pig-tails to facilitate the connecting of the Camp Lejeune load banking equipment.
v) Means of egress illumination for the building will be provided by wall mount stand-alone type emergency wall packs per response to WMJ-00014.
vi) Emergency lighting will be unswitched except where required.

f) Electrical Design Issues

i) Accessibility to Equipment
ii) Seismic Bracing - Provide seismic restraints and comply with the antiterrorism requirements criteria included in UFC 4-010-01, specifically Standards 16 through 21 as they relate to electrical systems.
iii) Voltage Drop – Voltage drop will be designed to meet the requirements MCB Camp Lejeune Electrical Policies and Criteria where all feeder conductors will be sized for a maximum voltage drop of 2% and all branch circuit conductors will be sized for a maximum voltage drop of 3%.

g) Special Systems

i) Corrosive and High Humidity Locations – Equipment will be rated for the environment for which it is installed. Exterior mounted equipment will be rated for local coastal, high humidity, and marine environments.

ii) Emergency Power Off (EPO) System – Providing an Emergency Power Off (EPO) System to disconnect electrical power to CRAC Units and UPS's.
iii) Server Room – Each server rack will be provided with Government Furnished UPS. Dedicated panels in the Server room will provide power to Government furnished UPS's.
iv) Dedicated Mechanical Panel will serve CRAC units in Server Room.

h) Energy Compliance Analysis

i) Daylighting – Lighting Controls that utilize light harvesting are not permitted per MCB Camp Lejeune Electrical Policies and Criteria. Camp Lejeune confirmed that daylight harvesting is not required as a response to RFI WMJ-00023.
ii) Occupancy Sensors in multi-person restrooms are not permitted per MCB Camp Lejeune Electrical Policies and Criteria

iii) Occupancy Sensors and Control – Area lighting will be controlled via manual switches, low voltage, and dim switches. A central scheduled lighting control system is not required per response to RFI WMJ-00021.

iv) Site Lighting will be controlled by only one photocell and group of contactors per zone per the response to RFI WMJ-00022.

v) Receptacle Control – Receptacle control via occupancy sensors is not required on this project per response to RFI WMJ-00020.

vi) Providing a digital meter to monitor the total power usage at the MV Pad-Mounted Distribution Transformer. Monitored output will report to and will be compatible with the existing Camp Lejeune Advanced Metering Infrastructure (AMI). Submetering is not required for this project per response to RFI WMJ-00015.

4) DESIGN APPROACH

a) Exterior Primary Power Distribution System

i) Primary Feeder will be in concrete encased underground ductbank.
ii) Secondary Feeder from Transformer to Main Switchboard will be in ductbank.
iii) Number of Primary Cables – 3PH, 4W. New service cables from existing overhead electrical system PP1 will be 15kV EPR cable type MV-105, and 133% insulation level.
iv) Available fault current – Infinite
v) Estimated Connected Load for the P1338 MEF Simulation Training Building– 1000kVA, 12.47kV-480/277V Transformer with 2000A, 480/277V Main Switchboard.
vi) Resulting demand Load – 806 kVA

vii) The connected load for the pedestals per RFP is 225 kVA. A 225kVA 12.47-208/120V transformer with 800A service entrance rated NEMA 4X distribution board.

viii) The total capacity of the 480/208V/120V step-down transformers exceeded 40 % of the service transformer size (1,000kVA). Camp Lejeune waived UFC's second service requirement.

ix) Voltage Drop - Voltage drop will be designed to meet the requirements MCB Camp Lejeune Electrical Policies and Criteria, where all feeder conductors will be sized for a maximum voltage drop of 2% and all branch circuit conductors, will be sized for a maximum voltage drop of 3%.

x) Equipment Rating - Equipment will be rated for the environment in which it is installed to meet RFP, NEC, and UFC requirements.

b) Interior Power

i) Electrical Characteristics
   (1) TVSS – Will be installed at service entrance with supplemental protection at panelboards located in computer rooms serving the computer equipment.

ii) Switchboard
   (1) Voltage – 480Y/277V
   (2) Short circuit rating – As indicated, EasyPower Design Analysis
   (3) Max voltage – 480V
   (4) Main Bus ampacity – 2000A

iii) Estimate Demand Load –806kVA

iv) Wiring Methods - Branch wiring will be insulated copper conductors in the raceway. Metal Clad Cable type MC and Armored Cable type AC will not be allowed.

v) Conductors - All wiring will be copper. Use of aluminum conductors and ENT conduit shall not be allowed.

vi) Panelboards
   (1) Type: Surface and recessed Mounted
   (2) Bolt-on breakers only
   (3) Spaces: Minimum 15% spare per RFP

c) Exterior Lighting

i) Illuminance values – Per UFC 3-530-01 "Interior and Exterior Lighting and Controls"

ii) Maximum wattage values - TBD

iii) Controls – Will be controlled centrally by photocell and contactor panel in compliance with Camp Lejeune Standard Criteria.

iv) Occupancy Sensors – Occupancy sensors will not be used for exterior lighting control

v) Security Lighting – Security fence lighting is provided in the training area, as shown on ES102.

d) Interior Lighting

i) Illuminance values - Per UFC 3-530-01 “Interior and Exterior Lighting and Controls”
ii) Maximum wattage values – Refer to Lighting Fixture Schedule E-601
iii) Controls – There will not be a central scheduled lighting control system.
iv) Occupancy Sensors – Will be used to control area lighting per RFI response
v) Daylight Controls – Daylighting controls are not permitted per Camp Lejeune Standard Design Guide.
vi) Egress Lighting – Means of egress illumination for the building will be provided by wall mount stand-alone type emergency wall packs.

e) Grounding and Lightning Protection Systems

i) Estimated Ground Rods Requirements – As indicated on the building grounding drawings and specification.
ii) Special Grounding Connections – Special grounding is required under the Server room as shown on the drawing set.
iii) Lightning Protection system will be designed in accordance with UFC 3-575-01 and NFPA 780.

f) Conduit Systems

i) Materials - Branch wiring will be insulated copper conductors in raceway. Metal Clad Cable type MC and Armored Cable type AC will not be allowed.

g) Metering

i) Providing a digital meter to monitor the total power usage at the MV Pad-Mounted Distribution Transformer. The monitored output will report to and will be compatible with the existing Camp Lejeune Advanced Metering Infrastructure (AMI).
ii) Per RFI response, submetering is not required on this project.

h) Energy Conservation

i) Compliance Forms

i) End of Section

5) APPENDICES

a) **Electrical Service Sizing**

b) **Generator Sizing**

c) **Lighting level**

d) **Emergency Lighting**

e) **EasyPower Analysis.**

f) **Lightning protection analysis**

g) **Equipment Cut sheets.**

CHAPTER 11 – TELECOMMUNICATIONS

1) SCOPE SUMMARY

a) Design Package

i) The project consists of a one-story training facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST). The facility will be constructed on a greenfield site that will include parking, outdoor training areas, and a new building with open secret storage space, containing multiple configurable simulation training classrooms, configurable First Integrated Rehearsal Environment (FIRE) classrooms, audio/visual, computer and server room equipment spaces, and spaces for personnel and administrative support. These functions will be relocated from several separate existing buildings and consolidated into the new training facility. Facility.

b) Project Objectives

i) Consolidation of multiple program areas under one roof. This includes personnel, equipment, and virtual simulation requirements.

ii) Increase efficiencies of these respective training exercises, offering considerable reductions in the cost of servers, various networking requirement, military support staff, and contractor support.

iii) Consolidation of multiple functional aspects of Building 125, the Deployable Virtual Training Environment (DVTE) at Building 127, and the CAST at Building H13 into a new state-of-the-art training facility.

2) REFERENCES

a) Project Program II MEF Simulation/Training Facility
   i) Parts 1 & 2 – Project Description, Project Objectives
   ii) 4.0 Building Requirements
   iii) 5.0 Room Requirements
   iv) 6.0 Engineering Systems Requirements
      (a) D50 Electrical
      (b) G40 Site Utilities Electrical

b) Building Codes

i) See Part 1.4 – Codes and Standards

c) Unified Facilities Criteria

i) UFC 1-200-01, General Building Requirements
ii) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
iii) UFC 3-580-01, Telecom Building Cabling Systems Planning and Design
iv) UFC 3-580-10, NMCI Standard Construction Practices
v) UFC 4-010-06 Cybersecurity of Facility Related Control Systems
vi) UFC 4-021-02, Electronic Security Systems
vii) UFC 4-021-02NF, Security Engineering Electronic Security Systems
viii) MCB Camp Lejeune Specification 27 10 00 Building Telecommunications Cabling System
ix) MCB Camp Lejeune Specification 33 82 00 Telecommunications Outside Plant
x) Other referenced UFC or Facility Specific FC's

d) Other Referenced Documents

i) ANSI/TIA/EIA-569 Commercial Building Standard for Telecommunications Pathways and Spaces
ii) Manufacturers Design Standard

3) CRITERIA

a) Design Conditions

i) Backbone and horizontal cabling components to comprise a structured cabling system (SCS) for both Classified and Unclassified communications
ii) Interior and exterior pathways: horizontal and vertical pathways, underground duct bank systems, sleeves, cable tray conduit, pull boxes, pull cords and outlet boxes, patch panels, equipment racks, cable management, telecommunications ground bus system, fire rated plywood backboards
iii) Telecommunications equipment spaces to include MDF, IDF, Server Room, Simulation Control Room, and Secure Comm Room Vault
iv) Public Address (PA) system
v) Community Access Television (CATV) system
vi) ESS (Electronic Security System), including pathway, wiring, cabling, and devices
i) Audiovisual Systems
ii) GPS System

b) Occupancy Hours of Operation

i) Student instruction 0700 to 1700, Monday through Friday; instructors and other administrative staff 24 hours per day, 7 days a week.

c) Redundancy/Future Considerations

i) Equipment Redundancy: No special requirements for this project.

ii) Phasing: This project will be constructed in one phase.
iii) Future Expansion: Twenty-five percent (25%) future growth factor for all cabling termination panels and termination equipment.

d) Life Safety Considerations

i) Fire Alarm Interface

2) DESIGN APPROACH

a) Site Utilities Overall

i) Fiber and copper cabling from existing demarcation point (Manhole 15) to the new Main Distribution Frame (MDF)

b) OSP Pathways and Cabling

i) New three (3) 4" ductbank to new site MH approximately 300’
ii) New 6-way 4" concrete encased ductbank to tie into existing duct bank at MH15 approximately 1000’
iii) 300 PR PE-39 copper from MHWC1-2-9 to new site via new and existing ductbank approximately 2300’
iv) 24-strand single mode optical fiber from MH15 to new site via new ductbank approximately 1300’
v) New two (2) 2” conduits from new handhole to new card reader locations for security swing arm gate locations
vi) Preserve and protect RORP211-5 and direct buried cabling to FORP211-5.
vii) Preserve and protect HH211-5-4, cabling and ductbank from HH211-5-4 to 1248
viii) Two (2) 2-inch conduits from an existing manhole to the building Main Distribution Frame (coordinate with government for actual location)
ix) Innerduct and buried detectable warning tape in all new ductbanks
x) OSP cabling termination:
   (a) PE-39 copper cabling to terminate on wall-mounted Building Entrance Protection (BEP) module in EF Room 115
   (b) Optical fiber cabling to terminate on rack mounted optical fiber termination panel in EF Room 115

c) Premise Cabling

i) Intrabuilding Backbone Cabling:
   (a) One (1) 24-strand OS2 single-mode fiber optical and (1) 24-strand OM4 multi-mode fiber optic cable, and 100-pair Category 3 riser cable from EF Room 115 to TR 208
   (b) One (1) 24-strand OS2 single-mode fiber optical and (1) 24-strand OM4 multi-mode fiber optic cable, and 200-pair Category 3 riser cable from EF Room 115 to SIM Server Room 304A

(c) One (1) 24-strand OS2 single-mode fiber optical and (1) 24-strand OM4 multi-mode fiber optic cable from EF Room 115 to TR 208 to Secure Comm Room 304B
(d) One (1) 12-strand OS2 single-mode fiber optical and (1) 12-strand OM4 multi-mode fiber optic cable from Secure Comm Room 304B to each enclave row in SIM Server Room 304A; to include MTWS (C), CACCTUS (C), SIPR (C), TIE (C), MTWS (U), CACCTUS (U), MCEN (U), and TIE (U)
(e) One (1) 48-strand multi-mode fiber per enclave (classified and unclassified) from each respective enclave server rack to switch rack in each enclave row in SIM Server Room 304A
(f) Intrabuilding backbone termination:
  (a) Category 3 copper cabling to terminate on rack-mounted termination blocks in MCEN racks
  (b) Optical fiber cabling to terminate on rack mounted optical fiber distribution panel in each respective cabinet or rack

ii) Horizonal Cabling:
(a) Four-pair Category 6A UTP copper cabling, green jacket, for all unclassified network, voice and data locations
(b) Four-pair Category 6A UTP copper cabling, green jacket, for WAP, DDC, FACP, Elevator interface, TV displays
(c) Four-pair Category 6A UTP copper cabling, red jacket, for SIPRNet network, voice and data locations
(d) Four-pair Category 6A UTP copper cabling, green jacket, for synchronized clock and wall phone locations, terminate on RJ-11 jacks
(e) Work area outlet (WAO) jack colors will match cabling jacket color
(f) Terminate all horizontal copper cabling on rack-mounted 48-port Category 6A patch panels in each respective EF/ER/TR termination location, and on 8P8C modular jacks in faceplates

iii) Work Area Outlets (WAOs)
(a) Wall mounted WAO: Standard 5” square in gypsum walls; 4-11/16’ square in CMU walls
(b) Minimum 1-1/4” EMT from each WAO location stubbed into cable tray system
(c) Standard WAO will have 4-port faceplate, RJ45 8P8C jacks
(d) Single-gang wall mounted junction boxes at wall phone locations, at 48” AFF, one-port faceplate with metal mounting studs

d) Telecom Equipment Spaces

i) MDF and IDF: House Ethernet switches, an active equipment rack, relay racks, patch panels to serve horizontal network cabling, fiber-optic cable termination cabinets for NIPR and SIPR networks.

(a) Minimum dimensions 10 feet by 10 feet or larger as needed to provide adequate working clearance around equipment. Adequate working clearance is defined as a minimum of 42 inches from an adjacent wall and 36 inches in aisles between racks
(b) Minimum 39” separation between NIPR and SIPR cabinets
(c) Securable in order to restrict access to authorized government personnel only
(d) All comm rooms: Provide two (2) 3” conduits to provide riser access for the backbone cabling
(e) 22” W cable runway with (4) series 44+ fire-Rated Pathways
(f) 19” free standing relay racks with vertical managers on both sides of each rack
(g) ¾” fire-rated plywood mounted on three walls of the room. 4’ X 8’ sheets will be mounted vertically 6” A.F.F
(h) Dedicated above ceiling basket-type cable tray system for NIPR/VOIP, SIPR and Training Networks

ii) Simulation Control Room
(a) CACCTUS equipment per enclave(5 NIPR, 5 SIPR racks), with 8 rackmount computer shelves per rack
(a) Five (5) 19-inch enclosed equipment racks for Unclassified MTWS equipment (Servers), with 8 rackmount computer shelves per rack
(b) Five (5) 19-inch enclosed equipment racks for Classified MTWS equipment (Servers), with 8 rackmount computer shelves per rack
(b) Four (4) 19-inch equipment racks per enclave (Exercise Classified, Unclassified) network and patch panel to simulation rooms
(c) Fiber connectivity to Simulation Control Secure Comm Room-Vault and TR

iii) Simulation Control Secure Comm Room – Vault
(a) Five (5) 19-inch enclosed equipment racks network equipment

e) Distribution

i) Horizontal and vertical pathways consisting of underground duct bank systems, sleeves, cable tray, conduit, pull boxes, pull cords and outlet boxes.
(a) Free laying of cabling under raised access flooring; Cantilever-type center hung tray or Poke-Thru devices; J-hooks/D-rings/bridal rings and other open face type cable pathways shall not be allowed.

f) Public Address

i) Public Address (PA) system with speakers in all common spaces and exterior speakers for outside activity spaces
ii) PA system headend will reside in TR Room 208, with additional equipment as required in TR Room 115
iii) Speakers to be centrally amplified via installed equipment and associated cabling
iv) Zones will be defined per client requirements

v) All PA cabling and wiring to be home-run to the respective TR in which the headend equipment resides. PA system wiring will not be run in common cabling pathways used for enterprise building or special networks. PA system wiring must be installed in a dedicated pathway.

g) ESS

i) Electronic security system (ESS) supporting infrastructure to include junction boxes, pathway, and pull string for GFGI equipment installation**:**

(a) Specified door locations provided with rough in for electronic intrusion detection and access control devices high-security switch (HSS), card reader, electric strike, motion sensor where required
(b) Card reader locations at vestibule turnstiles
(c) Exterior card reader locations at perimeter pedestrian and vehicle entry locations

ii) All interior security conduits for each respective door location will be home run to location identified by the end user

h) TV, CATV, CCTV

i) One (1) RG-6 coaxial cable and (2) Category 6 UTP green cables from the closest IDF to each television location.
(a) Coax cabling that traverses a secure boundary with an RF filter.

ii) Terminate coaxial cabling at outlet side, coil coaxial cabling inside IDF

i) GPS System

i) LMR400 Coaxial cable (or approved equivalent) from the training network server room to GPS Model 8225 antenna. Coordinate with government of location of antenna. Provide mount for GPS.

j) AV Systems

i) System design must be completed by an individual with a CTS-D certification. Refer to E20 for the Best Value Determination process for AV systems.

End of Section

CHAPTER 12 – SUSTAINABLE

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in two Design Packages.
   (1) Design Package (DP) 1 – This package will consist of the demolition, site civil, foundations, and underground utilities for the project. This package will be a critical fast track package.
   (2) Design Package 2 – This package will contain the building architecture, superstructure, and building systems design to include mechanical, electrical, plumbing, fire protection, and telecommunications.

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.

ii) The Scope of Work is to provide the design for the II MEF Simulation/Training Facility at Camp Lejeune.

2) REFERENCES

a) RFP Solicitation N40085-19R-9156

b) Unified Facilities Criteria

i) UFC 1-200-01, General Building Requirements
ii) UFC 1-200-02, High Performance and Sustainable Building Requirements
iii) UFC 3-210-10, Low Impact Development
iv) UFC 3-530-01, Interior and Exterior Lighting Systems and Controls
v) Other referenced UFC or Facility Specific FC's

c) Other Referenced Documents

i) ANSI/ASHRAE/IESNA Standard 90.1-2013 (ASHRAE 90.1), Energy Standards for Buildings Except Low Rise Residential Buildings, 2013
ii) ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 (ASHRAE 189.1), Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, 2014

iii) U.S. Green Building Council/Green Business Certification, Inc. (USGBC/GBCI), Guiding Principles Assessment Technical Guide, New Construction and Renovations, Guiding Principles Implemented by UFC 1-200-02 (December 2016), January 2019.

3) CRITERIA

a) Sustainable Design Criteria

i) The purpose of this project is to construct a new one-story training facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST) at Camp Lejeune, NC. The project must meet the 2016 Guiding Principles for High Performance and Sustainable Buildings, as issued by the Council of Environmental Quality on February 2, 2016 and codified in UFC 1-200-02, 01 Dec 2016 with Change 4, 01 Oct 2019.

ii) Compliance with the federal Guiding Principles is required, unless an item is not applicable due to scope, mission, life cycle cost, or other approved reason. This approach complies with the requirements of Table 1-1 of UFC 1-200-02 for Chapter 2.

b) P1338 II MEF Simulation/Training Facility (53,443 SF)

i) HPSB Tracking/Documentation – Required per Table 1-1 of UFC 1-200-02.
   (1) HPSB Tracking - NAVFAC HPSB Checklists.
   (2) Documentation - RFP Specification 01 33 29.05 20, Paragraph 1.6.

ii) Third Party Certification – Required per Table 1-1 of UFC 1-200-02.
   (1) GBCI Guiding Principles Assessment (GPA).

4) DESIGN APPROACH

a) Guiding Principles Validation (GPV)

General

Guiding Principles Validation requirements are per UFC 1-200-02 and as outlined in Paragraph 1.6 of RFP Specification 01 33 29.05 20. Numbering corresponds to Paragraph 1.6 numbering.

1.6.1 Integrated Design Process

Project team is utilizing an integrated design process, following ASHRAE 189.1 Section F1.1.1 (Charrette Process). An integrated design team encompasses architecture and engineering disciplines, construction representatives, subcontractors and installation personnel as appropriate. Project performance goals are as required by UFC 1-200-02 and the RFP.

1.6.2 Commissioning (Cx)

Commissioning of required systems will be completed in accordance with the requirements of Section 01 91 00.15 38 TOTAL BUILDING COMMISSIONING FOR PROJECT P-1338.

1.6.3 Optimize Energy Performance

Design will meet the requirements of ASHRAE 90.1-2013 and achieve at least 30% energy consumption reduction from ASHRAE 90.1 baseline, or highest percentage of energy consumption reduction that is life cycle cost effective.

1.6.4 Energy Efficient Products

Project design will include energy efficient products, Energy Star rated or that meet FEMP-designated efficiency requirements in covered product categories. Provide only energy using products that meet FEMP requirements for low standby power consumption.

1.6.5 Building-level Power Metering

Utility meters will be installed at the building, for each utility serving the building, including electricity, natural gas, and steam, as applicable. The meters will be connected using the installation's existing Advanced Metering Infrastructure (AMI) protocols.

1.6.6 Indoor Water Use

Design will meet the requirements of ASHRAE 189.1 Section 6.3.2 (Building Water Use Reduction) which incorporated the use of EPA WaterSense-labeled products.

As applicable to the project scope, the design will also meet the requirements of ASHRAE 189.1 Section 6.4.2 (Building Water Use Reduction), covering cooling towers, commercial food service operations, and medical and laboratory equipment.

ASHRAE 189.1 Section 6.4.3 (Special Water Features), covering ornamental fountains/water features and pools and spas, is not applicable to the project scope.

1.6.7 Indoor Water Metering

Design will include an advanced water meter to monitor whole-building potable water consumption as required by DoD Utilities Meter Policy, 16 April 2013.

1.6.8 Outdoor Water Use

No permanent irrigation system using potable water is included in the project scope of work. Item is designated as Not Applicable.

1.6.9 Outdoor Water Meters

Item is designated Not Applicable as there is no existing irrigation system using potable water and serving more than 25,000 square feet of landscape.

1.6.10 Alternative Water

Item is designated as Not Applicable as there is no permanent irrigation system included in the project scope of work.

1.6.11 Stormwater Management

Stormwater management strategies will be implemented in accordance with the requirements of UFC 3-210-10, Low Impact Development, and Agency processes.

1.6.12 Ventilation and Thermal Comfort

Project design will meet the requirements of UFC 3-410-01.

1.6.13 Moisture Control

Per ASHRAE 189.1 Section 10.3.1.5 "Moisture Control," Contractor must ensure that during construction, materials stored on-site and those that are absorptive are protected from moisture damage. Any materials that show evidence of biological growth due to the presence of moisture will not be installed on the project. Contractor must develop a plan to ensure these requirements are implemented.

Ventilation system will comply with the requirements of UFC 3-410-01, Chapter 3, Sections 3-2 and 3-3 (Ventilation Air).

Building envelope will comply with the requirements of UFC 3-101-01 Chapter 3.

1.6.14 Reduce Volatile Organic Compounds (VOC) (Low-Emitting Materials)

Materials and products with low or no pollutant emissions, including composite wood products, adhesives, sealants, interior paints and coatings, carpet systems, and furnishings, will be used as required by Table 3-1 of Specification Section 01 33 29.05 20.

1.6.15 Indoor Air Quality During Construction

Prior to construction, Contractor will create an indoor air quality (IAQ) plan. The IAQ plan must be implemented during construction. Prior to building occupancy, Contractor must flush building air in accordance with the requirements of ASHRAE 189.1 Section 10.3.1.4, Indoor Air Quality (IAQ) Construction Management.

1.6.16 Recycled Content

Project will comply with 40 CFR 247 per the EPA Comprehensive Procurement Guideline (CPG) program for product selections with recycled content.

1.6.17 Bio-Based Products

Project will utilize products composed of the highest percentage of bio-based materials, consistent with FSRIA 9002 Biopreferred Program, to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Products must be available at a competitive cost.

1.6.18 Ozone Depleting Substances

In accordance with the requirements of ASHRAE 189.1 Section 9.3.3 Refrigerants, no CFC-based refrigerants will be used in HVAC&R systems. Products from U.S. EPA Significant New Alternatives Policy (SNAP) will be used (or products that meet the criteria of SNAP).

1.6.19 Waste Material Management (Recycling – Design)

As directed at the CDW, item will be designated Not Applicable.

1.6.20 Waste Material Management (Recycling – Construction)

Project will comply with Section 01 74 19.05 20, CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT FOR DESIGN-BUILD, including diverting a minimum of 60% of construction waste from landfill.

1.6.21 Address Climate Change Risk

As confirmed at the CDW, the project scope includes no Government-provided projections of climate change or floodplain risk; therefore item is designated Not Applicable.

b) GBCI Guiding Principles Assessment (GPA) Third-Party Certification

General

Guiding Principles Assessment requirements mirror those of UFC 1-200-02, Chapter 2. GBCI developed documentation requirements to demonstrate compliance with each of the UFC criteria. In many cases, these requirements and documentation is the same as what is required by the Guiding Principles Validation section. In those instances, the reader is referred to the applicable Guiding Principles Validation item(s).

2-2.1 Integrated Design

Reference Guiding Principles Validation, Paragraph 1.6.1, Integrated Design Process.

2-2.1.1 Integrated Planning

Reference Guiding Principles Validation, Paragraph 1.6.1, Integrated Design Process.

2-2.1.2 Evaluation for Design Strategies

Site and building components will be evaluated for passive and natural design strategies, incorporating where cost effective prior to the use of active and mechanical systems, to the extent possible given the prescriptive design requirements.

2-2.1.3 Evaluation of the Site

Item is designated as Not Applicable, as the project site was preselected.

2-2.1.4 Site Integration and Design of the Building

Site design and building orientation items will be implemented to the extent possible given the prescriptive design requirements. The use of high performance and sustainable systems will be included. Lastly, the project will promote opportunities for occupants to voluntarily increase physical activity to the extent possible.

2-2.2 Commissioning

Reference Guiding Principles Validation, Paragraph 1.6.2, Commissioning (Cx).

2-3.1.1 Energy Efficiency – Commercial and Multi-Family High Rise Residential Buildings

Reference Guiding Principles Validation, Paragraph 1.6.3, Optimize Energy Performance.

2-3.1.4 Energy Efficient Products

Reference Guiding Principles Validation, Paragraph 1.6.4, Energy Efficient Products.

2-3.1.5 Standby Powered Devices
Reference Guiding Principles Validation, Paragraph 1.6.4, Energy Efficient Products.

2-3.2 On-Site Renewable Energy
Item is listed as “not used” in the RFP. As directed at the CDW, item is designated Not Applicable.

2-3.2.1 Solar Domestic Hot Water (SDHW)
Item is listed as “not used” in the RFP. As directed at the CDW, item is designated Not Applicable.

2-3.4 Metering
Reference Guiding Principles Validation, Paragraph 1.6.7, Building-level Power Metering.

2-4.1 Indoor Water
Reference Guiding Principles Validation, Paragraph 1.6.8, Indoor Water Use.

2-4.1.1 Indoor Water Metering
Reference Guiding Principles Validation, Paragraph 1.6.9, Indoor Water Metering.

2-4.2.1 Outdoor Water - Landscaping
Reference Guiding Principles Validation, Paragraph 1.6.10, Outdoor Water Use.

2-4.2 Outdoor Water Metering
Reference Guiding Principles Validation, Paragraph 1.6.11, Outdoor Water Meters.

2-4.3 Alternative Water
Project does not include a permanent irrigation system, which per GPA Technical Guide means project complies with the requirement.

2-4.3.1 Stormwater Management
Reference Guiding Principles Validation, Paragraph 1.6.13, Stormwater Management.

2-5.1 Part 1 Ventilation
Reference Guiding Principles Validation, Paragraph 1.6.14, Ventilation and Thermal Comfort.

2-5.1 Part 2 Thermal Comfort
Reference Guiding Principles Validation, Paragraph 1.6.14, Ventilation and Thermal Comfort.

2-5.2 Daylighting and Lighting Controls
Security concerns preclude use of daylighting, as outlined in the RFP. Daylighting is designated Not Applicable due to Mission preclusion. Automated lighting controls will be provided, in accordance with UFC 3-530-01. Per MCB Electrical Policies and Criteria (RFP Part 6, Attachment 7), lighting controls that utilize light harvesting are not permitted.

2-5.3.1 Indoor Air Quality - Moisture Control
Reference Guiding Principles Validation, Paragraph 1.6.16, Moisture Control.

2-5.3.2 Reduce Volatile Organic Compounds (VOC) (Low-Emitting Materials)
Reference Guiding Principles Validation, Paragraph 1.6.17, Reduce Volatile Organic Compounds (VOC) (Low-Emitting Materials).

2-5.3.3 Protect Indoor Air Quality During Construction
Reference Guiding Principles Validation, Paragraph 1.6.18, Indoor Air Quality During Construction.

2-5.3.4 Environmental Tobacco Smoke Control
Smoking is prohibited within the building and within 50 feet of all building entrances, operable windows, and building ventilation intakes, unless more stringent facility criteria or Installation policy applies. This item is not reviewed by GBCI and is covered by general DOD policy.

2-5.4 Occupant Health and Wellness
Design will incorporate opportunities for occupants to voluntarily increase physical activity, as part of the Integrated Design Process, to the extent possible. It is anticipated that there will be limited opportunities to integrate the suggested strategies due to the functional nature of the facility.

2-6.1.1 Recycled Content
Reference Guiding Principles Validation, Paragraph 1.6.19, Recycled Content.

2-6.1.2 Biologically Based Products
Reference Guiding Principles Validation, Paragraph 1.6.20, Bio-Based Products.

2-6.1.3 Ozone Depleting Compounds
Reference Guiding Principles Validation, Paragraph 1.6.21, Ozone Depleting Substances.

2-6.2.1 Storage and Collection of Recyclables
Reference Guiding Principles Validation, Paragraph 1.6.22, Waste Material Management (Recycling – Design).

2-6.2.2 Waste Diversion
Reference Guiding Principles Validation, Paragraph 1.6.23, Waste Material Management (Recycling – Construction).

2-7 Address Climate Change Risks
Reference Guiding Principles Validation, Paragraph 1.6.24, Address Climate Change Risk.

End of Section

5) APPENDICES

a) NAVFAC HPSB Checklist – Goals

b) GBCI Guiding Principles Assessment TPC Checklist

CHAPTER 13 – LIFE SAFETY

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in two Design Packages.

(1) Design Package 1 (DP-1) includes demolition, site civil, foundations and underground utilities for the project.
(2) Design Package 2 (DP-2) includes the building architecture, superstructure and building systems design to include mechanical, electrical, plumbing, fire protection and telecommunications.

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.
ii) The Scope of Work is to provide the life safety analysis for the following building located at Camp Lejeune.
(1) P1338 II MEF Simulation/Training Center consisting of a an approximately 53,441 square foot, one-story facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST) with open secret storage space, multiple configurable simulation training classrooms, configurable First Integrated Rehearsal Environment (FIRE) classrooms, audio/visual, computer and server room equipment spaces and spaces for personnel and administrative support.
iii) Phasing – No phasing requirements exist for Fire Protection.
iv) Future Expansion – No future expansion is anticipated.

2) REFERENCES

a) RFP Solicitation N40085-19R-9253

i) Parts 1-5 – D40 Fire Protection – D4010, D4020, D4040, D4090
ii) Part 6, Attachment 5 – Specification 28 31 76 Interior Fire Alarm and Mass Notification System
iii) Part 6, Attachment 8 – Mass Notification to Basewide
iv) Part 6.1, Attachment 11 – Hydrant Flow Test

a) Building Codes

i) International Building Code 2018 (as modified per UFC 1-200-01)

b) Unified Facilities Criteria

i) UFC 1-200-01, DoD Building Code, 08 October 2019
ii) UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings, 12 December 2018
iii) UFC 3-600-01, Fire Protection Engineering for Facilities, with Change 3, 10 May 2019
iv) UFC 4-021-01, Design and O&M: Mass Notification Systems, with Change 1, January 2010
v) FC 1-300-09N, Navy and Marine Corps Design Procedures, with Change 4, 14 June 2018
vi) Other referenced UFC or Facility Specific FC's

c) Other Referenced Documents

i) NFPA 10, 2018 Edition – Standard for Portable Fire Extinguishers
ii) NFPA 13, 2019 Edition - Standard for the Installation of Sprinkler Systems
iii) NFPA 24, 2019 Edition – Standard for the Installation of Private Fire Service Mains and Their Appurtenances
iv) NFPA 72, 2019 Edition - National Fire Alarm and Signaling Code
v) NFPA 90A, 2018 Edition – Standard for the Installation of Air-Conditioning & Ventilating Systems
vi) NFPA 101, 2018 Edition - Life Safety Code
vii) Manufacturers Design Standards

3) Occupancy Classification

a) Separated, Mixed-Use containing:

IBC: Assembly Group A-3 (Section 303)	NFPA 101: New Assembly (Chapter 12)
IBC: Business Group B (Section 304)	NFPA 101: New Business (Chapter 38)
with accessory spaces:	
NFPA 101: Storage (Chapter 42)	IBC: Storage Group S-2 (Section 311)

The building contains two primary occupancy classifications including Business and Assembly. The occupancies are separated with a 1 hour fire barrier. Within each occupancy there are uses accessory to the main occupancy including storage, mechanical, electrical, communication and small assembly sapces.

4) Construction Type

a) Non-combustible Type II-B (IBC Section Table 602)

5) Height and Area Limitations

a) The building is a separated mixed-use occupancy (IBC 508.4). Allowable height and area is determined by the limitations of each occupancy. The total building area is 43,441 square feet. The allowable and actual values are shown in the table below.

	Allowable Area (Single Story, Sprinklered with Frontage Increase) (ft^2)	**Gross Floor Area** (actual) (ft^2)
Business	109,250	13,622
Assembly, A-3	45,125	38,819

	Allowable Height	**Actual Height**
Business	4 Stories/75 feet	1 Story
Assembly, A-3	3 Stories/75 feet	

b) The sum of ratios of the actual area dived by the allowable area is 0.98, less than 1 as required by Section 508.4.2.

c) A 1-hour fire resistive rated fire barrier is required between the Group B and Group A-3 Occupancies (IBC Table 508.4).

6) Fire Resistive Requirements (IBC Tables 601 and 602)

Primary Structural Frame	0 hour rating
Exterior Bearing Walls	0 hour rating
Interior Bearing Walls	0 hour rating
Exterior Non-Bearing Walls and Partitions	0 hour rating
Interior Non-Bearing Walls and Partitions	0 hour rating
Floor Construction and Secondary Members	0 hour rating
Roof Construction and Secondary Members	0 hour rating

7) Protection from Hazards (NFPA 101 and UFC 3-600-01)

a) Hazardous areas including, but not limited to, areas used for general storage, boiler or furnace rooms shall be protected in accordance with NFPA 101 Section 8.7. These areas include the mechanical rooms and shipping and receiving.

8) Opening Protection and Penetration Requirements (NFPA 101 Chapter 8)

a) Penetrations for cables, conduits, pipes, and similar items to accommodate electrical, mechanical, plumbing, and communications systems that pass through fire barriers shall be protected by approved firestop systems or devices tested in accordance with ASTM E 814 or ANSI / UL 1479.

b) Joints made within or at the perimeter of fire barriers shall be protected with a joint system that is capable of limiting the transfer of fire. Joints made within or between fire barriers shall be protected with a fire-tight joint system that is capable of limiting the transfer of fire. Joints made within or between fire resistance-rated assemblies shall be protected with a joint system tested in accordance with ASTM E1966 or ANSI / UL 2079.

c) Penetrations and joints through smoke partitions shall be protected by a system that is capable of limiting the transfer of smoke.

d) Opening protection will be in accordance with NFPA 101 Table 8.3.3.2.2:

Component	Walls and Partitions (hour)	Fire Door Assemblies (hour)
Fire Barrier	1	3/4
Smoke Partitions	0	Self-Closing

e) Fireblocking and Draftstopping are not required in non-combustible construction (IBC 718.2, 718.3, and 718.4)

9) Marking and Identification of Fire Barriers and Smoke Partitions (IBC 703.7)

a) Fire barriers and smoke petitions shall be effectively and permanently identified with signs of stenciling. Such identification shall:
   i) Be located in accessible concealed floor, ceiling, or attic space.
   ii) Be located within 15 feet of the end of each wall and at intervals not exceeding 10 feet measured horizontally along the wall or partitions.
   iii) Include lettering not less than 3 inches in height with a minimum 3/8 inch stroke in a contrasting color incorporating the suggested wording “FIRE BARRIER AND/OR SMOKE PARTITION – PROTECT ALL OPENINGS” or other wording.

10) Interior Finish Classification Limitations (NFPA 101, Table A.10.2.2)

a) Interior finish will be in accordance with NFPA 101.

Occupancy	Exit Access Corridors	Other Spaces
Business	Class A or B	Class A, B, or C
	Class I or II	N/A
Assembly	Class A or B	Class A or B
	Class I or II	N/A

11) Means of Egress

a) The means of egress system including exit access and exits will be designed to meet NFPA 101 and UFC 3-600-01. All doors will be sized at 0.2 inches per occupant, not less than 32 inches and all corridors will be sized at 0.2 inches per occupant, not less than 44 inches. Turnstiles provide a capacity of 50 persons each in accordance with NFPA 101 Section 7.2.1.11.

b) A minimum of two exits are required from the Business Occupancy and a minimum of four exits are required from the Assembly Occupancy (NFPA 101 Section 7.4.1.2.

c) Travel distance limitations are applied separately to each mixed occupancy and are summarized in the table below.

Egress Limitations – NFPA 101, Table A7.6			
Occupancy	Dead End (ft)	Common Path (ft)	Travel Distance (ft)
Business	50	100	300
Assembly	20/75	20	250

12) Occupant Load and Egress Capacity Calculation

a) The occupant load calculations are summarized below for each of the separated occupancies, using the occupant load factors of NFPA 101 and UFC 3-600-01. The occupant loads are summarized in the tables below.

Occupant Load Calculations: NFPA 101, Table 7.3.1.2 and UFC 3-600-01 Table 10-1 Business Occupancy			
Use	Occupant Load Factor (ft^2/Person)	Area (ft^2)	Occupant Load
Business (all areas not noted below)	150	5878	40
Mechanical 400,401	500	2962	6
Storage/Shipping 402	500	2034	5

Comm 115	300	149	1
Elec 137	500	138	1
Break 108	357	15	24
Storage 103A	769	500	2
Library Storage	897	500	2
Total		12,627	81
Exits Required: 2	Exits Provided: 2		

Occupant Load Calculations: NFPA 101, Table 7.3.1.2 and UFC 3-600-01 Table 10-1 Assembly Occupancy			
Use	Occupant Load Factor (ft^2/Person)	Area (ft^2)	Occupant Load
Elec 403	500	442	1
Comm 208	300	180	1
Break 206	30	676	23
Secure VTC 303B	30	471	14
Brief 209	30	286	10
Server Control 304B	300	359	2
Server Control 304A	300	1541	6
Sim 301A, 301B	20 (net)	2968	149
Sim 300X, 300Y, 300Z, 300A, 300B, 300C	20 (net)	8799	440
Exercise Control	20 (net)	1613	81
Auditorium 201	Fixed Seating	1591	123
Storage 203	500	1042	3
Sim 200A, 200B	20 (net)	3950	198
Brief 101	30	560	19
Brief 102	30	580	20
Comm 305	300	150	1
Elec 306	500	150	1
Business (all other areas)	150	91808	62
Total		38,252	1154
Exits Required: 4	Exits Provided: 4		
Exit Capacity: NFPA 101, 7.2.1.2.3, Table 7.3.3.1			

Exits	Actual Clear Width (Inches)	Actual Use	Calculated Capacity
E-1	46	230	230
E-2	68	340	340
E-3	68	300	340
E-4	68	284	340
E-5	34	35	170
E-6	68	35	340
IRE-1	34	4	170
IRE-2	68	2	340
IRE-3	34	5	170
IRE-4	68	1	340

13) Discharge from Exits (NFPA 101, 7.7)

a) Building exits will terminate directly at a public way in accordance with NFPA 101, section 7.7.

14) Illumination of Means of Egress (NFPA 101, 7.8)

a) Means of egress will be illuminated in accordance with NFPA 101 section 7.8.

15) Emergency Lighting (NFPA 101, 7.9)

a) Emergency lighting will be provided in accordance with Section 7.9.

16) Markings of Means of Egress (NFPA 101, 7.10)

a) Means of egress will have signs in accordance with Section 7.10.

17) Portable Fire Extinguishers (NFPA 10)

a) Fire extinguisher s will be provided in accordance with NFPA 101 and located in accordance with NFPA 10.

18) Fire Department Access (UFC 3-600-01)

a) Fire department access shall be provided in accordance with UFC 3-600-01 Section 9-1.

19) Automatic Sprinklers and other Extinguishing Equipment (UFC 3-600-01 and NFPA 13)

a) The entire building shall be protected throughout with a hydraulically calculated automatic sprinkler system. Design densities shall be in accordance with UFC 3-600-01 and NFPA 13.

20) Fire Alarm and Mass Notification Systems (UFC 3-600-01, UFC 4-021-01, and NFPA 72)

a) Fire alarm and mass notification will be provided in accordance with UFC 3-600-01, UFC 4-021-01 and NFPA 72. The system shall consist of manual pull stations, strobes, speakers, sprinkler flow and valve tamper supervision, and smoke detectors within the HVAC systems as required by NFPA 90A.

21) Accessibility Requirements

a) The building shall be accessible and conform to ABA Accessibility Standard for Department of Defense Facilities as adopted by the Deputy Secretary of Defense in lieu of IBC Chapter 11 per UFC 1-200-01.

22) Anti-Terrorism and Force Protection Requirements (AT/FP) (UFC 4-010-01 Section B-4.3)

a) An emergency shutoff switch in the HVAC control system capable of immediate shut down of the air distribution system throughout the building.

End of Section

CHAPTER 14 – ATFP

1) SCOPE SUMMARY

a) Design Package

i) The Project Design is provided in two Design Packages.
   (1) P1338 Early Site Civil Design Package – which will include the Site work, Foundations, and Geotechnical work
   (2) P1338 Building Design Package – which will include the design of Architectural, Interiors, Structural, Building Enclosures, and Remaining Work, as well as design of Furniture/Equipment

ii) List all design packages
   (1) DP1 – P1338 Early Site Civil Design Package
   (2) DP2 – P1338 Building Design Package

b) Project Objectives

i) This Design Analysis provides a roadmap that defines the required design inputs and analysis of the design approach used to take the design inputs and create the design output Contract Drawings and Specifications.

ii) The Scope of Work is to provide the design for the following building located at the northeast corner of McHugh Boulevard and Cross Street at Marine Corps Base (MCB) Camp Lejeune, North Carolina.

iii) P1338F - II MEF Simulation/Training Center Replacement, one-story building consisting of (53,400) gross square feet square to provide the following functions:
   (a) a new building with open secret storage space, containing multiple configurable simulation training classrooms, and configurable First Integrated Rehearsal Environment (FIRE) classrooms;
   (b) Ready Room / Auditorium
   (c) audio/visual, computer and server room equipment spaces;
   (d) offices and spaces for personnel and administrative support;
   (e) Storage/shipping/receiving area
   (f) impervious and pervious outdoor training areas;
   (g) gazebo;
   (h) parking,
   (i) Development of a greenfield site on the northeast corner of McHugh Boulevard and Cross Street

(j) Stormwater management features to comply with Government LID requirements and state stormwater management permit requirements.
(k) Site utility connections
(l) Demolition of existing Buildings 125, 125A, 127 and H13
(m) Removal of existing mobile Buildings 125B and 125C.

iv) Phasing – no phasing planned
v) Future Expansion – no future expansion planned

2) REFERENCES

a) Design-Build Request for Proposal Hurricane Florence Recovery Training and Storage Facilities, Marine Corps Base Camp Lejeune, North Carolina, Solicitation Number N4008519R9253 (Phases 1 and 2)

iii) Parts 1 through 6 (See RFP Table of Contents for specific sections)
iv) Specific Attachments (See RFP Table of Contents for specific attachments) including, but not limited to:
(1) Camp Lejeune Base Exterior Architectural Plan
(2) Investigation and Remediation Waste Management Plan
(3) USMC Finding of No Significant Impact for the Environmental Assessment for Demolition of Historic Properties
(4) Camp Lejeune Mechanical Design Guidance
(5) Camp Lejeune Specifications

- 07 31 13 Asphalt Roof Shingles
- 07 52 00 Modified Bituminous Membrane
- 07 61 15.00 20 Aluminum Stand Seam
- 08 33 23 Roll Up Doors
- 08 91 00 Wall Louvers
- 09 67 23.13 Epoxy Flooring
- 10 14 00.20 Interior Signage
- 10 14 00.20a MCBLNC Signs Standards Graphics
- 10 22 13 Wire Mesh Partitions
- 11 24 24 Roof Fall Protection
- 23 09 23.13
- 28 31 76 Interior Fire Alarm and Mass Notification System
- 33 71 01.00 22 Overhead Transmission and Distribution
- 33 71 02.00 22 Underground Electrical Distribution

b) United Facilities Criteria

i) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings

ii) UFC 4-010-02, *DoD Minimum Antiterrorism Standoff Distances for Buildings (For Official Use Only [FOUO])*
iii) UFC 4-023-03, Design of Buildings to Resist Progressive Collapse

c) Other Referenced Documents

i) ASTM F2248, Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass

3) CRITERIA

a) All new buildings regardless of funding must meet Minimum Antiterrorism Standards for buildings.
b) Due to location within installation perimeter UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings apply to this project.

4) STANDARD 1. STANDOFF DISTANCES

a) Building P1338 is located within a controlled perimeter. Standoff distance applies to new buildings from installation perimeter
b) The location of P1338 exceeds the Minimum 50-foot standoff from the building to the installation perimeter.

5) STANDARD 2. UNOBSTRUCTED SPACE

a) The unobstructed space around the building is a 33ft zone from the building to any obstacle, topographical feature, or vegetation exceeding 6in.

b) In order to comply with this standard, mechanical and electrical equipment shall be configured/located such that it does not provide opportunity for concealment of explosive devices (B-1.2.1). While a generator pad is proposed to be within the unobstructed space, it will be located in the secured fenced area at the rear of the facility. No other equipment is anticipated to be within the unobstructed space.

6) STANDARD 3. DRIVE-UP/DROP-OFF AREAS

a) Vehicular access to the facility is restricted through a secondary site control fence and an access control gate.

7) STANDARD 4. ACCESS ROADS

a) Access roads have been provided for emergency vehicle access to the facility. A fence, gate, and Knox box have been provided to maintain security while offering emergency access.

8) STANDARD 5. PARKING BENEATH BUILDINGS OR ON ROOFTOPS

a) This standard does not apply to this facility, since parking will not occur below or on top of the facility.

9) STANDARD 6. PROGRESSIVE COLLAPSE

a) The structure is less than three stories and therefore progressive collapse mitigation is not required for this project.

10) STANDARD 7. STRUCTURAL ISOLATION

a) Structural isolation is not applicable to this project as the building does not abut an adjacent existing structure.

11) STANDARD 8. BUILDING OVERHANGS

a) Building overhangs with uninhabited space above them where people could gain access have not been designed into this facility.

12) STANDARD 9. EXTERIOR MASONRY WALLS

a) Unreinforced masonry walls are prohibited. All exterior walls will be tilt-up concrete panels designed by a specialty engineer.

13) STANDARD 10. WINDOWS AND SKYLIGHTS

a) With the installation perimeter and standoff distances noted above the windows are not required to be designed for blast resistance

b) Minimum glazing requirements require ¼" laminated glass as the innermost pane of the insulated glass unit.

c) The glazing frame will have structural silicone sealant of 3/8" or the thickness of the laminated glass (whichever is larger)

d) All entrance glazing will also meet this requirement.

14) STANDARD 11. BUILDING ENTRANCE LAYOUT

a) The main building entrances are located such that all direct lines of sight are within the controlled perimeter.

15) STANDARD 12. EXTERIOR DOORS

a) Conventional construction standoff distance has been met with this design. All exterior doors open outward and have been selected to meet the requirements of table 2-1 and glazing meeting the requirements of Standard 10.

16) STANDARD 13. MAIL ROOMS AND LOADING DOCKS

a) There are no mail rooms or loading docks on this project.

17) STANDARD 14. ROOF ACCESS

a) There is no rooftop mechanical equipment and therefore no roof access on this building.

18) STANDARD 15. OVERHEAD MOUNTED ARCHITECTURAL FEATURES

a) These standards will be followed for all overhead mounted features located within the facility.

19) STANDARD 16. AIR INTAKES

a) The outside air intake louvers for the Dedicated Outdoor Air Systems (DOAS units) will be located above the 10' requirement of this standard.

20) STANDARD 17. MAIL ROOM AND LOADING DOCK VENTILATION

a) This facility does not have a mail room or loading dock.

21) STANDARD 18. EMERGENCY AIR DISTRIBUTION SHUTOFF

a) The building shall be provided with AT/FP "shutdown" switch which disables all air handling units and closes all motorized dampers upon an AT/FP event. All building ventilation openings such as exhaust louvers, fresh air intakes, etc. will be provided with low-leakage motorized dampers (3 cfm/sq ft with a differential pressure of 1" w.c.).

22) STANDARD 19. EQUIPMENT BRACING

a) As a minimum, equipment bracing is specified to meet utilities and fixtures weighing more than 31 pounds to be resist forces of 0.5 times the weight in any horizontal direction and 1.5 times the weight in the downward direction

23) STANDARD 20. UNDER BUILDING ACCESS

a) This does not apply to this facility. No under building access exists.

24) STANDARD 21. MASS NOTIFICATION

i) A complete Mass Notification system has been designed for this facility.

25) APPENDICES – if needed

End of Section

CHAPTER 15 - CYBERSECURITY

1. SCOPE SUMMARY

a. Design Package

i. The Project Design is provided into two (2) Design Packages.
   1. Design Package 1 (DP-1): P1338 Early Site Civil Design Package – which will include the Master Site Plan, Demolition, Site work, and Geotechnical work
   2. Design Package 2 (DP-2): P1338 Building Design Package – which will include the design of Foundation, Structural, Building Enclosures, and Remaining Work, as well as design of Furniture/Equipment

ii. All the mechanical work will be designed in DP-2.

b. Project Objectives

i. This Design Analysis provides a roadmap that defines the cybersecurity requirements that need to be met to create the Contract Drawings and Specifications for this submission package.

ii. The Scope of Work is to meet the cybersecurity requirements for Building P1338F II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST).

iii. The project consists of a one-story training facility to contain the II Marine Expeditionary Force (MEF) Battle Simulation Center and II MEF Combined Arms and Staff Trainer (CAST). The facility will be constructed on a greenfield site that will include parking, outdoor training areas and a new building with open secret storage space, containing multiple configurable simulation training classrooms, configurable First Integrated Rehearsal Environment (FIRE) classrooms, audio/visual, computer and server room equipment spaces, and spaces for personnel and administrative support. These functions will be relocated from several separate existing buildings and consolidated into the new training facility.

2. REFERENCES

a. P1338F II MEF SIMULATION/TRAINING CENTER REPLACEMENT

i. RFP base document plus Amendments
ii. Project Program (RFP Part 3), specifically:
    1. Chapter 6: Engineering System Requirements – Section D20: Plumbing
    2. Chapter 6: Engineering System Requirements – Section D30: HVAC
    3. Chapter 6: Engineering System Requirements – Section D40: Fire Protection, including Cooper Notification, Inc. WAVES Emergency Notification System
    4. Chapter 6: Engineering System Requirements – Section D50: Electrical

b. Building Codes

i. International Building Code 2018 (as modified per UFC 1-200-01)

c. United Facilities Criteria

i. UFC 1-200-01, General Building Requirements
ii. UFC 3-410-02, Direct Digital Control for HVAC and Other Building Control Systems
iii. UFC 3-470-01, Utility Monitoring and Control System (UMCS) Front End Integration
iv. UFC 4-010-06, Cybersecurity of Facility-Related Control Systems

d. Other Referenced Documents

i. ABA Accessibility Standard for Department of Defense Facilities June 2009
ii. ASHRAE Standard 135
iii. ASHRAE Standard 36
iv. EIA 568-C.2 Balanced Twisted-Pair Telecommunication Cabling and Components Standards (2009)
v. NIST 800-82 R2
vi. NIST 800-53 R4

e. Meeting Minutes

3. CRITERIA

a. Risk Management Framework (RMF)

i. The RMF is the DoD process, described in UFC 4-010-06 Cybersecurity of Facility-Related Control Systems, for applying cybersecurity to information technology (IT) systems. This includes building control systems.

ii. The goal of the RMF process is to reduce and mitigate risk and vulnerabilities until the risk is acceptable to the System Owner (SO), Authorizing Official (AO), and the (ISSM) Information System Security Manager. Under the RMF, risk reduction is not "all or nothing," rather the security solution must reduce risk while considering the constraints of resources and mission requirements. For application of the RMF to control systems, the determination of cybersecurity risk reduction must also account for any additional risks to system functionality due to the application of security controls.

The decision of whether a level of risk is acceptable is made by the assigned government AO. The designer provides input into the risk analysis process by advertising on the impact, or lack thereof, of applying security controls to the control system.

4. DESIGN APPROACH

a. Risk Management Framework (RMF)

Step 1 Per UFC 4-010-06: Involve the System Owner (SO), Information System Security Manager (ISSM), and the Authorizing Official (AO) to determine the Confidentiality (data security), Integrity (incorrect information), and Availability (failure) (C-I-A) impact levels (LOW, MODERATE, or HIGH) for the Facility-Related Control Systems (FRCS). These impact levels could vary for the individual Facility-Related Control Systems (FRCS) serving the various buildings at Camp LeJeune. The final impact levels will be determined by the SO, ISSM, and AO. James Mahoney is assigned or representing the government ISSM for the project. James Mahoney will be providing MBI with the final approved CIA impact level and coordinate the selection of appropriate security controls from the CCI list for the Facility-Related Control Systems (FRCS).

Step 2 and Step 3 Per UFC 4-010-06: Obtain a list of relevant controls and Control Correlation Identifiers (CCIs) from the SO, ISSM, and/or AO. NIST SP 800-82 and the RMF Knowledge Service (link provided in UFC 4-010-06) provide guidance on determining controls from C-I-A ratings and this list of controls can identify corresponding CCIs.

Step 4 and Step 5 Per UFC 4-010-06: Categorize each CCI into one or more of the following categories: DoD-Defined, Designer, Non-Designer, Platform Enclave, and/or Impractical. Once each CCI is categorized, incorporate the CCI into the design and provide explanation of any changes to standard CCI requirements. CCI notations are provided in the Section titled 25 05 11 Cybersecurity for Facility-Related Control Systems and correlate to the categorized CCI list. See Appendix A

b. Requirements at Each Design Phase

i. Basis of Design
   1. Provide a single submittal indicating the C-I-A impact level of the control system and listing the security controls generated during Step 2 (above) along with recommendations and justifications for further tailoring of the security control set.

ii. Design Submittals
   1. Concept Design Submittal (10-15%)
      a. Provide single submittal indicating the CCIs resulting from the approved tailored control list (Step 3 above) and an initial classification list for each CCI (Step 4 above).

2. Design Development Submittal (30-50%)
    a. The final classification of each CCI (Step 4 above).
    b. The changes to standard CCI requirements identified in Step 5 (above), along with an explanation of the changes.
    c. The CCIs which have been incorporated into the control system design (Step 5 above), any changes from standard requirements, or selections made when multiple options are available.
    d. Information for others as required (Step 5 above).
3. Pre-Final Design Submittal (90%)
    a. Provide a submittal updating the Design Development Submittal.
4. Final Design Submittal (100%)
    a. Provide a submittal updating the Pre-Final Design Submittal with complete final information.

c. Mechanical, Electrical, and Fire Protection Requirements

i. Mechanical, electrical, and fire protection specific requirements shall be listed in their respective design narratives.

End of Section

5. APPENDICES

a. Cyber Security C-I-A Impact Level / Controls List / CCI List

Table 1: Baseline C-I-A Impact Level Ratings

Authorizing Official (AO)	System Owner	System Group	System	Existing Authority to Operate (ATO)?	C-I-A Impact Level
USMC AO Dr. Ken Bible	DPW	UMCS	HVAC	Existing ATO in MCCAST (USMC) to be validated by Information System	LOW-LOW-LOW – ISSM must validate

				Security Manager (ISSM)	
USMC AO Dr. Ken Bible	DPW	UMCS	Lighting	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible	DPW	UMCS	Advanced Meter Infrastructure (AMI)	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible	DPW	BCS	Backup Power Generator Annunciator Panels and Controls	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible		FLS	Fire Alarm Reporting System	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible		FLS	Mass Notification System	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible		ESS	Physical Access Control System	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible		ESS	Intrusion Detection System	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate
USMC AO Dr. Ken Bible		ESS	Closed-Circuit Television (CCTV)	Existing ATO in MCCAST (USMC) to be validated by ISSM	LOW-LOW-LOW – ISSM must validate

Tables

Table 1: NIST 800-82 R2 Section G-1 Security Control Baselines

CNTL NO.	CONTROL NAME	Initial Control Baselines
		LOW
AC-1	Access Control Policy and Procedures	**AC-1**
AC-2	Account Management	**AC-2**
AC-3	Access Enforcement	**AC-3**
AC-7	Unsuccessful Logon Attempts	**AC-7**
AC-8	System Use Notification	**AC-8**
AC-14	Permitted Actions without Identification or Authentication	AC-14
AC-17	Remote Access	**AC-17**
AC-18	Wireless Access	**AC-18**
AC-19	Access Control for Mobile Devices	**AC-19**
AC-20	Use of External Information Systems	**AC-20**
AC-21	Collaboration and Information Sharing	**AC-21**
AC-22	Publicly Accessible Content	**AC-22**
AT-1	Security Awareness and Training Policy and Procedures	**AT-1**
AT-2	Security Awareness Training	**AT-2**
AT-3	Role-Based Security Training	**AT-3**
AT-4	Security Training Records	AT-4
AU-1	Audit and Accountability Policy and Procedures	**AU-1**
AU-2	Audit Events	**AU-2**
AU-3	Content of Audit Records	**AU-3**
AU-4	Audit Storage Capacity	AU-4 **(1)**
AU-5	Response to Audit Processing Failures	AU-5

AU-6	Audit Review, Analysis, and Reporting	AU-6
AU-8	Time Stamps	**AU-8**
AU-9	Protection of Audit Information	AU-9
AU-11	Audit Record Retention	AU-11
AU-12	Audit Generation	AU-12
CA-1	Security Assessment and Authorization Policies and Procedures	**CA-1**
CA-2	Security Assessments	**CA-2**
CA-3	System Interconnections	**CA-3**
CA-5	Plan of Action and Milestones	CA-5
CA-6	Security Authorization	CA-6
CA-7	Continuous Monitoring	**CA-7**
CA-9	Internal System Connections	**CA-9**
CM-1	Configuration Management Policy and Procedures	**CM-1**
CM-2	Baseline Configuration	CM-2
CM-4	Security Impact Analysis	**CM-4**
CM-6	Configuration Settings	CM-6
CM-7	Least Functionality	**CM-7 (1)**
CM-8	Information System Component Inventory	CM-8
CM-10	Software Usage Restrictions	**CM-10**
CM-11	User-Installed Software	CM-11
CP-1	Contingency Planning Policy and Procedures	**CP-1**
CP-2	Contingency Plan	**CP-2**
CP-3	Contingency Training	CP-3
CP-4	Contingency Plan Testing	CP-4
CP-9	Information System Backup	CP-9
CP-10	Information System Recovery and Reconstitution	**CP-10**

CP-12	Safe Mode	**CP-12**
IA-1	Identification and Authentication Policy and Procedures	**IA-1**
IA-2	Identification and Authentication (Organizational Users)	**IA-2 (1) (12)**
IA-3	Device Identification and Authentication	**IA-3**
IA-4	Identifier Management	IA-4
IA-5	Authenticator Management	**IA-5** (1) (11)
IA-6	Authenticator Feedback	**IA-6**
IA-7	Cryptographic Module Authentication	IA-7
IA-8	Identification and Authentication (NonOrganizational Users)	**IA-8 (1) (2) (3) (4)**
IR-1	Incident Response Policy and Procedures	**IR-1**
IR-2	Incident Response Training	IR-2
IR-4	Incident Handling	IR-4
IR-5	Incident Monitoring	IR-5
IR-6	Incident Reporting	**IR-6**
IR-7	Incident Response Assistance	IR-7
IR-8	Incident Response Plan	IR-8
MA-1	System Maintenance Policy and Procedures	**MA-1**
MA-2	Controlled Maintenance	MA-2
MA-4	Nonlocal Maintenance	MA-4
MA-5	Maintenance Personnel	MA-5
MP-1	Media Protection Policy and Procedures	**MP-1**
MP-2	Media Access	MP-2
MP-3	Media Marking	MP-3
MP-4	Media Storage	MP-4
MP-5	Media Transport	MP-5
MP-6	Media Sanitization	MP-6
MP-7	Media Use	MP-7

PE-1	Physical and Environmental Protection Policy and Procedures	**PE-1**
PE-2	Physical Access Authorizations	PE-2
PE-3	Physical Access Control	PE-3
PE-4	Access Control for Transmission Medium	PE-4
PE-5	Access Control for Output Devices	PE-5
PE-6	Monitoring Physical Access	**PE-6**
PE-8	Visitor Access Records	PE-8
PE-9	Power Equipment and Cabling	PE-9
PE-11	Emergency Power	PE-11 (1)
PE-12	Emergency Lighting	PE-12
PE-13	Fire Protection	**PE-13**
PE-14	Temperature and Humidity Controls	PE-14
PE-15	Water Damage Protection	**PE-15**
PE-16	Delivery and Removal	PE-16
PE-18	Location of Information System Components	PE-18
PL-1	Security Planning Policy and Procedures	**PL-1**
PL-2	System Security Plan	PL-2 (3)
PL-4	Rules of Behavior	PL-4
PL-7	Security Concept of Operations	
PL-8	Information Security Architecture	PL-8
PS-1	Personnel Security Policy and Procedures	**PS-1**
PS-2	Position Risk Designation	PS-2
PS-3	Personnel Screening	PS-3
PS-4	Personnel Termination	PS-4
PS-5	Personnel Transfer	PS-5
PS-6	Access Agreements	PS-6
PS-7	Third-Party Personnel Security	PS-7
PS-8	Personnel Sanctions	PS-8
RA-1	Risk Assessment Policy and Procedures	**RA-1**
RA-2	Security Categorization	RA-2
RA-3	Risk Assessment	RA-3

RA-5	Vulnerability Scanning	**RA-5**
SA-1	System and Services Acquisition Policy and Procedures	**SA-1**
SA-2	Allocation of Resources	SA-2
SA-3	System Development Life Cycle	SA-3
SA-4	Acquisition Process	**SA-4 (10)**
SA-5	Information System Documentation	SA-5
SA-8	Security Engineering Principles	SA-8
SA-9	External Information System Services	SA-9

Table 2: UFC 4-010-06 Table H-4 Designer CCIs for LOW and MODERATE Impact Control Systems

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-001682	AC-2(2)	The information system automatically removes or disables emergency accounts after an organization defined time period for each type of account.	DoD-Defined Enclave Designer Non-Designer Impractical
CCI-001361	AC-2(2)	The organization defines a time period after which temporary accounts are automatically terminated.	DoD-Defined Enclave Designer Non-Designer Impractical
CCI-001365	AC-2(2)	The organization defines a time period after which emergency accounts are automatically terminated.	DoD-Defined Enclave Designer Non-Designer Impractical
CCI-000017	AC-2(3)	The information system automatically disables inactive accounts after an organization-defined time period.	DoD-Defined Enclave Designer Non-Designer Impractical

CCI-000217	AC-2(3)	The organization defines a time period after which inactive accounts are automatically disabled.	DoD-Defined Designer Impractical
CCI-000018	AC-2(4)	The information system automatically audits account creation actions.	Enclave Designer Impractical
CCI-001403	AC-2(4)	The information system automatically audits account modification actions.	Enclave Designer Impractical
CCI-001404	AC-2(4)	The information system automatically audits account disabling actions.	Enclave Designer Impractical
CCI-001405	AC-2(4)	The information system automatically audits account removal actions.	Enclave Designer Impractical
CCI-002130	AC-2(4)	The information system automatically audits account enabling actions.	Enclave Designer Impractical
CCI-001683	AC-2(4)	The information system notifies organization-defined personnel or roles for account creation actions.	Enclave Designer
CCI-001684	AC-2(4)	The information system notifies organization-defined personnel or roles for account modification actions.	Enclave Designer
CCI-001685	AC-2(4)	The information system notifies organization-defined personnel or roles for account disabling actions.	Enclave Designer
CCI-001686	AC-2(4)	The information system notifies organization-defined personnel or roles for account removal actions.	Enclave Designer
CCI-000048	AC-8(a)	The information system displays an organizationdefined system use notification message or banner before granting access to the system that provides privacy and security notices consistent with applicable federal laws, Executive Orders, directives, policies, regulations, standards, and guidance.	Enclave Designer Impractical
CCI-002247	AC-8(a)	The organization defines the use notification message or banner the information system displays to users before granting access to the system.	DoD-Defined Enclave Designer Impractical

CCI-002243	AC-8(a)(1)	The organization-defined information system use notification message or banner is to state that users are accessing a U.S. Government information system.	DoD-Defined Enclave Designer Impractical
CCI-002244	AC-8(a)(2)	The organization-defined information system use notification message or banner is to state that information system usage may be monitored, recorded, and subject to audit.	DoD-Defined Enclave Designer Impractical
CCI-002245	AC-8(a)(3)	The organization-defined information system use notification message or banner is to state that unauthorized use of the information system is prohibited and subject to criminal and civil penalties.	DoD-Defined Enclave Designer Impractical
CCI-002246	AC-8(a)(4)	The organization-defined information system use notification message or banner is to state that use of the information system indicates consent to monitoring and recording.	DoD-Defined Enclave Designer Impractical
CCI-000050	AC-8(b)	The information system retains the notification message or banner on the screen until users acknowledge the usage conditions and take explicit actions to log on to or further access.	Enclave Designer
CCI-002248	AC-8(c)(1)	The organization defines the conditions of use which are to be displayed to users of the information system before granting further access.	DoD-Defined Enclave Designer Impractical
CCI-000139	AU-5(a)	The information system alerts designated organization-defined personnel or roles in the event of an audit processing failure.	Enclave Designer Impractical
CCI-000140	AU-5(b)	The information system takes organization defined actions upon audit failure (e.g., shut down information system, overwrite oldest audit records, stop generating audit records).	Enclave Designer Impractical
CCI-001490	AU-5(b)	The organization defines actions to be taken by the information system upon audit failure (e.g., shut down information system, overwrite oldest audit records, stop generating audit records).	Enclave Designer Non-Designer Impractical

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-000258	CA-3(b)	The organization documents, for each interconnection, the interface characteristics.	Enclave Designer Non-Designer
CCI-000550	CP-10	The organization provides for the recovery and reconstitution of the information system to a known state after a disruption.	Enclave Designer Non-Designer

CCI-000551	CP-10	The organization provides for the recovery and reconstitution of the information system to a known state after a compromise.	Enclave Designer Non-Designer
CCI-000552	CP-10	The organization provides for the recovery and reconstitution of the information system to a known state after a failure.	Enclave Designer Non-Designer
CCI-000764	IA-2	The information system uniquely identifies and authenticates organizational users (or processes acting on behalf of organizational users).	Enclave Designer Impractical
CCI-000765	IA-2(1)	The information system implements multifactor authentication for network access to privileged accounts.	Enclave Designer Impractical
CCI-001953	IA-2(12)	The information system accepts Personal Identity Verification (PIV) credentials.	Enclave Designer Impractical
CCI-001954	IA-2(12)	The information system electronically verifies Personal Identity Verification (PIV) credentials.	Enclave Designer Impractical
CCI-000777	IA-3	The organization defines a list of specific and/or types of devices for which identification and authentication is required before establishing a connection to the information system.	DoD-Defined Enclave Designer Impractical
CCI-000778	IA-3	The information system uniquely identifies an organization defined list of specific and/or types of devices before establishing a local, remote, or network connection.	Enclave Designer Impractical
CCI-001958	IA-3	The information system authenticates an organization defined list of specific and/or types of devices before establishing a local, remote, or network connection.	Enclave Designer Impractical
CCI-000192	IA-5(1)(a)	The information system enforces password complexity by the minimum number of upper case characters used.	Enclave Designer
CCI-000193	IA-5(1)(a)	The information system enforces password complexity by the minimum number of lower case characters used.	Enclave Designer
CCI-000194	IA-5(1)(a)	The information system enforces password complexity by the minimum number of numeric characters used.	Enclave Designer
CCI-000205	IA-5(1)(a)	The information system enforces minimum password length.	Enclave Designer

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-001619	IA-5(1)(a)	The information system enforces password complexity by the minimum number of special characters used.	Enclave Designer

CCI-000195	IA-5(1)(b)	The information system, for password-based authentication, when new passwords are created, enforces that at least an organization-defined number of characters are changed.	Enclave Designer
CCI-000196	IA-5(1)(c)	The information system, for password-based authentication, stores only cryptographically-protected passwords.	Enclave Designer Impractical
CCI-000197	IA-5(1)(c)	The information system, for password-based authentication, transmits only cryptographically protected passwords.	Enclave Designer
CCI-000199	IA-5(1)(d)	The information system enforces maximum password lifetime restrictions.	Enclave Designer
CCI-000200	IA-5(1)(e)	The information system prohibits password reuse for the organization defined number of generations.	Enclave Designer Non-Designer Impractical
CCI-001618	IA-5(1)(e)	The organization defines the number of generations for which password reuse is prohibited.	DoD-Defined Enclave Designer Impractical
CCI-002041	IA-5(1)(f)	The information system allows the use of a temporary password for system logons with an immediate change to a permanent password.	Enclave Designer Impractical
CCI-002002	IA-5(11)	The organization defines the token quality requirements to be employed by the information system mechanisms for token-based authentication.	DoD-Defined Enclave Designer Impractical
CCI-002003	IA-5(11)	The information system, for token-based authentication, employs mechanisms that satisfy organization-defined token quality requirements.	Enclave Designer Impractical
CCI-000206	IA-6	The information system obscures feedback of authentication information during the authentication process to protect the information from possible exploitation/use by unauthorized individuals.	Enclave Designer Impractical
CCI-000803	IA-7	The information system implements mechanisms for authentication to a cryptographic module that meet the requirements of applicable federal laws, Executive Orders, directives, policies, regulations, standards, and guidance for such authentication.	Enclave Designer Impractical
CCI-003051	PL-2(a)(2)	The organization's security plan for the information system explicitly defines the authorization boundary for the system.	Enclave Designer Non-Designer

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility

CCI-000236	PM-11(b)	The organization determines information protection needs arising from the defined mission/business processes and revises the processes as necessary, until an achievable set of protection needs are obtained.	Enclave Designer Non-Designer
CCI-001054	RA-5(a)	The organization scans for vulnerabilities in the information system and hosted applications on an organization-defined frequency.	Enclave Designer Non-Designer
CCI-001055	RA-5(a)	The organization defines a frequency for scanning for vulnerabilities in the information system and hosted applications.	DoD-Defined Enclave Designer Impractical
CCI-001056	RA-5(a)	The organization scans for vulnerabilities in the information system and hosted applications when new vulnerabilities potentially affecting the system/applications are identified and reported.	Enclave Designer Non-Designer
CCI-001641	RA-5(a)	The organization defines the process for conducting random vulnerability scans on the information system and hosted applications.	Enclave Designer Non-Designer Impractical
CCI-001643	RA-5(a)	The organization scans for vulnerabilities in the information system and hosted applications in accordance with the organization-defined process for random scans.	Enclave Designer Non-Designer
CCI-001057	RA-5(b)	The organization employs vulnerability scanning tools and techniques that facilitate interoperability among tools and automate parts of the vulnerability management process by using standards for: enumerating platforms, software flaws, and improper configurations; formatting checklists and test procedures; and measuring vulnerability impact.	Enclave Designer Non-Designer Impractical
CCI-001058	RA-5(c)	The organization analyzes vulnerability scan reports and results from security control assessments.	Enclave Designer Non-Designer
CCI-001059	RA-5(d)	The organization remediates legitimate vulnerabilities in organization-defined response times in accordance with an organizational assessment risk.	Enclave Designer Non-Designer Impractical
CCI-003116	SA-4(10)	The organization employs only information technology products on the FIPS PUB 201-2-approved products list for Personal Identity Verification (PIV) capability implemented within organizational information systems.	Enclave Designer Impractical
CCI-001093	SC-5	The organization defines the types of denial of service attacks (or provides references to sources of current denial of service attacks) that can be addressed by the information system.	Enclave Designer

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-002385	SC-5	The information system protects against or limits the effects of organization-defined types of denial of service attacks by employing organization-defined security safeguards.	Enclave Designer
CCI-002386	SC-5	The organization defines the security safeguards to be employed to protect the information system against, or limit the effects of, denial of service attacks.	Enclave Designer Non-Designer
CCI-001097	SC-7(a)	The information system monitors and controls communications at the external boundary of the system and at key internal boundaries within the system.	DoD-Defined Enclave Designer Impractical
CCI-002544	SC-41	The organization defines the information systems or information system components on which organization-defined connection ports or input/output devices are to be physically disabled or removed.	Enclave Designer Non-Designer
CCI-002545	SC-41	The organization defines the connection ports or input/output devices that are to be physically disabled or removed from organization-defined information systems or information system components.	Enclave Designer Non-Designer
CCI-001241	SI-3(c)(1)	The organization configures malicious code protection mechanisms to perform periodic scans of the information system on an organization-defined frequency.	Enclave Designer Non-Designer
CCI-001253	SI-4(a)(1)	The organization defines the objectives of monitoring for attacks and indicators of potential attacks on the information system.	DoD-Defined Enclave Designer Impractical
CCI-002645	SI-4(b)	The organization defines the techniques and methods to be used to identify unauthorized use of the information system.	Enclave Designer Non-Designer
CCI-002110	AC-2(a)	The organization defines the information system account types that support the organizational missions/business functions.	Designer
CCI-000213	AC-3	The information system enforces approved authorizations for logical access to information and system resources in accordance with applicable access control policies.	Designer
CCI-000043	AC-7(a)	The organization defines the maximum number of consecutive invalid logon attempts to the information system by a user during an organization-defined time period.	DoD-Defined Designer Impractical
CCI-000044	AC-7(a)	The information system enforces the organization defined limit of consecutive invalid logon attempts by a user during the organization-defined time period.	Designer

CCI-001423	AC-7(a)	The organization defines the time period in which the organization-defined maximum number of consecutive invalid logon attempts occurs.	DoD-Defined Designer Impractical

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-002236	AC-7(b)	The organization defines the time period the information system will automatically lock the account or node when the maximum number of unsuccessful attempts is exceeded.	DoD-Defined Designer Impractical
CCI-002237	AC-7(b)	The organization defines the delay algorithm to be employed by the information system to delay the next login prompt when the maximum number of unsuccessful attempts is exceeded.	DoD-Defined Designer Impractical
CCI-002238	AC-7(b)	The information system automatically locks the account or node for either an organization-defined time period, until the locked account or node is released by an administrator, or delays the next login prompt according to the organization-defined delay algorithm when the maximum number of unsuccessful attempts is exceeded.	Designer Impractical
CCI-000061	AC-14(a)	The organization identifies and defines organizationdefined user actions that can be performed on the information system without identification or authentication consistent with organizational missions/business functions.	Designer
CCI-000232	AC-14(b)	The organization documents and provides supporting rationale in the security plan for the information system, user actions not requiring identification and authentication.	Designer
CCI-001438	AC-18(a)	The organization establishes usage restrictions for wireless access.	Designer Non-Designer
CCI-001439	AC-18(a)	The organization establishes implementation guidance for wireless access.	Designer Non-Designer
CCI-002323	AC-18(a)	The organization establishes configuration/connection requirements for wireless access.	Designer Non-Designer
CCI-001441	AC-18(b)	The organization authorizes wireless access to the information system prior to allowing such connections.	Designer Non-Designer
CCI-000123	AU-2(a)	The organization determines the information system must be capable of auditing an organization-defined list of auditable events.	Designer Non-Designer
CCI-001571	AU-2(a)	The organization defines the information system auditable events.	DoD-Defined Designer Impractical

CCI-000125	AU-2(c)	The organization provides a rationale for why the list of auditable events is deemed to be adequate to support after-the-fact investigations of security incidents.	Designer Non-Designer
CCI-001485	AU-2(d)	The organization defines the events which are to be audited on the information system on an organizationdefined frequency of (or situation requiring) auditing for each identified event.	Designer Non-Designer

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-000130	AU-3	The information system generates audit records containing information that establishes what type of event occurred.	Designer
CCI-000131	AU-3	The information system generates audit records containing information that establishes when an event occurred.	Designer
CCI-000132	AU-3	The information system generates audit records containing information that establishes where the event occurred.	Designer
CCI-000133	AU-3	The information system generates audit records containing information that establishes the source of the event.	Designer
CCI-000134	AU-3	The information system generates audit records containing information that establishes the outcome of the event.	Designer
CCI-001487	AU-3	The information system generates audit records containing information that establishes the identity of any individuals or subjects associated with the event.	Designer Impractical
CCI-001848	AU-4	The organization defines the audit record storage requirements.	Designer Non-Designer
CCI-001849	AU-4	The organization allocates audit record storage capacity in accordance with organization-defined audit record storage requirements.	Designer Non-Designer
CCI-000159	AU-8(a)	The information system uses internal system clocks to generate time stamps for audit records.	Designer
CCI-001889	AU-8(b)	The information system records time stamps for audit records that meets organization-defined granularity of time measurement.	Designer
CCI-001890	AU-8(b)	The information system records time stamps for audit records that can be mapped to Coordinated Universal Time (UTC) or Greenwich Mean Time (GMT).	Designer
CCI-000169	AU-12(a)	The information system provides audit record generation capability for the auditable events defined in AU-2(a) at organization defined information system components.	Designer

CCI-001459	AU-12(a)	The organization defines information system components that provide audit record generation capability.	DoD-Defined Designer Impractical
CCI-000171	AU-12(b)	The information system allows organization-defined personnel or roles to select which auditable events are to be audited by specific components of the information system.	Designer Impractical
CCI-001910	AU-12(b)	The organization defines the personnel or roles allowed select which auditable events are to be audited by specific components of the information system.	DoD-Defined Designer Impractical

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-000172	AU-12(c)	The information system generates audit records for the events defined in AU-2(d) with the content defined in AU-3.	Designer
CCI-002102	CA-9(a)	The organization defines the information system components or classes of components that that are authorized internal connections to the information system.	Designer
CCI-002103	CA-9(b)	The organization documents, for each internal connection, the interface characteristics.	Designer
CCI-002104	CA-9(b)	The organization documents, for each internal connection, the security requirements.	Designer
CCI-002105	CA-9(b)	The organization documents, for each internal connection, the nature of the information communicated.	Designer
CCI-000293	CM-2	The organization develops and documents a current baseline configuration of the information system.	Designer
CCI-000363	CM-6(a)	The organization defines security configuration checklists to be used to establish and document configuration settings for the information system technology products employed.	Designer
CCI-000364	CM-6(a)	The organization establishes configuration settings for information technology products employed within the information system using organization-defined security configuration checklists.	Designer
CCI-000365	CM-6(a)	The organization documents configuration settings for information technology products employed within the information system using organization-defined security configuration checklists that reflect the most restrictive mode consistent with operational requirements.	DoD-Defined Designer Non-Designer Impractical
CCI-001588	CM-6(a)	The organization-defined security configuration checklists reflect the most restrictive mode consistent with operational requirements.	DoD-Defined Designer Non-Designer Impractical

CCI-001755	CM-6(c)	The organization defines the information system components for which any deviation from the established configuration settings are to be identified, documented and approved.	DoD-Defined Designer Non-Designer Impractical
CCI-000381	CM-7(a)	The organization configures the information system to provide only essential capabilities.	Designer
CCI-000380	CM-7(b)	The organization defines for the information system prohibited or restricted functions, ports, protocols, and/or services.	Designer
CCI-000382	CM-7(b)	The organization configures the information system to prohibit or restrict the use of organization-defined functions, ports, protocols, and/or services.	Designer

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-001761	CM-7(1)(b)	The organization defines the functions, ports, protocols and services within the information system that are to be disabled when deemed unnecessary and/or non-secure.	Designer
CCI-001762	CM-7(1)(b)	The organization disables organization-defined functions, ports, protocols, and services within the information system deemed to be unnecessary and/or non-secure.	Designer Impractical
CCI-000389	CM-8(a)(1)	The organization develops and documents an inventory of information system components that accurately reflects the current information system.	Designer
CCI-000392	CM-8(a)(2)	The organization develops and documents an inventory of information system components that includes all components within the authorization boundary of the information system.	Designer
CCI-000398	CM-8(a)(4)	The organization defines information deemed necessary to achieve effective information system component accountability.	DoD-Defined Designer Non-Designer Impractical
CCI-002855	CP-12	The information system, when organization-defined conditions are detected, enters a safe mode of operation with organization-defined restrictions of safe mode of operation.	Designer
CCI-002856	CP-12	The organization defines the conditions, that when detected, the information system enters a safe mode of operation with organization-defined restrictions of safe mode of operation.	Designer
CCI-002857	CP-12	The organization defines the restrictions of safe mode of operation that the information system will enter when organization-defined conditions are detected.	Designer

CCI-000176	IA-5(b)	The organization manages information system authenticators by establishing initial authenticator content for authenticators defined by the organization.	Designer Non-Designer
CCI-001544	IA-5(c)	The organization manages information system authenticators by ensuring that authenticators have sufficient strength of mechanism for their intended use.	Designer Non-Designer Impractical
CCI-001989	IA-5(e)	The organization manages information system authenticators by changing default content of authenticators prior to information system installation.	Designer
CCI-000182	IA-5(g)	The organization manages information system authenticators by changing/refreshing authenticators in accordance with the organization defined time period by authenticator type.	DoD-Defined Designer Non-Designer Impractical
CCI-001610	IA-5(g)	The organization defines the time period (by authenticator type) for changing/refreshing authenticators.	DoD-Defined Designer Non-Designer Impractical

CCI #	800-53 Control Text Indicator	CCI Definition	Responsibility
CCI-001611	IA-5(1)(a)	The organization defines the minimum number of special characters for password complexity enforcement.	DoD-Defined Designer Impractical
CCI-001612	IA-5(1)(a)	The organization defines the minimum number of upper case characters for password complexity enforcement.	DoD-Defined Designer Impractical
CCI-001613	IA-5(1)(a)	The organization defines the minimum number of lower case characters for password complexity enforcement.	DoD-Defined Designer Impractical
CCI-001614	IA-5(1)(a)	The organization defines the minimum number of numeric characters for password complexity enforcement.	DoD-Defined Designer Impractical
CCI-001615	IA-5(1)(b)	The organization defines the minimum number of characters that are changed when new passwords are created.	DoD-Defined Designer Impractical
CCI-000198	IA-5(1)(d)	The information system enforces minimum password lifetime restrictions.	Designer Impractical
CCI-001616	IA-5(1)(d)	The organization defines minimum password lifetime restrictions.	DoD-Defined Designer Impractical
CCI-001617	IA-5(1)(d)	The organization defines maximum password lifetime restrictions.	DoD-Defined Designer Impractical

CCI-003053	PL-2(a)(4)	The organization's security plan for the information system provides the security categorization of the information system including supporting rationale.	Designer Non-Designer
CCI-000207	PM-5	The organization develops and maintains an inventory of its information systems.	Designer Non-Designer Impractical
CCI-001048	RA-3(a)	The organization conducts an assessment of risk of the information system and the information it processes, stores, or transmits that includes the likelihood and magnitude of harm from the unauthorized access, use, disclosure, disruption, modification, or destruction.	Designer Non-Designer
CCI-003124	SA-5(a)(1)	The organization obtains administrator documentation for the information system, system component, or information system services that describes secure configuration of the system, component, or service.	Designer Non-Designer
CCI-003125	SA-5(a)(1)	The organization obtains administrator documentation for the information system, system component, or information system services that describes secure installation of the system, component, or service.	Designer Non-Designer
CCI-003126	SA-5(a)(1)	The organization obtains administrator documentation for the information system, system component, or information system services that describes secure operation of the system, component, or service.	Designer Non-Designer
CCI #	**800-53 Control Text Indicator**	**CCI Definition**	**Responsibility**
CCI-003127	SA-5(a)(2)	The organization obtains administrator documentation for the information system, system component, or information system services that describes effective use and maintenance of security functions/mechanisms.	Designer Non-Designer
CCI-003128	SA-5(a)(3)	The organization obtains administrator documentation for the information system, system component, or information system services that describes known vulnerabilities regarding configuration and use of administrative (i.e., privileged) functions.	Designer Non-Designer
CCI-003129	SA-5(b)(1)	The organization obtains user documentation for the information system, system component, or information system service that describes user-accessible security functions/mechanisms and how to effectively use those security functions/mechanisms.	Designer Non-Designer
CCI-003130	SA-5(b)(2)	The organization obtains user documentation for the information system, system component or information system service that describes methods for user interaction which enables individuals to use the system, component, or service in a more secure manner.	Designer Non-Designer

CCI-003131	SA-5(b)(3)	The organization obtains user documentation for the information system, system component or information system service that describes user responsibilities in maintaining the security of the system, component, or service.	Designer Non-Designer
CCI-002530	SC-39	The information system maintains a separate execution domain for each executing process.	Designer
CCI-002546	SC-41	The organization physically disables or removes organization-defined connection ports or input/output devices on organization-defined information systems or information system components.	Designer Impractical
CCI-002623	SI-3(c)(1)	The organization defines the frequency for performing periodic scans of the information system for malicious code.	DoD-Defined Designer Impractical
CCI-002773	SI-17	The organization defines the fail-safe procedures to be implemented by the information system when organization-defined failure conditions occur.	Designer
CCI-002774	SI-17	The organization defines the failure conditions which, when they occur, will result in the information system implementing organization-defined fail-safe procedures.	Designer
CCI-002775	SI-17	The information system implements organization defined fail-safe procedures when organization defined failure conditions occur.	Designer

CHAPTER 16 – HAZARDOUS MATERIALS

1. SCOPE SUMMARY

a. Submission Packages

i. Concept Design
ii. Pre-Final Demo/Site Design
iii. 50% Design
iv. Final Demo/Site Design
v. Prefinal 100% Design
vi. Final Design

b. Project Objectives

i. This narrative outlines the hazardous materials design approach used to create the Contract Drawings and Specifications for this submission package.
ii. The hazardous material work associated with this project includes removal of asbestos-containing materials, lead paint, mercury-containing thermostats, and other potential universal waste associated with the demolition of facilities 125, 125A, 125B, 125C, 127, and H-13.

2. CRITERIA

a. Asbestos-Containing Materials

The United States Environmental Protection Agency (USEPA) and State of North Carolina define ACM as any material that contains greater than one percent asbestos. Title 40 of the Code of Federal Regulations, Part 61 (40 CFR 61), Subpart M (USEPA National Emission Standards for Hazardous Air Pollutants) requires that an asbestos inspection be conducted prior to renovation/demolition activities. The State of North Carolina also requires that asbestos inspections be conducted prior to renovation/demolition activities.

b. Lead Paint

The Occupational Safety and Health Administration (OSHA) Lead Standard (29 CFR 1926.62) is applicable where paints that contain any amount of lead will be disturbed. OSHA considers all paint (since all paint has some level of lead within it) as Lead-Containing Paint (LCP). Thus, all of the paint in this project would be considered LCP.

c. Waste Debris

The USEPA and the State of North Carolina define elevated waste debris as 5 milligrams per liter (mg/L) for Toxicity Characteristic Leaching Procedure (TCLP) for lead.

3. DESIGN APPROACH

The purpose of the hazardous material assessment/survey was to identify hazardous materials (ACM, LCP, etc.) prior to the renovation of these buildings, so that proper procedures can be utilized to prevent creation of any potential hazards. The Hazardous Material Report is contained in Appendix O. This survey was conducted in support of the initial concept renovation design for these buildings; thus, it is assumed that all of the materials identified in this survey may have to be removed to accomplish the project. Specific recommendations have been provided based upon discussion of the potential renovation of these buildings (plans are subject to change).

a. Asbestos-Containing Materials

Based upon the results of the investigation, all of the buildings contain building components that can be classified as ACM (see Table 1 of report). Most of the ACM is currently in good condition, and they can be managed in-place with little potential hazard. However, in the event of the proposed renovation project, all of the ACM that will be impacted or disturbed should be properly handled or removed, and if removed, disposed of accordingly. Abatement plans should be designed in accordance with USEPA and other

federal, state, and local regulations and/or using appropriate guidelines by a certified Asbestos Designer and reviewed by a Certified Industrial Hygienist. All of the abatement activities should be overseen and managed by an experienced Asbestos Abatement Supervisor, and removal should be performed by certified, trained asbestos workers. Removal notifications, activities, and disposal must be completed in accordance with USEPA and other applicable federal, state, and local regulations.

b. Lead-Containing Paint

Based upon the age of the selected buildings, all of the buildings contain building components that are coated with LCP (see Table 2 of report). The exterior of the selected buildings had areas of damaged or deteriorated paint. The interior of several buildings also had areas of damaged and/or deteriorate paint. If the buildings are demolished, the selected contractor should be responsible for the safe and proper handling of the painted items according to all federal, state, and local regulations. All of the activities should be overseen and managed by an experienced supervisor and trained workers. The contractor should comply with the OSHA lead standard, which regulates occupational exposure to lead.

c. Waste Debris via Toxicity Characteristic Leaching Procedure (TCLP)

Based upon the results of the TCLP samples, the painted building components for all of the buildings should not produce construction debris that would need to be reported and handled as a hazardous waste (see Table 3 of report).

d. Other Hazards

Based upon the results of this investigation, there are numerous hazards associated with the components used in the buildings (see Table 4 of report). All of the items should be corrected and/or handled prior to the proposed renovation project to ensure that the current building conditions do not represent any safety concerns during the project.

4. APPENDICES

See Appendix O – Hazardous Material Report.

End of Section

CHAPTER 17 – AUDIOVISUAL

1. SCOPE SUMMARY

Audiovisual (AV) systems within the building will be provided to support the end user's presentation and meeting operations. The systems will consist of audio and video interfaces, video displays, sound reinforcement control systems, video teleconferencing (VTC) equipment, audio conferencing (ATC) equipment, and other AV equipment necessary to accommodate the operation of the systems. AV designer will coordinate with the government throughout the design to verify equipment standards. System interfaces and equipment locations will be coordinated with interior and architectural design to ensure devices are well placed and provide appropriate aesthetics within the rooms.

2. REFERENCES

a. AV Systems

Refer to section E10. System design must be completed by an individual with a CTS-D certification.

3. CRITERIA

i. Flat panel displays will have a 20A circuit (1) one data drop, mounted into an AV wall box. Blocking will be installed to support a minimum of five times the weight of the flat panel and mounting systems.

ii. Podium locations will be equipped with a floor/poke-thru box at a minimum size of 8". Each box will have a minimum of a 20A circuit, three data drops, and AV connections located inside.

iii. Audiovisual equipment rack locations will be equipped with the minimum, a 20A circuit, four data drops, one CATV and AV connections.

4. DESIGN APPROACH

a. Secure VTC 303B

The Conference Room will have dual 75" wall mounted flat panel displays. Behind each flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. A pan/tilt/zoom camera will be installed under the displays to capture all participants during a conference call. AV connectivity will be located at each table unit. A CATV receiver and additional audiovisual equipment will be located in an AV equipment rack inside a credenza within the room. Ceiling mounted microphones will be installed to pick up participants' voices during video or audio conference calls. Ceiling speakers will be installed to evenly distribute audio throughout the space. An AV control panel will be

mounted on conference room table to control audiovisual aspects inside the room. The AV designer will coordinate AV requirements of tables for AV connectivity with interior designer and FF&E supplier.

b. Brief/Debrief 101 & 102

The Brief/Debrief rooms will come equipped with a 98" flat panel display and mount. Behind the flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. An AV switcher will be installed inside the enclosure. AV connectivity will be located at the conference table, user's workstation, and at the podium. A table mounted control panel will be located on the user's workstation. The AV control panel will be able to control all the AV aspects within the space, including system on/off, source selection, and volume adjustments. The The AV designer will coordinate AV requirements of tables for AV connectivity with interior designer and FF&E supplier.

c. Brief/Debrief 209

The Brief/Debrief room will come equipped with a 75" flat panel display and mount. Behind the flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. An AV switcher will be installed inside the enclosure. AV connectivity will be located at the conference table and wall mounted under the display. A table mounted control panel will be located on the conference table. The AV control panel will be able to control all the AV aspects within the space, including system on/off, source selection, and volume adjustments. The AV designer will coordinate AV requirements of tables for AV connectivity with interior designer and FF&E supplier.

d. Lobby/Vest L010

The Lobby/Vest L010 will come equipped with a 55" flat panel display and mount. The flat panel will be located above the user window in the room. Behind the flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. AV connectivity will be installed at the desk located in Entry WS 100. A wall mounted control panel will be located in the Entry WS 100. The AV control panel will be able to control all the AV aspects within the space, including system on/off, source selection, and volume adjustments. The AV designer will coordinate AV requirements of tables for AV connectivity with interior designer and FF&E supplier.

e. Simulation Classrooms

The Simulation Classrooms will come equipped with a 98" flat panel display and mount. Behind the flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. AV connectivity will be located at the podium. A table mounted control panel will be located on the podium. The AV control panel will be able to control all the AV aspects within the space, including system on/off, source selection, and volume

adjustments. The The flat panel will also have the ability to receive AV sources from the exercise control room. Two mobile carts with a 50" flat panel display will be provided per room. Each cart will have an HDMI cable for local AV connectivity. Each cart will also have the ability to receive AV sources from the exercise control room. An intercom system will be installed in each room so there can be communication to the Exercise control room.

f. Exercise Control 202

The Exercise Control room will come equipped with a LED Video wall. Behind the video wall will be power. Two 75" flat panel displays, and mounts will be provided on adjacent walls from the video wall. Behind the flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. Located at the control desk will be 3 HDMI inputs these inputs will be used to take video signals from owner furnished PC to get video from the server room to the exercise control room or can be used to connect to user's workstations. Located under each row of seats will be another HDMI connection for users' workstations stations or owner furnished PC. A 20" touch panel will be located at control desk to control all AV aspects in the room, including but not limited, source selection, video wall layouts, dialing audio/video conference calls, setting up the intercom between rooms, camera control, and audio adjustments. Two PTZ cameras located in the front of the room and one auto tracking camera located in the rear of the room, will be located in the room, giving the users the ability to participate in conference calls with the Ready Room/Auditorium. An intercom system will be installed in the room giving the users the ability to communicate to all simulation classrooms individual or as a group. Located at each table unit will be headsets, which can be used for communication between the exercise control room and simulation classroom. Ceiling mounted microphones will be installed to pick up participant's voices during video or audio-conferencing calls. Ceiling speakers will be installed to evenly distribute audio throughout the space.

g. Ready Room/Auditorium 201

The Ready Room/Auditorium will come equipped with a LED Video wall. Behind the video wall will be power. Located at the control desk will be 6 HDMI inputs. these inputs will be used to take video signals from owner furnished PC to get video from the server room to the exercise control room or can be used to connect to user's workstations. A 20" touch panel will be located at control desk to control all AV aspects in the room, including but not limited, source selection, video wall layouts, dialing audio/video conference calls, camera control, and audio adjustments. Two PTZ cameras located in the front of the room and one auto tracking camera located in the rear of the room, giving the users the ability to participate in NIPR or SIPR video or audio-conferencing calls. The room will have the ability to have the exercise control room join video or audio conference calls. Ceiling mounted microphones will be installed to pick up participant's voices during video or audio-conferencing calls. Ceiling speakers will be installed to evenly distribute audio

throughout the space. The users will be able to send video or audio to the exercise control room.

h. Exercise Control 207

The exercise control room will come equipped with dual 75" flat panel display and mounts. The flat panels will on adjacent walls. Behind the flat panel will be a recessed in-wall enclosure. Power and data will be attached to the enclosure. AV connectivity will be located on each side of the room. AV connectivity will consist of two HDMI connections on each side. Two table mounted AV control panels within the room, one at each table section. The AV control panel will be able to control all the AV aspects within the space, including system on/off, source selection, and volume adjustments. Ceiling speakers and microphones will be installed giving users the ability to communicate with the exercise control room 202. The users will also have the ability to send and receive video signals between the two exercise control rooms. The AV designer will coordinate AV requirements of tables for AV connectivity with interior designer and FF&E supplier.

End of Section