

# 2336W WRAP Roof Overbuild System, Performance Specification

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy  
under Contract DE-AC06-08RL14788

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Plateau Remediation Company

**P.O. Box 1600  
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# 2336W WRAP Roof Overbuild System, Performance Specification

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## 1.0 SCOPE

1.1 Purpose: These specifications establish the roof performance requirements for design of a roof overbuild system for the 2336W Waste Receiving and Processing (WRAP) building. The building is located in the 200 West Area of the Hanford Site, Richland Washington. See Figure A-1, and A-2.

1.1.1 The Contractor shall provide services as needed for the design, procurement, and installation of an overbuild system complete with structural supporting framework, attachments, anchorage, flashing, waterproofing, gutters, pre-manufactured expansion systems located at industry recommended spacing, and lightning protection.

## 2.0 APPLICABLE DOCUMENTS, ACRONYMS, AND DEFINITIONS

### 2.1 Acronyms

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Method
AWS	American Welding Society
CHPRC	CH2M Hill Plateau Remediation Company
CMU	Concrete Masonry Unit(s)
CP	Central Plateau Document
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
EN	Engineering
FAR	Federal Acquisition Regulations
FM	Factory Mutual Research Corporation
GD	Guide
GP	General Provisions
HNF	Hanford
IBC	International Building Code
IECC	International Energy Conservation Code
L	Length
LRFD	Load Resistance Factor Design
mph	miles per hour
NFPA	National Fire Protection Association
NPH	Natural Phenomena Hazards (ref. DOE-STD-1020-2016, and PRC-PRO-EN-097)
NRTL	Nationally Recognized Testing Laboratories
MBMA	Metal Building Manufacturer's Association
PRC	Plateau Remediation Contract

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PRO	Procedure
RD	Requirements Document
R-Span	American Panel Industries Batten Rib Roof Panel
SDC	Standard Design Criteria
SDS	Safety Data Sheets
SE	Structural Engineer, licensed in the State of Washington
SP	Special Provisions
SSMR	Structural standing seam metal roof
STD	Standard
UBC	Uniform Building Code
UCRLA	University of California Research Laboratory
UL	Underwriter Laboratories
V	Vendor
WRAP	Waste Receiving and Processing Building (Building 2336W)
Z-purlin	Purlin shaped like the letter Z.

## 2.2 Applicable Documents

Work shall be performed in accordance with the requirements, design criteria, national codes and standards, specifications, drawings, exhibits, and other documents, which by this reference are made a part of these specifications.

Components shall be designed, procured, tested, and/or inspected in accordance with recognized industry codes, standards, or other design criteria unique to DOE contractors as applicable. It is the Contractor's responsibility to identify all applicable codes or standards that apply to each component. Unless specified otherwise, the current edition or revision of the code or standard in effect on the date of award shall be used. The Contractor shall document the code or standard that will be used for each component.

### 2.2.1 Government Documents

Applicable government, Hanford requirements, procedures, and standards are:

- [SP-4](#) Special Provisions, Construction Contracts
- [SP-5](#) Special Provisions, On-Site Services
- [SP-7](#) Special Provisions, Rights in Data
- [GP](#) General Provisions
- [DOE-0346](#) *Hanford Site Fall Protection Program*
- [DOE-0359](#) *Hanford Site Electrical Safety Program (HSESP)*
- [DOE-STD-1020](#) *Natural Phenomena Hazard Analysis and Design Criteria for Department of Energy Facilities*
- [DOE-STD-1066](#) *DOE Standard - Fire Protection*
- [DOE-RL-92-36](#) *Hanford Site Hoisting and Rigging Manual*

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- PRC-PRO-EN-097 *Engineering Design and Evaluation (Natural Phenomena Hazard)*
- PRC-PRO-EN-440 *Engineering Documentation Preparation and Control*
- PRC-RD-EN-1819 *CHPRC Engineering Requirements*
- PRC-PRO-EN-2001 *Facility Modification Package Process*
- PRC-PRO-EN-8016 *Design Change Notice Process*
- PRC-PRO-EN-8017 *As-Built Verification Process*
- PRC-PRO-EN-8336 *Design Verification*
- PRC-PRO-EN-20050 *Engineering Configuration Management*
- PRC-STD-EN-40255 *Design Requirements Documentation*
- PRC-GD-EN-40256 *Engineering Codes and Standards*
- PRC-STD-EN-40259 *Engineering Calculations*
- PRC-PRO-EN-40264 *Formal Design Review*
- PRC-PRO-EN-40271 *Engineering Design Process*
- PRC-STD-EN-40279 *Engineering Drawing Standards*
- PRC-STD-EN-40280 *Engineering Specifications*
- PRC-STD-EN-52773 *Third Party Inspections*

## 2.2.2 Original Construction of Facility Specific References

Original construction and facility information may be found at:

- CP-63969 *WRAP Roof Panel Water Intrusion Technical Evaluation*
- H-2-131751 *WRAP Module I Roof Plan*
- H-2-131753 *Building Elevations (Sheets 1 and 2)*
- H-2-131827 *WRAP Module 1 Lightning Protection Plan*
- H-2-131828 *WRAP Module 1 Grounding and Lightning Protection Details*
- H-2-131887 *Fire Protection Zone Plan*
- H-2-818276 *WRAP General Arrangement*
- HNF-6694 *WRAP Design Calculations (original calculations)*
- ECR-19-001540 *“WRAP Roof Panel Vendor Drawings”, Vendor Information Drawings for Thermalspan Granitstone R-Span Panels – Shop drawings for panels, connections, and flashings.*

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- ECR-19-001797            “WRAP EMBD/MISC. Drawings” – Shop drawings for embedment plates, columns, and anchors.
- ECR-19-001799            “WRAP Steel Framing Drawings” – Shop Drawings from American building showing structural frame, missing sheet 3 and 6
- ECR-20-000099            “2336W Metal Building Calculations” – All structural calculations for WRAP
- ECR-20-000136            “2336W Metal Building Erection Drawings”, Vendor Information Drawings for American Buildings Company. Includes all drawings from ECR-19-001799 plus sheet 3 and 6.
- ECR-20-000225            “WRAP Specifications V-W026-001” (construction specifications)
- ECR-20-000234            “Construction Package V-W026-001” (construction drawings)

### 2.2.3 Non-Government Documents – Codes and Standards

- American Institute of Steel Construction (AISC) “Manual of Steel Construction,” 14th Edition.
- American Institute of Steel Construction (AISC) ANSI/AISC 303-16, “AISC Code of Standard Practice for Steel Buildings and Bridges.”
- American Iron and Steel Institute, “North American Specification for the Design of Cold-Formed Steel Structural Members.”
- American National Standards Institute (ANSI) Y14 Series, “Engineering Drawing and Related Documentation Practices, American National Standards Institute, New York, New York.”
- American Society of Civil Engineers (ASCE) 7 “Minimum Design Loads for Buildings and Other Structures,” 2010.
- American Society of Mechanical Engineers (ASME) NQA-1-2008, *Quality Assurance Requirements for Nuclear Facility Applications, with 2009 addenda.*
- American Society of Mechanical Engineers (ASME) A325, *Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.*
- American Society of Heating, Refrigerating, and Air-Conditioning (ASHRAE) 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings.”
- American Society for Testing Method (ASTM) specifications and standards, as applicable.

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- ASTM A463/A463M, *“Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process.”*
- ASTM A792/A792M, *“Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.”*
- ASTM E 1646, *“Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.”*
- American Welding Society (AWS) D1.1, *“Structural Welding Code.”*
- American Welding Society (AWS) D1.3 *“Structural Welding Code – Sheet Steel.”*
- American Welding Society (AWS) D9.1 *“Sheet Metal Welding Code.”*
- International Code Council (ICC), *International Building Code (IBC)*, 2015
- International Energy Conservation Code (IECC) requirements for roof replacement or roof re-covering. Ref. <http://rci-online.org/wp-content/uploads/2017-cts-fischer.pdf>
- Metal Building Manufacturer’s Association (MBMA), *“Metal Building Systems Manual”*
- National Roofing Contractor Association (NRCA) guidelines
- Factory Mutual (FM) Research Corporation 1-90 criteria as listed in FM 1-28, *“FM Global, Property Loss Prevention Data Sheets – Wind Design.”*
- Factory Mutual (FM) Research Corporation 1-90 criteria as listed in FM 1-28r, *“Roof Systems.”*
- Factory Mutual (FM) Research Corporation 1-90 criteria as listed in FM 1-29, *“FM Global Property Loss Prevention Data Sheets – Roof Deck Securement and Above-Deck Roof Components.”*
- Factory Mutual (FM) Research Corporation 1-90 criteria as listed in FM 1-31, *“Panel Roof Systems.”*
- Occupational Safety and Health Standards, 29 CFR 1910, Code of Federal Regulations.
- NFPA 70, *“National Electric Code.”*
- NFPA 70E, *“Standard for Electrical Safety in the Workplace”*
- NFPA 221, *“Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls.”*
- NFPA 780, *“Standard for the Installation of Lightning Protection Systems.”*
- Safety and Health Regulations for Construction, 29 CFR Part 1926, Code of Federal Regulations
- Worker Safety and Health Program, 10 CFR Part 851, Code of Federal Regulations



- Underwriter Laboratories (UL) 580, "*Standard for Tests for Uplift Resistance of Roof Assemblies.*"

#### 2.2.4 Original Code of Record (for reference)

- American Concrete Institute ACI-318, "*Building Code Requirements for Reinforced Concrete,*" 1989
- American Institute of Steel Construction (AISC), "*Manual of Steel Construction,*" 9th edition.
- American Society Civil Engineers (ASCE), "*Minimum Design Loads for Buildings and Other Structures,*" ASCE 7-88.
- American Welding Society D1 .1, "*Structural Welding Code,*" 1990.
- ECR-20-00261, Hanford Plant Standards, "*Architectural-Civil Design Criteria/Design Loads for Facilities*", SDC-4.1, Rev. 11 (legacy design standard).
- "*Uniform Building Code*" (UBC), 1988 edition.
- University of California Research Laboratory UCRL-15910, "*Design and Evaluation Guidelines for Department of Energy Subjected to Natural Phenomena Hazards,*" June 1990.

#### 2.2.5 Existing Configuration

- 2.2.5.1 WRAP roof was constructed in 1994 and made with R-Span batten rib roof panels, manufactured by American Panel Industries (Ref. ECR-19-001540, WRAP Roof Panel Vendor Drawings).
- 2.2.5.2 Panels are 2 1/2" thick, consist of 24 gauge (0.0239 in. thick), top and bottom sheets filled with urethane foam. The panels are 44 5/8" wide (Ref. ECR-19-001540, WRAP Roof Panel Vendor Drawings).
- 2.2.5.3 The length of the panels at the ridge is 30'- 6 1/2." The length of the panels at the eave is 29'-8." The length of the panels between the eave and ridge is 30'-0" (Ref. ECR-19-001540, WRAP Roof Panel Vendor Drawings).
- 2.2.5.4 The panels are supported by 9 1/2" deep cold formed "Z" purlins spaced at 5'-0" (ECR-20-000136, 2336W Metal Building Erection Drawings).
- 2.2.5.5 The panels are connected to the Z-purlins with "Bulb-Tite" rivets placed through the Z-Purlins, placed from below the roof and extending through top flange of the Z-purlin into the lower panel sheathing layer (Ref. ECR-19-001540, WRAP Roof Panel Vendor Drawings).
- 2.2.5.6 The purlins are supported by steel frames at 25'-0" spacing (ECR-20-000136, 2336W Metal Building Erection Drawings).
- 2.2.5.7 ECR-19-001540, WRAP Roof Panel Vendor Drawings, describes "Endlap" connections, panels, and other flashing details.

## **2.2.6 Design Loads (Based on the Code of Record)**

### **2.2.6.1 Wind Loads (ASCE 7-88)**

2.2.6.1.1 Base Wind Speed: 70 mph.

2.2.6.1.2 Exposure Category: C.

2.2.6.1.3 Importance Factor: I = 1.07.

2.2.6.2 Seismic: The most stringent loading as determined by the requirements of the Uniform Building Code (UBC-88) or UCRL -15910 (June, 1990).

#### **2.2.6.2.1 UBC**

- Seismic Zone: 2B.
- Importance Factor I = 1.25.

#### **2.2.6.2.2 UCRLA 15910**

- Peak ground acceleration: 0.12g.
- Amplification factor for 5% critical damping: C = 2.083.
- Importance factor: I = 1.25.

### **2.2.6.3 Live Load:**

- Minimum roof live load: 20 psf.
- Collateral loads under roofs and elevated floors: 10 psf.
- Collateral loads for future equipment installation under roofs and floors: 10 psf.

### **2.2.6.4 Snow Load:**

- Ground snow load: 15 psf.
- Design for snow drifting per ASCE 7-88, Section 7

## **2.2.7 Definitions**

2.2.7.1 Buyer – CH2M Hill Plateau Remediation Company (CHPRC), or successor contractor acting in behalf of the Department of Energy for the current plateau contract.

2.2.7.2 Contractor – Sole entity responsible for procurement, design, installation, warranty, safety, quality assurance and management of scope for facility upgrade as described in this document.

2.2.7.3 Single Manufacturer – A sole manufacturer for the roof system to be installed as described in this document.

## **3.0 TECHNICAL REQUIREMENTS**

### **3.1 Overbuild System Requirements**

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- 3.1.1 Roof shall have a minimum design life of 25 years.
- 3.1.2 A metal over metal type system is preferred to minimize the vertical profile of the structure and resulting wind loads.
- 3.1.3 The new overbuild system shall be a structural standing seam metal roof (SSMR) system, or other Buyer approved overbuild system.
- 3.1.4 Overbuild system assembly, penetration seals, etc. shall be fire rated where applicable in accordance with the IBC.
  - 3.1.4.1 Any interstitial spaces found between the original building frame and overbuild system shall be of non-combustible construction with wholly non-combustible contents in accordance with the IBC and NFPA 13 for permissible fire sprinkler omissions.
- 3.1.5 All pre-manufactured components used in the overbuild system shall have a factory finish applied at the place of manufacture. Additional or alternate coating systems, if provided, shall be approved by Buyer.
  - 3.1.5.1 Overbuild system shall be of Class 1 construction as defined in FM Global Property Loss Prevention Data Sheets 1-28R, Overbuild systems, and 1-31, Metal Overbuild systems (Ref. DOE-STD-1066, Fire Protection Design Criteria, Section 4.2.4.4). Structural and associated materials shall be non-combustible.
- 3.1.6 The project prefers work to be performed from outside of the facility. However, needed alterations of existing underlying structural members, or required work within the facility imposes these additional requirements to affected work:
  - 3.1.6.1 If replacement of an existing roof panel is required, restored roof shall have a minimum insulation value of R-35 / U-0.028 (IECC), and meet the requirements of Class 1 construction as defined in FM Global Property Loss Prevention Data Sheets 1-28R, Overbuild systems, and 1-31, Metal Overbuild systems (Ref. DOE-STD-1066, Fire Protection Design Criteria, Section 4.2.4.4).
  - 3.1.6.2 If replacement of an existing roof panel is required, roof to supporting CMU wall fire barrier interface, shall be furnished with NFPA 221 compliant-Buyer approved and listed joint system installed between CMU walls and roof. Existing facility fire barriers shall be maintained (Ref. drawing H-2-131887).
- 3.1.7 Leading edges of the roof shall be sealed with flashing to prevent water intrusion as well as bird and other vermin intrusion. Vent and/or louvers screens shall be sealed with wire mesh backing.
  - 3.1.7.1 If applicable, interstitial spaces between original and overbuild space shall be screened, vented, and sealed against birds and insects, moisture, and other intrusions.

## 3.2 Utility Requirements

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- 3.2.1 All protruding elements on the roof shall be accounted for in the design and construction of the new overbuild system. Architectural flashing details and weather proofing details shall be identified on drawings.
- 3.2.2 Replace or reinstall all the lightning protection systems (air terminals, bonding, cables, grounding, and other components). Ensure appropriate protections are also in place for both facility and personnel during construction. Contractor shall provide drawings/specifications for the installation of lightning protection systems in accordance with NFPA 780, *Standard for the Installation of Lightning Protection Systems*.
  - 3.2.2.1 Contractor shall follow NFPA 780, Section D.2 as applicable for installation or modification of the lightning protection system for the WRAP facility.
- 3.2.3 Contractor's design shall ensure drilling for fasteners will not come in contact with live electrical conduit and conductors mounted on Z-purlins, or on or below existing sheet metal roof.
- 3.2.4 Contractors shall add or modify gutters and downspouts or diverters to the low sides of the roof. Gutters and downspouts shall be made of material compatible for heat tracing.
- 3.2.5 For existing roof air intakes or other penetrations, provide duct extensions for roof elevation increase. Provide drawings and specifications as required to fully describe required penetration extension modifications and associated flashings. Each penetration shall be described specifically, but may share common specifications or details.

### 3.3 Design Criteria for Overbuild System

- 3.3.1 The overbuild system shall be designed as Safety Significant, Performance Category 2 structure in accordance with DOE-STD-1020, and PRC-PRO-EN-097. Roof panels, fasteners, and anchors are Safety Significant items to be procured as Quality Level 2 (Ref. Section 4.0).
- 3.3.2 Contractor shall provide Washington State Licensed Structural Engineer (SE), Washington State Licensed Architect, or appropriate discipline engineer stamped drawings/calculations/specifications.
- 3.3.3 Contractor shall provide structural analysis submittal, approved by a licensed Structural Engineer (SE) in the State of Washington to confirm the capacity of the structure shall certify the submitted solution meets the Buyer's design specifications.
  - 3.3.3.1 If capacity of the existing structure cannot support the new overbuild system, the Contractor shall provide recommendations to Buyer on how to strengthen the load-force resisting members so that the requirements of Section 3.3.10 are met. Contractor's design may then be approved assuming such strengthening measures are in place.

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- 3.3.4 Anchorage screws shall conform to AISI standards.
- 3.3.5 Structural anchor bolts shall be ASTM A325 with capacities per AISC.
- 3.3.6 For light gauge steel material, comply with American Iron and Steel Institute (AISI) *“North American Specification for the Design of Cold-Formed Steel Structural Members.”* For structural steel, comply with American Institute of Steel Construction (AISC) *“Manual of Steel Construction.”*
- 3.3.7 Design secondary members and covering for applicable loads and combination of loads in accordance with Metal Building Manufacturer’s Association (MBMA) *“Metal Roofing System Design Manual.”*
- 3.3.8 For welded connections of structural components, comply with AWS D1.1 *“Structural Welding Code;”* or AWS D1.3, *“Structural Welding Code – Sheet Steel.”* For welded sheet metal connections, comply with AWS D9.1 *“Sheet Metal Welding Code.”*
- 3.3.9 Design Loads: The roof system shall be designed to resist the specified loads in accordance with ASCE-7; the *“International Building Code (IBC);”* PRC-PRO-EN-097, *“Engineering Design and Evaluation (Natural Phenomena Hazard);”* and DOE-STD-1020, *“Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities.”*
- NOTE:** If evaluation using site-specific natural phenomena hazards (NPHs) cannot show existing facility to be in conformance with the acceptance criteria, then the methods for evaluating existing structures defined in DOE-STD-1020 may be used. Application of the methods for evaluating existing structures defined in DOE-STD-1020 shall be subject to Buyer and DOE approval and in accordance with PRC-PRO-EN-097 (allow 90 days).
- 3.3.10 Contractor shall consider existing roof panels as delaminated (composite structural properties of existing panels compromised), unless shown otherwise by inspection and testing.
- 3.3.11 Deflection of roofing panel system shall not exceed  $L/180$  of span, when supporting design dead load plus live and wind loads.
- 3.3.12 Slope shall match existing roof slope.
- 3.3.13 Overbuild system shall have no uncontrolled water penetration through the panel seams when tested in accordance with ASTM E 1646 at static pressure differential of 12.0 psf.
- 3.3.14 Thermal effects: Panels shall be free to move in response to expansion and contraction forces resulting from a total ambient temperature change of  $\pm 100$  degree F during the life of the structure.
- 3.3.15 SSMR Roof Panel and Fascia Panel Finish: Factory finish shall be Steel Sheet, Aluminum-Coated, by the Hot-Dip Process per ASTM A463/A 463M; or Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process per ASTM A 792/A 792M with a factory applied, polar white color coating.

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- 3.3.16 SSMR Cold Form Support Member Finish: Ferrous materials shall have a factory applied Galvanized or Galvanized sealed coating prior to assembly. Breaks in this “base” coating after assembly will be spot repaired with same factory supplied coating and in accordance with the manufacturer’s instructions.
- 3.3.17 Fasteners/ Anchor Clips for roofing panels and structural support members shall be factory finished with a Galvanized or Galvannealed coating. Fasteners shall be concealed where practical.

### 3.4 Calculation and Documentation Requirements

- 3.4.1 Structural Calculations: Prepare the following calculations.
- Building roof loading in compliance with IBC requirements.
  - Roof reaction loads at anchor points.
  - Roof Fasteners sizing.
- 3.4.2 Required Drawings: Contractor shall furnish complete erection drawings plans and details showing fabrication and assembly of the overbuild system. Submit both electronic and hard copy drawings (minimum 24 x 36 prints). New facility drawings or revisions to existing facility drawings shall be performed in accordance with PRC-STD-EN-40279, *Engineering Drawing Standards*.
- 3.4.3 Architectural: Before installation, submit documentation and product specifications necessary in support of the building performance specification detailed above. Drawings (Shop/Architectural/Field) and calculations shall be performed in accordance Buyer procedures and for Buyer approval. Construction Specifications shall be shown in CSI format and numbering.
- 3.4.3.1 Specifications shall be generated from state of the art specification software (Building Systems Design Speclink-E, Master Format, ARCAT, e-Specs, or other CSI compliant specification system). Specifications shall, at a minimum, include CSI Division 2 (existing conditions), 3 (concrete if applicable), 4 (masonry if applicable), 5 (metals), 7 (thermal and moisture protection), 13, 16 for lightning protection, others if applicable. The resulting specifications shall be included with these Contract documents as applicable during the Construction Option. This Statement of Work and the associated specifications are considered to be Division 1 for Construction.
- 3.4.4 Documentation shall include the following:
- List of all architectural, structural, lightning protection drawings.
  - Roofing installation figures & details.
  - Framing and panel layout plans, sections, and details.
  - Anchor bolt sizes, lengths and layouts.
  - Details on edge conditions, joint corners, custom profiles, supports, anchorages, trims, flashings, closures.
  - Roofing and exterior finish connections/application.
  - Joint sealing and caulking, and specialty details

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- h. Flashings, gutters, and downspouts, and other sheet metal accessories including profiles, methods of joining, and anchorage.
- i. Sheeting thickness.
- j. Accessory installation.
- k. Details and instructions for assembly.
- l. Fabrication drawings to supplement instructions and diagrams.
- m. Erection drawings
- n. Fire Protection: Provide documentation from a fire protection perspective demonstrating conformance with Class 1 construction as defined in FM Global Property Loss Prevention Data Sheets 1-28R.

3.4.5 Color coating shall have protective components to prevent chalking, fading and provide color stability.

#### 4.0 QUALITY ASSURANCE REQUIREMENTS

- 4.1 *Design*: the Contractor shall provide a compliance matrix of design requirements to be verified during the conceptual, preliminary, and final design reviews by Buyer.
- 4.2 *Construction*: the Contractor shall be responsible for performing quality workmanship and shall conduct the quality control measures necessary to ensure work conforms to requirements above.
- 4.3 The contractor shall have a quality assurance program that includes procedures controlling the design process, including design verification, calculation verification, drafting checks by qualified personnel, and a NQA-1 compliant red-line / design change control / as-built program, procurement, receiving, construction, and inspection.
- 4.4 In addition, as design is for nuclear safety significant (SS) Quality Level 2 (QL2) work, a Quality Assurance program compliant with ASME NQA-1 is required. The Contractor shall maintain a documented ASME NQA-1-2008 (with 2009 addenda) program, “*Quality Assurance Requirements for Nuclear Facility Applications*,” as specified in the Table below.

**Table 4-1 ASME NQA-1-2008 Part 1 Requirements  
(Identify Safety Classification and Quality Level)**

Section	Basic Requirement	Application
1.	Organization (Section 100, 200)	Design, Construction
2.	Quality Assurance Program (Section 100, 200, 300, 400, 500)	Design, Construction
3.	Design Control (Section 100, 200, 300, 400, 500, 600 [except Article 601], 700, 800, 900)	Design, Construction
4.	Procurement Document Control (Section 100, 200)	Construction
5.	Instructions, Procedures and Drawings (Section 100)	Design, Construction

**Table 4-1 ASME NQA-1-2008 Part 1 Requirements  
 (Identify Safety Classification and Quality Level)**

Section	Basic Requirement	Application
6.	Document Control (Sections 100, 200, 300)	Design, Construction
7.	Control of Purchased Items and Services (Section 100, 200, 400, 500 [except Article 506], 600, 700, 800)	Construction
8.	Identification and Control of Items (Sections 100, 200, 300)	Construction
9.	Control of Process (Sections 100, 200, 300, 400)	Construction
10.	Inspection (Sections 100, 200, 300, 400 [except Article 402], 500, 600, 700, 800)	Construction
11.	Test Control (Sections 100, 200 [except Article 200c], 300, 400, 500, 600)	Construction
12.	Control of Measuring and Test Equipment (Sections 100, 200, 300, 400)	Construction
13.	Handling, Storage and Shipping (Section 100, 600)	Construction
14.	Inspection, Test and Operating Status (Section 100)	Construction
15.	Control of Nonconforming Items (Sections 100, 200, 300, 400)	Construction
16.	Corrective Action	NA – CHPRC
17.	Quality Assurance Records (Section 100, 200, 300, 400,(except 401) 500, 600, 800 [Except Articles 800 d, e, f])	Design, Construction
18.	Audits	NA – CHPRC
NQA-1 Part 2 Subpart 2.14	NQA-1 Part 2 Subpart 2.14 – Quality Assurance Requirements for Commercial Grade Items and Services for Hardware only (Section 100, 200, 300, 400, 401, 402, 403 500, 600 [excluding 602 par 3 “Sampling plans”, 602 par 4 “When post installation test(s) are used”], 800 [excluding 800 i ,“historical performance information”])	Construction

#### 4.5 Qualifications and Warranty

- 4.5.1 **Manufacturer’s Qualifications:** Provide a pre-engineered metal building manufactured by a firm having a minimum of five years experience in manufacturing metal building systems and overbuild systems that are similar to those indicated for this project.
- 4.5.2 **Roofing and Finish Warranty.** Furnish the overbuild system manufacturer’s written warranty covering failure of the factory-applied exterior finish on overbuild system



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within the warranty period against defects in materials or workmanship, including blistering, peeling, and flaking. This warranty shall be in addition to and not a limitation of other rights the Buyer may have against the Contractor under the Contract Documents and these specifications.

- 4.5.3 Submit a manufacturer's 25-year structural, weather tightness, and material warranty for new and existing roof elements as an integrated roof system. The contractor shall also warrant labor and materials for 2 years for weather tightness, and other defects after acceptance of the overbuild system in accordance with the Contract's general and special provisions.
- 4.5.3.1 The warranty shall also comply with Buyer's Special Provisions SP-4, *Construction Contracts*, and FAR 52.246-12 on "Inspection," and the Buyer's GP, *General Provisions* on "Warranty."

End of Specification

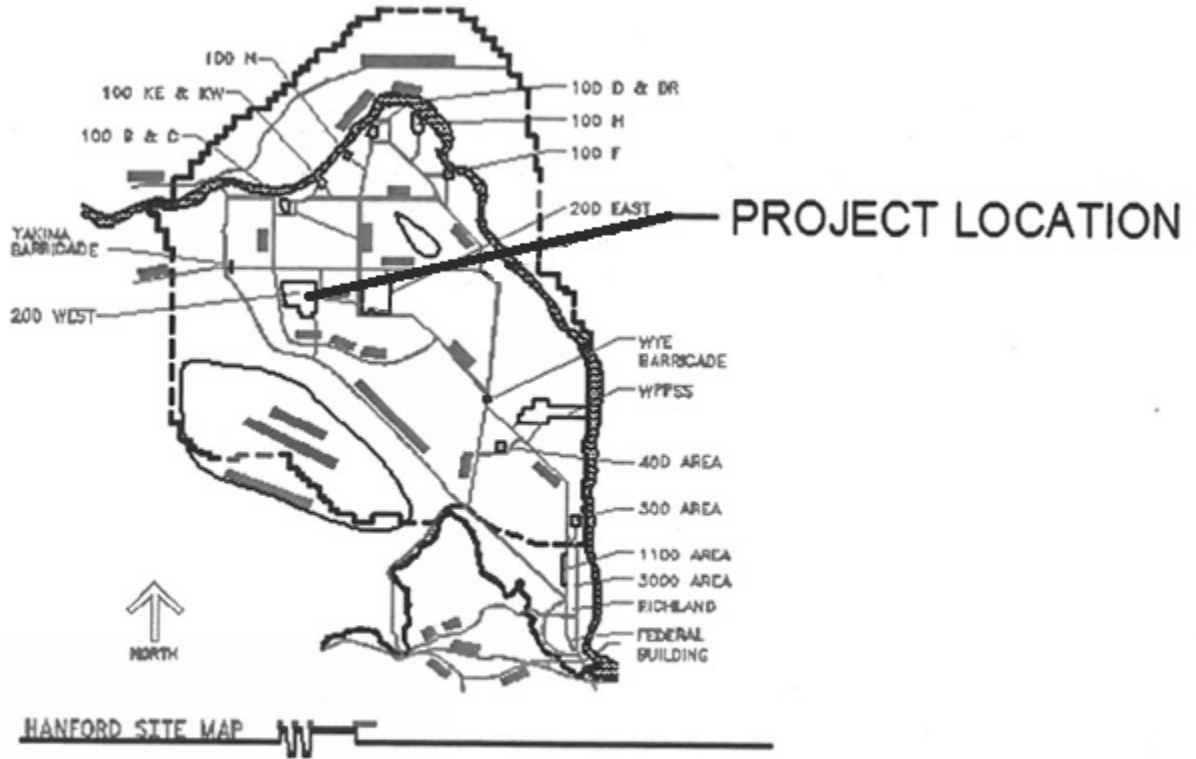


Figure A-1  
Site Plan and Vicinity Map

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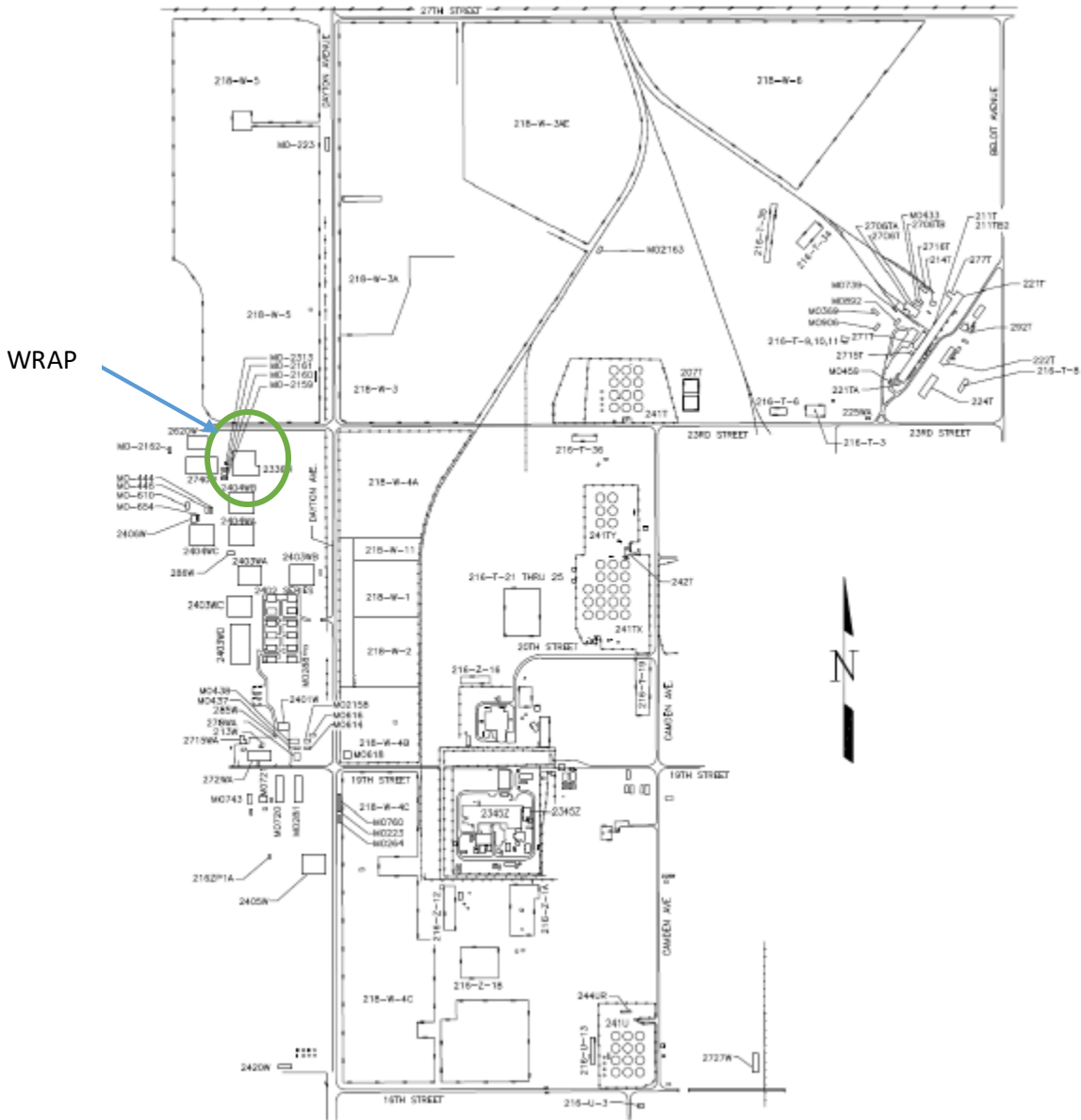


Figure A-2, Facility Location in the 200 West Area