Statement of Structural Tests and Special Inspections

National Park Service (NPS) - Denver Service Center (DSC) | 8-22-24

Park: Mammoth Cave National Park (MACA)

Project Management Information System (PMIS) Number: 258051

Project Name: Replace Seasonal Housing Units

Structural Engineering Firm: DJ&A, P.C.

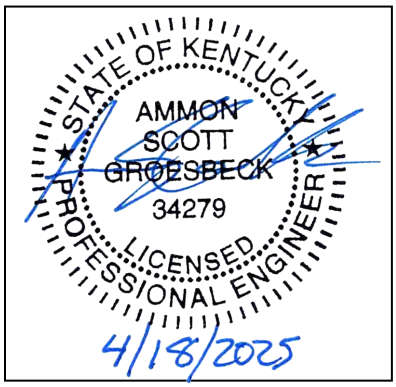
This Statement of Structural Tests and Special Inspections is being submitted as required by Chapter 17 of the **2024 International Building Code** (IBC 2024). It includes the following:

1. Seismic requirements
2. Wind requirements
3. Qualification Requirements for Inspectors and Testing Technicians
4. Listing of Required Structural Tests and Special Inspections

The Construction Contractor's Quality Control Supervisor will provide copies of all special inspection reports and associated documentation to the Contracting Officer (CO). The Construction Contractor will be required to correct all deficiencies discovered in the Special Inspection and Structural Testing program.

Prepared By: Ammon Groesbeck
(Type or print name)

Signature: _____ Date: 4/18/2025



Stamped by Professional Engineer (PE) or Structural Engineer (SE)

Seismic and Wind Requirements

Seismic Requirements, IBC 2024 Section 1704.3

Description of seismic-force-resisting system and designated seismic systems subject to special inspections:

This project is not subject to seismic-force-resisting system special inspections per IBC-21 Section 1705.13. The structure is of light-frame construction, SDS = 0.29, and the building height is under 35'. The structure therefore, does not require seismic special inspections per IBC-24 1705.13, Exception 1.

Wind Requirements, IBC 2024 Section 1704.3

Description of wind-force-resisting system and designated wind systems subject to special inspections:

This project is not subject to wind-force-resisting system special inspections per IBC-24 Section 1705.12(1). The structure is of light-frame construction, is assigned to Exposure Category B, and the ultimate basic wind speed is Vult = 105 mph. Risk II structures are not required to be designed for tornado loads.

Instructions:

1. Under Listing of Required Structural Tests and Special Inspections:
    a. **Required?** - Place an **X** for all Special Inspections and Tests required for this project.
    b. **Required Qualifications** - Provide qualifications for the special inspector, using the Qualification Requirements for Inspector and Testing Technicians list below, for all required Structural Tests and Special Inspections.
    c. **Continuous** - If marked with an **X**, continuous special inspection shall be as defined in Chapter 2, IBC 2024.
    d. **Periodic** - If marked with an **X**, provide the minimum number of tests, i.e. 20% of all field welds, or the amount of work to be inspected (e.g. 10% of all wall surfaces).
2. Attach completed Statement of Structural Tests and Special Inspections to the end of NPS DSC Division 1 Specifications **Section 01 40 00 Quality Requirements**.

Qualification Requirements for Inspectors and Testing Technicians

PE/SE	Structural Engineer – licensed PE or SE specializing in the design of buildings and structures
PE/GE	Geotechnical Engineer – licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – graduate engineer who has passed the Fundamentals of engineering examination

American Concrete Institute (ACI) Certification

ACI-CCSI	Concrete Construction Special Inspector
ACI-LTT	Concrete Laboratory Testing Technician Level 1 or 2
ACI-STT	Concrete Strength Testing Technician
ACI-FTT	Concrete Field Testing Technician – Grade I

American Society of Non-Destructive Testing (ASNT) Certification

Non-Destructive Testing Technician – Level II or III

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector

Exterior Design Institute (EDI) Certification

EDI-EIFS	Certified EIFS inspector

International Code Council (ICC) Certification

ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector
ICC-SSI	Soils Special Inspector
ICC-SFSI	Spray-applied Fireproofing Special Inspector
ICC-SMSI	Structural Masonry Special Inspector
ICC-SSBSI	Structural Steel and Bolting Special Inspector
ICC-SWSI	Structural Welding Special Inspector

National Institute for Certification in Engineering Technologies (NICET) Certification

NICET-CT	Concrete Technician – Levels I, II, III and IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III and IV
NICET-ST	Soils Technician - Levels I, II, III and IV

Other

Listing of Required Structural Tests and Special Inspections

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
	Structural Steel (IBC 2024 Section 1705.2; American Institute of Steel Construction: AISC 360-22 Chapter N, AISC 341-22 Chapter J)				
	Prior to Welding (AISC 360-22 Table C-N5.4-1)				
X	1. Welder qualification records and continuity records.	ICC-SWSI/AWS-CWI	X		
X	2. Welding procedure specifications (WPS) available.	ICC-SWSI/AWS-CWI	X		
X	3. Manufacturer certifications for welding consumables available.	ICC-SWSI/AWS-CWI	X		
X	4. Material identification (type/grade).	ICC-SWSI/AWS-CWI		X	
X	5. Welder identification system.	ICC-SWSI/AWS-CWI		X	
	6. Fit-up of groove welds (including joint geometry).				
X	a. Joint preparation.	ICC-SWSI/AWS-CWI		X	
X	b. Dimensions (alignment, root opening, root face, bevel).	ICC-SWSI/AWS-CWI		X	
X	c. Cleanliness (condition of steel surfaces).	ICC-SWSI/AWS-CWI		X	
X	d. Tacking (tack weld quality and location).	ICC-SWSI/AWS-CWI		X	
X	e. Backing type and fit (if applicable).	ICC-SWSI/AWS-CWI		X	
	7. Fit-up of CJP (complete joint penetration) groove welds of HSS (hollow structural sections) T-, Y- and K-joints without backing (including joint geometry).				
X	a. Joint preparation.	ICC-SWSI/AWS-CWI			

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
X	b. Dimensions (alignment, root opening, root face, bevel).	ICC-SWSI/AWS-CWI			
X	c. Cleanliness (condition of steel surfaces).	ICC-SWSI/AWS-CWI			
X	d. Tacking (tack weld quality and location).	ICC-SWSI/AWS-CWI			
X	8. Configuration and finish of access holes.	ICC-SWSI/AWS-CWI		X	
	9. Fit-up of fillet welds.				
X	a. Dimensions (alignment, gaps at root).	ICC-SWSI/AWS-CWI		X	
X	b. Cleanliness (condition of steel surfaces).	ICC-SWSI/AWS-CWI		X	
X	c. Tacking (tack weld quality and location).	ICC-SWSI/AWS-CWI		X	
X	10. Check welding equipment.	ICC-SWSI/AWS-CWI		X	
	During Welding (AISC 360-22 Table C-N5.4-2)				
	1. Control and handling of welding consumables				
X	a. Packaging.	ICC-SWSI/AWS-CWI		X	
X	b. Exposure control.	ICC-SWSI/AWS-CWI		X	
X	2. No welding over cracked tack welds.	ICC-SWSI/AWS-CWI		X	
	3. Environmental conditions.				
X	a. Wind speed within limits.	ICC-SWSI/AWS-CWI		X	
X	b. Precipitation and temperature.	ICC-SWSI/AWS-CWI		X	
	4. WPS followed.				
X	a. Settings on welding equipment.	ICC-SWSI/AWS-CWI		X	

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
X	b. Travel speed.	ICC-SWSI/AWS-CWI		X	
X	c. Selected welding materials.	ICC-SWSI/AWS-CWI		X	
X	d. Shielding gas type/flow rate.	ICC-SWSI/AWS-CWI		X	
X	e. Preheat applied.	ICC-SWSI/AWS-CWI		X	
X	f. Interpass temperature maintained (minimum/maximum).	ICC-SWSI/AWS-CWI		X	
X	g. Proper position (F, V, H, OH).	ICC-SWSI/AWS-CWI		X	
X	h. Intermix of filler metals avoided unless approved (AISC 341-22 Section J7).	ICC-SWSI/AWS-CWI		X	
X	5. Use of qualified welders.	ICC-SWSI/AWS-CWI	X		
	6. Welding techniques.				
X	a. Interpass and final cleaning.	ICC-SWSI/AWS-CWI		X	
X	b. Each pass within profile limitations.	ICC-SWSI/AWS-CWI		X	
X	c. Each pass meets quality requirements.	ICC-SWSI/AWS-CWI		X	
X	7. Placement and installation of headed stud anchors.	ICC-SWSI/AWS-CWI	X		
	After Welding (AISC 360-22 Table C-N5.4-3)				
X	1. Welds cleaned.	ICC-SWSI/AWS-CWI		X	
X	2. Size, length and location of welds.	ICC-SWSI/AWS-CWI	X		
	3. Welds meet visual acceptance criteria.				
X	a. Crack prohibition.	ICC-SWSI/AWS-CWI	X		

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
X	b. Weld/base-metal fusion.	ICC-SWSI/AWS-CWI	X		
X	c. Crater cross section.	ICC-SWSI/AWS-CWI	X		
X	d. Weld profiles.	ICC-SWSI/AWS-CWI	X		
X	e. Weld size.	ICC-SWSI/AWS-CWI	X		
X	f. Undercut.	ICC-SWSI/AWS-CWI	X		
X	g. Porosity.	ICC-SWSI/AWS-CWI	X		
X	4. Arc strikes.	ICC-SWSI/AWS-CWI	X		
X	5. k-area.	ICC-SWSI/AWS-CWI	X		
X	6. Weld access holes in rolled heavy shapes and built-up heavy shapes.	ICC-SWSI/AWS-CWI	X		
X	7. Backing removed and weld tabs removed (if required).	ICC-SWSI/AWS-CWI	X		
X	8. Repair activities.	ICC-SWSI/AWS-CWI	X		
X	9. Document acceptance or rejection of welded joint or member.	ICC-SWSI/AWS-CWI	X		
X	10. No prohibited welds have been added without the approval of the EOR (Engineer of Record).	ICC-SWSI/AWS-CWI	X		
X	11. Placement of reinforcing or contouring fillet welds (if required) (AISC 341-22 Table J7.1).	ICC-SWSI/AWS-CWI	X		
	Nondestructive Testing (AISC 360-22 Section N5 and AISC 341-22 Section J7)				
X	1. Risk Category II Structures - Perform Ultrasonic Testing on 10% of CJP groove welds in butt, T- and corner joints subject to transversely applied tension loading, in materials 5/16 inch thick or greater.	ASNT Level III		X	

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
	2. Risk Category III or IV Structures - Perform Ultrasonic Testing on all CJP groove welds subject to transversely applied tension loading in butt, T- and corner joints, in materials 5/16 inch thick or greater.	ICC-SWSI/AWS-CWI	X		
	3. Access Holes - Perform Magnetic Particle Testing or Liquid Penetrant Testing when the flange thickness exceeds 1.5 inches for rolled shapes, or when the web thickness exceeds 1.5 inches for built-up shapes.	ICC-SWSI/AWS-CWI	X		
	4. Welded Joints Subject to Fatigue - Perform testing per AISC 360-22 Section N5c.	ICC-SWSI/AWS-CWI	X		
	Nondestructive Testing (AISC 341-22 Section J7)				
	Column Splice and Column to Base Plate PJP Groove Weld (AISC 341-22 Section J7 2b)				
	1. Perform Ultrasonic Testing on 100% of PJP (partial-joint-penetration) groove welds in column splices and column to base plate welds.	ICC-SWSI/AWS-CWI	X		
	2. CJP Groove weld.	ICC-SWSI/AWS-CWI	X		
	3. Lamellar tearing.	ICC-SWSI/AWS-CWI	X		
	4. Beam cope and access hole.	ICC-SWSI/AWS-CWI	X		
	5. Reduced beam section repair.	ICC-SWSI/AWS-CWI	X		
	6. Weld tab removal.	ICC-SWSI/AWS-CWI	X		
	Prior to Bolting (AISC 360-22 Table C-N5.6-1)				
	These inspections are not required for snug-tight joints.				
	1. Manufacturer's certifications available for fastener materials.	ICC-SSBSI	X		
	2. Fasteners marked in accordance with ASTM requirements.	ICC-SSBSI		X	

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
	3. Correct fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane).	ICC-SSBSI		X	
	4. Correct bolting procedure selected for joint detail.	ICC-SSBSI		X	
	5. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements.	ICC-SSBSI		X	
	6. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used.	ICC-SSBSI		X	
	7. Protected storage provided for bolts, nuts, washers and other fastener components.	ICC-SSBSI		X	
	During Bolting (AISC 360-22 Table C-N5.6-2)				
	These inspections are not required for snug-tight joints.	ICC-SSBSI			
	These inspections are not required for pretensioned joints and slip-critical joints, when the installer is using the turn-of-nut method with matchmarking techniques, the direct-tension-indicator method, or the twist-off-type tension control bolt method.				
	1. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required.	ICC-SSBSI		X	
	2. Joint brought to the snug-tight condition prior to the pretensioning operation.	ICC-SSBSI		X	
	3. Fastener component not turned by the wrench prevented from rotating.	ICC-SSBSI		X	
	4. Fasteners are pretensioned in accordance with the RCSC (Resource Council on Structural Connections) Specification, progressing systematically from the most rigid point toward the free edges.	ICC-SSBSI		X	
	After Bolting (AISC 360-22 Table C-N5.6-3)				
	Document acceptance or rejection of bolted connections.	ICC-SSBSI	X		

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
	Galvanized Structural Steel Main Members (AISC 360-22 Table C-N5.6-3)				
X	Inspect per AISC 360-22 Section N5.7.	ICC-SSBSI		X	
	Other Inspection Tasks (AISC 360-22 Section N5.8 and AISC 341-22 Section J9)				
X	1. Verify compliance of fabricated steel with the details shown on the approved shop drawings.	ICC-SSBSI		X	
X	2. Verify compliance of the erected steel frame with the details shown on the approved erection drawings, including braces, stiffeners, member locations and joint details.	EIT		X	
	3. Anchor rods and other embedments support structural steel.				
X	a. Verify the diameter, grade, type and length of the anchor rod or embedded item.	ICC-SSBSI or ICC-RCSI		X	
X	b. Verify the extent or depth of embedment into the concrete.	ICC-SSBSI or ICC-RCSI		X	
	4. Protected zone - no holes or unapproved attachments made by fabricator or erector, as applicable. (AISC 341-22)	ICC-SSBSI		X	
	Concrete Construction (IBC 2024 Section 1705.3)				
X	1. Inspect reinforcing steel, including prestressing tendons, and verify placement.	ACI-CCSI or ICC-RCSI		X	
	2. Inspection of reinforcing steel welding				
	a. Verify weldability of reinforcing bars other than ASTM A706.	ICC-SWSI		X	
	b. Inspect welded reinforcement splices.	ICC-SWSI	X		
	c. Inspect single pass fillet welds, maximum 5/16 inch.	ICC-SWSI		X	
	d. Inspect all other weds.	ICC-SWSI		X	
X	3. Inspection of anchors cast in concrete.	ACI-CCSI or ICC-RCSI		X	

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
	4. Inspection of anchors post-installed in hardened concrete members.				
X	a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension load.	ACI-CCSI or ICC-RCSI	X		
X	b. Mechanical anchors and adhesive anchors not defined in 4a.	ACI-CCSI or ICC-RCSI		X	
X	5. Verify use of approved design mix.	ACI-CCSI or ICC-RCSI		X	
X	6. Prior to placement fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	ACI-CCSI or ICC-RCSI	X		
X	7. Inspect concrete and shotcrete placement for proper application techniques.	ACI-CCSI or ICC-RCSI	X		
X	8. Inspect for maintenance of specified curing temperature and techniques.	ACI-CCSI or ICC-RCSI		X	
X	9. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	ACI-CCSI or ICC-RCSI		X	
X	10. Inspection formwork for shape, location and dimensions of the concrete member being formed.	ACI-CCSI or ICC-RCSI		X	
	Wood Construction (IBC 2024 Section 1705.5)				
X	1. Inspect prefabricated wood structural elements in accordance with Section 1704.2.5.	EIT		X	
	2. High load diaphragms:				
X	a. Verify sheathing grade and thickness.	EIT		X	
X	b. Verify nominal size of framing members at adjoining panel edges.	EIT		X	
X	c. Verify nail or staple diameter and length.	EIT		X	
X	d. Verify number of fastener lines.	EIT		X	

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
X	e. Verify spacing between fasteners in each line and at panel edges.	EIT		X	
	3. Shearwalls:				
X	a. Verify sheathing grade and thickness.	EIT		X	
X	b. Verify nominal size of framing members at adjoining panel edges.	EIT		X	
X	c. Verify nail or staple diameter and length.	EIT		X	
X	d. Verify number of fastener lines.	EIT		X	
X	e. Verify spacing between fasteners in each line and at panel edges.	EIT		X	
X	f. Location and size of holdowns.	EIT	X		
	4. Verify nailing, bolting, anchoring and fastening of:				
X	a. Drag struts and collectors.	EIT	X		
X	b. Braces.	EIT	X		
X	c. Hold-downs.	EIT	X		
	5. Metal-plate-connected wood trusses spanning 60 feet or greater:				
	a. Verify temporary installation restraint/bracing installed in accordance with the approved shop drawings.	EIT		X	
	b. Verify permanent individual truss member restraint/bracing installed in accordance with the approved shop drawings.	EIT		X	
	Soils (IBC 2024 Section 1705.6)				
X	1. Verify materials below shallow foundations are adequate to achieve the required bearing capacity.	EIT		X	
X	2. Verify excavations are extended to proper depth and have reached proper material.	EIT		X	

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
X	3. Perform classification and testing of compacted fill materials.	EIT		X	
X	4. During fill placement, verify use of proper materials and procedure in accordance with the provisions of the approved geotechnical report. Verify densities and lift thicknesses during placement and compaction of compacted fill.	EIT	X		
X	5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	EIT		X	
	Fabricated Items (IBC 2024 Section 1705.11)				
	1. Inspect fabricated items in accordance with Section 1704.2.5.	EIT	X		
	Wind Resistance (IBC 2024 Section 1705.12)				
	1. Provide inspections when required by Section 1705.12.	EIT			
	Seismic Resistance (IBC 2024 Section 1705.13)				
	1. Provide inspections when required by Section 1705.13.	EIT			
	Testing and Qualification for Seismic Resistance (IBC 2024 Section 1705.14)				
	1. Test and qualify seismic resistance in accordance with IBC 2024 Section 1705.14 and the project specifications.	EIT			
	Sprayed Fire-Resistive Materials (IBC 2024 Section 1705.15)				
	1. Inspect sprayed fire-resistant materials in accordance with IBC 2024 Section 1705.15 and the project specifications.	ICC-SFSI			

Required?	Structural Test or Special Inspection	Required Qualifications	Continuous	Periodic	Frequency of Periodic Test or Inspection
	Intumescent Fire-Resistive Materials (IBC 2024 Section 1705.16)				
	1. Perform inspections in accordance with AWCI 12-B (Association of the Wall and Ceiling Industry) and IBC 2024 Section 1705.16.	ICC-SFSI		X	
	Fire-Resistant Penetrations and Joints (IBC 2024 Section 1705.18)				
	1. Perform inspections in accordance with project specifications and IBC 2024 Section 1705.18.	ICC-SFSI		X	
	Smoke Control (IBC 2024 Section 1705.19)				
	1. Perform testing in accordance with project specifications and IBC 2024 Section 1705.19.	ICC-SFSI			