

NOAH+ Standard & Inspection Guide

Building Standards

The NOAH+ Standard is outlined and inspected by NOAH: the National Organization for Alternative Housing. The NOAH+ Standard includes standards from multiple entities, including the American National Standards Institute (ANSI), the National Fire Protection Association (NFPA), the International Code Council (ICC), the American Wood Council (AWC), and the Engineered Wood Association (APA).

The bulk of the NOAH+ Standard includes the ANSI 119.5: Park Model Recreational Vehicle Standard, NFPA 1192 Standard on Recreational Vehicles, as well as Article 551 for Recreational Vehicles and Recreational Vehicle Parks and Article 552 for Park Trailers in NFPA 70— the National Electric Code (NEC). Additionally, the NOAH+ Standard requires and inspects for provisions per the following stipulations of the International Residential Code (IRC), AWC, and APA codes.

Inspection Services

Inspections are performed at all critical stages of construction for compliance to The NOAH+ Standard. NOAH inspectors are Certified Professional Inspectors. NOAH utilizes InterNACHI CPI's, Engineers, General Contractors, Plumbers, Electricians & Building Inspectors.

Inspections are performed by licensed individuals, in-person or remotely, using an expert mobile application which can be hosted anywhere. Live stream video & audio allow the inspector to guide the builder through each Inspection Stage. Inspectors can also take snapshots/photos during the Inspection Video & make annotations to thoroughly document specific details.

NOAH maintains all inspection records for each NOAH Certified Structure using AES-256 encryption of data which is stored in world class secure facilities that meet PCI, HIPAA, Military, and other regulatory requirements. Records are stored and retrievable by the following identifiers:

- VIN – Vehicle Identification Number/or Other Identifier
- NOAH Certification Seal Number
- Builder Name

If the build does not pass inspection at a Stage, a one-time re-inspection can be performed, at no additional fee. After the second inspection, if the build does not pass, there will be a re-inspect fee for each additional inspection performed. Builders failing or refusing compliance are subject to disciplinary action ranging from membership probation (resulting in more frequent inspections & re-inspection fees) to expulsion from NOAH Membership.

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Stage 1: Trailer

1A: Trailer frame	<ul style="list-style-type: none"> - VIN permanently attached. - Dimension of frame and tongue metal. - Cross-member spacing. - Total trailer weight rating or axle -weight rating. - Number of axles, lug pattern, brakes, coupler size. - Length and width of frame. 																				
1B: House length & required trailer capacities	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Length</th> <th style="padding: 5px;">Average finished weight</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">18'</td> <td style="padding: 5px;">7,000-9,000 lbs.</td> </tr> <tr> <td style="padding: 5px;">24'</td> <td style="padding: 5px;">9,000 -12,000 lbs</td> </tr> <tr> <td style="padding: 5px;">32'</td> <td style="padding: 5px;">12,000 -16,000 lbs</td> </tr> </tbody> </table> <p style="margin-top: 10px;">If your trailer doesn't have a total weight rating tag on it or a weight rating tag on the axles, here's a guideline to assist you:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2" style="padding: 5px;">Typical Axle Diameters Based on Axle Capacity</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">3,500-lb axle</td> <td style="padding: 5px;">2 3/8-inch diameter</td> </tr> <tr> <td style="padding: 5px;">6,000-lb – 7,200-lb axle</td> <td style="padding: 5px;">3-inch diameter</td> </tr> <tr> <td style="padding: 5px;">8,000-lb axle</td> <td style="padding: 5px;">3-1/2-inch diameter</td> </tr> <tr> <td style="padding: 5px;">9,000-lb axles</td> <td style="padding: 5px;">4-inch diameter</td> </tr> <tr> <td style="padding: 5px;">10,000-lb or more axles</td> <td style="padding: 5px;">5-inch diameter</td> </tr> </tbody> </table>	Length	Average finished weight	18'	7,000-9,000 lbs.	24'	9,000 -12,000 lbs	32'	12,000 -16,000 lbs	Typical Axle Diameters Based on Axle Capacity		3,500-lb axle	2 3/8-inch diameter	6,000-lb – 7,200-lb axle	3-inch diameter	8,000-lb axle	3-1/2-inch diameter	9,000-lb axles	4-inch diameter	10,000-lb or more axles	5-inch diameter
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Stage 2: Framing

2A: Framing	<ul style="list-style-type: none"> - Frame up with trailer mounts, all hold down straps and headers. - Sheathing: Proper size and nail/screw pattern for rack bracing. - Proper headers supported by jacks and proper stud spacing. - Anchors: house frame to trailer frame, no more than 10ft apart: <ul style="list-style-type: none"> o 1/2" bolts o 1/2" thread rod o flat hold down straps - House wrap and taping of the seams. - Installation of the windows, including flashing and taping around windows and doors. - Inspection of roof covering prior to installation of either metal or shingles. - All roofs 2/12 or less shall have Ice & Water Shield or equivalent covering the entire roof or a double layer of felt paper. - All designs must meet 140 mph wind loads. <p style="margin-top: 10px;"><i>Note: Measure the total height and width of the unit. The maximum width is 8' 6"; maximum height is 13'6". Be sure to include overhangs and protrusions. If these measurements are exceeded, a special permit will be required to move the home. This measurement will be done can be done separately or in conjunction with Stage 3, then again at the Stage 5 final inspection.</i></p>
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	<p><i>Note: Prior to installing siding, an inspection of the house wrap (if used) is required. Prior to installing roof covering, an inspection of the underlayment is required. These inspections can be done separately or in conjunction with a Stage 3 or 4 inspection.</i></p> <p><i>Note: If floor plywood will cover floor insulation or trailer attachment, a separate partial inspection of these items must be performed prior to installing plywood.</i></p>
Anchoring	<ul style="list-style-type: none"> - Weld house frame to trailer frame/chassis. <ul style="list-style-type: none"> o 1' from each corner and every 6' of exterior wall o If welding is not an option, anchor with a ½" bolt 4' on center or ½" thread rod, plus lock washer and nut. - SP1 and SP2 Simpson hangers may be used on top and bottom studs.
Walls	<ul style="list-style-type: none"> - Use nominal 2x4 no.2 or better studs 16" on center with single bottom and double top plates. - Add a 3 ½" by 12" glue lam header under the window for added strength on shear/rack walls. - Sip panels, engineered metal framing, or engineered trusses may also be used. <ul style="list-style-type: none"> o The inspector will need engineer's specifications to insure proper use and installation of these systems. - King studs: <ul style="list-style-type: none"> o require mechanical fastener's (No L brackets) o spacing 6' for 140", Studs 16" on center and 24" on center when using the advanced framing method. o Use Simpson H2.5 twist rafter ties or equivalent. - Headers: <ul style="list-style-type: none"> o 4"x4", up to 4ft span. o double 2"x4", up to 4ft span. o single 2"x6", up to 4ft span. o double 2"x6", up to 6ft span. o single 2"x10", up to 6ft span. o double 2"x8", up to 8ft span. o double 2"x10", up to 9ft span. o double 2"x12", up to 10ft span. o Spans Greater than 10ft. are handled on a case-by-case basis.
Roof	<ul style="list-style-type: none"> - For a nominal shed roof, use 2x6 rafter/ceiling joists 24" or 16" on center with maximum span of 7'6". - "A" frame style roofs require one of the following at framing: <ul style="list-style-type: none"> o Collar ties placed at maximum distance of 48" on center, or o Metal Ridge Strap, min 24" in length. - Use 8D rink shank nails every 6" on center in the field. - If using 24" on center, use ½" H clips at the plywood joints between rafters. - Strapping <ul style="list-style-type: none"> o GoBolts connected to each anchor bolt <ol style="list-style-type: none"> a. with 2" long needs connectors, b. 1' from each corner, c. every 6' of wall and on either side of all openings greater than 6',

	<ul style="list-style-type: none"> d. penetrating the double top plate with a 3"x3" washer, a lock washer and ½" nut. ○ Attach the end of each rafter to the top plates with a Simpson H2.5 strap using 10D galvanized hanger nails of 1 ½" length, or equivalent. ○ Mechanically attach all exterior king wall studs to the top and bottom plates with Simpson H2.5 twist rafter ties or equivalent. - Pitch: <ul style="list-style-type: none"> ○ 4/12 or less, entire roof shall be covered. ○ greater than 4/12, roof eaves up a minimum of 3 feet into building line shall be covered.
<p>Sheathing</p>	<ul style="list-style-type: none"> - T111 or ½" exterior plywood with batten boards will not require sub sheathing. - Tyvek is no longer needed when using the new zip panel sheathing. - ½" zip panel sheathing or equivalent, glued and nailed 4" on the edges and 8" in the field with 8D ring shank nails - Size and nail/screw pattern for rack bracing. - Studs 16" on center, 24" on center with advanced framing method minimum, 2x4 wood or metal studs, or sip panels - Underlayment as needed - Roof: <ul style="list-style-type: none"> ○ ½ or 7/16 CDX (or 9/16 for 24" on center rafters) ○ ½" OSB sheathing nailed 3" on center on the edges. - Walls: <ul style="list-style-type: none"> ○ OSB sheathing nailed 6" in field for walls. ○ 8D ring shank nails. - House wrap or zip board. <ul style="list-style-type: none"> ○ Prior to installing siding, an inspection of the house wrap (if used) is required.
<p>2B: Dry-in</p>	<ul style="list-style-type: none"> - Ice & Water Shield underlayment shall be installed as indicated and inspected prior to covering during the Dry-In of Stage 2. - Lofts: <ul style="list-style-type: none"> ○ All homes with a loft over 24" high must have a guardrail installed. (ANSI 5-10.7) ○ A loft measuring 35sq ft or greater shall have a primary and secondary means of egress. (Example: Window 24" X 17" or Outdoor Passage 18" X 48") (ANSI 3-2.1) ○ All open sided stairs are required to have a Guard rail 34" high with openings no greater than 4". (ANSI 5-10.7) ○ Cantilevered floor systems supporting exterior walls shall have solid full depth blocking placed in every joist bay over the metal trailer frame. ○ C.Section AQ104 LOFTS(1)Section AQ104.1 Minimum loft area and dimensions: Lofts used as a sleeping or living space shall meet the minimum area and dimension requirements of Sections AQ104.1.1 through AQ104.1.3. ○ (a)Section AQ104.1.1 Minimum area. Lofts shall have a floor area of not less than 35 square feet (3.25 m2). ○ (b)Section AQ104.1.2 Minimum dimensions. Lofts shall be not less than 5 feet (1524 mm) in any horizontal dimension.

	<ul style="list-style-type: none"> ○ (c)Section AQ104.1.3 Height effect on loft area. Portions of a loft with a sloping ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft. Exception: Under gable roofs with a minimum slope of 6:12. portions of a loft with a sloping ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft. ○ Loft minimum floor system for loft spans 7' 10" or less: <ul style="list-style-type: none"> ● single 2"x4" at 12" on center ● double 2"x4" at 24" on center ● single 4"x4" at 24" on center ● single 2"x6" at 24" on center
Stage 3: Plumbing & Electrical	
3A: Rough plumbing	<ul style="list-style-type: none"> - Pressure test (100psi) - Hanger straps every 3ft., and proper sizes. - Drain lines should have 1/4" drop per 12" - Water heater needs overflow pipe to outside. - Supply lines should be pressurized with air or water to a minimum of 80 lbs. PSI for this inspection. To accomplish this, a pressure meter may be attached to the hose bib. <ul style="list-style-type: none"> ○ <i>Note: The inspector will check the pressure before and after the inspection.</i> - The wastewater line should hold a 10' column of water during the inspection. <ul style="list-style-type: none"> ○ Builders can fill the vent pipe with water to meet this requirement. - There must be at least one bathroom vent to release methane gas, "Studor" vents and Air Admittance Valves may be used. - According to NFPA 1192 the gas piping must hold 3 lbs. of pressure for 10 minutes. - Gas, water, and waste pipe shall be bonded to the chassis.
3B: Rough electrical	<ul style="list-style-type: none"> - Electric panels may not be installed in a bathroom, closet or stairs and wet area. - Proper stapling of wire to studs/nailer plates - Placement of panel (not in bathroom) - Externally run wires in conduit or UF - Proper gauge wire for service supply - See Article 551 NEC - Electric Service: <ul style="list-style-type: none"> ○ Up to 5 circuits may be on a 30A service. 6 circuits or more will require a 50A service. - Main Disconnect: <ul style="list-style-type: none"> ○ A Main disconnect is required where there are more than six circuits, i.e. if you only have two 20A circuits in the unit you will not need a main disconnect. - Length of power cord: <ul style="list-style-type: none"> ○ 25' if on the side 30' if on the rear. If the entrance of the cable into the vehicle is more than 3' from the ground, add that distance to the length of the power cord. - Spacing of outlets: <ul style="list-style-type: none"> ○ Any wall 2' or more will require a receptacle outlet, and an outlet is required so no point along the floor line is an outlet more than 12' away. - Each side of the sink, adjacent to the refrigerator or range if it is a gas fired appliance.

	<ul style="list-style-type: none"> - Any counter 12" or wider. - Two 20A circuits for the kitchen and one 20A circuit for the bath, if it includes a sink, are required. - GFCI: Within 6' of the kitchen sink or the bathroom sink. - Electric water heaters may be installed in the bathroom in a closed cabinet. - On a roof top deck at least one outlet is required. - At least one outside outlet is required. - An outside light is required at each exit door. - A hard-wired smoke detector is required to be mounted as high as possible either outside or inside the sleeping area. - No outlet is to be installed in the face up position. - Each Tiny House must have only 1 main power supply. - Working clearance for the electric panel 24" wide 30" deep. - Cable supports (staples) <ul style="list-style-type: none"> o If the box has cable connectors; provide cable supports every 12" from the box and every 4.5'. o If the box has no connectors; provide cable supports every 8" from the box and every 4.5'. - Metal roof/siding panels must be grounded with 8 AWG copper to the trailer frame only. - Electric panel ground bus bar must be isolated from the neutral bus bar and grounded to the trailer frame with 8 AWG copper. - Follow NEC 552 guidelines for all electrical switches
Stage 4: HVAC and Insulation	
Insulation	<ul style="list-style-type: none"> - A vapor barrier must be installed between the insulation and the subfloor. - Windows and seal tape around windows. - Exterior door(s) require weather stripping. - Minimum R-values: R-13 walls; R-19 ceiling; and R-13 floors. - Closed cell Spray foam or ventilation in ceiling/rafters
HVAC	<ul style="list-style-type: none"> - Where there is a metal pan, venting must be installed in every bay of the metal pan before installing the insulation. - A thermal break must be installed between metal trailer and subfloor. - All penetrations of the bottom and top plates shall be sealed using fire rated sealant, fire chalk or equal. - Refer to International Plumbing Code 903.6 for vent terminals: <ul style="list-style-type: none"> o Vent terminals that extend through the wall shall terminate not less than 10" above ground and not under an overhang with soffit vents. o Side wall vents shall be protected against birds or rodents from entering the vent. - Terminate the vents 4' below, 3' above, and 10' horizontal of an opening or air intake.
Stage 5: Final Overview	
Final complete product	<ul style="list-style-type: none"> - The Title or Certificate of Origin for the trailer - Roof ridge caps, drip edge, rakes, screw pattern, and flashing - Siding: proper trim and seal
Electrical	<ul style="list-style-type: none"> - Check panel for proper breakers, gauge, and loads. - Check for GFCI outlets near sinks and shower.

	<ul style="list-style-type: none"> - Check for external wire in conduit wire mold. - <p><i>Note: Dielectric tests are required (NEC551 and 552) prior to NOAH certificate and seal being issued.</i></p>
Accommodations	<ul style="list-style-type: none"> - Toilet, shower, refrigerator, cooking unit, and sink. - Heating and cooling source - Windows must be tempered glass, covered with safety film, or have shutters or means of covering for travel, which can simply be 1/4" plywood or plastic panels. - Smoke and dangerous gas detectors installed. <ul style="list-style-type: none"> o Detectors shall be hard wired and interconnected with battery back-up. - Fire extinguisher: <ul style="list-style-type: none"> o A standard ABC fire extinguisher, stored in plain view and mounted within 2 feet from the entrance door. - Each sleeping area must have a primary and a secondary means of egress. <ul style="list-style-type: none"> o The secondary can be an egress window of an elliptical shape that is 24" wide and 17" high, at minimum. o NFPA 1192- Figure A.6.2.5.1 o If a roof widow is used it must also have a rope ladder or other means to get down, which is labeled properly with a red handle and red letters reading: EXIT. - Protect water supply from freezing. (NFPA 1192-7.3.6.2 to 7.3.6.3) - Check the location of the potable water supply inlet. (NFPA 1192-7.3.8.3 This will apply ONLY if we are inspecting the home as an RV.) - Swinging shower doors open out. (NFPA 1192- 7.2.4.8) - Moisture control system or air exchanger must be implemented within the home.