



Factory Assembled Structures Program

## **Factory-Built Residential Buildings – Plan Submittal Checklist**

Plan reviews from approved Licensed Professionals (LP) serve as the required plans that factories must have to obtain FAS inspections and insignia on modular buildings for Washington State. The manufacturer or their agent sends plans approved by the licensed professional electronically to the FAS program in three files.

The main file sent to FAS contains all of the LP approved documents listed in the checklist below. This file must be a flattened PDF and be stamped by the licensed professional showing that they have approved the plan review. The second file is a copy of any insignia order forms that need we need to process along with the corresponding NLEA forms. The third file is the letter from the manufacturer about special inspections and structural observations. Note that the documents in the second and third file also need to be in the flattened file approved by the LP reviewer. Once received by FAS the plan is processed for acceptance and assigned an LNI approved plan number against which the manufacturer may order additional insignia and request inspections.

See the “Submittal of Plans Reviewed by Approved Licensed Professionals” document for the plan submittal process and requirements. The submittal must be a complete package with all of the necessary drawings, forms and other documents. Partial submittals or submittals from multiple sources are not accepted.

Modular house construction plans must include the following drawings and information. Use this checklist to be sure your plans are complete. Plans submitted for review by approved LPs must be complete. Plan reviewers, including approved licensed professionals are not involved in designing or assisting the manufacture in completing their design plans and forms.

This checklist provides general guidance for licensed professionals and manufacturers about the typical drawings and other information that must be submitted in professionally approved plans for a residential house. *As such, this list may not be all-inclusive and may contain items that are not applicable to your particular project.*

### **Documents and associated items:**

The following documents and associated items, as applicable, must be included in the LP approved plan file. The approved licensed professional must apply their “plan review approved” stamp to the cover drawing of the plan set.

#### **At the front of your package, include the following:**

- A copy of the authorization letter from us for each licensed professional.

- The plan fee worksheet for design plans approved by professionals or firms; (see WAC 296-150F-3000). The fee will be verified and the applicant provided with instructions on how to pay:
- A completed “plan approval request” form. Completed form F623-006-000 - see instructions.
- Either a draft Notice to Local Enforcement Agency form or the final NLEA form with an insignia application form and fees (agency forms F623-014-000)
- A cover letter listing which licensed professional approved the plan review for each portion of the plan.
- A copy of this checklist marked to show what items were reviewed and an “N/A” next to those that don’t apply.

**Next, include each of these:**

- A completed set of Washington State Energy Code (WSEC) forms including; prescriptive or UA component worksheets, glazing schedule and heat sizing worksheet. The energy code forms should include a completed WSEC “Residential Energy Compliance Certificate”. WSEC forms and resources are at <http://energy.wsu.edu/BuildingEfficiency/EnergyCode.aspx>. If credit is being taken for high efficiency water heating or renewable energy, either cuts sheets for this equipment should be included or the equipment specifications need to be listed on the plans.
  - Note: WSU energy offers a hotline number on their website if you need assistance with filling out the forms.
- Engineering calculations. Gravity and lateral load calculations are required for all structural designs. A Washington State registered professional engineer (PE) or a Washington State registered Architect must stamp all engineering calculations in accordance with WAC 196-23.
- “Statement of special inspection” and “statement of structural observation”: When required by the building code a “statement of special inspection” and “statement of structural observation” in accordance with chapter 17 of the IBC and sealed by the design engineer must be included in the submitted plan sets.
- A list of special inspectors and structural observers: Include a completed “Manufacturers Information on Special Inspection and Structural Observation” statement from the manufacturer indicating Yes/No whether special inspection and structural observation are required and list the names of persons being retained by the manufacturer to do this work. In addition to being part of the LP reviewed plan file, this statement along with supporting credentials must be sent to FAS in a separate file, so that we can review and approve the inspectors/observers during plan acceptance. FAS must approve the credentials of those persons prior to inspections taking place.
- Truss drawings (if you are using trusses and/or girder trusses). Each type of roof or floor truss must include an engineered drawing stamped by a Washington PE.

**Plan sheets and associated documents:**

Following the documents above, include a set of design drawings. Design drawings and structural calculations must be stamped and signed by a Washington state registered professional engineer or registered architect in accordance with current Washington State law WAC 196-23. The engineer’s registration board also provides guidance on this subject.

Plan drawings must be neat, legible, and drawn to a recognized architectural “scale”. Each page of the drawing set needs to have a drawing name, for example; “floor plan”, “details”, “plumbing”, etc., a drawing number and the date prepared or last revision.

- Cover drawing with:
  - Information identifying the person or company submitting the plans with mailing address, phone and email contact information. Also, include the factory address. The “factory address” is the off-site location where you will be building your modular house.
  - A list of any design professionals, such as engineers and architects for the project.
  - A list of all pages in the drawing set by page title and drawing number. You can choose the drawing numbers as long as each page has a unique number.
  - A list of the codes used to design the plan. These must include the version year of each code. See the WA State Building Code Council website for current information: <https://sbcc.wa.gov/state-codes-regulations-guidelines>
  - The location where the house will be installed and a list of the design criteria used for the house, such as roof load, wind load, earthquake zone etc. Most building department publish the required minimum design criteria for their city or county on their web site.
  - List any prescriptive designs used to design the house. This would be specific code sections and table numbers from the IRC and could include such items as floor joists, wall studs, braced walls, wall headers, roof joists.
  - Other pertinent information, such as general notes, may be included.
- Floor Plan of the main floor, and plan of any other floor levels (including lofts) in the house. The plan needs to show:
  - The location of each module or section of the house and the associated manufacturer’s serial number.
  - The locations of the exterior and interior walls.
  - The overall dimensions of the house and the interior dimensions for rooms and width of hallways.
  - Label each room showing its use (e.g. bedroom, living room etc...).
  - Locations and sizes of doors, windows and skylights. Identify which windows are for emergency escape (you can add “esc” to the window size callout).
  - Location of any safety glazing.
  - Attic accesses and crawl space accesses if located inside the house.
  - Cabinets, equipment, appliances and fixture locations.
  - Interior stairs, location, orientation and run.
  - Exterior porches, decks, stairs, awnings.
  - Locations of handrails and guardrails at stairs, porches, lofts etc...
  - Radon vent locations.
- Outside Elevations showing:
  - Siding and roofing materials (call out types or products)
  - Window and door configurations and swings
  - Roof eaves and overhangs.
  - Exterior porches, decks, awnings, and guardrails.
- Cross Section(s) – a major transverse section through the house showing:

- The main material components of the floor, wall and roof assemblies including: framing materials, sheathing type exterior coverings, type of insulation in each assembly, location/type of vapor retarder, interior finish, etc.
- Vertical and horizontal dimensions showing overall width and height and the finished floor to ceiling dimensions for all areas. Multiple sections may be required if there are areas of varying ceiling height, etc.
- Roof eave and overhangs.
- Locations of roof vents, baffles, etc. (including a calculation of the venting per square foot of floor area).
- Show the complete structural load paths from the roof through the supporting structure and into the foundation or chassis support locations under the floor of the house.
- Cross sections should be drawn at 1/2" scale or larger.
- Structural Plans and Framing Plans (as applicable).
  - Types, locations and lengths of prescriptive braced walls (see IRC 602.10) or engineered shear-walls.
  - Wall headers, beam sizes, locations, column sizes, locations, and section/detail reference tags.
  - Connection details for all braced walls to upper framing (roof/ceiling), and to the floor framing.
  - Structural framing drawings for floors and roof where the spacing and layout of the structural members is not obvious from the structural floor plan and cross section. If you are using trusses in a roof or floor, then provide a truss plan showing the location of each type of truss in the assembly. These may be part of the engineered truss drawings from the truss manufacturer.
- Construction/Section Details (as needed).
  - Relevant structural details including connections of trusses/ rafters to the ridge-beam and sidewalls.
  - General fastening schedule or code section references.
  - Diaphragm and shearwall construction and connection details and/or schedules.
  - Shearwall and beam uplift tie details and/or schedules.
  - Truss bracing details.
  - Ridge beam fabrications details.
  - Section details are normally drawn at 3/4" scale or larger.
- Stair Details (if applicable).
  - If the house has an interior stair, provide a section drawing through the long dimension showing the rise and run overall and of the steps along with any landing dimensions.
  - Indicate guardrail, and handrail, locations either on a "stair plan" or on the main floor plan.
- Foundation Plan, Details and Site Plan – these can be two separate drawings. Note: L&I only reviews the foundation plan and the siting of the house to be sure it is suitable for the general house design. The local building department where your house is being installed must approve your foundation and site plans.

- Location of the house on the building site and dimensions to nearest property lines (a site plan is not needed if you list the clearances from property lines on the “Plan Approval Request” form).
- Foundation wall locations with dimensions.
- Pier and blocking locations with spacing dimensions.
- Point load locations corresponding with the framing plans
- Hold down/strap connection points (if applicable) corresponding to framing (brace/shear wall) plans.
- Tie-down or special connection locations.
- Details on foundation footings, walls and pier construction
- Chassis (for Modular Houses with a permanent transport frame under it), this drawing(s) will require an engineer’s stamp and supporting calculations.
  - All frame components such as steel beams, axles, cross-members, outriggers headboard and towing hitch.
  - Welding callouts showing how each of the chassis components is welded together. The welding callouts need to show the location, type and length of each weld.
  - Additional documents showing welding procedures, welder certification and welding inspector certifications.
  - A detail or details showing the connection of the modular house to the chassis.
  - A detail or details showing how the chassis is connected to the foundation system.
- Draft-stopping or fire rated construction located in or on the building must be detailed on the plans showing:
  - The location of draft stopping.
  - The locations and hourly ratings of the various fire resistant assemblies, fire/smoke dampers and fire doors/windows.
  - List the testing references showing the ratings assigned to the fire assemblies.
  - Door and equipment schedules listing fire door/window and fire damper ratings, manufacturers, model numbers and characteristics.
  - Details showing how penetrations, joints and openings in fire resistant assemblies are protected.
- Welding (as applicable for any welded assemblies):
  - Written welding procedures.
  - Welding qualification test records (if not prequalified).
  - Welder certification cards.
  - All welding must be detailed on the structural plans.
- Electrical Plan Drawing or layout of the house showing the locations of:
  - Appliances.
  - Electrical equipment such as the electrical panel(s), electrical utility meter, ATS, MTS
  - Emergency disconnect required by NEC 230.85 (readily accessible outdoor location)
  - Required working space width and depth per NEC 110.26A - Working space depth and width shall be identified with dash lines and in inches or feet.
  - Rooms and spaces properly identified
  - HVAC equipment and water heaters.

- Disconnects for equipment such as HVAC, water heaters, (Indicate if fused or non-fused)
  - Receptacles, lights and switches.
  - Ground fault circuit interrupter receptacles/devices shall be identified “GFCI” – GFCI protection shall be installed in a readily accessible location. A GFCI receptacle located behind an appliance such as a refrigerator is not considered readily accessible. GFCI protection located in panel board is considered readily accessible.
  - Identify all devices/equipment with a circuit number(s) consistent with a circuit(s) on the panel schedule drawing.
  - Smoke alarms.
  - Carbon monoxide detectors.
  - The electrical plan shall indicate the “wiring methods” utilized (interior and exterior). Chapter 3 of the National Electrical Code describes wiring methods. Examples: NM-B cable, EMT, RMC, LFMC, FMC – do not use words such as “romex”
  - Contain symbol legend or shall be provided on an additional electrical plan drawing.
  - Electrical cover drawing shall indicate the currently adopted NEC year and WAC 296-46B
- Electrical Panel Schedules located on Electrical Drawing shall indicate:
    - Panel Identification
    - System Voltage, Phase, Bus Rating, bus AIC rating
    - Main CB Amp rating/setting and Main CB AIC rating, or Main Lug Only,
    - Each branch circuit number (shall be shown as actual installation (odd numbers on left and even numbers on the right)
    - Each branch circuit breaker rating/setting
    - Circuit identification/description (Clear, evident, specific purpose)
    - Connected VA or KVA on each circuit phase
    - Total connected KVA
    - Size of each branch circuit conductor
    - Circuit breakers that are lockable per NEC 110.25
    - Identify each circuit breaker that is a GFCI, AFCI, or a combination AFCI/GFCI circuit breaker. (If GFCI protection is provided via a GFCI circuit breaker, it should not be identified on floor plan drawing as a GFCI receptacle) Only the method of protection used shall be identified.)
  - A “one line Service/Feeder” diagram shall indicate:
    - Distribution equipment identification
    - System Voltage and phase (single phase or three phase)
    - Service and feeder overcurrent protective device sizes/ratings
    - Bus ratings and AIC ratings of main electrical distribution equipment
    - Clearly identified Service Point and clearly identified Service Disconnect if building is supplied by service
    - Clearly identified Building main disconnect if building is supplied by feeders from a remote service.
    - Service and feeder conductor sizes, type of conductor, and counts (including grounding electrode conductors(GEC) and/or equipment grounding conductors(EGC)). Example (3) 3/0 XHHW-CU, (1) #4 XHHW-CU (EGC)

- Service and feeder raceway sizes, types, and counts. (Examples of types: RMC, EMT, schedule 80 PVC) -
- A compliant grounding electrode system per NEC 250.50 including size of grounding electrode conductors and type of grounding electrodes as identified in NEC 250.52A. (All available grounding electrodes shall be used).
- Locations of fault calculation values greater than 10,000 AIC shall be identified
- Emergency disconnect required by NEC 230.85
- Surge protection device required by NEC 230.67 (Shall indicate if Type 1 SPD or a Type 2 SPD)
- Electrical load calculation(s) for the modular house showing:
  - A total electrical building load calculation per NEC 220
  - Indicate if the NEC 220 standard method was used or the NEC 220.82 optional method was used
  - An electrical load calculation for each panel board shall be provided  
Electrical load calculations shall indicate:
    - Panel or distribution equipment identification/name
    - Bus amp rating, System voltage
    - Connected load in VA or KVA for each load type category
    - Demand factor applied to each load category
    - Calculated load in VA or KVA for each load category
    - Total connected load in VA or KVA and total connected amp load
    - Total calculated load in VA or KVA and total calculated amp load
    - Load calculations shall be clear and detailed. Please see NEC Annex D examples for dwelling load calculation expectations

Electrical plan drawings shall clearly show how the dwelling complies with the following NEC code sections:

- NEC 210.8A, C, D, E, F: Ground fault interrupter protection for personnel
- NEC 210.11C: Branch circuits required
- NEC 210.12A: Arc-fault circuit interrupter Protection
- NEC 210.52A through I: Dwelling unit receptacle outlets
- Other sections as applicable
- Potable water line drawing in plan or isometric view. Indicate:
  - The type of piping material.
  - All fixture locations.
  - Pipe size and locations along with changes in direction.
  - Indicate where the water service and the water heater connect along with shut off valves required in these locations.
  - Indicate the size, and type, of the water heater
  - Note seismic strapping for tank-type water heaters.
  - The pressure relief valve (PRV) with the overflow pipe discharging to the exterior of the house.

- A tee must be installed at each cold-water inlet to a water heater tank, so that an expansion tank can be added if required by the local building department.
- Drain/waste/vent (DWV) piping system shown in isometric view. Indicate:
  - Type of pipe material.
  - The sewer connection location
  - All fixture locations.
  - All pipe runs with the pipe size, changes in direction.
  - Locations of clean-outs, traps and vents through the roof.
- Gas System (if applicable) In plan or isometric view. Indicate:
  - List the type (propane or natural gas), and pressure of the gas piping system.
  - The type of pipe material.
  - Locations, length and size of each part of the gas piping system along with changes in direction.
  - Label the points where gas appliances connect to the system.
  - List the BTU input rating of each appliance connected to the system.
  - Indicate where the gas service connects to the system.
  - Indicate where all shut off valves are located where required at the service and at each appliance.
- Fire Sprinkler (if applicable)
  - Plans showing location and types of sprinkler heads, locations and size of piping runs and the location of the sprinkler riser.
  - Hydraulic calculations
  - Sprinkler riser diagram.
  - Cut sheets for each sprinkler head type, the piping material and for the components of the sprinkler riser.
  - A WA registered sprinkler designer must stamp sprinkler plans and calculations.
- Mechanical drawing showing
  - The location of all equipment such as furnaces, heaters, heat pumps, mini-split HVAC system components. List the make, model and size of equipment.
  - Heat loss/gain calculations showing proper sizing of the HVAC system (may be included on the energy compliance forms).
  - Locations of controls such as thermostats and timers.
  - Locations, type and size of ductwork and registers that are part of a forced air heating system.
  - Hydronic systems must include a plan of the zoned piping layout and a diagram of the boiler set up.
  - Locations, make, model of spot ventilation fans, and the whole house fan. Show the method of control for the whole house fan –intermittent, or continuous.
  - Information on special equipment required for energy credits
  - The exterior termination locations of all exhausts and condensate drains.