

To: Knoxville / Knox County Planning Staff + Commissioners
From: Dale Akins
Re: Planning Commission Meeting – 01/11/24
1-J-24-SP – Southwest Sector Plan Amendment
9-I-23-RZ – Rezoning

REQUEST - The purpose of this correspondence is to request an Amendment of the Southwest Sector Plan and Rezoning of 9.3 acres of vacant land on Ebenezer Road owned by and adjacent to Pip's Iron Works.

THE DEVELOPMENT PLAN is to create a "Nano Home Construction Yard" adjacent to Pip's Iron Works to be operated by Knox Nano Homes, LLC.

PROBLEM TO RESOLVE – HOUSING AFFORDABILITY + AVAILABILITY CRISIS

Prices - Housing costs skyrocketed 52% Nationwide from 2017-2022. (*Addendum F*). The Knoxville Metro is certainly not immune and is also experiencing a housing affordability crisis. The retail value of a "new entry level" home in Knox County now approaches \$500,000. (*themarketedge.com*)

Rates - Due to rising interest rates, from 2022 to 2023, **2.4 million** potential homeowners can no longer afford to purchase a median priced home in the US. Translation: 275 additional people per hour can't qualify to purchase a home. (*<https://finance.yahoo.com/news/homebuyers-now-require-117k-annual-155411655.html>*)

Combine high prices with increased interest rates PLUS stagnant wage inflation PLUS the "Build to Rent" movement where institution investors buy entire subdivisions of new construction forcing potential buyers into rental options only, and it's easy to see why entry-level homebuyers are facing an even worse "availability" crisis. There are simply NO OPTIONS to ATTAIN homeownership. Government alone can not fix this problem.

Translation: Millions of people will NOT be able to create net worth causing an increased gap between extreme wealth and poverty. Locally, the "brain drain" continues as young professionals move to where housing is attainable.

THE GOOD NEWS is Knox Nano Homes is offering a homeownership solution that

- 1 – Does not require government subsidies (most of which pertain to rental subsidies anyway)
- 2 – Is completely compliant with 2018 IRC (building code adopted by Knox County, Knoxville, & Farragut)
- 3 – Is completely compliant with existing zoning ordinances for residential site development
- 4 – Is attainable. I.e. creates a lower entry point that currently does not exist

KEY COMPONENTS - NANO HOME CONSTRUCTION

1	Reduced Size	560 sq ft of conditioned space can easily accommodate 2 full-size bedrooms.
2	Maximize Living Spaces	560 sq ft of outdoor living space costs less to build than conditioned space so screened in porches and covered decks create cost effective additional space.
3	Off Site Const Yard	“Off Site” or “centralized” construction is the key to lowering both material and labor costs. Site building is the most expensive option because of waste.
4	Welded Steel Frame	Each Nano Home begins as a designed and engineered 12’ x 48’ welded steel frame cuboid fabricated and painted inside a factory, then moved and completed at the adjacent construction yard, then moved to the relocation site, attached to an engineered foundation, stacked, and covered with a canopy. Note: This process can be reversed allowing Nano Homes to be relocated. Not only does this feature provide excellent temporary use of property if needed but also allows buyers to relocate their home and not be forced to liquidate equity in the event a relocation is necessary.
5	Permitting & Inspections	State of TN – Modular Building Program: www.tn.gov/content/tn/commerce/fire/sections-programs/modular-building-program.html A special THANK YOU must be extended to Steve Elliott and Greg Taylor of Knox County Codes for their efforts to facilitate this process with Jim Hightower, Director, Modular Building Program, TN Dept of Commerce & Insurance.
6	Relocation	Per license from State of TN – Modular Building Program.

KEY COMPONENTS - NANO HOME COMMUNITIES

1	Site Development	Nano Home Communities are developed in the exact same way traditional single-family subdivisions are developed since Nano Homes are built using the exact same building codes as traditional single-family homes. i.e. in accordance with all applicable engineering specs and zoning ordinances in Knox County.
2	Utilities	Water, Sewer, & Electric. No combustible fuel sources used for fire safety reasons.
3	Piers + Natural	Nano Home are engineered and designed to be placed on piers instead of traditional foundations. This is not a cost savings element. Piers allow for minimum site grading and less land disturbance meaning existing vegetation can be preserved during the development process. A key design element for Nano Communities is maximum natural vegetation and minimal mowing expense. See Addendum F for examples.
4	Step Ownership	What if the homeownership process could begin without the high cost of land to help make a house more affordable? We believe it can. Step Ownership simply means a buyer can purchase and move a Nano Home to one of our Nano Home Communities. Then once buyer has additional funds, the Knox Nano Home could be relocated to a residential lot or parcel of land if desired.
5	Condo Association and Common Area Expenses	Each Nano Home Communities will be managed by a Condo Association that owns the common area and manages the shared amenities. I have managed the Jackson Oaks West Office Condo Association since 2005. Each Nano Homeowner will pay dues for their allocated shared of common expenses of land, mowing, water, exterior lighting, and trash service.

I submit the following ADDENDUMS for your review and appreciate your consideration.

ADDENDUMS

- A Types Of Housing + Applicable Building Code Comparison
- B Nano Home Blueprint
- C Design - 2 Nano Homes Stacked On Piers
- D Concept Elevation - 2 Nano Homes
- E Elevation Inspiration
- F Pier Example
- G Examples - Shipping Container Homes
- H News Story - Off Site Construction
- I MBI - Modular Vs. Stick Built - A Case For The Future Of Construction
- J MBI - Relocatable Buildings Report

Respectfully,



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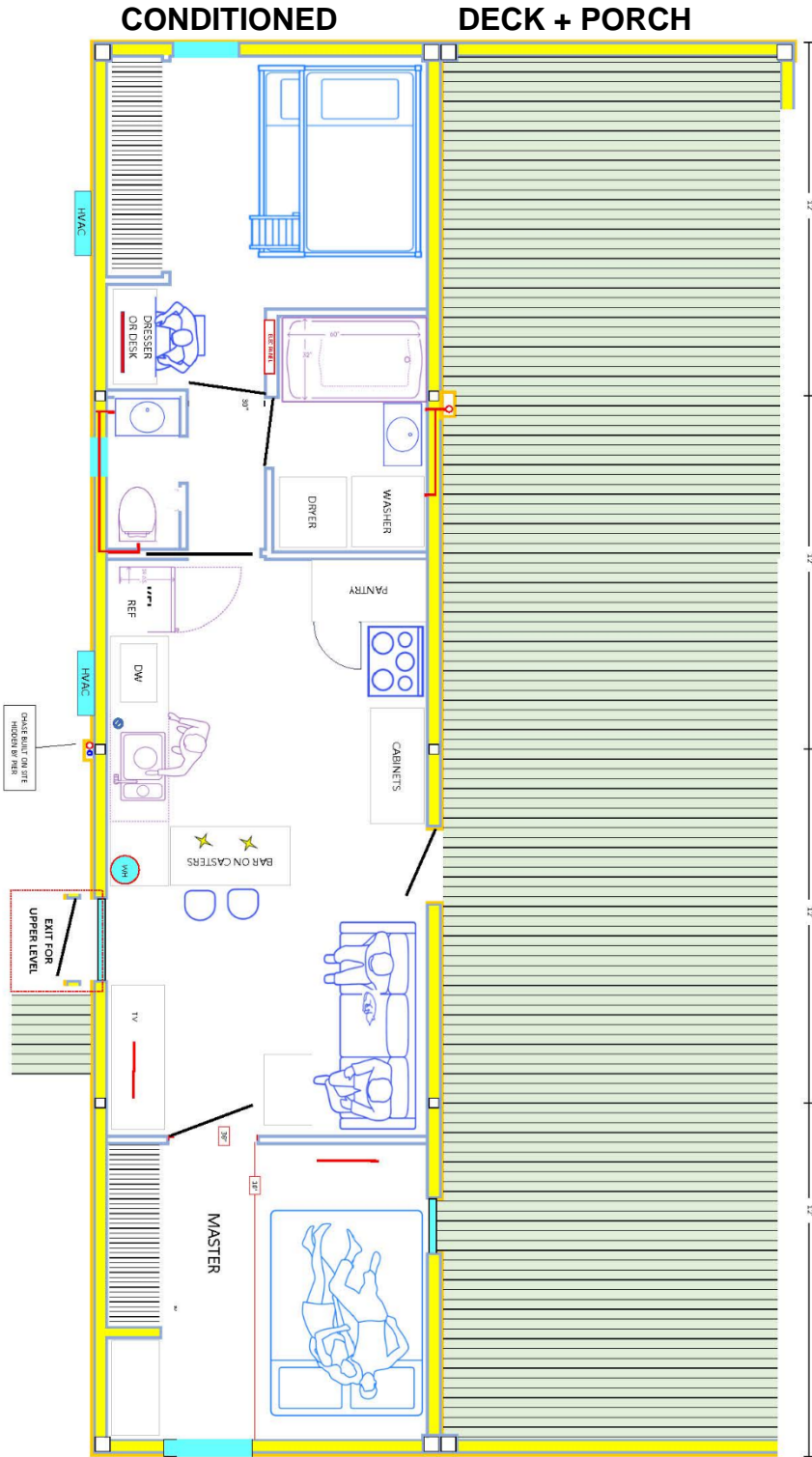
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ADDENDUM A

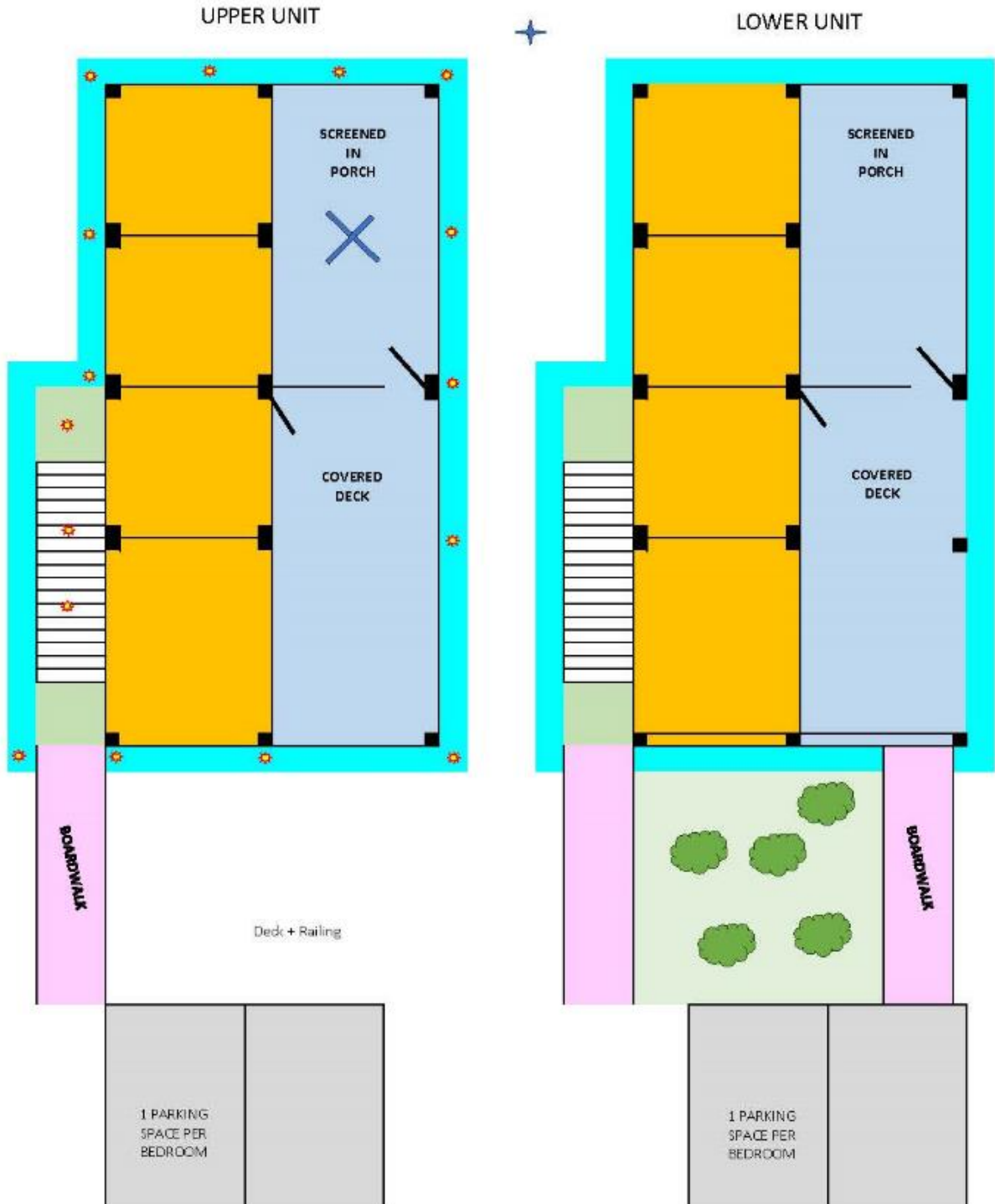
TYPES OF HOUSING + APPLICABLE BUILDING CODE COMPARISON

TYPE OF OWNER OCCUPIED RESIDENCES	BUILDING CODE	BUILDING PERMIT REQUIRED	ALLOWED AS RESIDENCE IN KNOX COUNTY	DETAILS + NOTES
Shipping Container Home	IRC 2021	YES	YES	IRC 2021 discontinues the use of combustible fuel sources (no gas) and requires closed cell spray foam insulation to remedy moisture & mold issues. To my knowledge, there are no 2021 IRC compliant shipping container homes occupied as residences in Knox County.
Single Family Residential Homes	IRC 2018	YES	YES	2018 IRC is the standard for residential construction and adopted by Knox County, the City of Knoxville, and the Town of Farragut.
Condo	IRC 2018	YES	YES	Traditional, site-built Condo with wood framing
Nano Home	IRC 2018	YES	YES	Steel Frame Home (site built then moved)
Shipping Container Home	IRC 2018	YES	YES *	2018 IRC – Appendix Q addresses shipping container construction in an attempt to remedy moisture + mold issues. * See Addendum G for Shipping Container Homes currently under construction on John Sevier Highway.
Mobile, Modular and Manufactured Home	HUD	NO	Restricted	HUD = Code administered by the Dept of Housing & Urban Development. Essentially the same construction standards as ANSI but the electrical connection is a permanent electric meter not a power cords like camper. HUD code is the standard for mobile, modular, manufactured, and emergency FEMA housing.
Tiny Homes and Campers	ANSI	NO	Temp Uses Only	ANSI = Code created by the RV industry for the fabrication of utility trailers, campers, motorhomes. i.e. standards to make a unit safe to travel on a public roadway. A defining characteristic is ANSI products have wheels are typically connect to electricity via a temporary electrical cord. ANSI does NOT meet code requirements for Knox County. Only allowed as temp accommodations in RV park zoning..
Shipping Container Home	ANSI	NO	NO	Incredible Tiny Homes in Newport, TN builds shipping container homes to ANSI standard and rents lots in a subdivision adjacent to their facility.
ADU	Varies *	Varies*	Varies *	ADU = Accessory Dwelling Units can be built to any standard depending on the end use. An ADU built on site as an apartment must comply with IRC 2018 to be inhabited in Knox County

ADDENDUM B NANO HOME BLUEPRINT



ADDENDUM C DESIGN - 2 NANO HOMES STACKED ON PIERS



**ADDENDUM D
CONCEPT ELEVATION - 2 NANO HOMES**



**ADDENDUM E
ELEVATION INSPIRATION**

Nano Home Side Porch
inspired by
Charleston Side Porch



Canopy & Pier
Example



Lower level provides good
illustration of open and
screened porch concept



ADDENDUM F PIER EXAMPLE

<https://haus-arch.com/project/bridge-house-lake-michigan/>



Piers allow for natural drainage
Notice minimal site grading and preservation of existing vegetation



Boardwalk entry minimizes concrete



Covered porch for outdoor living area

ADDENDUM G EXAMPLES - SHIPPING CONTAINER HOMES

(existing alternative housing - provided for comparison)

Elm Mott, TX

The Helm
By Cargo Home
www.cargohome.com/the-helm/

(20' container stacked
on 40' container)

\$194,000

IRC 2021 Code Compliant and
can be shipped to Knoxville



Knox County, TN

Shipping Container Community
under construction
on John Sevier Highway

Tax ID **136 PB 01902**



Nashville, TN

Shipping Container
Apartment Complex

www.83freight.com



ADDENDUM H NEWS STORY - OFF SITE CONSTRUCTION

<https://www.seattletimes.com/opinion/to-ease-housing-crisis-remove-barriers-to-off-site-construction/>

To ease housing crisis, remove barriers to off-site construction

Aug. 17, 2023 at 3:25 pm



1 of 2 | A multistory residential apartment building is shown being set on a podium manufactured by NRB Modular Solutions for Synergy Inc. (Courtesy of NRB Modular Solutions)

Builders across the country are rethinking how we construct homes to address the housing affordability and availability crisis that has left millions of average Americans struggling to purchase homes. Between 2017-22, national housing costs skyrocketed by 52%.

Years of market fluctuations have led to an unprecedented shortage of homes for sale as well as too few affordable rentals. Overall, the U.S. faces a deficit of 1.5 million homes, with the greatest supply shortages at low-income price points. Over the next 20 years, the Washington Department of Commerce estimates a need for 1.1 million new houses in the state. This disconnect is unsustainable and must be addressed now. Off-site construction, also known as modular or prefabricated construction, offers a practical solution.

Off-site construction involves building components or entire houses in a controlled factory environment and then assembling them on-site. In communities like Seattle, where the permitting process for any project can be

extensive, completing projects quickly once that process is finished is essential to addressing the housing gap. Off-site construction streamlines the building process and significantly reduces construction time, delivering projects 20% to 50% faster than traditional methods **at a cost savings of up to 20%.**

This approach also offers a strong business case to builders, for whom time is money, by mitigating delays due to weather exposure, availability issues with on-site delivery and assembly on a piecemeal basis. Numerous government and industry organizations have identified off-site construction as a key housing affordability strategy. President Joe Biden recently recognized this opportunity in the Housing Supply Action Plan while the U.S. Department of Housing and Urban Development, backed by both parties in Congress, is supporting research to help expand its use. Contrary to the popular notion that energy conservation and lower-cost housing represent a zero-sum game, off-site construction offers significant sustainability benefits alongside its affordability perks. As much as **30% of all building materials delivered to a traditional construction site end up as waste.**

Despite the benefits that can be achieved through modular/off-site building projects, some major barriers are limiting uptake, including a patchwork of state and local regulatory requirements and a lack of understanding of the off-site construction process. In Washington, off-site construction is regulated at the state level. Until recently, the state required construction documents for all off-site projects to be reviewed by state employees — a process that, due to staffing levels, delayed off-site construction by months. Washington now allows the use of approved third-party experts to conduct these reviews, cutting approval times significantly. However, the state does still require in-factory inspections to be conducted by state employees, which can contribute to delays where officials are not able to conduct timely inspections of out-of-state factories.

Fortunately, for Washington and beyond, there are some encouraging developments on the regulatory front. In June, the International Code Council and the Modular Building Institute announced a national initiative focused on the adoption of standards for off-site construction. Developed and supported by a broad cross-section of manufacturers, builders, design professionals, affordable housing advocates and building code officials, these standards capture best practices from across the country to streamline the deployment of modular projects.

You won't often hear a builder use "encourage" and "regulation" in the same sentence. But given the consensus reached on the ICC/MBI standards and the need to address the off-site regulatory patchwork, it was my honor, as chair of the National Association of Home Builders Building Systems Council, to propose a resolution formally **supporting the adoption of ICC/MBI Standards 1200 and 1205.** With approvals now by six NAHB committees as well as the NAHB Leadership Council, the nation's largest association of builders backs this critical effort.

Off-site construction offers a unique means to tackle the affordable housing crisis head-on. Policymakers and industry leaders must work together to remove regulatory barriers — including the patchwork application of inconsistent building standards — that are presently stifling its growth. Washington's recent steps are to be commended, but additional opportunities exist to better align the state's regulations with the ICC/MBI standards as well as the practices employed in neighboring states. Buoyed by greater national standardization, and through its streamlined processes and cost efficiency, off-site construction can play a meaningful role in helping to meet the demand for affordable housing while delivering crucial sustainability benefits for our communities.

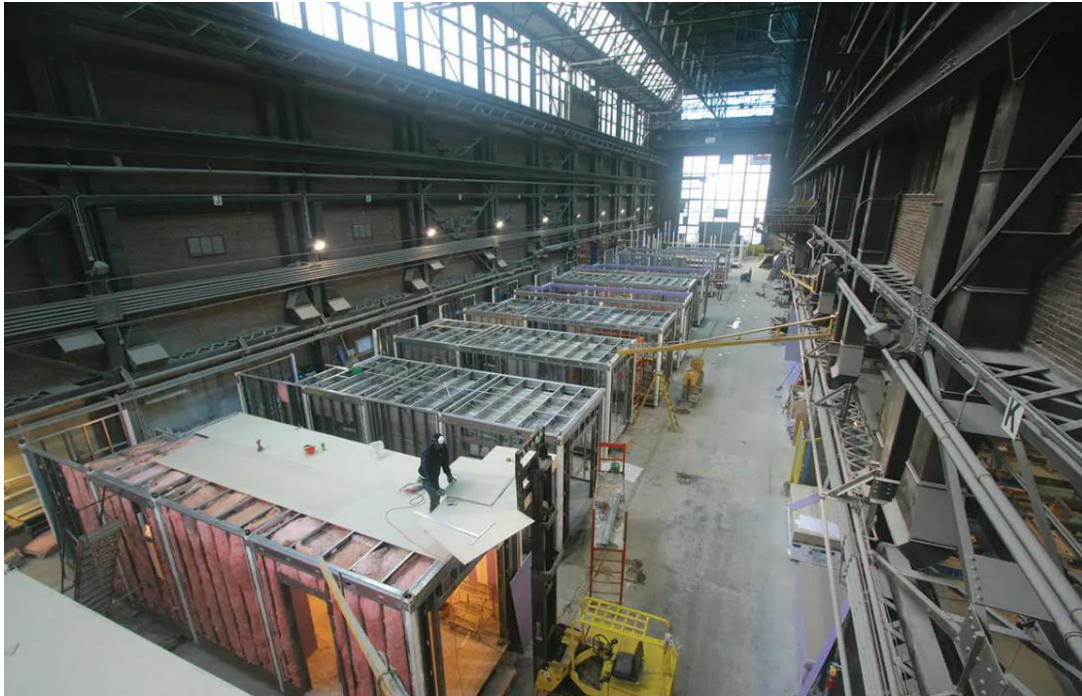
Matt Belcher is a builder, consultant and author on the business of green building, and currently serves as chairman of the National Association of Home Builders Building Systems Council.

ADDENDUM I

MBI - Modular vs. Stick Built - A Case for the Future of Construction



FULL STORY: www.modular.org/2023/01/12/modular-vs-stick-built-and-a-case-for-the-future-of-construction/



ADDENDUM J

MBI - RELOCATABLE BUILDINGS REPORT

LINK: <https://mbimodularbuildinginstitute.growthzoneapp.com/ap/CloudFile/Download/LvxjE23p>

