



MINISTRY OF
ECONOMIC GROWTH &
INFRASTRUCTURE DEVELOPMENT

Modular Housing Solutions and Hurricane Resilience

*A Standards-Led Approach to
Resilient Housing Delivery in Jamaica*

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Ministry of Economic Growth & Infrastructure Development



SECTION 1 | UNDERSTANDING MODULAR HOUSING

What Makes a House Modular?

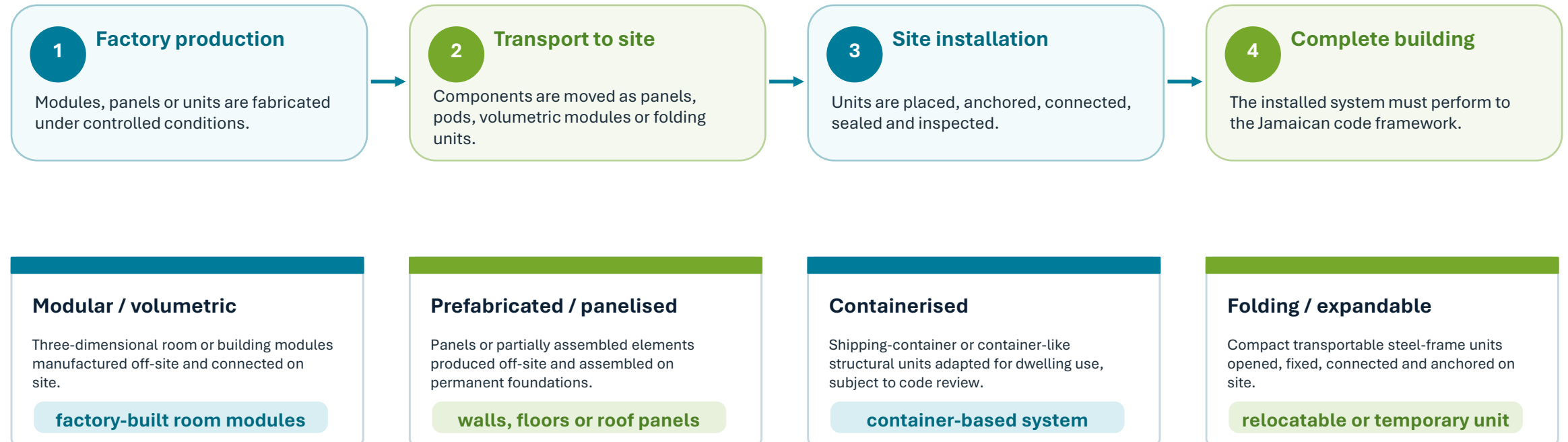
From factory-built components to complete homes.



What Makes a House Modular?

SECTION 1 | UNDERSTANDING MODULAR HOUSING

Modular housing is not a style of house; it is a method of delivery where components are manufactured off-site, transported, installed and connected on site as a complete building system.



Key idea: the word “modular” describes the method of manufacture and assembly

Examples Of Modular Housing Systems

SECTION 1 | UNDERSTANDING MODULAR HOUSING

Modular describes the delivery method not one material. A modular home may be timber, steel, concrete, containerised or hybrid, provided its components are factory-produced and assembled into a compliant building system on site.

01 Timber / wood modular



- Factory-built timber frames or room modules.
- Fast and light; requires termite, moisture, fire and anchorage detailing.

02 Light-gauge steel / panelised



- Steel frames or panels assembled into a dwelling.
- Corrosion protection and connection design are essential.

03 Precast concrete modular



- Concrete panels or modules lifted and tied together.
- Heavier system; requires lifting, bearing and foundation design.

04 Containerised / folding

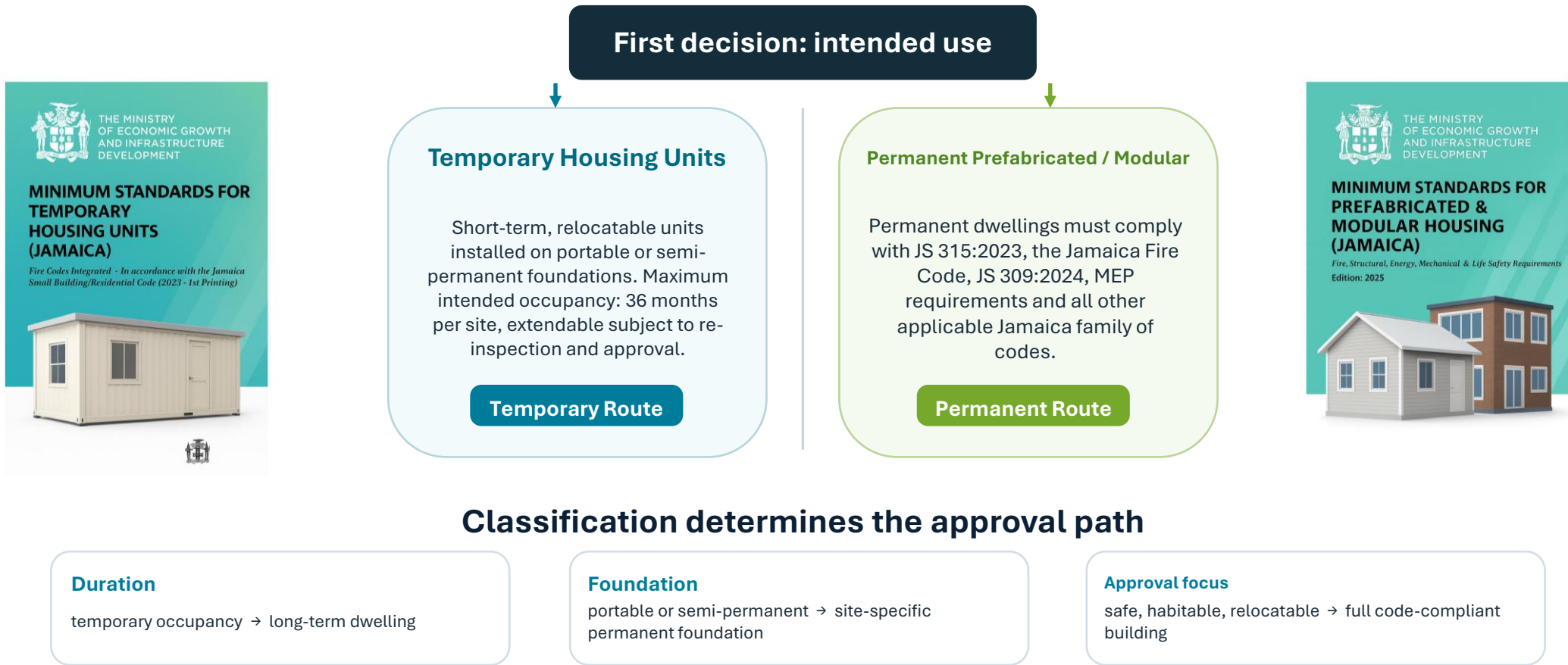


- Compact units transported, opened and connected on site.
- Temporary use must not become permanent by default.

Different materials can be modular. The test is the installed building system: foundation, anchorage, services, fire safety and inspection.

Temporary Versus Permanent Use

SECTION 1 | UNDERSTANDING MODULAR HOUSING



A temporary unit must not become permanent housing by default.

Factory Production + Site Performance

SECTION 1 | UNDERSTANDING MODULAR HOUSING



Factory-controlled production

The transfer point



Site-specific installation

What the factory can improve

- ✓ Repeatable quality-control checks
- ✓ Weather-protected fabrication
- ✓ Standardised components and sequencing

What the site must prove

- ✓ Foundation, drainage and access
- ✓ Anchorage, lifting and inter-module connections
- ✓ Utilities, fire access, inspection and maintenance

The factory can control quality; the site determines whether it survives.

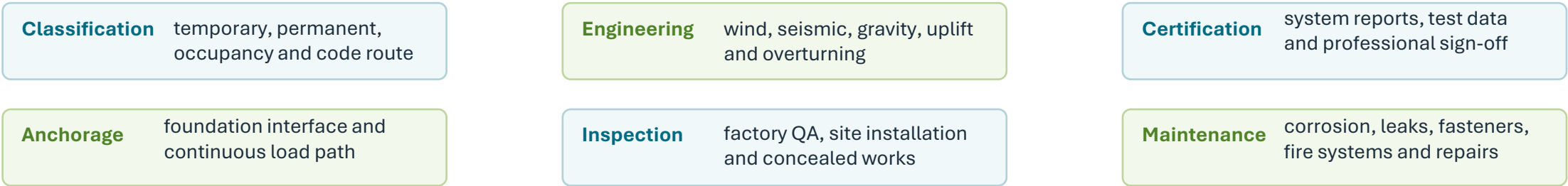
Modular is a Method, Not a Guarantee

SECTION 1 | UNDERSTANDING MODULAR HOUSING

A modular claim is only a starting point. MEGID’s concern is the performance of the installed building system.



What must be checked before confidence is given



We are not approving a label; we are assessing a complete building system.

SECTION 2 | HURRICANE RESILIENCE

Resilience Beyond the Category Label

From wind-speed claims to real structural performance.



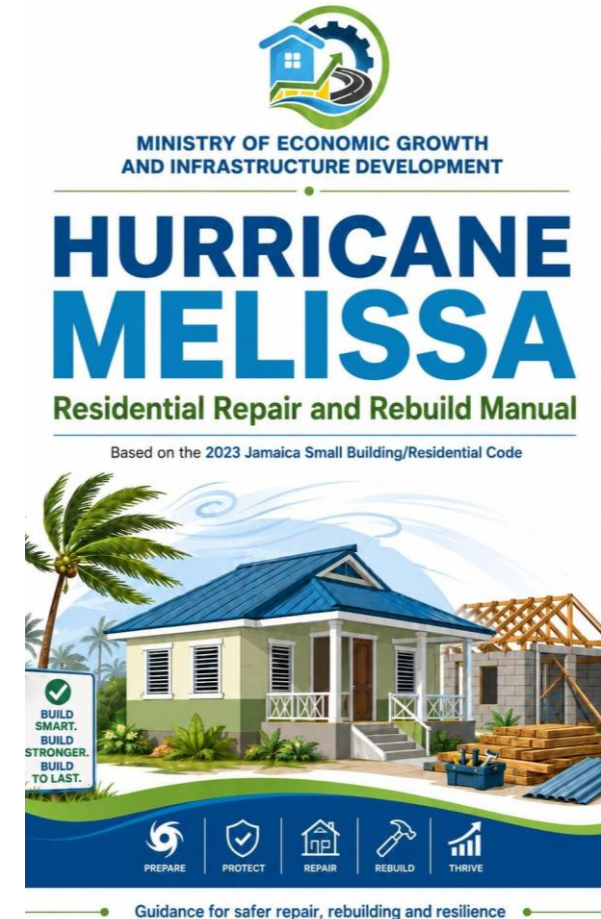
Government's Post-Hurricane Melissa Technical Response

SECTION 2 | HURRICANE RESILIENCE

Following Hurricane Melissa, the Government advanced a coordinated technical response to guide housing recovery, repair and alternative housing systems.

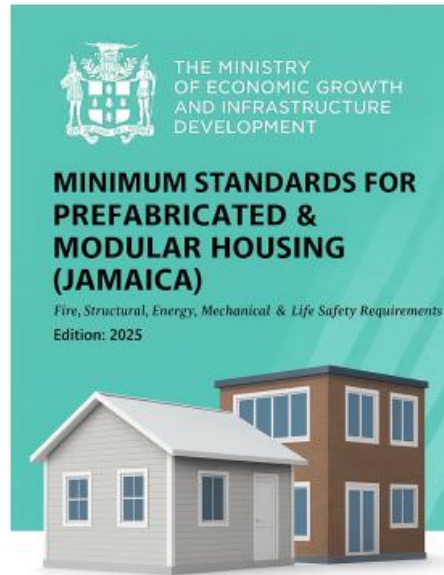
The Ministry advanced a standards-led response to guide safe housing recovery, repair and alternative housing solutions. A Technical Working Group was convened with standards, engineering, housing, construction and regulatory expertise, including BSJ participation. In parallel, our NSDMB led no-build zone mapping with NEPA, Municipal Corporations and other land-regulating entities to guide where recovery and future development should safely proceed.

The national response could not be only about speed; it had to be about safe, habitable and code-aligned recovery in the right places.



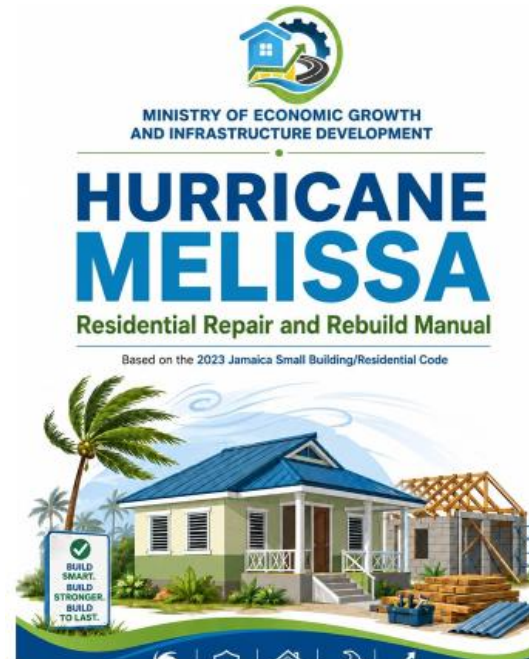
Technical Response Outputs

SECTION 2 | HURRICANE RESILIENCE



Prefab & Modular Standard

Draft minimum requirements for permanent prefabricated and modular housing; currently under revision.

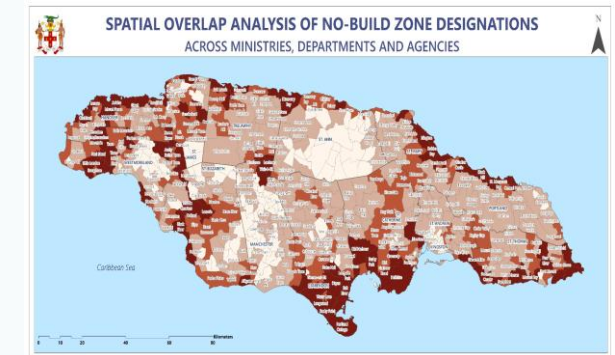


Residential Repair Manual

Repair guidance based on the Jamaica Small Building/Residential Code; currently under revision.

NO-BUILD ZONE MAPPING

Spatial overlap analysis across MDAs



No-Build Zone Mapping

Spatial overlap analysis to guide land suitability, recovery planning and future development decisions.

From emergency response to resilient housing and safer land-use decisions

BSJ Review and Market Interest

SECTION 2 | HURRICANE RESILIENCE

Alternative housing systems did not begin with Hurricane Melissa.

BSJ has been reviewing building systems and maintaining Jamaica’s building-related codes through technical committees and stakeholder input. Hurricane Melissa accelerated market interest in imported, folding, containerised, modular, panelised and hybrid systems. System evaluations should be read by scope, caveat and intended use; they are not blanket project approvals.

The question is not whether a system is new. The question is whether it is proven, certified, installed and inspected for Jamaica.



Website: [REDACTED]
Email: [REDACTED]

BUILDING SYSTEMS EVALUATION REPORT

Report No.: [REDACTED] (Re-issue)

This report is a correct record of the measurements and observations made. The report is intended for private information of those for whom the work was done and not used in whole or in part in any other way except with the written approval of the director of Standards. Misuse may lead to the penalties provided under the Standards Act, 1968. The Bureau accepts no responsibility for any loss or damage, which may be sustained as a result of the use or reliance upon this report.

Evaluated For: [REDACTED]	Reference: [REDACTED]
Manufacturer: [REDACTED]	Date Received: [REDACTED]
	Date Reported: [REDACTED]
Address: [REDACTED]	Job No.: [REDACTED]
Product: [REDACTED]	Evaluation Method: Professional Assessment
Specification: See “Purpose of the Report” below.	

1.0 General Recommendation:

The [REDACTED] is recommended by the Bureau of Standards Jamaica for use in Jamaica for [REDACTED] as set out in section 15 of this report.

2.0 Name of Building System:

[REDACTED]

3.0 Proposed Distributor:

[REDACTED]



Circulation:	Prepared by:	Checked by:	Approved by:
1. Client copy	Signature: [REDACTED]	Signature: [REDACTED]	Signature: [REDACTED]
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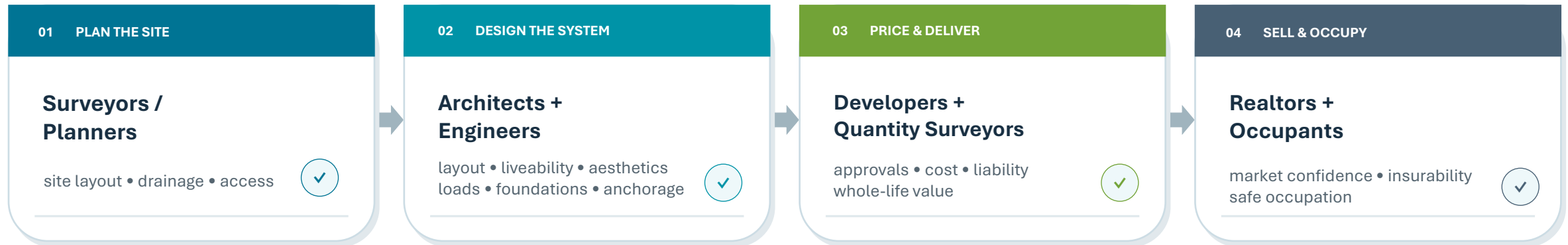
Why The Standards Matter

SECTION 2 | HURRICANE RESILIENCE

These standards matter because modular, prefabricated and temporary housing affect public safety, approvals, insurability, cost certainty and market confidence. They are relevant to everyone involved in planning, designing, financing, approving, selling and occupying alternative housing systems.

Standards carry through the full development chain

The standard follows the project from site planning to occupancy not just the purchase of a unit.



Standards-led assurance

Public safety

Approvals

Insurability

Cost certainty

Market confidence

These standards shape safety, approvals and market confidence.

What “Hurricane Resilient” Really Means

SECTION 2 | HURRICANE RESILIENCE

Resilience is proven, not promised.

A wind-speed number is only one part of the assessment. The real issue is whether the full building system is designed, detailed, anchored and inspected for the actual Jamaican site conditions.

Speed comparison

252

km/h • Cat. 5 threshold

–

248

km/h • JSB/RC benchmark

=

4

km/h difference

≈ 1.6% in speed

≈ 3.3% pressure

Wind pressure scales roughly with V^2

So, the key question is not simply: “What wind speed is claimed?” It is: “Can the project-specific design demonstrate a safe, continuous load path from roof to foundation?”

IMPORTANT CONSIDERATIONS

- 1 Site wind demand**
Exposure, topography and local wind design basis.
- 2 Openings**
Rated windows, doors, shutters and impact protection.
- 3 Continuous load path**
Roof, walls, floor and foundation tied together.
- 4 Anchorage**
Hold-downs, bolts, straps and embedment verified.
- 5 Inspection evidence**
Factory QA, test reports and site inspection before use.

The Core Principle: Continuous Load Path

SECTION 2 | HURRICANE RESILIENCE



Illustrative continuous load path from roof to ground

Foundation & Anchorage Are Usually the Critical Interface

SECTION 2 | HURRICANE RESILIENCE



A strong unit on a weak support system is still a weak building.

- Foundation design must reflect site geotechnical conditions.
- Bearing points must be coordinated between factory design and foundation design.
- Positive anchorage is required to resist uplift, sliding and lateral forces.
- Anchorage details should be inspected before concealment where practicable.

The factory builds the unit; the site determines whether it survives.

Durability in Jamaica is a Design Issue

SECTION 2 | HURRICANE RESILIENCE



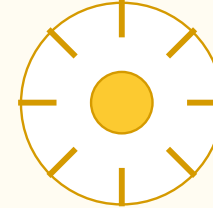
Corrosion

coastal and
marine exposure



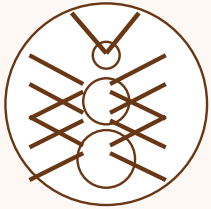
Moisture

rain, leaks, mould,
trapped condensation



Heat

thermal comfort and
envelope performance



Termites

timber and
composite detailing



Maintenance

inspectable connections
and replaceable parts



Flooding

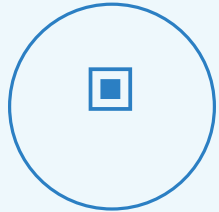
finished floor levels
and site drainage

Durability is not just material selection; it is detailing, protection, installation, inspection and maintenance.

Whole-life resilience is the test: can the building remain safe, habitable and maintainable after repeated exposure?

Implications For Developers

SECTION 2 | HURRICANE RESILIENCE



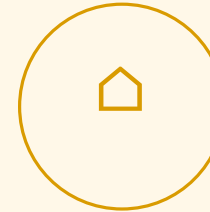
Design responsibility

select systems for Jamaica's wind, seismic, flood and exposure conditions



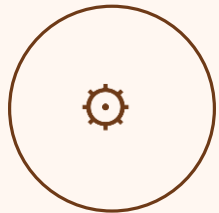
Proof before approval

require signed engineering, wind-load data, test reports and product certification



Site-specific foundations

anchor every unit to verified soil, slope, flood and drainage conditions



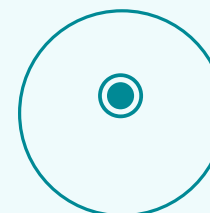
Installation control

factory quality must be matched by site supervision and inspection records



Maintainable assets

plan access to connectors, coatings, roof fixings, MEP systems and replacement parts



Buyer and insurer confidence

document compliance, warranties, occupancy approvals and handover obligations

Category 5-ready is not a marketing claim; it is a documented design, installation and inspection responsibility.

For developers, resilience shifts risk management to the front end: due diligence, specification, certification, supervision and maintenance must be built into the project from concept stage.



MINISTRY OF
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SECTION 3 | Minimum Technical Requirements

Minimum Technical Requirements

What must be demonstrated before a modular solution can be accepted for Jamaica.



THE MINISTRY
OF ECONOMIC GROWTH
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DEVELOPMENT

MINIMUM STANDARDS FOR PREFABRICATED & MODULAR HOUSING (JAMAICA)

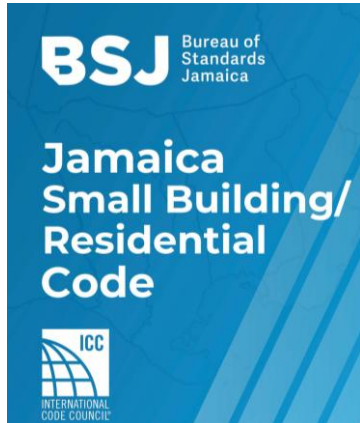
Fire, Structural, Energy, Mechanical & Life Safety Requirements

Edition: 2025

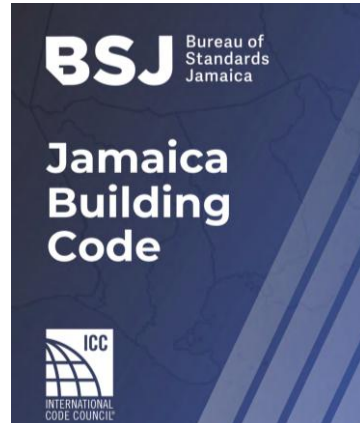


The Standards Foundation Already Exists

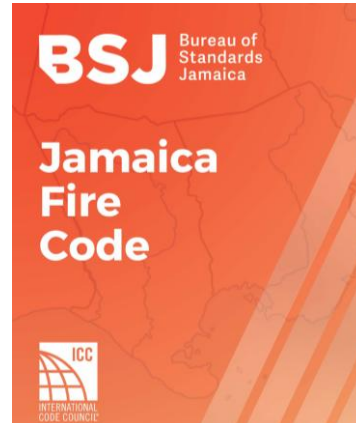
SECTION 3 | MINIMUM TECHNICAL REQUIREMENTS



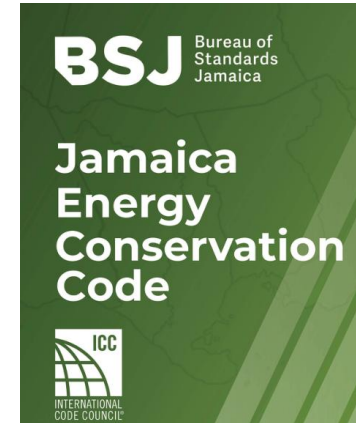
Small Building / Residential



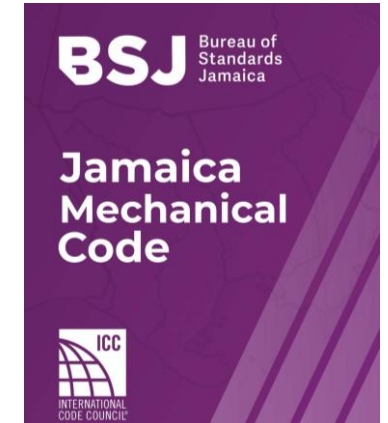
Building



Fire



Energy Conservation



Mechanical

The Jamaica Small Building/Residential Code establishes minimum requirements for one- and two-family dwellings, townhouses and general-purpose buildings up to 300 m², and seeks to facilitate buildings capable of withstanding sustained hurricane winds of at least 248 km/h and earthquakes of 6.5 on the Richter Scale.

Modular systems do not sit outside the code environment. They must be assessed within it.

Structural Performance: What Must Be Proven

SECTION 3 | MINIMUM TECHNICAL REQUIREMENTS



The installed system must demonstrate:

Dead, live, roof and special loads applicable to the use and occupancy.

Wind loads appropriate to Jamaica's hurricane-prone climate.

Seismic loads under the Jamaica Building Code framework.

Transport and lifting loads, including dynamic effects and point lifting.

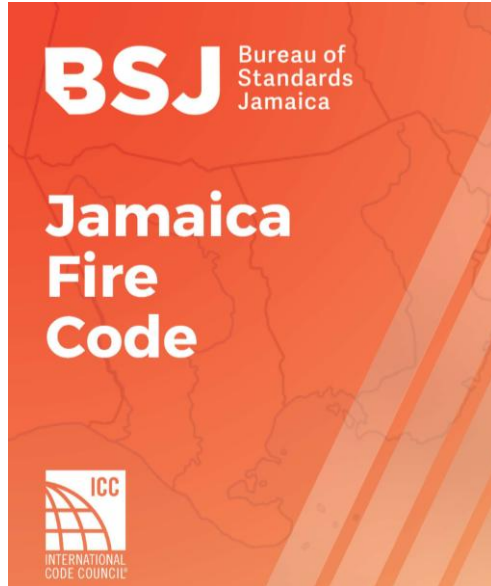
Inter-module and panel-to-panel connections that transfer vertical and lateral loads.

Uplift and overturning resistance to code-specified safety factors.

Hurricane resilience is an engineering submission, not a marketing sentence.

Fire and Life Safety: Resilience is More Than Wind Resistance

SECTION 3 | MINIMUM TECHNICAL REQUIREMENTS



The fire protection strategy must address:

Occupancy classification and fire-resistance-rated separations.

Means of egress: number, width, travel distances and discharge.

Smoke detection, alarms and suppression where required.

Interior finish performance, flame spread and smoke development.

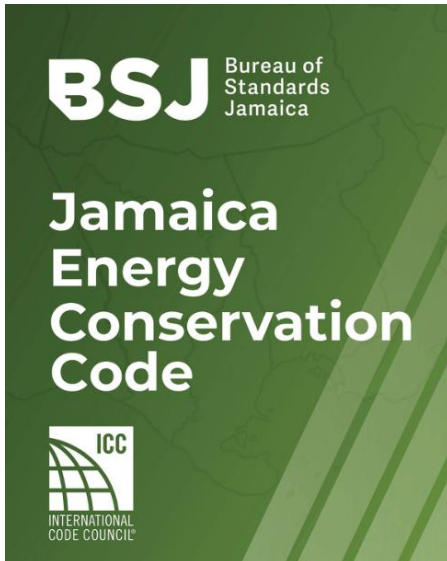
Fire service access, water supply and site layout.

Maintenance of fire and life-safety systems after occupation.

A house that survives wind but compromises egress or fire safety is not a resilient house.

Energy, Ventilation and Liveability

SECTION 3 | MINIMUM TECHNICAL REQUIREMENTS



In Jamaica, habitability is part of resilience.

Building envelope, lighting, HVAC and service water heating must comply with the applicable energy path.

Ventilation and daylighting must be designed for climate, health and comfort.

Emergency escape openings, door widths and ceiling heights must be verified.

Moisture control must prevent mould, condensation and premature deterioration.

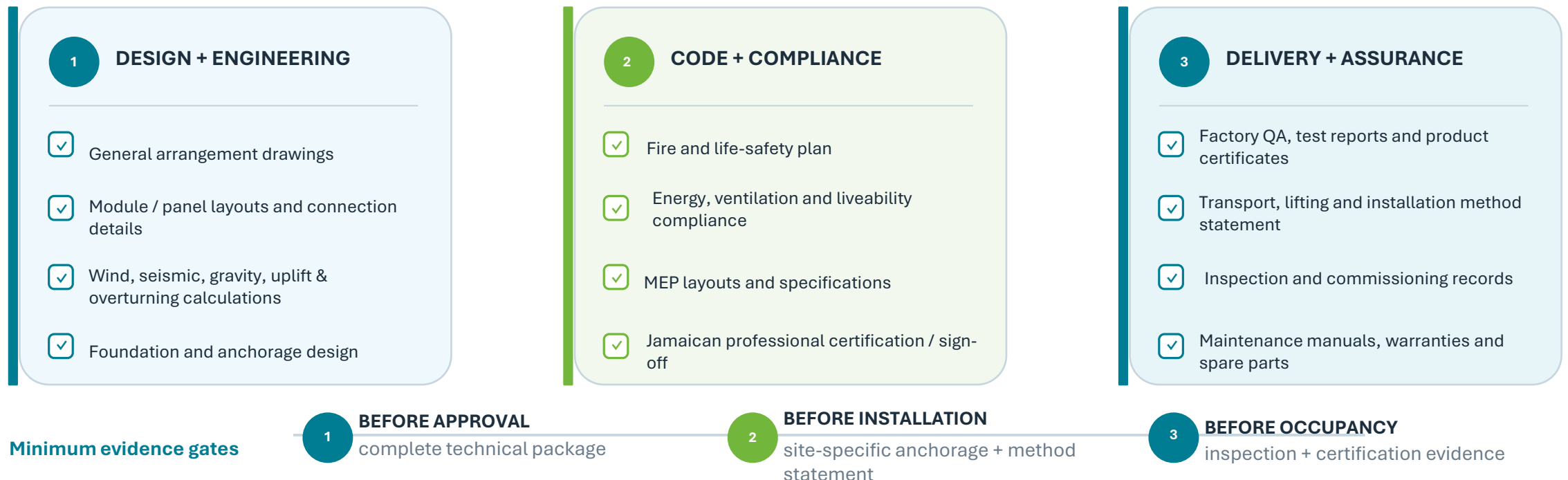
Rapid housing must still be decent housing.

Documentation Required from Suppliers and Developers

SECTION 3 | MINIMUM TECHNICAL REQUIREMENTS

A quotation is not a technical submission.

For Hurricane Resilient modular housing, approval depends on verifiable evidence not brochure claims.



No installation or occupation should proceed without site-specific engineering, Jamaican professional certification and inspection evidence.



SECTION 4 | LESSONS FROM CURRENT MARKET INTEREST

Market Signals & Technical Lessons

What recent proposals reveal about speed, volume, innovation and technical lessons.

PROPOSAL REVIEW

-  Speed to Market ☒
-  Volume & Scalability ☒
-  Innovation & Design ☒
-  Technical Capability ☒
-  Local Value & Jobs ☒



MARKET INTEREST OVERVIEW



What Recent Proposals Show: Speed, Volume & Innovation

SECTION 4 | LESSONS FROM CURRENT MARKET INTEREST

Market interest is strong — but claims must be translated into technical evidence.

Speed

Rapid production, compressed delivery timelines and quick installation are common selling points.

Volume

Proposals often promise large batch supply, village-scale rollout and fast post-disaster deployment.

Innovation

The market now includes folding, containerised, panelised, volumetric and hybrid systems.

Evidence

The strongest proposals pair product claims with structural calculations, code compliance data and installation details.

Developer lesson: procurement decisions must move beyond brochures, wind-speed claims and unit prices.

Market momentum is useful; technical readiness is what matters.

What Technical Reviews Often Find Missing

SECTION 4 | LESSONS FROM CURRENT MARKET INTEREST

The common issue is not the absence of a product — it is the absence of proof.

Structural calculations
wind, seismic, gravity, uplift and overturning

Foundation + anchorage
site-specific details, soil assumptions and embedment

Fire and life safety
egress, alarms, fire resistance, separation and access

MEP integration
electrical, plumbing, mechanical and fuel gas layouts

Testing + certification
factory QA, product reports and third-party evidence

Installation evidence
lifting, transport, concealed works and inspection records

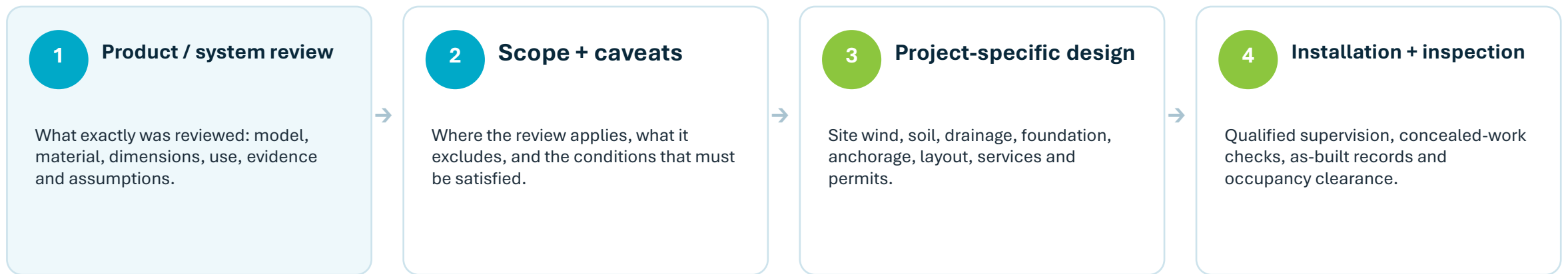
COMMON EVIDENCE GAPS

A proposal is only technically strong when the complete building system can be checked, certified and inspected.

Why BSJ/System Reviews Must Be Read With Scope and Caveats

SECTION 4 | LESSONS FROM CURRENT MARKET INTEREST

A system review is important, but it is not the same as project approval.



Read the review as evidence within a defined scope — not as a blanket approval for every site, layout or use.

System evidence starts the approval pathway; site-specific engineering completes it.

Cost, Speed and Compliance: The Real Value-For-Money Test

SECTION 4 | LESSONS FROM CURRENT MARKET INTEREST

Fast delivery and low unit cost have value but only after minimum safety and compliance are satisfied.

VALUE FOR MONEY = PURCHASE PRICE + DELIVERY SPEED + TECHNICAL COMPLIANCE + WHOLE-LIFE PERFORMANCE

Initial price

Unit purchase, shipping, customs, inland transport and site works.

Delivery speed

Factory capacity, shipment schedule, installation crew and inspection sequencing.

Compliance

Jamaican codes, professional sign-off, testing, fire/life safety and permits.

Whole-life value

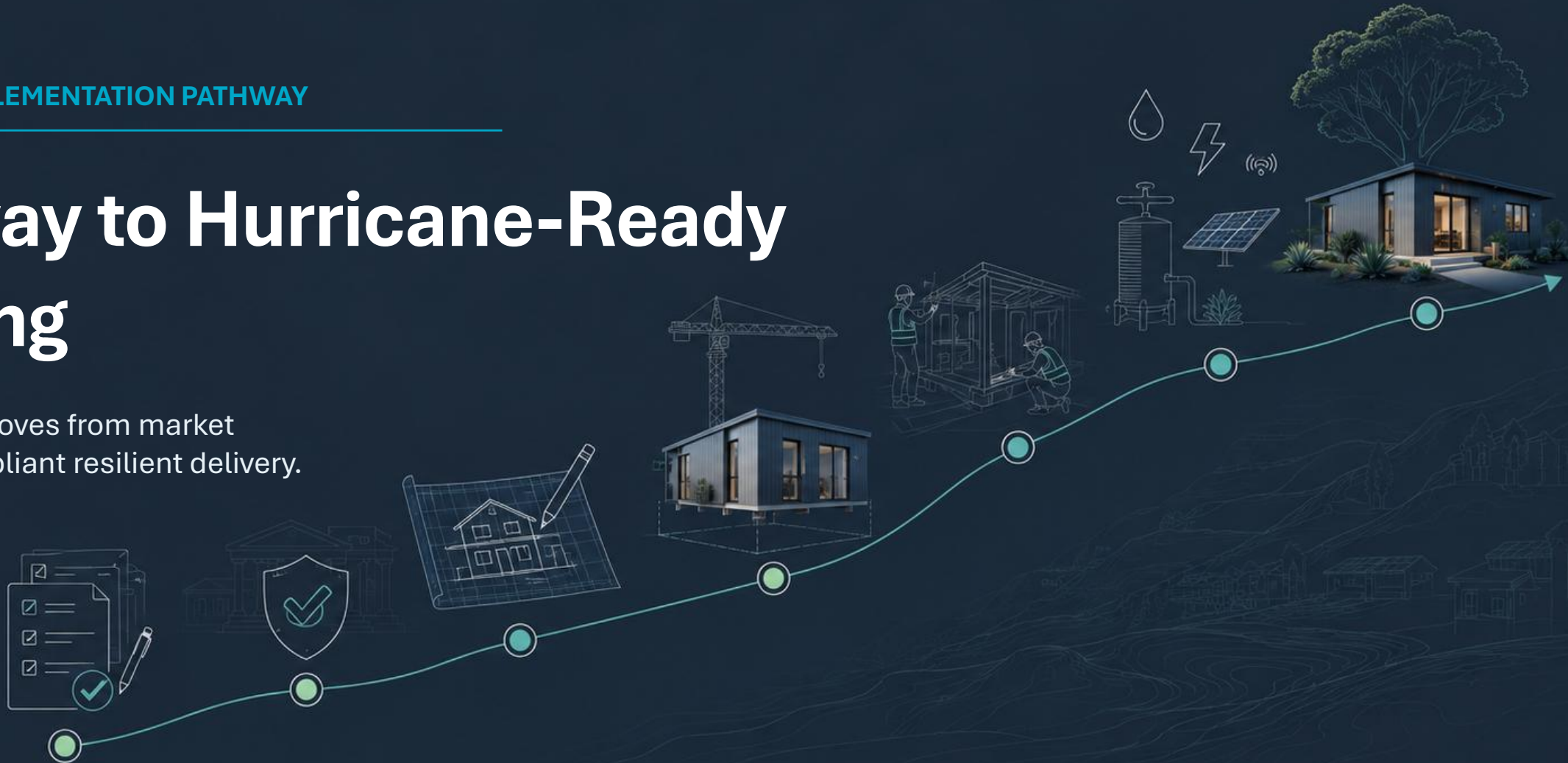
Durability, maintenance, warranties, insurability, resale and repairability.

The cheapest non-compliant unit is not savings; it is deferred risk.

SECTION 5 | IMPLEMENTATION PATHWAY

Pathway to Hurricane-Ready Housing

How Jamaica moves from market interest to compliant resilient delivery.



Developer Approval Pathway

SECTION 5 | IMPLEMENTATION PATHWAY



Modular housing must be procured as a building system, not purchased as furniture.

Roles and Responsibilities

SECTION 5 | IMPLEMENTATION PATHWAY

MEGID

Policy direction, technical standards, housing implementation guidance

BSJ

Standards, system evaluation and certification framework

Local authorities

Development/building approvals and inspections

Professionals

Design certification and site-specific engineering

Developers

Due diligence, procurement, compliance and quality control

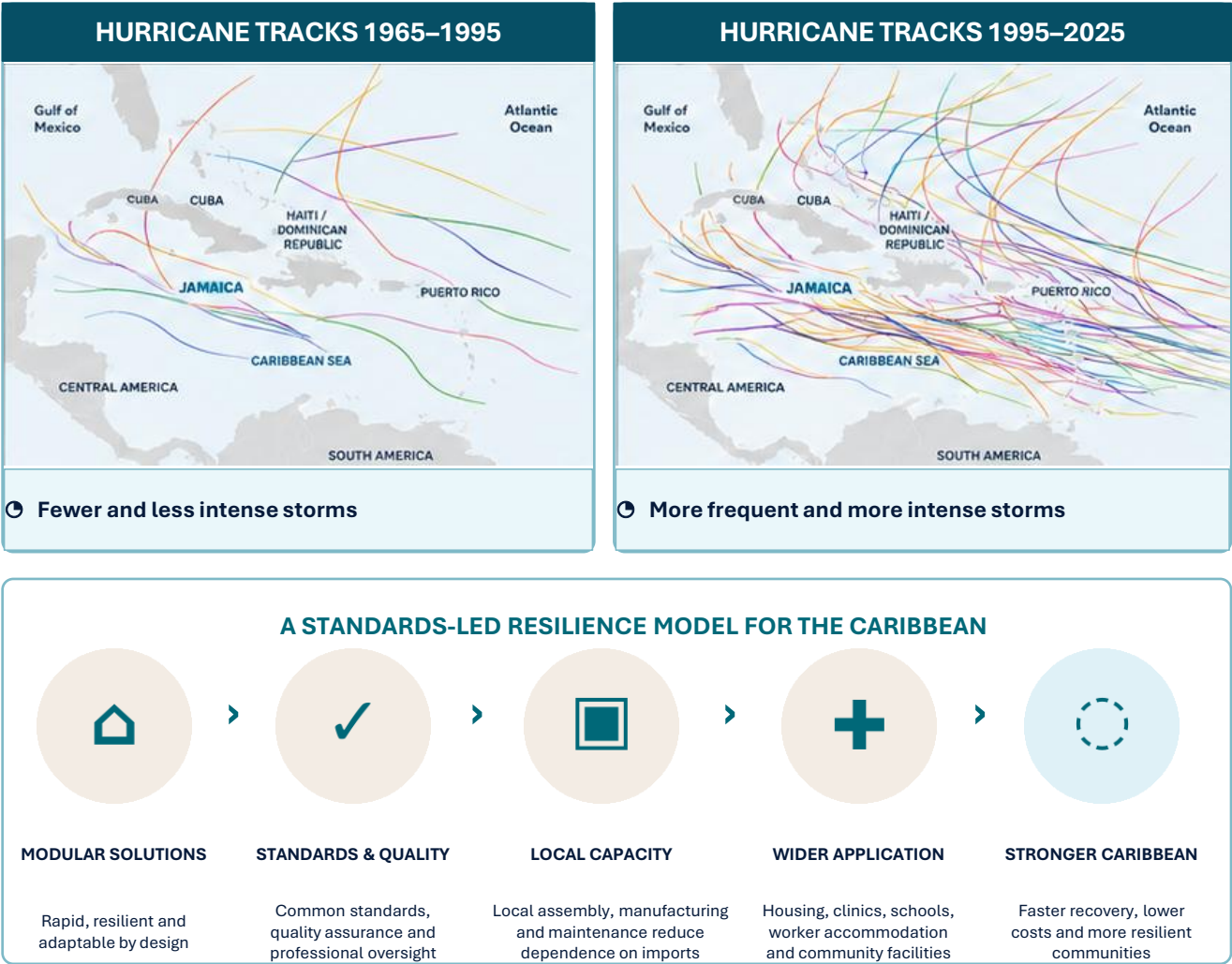
Suppliers / installers

Test evidence, manuals, warranties, installation and QA

Government sets the standard; professionals certify the solution; developers deliver the compliant asset.

A Wider Caribbean Opportunity

SECTION 5 | IMPLEMENTATION PATHWAY



Jamaica can help lead a standards-led resilience model.

- The Caribbean needs faster post-disaster housing options.
- Regional scale depends on standards, quality assurance, training and professional oversight.
- Local assembly, manufacturing and maintenance capacity can reduce dependence on emergency imports.
- Modular systems can support housing, clinics, schools, worker accommodation and community facilities.

Key Takeaways For the Development Sector

SECTION 5 | IMPLEMENTATION PATHWAY

- 1 — Modular housing is a delivery method, not an automatic guarantee of resilience.
- 2 — Performance requires a complete engineered load path.
- 3 — Temporary and permanent modular housing must be classified differently.
- 4 — Foundation, anchorage, fire safety, energy performance and inspection are non-negotiable.
- 5 — Jamaica can use modular housing confidently through a standards-led approach.

The opportunity is not simply to build faster — it is to build faster, safer and with confidence.

From rapid shelter to resilient housing

The opportunity before Jamaica is not simply to import or assemble houses faster. The opportunity is to establish a Jamaican model for resilient, code-compliant, climate-ready modular housing one that protects lives, supports recovery, gives confidence to developers and homeowners, and can serve as a model for the wider Caribbean.

Thank you

-
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Any Questions?

