

INNOVATIVE BUILDING PRACTICES

INTRODUCING HIGH ENERGY COMPOSITE (HEC)

BUILDING SYSTEMS

ROOFING JOISTS BEAMS WALLS

COLUMNS FLOORING DECKING

TANKS FORMWORK

by r p clarke

CARIBBEAN HOUSING REQUIREMENTS

- No more earthquake or
hurricane problems and at
affordable prices

- Earthquake resistant
- Hurricane resistant
- Sustainable
- Affordable (especially if labor is community-based)
- Low maintenance
- Fast construction time

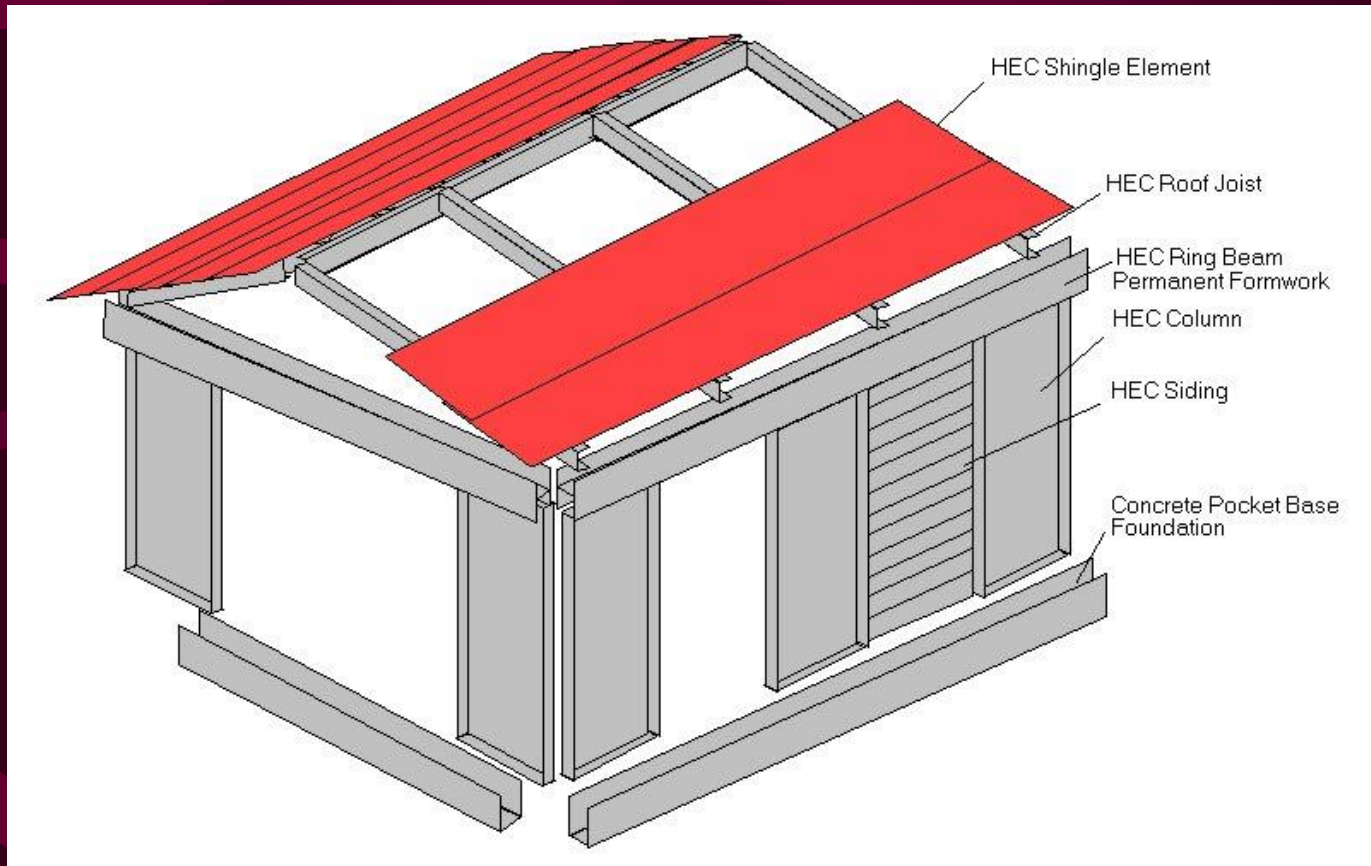
HEC CHARACTERISTICS

- A Thin (12mm) Laminated Cementitious Composite Material
- Advanced Material that is Strong, Durable, Attractive, Fast and Easy to Fabricate
- Complies with Design Standards and Codes Requirements
- Precast Sections or In-situ construction
- From Steel-Like Linear Sections to Curved Shells
- Naturally Earthquake/Hurricane/Impact Resistant; Waterproof; Can be Designed for Thermal Control
- Can yield 40% savings on roofing; 35% savings for single-storey; 25% for 2-storey (much higher if labor is community-based)
- True lifetime service

LOCAL INNOVATIONS/INVENTIONS FOR HOUSING

- A Roofing form called the “Ribbon Design” – Thin strips that may be curved or straight
- A new embedded steel connection that enables the “Ribbon Design”
- Advanced and internationally acknowledged analysis methodologies (laminated strength analysis; nonlinear cyclic material model for vibration conditions).
- Special combinations of non-metallic mesh and/or matrix additives for optimised performance/economics under local conditions (in progress)

HEC HOUSE COMPONENTS – “RIBBON DESIGN”



TESTING AND ANALYSIS - ROOFS



Figure 11. Photograph of pullout testing of roof slab-to-beam connection



Figure 6. Photograph of test setup for ferrocement pitched portal frame



Figure 9. Photograph of testing of ferrocement hollow roof slab

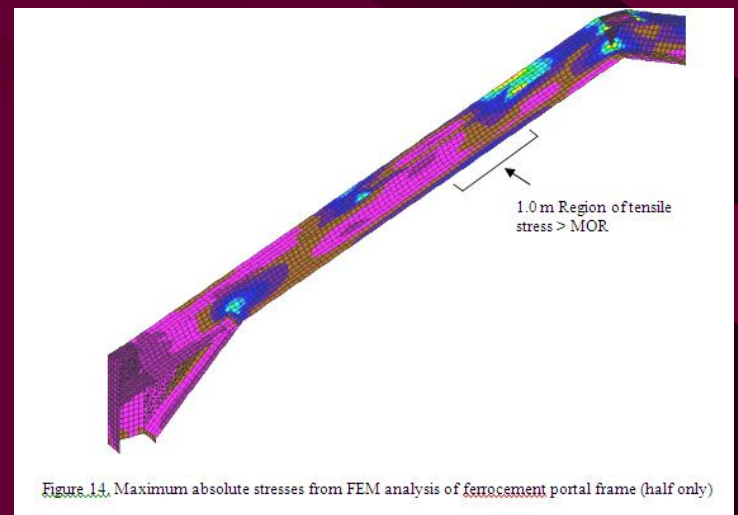
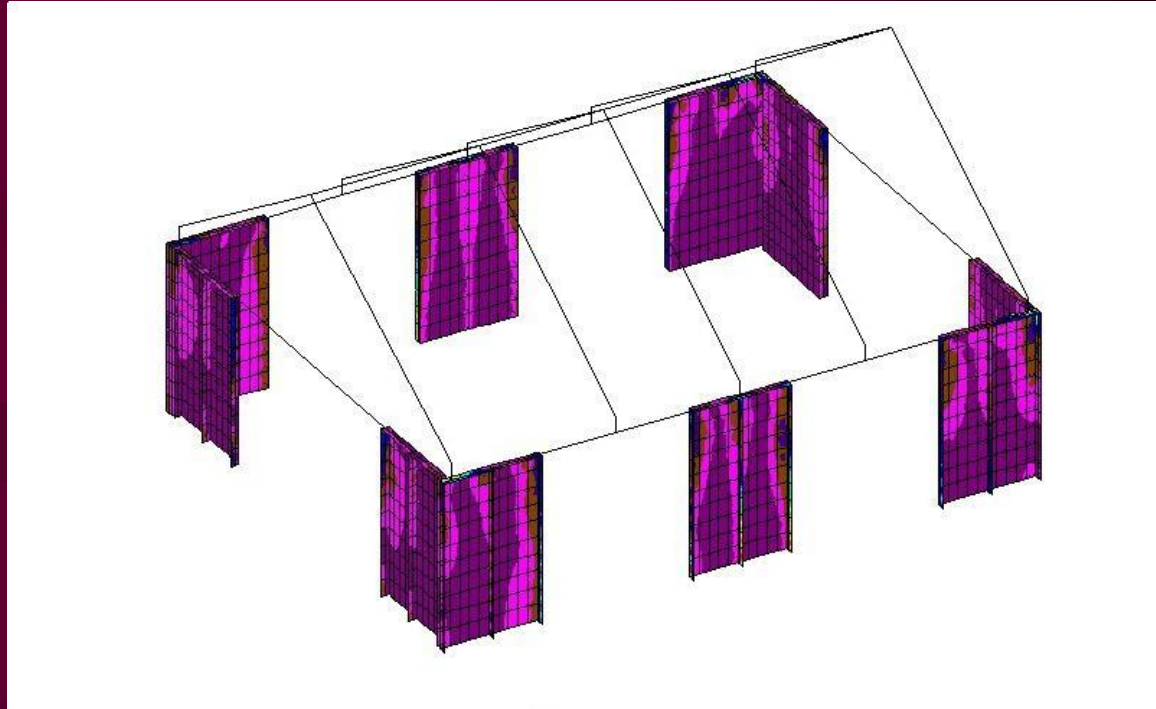


Figure 14. Maximum absolute stresses from FEM analysis of ferrocement portal frame (half only)

TESTING AND ANALYSIS - WALLS



- THE NEXT STEP -

- PROTOTYPE IN FIELD
- FIELD TESTING
- FINAL TESTING/ANALYSIS
- PARTNERING WITH REGIONAL GOVERNMENTS/ORGANIZATIONS/BUSINESSES



THANK YOU
FOR YOUR TIME