

Innovative Building Technologies and Decision Support Tools

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Innovation in Disaster Management: Decision-Support

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The challenge in SA

Context:

- Vulnerable settlements in SA are increasingly subject to disasters such as flooding or fires.
- Government response offers emergency shelter in a Phased approach, dependent on situational assessment:
 - Rapid interim shelter (e.g. tents, community centres).
 - Temporary Residential Units (TRUs) provided.
 - Permanent housing.



The challenge in SA

Context:

- TRUs are not intended for permanent use (5-year life-span):
 - Poor thermal performance
 - Poor durability
- TRUs often become permanent due to delay in delivery of permanent housing.
- Deployment of TRUs is often delayed by
 - Material shortages & logistics
 - Contractor performance
 - Land & site issues
 - Procurement & approval processes



The challenge in SA

The need:

- A building solution that is:
 - Suitable for permanence (even if on a temporary site).
 - Rapid to construct.
 - Sustainable (social, economic, environmental).

Key issue & Potential for Innovative Building Technologies to provide a solution



Which IBTs are suitable for Sustainable TRUs?



The need:

- DECISION SUPPORT

AGREMENT SOUTH AFRICA

NHBC SOUTH AFRICA

T4SD Technologies For Service Delivery

BROWSE TECHNOLOGIES

ALL

Home > Browse Technologies

0 items found Clear All Filters

CATEGORIES Clear

TECHNOLOGY READINESS LEVEL 1

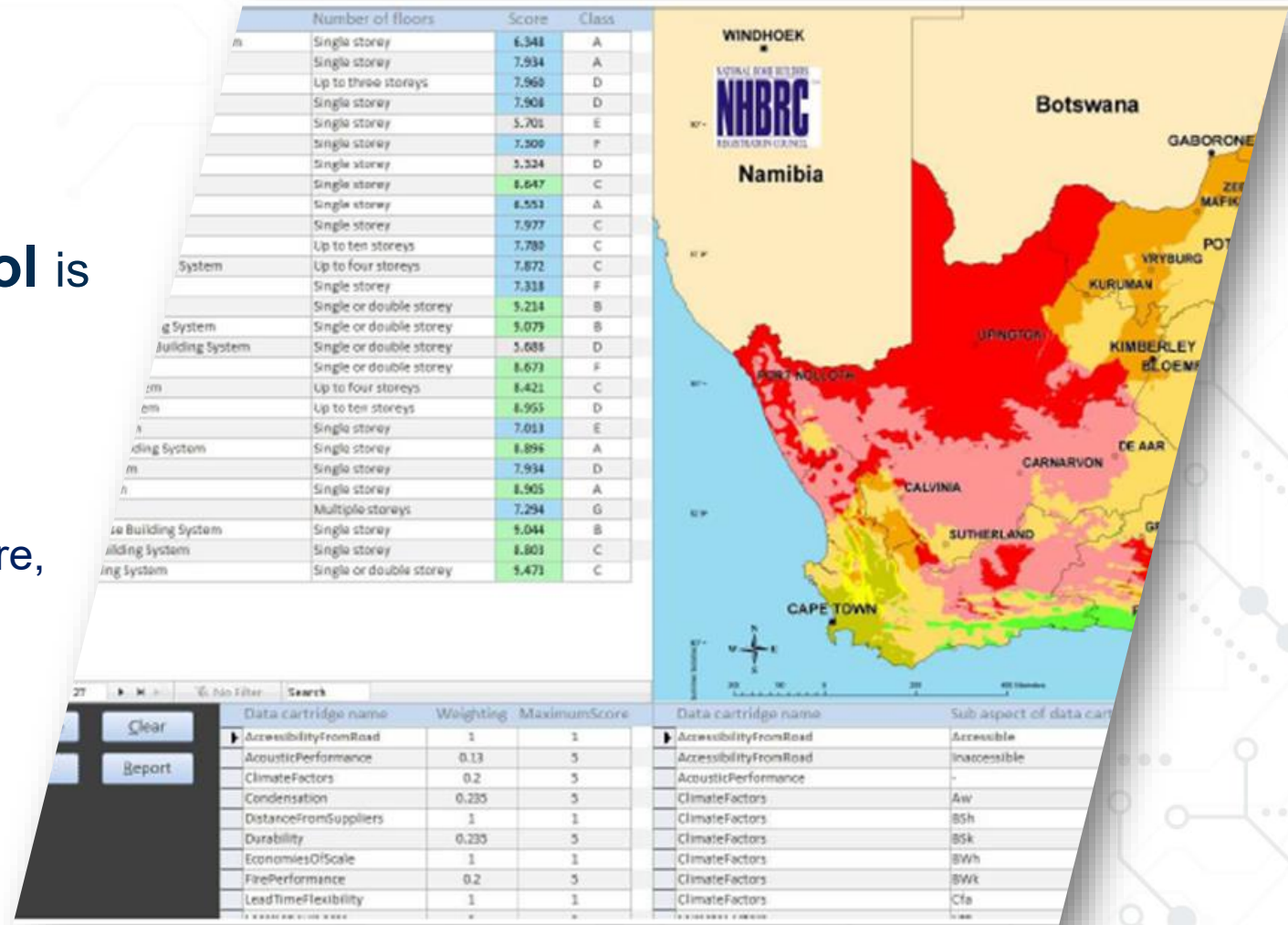
GEOGRAPHIC ORIGIN All

Which IBTs are suitable for Sustainable TRUs?



The need: DECISION SUPPORT

- The **NHBRC IBT Analyser Tool** is the first filter to select a suitable IBT,
- However:
 - Limited to fixed list of IBTs
 - Limited to 10 specific technical performance factors (e.g. thermal, fire, durability, acoustics)



Which IBTs are suitable for Sustainable TRUs?



CSIR IBT for Disaster Response Tool

accounts for the key principles of:

- Rapid construction
- Sustainability
- Re-locatability

Translates to
criteria:

- Prefabricated (time & construction waste reduced)
- Dry construction (time & water use reduced)
- Mechanical fixing (facilitates relocation & reuse – material & cost efficiency)
- Adaptability (social sustainability: can add on to grow with user needs)
- Minimal earthworks (time, cost & environmental impact reduced)
- Light footings & flooring (time & cost reduced)
- Sustainability of materials (renewable, recycled content: resource efficiency)

IBTs for Disaster Response Tool

Intended for **comparing** two products

IBT suitability for Disaster Response		
	Answer	Weighting
Is the technology appropriate for the region (NHBRC IBT Analyser)?	NO	0
Is the technology prefabricated?	YES	3
Does the technology have mechanical fixings?	YES	3
Does the technology NOT require plaster to achieve water resistance and durability requirements?	YES	3
Does the technology NOT rely on in-situ concrete footings and slab?	YES	3
Does the technology NOT rely earthworks for foundations?	YES	3
Does the technology allow for deconstruction and re-use?	YES	1
Can the technology accommodate additions?	NO	2
Is the technology made from a renewable resource?	YES	3
Is the technology made using recycled material?	NO	0
SCORE		19

IBT suitability for Disaster Response		
	Answer	Weighting
Is the technology appropriate for the region (NHBRC IBT Analyser)?	NO	0
Is the technology prefabricated?	YES	3
Does the technology have mechanical fixings?	YES	3
Does the technology NOT require plaster to achieve water resistance and durability requirements?	YES	3
Does the technology NOT rely on in-situ concrete footings and slab?	YES	3
Does the technology NOT rely earthworks for foundations?	YES	3
Does the technology allow for deconstruction and re-use?	NO	3
Can the technology accommodate additions?	NO	2
Is the technology made from a renewable resource?	NO	3
Is the technology made using recycled material?	NO	0
SCORE		15

IBTs for Disaster Response Tool

Intended for **comparing** two products

Product A

Question	Answer	Weighting
Is the technology appropriate for the region (NHBRC IBT Analyser)?	NO	0
Is the technology prefabricated?	YES	3
Does the technology have mechanical fixings?	YES	3
Does the technology NOT require plaster to achieve water resistance and durability requirements?	YES	3
Does the technology NOT rely on in-situ concrete footings and slab?	NO	3
Does the technology NOT rely earthworks for foundations?	NO	3
Does the technology allow for deconstruction and re-use?	YES	3
Can the technology accommodate additions?	NO	2
Is the technology made from a renewable resource?	YES	3
Is the technology made using recycled material?	YES	0
SCORE	15	

Product B

Question	Answer	Weighting
Is the technology appropriate for the region (NHBRC IBT Analyser)?	NO	0
Is the technology prefabricated?	YES	3
Does the technology have mechanical fixings?	YES	3
Does the technology NOT require plaster to achieve water resistance and durability requirements?	YES	3
Does the technology NOT rely on in-situ concrete footings and slab?	YES	3
Does the technology NOT rely earthworks for foundations?	YES	3
Does the technology allow for deconstruction and re-use?	YES	3
Can the technology accommodate additions?	NO	2
Is the technology made from a renewable resource?	YES	3
Is the technology made using recycled material?	YES	0
SCORE	21	

Pilot study

- Products shortlisted by IBT Analyser tool: 21 technologies based on NHBRC-listed technologies (limited to Agrément-certified).
- None of the 21 products met the Emergency Response criteria.
- Broader search revealed Engineered Timber as a good potential solution.



IBT suitability for Disaster Response

	Answer	Weighting
Is the technology appropriate for the region (NHBRC IBT Analyser)?	NO	0
Is the technology prefabricated?	YES	3
Does the technology have mechanical fixings?	YES	3
Does the technology NOT require plaster to achieve water resistance and durability requirements?	YES	3
Does the technology NOT rely on in-situ concrete footings and slab?	YES	3
Does the technology NOT rely earthworks for foundations?	YES	3
Does the technology allow for deconstruction and re-use?	YES	3
Can the technology accommodate additions?	NO	2
Is the technology made from a renewable resource?	YES	3
Is the technology made using recycled material?	YES	0

SCORE 21

Pilot study

Is the technology prefabricated?

YES



Does the technology have mechanical fixings?

YES



Pilot study

Does the technology rely on in-situ concrete footings and slab?

YES

Does the technology rely earthworks for foundations?

YES



Pilot study

Does the technology require plaster to achieve water resistance and durability requirements?

YES

Is the technology made from a renewable resource?

YES



Pilot study

Does the technology require plaster to achieve water resistance and durability requirements?

YES



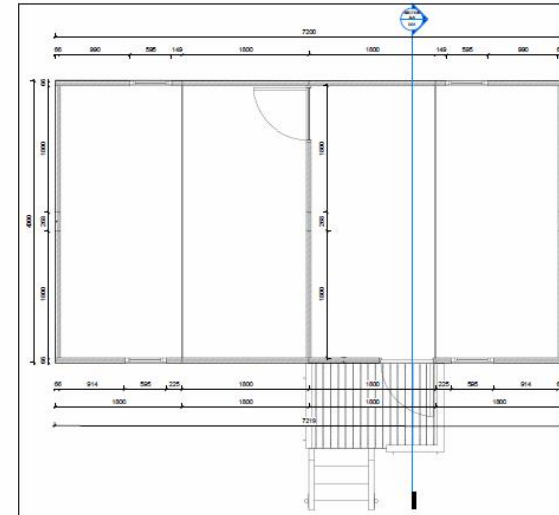
Pilot study

Does the technology allow for deconstruction and re-use? **YES**

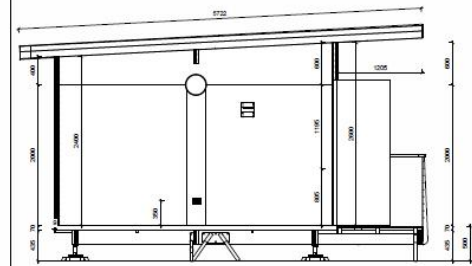
Can the technology accommodate additions? **NO**

Further research:

- Thermal performance over 12-months.
- Potential to extend / add on.
- Relocation planned after 12 months.



① FLOOR PLAN DIMS 01
1:25



② SECTION A-A
1:25



③ 3D CUT ISOMETRIC



④ 3D EXTERNAL VIEW

Conclusion

- There is no single perfect solution but the IBTs for Disaster Response Tool assists with evaluation.
- Research is on-going.
- Innovators are invited to submit a request to construct on the CSIR test site to evaluate performance in practice.

The background is a deep blue color with a subtle, intricate pattern of white and light blue circuit board traces. A large, thick, blue arrow points from the left side towards the right, partially overlapping the circuit pattern. The text "Thank you" is centered in the middle of the image in a white, sans-serif font.

Thank you