

Centre for Housing Performance Excellence

**Assessment of
Housing Products**
(Does your product comply with the
National Building Regulations?)

Quality is our priority

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NHBRC TECHNICAL STANDARDS

1. Background

The National Building Regulations and Building Standard Act, 1977 (Act 103 of 1977) form a basis on how the development of buildings and their surroundings are to be done in order suit human habitation. It is from this basis that the Regulations, made in terms of the Act, prescribes mandatory requirements that support the objectives of the Act. Any conventional material, methods or systems that can be utilised in the construction of building are documented in the Code of Practice (SANS 10400): The Application of the National Building Regulations.

The purpose of this document is to describe the process at which a housing product, either conventional or not, follows in order to comply with the National Building Regulation's mandatory requirements. The document also discusses the National Home Builders Registration Council (NHBRC) and Agrément processes of assessing new housing products.

2. Definitions

Agrément Certification: the process whereby a certificate confirming fitness-for-purpose of non-standardised construction products and/or the acceptability of the related non-standardised design and the conditions pertaining thereto, is issued by the Board of Agrément of South Africa.

Competent Person: shall mean a registered person in terms of the Engineering Professions of South Africa Act, 1990 (Act No. 114 of 1990) or a person registered in terms of section 11 of the Natural Scientific Professions Act, 1993.

Rational design: any design involving a process of reasoning and calculation that is based on the consistent application of appropriate national or international standards, and engineering codes or other relevant, authoritative and published technical literature.

Rational assessment: the assessment of the adequacy of the performance of a solution in relation to requirements by a process of reasoning, calculation and consideration of accepted engineering principles, based on a combination of deductions from available information, research and data, appropriate testing and service experience.

3. National Building Regulations

Any dwelling house to be built in an area under the jurisdiction of a local authority falls within the scope of the National Building Regulations and Building Standards Act (Act 103 of 1977), and the regulations made in terms of that act. The regulations include mandatory performance requirements that support the objectives of the act which is to ensure the safety and health of persons living or working in any building. Guidance in the application of the regulation may be found in SANS 10400: The Application of the National Building Regulations. SANS 10400 contains prescriptive rules given for any form of construction that are deemed-to-satisfy the National Building Regulations. The application of these rules is not mandatory; therefore the owner of the dwelling house is allowed to utilize any means necessary to satisfy the requirements of the National Building Regulations.

There are various non-mandatory ways in which one could comply with requirements of the National Building Regulations as shown in Figure 1. These non-mandatory ways are summarized below as:

- *Prescriptive “deemed-to-satisfy rules”*

There are various prescriptive standards (codes of practice) which are intended to simplify the application of the regulations. The South African National Standards (SANS) is an organisation that deals with setting standards and codes of practice which relate to conventional products.

The following codes, with “deemed-to-satisfy rules” are applicable for house construction and design:

SANS 10400: The code of Practice for the application of the National Building Regulations.

This code reproduces the Regulations and also covers provisions for building site operations, building design and construction that are deemed-to-satisfy the requirements of the Regulations. Compliance with the deemed-to-satisfy rules is a straightforward means of ensuring that the Regulations have been applied. However, deemed-to-satisfy rules are not Regulations and therefore not mandatory.

SANS 10401: The Code of Practice for the construction of Dwelling Houses in accordance with the National Building regulations

This code specifically covers the deemed-to-satisfy rules for housing and includes:

- conventional housing
- incremental housing and
- informal housing

National Home Builders Registration Council (NHBRC): Home Building Manuals

The role of NHBRC is to enforce compliance with National Building Regulation requirements by the home builders in the home building industry. The NHBRC home building manuals are compiled in line with SANS 10400 and SANS 10401. The main difference is that, NHBRC manuals have simplified and more user-friendly deemed-to-satisfy rules. Any revisions to the codes are also reflected in the home building manuals. Therefore, compliance with NHBRC manuals ensures that the Regulations have been applied. The rules contained in the manuals are not Regulations and therefore not mandatory.

- *Rational Design or Assessment*

The purpose of rational designs is to ensure “fitness-for-purpose” of the elements covered by the design. Rational designs are required in respect of housing systems or components, which comprise materials and/or elements whose properties, characteristics and behaviour may be known or unknown. In both cases, a competent person (as defined under the Engineering Profession of South Africa Act, Act 114 of 1990), is required to produce the rational design.

- *A valid Agrément Certificate*

Agrément SA is an independent organisation established by the Minister of Public Works and housed at the CSIR. Their primary business focus is the certification of non-standardised or innovative building products through technical assessments that verify whether the products and systems are fit for purpose. Agrément certifies products where no national standards are applicable and their certification process is performance based. A valid Agrément certificate will comply with the National Building regulations.

Figure 1: The diagram below shows how the above process works.

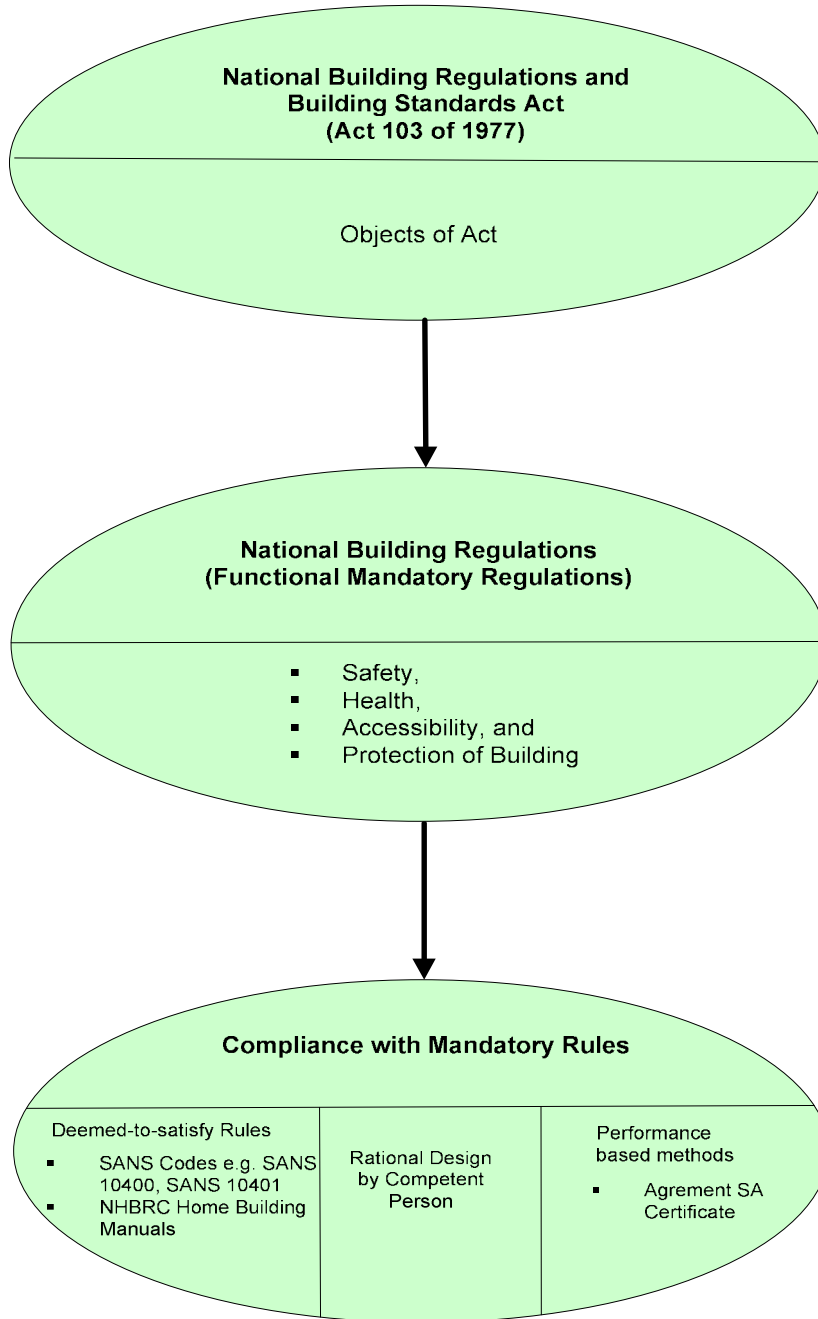


Figure 1: Requirements of the National Building Regulations and Building Standards Act

4. Product Registration on the NHBRC Database

All new homes built in the Republic of South Africa are required to comply with the provisions of the Housing Consumer Protection Measures Act (Act 95 of 1998). This Act provides inter alia, for warranty protection against defects in new homes and the establishment of technical requirements in and the regulation of the home building industry. Housing consumer protection in the context of the Housing Protection Measures Act is about managing the risk of major structural defects occurring in the provision of housing.

Therefore, the NHBRC should make sure that any housing product utilised in the provision of homes for the consumer, does meet National Building Regulation rules. NHBRC has established a database of housing products that satisfy the National Building Regulations excluding those covered in the SANS Codes of Practice. The products on the database were submitted to NHBRC either directly by the respective owners or were utilised in the construction of houses enrolled with the NHBRC.

4.1. Product Assessment

The process at which NHBRC assess whether a product meets necessary technical requirement is done in four stages as shown in Figure 2, namely: Submission, Technical Evaluation, Practical Evaluation and Registration.

a) Submission

The product information will be submitted to NHBRC Technical Division either directly or through a Provincial Office. The following information is required for successful submission:

- Product description
- Detailed technical Information on how the product meets National Building Regulation (NBR's) rules, and NHBRC technical requirements.
- Project history of the product (if available)

b) Technical Evaluation

- The NHBRC Technical Division will assess the technical submission on how the product meets NBR's rules and how quality control will be done to ensure constant quality repetition (note a comprehensive quality control document must be available, and must be part of the submission)
- If the technical assessment is successful the Technical Division will advise the product applicant in writing and make arrangements for practical evaluation.
- If the technical assessment is unsuccessful the Technical Division will advise the product applicant in writing and outline the reason/s thereof.

c) Practical Evaluation

This stage involves practical verification of application of construction specifications as stipulated in the technical submission. It will include:

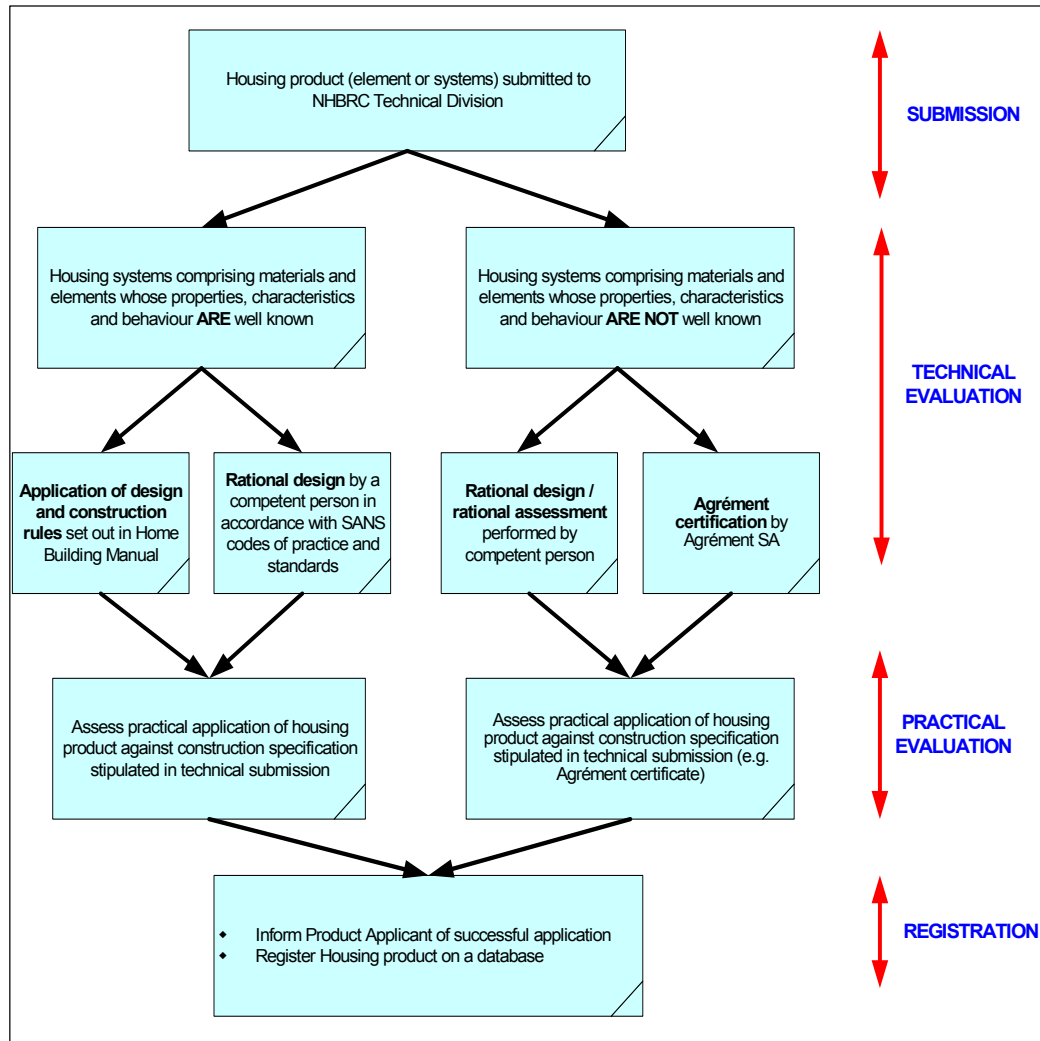
- Site visits of projects on ground where the product was used;
 - Site visits where construction work is in progress;
 - Visit demonstration sites (e.g. showroom, prototypes etc.)
 - Introduction of product to NHBRC Provincial Office's Quality Assessor or Inspectors.
- The practical evaluation process should be documented in a report. If the practical evaluation is:
- **successful**, the Technical Division's recommendation of the product for NHBRC's registration on the database.
 - **unsuccessful**, the Technical Division will inform the product applicant of reason/s thereof.

d) Registration on the Database

The Technical Division will inform, in writing, the product applicant of a successful application. The products will be registered on the database that should include the following information about the product:

- i. Product Name;
- ii. Product Description
- iii. Endorsement Status
- iv. Endorsement Conditions (e.g. refer database users to check with Agrément SA regarding current status of approved products)
- v. List of Projects (product owner informs NHBRC and has verified)

Figure 2 illustrates how NHBRC assess products for registration on the database:
 (Process map for assessing a housing product)



It should be noted that:

- a rational design can be used to satisfy requirements relating to housing systems irrespective of whether or not their elements have properties that are well known;
- design rules are invariably based on rational designs;
- a rational assessment can be undertaken by an individual should there be sufficient information, research and data to make the necessary judgements; and
- Agrément assessment is based on rational assessments conducted by *technical experts engaged by Agrément South Africa*.

The NHBRC accordingly interprets “rational design” to mean either a **rational design** or a **rational assessment** as defined in section 2 of this document.

4.2. NHBC Assessment Criteria for Rational Designs

4.2.1. Rational designs in respect of housing systems or components comprising materials and elements whose properties, characteristics and behaviour are well known.

Competent persons should:

- i) document the form and size of principal structural elements for a proposed system, detail all connections associated therewith and determine the construction and materials specifications necessary to achieve the design intent;
- ii) ensure that any assumptions made in the design can be justified, and if called upon, substantiated;
- iii) ensure that the design is based on appropriate national or international standards or other relevant, authoritative and published technical literature, and
- iv) apply standards and specialist literature in a consistent manner.

The criteria that the NHBC uses in assessing the acceptability of rational designs are:

- i) the competent person has produced a design and provided documentary evidence that confidently demonstrates compliance with the NBR's rules; and
- ii) the reviewer would arrive at a substantially similar solution were he / she to utilise the same standards and specialist literature.

4.2.2. Rational designs in respect of housing systems or components comprising materials and elements whose properties, characteristics and behaviour are not well known.

The competent person should:

- i) document all assumptions made, the form and size of principal structural elements for a proposed system, detail all connections associated therewith and determine the construction and materials specifications necessary to achieve the design intent;
- ii) demonstrate by way of one or more of the following techniques that the performance of the housing system or component thereof reliably satisfies the NBR's rules:
 - a) engineering first principles;
 - b) relevant research;
 - c) applicable codes of practice and publications;
 - d) verifiable experience; and
 - e) suitable and / or appropriate test result and analysis; and
- iii) ensure that the assumptions made and the level of reliability of rational design and / or rational assessment is such that a peer review of the housing system or component thereof would arrive at a similar conclusion;

The criteria that the NHBC uses in assessing the acceptability of rational designs are:

- i) the competent person has produced a design and provided documentary evidence that confidently demonstrates compliance with the NBR's rules; and
- ii) a peer review of the parameters that are adopted, assumptions, design approach, testing, reliability incorporated in the design and related parameters, etc would concur with the conclusions made by the competent persons regarding the acceptability of the solution in terms of the NBR's rules.

5. References

National Building Regulations and Building Standards Act (1977), Act 103 of 1977, Department of Trade and Industry, Pretoria, RSA.

South African National Standards, SANS 10400 (2005). Code of Practice for the application of the National Building Regulations, Pretoria, RSA.

South African National Standards, SANS 10400 (2005). Code of Practice for the construction of Dwelling Houses in accordance with the National Building Regulations, Pretoria, RSA.

Home Building Manuals Parts 1, 2 & 3 (1999), National Home Builders Registration Council, Revision 1, Bryanston, Johannesburg, RSA.