

DEVELOPMENT OF PERFORMANCE SOLUTIONS



The Australian Building Codes Board (ABCB) has produced this document to facilitate the development of performance solutions. The document is intended for use by all parties with an interest in the formulation of performance solutions that comply with the Performance Requirements of Volume One, Volume Two and Volume Three of the National Construction Code (NCC). Compliance with the NCC is only achieved by satisfying the Performance Requirements. This document is suitable for use in the development of both simple and complex performance solutions. The process requires project stakeholders to collaborate and develop an agreed pathway for the design process to follow, in order to produce an acceptable outcome.

A process to assist in the development of a performance solution is outlined below:



PREPARE A PERFORMANCE-BASED DESIGN BRIEF



CARRY OUT ANALYSIS, MODELLING OR TESTING



COLLATE AND EVALUATE RESULTS



PREPARE A FINAL REPORT

GUIDANCE DOCUMENT



PREPARE A PERFORMANCE-BASED DESIGN BRIEF

A performance-based design brief (PBDB) is a document that is developed in collaboration with key stakeholders as part of a proposed performance-based design and approval process. When completed, the PBDB becomes the platform upon which the proposed design is constructed.

The purpose of the PBDB is to record fundamental activities and outcomes of the performance-based design process, as agreed during key stakeholder negotiations. When the PBDB is finalised, all critical activities and outcomes would have been identified. Consequently, the design process can be commenced with a high degree of confidence that provided the requirements of the PBDB are achieved, the proposed design is likely to be approved.

The process of developing a PBDB is typically initiated by the designer through round table discussions amongst key stakeholders. A need for ongoing discussion is usually determined by the success of initial negotiations and/or the complexity of the proposed solution(s).

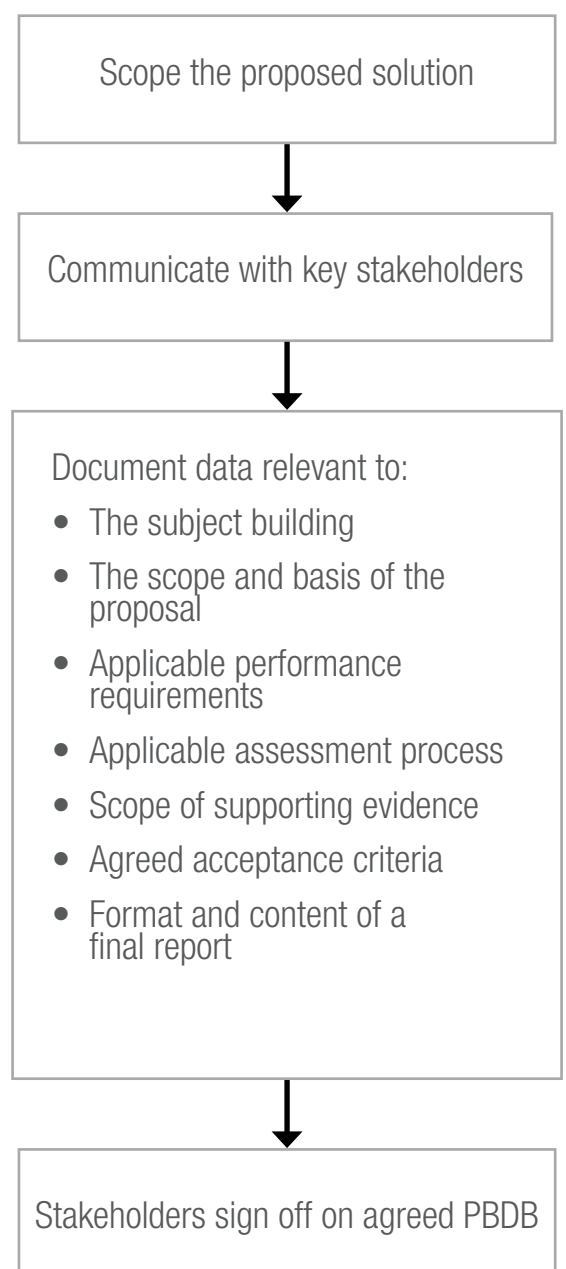
Generally, key stakeholders in a performance solution include:

- building owner or owner's representative
- builder or project manager
- relevant design process practitioners such as
 - architects
 - engineers (structural, hydraulic, civil etc.)
 - design specialists (ESD, HVAC etc.)
 - building design professionals
- appropriate approval authority, including building surveyors¹
- relevant government agency related to
 - planning
 - environment
 - fire safety
- representatives of any other relevant party.

The scope and content of a PBDB will depend on the scope and complexity of the proposed solution, so these two aspects should be established early in the process.

Typically a PBDB should include:

- a summary of the proposed building, for example
 - building type and function
 - effective height
 - location of the building
- a description and explanation of the proposed solution
- nominated applicable Performance Requirement(s)
- agreed analytical assessment processes
- agreed acceptance criteria
- required scope of supporting evidence
- format and content of the final report
- acknowledgement of participants.



Note

¹ In order to avoid perceived or potential conflicts of interest an appropriate approval authority may limit its involvement in the overall design process to the development of the PBDB only.



CARRY OUT ANALYSIS, MODELLING OR TESTING

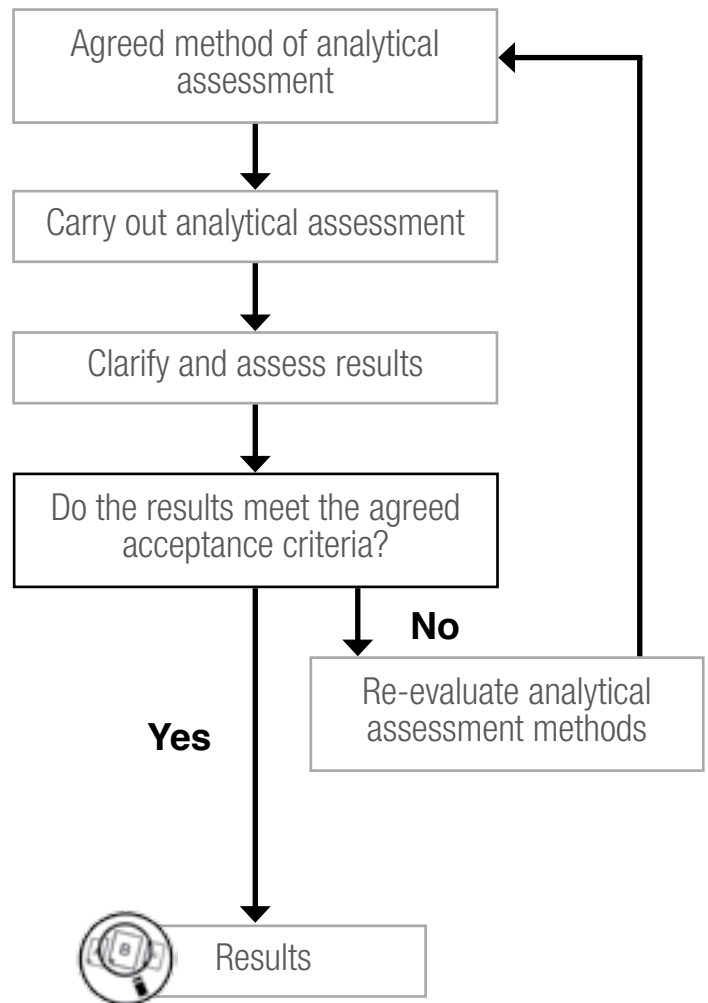
Given that each performance solution is unique, each proposal will require a specific analysis, modelling or testing process relevant to its complexity. In order to assure compliance with the NCC, a performance solution must be evaluated according to one or more of the Assessment Methods outlined in the NCC.

Any analytical assessment should be completed as agreed in the PBDB.

Examples of tools that could be used to evaluate a design proposal include:

- comparative or absolute analysis
- qualitative or quantitative analysis
- deterministic or probabilistic analysis
- empirical calculations
- in-situ or laboratory testing
- computer aided modelling.

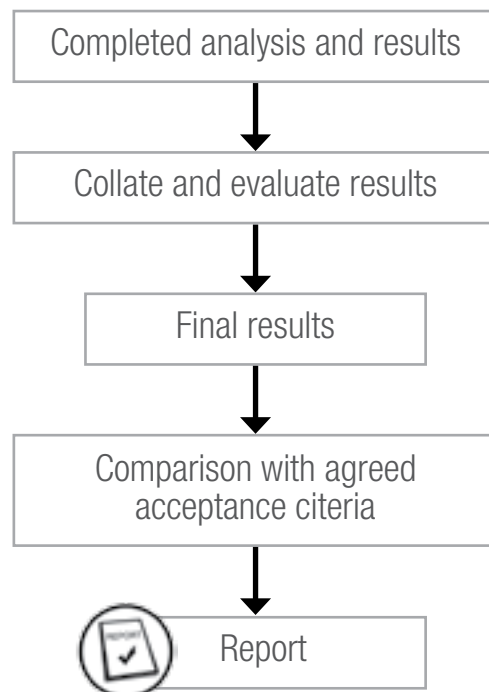
As each process may require specific input and output information, it is essential that potential variables in the agreed method of evaluation are identified during the stakeholder consultation process and documented within the PBDB prior to commencing the activity. Ultimately, agreed analytical processes may need to be reviewed if initial outcomes do not meet the agreed acceptance criteria.



COLLATE AND EVALUATE RESULTS

During the process of analysis, multiple trials or design scenarios may have been considered and analysed.

It is then necessary to collate and evaluate these results and draw conclusions to form the final report. The evaluation needs to take into account the agreed acceptance criteria for the analysis as set out in the PBDB and the results of any uncertainties or sensitivities. Further analysis, modelling and/or testing may be required if the outcomes are not consistent with the agreed acceptance criteria.

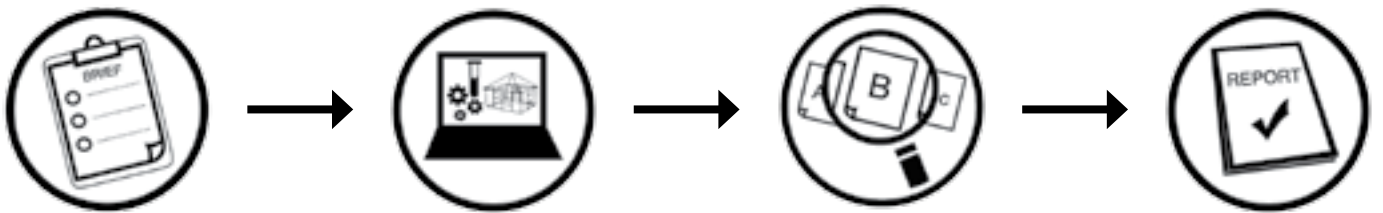




PREPARE A FINAL REPORT

The final report should clearly demonstrate that compliance with the NCC Performance Requirements agreed in the PBDB have been met. The content of a typical final report might include:

- An overview of the PBDB, including
 - Scope of the project
 - Relevant stakeholders
 - Applicable NCC Performance Requirements
 - Approaches and methods of analysis
 - Any assumptions that were made
 - Acceptance criteria and safety factors agreed to by stakeholders
- Overview and outline of the analysis, modelling and/or testing carried out
 - Method of analysis used
 - Calculations and outcomes
 - The sensitivities, redundancies and uncertainty studies carried out
 - The results obtained and relevance to the PBDB
- Evaluation of results including:
 - Comparison of results with acceptance criteria
 - Any further sensitivity studies undertaken
 - Any expert judgement applied and its justification
- Conclusion
 - Specifications of the final design that are deemed to be acceptable
 - The NCC Performance Requirements that were met
 - All limitations to the design and any conditions of use.



The development and approval of a performance solution can be made a relatively simple process if it is initiated by the collaborative preparation of a PBDB. Utilising this process can assist in the development of a solution which satisfies the requirements of the NCC specifically the Performance Requirements of Volume One, Volume Two and Volume Three of the NCC.



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