

CPC 60115 Advanced Diploma of Building Surveying

CPCSS00004 (Skill Set) Provide building surveying services for residential buildings up to three storeys

Built Environment Learning Manual



CPCCBS6001

Research and evaluate construction methods and materials for residential buildings to three storeys



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I. Introduction

Welcome to 'Materials'. This unit will guide you through the processes involved in researching, evaluating and reporting on residential (class I and IO) buildings and structures. The scope of your work will be limited to residential buildings up to three storeys and less than 2000m² in floor area. You will be required to read and interpret the BCA Volume Two and relevant standards and technical reports.

In this unit, you will examine building materials and methods through the entire residential building process from site analysis to completion. You will prepare and submit detailed reports and establish a records management protocol for your observations.

You are advised to seek support from your local Council office or a Building Surveying firm in order to complete the assessments satisfactorily. You will need to have access to the National Construction Code (NCC) and relevant standards. Volume Two of the BCA will be your primary reference.

There are several exercises set in this learning package. **You are not required to submit these exercises for marking.** They are intended to guide you to material that will support your understanding. They are not mandatory but are strongly recommended. The required assessments are in the separate Student Assessment Package.

Application of this unit

This unit will prepare you to develop an understanding of traditional, new and emerging construction methods and materials, including systems and components for services. It involves researching and analyzing construction industry information, including research papers, engineering reports, material specifications and performance data. It also includes following information management procedures to ensure that construction methods and materials are evaluated using current and accurate information.

The BCA is a nationwide code but many of the statutory impacts on your work will be state based or even at the local council level. Licensing, legislative, regulatory or certification requirements may differ from state to state and from council to council. You will be guided to consult relevant state and territory regulatory authorities to explore the requirements that apply in your home locality.

This course may be a bit different to your previous study. You will get away from the more traditional heavy reliance on learning materials and teachers as the sources of all knowledge and towards a template in which you will rely more heavily on your own research skills and communication with your peers. We believe that this more accurately reflects your future working environment as a building surveying professional.

And here are a few reasons why.

The environment we work in is constantly evolving

Simply having a snapshot of how things are at any given time just won't work for you in the long term. You need to learn how to research and apply contemporary information, how to interpret and apply the legislative requirements you'll be working with and perhaps most importantly how to consult with your colleagues in order to arrive at a collective understanding.

In short you cannot expect that this course will deliver all the knowledge that you'll ever

need because Building Surveying needs to respond to an every changing built environment: new materials, emerging technologies and designs.

You need to develop the skills to research, reason, communicate and ultimately make reasonable evidence based decisions.

There is simply too much information out there to learn in one go.

As you progress through this course, you will discover that here is an enormous amount of information to take on board; too much for us to even attempt to get across to you during your time with us. This might be a little daunting but it's also one of the reasons the building industry can be so fascinating. You simply don't get a chance to get bored. The Built Environment teachers and professional colleagues that you will have contact with have significant collective industry experience but are still learning new stuff pretty much every day.

You'll do the same over the course of your career. The trick is to learn how to sort the worthwhile information from the rest and how to access information when you need it. You do not need to know everything to do with building but you need to know how to access that information.

You need to think like a building surveyor.

It's not what you know; it's what you can prove.

As a practicing Building Surveyor, the buck stops with you, therefore you need to ensure that you have good reasons for making the decisions you do. Evidence based decision making lies at the heart of how we all must approach our work.

Decision making can be thought of as making an argument that a chosen course of action will deliver a given outcome. The essence of a decision can be represented as, "If I choose A (a specific alternative) then B (a specific desired outcome and its consequences) will occur." The underlying belief is that our choice will cause, in whole or in part, the desired result in the future.

Evidence based decision making provides information that supports this argument. It supplies information to establish the likelihood or predictability of the desired outcome based on what we choose. In theory, the evidence should increase our level of confidence in achieving the preferred results.

(Decision Innovation, 2016)

In short we just can't afford to fly by the seat of our pants. Ever!!!

Building surveyors need to research thoroughly, consult with colleagues and ensure rigor in their decision making process. It is also vital that this process be thoroughly documented should your work be questioned at some point in the future.

Do one thing at a time, do it slowly and deliberately, do it completely and, above all, accurately record your decision making process. In doing so you will ensure you conduct yourself in a professional manner (and cover your backside) as effectively as you can.

2. The Role(s)

In the context of your role as a building professional, 'Building Surveyor' is the broader term that has been generally used and it is inter-changeable with locally used terminology when it is used to imply a person who certifies plans and structures in accordance with relevant legislation, performs an investigative and reporting role on compliance with the BCA, or any other role which requires the qualification, registration or accreditation of competencies in building surveying.

"Building certifier" is a more specific term that is used to describe the core statutory role and responsibilities of those practitioners who certify the efficacy of built structures under relevant State/Territory legislation including compliance with the Building Code of Australia (BCA). We'll explore the wider 'building surveyor' role as opposed to the 'building certifier' role more fully in later modules. However, it is important to make the distinction now.

Building Surveying is a bit of an odd role, partly regulatory and partly consultative. Other professionals in the building industry don't really have to come to terms with conflicting responsibilities in the same way that Building Surveyors do. It is not just the specifics of what we do in these roles that differ, it's the entire mindset.

The role of Building Surveyors has evolved into many professional disciplines within the building industry, as professionals who assess, certify and inspect building works; as consultants working in design, fire safety, energy efficiency and access solutions; as educators and expert witnesses in support of the legal process.

(AIBS, 2015)

The Regulator

Our original, and still primary role, is to uphold statutory responsibilities for ensuring buildings are: safe to occupy, energy efficient, accessible and meet all legal requirements. We review, analyses and assess plans for compliance to current standards, conduct inspections and issue relevant legislative permits, certification and approvals.

We are required to be competent in local council, State and Territory legislation, guidelines, codes, policies and ministerial directions, as well as the National Construction Code and associated Australian Standards.

Our responsibilities extend well beyond review of and ordering compliance with legislation, regulation or codes. Building surveying is a hands-on role where onsite inspections are carried out to ensure buildings are structurally sound, fit for purpose and able to be occupied. Our competency is central to safeguarding all sections of the community.

In short building surveyors are the auditors of the building industry, we are the individuals charged with ensuring that everything is as it should be.

The Consultant

This is different role that we may specialize in or just undertake from time to time.

Essentially the role of the consulting building surveyor is to provide advice as to how compliance may be achieved rather than enforcing compliance.

It is vital that we don't confuse the regulatory and consultative roles, particularly not on the same job. To do so would create a conflict of interest and put us in breach of the legislative

framework we're charged with upholding. Without that separation of advisory and assessment roles we lose that last line of defence between the building industry and the consumer, those whose safety we're charged with.

Now read that last sentence again. Think about it. Let it sink in. Understanding the difference between the statutory role and the consultant role of Building Surveyors is one of the most important things you will need to develop in your career. It is a difficult pair of hats to wear and remain professional in your dealings.

In 2015, following a significant landslip related building failure, the Age newspaper reported on more general failings in the construction industry. Much of the blame, according to the article, could be attributed to “concerns that there is an inherent conflict of interest in requiring private building surveyors to assess building work while they are also employed by the builder.”

If we provide advice regarding achieving compliance we must not then assess that compliance; another building surveyor, usually completely independent of us, must take on that role.

The following extract is from the Tasmanian Building Act 2000. Check out the enabling legislation that applies in your state. Note the limits to your statutory powers.

52. Exercise of powers prohibited

A building surveyor must not exercise any power under this Act in relation to any building work or building if the building surveyor –

- (a) prepared the design of, or an alternative solution for, the building work or building; or*
- (b) was employed within the previous 12 months by a person who prepared the design of the building work or building; or*
- (c) has a direct or indirect pecuniary interest –*
 - (i) in the person who prepared the design of the building work or building;*
or
 - (ii) in the building work or building; or*
 - (iii) in any person associated with the building work or building; or*
- (d) has a potential for a conflict of interest between his or her duties to owners or the public and his or her personal or business interests;*

The importance of standards and ethics

As regulators the legislative framework we work within conveys on us the legislative power to enforce our decisions; we are directly responsible for upholding the requirements of that legislation. So with power comes responsibility. The following extract from the Tasmanian Building Act 2000 establishes the duties of building surveyors.

15. Duties of building surveyors

- (1) A building surveyor is to ensure that he or she acts only within the area of his or her competence.*

- (2) *A building surveyor, as far as is reasonably practicable, is to ensure that building work is carried out in accordance with this Act.*

Again, check out the legislation in your state and note what duties are set out there. What do you think is meant by the phrase “as far as reasonably practicable”? Is there a similar clause in your state?

Some might say that this puts Building Surveying squarely at the top of the building industry food chain; not only are they responsible for ensuring that they work within the requirements of the legislative framework, Building Surveyors are also responsible for ensuring that everyone else does as well.

As a profession, Building Surveyors face significant challenges right now; some say that a lack of rigour in education, practice and the regulation of our profession have led to a point at which that position at the top of the building industry food chain is at risk.

In 2011, the Victorian Auditor-General completed an audit of compliance with building permits across Victoria. A copy of the audit report can be viewed at the Victorian Government website although it does not make comfortable reading for building professionals. The results of the audit were highly critical of the level of compliance, citing that some ninety-six percent (that's right 96%) of permits examined by the auditors did not comply with minimum statutory building and safety standards.

The audit examined how effective the building permit system is in providing assurance that approved building works meet the required building and safety standards....Ninety-six per cent of permits examined did not comply with minimum statutory building and safety standards. Instead, our results have revealed a system marked by confusion and inadequate practice, including lack of transparency and accountability for decisions made.

Consequently, there is little assurance that (building) surveyors are carrying out their work competently, that the Building Act 1993 is being complied with, and the risk of injury or damage to any person is being minimized.

(Victorian Auditor General, 2011)

That is not comforting and there is no reason to think that other states are performing much better. If Building Surveyors want to be seen as the peak profession in the building industry, then the standards of professionalism we set for ourselves must reflect this position or ultimately it will be lost. You, as an emerging professional, are a vital part of the solution.

Maintaining strong professional links and a commitment to continuing professional development is a good place to start.

AIBS Code of Conduct

Practitioners accredited by the Australian Institute of Building Surveyors (AIBS) must comply with a Code of Conduct which addresses the following issues:

- Acting in the public interest
- Regard for the interests of others
- Duty of care
- Making decisions and taking actions

- Protecting and using information
- Proper exercise of power
- Ethical behaviour

You are strongly advised read the AIBS National Accreditation Scheme Accreditation Code of Professional Conduct in full. It is available at <http://aibs.com.au/>.

You could add professional development to that list. Maintaining your professional knowledge and keeping up with emerging issues is vitally important in reinforcing your professionalism and maximizing the quality of your work.

A very important component of your professionalism will be your approach to research and ongoing knowledge maintenance. Your decisions must be based on sound, rigorous and current industry knowledge. Your approach to research must be open-minded and independent. You will need to develop a strategy for gaining and maintaining your knowledge base and remain committed to it. Building methods, materials, techniques and legislation is continually evolving. You will need to make sure that you evolve along with it.

3. Legislation

It is important, before we actually start assessing any building plans to look at just what it is we do and what we are responsible for first. To do this we'll look at the legislation that conveys on us our powers and responsibilities as well as considering our relationships with other building industry practitioners.

Ideally, you'll have a building surveyor or other industry professional you can talk to but it's certainly not a big issue if you don't at this stage. However, we do strongly urge you to develop contacts within the building surveying profession as they will prove a very valuable resource as you progress through this course and in your future work in building surveying practice. Your local Council can also be a good source of information, whether you chat to the people on the front counter, cultivate contacts within the building department or refer to their website. You should also take advantage of the TasTAFE Forums; you may find that you strike up a relationship with another student or student(s) that will last you right through your studies. Practicing building surveyors constantly talk with their peers; it's only natural that you should start doing the same right away.

Of course if you really get stuck, or at any time really, talk to one of your teachers; that's what we're here for after all.

The Legislative Framework

Here's our first bit of research, it's a simple step but an important one, and you'll probably want to save these web addresses as favorites in your web search engine. You're going to need them. Frequently!

The BCA is freely available for viewing or download through the Australian Building Codes Board (ABCB) website at the following address:

<http://services.abcb.gov.au/NCCOnline/Publications/Publications?year=NCCOnline.Web.Models.PublicationYear>

The Volume we're most interested in at present is *Volume Two Class 1 and Class 10 Buildings*. It's the red book and it focusses on the technical requirements for domestic scale buildings

Legislation is constantly evolving and this is where web addresses come in. You are going to need to make sure you stay current; a dog-eared hard copy of the Building Act that you printed out 5 years ago is only going to land you in trouble. Understanding that the legislation we work with, including the BCA and adopted documents such as the Australian Standards are constantly changing and ensuring that you only refer to up-to-date information will provide a basic level of protection from liability.

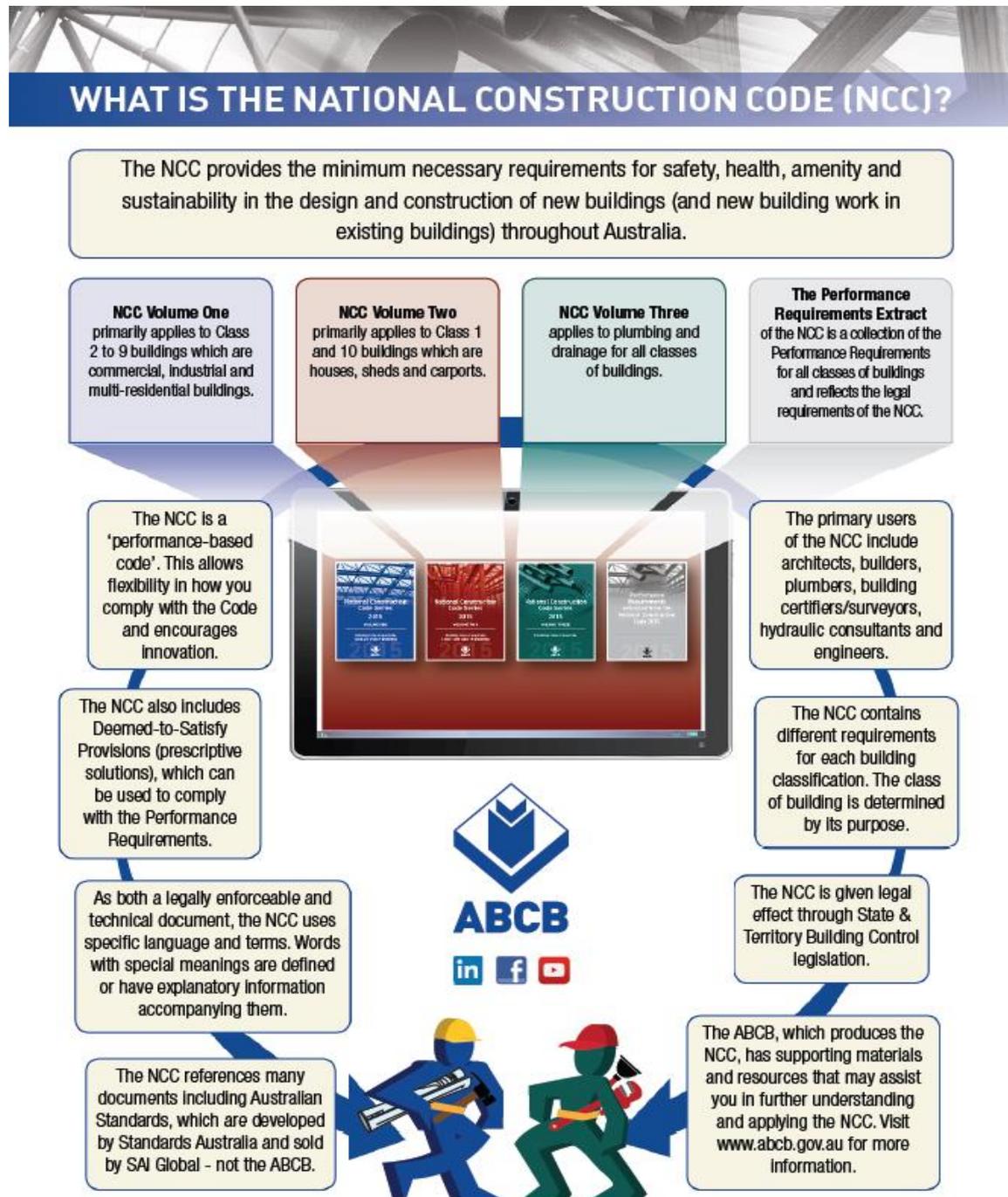
Exercise

Read the Introduction to Volume 2 of the BCA, identify the Act of Parliament and subordinate legislation that pertains to **your specific context**, and note the web addresses for this legislation. These are also freely available through your State/Territory Government websites; you may wish to search 'Building Legislation Western Australia' or the like, depending where you live and work..

Legislative Hierarchy

Now that you have identified the legislation that you will be working with, how does it all work together?

Have a look at the following graphic:



Exercise

What we'd like you to do is consider each of the levels of legislation and where they sit in relation to each other. We'll give you a hint; it all starts with an Act of Parliament and finishes up with Documents Adopted by Reference which includes Australian Standards. Gaining a good understanding of this hierarchy right at the start of your studies will give you a solid foundation to build on, if you'll excuse the pun.

The BCA

We have now identified the legislation you will be working with and how it all works together. You will find that most of your work as a building surveyor will focus on the NCC and specifically Volumes One and Two, i.e. the BCA. Before we can really get our teeth into the following assessments we need to get our heads around just how the BCA works. It puts forward a number of accepted practices which, if complied with, will mean those same aims will be achieved; these are referred to as the Deemed to Satisfy Provisions, commonly referred to as the DtS. If you meet the DtS then you meet the minimum standards in the BCA.

Sometimes, it is not practical or desirable to meet the DtS provisions and we need to look for alternatives. The BCA is a performance based document. This means that you do not have to meet the DtS word for word. Often there are alternative ways to tackle an issue as long as we can prove that they will achieve the aims of the BCA. These are referred to as Alternative Solutions.

Exercise

Assume that you have been presented with a house plan where the cladding is to be polystyrene board. It does not demonstrate compliance with Vol 2 part 3.5.3 of the BCA under the Deemed to Satisfy provisions. How would you determine compliance with the Performance Provisions of the BCA? Consider which clauses in the BCA relate to these and how you would apply each of these. Discuss this issue with your building surveying contacts. Find out how they would approach an application based on an alternative solution if it came before them for assessment. Consider where you might look for information and advice.

Other Information Sources

The BCA is a very important primary source of information. However it will not provide all the information that you need to consider when making an assessment of a building application or proposed building methods, materials and/or installation techniques. You will need to develop broad research skills. Potential sources of information may include formally recognized sources such as the Australian Standards and other documents adopted by reference in the BCA. However there is an enormous array of information sources that you may consult in your search for information in relation to specific issues that confront you in your work. These may include:

- Published reports, papers and books
- Websites
- Manufacturer's installation and operations manuals
- Technical manuals

Consultation with experts
Consultation with colleagues
Observation
Professional development training

The crucial consideration in your consideration of any research source is whether the source is credible. You must assure yourself that the people that you consult are suitably qualified and experienced in the field relevant to that advice; that published material is peer reviewed and has industry acceptance; that manufacturer's publications are supported by solid evidence; that your observations are relevant and applicable to the application under consideration.

Throughout your career in building surveying you should take nothing for granted. Always make sure that your decisions are based on sound research. Keep up to date with innovations in building materials and techniques. Make sure that your knowledge is current and that you have in place a strategy to keep informed of new developments in building products and legislation.

Trade Sequencing

This is a relatively simple task which you should be able to finish relatively quickly, but an important one none-the-less. You need to have a good understanding of the sequence in which buildings are constructed and how one trade impacts on another. This is particularly important when dealing with new techniques as there may be unforeseen impacts on the building sequence and processes.

Fortunately for us the BCA follows this sequencing in Part 3 to a degree so you've immediately got something to work from.

Exercise

Consider the stages and sequencing from commencement to completion of a residential building project.

Consider how a new building product or process might impact on that sequencing.

4. Unit Structure

The unit

In this unit and the assessments, we will consider three important phases of the building process:

1. Construction methods
2. Construction materials
3. Service Provision

The coursework will follow a logical pathway through the actual process of building:

- Research and sources of information
- Building identification
- Foundations and footings
- Supporting systems
- Enclosure/building envelope
- Fire safety
- Health and amenity
- Safe movement and access
- Energy efficiency
- Construction process and sequencing
- Context – differing locations and conditions.

This course is structured so that much of your learning is done through the assessments rather than the assessments being a test of what you have read. When completing the assessments, it is important to be mindful of the role that Building Surveyors play in the building process and what they are responsible for. You will also need to consider the extent of that responsibility and a little about how conducting proper research can help in protecting your professional reputation and your exposure to liability.

Although this can all sound a little daunting, you will find that conducting proper research and maintaining your knowledge will provide you with very clear direction as to how to tackle the many technical issues that you will encounter in your professional life.

While you will need to consult a wide range of information sources, the National Construction Code remains the principal source that will guide the application of your knowledge in your role as a Building Surveyor. The BCA steps things through very methodically and will be a faithful guide throughout this course and in your professional career. To keep things as simple as possible the assessments will generally follow the order

of the BCA (*start at ground level and work your way up*).

You should now work your way through the assessment tasks. As you do the assessments, you should continuously refer back to these notes, to the BCA, to websites and any other reference material that you find helpful. You should make contacts with professionals working in your area.

As you work your way through the assessments, keep in contact with your teachers and involve yourself in any forums or webinars that become available. Building Surveying is a collaborative occupation. The best building surveyors do not work in isolation but continually consult with other professionals from various building disciplines.

Assessments

There are five assessment tasks. You should complete them in order.

Three of the assessments (Tasks 2, 3 and 4) are in the form of research reports. You have some flexibility in the presentation of these reports and are encouraged to include photographs, diagrams and other attachments that support your observations and recommendations.

You are not expected to consider all available methods and materials. You will be expected to focus on those that are appropriate for the application outlined in the task. Then identify one major issue and provide research information in relation to that issue.

For example:

In relation to 'enclosing systems', you may decide to select corrugated metal as an appropriate cladding material.

Justify your choice as being appropriate to the application and then focus on the merits and methods of preparation, construction and installation for that application.

Consider any special requirements (if it is near the beach for example, what special treatment or installation techniques may be necessary to protect it from the corrosive environment)

Identify any relevant compliance issues that apply.

A suggested template for your reports is as follows:

Cover page

Identifies the research paper – heading, author, date

Index

Standard contents page – should show subject headings and page numbers

Introduction

General introduction – describes the purpose of the report and provides a general summary of the subject matter.

Information Sources

This section is optional – you may find it useful to provide a discussion on the extent and limits of information sources used in your research.

Site investigation and preparation

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Foundations and footings

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Structural and supporting systems

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Enclosing systems

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*

- *Installation methods*

Fire safety

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Health and amenity

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Safe movement and access

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Energy efficiency

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Services

- *Research findings*
- *Methods, systems and materials*
- *Compliance issues*
- *Installation methods*

Conclusion

References