

## Case study two: 2–4-storey attached houses

Estate agent Paula and entrepreneur Jess have bought a 720m<sup>2</sup> section in Dunedin, which they plan to develop into medium-density housing to provide accommodation.

Estate agent Paula and entrepreneur Jess have bought a flat, 720m<sup>2</sup> L-shaped section in Dunedin near the hospital. They plan to develop the land for MDH to cater to medical staff and other people who need accommodation near the hospital. They have some experience in residential development, but not on this scale.

### Specialists needed

Paula and Jess have approached a reputable architectural firm, which has given the job to a suitably experienced registered architect who is considered a Level 3 Design LBP for the purposes of restricted building work.



They have already been granted a bank loan, but don't intend to invite tenders from builders until they have finalised the design for the project.

Paula and Jess have commissioned a quantity surveyor to complete a feasibility study. The quantity surveyor has estimated the land can accommodate 10 apartments if each apartment has two storeys and the apartments are stacked to create a four-storey building.

Jess has agreed to project manage the development. The various consultants involved with the project will rely on Jess to ensure they get the information they need, within deadline, to complete their pieces of the design.

The architect recommends a structural engineer, because the building will be over 10 metres tall and therefore sits outside the scope of NZS 3604 (Timber-framed buildings). Paula and Jess engage the structural engineer for foundation design, the intertenancy walls and the floors. On the structural engineer's advice, a geotechnical engineer is also engaged to assess the site conditions before the foundations and other structural elements are designed.

## Demonstrating compliance with the Building Code

As one of the first steps in the development of the project, Jess visits the Building Performance website to read about how the Building Code works. Jess then arranges to sit down with the architect to work through how the design will meet each clause of the Building Code.

### B1 Structure

The framing will combine structural steel and timber, and will use concrete block for the intertenancy floors and walls. To ensure compliance with Building Code clause B1 Structure, the concrete block will be designed in accordance with NZS 4230 (Design of reinforced concrete masonry structures).

### C Protection from fire

A fire engineer is engaged to ensure compliance with Building Code clause C Protection from fire. The fire engineer will advise on the design needed to comply with egress requirements and the fire ratings needed for intertenancy walls.

While each unit will have an independent means of escape, there is also a stairwell in the common area.

Acceptable Solution C/AS2 will be used for the units to ensure compliance with C Protection from fire.

### D1 Access routes

The stairwell will be designed using Acceptable Solution D1/AS1.

## C6 Structural stability

The fire and structural engineers will need to work together to ensure the design complies with C6 Structural stability. Either the architect, as lead consultant, or Jess, as the project manager, should coordinate meetings between specialists.

In the early stages of the design, Jess arranges a pre-application meeting with the BCA. The architect, fire engineer and structural engineer accompany Jess to the meeting to help explain the details of the project and how it will satisfy all Building Code requirements. The consenting officer informs Jess that a producer statement and supporting evidence will be needed for the cladding system, and that the proposed fire design will need to be peer reviewed to ensure code compliance.

Read more about producer statements (<https://www.building.govt.nz/projects-and-consents/apply-for-building-consent/support-your-consent-application/producer-statements/>)

## G Services and facilities

The architect decides to consult a services engineer to ensure the building design complies with Building Code clause G Services and facilities.

To design the plumbing and drainage, the services engineer follows NZS 3500 (Plumbing and drainage).

To design an internal ventilation solution, the services engineer follows AS/NZS 1668 (The use of mechanical ventilation and air-conditioning in buildings).

## H1 Energy efficiency

The design includes pipes and other services running through the building. The services engineer coordinates with the fire and structural engineers to limit clashes with the structural and fire design, and carries out energy efficiency calculations to ensure compliance with Building Code clause H1 Energy efficiency.

## E Moisture

Jess and the architect discuss compliance with Building Code clause E Moisture. Because the building is above 10 metres in height, the architect can't use Acceptable Solution E2/AS1 to demonstrate compliance with E2 External moisture. Instead, the architect uses a specific design and works with a reputable supplier of cladding systems. The supplier provides a producer statement to Jess and the architect stating that the product complies with the Building Code.

The site has a catchment area of less than 0.25 hectares, is free from a history of flooding, is not adjacent to a watercourse, and is not located in a low-lying area or in a secondary flow path. As a result, the architect can use Acceptable Solution E1/AS1.

This will ensure compliance with E1 Surface moisture. He refers to the NZ Metal Roof and Cladding Code of Practice for the design of gutters, downpipes and roofing.

Check out the NZ Metal Roof and Wall Cladding Code of Practice (<https://www.metalroofing.org.nz/cop>)

### Specialists needed

Jess and the architect also engage a civil engineer. The civil engineer focuses on what's needed below ground together with site works such as culverts and drains in the carpark, the curb, and the connection to the road and existing services. The civil engineer works closely with the services engineer and the structural engineer to ensure the plan for the underground services will work with their designs.

## G6 Airborne and impact sound

Jess is keen for the design to exceed Building Code requirements in relation to G6 Airborne and impact sound because she's read that consumers expect a better acoustic environment than prescribed by the Building Code (BRANZ Ltd Study Report SR381).

### Specialists needed

She asks the architect about engaging an acoustic engineer, but the structural engineer has used a concrete slab and masonry walls that are strapped and lined between tenancies, which is very effective at reducing noise transfer and complies with Acceptable Solution G6/AS1.

The architect has also taken care to design around drainage stacks to maximise acoustic isolation from bathroom, laundry and kitchen use.

## Applying for building consent

As the building owners, Paula and Jess are legally responsible for lodging the building consent application. In her role as project manager, Jess has agreed to lodge the application and ensure each code clause has been met and the relevant documentation included. The BCA's website has information on how to apply and a checklist of what needs to be provided.

Applying for building consent is a big job, but Jess has built it into her timeline and sought guidance from the architect and other specialists. She also visits the Building Performance website to find out more about applying for building consent.



New Zealand Government

This information is published by the Ministry of Business, Innovation and Employment's Chief Executive. It is a general guide only and, if used, does not relieve any person of the obligation to consider any matter to which the information relates according to the circumstances of the particular case. Expert advice may be required in specific circumstances. Where this information relates to assisting people:

- with compliance with the Building Act, it is published under section 175 of the Building Act
- with a Weathertight Services claim, it is published under section 12 of the Weathertight Homes Resolution Services Act 2006.