Showing compliance

Mid-rise buildings – those that fall within a 10–25 m height range – are outside the scope of detailing solutions such as E2/AS1 and NZS 3604:2011 *Timber-framed buildings*. However, they are often not considered tall enough or complicated enough to warrant the involvement of specialist design consultants such as fire or façade engineers.

A CHALLENGE with mid-rise buildings for designers is demonstrating compliance with the Building Code at the consenting stage and how to deliver a building that actually works.

Here are some suggested steps:

1. Determine which Building Code clauses apply to the proposed building. For mixed-use buildings, have a firm idea of the uses upfront.
2. Determine which, if any, Acceptable Solutions and Verification Methods are applicable to the proposed building given its location and height. For example, Acceptable Solutions and Verification Methods for the following Code clauses are likely to be directly applicable to mid-rise buildings:
   - B1 *Structure*
   - B2 *Durability*
   - C *Protection from fire*
   - D1 *Access routes*
   - D2 *Mechanical installations for access*
   - E1 *Surface water*
   - E3 *Internal moisture*
   - F4 *Safety from falling*
   - F6 *Visibility in escape routes*
   - F7 *Warning systems*
   - F8 *Signs*
   - G4 *Ventilation*
   - G6 *Airborne and impact sound*
   - G7 *Natural light*
   - G9 *Electricity*
   - G13 *Foul water*
   - H1 *Energy efficiency.*

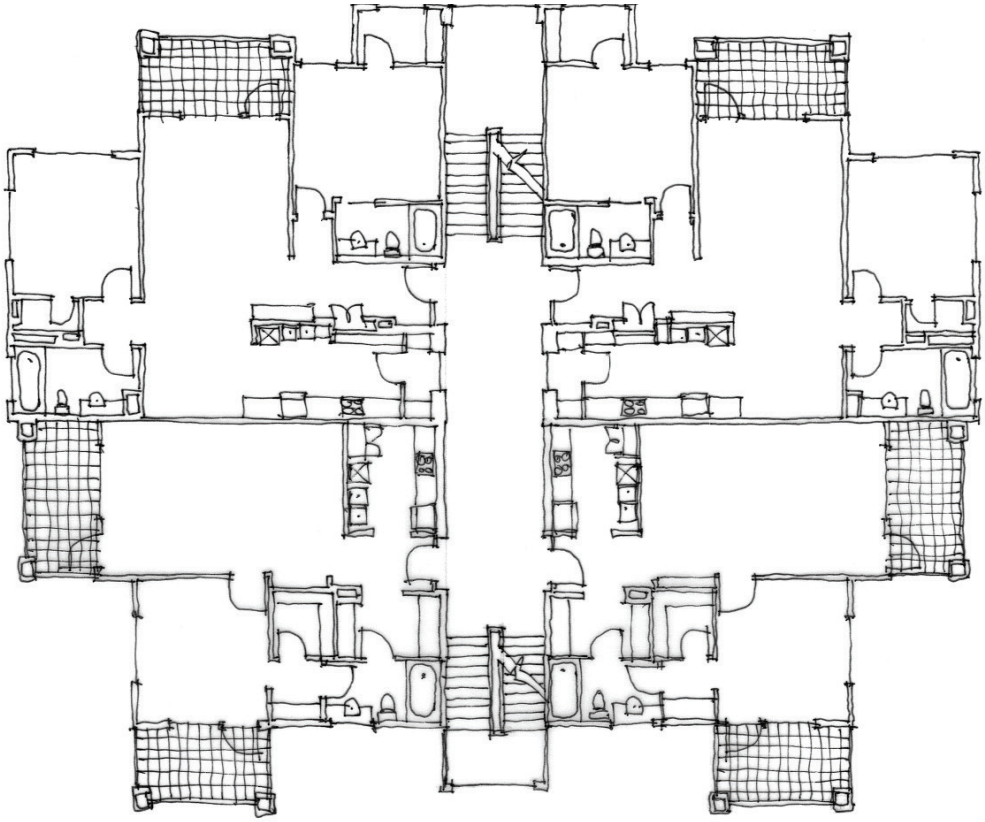
   Depending on building usage, other clauses such as G14 Industrial liquid waste and G15 Solid waste may also be applicable.
3. Set up the design team with the appropriate experts.

4. Identify relevant supporting information with respect to material and component specification.
5. Identify and consult with contractors who have a proven track record in the (satisfactory) construction of mid-rise buildings.

Key aspects

These key aspects need to be determined before the options to demonstrate compliance are formulated:

- Design wind speed – if it is within the parameters of NZS 3604:2011, which many mid-rise buildings may be, using E2/AS1 for flashing details or having similar flashings may be an appropriate option. (Many low-rise buildings are outside the scope of E2/AS1 because of their design wind speed.)
- Proposed window system – framed windows, structural glazing, curtain wall, etc. Is the design wind speed within the limits for glazing tested under NZS 4211:2008 *Specification for performance of windows* or is specific testing required?
- The maximum permitted inter-storey drift (determine this early and then design for it).
- Ensuring the structural design can accommodate multiple uses within the building without compromise – for example, basement parking and vehicle access, retail spaces and/or apartments.
- The proposed method of providing an air barrier component of the cladding system.
- The ability of the cladding system to resist design wind pressures and accommodate inter-storey drift as building height increases.
- The presence and detailing of known high-risk features – balconies, parapets,



One option for apartments in a stand-alone mid-rise apartment block.

internal gutters, complexity.
- The ownership structure of the completed building – for example, one owner or unit titled.
- Daylighting and ventilation of spaces within the building especially with wider building footprints.
- For residential buildings, access to individual dwelling units – for example, are long corridors aesthetically or visually acceptable?
- Vertical transport options within the building and their location/number.
- Identification of specified systems within the building.

Compliance path options

There are a number of ways that Building Code compliance can be demonstrated for mid-rise buildings:
- Expert professional evaluation of the design and performance of the proposed building – specialist façade design, acoustic design and structural design.
- The use of CodeMark or appraised products and systems provided their use is within the scope of the appraisal or CodeMark certification.
- Using systems, components, materials and details that have a proven successful history of use (structure, weathertightness, durability) in mid-rise buildings.
- Design to a specific standard that is applicable in New Zealand.
- Relevant overseas testing or performance data from a reputable source.
- Specific testing of components to a recognised standard in an accredited testing facility.
- An MBIE determination.

Options to show compliance:
- B1 *Structure* – specific design using AS/NZS 1170 *Structural design actions* set, NZS 4211:2008 for window testing, NZS 3101.1&2:2006 *Concrete structures standard*.
- B2 *Durability* – manufacturer-supplied verified information such as a BRANZ Appraisal.
- E2 *External moisture* – AS/NZS 4284:2008 *Testing of building facades*, NZS 4211:2008, NZS 4223 *Glazing in buildings* set.
- C *Protection from fire* – Acceptable Solutions or specific fire engineering design using the fire engineering brief (FEB) process and C/VM1, C/VM2.
- D1 *Access routes* – D1/AS1.
- D2 *Mechanical installations for access* – D2/AS1 *Passenger carrying lifts* cites NZS 4332:1997 *Non-domestic passenger and goods lifts* as modified by the Acceptable Solution, D2/AS3 *Escalators and moving walks* cites EN 115 *Safety of escalators and moving walks. Construction and installation*.
- H1 *Energy efficiency* – NZS 4243:2007 *Energy efficiency – Large buildings* for commercial building thermal performance. There is currently no specific means of compliance for apartments.
- G6 *Airborne and impact sound* – limited solutions in G6/AS1 for specific acoustic design.
- G13 *Foul water* – G13/VM1 (references BS EN 12056.2:2000 *Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation* for sanitary plumbing), G13/AS1 for sanitary plumbing, G13/AS2 for drainage, AS/NZS 3500 *Plumbing and drainage – Part 2: Sanitary plumbing and drainage* as modified by G13/AS3.