Designing wing wall construction without specific engineering design

Guidance document

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This guidance has been developed to:

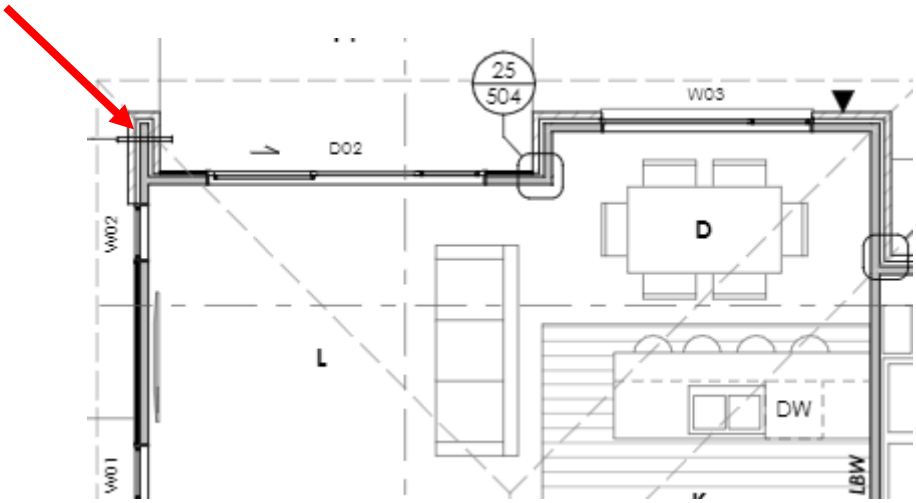
- provide guidance for designers to consider when detailing foundations, wall structures and the connecting roof structures for wing walls when using NZS 3604:2011 as their means of compliance, and
- provide a reference document for Selwyn District Council (SDC) Building Surveyors when assessing compliance with B1 structure.

This information does not apply to foundations for specific engineering design (SED) slabs such as raft slabs, however, the guidance in relation to the wall structures and the connecting roofs is still applicable.

Where there is specific engineering design (SED) for a project for the wingwall foundation and/or wall structures the SED overrules this guidance.

Wing wall definition

For the purpose of this guidance wing walls are defined as isolated external walls of buildings that are connected to a foundation projecting from a floor slab and tied at the top by roof framing.



These wall projections are common in residential construction, however their compliance with the generally used construction standard NZS3604:2011 is not easy to define.

Engineering background to guidance

This guidance has been developed in consultation with SDC contracted structural engineers.

The intention is to set minimum and maximum parameters that would apply to wing walls in order that Selwyn Council Building Surveyors can have confidence that they fit within the engineering principles of the NZS3604 standard.

Structural engineering considerations are:

- the floor slab requirement of section 7 only allow for a fully enclosed perimeter and doesn't allow for an isolated projecting foundation,
- the wall framing may be carrying cladding on both sides which is potentially outside the wall framing scope for weight loads,
- the isolated wall has lateral support and the roof structure must be assessed for how it provides for this,
- the isolated wall is carrying or resisting roof loads and the foundation must provide for this,
- the wing wall may be detailed as a bracing wall which apply loads that have to be considered, and
- wingwalls typically include nibs above the foundation for durability of framing.

Specific detailing requirements of the guidance

The following scope limitations and the required detailing is a result of the engineering consultation.

It defines what can be approved by SDC Building Surveyors unless additional specific engineering design (SED) is provided.

Foundation requirements

Note: these do not apply where slabs are SED such as raft type slabs, or where ground conditions do not meet the "good ground" scope of 3604.

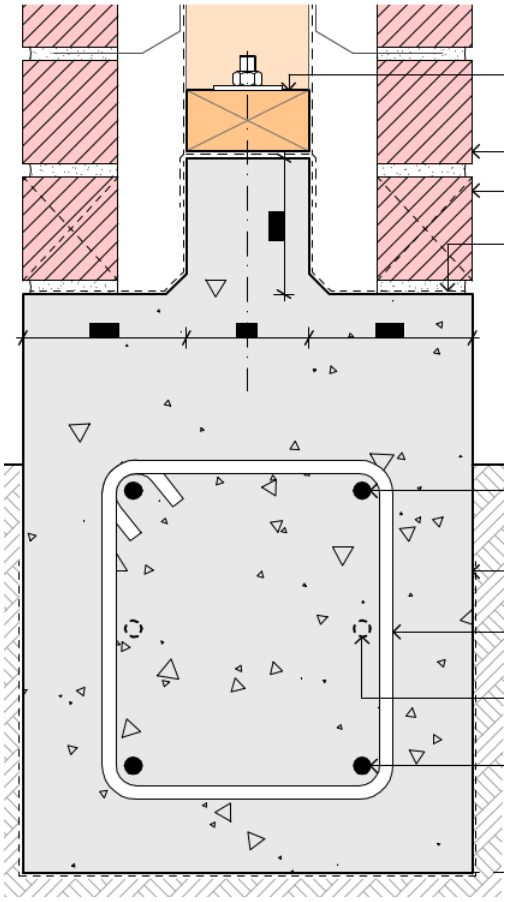
This applies to:

- single level importance level 1 and 2 buildings, and
- only to concrete slabs – not to timber floor buildings.

Requirements:

- Maximum foundation projection is 1200mm from face of slab
- Foundation minimum dimensions 600mm deep overall (excluding nibs) and 400 wide
- Minimum reinforcing 4 D12 rods in stirrup cage – with reinforcing to extend into attached foundation by 60 x diameter (e.g. 60 x D12ø = 720mm lap)
- Minimum nib width 130mm and maximum nib height 200mm

- Nib to be:
    - reinforced with one horizontal rod – min D10, and
    - tied to foundation either by vertical starters 600C max, or by cast in cranked bolts that are used to hold down wall plates
- Concrete 17.5MPa min



Above diagram is example section through typical wing wall (indicative only)

Wall framing requirements

- Wind-zones up to very high permitted
- Earthquake zones limited to 1, 2, and 3 – zone 4 requires SED
- Wall length maximum 1200mm
- Framing dimensions 140x45mm SG8 minimum unless framing is two separate 90x45mm walls each selected to table 8.2
- Wall height maximum 3000mm
- Walls must be tied by roof and soffit construction
- Sloping soffits allowable up to 30 degrees
- Bracing walls not permitted that require hold down brackets if on the nib walls
- All cladding weights allowed for up to 90 series brick.