Jacobsen Dincel® Structural Walling Formwork

DESIGN GUIDE

Version 1.0. November 2021

Jacobsen®

GENERAL AND PRODUCT INFORMATION

PURPOSE

This design guide relates to the design of Jacobsen Dincel® Structural Walling Formwork system and the Dincel® Structural Walling Basement Formwork (the Dincel® system).

IMPORTANT DOCUMENTS

This guide must be read in conjunction with:

- the Jacobsen Dincel® Structural Walling System pass™
- the Jacobsen Dincel® Structural Walling Wall Formwork Specification guide or the Jacobsen Dincel® Structural Walling Basement Formwork Specification guide
- relevant Dincel® Structural Walling details
- the Jacobsen Dincel® Structural Walling System Installation guide
- the Jacobsen Dincel® Structural Walling System Installation record
- the Jacobsen Dincel® warranty.

SKILLS REQUIRED

This guide is suitable for use by a designer who is a licensed building practitioner licensed to the relevant class or deemed LBP.

FOR MORE HELP

Technical assistance is available at www.jacobsen.co.nz.

While all reasonable efforts have been made to ensure the accuracy of information provided, this guide is a guide only. It may be subject to change.

FOR OUR WARRANTY

Refer to www.jacobsen.co.nz.

PRODUCT DESCRIPTION

The Dincel® system comprises lightweight, rigid, hollow re-engineered PVC panels, floor tracks and specialist components that snap-lock together. The structure is made watertight when the core is filled with concrete and steel reinforcement. It is a time and cost-efficient alternative to the traditional masonry block, precast and concrete formwork.

The PVC components are provided to create four wall thicknesses (110 mm, 155 mm, 200 mm and 275 mm).

The Dincel® system reduces concrete cracking by reducing evaporation time during curing (eliminating plastic shrinkage cracking). The combination of the continued cement hydration process and a reduced water/cement ratio concrete mix results in early tensile and compressive strength capacity and less porous concrete. These characteristics are maintained over time.

It can be finished by adhering an acrylic render, an overlay cladding, or insulation sheet, directly to the Dincel®. The uniform finished polymer surface can also be painted.

SCOPE AND LIMITATIONS

For scope of use, limitations, conditions and statement of building code compliance, refer to the Jacobsen Dincel® Structural Walling System pass™.

pass

MORE INFO

DESIGN

Design the Dincel® system using the following steps. While the Dincel® system can be specified by a designer who is a licensed building practitioner licensed to the relevant class, it is anticipated that the design work is carried out by a structural engineer in order to establish ground conditions, calculate loads, design the foundation and design the wall structure.

STEP 1:	**CONFIRM SCOPE**
	Confirm the proposed use is within the scope and limitations of the pass™.
STEP 2:	**ESTABLISH GROUND CONDITIONS**
	Establish the ground conditions for the proposed site in accordance with a geotechnical report or other information.
STEP 3:	**CALCULATE LOADS**
	Calculate loads for the proposed building in accordance with NZS 1170:2002 or NZS 3101:2006. This includes liquid pressure, groundwater and earth pressure loads where the system is to be used below ground and/or below the water table.
STEP 4:	**DESIGN THE FOUNDATION**
	Design a foundation in accordance with NZS 3101:2006 or specific design. The foundation must be suitable for the ground conditions at the site and the calculated design loads for the building. Ensure starter bar centres are as per engineer recommendations The design must provide for permanent waterproofing of the foundation and wall junction where the Dincel® system is used below ground and/or below the water table. Where the Dincel® system is used below ground and/or below the water table , the design must provide for permanent waterproofing of the joints where snap-lock joints are not used. The design must also include subsoil drainage to an approved outfall in accordance with Acceptable Solution B1/AS1 or to a specifically designed subsoil drainage, where the Dincel® system is used below ground and/or below the water table. Alternatively, pre-engineered retaining wall designs for the Dincel® system 200 mm profiles are available, which include calculations and a PS1. Refer to www.jacobsen.co.nz.
STEP 5:	**DESIGN THE WALL STRUCTURE**
	Design the reinforced concrete wall structure in accordance with NZS 3101:2006, taking account of the Dincel® panel sizes appropriate for the application. There are four set sizes that create wall thicknesses of 110 mm, 155 mm, 200 mm and 275 mm. The design must take account of relevant applied loads, including environmental loads, axial loads, shear loads, roof loads, lateral earth pressure, and surcharge loads. The design must specify width, minimum cement and aggregate properties, and the diameter and tensile strength of the reinforcing steel. Specify the Dincel® panel sizes and components for the application. Alternatively, pre-engineered retaining wall designs for the Dincel® system 200 mm profiles are available, which include calculations and a PS1. Refer to www.jacobsen.co.nz.

STEP 6:	**ESTABLISH FIRE REQUIREMENTS** Establish the fire requirements for the proposed building and confirm the design meets all relevant Building Code requirements in respect of Clause C Protection from Fire. The Verification Method C/VM2 can be used. The Dincel® system has a classification of Group 1-S in accordance with C/VM2.
STEP 7:	**ESTABLISH ACOUSTIC REQUIREMENTS** Establish the acoustic requirements for the proposed building and confirm design meets the requirements of Clause G6.3.1 of the Building Code. The Acceptable Solution G6/AS1 can be used. For acoustic properties of the Dincel® system refer to: › 110 mm profile [link] https://jacobsen.co.nz/media/uploads/products/plytixasset/Dincel_110_profile_acoustic_testing__day_design__-_5580-1.1_6Mp8UzQ.pdf › 155 mm profile [link] https://jacobsen.co.nz/media/uploads/products/plytixasset/Dincel_155mm_profile_acoustic_testing__day_design__-_5880-4_IUhtxJ8.pdf › 200 mm profile [link] https://jacobsen.co.nz/media/uploads/products/plytixasset/Dincel_200mm_profile_acoustic_testing__day_design__-_5880-3_QbJuyEt.pdf.
STEP 8:	**DESIGN THE SERVICES** Confirm the required services e.g., electrical, plumbing. Detail the installation method, location of penetrations and any specific waterproofing or protection from fire requirements.
STEP 9:	**SELECT RELEVANT DETAILS** Select the relevant Dincel® system details www.jacobsen.co.nz/downloads
STEP 10:	**DOCUMENTATION AND QUALITY CHECK** Check all relevant design requirements are met. Check all required documentation for the building consent application is collated and that the building consent plans clearly define and include: › foundation design › reinforced concrete wall design › Dincel® panels selections and relevant details. Complete the relevant Jacobsen Dincel® Structural Walling Specification guide (wall formwork or basement formwork), ensuring all relevant information is included with component quantities.

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