

Schematic Design Report Structural Engineering

Jindabyne Education Complex

80821348-05



Prepared for
SINSW

3 December 2021

Contact Information

Cardno (NSW/ACT) Pty Ltd

ABN 95 001 145 035

Level 9 - The Forum

203 Pacific Highway

St Leonards NSW 2065

Australia

www.cardno.com

Phone +61 2 9496 7700

Fax +61 2 9439 5170

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1 Proposal

The proposed development is for the construction of the Jindabyne Education Campus comprising a new primary school and a new high school at Jindabyne (the proposal). The proposal is located within the JSRC located at 207 Barry Way (the site) and will accommodate approximately 925 students with the capacity for expansion in the future.

The new primary school will be located generally in the northern portion of the site whilst the new high school will be to the south of the site. While the schools are inherently separate identities, with separate student entries, opportunities for integration are provided in a central shared plaza with co-located school administration facilities, as identified in Figure 1 below. This outdoor learning space is activated by the school canteen (shared) and separate core facilities including the primary school hall and library, and the high school gym and library, and provides opportunities for shared community use.

The new primary school will provide for a Core 21 school. This will comprise of 20 home base units and 2 support learning units, administration and staff facilities, covered outdoor learning area (COLA), hall, staff and student amenities, out of school care facilities, library and special programs. Landscaped areas include active and passive open space play areas, and a games court.

The new high school will provide for a stream 2 high school. This is to comprise of 20 general/specialised learning spaces and support learning units, administration and staff facilities, covered outdoor learning area (COLA), hall, staff and student amenities, library, an agricultural learning unit. Landscaped areas include active and passive open space play areas, a sports field and multipurpose games courts.

A new access driveway is proposed off Barry way Road along the western boundary of the site and includes car parking, bus and private vehicle drop-off zones, and delivery zones.

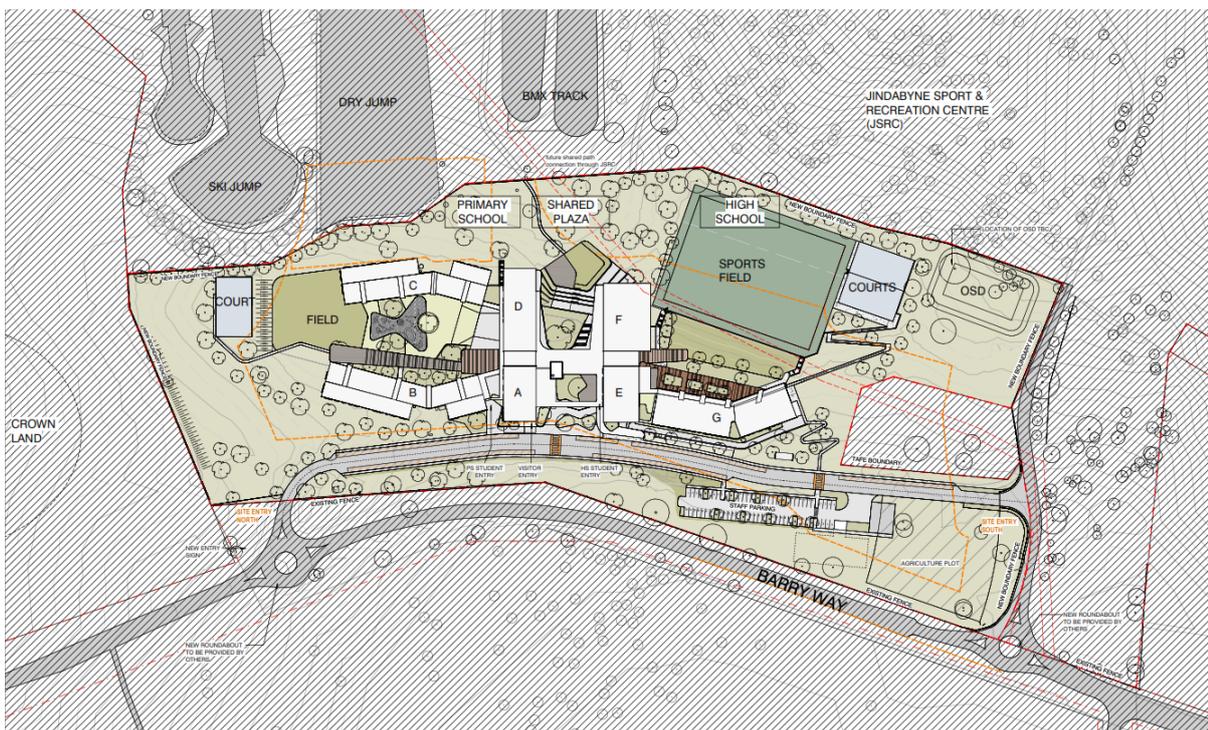


Figure 1-1 Proposed site plan

2 Site description

The site of the proposed new education campus at Jindabyne is located within the western extent of the existing JSRC at 207 Barry Way (101 DP1019527). The site is located within the Snowy Monaro Regional

Council local government area and is approximately 2.2km south of the Jindabyne town Centre. A site aerial is provided in **Error! Reference source not found.**

The site is approximately 9ha in size, containing a former golf course and three existing workers cottages which were occupied during the construction of the Snowy Hydro Scheme. The majority of the site is undeveloped and contains maintained grasslands and scattered trees. Much of the surrounding land comprises remnant grassland, woodland and agricultural land.

As identified above, the site is within the existing JSRC which is a high performance and community sport centre located directly east of the site. The JSRC has a range of sporting facilities including a synthetic running track, cycling track, netball and tennis courts, fitness and indoor sports centres, and sporting ovals, as well as other services and accommodation facilities. The newly constructed BMX track is located directly east of the site with the new ski jump currently under construction to the northeast.

TAFE NSW have recently lodged a development application for a Connected Learning Centre (CLC) and Mobile Training Unit (MTU) which is proposed to the south of the site. The CLC and MTU will utilise interactive, digitally enabled, flexible, and multipurposed learning environments to provide high-quality training and learning experiences accommodating a maximum of 20-25 students and 3 teachers.

The surrounding locality is generally rural in character with other land uses also including the Jindabyne Aero Club located to the west of the site on Tinworth Drive, an industrial area to the southwest and the Jindabyne Community recycling centre is located east of the JSRC.

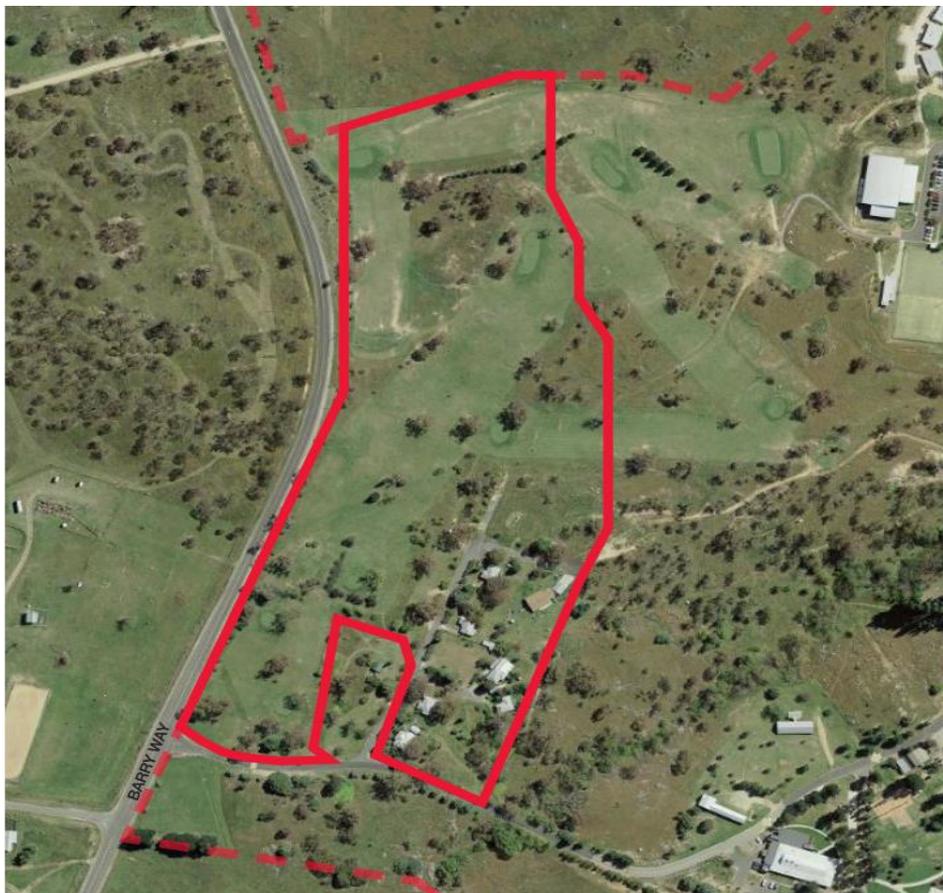


Figure 2-1 Site aerial: Source – DJRD

3 Structural Engineering

3.1 Review of existing information

3.1.1.1 Geotechnical investigation report

A geotechnical investigation report on expected foundation conditions has been completed, ref Douglas Partners report ref 103109.02 dated June 2021. Foundation conditions are:

- Topsoil: potentially up to 0.1-0.3m overlaying,
- Fill and natural soils up to depths of 1.5m overlaying,
- Variable very low strength to high-very high strength granodiorite/tonalite from depths of 0.2 to 1.5m to 0.6m to 3.6m in all but two test pits. rock: likely to be initially low to medium strength grading to stronger with depth.

3.1.1.2 Contamination investigation report

A report on "Limited Intrusive Investigation (Contamination)" has been completed, ref Douglas Partners report ref 103109.03 dated June 2021.

Potential asbestos containing materials were identified.

The report recommends that further intrusive investigations be carried out to on the sites identified to contain asbestos containing materials and other areas of the site with the same potential source of contamination.

The report concludes that the site can be made suitable for the proposed development subject to the additional recommended investigation and subsequent remediation or management if considered necessary.

3.2 Design loads

3.2.1 Live Load

The following live loads are used as derived from AS1170.1:

- Classrooms: 3.0kPa
- Offices: 3.0kPa
- Halls: 4.0kPa

3.2.2 Site specific wind loads

Wind loads are derived using AS1170.2 based on Region A4 for, V_{1000} (ultimate) and V_{20} (serviceability) for a Terrain Category of 2 ("open terrain, including grassland, with well scattered obstructions having heights generally from 1.5m to 5m, with no more than two obstructions per hectare, e.g farmland and cleared subdivisions with isolated trees and uncut grass"),

3.2.3 Site specific design loads -snow

Ground snow loads (Sg) are specified in "AS1170.3 Snow and ice actions" and are based on the region as specified in Section 2. Jindabyne falls under the category of a "sub-alpine" region.

Snow loads on the roof are calculated based on the characteristic value of snow load on the ground, the exposure reduction coefficient and the roof shape coefficient. Additional consideration is required for snow overhanging the edge of the roof and any obstructions such as snow guards that may result in accumulation of snow loads.

3.2.4 Site specific design loads -earthquake

Earthquake loads are calculated based on the following:

- Annual probability of exceedance = 1:1000
- Probability Factor (Kp) = 1.3
- Hazard Factor (Z) = 0.09
- Sub-Soil Class = Be

3.3 Schematic design

3.3.1 Design description

The proposed buildings range from single storey to a maximum of 3 stories high. Structural grids are at 9m x 7.5m and based on using “kit of parts” construction, post-tensioned suspended slabs and steel framed roofs.

Footings are founded on rock. The rock is generally very shallow below existing ground level, however, depth of fill required to raise levels has led to the design of suspended ground floor slabs on fill as form to avoid Level 1 compaction.

A brief description of the various buildings is provided below:

3.3.1.1 Primary School PS.B1, PS.B2, PS.C1 and PS.C2

The buildings are single story.

The following options for the ground floor slab have been investigated:

- > External ground level raised to match internal floor level: Suspended slab on fill as form (as drawn)
- > Batters under the floor level: Steel framed with 19mm particle board and 24mm CFC cladding to give a “concrete feel”.

The roof is steel framed with a single row of internal columns. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls.

3.3.1.2 Primary School Administration PS.A

The building is two storeys. The ground floor slab is a suspended slab on fill as form. Level 1 suspended slab is a post-tensioned slab with band beams.

The roof is steel framed with a single row of internal columns. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls.

3.3.1.3 Primary School Library PS.D

The building is a large single storey building with an internal mezzanine floor. The ground floor slab is a suspended slab on fill as form with a fully suspended section at the eastern end. The following options for the mezzanine floor have been investigated:

- > Bondek slab on steel frames (as drawn)
- > Steel framed with 19mm particle board and 24mm CFC cladding to give a “concrete feel”.

The roof is steel framed with a single row of internal columns. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls.

3.3.1.4 High School Administration HS.A

The building is two storeys. The ground floor slab is partly on grade and partly suspended slab on fill as form. Level 1 suspended slab is a post-tensioned slab with band beams.

The roof is steel framed with a single row of internal columns. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls.

3.3.1.5 Gym HS.B

The building is single story with a part basement floor. The basement slab is suspended on fill as form. The ground floor suspended slab is a post-tensioned slab with band beams.

The roof is steel framed with two internal columns located within partitions and two transfer trusses. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls.

3.3.1.6 High School HS.C1

The building is two storeys. The ground floor slab is on grade. Level 1 suspended slab is a post-tensioned slab with band beams.

The roof is steel framed with a single row of internal columns. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls.

3.3.1.7 High School SH.C2

The building is two storeys. The ground floor slab is partly on grade and partly suspended slab on fill as form. Level 1 suspended slab is a post-tensioned slab with band beams.

The roof is steel framed with a single row of internal columns. Lateral stability is provided by a fully braced roof and vertical bracing on the external walls