

7.10.21 – R02

Hailiang Property Group
PO Box 169
St Peters NSW 2044
Attn: Barney Oros

Dear Barney,

Re: 445-459 Canterbury Road | Campsie Private Hospital Development

Northrop Engineers have been engaged by Hailiang Property Group to provide advice regarding appropriate allowances that should be made for building services zones in the ceiling space and on the roof, as well as structural floor thicknesses, to assist in establishing floor-to-floor heights for the above development.

We have reviewed drawings prepared by Team2 for DA submission including the massing section below for context:

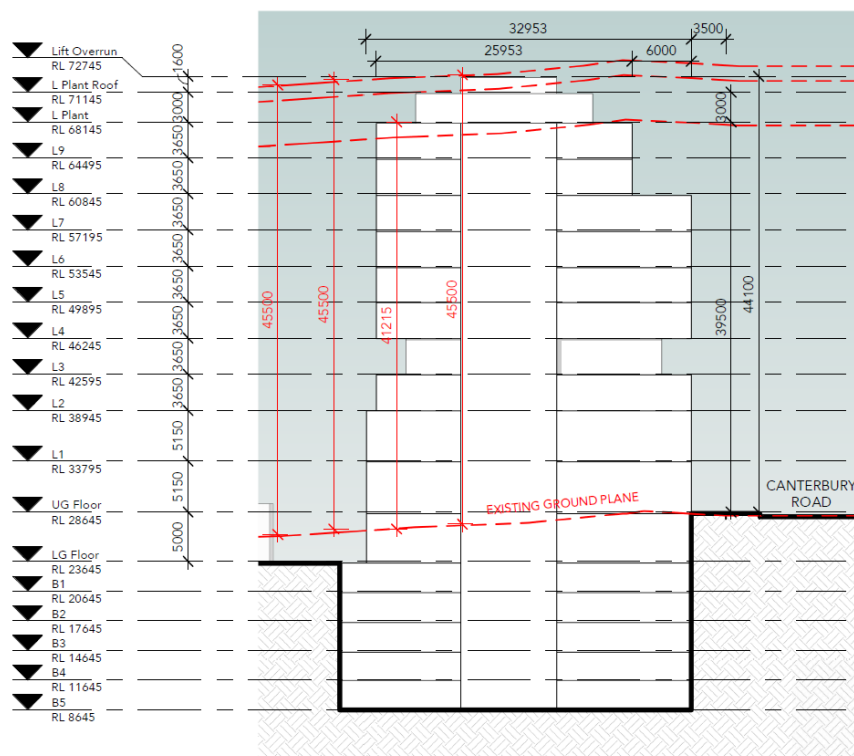


Figure 1: Massing Section prepared by Team2

Ground and Level 1 are proposed to contain retail and operating theatre areas, with upper levels consisting of in-patient and consultancy services.

From our experience working on health projects of a similar scale, we believe the floor-to-floor heights proposed by Team2 appear reasonable. For your reference we have provided typical allowances we recommend for building services zones and structural floor thicknesses below.

Operating theatres:

- Building services including mechanical, electrical, fire, hydraulic and medical gasses typically require a zone of 1-1.2m in the ceiling space in operative theatres and other hospital spaces requiring high sterile environments including isolation rooms.
- The building structure typically consists of 250-300 deep concrete post-tensioned floor plates, supported by a column grid of approximately 8.5m. Some areas may require additional structure to resist footfall vibration for sensitive equipment.

In-patient recovery areas, patient consultancy areas, general purpose clinical areas:

- Building services require a zone of 750mm-1.2m to allow for medical gasses, significant mechanical ductwork and framing for equipment including bariatric hoists, curtains, etc.
- As above, the building structure typically consists of 250-300 deep concrete post-tensioned floor plates, supported by a column grid of approximately 8.5m.

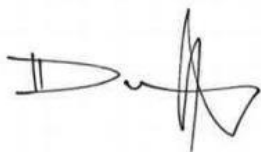
Roof plant

- An appropriate allowance for building services plant on the roof is 3m for plant plus 1.6m above this for a single lift shaft overrun. Lift access to the roof is likely to be necessary for ongoing plant and equipment maintenance. This is shown in the Team2 concept sections and drawings.

Our recent health experience includes engineering design services for Nepean Private Hospital, Hermitage Health Care, Westmead Hospital, North Shore Health Hub and Manly Hospice.

We remain available if you have any further questions.

Kind regards,



Isabel Duffy

Associate | Structural Engineering Group
Manager
BE Civil w Arch Hons MIEAust CPEng NER



Peter Young

Principal | Mechanical Engineering Group
Manager
BE Mech MIEAust CPEng NER