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CONSULT AUSTRALIA
Member Firm

Ref:6068:RY:rp

13 June 2018

Owners Corporation SP 7114
C/- Premium Strata
Suite 404, Level 4,
64-75 Kippax Street
Surry Hills NSW 2010

Dear Sir/Madam

**MANLY NATIONAL BUILDING**
**PROPOSED CARPARKING COVERING**
**22 CENTRAL AVENUE, MANLY**

As requested we have reviewed your proposal to add lightweight carpark coverage to areas of the National Building, 22 Central Avenue Manly.

We confirm receipt of the following documents.

- Structural drawings prepared by Wargon Chapman & Associates
  Ref 6805 S106D, S107D, S108D, S109B, S110B, S111A, S131B, S132B, S133B, and cover sheet.

- ABACUS Shade Structures quotation dated 17 October 2017.

- STRATCO quotation dated 18/10/2017.

- Architectural drawings prepared by Frank Fox & Associates A102F, A103B, A104 Project 6805.

The building at 22 Central Avenue is a multilevel residential tower.

Ground floor consists of retail premises, floors 1, 2, 3 & 4 consist of carparking.

You have advised that you wish to erect lightweight roof structures over areas of the level 4 carparking not covered by the residential tower above.

Two quotes have been received by the Body Corporate. We have referred to them as ABACUS and STRATCO.

## OBSERVATIONS

Mr Richard Yates attended site to inspect the level 4 areas proposed for roofing. In general, the layout and visible construction of the building appeared to be consistent with the structural and architectural drawings provided.

The building is constructed from conventionally reinforced concrete.

With reference to the structural drawings. The carpark areas are nominated to have a live load capacity of 60 1b (pounds)/sq ft. This is equivalent to approximately 2.9kPa. This is consistent with the historical loading requirements for carparks (3kPa). We note that the loading code has subsequently changed to nominate the minimum load capacity of a car park to be 2.5kPa (1kPa equals 100kg/sqm).

The carpark slabs are detailed as 230mm thick with continuous top and bottom reinforcement. Reinforced concrete upstands/beams are located along the edges of the carpark.

The thickness of and reinforcement in the upstands varies depending on the location on the building. This prime function is to serve as a barrier to prevent cars driving off the roof as well as a slab edge stiffener/support.

## STRATCO

The Stratco quote describes basic portal framed roofs over the car spaces. Columns are indicated along both the rear of the carparking area as well as the front (aisle) side.

Lateral stability appears to be achieved through rigid connections between the new steel columns and beams.

The weight of the system is estimated to be less than 0.5kPa.

Columns are nominated at 5450 centres however they appear to be at 4100 in the sketch plans.

We note that 5 carparking spaces are located beneath the proposed roof. The columns on the aisle side are subject to restrictions on positioning to allow unhindered access to the carspaces. (Refer attached extract from the carparking code).

The quote states that they have not carried out a site inspection.

We have not commented on the cost of the quote.

There appears to be adequate load capacity to support the lightweight structure. However, given the requirements to locate columns to allow parking, we believe amendments to the initial design will be required. This may preclude the use of standard detailing everywhere which is likely to have an effect on cost.

## ABACUS

The Abacus quote describes a cantilevered solution with no aisle side columns.

There is a greater reliance on the base connection to the slab and upstand for the primary structural elements however, there appears to be adequate capacity in the slab and upstand to support this construction.

The quote does not detail the number and spacing of primary supports. Various images have been provided which detail centres that range from 1 car space to 2 car spaces. It is unclear how many structural columns are proposed.

## SUMMARY

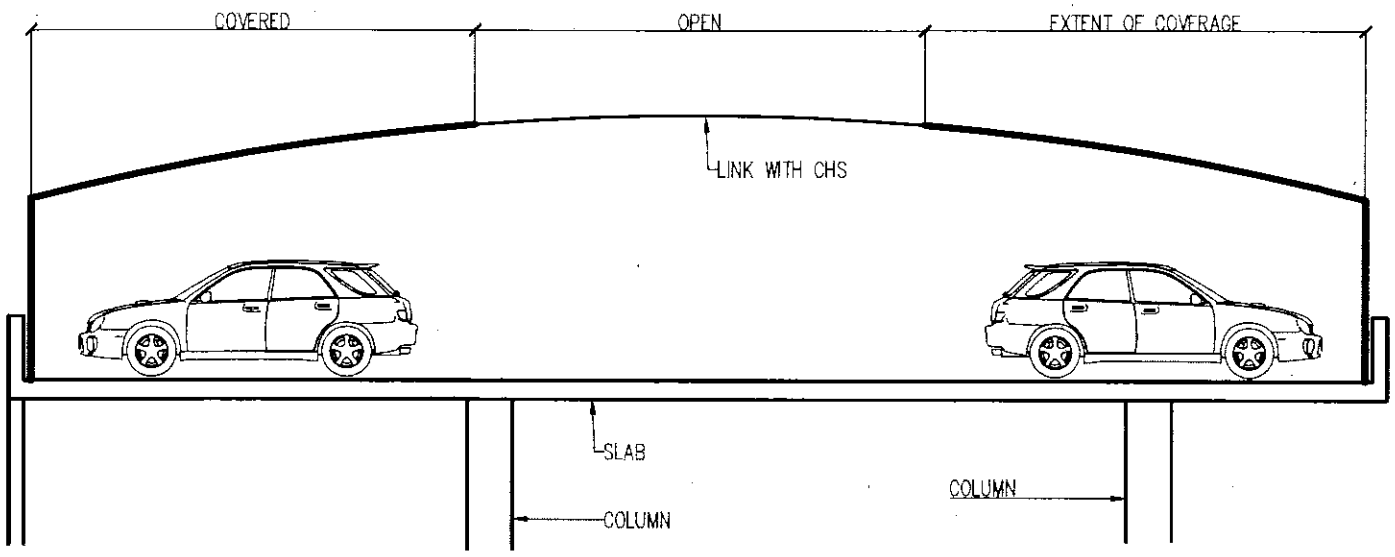
In comparing both schemes the base building appears to have adequate capacity to support the light weight addition(s).

We note that in both scenarios the location and detailing of the columns requires confirmation.

The drawback of the STRATCO option is the location of columns within the aisle and the obvious restrictions to parking and manoeuvring.

The ABACUS proposal concentrates load at each cantilever base fixing point which will require careful detailing to avoid impacting drainage.

A hybrid option may be considered. This is based on a spanning frame similar to the ABACUS proposal with coverage limited to cover the cars but to have the portal frame structure span the full width of the carpark.



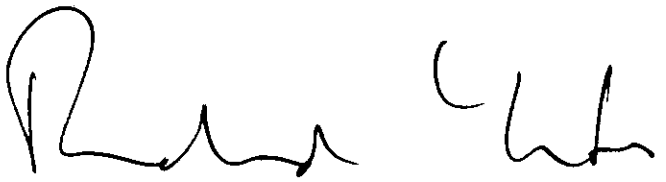
This reduces the fixity requirements at the baseplate while maintaining a similar bending moment and section size.

Placing columns within the parking spaces will restrict parking access.

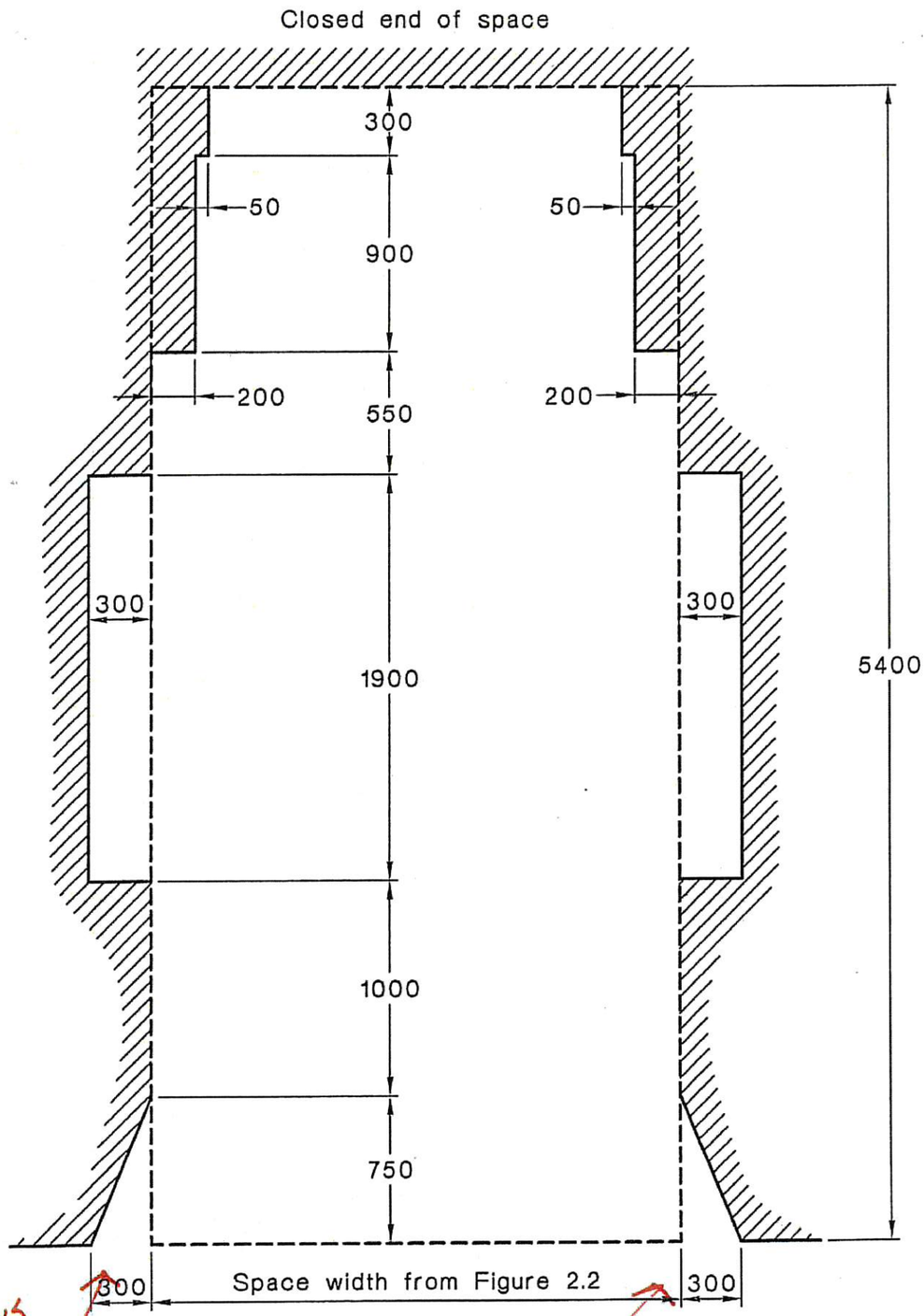
We recommend that consideration be given to a hybrid option as nominated above.

We trust that this information is sufficient for your current requirements. Should you require any further information, please contact the writer.

Yours faithfully
**JAMES TAYLOR & ASSOCIATES**



**RICHARD YATES** B.E.(Hons) MIEAust CPEng NER 620330
**Director**




NOTE: The design envelope provides for structural elements to be clear of all four side doors.

DIMENSIONS IN MILLIMETRES

FIGURE 5.2 DESIGN ENVELOPE AROUND PARKED VEHICLE TO BE KEPT CLEAR OF COLUMNS, WALLS AND OBSTRUCTIONS

## 5.3 HEADROOM

### 5.3.1 General requirements

To permit access for both cars and light vans, the height between the floor and an overhead obstruction shall be a minimum of 2200 mm.

NOTE: AS/NZS 2890.6* requires that any vehicular path of travel to or from a parking space for people with disabilities has a clearance of 2300 mm.

* In preparation. See footnote to Clause 1.2.