

Technical Note – Vertical Transportation

To	Mirvac (Linda Holliday)
Date	24 July 2026
Copies	-
Reference number	312477 – Memo 1a
From	Scott Hampson
File reference	
Subject	Response to Submissions – HDA Lift Performance / compliance

Project Name and SSDA no.

The project is referred to as Mixed Use Development at Green Square Town Centre - Sites 7, 17 and 18. The SSDA number is SSD-83899206.

Background Information

The SSDA was lodged and publicly exhibited between February – March 2026. Since then, a number of submissions from relevant agencies and community submissions have been received, as well as a Request for Further Information (RFI) from the Department of Planning, Housing and Infrastructure (DPHI).

In responding to these submissions and comments raised, a number of changes have been made to the project. As such, some new reports and or addendum letters will be required to detail and describe the revised design.

Vertical Transpiration Scope

Arup has been commissioned by Mirvac to provide vertical transportation engineering services for the new residential towers development at Green Square, known as Green Square HDA Build to Rent.

The development includes 3 residential towers (7, 17 and 18) located above basement floors, retail spaces and commercial tenancies. Within the buildings there are also appropriate residential amenities will be provided in the form of bike storage, wellness spaces, communal spaces and terraces.

The current design includes 3 main tower lifts in building 7, a single lift serving the slither apartments in tower 7 and 2 main tower lifts in each building 17 and 18. Other lifts provided in the development retail, amenity or commercial are not considered within this memo.

This memo confirms that lifts currently provisioned for Green Square Sites 7, 17 and 18 have been appropriately considered and designed to meet standards and guidelines applicable to residential buildings.

RtS

This letter has been prepared in response to the public submissions and agency advice received for SSD-83899206, being the Mixed-Use Development at Green Square Town Centre - Sites 7,17 and 18. This letter provides an assessment of the amended design for the development following SSD lodgement.

The key design changes made since lodgement include the following:

- Increase in non-residential land uses in the podium.
- Additional residential communal open space provided.
- Reversion of the public domain design to align with the endorsed Voluntary Planning Agreement, and associated changes to the built form.
- Changes to apartment layout and mix to improve residential amenity.
- Amendments to floor-to-floor heights and alignment of podium datums.
- Tweaks to the top of Site 18 to ensure acceptable overshadowing to the Drying Green.
- Other design development and technical co-ordination changes.

For a detailed description of the changes, refer to the RTS Report prepared by Colliers Urban Planning and the Architectural Drawings prepared by Fender Katsalidis and Plus Studio.

Updated Overview of the Proposed Development

The proposed development seeks to deliver the construction of three BTR buildings which will integrate residential, retail, resident amenity and public domain uses. Specifically, the proposal seeks approval for:

- *Excavation and enabling works.*
- *Construction of 3 mixed use BTR buildings up to 21 storeys in height, comprising:*
 - *504 BTR dwellings including a variety of dwelling types including Studio, 1, 2 and 3-bedroom apartments, a portion of which will be affordable housing.*
 - *Shared internal and external residential amenity space.*
 - *Non-residential floor space including retail, food and beverage tenancies, BTR staff offices and BTR resident lobbies*
 - *A shared basement level, incorporating loading zones, waste collection and servicing.*
 - *Car parking and bike parking to service the proposed development.*
- *Public domain and landscaping improvements, including:*
 - *External pedestrian laneways, pathways and through-site links.*
 - *Tree removal, protection, new plantings and landscaping works.*
- *Utility and stormwater connections to support the new development.*
- *Concurrent amendments to the Sydney Local Environmental Plan (Green Square Town Centre) 2013 to facilitate the SSDA.*

Response to Submissions Table

The following matters raised in the submissions have been addressed in this letter:

Agency Comment / Matter	Response / Location Addressed in Letter
DPHI	
<i>The ADG states that the maximum number of apartments off a circulation core on a single level is 8, and that for buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.</i> <i>Flexibility is sought on the basis of the Department's fact sheet, with up to 13 apartments proposed on a single level in Building 7 and 11 proposed in Building 17. Where the design criteria is not able to be met, the ADG requires a high level of amenity for common lobbies and corridors to be demonstrated.</i> <i>VT Revise the design to incorporate an additional lift within Building 17</i> <i>Submit a Vertical Transport Strategy to demonstrate an appropriate level of service is provided for the proposed development.</i> (Ref 3G)	Objective 4F-1 of the Apartment Design Guide (ADG) is sometimes misinterpreted in relation to the number of lifts required in an apartment building. The statement that “the maximum number of apartments sharing a single lift is 40” should not be read as a simple ratio requiring the total number of apartments to be divided by 40 to determine the required number of lifts. Rather, the intent of the requirement is to provide lift redundancy in larger apartment buildings. It is intended to avoid situations where a building with a substantial number of apartments or floors is served by only one lift. Generally, for Sites 7, 17 and 18, the ADG requirement is satisfied because each building is provided with more than one lift. Accordingly, although each building contains more than 40 apartments, the proposed lift arrangements provide the required redundancy (2 lifts or more) and meet the intent of Objective 4F-1. Only lift 4 in building 7 (single residential lift) has no redundancy however this lift serves only 12 apartments and 4 floors (including ground floor). In all cases the proposed vertical transportation strategy satisfies the ADG without the need for additional lifts. (This statement is supported by our detailed report below).

Supporting Information

All vertical transportation designs are based on the architectural information provided by FK Architects and Plus Studios.

Site name	Designer	Drawing numbers	Date
Site 7	FK Architects	DA-0-000 – DA-17-250	22/7/2026
Site 17	FK Architects		
Site 8	Plus Studio	AR-18-1000 – AR18-1121	17/7/2021

Lift Design Requirements

Design Standards Applicable to Residential Apartment Buildings

The relevant design standards that apply to residential apartment buildings are summarised below.

Design Standard	Detail	Outcome/ Deviations/ Notes
AS1735	Lifts are required to comply with relevant parts of the lift code AS1735 including (parts 1.1, 1.2, 11, 12)	Lifts specified to be compliant
AS1170.4	Lifts are required to comply with relevant parts of the seismic code	Lifts specified to be compliant
NCC	Lifts are required to comply with relevant parts of NCC including: C4D11, E3, S24, S7C6	Compliant
ADG (SEPP 65) Objective 4F-1	The vertical transportation requirements of the apartment design guide (NSW) are intended to ensure that developments with >10 floors and 40 or more apartments are provisioned with more than one lift, thus providing redundancy.	Compliant
ISO 8100-32 Section 5.4.3	International standard for planning the selection of passenger lifts. Handling capacity of lifts (simulation method) -7% Required average waiting time – 60 seconds	Compliant Note lifts are designed to Mirvac standard of 50 seconds AWT
ISO 8100-32 Section 6.3.4	International standard for planning the selection of passenger lifts. Apartment occupancy for a standard quality development	Compliant
ISO 8100-32 Section 6.5.2	International standard for planning the selection of passenger lifts. Selection of lift speed, up to 45 seconds (top to bottom)	Compliant

Detailed Design Review

To further confirm the performance of the lifts we reference standards and guidelines such as CIBSE Guide D and ISO 8100-32 and conduct detailed traffic studies of the lift performance using specialist simulation software (Elevate).

Below is a summary of the various standards as well as the Mirvac BTR performance requirement and the performance outcomes based on average waiting times.

The summary shows that the lifts are performing very well and additional lifts are not required.

Performance source	Performance Criteria	Requirement	S7 (3 lifts)	S7 (1 lift)	S17 (2 lifts)	S18 (2 lifts)
			Outcomes			
CIBSE Guide D / ISO 8100-32	Handling Capacity	7%	Complies	Complies	Complies	Complies
	Average Waiting time	60 Seconds	41.4	13.0	48.0	36.3
	Population	Studio = 1.5 Pax 1 Bedroom = 1.8 pax 2 Bedroom = 3 pax 3 Bedroom = 4 pax	Complies	Complies	Complies	Complies
Mircac BTR Design Manual	Handling Capacity	5%	Complies	Complies	Complies	Complies
	Average Waiting time	50 Seconds	28.4	11.9	36.0	27.2
	Population	1 Bedroom = 2 pax 2 Bedroom = 3 pax	Complies	Complies	Complies	Complies

In all cases we have taken into account multiple entry levels (car parking, bikes, amenity floors).

Site 7 - An allowance has been made for 100 PAX to Level 5 of Site 17 to allow for precinct use of the space and furthermore an allowance has been made for transporting bikes within the passenger lifts between B and G.

Where applicable and we have used conservative parameters for lift door speeds, lift accelerations etc.

Table of lift performance parameters.

Item	Detail
Lift speed (m/s) – Typical lifts	1.75
Lift speed (m/s) – Site 7 – Lift 4	1.0
Lift capacity (passengers)	20
Acceleration (m/s/s)	0.7
Jerk rate (m/s/s/ss)	1.0
Door open time (seconds)	2.4
Door close time (seconds)	2.6
Start delay (seconds)	0.5
1 st Door dwell / 2 nd Door dwell (seconds)	3/2
Loading / Unloading times (seconds)	1/1

Design Inputs

The following table show details of the apartment typology and the calculated populations per floor for each tower.

Level	Function	Parking & Bike Spaces	SITE 7 - Main Tower						SITE 7 - Slither Core						SITE 17								
			Studio	1	2	3	Total	ISO PAX	Entrance	Studio	1	2	Total	ISO PAX	Entrance	Studio	1	2	3	Total	ISO PAX	Entrance	
			Bed	Bed	Bed	Bed	Pop		Bias	Bed	Bed	Bed	Pop		Bias	Bed	Bed	Bed	Bed	Pop		Bias	
19	Residential / Amenity		0	0	0	0	0	0	1.5%							3	3	3	0	20	19		
18	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
17	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
16	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
15	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
14	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
13	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
12	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
11	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
10	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
9	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
8	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
7	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
6	Residential		4	5	3	1	29	28								3	3	3	0	20	19		
5	Residential / Amenity	*	0	3	2	2	120	119	2.0%							1	1	5	0	19	18	1.5%	
4	Residential / Parking	16	0	2	4	1	20	20	1.0%	1	3	2	19	19		3	3	4	1	27	26		
3	Residential / Parking	16	0	2	4	1	20	20	1.0%	1	3	2	19	19		3	3	4	1	27	26		
2	Residential / Parking	16	0	2	5	1	23	23	1.0%						5.0%	2	1	2	0	11	11		
1	Residential / Parking	16	0	2	5	1	23	23	1.0%												0		
G	Retail / Entry	0							91%						95.0%							96%	
B	Bikes	170							1.5%													2.0%	
			234	52	76	59	19	583	568	100.0%	2	6	4	38	38	100.0%	51	50	57	2	356		100%

Level	Function	SITE 18						Entrance Bias
		Studio	1 Bed	2 Bed	3 Bed	Total Pop	ISO PAX	
19	Residential / Amenity	3	1	0	0	7	6	1.5%
18	Residential	2	3	1	1	16	15	
17	Residential	2	3	1	1	16	15	
16	Residential	2	3	1	1	16	15	
15	Residential	2	3	1	1	16	15	
14	Residential	2	3	1	1	16	15	
13	Residential	3	3	2	0	17	16	
12	Residential	3	3	2	0	17	16	
11	Residential	3	3	2	0	17	16	
10	Residential	2	2	3	0	16	16	
9	Residential	2	2	3	0	16	16	
8	Residential	2	2	3	0	16	16	
7	Residential	2	2	3	0	16	16	
6	Residential	2	2	3	0	16	16	
5	Residential	2	2	3	0	16	16	
4	Residential	2	2	3	0	16	16	
3	Residential	2	2	3	0	16	16	
2	Residential	2	2	3	0	16	16	
1	Amenity							1.5%
G	Retail / Entry							96.5%
B	Waste							0.5%
		40	43	38	5	280		100%

Conclusion

Based on the applicable codes, guidelines and lift traffic analysis undertaken, the lift provisions for Green Square Sites 7, 17 and 18 are appropriate for the proposed residential developments. The proposed arrangements satisfy the relevant requirements of AS1735, the NCC and the Apartment Design Guide.

The detailed performance assessments confirm that each tower meets, and in some cases exceeds, the benchmark criteria set out in ISO 8100-32, CIBSE Guide D and the Mirvac Build to Rent design requirements.

On this basis, the currently proposed lift arrangements are considered suitable for the development, and no additional lifts are required.

Qualifications and Associations (Scott Hampson)

Vertical transportation industry – 39 years.

NSW Design Practitioner – VT (DEP0000567)

President – Lift Engineering Society Australia

Member – International Association of Elevator Engineers

Scott Hampson

Associate | Vertical Transportation Leader, Australasia

Arup

Gadigal Country

Barrack Place, 151 Clarence Street,

Sydney NSW, 2000, Australia

d +61 2 9320 9805

m +61 468 307 406

arup.com