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Airspace Assessment for Building at 2-4 Burleigh St and 20-24 Railway Pde, Burwood, NSW

Final Report

NSW Housing Corporation Pty Ltd

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Table of Contents

Glossary

AHD	Australian Height Datum
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations
DITRDCSA	Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
ft	Feet
IFR	Instrument Flight Rules
Km	Kilometres
m	Metres
MOS	Manual of Standards
nm	Nautical miles
OLS	Obstacle Limitation Surface
PANS-OPS	Procedures for Air Navigation Services-Operations
RTCC	Radar Terrain Clearance Chart
VFR	Visual Flight Rules

Executive Summary

- NSW Housing Corporation Pty Ltd is seeking approval to construct a building at 2-4 Burleigh St & 20-24 Railway Pde, Burwood-termed the Site.

- This aviation assessment report about the proposed building has been prepared for two purposes, being 1) for inclusion in the development application (DA) to the planning authority, and 2) for inclusion in the aviation application for the building to penetrate Sydney and Bankstown prescribed airspace.

- The development site is located approximately 9.4 km northwest of the Sydney Airport and 11.4km northeast of Bankstown Airport. This building will reach a maximum height of 170.0m AHD.

- The heights of prescribed airspace over the development site are:
    - Sydney and Bankstown obstacle limitation surface (OLS): 156m AHD;
    - Sydney PANS-OPS surface: 184.8m AHD;
    - Bankstown PANS-OPS surface: 350m AHD;
    - Radar terrain contour chart: 243.8m AHD.

  Since the Sydney PANS-OPS surface (184.8m AHD) is lower than Bankstown it is the controlling surface that determines the maximum height of permanent obstructions i.e., buildings.

- The building at a maximum height of 170m AHD will impact Sydney and Bankstown prescribed airspace in the following:
    - OLS (156m AHD): The building will penetrate the Sydney and Bankstown OLS by 14m;
    - PANS-OPS surface (184.8m AHD): The building is 14.8m below the Sydney PANS-OPS surface;
    - RTCC (243.8m AHD: The building is 73.8m below the RTCC.

- One hammerhead crane will undertake construction and operate to a maximum height of the crane is 184.8m AHD. The crane will impact Sydney and Bankstown airspace in the following:
    - OLS (156m AHD): TC1 will penetrate the OLS by 28.8m;
    - PANS-OPS (184.8m AHD: TC1 is at the same height and will not penetrate the PANS-OPS surface;
    - RTCC (243.8m AHD): TC1 is 59m below the RTCC surface.

- Analysis of IFR and VFR activities in the Burwood area has found that the safety and efficiency of aircraft and helicopter operations will not be impacted by the proposed building and crane.

- A nearby building at 52-60 Railway Pde, Burwood has gained aviation approved to a maximum height of 163.5m AHD. It will penetrate the Sydney and Bankstown OLS by 7.5m.

- The building and crane will not impact aviation communication, navigation and surveillance systems located at Sydney and Bankstown airports.

- Since the building and crane will penetrate the Sydney and Bankstown OLS, the Civil Aviation Safety Authority (CASA) will likely require obstacle lighting to be placed at the top of the building and crane to ensure they are visible to aircraft and helicopter flying in the vicinity of the Site.

- A review of IFR and VFR activities in the Burwood area has found that the building and crane will not impact the safety and efficiency of aircraft and helicopter operations.

1.0 Introduction

NSW Housing Corporation Pty Ltd is seeking approval to construct a building at 2-4 Burleigh St & 20-24 Railway Pde, Burwood. This is referred to as 'the Site' throughout the aviation impact assessment report. Construction will be undertaken by one hammerhead crane.

The aviation impact assessment report has been prepared for two purposes, being 1) to provide aviation input to accompany the development application (DA) to the planning authority, and 2) to form part of the aviation application for the building and crane to penetrate Sydney and Bankstown prescribed airspace. It will assess whether the building and crane will impact the safety and efficiency of air transport operations.

This Site is located approximately 9.4 km northwest of the Sydney Airport and 11.4km northeast of Bankstown Airport. The building will reach a maximum height of 170.0m AHD, while the crane will operate up to 184.8m AHD. Both the building and crane will penetrate the Sydney and Bankstown obstacle limitation surfaces (OLS) but remain below the PANS-OPS and radar terrain clearance chart (RTCC) surfaces.

This report details the height of the prescribed airspace at the Site plus presents an assessment of the impact on aircraft and helicopter operations from the proposed building and crane. It includes: legislative context; methodology for the study; location and height of the building and crane relative to prescribed airspace; an assessment of aircraft and helicopter operations in the vicinity of the Site; other nearby high-rise buildings that have gained aviation approval; and the impact of the building and crane on the performance of navigation aids and surveillance systems.

2.0 Legislative Context

Airspace surrounding an airport is protected by the Airports (Protection of Airspace) Regulations 1996. It details the process required to be undertaken when an obstacle could infringe prescribed airspace and the responsibilities of various organisations.

Prescribed airspace around an airport includes the obstacle limitation surface (OLS), the PANS-OPS surface and radar terrain clearance chart (RTCC) surface. An OLS provides general protection for aircraft operations around an airport. A PANS-OPS surface protects the airspace used by aircraft flying instrument approach

procedures. The RTCC provides protection for aircraft that are operating under radar control but not flying on published instrument flight procedures or routes.

Permanent or temporary obstructions can be approved to penetrate the OLS. Permanent obstructions cannot be approved to penetrate the PANS-OPS surface. The Airports Act provides provision for temporary obstructions e.g., construction cranes to penetrate the PANS-OPS surface for a duration not exceeding three months. This temporary penetration of the PANS-OPS surface requires the support of the airport owner. It must also not materially impact aircraft operations. A temporary penetration of the RTCC may be permitted for a maximum duration of three months.

When the proposed height of an obstruction is likely to penetrate the OLS a proponent is required to make application to the airport owner-operator, in this case Sydney Airport Corporation Ltd (SACL) since this airport is closest to the Site. In cases where shielding is not available from existing buildings or a potential hazard may exist, the airport owner-operator may require the proponent to complete a detailed aviation study to be completed to support the application. The airport owner-operator then seeks the input from the Civil Aviation Safety Authority (CASA), Airservices and the building authority concerned. This process seeks to determine whether there is any impact on safety or operational efficiency to aircraft activities.

The Department of Infrastructure, Transport, Regional Development Communications, Sport and the Arts (DITRDCSA) ultimately grant approval for the buildings and cranes to penetrate prescribed airspace. Should the development not be approved by DITRDCSA, there is also an appeal process to the Administrative Appeals Tribunal.

3.0 Methodology

This section provides an overview of the approach undertaken to determine the impact on prescribed airspace and aircraft operations of the proposed building development at the Site.

The airspace over Burwood is impacted by the prescribed airspace defined for Sydney and Bankstown airports. It governs the maximum permissible heights for buildings in this area. Calculations of the height of the OLS, PANS-OPS and RTCC surfaces were sourced from planning information maintained by SACL and Bankstown Airport Ltd.

The purpose of this report is to assess the impact that the proposed development at the Site presents to aircraft and helicopter operations. In particular it involves a safety assessment about the impact on aircraft or helicopter operations by the proposed development.

In order to explore the safety impact on aircraft and helicopter operations of the proposed development at the Site, discussions and/or information was obtained from:

- Sydney Airport Corporation Ltd;
- Bankstown Airport Ltd;
- Airservices-Sydney operations; and
- CASA.

4.0 Details of Prescribed Airspace

This section details the heights of Sydney and Bankstown Prescribed Airspace at the Site.

4.1 Sydney and Bankstown Obstacle Limitation Surface (OLS)

The Site is located in the Outer Horizontal area of the OLS defined for Sydney and Bankstown airports. At this position, the height of the Sydney OLS is 156m AHD.

The height of the Bankstown OLS is also 156m AHD.

4.2 Sydney and Bankstown PANS-OPS Surfaces

The height of the Sydney PANS-OPS surface overhead the Site is 184.8m AHD.

The height of the Bankstown PANS-OPS surface is estimated to be 350m AHD.

Since the Sydney PANS-OPS surface (184.8m AHD) is the lowest it controls the maximum height of the building.

Airservices' Procedure Design Unit (PDU) will confirm this height during their evaluation of the aviation application. They are final arbiter of the PANS-OPS height.

4.3 RTCC Surface

At the position of the Site the height of the RTCC surface is 243.8m AHD.

5.0 Position and Height of the Building, and Impact on Prescribed Airspace

This section details the position and height of the building. It then details the impact of the building on prescribed airspace.

5.1 Position of the Building

The building tower has an oval form. Table 1 below presents the position coordinates at key points on the building roof.

Table 1: Building Position Coordinates

Position ID	Position	Coordinates
1	Northwest Corner	E 324725.262 N 6249784.318
2	North Side	E 324733.127 N 6249787.331
3	Northeast Corner	E324739.782 N 6249782.170
4	East Side	E 324738.475 N 6249770.012
5	Southeast Corner	E 6249757.997
6	South Side	E 324728.342 N 6249754.983
7	Southwest Corner	E 324721.687 N 6249760.144
8	West Side	E 324722.993 N 6249772.302

Attachment 1 presents the position coordinates for each corner of the building and depicts the key points mentioned in Table 1.

5.2 Height of the Building

The development comprises one building tower and will be constructed to a maximum height of 170m AHD. An elevation diagram depicting the maximum height of the building is at Attachment 2.

5.3 Impact of Building on Sydney Prescribed Airspace

The building at a maximum height of 170m AHD will impact Sydney prescribed airspace in the following:

- OLS (156m AHD): The building will penetrate the Sydney and Bankstown OLS by 14m;
- PANS-OPS surface (184.8m AHD): The building is 14.8m below the Sydney PANS-OPS surface;
- RTCC (243.8m AHD): The building is 73.8m below the RTCC.

5.4 Summary

The building will impact the Sydney and Bankstown OLS but remain below the PANS-OPS and RTCC surfaces.

6.0 Summary of Crane Strategy

Construction will be undertaken by one hammerhead crane (TC1). TC1 will operate up to, but not penetrate the PANS-OPS surface.

Once TC1 has completed its construction responsibilities it will be dismantled by a recovery crane. Details of the recovery crane are still to be finalised but it is anticipated that it will not penetrate the Sydney PANS-OPS surface. Full details of the recovery crane will be presented in the aviation application for the cranes to penetrate Sydney and Bankstown prescribed airspace.

7.0 Position, Height of Crane and Impact on Prescribed Airspace

This section details the position and maximum height of the tower crane and its impact on prescribed airspace.

7.1 Position Coordinates and Operating Radius of Tower Crane

Table 2 below details the position coordinates of the crane shaft and the operating radius of the boom.

Table 2: Crane Position and Operating Radius

	Position Coordinates	Boom Radius
TC1	E 324719.446; N 6249770.527	35m

Attachment 3 presents the position coordinates of the crane shaft and operating radius of the boom.

7.2 Height of Tower Crane and Impact on Prescribed Airspace

The maximum height of TC1 is 184.8m AHD. It will have the following impact on Sydney prescribed airspace:

- OLS (156m AHD): TC1 will penetrate the Sydney and Bankstown OLS by 28.8m;
- PANS-OPS (184.8m AHD: TC1 is at the same height and will not penetrate the PANS-OPS surface;
- RTCC (243.8m AHD): TC1 is 59m below the RTCC surface.

Attachment 4 presents the maximum height of TC1.

7.3 Summary

TC1 will penetrate the Sydney and Bankstown OLS but will not penetrate the PANS-OPS or RTCC surfaces.

8.0 Aircraft and Helicopter Operations in the Burwood Area

This section details the impact of the building and crane on aircraft and helicopter operations in the Burwood area.

8.1 IFR Operations

The development site is located approximately 8.3km northwest of the threshold of Sydney Runway 16R/34L. It is clear of the arrival and departure tracks at Sydney Airport. In-bound IFR aircraft to Sydney to land on Runway 16R will pass to the west and north of the Site at Burwood. IFR aircraft arriving from the north to land Runway 34L are well above the Site. IFR aircraft departing Sydney on Runway 34L will pass well above the Site. Since the building and crane will not penetrate the PANS-OPS surface, they will not impact Sydney instrument flight procedures (IFPs).

The Site is well clear of any IFR arrival and departure tracks at Bankstown Airport. The building and crane will not impact Bankstown IFPs.

8.2 VFR Operations

The Site is located within the Sydney control zone. VFR aircraft in the Sydney control are permitted to operate up to 2,500ft. Over populous areas, VFR aircraft and helicopters are required to fly at least 1,000ft above the highest obstacle.

The building at a maximum height of 170m AHD (557ft) will require VFR aircraft and helicopters to operate at 1,600 ft AHD or above. At 184.8m AHD (606ft), the crane will require aircraft and helicopters to operate at 1,700ft or above.

The Site is clear to the east of the VFR departure route from Bankstown Airport to the north, which tracks over the Parramatta central business district (CBD). It also clear to the south of restricted area R405, which is used by VFR aircraft operating along the Parramatta River. There are no hospital strategically important helipads in the vicinity of the development site. The closest hospital, Concord, is approximately 4.5km north of Site and will not be impacted by the building or crane.

VFR aircraft and helicopter operations may occasionally fly outside normal transit corridors in the vicinity of the Site. The placement of obstacle lighting, in accordance with the CASA Manual of Standards (MOS) Part 139-Aerodromes, on the top of the building and crane will alert VFR pilots to its location.

In view of the operation of helicopter and aircraft operations in the Burwood area, we conclude that the proposed building and crane will not present a risk to aviation safety.

8.3 Summary

This review of IFR and VFR activities at Sydney and Bankstown airports, as well as near the Burwood area, has found that the building and crane will not impact the safety and efficiency of aircraft and helicopter operations.

9.0 Other Nearby High-Rise Buildings

One other high-rise building in the vicinity of the Site has obtained aviation approval to penetrate the Sydney and Bankstown OLS. A building at 52-60 Railway Pde, Burwood has been approved to a maximum height of 163.5m AHD. This building will penetrate the OLS by 7.5m. It is 6.5m lower than maximum height of the building at the subject site.

10.0 Impact on Navigation Aids, Communication Systems and Surveillance Radar Performance

At a distance of approximately 9.4km from Sydney Airport and 11.4km from Bankstown Airport, the Site will not impact aviation communication, navigation and surveillance systems.

11.0 CASA

CASA will review this aviation impact assessment report as part of their assessment into the safety risk to aircraft and helicopter operations presented by the proposed building.

When a proposed development penetrates the OLS, CASA will almost certainly require that the high point of the building is lit. It is likely that a medium intensity red light will be required to be placed at the top of the building, in accordance with the Civil Aviation Safety Regulations (CASR) Manual of Standards (MOS) Part 139 (Aerodromes).

The top of the crane and boom will also be required to be lit. During daylight hours the crane needs to be lit with flashing white obstacle lighting. The crane must be obstacle lit with medium intensity steady red obstacle lighting at night and during periods of low visibility. This lighting needs to be placed at the tallest point of the crane in accordance with MOS Section 9.31.

Consideration should be given for obstacle marking, involving alternating red and white bands of colour, to be painted on the crane.

12.0 Conclusion

This report has assessed the impact of a building and crane at 2-4 Burleigh St and 20-24 Railway Pde Burwood. It has found that the building and crane will both penetrate the OLS for Sydney and Bankstown airports. They will both not penetrate the PANS-OPS surface and RTCC. A review of IFR and VFR activities in the Burwood area has found that the building and crane will not impact the safety and efficiency of aircraft and helicopter operations.