SUBURBAN RAIL LOOP EAST

SRL East Draft Structure Plan

Aviation and Airspace Technical Report

More Homes For Victorians

VICTORIA State Government

Suburban Rail Loop

PREPARED FOR SUBURBAN RAIL LOOP AUTHORITY

SRL EAST DRAFT STRUCTURE PLAN – AVIATION AND AIRSPACE TECHNICAL REPORT

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Contents

Appendices

Glossary and abbreviations

TERM	DEFINITION
AC	Advisory Circular
AEO	Airport Environs Overlay
AHD	Australian Height Datum
AJM JV	Aurecon, Jacobs, Mott MacDonald Joint Venture
ARP	Airport Airfield Reference Point
CA	Circular Advisory
CASA	Civil Aviation Safety Authority
Cth	Commonwealth
DDO	Design and Development Overlay
DELWP	Department of Environment, Land, Water and Planning
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications and the Arts
DTP	Department of Transport and Planning
GNSS	Global Navigation Satellite System
HP	Horizontal planes
ICAO	International Civil Aviation Organisation
LGA	Local Government Area
LiDAR	Light Detection and Ranging
m	Metre(s)
NDB	Non Directional Radio Beacon
NGL	Natural ground level
OLS	Obstacle Limitation Surface
PANS-OPS	Procedures for Air Navigational Services – Aircraft Operations
the Regulations	Airports (Protection of Airspace) Regulations 1996
RNAV	Area Navigation
RPT	Regular Passenger Transport services
SID	Standard Instrument Departures
SRL	Suburban Rail Loop
SRLA	Suburban Rail Loop Authority

Executive summary

As part of the Suburban Rail Loop (SRL) East project, Draft Structure Plans (Structure Plans) are being prepared for the neighbourhoods surrounding the new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

The Structure Plans will set a vision and framework to guide growth and change in each Structure Plan Area while protecting and preserving the features that people love about them now.

This SRL East Structure Plan – Aviation and Airspace Technical Report will inform the development of Structure Plans to guide development in the SRL East Structure Plan Areas.

The report provides an analysis of existing airspace controls which affect each SRL East Structure Plan Area to provide guidance on maximum development heights based on the existing and potential airspace controls.

AVIATION

Aviation-related laws seek to protect the airspace in the vicinity of airports and helicopter landing sites. The height of buildings and other permanent structures as well as temporary structures like construction cranes are regulated in protected airspace, along with exhaust plumes from industrial facilities, cooling towers or power generation facilities which can create aircraft safety hazards.

It is important that limitations and any permission requirements relating to aviation safety and development are considered in the preparation of the SRL East Structure Plans.

FINDINGS

Planning controls

Planning controls relating to airspace are limited as they only impact land immediately proximate to existing airports through the use of a Design and Development Overlay (DDO) or Airport Environs Overlay (AEO) applies. These overlays are the mechanisms available within the Victoria Planning Provisions to regulate development with respect to airspace.

Planning controls regulate the height of developments outside the immediate airport boundary which may intersect with the airspace controls. It is generally the responsibility of an applicant who seeks to construct 'tall' buildings to ensure their development is compatible with airspace requirements, and that a proposed development complies with the *Airports Act 1996* (Cth), as this is generally not regulated by the Victorian planning process.

No existing planning controls relating to airspace apply to the Cheltenham, Glen Waverley, Burwood and Box Hill Structure Plan Areas.

The Monash Planning Scheme contains four schedules to the DDOs with planning controls that relate to airspace in the Monash and Clayton Structure Plan Areas. These protect helicopter flight paths of the Victorian Heart Hospital and the Monash Medical Centre.

A large part of the Monash Structure Plan Area is covered by two of the schedules to the DDOs. Smaller areas of the Clayton Structure Plan Area are covered by three of the schedules to the DDOs:

- DDO14 affects the northern part of the Clayton Structure Plan Area
- DDO15 affects the northern part of the Clayton Structure Plan Area and a very small part of the Monash Structure Plan Area
- DDO17 is entirely within the Monash Structure Plan Area

- DDO18 is mostly within the Monash Structure Plan Area and a small part of the Clayton Structure Plan Area.

The height limits that DDOs set in the Monash and Clayton Structure Plan Areas are shown in the table below.

Planning permits are required for developments that exceed these heights. Planning permit applications must be referred to the Victorian Department of Health as required by the Monash Planning Scheme.

FACILITY	PLANNING SCHEME	CONTROLS	HEIGHTS (AHD)	STRUCTURE PLAN AREA
Victorian Heart Hospital	Monash	DDO17	128.2 m	Monash
		DDO18	138.2 m	Monash Clayton
Monash Medical Centre	Monash	DDO14	92.6 m	Clayton
		DDO15	102.6 m	Monash Clayton

Airspace controls and maximum heights

Airspace controls relating to Moorabbin Airport and Essendon Airport set development height limits in specified areas of the SRL East Structure Plan Areas. Moorabbin and Essendon airspace controls also set height limits for temporary construction cranes in specified areas in the Box Hill and Burwood Structure Plan Areas. The height limits are listed in the table below.

Moorabbin Airport and Essendon Airport must also approve temporary cranes in any area subject to a Procedures for Air Navigational Services – Aircraft Operations (PANS-OPS) or Obstacle Limitation Surface (OLS) surface where the cranes may exceed these surfaces. PANS-OPS surfaces are generally above the OLS and designed to safeguard aircraft from obstacles when using instrument flight rules in conditions of poor visibility.

STRUCTURE PLAN AREA	RELEVANT AIRSPACE CONTROL	LOWEST AIRSPACE HEIGHT CONTROL CONSIDERING ELEVATIONS NATURAL GROUND LEVEL (NGL)
Cheltenham	Conical OLS – Moorabbin	40 m above NGL – refer to Figure 5.5
	PANS-OPS 157.2 m Horizontal Plane – Moorabbin	115 m above NGL – refer to Figure 5.6
	PANS-OPS 99.0 m Horizontal Plane – Moorabbin	55 m above NGL – refer to Figure 5.7
Clayton	Conical OLS – Moorabbin	55 m above NGL – refer to Figure 5.10
	PANS-OPS 99.0 m Horizontal Plane – Moorabbin	46 m above NGL – refer to Figure 5.12
	PANS-OPS 121.9 m Horizontal Plane – Moorabbin	65 m above NGL – refer to Figure 5.13
	PANS-OPS 157.2 m Horizontal Plane – Moorabbin	80 m above NGL – refer to Figure 5.11
Monash	PANS-OPS 157.2 m Horizontal Plane – Moorabbin	90 m above NGL – refer to Figure 5.17
	PANS-OPS 182.8 m Horizontal Plane – Moorabbin	85 m above NGL – refer to Figure 5.18
	PANS-OPS Sloping Plane 182.8 m to 243.8 m – Moorabbin	90 m above NGL – refer to Figure 5.19
	PANS-OPS 243.8 m Horizontal Plane – Moorabbin	160 m above NGL – refer to Figure 5.16
Glen Waverley	PANS-OPS 213.3 m Horizontal Plane – Moorabbin	100 m above NGL – refer to Figure 5.24
	PANS-OPS 243.8 m Horizontal Plane – Moorabbin	130 m above NGL – refer to Figure 5.23
	PANS-OPS 400 m Horizontal Plane – Moorabbin	275 m above NGL – refer to Figure 5.22
Burwood	PANS-OPS 335.2 m Horizontal Plane – Moorabbin	250m above NGL – refer to Figure 5.27

STRUCTURE PLAN AREA	RELEVANT AIRSPACE CONTROL	LOWEST AIRSPACE HEIGHT CONTROL CONSIDERING ELEVATIONS NATURAL GROUND LEVEL (NGL)
Box Hill	PANS-OPS 337.7 m Horizontal Plane – Moorabbin	255.1 above NGL – refer to Figure 5.30
	PANS-OPS Sloping Plane 337.7 m to 457.2 m – Moorabbin	260m above NGL – refer to Figure 5.31
	PANS-OPS 457.2 m Horizontal Plane – Moorabbin	360m above NGL – refer to Figure 5.33
	PANS-OPS 335.2 m Horizontal Plane – Moorabbin	230m above NGL – refer to Figure 5.32

RECOMMENDATIONS

1. Airspace controls relating to Moorabbin Airport and Essendon Airport set development height limits in specified areas of the SRL East Structure Plan Areas. Moorabbin and Essendon airspace controls also set height limits for temporary construction cranes in specified areas in the Box Hill and Burwood SRL East Structure Plan Areas. A summary of these maximum permitted building height limits is included in the Executive Summary of this report. Section 5.2 of this report includes 'heat maps' which have been prepared based on the aviation and airspace controls showing the maximum permitted heights in each location.
2. Structure Plans for the Clayton and Monash Structure Plan Areas should not be inconsistent with the existing DDO14 and DDO15 to protect helicopter flight paths associated with the Monash Medical Centre, which require a planning permit for development that exceeds a height of 92.6 metres (DDO14) or 102.6 metres (DDO15) in specified areas.
3. Structure Plans for the Clayton and Monash Structure Plan Areas should not be inconsistent with the existing DDO17 and DDO18 to protect helicopter flight paths associated with the Victorian Heart Hospital, which required a planning permit for development that exceeds a height of 128.2 metres (DDO17) or 138.2 metres (DDO18) in specified areas.

Other opportunities

1. The following actions would be expected of applicants as part of the approvals process for future land use and development where they come close to or operate within protected airspace (based on the airspace controls described under Recommendation 1):
    a. Building and crane activity in the Cheltenham Structure Plan Area is assessed by Moorabbin Airport for final height assessment when statutory planning approval is sought for future land use and development within the Structure Plan Area.
    b. Where buildings are expected to emit exhaust plumes in locations where airspace controls apply, it is recommended to provide and submit '*Form 1247 – Operational Assessment of a proposed plume rise*' to CASA for a plume rise assessment.

1 Introduction

SRL is a transformational project that will help shape Melbourne's growth in the decades ahead. It will better connect Victorians to jobs, retail, education, health services and each other – and help Melbourne evolve into a 'city of centres'.

SRL will deliver a 90-kilometre rail line linking every major train service from the Frankston Line to the Werribee Line via Melbourne Airport.

SRL East from Cheltenham to Box Hill will connect major employment, health, education and retail destinations in Melbourne's east and south east. Twin 26-kilometre tunnels will link priority growth suburbs in the municipalities of Bayside, Kingston, Monash and Whitehorse.

SRL East Structure Plan Areas will surround the six new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

1.1 Purpose of this report

This SRL East Draft Structure Plan – Aviation and Airspace Technical Report will inform the development of the Draft Structure Plans (Structure Plans) to guide land use planning and development in the Structure Plan Areas of SRL East.

The report describes the existing aviation and airspace activities in each Structure Plan Area.

Issues and opportunities relating to aviation and airspace that impact planning for the development of each Structure Plan Area are identified.

Recommendations to consider when developing the Structure Plans are also made, with the objective to avoid, minimise or manage potential negative impacts of change, and to maximise potential for positive change.

1.2 Project context

Construction of the SRL East underground stations is underway at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill. This provides an opportunity to enhance the surrounding neighbourhoods.

SRL East will support thriving and sustainable neighbourhoods and communities that offer diverse and affordable housing options, with easy access to jobs, transport networks, open space, and community facilities and services.

A vision for SRL East Structure Plan Area and surrounds has been developed in consultation with the community and stakeholders. The visions set out the long-term aspirations for each Structure Plan Areas, so they are ready to meet the needs of Melbourne's growing population.

Figure 1.1 shows SRL East in the context of the entire SRL project and Melbourne's rail network.

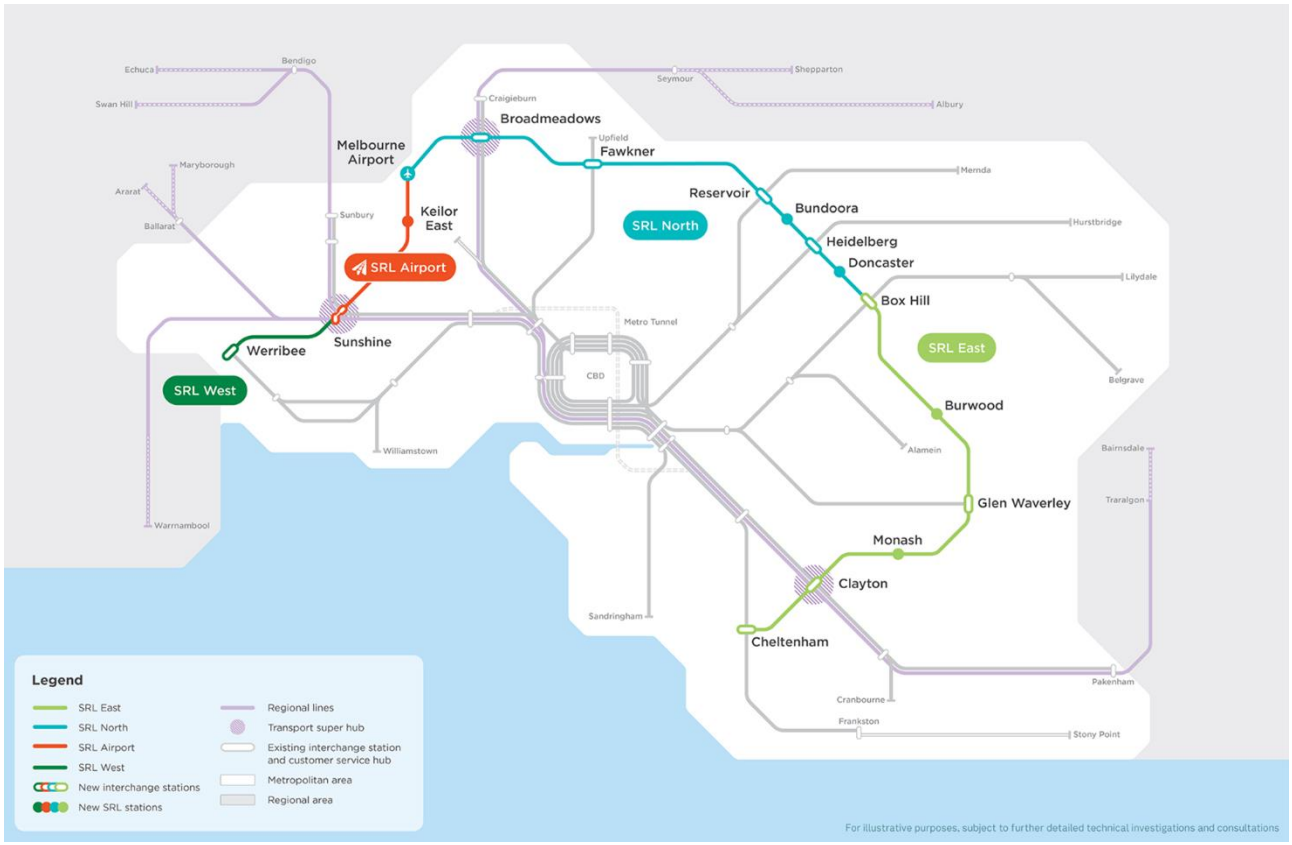


FIGURE 1.1 SRL EAST CONTEXT IN MELBOURNE'S RAIL NETWORK

1.3 Structure planning

Structure Plans are being prepared to help develop the vision for each SRL East neighbourhood.

The Structure Plans cover defined SRL East Structure Plan Areas. These are the areas immediately surrounding the SRL stations, where the most growth and change will occur.

The Structure Plans cover defined SRL East Structure Plan Areas that can support the most growth and change. These areas cover a walkable catchment that extends from the SRL station entrances. Additional places are included each Structure Plan Area as required to make planning guidance more robust and effective, and to align with each community's aspirations and current and future needs.

The Structure Plans will provide a framework to meet local housing, employment and social infrastructure needs over the next decades. This may include changes to land use, building heights and densities, additional infrastructure, community services and open space.

A Structure Plan is a blueprint to guide how an area develops and changes over time. Structure Plans describe how future growth within the area will be managed in an appropriate and sustainable way to achieve social, economic and environmental objectives. The Structure Plans cover transport connections and car parking, housing and commercial development, community infrastructure, urban design, open space, water and energy management, climate resilience and sustainability.

By tailoring planning decisions to reflect the needs of a defined area, Structure Plans give effect to the policies and objectives set for these areas and cater for changing community needs. They also provide certainty for residents, businesses and developers by identifying the preferred locations and timing of future land uses, development and infrastructure provision.

Structure Plans take a flexible and responsive approach that enables places to evolve over time.

Planning scheme amendments will be required to implement the Structure Plans into the planning schemes of the cities of Bayside, Kingston, Monash and Whitehorse.

1.4 Structure of this report

- **Section 1** provides the background and context of the technical assessment.
- **Section 2** explains the methodology for the technical assessment.
- **Section 3** defines the six SRL East Structure Plan Areas.
- **Section 4** summarises legislation, policies and other documents relevant to the assessment.
- **Section 5** describes the existing aviation and airspace controls and activities in each Structure Plan Area.
- **Section 6** sets out the findings of the assessment. It identifies the issues, challenges and opportunities relating to aviation and airspace that will impact land use planning and development in each Structure Plan Area.
- **Section 7** sets out the recommendations to consider when developing the Structure Plans.

2 Methodology

The methodology for the aviation and airspace technical assessment involved:

- Study Areas for the assessment in each Structure Plan Area were established – for this assessment the Study Areas are the same area as the SRL East Structure Plan Areas (see Section 3)
- Legislation, policies, planning zones and overlays and other relevant documents relating to aviation and airspace that impact structure planning and development in the SRL East Structure Plan Areas were reviewed (see Section 4)
- Existing aviation activities and airspace controls in each Structure Plan Area were identified (see below for more details, also see Section 5)
- Potential future airspace constraints which would impact structure planning in the SRL East Structure Plan Areas were considered
- The impact of aviation activities and airspace controls on development in the SRL East Structure Plan Areas was assessed, specifically height limits and required planning permits and approvals (see Section 5.2)
- Based on the assessment, recommendations were developed to inform the Structure Plans (see Section 7).

Identification of existing aviation controls

Maps developed to identify aviation controls for the assessment were:

- OLS and PANS-OPS maps using data provide by Moorabbin Airport Corporation
- 'Heatmaps' which show airspace development height restrictions
- Longitudinal sections of the restrictions in each Structure Plan Area.

Developing the maps involved:

- Review of Essendon Airport's protected airspace, the OLS and PANS-OPS Surfaces
- Review of Moorabbin Airport's protected airspace, the OLS and PANS-OPS Surfaces
- Review of the existing ground elevation Light Detection and Ranging (LiDAR) data from the Department of Environment, Land, Water and Planning (DELWP) (now Department of Transport and Planning (DTP)) 2017-2018 Greater Melbourne LiDAR Project
    - » Appendix A shows an example of an OLS diagram, which is a conceptual (imaginary) surfaces associated with a runway, which identify the lower limits of the aerodrome safeguarded airspace above which objects become infringements and must be reported to the CASA. (SRLA Study of Aviation Impact to Station Precinct Development report dated 28 June 2021 Rev C)
- All heights on the maps are shown as Australian Height Datum (AHD) and LIDAR data is measured from natural ground level (NGL).

2.1 Stakeholder engagement

This technical report builds on previous consultation undertaken for the feasibility, design development and environmental and planning approval phases of the SRL project. The structure planning process has involved comprehensive and robust conversations with the community, councils, key institutions and other stakeholders on the proposed visions and precinct key directions for the SRL East Structure Plan Areas and surrounds. For

further information please refer to the SRL Structure Planning Engagement Reports available on the SRL website (https://bigbuild.vic.gov.au/library/suburban-rail-loop/reports/engagement-reports).

Table 2.1 summarises the stakeholder engagement conducted and how it has informed the preparation of this technical report. Data was sourced by SRLA from Moorabbin Airport Corporation and provided to AJM-JV for use in this assessment.

TABLE 2.1 STAKEHOLDER ENGAGEMENT

STAKEHOLDER	DATE	MATTERS DISCUSSED/ ISSUES RAISED	OUTCOME
All SRL East Structure Plan Areas			
Moorabbin Airport Corporation	12 February 2024	Sourcing updated copies of the PANS-OPS and OLS data as per the 2021 Moorabbin Airport Masterplan	Updated airspace surface data received.

2.2 Assumptions and limitations

The following assumptions and limitations apply to this technical assessment:

- Existing ground elevation does not consider any further development from the time the ground elevation LiDAR data was produced in 2017–2018. It is assumed that no significant ground elevations changes will occur at the time more recent LiDAR data becomes available
- Impacts of exhaust plume from the Structure Plan Area buildings within all SRL East Structure Plan Areas are excluded from this assessment – refer to CASA Advisory Circular (AC) 139.E-02v1.0 for details on definitions and assessment process of a Plume Rise Assessment
- The updated Moorabbin Airport Masterplan 2021 data provided by the Moorabbin Airport Corporation shows updates to the OLS relevant to the Moorabbin Airport but not updated PAN-OPS information. This report has been prepared on the basis that the release of the Moorabbin Airport 2021 Master Plan does not include any changes to the PANS-OPS surfaces
- This technical report does not provide commentary on the development potential of the SRL East Structure Plan Areas.

3 SRL East Structure Plan Areas

This section defines the Structure Plan Area in each SRL East neighbourhood.

3.1 Cheltenham Structure Plan Area

The Cheltenham Structure Plan Area surrounds the SRL station at Cheltenham in the cities of Kingston and Bayside.

The Structure Plan Area is generally bordered by residential land north of Stayner Grove and Alison Street to the north, residential land east of Chesterville Road to the east, Park Road to the south and Middleton Street and Worthing Road to the west.

The Structure Plan Area is intersected by the Nepean Highway and the Frankston Line.

The Cheltenham Structure Plan Area is shown in Figure 3.1.

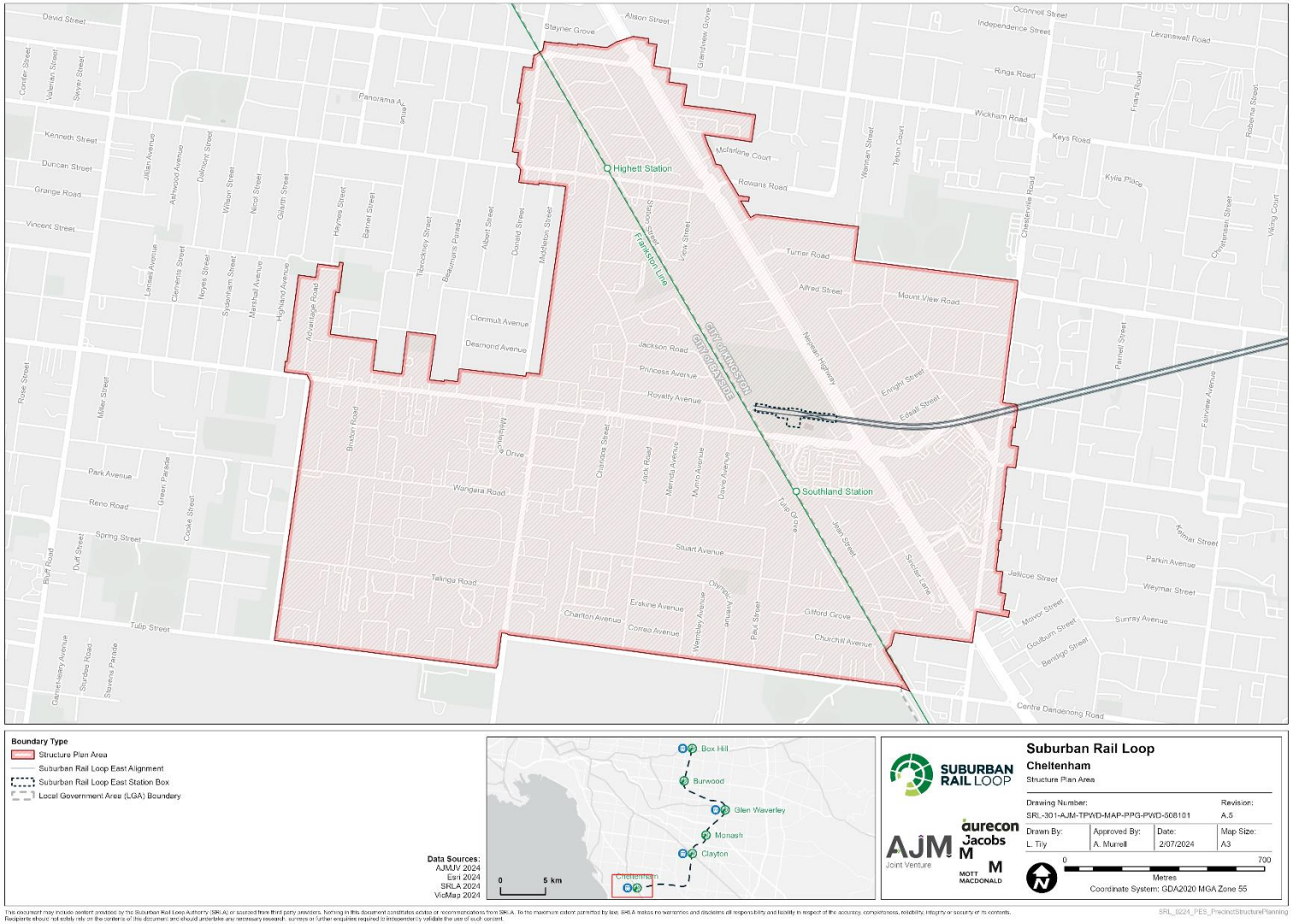


FIGURE 3.1 CHELTENHAM STRUCTURE PLAN AREA

3.2 Clayton Structure Plan Area

The Clayton Structure Plan Area surrounds the SRL station at Clayton in the cities of Monash and Kingston.

The Structure Plan Area is generally bordered by North Road / Wellington Road to the north, Ormond Road to the west, residential lots between Alward Avenue and Murdock Street, and parts of the Cranbourne / Pakenham Line to the south, and Kombi Road and Buckland Street to the east.

Dandenong Road is a major road, running in a north-west to south-east alignment through the edge of the Structure Plan Area. The existing Cranbourne / Pakenham Line intersects the Structure Plan Area in an east-west alignment.

The Clayton Structure Plan Area is shown in Figure 3.2.

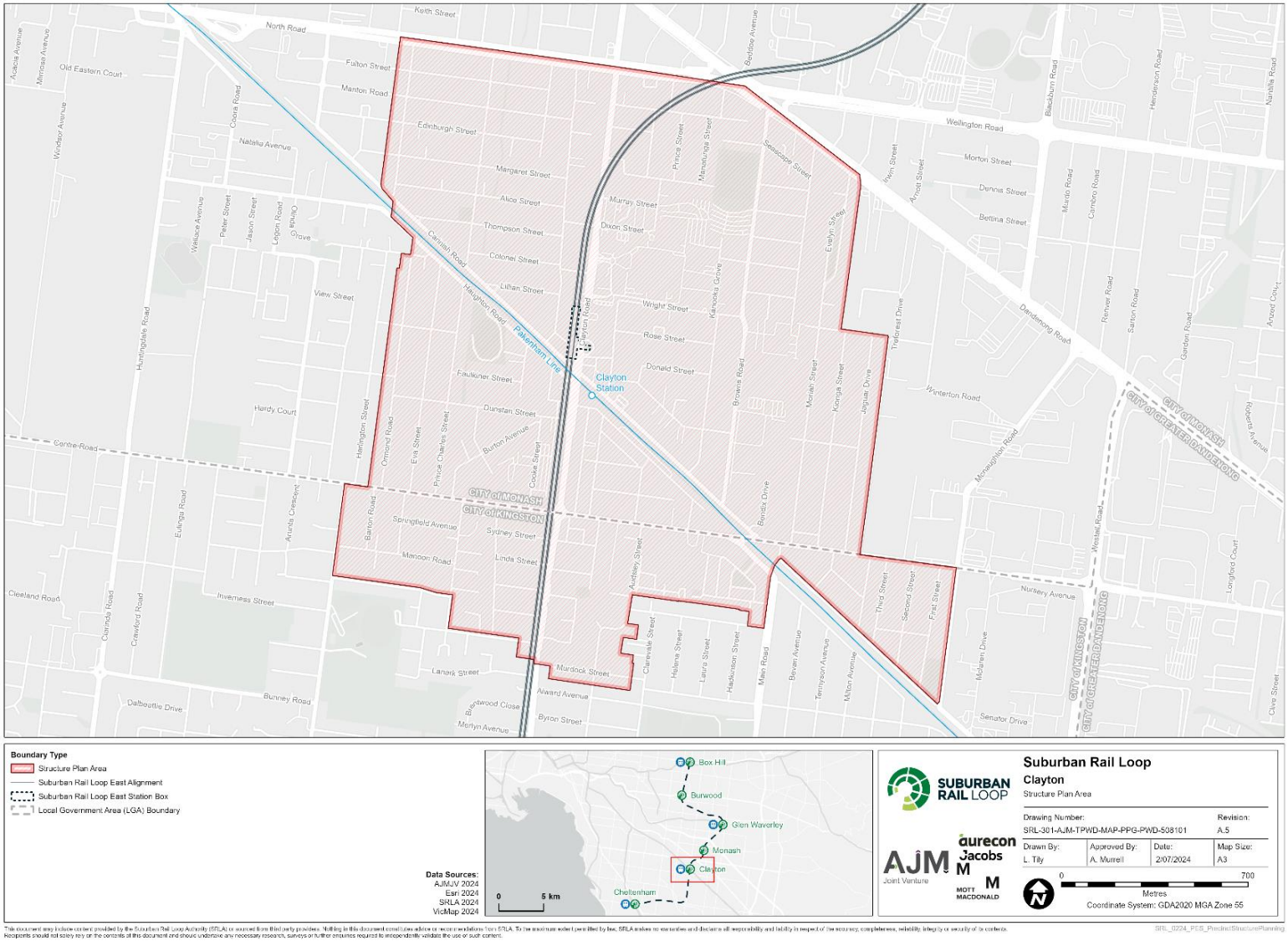


FIGURE 3.2 CLAYTON STRUCTURE PLAN AREA

3.3 Monash Structure Plan Area

The Monash Structure Plan Area surrounds the SRL station at Monash in the City of Monash.

It is generally bordered by Wellington Road and Princes Highway to the south, Gardiner Road and residential properties between Clayton Road and Dover Street to the west, land north of Ferntree Gully Road to the north and a reservation for a future road, which forms a natural barrier to properties to the east.

Monash University Clayton campus is located in the Monash Structure Plan Area.

The Monash Structure Plan Area is shown in Figure 3.3.

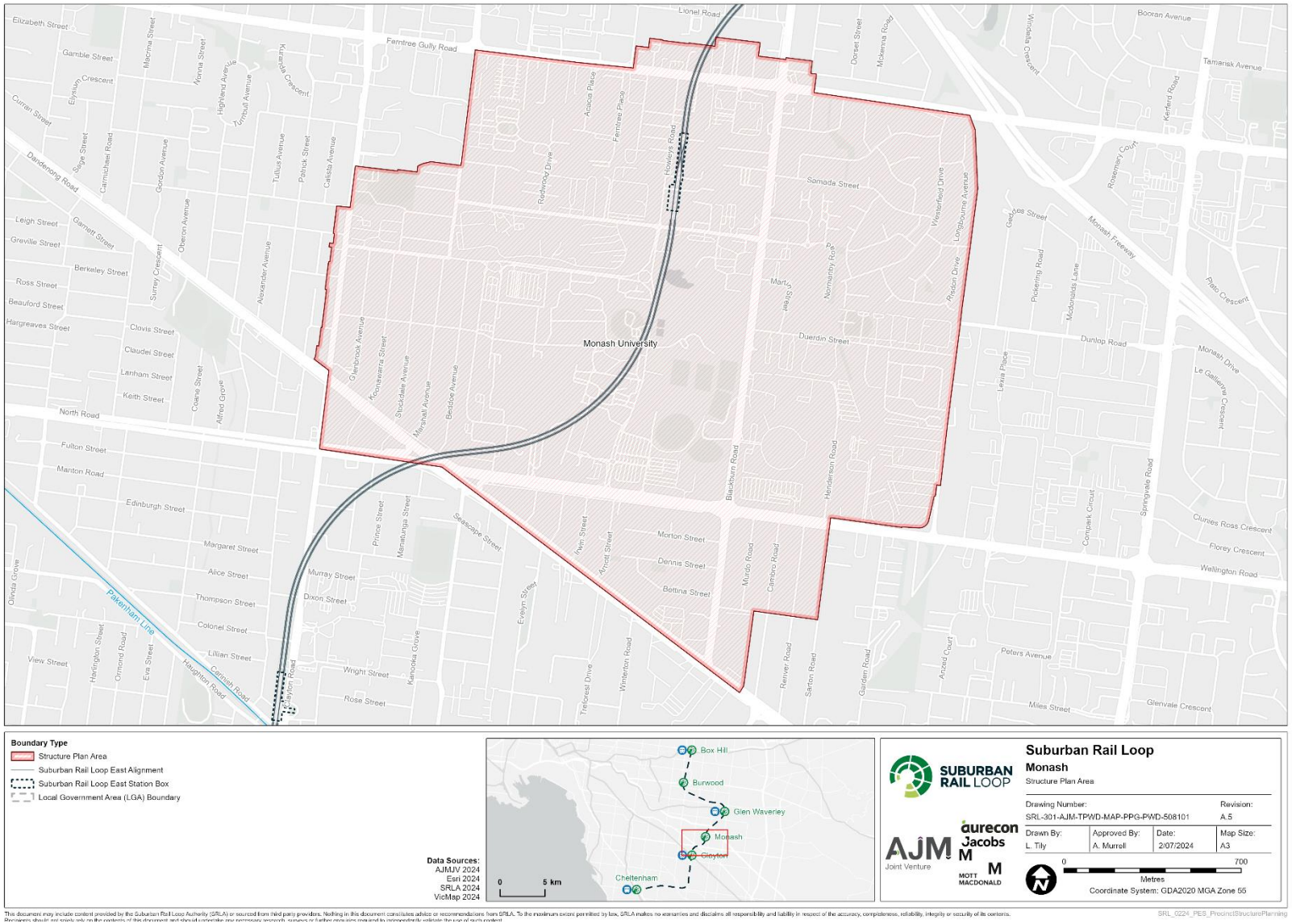


FIGURE 3.3 MONASH STRUCTURE PLAN AREA

3.4 Glen Waverley Structure Plan Area

The Glen Waverley Structure Plan Area surrounds the SRL station at Glen Waverley in the City of Monash.

It is generally bordered by residential properties along Madeline Street to the north, Danien Street and The Outlook to the east, Waverley Road to the south and Kinnoull Grove and Rose Avenue to the west.

Coleman Parade and the existing Glen Waverley Line intersect the centre of the Structure Plan Area in an east-west alignment.

Key arterial roads include Springvale Road which intersects the Structure Plan Area in a north-south alignment, and High Street Road and Waverley Road.

The Glen Waverley Structure Plan Area is shown in Figure 3.4.

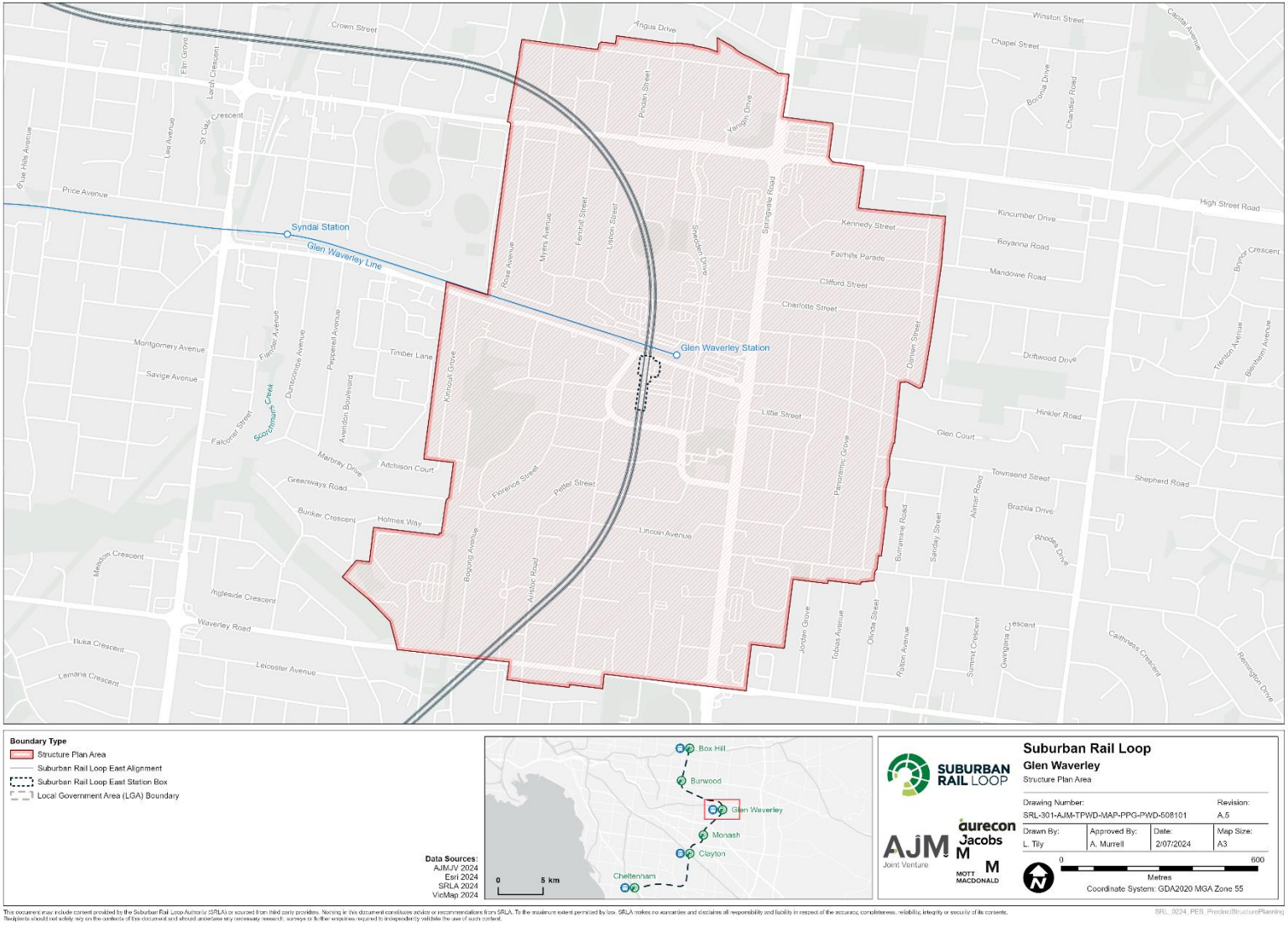


FIGURE 3.4 GLEN WAVERLEY STRUCTURE PLAN AREA

3.5 Burwood Structure Plan Area

The Burwood Structure Plan Area surrounds the SRL station at Burwood. The Structure Plan Area is mainly located in the City of Whitehorse, with the southern portion south of Highbury Road extending into the City of Monash.

The Structure Plan Area is generally bounded by Uganda Street, Deakin University, Inverness Avenue, Bronte Avenue and Yarra Bing Crescent to the north, Andrews Street, Wridgway Avenue, Prospect Street and Huntingdale Road to the east, Zodiac Street, Ashwood Drive, Carmody Street and Barlyn Road to the south and Sixth Avenue, Evans Street, Warrigal Road, Parer Street and Meldan Street to the west.

Burwood Highway intersects the centre of the Structure Plan Area in an east-west alignment.

Deakin University Burwood campus is located in the Structure Plan Area.

The Burwood Structure Plan Area is shown in Figure 3.5.

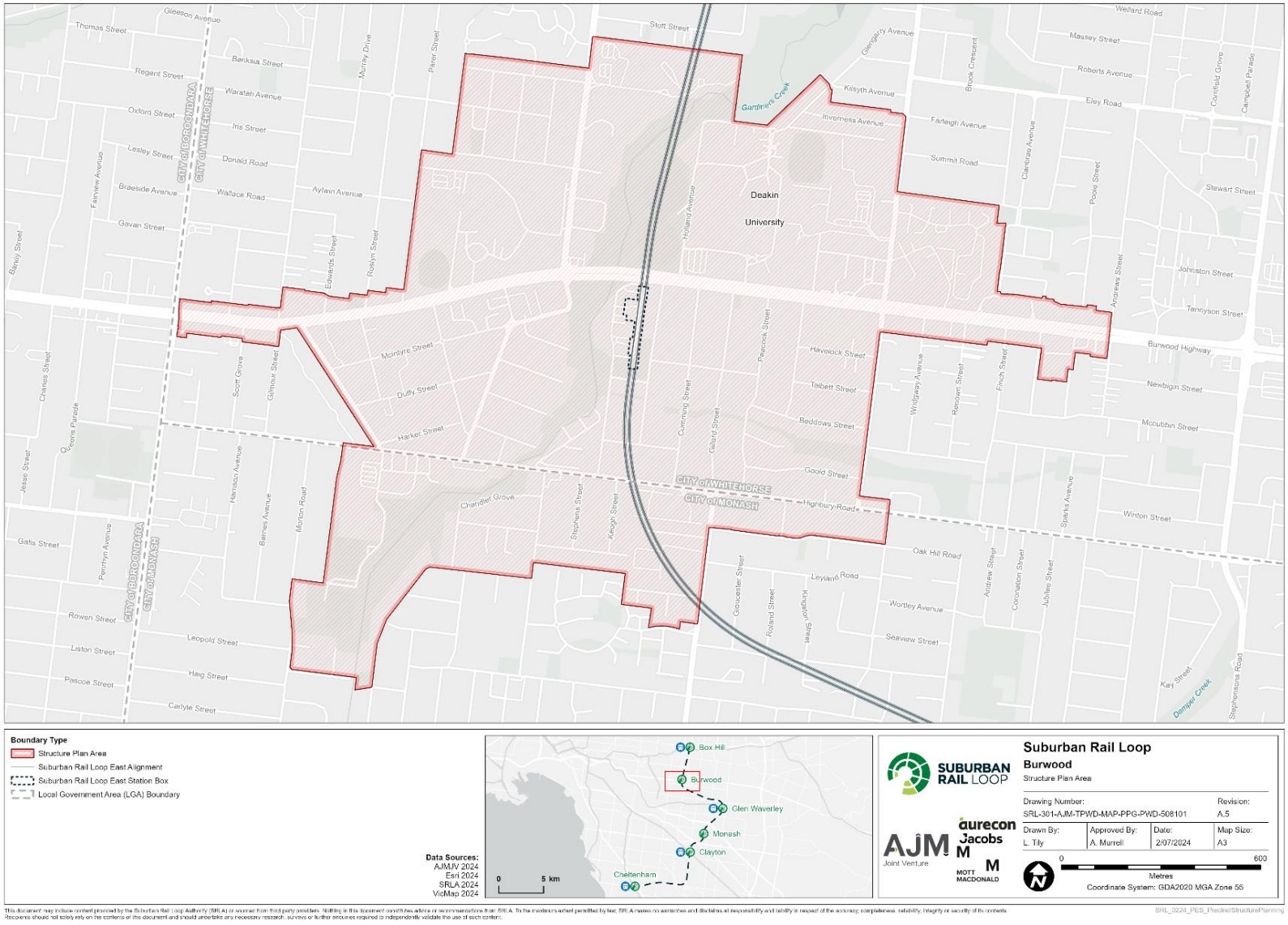


FIGURE 3.5 BURWOOD STRUCTURE PLAN AREA

3.6 Box Hill Structure Plan Area

The Box Hill Structure Plan Area surrounds the SRL station at Box Hill in the City of Whitehorse.

It is generally bordered by Severn Street and McKean Street to the north, Clota Avenue and Laburnum Street to the east, slightly west of Elgar Road to the west and Canterbury Road to the south.

Whitehorse Road / Maroondah Highway and the existing Belgrave / Lilydale Line intersect the centre of the Structure Plan Area in an east-west alignment. The main road corridors include Whitehorse Road, Elgar Road and Station Street.

The Box Hill Structure Plan Area is shown in Figure 3.6.

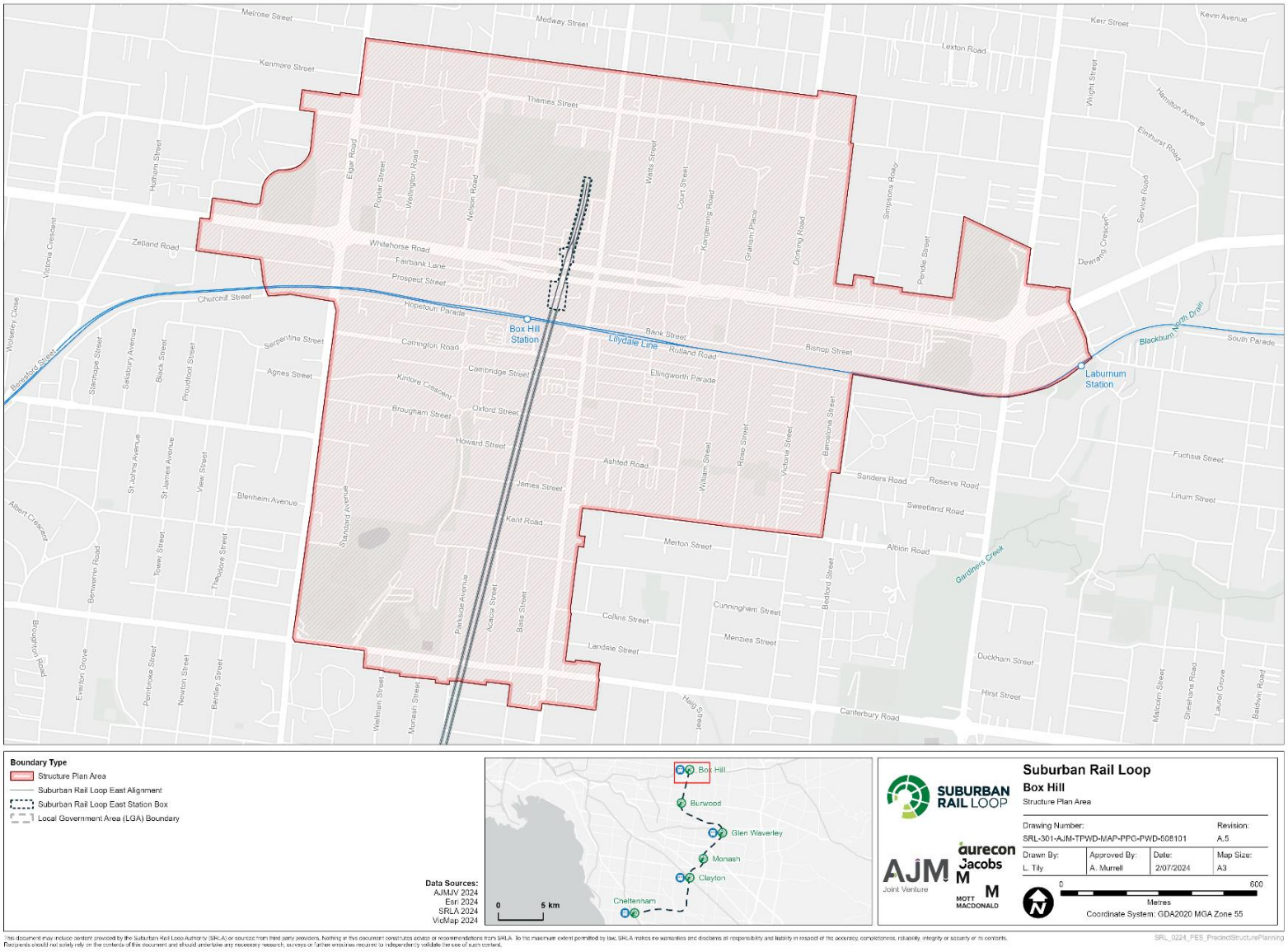


FIGURE 3.6 BOX HILL STRUCTURE PLAN AREA

4 Legislative and policy context

This section summarises legislation, polices and other documents relevant to the aviation and airspace technical assessment.

4.1 Commonwealth

Australian and international aviation-related laws seek to protect airport airspace. Australian rules and regulations generally follow international equivalents.

4.1.1 AIRPORTS ACT 1996 AND ASSOCIATED REGULATIONS

Part 12 of the *Airports Act 1996* (Cth) and the *Airports (Protection of Airspace) Regulations 1996 (*Cth) (the Airports Regulations) establish a framework for the protection of airspace at and around Australian airports.

The Airports Act defines certain activities that intrude into an airport's protected airspace as a 'controlled activity'. The Civil Aviation Safety Authority (CASA) must approve any controlled activities.

International Civil Aviation Organisation (ICAO) standards adopted by CASA define the airspace to be protected for aircraft operating during the initial and final stages of flight, or when manoeuvring in the vicinity of an airport.

These standards consist of two sets of invisible above-ground surfaces up to and outside 15 kilometres from an airport's vicinity which form an airport's protected airspace:

- Obstacle Limitation Surface (OLS) – this is generally the lowest surface and is designed to provide protection for aircraft flying into or out of an airport when a pilot is flying by sight
- Procedures for Air Navigational Services – Aircraft Operations (PANS-OPS) – this surface is generally above the OLS and is designed to safeguard an aircraft from collision with obstacles when an aircraft's flight may be guided solely by flight instruments, in conditions of poor visibility
- Where buildings may (under certain circumstances) be permitted to penetrate the OLS, they cannot be permitted to penetrate any PANS-OPS surface, because the purpose of these surfaces is to guarantee that aircraft operating under instruments are free of obstacles on an approach or departure.

The Airports Regulations enable an airport operator or the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) to approve applications to construct permanent and temporary structures, and to impose conditions on an approval. OLS and PANS-OPS surfaces outline the extent to which objects or structures may project into the airspace around an aerodrome, either temporarily or permanently, without compromising aircraft safety.

In relation to helicopters, the operator is responsible for ensuring a helicopter site or heliport meets CASA's *Advisory Circular (AC) 91-92v1.1 – Guidelines for helicopters – suitable places to take off and land* (Cth). However, safety may be considered a relevant matter (s.60(1A) of the *Planning and Environment Act 1987* (Vic) if there is an obvious or suspected safety issue or obstacle within the immediate vicinity of the helicopter landing site. It is recommended the responsible authority (as defined in s.13(2) of the Planning and Environment Act discuss the issue with the applicant and seek advice from CASA, if considered necessary.

The National Airports Safeguard Framework on '*Managing the Risk of Intrusions into the Protected Airspace of Airports'* is mirrored by the Airports Act and associated regulations.

4.1.1.1 Plume rise assessment

Aircraft operations in various stages of flight may be affected by exhaust plume. A light aircraft in approach configuration is more likely to be affected by a plume compared to a heavy aircraft cruising at higher altitude. Helicopters and light recreational aircraft can potentially be severely affected by high temperature plume and the altered air mixture above an exhaust plume. Critical plume height refers to the height up to which the plume of critical velocity may impact the handling and safety of an aircraft in flight – conversely demarcate the lowest safe altitude which aircraft should be flying over the plume rise.

Exhaust plumes can be produced from a number of sources:

- Industrial facilities that release process emissions through stack or vents
- Industrial flares that create an instantaneous release of hot gases during the depressurisation of gas systems
- Cooling towers that produce large volumes of buoyant gases that can rise a significant distance into the atmosphere
- Exhaust gases from power generation facilities that can produce plumes of varying velocities during different operating scenarios.

A plume rise assessment is mandatory for any building which emits an exhaust plume within protected airspace. However, subsequent exhaust plume later found to be impacting flight safety (in accordance with CASA's *Advisory Circular (AC) 139.E-02v1-0 – Plume rise assessments*) (Cth) can be required or ordered to permanently shut-down – as required by Regulation 139.180 of the *Civil Aviation Safety Regulations 1998* (CASR) (Cth).

If there is no plume rise assessment completed during planning, the relevant airport operator has the right to request a plume rise assessment and approval by CASA after construction if it considers the building to be affecting aircraft handling and safety.

If unsure of the potential impact, CASA recommends that a building development undertake a due diligence check during the early planning phase and that it be submitted to CASA for verification through *'Form 1247 – Operational Assessment of a proposed plume rise'*. Third-party developers within the SRL East Structure Plan Areas should consider undertaking a plume risk assessment where a proposed development may produce an exhaust plume.

4.1.2 MOORABBIN AIRPORT MASTER PLAN

Development and growth of Moorabbin Airport is governed by the Moorabbin Airport 2021 Masterplan. The 2021 Master Plan governs the development and growth of Moorabbin Airport over the next 20 years and provides a general aviation growth strategy. Key elements include:

- Up to seven aviation sub-precincts including flight training, maintenance and rotary
- Enhancing flight training capability
- Long-term aviation lease agreements
- Release of new aviation development sites for hangars, student accommodation and offices
- Investment in airport infrastructure including runway overlays, taxiway improvements, aircraft guidance signs, new aircraft parking areas, a western access road and new utilities to service the aviation precinct
- Youth engagement programs for primary and secondary schools and youth groups
- Marketing and promotion at aviation industry events, on the airport perimeter and in the media
- Participation in government trade missions

- Cross-promotion of flight training in airport retail precincts and at the museum
- Encouraging universities and higher education providers to locate at Moorabbin Airport.

4.2 State

4.2.1 PLANNING SCHEMES

The *Planning and Environment Act 1987* (Vic) is the legislative framework that governs the use, development and protection of land in Victoria. Planning schemes are subordinate instruments under the Act that apply to local government areas and set out how land may be used and developed.

Planning schemes set out planning controls which determine whether planning approval is required for the use and/or development of land. These controls include zones, overlays, particular and general provisions. These controls may also specify discretionary or mandatory built form perimeters, including building heights.

An assessment of policy relating to development affecting airspaces, flight paths or airports in each SRL East Structure Plan Area against the provisions of the applicable local government planning scheme comprising the relevant policies, zones, overlays and particular provisions is provided in Appendix B of this report.

The Monash and Clayton Structure Plan Areas are affected by planning controls relating to airspace.

4.2.1.1 Planning Practice Note 75 'Planning requirements for heliports and helicopter landing sites'

Planning Practice Note 75 (PPN75) explains how helicopter activity is regulated by the planning system and provides guidance to applicants and responsible authorities (as defined in s.13(2) of the Planning and Environment Act on preparing and assessing an application under Clause 52.15 (Heliport and Helicopter Landing Site) of the Victoria Planning Provisions.

PPN75 advises that planning controls do not apply to airborne helicopters and that consideration of a heliport or helicopter landing site does not generally extend to a helicopter flying overhead.

For controlled airspace areas, Airservices Australia is responsible for air traffic services, including managing designated flight paths. For uncontrolled airspace areas, the *Civil Aviation Regulations 1988* stipulate that a helicopter pilot must not fly over a city, town or populous area at a height lower than 1000 feet, or 500 feet over any other area. This does not apply if a helicopter is flying at a designated altitude, for example a flight path in controlled airspace.

Given a helicopter's flexibility in flight, they are able to be landed virtually anywhere which often requires variable flight paths. While land use planning does consider flight paths near to airports, it is not always necessary or appropriate to do so for helicopter landing sites.

Airservices Australia is the federal statutory authority responsible for ensuring that pilots comply with the *Air Navigation (Aircraft Noise) Regulations 1984.* The authority also provides air traffic management for Melbourne's controlled airspace, including designating flight paths for helicopters. For helicopter landing sites in uncontrolled airspace areas, flight paths are not approved and operators must adhere to Visual Flight Rules and Civil Aviation Regulations which are based on safety.

PPN75 advises that where a flight path is imperative to be maintained for a heliport or helicopter landing site, a planning authority may consider implementing a Design and Development Overlay (DDO) on adjacent land to restrict building height levels on sites underlying the designated flight path.

4.2.1.2 Monash and Clayton Structure Plan Areas

The Monash and Clayton Structure Plan Areas are both subject to Monash Planning Scheme DDOs which seek to protect helicopter flight paths for hospitals in the area.

There are four relevant schedules to the DDO:

- DDO14 and DDO15 implement the 'Monash Medical Centre Hospital Emergency Medical Services Helicopter Flight Path Protection'. These DDOs seek to ensure the heights of buildings and works do not encroach on flight path areas associated with the Monash Medical Centre helicopter landing site and that development heights avoid creating a hazard to aircraft using the landing site
    - » DDO14 requires a permit for any development which exceeds 92.6 metres above the Australian Height Datum (AHD)
    - » DDO15 requires a planning permit for any development which exceeds 102.6 metres above the AHD.

      A small portion of DDO15 affects the southern part of the of the Monash Structure Plan Area. DDO14 and DDO15 affect the northern portion of the Clayton Structure Plan Area, as shown in Figure 4.1
- DDO17 and DDO18 implement the 'Victorian Heart Hospital Emergency Medical Services Helicopter Flightpath Protection'. These DDOs seek to ensure the heights of buildings and works do not encroach on flight path areas associated with the Victorian Heart Hospital helicopter landing site and that development heights avoid creating a hazard to aircraft using the landing site
    - » DDO17 requires a permit for new development which exceeds 128.2 metres above the AHD. A permit is not required for works to an existing dwelling which exceeds a height of 128.2 metres above the AHD if the works do not exceed the height of the existing building and the lot does not immediately adjoin the hospital land (the Public Use Zone 2 land occupied by the Victorian Heart Hospital).

      DDO17 affects a large portion of the Monash Structure Plan Area, primarily in its eastern half.
- DDO18 requires a permit for new development which exceeds 138.2 metres above the AHD. A permit is not required for works to an existing dwelling which exceeds a height of 138.2 metres above the AHD if the works do not exceed the height of the existing building and the lot does not immediately adjoin the hospital land (the Public Use Zone 2 land occupied by the Victorian Heart Hospital)

  DDO18 affects the Monash and Clayton Structure Plan Area, with the majority of the DDO affecting the Monash Structure Plan Area and a small portion of the north-eastern portion of the Clayton Structure Plan Area, as shown in Figure 4.1.

Planning permit applications for development under the above DDOs must be referred to the Department of Health as the determining referral authority.

Monash Medical Centre is developing plans which will have implications for helicopter flight paths (DDO14 and DDO15), potentially changing the existing flight path from an east-west direction to a north-south direction.

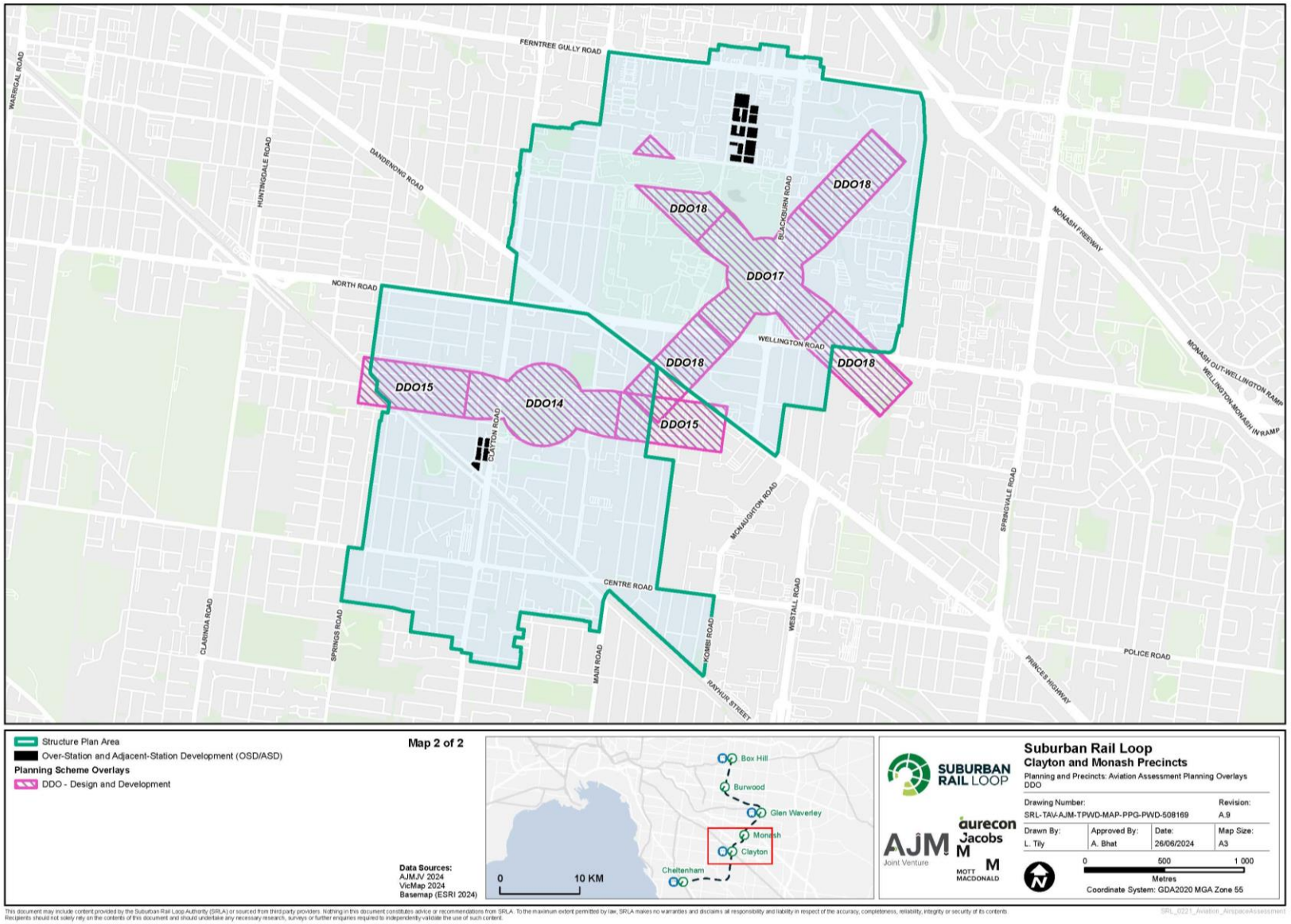


FIGURE 4.1 FLIGHT PATH PROTECTION DDO MAP OF THE MONASH AND CLAYTON STRUCTURE PLAN AREAS

5 Existing conditions

This section assesses existing conditions relevant to aviation and airspace in each SRL East Structure Plan Area.

Section 5.1 details current airspace controls in each SRL East Structure Plan Area.

Section 5.2 details the maximum development heights in each SRL East Structure Plan Area.

5.1 Airspace controls

Figure 5.1 and Figure 5.2 show the proximity of the SRL East Structure Plan Areas to Moorabbin Airport PANS-OPS and OLS controls.

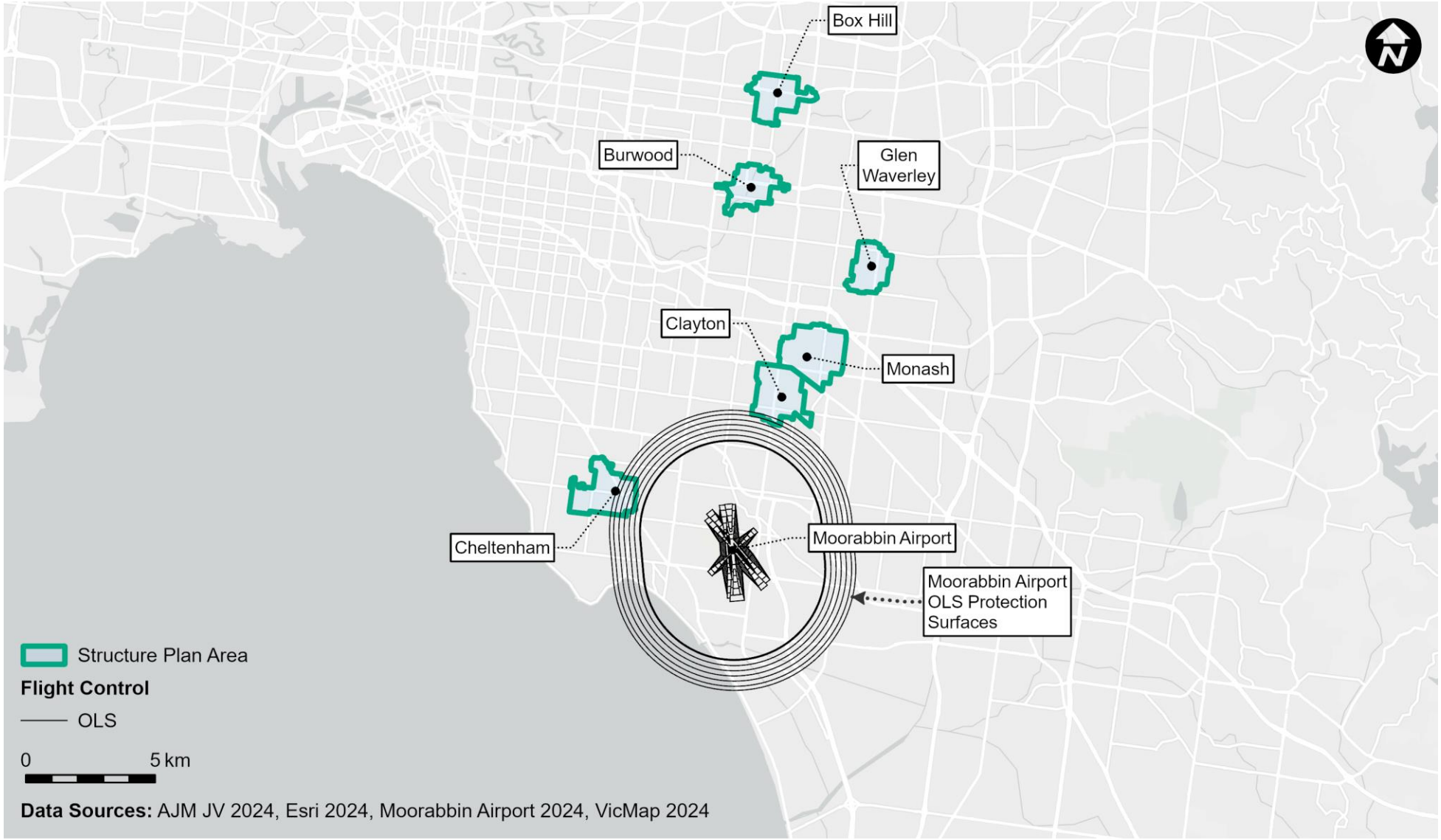


FIGURE 5.1 LOCALITY LAYOUT – SRL EAST STRUCTURE PLAN AREAS WITHIN MOORABBIN AIRPORT OLS PROTECTION SURFACES

Source: AJM-JV (OLS layout provided by Moorabbin Airport)

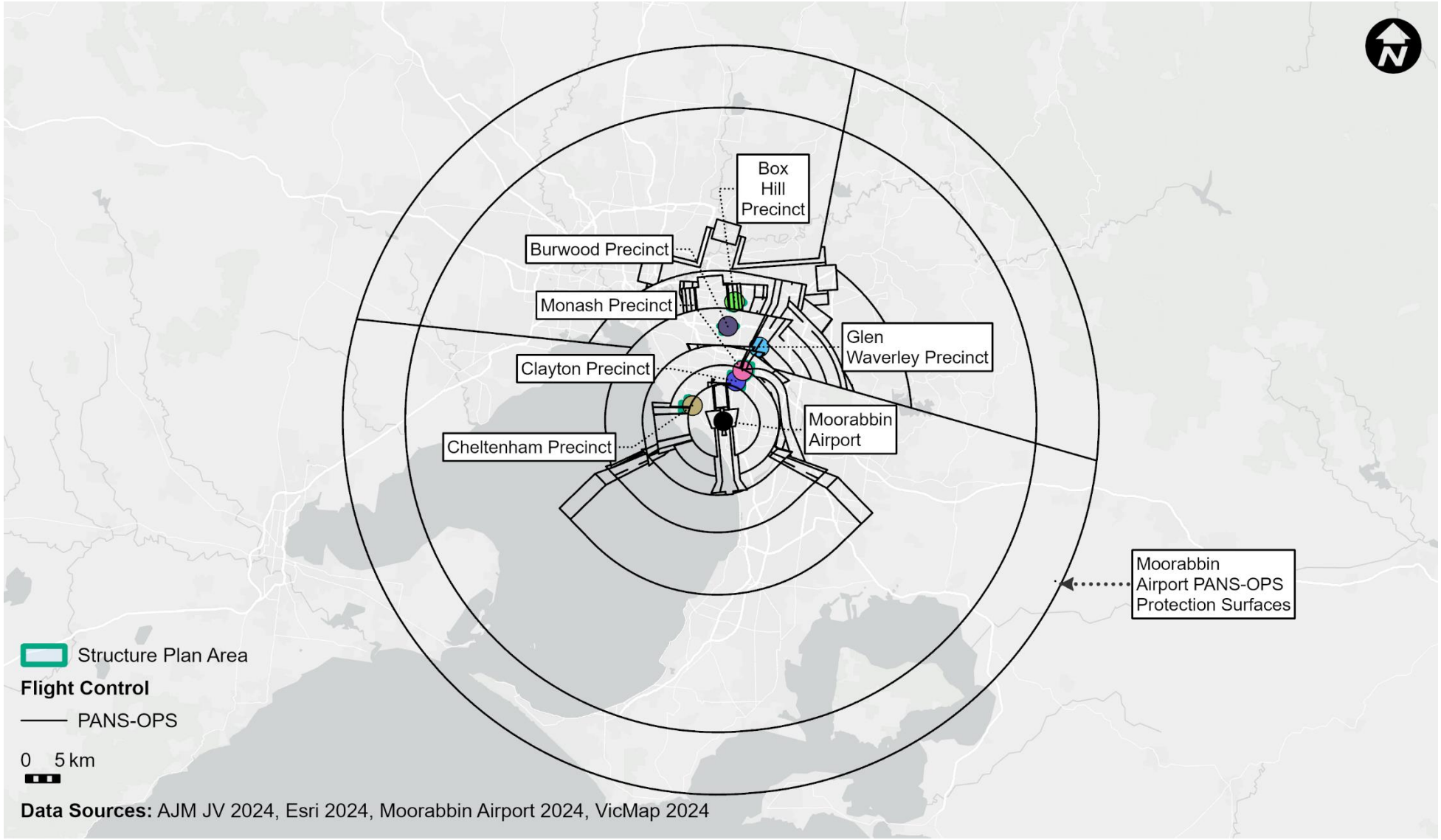


FIGURE 5.2 LOCALITY LAYOUT – SRL EAST STRUCTURE PLAN AREAS WITHIN MOORABBIN AIRPORT PANS-OPS PROTECTION SURFACES

Source: AJM-JV (PANS-OPS layout provided by Moorabbin Airport)

5.1.1 CHELTENHAM STRUCTURE PLAN AREA

The Cheltenham Structure Plan Area is within the OLS and PANS-OPS surfaces of Moorabbin Airport Runway. The Cheltenham Structure Plan Area is approximately 5.2 kilometres from Moorabbin Airport Airfield Reference Point (ARP).

Figure 5.3 and Figure 5.4 show the airspace protection in the Cheltenham Structure Plan Area.

Figure 5.5, Figure 5.6 and Figure 5.7 show heatmaps that depict the maximum development height limits permitted by the relevant OLS and PANS-OPS surfaces.

It is noted that relevant airspace planning controls are limited in nature as they only impact land immediately proximate to existing airports where a DDO or Airport Environs Overlay (AEO) are applicable. These are the mechanisms available within the Victoria Planning Provisions to consider development with respect to airspace.

Planning controls regulate the height of tall development outside the immediate airport boundary which may intersect with the airspace controls. It is generally the responsibility of an applicant who seeks to construct 'tall' buildings to ensure their development is compatible with the airspace requirements and complies with the *Airports Act 1996* (Cth), as the Kingston Planning Scheme does not necessarily require this.

The eastern portion of the Cheltenham Structure Plan Area is located under the Inner Horizontal OLS and Conical OLS that slopes upward in a westerly direction. The Conical OLS ranges from 58 to 118 metres AHD.

The existing PANS-OPS surfaces for Moorabbin Airport provide airspace protection for the following instrument departure and approach procedures published by Airservices Australia: 5 GNSS arrival procedures; an approach procedure to a circling minimum using the Moorabbin Non Directional Radio Beacon (NDB); and a runway 17L and 35R Global Positioning System RNAV (GNSS) approach procedure.

The Cheltenham Structure Plan Area was assessed against these PANS-OPS surfaces. The north-west portion of the assessment is located under PANS-OPS horizontal surface of 157.2 metres AHD, while the south-east portion is under 99 metres AHD.

Development within the Cheltenham Structure Plan Area is regulated by CASA as follows:

- Temporary structures, less than 3 months, such as construction cranes which penetrate the OLS can be approved or refused by Moorabbin Airport after consultation with CASA and Airservices Australia
- Temporary structures, less than 3 months, such as construction cranes which penetrate the PANS-OPS surfaces require approval by the DITRDCA but must be supported by Moorabbin Airport after consultation with CASA and Airservices Australia
- Permanent structures such as buildings which penetrate the OLS must be referred to DITRDCA for approval or refusal by Moorabbin Airport after consultation with CASA, Airservices and the Victorian Building Authority
- Permanent structures such as buildings penetrating the PANS-OPS airspace are not permitted.

This means that buildings in the Cheltenham Structure Plan Area must be below the stipulated OLS surface unless approved by DITRDCA and cannot penetrate the stipulated PANS-OPS surfaces. Temporary construction cranes, less than 3 months, are also required to be below the stipulated OLS and PANS-OPS surfaces; deviations require approval by Moorabbin Airport or DITRDCA.

It is recommended that all building and crane activity particularly where they come close to, or operate within, the protected airspace in the Cheltenham Structure Plan Area is assessed by Moorabbin Airport for final height assessment when statutory planning approval is sought for future land use and development within the area.

5.1.2 CLAYTON STRUCTURE PLAN AREA

The Clayton Structure Plan Area is located approximately 6 kilometres north-east of Moorabbin Airport and 19 kilometres south-east of the Melbourne Central Business District.

The Structure Plan Area is within the OLS and PANS-OPS airspace protection surfaces of Moorabbin Airport. The southern part of the Structure Plan Area is under the Conical OLS. The Clayton Structure Plan Area is largely within the PANS-OPS 157.2 metre AHD horizontal plane with a small portion at the south of the area within the 99 metre and 121.9 metre AHD horizontal plane.

Figure 5.8, Figure 5.9, and Figure 5.10 show the airspace protection in the Clayton Structure Plan Area.

Figure 5.11, Figure 5.12, and Figure 5.13 show heatmaps that depict the maximum development height limits permitted by the relevant OLS and PANS-OPS surfaces.

The northern portion of the Clayton Structure Plan Area is subject to DDO14 and DDO15 which seek to protect the inner and outer areas of the 'Monash Medical Centre Hospital Emergency Medical Services Helicopter Flight Path Protection'. This overlay seeks to ensure the height of buildings and development do not encroach on the flight path areas associated with the Monash Medical Centre helicopter landing site and the height of development avoids creating a hazard to aircraft using the Monash Medical Centre helicopter landing site.

DDO14 requires a planning permit for development which exceeds a building height of 92.6 metres above the AHD. DDO15 requires a planning permit for development which exceeds a building height of 102.6 metres above the AHD. Planning permit applications must be referred to the Department of Health as the determining referral authority.

A small portion in the north-eastern section of the Clayton Structure Plan Area is subject to DDO18, which seeks to protect flight paths for the outer area of the 'Victorian Heart Hospital Helicopter Flight Path Protection'.

A planning permit is required for new development which exceeds a height 138.2 metres above the AHD. Planning permit applications must be referred to the Department of Health which is a determining referral authority.

Works to existing dwellings which exceed these heights but do not increase building heights further and are not adjacent to the PUZ2 land which comprises the Victorian Heart Hospital are exempt from requiring a planning permit under the DDO18.

Development proximate to the Monash Medical Centre Hospital and Victorian Heart Hospital should be cognisant of the requirements of these DDOs and should ensure development does not encroach into the helicopter flight paths.

5.1.3 MONASH STRUCTURE PLAN AREA

The Monash Structure Plan Area is located approximately eight kilometres north-east of Moorabbin Airport and 18 kilometres south-east of the Melbourne Central Business District.

The Structure Plan Area is outside Moorabbin Airport OLS but within four PANS-OPS surfaces. The north of the area is within the 182.2 to 243.8 metre AHD PANS-OPS sloping plane, north-west of the area within the 182.2 metre AHD PANS-OPS horizontal plane, north-east of the area within the 243.8 metre AHD PANS-OPS horizontal plane, and the southern part of the Structure Plan Area within the 157.2 metre AHD PANS-OPS horizontal plane.

Figure 5.14, Figure 5.15, and Figure 5.16 show the airspace protection in the Monash Structure Plan Area.

Figure 5.17, Figure 5.18 , Figure 5.19 show heatmaps that depict the maximum development height limits permitted by the relevant PANS-OPS surfaces.

A large area of the Monash Structure Plan Area is subject to DDO17 and DDO18, which seek to protect flight paths for different areas of the 'Victorian Heart Hospital Helicopter Flight Path Protection'.

A planning permit is required for new developments which exceed a height of 128.2 metres or 138.2 metres above the AHD (for DDO17 and DDO18 respectively). Planning permit applications must be referred to the Department of Health which is a determining referral authority.

Works to existing dwellings which exceed these heights but do not increase building heights further and are not adjacent to the PUZ2 land which comprises the Victorian Heart Hospital are exempt from requiring a planning permit under DDO17 and DDO18.

A small portion of the southern part of the Monash Structure Plan Area is subject to DDO15, which seeks to protect flight paths for different areas of the 'Monash Medical Centre Hospital Emergency Medical Services Helicopter Flight Path Protection'.

A planning permit is required for proposed developments which exceed a height of 102.6 metres above the AHD. Planning permit applications must be referred to the Department of Health which is a determining referral authority.

Development proximate to the Victorian Heart Hospital and Monash Medical Centre Hospital should be cognisant of the requirements of DDO15, DDO17 and DDO18 to ensure that development does not encroach into helicopter flight paths.

5.1.4 GLEN WAVERLEY STRUCTURE PLAN AREA

The Glen Waverley Structure Plan Area is located approximately 13 kilometres north-east of Moorabbin Airport and 19 kilometres south-east of the Melbourne Central Business District.

The Structure Plan Area is outside the Moorabbin Airport OLS but within three PANS-OPS horizontal plane surfaces. Approximately one-third of the area towards the south is within the 243.8 metre AHD PANS-OPS horizontal plane and majority of the area is within the 400 metre AHD PANS-OPS horizontal plane. A very small portion of the western side of the area is within the 213.3 metre AHD PANS-OPS horizontal plane.

Figure 5.20 and Figure 5.21 show the airspace protection in the Glen Waverley Structure Plan Area.

Figure 5.22, Figure 5.23 and Figure 5.24 show heatmaps that depict the maximum development height limits permitted by the relevant PANS-OPS surfaces.

No existing planning airspace controls apply to the Glen Waverley Structure Plan Area.

5.1.5 BURWOOD STRUCTURE PLAN AREA

The Burwood Structure Plan Area is located approximately 14 kilometres north of Moorabbin Airport and 14 kilometres east of the Melbourne Central Business District.

The Structure Plan Area is within the PANS-OPS horizontal plane of 335.2 metres AHD airspace protection surface of Moorabbin Airport.

The Burwood Structure Plan Area is beyond the Essendon Airport a small portion of the southern edge of the Structure Plan Area is within the 575 to 609.6 metre AHD PANS- OPS airspace protection surface of the Essendon Airport.

Figure 5.25 and Figure 5.26 show the airspace protection surface in the Burwood Structure Plan Area.

Figure 5.27 shows heatmaps that depict the maximum development height limits permitted by the relevant PANS-OPS surfaces.

No existing planning airspace controls apply to the Burwood Structure Plan Area.

5.1.6 BOX HILL STRUCTURE PLAN AREA

The Box Hill Structure Plan Area is located approximately 21 kilometres north of Moorabbin Airport and 14 kilometres east of the Melbourne Central Business District.

The Structure Plan Area is outside the Moorabbin Airport OLS but within four PANS-OPS surfaces. The majority of the Box Hill Structure Plan Area is within the 337.2 metre to 457.2 metre AHD PANS-OPS sloping plane.

The Box Hill Structure Plan Area is outside the Essendon Airport OLS but a small portion of the southern edge of the Structure Plan Area is within the 550 to 600 metre AHD PANS-OPS airspace protection surface of the Essendon Airport.

Figure 5.28 and Figure 5.29 show the airspace protection in the Box Hill Structure Plan Area.

Figure 5.30, Figure 5.31, Figure 5.32 and Figure 5.33 show heatmaps that depict the maximum development height limits as permitted by the relevant PANS-OPS surfaces.

No existing planning airspace controls apply to the Box Hill Structure Plan Area. Box Hill Hospital does not have any helipads which would require airspace or flight path protection.

5.2 Airspace maximum heights

Based on the existing ground elevation LiDAR data from the DELWP 2017–2018 Greater Melbourne LiDAR Project, building heights in the SRL East Structure Plan Areas must be below the maximum development height limit described in Sections 5.2.1 to 5.2.6.

Maximum development height limits are shown on heatmaps. The heatmap calculations involve comparing the height of the ground surface data within the airspace protection areas, as defined by the OLS and PANS OPS criteria, with the reference heights or limitations set by the by the Civil Aviation Safety Regulations (CASR) and the standards and procedures outlined by CASA regulations. By applying these regulations and utilising the 2017-2018 LiDAR data, aviation authorities can ensure that adequate clearance is maintained and that any potential obstacles are accounted for in the design and operation of the airspace in question.

If temporary construction cranes are to be used during construction works, their height must also be considered. A penetration as a result of temporary construction cranes may be allowable, but approval must be obtained from Moorabbin Airport and/or Essendon Airport (in relation to the Box Hill and Burwood Structure Plan Areas) and/or DITRDCA.

Other airspace that may impact development controls for the SRL East Structure Plan Areas includes Essendon Airport. Essendon Airport is approximately 22 kilometres and 21 kilometres from the Box Hill and Burwood Structure Plan Areas respectively. The Box Hill and Burwood Structure Plan Areas are located outside the Essendon Airport OLS and so this does not impact their development. The other four SRL East Structure Plan Areas are located further away from Essendon Airport and will not be impacted by the Essendon Airport OLS.

A small area on the southern portion of the Box Hill Structure Plan Area is within the Essendon Airport PANS-Ops surfaces within the 550 to 600 metre AHD airspace protection surface. For context, this is significantly higher than the PANS-OPS development safeguarding surfaces on Moorabbin Airport at 337.7 metres AHD. The western area of the Burwood Structure Plan Area is also located within the Essendon Airport PANS-Ops surfaces at approximately 575 to 609.6 metre AHD airspace protection surface, and significantly higher than the 335.5 metre AHD PANS-Ops development safeguarding surface for Moorabbin Airport.

Given the height of the Essendon airspace protection surfaces, which affect the Burwood and Box Hill Structure Plan Areas, it is unlikely to impact future development outcomes.

5.2.1 CHELTENHAM STRUCTURE PLAN AREA

FIGURE 5.3 OLS IMPACT IN CHELTENHAM STRUCTURE PLAN AREA

Note:

The eastern portion of the Cheltenham Structure Plan Area is located within the Moorabbin Airport prescribed OLS as shown in Figure 5.3.

FIGURE 5.4 PANS-OPS IMPACT IN CHELTENHAM STRUCTURE PLAN AREA

Note:

The Cheltenham Structure Plan Area is located within the Moorabbin Airport prescribed PANS-OPS as shown in Figure 5.4.

Maximum development limits are shown within the following heatmap Figures that provide indicative maximum development height under the PANS-OPS surfaces:

- PANS-OPS Horizontal Plane 157.2 metres AHD (refer to Figure 5.5)
- PANS-OPS Horizontal Plane 99 metres AHD (refer to Figure 5.6).

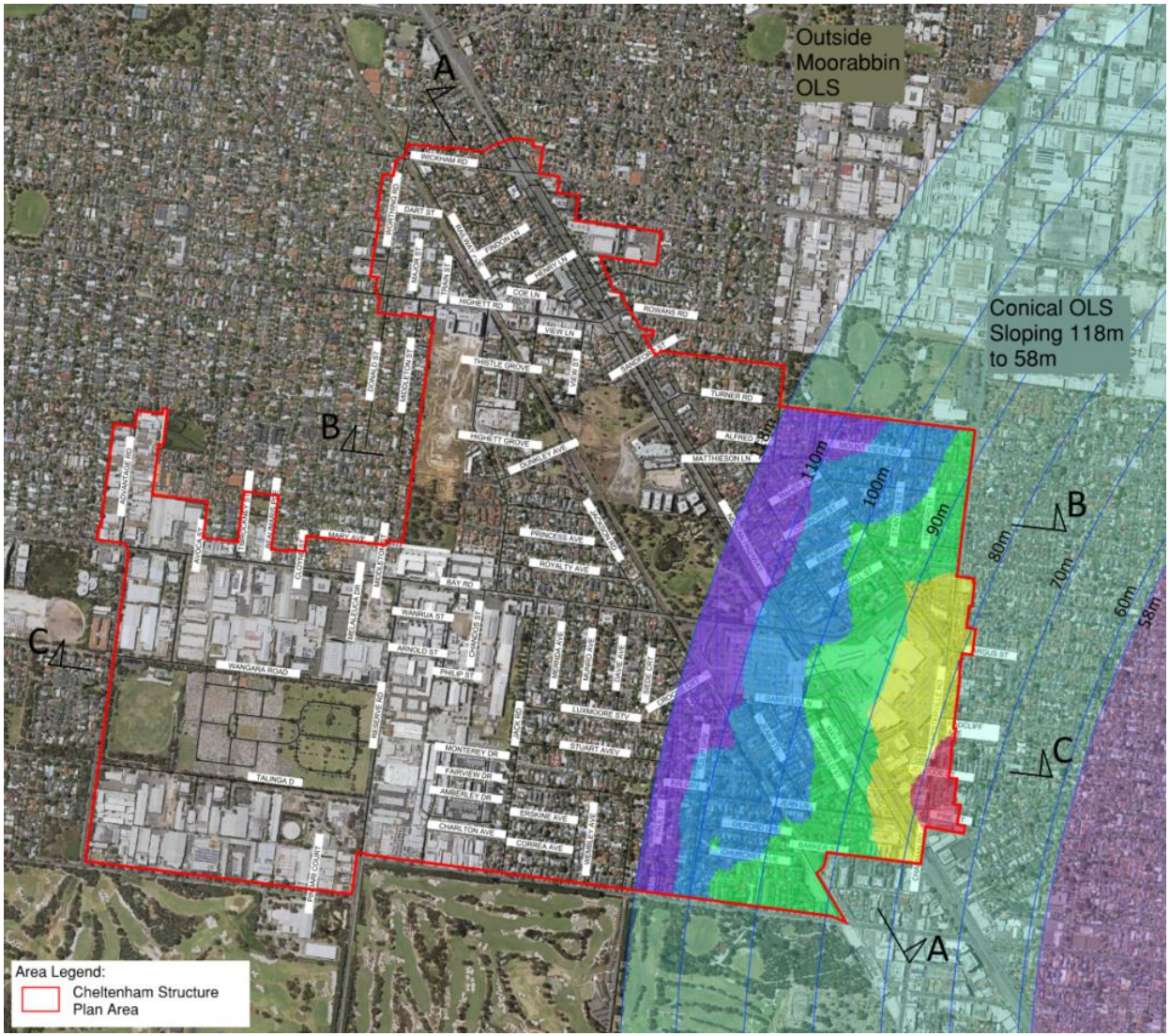


FIGURE 5.5 CONICAL OLS DEVELOPMENT HEIGHT LIMITS IN CHELTENHAM STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Elevation
1		40.000
2		50.000
3		60.000
4		70.000
5		80.500

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the Conical OLS that slopes upward in a northerly direction, from 58 metres to 118 metres AHD protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A, B-B, and C-C across the Cheltenham Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

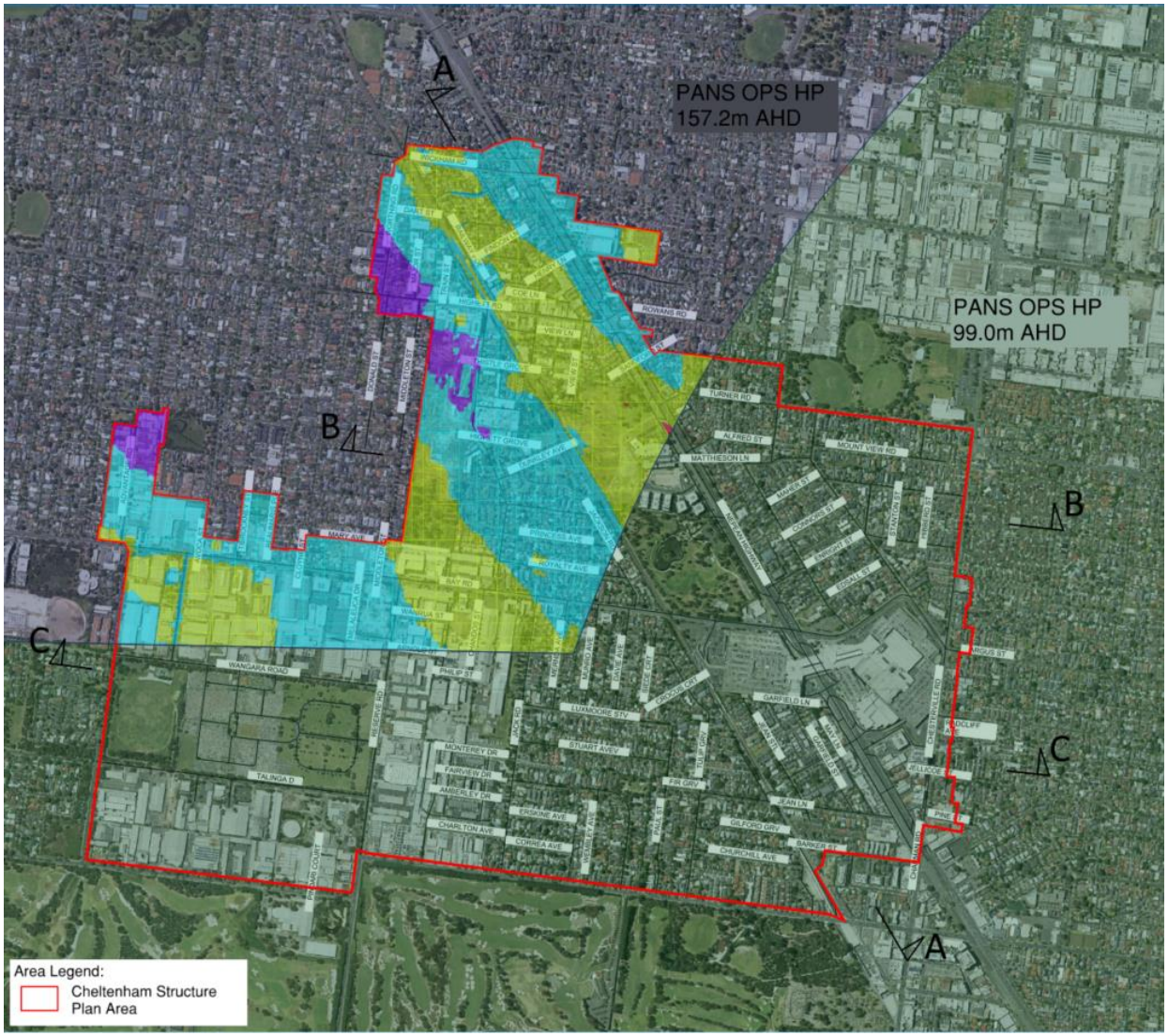


FIGURE 5.6 PANS OPS SURFACES HP 157.2 METRES DEVELOPMENT HEIGHT LIMITS IN CHELTENHAM STRUCTURE PLAN AREA

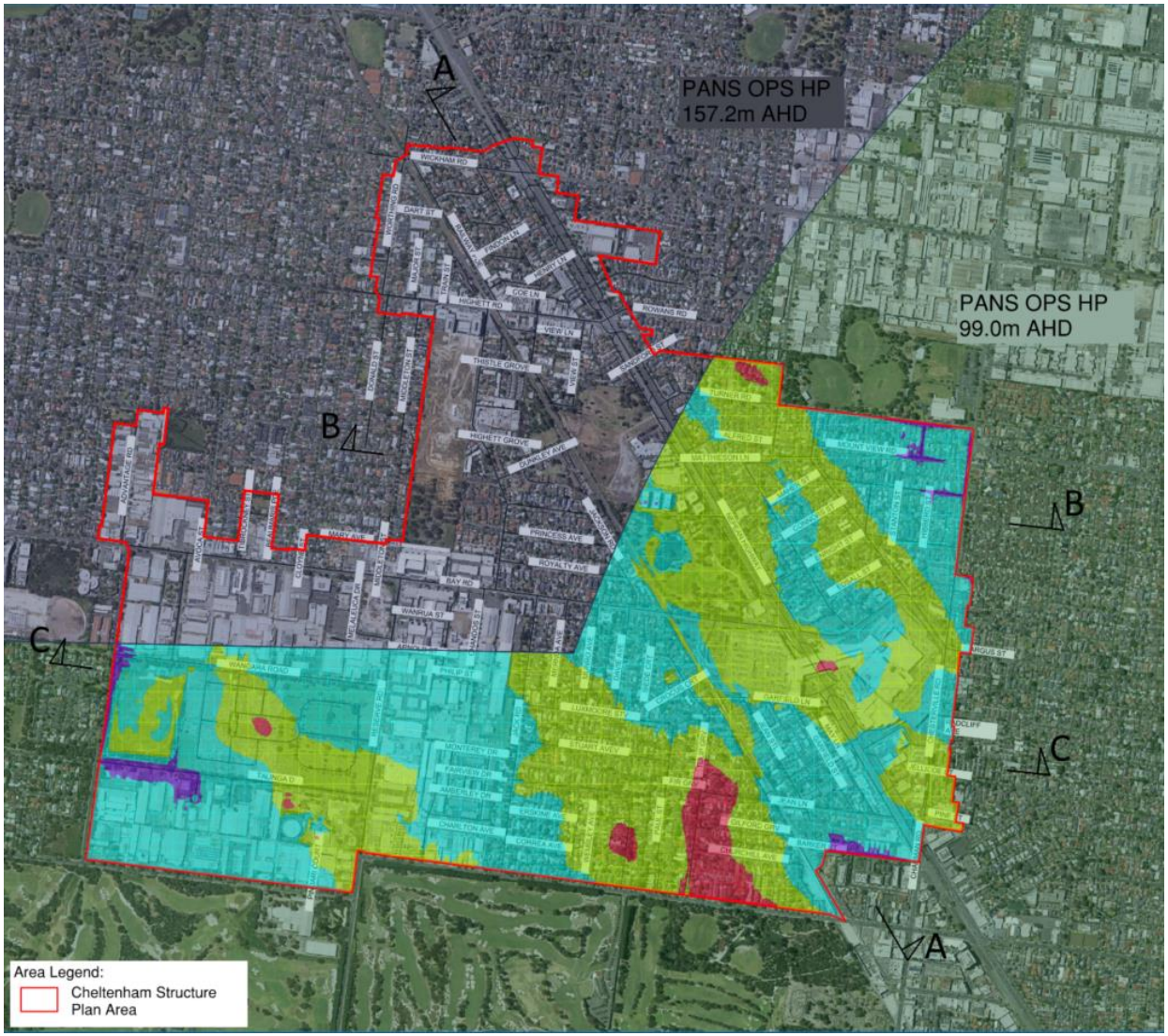
Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Elevation
1		115.000
2		120.000
3		125.000
4		127.800

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 157.2 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A, B-B and C-C across the Cheltenham Structure Plan Area are shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.



Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Elevation
1		55.000
2		60.000
3		65.000
4		67.900

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 99 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A, B-B and C-C across the Cheltenham Structure Plan Area are shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

FIGURE 5.7 PANS OPS SURFACES HP 99 METRES DEVELOPMENT HEIGHT LIMITS IN CHELTENHAM STRUCTURE PLAN AREA

5.2.2 CLAYTON STRUCTURE PLAN AREA

FIGURE 5.8 OLS IMPACT IN CLAYTON STRUCTURE PLAN AREA

Note:

The southern portion of the Clayton Structure Plan Area is located within Moorabbin Airport prescribed OLS that slopes upward in a northerly direction, from 58 to 118 metres AHD, as shown in Figure 5.8.

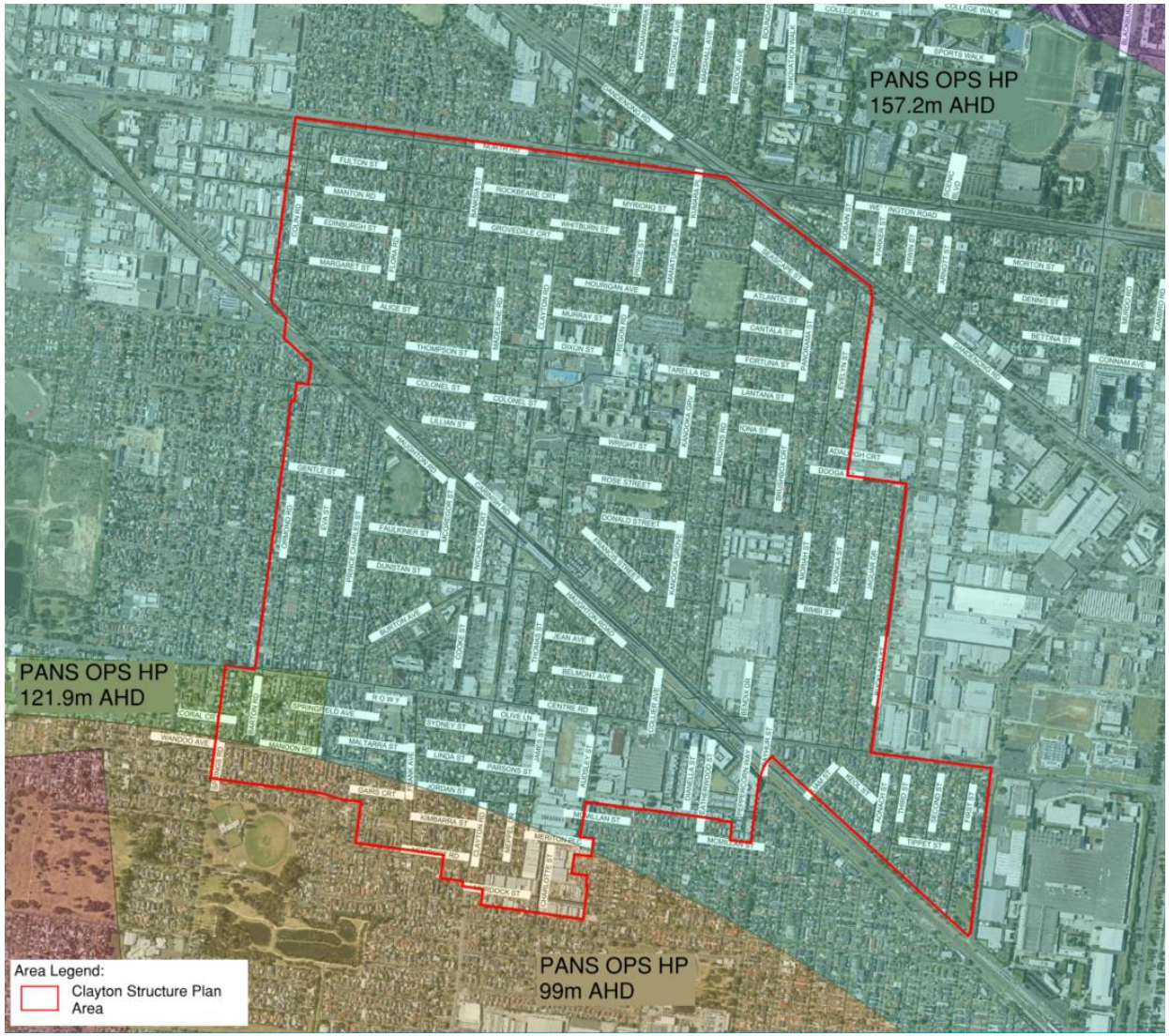


FIGURE 5.9 PANS OPS SURFACES IMPACT IN CLAYTON STRUCTURE PLAN AREA

Note:

The Clayton Structure Plan Area is located within the Moorabbin Airport prescribed PANS-OPS as shown in Figure 5.9.

Maximum development limits are shown within the following heatmap Figures that provide indicative maximum development height under the PANS-OPS surfaces:

- PANS-OPS Horizontal Plane hands APS horizontal plane metres AHD (refer to Figure 5.11)
- PANS-OPS Horizontal Plane 99 metres AHD (refer to Figure 5.12)
- PANS-OPS Horizontal Plane 121.9 metres AHD (refer to Figure 5.13).

FIGURE 5.10 CONICAL OLS DEVELOPMENT HEIGHT LIMITS IN CLAYTON STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		55.000
2		60.000
3		65.000
4		67.000

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the Conical OLS that slopes upward in a northerly direction, from 58 metres to 118 metres AHD protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Clayton Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

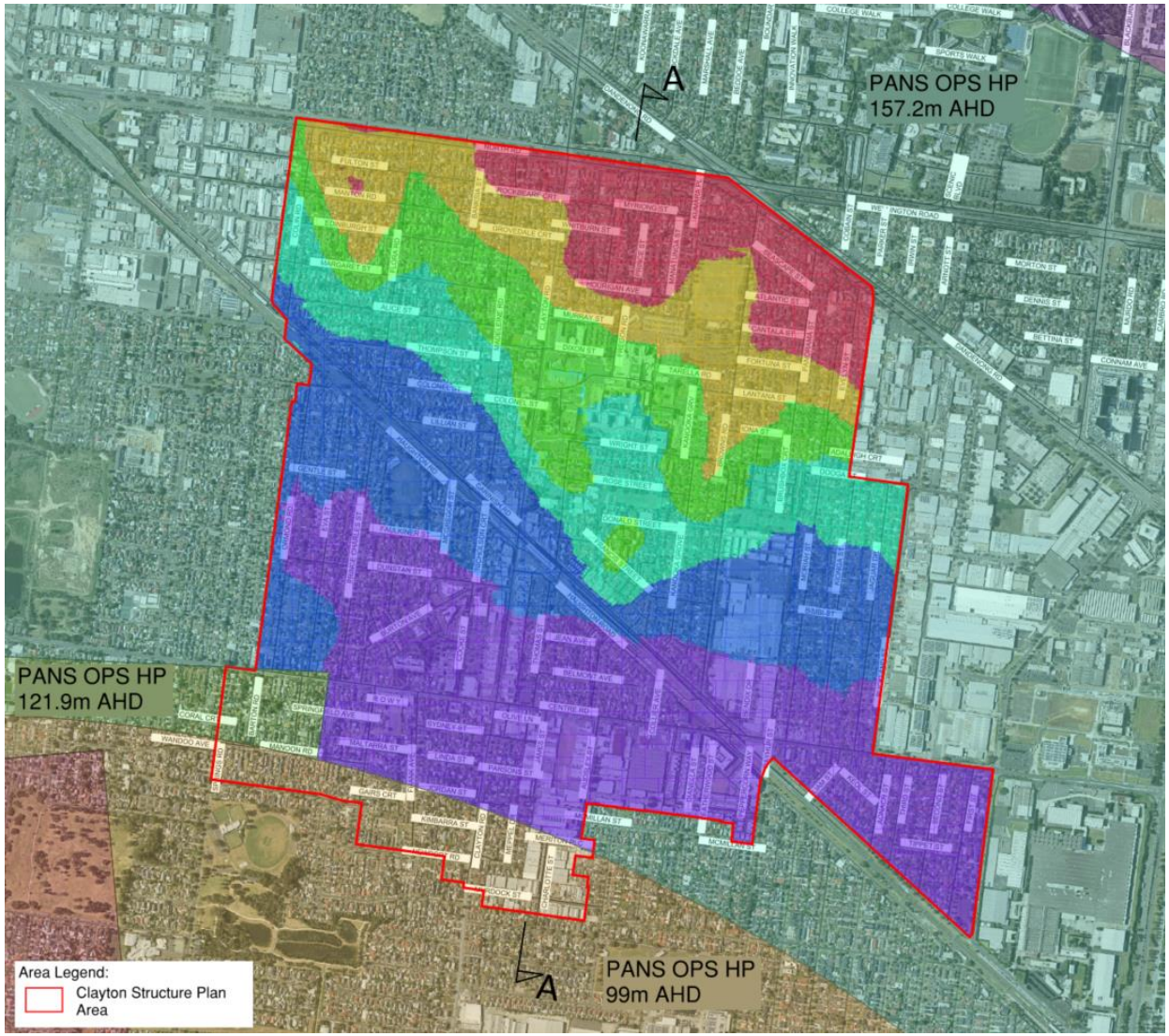


FIGURE 5.11 PANS OPS SURFACES HP 157.2 METRES DEVELOPMENT HEIGHT LIMITS IN CLAYTON STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		80.000
2		85.000
3		90.000
4		95.000
5		100.000
6		106.500

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 157.2 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Clayton Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

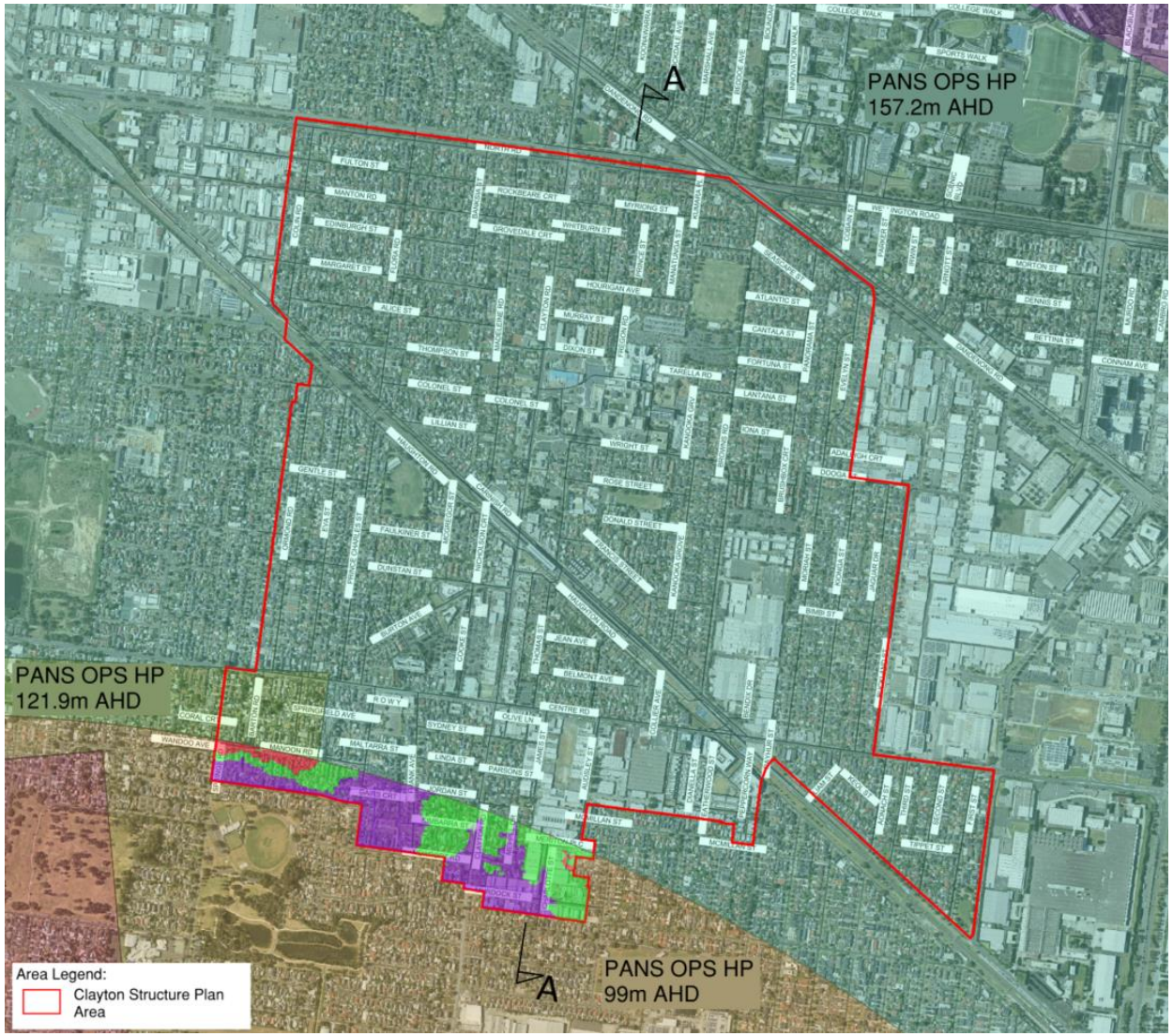


FIGURE 5.12 PANS OPS SURFACES HP 99 METRES DEVELOPMENT HEIGHT LIMITS IN CLAYTON STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		46.000
2		47.000
3		50.500

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 99 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Clayton Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

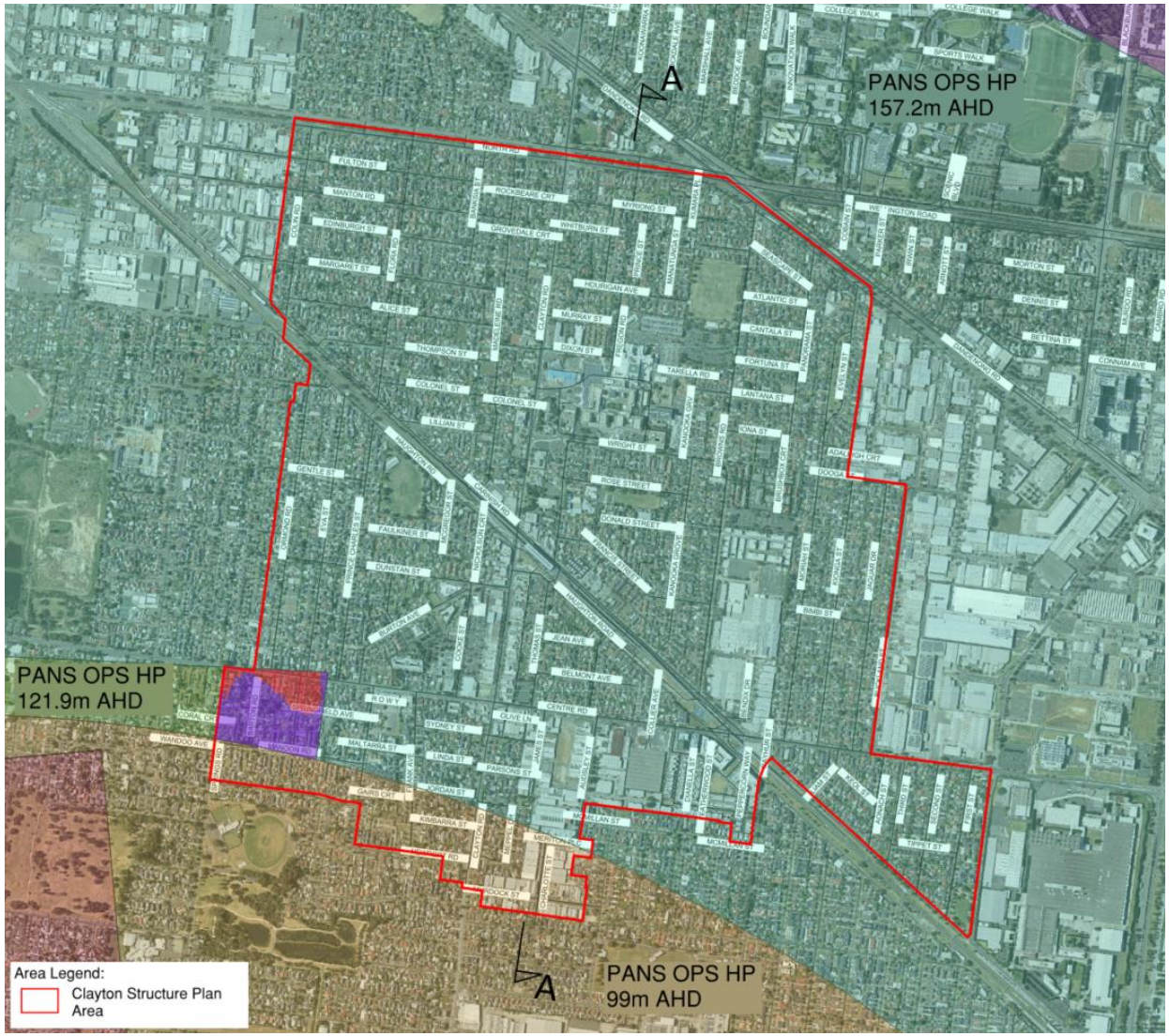


FIGURE 5.13 PANS OPS SURFACES HP 121.9 METRES DEVELOPMENT HEIGHT LIMITS IN CLAYTON STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		65.000
2		68.900

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 121.9 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Clayton Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

5.2.3 MONASH STRUCTURE PLAN AREA

Note:

The Monash Structure Plan Area is located *outside* Moorabbin Airport prescribed OLS as shown in Figure 5.14.

FIGURE 5.14 NO OLS IMPACT IN MONASH STRUCTURE PLAN AREA

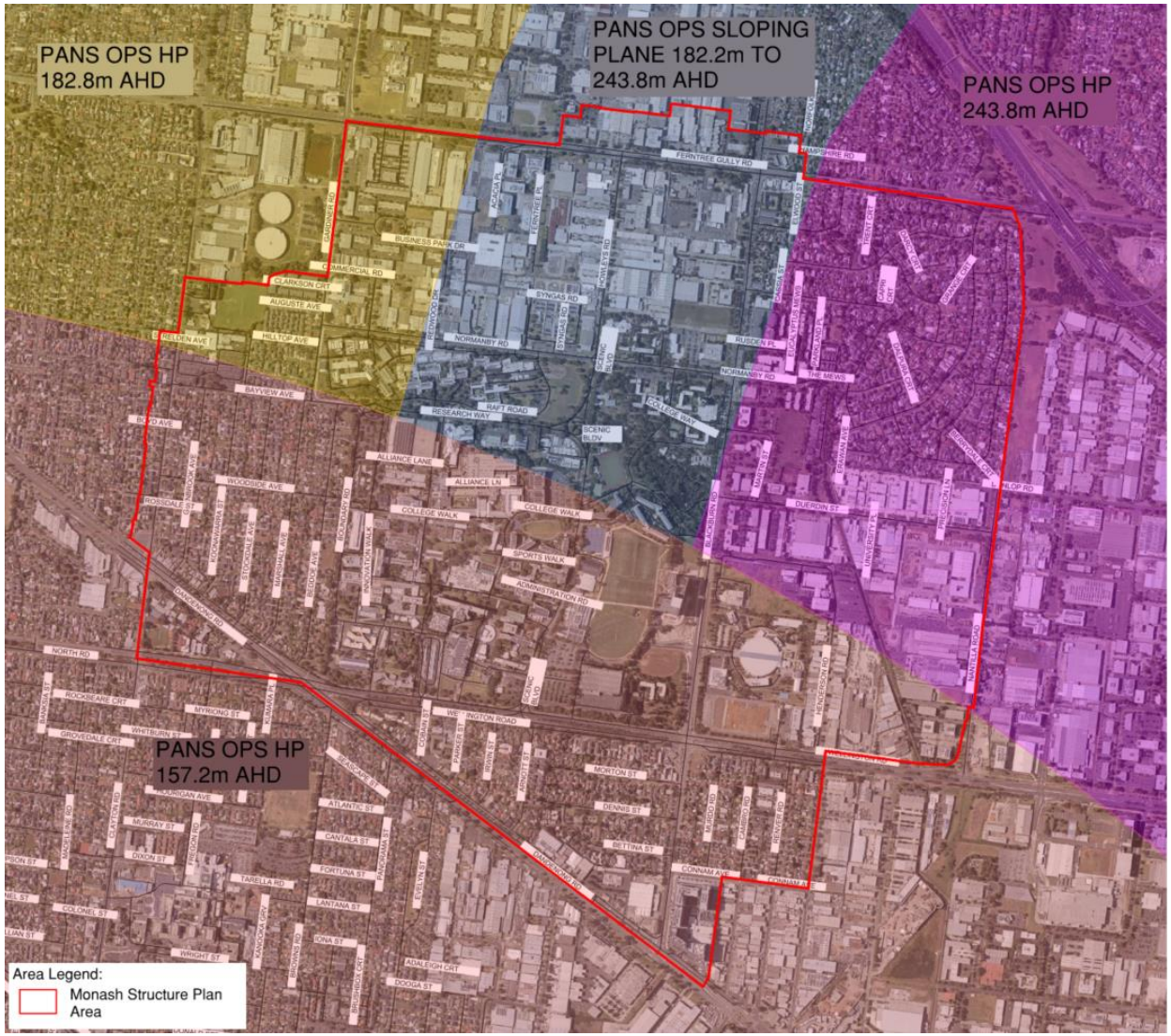


FIGURE 5.15 PANS-OPS SURFACES IMPACT IN MONASH STRUCTURE PLAN AREA

Note:

Monash Structure Plan Area is located within Moorabbin Airport prescribed PANS-OPS as shown in Figure 5.15.

Maximum development limits are shown within the following heatmap Figures that provide indicative maximum development height under the PANS-OPS surfaces:

- PANS-OPS Horizontal Plane 243.8 metres AHD (refer to Figure 5.16)
- PANS-OPS Horizontal Plane 157.2 metres AHD (refer to Figure 5.17)
- PANS-OPS Horizontal Plane 182.8 metres AHD (refer to Figure 5.18)
- PANS-OPS that slopes upward in an easterly direction, from 182.8 to 243.8 metres AHD (refer to Figure 5.19).

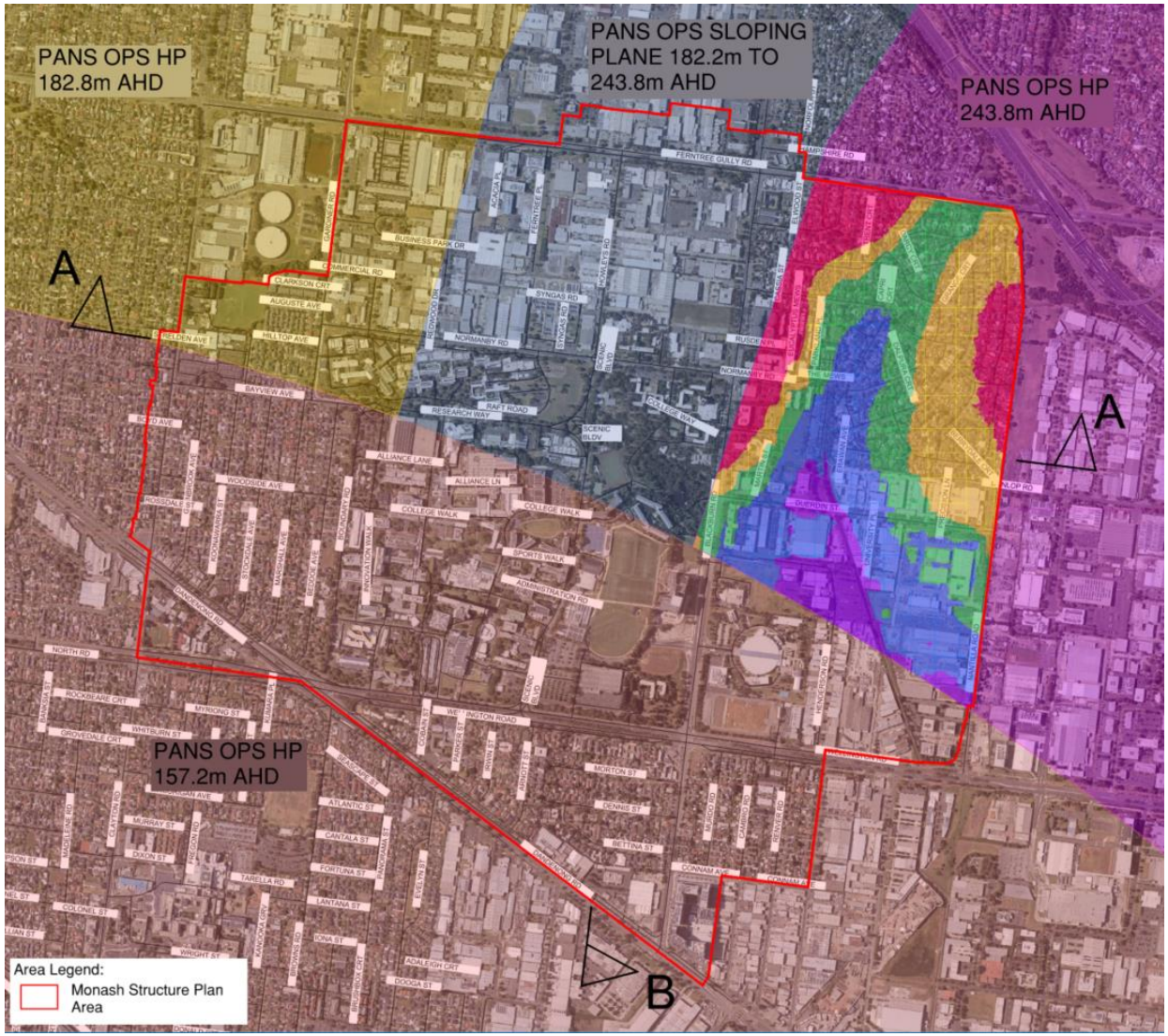


FIGURE 5.16 PANS OPS SURFACES HP 243.8 METRES DEVELOPMENT HEIGHT LIMITS IN MONASH STRUCTURE PLAN AREA

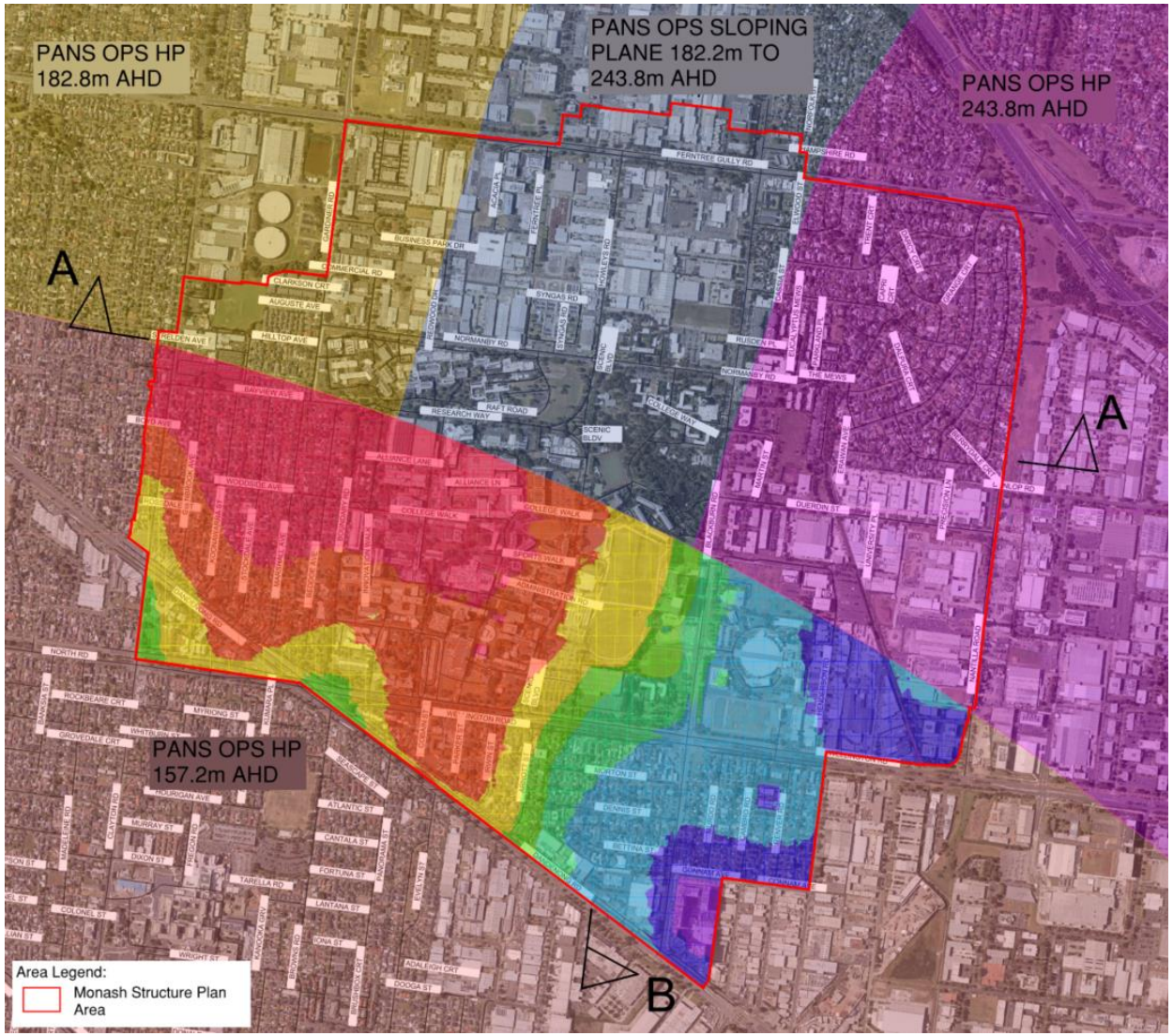
Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		160.000
2		165.000
3		170.000
4		175.000
5		180.800

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 243.8 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A and B-B across the Monash Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.



Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		90.000
2		100.000
3		110.000
4		120.000
5		130.000
6		140.000
7		150.000
8		169.300

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 157.2 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A and B-B across the Monash Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

FIGURE 5.17 PANS OPS SURFACES HP 157.2 DEVELOPMENT HEIGHT LIMITS MONASH STRUCTURE PLAN AREA

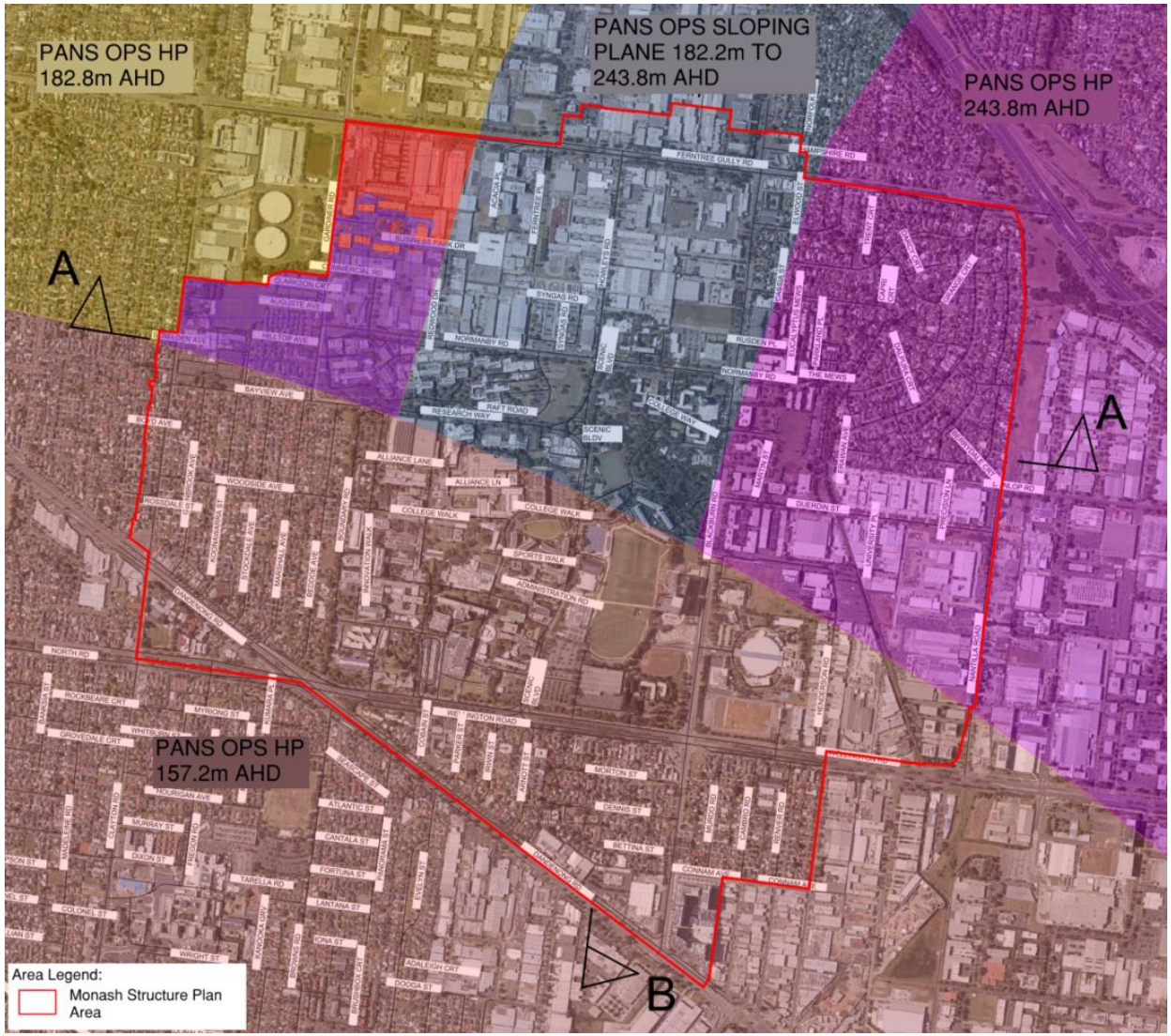


FIGURE 5.18 PANS OPS SURFACES HP 182.8 METRES DEVELOPMENT HEIGHT LIMITS IN MONASH STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height Table		
Number	Color	Maximum Height
1		85.000
2		88.400

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 182.8 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A and B-B across the Monash Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

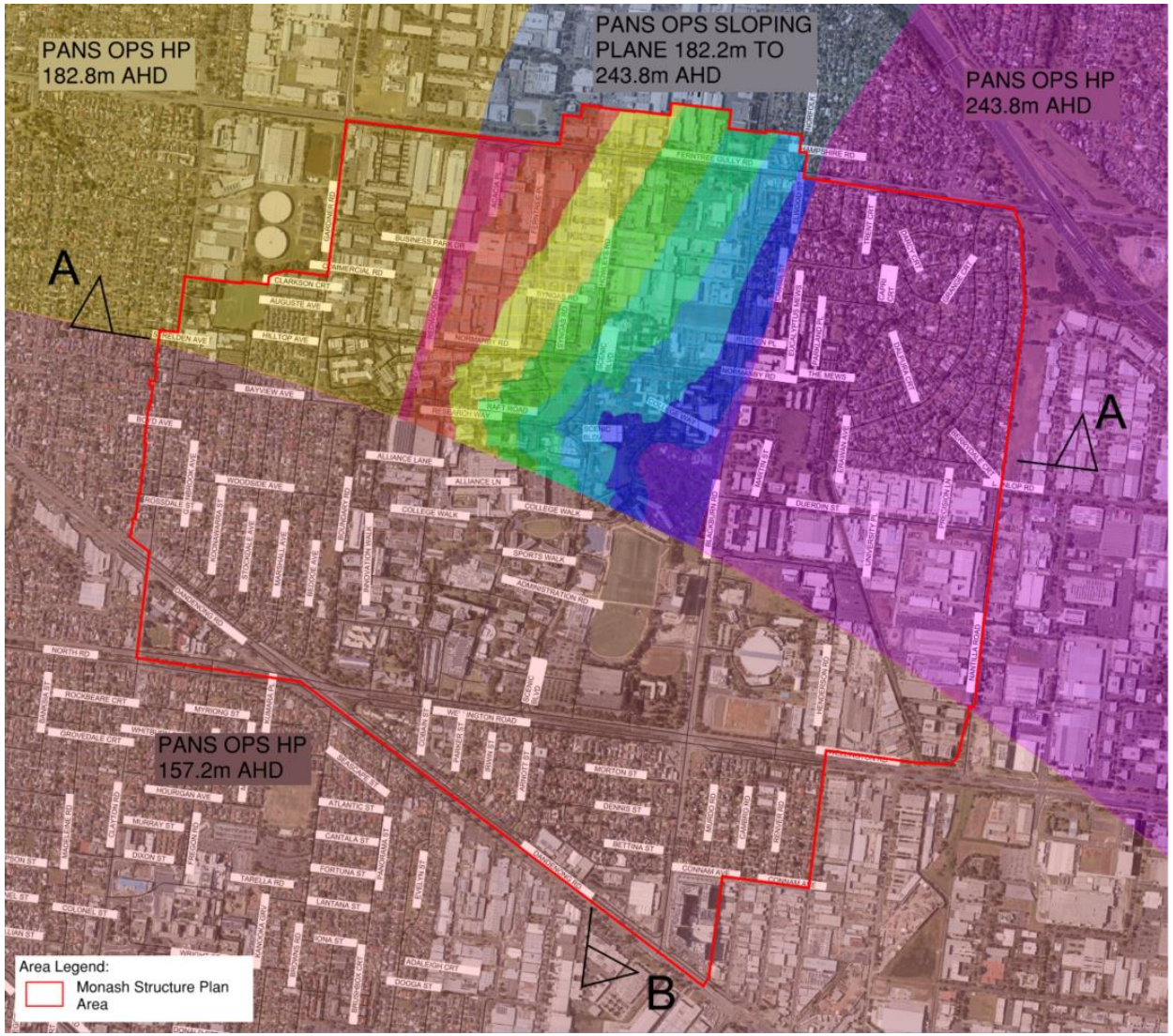


FIGURE 5.19 PANS OPS SURFACES SLOPING AT 182.8 TO 243.8 METRES DEVELOPMENT HEIGHT LIMITS IN MONASH STRUCTURE PLAN AREA

Heatmap legend

Maximum Development Height Table		
Number	Color	Maximum Height
1		90.000
2		100.000
3		110.000
4		120.000
5		130.000
6		140.000
7		150.000
8		169.300

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS that slopes upward in an easterly direction, from 182.8 metres to 243.8 metres AHD protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Sections A-A and B-B across the Monash Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

5.2.4 GLEN WAVERLEY STRUCTURE PLAN AREA

Note:

The Glen Waverley Structure Plan Area is located outside Moorabbin Airport prescribed OLS as shown in Figure 5.20.

FIGURE 5.20 NO OLS IMPACT IN GLEN WAVERLEY STRUCTURE PLAN AREA

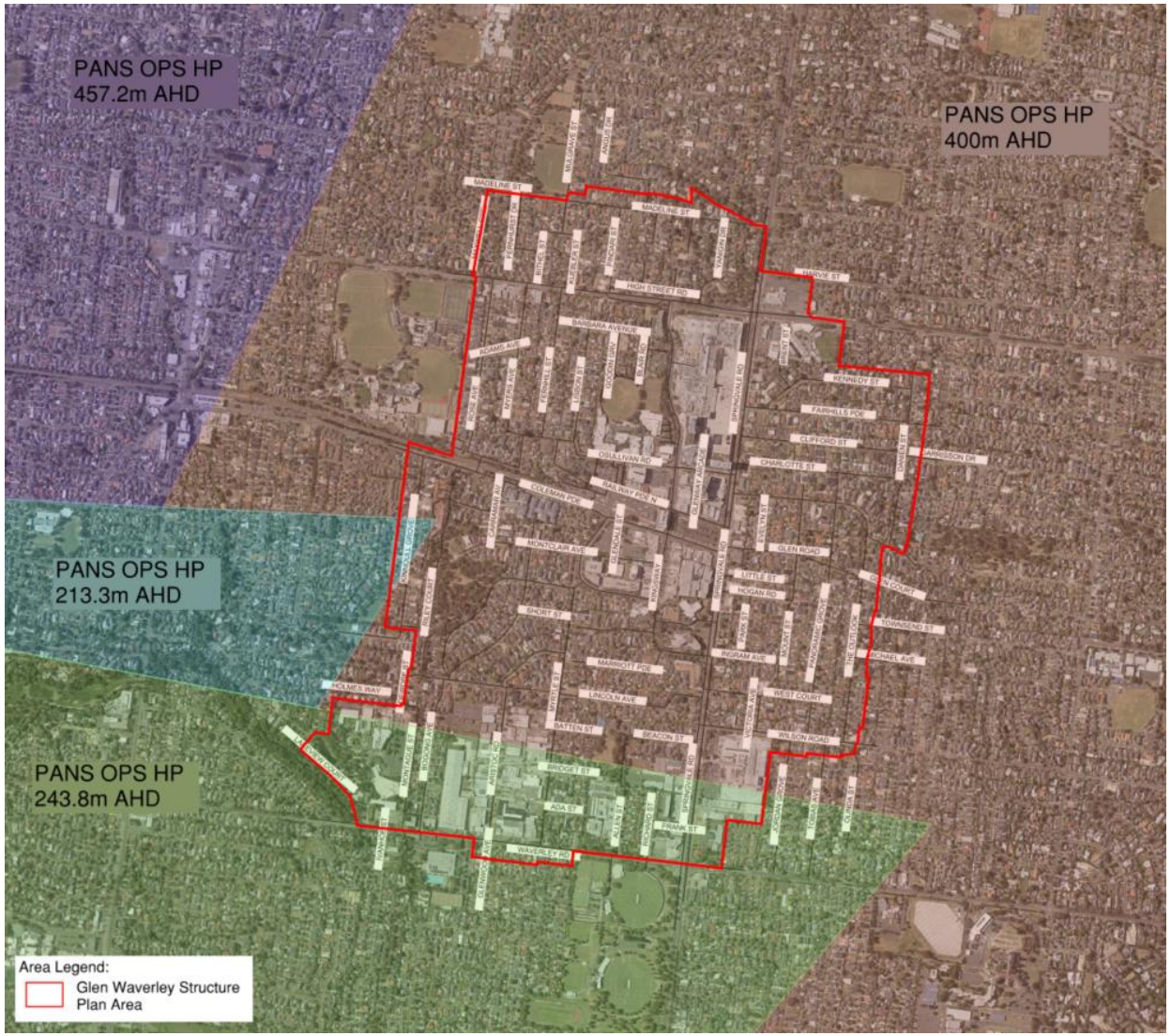


FIGURE 5.21 PANS-OPS IMPACT IN GLEN WAVERLEY STRUCTURE PLAN AREA

Note:

The Glen Waverley Structure Plan Area is located under Moorabbin Airport prescribed PANS-OPS Surfaces as shown in Figure 5.21.

Maximum development limits are shown on the following heatmap Figures that provide indicative maximum development height under the PANS-OPS surfaces:

- PANS-OPS Horizontal Plane 400 metres AHD (refer to Figure 5.22)
- PANS-OPS Horizontal Plane 243.8 metres, AHD (refer to Figure 5.23)
- PANS-OPS Horizontal Plane 213.3 metres AHD (refer to Figure 5.24).

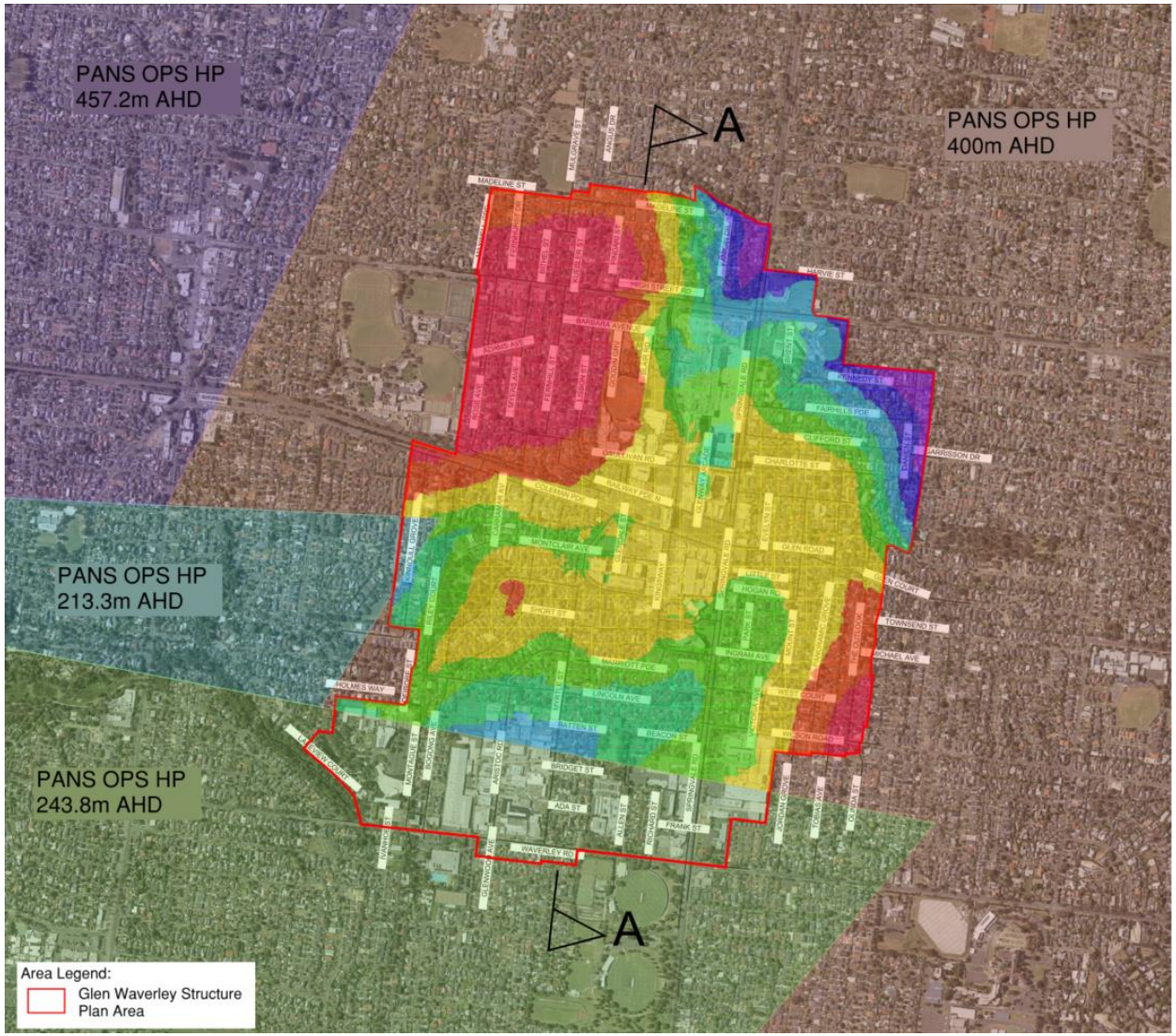


FIGURE 5.22 PANS OPS SURFACES HP 400 METRES DEVELOPMENT HEIGHT LIMITS IN GLEN WAVERLEY STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height		
Number	Color	Maximum Elevation
1		275.000
2		280.000
3		285.000
4		290.000
5		295.000
6		300.000
7		305.000
8		312.900

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 400 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Glen Waverley Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

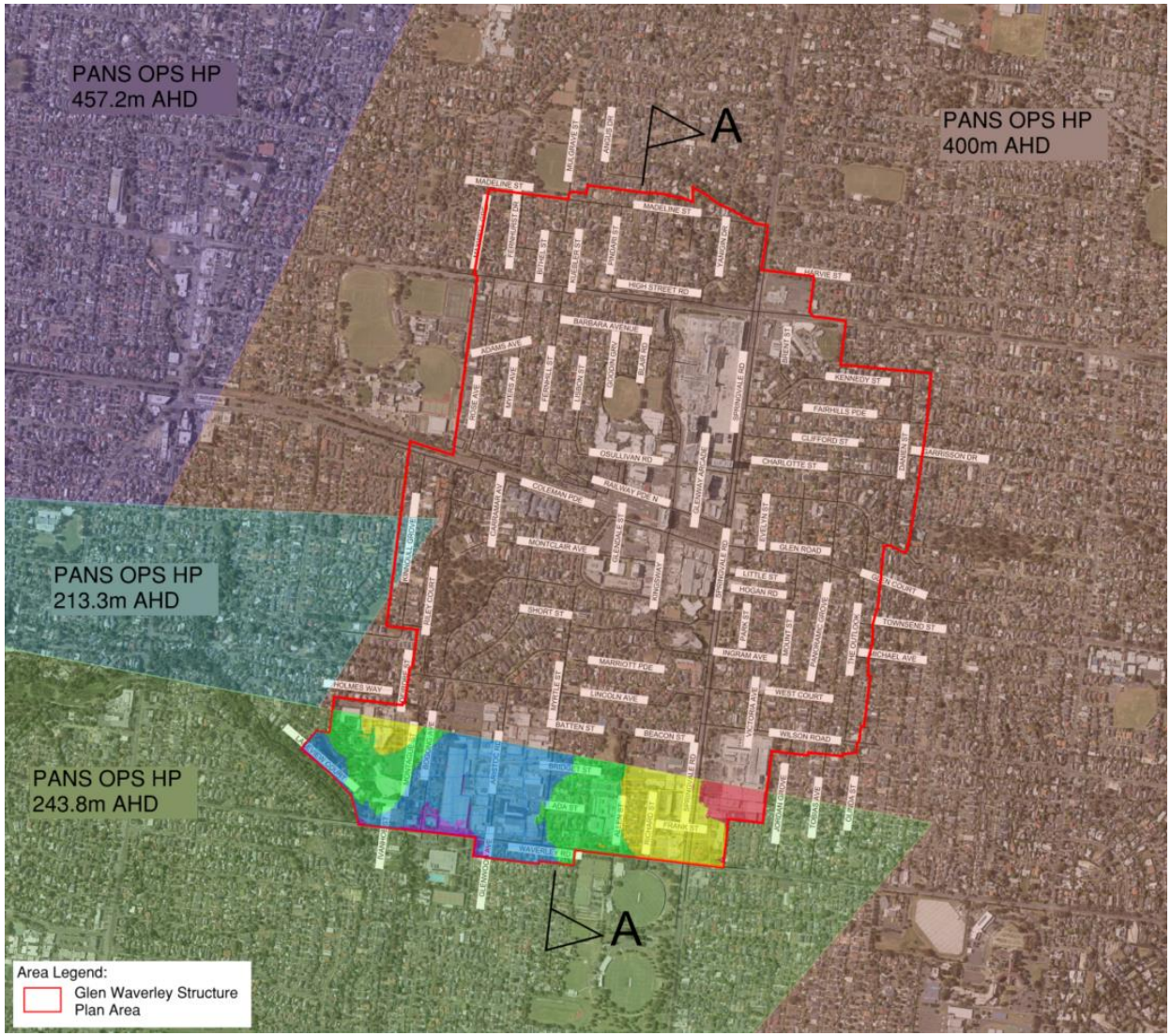


FIGURE 5.23 PANS OPS SURFACES HP 243.8 METRES DEVELOPMENT HEIGHT LIMITS IN GLEN WAVERLEY STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height		
Number	Color	Maximum Elevation
1		130.000
2		135.000
3		140.000
4		145.000
5		146.500

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 243.8 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Glen Waverley Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

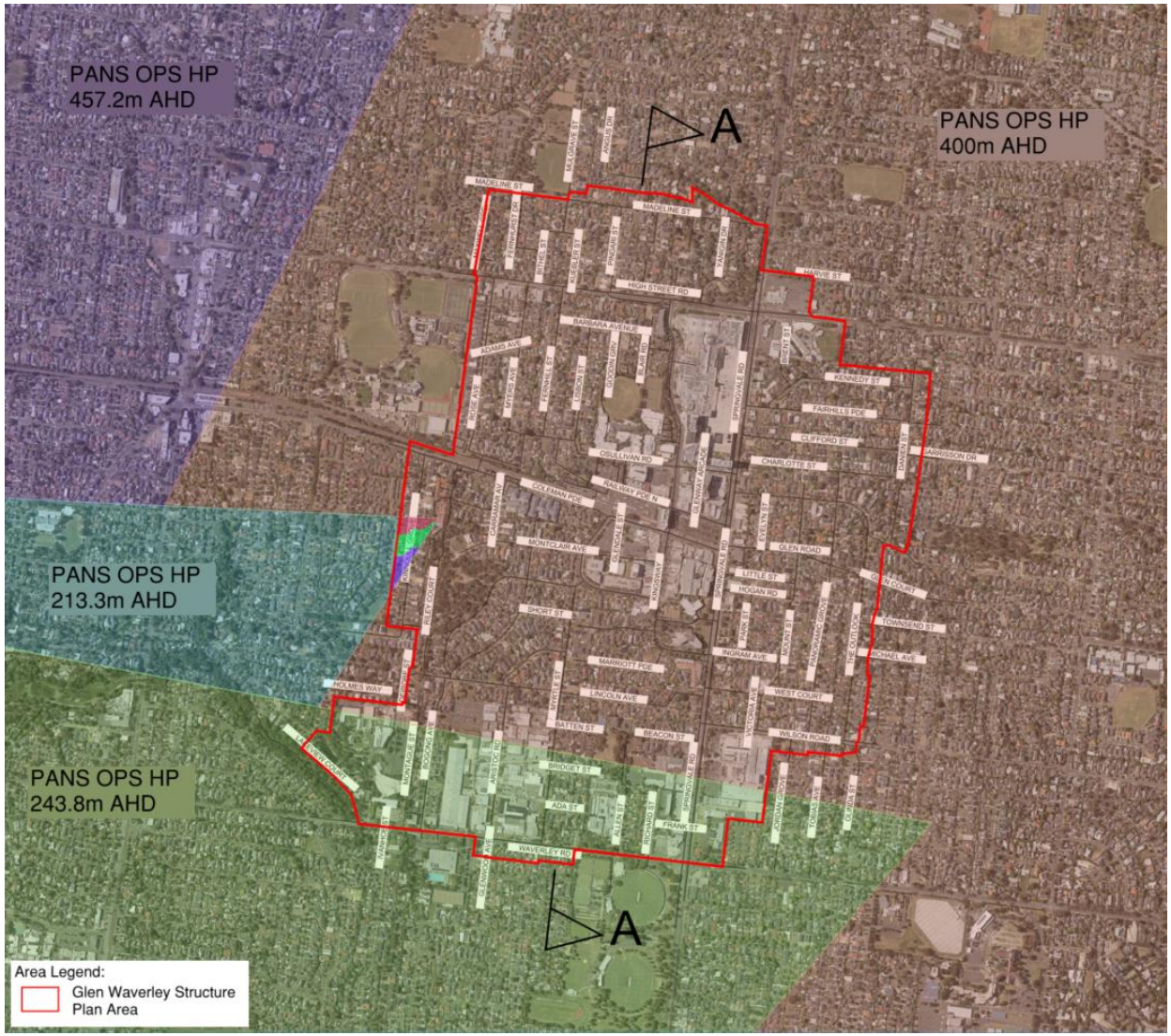


FIGURE 5.24 PANS OPS SURFACES HP 213.3 METRES DEVELOPMENT HEIGHT LIMITS IN GLEN WAVERLEY STRUCTURE PLAN AREA

Heatmap legend:

Maximum Development Height		
Number	Color	Maximum Elevation
1		100.000
2		105.000
3		110.500

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 213.3 metres AHD Horizonal Plane protection surface and measured from the 207-2018 LiDAR natural ground level data.

Section A-A across the Glen Waverley Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

5.2.5 BURWOOD STRUCTURE PLAN AREA

Note:

The Burwood Structure Plan Area is located outside Moorabbin Airport and Essendon Airport prescribed OLS as shown in Figure 5.25.

FIGURE 5.25 NO OLS IMPACT IN BURWOOD STRUCTURE PLAN AREA

FIGURE 5.26 PANS-OPS IMPACT IN BURWOOD STRUCTURE PLAN AREA

Note:

The Burwood Structure Plan Area is located under Moorabbin Airport prescribed PANS-OPS Surfaces as shown in Figure 5.26.

A check was also conducted on the Essendon Airport prescribed PANS-OPS surface. A small area of the eastern portion of the Burwood Structure Plan Area is within this area. However, the surface is significantly higher, ranging from 535 metres to 609.6 metres AHD.

FIGURE 5.27 PANS OPS SURFACES HP 335.2 METRES DEVELOPMENT HEIGHT LIMITS IN BURWOOD STRUCTURE PLAN AREA

HEATMAP LEGEND:

PANS-OPS Horizontal Plane 335.2 metres AHD

Maximum Development Height Table		
Number	Color	Maximum Height
1		250.000
2		260.000
3		270.000
4		280.000
5		295.100

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 335.2 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Burwood Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

5.2.6 BOX HILL STRUCTURE PLAN AREA

FIGURE 5.28 NO OLS IMPACT IN BOX HILL STRUCTURE PLAN AREA

Note:

The Box Hill Structure Plan Area is located outside Moorabbin Airport and Essendon Airport prescribed OLS as shown in Figure 5.28.

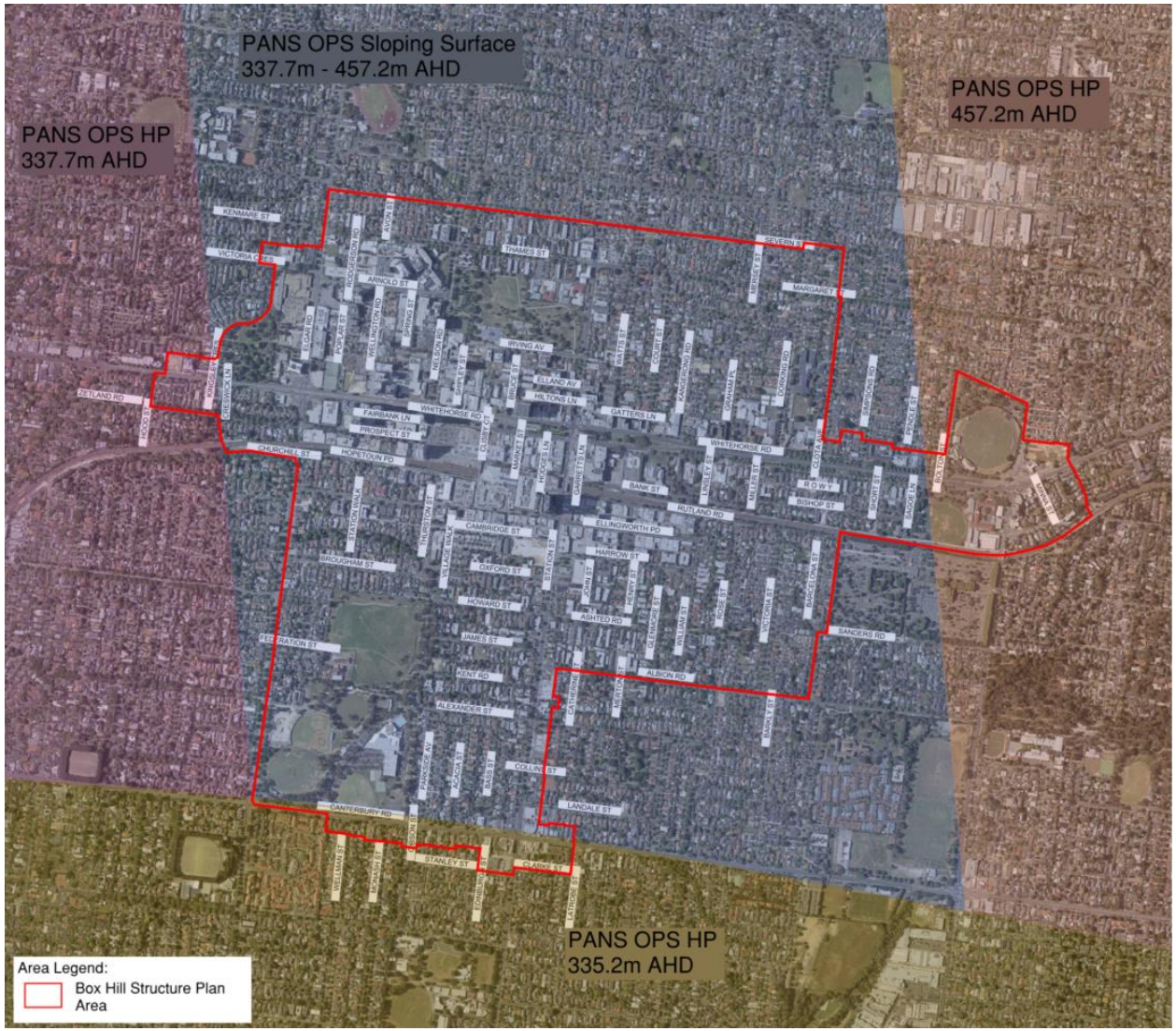


FIGURE 5.29 PANS-OPS IMPACT IN BOX HILL STRUCTURE PLAN AREA

Note:

The Box Hill Structure Plan Area is located under Moorabbin Airport prescribed PANS-OPS Surfaces as shown as shown in Figure 5.29.

Maximum development limits are shown on the following heatmap Figures that provide indicative maximum development height under the PANS-OPS surfaces:

- PANS-OPS Horizontal Plane 337.7 metres AHD (refer to Figure 5.30)
- PANS-OPS Sloping Surfaces (west to east) at 337.2 to 457.2 metres (refer to Figure 5.31)
- PANS-OPS Horizontal Plane 335.2 metres AHD (refer to Figure 5.32)
- PANS-OPS Horizontal Plane 457.2 metres AHD (refer to Figure 5.33).

A small area of the southern portion of the Box Hill Structure Plan Area is within the Essendon Airport prescribed area, significantly higher than Moorabbin Airport prescribed PANS-OPS surfaces at 550 to 600 metres AHD.

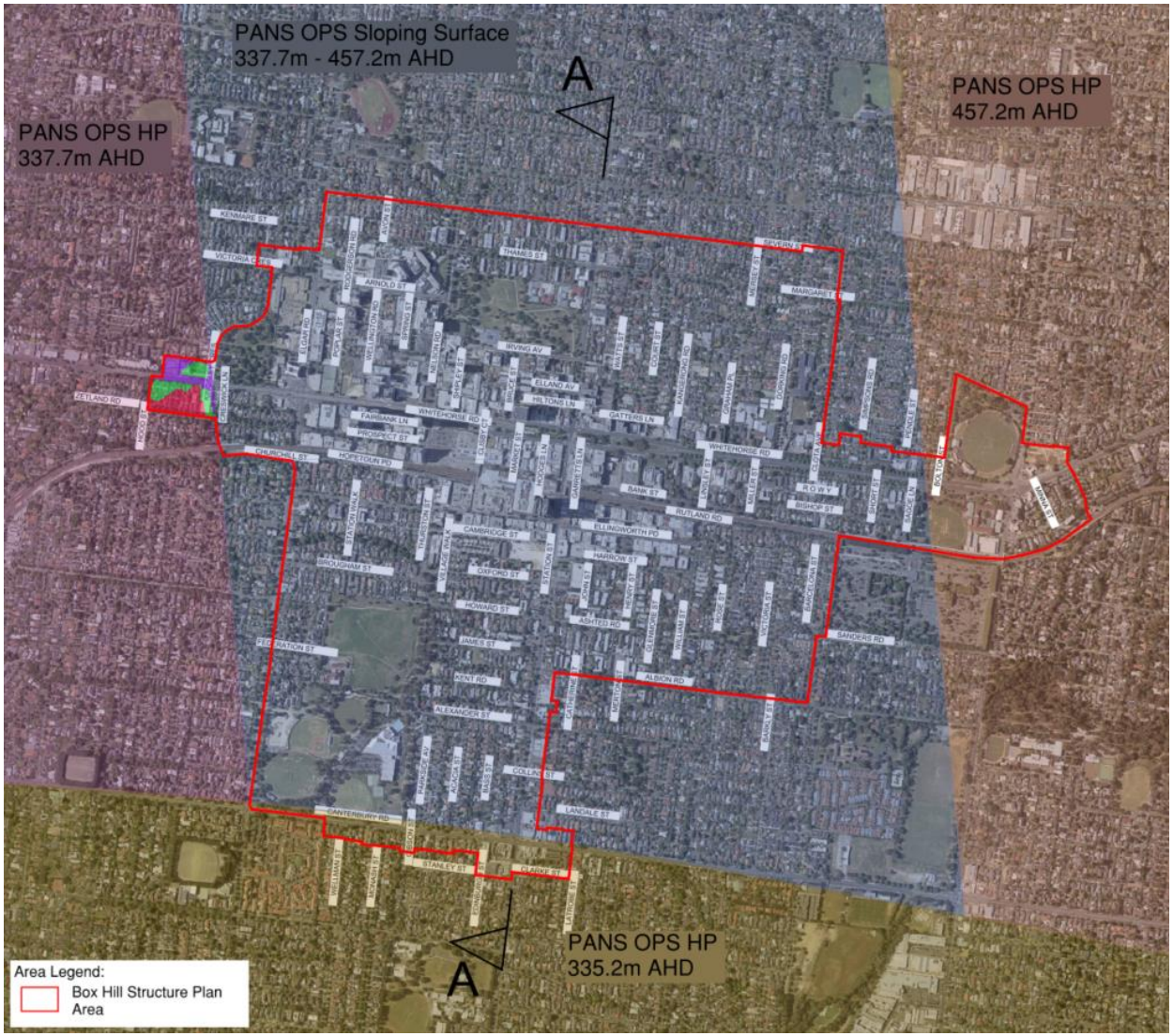


FIGURE 5.30 PANS-OPS HP 337.7M / DEVELOPMENT HEIGHT LIMITS ON BOX HILL STRUCTURE PLAN AREA

Heatmap legend:

PANS-OPS Horizontal Plane 337.7 metres

Maximum Development Height Table		
Number	Color	Maximum Height
1		255.100
2		257.000
3		261.500

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 337.7 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Box Hill Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

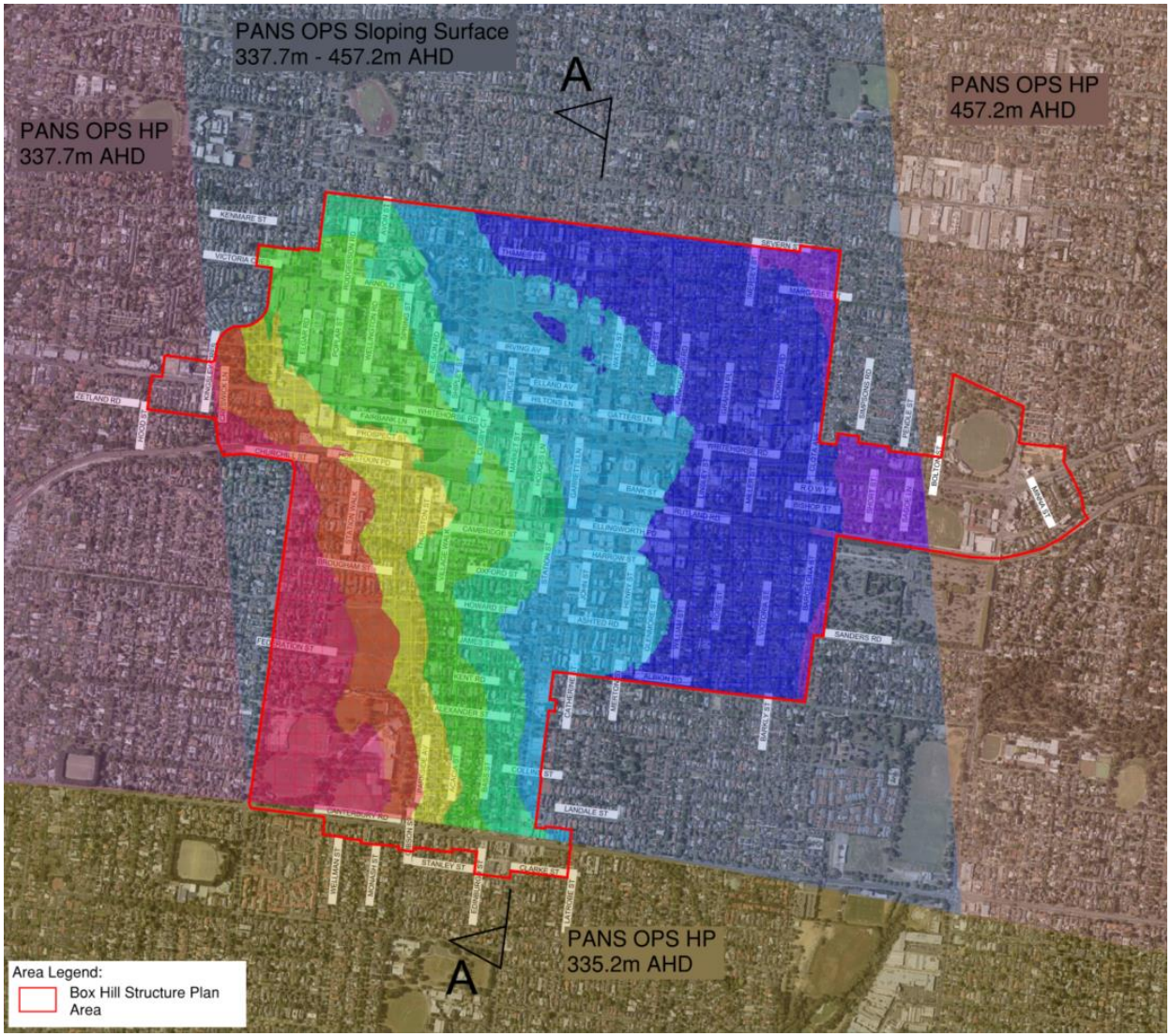


FIGURE 5.31 PANS-OPS SLOPING 337.2 TO 457.2 METRES / DEVELOPMENT HEIGHT LIMITS IN BOX HILL STRUCTURE PLAN AREA

Heatmap legend:

PANS-OPS Sloping Plane from 337.2 to 457.2 metres AHD.

Maximum Development Height Table		
Number	Color	Maximum Height
1		260.000
2		270.000
3		280.000
4		290.000
5		300.000
6		320.000
7		340.000
8		366.600

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS that slopes upward in an easterly direction, from 337.2 metres to 457.2 metres AHD protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Box Hill Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

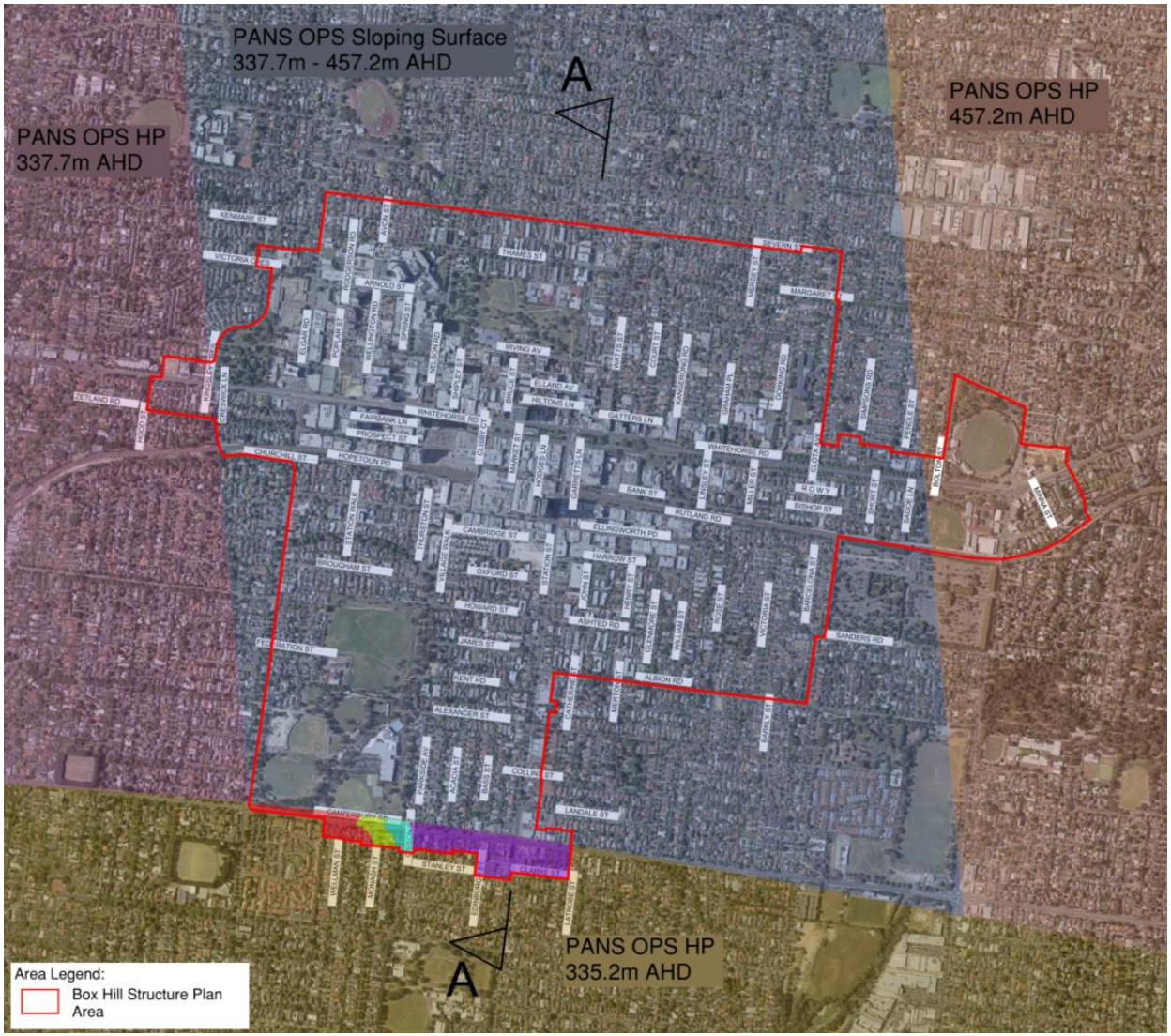


FIGURE 5.32 PANS-OPS HP 335.2 METRES / DEVELOPMENT HEIGHT LIMITS IN BOX HILL STRUCTURE PLAN AREA

Heatmap legend:

PANS-OPS Horizontal Plane 335.2 metres AHD

Maximum Development Height Table		
Number	Color	Maximum Height
1		230.000
2		235.000
3		240.000
4		248.700

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 335.2 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Box Hill Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

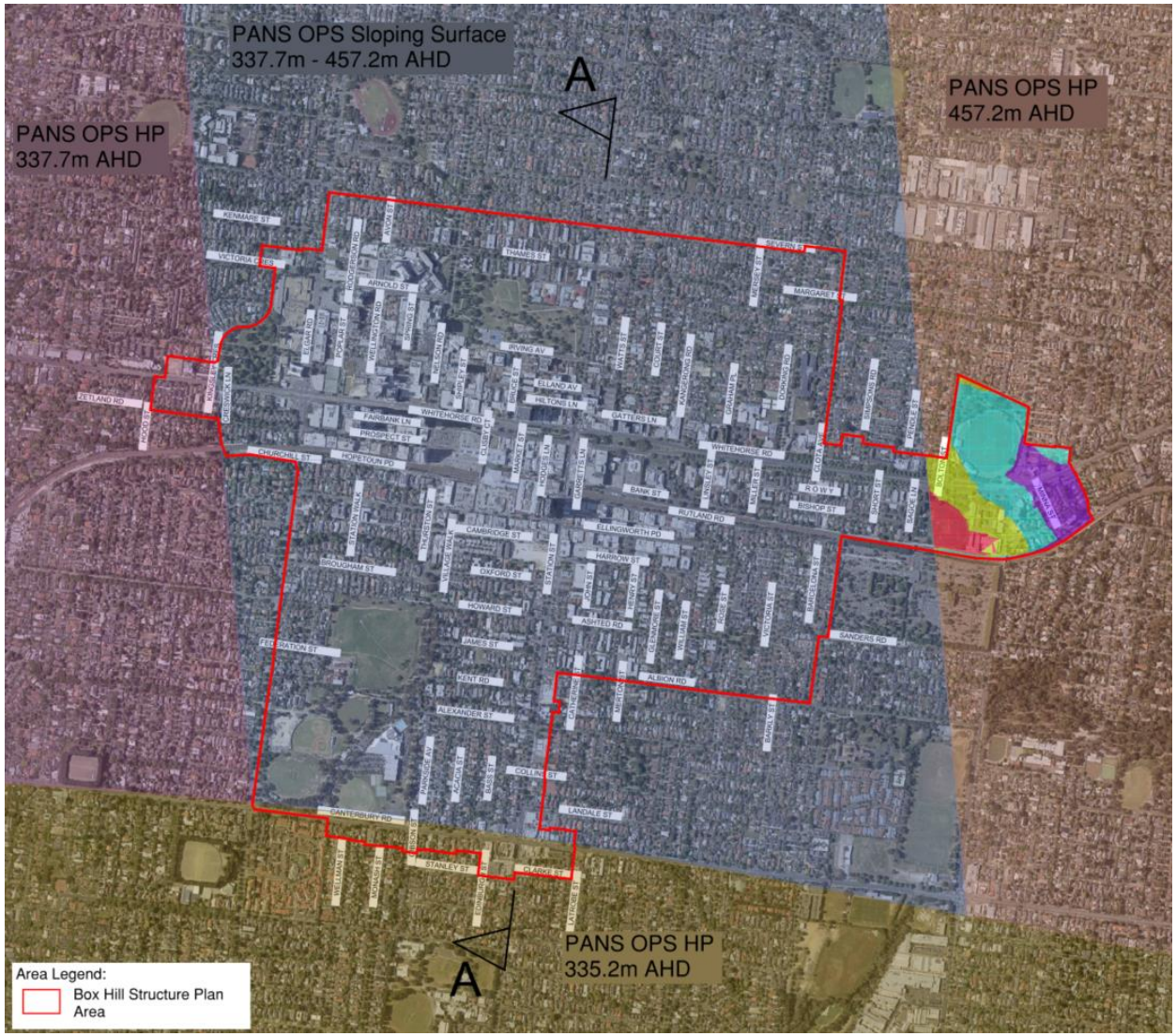


FIGURE 5.33 PANS-OPS HP 457.2 METRES / DEVELOPMENT HEIGHT LIMITS IN BOX HILL STRUCTURE PLAN AREA

Heatmap legend:

PANS-OPS Horizontal Plane 457.2 metres AHD

Maximum Development Height Table		
Number	Color	Maximum Height
1		360.000
2		365.000
3		370.000
4		377.000

Note:

The heatmap depicts the maximum development height limits for each hatch colour ranges below the PANS-OPS 457.2 metres AHD Horizonal Plane protection surface and measured from the 2017-2018 LiDAR natural ground level data.

Section A-A across the Box Hill Structure Plan Area is shown in Appendix C for further appreciation of the development height limits, airspace protection surfaces, and existing ground elevation.

6 Findings

6.1 Relevant Airspace controls

Maximum building height limits proposed in each SRL East Structure Plan Area should consider the height limits based on airspace controls for Moorabbin Airport and Essendon Airport, which are based on the:

- Obstacle Limitation Surface (OLS) – this is generally the lowest surface and is designed to provide protection for aircraft flying into or out of an airport when a pilot is flying by sight
- Procedures for Air Navigational Services – Aircraft Operations (PANS-OPS) – this surface is generally above the OLS and is designed to safeguard an aircraft from collision with obstacles when an aircraft's flight may be guided solely by flight instruments, in conditions of poor visibility.

6.1.1 CHELTENHAM STRUCTURE PLAN AREA

The Moorabbin Airport 2021 Master Plan indicates no provision for future high capacity Regular Passenger Transport (RPT) services, so there is no foreseen requirement for precision instrument approaches. Since the publication of the Moorabbin Airport Master Plan 2015, there have been changes to the airport's Runway Codes. Coding for Runway 17L/35R has changed from Code 3 to Code 2. Coding for Runway 17R/35R has change from Code 2 to Code 1. These changes mean the OLS surfaces shown in the Moorabbin Airport 2021 Master Plan are less limiting on building height restrictions in the Cheltenham Structure Plan Area.

The currently published instrument approach procedures were retained from the previously published Moorabbin Airport Master Plan 2015. Since there are no further planned infrastructure changes, the existing procedures will remain effectively in their current form subject to routine maintenance undertaken by Airservices Australia (as the custodian of the procedures) through its periodic review process.

Non-precision instrument approaches to Runway 13L/31R and Standard Instrument Departures (SIDs) for Runways 17L, 13L, 31R and 35R were also published in the 2021 Master Plan and the corresponding charts in the 2021 Master Plan indicate that height restrictions on buildings in the Cheltenham Structure Plan Area will remain unchanged since the 2015 Master Plan.

If Moorabbin Airport operations expand in future, new planning controls may be required so that new development is compatible with the airport's operation.

6.1.2 CLAYTON STRUCTURE PLAN AREA

Structure planning in the Clayton Structure Plan Area should consider the potential for future development and expansion of the Monash Medical Centre hospital, as this may result in expansion or changes to DDO14 or DDO15 relating to the helicopter flight paths and development height limits in specified areas.

Structure planning in the Clayton Structure Plan Area should also consider the potential for future development and expansion of the Victorian Heart Hospital, as this may result in expansion or changes to DDO18 relating to the helicopter flight paths and development height limits in specified areas.

6.1.3 MONASH STRUCTURE PLAN AREA

Structure planning for the Monash Structure Plan Area should consider the potential for future development and expansion of the Monash Medical Centre hospital, as this may result in expansion or changes to DDO14 and DDO15 relating to the helicopter flight paths and development height limits in specified areas.

Ongoing consultation with Monash Medical Centre should occur to ensure awareness of any changes to helicopter flight paths and DDO14 and DDO15.

Structure planning in the Monash Structure Plan Area should also consider the potential for future development and expansion of the Victorian Heart Hospital, as this may result in expansion or changes to DDO17 and DDO18 relating to the helicopter flight paths and development height limits in specified areas.

6.1.4 GLEN WAVERLEY STRUCTURE PLAN AREA

No future airspace controls which would impact future development are present in the Glen Waverley Structure Plan Area.

6.1.5 BURWOOD STRUCTURE PLAN AREA

No future airspace controls which would impact future development are present in the Burwood Structure Plan Area.

6.1.6 BOX HILL STRUCTURE PLAN AREA

Structure planning for the Box Hill Structure Plan Area should consider the potential for Box Hill Hospital to introduce a helipad(s) which would require a DDO to limit development height limits in specified areas to protect helicopter flight paths.

6.2 Airspace maximum heights

Development height limits in planning scheme zoning and overlay controls relevant to the SRL East Structure Plan Areas are significantly lower than those permitted by the relevant airspace controls.

The range of development heights is shown in Table 6.1. These correspond with the information included in the heatmaps in the previous Section 4. Table 6.1 shows the lowest development height permitted in each Structure Plan Area against the highest, and the control which enforces the height limit.

TABLE 6.1 SUMMARY OF THE RANGE OF DEVELOPMENT HEIGHTS BASED ON PANS OPS AND OLS CONTROLS

STRUCTURE PLAN AREA	LOWEST AIRSPACE HEIGHT CONTROL (AHD)	HIGHEST AIRSPACE HEIGHT CONTROL (AHD)
Cheltenham	OLS – 40 m	PANS-OPS -127.8 m* *Noting there is a portion of the Cheltenham Structure Plan Area where the PANS-OPS controls allow a maximum developable height limit of 99 m, which is less than the OLS control in this area. Refer to Cheltenham Structure Plan Area Sections A-A and C-C in Appendix C of this report.
Clayton	PANS-OPS – 46 m	PANS-OPS – 106.6 m* *Noting there is a portion of Clayton Structure Plan Area where the PANS-OPS controls allow a maximum development height limit of 99 m, which is less than the OLS control in this area. Refer to Clayton Structure Plan Area Sections A-A in Appendix C of this report.
Monash	PANS-OPS – 85 m	PANS-OPS – 180.8 m
Glen Waverley	PANS-OPS – 100 m	PANS-OPS – 312.9 m
Burwood	PANS-OPS – 250 m	PANS-OPS – 295.1 m
Box Hill	PANS-OPS – 230 m	PANS-OPS – 377 m

When read in conjunction with the longitudinal sections provided in Appendix C of this report, shown as Sections A-A, B-B, and C-C across the Cheltenham Structure Plan Area, a further appreciation of the interaction between development height limits, airspace protection surfaces, and existing ground elevation is evident.

Longitudinal sections A-A and C-C show points where the PAN-OPS goes below the OLS (see Appendix C of this report). This is an unusual occurrence as typically, the PANS-OPS surfaces tend to sit higher than the OLS surfaces. In instances where this occurs, the lower protection surfaces elevation will be the maximum development height limit. This means that in the Cheltenham Structure Plan Area, where the PANS-OPS surfaces are lower than the OLS, the PANS-OPS surfaces dictate the maximum development height.

7 Recommendations

7.1 Structure planning

1. Airspace controls relating to Moorabbin Airport and Essendon Airport set development height limits in specified areas of the SRL East Structure Plan Areas. Moorabbin and Essendon airspace controls also set height limits for temporary construction cranes specified areas in the Box Hill and Burwood Structure Plan Areas. A summary of these maximum building height limits is included in the Executive Summary of this report. Section 5.2 of this report includes 'heat maps' which have been prepared based on the aviation and airspace controls showing the maximum permitted heights in each location.
2. Structure Plans for the Clayton and Monash Structure Plan Areas should not be inconsistent with the existing DDO14 and DDO15 to protect helicopter flight paths associated with the Monash Medical Centre, which require a planning permit for development that exceeds a height of 92.6 metres (DDO14) or 102.6 metres (DDO15) in specified areas.
3. Structure Plans for the Clayton and Monash Structure Plan Areas should not be inconsistent with the existing DDO17 and DDO18 to protect helicopter flight paths associated with the Victorian Heart Hospital, which required a planning permit for development that exceeds a height of 128.2 metres (DDO17) or 138.2 metres (DDO18) in specified areas.

7.2 Other opportunities

1. The following actions would be expected of applicants as part of the approvals process for future land use and development where they come close to or operate within the protected airspace (based on the airspace controls described under Recommendation 1):
    a. Building and crane activity in the Cheltenham Structure Plan Area is assessed by Moorabbin Airport for final height assessment when statutory planning approval is sought for future land use and development within the area
    b. Where buildings are expected to emit exhaust plume emissions, it is recommended to undertake relevant plume risk assessment and furnish the results to Moorabbin Airport Corporation and CASA.

AJM
Joint Venture

Appendix A

Obstacle Limitation Surface Illustration (OLS)

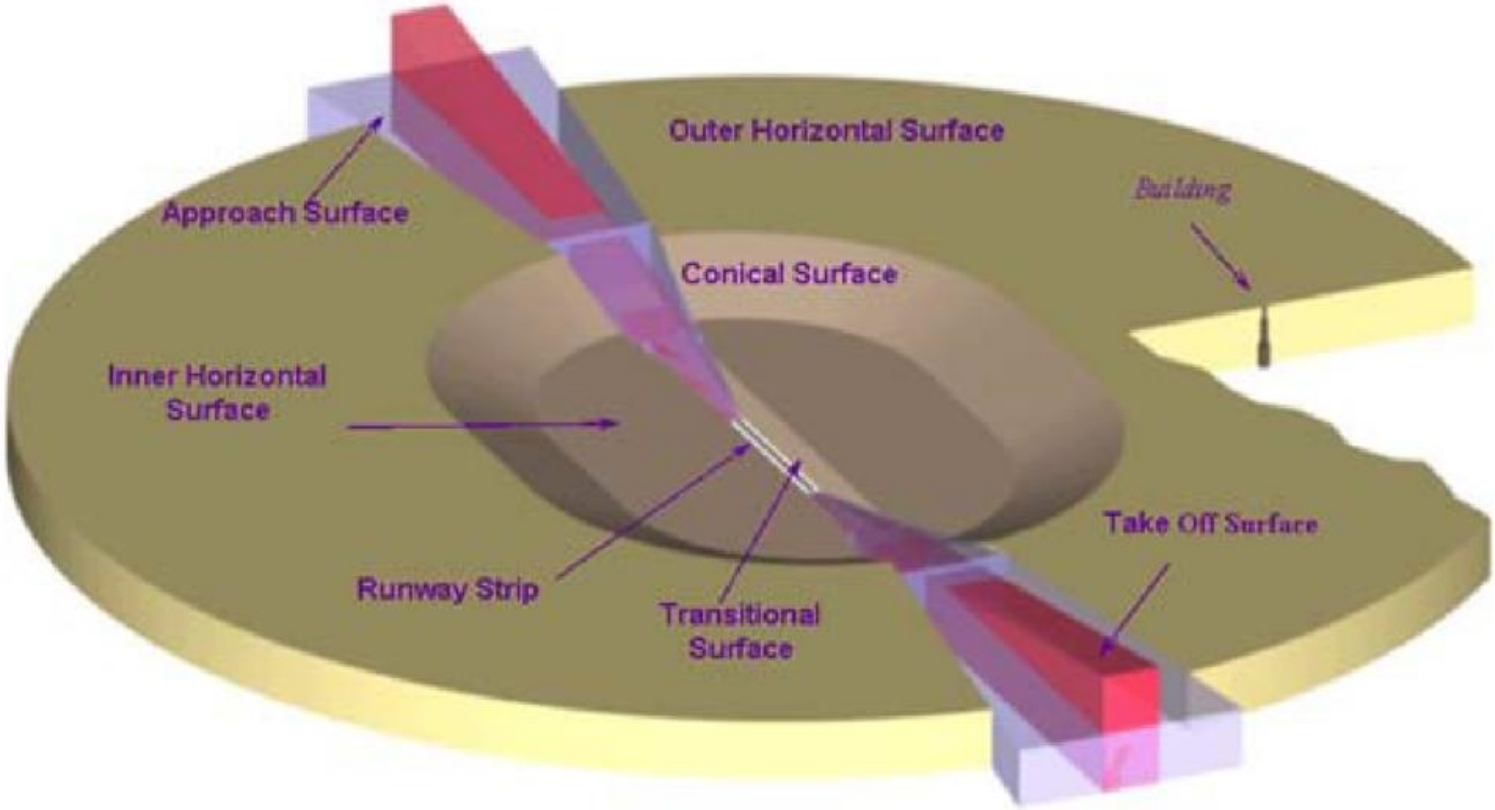


Figure 7.07-1 Relationship of outer horizontal, conical, inner horizontal and transitional surfaces, with an example obstacle (illustrates matters)

AJM
Joint Venture

Appendix B

Planning assessment

State planning policy

Line-wide assessments

In review of the relevant planning schemes, the following State planning policies are relevant to the respective SRL East Structure Plan Areas.

TABLE A.1 RELEVANT STATE POLICY

RELEVANT PROVISION	SUMMARY
Clause 18.02-7S Airports and airfields	This policy seeks to strengthen the role of Victoria's airports and airfields as well as safeguard their ongoing, safe and efficient operation. It also includes strategies which seek to ensure compatible land uses are proposed around airports.

Local planning policy

Cheltenham Structure Plan Area

Local policies in the Bayside and Kingston Planning Schemes relevant to this assessment are summarised in Table A.2.

TABLE A.2 RELEVANT LOCAL POLICY IN THE BAYSIDE AND KINGSTON PLANNING SCHEMES

RELEVANT LOCAL POLICY	SUMMARY
Bayside Planning Scheme	
No specific airspace planning policy in the Bayside Planning Scheme.	
Kingston planning scheme	
Clause 18.02 'Movement Networks' Clause 18.02-7L-01 'Moorabbin Airport'	Seeks to ensure that future use and development around the Moorabbin airport is sensitive to its long-term operation protect the airport's flight paths are from encroachment. Policy guidelines include: • *The Moorabbin Airport Aviation Obstacle Referral Height Plan* • *The Moorabbin Airport Masterplan.*

Clayton Structure Plan Area

Local policies in the Monash and Kingston Planning Schemes relevant to the Clayton Structure Plan Area are summarised in Table A.3.

TABLE A.3 LOCAL POLICY RELEVANT TO THE CLAYTON STRUCTURE PLAN AREA

RELEVANT LOCAL POLICY	SUMMARY
Monash Planning Scheme	
No specific airspace planning policy in the Monash Planning Scheme.	
Kingston Planning Scheme	
Clause 18.02 'Movement Networks' Clause 18.02-7L-01 'Moorabbin Airport'	Seeks to ensure that future use and development around Moorabbin Airport is sensitive to its long-term operation and the airport's flight paths are protected from encroachment. Policy guidelines include: • *The Moorabbin Airport Aviation Obstacle Referral Height Plan* • *The Moorabbin Airport Masterplan.*

Monash Structure Plan Area

There is no aviation or airspace related planning policy or controls which affect the land in the Monash Structure Plan Area.

Glen Waverley Structure Plan Area

There is no aviation or airspace related planning zones or overlays controls which affect the land in the Glen Waverley Structure Plan Area.

Burwood Structure Plan Area

There is no aviation or airspace related planning policy or controls which affect the land in the Burwood Structure Plan Area.

Box Hill Structure Plan Area

There is no aviation or airspace related planning policy or controls which affect the land in the Box Hill Structure Plan Area.

Zone and overlay planning assessment

Cheltenham Structure Plan Area

There is no aviation or airspace related planning zones or overlays controls which affect the land in the Cheltenham Structure Plan Area.

Clayton Structure Plan Area

Zones and overlays in the Monash and Kingston Planning Schemes which affect the Clayton Structure Plan Area are summarised Table A.4 and Table A.5.

TABLE A.4 ZONES RELEVANT TO THE CLAYTON STRUCTURE PLAN AREA

RELEVANT ZONE	SUMMARY
Monash Planning Scheme	
No specific airspace planning policy in the Monash Planning Scheme.	
Kingston Planning Scheme	
No specific airspace planning policy in the Kingston Planning Scheme.	

TABLE A.5 OVERLAYS RELEVANT TO THE CLAYTON STRUCTURE PLAN AREA

RELEVANT OVERLAY	SUMMARY
Monash Planning Scheme	
Clause 43.02 Design and Development Overlay, Schedule 1 (DDO1)	DDO1 seeks to implement design controls for the 'Industrial and Commercial Design and Development Area'. This overlay seeks to maintain the existing Garden City Character within Monash. No development height restrictions are specified, however building scale in terms of height and bulk must complement surrounding buildings.
Clause 43.02 Design and Development Overlay, Schedules 14, 15 and 18 (DDO14 and DDO15).	DDO14 and DDO15 seeks to implement design controls for different areas of the 'Monash Medical Centre Hospital Emergency Medical Services Helicopter Flight Path Protection'. DDO14 corresponds with the Inner Area of these flight paths and DDO15 relates to the Outer Area of these flight paths. These overlays seek to ensure the height of buildings and works do not encroach on the flight path areas associated with the Monash Medical Centre helicopter landing site and the height of development avoids creating a hazard to aircraft using the Monash Medical Centre helicopter landing site. DDO14 stipulates that a permit is required for any buildings or works which exceed 92.6 m above the Australian Height Datum (AHD). DDO15 stipulates that a permit is required for any buildings or works which exceed 102.6 m above the AHD. Applications for developments which exceed the specified heights must be referred to the Department of Health and Human Services (now known as the Department of Health) as the determining referral authority.

RELEVANT OVERLAY	SUMMARY
Clause 43.02 Design and Development Overlay, Schedules 18 (DDO18)	DDO18 seeks to implement the 'Victoria Heart Hospital Emergency Medical Services Helicopter Flightpath Protection (Outer Area)'. This overlay seeks to ensure the heights of buildings do not encroach on the flight path areas associated with the Victorian Heart Hospital helicopter landing site and that development avoids creating a hazard to aircraft using the Victorian Heart Hospital helicopter landing site.
Kingston Planning Scheme	
No specific airspace planning policy in the Kingston Planning Scheme.	

Monash Structure Plan Area

Zones and overlays in the Monash Planning Scheme which affect the Monash Structure Plan Area are summarised in Table A.6 and Table A.7.

TABLE A.6 ZONES RELEVANT TO THE MONASH STRUCTURE PLAN AREA

RELEVANT ZONE	SUMMARY
No specific airspace planning policy in the Monash Planning Scheme.	

TABLE A.7 OVERLAYS RELEVANT TO THE MONASH STRUCTURE PLAN AREA

RELEVANT OVERLAY	SUMMARY
Clause 43.02 Design and Development Overlay, Schedule 14 (DDO14)	DDO14 seeks to implement design controls for the 'Monash Medical Centre Hospital Emergency Medical Services Helicopter Flight Path Protection (Inner Area)'. This overlay seeks to ensure the height of buildings and works do not encroach on the flight path areas associated with the Monash Medical Centre helicopter landing site and the height of development avoids creating a hazard to aircraft using the Monash Medical Centre helicopter landing site. DDO14 stipulates that a permit is required for any buildings or works which exceed 92.6 m above the Australian Height Datum (AHD). Applications for developments which exceed the specified heights must be referred to the Department of Health and Human Services (now known as the Department of Health) as the determining referral authority.
Clause 43.02 Design and Development Overlay, Schedules 15 (DDO15)	DDO15 seeks to implement design controls for the 'Monash Medical Centre Hospital Emergency Medical Services Helicopter Flight Path Protection (Outer Area)'. This overlay seeks to ensure the height of buildings and works do not encroach on the flight path areas associated with the Monash Medical Centre helicopter landing site and the height of development avoids creating a hazard to aircraft using the Monash Medical Centre helicopter landing site. DDO15 stipulates that a permit is required for any buildings or works which exceed 102.6 m above the Australian Height Datum (AHD). Applications for developments which exceed the specified heights must be referred to the Department of Health and Human Services (now known as the Department of Health) as the determining referral authority.
Clause 43.02 Design and Development Overlay, Schedules 17 (DDO17)	DDO17 seeks to implement the 'Victoria Heart Hospital Emergency Medical Services Helicopter Flightpath Protection (Inner Area)'. This overlay seeks to ensure the heights of buildings do not encroach on the flight path areas associated with the Victorian Heart Hospital helicopter landing site and that development avoids creating a hazard to aircraft using the Victorian Heart Hospital helicopter landing site. DDO17 requires a permit for new development which exceeds 128.2 m above AHD in height. A permit is not required for works to an existing dwelling which exceeds a height of 128.2 m above AHD provided the works do not exceed the height of the existing building and the lot does not immediately adjoin the hospital land

RELEVANT OVERLAY	SUMMARY
	(the Public Use Zone 2 land occupied by the Victorian Heart Hospital).
Clause 43.02 Design and Development Overlay, Schedules 18 (DDO18)	DDO18 seeks to implement the 'Victoria Heart Hospital Emergency Medical Services Helicopter Flightpath Protection (Outer Area)'. This overlay seeks to ensure the heights of buildings do not encroach on the flight path areas associated with the Victorian Heart Hospital helicopter landing site and that development avoids creating a hazard to aircraft using the Victorian Heart Hospital helicopter landing site. DDO18 requires a permit for new development which exceeds 138.2 m above AHD in height. A permit is not required for works to an existing dwelling which exceeds a height of 138.2 m above AHD provided the works do not exceed the height of the existing building and the lot does not immediately adjoin the hospital land (the Public Use Zone 2 land occupied by the Victorian Heart Hospital).

Glen Waverley Structure Plan Area

There is no aviation or airspace related planning zones or overlays controls which affect the land in the Glen Waverley Structure Plan Area.

Burwood Structure Plan Area

There is no aviation or airspace related planning zones or overlays controls which affect the land in the Burwood Structure Plan Area.

Box Hill Structure Plan Area

There is no aviation or airspace related planning zones or overlays controls which affect the land in the Box Hill Structure Plan Area.

Particular provisions

The following particular provisions are included in the Bayside, Kingston, Monash and Whitehorse Planning Schemes and so are relevant to all SRL East Structure Plan Areas.

TABLE A.8 AIRSPACE RELEVANT PARTICULAR PROVISIONS

RELEVANT PROVISION	SUMMARY
Clause 52.15 'Heliport and Helicopter Landing Site'	Specifies planning permit requirements and exemptions for heliports and helicopter landing sites.

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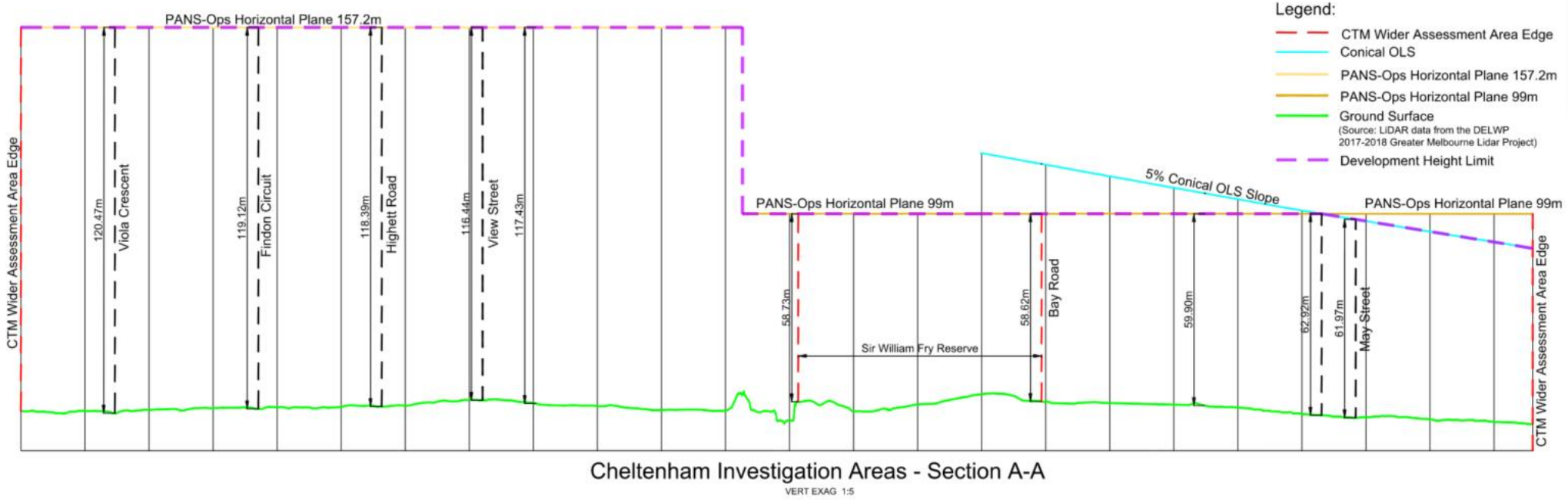
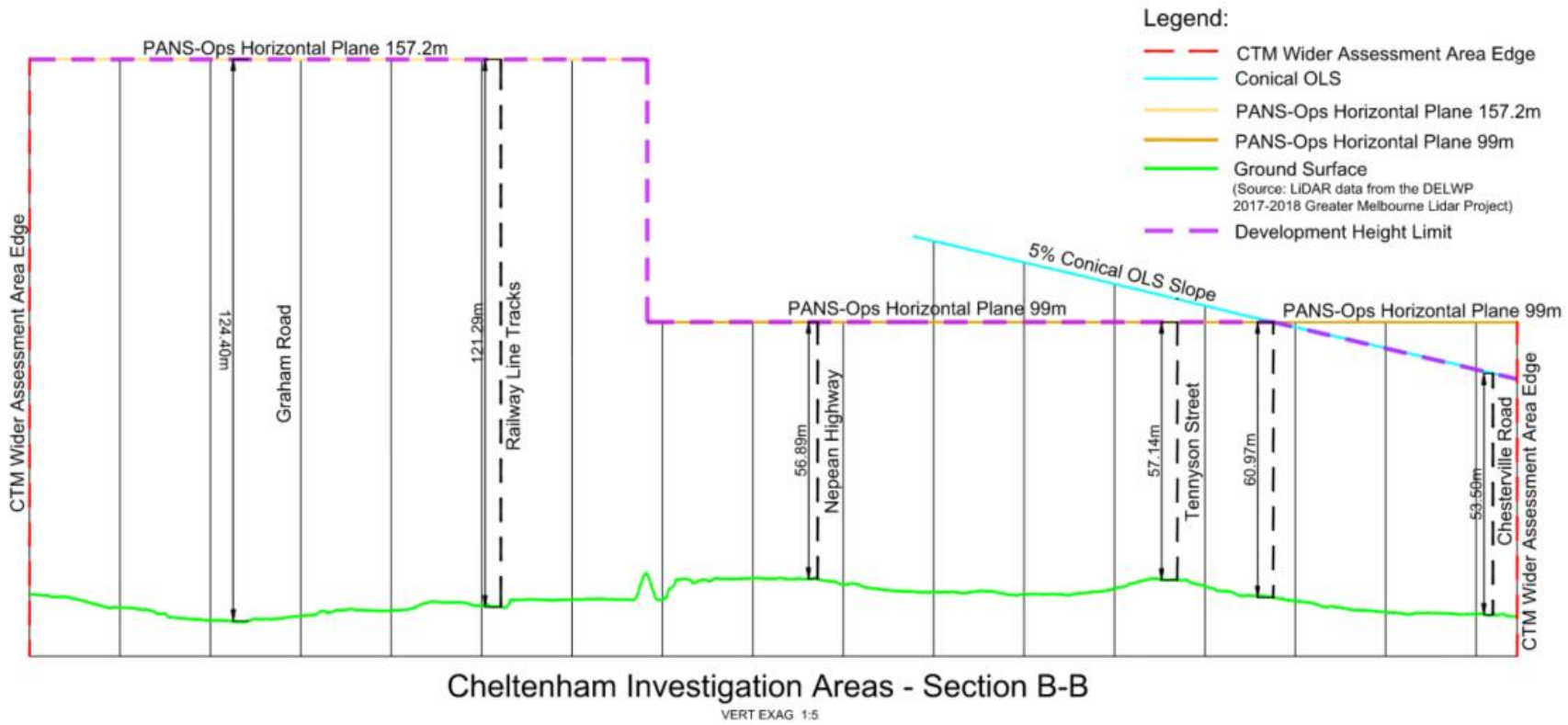
Appendix C

Longitudinal sections



Cheltenham Investigation Areas - Section A-A

VERT EXAG 1:5



Cheltenham Investigation Areas - Section B-B

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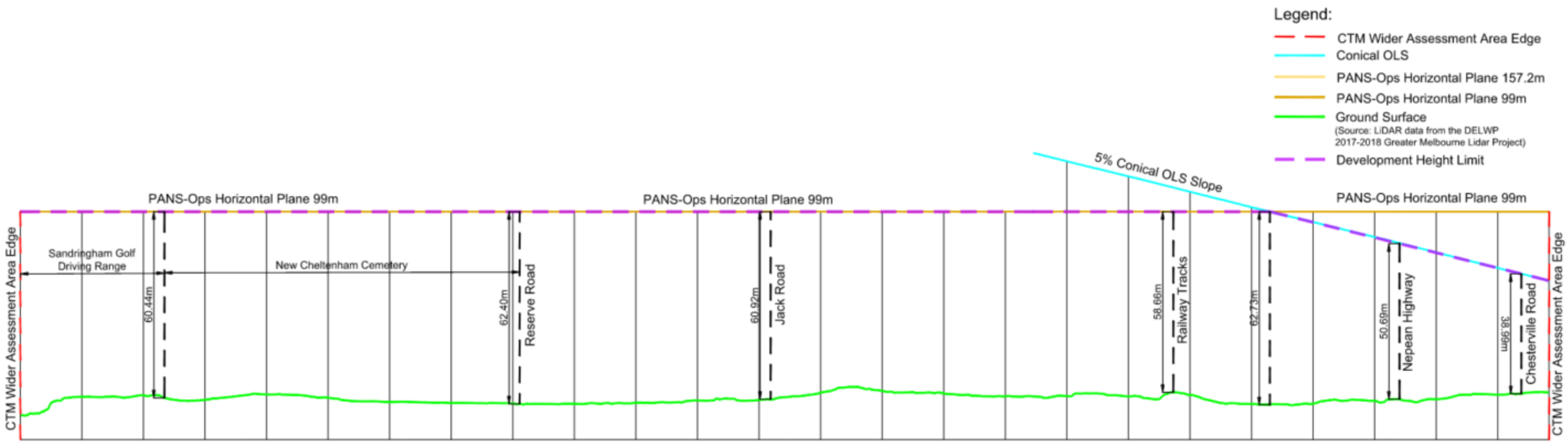
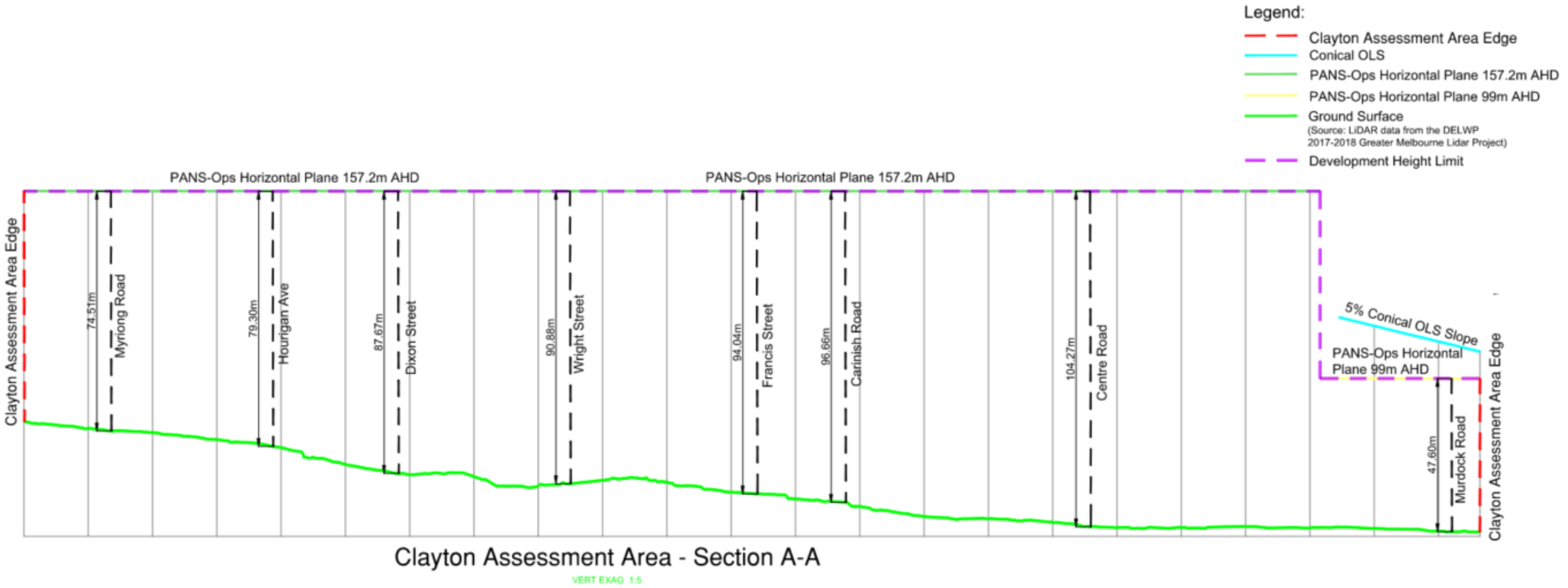
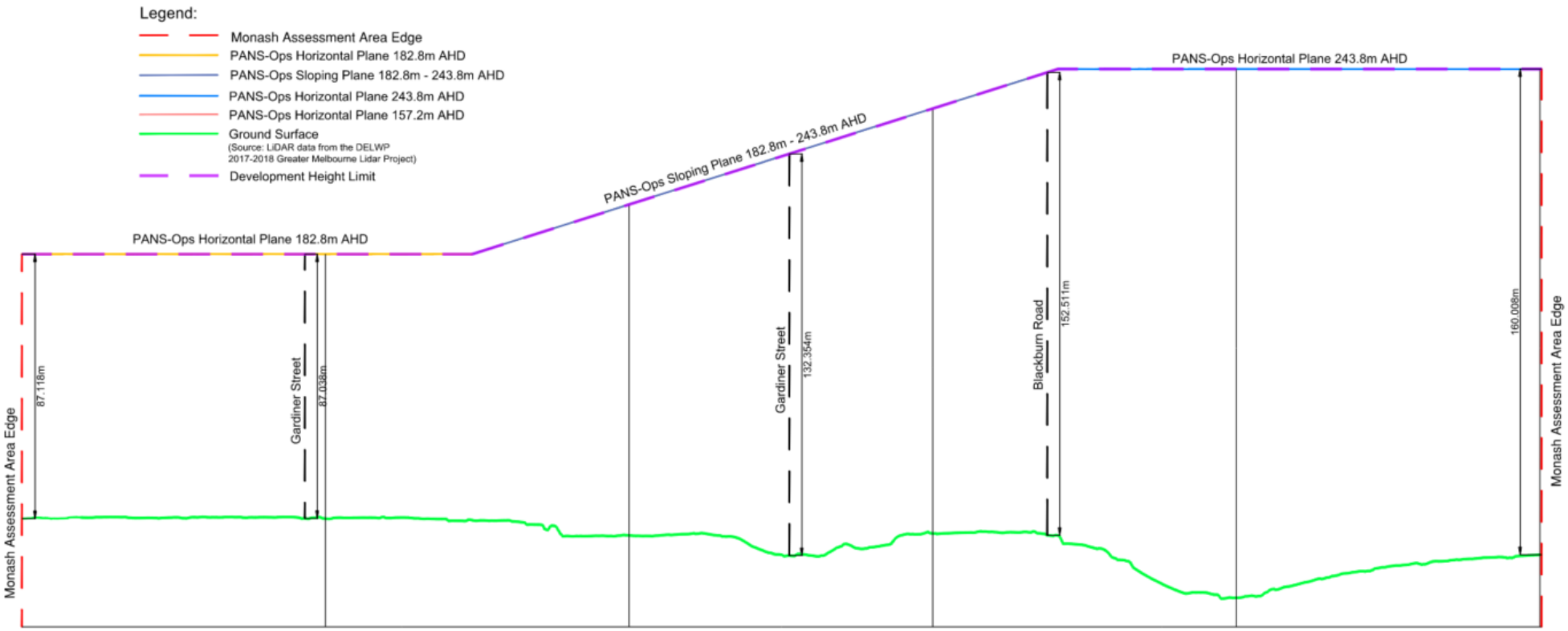


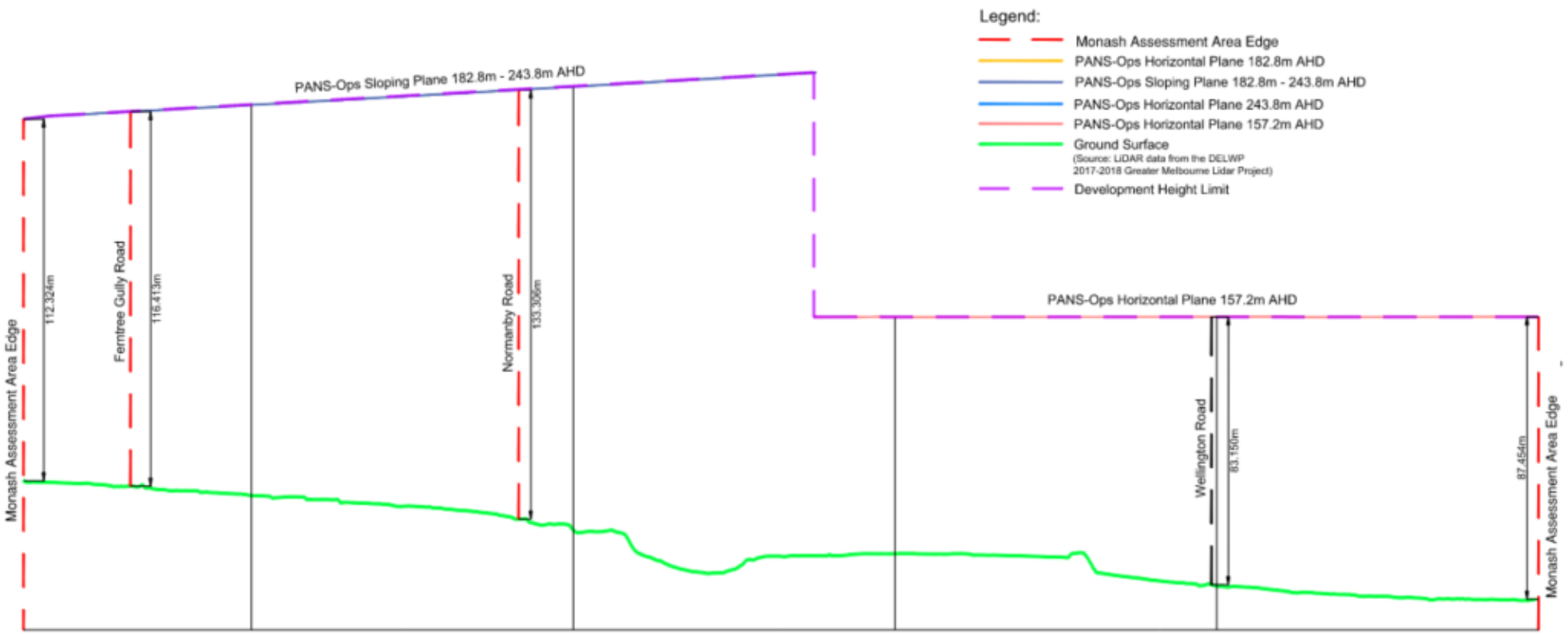
Cheltenham Investigation Areas - Section C-C


Legend:
Clayton Assessment Area Edge
Conical OLS
PANS-Ops Horizontal Plane 157.2m AHD
PANS-Ops Horizontal Plane 99m AHD
Ground Surface
(Source: LiDAR data from the DELWP 2017-2018 Greater Melbourne Lidar Project)
Development Height Limit
PANS-Ops Horizontal Plane 157.2m AHD
PANS-Ops Horizontal Plane 157.2m AHD
Clayton Assessment Area Edge
74.51m
Myriong Road
79.30m
Hourigan Ave
87.67m
Dixon Street
90.88m
Wright Street
94.04m
Francis Street
96.66m
Carinish Road
104.27m
Centre Road
5% Conical OLS Slope
PANS-Ops Horizontal Plane 99m AHD
47.60m
Murdock Road
Clayton Assessment Area Edge
Clayton Assessment Area - Section A-A
VERT EXAG 1:5



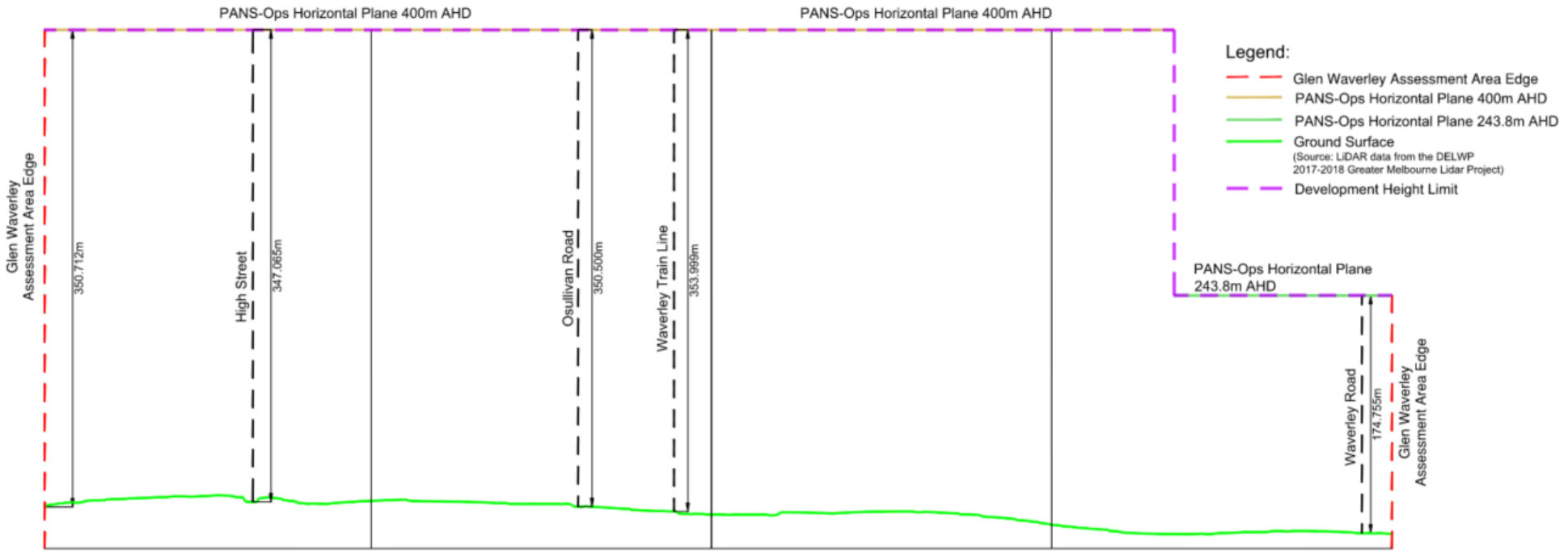
Monash Assessment Area - Section A-A

VERT EXAG 1:5



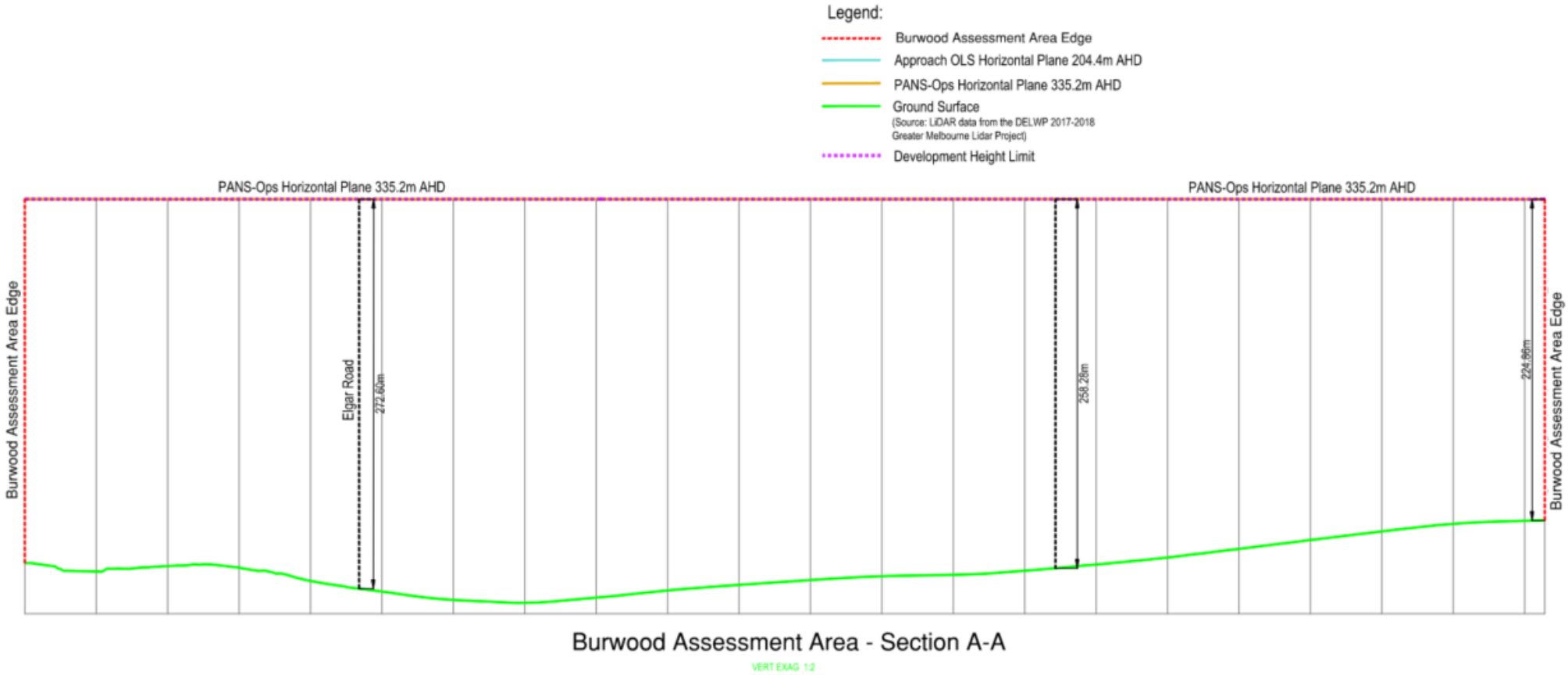
Monash Assessment Area - Section B-B

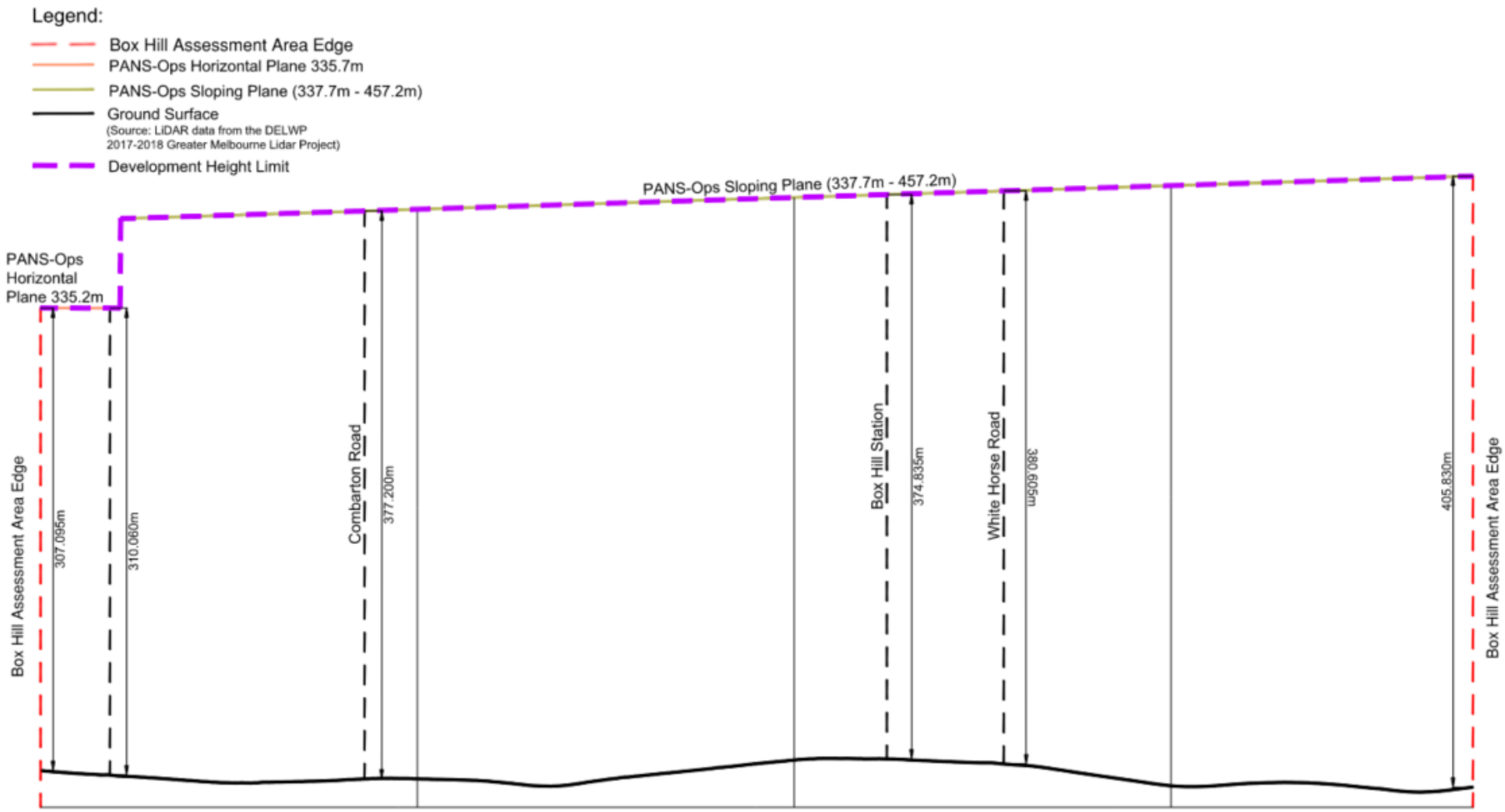
VERT EXAG 1:5



Glen Waverley Assessment Area - Section A-A

VERT EXAG 1:2


Legend:
Burwood Assessment Area Edge
Approach OLS Horizontal Plane 204.4m AHD
PANS-Ops Horizontal Plane 335.2m AHD
Ground Surface
(Source: LiDAR data from the DELWP 2017-2018
Greater Melbourne Lidar Project)
Development Height Limit
PANS-Ops Horizontal Plane 335.2m AHD
PANS-Ops Horizontal Plane 335.2m AHD
Burwood Assessment Area Edge
Elgar Road
272.60m
258.26m
224.86m
Burwood Assessment Area Edge
Burwood Assessment Area - Section A-A
VERT EXAG 1:2



Box Hill Assessment Area - Section A-A

VERT EXAG 1:2

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