Royal Perth Hospital Flight Path Protection

Scheme Amendment Request

Prepared for the Department of Health - East Metropolitan Health Service

October 2022 | 19-139



Cover image source: East Metropolitan Health Services

We acknowledge the Whadjuk people of the Noongar nation as traditional owners of the land on which we live and work.

We acknowledge and respect their enduring culture, their contribution to the life of this city, and Elders, past and present.

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Source: East Metropolitan Health Services

element.

1. Introduction

element has prepared this report, on behalf of the East Metropolitan Health Service (EMHS), in support of a request to amend the City of Vincent Local Planning Scheme No. 2 (LPS2) as it relates to a number of landholdings identified as being within essential helicopter flight paths associated with the operation of emergency helicopter operations at the Royal Perth Hospital (RPH) located at Lot 916 and Lot 920 (No. 212) Wellington Street, Perth.

The Western Australian Planning Commission (WAPC) have recently approved the proposed development of an upgraded Helicopter Landing Site (HLS) at RPH. The upgraded HLS will enable a fleet of upgraded helicopters to utilise the facility and continue to support the State Major Trauma Unit (SMTU) at RPH into the future. As part of securing the long term use of the facility, it has been identified that the existing development potential of a number of landholdings immediately surrounding RPH may result in future development impacting on the safety of helicopter operations.

The existing and future development potential of land within the vicinity of RPH is therefore required to be considered as part of this proposed amendment to ensure essential emergency helicopter flight paths are not obstructed by development that may impact the safety of an emergency medical flight and ultimately result in the upgraded HLS being decommissioned, bringing with it significant impacts upon the efficiency of services provided by the SMTU.

The proposed amendment is being undertaken to align with a number of relevant elements that influence the ongoing successful operation of the Emergency Rescue Helicopter Service (ERHS) at RPH. This includes the interrelationship between the existing planning framework and development opportunities, the National Airports Safeguarding Framework, relevant aviation standards, State government investment and futureproofing the successful operation of the SMTU at RPH to support the States medical emergency needs.

The overarching objective of this request is to ensure that the SMTU located at RPH is able to continue to be serviced by the ERHS that is managed by the Department of Fire and Emergency Services (DFES) by introducing a Special Control Area (SCA) to create a Royal Perth Hospital Emergency Flight Path Protection area.

1.1 At a Glance - The Importance of Protecting Emergency Flight Paths

- Safety, viability and ongoing operations of HLS can be compromised by permanent and temporary development (such as cranes), gaseous plumes, telecommunications towers, powerlines and landscape features (such as trees).
- Recently, helipads have been decommissioned due to nearby operation of construction cranes. In the United Kingdom (UK), a fatal accident occurred where a helicopter collided with a construction crane. This has led to the UK Government formalising safeguarding arrangements to ensure a more robust notification system is in place. Around the world, building induced windshear has played a role in many helicopter crashes.
- Population growth and increased high-rise development continue to place pressures on HLS's located within built up areas.
- Despite the importance of maintaining unimpeded access to strategically important HLS, protective legislation varies across the country.
- In Australia, HLS are not licensed, certified or regulated in the way that aerodromes are under the *Civil Aviation Safety Regulations 1998* (CASR). Outside airports and commonwealth owned land, there are varying levels of regulation and guidance around safeguarding HLS across the country.
- Whilst the new HLS at RPH was formally considered and approved, ongoing development within the City may impact the safety of operations into the future, especially where a helicopter is required to fly with one engine inoperable. At present, there is no formal notification process in place for pilots to be aware of any proposed development (and construction cranes) within areas flown.
- Without protection, strategically important HLS may be required to be decommissioned as a result of ongoing development jeopardising the safety and efficiency of operations.

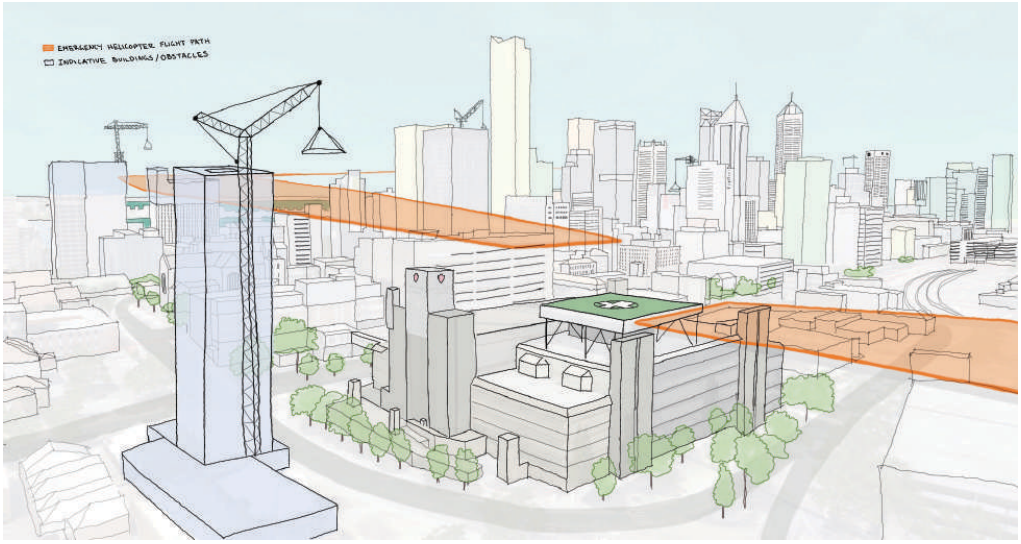


Figure 1. The importance of protecting helicopter flight paths at Royal Perth Hospital

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2. Background

2.1 Royal Perth Hospital

RPH is Western Australia's longest serving hospital. Its origins date back to the old Colonial Hospital that was originally established on Garden Island in 1829 until it was subsequently relocated to Perth. The hospital continued to change location and then in 1855, the hospital commenced operations on the corner of Victoria Square and Murray Street. Since then, a number of additional buildings have contributed to the expansion of the hospital's operations toward Wellington Street where an existing helipad is situated on top of the 'North block'. The existing helipad provides an essential service to patients who are in need of urgent specialist trauma treatment at RPH's SMTU. The SMTU is used by the ERHS operated by the DFES. Other operators are also able to utilise the existing helipad when specifically required.

RPH is now the designated provider of major trauma services for adults in Western Australia. More than 75,000 patients are admitted to RPH annually, with over 700 of these patients being classed as major trauma. Approximately 80% of the State's major trauma cases are treated at RPH's SMTU, which provides state-of-the-art multidisciplinary emergency trauma and critical care for patients suffering complex injuries requiring care from multiple medical specialities.

2.1.1 State Major Trauma Unit and Emergency Rescue Helicopter Service

In respect to the existing helicopter operations at RPH, 70.4% of patients transported via the ERHS are taken to RPH for treatment, with an average of 354 patients being received per year. The following statistics from RPH Trauma Data in 2020 emphasise the importance of the service provided:

- 222 patients received were **trauma** patients, meaning that they required urgent medical care as a result of a sudden physical injury from impact, violence or accident;
- 101 patients received were considered **major trauma** patients;
- 43% of **major trauma** patients were considered to have sustained severe or critical trauma; and
- More than 50% of **major trauma** admissions to RPH required critical surgical intervention in response to their injuries.

'Trauma' *– means a body wound produced by sudden physical injury from impact, violence or accident.*

'Major Trauma' *– means a person who has many (multi-trauma) and/or severe injuries. Major and multi-trauma patients can experience serious complications including:*

haemorrhage – losing large amounts of blood can result in shock and other complications

infection or sepsis – the presence of open wounds increases risk of infection

multi-organ failure – when one or more organs, such as kidneys or liver, begin to stop working.

The statistics provided above have been extracted from a letter provided by the Western Australian State Director of Trauma, Dr Sudhakar Rao. The following statements are taken from Dr Sudhakar's letter, which provide a response to matters raised by the City of Perth as part of preliminary consultation and ultimately highlight the importance of the ERHS, the associated helipad at RPH and the overall operations of the SMTU at RPH:

> *The need for helicopter emergency medical services to pick up a patient from their location, followed by immediate access to specialist treatment teams on arrival at a hospital is imperative.*
>
> *Helicopter transport provides the quickest means of transferring critically injured patients to a major trauma service. Off-site landings have been found to result in longer transport to the emergency room, however, the construction of helipads in trauma centres can reduce transport time, in addition to reducing the costs and sequelae of trauma.*
>
> *Acknowledging the increased chances of survival and recovery from on-site HLS, alternative locations such as Wellington Square or Langley Park were determined to be unacceptable for Standard Operating Procedures as both locations would cause delays to patient transfer with an additional ambulance transfer, and risk to life (including increased infection risk). These locations would further pose security and accident risks for the Rescue Helicopter as well as the general public on the ground, thus requiring WA Police intervention for each helicopter landing.*
>
> *The time critical nature of the relationship between event, definitive tertiary clinical intervention and the patient's survival is the reason why the construction of a new on-site helipad that will allow immediate access for the State Emergency Rescue Helicopter Service's (ERHS's) upgraded helicopter fleet at RPH is critical for the ongoing provision of emergency healthcare in WA.*

Refer to Appendix 1 – Letter from WA State Director of Trauma 4 November 2021 (Dr Sudhakar Rao)

DFES have provided its support for the proposed flight paths, being the agency responsible for the ongoing operation of the ERHS at RPH. DFES support can also be referred to at Appendix 2.

Refer to Appendix 2 - DFES Letter of Support

2.2 Futureproofing Royal Perth Hospital

The gazettal of the *Royal Perth Hospital Protection Act 2016* secured and reiterated the importance of the hospital for the State with clause 6 of the Act stating, *Royal Perth Hospital is to continue to operate as a public hospital unless a resolution approving the closure of the hospital has been passed by each House of Parliament.*

The Commonwealth and State Government has recently announced significant funding to upgrade clinical services and infrastructure including the Intensive Care Unit and a new authorised Mental Health Unit at RPH. Additional investments have been made in innovation as well as general building and maintenance upgrades to support the ongoing operation of the hospital.

2.2.1 Requirement for Upgraded Helicopter Facilities (Helipad)

The Australian Civil Aviation Safety Authority (CASA) has released a Notice of Proposed Rule Making NPRM 1304OS entitled *Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations*. The significance of the updated regulatory framework on emergency air ambulance helicopter flights is that they will need to operate in accordance with a prescribed performance criteria of Performance Class 1, which requires the use of multi-engine helicopters certified in Category A.

The Category-A certification verifies that a helicopter with one engine inoperative is capable of meeting specified performance capabilities and prescribed limits set out in *Category-A Supplement to the Rotorcraft Flight Manual* compliance. With these operational parameters it ensures the helicopter is able to continue an approach on one engine (or reject a take-off) and set down on a HLS or fly away on one engine and clear all obstacles within the flight path boundary by approximately 10 metres.

Put simply, air ambulance helicopters are required to operate at the Performance Class 1 criteria. This requires a HLS and supporting structure that is capable of withstanding the dynamic loads generated by a helicopter making a heavy landing as well as the static loads generated by stationary helicopters.

The old HLS at RPH being used by air ambulance helicopters did not meet the physical dimensions of a Category A helipad. As such, the provision of a Category-A sized helipad in support of emergency medical transport flights has been approved and is now being utilised.

2.2.2 Upgraded Helipad Development Approval

At its meeting on 28 October 2019, the Statutory Planning Committee (SPC) of the WAPC resolved to approve the new HLS for RPH subject to a number of conditions.

Please refer to Appendix 3 – Development Approval - Helicopter Landing Site

A large body of work was undertaken by RPH and technical consultants to determine the most suitable location for an upgraded HLS, which was provided in support of the development application considered by the WAPC. A combination of factors were considered to determine the most suitable location, including the following:

- Patient care outcomes associated with location characteristics (as referred to above and within Appendix 1) - Prioritising speed from injury to specialist trauma treatment, eliminating additional transfer requirements and increased patient handling risks, and reducing costs to the State/patient;
- Existing location of the SMTU;
- Existing obstacle environment in the vicinity of a proposed helipad;
- Relationship between dominant period of helicopter activity and weather patterns, in particular prevailing wind characteristics; and
- High level review in consultation with the City of Perth to determine potential building heights and reduce impacts.

'The need for helicopter emergency medical services to pick up a patient from their location, followed by immediate access to specialist treatment teams on arrival at a hospital is imperative. The location of the new helipad was carefully thought through in order to ensure alignment with the WA State Trauma System objective of optimum speed from injury to specialist trauma treatment at WA's only Level 1 Major Trauma Centre. This eliminates an additional ambulance transfer and increased patient handling risks, as well as additional cost to the State/patient…'

Source: Dr Sudhakar Rao – WA State Director of Trauma (Letter from Dr Sudhakar Rao, WA State Director of Trauma 4 November 2021)

2.2.3 Aviation Standards

The physical characteristics of a HLS as well as the associated flight paths are controlled through the following documents:

- The Civil Aviation Safety Authority (CASA) Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment of on-shore helicopter landing sites (February 2014);
- International Civil Aviation Organisation (ICAO) Annex 14 Aerodromes – Volume II: Heliports (4th edition July 2013); and
- Civil Aviation Safety Authority NPRM 1304OS Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations.

The pilots currently operating the ERHS and DFES have advised that in order to continue to conduct flights to and from the RPH HLS, the flight paths need to be protected in accordance with ICAO Annex 14.

This amendment has been prepared in direct response to the above documents, with elements of these being discussed within the following report. Further technical information can also be referred to at Appendix 4.

Refer to Appendix 4 – HLS Flight path Requirements (Rehbein Airport Consulting)

Please also refer to an explanation of the interpretation of relevant aviation regulations at Appendix 5.

Refer to Appendix 5 - Interpretation of Aviation Regulations (Rehbein Airport Consulting)

element has prepared this report on behalf of EMHS in consultation with key agencies. DFES have provided its support for the proposed flight paths, being the agency responsible for the ongoing operation of the ERHS at RPH. DFES support can also be referred to at Appendix 2.

Refer to Appendix 2 - DFES Letter of Support

2.2.4 Requirement to Protect Emergency Flight Paths

The need to protect the airspace in accordance with the above mentioned CASA regulation has been acknowledged at the federal level through the Department of Infrastructure, Transport, Regional Development and Communications publication titled *National Airports Safeguarding Framework* and in particular Guideline H. Guideline H presents information relevant to protecting strategically important HLS and includes discussion on the protection measures required to ensure buildings and structures (such as construction cranes) do not intrude into the Obstacle Limitation Surface (OLS) that outlines the lower limit of the operational airspace of a helicopter flying on one engine.

Being located in the Perth central city area, RPH is located within close proximity to a number of landholdings that currently contain and/or are able to contain buildings of a significant scale. This creates a significant and very real risk to the continued successful and safe operation of the hospital and the SMTU, which is reliant upon emergency air ambulance transporting critically ill patients for urgent treatment.

It is anticipated that over time and without intervention, the safety of emergency helicopter pilots, hospital staff, patients and the general public will be compromised through the cumulative impact of additional buildings constructed within the approach and departure routes to the HLS at RPH.

The parameters guiding the methodology used to determine the most appropriate flight paths are addressed later in this report.

> *"If intrusions into the flight paths for a HLS, and risks associated with the use of those SHLS are not regulated the ongoing helicopter operations at strategically important sites may be compromised. Without protection, development in the vicinity of a SHLS could jeopardise safety and efficiency and potentially result in the decommissioning of the HLS."*
>
> *Extract from the National Airports Safeguarding Framework*

2.3 Consultation and Engagement

Throughout the preparation of this amendment request, **element** and EMHS have worked closely with a number of key stakeholders. This has included a number of project meetings and ongoing correspondence with the City as well as the following stakeholders:

- Department of Planning, Lands and Heritage;
- City of Perth;
- Development WA;
- Department of Fire and Emergency Services; and
- Relevant technical professionals; and
- Civil Aviation Safety Authority.

The culmination of technical advice and assistance from these stakeholders has allowed for a coordinated approach to be taken. This has allowed a number of relevant matters to be considered as part of the ongoing refinement of the proposed emergency flight paths to determine the most appropriate alignment with respect to flight requirements, strategic land use planning and minimising the impact to existing development potential as discussed throughout this report.

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Figure 2. Constructed helipad (Source: East Metropolitan Health Services)


Source: East Metropolitan Health Services

element.

3. Subject Site

3.1 Site Details

RPH is located within the Perth CBD and is generally situated toward the northern extent of the City's local government authority boundary, adjacent to the Graham Farmer Freeway and the Midland and Armadale Railway Line. RPH's facilities span multiple lots with a total land area of approximately 5.575ha. RPH maintains frontages to Murray Street, Victoria Square, Lord Street, Wellington Street and Moore Street.

Two bridges provide pedestrian connections over the road reserve of Moore Street and Wellington Street to individual buildings. The previous HLS is situated on top of the existing building located at Lot 916 (No. 212) Wellington Street, Perth. This HLS will remain operational for a temporary period of time as a backup facility to the recently completed upgraded HLS.

Refer to Figure 3 – Location Plan

Refer to Figure 4 – Aerial Plan

To protect the flightpath this amendment will apply to a series of landholdings that are located within two identified emergency helicopter flight paths and is referred to as the core flight corridor area. The core flight corridor area spans a total width of 165m and extends a total distance of 3.386km as required by relevant aviation standards and requirements for emergency helicopter flights.

This amendment also applies to a number of landholdings that are located either side of the core area. This will be referred to as the frame area and will extend 90m beyond the outer edges of each flight path for the total distance of the core area, being 3.386km. The intent of the frame area is to ensure that DFES is aware of, and approve any temporary encroachments into the core area such as swinging tower cranes associated with the construction of nearby buildings.

Differentiating between the core and frame areas will allow separate development provisions to be applied to each area to prevent obstructions within each flight path. The frame area is shown in Figures 3 and 4.



Figure 3. Location Plan

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Figure 4. Aerial Plan

3.2 Site Context

The area immediately surrounding RPH is characterised by an eclectic mixture of buildings and land uses. The land to the immediate south of the RPH is characterised by a number of medium sized skyscrapers, whereas existing development to the immediate north and east are of a much lower scale and generally taper down toward the Swan River to the east.

There have been a number of developments recently completed in the immediate vicinity of RPH within the City of Perth. Notably, the Westin Hotel located immediately south west of RPH along with numerous development in Northbridge and the Perth City Link. Many of these developments are of a significant scale and their overall height has resulted in ERHS pilots seeking alternative routes in and out of RPH in recent years.

Figure 5 identifies RPH within the context of the applicable planning framework and indicatively explores the potential development height above natural ground level of certain landholdings within the vicinity of RPH and the flight paths. This emphasises the purpose of the proposed amendment being sought and the importance in limiting development height where appropriate to ensure the upgraded HLS facility at RPH is protected and remains operational.



Figure 5. Indicative Development Potential Surrounding RPH

0 100 200m

Date: 28 Jun 2022 Scale: 1:10k@ A3 1:5k @ A1 File: **19-139 CP-1 A** Staff: LS GW Checked: LS



Source: East Metropolitan Health Services

element.

4. Planning Framework

4.1 State and Regional Planning Context

4.1.1 Metropolitan Region Scheme

The Metropolitan Region Scheme (MRS) provides the legal basis for controlling development and land use at the regional level. The RPH site is reserved for 'Public Purposes – hospital'. The purpose and function of the 'Public Purpose' reservation is to protect land for public facilities, such as hospitals, high schools, universities, etc.

The northern flight path traverses land that is primarily zoned 'Urban'. It will also traverse land that is reserved for 'Primary Regional Roads', 'Railways', 'Parks and Recreation' and 'Waterways'.

The southern flight path traverses land that is primarily zoned 'Central city area'. It will also traverse land that is reserved for 'Public purposes – car park', 'Civic and Cultural', 'Other Regional Roads, 'Parks and Recreation', 'Waterways' and 'Primary Regional Roads'.

Refer to Figure 6 – MRS Extract

4.1.2 State Planning Strategy 2050

The State Planning Strategy 2050 was prepared by the Department of Planning, Lands and Heritage (DPLH) on behalf of the WAPC and aims to build strategic planning capacity and capability around a State planning vision.

Planning principles, strategic goals and State strategic directions are set out to respond to the challenges and opportunities that exist for the future land-use planning and development of Western Australia. The document is intended to guide and inform local community plans, growth plans and local planning schemes and strategies with structure planning and development assessments as well as planning for the coordination of physical and community infrastructure, such as hospitals.

The following extracts are of relevance to this amendment:

> *"Demand for Western Australia's goods and services will continue to rise in the foreseeable future, which will increase the pressure on the State's infrastructure."*
>
> *"Planning for the integration and coordination of both physical and social infrastructure is critical in achieving the strategic vision and goals of this document."*
>
> *"Of particular importance will be the continued collaborative approach to define the roles within all tiers of Government; and between the Government and the private sector."*
>
> *"Social infrastructure is by nature highly complex and multidimensional. All levels of government have a role to play in the coordinated delivery of the 'hard' elements of community infrastructure, including…hospitals…"*

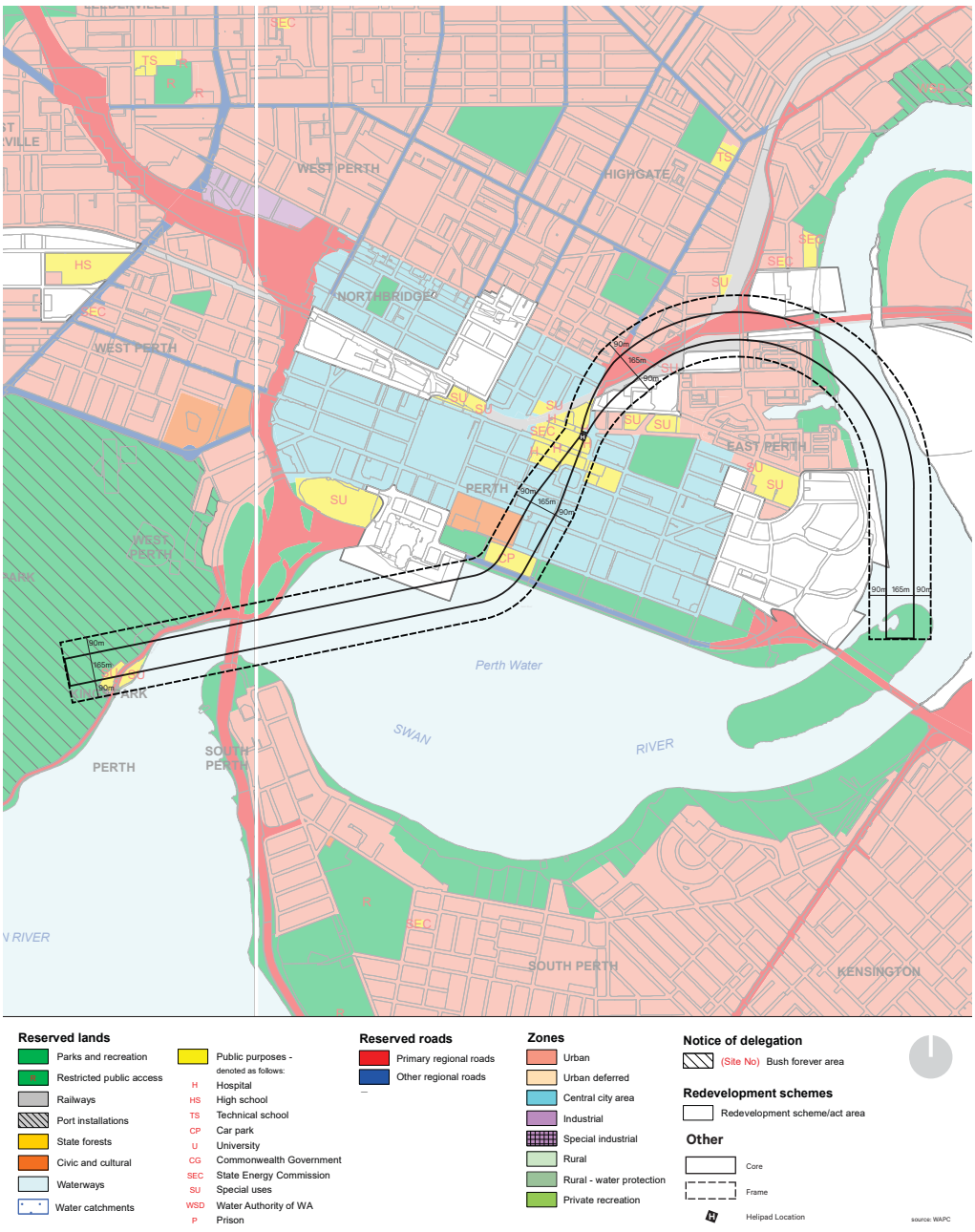


Figure 6. MRS Extract

4.1.3 Perth and Peel @ 3.5 Million

The *Perth and Peel @ 3.5million* strategic suite of documents has been developed to provide a long-term growth strategy for land use and infrastructure for the Perth and Peel regions. The framework outlines a number of overarching objectives in relation to urban form; economy and employment; community and social infrastructure; movement and access; service infrastructure; environment and landscape; and natural resources.

Relevant to the proposed amendment, the document outlines the following objective in relation to community and social infrastructure:

> *To provide a wide range of community and social infrastructure to enhance the health and wellbeing of the community and meet the community's needs including health, education and recreation, while promoting co-location and optimising the use of existing facilities and infrastructure.*

The document states that *"while population growth over time will result in increased demand for regional health facilities, the future focus will be to optimise the use of existing sites in preference to developing facilities on new sites".*

This amendment seeks to protect the ERHS at RPH and its role in supporting the SMTU.

4.1.3.1 Central Sub-Regional Planning Framework

The *Central Sub-Regional Planning Framework* (Framework) forms an integral part of the *Perth and Peel @ 3.5million* strategic suite of draft planning documents. The Framework has been developed to guide further detailed planning and decision-making by State Government agencies and local governments.

Relevant to the proposed amendment, a key principle of the framework is to *"ensure more efficient use of existing and planned service and social infrastructure to achieve a more sustainable urban environment".*

Of relevance to the proposed amendment, the following key strategic directions/priorities in relation to social infrastructure and employment are to:

> *"optimise use of existing infrastructure, with urban infill and employment opportunities utilising the principles of urban consolidation" through review and amendments to the planning framework.*

> *'Protect strategic industries and land classified for this purpose, together with their buffers, from the encroachment of non-strategic and/or incompatible land uses'*

The proposed amendment aligns with the broad principles and objectives of the *Perth and Peel @ 3.5million* documents, in that it will allow the existing hospital facility to remain operational and continue to meet the future needs of both the local and regional community. The proposed amendment will ensure a significant employment generator within the sub region is supported and consistent with the last strategic direction/priority outlined above, it seeks to protect the strategic industry and overall successful operation of RPH, which relies on supporting services from helicopters to meet the needs of the State.

4.1.4 Capital City Planning Framework

The Capital City Planning Framework (CCPF) establishes a spatial strategy for Central Perth and indicates how the objectives of *Directions 2031 and Beyond* and the *Central Metropolitan Perth Sub-Regional Strategy* can be delivered in this focus area.

The area of land to the east of RPH and in particular the northern flight path corridor is identified as being 'Urban', stating the following built form characteristics:

> ***Urban perimeter block:*** *For areas with consistently high development intensity, strongly defined urban blocks create legible built form and streetscape. Primary frontages are built to the boundary at heights appropriate to pedestrian-scaled streetscapes, typically three to six storeys. Additional levels above may be acceptable according to urban context, with further setbacks to differentiate from the primary frontage. Restrained overall heights maintain contrast with the high-rise development of the city centre and reinforce a hierarchy of building form.*
>
> ***Modulated urban frontage:*** *Buildings are set back from the front boundary to allow for landscaped forecourts that contribute to green streetscapes. Buildings generally rise to their full height at their front elevation, creating a strong but less continuous street frontage.*

Refer to Figure 7 – Capital City Planning Framework Proposed Urban Form

The proposed amendment considers the built form characteristics set out under the CCPF and aims to limit the impact to areas identified as 'City' and indeed 'Urban' under the CCPF as far as practically possible. The south western flight path located within the City of Perth local government area will impact landholdings identified as having a 'City' built form, however, as outlined within the methodology section of this report and having considered all relevant parameters, there are no reasonable alternative flight path options available to the south. Notwithstanding this, the southwestern flight path impacts only a small number of landholdings before continuing over the Swan River, and this flight path will not impact Vincent's local government area.

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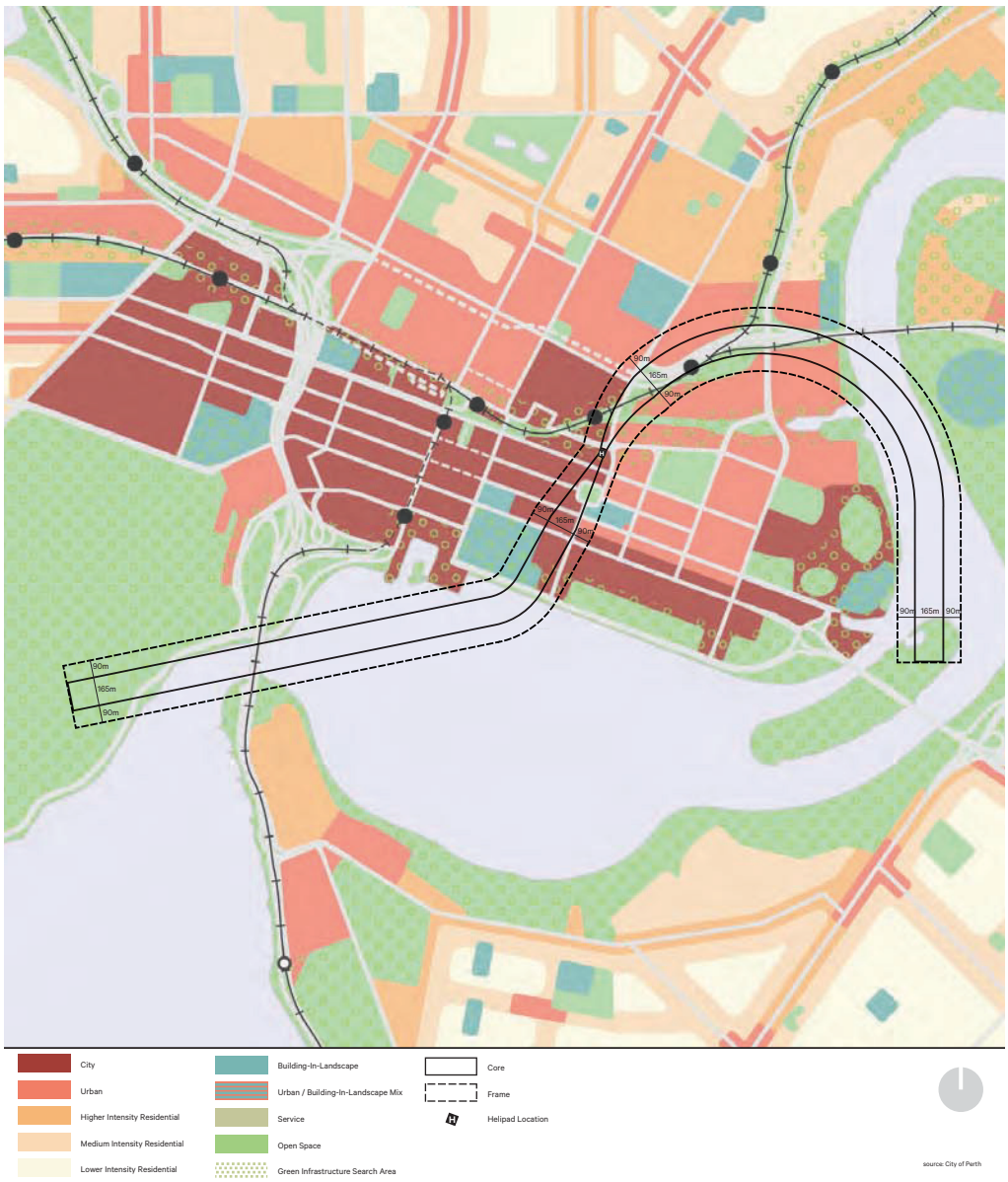


Figure 7. Capital City Planning Framework Proposed Urban Form

4.2 City of Vincent Strategic Planning Framework

4.2.1 Local Planning Strategy 2016

The City's Local Planning Strategy (the Strategy) has been prepared to guide future land use planning and decision-making within the City over the next 10-15 years. A place based planning approach was undertaken by the City in preparing the City's Strategy, which has informed the City's Local Planning Scheme No. 2 (LPS2) currently providing detailed development guidance. It is noted that the City undertook a review of its Local Planning Strategy recently, with Council considering a review report on 17 May 2022. The WAPC have considered the review report and provided confirmation that the City's Local Planning Strategy and Local Planning Scheme is satisfactory subject to a number of minor amendments, which do not have an impact on this proposal.

The City's Strategy is divided into five 'place based' areas that each have their own characteristics and vision. The five areas are as follows:

- Mount Hawthorn
- Mount Lawley/Highgate
- Perth / West Perth
- North Perth
- Leederville

The City's intention is for the Strategy to inform the preparation of local planning policies that will be adopted pursuant to the City's LPS2 and specifically a Precinct Policy for each of the five place based areas identified above. The City are yet to prepare and/or adopt a Precinct Policy for any of the five areas. Notwithstanding, this amendment relates to the Mount Lawley-Highgate area, which the Strategy provides the following vision statement:

> *Mount Lawley Highgate Vision 2024 - A Fabulous Diversity of Lifestyles and Cultures*
>
> *In 2024, Mount Lawley/Highgate is a place with something for everyone. With a depth of character and an accepting attitude at its foundation, people are drawn to Mount Lawley/Highgate's fabulous diversity of lifestyles and cultures – from the cosmopolitan inner city environment to quiet, tree-lined neighbourhoods. New migrants, artists and students live here, adding diversity, a sense of creativity and festivity to our community. Beaufort Street is a boulevard of pedestrians, trees, and greenery, exuding a distinction and flair all of its own. Traffic is calm and moves slowly on Beaufort Street. With many enticing shops and some unpolished elements, the town centre is always an interesting and lively place. New development is inspired and considered, contributing to and enhancing the character of the area. With some of the most beautiful parks around and an easy walk to the peaceful interludes of the river foreshore, Mount Lawley/Highgate could not get much better.*

4.2.1.1 Planned Growth Areas

Within the Mount Lawley-Highgate area, Directions 2031 and Beyond identified three planned growth areas, these being East Parade Urban Regeneration Project, East Perth Power Station and East Perth Rail Station. These planned areas are discussed below.

East Parade Urban Regeneration Project, East Perth Power Station

The City's Strategy outlines that for the East Parade Urban Regeneration Project and the East Perth Power Station to progress, these areas are required to be appropriately zoned and guidelines prepared to ensure appropriate development outcomes are achieved. The East Perth Power Station was considered as part of this amendment and the flight paths proposed ensure the anticipated development potential at this site can be realised. The East Parade Urban Regeneration Project is not relevant to this amendment as it is not located within close proximity to the flight paths proposed.

East Perth Rail Station

The City's Strategy considered that the East Perth Rail Station growth area as not being appropriate for future planned growth given constraints associated with the existing surrounding land use, residential character and disjointed access to the site. In lieu of this area being considered further, the City has identified the Claisebrook Road North Area as a more suitable location for a planned growth area. This is discussed in further detail below.

Claisebrook Road North

The Claisebrook Road North area identified as being a potential planned growth area is generally described as being the area that is bound by Lord Street, Summers Street, Graham Farmer Freeway and the Perth to Midland railway reserve. This amendment will locate within the Claisebrook Road North area.

The Strategy outlines a number of objectives to be considered throughout the preparation of a dedicated Structure Plan to guide further ongoing development in the area. Ultimately, the intent is for the Claisebrook Road North area to develop in accordance with key principles of Transit Oriented Development. The Strategy identifies the Claisebrook Road North area as a 'long term' project, meaning its realisation is 11 to 15 years away.

It is understood that the City have not undertaken any further work progressing the planning framework within this area. As such, the City's LPS2 and relevant City wide local planning policies currently guide development within the area, which is yet to specifically respond to the objectives for the Claisebrook Road North area as set out within the City's Strategy.

The ongoing planning and investigation of this area can continue to occur into the future, however, this needs to consider the critical nature of what is being considered as part of the proposed amendment. Flight paths associated with RPH being sought for protection are considered to be of a much higher priority and will need to be considered by the City as part of any future strategic planning tasks.

As discussed elsewhere within this report, the flight paths have considered the potential impact to existing areas and in particular areas that are planned to comprise significant development potential into the future. In this respect, this amendment will have no impact on existing development potential (height) within the Claisebrook Road North area as helicopters will be above the potential height a building could develop to.

4.2.2 City of Vincent Local Planning Scheme No. 2

The City's LPS2 is a statutory document setting out the way land is to be used and developed. The City's LPS 2 consists of the Scheme Text and Scheme Map, which sets out the rules for development in the City that align with the direction and vision provided for in the City's Strategy. The Local Planning Scheme maps provide the land zoning, which in turn indicates the type of uses that may be possible in each particular area.

Whilst there are two flight paths being protected as part of the overall project to support RPH's requirements, it is only the northern flight path that will traverse into the City's local government area. Only a minor portion of the northern flight path will locate within the City's local government area, with the majority of it being confirmed to the City of Perth's local government area.

In addition, a significant portion of the flight path within the City's local government area will locate within areas that are reserved for the purposes of 'Railway' and 'Primary Regional Roads' under the Metropolitan Region Scheme. The remainder of the flight path area within the City is included within the 'Mixed Use' zone and assigned a residential density coding of R100 to R160.

The City's LPS 2 is shown in relation to the proposed flight paths in Figure 8.

Refer to Figure 8 – LPS2 Extract

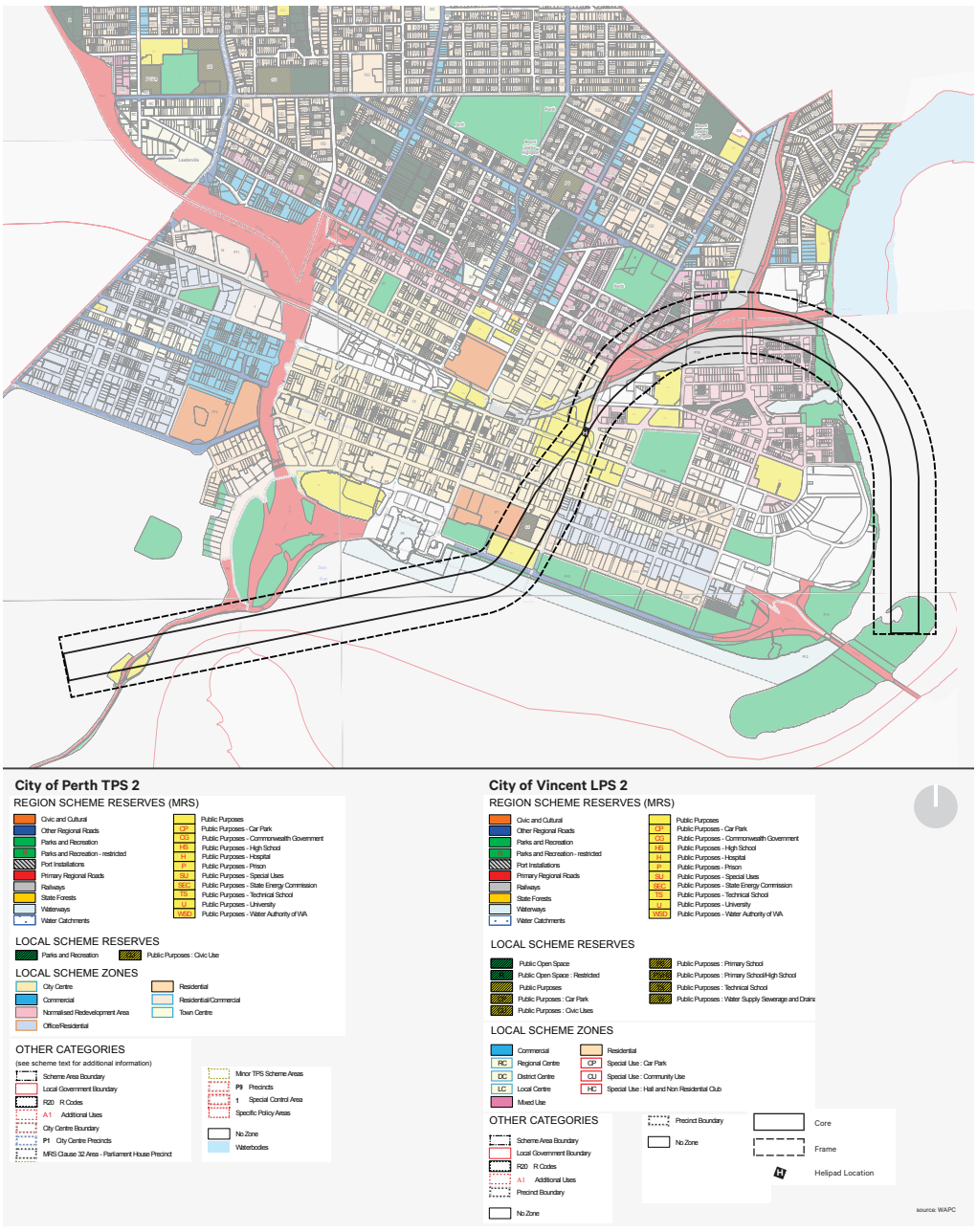


Figure 8. LPS2 Extract

element.

4.3 Royal Perth Hospital Development Context

The area immediately surrounding RPH is characterised by an eclectic mixture of buildings and land uses. The land to the immediate south of the RPH is characterised by a number of medium sized skyscrapers, whereas existing development to the immediate north and east are of a much lower scale and generally taper down toward the Swan River in the east.

There have been a number of developments recently completed in the immediate vicinity of RPH largely within the City of Perth. Notably, the Westin Hotel located immediately south-west of RPH and numerous developments in Northbridge and the Perth City Link. Many of these developments are of a significant scale and their overall height has resulted in ERHS pilots seeking alternative routes in and out of RPH in recent years.

Figure 5 identifies RPH within the context of the applicable planning framework and explores the potential development height of certain landholdings within the vicinity of RPH and the flight paths. It shows the location and height of recent planning approvals in close proximity to RPH and the proposed flight paths. This emphasises the purpose of the proposed amendment being sought and the importance in limiting development height where appropriate to ensure the upgraded HLS facility at RPH is protected and remains operational.

It should be noted that heights under the City's LPS 2 planning framework are taken from the natural ground level and figure 5 is indicative only and has not been used to inform planning controls. The proposed flight path heights are shown in Australian Height Datum (AHD).

Refer to Figure 5 - Indicative Development Potential Surrounding RPH


DFES

element.

5. Proposal

5.1 Overview of Proposed Scheme Amendment

The purpose of the proposed scheme amendment and Special Control Area is to protect emergency air ambulance flight paths in accordance with CASA regulations, to ensure the continued successful operation of RPH and the SMTU.

In brief, the proposed scheme amendment to the City's LPS2 will implement the following changes:

- Introduce the Royal Perth Hospital Flight Path Protection Special Control Area over land as shown in Figure 3, comprised of a Core Flight Path Area and a Frame Flight Path Area;
- Introduce maximum building heights in Australian Height Datum (AHD) metres within the Core Flight Path Area;
- Introduce provisions to control permanent development within the Core Flight Path Area;
- Introduce provisions to manage permanent and temporary structures (such as cranes) within the Core Flight Path Area and Frame Flight Path Areas so they are not a flight risk to flight path users; and
- Create a referral process to the owner of Royal Perth Hospital Helicopter Landing Site so they can provide advice on proposed development within the Core Flight Path Area and Frame Flight Path Area.

5.2 Proposed Scheme Amendment Provisions

This amendment seeks to insert provisions into the City's LPS2 to protect emergency air ambulance flight paths in accordance with CASA regulations, to ensure the continued successful operation of RPH and particularly the SMTU.

To achieve this, it is proposed to amend the City's LPS2 as follows:

1. Delete the following text under Part 5 clause 36:

   There are no special control areas which apply to this Scheme.

2. Insert the following text into Part 5 clause 36:

   1. The following special control areas are listed in Schedule 4 –

   (a) Royal Perth Hospital Flight Path Protection Special Control Area

   2. Provisions that apply to a special control area are set out in Schedule 4 and apply in addition to any other provision of this Scheme.

   3. Where a provision of a special control area is inconsistent with any other provision of this Scheme, the provision of the special control area is to prevail.

3. Insert new Schedule 4:

   Schedule 4 - Special Control Areas

   1. (a) Royal Perth Hospital Helicopter Flight Path Protection Special Control Area

   1.1 Special Control Area

   The following provisions apply to the land shown in Figures 1.1 to 1.4 as the Royal Perth Hospital Helicopter Flight Path Protection Special Control Area which comprises Core and Frame Flight Path Areas.

   Note: The provisions of this Special Control Area do not apply to the parts of the Special Control Area which are legislated under the Metropolitan Redevelopment Act 2011 or to telecommunication facilities legislated by the Telecommunications (Low Impact Facilities) Determination Act 1997.

1.2 Objectives

The objectives of the Royal Perth Hospital Helicopter Flight Path Protection Special Control Area are –

a. To ensure the continued safe operation of Royal Perth Hospital's Strategic Helicopter Landing Site in support of the hospital's function as the State's Major Trauma Unit.

b. To ensure that permanent development does not encroach into the Core Flight Path Area.

c. To ensure that temporary works and equipment within the Special Control Area do not present a hazard to helicopters using the Core Flight Path Area.

1.3 General Provisions

1.3.1 Where a provision of another Special Control Area is inconsistent with a provision of this Special Control Area, the provisions of this Special Control Area shall prevail.

1.3.2 Notwithstanding clause 36(3) of the Scheme, where the heights specified in sub-clause 1.5.1 of this Special Control Area are inconsistent with the heights specified on the Maximum Building Heights Plan, whichever is the lower height shall apply.

1.4 Requirement for Development Approval for Works

In accordance with sub clause 61(6)(a) of the Deemed Provisions, an application for development approval for works that are typically excluded under clause 61(1) of the Deemed Provisions shall be required for works that are situated above or within 30 metres of the maximum Australian Height Datum (AHD) heights specified in Figures 1.2 and 1.3 for the Core and Frame Flight Path Areas.

1.5 Development Requirements

1.5.1 Within the Core Flight Path Area, permanent development, including the parts of a building which are ordinarily excluded from building height calculations, shall not exceed the maximum AHD heights specified in Figures 1.2 and 1.3, as well as intermediate maximum AHD heights determined by a 4.5% gradient as shown in Figure 1.4.

1.5.2 Within the Core and Frame Flight Path Areas, temporary works and equipment shall not present a hazard to helicopters using the Core Flight Path Area.

1.6 Consultation with Other Authorities

Where development and any associated works and equipment are situated above or within 30 metres of the maximum AHD heights specified in Figures 1.2 and 1.3 and/or the intermediate maximum AHD heights specified in Figure 1.4 for the Core and Frame Flight Path Areas, the local government shall provide a copy of the application for development approval to the owner of the Royal Perth Hospital Helicopter Landing Site for objections and recommendations in accordance with clause 66 of the Deemed Provisions.

Note: The Department of Health's East Metropolitan Health Service is the owner of the Royal Perth Hospital Helicopter Landing Site.

1.7 Consideration of Application by Local Government

1.7.1 Development approval shall not be granted for permanent development in the Core Flight Path Area which exceeds the maximum AHD heights specified in Figures 1.2 and 1.3 or the intermediate maximum AHD heights specified in Figure 1.4.

1.7.2 In considering an application for development approval (other than an application for which approval cannot be granted under subclause 1.7.1), the local government is to have due regard to the following matters:

a. the objectives of this Special Control Area; and

b. the views of the owner of the Royal Perth Hospital Helicopter Landing Site in relation to how the application addresses the National Airports Safeguarding Framework - Guideline H, or any other relevant technical guidelines.

1.7.3 Where development and associated works are situated above or within 30 metres of the maximum AHD heights specified in Figures 1.2 and 1.3, or the intermediate maximum AHD heights in Figure 1.4, for the Core and Frame Flight Path Areas, the local government shall include as a condition of development approval, the submission of a Construction and Demolition Management Plan in a form and manner to the satisfaction of the local government.

1.7.4 The local government shall provide a copy of the Construction and Demolition Management Plan, including any subsequent amendments to the plan, to the owner of the Royal Perth Hospital Helicopter Landing Site for recommendations for the local government to consider in determining the acceptability of the plan.

1.7.5 The owner of the Royal Perth Hospital Helicopter Landing Site shall, within 21 days of receiving the Construction and Demolition Management Plan, or within such longer period as the local government allows, provide to the local government a memorandum in writing containing any recommendations with respect to the plan and any subsequent amendments to the plan.

1.7.6 The Construction and Demolition Plan shall provide details of the temporary works and equipment, including cranes, to be used on site for construction and demolition purposes including but not limited to:

a. The duration of the construction period (start date and end date) and the time period in which any crane or other equipment will remain on site;

b. Maximum operating height, maximum operating radius and operating time/s of any crane or other equipment; and

c. The measures to be taken to minimise any potential impact on and/or encroachment into the Core Flight Path Area.

1.8 Definitions

The following definitions apply within the Special Control Area:

Core Flight Path Area - is the protected operational flight paths used by helicopters arriving and departing the Royal Perth Hospital Helicopter Landing Site as defined by the relevant civil aviation guidelines and/or standards as shown in

Figures 1.1 to 1.4.

Frame Flight Path Area - is the area adjoining the Core Flight Path Area as shown in Figures 1.2 and 1.3 within which temporary works and equipment need to be considered in relation to their impact on the Core Flight Path Area.

Royal Perth Hospital Helicopter Landing Site – the rooftop landing surface used for the arrival or departure of helicopters associated with the operations of the Royal Perth Hospital State Major Trauma Unit as shown in Figure 1.1.

Permanent development – development which is not temporary works or equipment.

Temporary works and equipment – works and equipment such as cranes, machinery and structures used temporarily to undertake development and/or maintenance.

4. Insert Figures 1, 1.1 to 1.4 into Schedule 4 – Special Control Areas of the Scheme.



Figure 1.1 Detail Location Plan

Royal Perth Hospital Flight Path

Date: 27 Jun 2022 Scale: 1:12.5k@ A3 1:6.25k @ A1 File: **19-139 CP-2** Staff: LS GW Checked: LS

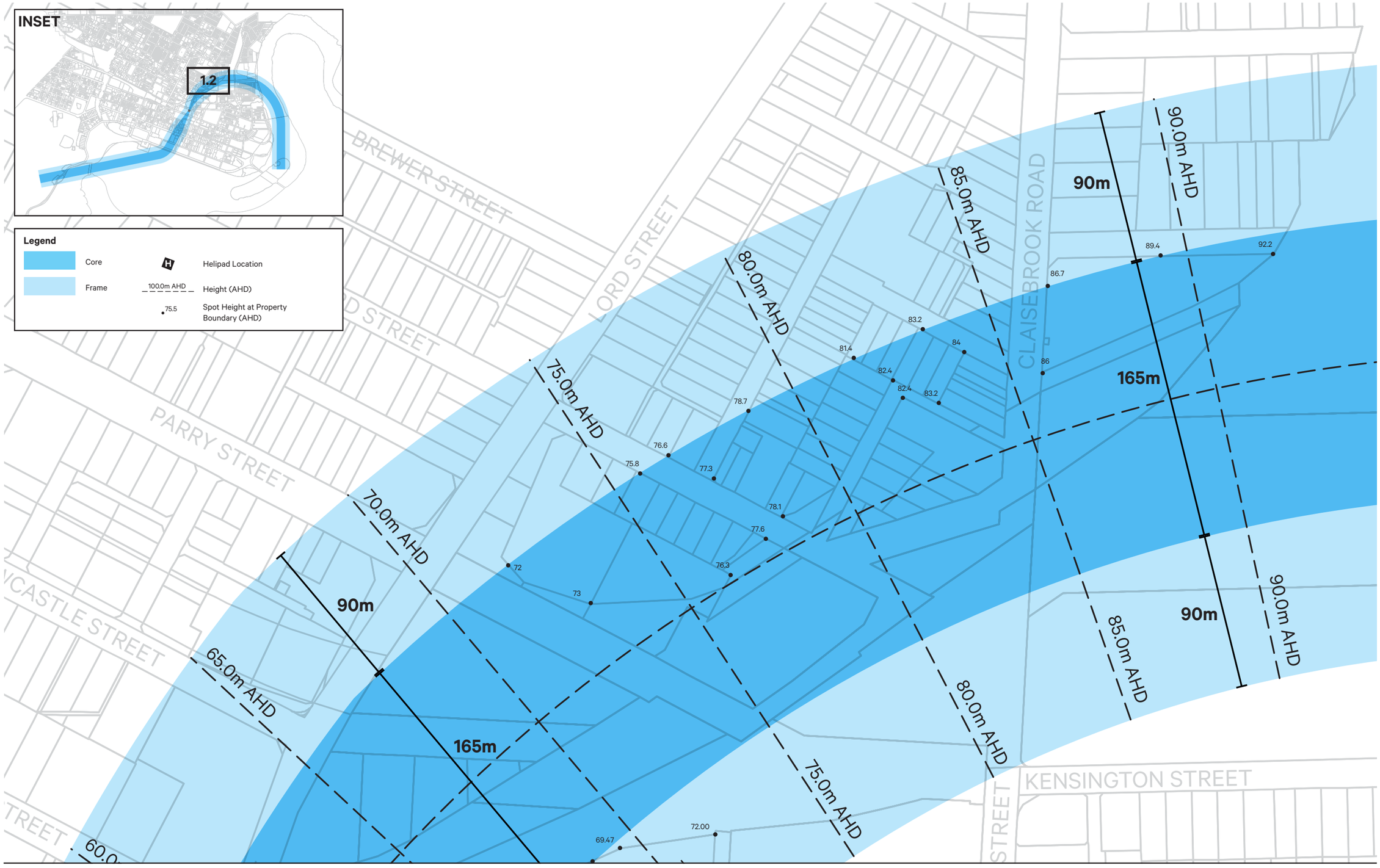


Figure 1.2 Detail

Royal Perth Hospital Flight Path

Date: 27 Jun 2022 Scale: 1:2000@ A3 1:1000 @ A1 File: **19-139 CP-3** Staff: LS GW Checked: LS

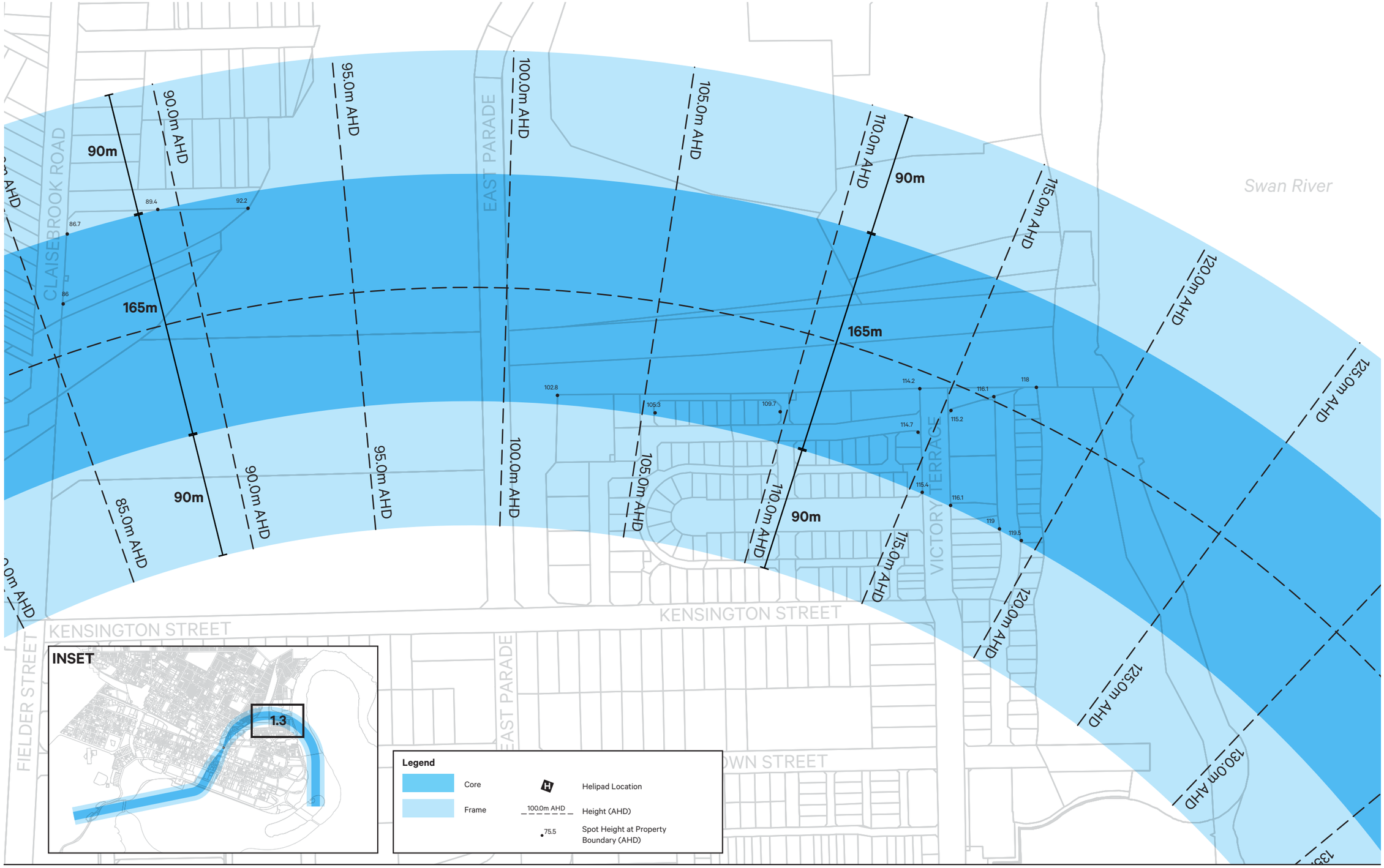
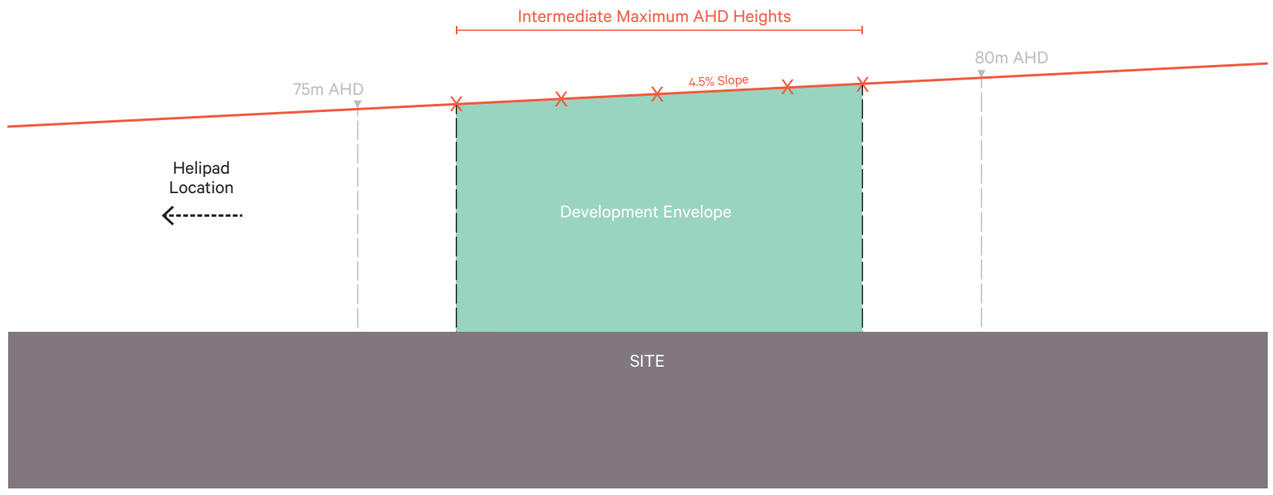


Figure 1.3 Detail

Royal Perth Hospital Flight Path

Date: 27 Jun 2022 Scale: 1:2500@ A3 1:1250 @ A1 File: **19-139 CP-4** Staff: LS GW Checked: LS

element.



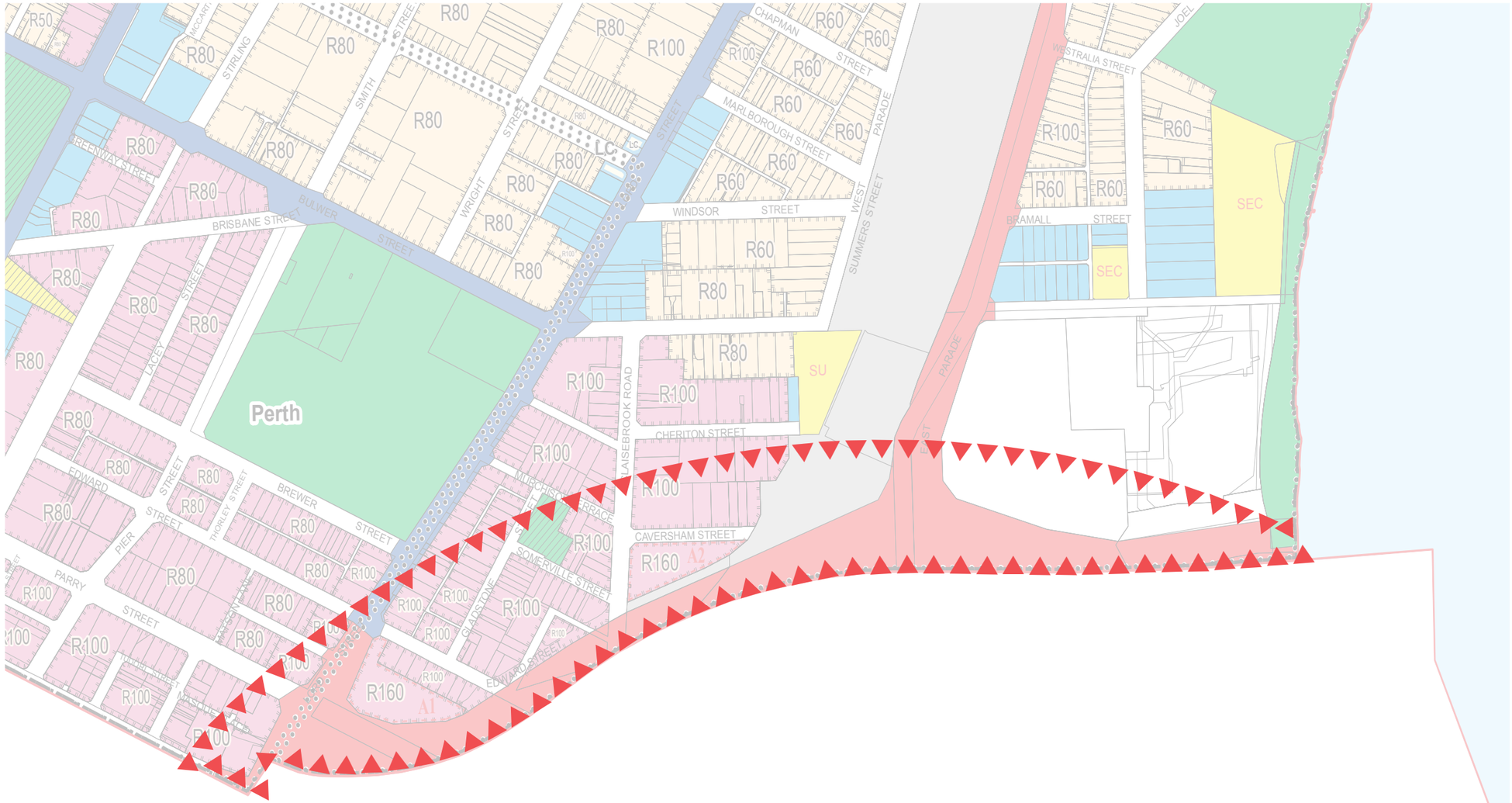
Typical section showing application of intermediate maximum AHD heights.

Note: Proponents will need to consider location, orientation and context of the development site in relation to the Helipad and associated flight paths in calculating intermediate maximum AHD heights.

Figure 1.4 Intermediate Maximum AHD Heights

Royal Perth Hospital Flight Path

Date: 3 Oct 2022 Scale: NTS @ A3 NTS @ A1 File: **19-139 CP-7 A** Staff: LS GW Checked: LS



Legend

Region Scheme Reserves (MRS)

- Civic and Cultural
- Other Regional Roads
- Parks and Recreation
- PR — Parks and Recreation - Restricted
- Port Installations
- Primary Regional Roads
- Railways
- State Forests
- Waterways
- Water Catchments
- Public Purposes
- CP — Public Purposes: Car Park
- CG — Public Purposes: Commonwealth Government
- HS — Public Purposes: High School
- H — Public Purposes: Hospital
- P — Public Purposes: Prison
- SU — Public Purposes: Special Uses
- SEC — Public Purposes: State Energy Commission
- TS — Public Purposes: Technical School
- U — Public Purposes: University
- WSD — Public Purposes: Water Authority of WA

Local Scheme Reserves

- Parks and Recreation
- R — Parks and Recreation
- Public Purposes
- CP — Public Purposes: Car Park
- CIV — Public Purposes: Civic Uses
- PS — Public Purposes: Primary School
- PS/HS — Public Purposes: Primary School / High School
- TS — Public Purposes: Technical School
- SV — Public Purposes: Water Supply Sewerage and Drainage

Local Scheme Zones

- Commercial
- RC — Regional Centre
- DC — District Centre
- LC — Local Centre
- Mixed Use
- Residential
- CP — Special Use: Car Park
- CU — Special Use: Community Use
- HC — Special Use: Hall and Non Residential Club

Other Categories

- Scheme Boundary
- Local Government Boundary
- R20 RCodes
- A1 Additional Use
- Precinct Boundary
- No Zone
- Proposed Special Control Area

City of Vincent LPS 2 - Proposed Special Control Area

Royal Perth Hospital Flight Path

Date: 20 May 2021 Scale: 1:5000@ A3 1:2500 @ A1 File: **19-139 CP-2** Staff: LS GW Checked: LS

0 50 100m

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5.3 Proposed Scheme Amendment Classification

The *Planning and Development (Local Planning Schemes) Regulations 2015* include three categories for amending Local Planning Schemes, each with their own processes and timeframes to be followed. In this instance, the proposed amendment is considered to align most closely with the definition of a 'complex amendment', which is set out as follows:

> ***complex amendment*** *means any of the following amendments to a local planning scheme —*
>
> *a. an amendment that is not consistent with a local planning strategy for the scheme that has been endorsed by the Commission;*
>
> *b. an amendment that is not addressed by any local planning strategy;*
>
> *c. an amendment relating to development that is of a scale, or will have an impact, that is significant relative to development in the locality;*
>
> *d. an amendment made to comply with an order made by the Minister under section 76 or 77A of the Act;*
>
> *e. an amendment to identify or amend a development contribution area or to prepare or amend a development contribution plan;*

The proposed scheme amendment will have an impact on development within the locality and on this basis, the scheme amendment is considered to be 'complex'.

5.4 Planning Justification

5.4.1 Background to Flight Path Evaluation Methodology

To support the development application associated with the new upgraded HLS at RPH, EMHS previously engaged a project team with relevant professional to design and document the optimal helicopter approach and departure flight paths to the upgraded HLS. Two separate flight paths were developed having regard to the relevant guidelines and documentation controlling helicopter operations.

At its meeting of 3 September 2018, the Central Perth Central Planning Committee considered and resolved to:

1. provide support for the amended flight paths as detailed in Attachment 2;
2. provide support for the lodgement of a Development Application relating to the proposed helipad and helicopter flight paths; and
3. provide support for the preparation of a scheme amendment to protect the proposed flight paths from future development.

Refer to Appendix 6 – Central Perth Planning Committee Meeting (3 September 2018)

The flight paths outlined in Attachment 1 of Appendix 6 informed the location of the upgraded HLS and facilitated discussions between key stakeholders in the vicinity of RPH. Development WA (formerly Metropolitan Redevelopment Authority) and the Roman Catholic Archbishop of Perth also provided in principle support for the project and the proposed flight paths.

Refer to Appendix 7 – Letters of Support (previous indicative flight paths)

In respect to Central Perth Planning Committee's resolution outlined above, it is acknowledged that the proposed flight paths forming part of this amendment differ from the previous flight paths given in principle support. Since this time, ongoing detailed analysis and consideration has been given to the proposed flight paths to meet all relevant guidelines and documents controlling aviation operations. Notwithstanding this, the updated flight paths incorporated within this amendment are largely consistent with the existing flight paths that were previously supported. Further detail in this respect can be found within Appendix 4.

Refer to Appendix 4 – HLS Flight path Requirements (Rehbein Airport Consulting)

5.4.2 Requirement to Protect Emergency Flight Paths

The proposed amendment is being undertaken to align with a number of relevant elements that influence the ongoing successful operation of the ERHS at RPH. This includes the interrelationship between the existing planning framework and development opportunities, the National Airports Safeguarding Framework, relevant aviation standards, State government investment and futureproofing the successful operation of the SMTU at RPH to support the States medical emergency needs.

There are currently no set flight paths in place for the existing helicopter operations at RPH. Current flight paths in and out of RPH are determined by the operator of the ERHS, with specific decisions being made by the pilot in charge at the time of operation. Pilots are required to operate the ERHS in accordance with the *Civil Aviation Act 1988, the Civil Aviation Safety Regulations 1998* and associated guidance material. The existing regulatory framework allows pilots to fly in and out of RPH in the most appropriate direction, taking existing obstacles and weather conditions into consideration. As a greater number of buildings with significant scale are developed in the vicinity of RPH, pilots are having to continuously adjust the approach and take off directions, with the overall number of options being reduced as a result.

The proposed amendment seeks to protect flight paths associated with the ERHS at RPH in accordance with the National Airports Safeguarding Framework. Importantly, this amendment seeks to protect ERHS flight paths in an emergency, one-engine inoperative (OEI) scenario that may occur in the event of an engine failure. Protecting emergency flight paths at RPH in accordance with the National Airports Safeguarding Framework and applicable regulations will ensure that a helicopter can safely continue its flight to an appropriate landing area to protect its crew and the general public from a catastrophic event.

For the majority of the time and in normal operating conditions, the ERHS and pilot in command will continue to determine the most appropriate flight path by considering existing obstacles and weather conditions. Notwithstanding, ongoing development of significant scale in proximity to RPH will continue to limit flight path directions and options available to pilots. Over time, this will see the proposed flight paths become the preferred path of travel as limits ongoing operational risk to the ERHS.

5.4.2.1 National Airports Safeguarding Framework

At the national level, the Department of Infrastructure, Transport, Regional Development and Communities have developed the National Airports Safeguarding Framework (the Framework), which aims to provide guidance on planning and development that may impact upon aviation operations. This includes development around airports and strategically important HLS.

The Framework was developed by an advisory group made up of representatives from Commonwealth Infrastructure and Defence departments, aviation agencies, State and Territory planning and transport departments as well as the Australian Local Government Association.

The Framework comprises a series of Guidelines that each refer to a specific area of aviation. This includes, but is not limited to, matters such as wildlife risk, lighting distraction, communication and navigation. Of importance to this proposed amendment is Guideline H: Protecting Strategically Important Helicopter Landing Sites.

The National Airports Safeguarding Framework Factsheet summarises the importance of HLS and the purpose of Guideline H as follows:

> *'The protection of strategically important helicopter landing sites (HLS) (such as those associated with hospitals) from the adverse impacts of development has become a critical issue in recent years. There have been times where hospital emergency helipads have been closed due to safety concerns arising from the nearby operation of construction cranes. Guideline H seeks to provide a consistent national approach for land use planning in the vicinity of these facilities. State and Territory governments are responsible for identifying HLS that are considered to be of strategic importance, or those that are to be protected in the interest of public safety'.*

Guideline H addresses a number of matters to ensure that:

1. HLS are not compromised by development encroaching into flight paths;
2. new development (and activities) do not present a hazard to helicopters arriving or departing from HLS;
3. lighting does not distract or cause interference with night time operations;
4. noise impacts from helicopter operations are mitigated; and
5. building induced windshear or air turbulence is considered, where this could affect the normal flight of helicopters operating from HLS.

In assessing a proposed development within the vicinity of RPH and the associated flightpaths, the decision maker should have regard to the abovementioned matters and other guidance provided within Guideline H. Consistent with the purpose of Guideline H, the ongoing consideration of these matters by a decision maker as part of a development assessment process will ensure:

a. the ongoing operation of those SHLS;

b. the use of those SHLS are not compromised by any proposed development encroaching into flight paths;

c. new development (and associated activities) do not present a hazard to helicopters arriving or departing from those SHLS;

Of the matters addressed in Guideline H, most of these are matters to be considered by the decision maker, although the following matters are of relevance to the operator of the ERHS in respect to determining the suitability of a HLS location:

- Obstacle Limitation Surfaces;
- Lighting;
- Noise; and
- Windshear and Turbulence.

5.4.3 Helicopter Design Characteristics and Flight Path Design Requirements

The following summarises the key helicopter design characteristics and requirements that have informed the flight paths propose to be protected. These represent a culmination of matters that are addressed within the following documents:

- The Civil Aviation Safety Authority (CASA) Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment of on-shore helicopter landing sites (February 2014);
- International Civil Aviation Organisation (ICAO) Annex 14 Aerodromes – Volume II: Heliports (4th edition July 2013); and
- Civil Aviation Safety Authority NPRM 1304OS Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations.

5.4.3.1 Helicopter Design Characteristics

DFES and the operator of the ERHS have confirmed the following key design characteristics are consistent with the current and future emergency helicopter fleet utilising the upgraded HLS at RPH, which have informed the design requirements for the upgraded helipad and associated flight paths.

D-Value

The D-Value is the largest overall dimension of the helicopter when its rotors are turning. The helicopter fleet utilising the RPH HLS will have a maximum D-value of 21m as shown in Figure 9 below.

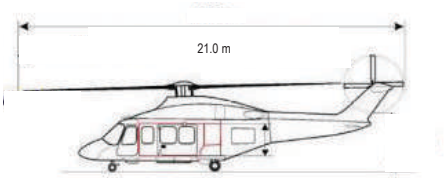


Figure 9. Helicopter D-value

Rotor Diameter

The helicopter fleet utilising the RPH HLS will have a maximum rotor diameter of 16.5 m as shown in Figure 10 below.

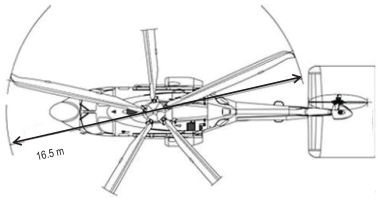


Figure 10. Helicopter rotor diameter

Core Flight Path Width

The proposed flight paths will have an overall width of 165m, being ten times the helicopter's rotor diameter as required by CAAP 92-2(2) for night time operations. The minimum width of a flight path ensures that the area of flight is protected from obstacles. The total width takes crosswinds into consideration.

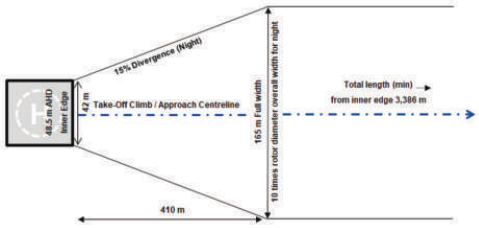


Figure 11. Helicopter flight path width

Performance Class

The helicopter fleet utilising the RPH HLS will be of a Performance Class 1, which effectively means that in the event of an engine failure, sufficient performance is available to enable the helicopter to land safely or continue to fly toward an appropriate landing area, depending on where the failure occurs.

Obstacle Limitation Surface (OLS) Slope

To ensure that the Performance Class 1 helicopter fleet can operate safely on one engine, a maximum take-off climb surface of 4.5% is required as illustrated below. This ensures that there is a minimum level of performance available to clear obstacles and remain within the OLS that is proposed to be protected through this amendment.

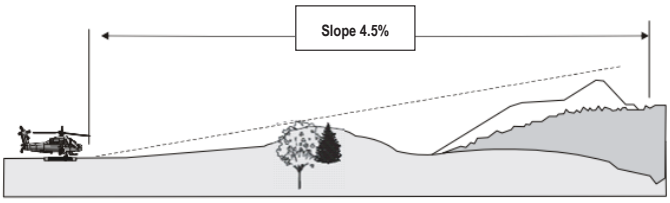


Figure 12. Helicopter take-off climb surface | Source: ICAO Annex 14-II Figure 4-6

Approach and Take-off Climb Surfaces

ICAO Annex 14 and CASA CAAP 92-2(2) requires that a HLS must comprise at least two (2) approach and take-off climb surfaces. These surfaces are required to be separated by a minimum angle of 150°.

ICAO Annex 14 allows for the flight paths to be curved to avoid obstacles or take advantage of a more suitable flight path course, however, only one (1) curve is allowed and it must have a constant rate radius of turn.

The total length of the approach and take-off climb surfaces must be 3,386m. The proposed flight paths for the HLS at RPH are each constructed to 3,400m in total length, bringing each flight path to a total of 201.5m AHD or 153m above the elevation of the HLS.

element.

5.4.3.2 Flight Path Design Characteristics

The project team have continued to work closely with key stakeholders in determining the most appropriate flight paths to be incorporated within this proposed amendment. Importantly, the flight paths have been designed to meet all relevant aviation standards and requirements whilst minimising the impact to landholdings as far as practically possible by limiting flight time over land.

The following matters were considered in determining the most appropriate flight paths:

- Limit impact to landholdings as far as practical by:
  - taking advantage of major road and rail reservations; and
  - utilising the Swan River for a large proportion of the flight path length;
- Consider the existing and future planning framework to:
  - limit the impact on existing development potential as far as practical; and
  - recognise and limit the impact to areas of land that are of strategic importance to the State, the City of Perth, the City of Vincent and DevelopmentWA for future infill development;
- Ensure all relevant aviation safety standards and requirements are met.

For further information related to the flight path design requirements and helicopter design requirements, please refer to Appendix 4.

Appendix 4 - HLS Flight path Requirements (Rehbein Airport Consulting)

North East Emergency Flight Path

A north-eastern flight path is shown in Figure 13 below. This flight path consists of a curved take-off and climb surface and begins to straighten out once over the Swan River before finishing at the northern most portion of Herrison Island, 3.386km away from the RPH HLS.

The north eastern flight path is primarily located within the City of Perth's local government area. The northern most portion also crosses into the City of Vincent's local government area as shown in Figure 13.

Detailed investigation has been undertaken to determine the most suitable flight path course. The analysis considered the various matters outlined above under the flight path design characteristics. Consideration of various options involved ongoing consultation with Rehbein Airport Consulting, EMHS, DFES, the operator of the ERHS, the City of Perth, the City of Vincent and Development WA.

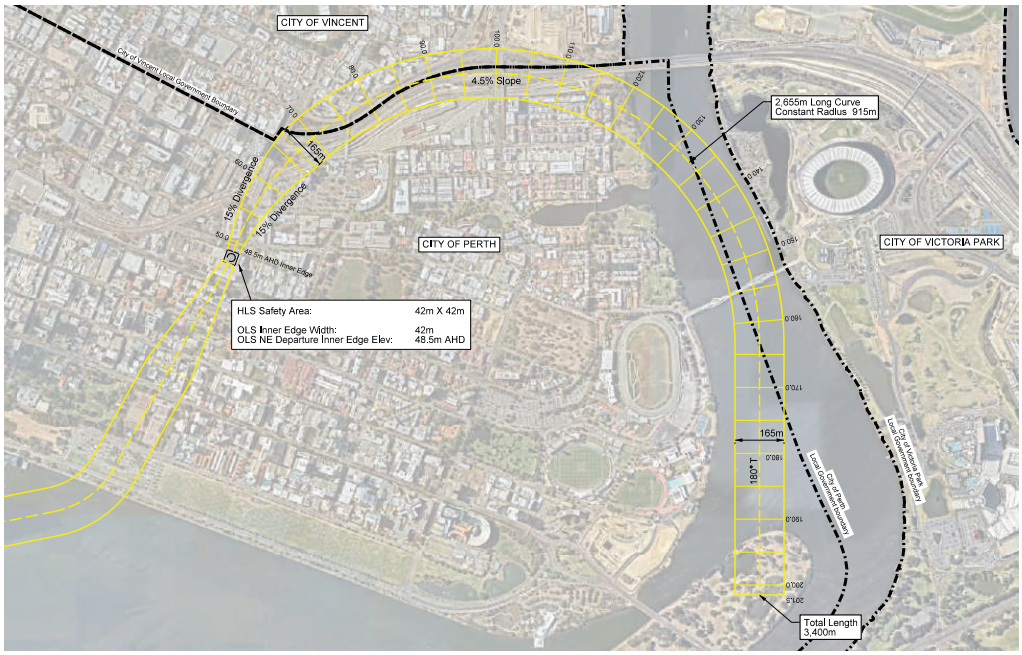


Figure 13. North east flight path

South West Emergency Flight Path

The south western flight path commences with a straight section for a distance of 790m in south westerly direction. The flight path then transitions to a curve at the edge of the Swan River where it continues in a west south westerly direction before finishing over Kings Park, 3.386km away from the RPH HLS as shown in Figure 14.

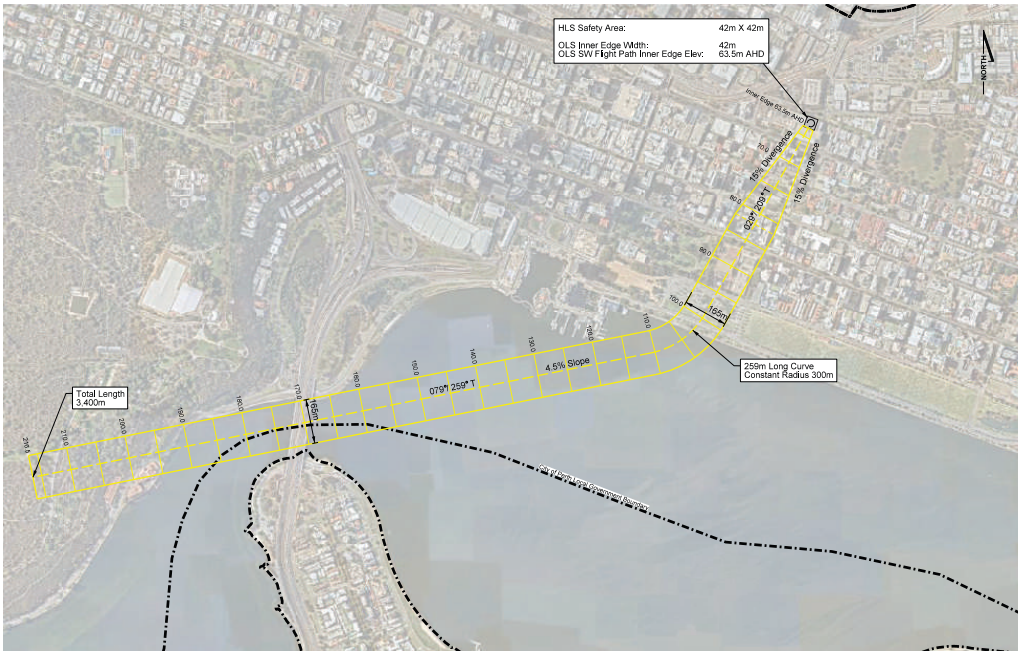


Figure 14. South west flight path

The OLS of the flight path has been designed to begin 15m above the height of the HLS. This is required to ensure helicopters clear an existing RPH building that is located immediately south of the HLS known as 'South block'.

To clear the existing building to the south, during take-off, pilots will to elevate to an appropriate distance during the back-up procedure before continuing its flight in a forward direction. This is a common procedure undertaken by pilots of Performance Class 1 helicopters and is explained below in Figure 15. The take-off procedure has been approved by DFES and the operator of the ERHS during ongoing consultation as part of this process.

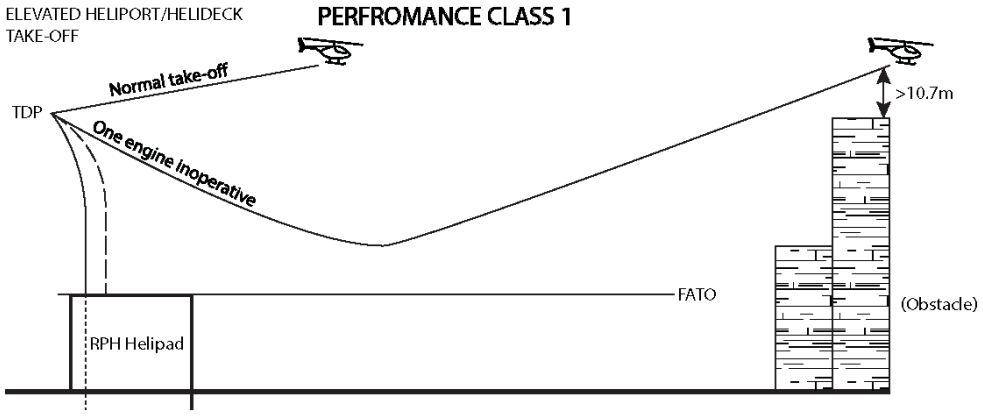


Figure 15. Take-off backup procedure

element.

As undertaken with the north eastern flight path, detailed investigation has been undertaken to determine the most suitable course for the southern flight path and has considered various matters outlined previously within this report and addressed in more detail within Appendix 4.

Refer to Appendix 4 – HLS Flight path Requirements (Rehbein Airport Consulting)

Whilst not of relevance to the City, the southern flight path is positioned to avoid the following existing buildings as also illustrated in Figure 16:

- The Westin Hotel at 480 Hay Street, Perth (approximately 120m AHD);
- Condor Tower at 22 St Georges Terrace, Perth (approximately 103m AHD); and
- 256 Adelaide Terrace, Perth (approximately 83m AHD).

The location and height of these buildings constrain the flight path to the extent that there is no other option that exists without there being a far greater impact to a larger number of landholdings. In addition, the southern flight path proposed impacts a number of Government landholdings and therefore reduces the impact to private landholdings.

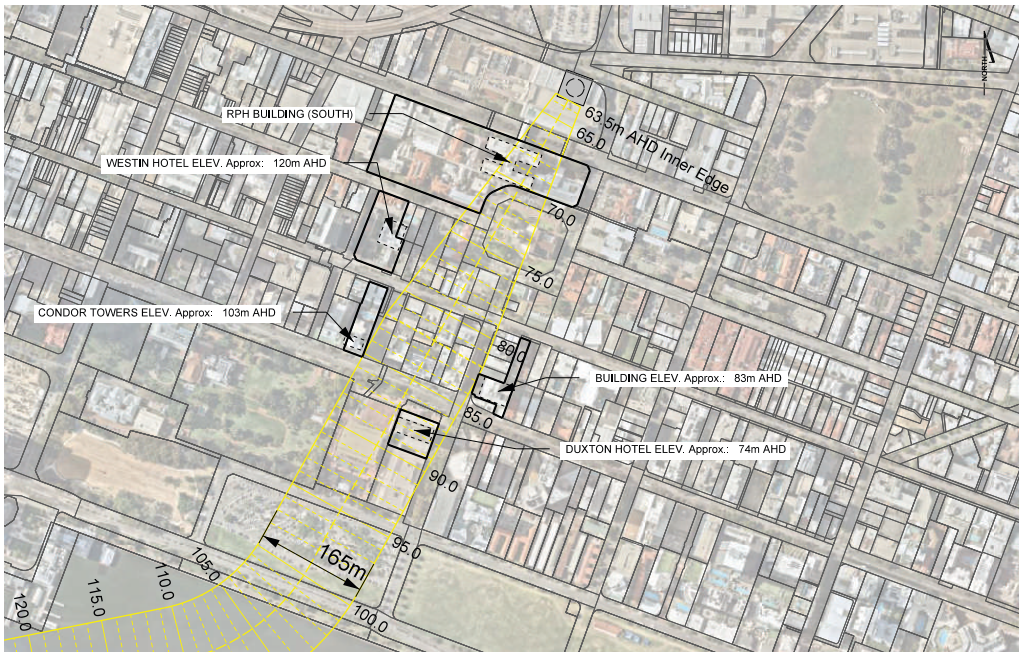


Figure 16. South west flight path and existing buildings

5.4.4 Consideration of Impact on Development Potential

5.4.4.1 Land Ownership

As outlined above, careful consideration has been given to limiting the overall impact on landholdings by the designated flight paths, whilst acknowledging that it is not possible for there to be no impacts. Where landholdings are impacted, these are considered to be only minor or relatively minor with substantial development still being able to occur directly beneath and/or adjoining the flightpath. By utilising existing major road and rail alignments, as well as the Swan River, the vast majority of the flight path area will occur over publicly owned land parcels. Only a small portion of the overall area will impact privately owned land parcels as shown in Figure 17 below.



Figure 17. Public/private ownership

The privately owned land parcels identified in the following figures represents approximately 6.13ha, or 5.7% of the total flight path area. 101.03ha, or 94.3% of the total flight path area occurs over publicly owned land parcels.

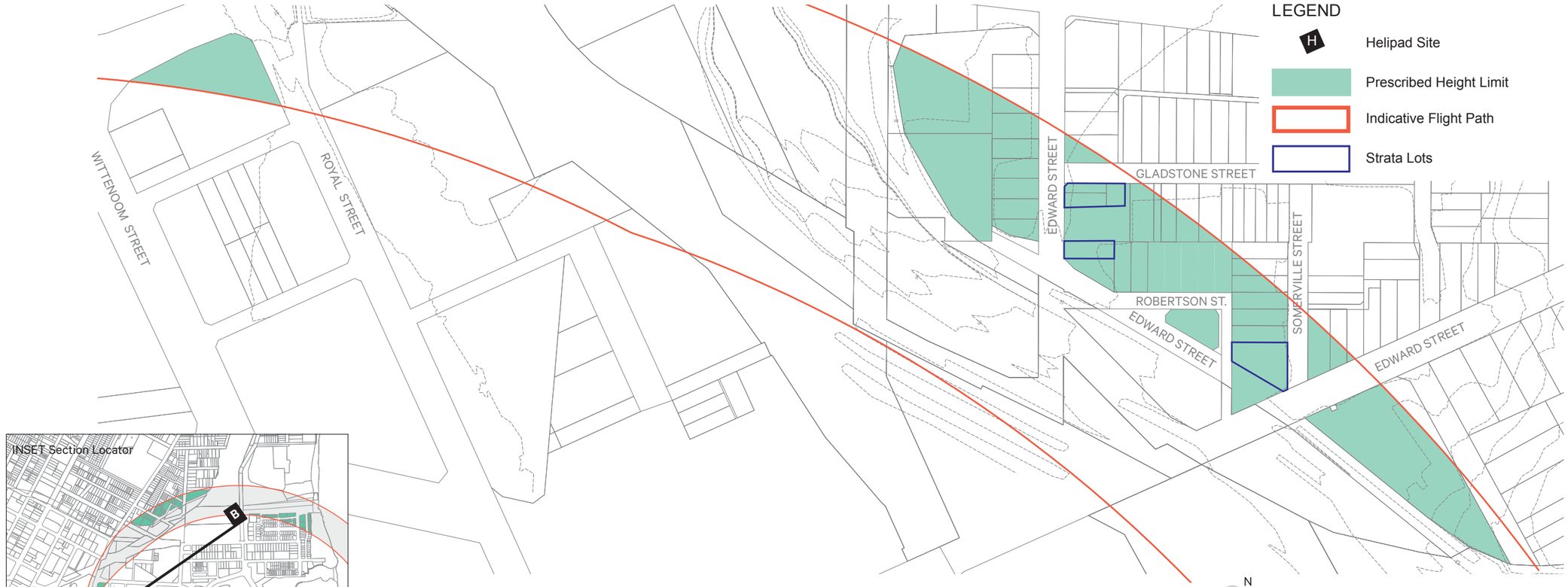
5.4.4.2 Impact on Building Height

In respect to the potential scale of future development within these privately owned land parcels identified above, the majority of these land parcels will be able to deliver a development of a scale that is as envisaged by the applicable planning framework in terms of prescribed building height.

The height of future development on private landholdings within the north eastern flightpath will not be impacted as shown in Figures 18 and 19.

The height of future development on private landholdings within the south western flightpath within the City of Perth will be impacted as shown in Figure 20.

element.



Indicative plan showing sites impacted by the flight path.

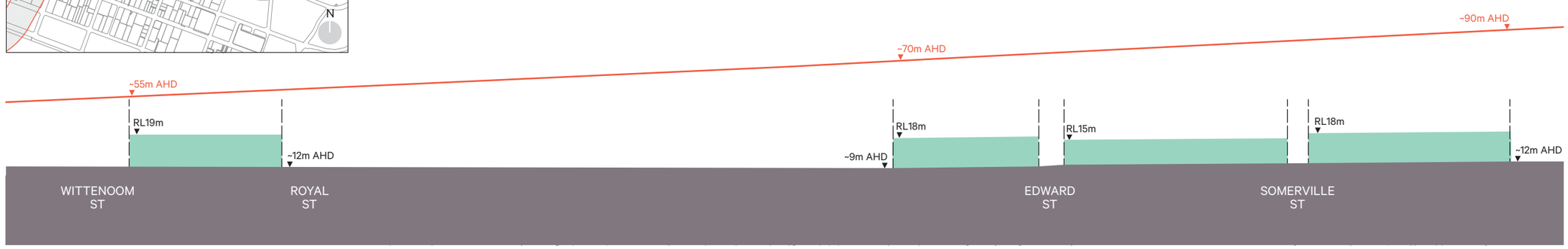
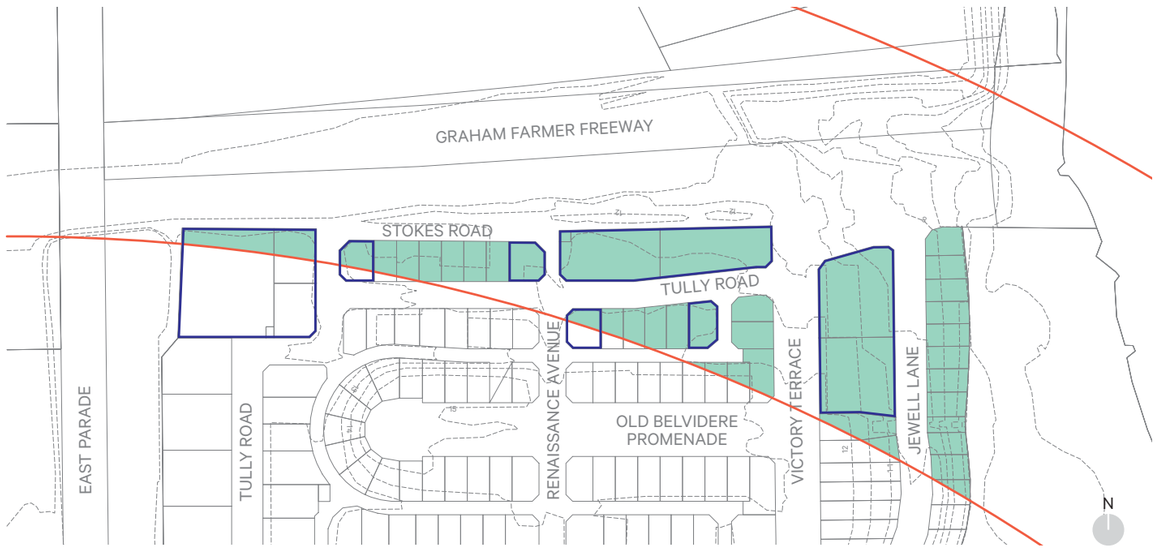


Figure 18. Height Impact Study - Northern

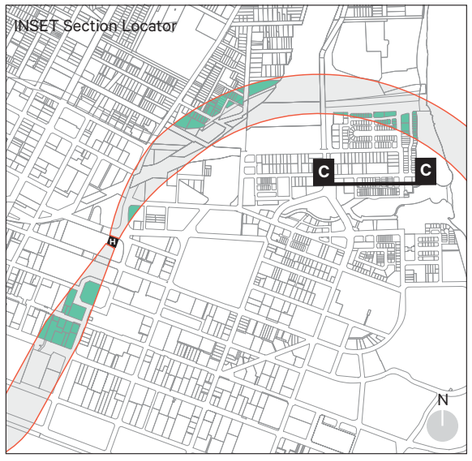
Royal Perth Hospital Flight Path Protection Scheme Amendment Request

LEGEND

- Helipad Site
- Prescribed Height Limit
- Indicative Flight Path
- Strata Lots



Indicative plan showing sites impacted by the flight path.



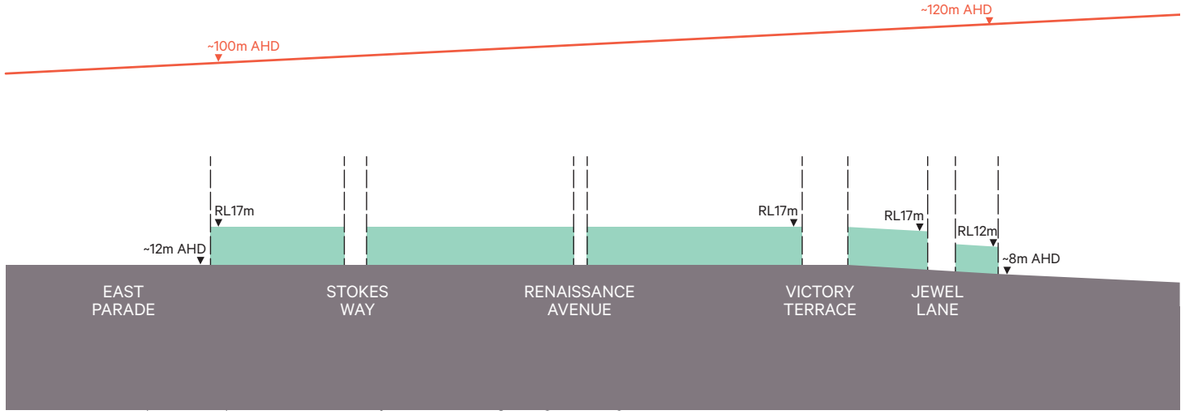
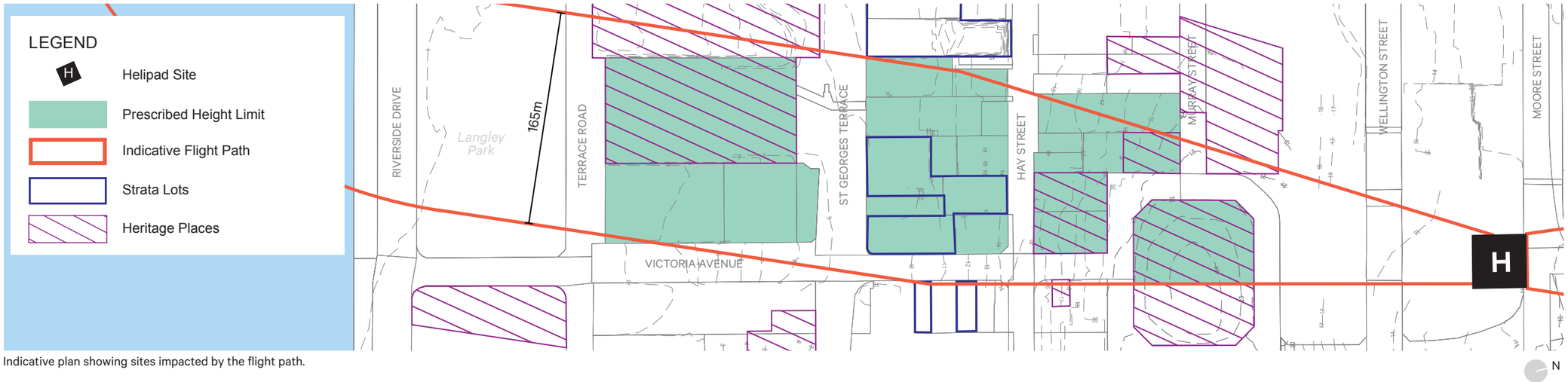


Figure 19. Height Impact Study - Northern (continued)

element.



Indicative plan showing sites impacted by the flight path.

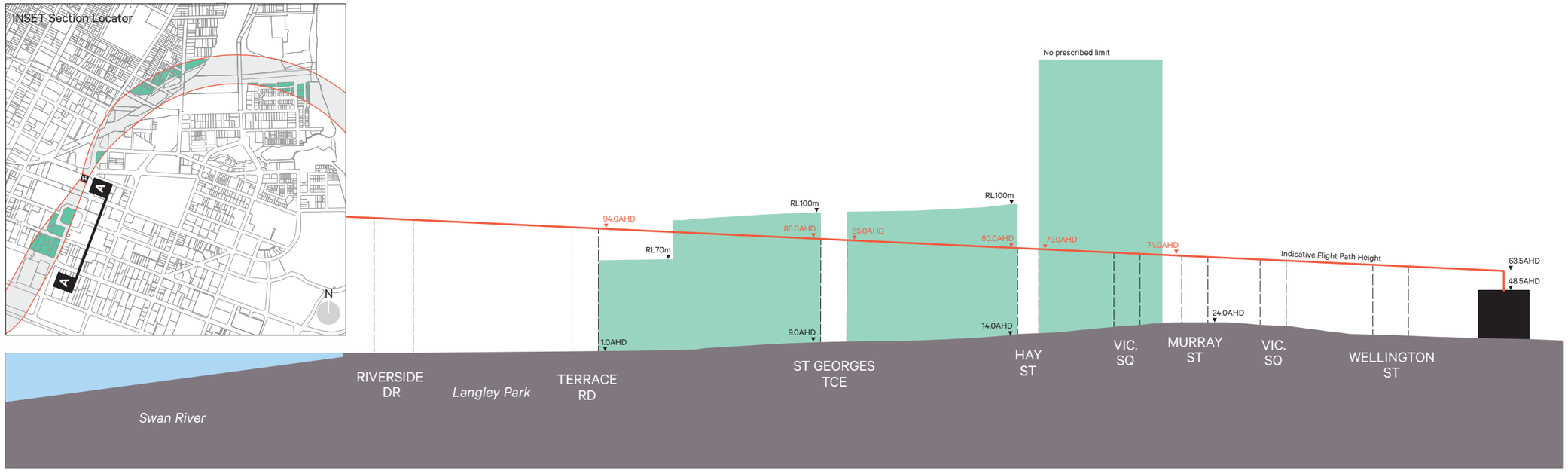


Figure 20. Height Impact Study - Southern

5.4.5 Appropriateness of Special Control Area

A Special Control Area (SCA) is the most appropriate mechanism to control development spanning various zones and reserves. A SCA will be visible on the City's Scheme Maps, making it very clear to landowners and prospective purchasers of the special circumstances that apply to specific landholdings.

The *Planning and Development (Local Planning Scheme) Regulations 2015*, states the following in respect to SCA's:

> *(This Part is included in the Scheme to identify areas which are significant for a particular reason and where special provisions in the Scheme may need to apply. These provisions would typically target a single issue or related set of issues often overlapping zone and reserve boundaries. The special control areas should be shown on the Scheme Map as additional to the zones and reserves. If a special control area is shown on the Scheme Map, special provisions related to the particular issue would apply in addition to the provisions of the zones and reserves. These provisions would set out the purpose and objectives of the special control area, any specific development requirements, the process for referring applications to relevant agencies and matters to be taken into account in determining development proposals.)*

Based on the above, it is considered that a SCA is the most appropriate way to control development within the flight path area.

5.4.6 Flight Path Protection Areas – Core and Frame

The SCA is split into a 'Core' and 'Frame' area. The purpose of the Core Area and Frame Area is explained below.

5.4.6.1 Core Area

The Core Area is 165m wide, being ten times the helicopter's rotor diameter. This reflects the minimum width of a flight path that is required to be protected from obstacles.

Development that is within the Core Area will locate directly beneath a helicopter flying in an emergency scenario (one engine only) with reduced flight capabilities.

Specific provisions apply to development located within the Core Area to limit the overall development height achievable. This will ensure that a helicopter operating in an emergency scenario (one engine only) will have an appropriate underside clearance to obstacles below.

Two separate provisions apply to a development within the Core Area – Maximum Development Height and Referral Requirements. These provisions are discussed below.

Maximum Development Height

In an emergency flight with one engine only operating, the ERHS fleet of helicopters will have a reduced ability to fly away and clear all obstacles. In considering a helicopter flying away with one engine operating only, very high ambient temperature exists (resulting in low air density) and the helicopter is fully loaded, a minimum elevation gain of 4.5% is possible.

Given the above, a development located within the Core Area cannot extend within the minimum elevation gain of a helicopter flying away from the HLS at RPH as it would form an unavoidable obstacle.

A series of Figures forming part of the SCA (Figures 1.1 - 1.4) show the applicable Maximum Development Height achievable within landholdings located in the Core Area.

Pilots will be required to determine their ability to fly away with one engine only if required. In undertaking a backup procedure as discussed in this report previously, pilots will reach a specific altitude before deciding to proceed. This altitude will consider minor projections above buildings that are exempt from the requirement to obtain approval (telecommunications infrastructure) and cannot be overridden by local planning scheme provisions.

Referral Requirement

Where a proposed development and any associated works a situated above or within 30 metres of the maximum AHD heights specified in Figures 1.1 - 1.3, and/or the intermediate maximum AHD heights in Figure 1.4, the application is required to be referred to the EMHS, being the managing authority of the RPH HLS.

This will allow the EMHS to consider a potential development that locates within close proximity to the flight path and to liaise with the operator of the ERHS to identify any matters that may potentially impact on emergency flights.

The provision allows for the EMHS to provide objections and recommendations in relation to a development application and the location and operation of temporary works and equipment, such as construction cranes, directly below the Core Area of the flight path. This will ensure that temporary works and equipment do not encroach within the flight path at all or where considered appropriate, arrange for certain encroachments to occur for a period of time that the EMHS consider suitable.

element.

5.4.6.2 Frame Area

The Frame Area immediately adjoins each side of the Core Area and is 90m wide.

The Frame Area is intended to not limit development, but to ensure the construction of a development does not impact the Core Area by way of inappropriate intrusions into it from temporary structures such as construction tower cranes.

The Frame Area acknowledges that development potential is not impacted in this location, but careful consideration must be given to the type of crane that is used to construct a development.

Referral Requirement

Where development and associated works are situated above or within 30 metres of the maximum AHD heights specified in Figures Figures 1.1 - 1.3, or the intermediate maximum AHD heights in Figure 1.4, the local government will require a Construction and Demolition Management Plan to be submitted as a condition of development approval. A Construction and Demolition Management Plan, and any subsequent amendment to the plan, will be provided to the EMHS for recommendations on temporary works and equipment, such as cranes, to prevent or limit encroachments into the Core Area.

Where a proposed development is located within the Frame Area, does not exceed the heights shown on Figures 1.1 - 1.4 and does not have the potential for construction cranes to extend above these heights, there is no requirement for a proposed development to be referred to DFES for comment.

The provisions are intended to allow lower scale development to occur without the need for a referral to DFES, where these are considered to have no risk, being below 30m of the applicable height limits as set out in Figures 1.1 - 1.4.

Taller development within the Frame Area may result in a construction crane swinging into the Core Area. The provisions are worded to capture such development and require additional supporting detail for the development, particularly around the ongoing use of a crane during construction activity.

element.

6. Conclusion

element has prepared this report on behalf of the EMHS, in support of a request to amend the City's LPS2 as it relates to a number of landholdings identified as being within essential helicopter flight paths associated with the operation of emergency helicopter operations at RPH.

The proposed amendment is being undertaken to align with a number of relevant elements that influence the ongoing successful operation of the ERHS at RPH, which includes the interrelationship between the existing planning framework and development opportunities, the National Airports Safeguarding Framework, relevant aviation standards, State government investment at RPH and futureproofing the successful operation of the SMTU to support the States medical emergency needs.

This report has considered the existing planning framework in detail and addressed a number of relevant matters that have been used to determine the most suitable flight paths that are required to be protected. The proposed amendment has considered a series of provisions that will seek to control development outcomes directly beneath the emergency flight paths and directly adjoining them. A rationale is provided for each of the provisions and addresses limitations to development height and the requirement for applications to be referred to DFES in certain circumstances that may trigger the need for Crane Management Plan to be required.

The proposed amendment seeks to ensure that the new HLS at RPH continues to operate and support the needs of the State, transferring critically ill patients to the SMTU. Ongoing development within the City may impact the safety of operations into the future, especially where a helicopter is required to fly with one engine inoperable. At present, there is no formal controls in place to limit development potential immediately surrounding the HLS at RPH. Without protection, the HLS may be required to be decommissioned as a result of ongoing development jeopardising the safety and efficiency of operations, in turn having significant impacts on the ability to treat patients that are in need of critical care.

element.

Appendix 1

Letter from WA State Director of Trauma 4 November 2021 (Dr Sudhakar Rao)

Government of Western Australia
East Metropolitan Health Service



Dear Mrs Circosta,

Response: request for further information – Royal Perth Hospital Emergency Flight Path Scheme Amendment

Thank you for the opportunity to provide further information in relation to the RPH Emergency Flight Path Scheme Amendment (email correspondence dated 29 October 2021).

You will be aware, RPH State Major Trauma Centre (SMTC) has been the designated provider of major trauma services for adults in WA since 2008 and continues to provide services to 95% of the State's population, including receiving major trauma patients from regional WA.

The protection of emergency flight paths for RPH is integral to ensuring West Australians (WA) continue to have access to world-class emergency trauma and critical care services, and plays an integral role in the State's Clinical Services Framework (2014-2024) – a framework that lays the foundation for health system planning. Aligned to this framework, the SMTC is a key provider in WA Emergency Response planning which is evidenced in the State Trauma Sub-plan (2014).

As per your request please refer to the below responses to your questions;

3. Scheme Amendment request should include background information as to why the Helicopter Landing Site (HLS) is located where it is and why it cannot be located elsewhere, that is, why other options were ruled out, for example Langley Park.

The need for helicopter emergency medical services to pick up a patient from their location, followed by immediate access to specialist treatment teams on arrival at a hospital is imperative. The location of the new helipad was carefully thought through in order to ensure alignment with the WA State Trauma System objective of optimum speed from injury to specialist trauma treatment at WA's only Level 1 Major Trauma Centre. This eliminates an additional ambulance transfer and increased patient handling risks, as well as additional cost to the State/patient for Langley Park transfers.

In 2018, the RPH Helipad Strategic Overview document was developed and investigated several options for the location of the new helipad. Construction of a new helipad on the north eastern rooftop of RPH R Block (North Block) was selected as the preferred location for various reasons including;

- clinical needs;
- physical building structural limitations, and;
- operational requirements of the helicopters.

Helicopter transport provides the quickest means of transferring critically injured patients to a major trauma service. Off-site landings have been found to result in longer transport to the emergency room, however, the construction of helipads in trauma centres can reduce transport time, in addition to reducing the costs and sequelae of trauma .

The "Golden Hour" concept is one deeply entrenched in trauma systems and the emergency management of trauma victims, indicating that the first 60 minutes following a trauma is a critical period for getting patients to a trauma centre.

It is widely accepted that on-site helipads result in more positive patient outcomes, with no medical disadvantages. The clear need to move toward helicopter landing-areas that are physically on-site at referring and receiving institutions is undeniable. Consideration of on-site HLS were found to be particularly important for medical transport systems to contemplate when building a new helipad.

Acknowledging the increased chances of survival and recovery from on-site HLS, alternative locations such as Wellington Square or Langley Park were determined to be unacceptable for Standard Operating Procedures as both locations would cause delays to patient transfer with an additional ambulance transfer, and risk to life (including increased infection risk). These locations would further pose security and accident risks for the Rescue Helicopter as well as the general public on the ground, thus requiring WA Police intervention for each helicopter landing.

4. Scheme Amendment request should include detail of how frequently the HLS and the emergency flight path are expected to be used. Explain what the current situation is including:

4.2. How many helicopter landings does RPH receive delivering critically ill patients to the State Major Trauma Centre per year.

4.3. What percentage of these are considered major (that is would die without emergency treatment).

Of the three Tertiary Hospitals in Perth, the State's Emergency Rescue Helicopter transports 70.4% of patients to RPH (avg of 354 per year). In 2020, a significant number of helicopter arrivals to RPH were trauma presentations (222) and, of these, 101 were major trauma patients, with 43 (43%) considered severe or critical trauma. These patients generally spend longer in hospital and often require Intensive Care treatment (critical lifesaving interventions) as well as extensive rehabilitation.

RPH Trauma Data (2020) shows that more than 50% of major trauma admissions to RPH required critical surgical intervention in response to their injuries, further emphasising the importance of time from injury to specialist treatment.

The time critical nature of the relationship between event, definitive tertiary clinical intervention and the patient's survival is the reason why the construction of a new on-site helipad that will allow immediate access for the State Emergency Rescue Helicopter Service's (ERHS's) upgraded helicopter fleet at RPH is critical for the ongoing provision of emergency healthcare in WA.

I trust this information is sufficient to allow the City of Perth to progress the Scheme Amendment Request.

Please do not hesitate to contact Emma Morony at emma.morony@health.wa.gov.au for further information should you require it.

Kind regards,



Dr Sudhakar Rao
State Director of Trauma
Royal Perth Hospital

4 November 2021

Wellington Street Campus) Box X2213 GPO) Perth 6847) Western Australia
Tel: (08) 9224 2244) Fax: (08) 9224 3511
rph.health.wa.gov.au) Where tradition plus innovation equals excellence

element.

Appendix 2

DFES Letter of Support

Government of **Western Australia**
Department of **Fire & Emergency Services**

DFES
Department of Fire & Emergency Services

Our Ref: 20210129
Your Ref:

Mr. Graeme Jones
Executive Director, Finance and Infrastructure
East Metropolitan Health Service
197 Wellington Street
EAST PERTH WA 6004

Dear Mr. Graeme Jones,

ROYAL PERTH HOSPITAL HELIPORT'S APPROACH AND DEPARTURE PATHS

Following the approval of the East Metropolitan Health Services (EMHS) development application by the State Planning Commission for the construction of a new hospital heliport at Royal Perth Hospital (RPH) in October 2019, consultation commenced with the Department Fire and Emergency Services (DFES) Aviation Services for design input and aviation expertise. As the managing agency for the State's Emergency Rescue Helicopter Service (ERHS) and the primary user of the RPH heliport, DFES Aviation Services have been in consultation with EMHS to address the new heliport operational requirements and provided consultation with aviation regulatory requirements.

These discussions included the securing of approach and departure flight paths from the edge of the RPH heliport Safety Area as mandated under current Civil Aviation Safety Authority (CASA) and International Civil Aviation Organisation (ICAO) legislation and Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) guidelines. Establishment and protection of these flight paths must be ensured by the responsible local government for continued helicopter operations into the new RPH heliport. Failure to comply may result in non-compliance and permanent cease of operations into the RPH heliport.

The flight paths presented to the Central Perth Planning Committee in September 2018 did not meet the regulatory requirements for RPH heliport's approach and departure flight paths. The most prominent issues and non-compliances identified by DFES and their contracted helicopter service provider with the September 2018 flight paths are:

- Length of the approach and departure flight paths were not developed out to the regulatory distance requirement of 3,386 metres;
- Only a one, constant radius of turn is permitted by regulation with the flight paths. The north-eastern flight path was designed with two;
- Width of the flight paths did not incorporate the future ERHS aircraft fleet, or other emergency services helicopters that could operate into the new RPH heliport; and
- Elevations depicted were not compliant with the mandatory 4.5% incline slope commencing from the edge of the heliport's Safety Area. This requirement limit building heights and construction activities underneath and to the side of the flight paths, ensuring compliance and safe operation with the heliport.

Emergency Services Complex I 20 Stockton Bend Cockburn Central WA 6164 I PO Box P1174 Perth WA 6844
Tel (08) 9395 9300 I Fax (08) 9395 9384 I dfes@dfes.wa.gov.au I www.dfes.wa.gov.au
ABN 39 563 851 304

Due to these regulatory non-compliances with the September 2018 approach and departure flight paths, DFES recommended EMHS to consult with an alternative aeronautical consultant to provide revised flight paths to ensure regulatory and legislative compliance. EMHS completed this consultation for design of new approach and departure flight paths in early 2020.

DFES was asked to participate by Rehbein Airport Consulting during this consultation process for the development of the new flight paths, as presented in their report: *'Royal Perth Hospital Helicopter Landings Site Flight Path Requirements'* (revision 2). These north-east and south-west flight paths for RPH's heliport were developed to meet regulatory compliance, whilst minimising impact on Perth International Airport's approach and departure paths and the city building schemes for the City of Perth and City of Vincent.

In 2015, the Royal Melbourne Hospital the heliport / helipad was shut down due to construction of high-rise building impeding into the hospital's heliport flight path. The approach and departure paths were not secured for the hospital's heliport. The Victorian State planning tribunal over-ruled the Melbourne City Council building approval, which resulted in the new construction building height being reduced by three floors. Subsequently, the Commonwealth's DITRDC published the *Protecting Strategically Important Helicopter Landing Sites* document, which was endorsed by all States and Territories. This document directly addressed protecting Strategically Important Helicopter Landing Sites (i.e. hospital heliports) and their respective approach and departure flight paths.

It is critical that the RPH heliport approach and departure flight paths are secured and protected to ensure ERHS helicopter operations into the future. As demonstrated with the Royal Melbourne Hospital, if these flight paths are not secured and protected from future development, there is significant risk that ERHS operations will cease with into the Western Australia's only Level 1 Trauma Centre.

If you have any further queries on the above, please do not hesitate to contact Steven Sartain, Manager Emergency Rescue Helicopter Service, DFES on 6499 1888.

Yours sincerely



TERRY SHEHAN
SUPERINTENDENT AVIATION SERVICES

28 January 2021

element.

Appendix 3

Development Approval - Helicopter Landing Site

Western Australian Planning Commission

Our Ref : 10-50286-1
Your Ref :
Enquiries : Suzanne Roach (Ph 6551 9181)

Department Of Finance - Building Management & Works
Optima Centre
16 Parkland Road
OSBORNE PARK WA 6017

Application for Approval to Commence Development dated 21 June 2019 received 2 July 2019.

Lot Number	:	916
Location	:	
Plan / Diagram	:	Deposited Plan 183230
Volume/Folio	:	2820/191
Locality	:	No. 212 Wellington Street, Perth
Owner	:	Metropolitan Health Service Board C/- Department Of Health - East Metropolitan Health Service G P O Box X2213 PERTH WA 6847

Under the provisions of the Metropolitan Region Scheme this application has been referred for determination by the Western Australian Planning Commission.

The application has now been considered by the Commission and the formal notice setting out the terms of the decision is attached.

A copy of this decision has been forwarded to the Local Government for information.

Should the applicant be aggrieved by this decision there is a right to apply for a review pursuant to the provisions of Section 252 of the *Planning and Development Act 2005*. Such an application for review must be submitted to the State Administrative Tribunal, Level 6, State Administrative Tribunal Building, 565 Hay Street, PERTH WA 6000 in accordance with Part 14 of the *Planning and Development Act 2005*. It is recommended that you contact the State Administrative Tribunal for further details (telephone 9219 3111) or go to its website: http://www.sat.justice.wa.gov.au.

Ms Sam Fagan
Secretary
Western Australian Planning Commission
6 November 2019

140 William Street, Perth, Western Australia 6000, Locked Bag 2506 Perth, 6001
Tel: (08) 6551 8002; Fax: (08) 6551 9001; Infoline: 1800 626 477
e-mail: info@dplh.wa.gov.au; web address http://www. dplh.wa.gov.au
ABN 35 482 341 493

Western Australian Planning Commission

Our Ref : 10-50286-1
Your Ref :
Enquiries : Suzanne Roach (Ph 6551 9181)

METROPOLITAN REGION SCHEME

City of Perth

APPROVAL TO COMMENCE DEVELOPMENT

Name and Address of Owner and Land on which Development Proposed:

Owner	:	Metropolitan Health Service Board C/- Department Of Health - East Metropolitan Health Service G P O Box X2213 PERTH WA 6847
Lot Number	:	916
Location	:	
Plan / Diagram	:	Deposited Plan 183230
Volume/Folio	:	2820/191
Locality	:	No. 212 Wellington Street, Perth
Application Date	:	21 June 2019
Application Receipt	:	2 July 2019
Development Description	:	Construction Of Roof Mounted Helipad And Associated Structures On North East Corner Of R-Block Building

The application for approval to commence development in accordance with the plans submitted thereto is granted subject to the following condition(s):

1. The development is to be carried out in accordance with the plans date stamped 4 July 2019, subject to any modifications as required by the conditions of approval.

2. The development approval is valid for two years from the date of this letter. If the subject development is not substantially commenced within a two-year period, the approval shall lapse and be of no further effect.

3. Prior to commencement of works, final details of the design and a sample board of the materials, colours and finishes and details of the signage illumination shall be submitted and approved to the specification of the City of Perth and to the satisfaction of the Western Australian Planning Commission.

If the development the subject of this approval is not substantially commenced within a period of two years from the date of this letter, the approval shall lapse and be of no further effect.

140 William Street, Perth, Western Australia 6000, Locked Bag 2506 Perth, 6001
Tel: (08) 6551 8002; Fax: (08) 6551 9001; Infoline: 1800 626 477
e-mail: info@dplh.wa.gov.au; web address http://www. dplh.wa.gov.au
ABN 35 482 341 493

Where an approval has so lapsed, no development shall be carried out without the further approval of the responsible authority having first been sought and obtained.

Ms Sam Fagan
Secretary
Western Australian Planning Commission
6 November 2019

140 William Street, Perth, Western Australia 6000, Locked Bag 2506 Perth, 6001
Tel: (08) 6551 8002; Fax: (08) 6551 9001; Infoline: 1800 626 477
e-mail: info@dplh.wa.gov.au; web address http://www. dplh.wa.gov.au
ABN 35 482 341 493

element.

Appendix 4

HLS Flight path Requirements (Rehbein Airport Consulting)



ROYAL PERTH HOSPITAL
HELICOPTER LANDING SITE
FLIGHT PATH REQUIREMENTS

EAST METROPOLITAN HEALTH SERVICE

REHBEIN Airport Consulting



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Revision	Date	Description	Author	Verifier	Approver
0	12/06/2020	DRAFT	BMW		
1	07/07/2020	FINAL DRAFT for approval	BMW	BJH	BJH
2	10/08/2020	FINAL	BMW	BJH	BJH

Reviewed by:



Steven Sartain

Manager, Emergency Rescue Helicopter Service

Department of Fire and Emergency Services

1. INTRODUCTION

REHBEIN Airport Consulting was engaged by East Metropolitan Health Service (EMHS) to prepare a report on the technical requirements for helicopter flight paths associated with the proposed helicopter landing site at the Royal Perth Hospital (RPH).

The purpose of establishing and protecting helicopter flight paths for the Royal Perth Hospital (RPH) is to ensure new developments (and associated activities) do not prevent helicopters from arriving or departing from the new RPH Helicopter Landing Site (HLS). An effective and safe helicopter service to support emergency services relies entirely on a clear flight path which is free from obstructions.

The responsibility for determining the suitability of a place as a HLS is held, under Civil Aviation Regulation 92, by the pilot-in-command and the organisation that holds the helicopter operating certificate. This means that the pilot in control of the aircraft will decide during each and every mission as to whether it is safe to arrive or depart the RPH HLS. This decision will be based on a number of factors including whether the flight path required is clear of obstructions.

The Australian Government Department of Infrastructure, Transport, Regional Development and Communications in May 2018 published the National Airports Safeguarding Framework Guideline H: *Protecting Strategically Important Helicopter Landing Sites*. Guideline H is intended to assist planners in making decisions around important HLSs that should be safeguarded through land use planning controls and in making decisions about applications, proposals, planning permits or planning scheme amendments that relates to a facility's essential flight paths.

Guideline H provides guidance to State/Territory and local government decision makers to safeguard ongoing operations at strategically important HLSs, as well as to ensure any new HLS is appropriately located. Importantly, this Guideline assists in making decisions around developments encroaching into flights that would render the approach or departure path unsafe and result in the pilot-in-command aborting a mission.

The Guideline identifies a HLS which is associated with a hospital, or one which is elevated within a populated area, as being strategically important.

In Australia, helipads are not currently licensed, certified or regulated in the same way that aerodromes are under Part 139 of the Civil Aviation Safety Regulations 1998 (CASR).

Relevant regulations and references pertaining to the physical characteristics of a HLS as well as the associated flight paths are:

- The Civil Aviation Safety Authority (CASA) Civil Aviation Advisory Publication CAAP 92-2(2) *Guidelines for the establishment of on-shore helicopter landing sites* (February 2014);
- International Civil Aviation Organisation ICAO Annex 14 *Aerodromes – Volume II: Heliports* (4th edition July 2013); and
- Civil Aviation Safety Authority NPRM 1304OS *Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations*.

The pilots of the helicopter service currently operating the ambulance services have stated that the flight paths must be protected in accordance with ICAO Annex 14 for them to safely conduct flights to and from the RPH HLS.

2. RELATED GUIDELINES AND APPLICABLE STANDARDS

The Civil Aviation Safety Authority (CASA) does not currently have a legal instrument to certify or register HLSs that are not part of a certified or registered aerodrome under Part 139 of the Civil Aviation Safety Regulations 1998.

The responsibility for determining the suitability of a place as a helicopter landing site is held under Civil Aviation Regulation 92 by the pilot-in-command and/or by the helicopter operator.

The primary guidance pilots will use to decide whether to operate to an HLS is the Civil Aviation Advisory Publication (CAAP) 92-2(2) *Guidelines for the establishment and operation of onshore Helicopter Landing Sites.* CAAP 92-2(2) sets out factors that may be used to determine the suitability of a place for the landing and taking-off of helicopters.

In relation to flight paths and their protection from obstacles CAAP 92-2(2) refers to the Standards and Recommended Practices (SARPs) for Heliports, as set out in Volume II of Annex 14 to the Convention of International Civil Aviation (the Chicago Convention).

The International Civil Aviation Organisation (ICAO) sets out international standards and recommended practices for the safe conduct of civil aviation activities in various Annexes to the *Convention on International Civil Aviation (Chicago, 1944),* to which Australia is a signatory.

In 2013 CASA released a Notice of Proposed Rule Making (NPRM) 1304OS *Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations*. The NPRM provides directional guidance to the future regulatory environment for helicopter medical transport flights in Australia.

2.1 GUIDELINES FOR ESTABLISHMENT AND OPERATION OF ONSHORE HELICOPTER LANDING SITES – CIVIL AVIATION ADVISORY PUBLICATION (CAAP 92-2(2))

CASA CAAP 92-2(2) recommends that approach and departure paths for emergency medical service operations at metropolitan hospital sites should be in accordance with the standards and recommended practices set out in ICAO Annex 14 Volume II Heliports.

The factors that determine the characteristics of the helicopter flight path obstacle limitation surfaces (OLS) are:

- The specifications of the largest helicopter that is intended to use the HLS;
- Certain physical characteristics of the HLS itself; and
- The Performance Class applicable to the helicopter operation.

The Department of Fire and Emergency Services (DFES) and the current aeromedical service provider identified and confirmed the design helicopter characteristics as listed in **Section 3**.

2.2 CASA NOTICE OF PROPOSED RULE MAKING

The Australian Civil Aviation Safety Authority has released in July 2013 a Notice of Proposed Rule Making (NPRM) 1304OS entitled *Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations.*

The purpose of the NPRM is to advise the public and aviation community of CASA's intent to regulate, to the greatest extent practicable, ambulance function flights to the same safety standards that are currently applicable to air transport operations. This will extend to certification requirements, operating standards and maintenance standards.

Annex A to the NPRM clarifies that helicopters conducting operations to/from a final approach and take-off area (FATO), at a hospital that is located in a populous area and that is used as a Helicopter Medical Transport (HMT) heliport or HMT operating base, will be operated in accordance with the requirements of Performance Class 1 or Performance Class 2 with exposure. The exception to this is when the heliport approach and departure pathways provide sufficient safe forced landing areas for Performance Class 2 operations, in which case Performance Class 2 operations may be used.

Given that safe forced landing areas do not exist in proximity to RPH, what NPRM effectively means is that the flight paths for the RPH helipad need to meet the obstacle clearance requirements associated with Performance Class 1 helicopter operations.

2.3 ICAO ANNEX 14 AERODROMES VOLUME II HELIPORTS JULY 2013

The minimum standards and recommended practices for helipad approach and departure paths are set out in Chapter 4 *Obstacle Environment* of ICAO Annex 14 Volume II.

The objective of these specifications is to describe the clear airspace required around heliports so as to permit intended helicopter operations to be conducted safely and to prevent, where appropriate State controls exist, heliports from becoming unusable by the growth of obstacles around them. This is achieved by establishing a series of obstacle limitation surfaces that define the limits which objects may project into the airspace in the vicinity of heliports.

3. HELICOPTER DESIGN CHARACTERISTICS

The *Royal Perth Hospital Rooftop Helipad Concept Design Report* (Revised 190527) prepared by PSNK Aeronautical Services (hereafter referred to as the 'PSNK Report 190527'), submitted as Appendix A of the Planning Report, and identifies key characteristics of the design helicopter to be:

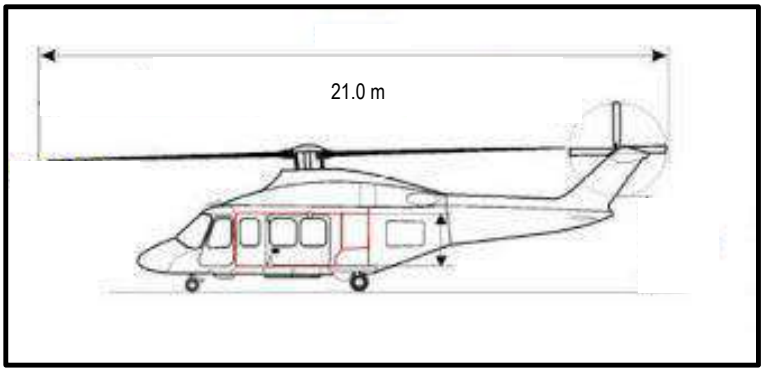
- D-value, the largest overall dimension with rotors turning 21.0 metres
- Rotor diameter 16.5 metres
- Maximum mass 12 tonnes
- Performance Class 1
- Night operations

These specifications have been confirmed by DFES and the current aeromedical services provider as meeting the current and likely future helicopter specifications.

D-Value

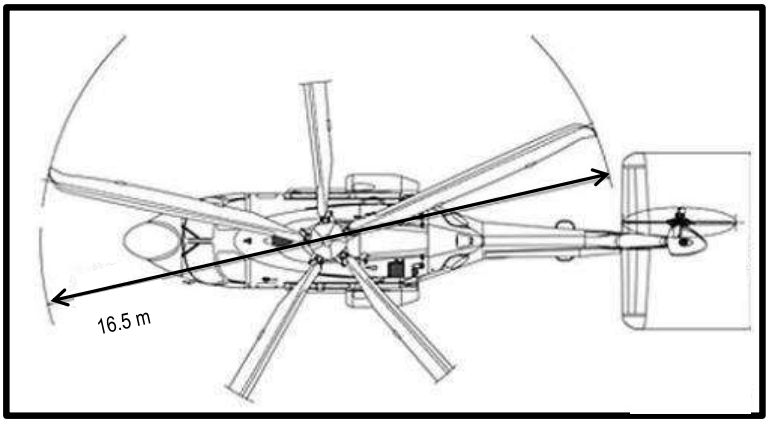
The D-Value is the largest overall dimension of the helicopter when rotor(s) are turning, normally measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane. The physical size of the new RPH HLS is 27 x 27m which provides for a civil medical transport helicopters operating in Performance Class 1 to $1.5*D_{18}$, the utilisation of a 21m D-Value for the 'Operational Airspace' accommodates current and potential future medical transport helicopters.

A D-value of 21 m was established as the largest helicopter that may use the facility.



Rotor Diameter

Rotor diameter is the diameter of the main rotor with the engine(s) running. A rotor diameter of 16.5 m was established as the largest helicopter that may use the facility.



Performance Class

Performance Class 1 means the operations where, in the event of failure of an engine, performance is available to enable the helicopter to land within the rejected take-off distance available or safely continue the flight to an appropriate landing area, depending on when failure occurs.

Performance Class 1 is the operation which must be protected for at RPH HLS.

4. ROYAL PERTH HOSPITAL HELICOPTER LANDING SITE

CASA CAAP 92-2(2) defines the basic areas of a helicopter landing site (HLS). Specific to the construction of flight paths the relevant HLS characteristic is the size of the Final Approach and Take-off Area (FATO) and the associated Safety Area. The FATO is the area over which the final approach is completed and the take-off conducted. The Safety Area surrounds the FATO and is free of obstacles, other than those required for air navigation purposes and intended to reduce the risk of damage to helicopters accidentally diverging from the load-bearing area primarily intended for landing or take-off.

Both the FATO and the safety area are determined by the D-value of the largest helicopter intended to use the HLS facility.

The DFES and the East Metropolitan Health Services (EMHS) identified and confirmed the below RPH HLS characteristics. These characteristics were confirmed and reviewed to ensure that all current and potential operations are protected.

The RPH HLS is confirmed through the PSNK Report 190527 to have the following characteristics

- Safety Area (2 x ‘D-Value’) 42 m x 42 m
- HLS elevation 48.5 m AHD

5. FLIGHT PATH CONSTRUCTION

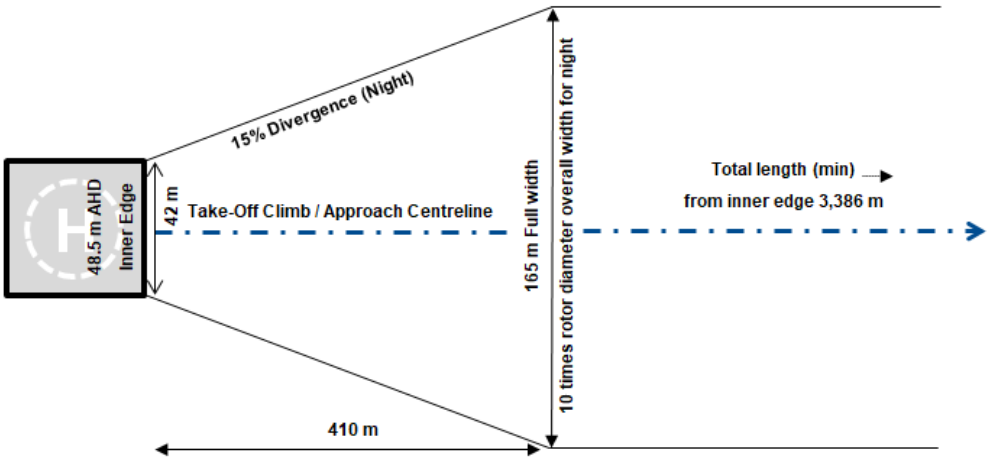
Land-use planning authorities should be aware that all intrusions into the flight paths have the potential to create aviation safety risks and to limit the scope of operations possible from the HLS. This is a determination and responsibility of the pilot on every approach and departure.

The ICAO and CAAP 92-2(2) compliant flight path construction is summarised in **Table 1** and **Figure 1** below with a detailed explanation following.

Table 1: Flight Path Construction

Approach and Take Off Climb Surface and Dimensions	
Length of inner edge	42 m
Elevation of inner edge	48.5 m AHD
Night Use	15%
Total Length	3,386 m (min.)
Slope	4.5%
Outer Width	165 m

Figure 1: Flight Path Construction



Approach and take-off climb surfaces

Both ICAO Annex 14 and CASA CAAP 92-2(2) require a HLS to have at least two (2) approach and take-off climb surfaces. These surfaces must be separated by a minimum angle of 150°.

The flight paths may be curved to avoid obstacles or take advantage of more advantageous flight paths, however only one curve is allowed which must have a constant rate radius of turn.

The approach and take-off climb surfaces slope upwards from the edge of the HLS safety area starting at the height of the Final Approach and Take-Off Area (FATO).

Both surfaces are comprised of an inner edge, two side edges and an outer edge specified as follows.

Inner Edge

The inner edge is equal in length to the minimum specified width of the HLS FATO plus safety area and located at the outer edge of the safety area.

The HLS Safety Area for the RPH HLS is 42 m wide and the elevation of the FATO is 48.5 m AHD as illustrated in **Figure 1** above.

The OLS inner edge is therefore also 42 m wide, 21 m either side of the flight path centreline.

In the absence of restricting obstacles, the elevation of the OLS inner edge shall be the elevation of the FATO. However, for heliports intended to be used by helicopters operated in Performance Class 1 the origin of the inclined plane may be raised directly above the FATO. The intention in raising the origin of the inclined plane may be to avoid already existing obstacles within the flight path.

The south-west flight path at RPH appears to be obstructed by the RPH building to the south. The PSNK Report 190527 identifies the hospital south block as an obstacle. The south-west flight path must pass over the existing hospital building which is approximately 15 m higher than the proposed FATO elevation. Accordingly, the inner edge for the south-west approach and take-off climb surfaces was set at 15 m above the HLS which is at 48.5 m AHD, therefore the inner edge elevation is 63.5 m AHD (Refer GHD Drg No 61-12512706/Figure 01/RevC). Refer **Section 6.2** for further discussion.



Source: Google Earth

Side Edges

The two side edges originate at the ends of the inner edge and diverge uniformly from the centreline at a specified rate. The divergence rate for night operations is 15% each side. The overall width of the approach and take-off climb surfaces increases by 30 m (15 m each side of the centreline) for every 100 m along the centreline.

The final width of the surface for night operations is 10 times the design helicopter rotor diameter. For RPH HLS flight paths this means 165 m (10 x 16.5m). This makes the length of the splayed section 410 m.

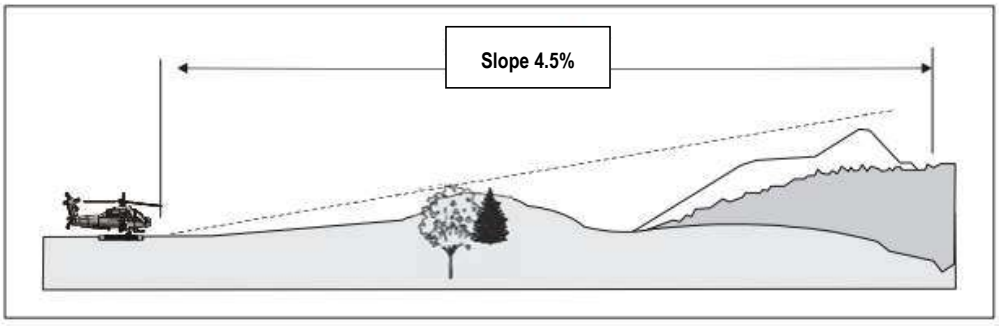
Outer Edge

The outer edge is horizontal and perpendicular to the flight path centreline and located at a specified height of 152 m (500 feet) above the FATO.

Slope of the surface

The slope of the approach and take-off climb surfaces is measured in the vertical plane containing the centreline of the surface. The slope of the surface is determined by the performance class of operations at the HLS.

The operations at RPH HLS are required to be Performance Class 1. As such the maximum slope of the approach and take-off climb surface permitted is 4.5% as illustrated below.



Source: ICAO Annex 14-II Figure 4-6

Curved approach and take-off climb surface

In the case of an approach or take-off climb surface involving a turn, ICAO Annex 14 stipulates that the surface must not contain more than one curved portion.

In addition, the minimum radius of turn permitted is 270 m. The sum of the radius of arc defining the centreline of the approach and take-off climb surfaces and the length of the straight portion originating at the inner edge shall not be less than 575 m.

Total length of the surface

The total length of the approach and take-off climb surface from the inner edge for slope design category A is 3,386 m. This length brings the helicopter to 152 m (500 ft) above the FATO elevation of 48.5 m AHD. Flight paths for the RPH HLS are each constructed to 3,400 m in total length bringing each flight path to a total of 201.5 m AHD or 153 m above the FATO elevation.

6. RPH HLS FLIGHT PATHS

6.1 NORTH-EAST FLIGHT PATH

The North-east flight path is illustrated on **Figure NE-1** included at **Appendix A**. This flight path consists of a curved take-off climb surface initiated from a bearing of 020°True. The radius of turn is 915 metres until it reaches a bearing of 180° True and then continues straight on bearing 180° to its full length of 3,400 metres.

Emergency Rescue Helicopter Service

Consultation with helicopter pilots through DFES ERHS indicated that a bearing of 020° True avoids an obstacle, the hospital stack, in the event of a back–up procedure for departure as per the Flight Manual.

Deviation from this bearing means the hospital stack is an obstacle in their back-up procedure and must be taken into account. This limits the number of pilots that can service RPH safely as special training is required and not all pilots will be suitably qualified to accommodate such a procedure. An initial departure bearing other than 020° True risks the ERHS being unable to access the RPH HLS.

Planning Environment

The North-east flight path is within the City of Perth local government area and crosses partially into the City of Vincent as illustrated on **Figure NE-1**.

Impact on building areas

The impact on building areas as identified allocated by Element Advisory drawing number 19-139 CP-1/A (10 February 2020) *RPH Flight path – Height Limitations* has been assessed. This assessment should be treated as an indicative order of magnitude only. These heights and areas should not be used directly to inform planning controls. Any planning controls should be based on the technical flight path geometry as shown on Figures NE-1 and NE-2.

The orange areas on **Figure NE-2** illustrate the area of land where current/proposed development on land does not exceed the elevation of the HLS and therefore would not be considered as part of the obstacle environment to the OLS. The blue areas represent land where development either currently exists, is planned and could exceed the elevation of the HLS at 48.5 m AHD and therefore may require further consideration.

The total area (blue areas only) affected by the North-east flight path is 34,212 square metres.

The North-east flight path partially covers development areas identified as 4, 6, and 9.

Area 6 is identified as having no prescribed height limit. The flight path OLS covers a small area of 122 metres square of the south-eastern corner of Area 6. The flight path OLS ranges from a lower limit at 61 m AHD to 63 m AHD. The ground elevation is estimated at 12 m AHD therefore the available building height would be in the order of 49 m to 51 m high, depending on the exact location on the block. A newly constructed development / under construction at 40 m (10 storey) is identified as 'H' in Area 6 as per the Element Advisory drawing number 19-139 CP-1/A (10 February 2020) *RPH Flight path – Height Limitations*. Element Advisory has confirmed that this development is outside the flight path OLS.

Areas 4 and 9 are identified as having a limited planning framework in place and therefore no height restrictions have been applied at this stage. Area 4 is the Claisebrook Village precinct numbered 16B in Figure 3 of the City of Perth letter dated 7 October 2019. Area 9 is the Claisebrook Village precinct numbered as 5.

Area 4 is 23,326 square metres in total area. The North-east flight path effectively covers this whole area (23,202 square metres). The flight path OLS ranges from a lower limit of 100 m AHD to an upper limit of 118 m AHD. The ground elevation is estimated at 12 m AHD therefore available building height would be in the order of 88 m to 106 m high depending on the exact location within this precinct.

Area 9 is a total area of 76,670 square metres. The North-east flight path covers 10,797 square metres of the western portion of the block. The flight path OLS ranges from a lower limit of 55 m AHD to 68 m AHD. The ground elevation is estimated at 11 m AHD therefore available building height would be in the order of 44 m to 57 m high depending on the exact location on the block.

6.2 SOUTH-WEST FLIGHT PATH

The south-west flight path is based on the previous GHD Figure 01 Rev C. The current ambulance helicopter service provider for Western Australia, identifies that the dominant period of activity for RPH flights is in the afternoon when there are prevailing winds from the south west, there is a requirement for a south-west flight path so as to provide Performance Class 1 departure capability during this high activity period.

The south-west flight path commences with a straight section bearing 029°/209° True for a distance of 790 m at which point it transitions to a curve radius 300 m then onto a straight section bearing of 079°/259°True for a total length of 3,400 m as illustrated on **Figure SW-1**.

The inner edge width is 42 m at an elevation of 63.5 m AHD. In accordance with ICAO Annex 14 Vol II paragraph 4.1.3 and 4.1.15 the elevation of the inner edge may be raised directly above the FATO, for use by helicopter in performance class 1 and must be approved by an appropriate authority. In the absence of specific CASA rules on this matter, it would be reasonable for the current helicopter operator to be considered the appropriate authority.

The south-west flight path is within the City of Perth local government area as illustrated on **Figure SW-1**.

Surrounding Building Environment



The OLS for the south-west flight path, based on GHD Figure 01 Rev C, commences 15m above the FATO elevation at 63.5 m. It appears the OLS has been raised in this manner in order to clear the building to the south, by applying the provisions of ICAO Annex 14 Vol. II Chapter 4 - *Obstacle Environment*. Given the presence of the building, the OLS as defined in GHD Figure 01 is considered appropriate for the purposes of protecting the OLS from any future intrusions. The flight path direction is positioned so that the OLS avoids the following buildings as illustrated in **Figure SW-2**:

- The Westin Hotel (120 m AHD approx.)
- Condor Tower building at 22 St Georges Terrace (approx. 103m AHD). This building would remain just outside the western edge of the south-west flight path.
- A building at approximately 83 m AHD on the north-east corner of Victoria Ave and St Georges Terrace. This building would remain just outside of the eastern edge of the south-west flight path.

These latter two buildings constrain the location of the south-west flight path to the extent that no other location option exists.

The Duxton Hotel on the south-west corner of Victoria Ave and St Georges Terrace is within the lateral extents of the south-west flight path. The building at approximately 74m AHD would remain below the south-west flight path OLS which will be approximately 87 m AHD over the site.

7. CONCLUSION

The purpose of establishing and protecting helicopter flight paths for the Royal Perth Hospital (RPH) is to ensure new developments (and associated activities) do not prevent helicopters from arriving or departing from the new RPH Helicopter Landing Site (HLS).

The responsibility for determining the suitability of a place as a HLS is held by the pilot-in-command and the organisation that holds the helicopter operating certificate. The pilot in control of the aircraft will make the decision as to whether it is safe to arrive or depart the RPH HLS during each mission.

The North-east flight was developed taking into account the following considerations in the construction of the approach and take-off climb surfaces for helicopters arriving north-easterly direction for RPH HLS:

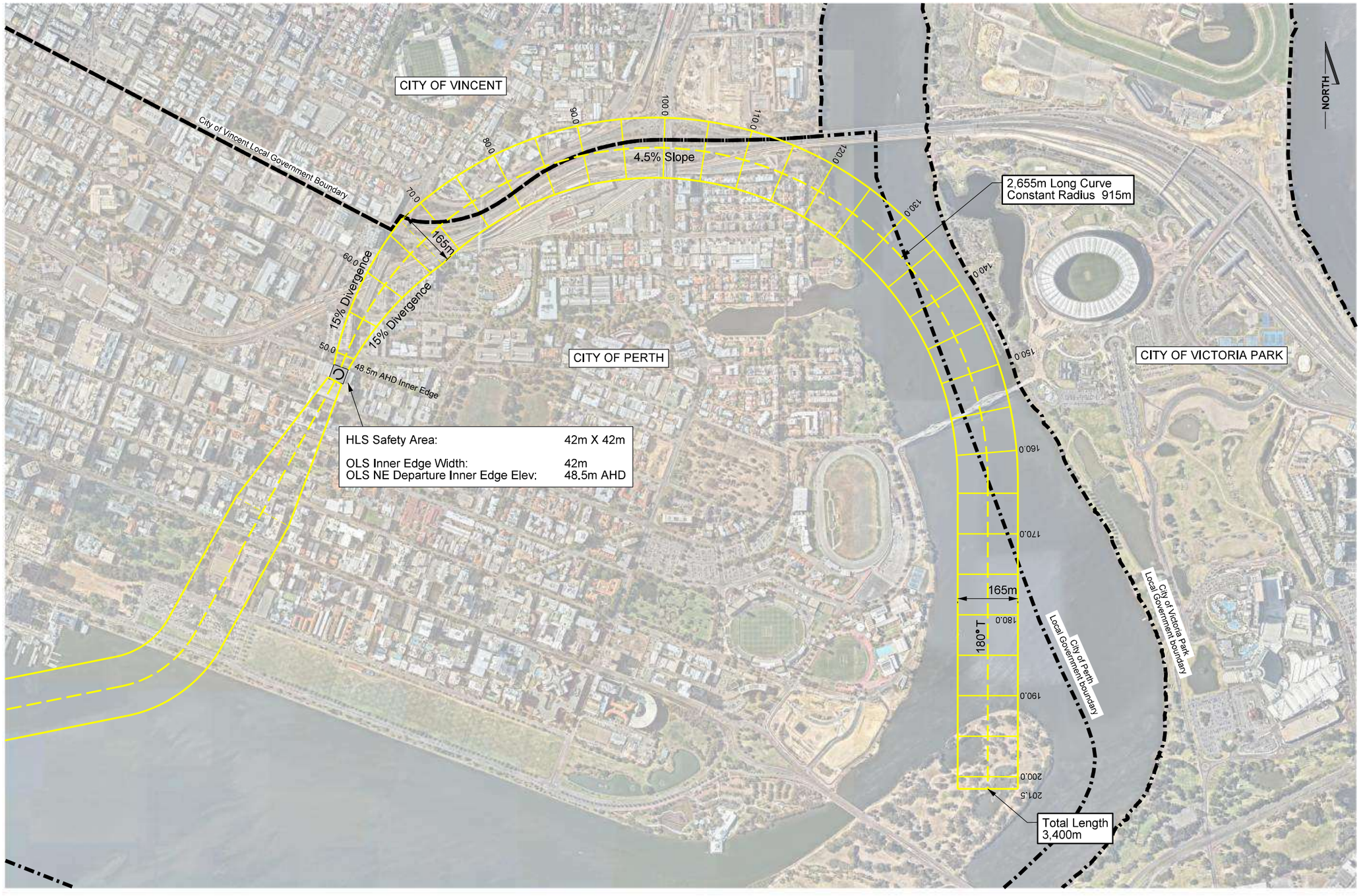
- The physical characteristics and immediate surrounds of the HLS;
- Flight paths must comply with ICAO Annex 14 Volume II criteria;
- Helicopter pilot feedback; and
- The obstacle and planning environment.

The south-west flight path commences 15m above the FATO elevation. It appears the OLS has been raised in this manner in order to clear the building to the south. EMHS should confirm the current aeromedical service provider and DFES that the presence of the RPH South building is accounted for adequately in helicopter operations to the new helipad.

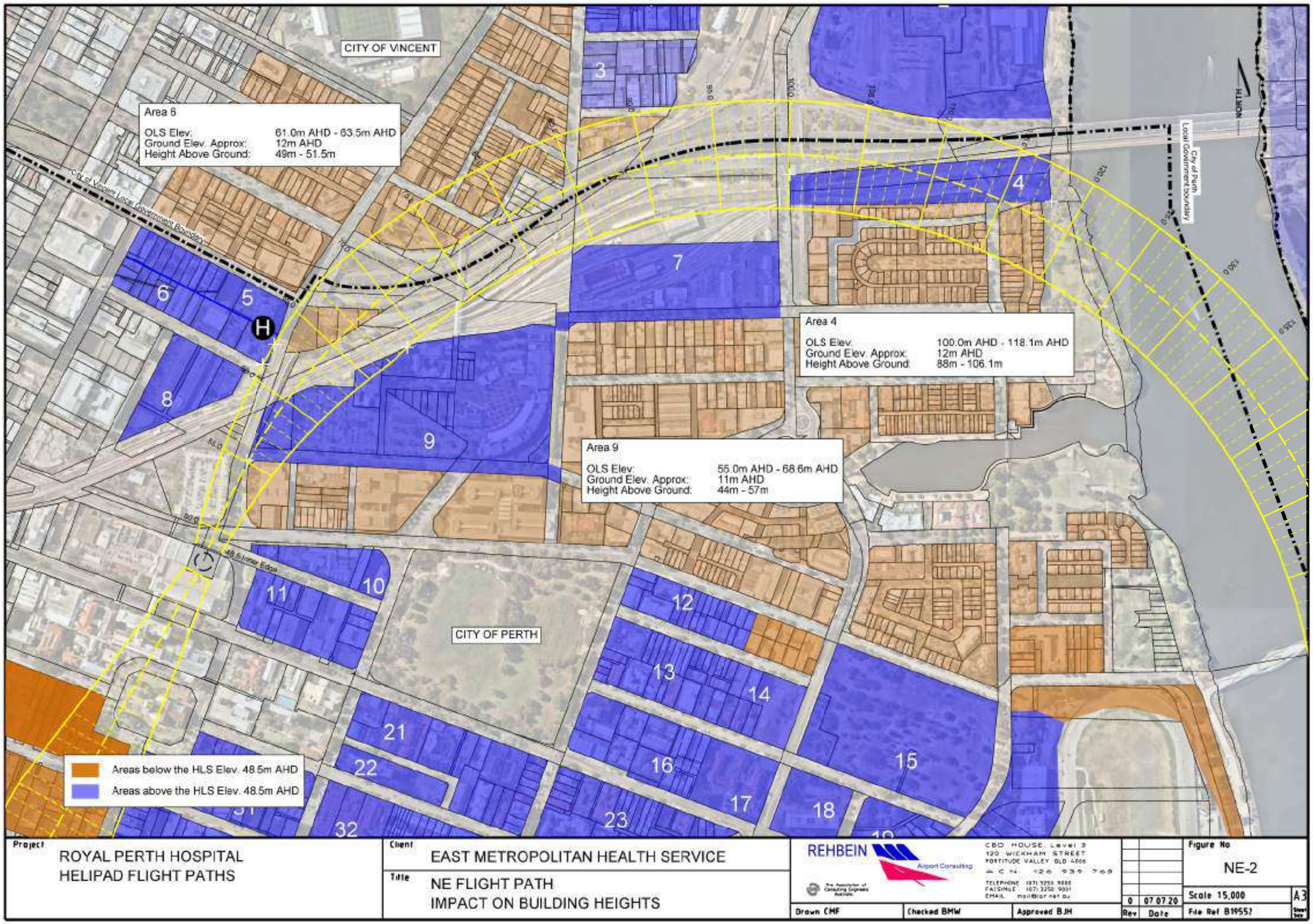


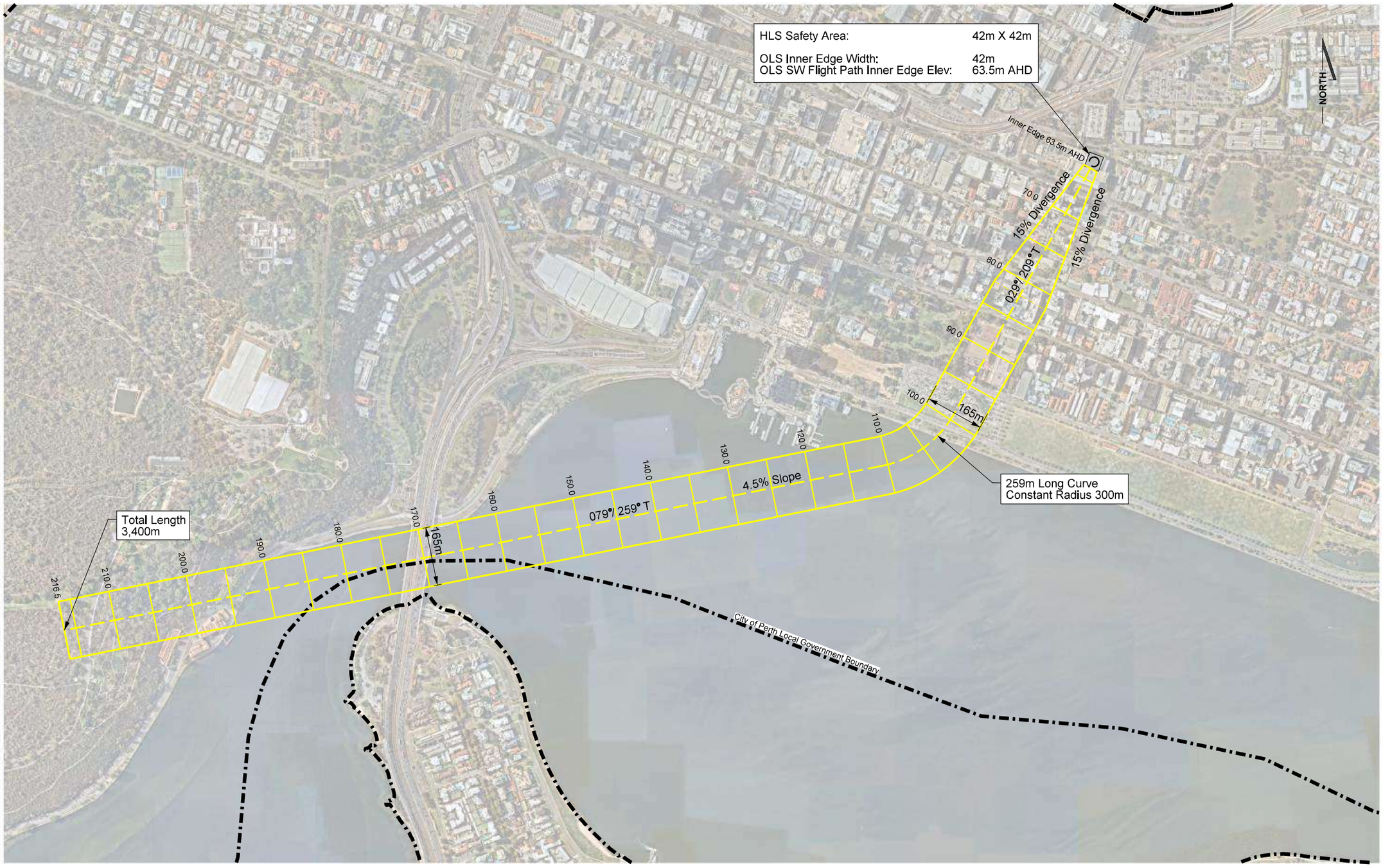
APPENDIX A

RPH HLS Flight Paths

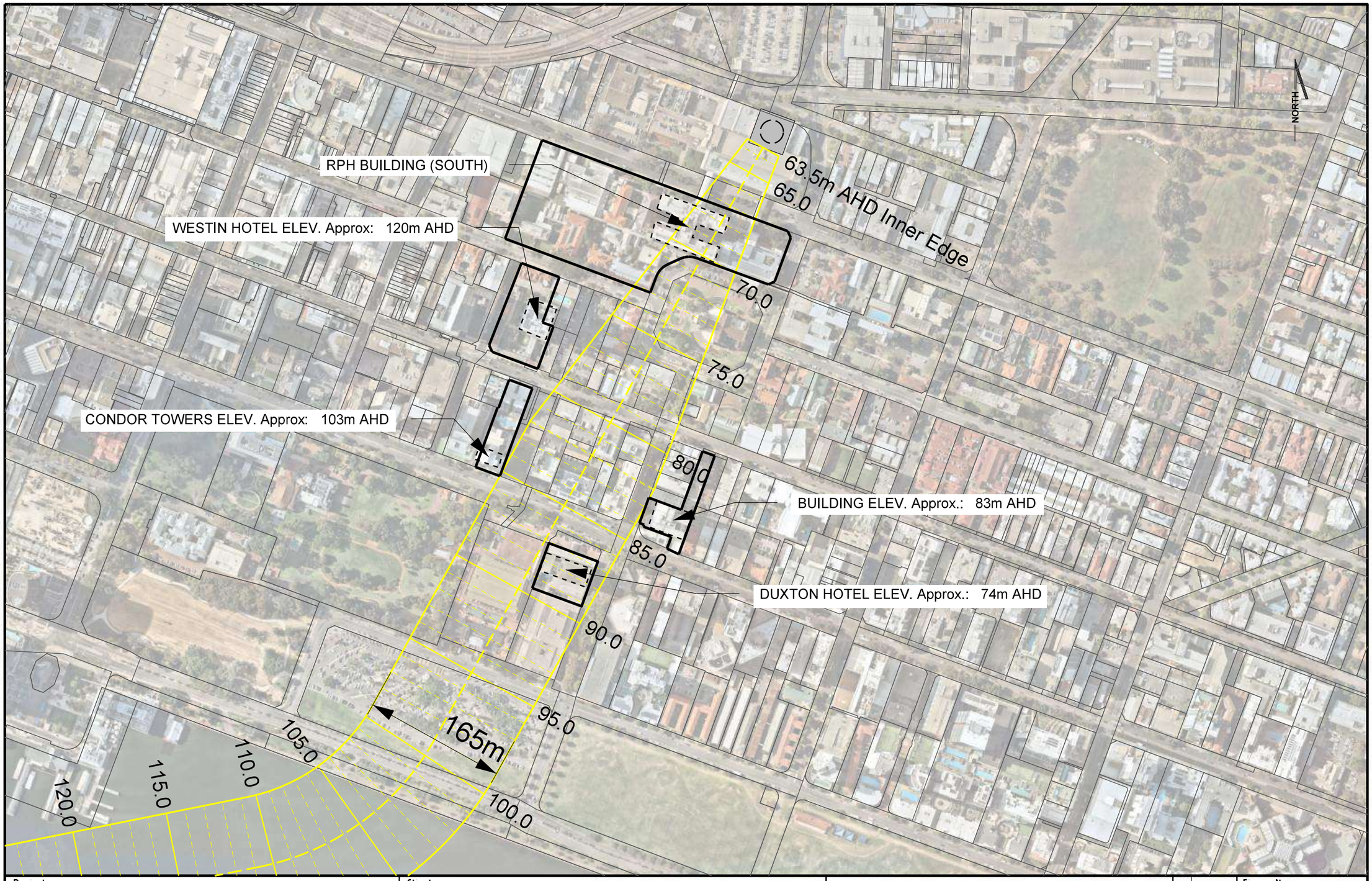


Project: ROYAL PERTH HOSPITAL HELIPAD FLIGHT PATHS	Client: EAST METROPOLITAN HEALTH SERVICE	REHBEIN Airport Consulting The Association of Consulting Engineers Australia	Figure No: NE-1
	Title: NE FLIGHT PATH OLS CONSTRUCTION	CBD HOUSE, Level 3 120 WICKHAM STREET FORTITUDE VALLEY QLD 4006 A C N 126 939 768 TELEPHONE (07) 3250 9000 FACSIMILE (07) 3250 9001 EMAIL mail@lar.net.au	Scale: 1:10,000 A3
		Drawn: CMF Checked: BMW Approved: BJH	0 07.07.20 Rev Date File Ref: B19552 Sheet Size


CITY OF VINCENT
CITY OF PERTH
Area 6
OLS Elev: 61.0m AHD - 63.5m AHD
Ground Elev. Approx: 12m AHD
Height Above Ground: 49m - 51.5m
Area 4
OLS Elev: 100.0m AHD - 118.1m AHD
Ground Elev. Approx: 12m AHD
Height Above Ground: 88m - 106.1m
Area 9
OLS Elev: 55.0m AHD - 68.6m AHD
Ground Elev. Approx: 11m AHD
Height Above Ground: 44m - 57m
City of Vincent Local Government Boundary
City of Perth Local Government boundary
NORTH
48.5 Inner Edge
Areas below the HLS Elev. 48.5m AHD
Areas above the HLS Elev. 48.5m AHD
Project
ROYAL PERTH HOSPITAL
HELIPAD FLIGHT PATHS
Client
EAST METROPOLITAN HEALTH SERVICE
Title
NE FLIGHT PATH
IMPACT ON BUILDING HEIGHTS
REHBEIN
Airport Consulting
CBD HOUSE, Level 3
120 WICKHAM STREET
FORTITUDE VALLEY QLD 4006
Drawn CMF
Checked BMW
Approved BJH
0 07.07.20
Rev Date
Figure No
NE-2
Scale 1:5,000
A3
File Ref B19552



Project: ROYAL PERTH HOSPITAL HELIPAD FLIGHT PATHS	Client: EAST METROPOLITAN HEALTH SERVICE	REHBEIN Airport Consulting	Figure No: SW-1
	Title: SW FLIGHT PATH OLS CONSTRUCTION	CBD HOUSE, Level 3, 120 WICKHAM STREET, FORTITUDE VALLEY QLD 4006, A C N 126 939 768, TELEPHONE (07) 3250 9000, FACSIMILE (07) 3250 9001, EMAIL mail@lar.net.au	Scale 1:10,000 A3
		Drawn: CMF Checked BMW Approved BJH	0 30 03 20 Rev Date
			File Ref: B19552



Project:
ROYAL PERTH HOSPITAL
HELIPAD FLIGHT PATHS

Client:
EAST METROPOLITAN HEALTH SERVICE

Title:
SW FLIGHT PATH OLS
BUILDING SURROUNDS

REHBEIN Airport Consulting
The Association of Consulting Engineers Australia

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Rev	Date
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0	30 03 20

Figure No: SW-2
Scale 1:10,000 A3
File Ref: B19552 Sheet Size

element.

Appendix 5

Interpretation of Aviation Regulations (Rehbein Airport Consulting)

REHBEIN Airport Consulting

10 February, 2021
Our File Ref: B19552AL001
Contact: Ben Hargreaves

Senior Project Manager
East Metropolitan Health Service
Level 4, Room 4202, O Block (Goderich St)
Royal Perth Hospital
Perth, WA 6000

Attention: Emma Morony

RE: PROPOSED RPH HELIPAD
HELICOPTER FLIGHT PATH PROTECTION

1. INTRODUCTION

REHBEIN Airport Consulting was engaged by East Metropolitan Health Service (EMHS) to review aspects of helicopter flight path protection associated with the proposed Royal Perth Hospital (RPH) helipad, which was recently approved for construction.

Previously, PSNK Aeronautical Services was engaged by EMHS, to provide advice on suitable flight paths for the proposed helipad at Royal Perth Hospital based on the operational needs of helicopters with performance capabilities equivalent to that of the AW139.

The result was report titled *RPH Rooftop Helipad Assessment of Operational Airspace* Version 180424. Following consultation between EMHS and DFES, two points were raised:

- Flight path geometry must be compliant with International Civil Aviation Organisation (ICAO) specifications for obstacle limitation applicable to Performance Class 1 / Category A operations; and
- Obstacle-free airspace must accommodate a wider range of potential future helicopter types.

The purpose of this letter is to confirm the flight path protection requirements, based on the nominated helicopter characteristics and ICAO specifications.

2. RELEVANT REGULATIONS

There are currently no legislative regulations specifically addressing the requirements for physical characteristics of helicopter flight paths and an HLS. Rather, the *Civil Aviation Regulations 1998* Regulation 92 places the responsibility on the pilot-in-command/helicopter operator for determining whether an HLS is safe or not to use.

DIRECTORS Brendan L Rehbein Ashley P Ruffin Steve A Williams Brent F Woolgar
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Member Firm

There is, however, strong and accepted guidance material from the Civil Aviation Safety Authority (CASA) and International Civil Aviation Organisation (ICAO) that is broadly accepted by helicopter operators in Australia and internationally as indicating whether facilities offer acceptable levels of safety.

This is reinforced by the National Airports Safeguarding Advisory Group comprising high-level Commonwealth, State and Territory transport and planning offices who prepared the National Airports Safeguarding Framework which includes Guideline H *Protecting Strategically Important Helicopter Landing Sites.* The purpose of Guideline H is to provide guidance to State/Territory and local government decision makers of identified strategically important HLS particularly in recognition that HLS in Australia are not licensed, certified or regulated in the way that aerodromes are. Strategically important HLS includes an HLS associated with a hospital and an elevated HLS within a populated area.

Relevant regulations and guidance pertaining to the use of a HLS as well as the associated flight paths are:

- *Civil Aviation Regulations 1988* – Regulation 92;
- The Civil Aviation Safety Authority (CASA) Civil Aviation Advisory Publication CAAP 92-2(2) *Guidelines for the establishment of on-shore helicopter landing sites (February 2014)*;
- International Civil Aviation Organisation ICAO Annex 14 Aerodromes – Volume II: Heliports (4th edition July 2013) – herein referred to as ICAO Annex 14-II; and
- Civil Aviation Safety Authority NPRM 1304OS Regulation of aeroplane and helicopter 'ambulance function' flights as Air Transport Operations.

Paragraph 4.6 of CAAP 92-2(2) states:

> '*In keeping with its submissions to ICAO on this topic, CASA recommends owners and operators of an HLS who intend to develop and operate a heliport for the purposes of RPT or Charter operations refer to, and comply with, the SARPs* [standards and recommended practices] *as set out in Annex 14.*'

Per NPRM1304OS, CASA has signalled its intention to create legislation treating emergency medical transport operations in a similar category to RPT and Charter.

Until there exists legislation to the contrary, it is for the relevant service provider, or any operator into and out of RPH, to determine the appropriateness of the RPH HLS facilities and flight path protection. The pilots of the helicopter service currently operating the ambulance services (CHC Helicopter Services) and DFES have stated to EMHS and REHBEIN Airport Consulting that the flight paths must be protected in accordance with ICAO Annex 14 for them to safely conduct flights to and from the RPH HLS. It will, therefore, be for the current helicopter operators and DFES to approve any deviation from the ICAO Annex 14 specifications.

3. HELICOPTER CHARACTERISTICS

The critical characteristics of the design helicopter dictate the physical characteristics of the airspace required to be protected in order to ensure safe operations in a non-normal operating situation (i.e. with one engine inoperative), by reference to the relevant standards and guidance. These characteristics include the helicopter D-value (largest overall length/width) and the main rotor diameter.

The PSNK report v180424 determines flight path characteristics based on a design helicopter with a D-value of 21.0 metres and main rotor diameter of 15.0 metres.

DFES has subsequently advised that the emergency flight path airspace needs to accommodate a design helicopter with a main rotor diameter of 16.5 metres. This is larger than the design helicopter rotor diameter used for the PSNK report and requires a wider overall width of OLS (165 m vs. 150 m).

4. OLS EXTENTS

The PSNK report is predicated on obstacle limitation surfaces (OLS) dimensions for the flight paths as follows. These extents are not compliant with ICAO Annex 14-II requirements, as noted below.

4.1 North-east Flight Path OLS

The north-east flight path OLS (Figure 6 in the PSNK Report – reproduced below) extends a distance of approximately 1,600 metres. The minimum distance for Performance Class 1 OLS is 3,386 metres, per attached extract of ICAO Annex 14-II, Table 4-1.

The PSNK flight path also includes two (2) curved segments. ICAO Annex 14-II only permits one (1) curved portion:

4.1.6 In the case of an approach surface involving a turn, the surface shall not contain more than one curved portion.

4.1.19 In the case of a take-off climb surface involving a turn, the surface shall not contain more than one curved portion.

This requirement is described in the PSNK report and has been applied to the south-west flight path OLS but does not seem to have been adopted for the north-east flight path OLS.[1]

4.2 South-west Flight Path OLS

The south-west flight path OLS is shown in the PSNK Report (Figure 7 – reproduced below) extending a distance of approximately 850 metres, to the Swan River. The remainder of the south-west flight path length (if it was defined by PSNK) is not shown in the PSNK Report. However, by definition above, having already adopted a curved segment on departure from the helipad, the remaining length of 2.5 kilometres approximately would need to be straight in order to comply with ICAO Annex 14-II specifications. Alternatively the curved portion on departure would need to be removed in order to accommodate a curve further out.

[1] A subsequent version of the PSNK Report (190527) appears to address the limitation to a single curved section, but does not extend the flight path protection to the required length

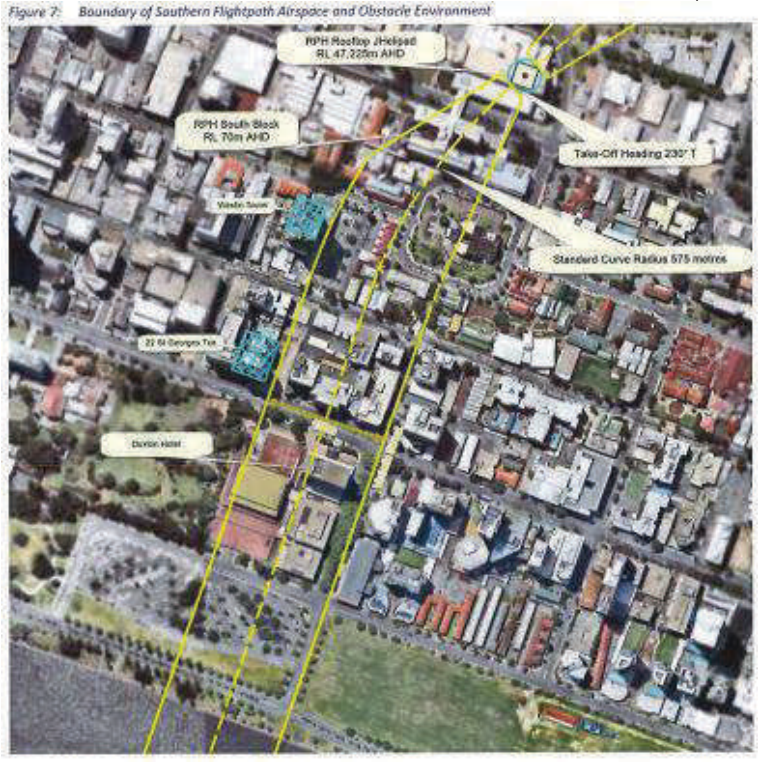
10 February, 2021 - 4 -
Our File Ref: B19552AL001
Contact: Ben Hargreaves

Figure 6: Airspace extent for northern and southern flightpath tracks



Source: PSNK Report V180424

Figure 7: Boundary of Southern Flightpath Airspace and Obstacle Environment



Source: PSNK Report V180424

5. OLS SLOPES

Annex 14-II specifies the slope design categories which apply to different helicopter performance class operations. For performance class 1 operations, the slope design category is A, and the required slope is 4.5%, per Annex 14-II Table 4-1 and Figure 4-6 (attached).

ICAO Annex 14-II also describes how the inner edge of the 4.5% slope may be raised in order to clear close in obstacles (see Figure 4-4, attached). Raising the inner edge is permitted under Annex 14-II with approval from the appropriate authority.

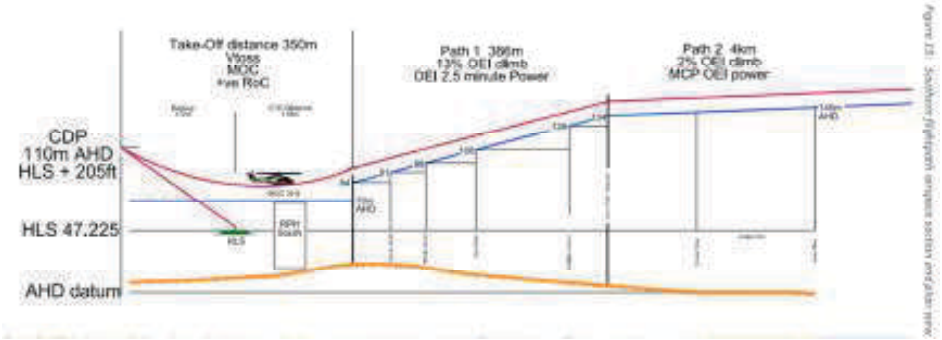
> 4.1.15 The elevation of the inner edge shall be the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the take-off climb surface. For heliports intended to be used by helicopters operated in performance class 1 and when approved by an appropriate authority, the origin of the inclined plane may be raised directly above the FATO.

In Australia currently, the appropriate authority would be the pilot-in-command/Chief Pilot of the helicopter operator, as the responsibility under the available regulations (*Civil Aviation Regulations 1998*) for the safety of operations lies with the operator.

The 4.5% OLS slope specified in ICAO Annex 14-II is a generic slope intended to protect for a wide range of helicopter operating capabilities and conditions. It forms an internationally accepted 'standard' which provides a quantifiable degree of certainty around the obstacle environment.

In our experience, helicopter operators providing emergency medical transport generally expect a 4.5% slope to be protected, as a minimum. For reference the Ministry of Health policy in NSW and Queensland Health guidelines both require a 4.5% slope commencing at the helipad elevation. The Department of Health and Human Services guidelines in Victoria require protection of (RPH-equivalent) helipads with a horizontal segment at the helipad elevation for the first 240 metres, followed by a 4.5% slope for 3,386 metres.

The PSNK report includes a technical analysis demonstrating that the AW139 helicopter, on a representative operating day of 40°C can exceed the 4.5% slope during the early part of the one engine inoperative climb (part of Figure 15 – reproduced below. This is a specific analysis for a particular helicopter type (which we have not verified but assume to be accurate).



Source: PSNK Report V180424 Figure 15 (part)

Although in common use for emergency medical transport operations, The AW139 is not the only type that might operate to the RPH helipad. DFES has noted in consultation that use of the helipad by a range of potential helicopter types must be protected into the future. DFES is not able to specify or guarantee the helicopter type or capability in soliciting future service providers.

While it may be sufficient for current operations to protect the slopes identified in the PSNK report, instead of the 4.5% required by ICAO, this may not be sufficient to ensure future operations.

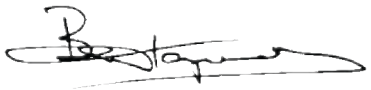
6. FLIGHT PATH APPROVAL

Under Civil Aviation Regulation 92-2 and Civil Aviation Advisory Publication 92-2(2) a person must not land an aircraft on, or engage in conduct that causes an aircraft to take-off from, a place unless that place is suitable for use for the purposes of the landing and taking-off of aircraft. The assessment of suitability lies with the pilot, including in particular the flight paths available for use in a one engine inoperative or other emergency situation.

Day-to-day approval of the RPH flight path obstacle clearances therefore comes from the Chief Pilot/s of the respective organisations which are required to operate there in providing emergency medical transport services (refer **Section 2**).

However, as custodian of the aeromedical services contract, we suggest DFES would be the appropriate overarching approval authority, in consultation with current and potential future helicopter operators and, at its discretion, CASA. We would expect that consultation to result in adoption of the current CASA guidance and ICAO Annex 14 Volume II specifications for obstacle limitation surface dimensions, geometry and slope.

Yours faithfully
For and on behalf of
LAMBERT & REHBEIN (SEQ) PTY LTD



B.J. HARGREAVES M.Eng, M.Sc, C.Eng MICE, MIEAust, CPEng, RPEQ
SENIOR ASSOCIATE

Enc: ICAO Annex 14 Volume II Table 4-1
ICAO Annex 14 Volume II Figure 4-6
ICAO Annex 14 Volume II Figure 4-4

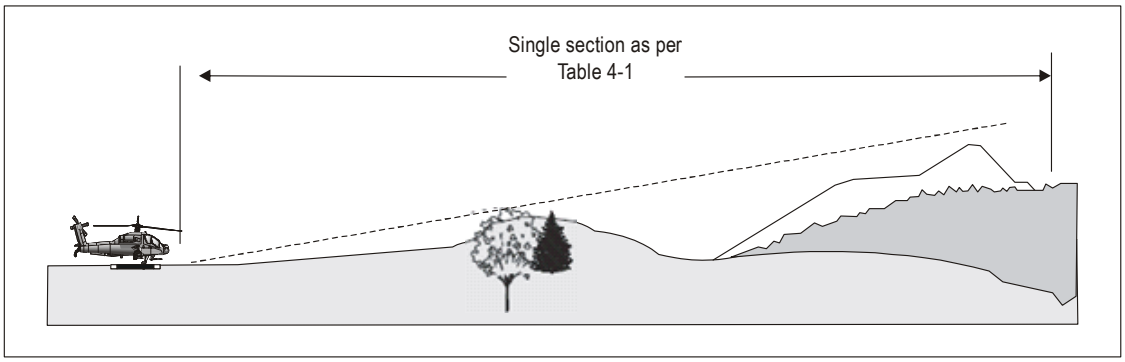
Table 4-1. Dimensions and slopes of obstacle limitation surfaces for all visual FATOs

SURFACE and DIMENSIONS	*SLOPE DESIGN CATEGORIES*		
	A	B	C
APPROACH and TAKE-OFF CLIMB SURFACE:			
Length of inner edge	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary (Clearway boundary if provided)	Safety area boundary	Safety area boundary
Divergence: (1st and 2nd section)			
Day use only	10%	10%	10%
Night use	15%	15%	15%
First Section:			
Length	3 386 m	245 m	1 220 m
Slope	4.5% (1:22.2)	8% (1:12.5)	12.5% (1:8)
Outer Width	(b)	N/A	(b)
Second Section:			
Length	N/A	830 m	N/A
Slope	N/A	16% (1:6.25)	N/A
Outer Width	N/A	(b)	N/A
Total Length from inner edge (a)	3 386 m	1 075 m	1 220 m
Transitional Surface: (FATOs with a PinS approach procedure with a VSS)			
Slope	50% (1:2)	50% (1:2)	50% (1:2)
Height	45 m	45 m	45 m

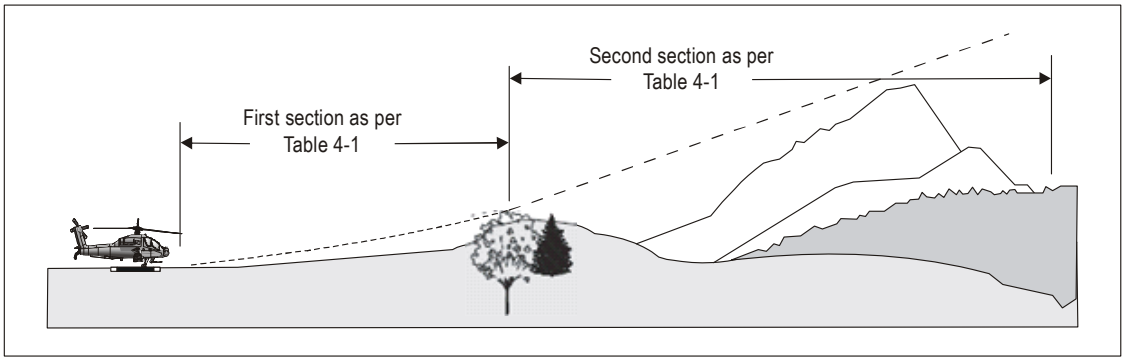
(a) The approach and take-off climb surface lengths of 3 386 m, 1 075 m and 1 220 m associated with the respective slopes, brings the helicopter to 152 m (500 ft) above FATO elevation.

(b) Seven rotor diameters overall width for day operations or 10 rotor diameters overall width for night operations.

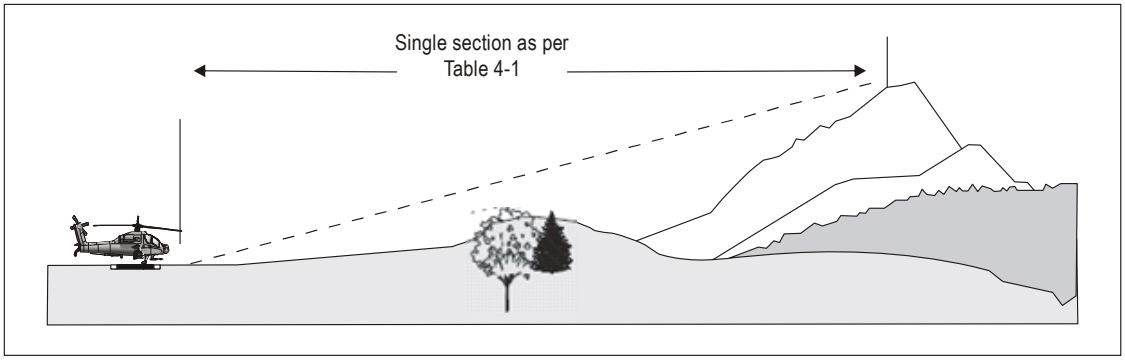
Note.— The slope design categories in Table 4-1 may not be restricted to a specific performance class of operation and may be applicable to more than one performance class of operation. The slope design categories depicted in Table 4-1 represent minimum design slope angles and not operational slopes. Slope category "A" generally corresponds with helicopters operated in performance class 1; slope category "B" generally corresponds with helicopters operated in performance class 3; and slope category "C" generally corresponds with helicopters operated in performance class 2. Consultation with helicopter operators will help to determine the appropriate slope category to apply according to the heliport environment and the most critical helicopter type for which the heliport is intended.



a) Approach and take-off climb surfaces - "A" slope profile - 4.5% design



b) Approach and take-off climb surfaces - "B" slope profile - 8% and 16% design



c) Approach and take-off climb surfaces - "C" slope profile - 12.5% design

Figure 4-6. Approach and take-off climb surfaces with different slope design categories

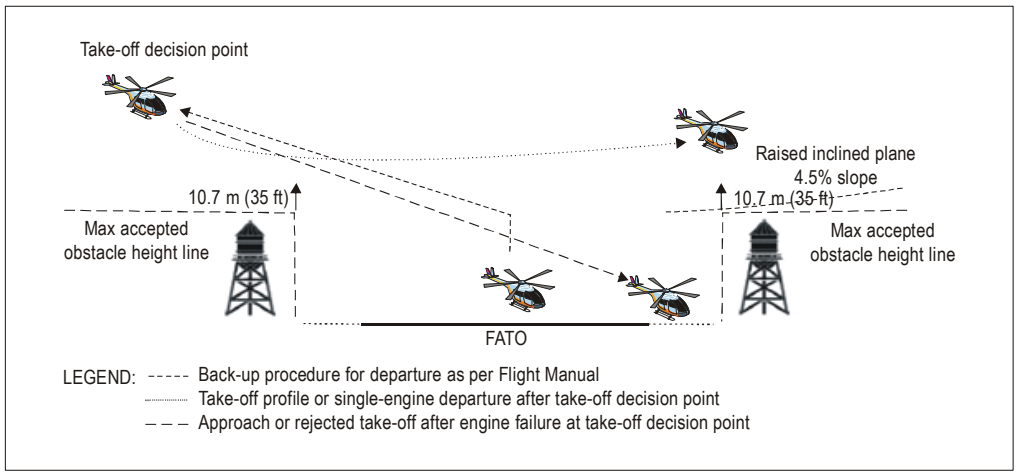


Figure 4-4. Example of raised inclined plane during operations in Performance Class 1

Note 1.— This example diagram does not represent any specific profile, technique or helicopter type and is intended to show a generic example. An approach profile and a back-up procedure for departure profile are depicted. Specific manufacturers operations in performance class 1 may be represented differently in the specific Helicopter Flight Manual. Annex 6, Part 3, Attachment A provides back-up procedures that may be useful for operations in performance class 1.

Note 2.— The approach/landing profile may not be the reverse of the take-off profile.

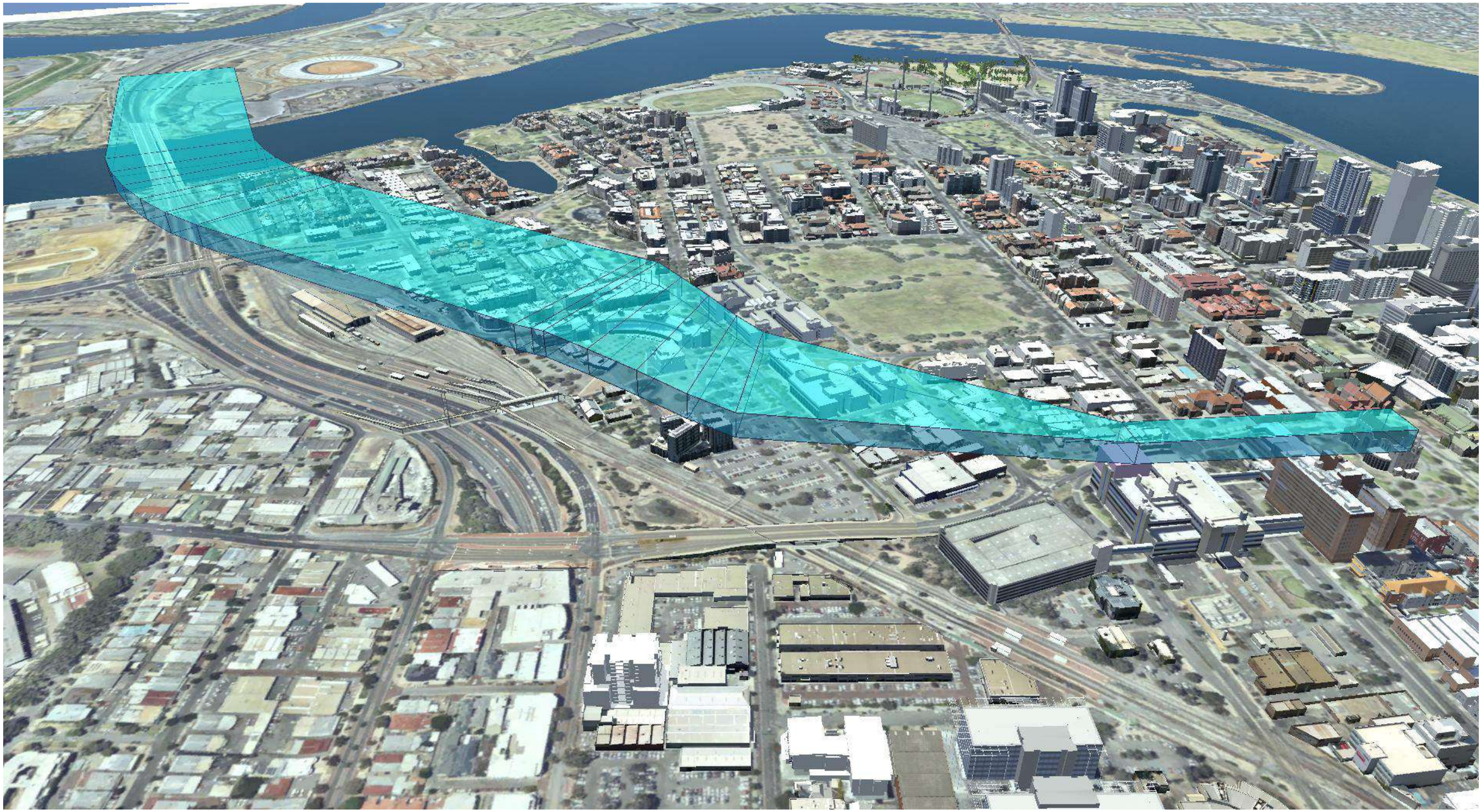
Note 3.— Additional obstacle assessment might be required in the area that a back-up procedure is intended. Helicopter performance and the Helicopter Flight Manual limitations will determine the extent of the assessment required.

element.

Appendix 6

Central Perth Planning Committee Meeting (3 September 2018)







GOVERNMENT OF WESTERN AUSTRALIA

Western Australian Planning Commission

Your ref: N/A
Our ref: DP/11/01552
Enquiries: Tyrone Desai (6551 9638)

Liz MacLeod
Chief Executive
East Metropolitan Health Service
PO BOX 8172
Perth Business Centre
PERTH WA 6849

Dear Ms MacLeod

CENTRAL PERTH PLANNING COMMITTEE MEETING – ROYAL PERTH HOSPITAL HELIPAD FLIGHT PATHS

The amended proposal for the Royal Perth Hospital Helipad flight paths was considered by the Central Perth Planning Committee on 3 September 2018 where the following resolution was passed:

That the Central Perth Planning Committee resolves to;

1. *provide support for the amended flight paths as detailed in Attachment 1;*
2. *provide support for the lodgement of a Development Application relating to the proposed helipad and helicopter flight paths; and*
3. *provide support for the preparation of a scheme amendment to protect the proposed flight paths from future development.*

If you have any queries regarding this advice, please contact Tyrone Desai on 6551 9638 or Tyrone.Desai@dplh.wa.gov.au

Yours sincerely

Sam Fagan
Secretary
Western Australian Planning Commission

7 September 2018

Postal address: Locked Bag 2506 Perth WA 6001 Street address: 140 William Street Perth WA 6000
Tel: (08) 6551 8002 Fax: (08) 6551 9001 info@dplh.wa.gov.au www.dplh.wa.gov.au
ABN 35 482 341 493
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element.

Appendix 7

Letters of Support (previous indicative flight paths)

GOVERNMENT OF WESTERN AUSTRALIA

Metropolitan Redevelopment Authority

31 May 2018

Ms Elizabeth MacLeod
Chief Executive Officer
East Metropolitan Health Service
PO Box X2213
PERTH WA 6847

File No: MRA-09705
Doc Id: A563193

Dear Ms MacLeod

PROPOSED ROYAL PERTH HOSPITAL HELIPAD AND FLIGHT PATHS

I write in relation to your correspondence received on 7 May 2018 regarding the proposed Royal Perth Hospital (RPH) helipad upgrade and associated flight paths.

The Metropolitan Redevelopment Authority (MRA) understands two designated flight paths have been identified, in accordance with emerging Civil Aviation Safety Authority (CASA) regulations. The proposed northern flight path will pass through a portion of the MRA's Central Perth Redevelopment Area, including portions of Claisebrook Village (at a minimum flight height of 60m) and the East Perth Power Station (at a minimum flight height of 150m).

I can advise that the MRA supports in-principle the proposed northern flight path, as indicated in Attachment 1 to this letter. It is requested that the Department of Health continue to work to minimize impacts on potential development options for the identified sites in the context of ensuring safe flight paths. Please advise the MRA of the final designated flightpaths, so that the MRA can inform prospective purchasers of sites such as the East Perth Power Station that the lots are situated in the vicinity of a designated helicopter flight path route.

The MRA encourages Department of Health to continue to liaise with the City of Perth regarding the southern flightpath.

Thank you for the opportunity to comment on the proposal and should you have any further queries regarding this matter please contact Ms Conor Ward on 6557 0781 or via email conor.ward@mra.wa.gov.au.

Yours sincerely

Ryan Keys
Executive Director Planning

Att Attachment 1 – Proposed Flight Paths

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Attachment 1 – Proposed Flight Paths (from 'Royal Perth Hospital Helipad Strategic Overview' prepared by PWC April 2018)

CATHOLIC ARCHDIOCESE OF PERTH

Administration Centre

23 August 2018

Mr Brad Caldwell
Director
PricewaterhouseCoopers
GPO Box D198
PERTH WA 6840

Dear Mr Caldwell

Proposed Royal Perth Hospital Helipad and Flight Paths

Further to your recent correspondence I am writing to confirm the following:

The Roman Catholic Archbishop of Perth:

- is the owner of a number of significant properties located within the 'Victoria Square Precinct'.
- is a stakeholder and neighbour of the Royal Perth Hospital
- supports in-principle, the proposed relocation of the existing helipad
- understands the relocation of the helipad is necessary to accommodate the new heavier helicopters being purchased to replace the existing helicopters currently in operation
- acknowledges the proposed protected flight path associated with the helicopter service is required for the service to continue providing this critical service to the community during "emergency" conditions and at other times flight paths will be dictated, as they are now by climatic conditions.

If you have any further queries, please do not hesitate to contract the Catholic Administration Centre.

Yours sincerely

Theresa Carroll
Manager Property

Address: Giver House, Administration Centre 249 Adelaide Terrace, Perth WA 6000, Australia
Mailing Address: GPO Box M962 Perth WA 6843
Telephone: +61 8 6104 3600 **Facsimile:** +61 8 6162 0345
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