Submission Hobart Airport, 30 September 2020

Attachments:

- Hobart Airport Master Plan, January 2020
- General Plan - Master Plan 2020 - Procedures for Air Navigation Services – Aircraft Operations Surface (PANS OPS), 1 July 2019
- Lowest surfaces - Procedures for Air Navigation Services – Aircraft Operations Surface (PANS OPS)
- General Plan - Master Plan 2020 - Obstacle Limitation Surface (OLS), 12 February 2020

From: Luke Clasener <LClasener@hobartairport.com.au>
Sent: Wednesday, 30 September 2020 11:13 AM
To: TPC Enquiry
Cc: Rhiannon West
Subject: FW: Clarence draft Local Provisions Schedule
Attachments: Clarence draft LPS - TPC letter directions prior to hearing, 29 September 2020.pdf

Good morning,
As requested in the attached letter, please find included in the below link the following information related to safeguarding of airports overlay mapping:

- Current version of HBA Noise modelling
- Current HBA Prescribed Airspace models covering:
    - Obstacle Limitation Surface (OLS)
    - Procedures for Air Navigation Services – Aircraft Operations Surface (PANS OPS)

https://hobartairport-my.sharepoint.com/:f:/g/personal/lclasener_hobartairport_com_au/Ek9noYWYadJFhZ5QFTnOoJIB-SNbmn3oWeaHzE6Uh0HzVA?e=SaQv78

If there are any questions or issues accessing the files, please do not hesitate to contact me directly.

Regards,

Luke Clasener **Airport Planner**
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January 2020

Hobart Airport Master Plan ANEF

Report

Hobart Airport ANEF

Report

Report

Luke Clasener

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North Melbourne, January 2020

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1 Introduction

T070 Aviation Australia (T070) has been appointed by Hobart Airport (HBA) to develop a standard 20-year ANEF for the 2020 Hobart Airport Master Plan.

The airport noise contours are produced using Integrated Noise Model (INM) version 7.0d which is the current version. INM is a computer noise prediction model developed by the U.S. Federal Aviation Administration used for airport noise assessments worldwide and Australia.

This document presents inputs, assumptions and results of the noise model calculations, including the parameters used to build the INM model.

Note that this report has been updated to reflect the recent changes to the aircraft movement forecast numbers in the previous report (Hobart Master Plan ANEF – Report V3). In addition to the forecast movement changes, runway departure track RN_BINIK is removed from the model as the procedure was not included in the final airspace design. Other parameters remain largely the same as the previous report.

2 Inputs and Assumptions

This section details the general settings of the INM model, as well as the inputs and parameters used. A list of the provided inputs which formed the basis of this document is detailed below.

Table 1 - List of provided inputs

Description	Received from	Date
Hobart Airport_Airside Extraction_MGA_112618.dwg	Luke Clasener	07/03/2019
Airfield Pavements - Aircraft Forecast v3 FINAL.xlsx Itinerant movements - aurecon.xlsx 20181108 HBA Forecast PPT_Revised Base Case.pptx 20181108 HBA DDFS_Revised Base Case.xlsx 20181108 HBA Forecast PPT_Revised Base Case.pptx	Luke Clasener/David Farrell	04/03/2019
Airservices new HBA procedures in pdf format	Luke Clasener	20/05/2019
HOBART_ROTORLIFT_HELIPAD_2014.pdf	Luke Clasener	10/06/2019
13014w105a Airfield Pavements - Aircraft Forecast	Luke Clasener	20/12/2019

2.1 General settings

Weather

Average weather parameters for temperature, humidity, pressure and headwind in the model were created from Bureau of Meteorology (BoM) daily observation data for the period from May 2019 – April 2018 from the nearest weather station at Hobart Airport {station 094008} based on 9AM and 3PM averages.
Weather settings are as follows:

Table 2: Weather settings

Parameter	Value
Temperature	16.9°C
Pressure	760.28 mm-Hg
Headwind	14.8 km/h

Aerodrome Reference Point (ARP)

Details of the HBA ARP is shown below:

Table 3 Hobart Airport aerodrome reference point

Description	Latitude	Longitude	Elevation (m)
ARP	-42.8361	147.5103	2.25

Runway and helipad coordinates

The airport layout used for the ANEC includes the main runway (12/30) and one helipad. It has been noted that the airside helicopter landing pad has been removed, however an alternative helicopter landing area is available nearby at the Rotorlift site. Although the landing pad has been removed, the Airservices published ERSA references the former helipad site as the aiming point for helicopter operations. Runway end coordinates are obtained from the CAD file provided by HBA on 07/03/2019 (*Hobart Airport_Airside*

Extraction_MGA_112618.dwg). Helipad coordinates are obtained from the Rotorlift survey report (*HOBART_ROTORLIFT_HELIPAD_2014.pdf*) on 10/06/2019.

Table 4 Hobart Airport runway coordinates

Runway End	Latitude	Longitude	Length/width (m)	Elevation (ft)	Displ. threshold
12	-42.8282	147.5010	2,727 x 45	12	119m
30	-42.8367	147.5317		13	-
Helipad	-42.8392	147.5006	-	13	-

Terrain

Local terrain data has been sourced from NASA's Shuttle Radar Topography Mission (SRTM) and was imported into the INM noise model.

2.2 Traffic

RPT and Non-RPT forecast traffic movements were provided by Hobart Airport on 04/03/2019; detailing the predicted number of movements for a long-term timeframe. The standard 20-year forecasted movements in this study is expected to be 55,162 total aircraft movements. The total forecasted movements include Helicopter traffic, which is derived from a simple linear growth model based on historic movements from 2010-2014.

The envisaged proportion of each category of aircraft is detailed in Table 5 below. Further details of movement numbers are shown in Appendix A: Forecast input.

Table 5 – Approximate aircraft category proportions

Category	Type	INM Representative	Share	Average annual day movements in 2040
RPT	B737-800	737800	33.18%	50.14
	A320-211	A320-211	16.59%	25.07
	A321-232	A321-232	16.59%	25.07
	B737-800	737800	1.54%	2.00
	A350	7878R	3.08%	2.82
ARCTIC	A320-211	A320-211	0.51%	0.77
	C17	C17	0.54%	0.82
Freight	Metroliner	1900D	0.30%	0.46
	B737-800	737800	0.76%	1.15
	A330-200	A330-301	0.32%	0.48
	777300	777300	0.32%	0.48
Other	BE20	1900D	2.04%	3.08
	Bombardier650	BD700	0.57%	0.86
	B737-800	737800	0.38%	0.58
Helicopter	Bell 206 JetRanger	B206L	5.84%	8.83

	Sikorsky Seaking S61	S61	6.18%	9.34
	Eurocopter AS350	EC130	6.64%	10.04
		Totals	**100%**	**141.97**

Aircraft mix and INM representative

A large number of unique aircraft types currently operate at HBA. These unique aircraft types are assigned into a representative INM aircraft type based on size, performance, type and number of engines. To70 will model the forecast aircraft data using INM equivalents detailed in Table 6 below. Note that all helicopters have been modelled with helicopter substitutions of similar nature due to the lack noise data for the forecasted helicopters in INM. This has been acknowledged as a known limitation in INM.

Table 6 - INM Aircraft representatives

Aircraft in Forecast	Aircraft representative in INM	INM description
B737-800	737800	Boeing 737-800
A320-211	A320-211	Airbus A320-211
A321-232	A321-232	Airbus A320-232
A350	7878R	Boeing 787-8R
7878R	7878R	Boeing 787-8R
777300	777300	Boeing 777-300
C17	C17	Boeing C17 Globemaster
Metroliner	1900D	Beech 1900D
A330-200	A330-301	Airbus A330-301
777300	777300	Boeing 777-300
BE20	1900D	Beech 1900D
Bombardier650	GV	Gulfstream GV
Bell 206 JetRanger	B206B3	Bell 206B-3
Sikorsky Seaking S61	B430	Bell 430
Eurocopter AS350	EC130	EuroCopter EC-130

Usage splits

The following runway utilisation proportions based on the previous HBA ANEF study in the 2015 Hobart Airport Master Plan, which should be also based on observation of predominant wind direction, shown in Table 7.

Table 7 - Runway usage split

Runway	Usage proportion
12	46.8%
30	53.2%

Day and night operations

INM calculations weigh night-time flights more heavily than day-time flights. Daytime operations are defined as 0700-1900 and night-time is defined as 1900-0700 in the ANEF system. To accurately model noise impacts, a day / night split of operations was defined, shown in Table 8. The day and night movement proportions are based on the previous HBA ANEF study and design day RPT schedule provided by HBA on 04/03/2019.

Table 8 - Daytime and night-time operation split

Description	Proportion
Day	78.1%
Night	21.9%

Tracks and usage

This section shows the expected flight paths at HBA. The tracks were created from the new flight procedures received from Airservices Australia and HBA on 20/05/2019. Departure tracks are dispersed by 0.5NM in order to emulate the typical departure track spread. Arrival Tracks are not dispersed on the basis that they are strictly controlled. The figures below detail the tracks that are used in the INM model.

Note that the runway 12 RNAV-Z flight path has been left out of the model and is represented by VORZ_DCT track in order to simplify similar flight paths.

Airservices have introduced the Hobart Airspace Review on the 06/11/19 and have advised that the RN_BINIK departure track on Runway 30 will not be included in the final airspace design, as well as the addition of two flight procedures. The review also introduced two new flight paths; IPLET Five Victor and MORGO One Victor arrivals for runway 30. For simplicity, these flight paths will be represented by the IPLET_5W and MORGO_1W tracks due their similarities.

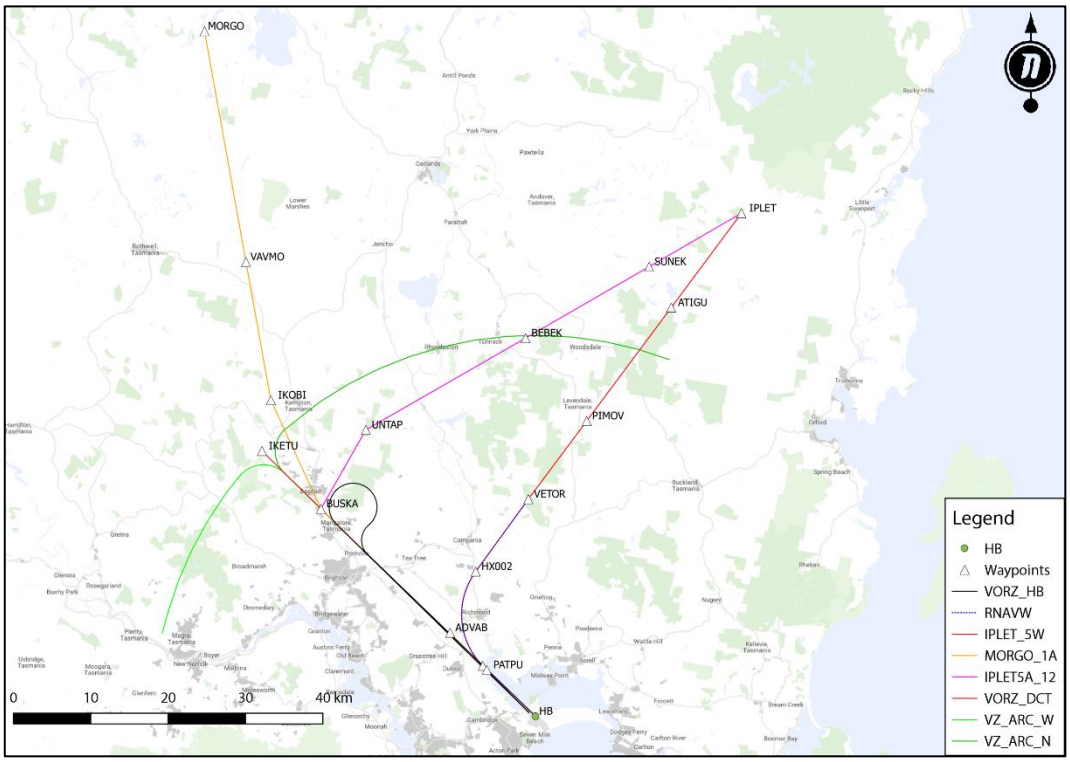


Figure 1 - Runway 12 Arrival tracks

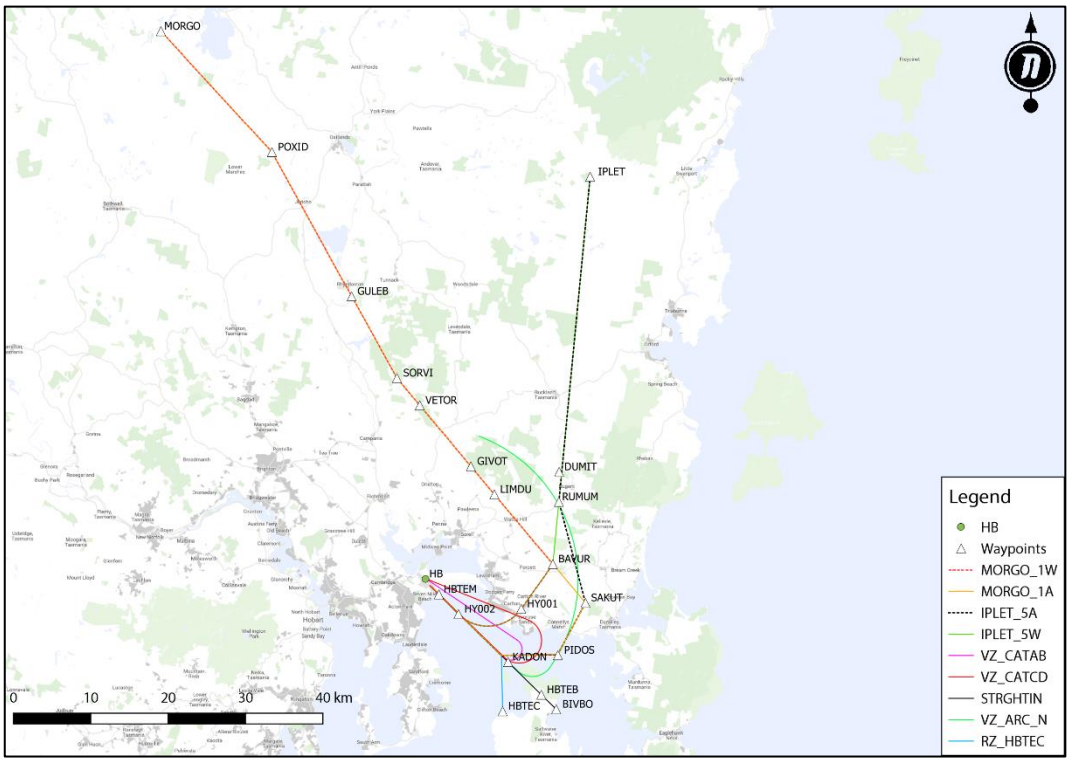


Figure 2 - Runway 30 Arrival tracks

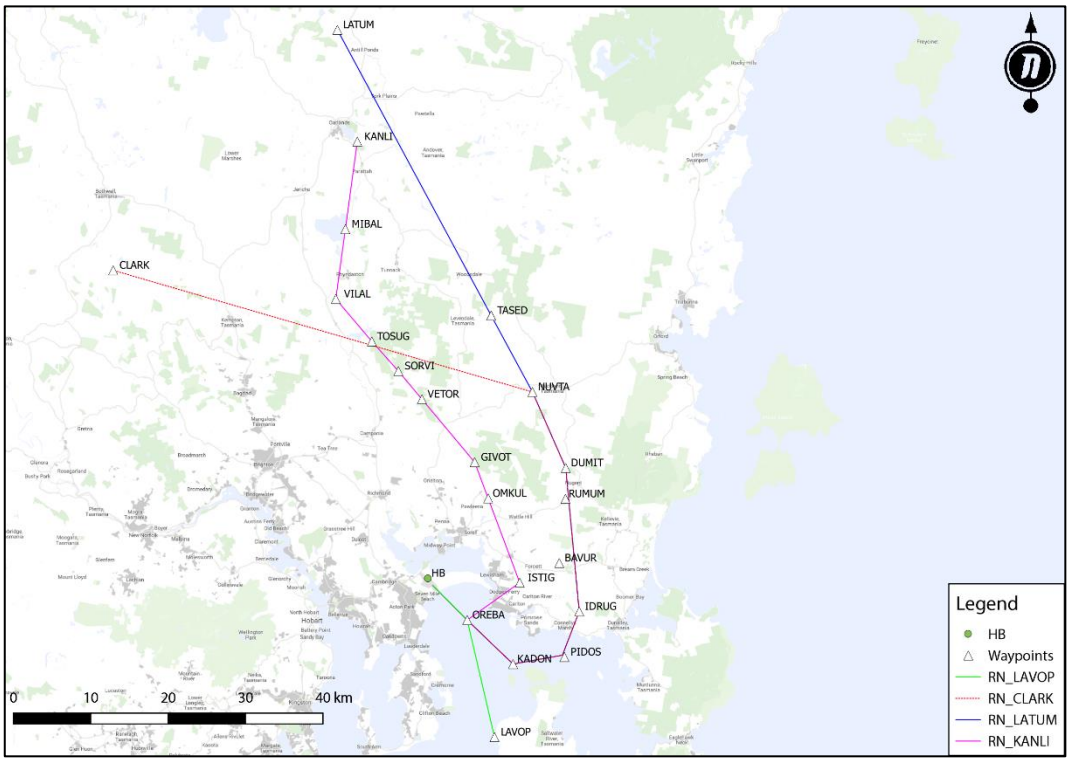


Figure 3 - Runway 12 Departure tracks

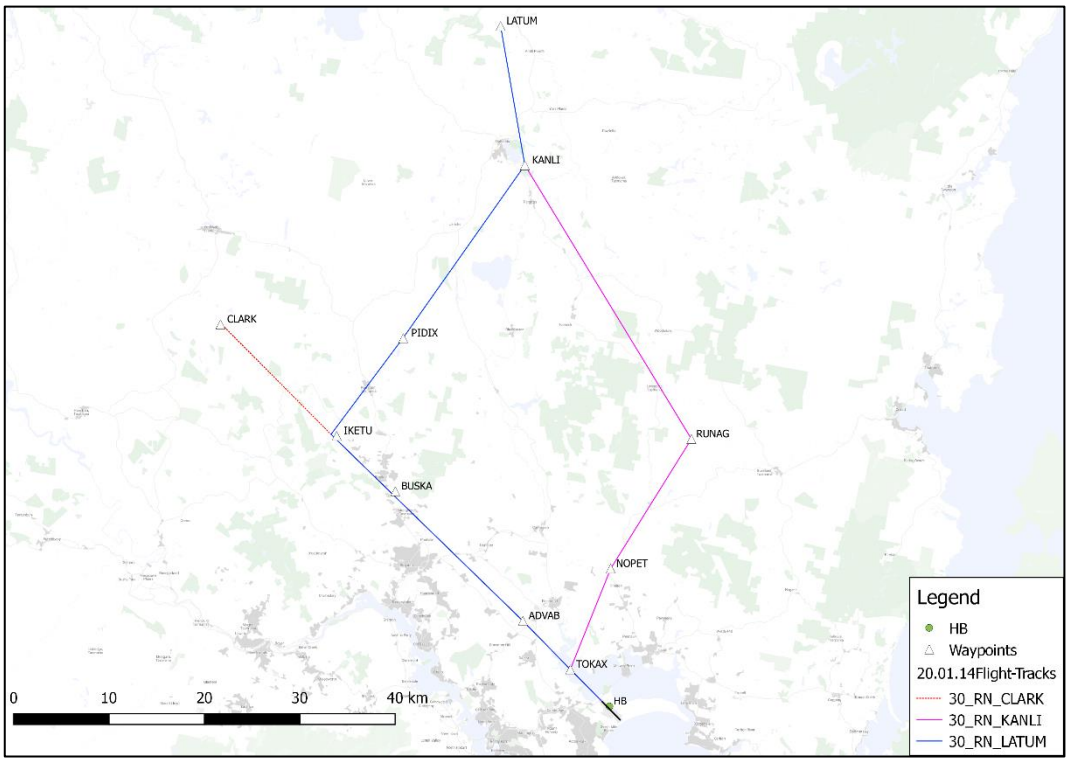


Figure 4 - Runway 30 Departure tracks

Figure 5 - Helicopter Departure and Arrival Tracks

2.3 Origin/Destination distribution

The following city pairings are based on a design day schedule provided by HBA on 04/03/2019. Table 9 shows the origin/destination pairs and stage length and the percentage of flights that go to/come from the airport. Flight track allocation is based on the city pairings, as well as aircraft type and stage length. The tracks have been allocated based on the direction of the flight paths with respect to the city pairings.

Note that due to the change in forecasted numbers received on 20/12/19, a number of international flights have been removed. Due to the removed flights, the city pair allocations have shifted slightly compared to the previous city pairs in the previous iteration of the study (Hobart ANEF – report V3).

Table 9 – Origin/Destination distribution

City Pair	Stage length	Percentage of flights
Adelaide	2	6.34%
Auckland	3	2.54%
Brisbane	2	7.61%
Canberra	1	5.07%
Christchurch	3	2.54%
Cairns	4	5.07%
Melbourne/Hong Kong	6	1.27%
Melbourne	1	27.89%
Nadi	4	2.54%
Newcastle	2	2.54%

City Pair	Stage length	Percentage of flights
Gold Coast	2	8.87%
Beijing	7	1.27%
Perth	4	5.07%
Shanghai	7	1.27%
Singapore	6	1.27%
Sydney	2	17.75%
Arctic	4	1.12%

3 Results

This section details the results of the noise modelling and provides a description of the metrics used to generate the noise contours. To70 has generated the following contours for HBA:

- Standard 20-year ANEC
- N-contours day (N60, N65, N70) and night (N60)

3.1 ANEC results

ANEC contours are used to quantify the noise impact of airport development scenarios. These maps are based on assumptions about the size, shape and demand of aircraft and airport operations, and can relate to the distant future. Because the concepts and scenarios are hypothetical and may never occur, the maps produced have no official status for land-use planning purposes. The ANEC uses the Effective Perceived Noise Level (EPNL) which applies a weighting to account for the fact that by the human ear is less sensitive to low audio frequencies.

The 20 ANEC contour is located away from most noise sensitive areas. The 2020 ANEC contour is similar to the previous ANEF contour generated in 2014 for the 2035 forecast and similar in shape for the Ultimate ANEF. These differences are due to the change in flight tracks and differences in the annual forecast. One of the more significant differences in the 2020 ANEC is the additional isolated contours in the North-Western direction of HBA shown in Figure 6. These isolated contours are caused by the elevated terrain in the area. The ANEC contour is presented in Figure 7.

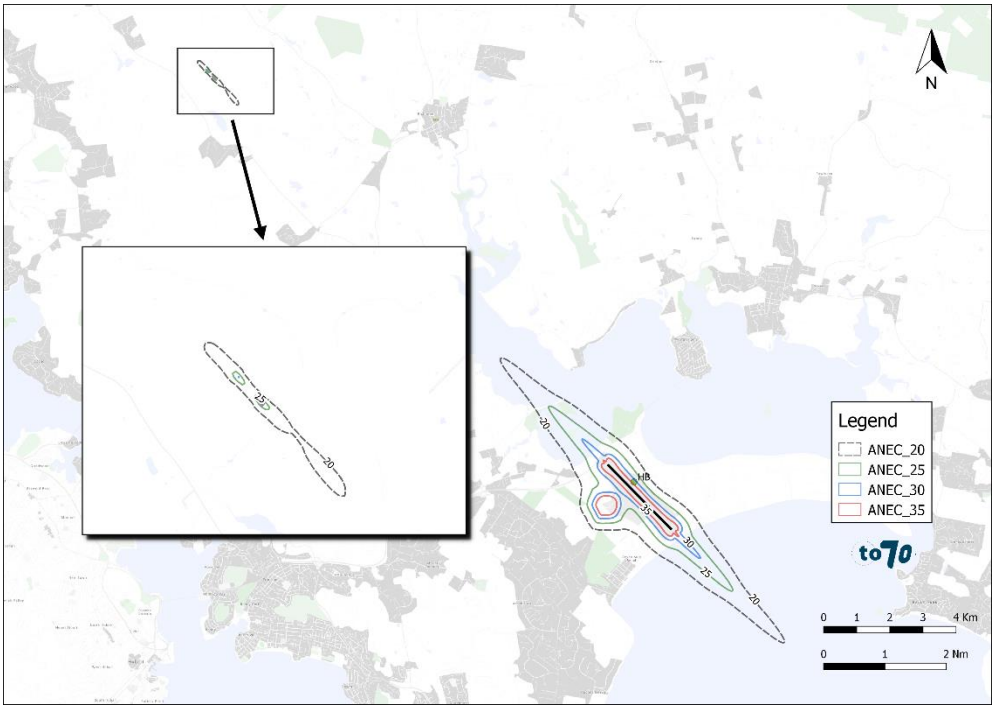


Figure 6 - ANEC isolated contours

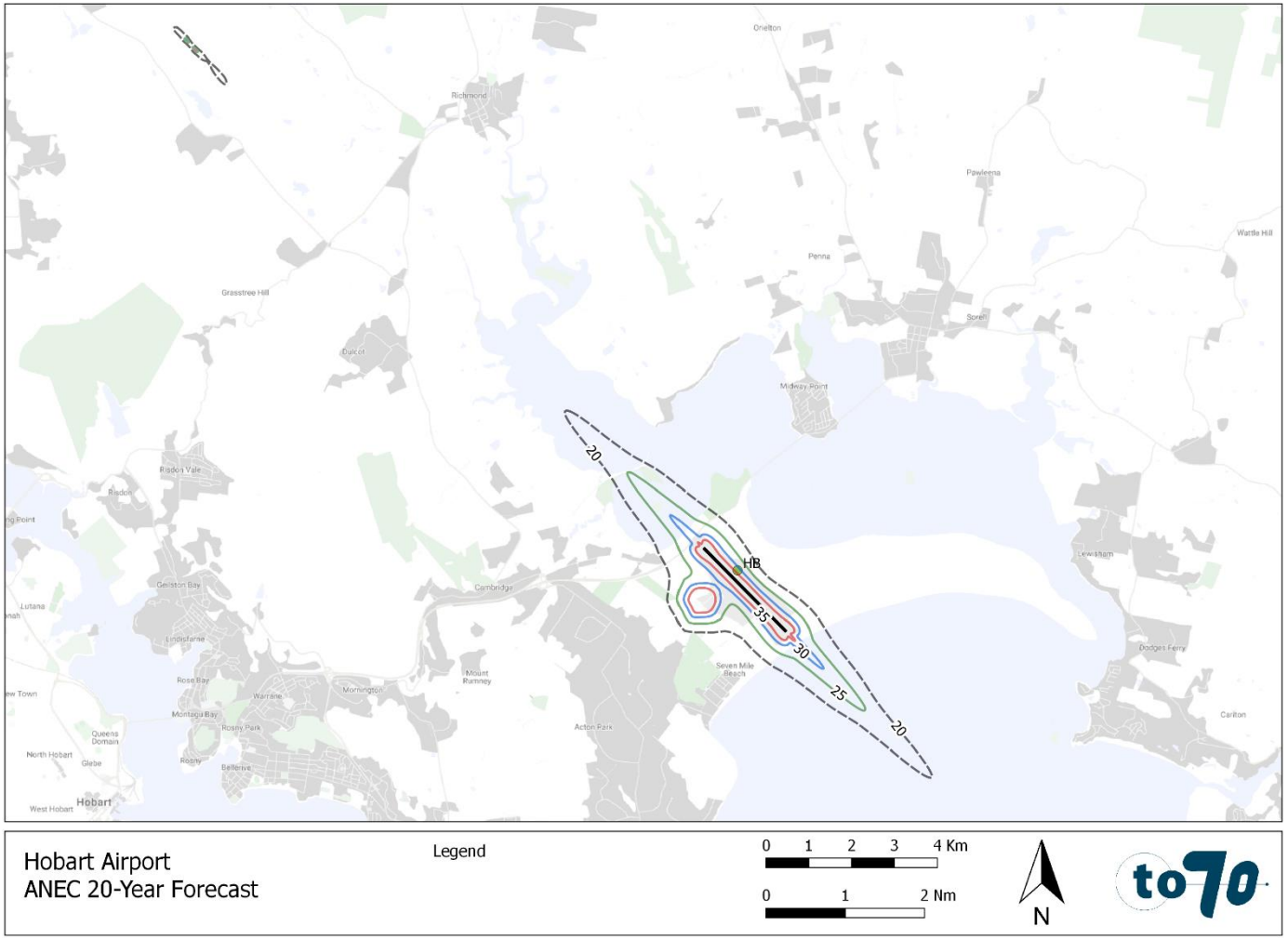


Figure 7 - Standard 20-year ANEC contour

Appendix A: Forecast input

Runway/Helipad	Aircraft	Arrivals		Departures		Totals
		Day	Night	Day	Night	
Runway 12	Metroliner	0.56	0.16	0.73	0.20	1.66
	Boeing 737-800	9.85	2.75	9.85	2.75	25.20
	Boeing 777-300	0.09	0.02	0.09	0.02	0.22
	Boeing 787-8R	0.51	0.14	0.51	0.14	1.32
	Airbus A320-211	4.72	1.32	4.72	1.32	12.09
	Airbus A320-232	4.58	1.28	4.58	1.28	11.73
	Airbus A330-301	0.09	0.02	0.09	0.02	0.22
	Boeing C17 Globemaster	0.15	0.04	0.15	0.04	0.38
	Gulfstream GV	0.16	0.04	0.16	0.04	0.40
	Totals	**20.72**	**5.79**	**20.88**	**5.84**	**53.23**
Runway 30	Metroliner	0.64	0.18	0.83	0.23	1.89
	Boeing 737-800	11.20	3.13	11.20	3.13	28.66
	Boeing 777-300	0.10	0.03	0.10	0.03	0.26
	Boeing 787-8R	0.59	0.16	0.59	0.16	1.50
	Airbus A320-211	5.37	1.50	5.37	1.50	13.75
	Airbus A320-232	5.21	1.46	5.21	1.46	13.34
	Airbus A330-301	0.10	0.03	0.10	0.03	0.26
	Boeing C17 Globemaster	0.17	0.05	0.17	0.05	0.44
	Gulfstream GV	0.18	0.05	0.18	0.05	0.46
	Totals	**23.56**	**6.59**	**23.75**	**6.64**	**60.54**
Helipad	Bell 206B-3	3.45	0.96	3.45	0.96	8.83
	Bell 430	3.65	1.02	3.65	1.02	9.34
	EuroCopter EC-130	3.92	1.10	3.92	1.10	10.04
	Totals	**11.02**	**3.08**	**11.02**	**3.08**	**28.20**
	Grand Total	**55.29**	**15.46**	**55.65**	**15.56**	**141.97**

Note: values are in annual average day movements.

Appendix B: Assigned Tracks by Aircraft

Track	1900D	737800	777300	7878R	A320-211	A321-232	A330-301	C17	GV
12									
IPLET_5A	✓	✓	✓	✓	✓	✓	✓		✓
IPLET_5W	✓	✓	✓	✓	✓	✓	✓		✓
MORGO_1A	✓	✓	✓	✓	✓	✓	✓		✓
RN_CLARK	✓	✓	✓	✓	✓	✓	✓		✓
RN_KANLI	✓								
RN_LATUM		✓	✓	✓	✓	✓	✓		✓
RN_LAVOP		✓	✓	✓	✓	✓	✓	✓	✓
VORZ_DCT		✓	✓	✓	✓	✓	✓		✓
VZ_ARC_N		✓	✓	✓	✓	✓	✓		✓
VZ_ARC_W					✓			✓	
30									
IPLET_5A	✓	✓	✓	✓	✓	✓	✓		✓
IPLET_5W	✓	✓	✓	✓	✓	✓	✓		✓
MORGO_1A	✓	✓	✓	✓	✓	✓	✓		✓
MORGO_1W	✓	✓	✓	✓	✓	✓	✓		✓
RN_CLARK	✓	✓	✓	✓	✓	✓	✓	✓	✓
RN_KANLI	✓	✓	✓	✓	✓	✓	✓		✓
RN_LATUM		✓	✓	✓	✓	✓	✓		✓
RNAVW		✓	✓	✓	✓	✓	✓		✓
RZ_HBTEC					✓			✓	
STRGHTIN		✓	✓	✓	✓	✓	✓		✓
VZ_ARC_N		✓	✓	✓	✓	✓	✓		✓
VZ_BIVBO					✓			✓	
VZ_CATCD		✓	✓	✓	✓	✓	✓		✓
VZ_CATAB	✓								

Appendix C: Track allocation

Row Labels	Allocation
12	**46.79%**
A	**23.32%**
IPLET_5A	5.19%
IPLET_5W	5.19%
MORGO_1A	7.26%
VORZ_DCT	0.49%
VZ_ARC_N	0.29%
VZ_ARC_W	0.26%
HELI_A_E	4.65%
D	**23.47%**
RN_CLARK	1.60%
RN_KANLI	0.63%
RN_LATUM	14.88%
RN_LAVOP	1.71%
HELI_D_W	4.65%
30	**53.21%**
A	**26.52%**
IPLET_5A	5.73%
IPLET_5W	5.73%
MORGO_1A	4.16%
MORGO_1W	4.16%
RNAVW	0.33%
RZ_HBTEC	0.15%
STRGHTIN	0.33%
VZ_ARC_N	0.22%
VZ_BIVBO	0.15%
VZ_CATAB	0.04%
VZ_CATCD	0.22%
HELI_A_W	5.28%
D	**26.69%**
RN_CLARK	2.81%
RN_KANLI	16.27%
RN_LATUM	2.33%
HELI_D_E	5.28%
Grand Total	**100.00%**

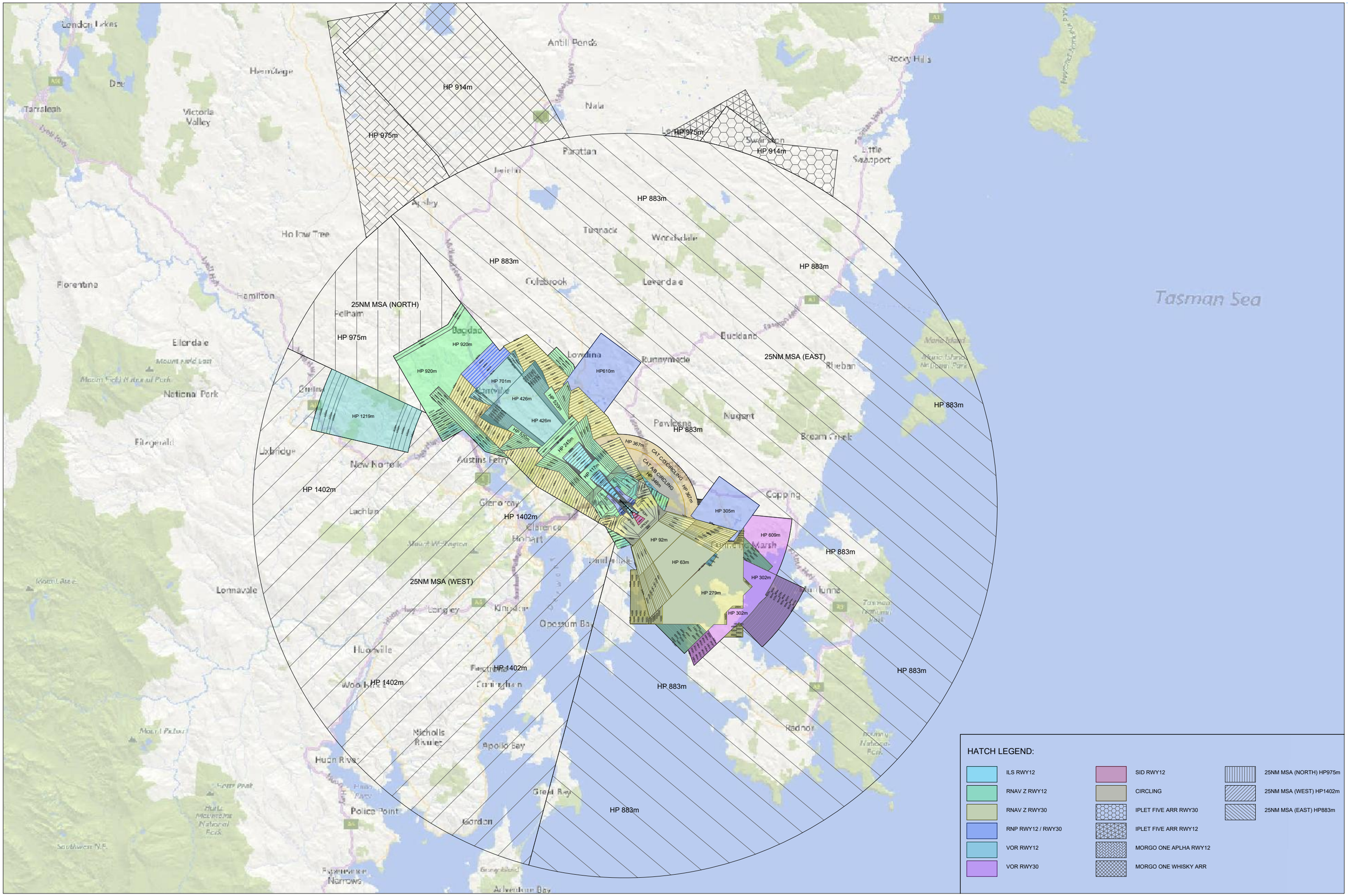
Appendix D: Capacity

The ultimate capacity of the runway system at Hobart Airport has been assessed using the FAA Annual Service Volume (ASV) methodology found in Chapter 2 of FAA Advisory Circular AC 150/5060-5 Airport Capacity and Delay. Details of the calculations are as follows:

- The aircraft mix is approximately 96% Class C aircraft and 4% Class D aircraft
- The mix index as defined by %(C+3D) equates to 108%
- Hobart Airport is assumed to be using runway use configuration No. 1 (from Figure 2-1 of AC 150/5060-5)
- This equates to the capacity of 210,000 operations per year

NO.	Runway-use Configuration	Mix Index %(C+3D)	Hourly Capacity Ops/Hr VFR	IFR	Annual Service Volume Ops/Yr
1.		0 to 20	98	59	230,000
		21 to 50	74	57	195,000
		51 to 80	63	56	205,000
		81 to 120	55	53	210,000
		121 to 130	51	50	240,000

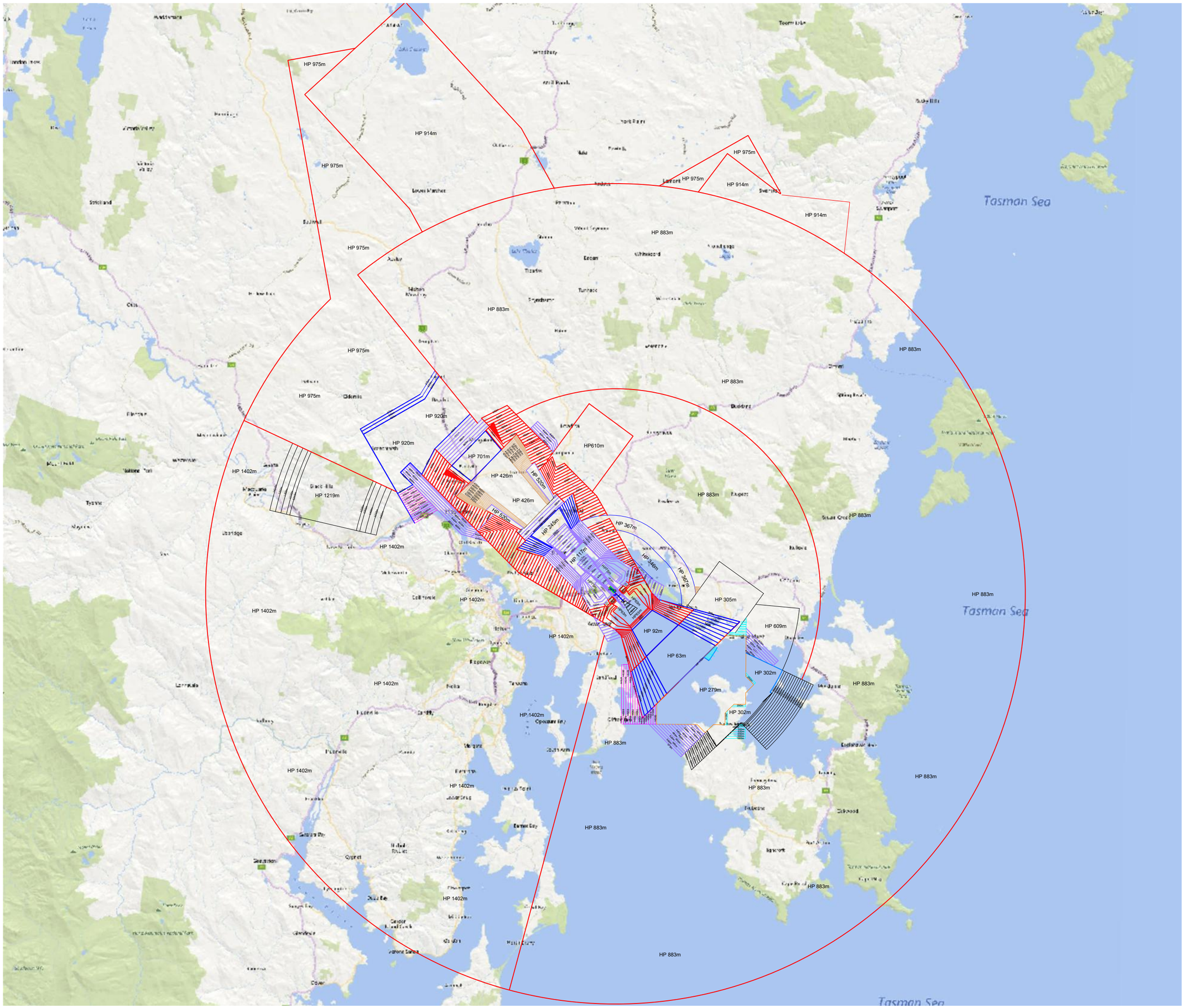
Figure 8 - Runway use configuration definition from Figure 2-1 of AC 150/5060-5



COMMERCIAL IN CONFIDENCE

DISCLAIMER:

PROJECT HOBART AIRPORT 2020 MP AIRSPACE PROTECTION	DRAWING GENERAL PLAN - MASTER PLAN 2020 PANS OPS SURFACES	SHEET NO. LB100		SCALE @ A3 1 : 5000	DATE 1 JULY 2019 Revision Date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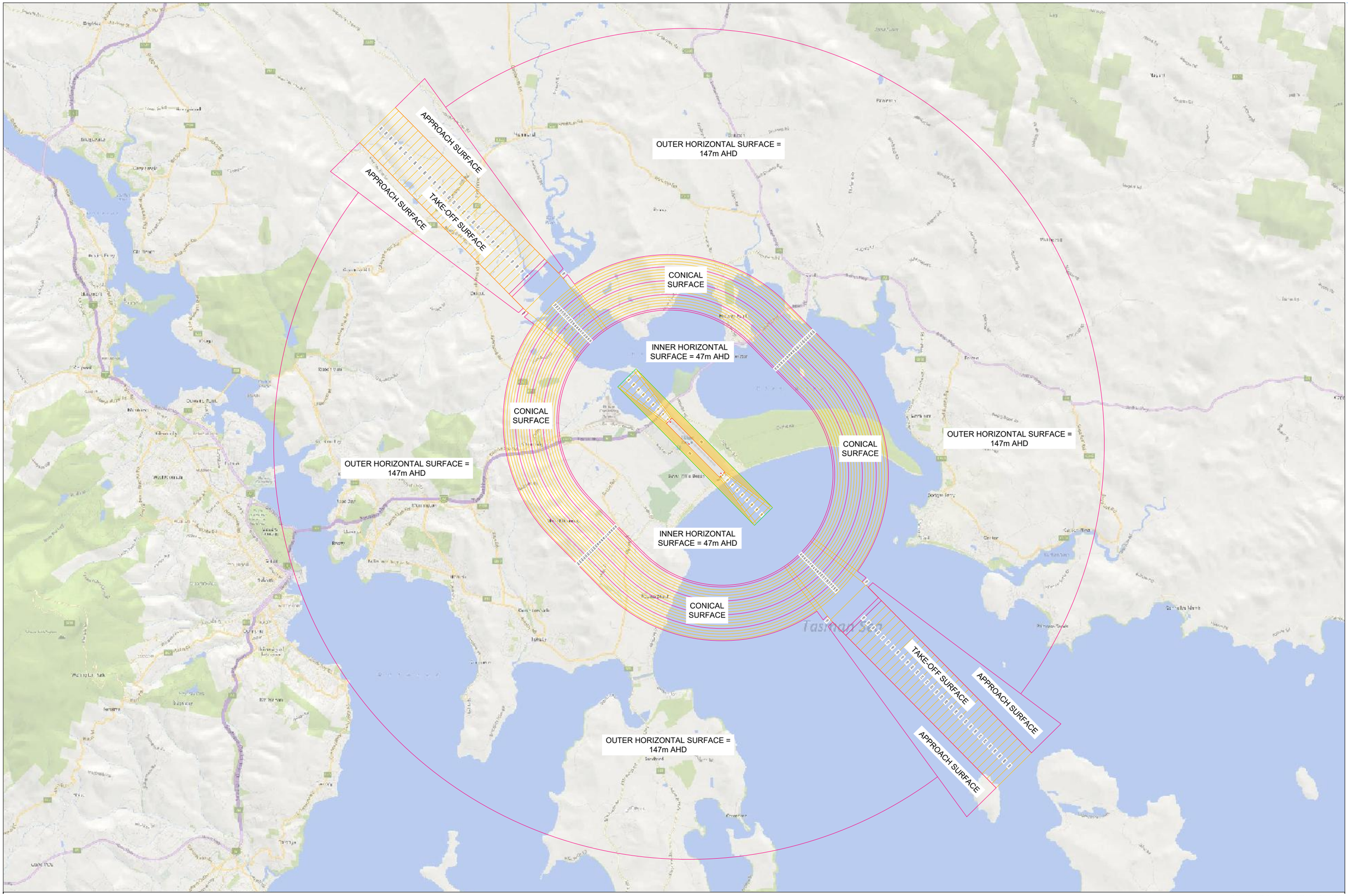

COMMERCIAL IN CONFIDENCE

DISCLAIMER:

PROJECT HOBART AIRPORT 2020 MP AIRSPACE PROTECTION	DRAWING GENERAL PLAN - MASTER PLAN 2020 OLS	SHEET NO. LB200		SCALE @ A3 1 : 5000	DATE 12 Feb 2020 Revision Date