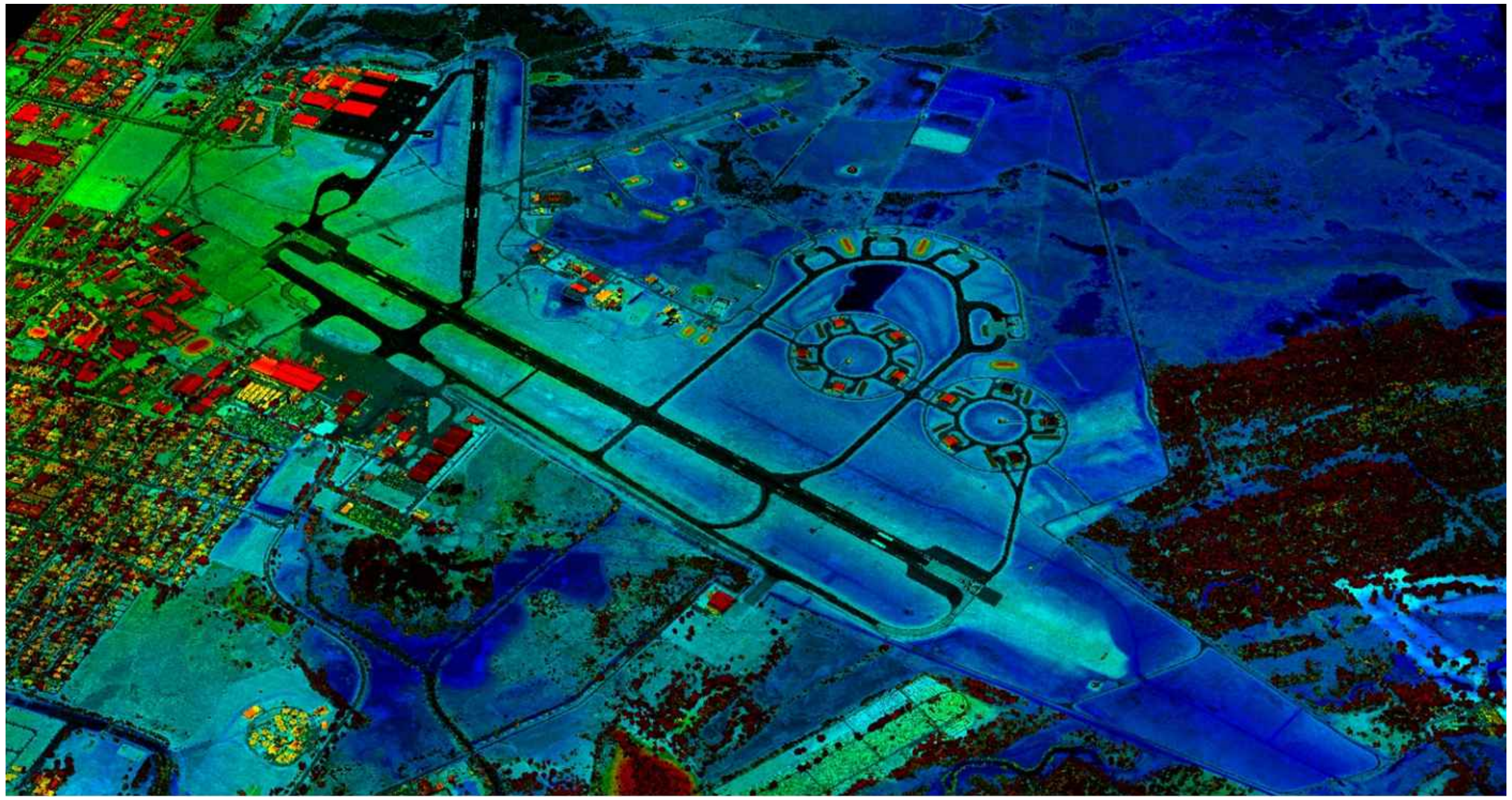
OBSTACLE LIMITATION SURVEYS AND ASSESSMENT

RWY01 ONLY (DISP THR 19 - BASED ON 478m DISPLACEMENT TO THR19)

RAAF BASE TOWNSVILLE
AERODROME OBSTACLE CHART ICAO TYPE A
(OPERATING LIMITATIONS) ISSUED NOVEMBER 2025



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REV	DATE	REVISION DETAILS	APPROVED
A	24.11.25	FOR REVIEW	DG
B	28.11.25	FOR ISSUE	DG

SCALE	SIZE
AS SHOWN	A1/A3

DRAWN: MH
SURVEYED: KI/MH/AAM
CHECKED: GH

FOR ISSUE
NOT FOR CONSTRUCTION

APPROVED: DANIEL GEEVES
DATE: 28/11/2025

PROJECT: OBSTACLE LIMITATION SURVEYS AND ASSESSMENT
RAAF BASE TOWNSVILLE

TITLE: AERODROME OBSTACLE CHART ICAO TYPE A
(OPERATING LIMITATIONS) ISSUED NOVEMBER 2025
COVER SHEET

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	SITE	NUMBER	REV
	521277	P0012	DRG	UU	TVL	001	B

DECLARED DISTANCES FOR RUNWAY 01	
TAKE OFF RUN AVAILABLE (TORA)	1960m (6430')
TAKE OFF DISTANCE AVAILABLE (TODA)	2020m (6627')
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)	1960m (6430')
LANDING DISTANCE AVAILABLE (LDA)	1960m (6430')
SUPPLEMENTARY TAKE OFF DISTANCE AVAILABLE (STODA)	1994m (6541') 5.0%

NOTE: ARRESTOR SYSTEM COMPONENTS LOCATED IN THE CLEARWAY, THEREFORE THE TODA GRADIENT CANNOT BE PUBLISHED

LEGEND

LOWEST SURVEYED SLOPE

GROUND LEVEL

MOST LIMITING OBSTACLE

OBSTACLE

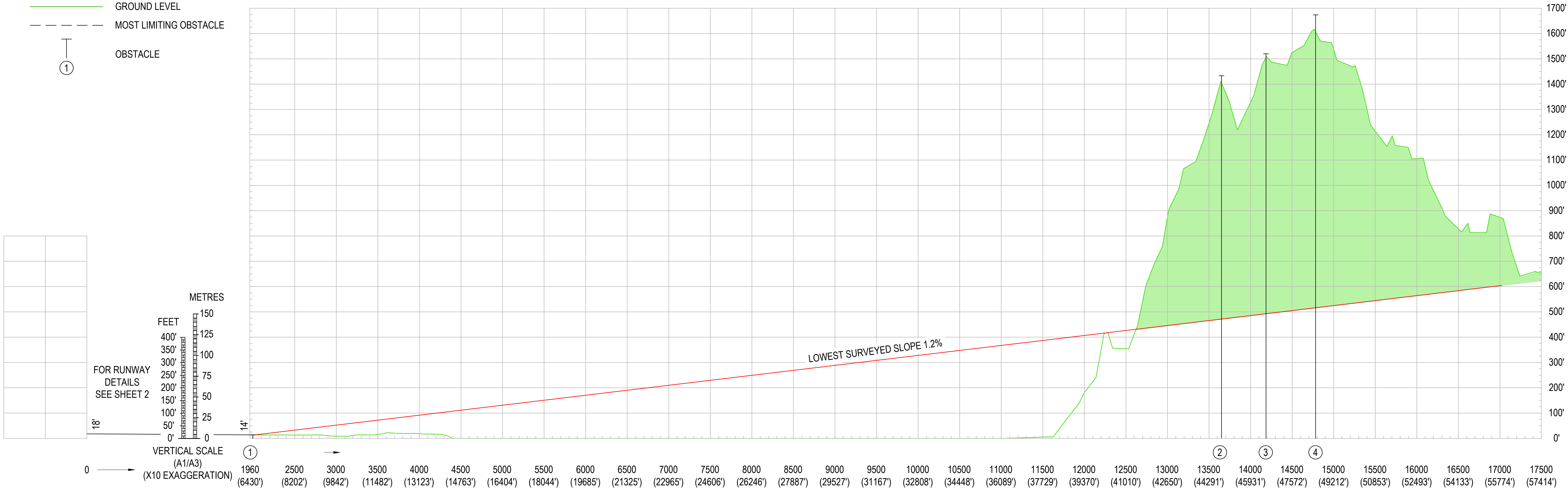
NOTES

1. AZIMUTH AND COORDINATES FOR THIS SURVEY ARE BASED ON MGA (GDA2020) ZONE 55 THE VERTICAL DATUM BEING AHD.
2. HORIZONTAL DIMENSIONS IN METRES (FEET) ELEVATIONS IN FEET
3. USERS OF THIS CHART SHOULD NOTIFY ANY ERRORS OR OMISSIONS AS SOON AS THEY BECOME APPARENT TO :
AERONAUTICAL INFORMATION SERVICE – AIR FORCE
EMAIL: AIS.AF@DEFENCE.GOV.AU
4. FOR FURTHER INFORMATION REGARDING THIS CHART CONTACT THE ABOVE
5. MAGNETIC VARIATION 7°15' E (OCTOBER 2025)
6. AERIAL SURVEY COMPLETED OCTOBER 2022. GROUND SURVEY CHECKS AND VERIFICATION OCTOBER 2025.

LEGEND

OBSTRUCTIONS AND OBSTACLES

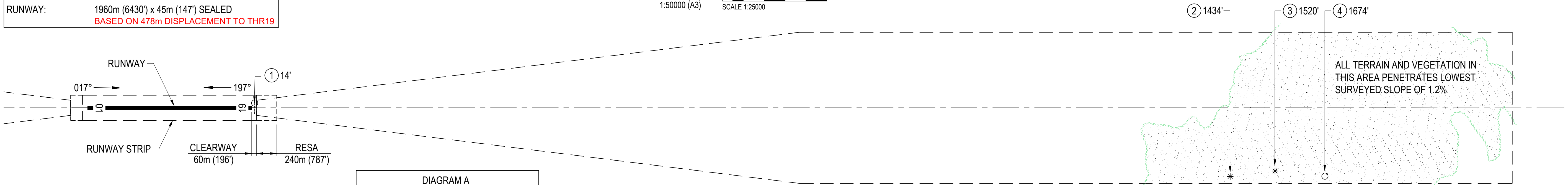
OBJECT NUMBER	ANTENNA
392' TOP ELEVATION IN FEET	MOVING (ROADS, RAILWAY TRACKS ETC)
TREE(S) OR VEGETATION	TERRAIN PENETRATING LOWEST SURVEYED SLOPE (ELEVATION)
BUILDING OR LARGE STRUCTURE	OVERHEAD TRANSMISSION LINE
POLE, TOWER, SPIRE, POST ETC	FENCE LINE
	TERRAIN PENETRATING LOWEST SURVEYED SLOPE (PLAN)

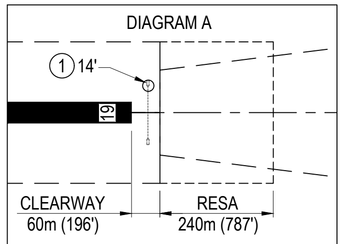


RUNWAY 01 (CODE 4)

RUNWAY STRIP:	2080m (6824') x 300m (984')
RUNWAY:	1960m (6430') x 45m (147') SEALED BASED ON 478m DISPLACEMENT TO THR19

1:25000 (A1)
1:50000 (A3)
SCALE 1:25000





CLEARWAY DETAIL
NOT TO SCALE

RUNWAY 01 SURVEY HAS BEEN ASSESSED BASED ON THE FOLLOWING "CODE 4" TAKE-OFF PARAMETERS:
LENGTH OF INNER EDGE - 180m
RATE OF DIVERGENCE (EACH SIDE) - 12.5%
FINAL WIDTH - 1800m
OVERALL LENGTH - 15000m

KEY DIAGRAM

THE TYPE A SURVEY HAS BEEN CONDUCTED IN ACCORDANCE WITH ICAO ANNEX 4 AND DEPARTMENT OF DEFENCE REQUIREMENTS. THE CHART CLEARLY SHOWS THE GRAPHICAL RESULTS OF THE SURVEY AND HAS BEEN CHECKED FOR ACCURACY AND COMPLETENESS OF INFORMATION. THE CHART IS CERTIFIED CORRECT FOR PUBLICATION.

DANIEL GEEVES
REGISTERED SURVEYOR
aurecon

DATE 28/11/2025

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SCALE	AS SHOWN
SIZE	A1/A3
DRAWN	MH
SURVEYED	KI/MH/AAM
CHECKED	GH

FOR ISSUE
NOT FOR CONSTRUCTION

APPROVED
DATE 28/11/2025
DANIEL GEEVES

PROJECT	OBSTACLE LIMITATION SURVEYS AND ASSESSMENT RAAF BASE TOWNSVILLE
TITLE	AERODROME OBSTACLE CHART ICAO TYPE A (OPERATING LIMITATIONS) ISSUED NOVEMBER 2025 RUNWAY 01 - SHEET 1 OF 2

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	SITE	NUMBER	REV
	521277	P0012	DRG	UU	TVL	002	B

DEPARTMENT OF DEFENCE

SECURITY AND ESTATE GROUP

AERODROME OBSTACLE CHART - ICAO TYPE A (OPERATING LIMITATIONS) NOVEMBER 2025, COMPILED BY AURECON

TO BE READ IN CONJUNCTION WITH CURRENT NOTAMs

THE ORIGIN OF THE TAKE OFF SURFACE IS LOCATED AT THE END OF THE CLEARWAY.
DISTANCES COMMENCE FROM THE RAAF RE-PSM AT THE START OF THE TAKE-OFF RUNWAY (SOT)

DATUM

AZIMUTH AND COORDINATES FOR THIS SURVEY ARE BASED ON MGA (GDA2020) ZONE 55
THE VERTICAL DATUM BEING AHD.

DEFINITIONS

- RE-PSM: RUNWAY END PERMANENT SURVEY MARK
- LENGTH OF INNER EDGE 180m
- RATE OF DIVERGENCE OF SPLAY (EACH SIDE) 12.5%
- FINAL WIDTH 1800m
- OVERALL LENGTH 15000m

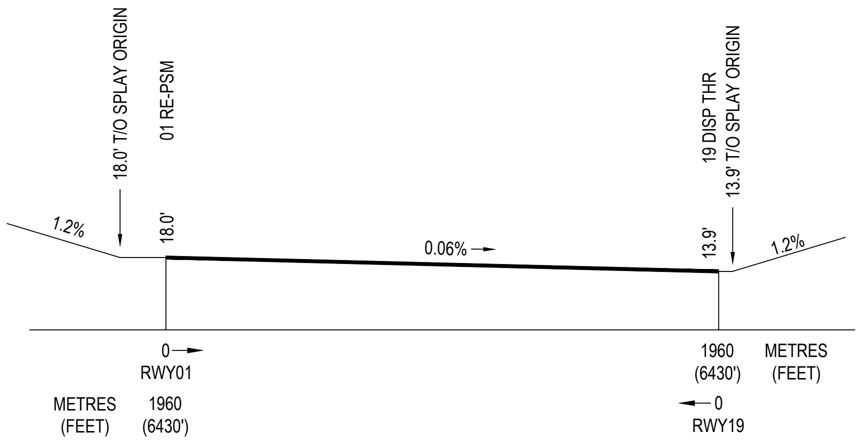
01 TAKE OFF - BASED ON 478m DISPLACEMENT TO THR19

REPSM AT START OF TORA (REPSM 01)

GEOGRAPHIC								MGA 2020 ZONE 55		ELEVATION		RUNWAY MAGNETIC BEARING			TORA		TODA		ELEVATION AT T.O. ORIGIN	
LAT				LONG				EASTING	NORTHING	(m AHD)	(Ft)	(DEG)	(MIN)	(SEC)	(m)	(Ft)	(m)	(Ft)	(m)	(Ft)
DECIMAL DEG	(DEG)	(MIN)	(SEC)	DECIMAL DEG	(DEG)	(MIN)	(SEC)													
-19.2582886	-19°	15'	29.839"	146.7647287	146°	45'	53.023"	475276.12	7870576.34	5.5	18.0	16°	54'	01"	1960	6430	2020	6627	4.2	13.9

OBJECTS THAT APPEAR ON THE CHART

REF No.	GEOGRAPHIC								MGA		ELEVATION TOP		TYPE OF OBSTACLE	DISTANCE FROM SOT		OFFSET			GRADIENT TO TOP
	LAT				LONG				EASTING	NORTHING									
	DECIMAL DEG	(DEG)	(MIN)	(SEC)	DECIMAL DEG	(DEG)	(MIN)	(SEC)			(m AHD)	(Ft)		(m)	(Ft)	(m)	(Ft)	LEFT/RIGHT	%
1	-19.241624	-19°	14''	29.85"	146.772004	146°	46''	19.22"	476038.27	7872421.29	4.3	14.0	ARRESTOR EQUIPMENT	1996.1	6549.0	57.0	186.9	L	-
2	-19.148744	-19°	08'	55.47"	146.824945	146°	49'	29.80"	481591.93	7882704.96	436.9	1433.4	TERRAIN/TREE	13655.4	44801.3	817.9	2683.5	R	3.72
3	-19.144090	-19°	08'	38.72"	146.826470	146°	49'	35.29"	481751.70	7883220.16	463.3	1519.9	TERRAIN/TREE	14191.2	46559.0	753.6	2472.4	R	3.77
4	-19.139400	-19°	08'	21.83"	146.829321	146°	49'	45.55"	482051.09	7883739.39	510.2	1673.9	TERRAIN/TWR - MAGNETIC IS.	14787.6	48515.8	815.1	2674.2	R	3.96



01 RWY LONGITUDINAL SECTION

BASED ON 478m DISPLACEMENT TO THR19

NOT TO SCALE

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DANIEL GEEVES
REGISTERED SURVEYOR
aurecon

28/11/2025
DATE

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SCALE	SIZE
AS SHOWN	A1/A3

DRAWN: MH
SURVEYED: KI/MH/AAM
CHECKED: GH

FOR ISSUE
NOT FOR CONSTRUCTION

APPROVED
DATE 28/11/2025
DANIEL GEEVES
-
-

PROJECT: OBSTACLE LIMITATION SURVEYS AND ASSESSMENT RAAF BASE TOWNSVILLE

TITLE: AERODROME OBSTACLE CHART ICAO TYPE A (OPERATING LIMITATIONS) ISSUED NOVEMBER 2025 RUNWAY 01 - SHEET 2 OF 2

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	SITE	NUMBER	REV
	521277	P0012	DRG	UU	TVL	003	B

Project Number and Title	**521277 P0012 DISP THR 19 Type A Chart** **RAAF Base Townsville** **Obstacle Chart ICAO Type A (Operating Limitations) – Survey Report Issued 28/11/2025**

Purpose and Scope

This report contains the supporting survey information relating to the Aerodrome Obstacle Chart Type A (Operating Limitations) for RAAF Base Townsville completed and signed in November 2025 by Aurecon.

The information obtained from these surveys is used for the compilation of Type A (Operating Limitations) Charts to be used by flight planners to determine the maximum performance of aircraft on take-off, in recognition of existing obstacles within the take-off area on nominated runways.

Note: This report and corresponding chart are for RWY 01 only with the runway 19 threshold being displaced 478m during the construction of the runway extension.

Methodology

The runway at RAAF Base Townsville was surveyed by ground instrument equipment and combined with aerial survey and assessed based on the following classification and physical characteristics:

- Runway 01 (RWY 01) – Code 4, Instrument, Precision Runway.
- Not Assessed – Runway 19 (RWY 19) – Code 4, Instrument, Non-Precision Runway.
- Not Assessed – Runway 07 (RWY 07) – Code 2, Instrument, Non-Precision Runway.
- Not Assessed – Runway 25 (RWY 25) – Code 2, Non-Instrument Runway.

The survey captured all objects and structures which project above a plane surface having a 1.2% slope in accordance with ICAO Annex 4, subject to applying shielding principles. If no objects were detected above the 1.2% plane surface, the plane was surveyed down to 1.0%.

The field survey was completed in October 2025 to support and update the aerial Light Detection and Ranging (LiDAR) survey which was captured in October 2022. The field survey also checked for any thin antennas, aerials or structures the LIDAR may not have captured.

The aerial imagery captured with the LiDAR survey assisted identifying obstructions detected in the LiDAR and ground survey. The LiDAR captured provided a comprehensive coverage of the assessment area and was deemed the most efficient way to survey the Type A Plane which extends up to 15km from the end of the clearway.

The take-off flight path area is listed in ICAO Annex 4, Chapter 3 however, at the request of Defence, the survey of the take-off flight path area is extended for the full length of the take-off climb surface splay to a total distance of 15,000m for a Code 3 or 4 runway as annotated in Civil Aviation Safety Authority (CASA) Manual of Standards Part 139 (MOS139) for a take-off runway. Code 1 and 2 runways are to be surveyed to the take-off climb surface OLS elements and dimensions annotated in MOS139 for a take-off runway.

Moving objects are assessed to a height of 4.6m above road/track level. Roads and tracks in areas where vehicles are in direct contact with Air Traffic Control (ATC) are considered controlled and not shown on the Type A charts. Likewise, any roads that are acceptably signed or otherwise controlled e.g. traffic lights.

It is noted in "Method of Working Plan – YBTL 06/25" that there is a maximum equipment height of 5m within the construction zone and this height was used to assess these moving obstacles.

Obstacle Summary

Obstacles listed in this summary are unshielded obstacles and are shown on the Type A charts and listed in the obstacle tables.

RWY 01 Obstacles

The RWY01 Take-off surface of 2% is significantly penetrated by the terrain of Magnetic Island (Obs. #2, 3) and a lit tower at the peak of the island (Obs. #4) as shown on Image 2.

Note: A TODA gradient has not been shown in the Declared Distances as components of the arrestor system (Obs. #1) located in the clearway as shown on Image 1.

Excluding the obstacle in the clearway, the critical obstacle for take-off is Obs. #4 as shown on Image 2. The critical climb gradient is 3.96%.

Image 1 – RWY 01 Take-Off Splay – Near DISP THR

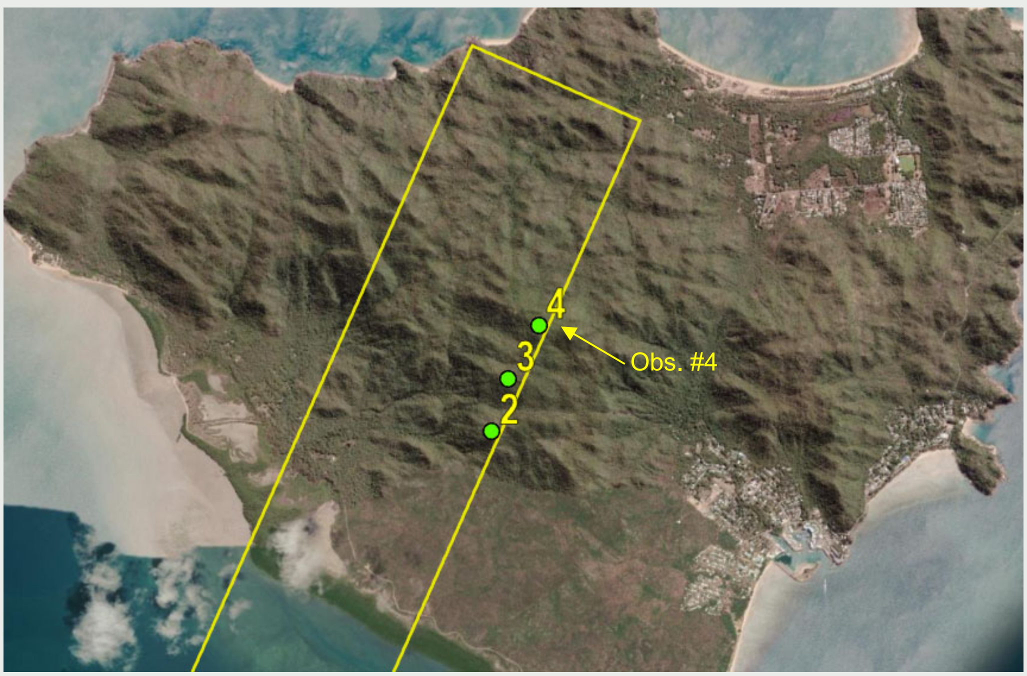

Image 2 – RWY 01 Take-Off – Magnetic Is.

Moving Objects

RWY 01 Moving Objects

No controlled or uncontrolled roads or tracks infringe the take-off.

Datum

The ARP and REPSMs are delivered in the following datums:

- Horizontal Datum: Geocentric Datum of Australia 2020 (GDA2020).
- Vertical Datum: Australian Height Datum (AHD).
- UTM Coordinates: Map Grid of Australia 2020 (MGA2020).

Accuracy: Horizontal: +/- 0.010m @95% Confidence Interval
Vertical: +/- 0.020m @95% Confidence Interval

Survey Control

Table 11 – Survey Control Marks GDA2020

Control	Datum	Easting (m) / Longitude	Northing (m) / Latitude	Elevation (mAHD)
ARP	UTM Zone 55	475335.446	7871207.285	3.359
(Existing Brass Plaque)	Degrees	E 146° 45' 55.085"	S 19° 15' 09.314"	
Good Condition	Decimal Degrees	146.7653013	-19.2525872	
REPSM 01	UTM Zone 55	475276.124	7870576.341	5.472
(Existing Bolt)	Degrees	E 146° 45' 53.023"	S 19° 15' 29.839"	
Good Condition	Decimal Degrees	146.7647287	-19.2582886	
REPSM 19	UTM Zone 55	476270.771	7872802.009	3.942
(Existing Bolt)	Degrees	E 146° 46' 27.196"	S 19° 14' 17.471"	
Good Condition	Decimal Degrees	146.7742211	-19.2381863	
DISP THR 19	UTM Zone 55	476075.822	7872365.783	4.223
(No Marker)	Degrees	E 146° 46' 20.499"	S 19° 14' 31.655"	
	Decimal Degrees	146.7723608	-19.2421263	
REPSM 07	UTM Zone 55	474309.037	7870850.545	3.560
(Existing Bolt)	Degrees	E 146° 45' 19.907"	S 19° 15' 20.874"	
Good Condition	Decimal Degrees	146.7555296	-19.2557984	
REPSM 25	UTM Zone 55	475366.781	7871155.969	4.200
(Existing Bolt)	Degrees	E 146° 45' 56.156"	S 19° 15' 10.985"	
Good Condition	Decimal Degrees	146.7655988	-19.2530514	

Photos – Survey Control

Photo 1 – ARP Survey Control Mark (Existing Brass Plaque)

Photo 2 – REPSM01 (Existing bolt in concrete)

Photo 3 – REPSM19 (Existing bolt in concrete)

Photo 4 – REPSM07 (Existing bolt in asphalt)

Photo 5 – REPSM25 (Existing bolt in asphalt)

Photos - Take Off Climb Surface Horizon

Photo 6 – RWY 01 Take-off Climb Surface Horizon (Photo taken to left of RWY pavement at DISP THR 19)

Author(s)

Name	Qualification
Mark Hansen Spatial Consultant	Bachelor of Engineering (Civil) Associate Degree of Spatial Science (GIS)
Daniel Geeves Geospatial Practice Leader (QLD)	Bachelor of Surveying Member of Surveying and Spatial Sciences Institute (MSSSi) Registered Cadastral Surveyor (Qld) (Membership Number 1005058)

Approval

Approval	Name	Signature	Title	Date
Author	Mark Hansen		Spatial Consultant	28/11/2025
Approver	Daniel Geeves		Geospatial Practice Leader (QLD)	28/11/2025

Project Deliverables	Included with this report are the following deliverables: • Type A Chart as compiled PDF File • Survey control and obstacles as CSV Files Any further questions regarding this Type A Chart production should be directed to **Dan Geeves** B.Surv, MSSSi, Cadastral Surveyor (Qld) Geospatial Practice Leader, Queensland M +61 400 151162 Email: daniel.geeves@aurecongroup.com

CONTROL	LAT DECIM	LONG DECI	EASTING (r	NORTHING	ELEVATION	UTM ZONE
REPSM01	-19.2583	146.7647	475276.1	7870576	5.472	55
REPSM19	-19.2382	146.7742	476270.8	7872802	3.942	55
DISP THR1!	-19.2421	146.7724	476075.8	7872366	4.223	55
REPSM07	-19.2558	146.7555	474309	7870851	3.56	55
REPSM25	-19.2531	146.7656	475366.8	7871156	4.2	55
ARP	-19.2526	146.7653	475335.4	7871207	3.359	55

01 TAKE OFF - BASED ON 478m DISPLACEMENT TO THR19

REPSM AT START OF TORA (REPSM 01)

	GEOGRAPHIC						
	LAT				LONG		
	DECIMAL D	(DEG)	(MIN)	(SEC)	DECIMAL D	(DEG)	(MIN)
	-19.2583	-19°	15'	29.839"	146.7647	146°	45'

OBJECTS THAT APPEAR ON THE CHART

REF No.	GEOGRAPHIC						
	LAT				LONG		
	DECIMAL D	(DEG)	(MIN)	(SEC)	DECIMAL D	(DEG)	(MIN)
1	-19.2416	-19°	14''	29.85"	146.772	146°	46''
2	-19.1487	-19°	08'	55.47"	146.8249	146°	49'
3	-19.1441	-19°	08'	38.72"	146.8265	146°	49'
4	-19.1394	-19°	08'	21.83"	146.8293	146°	49'

					RUNWAY MAGNETIC BEARING			TORA
	MGA 2020 ZONE 55		ELEVATION					
	EASTING	NORTHING	(m AHD)	(Ft)	(DEG)	(MIN)	(SEC)	(m)
(SEC)								
53.023"	475276.1	7870576	5.5	18	16°	54'	01"	1960

	MGA		ELEVATION TOP		TYPE OF OBSTACLE			DISTANCE F
	EASTING	NORTHING						
(SEC)			(m AHD)	(Ft)				(m)
19.22"	476038.3	7872421	4.3	14	ARRESTOR EQUIPMENT			1996.1
29.80"	481591.9	7882705	436.9	1433.4	TERRAIN/TREE			13655.4
35.29"	481751.7	7883220	463.3	1519.9	TERRAIN/TREE			14191.2
45.55"	482051.1	7883739	510.2	1673.9	TERRAIN/TWR - MAGNETIC IS.			14787.6

	TODA		ELEVATION AT T.O. ORIGIN	
(Ft)	(m)	(Ft)	(m)	(Ft)
6430	2020	6627	4.2	13.9

FROM SOT	OFFSET			GRADIENT
(Ft)	(m)	(Ft)	LEFT/RIGH	%
6549	57	186.9	L	-
44801.3	817.9	2683.5	R	3.72
46559	753.6	2472.4	R	3.77
48515.8	815.1	2674.2	R	3.96