IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER submissions and further Submissions lodged by Mercer Airport Limited on the Proposed Waikato District Plan

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STATEMENT OF EVIDENCE OF DAVID STEWARD PARK ON BEHALF OF MERCER AIRPORT LIMITED AS SUBMITTER

SUBMITTER REFERENCE 921

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1. INTRODUCTION

1.1. My full name is David Stewart Park. I am a Director of Astral Limited, a New Zealand based aviation consultancy. I have held this position for 23 years.

1.2. My qualifications include a bachelor's degree in Mechanical Engineering, master's degree in aeronautical engineering and an MBA. I am a UK Chartered Engineer, a member of the Royal Aeronautical Society and the Honourable Company of Air Pilots. I have had over 40 years' experience in the field of aircraft operations, airport "airside" design and aircraft noise management. In my current role, I provide professional advice to a range of airport, airline and government clients within New Zealand and overseas in relation to aircraft operations and aircraft noise management. Typically, this involves designing runway and taxiway layouts, the location of aircraft bases on an airport, assessing and advising on aircraft flight paths, advising airports on aircraft noise issues, preparing evidence and attending hearings as an expert witness.

1.3. During my career, I have been involved in numerous designation, resource consent and plan change processes, at both Local Authority and Environment Court levels. Airports I have been involved with include Te Anau-Manapouri, Queenstown, Mercer, Wanaka, Omarama, Pukaki, Timaru, Christchurch, Omaka (Blenheim), Kapiti Coast, Rotorua, Hawkes Bay, Bridge Pa (Hastings), Te Kowhai (Waikato), Hamilton, Ardmore, North Shore (Auckland), Wanaka, Whangarei and Bay of Islands airports.

1.4. This has involved providing advice to the airport owner or operator in relation to land use planning and controls on or adjacent to their airport. Additionally, I have been directly involved with authoring or contributing to noise management plans at several airports.

1.5. In July 2020 I was engaged by Palms on George Ltd, the owner and operator of Mercer aerodrome, to advise the owners on development of the facility, in particular to accommodate the Catalina flying boat aircraft they intend to base there.

1.6. I am aware of the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note 2014. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

2. INVOLVEMENT WITH MERCER AERODROME

2.1. My involvement with Mercer Aerodrome ("the Aerodrome") began in July 2020 when I was approached by the owners to provide advice relating to the layout of the aerodrome, in particular the runway required to accommodate the Catalina flying boat aircraft and the application of Civil Aviation design and standards to the Aerodrome.

2.2. In the course of doing this work I visited the aerodrome to check various design aspects, site dimensions and existing infrastructure locations.

2.3. I also prepared a layout plan for the proposed future main runway, a parallel grass runway and a parallel taxiway. Drafting and survey work for this plan was carried out by BBO, the aerodrome owner's planning consultants.

2.4. I also drafted a brief "Basis of Design" report summarising the key design standards and considerations applicable to the design. Both the plan and the Basis of Design document are appended to my evidence as Appendix 1.

2.5. The design was based on the runway location and obstacle limitation surfaces (OLS) contained in the Mercer Airport Submission on the proposed Waikato District Plan submitted by BBO on behalf of the aerodrome owners ("BBO Submission").[1] These had been developed by another consultant but my checks confirmed they were suitable.

3. SCOPE OF EVIDENCE

3.1. My evidence provides the background to and justification of the airfield design and obstacle limitation surfaces contained on pages 8-11 of the BBO Submission, including the following:

a) Background and operational context, CAA's role, aerodrome design standards and requirements, operational conditions and limitations on the use of aerodromes;

b) A description of the Mercer Aerodrome ("the Aerodrome"), the operations that occur there and the types of aircraft it is intended to cater for.

3.2. The key data and/ or documents I have used, or referred to, in forming my view while preparing this evidence are:

a) The BBO Submission;

b) Civil Aviation Rule (CAR) Part 139;[2]

c) CAA Advisory Circular AC139-6 -Aerodrome Standards and Requirements for— - All aeroplanes conducting air transport operations; and - All Aeroplanes above 5700 kg maximum certificated take-off weight (MCTOW)

d) CAA Advisory Circular AC139-7 -Aerodrome Standards and Requirements— Aeroplanes at or below 5700 kg MCTOW on non-Air Transport operations

e) Discussions with aerodrome owner; and

[1] Submission dated 9 Oct 2018

[2] https://www.aviation.govt.nz/rules/rule-part/show/139

f) My visit to the Aerodrome on 12 September 2020.

3.3. My evidence contains the following attachments:

a) Appendix 1: Basis of Design Report

4. BACKGROUND AND OPERATIONAL CONTEXT

4.1. The CAA is responsible for setting Rules and Standards relating, inter alia, to the design and operation of aerodromes from a flight safety perspective, and for the operation of aircraft at those facilities. The CAA's responsibilities do not include environmental matters such as airport noise.

4.2. Most Civil Aviation Rules and Standards in New Zealand are based on international standards and recommended practices ("SARPS") set by the International Civil Aviation Organisation ("ICAO") which is a body constituted under the United Nations. Some 193 States, including New Zealand, are members of ICAO and all are bound ("contracted") to align with ICAO SARPS under the United Nations 1944 Convention on International Civil Aviation (the "Chicago Convention").

4.3. These SARPS are adopted into New Zealand Civil Aviation Rules (CAR) and the associated Advisory Circulars (AC) that contain standards and guidance material relating to compliance with the CAR. The relevant CAR for aerodromes is CAR Part 139 ("CAR139"). The applicable aerodrome standards for aerodromes used by light aircraft are contained in AC139-7 and for heliports used by helicopters are contained in AC139-8.

4.4. ICAO and the CAA use the generic term "aerodrome" to describe a facility of any size, from a simple grass runway up to a large international airport. For the purpose of this evidence I describe Mercer aerodrome as "the Aerodrome".

4.5. AC139-6 sets design standards for aerodromes for larger aircraft such as the Catalina which has a MCTOW of approximately 15,600kg. AC139-7 sets design standards smaller aircraft with MCTOW 5,700kg or less. The MCTOW of a single engine typical light aircraft is about 1500kg.

4.6. Typically sealed runways of 800m or longer are designed to AC139-6 standards and runways below 800m are designed to AC139-7 standards. Whether the aircraft using the runway are operating at night or under "instrument flight rules" (IFR) or "visual flight rules" (VFR) are also factors in applying the standards. I explain "IFR" and "VFR" later in my evidence. The standards define the minimum width of aerodromes, flight path clearance requirements and the like.

4.7. Under CAR139, aerodromes are either "certificated", meaning certificated by the CAA as meeting the design and operational requirements of CAR139, or "non-certificated" meaning the aerodrome operator has not been issued with an aerodrome operator certificate under CAR139 requirements. Only aerodromes that have regular movements of aircraft with 30 or more passenger seats are required to be certificated. These are typically the regional and larger airports receiving Air New Zealand services.

4.8. Mercer aerodrome is "non-certificated" as it has no regular movements of aircraft with 30 or more passenger seats. It is currently an aerodrome designed to serve small single engine aircraft under daytime visual flying conditions. However, the planned arrival of the large, heavy Catalina and the development of a much more capable 1190m long sealed runway requires higher standards to be applied.

4.9. Given that the Aerodrome is and will remain non-certificated, the CAA has minimal involvement with its operation. The duty of care falls to the "Aerodrome Operator", as defined in CAR139.3, to ensure the facility is maintained in a fit for purpose condition. The responsibility for ensuring it is safe for use by a particular aircraft, falls on the person operating that aircraft, as prescribed in CAR91.127 Use of Aerodromes. This Rule, inter alia, requires the person operating the aircraft to:

"…comply with any limitations and operational conditions on the use of the aerodrome notified by the aerodrome operator".

5. AERODROME DESIGN CODES

5.1. The CAA design requirements are based on an aircraft Code category identified by a letter and a number such as Code 2B. The smallest aircraft requiring the least runway length are Code 1A (e.g. small single engine aircraft), and the largest Code 4F (e.g. an Airbus A380).

5.2. The number part of the code refers to the runway length the aircraft requires to take off at sea level at standard air temperature and pressure (15°C and 1013.3hPa). Most small single engine aircraft are Code 1, requiring less than 800m runway length, and Code 2 requires between 800 and less than 1200m runway length.

5.3. Both the DC3 and, as I am advised by the pilot, the Catalina are within the Code 2 definition, requiring less than 1200m for take-off under standard conditions.

5.4. The letter part of the Code refers to either the wing span or undercarriage track of the aircraft. Most light aircraft are Code A (less than 15m wing span), some larger single engine aircraft and light twin engine aircraft are Code B (15m or more, but less than 24m span) and the Catalina (32m span) and DC3 (29m span) are Code C aircraft as they are over 24m span but less than 35m.

5.5. The full table from CAA Rules Part 139 Appendix 2 is reproduced below:

Code element 1	
Code number (1)	**Aeroplane reference field length (2)**
1	Less than 800m
2	800m up to but not including 1200m
3	1200m up to but not including 1800m
4	1800m and over

Code element 2		
Code letter (3)	**Wing span (4)**	**Outer main gear wheel; span[a] (5)**
A	Up to but not including 15m	Up to but not including 4.5mm
B	15m up to but not including 24m	4.5m up to but not including 6m
C	24m up to but not including 36m	6m up to but not including 9m
D	36m up to but not including 52m	9m up to but not including 14m

		E	52m up to but not including 65m	9m up to but not including 14m

[a] Distance between the outside edges of the main gear wheels

6. AERODROME DESIGN

6.1. The owner has stated the following development objectives for the aerodrome:[3]

a) Air Transport Operations, being scheduled or charter services, for up to Code B aircraft for day non-instrument operations; and
b) Night/instrument operations for non-air transport operations for aircraft under 5700kg MCTOP (Code B)
c) Catalina/DC3 operations

6.2. I note that the applicable CAA Aerodrome Design standard for (a) and (c) above is AC139-6, and for (b) is AC139-7. I also note that the aerodrome does not need to be certificated under CAR139 unless it will have regular operations of aircraft with more than 30 passenger seats.

6.3. In its submission BBO referred to the Airbiz aviation consultant's assessment identifying the design and operational parameters (including OLS) that are needed to enable the airport's strategic objective. I concur with Airbiz's assessment which is included as Appendices 3 and 5 of the BBO Submission.

6.4. The BBO Submission includes a summary of the critical runway dimensions required for Code B aircraft which I repeat below for convenience. The critical dimensions are based on the most demanding type of operation which is day non-instrument air transport operations for up to Code 2B:

Item	Design parameter
Runway length	1190m
Runway strip width	80m
Runway width	23m
Runway end to strip end distance	60m[4]
Starter extension (both runway ends)	150m

[3] Refer BBO submission on District Plan page 8

[4] This is the longer of the strip end distance required under CAR139 Appendix C2.1 (30m) and that required by AC139-6 Table 4-1 (60m) for a Code 2 runway.

6.5. I concur with all of these dimensions except for "starter extension" which is an option, not a requirement.[5] However I confirm that the development plan I have put forward makes provision for 150m starter extensions at each runway end in the future, should they be required, for example to accommodate a type of aircraft not currently envisaged.

6.6. The airspace immediately above and beyond a runway must be protected so that aircraft flight paths are not infringed by obstructions in the take-off, approach and circling areas around an aerodrome. The purpose of Obstacle Limitation Surfaces (OLS) is to protect these flight paths.

6.7. In its submission BBO describes the OLS which I also concur with. I confirm that my aerodrome design plan includes these same surfaces in the location shown in BBO Plan 145420_00 0100_A attached at Appendix 3 to its submission.

6.8. In New Zealand the practice is for local authorities to protect OLS from key airports in their jurisdiction by means of height control rules in a District Plan. This applies to small privately owner aerodromes as well as those owned by Councils themselves. Examples of privately owned facilities protected in this manner include Ardmore Airport, Whitianga, and North Shore aerodromes.[6]

7. GRASS RUNWAY AND TAXIWAY

7.1. The proposed aerodrome design incudes a parallel grass runway 800m long by 30m wide immediately to the north of the sealed runway, and a parallel taxiway to the north again running the full length of both the grass and sealed runways

7.2. The separation of the grass runway from the sealed runway is not sufficient for both to be used at the same time. However this is quite usual at small aerodromes where space is often at a premium.

7.3. Grass runways are preferred by many small aircraft owners and pilots as they minimise tyre wear and are more forgiving especially for tailwheel aircraft.

7.4. Having a parallel taxiway greatly improves the efficiency of operation of the airfield as aircraft do not have to "backtrack" on the runway to commence take-off or after landing to return to their parking locations. In my opinion it is also safer as it reduces the risk of aircraft having to abort their landings and recircuit for another approach ("go around")

7.5. The separation of the taxiway from the adjacent grass runway grass runway is sufficient that an aircraft up to 12m wing span can use the taxiway without infringing on the grass runway. The great majority of aircraft expected to be hangered at the aerodrome are less than this wingspan.

7.6. Similarly, a 12m span aircraft using the taxiway will have approximately 6m wingtip clearance to the northern site boundary at its narrowest point. This is slightly less than the CAA standard clearance of 8m but I believe it is adequate for the size of aircraft using it if suitable precautions are taken while taxiing.

7.7. Large aircraft such as the Catalina and DC3 will not be able to use the parallel taxiway as their wingspans are too large. They will have to "backtrack" on the

[5] A "starter extension" is an additional section of runway available for the commencement of take-off roll only.

[6] Note Ardmore Airport Ltd (AAL) is a Requiring Authority and its OLS is protected by an AAL designation

runway for take-off and after landing. Given the relatively low frequency of operation of these aircraft I do not see that as an operational or safety issue.

8. STARTER EXTENSIONS

8.1. Both the Airbiz plan and the plan I developed have provision for 150m starter extensions at each end of the 1190m x 23m main runway. These can be accommodated within the existing site boundaries.

8.2. I concur with Airbiz that starter extensions provide a useful increase in the take-off run available to large aircraft. However, they are not essential and could be developed as a later stage of the aerodrome's enhancement.

8.3. Starter extensions do not affect the OLS but can have a small effect on the noise contours due to aircraft commencing their take-off run closer to the aerodrome's boundaries.

9. RUNWAY END SAFETY AREAS

9.1. A runway end safety area (RESA) is a cleared and graded area extending outwards from each end of the runway strip. Its purpose is to provide a safe area for aircraft overrunning or undershooting the runway on landing, and overrunning on take-off. Under CAR139.51(b) a runway end safety area is required if a runway has operations of aircraft with more than 30 passenger seats.

9.2. This is not expected to be the case at Mercer airport as a Code 2B facility, as to the best of my knowledge all the air transport aircraft with 30 or more passenger seats in current operation in New Zealand are Code 2C or 3C. Not withstanding this, RESA up to 90m length, the minimum allowable at runways where RESA is required, could be achieved.

10. Section 32 considerations

10.1. I consider that the OLS as proposed are sufficient to protect the Airport but are not an unreasonable or onerous imposition on existing neighbours. As mentioned earlier in my evidence protection of appropriate OLS for aerodromes in District Plans is standard practice in New Zealand and is provided for in AC139-10 – Control of Obstacles.[7]

10.2. The geometry of the OLS is set at the level required to protect the planned aircraft operations and no more i.e. it is not "over designed". The land surrounding the runway under the OLS is rural and used for cropping and grazing. There do not appear to be any existing protrusions of terrain, buildings or vegetation through the OLS.

[7] AC139-10 - Control of Obstacles Revision 1 27 April 2007 paragraph 2.3.1

11. Conclusions

11.1. The aerodrome design appended to my evidence is, to the best of my professional judgement, compliant with CAA requirements for the sizes of aircraft proposed to operate at the aerodrome. The OLS location and geometry, as described by BBO and the Airbiz report are appropriate for the aerodrome and intended operation. The protection of OLS of this typical geometry via height control limits on properties under the OLS is entirely consistent with other District Plans in New Zealand that I am familiar with.

Signature 

David Park _____

Date: 16 February 2021

Appendix 1

Mercer Airport Basis of Design report

MERCER AERODROME DEVELOPMENT

BASIS OF DESIGN REPORT

ASTRAL LIMITED

9 OCT0BER 2020

Contents

1 Background

In Jul 2020, Astral Ltd (trading as Astral Aviation Consultants) was engaged by Palms on George Ltd (PGL), the owner and operator of Mercer Aerodrome, to advise it on developments to the aerodrome layout following the purchase of the facility from its previous owner.

Prior to Astral's engagement, PGL had engaged Airbiz to advise them on design of the aerodrome's runway strip, main runway layout and obstacle limitation surfaces (OLS) for its submission to the Waikato District Council for rezoning of aerodrome owned and long term leased land as the "Mercer Airport Zone".[1] Astral acknowledges the work done by Airbiz and has drawn on it in preparation of its proposed aerodrome layout and this Basis of Design Report.[2]

It should be noted that Astral is in agreement with Airbiz's (main) runway strip and OLS design (dimensions, upslopes and spatial location). Astral proposes minor changes to the Airbiz's runway layout and has extended the Airbiz design by adding a parallel grass runway, parallel taxiway and fuel storage and dispensing siting.

2 Design aircraft

The selection of design aircraft for the facility is fundamental. This is the most demanding aircraft in terms of the physical size of the runways and OLS. Generally the most demanding aircraft will be the largest intended to operate at the facility.

PGL advised Astral that the vintage Douglas DC 3 and Consolidated PBY Catalina aircraft were intended to be operated at the aerodrome, especially the latter for which a large hangar has been constructed.

The remainder of operations are by light aircraft, generally single engine piston aircraft (such as the Cessna 172) but also on occasions light turbine powered twin engine aircraft such as the Beech Kingair.

The table below lists the characteristics of the design aircraft:

Aircraft	MCTOW	Wingspan	Undercarriage track[3]	Take-off distance	Design Code
Catalina	15,626kg	31.7m	5.0m	1,100m[4]	2C
DC3	11,431kg	29.0m	5.8m	1,190m[5]	2C
KingAir C90GTx	4,580kg	15.3m	4.2m	600m[6]	1B
Cessna 172	1,200kg	11.0m	2.2m	500m[7]	1A

[1] Submission on proposed Waikato District Plan, BBO, 9 Oct 2018.
[2] *Ibid*, Appendices 3 and 5.
[3] Scaled from 3 view plans
[4] Ref http://pbycatalina.com/specifications/ for land operations
[5] Ref QuebecAir Inc Air Regulations, DC3 operating data, Jan 10 1957 page 3.
[6] Ref https://www.google.com/search?client=firefox-b-d&q=beech+C90+takeoff+distance
[7] Typical distance

3 Applicable aerodrome design standards and reference codes

It is not intended that the Aerodrome be certificated by the CAA under Civil Aviation Rule (CAR) Part 139 as this is only necessary if regular services by aircraft with more than 30 passenger seats are planned. Below this level the aerodrome can operate as a non-certificated facility.

Applicable CAA aerodrome design standards are:

a) CAA Advisory Circular AC139-6 -Aerodrome Standards and Requirements for— - All aeroplanes conducting air transport operations; and - All Aeroplanes above 5700 kg maximum certificated take-off weight (MCTOW)

b) CAA Advisory Circular AC139-7 -Aerodrome Standards and Requirements— Aeroplanes at or below 5700 kg MCTOW on non-Air Transport operations

As the Catalina and DC3 are above 5700kg MCTOW the standards of AC139-6 are applied to the sealed runway that these aircraft will use. The operations of these aircraft would be day VFR only.

AC139-6 standards are based on design codes contained in Table B-1 of Appendix B to CAR139. The codes for the design aircraft are listed in section 3 above. Although a design code of 1A is listed for the C172 this is not relevant under AC139-7.

The grass runway and its parallel taxiway will be used by light aircraft (i.e. at or less than 5,700kg MCTOW). Consequently these facilities are designed to AC139-7 standards. It is intended that light aircraft may also use the sealed runway for non-air transport night and/or IFR operations which is also covered by AC139-7.

4 Site limitations

Refer to Plan 145420_00_0102 Revision F attached.

The site measures approximately 1800m long (east to west) by 121m wide (north to south) at its narrowest point and 198m at its widest point. To remain within Code 2 the proposed runway length is limited to 1190m. The proposed runway is located approximately centrally within the 1800m site length.

Open drainage channels exist on the north, south and west sides of the site. The south and west drains are treated as fixed constraints, but the drain system on the north side may need to be relocated or bridged to provide space for the proposed taxiway.

The primary constraint on the site is its width which ideally would be 198m for the full length of the north boundary. This would enable generous hangar sites to be developed facing the parallel taxiway.

The location of the Catalina hangar at the west end of the site is a constraint in that there is only 21m between the centreline of the western extension of the parallel taxiway which is required to allow aircraft access out of the south doors on the hangar onto the operational areas. To preserve wingtip clearances for a Code A (15m max span) aircraft on the taxiway no objects, e.g. fuels storage, equipment or aircraft can protrude out more than 3m from the hangar's south external wall.

5 OLS considerations

The main runway OLS has the dimensions as below, in conformance with AC139-6 and AC139-7 respectively. No OLS is protected for the grass runway given it largely within the strip width and northern transitional surface of the main runway. Once outside the aerodrome boundary the grass runway take-off and approach OLS, which have an upslope of 1:20, are above those of the main runway.

The OLS described below are as specified by Airbiz and provided for in the BBO Submission.

5.1 Take-off and approach OLS

	AC139-6 day non-instrument[8]	AC139-7 night or IFR[9]
Base width	80m	80m
Distance from runway end	60m	30m
Upslope	1:40	1:40
Lateral splay	1:10	1:10
Horizontal extent	2500m	2500m

5.2 Transitional OLS

	AC139-6 day non-instrument	AC139-7 night or IFR
Upslope	1:5	1:5
Vertical limit	45m	10m

5.3 Inner horizontal and conical surfaces

	AC139-6 day non-instrument	AC139-7 night or IFR
Inner horizontal height	45m	Not applicable
Lateral extent from strip	2,500m	Not applicable
Conical height abv aerodrome	150m	Not applicable
Conical upslope	1:20	Not applicable

6 Recommended layout

The recommended layout is shown in BBO plans 145420_00_0102 Revision F and 145420_00_0103 Revision D attached.

6.1 Main runway, strip and OLS origins.

The main runway is 1190m long by 23m wide. The 23m width is as specified in AC139-6 at 3.1.9 for a Code 2C runway. The runway strip is 1310m long, being the runway length plus 60m strip at each end. The OLS originated from the ends and edges of this strip, as depicted in BBO plan 145420_00_0100 Revision A attached.

6.2 Parallel grass runway

The parallel grass runway is 30m wide, the minimum width permitted under AC139-7 at para. 2.2.3. The wingspan limit for a 30m runway is 12m being 30m divided by the 2.5 factor as specified in AC139-7.

[8] AC136-6 Table 4-1 for Code 2C non-instrument.
[9] AC139-7 Para 3.3.1 and Figure 3-2.

The grass runway is separated from the sealed runway edge by 10m as required by AC139-6 para. 3.1.12.

6.3 Parallel taxiway

The parallel taxiway is designed for Code A aircraft with a maximum wingspan of 15m. It is separated 22.5m from the grass runway centreline to centreline, being half the width of the grass runway (15m) plus half the maximum Code A wingspan (7.5m). This keeps an aircraft on the taxiway centreline outside the grass runway strip.

To accommodate Code A aircraft, the grass taxiway should be a minimum of 7.5m wide per AC139-6 para. 3.9.6.

A taxiway clearance strip should extend 15.5m from the taxiway centreline on its north side. However only 12m is available to the site boundary at its narrowest width of 121m. This means the wing tip clearance of an aircraft on the taxiway centreline is reduced to 12m-7.5m = 4.5m compared to the standard of 15.5m-7.5m = 8.0m.

While not ideal, given the boundary is a 5 wire farm fence about 1.2m high with no trees or other large obstacles present, Astral considers this clearance to be adequate provided care is taken when taxiing aircraft.

6.4 Runway end safety areas

As it is not intended to have operations of aircraft with 30 or more passenger seats operating at the aerodrome, there is no requirement for runway end safety areas on either the sealed or grass runways.

Nevertheless there the site allows 90m stopway to extend from each end of the runway strip, as shown by the dashed rectangular outline on plan 145420_00_0102. We recommend even if not declared as such, the 90m is protected as RESA for the operation of large passenger carrying aircraft such as the Catalina and DC3. The width of the area protected should be a minimum of 46m being twice the runway width, as specified in CAR139 Appendix A1(b)(1). Ideally it would be 80m wide, being the width of the runway strip.

6.5 Starter extensions

If required, 150m starter extensions can be provided at each runway end by sealing the 60m of strip end plus an additional 90m, which can be the RESA.

Starter extensions, as described in AC139-6 at para. 3.3.2(b), can be 2/3 of the runway width (i.e. 15.4m) provided they do not exceed 150m in length.

6.6 Building line

The building line is the closest point at which new buildings should be located to the main runway. It is defined by the point at which:

a) The height of the tallest likely building, typically a 4.0m high light aircraft hangar, is just below the 1:5 transitional surface, i.e. half the 80m strip width plus 4m x 5 = 100m from the main runway centreline; or

b) A distance from the parallel taxiway centreline that permits a 20m deep apron in front of a hangar to be clear of the north side of the taxiway clearance strip, i.e. 15.5m from the taxiway centreline per 6.3 above. Allowing for a short 6m stub taxiway between the apron and the

taxiway this means the building line should be no less than 15.5m+6m+20m = 41.5m from the taxiway centreline.

In practice (b) is the greater distance and thus defines the building line as shown as a yellow dashed line parallel to the taxiway on BBO plan 145420-_00_0102 Rev F. Astral recommends this building line location to prevent encroachment of aircraft and ground equipment into the taxiway strip, risking damage to aircraft on the taxiway and parked outside hangars.

6.7 Fuel storage tank and dispenser

The aerodrome operator wishes to install an aviation fuel storage tank and dispenser in the vicinity of the Catalina hangar. The dispenser must be in a location that:

(a) Allows refuelling of the Catalina and various light aircraft
(b) Does not impede the free movement of aircraft along the parallel taxiway to and from the south entrance to the hangar
(c) Does not impeded future development eastwards from the Catalina hangar along the northern boundary, should it be possible to lease more land for hangar development along the proposed building line.

The location recommended for dispenser, shown on Plan 145420_00_0103_Rev C, is opposite the SE corner of the hangar on its east side. The recommended location has adequate room for the Catalina to pass between the dispenser (which is much lower than the aircraft's wing tip) and the hangar. There are two possible locations for the tank; at the SE corner of the south hangar outside wall and on the east side of the dispenser next to the existing north boundary. The latter is Astral's recommended position as the former position does not provide sufficient clearance between the taxiway and the hangar for Code 1 aircraft on the taxiway to pass by it.[10]

6.8 Access road

Large and small vehicles need to be able to access the east end of the site, where Rocket Lab currently has a test facility. The large vehicles are cryogenic tankers carrying rocket fuel constituents in liquid form. They make deliveries to and from the test facility approximately twice weekly.

We are advised by Rocket Lab that they will likely be moving from the site within 12 months.

The small vehicles are private cars and trucks servicing the existing row of container hangars towards the east end of the runway. These hangars will have to be relocated when/if additional land is available beyond the existing north boundary.

Site access will continue to be over the existing steel bridge across the large drainage channel on the site's west boundary, across the extended centre line of the existing and future sealed runways and onto the proposed parallel taxiway. Alternatively, the existing sealed runway can be used to reach the east end of the site when the future runway is not being used by aircraft.[11]

[10] We are advised that a tank must be located at least 4m away from a building wall, as indicatively shown on the Plan.
[11] The existing runway is inside the future runway's 80m wide strip and so cannot be used when aircraft are operating.

6.9 Existing light aircraft hangars

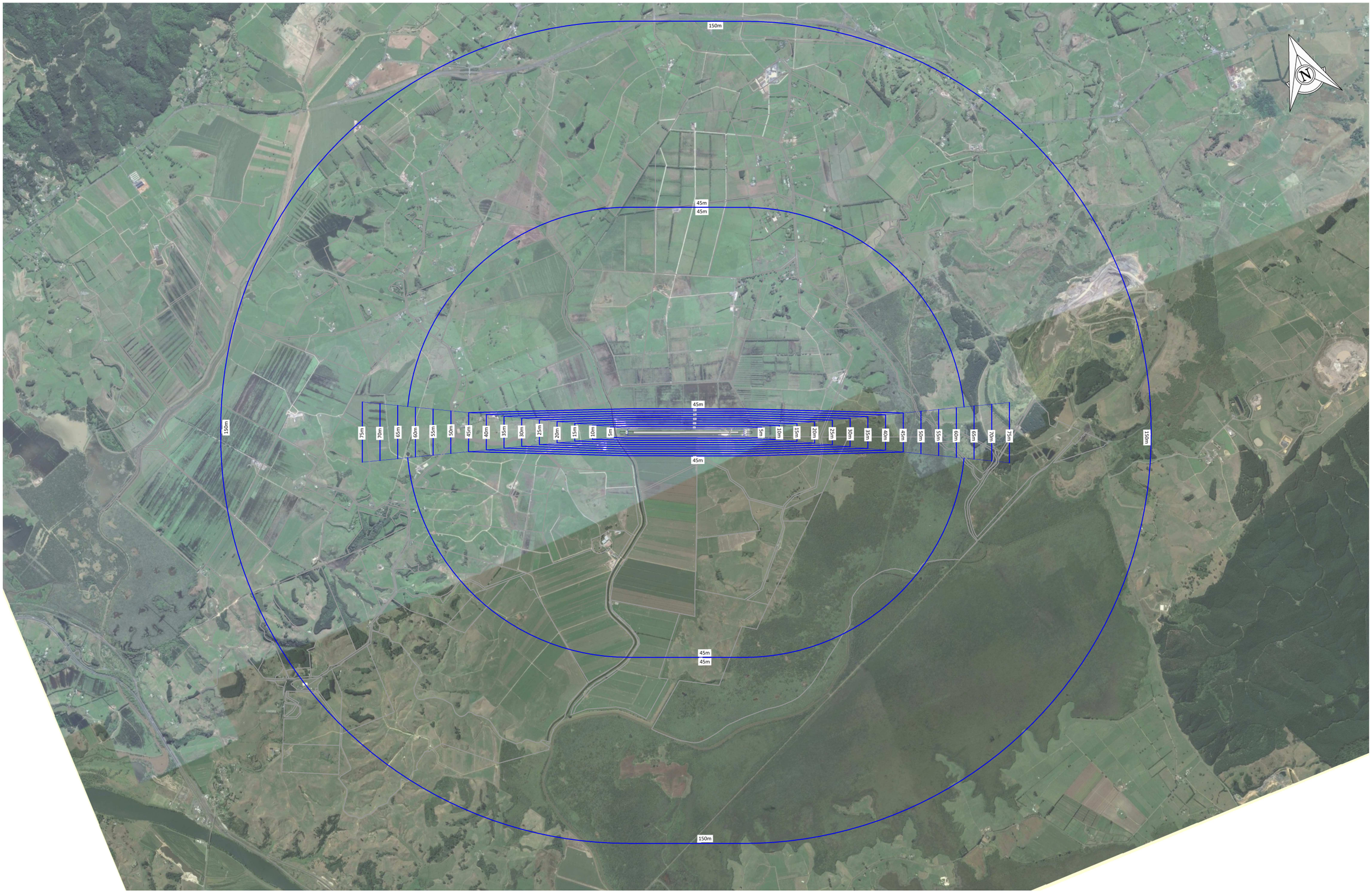
The existing row of container hangars, approximately 100m, long are incompatible with the development plan as the hangars encroach on the proposed sealed runway strip, the grass runway and the proposed taxiway.

It is beyond the scope of this report to provide a new location for these hangars. However it is our view that relocation will require acquisition by lease or purchase of additional land beyond the existing north boundary. Logically this acquisition would start from the Cataline hangar end such that hangars could be relocated along the proposed building line.

100mm

SCALE FOR VALIDATING SIZE OF A3 PLOT ONLY

0



						DESIGNED: JD	CHECKED: CD	
						DRAWN: JD	APPROVED: CD	
A	08.10.2018	INITIAL ISSUE	JD	CD	CD	mx model version:		
	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR			

Version 3.0 - September 2017

BLOXAM BURNETT OLLIVER

Phone +64-7-838 0144, Fax +64-7-839 0431

CLIENT: Neale Russell Ltd

PROJECT: Mercer Airport

DRAWING: Obstacle Limitation Surface (OLS) Extents

STATUS: PRELIMINARY

DATE: 08.10.2018

SCALE (ORIGINAL SIZE A3): 1:40000

DRAWING NUMBER: 145420_00_0100

REVISION: A

K:\145420 Mercer Airport\Drawings\145420_00_0100.dwg 9/10/2018 9:08 a.m. jdabnev

100mm

0

SCALE FOR VALIDATING SIZE OF A3 PLOT ONLY

CAT HANGAR

PROPOSED BUILDING LINE

EXISTING DRAIN
APPROXIMATE POSITION ONLY

PROPOSED TAXIWAY

PROPOSED GRASS RUNWAY

PROPOSED SEALED RUNWAY

OLS CONTOUR

7.5
41.5
22.0 (DRAIN)
8.0 (DRAIN)
7.5
22.5
30.0
36.5
120.8
50.0
50.0
23.0
0m
0m
0m
0m
60
27
150.0
1190.0
782.5

SEE DIAGRAM A
SHEET 2

SEE DIAGRAM B
SHEET 2

KEY:

- PROPERTY OWNED OR LEASED / RIGHT TO OCCUPY BY THE AIRFIELD
- PROPOSED GRASS RUNWAY
- PROPOSED SEALED RUNWAY AND TAXIWAY

UNITS = METRES

1:5000 (A3)

0 100 200 300m

K:\145420 Mercer Airport\Drawings\145420_00_0102.dwg 23/9/2020 9:51 AM hwildersmith

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
F	22.09.2020	UPDATE DRAIN	HW	-	
E	21.09.2020	UPDATE DRAIN	HW	CD	-
D	25.08.2020	ADD GRASS RUNWAY, DRAIN, TAXIWAY AND DIMENSION	BC		
C	18.08.2020	UPDATE LEASE AREA BOUNDARY	HW	CD	-
B	14.08.2020	UPDATE LEASE AREA BOUNDARY	HW	CD	-
A	13.08.2020	INITIAL ISSUE	HW	CD	-

DESIGNED: JD | CHECKED:
DRAWN: JD | APPROVED:
mx model version:

BLOXAM BURNETT & OLLIVER

CLIENT: NEALE RUSSELL LIMITED

PROJECT: MERCER AIRPORT

DRAWING: OBSTACLE LIMITATION SURFACE (OLS) OWNED AND LEASED AREAS

SHEET 1 OF 2

STATUS: FOR INFORMATION

DATE: 22.09.2020 | SCALE (ORIGINAL SIZE A3): 1:5,000

DRAWING NUMBER: 145420_00_0102 | REVISION: F

Version 3.0 - September 2017

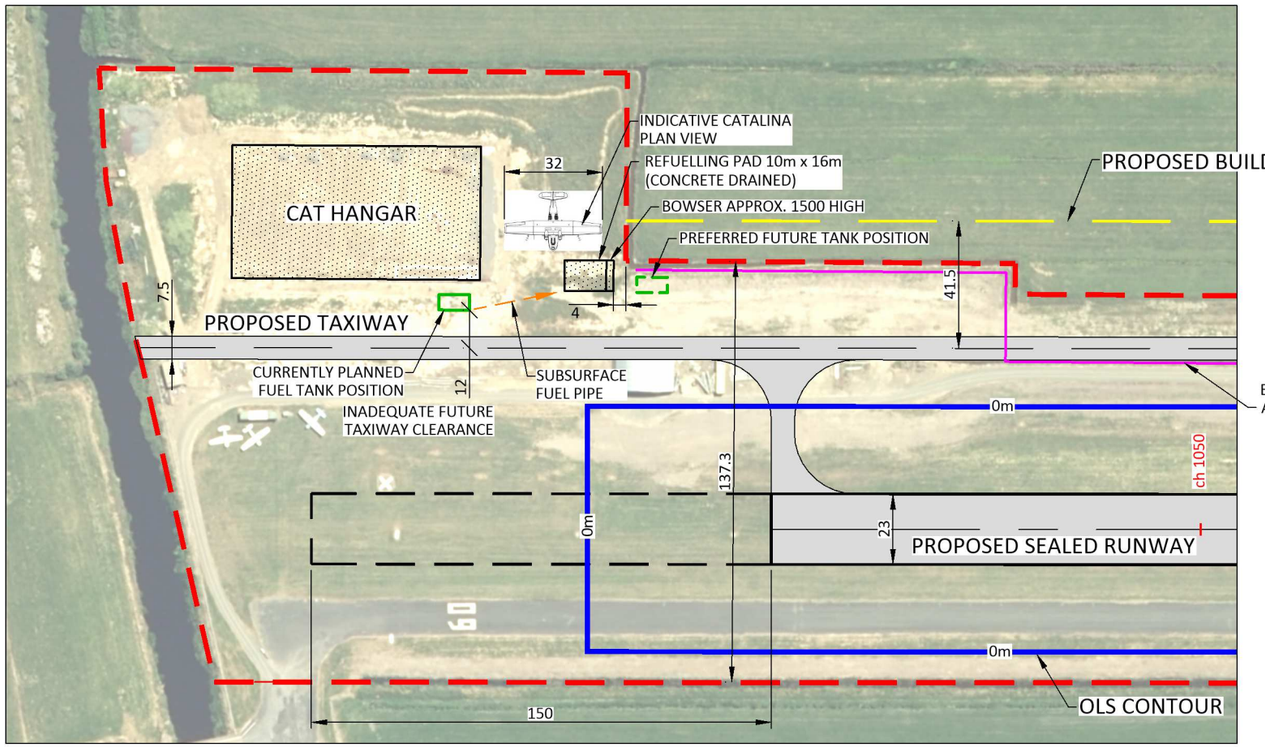


DIAGRAM A
SCALE 1 : 2,000

KEY:

- PROPERTY OWNED OR LEASED / RIGHT TO OCCUPY BY THE AIRFIELD
- PROPOSED GRASS RUNWAY
- PROPOSED SEALED RUNWAY AND TAXIWAY

UNITS = METRES

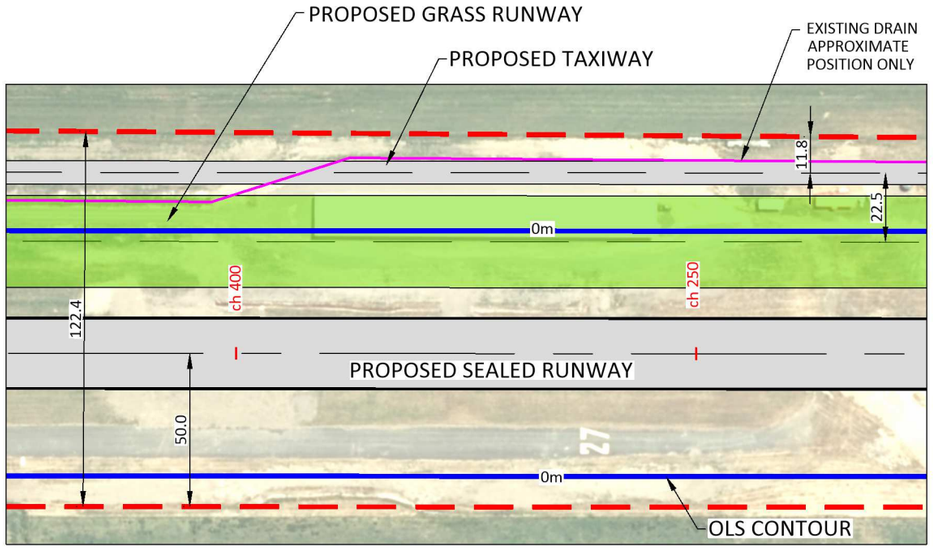


DIAGRAM B
SCALE 1:2,000

1:2500 (A3) 0 50 100 150m

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
C	22.09.2020	UPDATE DETAILS	HW	-	
B	21.09.2020	UPDATE DRAIN & ADD FUEL SUPPLY LAYOUT	HW	CD	
A	26.08.2020	INITIAL ISSUE	HW	-	-

DESIGNED: JD | CHECKED:
DRAWN: JD | APPROVED:
mx model version:

BLOXAM BURNETT & OLLIVER

CLIENT: NEALE RUSSELL LIMITED

PROJECT: MERCER AIRPORT

DRAWING: OBSTACLE LIMITATION SURFACE (OLS) OWNED AND LEASED AREAS AND FUEL SUPPLY LAYOUT SHEET 2 OF 2

STATUS: FOR INFORMATION

DATE: 22.09.2020 | SCALE (ORIGINAL SIZE A3): 1:2,000

DRAWING NUMBER: 145420_00_0103 | REVISION: C