AVIATION IMPACT ASSESSMENT

MURWILLUMBAH EDUCATION CAMPUS REDEVELOPMENT

Prepared for Built Holdings Pty Ltd

AVIATION PROJECTS

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DOCUMENT CONTROL

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GLOSSARY

AGL	above ground level
AHD	Australian Height Datum
AIP	aeronautical information package (Airservices Australia)
AMSL	above mean sea level
CAAP	Civil Aviation Advisory Publication
CAR	Civil Aviation Regulations (1988)
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations (1998)
DoE	Department of Education (NSW)
ERSA	En Route Supplement Australia (Airservices Australia)
ICAO	International Civil Aviation Organisation
HLS	Helicopter Landing Site
LSALT	lowest safe altitude
MSA	minimum safe altitude
MOC	minimum obstacle clearance
MOS	Manual of Standards Part 139—Aerodromes
NASF	National Airports Safeguarding Framework
OLS	obstacle limitation surface(s)
SSR	secondary surveillance radar

UNITS OF MEASUREMENT

ft	feet	(1 ft = 0.3048 m)
km	kilometres	(1 km = 0.5399 nm)
m	metres	(1 m = 3.281 ft)
nm	nautical miles	(1 nm = 1.852 km)

1. INTRODUCTION

1.1. Situation

The NSW Department of Education - School Infrastructure have proposed the development of an education campus, including a primary school and high school, at the Murwillumbah High School site. The Murwillumbah Education Campus will bring together students from Murwillumbah Primary School, Murwillumbah East Primary School, Murwillumbah High School, and Wollumbin High School.

The Murwillumbah High School is located at 86 Riverview St, Murwillumbah and is legally defined as Lot 2 in DP 578679 and Lots 5 and 6 in DP 820602. The school site is located within the Tweed Shire Council (TSC) Local Government Area (LGA) and the land is owned by the NSW Department of Education (DoE).

The Murwillumbah Education Campus development, involves the co-location of Murwillumbah Primary School, Murwillumbah East Primary School, Murwillumbah High School, and Wollumbin High School, to establish a new primary school and a new high school as part of the same education campus.

The project will include the following scope of works within the SSD application:

- Demolition of Building E
- All inground slabs, pathways, hardstands and footings including those to buildings B, C, D, G, H, M, P, S, AW and AZ
- Associated ground works required to facilitate the construction of new buildings and landscaped areas
- Construction of new Buildings 1, 2, 3 and 4:
    - Building 1 – New public school building comprising general learning spaces, administration, canteen, School Support Unit (SSU) and library
    - Building 2 – Hall building including a public school hall, out of school hours care (OSHC) facilities, high school hall/gymnasium and other spaces for physical education and creative and performing arts (CAPA)
    - Building 3 – New high school building including the following facilities;
        - general and specialist learning spaces, SSU, and library
    - Building 4 - New high school building including the following facilities;
        - science, support, administration and canteen
- Refurbish Building A for DoE offices and school community health facilities along with associated access requirements. Building A is a locally listed heritage building and will be retained and refurbished
- Refurbishment of Building F to provide learning space for agricultural education
- Retention of existing Building AY

- Creation of new public school and high school outdoor learning spaces to support future focused learning outcomes
- New landscaping and embellishment of outdoor playgrounds
- Civil and infrastructure works; and
- Kiss ‘n drop and parking off Nullum Street.

The project has requested the Secretary's Environmental Assessment Requirements (SEARs), and the Department of Planning, Industry and Environment (DPIE) has assessed the project and advised the studies that need to be included as part of the State Significant Development Application (SSDA) leading to additional stakeholder consultation.

Due to the proximity of the project site to the Bob Whittle Murwillumbah Airfield an Aviation Impact Assessment is required as part of the SEARs.

1.2. Purpose and scope of task

Aviation Projects has been engaged to provide an Aviation Impact Assessment for the proposed development, and to assess any impacts and mitigation measures for current operations at the Bob Whittle Murwillumbah Airfield. the nearest point of the site is approximately 1700 m west of the southern end of the runway.

The scope of this task includes the following:

- Review the site against all associated regulatory and airspace authorities
- Prepare an Aviation Impact Assessment that identifies and assesses the potential operation or construction impacts of the development on the aviation operations of any nearby on-shore helicopter landing sites (HLS) and associated flight paths in accordance with the relevant sections of the National Airports Safeguarding Framework (NASF)
- Propose any potential mitigation strategies.

1.3. Methodology

The task was performed according to the method outlined below:

1. Review client material
2. Review relevant regulatory requirements and information sources including Aeronautical Information Package and Civil Aviation Safety Authority (CASA) Civil Aviation Advisory Publication (CAAP) No 92-1(1) Guidelines for Aeroplane Landing Areas
3. Consider the National Airports Safeguarding Framework Guidelines, including Guideline H: Protecting Strategically Important Helicopter Landing Sites
4. Prepare an Aviation Impact Assessment with the preliminary aviation planning assessment and advice on safeguarding airspace and send to the client for comment
5. Finalise the letter report for Client acceptance.

1.4. Client material

The following material was provided by Built Holdings Pty Ltd for the purpose of this Aviation Impact Assessment:

- Building A – Survey.pdf, dated 21 January 2021
- Planning Secretary's Environmental Assessment Requirements (SEARS) SSD – 16848913.pdf, dated 5 May 2021SSDA0012 [c] Site Plan Proposed_PN.pdf, dated 6 October 2021
- SSDA1114 [B] Building A Elevations Existing VS Proposed – North + South.pdf, dated 6 October 2021
- SSDA1115 [B] Building A Elevations Existing VS Proposed – East + West.pdf, dated 6 October 2021
- SSDA1201 [A] Site Sections East West_PN.pdf, dated 6 October 2021.

1.5. References

References used or consulted in the preparation of this report include:

- Airservices Australia, *Aeronautical Information Package,* effective 02 December 2021
- Civil Aviation Safety Authority, Civil Aviation Regulations 1998 (CAR)
- Civil Aviation Safety Authority, Civil Aviation Safety Regulations 1998 (CASR)
- Department of Infrastructure and Regional Development, Australian Government, National Airport Safeguarding Framework, *Guideline B Managing the Risk of Building Generated Windshear and Turbulence at Airports*, dated May 2018, and *Guideline H: Protecting Strategically Important Helicopter Landing Sites* dated May 2018
- New South Wales Government, State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017
- OzRunways, accessed 12 October 2021
- Tweed Shire Local Environmental Plan 2014.

1.6. Planning Secretary's Environmental Assessment Requirements (SEARs)

Table 1 refers to a summary of the relevant SEARs as well as a reference to their location within the report.

Table 1 presents a summary of the relevant SEARs

Item Description	*Document Reference*
Plans, elevations and sections of the proposed development	Section 3: Background
Details of impact of the proposed development on Aviation and Airspace protection considering the Obstacle Limitation Surface (OLS) for Bob Whittle Murwillumbah Airfield.	Section 5: Aviation Impact Assessment

Details of the potential impacts of the future development on the aviation operations of any nearby airports and affected flight paths of any existing on shore Helicopter Landing Site (HLS) in accordance with the relevant sections of the National Airports Safeguarding Framework (NASF).	

The proposed redevelopment of the Murwillumbah Education Campus involves the expansion of the building facilities on the site, all of which are beneath the existing Administration Building that will remain on the site.

The proposed Murwillumbah Education Campus has the following characteristics:

- nominal ground level is between 7 and 18 m AHD
- new and remaining maximum building height is 12.3 m AGL
- maximum overall height is 34 m AHD (109.6 ft AMSL).

The project development:

- will not penetrate the obstacle identification surfaces of Bob Whittle Murwillumbah Airfield
- will not impact flight operations to/from airfields within the vicinity of the project
- will not impact flight paths associated with Gold Coast Airport
- will not impact helicopter flight operations within the vicinity of the project
- will not impact any aviation facilities
- will not impact any aviation facilities or ATC radar
- will not involve high velocity vertical plume.

2. BACKGROUND

2.1. Project description

The Project consist of multiple three storey buildings and a four-storey building set to the east of the existing A Block, Office Building which will be retained and remain the highest building on the school site at 34 m AHD. New school buildings, up to 3 levels above ground level will be located to the east of the Office Building with a maximum elevation of 27.63 m AHD (Building 3A).

Other works will include expanding sporting fields within the site.

A complete project description is contained in Section 1.1.

Figure 1 shows an aerial view of the Project site (source: SSDA0012 [C] Site Plan Proposed_PN.pdf)

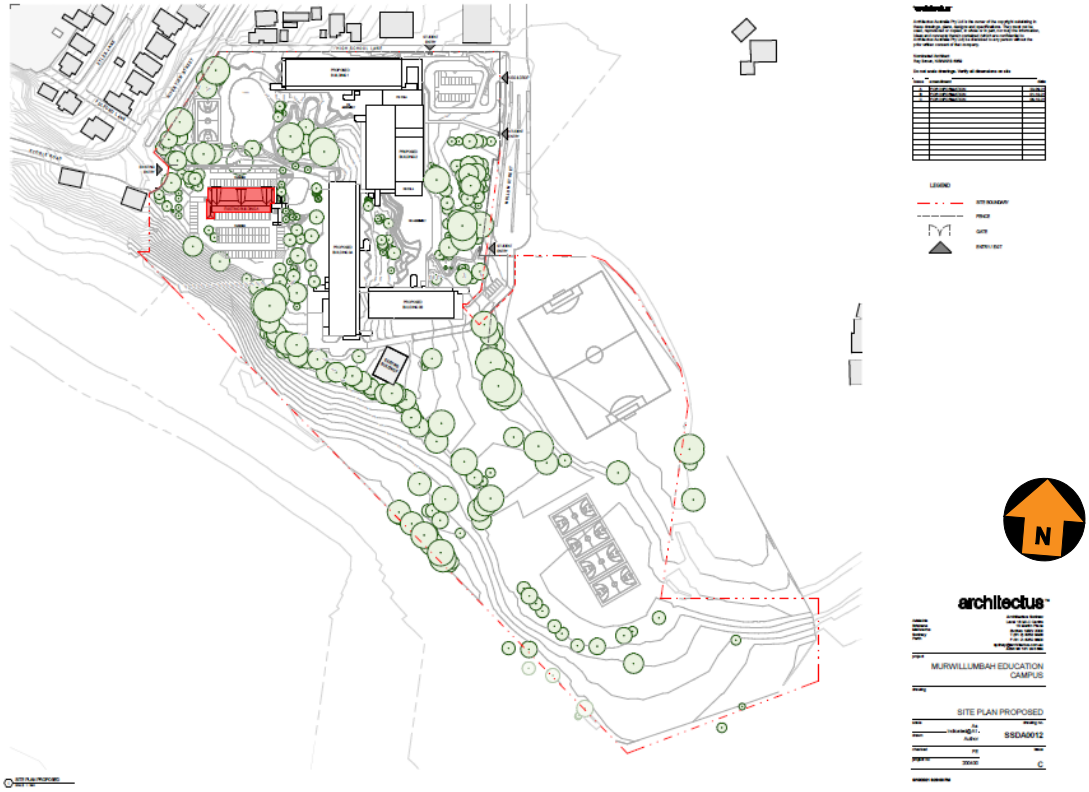

Figure 1 Aerial view of Project site

Figure 2 shows an east west elevation view of the proposed development (source: SSDA2101 [A] Site Sections East West_PN.pdf dated 6 October 2021).

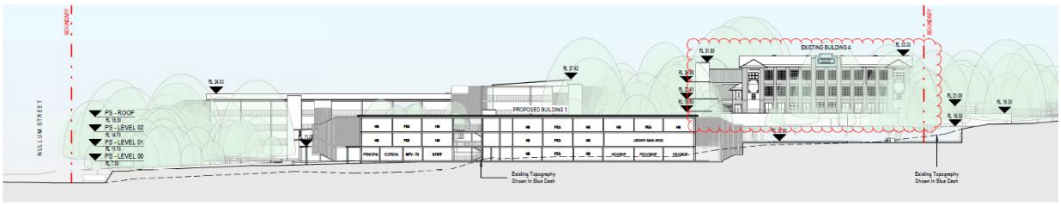

Figure 2 Site section east west No 1

Figure 3 shows an east west elevation view of the proposed development (source: SSDA2101 [A] Site Sections East West_PN.pdf dated 6 October 2021).

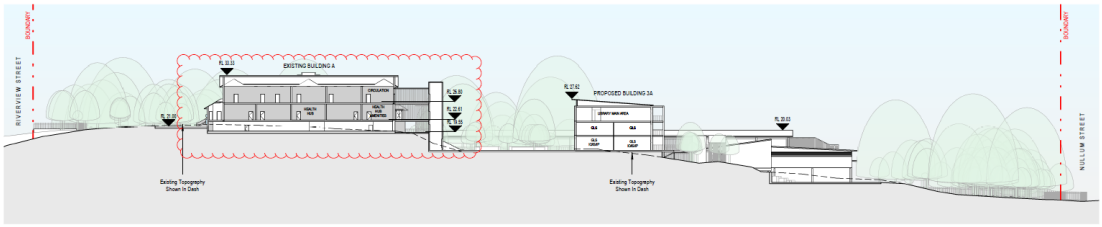

Figure 3 Site section east west No 2

Figure 4 shows an east west elevation view of the proposed development (source: SSDA2101 [A] Site Sections East West_PN.pdf dated 6 October 2021).

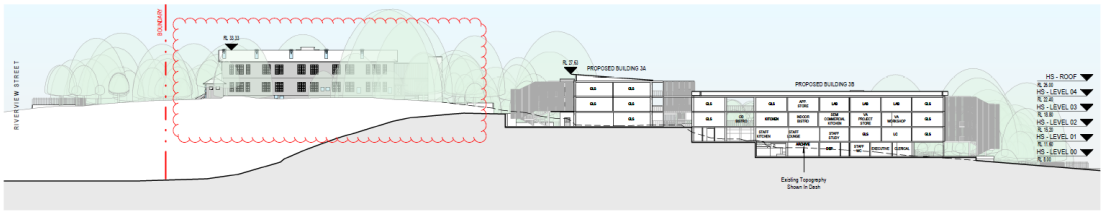

Figure 4 Site section east west No 3

2.2. Site overview

An overview of the project site and the Bob Whittle Murwillumbah airfield located approximately 1700 m east of the project site is provided in Figure 5 (source: Google Earth).

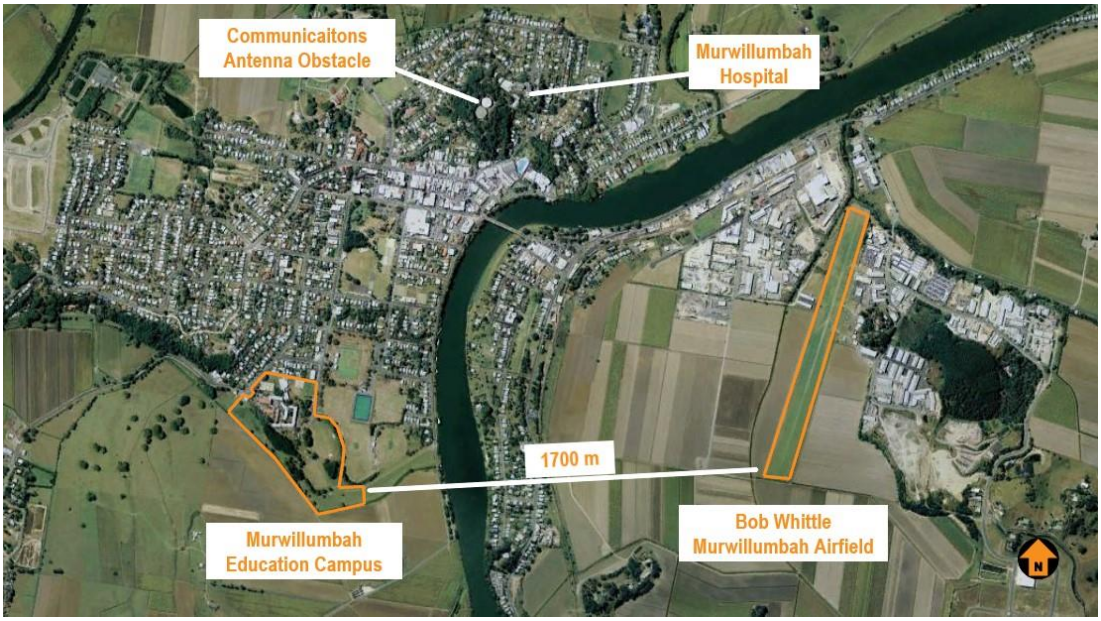

Figure 5 Project site relative to Bob Whittle Murwillumbah Airfield

For the purposes of this analysis, the following details of the Murwillumbah Education Campus are relevant to the assessment:

- natural ground level rises from approximately 7 m (23 ft) (AHD) on the river side of the campus to approximately 18 m (59 ft) at the site of the existing building that will remain
- building height for the new buildings is a maximum of approximately 11 m above ground level (AGL)
- maximum overall height for the new buildings is 27.63 m AHD (90.6 ft above mean sea level (AMSL)
- the existing Building has a maximum height of 34 m AHD (109.6 ft AMSL).

2.3. Temporary crane operations

Mobile cranes will be regularly used during the construction phase of the project. They will be set down when not in use with the boom brought back to its minimum length and resting on the truck.

The tallest crane will be required for Building 3, which is the highest building in the campus, will be located on level ground with a height of 15.2 m. With a maximum boom length of 66 m AHD, based atop a truck at 3 m AGL, it will extend to a maximum height of 84.2 m AHD.

It is unlikely that cranes will operate at night.

3. PLANNING CONTEXT

In the absence of formal Australian legislation for the protection of airspace and flight paths around Aeroplane Landing Areas, the following planning documents, and guidelines have been used or referenced as a basis for the aviation impact statement.

3.1. Tweed Local Environmental Plan (2014)

The Project is located within the TSC LGA. The Project is subject to the provisions of the Tweed Local Environmental Plan (LEP) (2014), effective 4 April 2014.

The LEP 2014 is the primary planning tool for the majority of the Tweed Shire and is based on the requirements of the Standard Instrument (Local Environmental Plans) Order 2006.

Clause 7.8A contains the local provisions with the following objectives:

- to provide for the effective and ongoing operation of the Murwillumbah Airfield by ensuring that such operation is not compromised by proposed development that penetrates the obstacle limitation surface for that airfield
- to protect the community from undue risk from that operation.[1]

The clause applies to a development application where the proposed development is on land shown on the Obstacle Limitation Surface Map for which an obstacle limitation surface is identified and will penetrate the obstacle limitation surface for the land.

3.2. Civil Aviation Safety Regulations (1998) Part 139 - Aerodromes

The Civil Aviation Safety Authority (CASA) regulates aviation activities in Australia. Applicable requirements include the Civil Aviation Regulations 1988 (CAR), Civil Aviation Safety Regulations 1998 (CASR) and associated Manuals of Standards (MOS) Part 139—*Aerodromes* and other guidance material.

3.2.1. Civil Aviation Safety Regulations 1998, Part 139 - *Aerodromes*

CASR 139.365 requires the owner of a structure (or proponents of a structure) that will be 100 m or more above ground level (AGL) to inform CASA. This is to allow CASA, under CASR 139.370, to assess the effect of the structure on aircraft operations and determine whether or not the structure will be a hazardous object because of its location, height, or lack of marking or lighting.

As the re-development of Murwillumbah Education Campus is lower than 100 m AGL, it is not subject to this requirement.

3.2.2. Manual of Standards 139 - Aerodromes

Chapter 7 of MOS 139 sets out the standards applicable to Obstacle Restriction and Limitation. Section 7.1 introduces which areas on and surrounding an aerodrome need to be kept clear of obstacles.

[1] Tweed Local Environment Plan 2014, Clause 7.8A

7.1 Introduction

(1) Both of the following must be monitored and maintained free from obstacles in accordance with this MOS:

(a) the airspace around an aerodrome;
(b) the manoeuvring area of an aerodrome.

In section 7.3 the Obstacle Limitation Surfaces (OLS) are introduced:

7.03 Introduction

(1) An aerodrome operator must establish and monitor the obstacle limitation surfaces (OLS) applicable to the aerodrome.

(4) As far as possible, the aerodrome operator must ensure that the OLS within the aerodrome boundary is maintained clear of obstacles.
Note: If third parties propose to erect structures likely to infringe the OLS outside the aerodrome boundary, it is in the interests of aerodrome operators to liaise as soon as possible with the proponents and the relevant planning authorities, with a view to ensuring the preservation of the OLS and limiting the introduction of new obstacles.

3.2.3. Civil Aviation Advisory Publications - CAAP 92-2(2)

Civil Aviation Advisory Publications (CAAPs) provide guidance, interpretation and explanation on complying with the Civil Aviation Regulations 1988 (CAR) or Civil Aviation Orders (CAO).

3.3. National Airports Safeguarding Framework

The National Airports Safeguarding Advisory Group (NASAG) was established by Commonwealth Department of Infrastructure and Transport to develop a national land use planning framework called the National Airports Safeguarding Framework (NASF). The purpose of this framework is to enhance the current and future safety, viability and growth of aviation operations at Australian airports through:

- the implementation of best practice in relation to land use assessment and decision making in the vicinity of airports
- assurance of community safety and amenity near airports
- better understanding and recognition of aviation safety requirements and aircraft noise impacts in land use and related planning decisions
- the provision of greater certainty and clarity for developers and land owners
- improvements to regulatory certainty and efficiency; and
- the publication and dissemination of information on best practice in land use and related planning that supports the safe and efficient operation of airports.

4. AVIATION IMPACT STATEMENT

The proposed Project site is located approximately 1700 m west of the Bob Whittle Murwillumbah Airfield.

4.1. Bob Whittle Murwillumbah Airfield

The Bob Whittle Murwillumbah Airfield is an Aeroplane Landing Area (ALA) and is not certified under CASA regulations.

It is operated by the TSC which has declared a set of obstacle limitation surfaces that define height limits above which assessment and approval is required prior to construction.

The Murwillumbah Aero Club operates several light aircraft at the airfield for flying training and club member aviation activities. Ultra-light and agricultural aircraft operations also occur at the ALA.

The nature of the airfield, with a grass runway subject to soft and wet conditions, limits aircraft operations to light single-engine aircraft and the occasional light twin-engine aircraft.

Airfield data is also published in the Aeronautical Information Publication – Australia, En-Route Supplement (ERSA).

TSC advises via the ERSA that the airfield is open for use by general aviation during daylight hours only.

The circuit direction at the airfield is left hand, the standard direction in use throughout Australia. Aircraft operating on Runway 36 and conducting circuits would overfly the township and the development site at a minimum altitude of 1000 ft AGL to minimise noise in the township and to allow a margin for the aircraft to be able to glide clear of the township in the event of an engine failure requiring an urgent landing in a safe area.

4.2. Instrument flight

There are no Instrument Flight Procedures published for the Bob Whittle Murwillumbah Airfield.

All flight procedures are conducted under the Visual Flight Rules (VFR), and in conditions that allow pilots to navigate by visual reference to the ground and water and able to identify potential hazardous obstacles in sufficient time to avoid them by the prescribed minimum margins.

4.3. Visual flight operations

TSC operates the airfield and sets the operation standards related to the safe operation of aircraft there and in the vicinity.

A document entitled *Pilot Notes for Bob Whittle Murwillumbah Airfield* is published on TSC's website. It provides detailed information to enable pilots using the airfield to operate in accordance with the Council requirements to ensure community amenity in the area (fly neighbourly advice), to notify potential obstacles such as industrial buildings and trees, high terrain, circuit directions, information on fuel availability, and parking requirements for aircraft.

4.4. Obstacle Limitations Surfaces (OLS)

The Murwillumbah Education Campus is located on land identified on the Tweed LEP 2014, Obstacle Limitation Surface Map – Sheet OLS_005. The majority of the campus is located within the lateral limits of the inner horizontal surface of the OLS, with the western part of the campus located beneath the rising surface of the conical surface of the OLS.

The highest portion of the Murwillumbah Education Campus will remain at 34 m AHD and is therefore 14.7 m beneath the inner horizontal surface and not infringing into that airspace.

The proposed redevelopment of the campus will not increase the overall height of the campus and not infringe the Bob Whittle Memorial Airfield airspace declared within the Tweed LEP 2014 and will not have an adverse impact on flight operations.

Figure 6 shows the Tweed LEP 2014 OLS charts with the Murwillumbah Education Campus location highlighted.

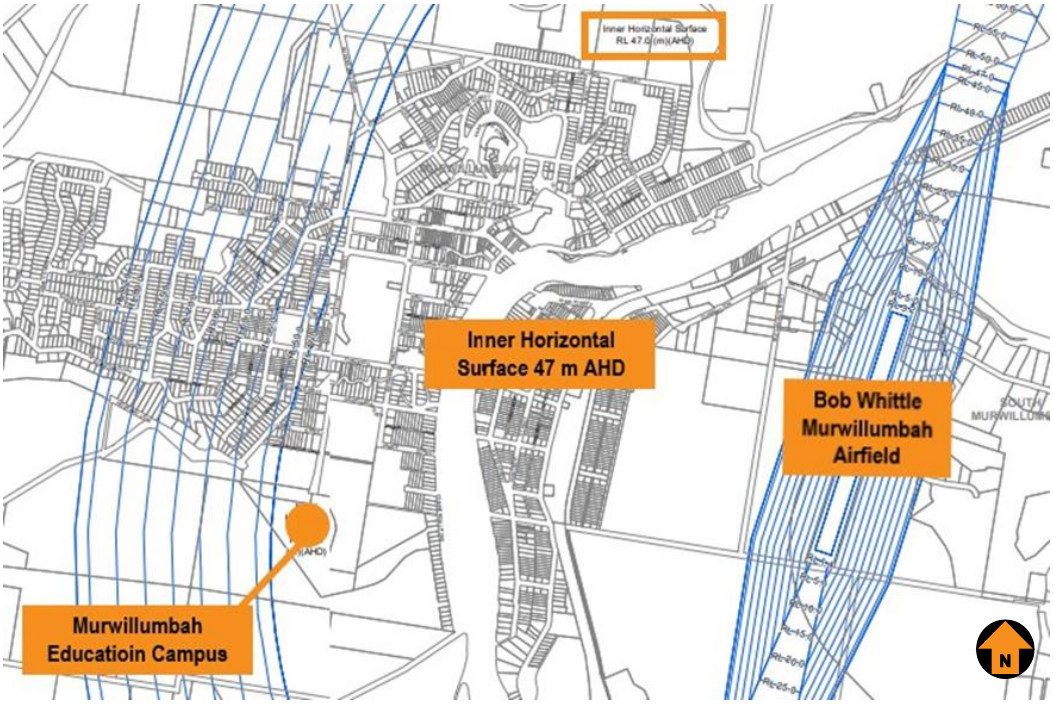

Figure 6 Bob Whittle Murwillumbah Airfield OLS

Mobile construction cranes to a maximum height of 84.2 m AHD will infringe the Inner Horizontal Surface of 47 m AHD. The maximum height of the crane will infringe the Inner Horizontal Surface by 37.2 m.

4.5. Air routes and LSALT

CASR Part 173 MOS requires that a minimum obstacle clearance of 1000 ft below the published lowest safe altitude (LSALT) is maintained along each air route.

The lowest LSALT above the site is above 5000 ft.

The development at the Murwillumbah Education Campus will have no impact upon air routes.

4.6. Airspace

The Project site is located wholly within Class G airspace, and is not located in any Prohibited, Restricted and Danger areas. It is unlikely that there will be any impact to military aviation activity.

Therefore, the Project will not have an impact on controlled or designated airspace.

4.7. Nearby aerodromes

Another ALA is located on private property at Nobbys Creek, approximately 7.5 km northwest of the Murwillumbah Education Campus.

An area of assessment for such developments is usually a 3 nm radius of the airfield.

The development will not have any adverse impact upon flight operations at the Nobbys Creek ALA.

4.8. Gold Coast Airport

Gold Coast Airport is located approximately 21 km north-east of the Murwillumbah Education Campus.

Flight paths associated with Gold Coast Airport were assessed and will not to be impacted.

4.9. Aviation facilities

A search on OzRunways and AIP, which sources its data from Airservices Australia (AIP), was conducted to identify any aviation facilities that may be affected by the project.

The closest aviation facilities to the Project site are located at the Gold Coast Airport, a certified airfield located approximately 22 kms northeast of Murwillumbah and remains outside any protection areas for the facilities listed in NASF Guidelines.

According to National Airports Safeguarding Framework Guideline G *Protecting Aviation Facilities - Communications, Navigation and Surveillance (CNS),* the navigation facilities have areas restricted to developments.

4.10. Radar

The closest Air Traffic Control (ATC) radar is located at Mount Summerville, approximately 13.6 km (7.3 nm) north from the Project site and at an elevation of approximately 326 m AHD.

Due to the higher elevation of the radar, well above the project site elevation, and terrain shielding by hills in the vicinity of Murwillumbah and also between Murwillumbah and the radar site, the Project is unlikely to impact the Mount Summerville radar ATC facility.

4.11. Reporting of tall structures

CASA's Advisory Circular AC 139-08 version 2.0 dated March 2018 provides some guidance to those authorities and persons involved in the planning, approval, erection, extension or dismantling of tall structures or sources of hazardous plumes so that they may understand the vital nature of the information they provide.

Paragraph 2.4 sets requirement to reporting tall structures. In particular, paragraph 2.4.2 states:

> *The Royal Australian Air Force (RAAF) has an additional requirement to know about the existence of low-level structures. The trigger height of these structures is:*
>
> – *30 m or more above ground level, within 30 km of an aerodrome*
>
> – *45 m or more above ground level elsewhere*

The maximum height of the existing segment of the development is less than 15 m (50 ft) AGL and the redevelopment segments are lower than that. Therefore, the proponent is not required to report details about this building to Airservices Australia.

4.12. Plume rise

Exhaust plumes that may originate at the top of the Murwillumbah Education Campus, which may impact airspace and if required, may need a Plume Rise Assessment in accordance with CASA Advisory Circular AC 139-05 (v3.0) Plume rise assessments.

There are no provisions or requirements regarding the need of a plume rise assessment within the Tweed Local Environmental Plan 2014.

Due to the nature of the education campus, it is unlikely to have a high velocity vertical plume and so no assessment should be required.

5. HAZARD LIGHTING AND MARKING

5.1. Civil Aviation Safety Authority

In considering the need for aviation hazard lighting, a review of the regulatory context was undertaken.

CASA regulates aviation activities in Australia. Applicable requirements include the *Civil Aviation Act 1988* (CAA), *Civil Aviation Regulations 1988* (CAR), *Civil Aviation Safety Regulations 1998* (CASR), associated Manuals of Standards (MOS) and other guidance material including *Civil Aviation Advisory Publication* (CAAP) and Advisory Circular (AC).

As the proposed Murwillumbah Education Campus does not penetrate any of the obstacle limitation surfaces for Bob Whittle Murwillumbah Airfield, it would not be considered as an obstacle and therefore not require obstacle lighting.

Permanently installed cranes are not planned to operate at the site.

Mobile cranes will be regularly used throughout the site during the construction phase of the project. They will be set down when not in use with the boom brought back to its minimum length and resting on the truck.

The tallest crane will be required for Building 3, which is the highest building in the campus, will be based on ground with a height of 15.2 m AHD. With a maximum boom length of 66 m AHD, based atop a truck at 3 m AGL, it will have a maximum height of 84.2 m AHD.

It is likely that CASA will recommend that the cranes be lit with a medium intensity white obstacle light at the highest point of the crane available for the light.

It is unlikely that cranes will operate at night, however if they do it is likely that CASA will recommend that the cranes be lit with a low intensity red obstacle light.

6. HELICOPTER LANDING SITES

An assessment of aviation publications and charts available on the internet, including AIP and Ozrunways, did not reveal any recognised Helicopter Landing Sites within 10 km of the development site.

Helicopters can take off and land at Bob Whittle Murwillumbah Airport, but they must comply with the local operating procedures published in AIP and the TSC pilot notes for the airfield.

Helicopters could also land and take off at a variety of locations, including the education campus, but the pilot must ensure that such operations have the permission of the landowner, except for emergencies, and must be suitable for the safe operation of the helicopter and the safety of nearby residents or passers-by.

7. CONCLUSIONS

As a result of this aeronautical assessment, the following conclusions are made:

1. The proposed Murwillumbah Education Campus has the following characteristics:
    a. nominal ground level is between 7 m and 18 m AHD
    b. new and remaining maximum building height is 12.3 m AGL
    c. maximum overall height is 34 m AHD (109.6 ft AMSL).
2. The permanent buildings to be constructed:
    a. will not penetrate the obstacle identification surfaces of Bob Whittle Murwillumbah Airfield
    b. will not impact flight operations to/from airfields within the vicinity of the project
    c. will not impact flight paths associated with Gold Coast Airport
    d. will not impact helicopter flight operations within the vicinity of the project
    e. will not impact any aviation facilities
    f. will not impact any aviation facilities or ATC radar facility
    g. will not involve high velocity vertical plume.
3. Temporary mobile construction cranes:
    a. will operate to a maximum height of 84 m AHD across the site and will infringe the Inner Horizontal Surface of the Bob Whittle Murwillumbah Airfield OLS which has a height of 47 m AHD
    b. obstacle lighting is likely to be recommended in accordance with Section 5.

8. RECOMMENDATIONS

As a result of this aeronautical assessment, the following recommendations are made:

1. The Project as proposed can be supported without adversely affecting aviation safety.
2. Any crane used on the site during construction and extended above 47 m AHD, should be appropriately marked and lit.

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