



Australian Government

Department of Defence

**AIR5431 PHASES 2 AND 3 - DEFENCE AIR
TRAFFIC MANAGEMENT AND CONTROL
SYSTEM FACILITIES
AND
AUSTRALIAN DEFENCE FORCE AIR
TRAFFIC CONTROL COMPLEX
INFRASTRUCTURE**

Various locations throughout Australia

**STATEMENT OF EVIDENCE
TO THE
PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS**

Canberra, Australian Capital Territory

September 2015

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AIR5431 Phases 2 and 3 - Defence Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic Control Complex Infrastructure Project

Identification of the Need

1. Australia controls approximately 11% of the global airspace with both civil and military aviation environments becoming increasingly complex as they support more traffic, more advanced platforms and more advanced flying operations. Concurrently, military aviation requires safe, efficient and flexible airspace access for military aviation capability. The safety, efficiency, business continuity and overall performance of Australia's civil and military aviation environment is underpinned by an air traffic management system comprised of air traffic and navigation services that needs to be supported by a contemporary infrastructure.
2. In December 2009 the Australian Government released the National Aviation Policy White Paper – *Flight Path to the Future*. Chapter 7 – *Air Traffic Management* noted that Australia has one of the safest and most efficient air traffic management systems in the world. It also noted that Australia's air traffic management system benefits considerably from the significant role played by Defence in the provision of air traffic management services. Currently Defence and Airservices Australia (Airservices) provide air traffic services using separate air traffic management systems with limited interoperability. Defence uses the Australian Defence Air Traffic System and Airservices uses The Australian Advanced Air Traffic System. Airspace co-ordination between Defence and Airservices currently relies on voice communication across the two systems. The National Aviation Policy White Paper 2009, also required Defence and Airservices to increase civil/military cooperation and harmonisation of civil-military Air Traffic Management system and infrastructure.
3. In line with the direction of the National Aviation Policy White Paper, Defence and Airservices will harmonise the military and civil elements of the National Air Traffic Management system as part of a joint project referred to as the Civil and Military air traffic

system and branded as ‘OneSKY Australia’ (OneSKY). This project accords with the Coalition’s *Policy for Aviation*, August 2013, and the guidance from the Australian Civil-Military Air Traffic Management Committee.

4. OneSKY presents a unique opportunity to transform Australia’s national air traffic management and improve the safety, efficiency and performance of the Australian aviation industry by acquiring a harmonised, joint civil military air traffic management system. The current separate civil and military systems are both reaching end-of-life and their replacement with a harmonised system will facilitate a seamless flow of national and international air traffic. A national air traffic management system will enable Defence to simultaneously conduct homeland security operations, support air base and capability generation operations, while enabling civil aviation industry activities to continue in a safe and flexible manner. A harmonised air traffic management system also represents a unique opportunity to achieve major economic savings in both acquisition and sustainment.
5. This project will enable a new level of operational and cost efficiency by enhancing the management of Australian airspace. It will place Airservices and Defence in a position to manage the forecast growth of air traffic movement in Australia well into the future.

Project AIR5431

6. Project AIR5431 is the Defence Capability Plan Project established to deliver the new Defence Air Traffic Management and Control System, including the Defence components of OneSKY. Project AIR5431 is being delivered in three Phases.
7. AIR5431 Phase 1, approved by Government in September 2014, will provide a new Deployable Defence Air Traffic Management and Control System which will enable the Australian Defence Force to safely manage airspace in deployable locations, both overseas and in Australia. The facilities associated with AIR5431 Phase 1 are being delivered by a separate project and do not form part of this submission.
8. AIR5431 Phases 2 and 3, approved by Government in December 2014, will provide a new fixed base Defence Air Traffic Management and Control System to replace the existing Alenia surveillance sensors and the Australian Defence Air Traffic System which are approaching the end of their asset lifecycle. The fixed Defence Air Traffic Management

and Control System will comprise fixed air traffic control surveillance sensors (Phase 2) and air traffic command and control systems (Phase 3). AIR5431 Phase 3 is the Defence component of OneSKY. The facilities associated with AIR5431 Phase 2 and 3 are being delivered by this project.

Australian Defence Force Air Traffic Control Complex Infrastructure Project

9. The Australian Defence Force Air Traffic Control Complex Infrastructure Project is a Major Capital Facilities Program project. The project will provide upgraded Defence air traffic control towers and airfield systems complex facilities nationally to replace facilities that are aged and/or deteriorated and have reached the end of their economic life. The majority of the current air traffic control towers and airfield systems complex facilities were constructed in the 1960s, and do not comply with current Building Code of Australia and engineering requirements.
10. Although the existing facilities were designed and built as fit for purpose at the time, the evolution of air traffic control systems since the 1960's has seen the transition from manual systems utilising radio and binoculars through the semi-computerised Australian Defence Air Traffic System to the fully computerised Civil Military Air Traffic Management System being delivered by the AIR5431 Phase 3 project. The integration of radar, voice communications and air traffic control into the Civil Military Air Traffic Management System requires additional Radio and Technical Equipment Rooms to be incorporated within the facilities to accommodate system infrastructure well beyond the requirements of the 1960's. Additionally, the aircraft using the aerodromes have also evolved significantly being both bigger and faster with markedly different capability and characteristics; this evolution has seen the extension of runways which has caused the smaller towers to be unable to visibly observe the runway thresholds to the extent required by current Civil Aviation Safety Authority standards, which is a fundamental requirement of air traffic control. The combination of inadequate tower cabin and support equipment space to accommodate the Civil and Military Air Traffic Management System together with the inability of controllers to observe fundamental air traffic control procedures highlight that the existing generation of facilities are no longer fit for the intended future purpose.

11. The AIR5431 Phase 2 and 3 facilities are being developed and delivered in unison with the Air Traffic Control Complex Infrastructure Project due to the close relationship between the capability acquisitions and the supporting facilities requirements. This will lead to economies and efficiencies in project delivery and will reduce the impact on operations at each site.
12. In December 2014, the Government in its consideration of AIR5431 Phase 3 also approved the Air Traffic Control Complex Infrastructure Project, inclusive of funding.

Capability Overview

13. Defence air traffic control services are provided for the purpose of preventing collisions between aircraft, between aircraft and obstructions, between aircraft and vehicles on the ground manoeuvring area, and expediting and maintaining an orderly flow of air traffic within military controlled airspace.
14. Royal Australian Air Force (RAAF) Joint Battlefield Airspace Control Officers provide air traffic services for all aircraft, civil and military, in the airspace surrounding RAAF air bases and designated military airfields. Joint Battlefield Airspace Controllers hold the same qualifications as civilian air traffic controllers, and are also trained to provide safe, efficient and flexible airspace control in combat environments, such as the Middle East Region, and in support of humanitarian assistance and disaster relief operations.
15. Air traffic control in military airspace is particularly complex because of the differences between military and civil aircraft performance and their purpose for flying. The Australian Defence Force Air Traffic Control workforce provides air traffic control services for approximately 500,000 aircraft movements per year, including around 230,000 civilian aircraft movements through military-controlled airspace. When controlling civil aircraft, RAAF applies the same air traffic control standards and procedures as those of Airservices, as determined by the national aviation regulator, the Civil Aviation Safety Authority.
16. RAAF No 44 Wing is responsible for the provision of Australian Defence Force air traffic control services. No 44 Wing commands two squadrons (452 Squadron and 453 Squadron) which in turn command 11 air traffic control Flights located across Australia at nine RAAF

bases, the Perth Terminal Control Unit at Perth International Airport, Her Majesty's Australian Ship (HMAS) Albatross at Nowra, New South Wales and the Army Aviation Centre at Oakey, Queensland. The Headquarters of No 44 Wing is located at RAAF Base Williamtown and forms part of Surveillance and Response Group.

Description of Proposal

17. The proposed works to be delivered from these combined projects include the provision of facilities to support the AIR5431 Phases 2 and 3 capabilities and ongoing provision of air traffic control services across the Defence fixed base Air Traffic Management and Control network. This includes a requirement for new or refurbished air traffic control towers and airfield systems complex facilities to house the new air traffic management system, sensor equipment buildings to support the new sensors, working accommodation to house Operational Maintenance Trainers for both Phase 2 and Phase 3 to support technical training, and upgrading the School of Air Traffic Control to support the training of Joint Battlefield Airspace Control Officers.
18. **Air Traffic Control Towers.** The function of the tower is to manage the active runway surfaces, maneuvering areas and surrounding airspace within five nautical miles (nine kilometres) of the airfield. The Joint Battlefield Airspace Controllers are responsible for clearing aircraft for takeoff or landing, ensuring that prescribed runway separation will exist at all times and aircraft are de-conflicted in the immediate airspace. The towers will be a multi-level facility comprising the cabin, rest and amenities spaces with a lift to facilitate passage between levels. The towers will be situated and purpose designed to achieve its core function of provision of air traffic control services. The towers will also be used for provision of approach control services during low activity periods.
19. **Airfield Systems Complex.** The Airfield Systems Complex facilities are the largest and most complex facilities being delivered. The principle functional workspaces within the airfield systems complex facilities typically include:
 - a. **Approach Control.** At most sites, Defence performs an approach control function to control and manage the airspace within approximately 40 nautical miles (75 kilometres) of their aerodrome of responsibility. This separate function requires an

open space with specialist console workstations to support the designated approach control roles, systems, equipment and a training simulator;

- b. **Executive Offices.** Air traffic control Flights include an executive team to manage the operations, training and equipment maintenance functions within the Flight. The purpose of the executive offices workspace is to accommodate Officers in performing their management and administrative duties;
- c. **Briefing, Training and Meeting Rooms.** Air traffic control Flights require various rooms to facilitate briefing, training and meetings in support of the air traffic control function. The number and size of these rooms is dependent on the size of the air traffic control Flight;
- d. **Work Areas and Administration.** These spaces will provide Controllers with a shared workspace to enable them to undertake military and personnel administration duties;
- e. **Crew Rest, Amenities and Recreation Spaces.** The air traffic control function must be able to operate continuously with controllers and supporting maintenance crew operating on a shift / duty roster arrangement according to the requirements of each site. Suitable crew rest, amenities and recreational spaces are therefore required for personnel during designated breaks within a work shift;
- f. **Maintenance Offices and Work Areas.** Maintenance management require office space to perform their management duties. In addition, open plan workspace is required for maintenance personnel to support the maintenance functions including maintenance planning, scheduling and ordering of stores / equipment;
- g. **Maintenance Technical Workshops.** Workshop space is required adjacent to the maintenance offices and work areas to enable maintenance personnel to undertake maintenance on the communications equipment supporting the air traffic control function;
- h. **Communications and Equipment Spaces.** The communications equipment required to operate the air traffic control systems must be located in large

environmentally controlled rooms. In addition, a communications room will be required for Information Technology and Computing services;

- i. **Plant, Generator and Uninterruptible Power Supply Equipment Spaces.** Significant engineering services infrastructure is required to support the wider facilities' operations and to provide the level of service continuity required for the air traffic control capability. This includes standby power generation, uninterruptible power supply systems to supply power to critical systems until standby power generation starts up, and mechanical plant to provide climate control and ventilation throughout the facilities;
- j. **Staff and Visitor Car Park.** A car park is generally required for military and civilian vehicles, including visitors as the site is isolated from other parts of the Base.

20. **Sensor Equipment Building.** The sensor equipment building is required to be located in close proximity to the sensors being acquired by AIR5431 Phase 2. The principle workspaces required to be provided within the sensor equipment building include:

- a. **Communications Room.** A communications room is required to house the communications equipment that will provide sensor connectivity to the wider National air traffic management and control network;
- b. **Stores, Dispatch and Maintenance Areas.** Designated space is required to receive and temporarily store equipment and spare parts. Space is also required for maintenance activities conducted on-site;
- c. **Plant, Generator and Uninterruptible Power Supply Equipment.** Significant engineering services infrastructure is required to support the sensor operations. The sensor equipment and systems have high demands of quality reliable power and precise temperature and humidity control requirements. This includes standby power generation, uninterruptible power supply systems to supply power to critical systems until standby power generation starts up, and mechanical plant to provide climate control and ventilation throughout the facility; and

- d. **Car Park.** A small car park is required for visiting military and supplier vehicles at the isolated site locations.
21. **Operational Maintenance Trainer.** The operational maintenance trainer replicates the equipment mission systems being acquired by AIR5431 Phases 2 and 3. A teaching facility is required to house the equipment whilst providing training to technical and maintenance personnel for the servicing of AIR5431 Phase 2 and 3 equipment. It consists of Classrooms and Work Rooms, providing theoretical and practical training.
22. **School of Air Traffic Control.** The School of Air Traffic Control provides the initial training for all Joint Battlefield Airspace Controllers and establishes the fundamental skills and attitudes required for the delivery of safe and expeditious air traffic services. The existing simulator room within the school will house the AIR 5431 Phase 3 equipment providing training on the Civil-Military Air Traffic Management System.
23. **Airfield Systems Infrastructure.** To facilitate the transition of air traffic control capability to facilities proposed as part of this project, existing airfield system assets including navigational aids, airfield lighting and aircraft arrestors will require connectivity to each Airfield Systems Complex. Connectivity is required to enable these airfield system assets to be monitored and controlled by the Civil Military Air Traffic Management System. This will require communication connectivity works at each airfield system asset to provide a suitable pathway onto the base area network at each site.

Options Considered for Fulfilling the Need

24. While AIR5431 Phases 2 and 3 will deliver new sensor equipment and new harmonised air traffic management system equipment, the basic functions of tower control and approach control of aircraft movements remains unchanged.
25. Defence has completed schematic design activities for the project. To determine the facilities requirements for each site, a range of options were considered based on the AIR5431 Phase 2 and 3 equipment requirements, operational requirements and the condition and the fitness for purpose of existing structures. As part of these design activities, the need for refurbishment of existing facilities or construction of new facilities was identified. The design solutions proposed are as follows:

- a. Tower modifications at RAAF Base East Sale, HMAS Albatross (Nowra), RAAF Base Edinburgh, RAAF Base Woomera and RAAF Gingin;
 - b. New Tower construction at RAAF Base Amberley, Army Aviation Centre Oakey, RAAF Base Pearce, RAAF Base Richmond, RAAF Base Townsville and RAAF Base Williamtown;
 - c. Airfield Systems Complex modifications at RAAF Base East Sale, HMAS Albatross, RAAF Base Edinburgh and RAAF Base Darwin;
 - d. New Airfield Systems Complex construction at RAAF Base Amberley, AAC Oakey, RAAF Base Townsville, RAAF Base Richmond, RAAF Base Williamtown, RAAF Base Pearce and RAAF Base Tindal;
 - e. Sensor Equipment Building modifications at RAAF Base Townsville and HMAS Albatross (Nowra Hill);
 - f. New Sensor Equipment Building construction at RAAF Base Amberley, AAC Oakey (Turkey Hill), RAAF Base Williamtown, RAAF Base East Sale (Deadmans Hill), RAAF Base Pearce (Eclipse Hill), RAAF Base Darwin and RAAF Base Tindal;
 - g. New Operational Maintenance Trainer facilities to be incorporated within the new Airfield Systems Complex at RAAF Base Amberley; and
 - h. Modifications to the RAAF Base East Sale School of Air Traffic Control simulator facility.
26. Further option analysis was required to determine the design solutions at both RAAF Base Darwin tower and the RAAF Base Tindal tower and airfield systems complex building. At both RAAF Base Darwin and RAAF Base Tindal either modification of the tower and airfield systems complex building or construction of new facilities were both viable options.
27. For RAAF Base Darwin the options analysis concluded that a new tower would be required rather than modification of the existing tower.

28. For RAAF Base Tindal the options analysis concluded that a new tower and airfield systems complex would be required rather than modification of the existing buildings.

Reasons for Adopting the Proposed Course of Action

29. A new tower is proposed for Darwin as refurbishment works would be required within an operational air traffic control tower, where noise, service disruptions and visual distractions would present a serious safety risk to air traffic operations. Darwin is an international airport operating 24 hours a day servicing Regular Public Transport. Coordination of construction works inside an operational tower, even during periods of low air traffic, would not be feasible or safe.
30. Although deploying a Transportable Air Operations Tower was considered for managing air traffic operations during control tower refurbishment and equipment installation, this was ruled out following a detailed assessment of safety risks. This portable tower facility is optimised for short-term use and is very limited in size, height and visibility, to the extent that it would not be possible maintain visual observation of the Darwin runways from within the Transportable Air Operations Tower. Additionally, the portable tower can not be used in strong winds, has no adequate staff rest area, and does not have any space for the required communications equipment essential for managing aircraft operations on the scale required at the Darwin international airport / RAAF Base Darwin joint-user aerodrome. Consequently, using the Transportable Air Operations Tower at Darwin would impose significant risk to the safe and efficient air traffic services at this major aerodrome.
31. At RAAF Base Tindal, the refurbishment of the Airfield Systems Complex facility would involve invasive construction works in an operational building, particularly those works required to address noise attenuation and roofline alteration. The refurbishment works would have required the cessation of air traffic control operations for the duration of the construction program, impacting the operational capability of the Base. The preferred option is to construct a new building so that air traffic control operations can continue uninterrupted until switchover to the new system.
32. Refurbishment of the tower at RAAF Base Tindal is not considered feasible as the existing building access is not compliant with fire egress and fire rating requirements under the

BCA and would have required significant invasive works to rectify. Additionally there are health and safety benefits of having lift access to the control tower, particularly in the event of a medical emergency, which will be provided as part of the new tower option.

Heritage Considerations

33. Air traffic control towers are a unique building typology with heritage considerations. There are presently ten c. 1960 air traffic control towers remaining at RAAF bases nationally with heritage value. The heritage values of these air traffic control towers were assessed as follows:
 - a. Exceptional Integrity – Gingin (c.1960);
 - b. High Integrity – Williamtown (c.1960), Amberley (c. 1960), Townsville (c. 1960) , Richmond (c.1960) , Edinburgh (c.1960) ;
 - c. Medium Integrity – N/A; and
 - d. Low Integrity – Woomera (c.1958), Oakey (c.1975), Pearce (c.1960), East Sale (c.1960).
34. A Heritage Impact Assessment conducted by Catalyst Architects (Jan 2015) has provided a strategy to best manage the heritage values of the towers. The Heritage Impact Assessment recommended:
 - a. that at least one of the 1960s era towers is retained to avoid any adverse impact to Commonwealth Heritage values; and
 - b. that a Heritage Management Plan be developed to protect and manage the 1960s era tower that is retained.
35. The tower at RAAF Gingin is proposed to be retained and refurbished as part of these works. Retention and conservation management of this tower will satisfy the heritage requirements.
36. RAAF Base Williamtown is registered on the Commonwealth Heritage List, with the air traffic control tower being included in this citation. A consolidated *Environmental*

Protection and Biodiversity Conservation Act 1999 referral¹ for the demolition of several structures at Williamstown, including the air traffic control tower, has been submitted for this project, the New Air Combat Capability Project and the RAAF Base Williamstown Redevelopment project.

37. An Environmental Report was compiled by the project's environment and heritage consultants, NRA Environment Consultants, during the period July to September 2013. As part of the Environmental Report, five Bases were identified as having the potential for sub-surface Indigenous cultural heritage to be encountered during the Project. These are:
- a. RAAF Base Amberley;
 - b. RAAF Base Darwin;
 - c. RAAF Base Townsville;
 - d. RAAF Base Williamstown; and
 - e. RAAF Base Pearce.
38. Further studies have been undertaken into Indigenous cultural heritage and have determined that the siting for proposed new air traffic control facilities at all Bases with the exception of RAAF Base Amberley, are located within precincts that have already been extensively disturbed.
39. At RAAF Base Amberley, initial consultation has been undertaken with the Indigenous Stakeholder Group, Jagera Darran, to enable geotechnical investigations to be undertaken at the site of the proposed new tower and airfield systems complex. A Cultural Heritage Management Plan was agreed to enable the above mentioned site investigations to proceed. It has also been agreed with Jagera Darran, that an updated Cultural Heritage Management Plan will need to be negotiated prior to any construction activities taking place on site.

¹ Referral submitted to the Department of Environment September 2014.

Environmental Impact Assessments

40. The 2013 Environmental Report was undertaken in accordance with the Defence Guidance on the Preparation of an Environmental Report (version 1.4). The study involved a desktop review of relevant literature (all Bases) and site investigations at seven Bases - RAAF Base Darwin, RAAF Base Townsville, RAAF Base Amberley, Army Aviation Centre Oakey, RAAF Base Williamtown, RAAF Base Pearce and RAAF Gingin.
41. The study identified a number of key site constraints and potential impacts associated with the Project that pose a potential risk to the environment, including:
 - a. historic heritage at RAAF Base Darwin, RAAF Base Townsville, RAAF Base Amberley, RAAF Base Williamtown, RAAF Base Richmond and RAAF Base Pearce;
 - b. potential Indigenous cultural heritage at RAAF Base Darwin, RAAF Base Townsville, RAAF Base Amberley, RAAF Base Williamtown and RAAF Base Pearce;
 - c. potential acid sulphate soil at RAAF Base Townsville, RAAF Base Darwin and RAAF Base Williamtown;
 - d. potential contamination, including Aqueous Film Forming Foam contamination, at all sites;
 - e. potential endangered flora and/or fauna at all sites, in particular at RAAF Base Darwin, RAAF Base Townsville and RAAF Base Amberley;
 - f. climate issues associated with heavy rain and cyclones at RAAF Base Darwin, RAAF Base Townsville, RAAF Base Tindal and RAAF Base Amberley;
 - g. stormwater infrastructure capacity issues at RAAF Base Darwin, RAAF Base Townsville, RAAF Base Amberley and RAAF Base Williamtown;
 - h. bushfire risk at RAAF Base Amberley;
 - i. noise and vibration impact on heritage buildings at RAAF Base Amberley; and

j. cumulative environmental impact development of various projects at RAAF Base Amberley and RAAF Base Williamtown.

42. In response to the above findings, a further Environmental Impact Assessment was undertaken by Golder Associates and issued in December 2014. The Environmental Impact Assessment determined that only the project works at RAAF Base Amberley may have a significant impact on a Matter of National Environmental Significance. In order to determine the impact, an Ecological Assessment into secondary Koala habitat was undertaken which confirmed the proposed works will not have a significant impact.

43. Further targeted studies have been undertaken to address the key risk items: historic heritage, indigenous cultural heritage and site contamination. All of these identified risk items have been addressed within the developed design for the Project.

Key Legislation

44. The following key legislation is relevant to this Project:

- a. *Defence Act 1903 (Cth)*;
- b. *Building and Construction Industry Improvement Amendment (Transition to Fair Work) Act 2012 (Cth)*;
- c. *Work Health and Safety Act 2011 (Cth)*;
- d. *Disability Discrimination Act 1992 (Cth)*;
- e. *Fair Work Act 2009 (Cth)*;
- f. *Fair Work (Building Industry) Act 2012 (Cth)*;
- g. *Civil Aviation Act 1988 (Cth)*; and
- h. *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*.

45. The design will comply with all relevant and current Defence Standards, Australian Standards, Codes and Guidelines including, but not limited to, the following:

- a. *National Construction Code - Building Code of Australia 2014;*
- b. *Fair Work (Building Industry) Act 2012 (Cth);*
- c. *Defence Manual of Fire Protection Engineering; and*
- d. *Defence Estate Quality Management System.*

Impact on the Local Community and Consultation with Stakeholders

- 46. Defence recognises the importance of providing local residents, local authorities and other interested stakeholders an opportunity to provide input into or raise concerns relating to major projects such as the facilities requirements for this project.
- 47. Defence has engaged with a variety of internal and external stakeholders. Further consultation will be conducted prior to the Public Works Committee hearing. The groups to be consulted include the local members of Federal and State Parliament; local councils; local industry; and the operators of airports using the same runway. Community Consultation events will be held to raise awareness of the project amongst the local communities and for the project to receive feedback on these proposals. The list of stakeholders is provided in Attachment 1.
- 48. Defence anticipates that local building sub-contractors will be employed on a large proportion of the construction works. Engagement with local industry groups will be made to maximise opportunities for local businesses, providing a positive economic impact to small and medium enterprises in each region.
- 49. The project will generate employment opportunities in the building, construction and unskilled labour markets in the areas surrounding each site. An estimated total of 2100 personnel are expected to be directly employed on construction activities Nationwide, as well as off-site functions for manufacturing and distribution of materials.
- 50. Construction traffic routes will be managed to minimise disruption to the local communities. Construction activities are not expected to cause any significant disruption to residents or businesses located in the vicinity of each site.

51. Site-specific transition plans will be developed during the design process to ensure any necessary temporary utility connection points and services requirements are identified and addressed.

Purpose of the Works

Project Objectives

52. Project AIR5431 Phases 2 and 3 established under the Defence Capability Plan is to deliver the new Defence Air Traffic Management and Control System. The Defence Air Traffic Management and Control System will comprise fixed base air traffic control surveillance sensors (Phase 2) and the Air Traffic Management automation systems (Phase 3). Project AIR5431 Phase 3 includes the Defence portion of the OneSKY program required to deliver the harmonised, joint civil military air traffic management system described in the National Aviation Policy White Paper and the Coalition's Policy for Aviation 2013.
53. The objective of this project is to supply facilities for the AIR5431 Phase 2 and 3 systems including facilities for training, support and maintenance of these new systems in order to allow air traffic control services to continue uninterrupted throughout the system rollout, cutover and operation.
54. In addition, Defence is updating air traffic control towers and airfield systems complex facilities that are no longer fit for purpose. These two activities are being conducted in unison to reduce the impact on operations at each site.

Details and Reasons for Site Selection

55. The selection of the sites for each project element has been undertaken in accordance with the Defence Estate planning guidance. The site selection board process addressed Defence policy and guidance including estate development, environmental, heritage and operational considerations including explosives safeguarding.
56. The methodology behind the siting of the air traffic control towers is based on the Civil Aviation Safety Authority and International Civil Aviation Organisation requirements. The

Civil Aviation Safety Authority has published Regulations and Advisory Circulars that air traffic control towers must comply with in terms of principles and function. These Regulations have been based on the International Civil Aviation Organisation publication, Air Traffic Services Planning Manual.

57. Analysis of siting options was undertaken across each of the Bases where a new air traffic control tower is proposed. The requirements of both the Civil Aviation Safety Authority and the International Civil Aviation Organisation place strong technical siting requirements on the possible sites for the towers on each Base. This in turn restricted the siting options available for the airfield systems complex due to the practical need for close proximity between the tower and airfield systems complex facilities. Amongst the factors affecting the siting of towers and the adjacent airfield systems complex are:
- a. angle from eye level in the tower to the airfield;
 - b. location of the tower relative to the direction of aircraft approach and the rising or setting sun;
 - c. location of the tower to afford uninterrupted views to the runway(s); and
 - d. location of the tower so that the response times to detect a moving aircraft on runway thresholds is within the limits outlined by the Civil Aviation Safety Authority.
58. AIR5431 Phase 2 will provide a sensor system (radar) at each base. The sensor equipment building is in direct support of the sensor and is consequentially sited to be in close proximity to the radar. The predominant siting constraints for the sensor and the adjacent sensor equipment building include:
- a. sensor coverage;
 - b. hazards of electromagnetic radiation to ordnance, fuel and personnel;
 - c. impact on the obstruction clearance surfaces; and
 - d. impacts on nearby facilities and navigation aids.

Detailed Description of the Proposed Scope of Works

Project Locations

59. The Project will be undertaken at 18 locations throughout Australia:

a. **Queensland:**

- (1) RAAF Base Amberley;
- (2) Army Aviation Centre Oakey;
- (3) Off-base sensor site Turkey Hill – approximately 9km to the north of the Army Aviation Centre Oakey;
- (4) RAAF Base Townsville; and
- (5) Off-base sensor site Many Peaks – approximately 7km to the north of RAAF Base Townsville.

b. **New South Wales:**

- (1) RAAF Base Richmond;
- (2) HMAS Albatross (Nowra);
- (3) Off-base sensor site Nowra Hill – approximately 2km to the east of HMAS Albatross; and
- (4) RAAF Base Williamtown.

c. **Victoria:**

- (1) RAAF Base East Sale; and
- (2) Off-base sensor site Deadmans Hill – radar site approximately 10.5km to the south of RAAF Base East Sale.

d. **South Australia:**

- (1) RAAF Base Woomera; and
- (2) RAAF Base Edinburgh.

e. **Western Australia:**

- (1) RAAF Gingin;
- (2) RAAF Base Pearce; and
- (3) Off-base sensor site Eclipse Hill – approximately 32km to the north of RAAF Base Pearce.

f. **Northern Territory:**

- (1) RAAF Base Darwin; and
- (2) RAAF Base Tindal.

60. A national site locations plan is at Attachment 2.

Scope Elements

61. The scope elements proposed for this project includes construction of air traffic control towers, new sensor equipment buildings, airfield systems complex facilities and infrastructure. Redundant facilities and infrastructure will be demolished. In some cases, existing facilities will be modified rather than replaced. Existing airfield system assets will be connected to each Airfield Systems Complex. In addition to the facilities above, Operational Maintenance Trainers for both Phases will be housed within the new airfield systems complex at RAAF Base Amberley. The School of Air Traffic Control facility at RAAF Base East Sale will be modified to accommodate the new Phase 3 simulator equipment. The table below is a summary of the proposed scope elements at each site.

	New SEB	Refurb SEB	New TWR	Refurb TWR	New AFLDSYS	Refurb AFLDSYS	Fire Watch Tower	New OMT	Mod SATC Simulator	Demolish TWR	Demolish AFLDSYS
Amberley	x		x		x			x		x	
Oakey	x(os)		x		x					x	x
Townsville		x(os)	x		x					x	x
Richmond			x		x					x	x
Nowra		x(os)		x		x					
Williamtown	x		x		x		x			x	x
East Sale	x(os)			x		x			x	x	
Woomera				x							
Edinburgh				x		x					
Gingin				x							
Pearce	x(os)		x		x					x	x
Darwin	x		x			x				x	
Tindal	x		x		x					x	
Total	7	2	8	5	7	4	1	1	1	9	5

Note: OS = Offsite; SEB = Sensor Equipment Building; TWR = Tower; AFLDSYS = Airfield System; OMT = Operational Maintenance Trainer; SATC = School of Air Traffic Control

62. Details of the scope proposed for each site is outlined below.

Queensland

RAAF Base Amberley

63. RAAF Base Amberley is located approximately 8 km southwest of Ipswich, Queensland and approximately 50 km southwest of Brisbane. RAAF Base Amberley is the largest operational base in the RAAF, employing over 5,000 uniformed and civilian personnel.

64. Although there is a radar facility at RAAF Base Amberley, there is currently no dedicated sensor equipment building as portable containers currently house the sensor equipment and back up power supply. These facilities are old and nearing the end of their economical life. The existing air traffic control tower on base was constructed c.1960. Due to runway extensions related to new aircraft capabilities over the years, the tower is no longer sited to allow efficient air traffic control. Structural deficiencies, Building Code of Australia deficiencies, asset ageing and siting issues warrant the replacement of both the tower and airfield systems complex building.
65. The proposed works for RAAF Base Amberley include construction of a new sensor equipment building, a new airfield systems complex, including accommodation for the new operational maintenance training equipment, and a new air traffic control tower. A plan showing the location of the proposed works is at Attachment 3.
66. **Sensor equipment building.** The proposed sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room located adjacent to the new sensor.
67. **Air traffic control tower.** The proposed new tower is a 25m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and a mechanical plant room. The existing tower will be demolished following the commissioning of the new facility.
68. **Airfield systems complex.** The proposed airfield systems complex will be a single-storey facility with approach control, maintenance, and administrative functions. The existing airfield systems complex will not be demolished due to a requirement to maintain Information and Communication Technology services that currently pass through the facility.
69. **Operational maintenance trainer.** Both Phase 2 and Phase 3 will provide a new operational maintenance trainer, which will enable technical training of engineering and maintenance personnel. The new trainers will be located within the airfield systems complex to maximise sharing of amenities without compromising the function of the facility.

Army Aviation Centre Oakey

70. Army Aviation Centre Oakey is situated approximately 3 km from the town centre of Oakey in Queensland, Australia. It provides a training establishment for Australian Army Aviation and hosts a Singapore Armed Forces Helicopter Squadron. RAAF Joint Battlefield Airspace Controllers provide air traffic services in support of Army operations.
71. The existing sensor equipment building is located off-base at Turkey Hill and is in fair condition but reconfiguration to allow for the installation of additional and replacement mechanical plant is not cost effective. The existing air traffic control tower, c.1975, and airfield systems complex are showing signs of deterioration, particularly with the mechanical services in the air traffic control tower.
72. The proposed works at Army Aviation Centre Oakey will include a new sensor equipment building at Turkey Hill. The existing air traffic control tower and airfield systems complex will be demolished and replaced with new facilities. A plan showing the location of the proposed works is at Attachment 4.
73. **Sensor equipment building.** The proposed sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room. The existing sensor equipment building on the site will be converted into a facility that provides amenities for technicians working on the sensors.
74. **Airfield systems complex.** The proposed airfield systems complex will be a two-storey facility with approach control, maintenance and administrative functions. The existing airfield systems complex will be demolished following the commissioning of the new facility.
75. **Air traffic control tower.** The proposed tower is a 25m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and a mechanical plant room. The existing tower will be demolished following the commissioning of the new facility.

RAAF Base Townsville

76. RAAF Base Townsville is located in the Townsville suburb of Garbutt, approximately 3.7 km west of the city. The airfield is shared with Townsville Airport Pty Ltd under a Joint User Deed. RAAF Joint Battlefield Airspace Controllers provide air traffic services to both military and civil Regular Public Transport aircraft.
77. The existing sensor equipment building is located off-base at Many Peaks and has recently been upgraded and is in good condition. The existing air traffic control tower, constructed c1960, is reaching the end of its useful life. The mechanical services and roof are in poor condition. The existing tower and airfield systems complex are no longer optimally sited for the efficient provision of Air Traffic Services.
78. The proposed works at RAAF Base Townsville include construction of a new air traffic control tower and airfield systems complex. Minor modification of the existing sensor equipment building is planned at Many Peaks. A plan showing the location of the proposed works is at Attachment 5.
79. **Sensor equipment building.** The existing sensor equipment building is in good condition, with proposed works to be limited to communications, electrical and mechanical services upgrades within the facility to accommodate the Phase 2 equipment.
80. **Airfield systems complex.** The proposed airfield systems complex will be a single-storey facility with approach control, administrative and maintenance functions. The existing airfield systems complex will be demolished following the commissioning of the new facility.
81. **Air traffic control tower.** The proposed tower will be a 25m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and a mechanical plant room. The existing tower will be demolished following the commissioning of the new facility.

New South Wales

RAAF Base Richmond

82. RAAF Base Richmond is one of Australia's oldest RAAF bases. It is located within the City of Hawkesbury in the north-western fringe of Sydney, New South Wales, between the towns of Windsor and Richmond.
83. The existing tower at RAAF Base Richmond, constructed c.1960, is ageing and is no longer sited correctly to allow efficient air traffic control. There is insufficient office space and as a result executive staff are located remotely from the airfield systems complex which impacts the efficiency of workplace functionality. There is no existing Defence air traffic control sensor at RAAF Base Richmond and there is no requirement to provide an air traffic control sensor at RAAF Base Richmond under project AIR5431 Phase 2.
84. The proposed works at RAAF Base Richmond include a new tower and airfield systems complex. The tower works will accommodate the installation of the Phase 3 equipment. A plan showing the location of the proposed works is at Attachment 6.
85. **Airfield systems complex.** The proposed airfield systems complex will be a two-storey facility with administrative and maintenance functions. The existing airfield systems complex will be demolished following the commissioning of the new facility.
86. **Air traffic control tower.** The proposed tower is a 25m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and a mechanical plant room. The existing tower will be demolished following the commissioning of the new facility.

HMAS Albatross

87. HMAS Albatross is an airfield operated by the Royal Australian Navy (RAN) in support of the Navy Fleet Air Arm. The base is located near Nowra, New South Wales. RAAF Joint Battlefield Airspace Controllers provide air traffic services in support of Navy operations.

88. The existing radar sensor is located off-base at the Nowra Hill site, 2km to the east of the air traffic control tower and is supported by equipment located in portable containers. However, there is an unused building on the site that is in fair condition and suitable to house the Phase 2 sensor equipment.
89. The tower and airfield systems complex facilities are 13 years old with no significant structural or building fabric deficiencies.
90. The proposed works at HMAS Albatross include modifications to the air traffic control tower and airfield systems complex to accommodate Phase 3 equipment requirements and modifications to the unused building at Nowra Hill as a sensor equipment building. A plan showing the location of the proposed works is at Attachment 7.
91. **Sensor equipment building.** There are to be modifications to the unused building at Nowra Hill to house the necessary electrical and communications infrastructure to support the Phase 2 sensor equipment.
92. **Airfield systems complex.** The proposed airfield systems complex upgrade will include a building extension and services upgrades to accommodate the Phase 3 equipment. This will include a new approach control room and technical equipment room that are required to facilitate installation and commissioning of the Phase 3 capability. The existing approach control and equipment room will be converted to a briefing room, work area and executive office space. The services upgrades will include replacement emergency power and uninterrupted power supply systems to provide the level of service continuity and reliability required by the Phase 3 capability.
93. **Air traffic control tower.** The proposed tower upgrade will include the minor refurbishment of building finishes, replacement of air conditioning and an upgrade of electrical and communication services to accommodate the Phase 3 equipment requirements.

RAAF Base Williamtown

94. RAAF Base Williamtown is located approximately 15 km north of the coastal city of Newcastle, New South Wales. The military base shares its runway facilities with

Newcastle Airport and although not a Joint User airfield, RAAF Joint Battlefield Airspace Controllers provide air traffic services to both military and civil Regular Public Transport aircraft.

95. The existing tower at RAAF Base Williamtown, which serves as both air traffic control and a fire watch tower, was constructed c.1960 and is no longer sited correctly to allow efficient air traffic control operations due to a lack of direct visibility of key taxiways. Defence's preferred option is to demolish the existing tower, pending the outcome of the RAAF Base Williamtown Environment Protection and Biodiversity Conservation Act Referral². In the event that the outcome of the referral is to retain the tower, the project will adaptively reuse the tower solely as a fire watch facility.
96. The proposed works at RAAF Base Williamtown include the construction of a new sensor equipment building on the southern side of the Base, construction of a new air traffic control tower, airfield systems complex and new fire watch tower. A plan showing the location of the proposed works is at Attachment 8.
97. **Sensor equipment building.** The proposed sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room.
98. **Airfield systems complex.** The proposed airfield systems complex will be a single-storey facility with approach control, administrative and maintenance functions. The existing airfield systems complex will be demolished with the exception of the Technical Equipment Room as it houses a base-wide communications hub. Demolition will follow the commissioning of the new facility.
99. **Air traffic control tower.** The proposed tower is a 25m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and plant room.

² Referral submitted to the Department of Environment September 2014.

100. **New fire watch fire facility.** The demolition of the existing tower will require provision for a new fire watch facility to maintain the existing air base fire service capability.³

Victoria

RAAF Base East Sale

101. RAAF Base East Sale is located approximately 200 km from Melbourne and is one of the main training establishments of the RAAF.
102. There is an off-site radar sensor at Deadmans Hill, approximately 10km from the Base. A new tower and airfield systems complex were recently constructed as part of the East Sale Redevelopment project.
103. The proposed works at RAAF Base East Sale include a new sensor equipment building at Deadmans Hill to house the electrical and communication services required to support the new Phase 2 sensor capability at the site. The existing sensor equipment building will be converted to accommodate a technical work area and spares storage room to replace an existing demountable building at the site. The proposed works also include minor modifications to the recently constructed tower and airfield systems complex to accommodate the Phase 3 equipment. The air traffic control simulator room at the School of Air Traffic Control will also be modified to accommodate the Phase 3 equipment. A plan showing the location of the proposed works is at Attachment 9.
104. **Sensor equipment building.** The proposed sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room. An existing building on the site will be converted to house support functions for the sensors including a technical work area and spares storage room.
105. **Airfield systems complex.** The proposed airfield systems complex upgrade will include services upgrades and layout alterations to the existing building to accommodate the Phase

³ Pending EPBC Referral determination.

3 equipment. The services upgrades will include replacement electrical generation systems to provide the level of service continuity required by the Phase 3 capability.

106. **Air traffic control tower.** The proposed tower upgrade will include minor improvements to the existing tower to accommodate the Phase 3 equipment. This will involve the fit out of two rooms specifically for the equipment. The old tower will be demolished following the commissioning of the new facility.
107. **School of Air Traffic Control.** Modifications to the air traffic control simulator room will be carried out to enable the transition to the Phase 3 System. The works will include partitioning and new wall and floor finishes.

South Australia

RAAF Base Woomera

108. RAAF Base Woomera is an operational RAAF airfield located approximately 6 km north of the Woomera Defence Village, in South Australia.
109. The existing tower, built c.1958, is in fair condition but does not achieve the required functionality for the site. Access to the tower cabin does not comply with current fire egress requirements under the Building Code of Australia. Additionally, RAAF Base Woomera is used as a testing site for other organisations and these cannot be accommodated in the current facility. There is no existing Defence air traffic control radar at RAAF Base Woomera and a radar is not required at Woomera as part of Project AIR5431 Phase 2. There is therefore no requirement for a sensor equipment building. As air traffic services are not provided permanently at this site, there is no requirement for an airfield systems building.
110. The proposed works at RAAF Base Woomera include refurbishment of the existing air traffic control tower. A plan showing the location of the proposed works is at Attachment 10.

111. **Air traffic control tower.** The control cabin will be replaced and all communications, electrical, mechanical and hydraulic services to the building will be upgraded to comply with the requirements of the Building Code of Australia.

RAAF Base Edinburgh

112. RAAF Base Edinburgh is located in Edinburgh, approximately 25 km north of the centre of Adelaide, South Australia.
113. A new tower was recently constructed at RAAF Base Edinburgh by the RAAF Base Edinburgh Redevelopment project. There is no existing Defence air traffic control radar at RAAF Base Edinburgh so there is no requirement for a sensor equipment building.
114. The proposed works at RAAF Base Edinburgh include tower and airfield systems complex modifications to accommodate the Phase 3 equipment. A plan showing the location of the proposed works is at Attachment 11.
115. **Airfield systems complex.** The proposed airfield systems complex upgrade will include a significant extension to increase functions at the building and accommodate the Phase 3 equipment. Minor layout improvements and services upgrades to the mechanical and electrical systems will be made in the existing building.
116. **Air traffic control tower.** The proposed tower facilities upgrade will include alterations to the internal layout and electrical services upgrades to accommodate the Phase 3 equipment.

Western Australia

RAAF Gingin

117. RAAF Gingin is a satellite airfield to RAAF Base Pearce and is used for pilot training. It is located approximately 40 km north of RAAF Base Pearce, which also administers the airfield.
118. The existing tower, built c.1960, is proposed to be retained due to its heritage values. The tower is showing signs of water damage and electrical, mechanical and hydraulic services are in poor condition.

119. The proposed works include refurbishment of the existing tower. The airfield systems functions are accommodated in the lower levels of the tower. There is no radar sensor at the site as radar coverage is provided by RAAF Base Pearce. A plan showing the location of the proposed works is at Attachment 12.
120. **Air traffic control tower.** The proposed works will involve improvements and services upgrades to the existing tower to accommodate the Phase 3 equipment.

RAAF Base Pearce

121. RAAF Base Pearce is the main RAAF Base in Western Australia. It is located in Bullsbrook, north of Perth.
122. The current radar sensor is located off site at Eclipse Hill and also services RAAF Gingin. There is no dedicated sensor equipment building at the site as portable containers currently house the sensor equipment and backup power supply. The existing tower, constructed c.1960, requires replacement as it has reached the end of its useful life. There are significant asbestos containing materials in the building and fire egress does not comply with the Building Code of Australia. The existing airfield systems complex is aged and showing signs of deterioration. The hydraulic and electrical services in the tower and other buildings are in poor condition. The mechanical services in both buildings are poor with a detrimental effect on the ventilation to the building.
123. The proposed works will include construction of a new sensor equipment building at Eclipse Hill, and a new airfield systems building and tower at RAAF Base Pearce. A plan showing the location of the proposed works is at Attachment 13.
124. **Sensor equipment building.** The proposed sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room.
125. **Airfield systems complex.** The proposed airfield systems complex will be a single-storey facility with administrative and maintenance functions. The existing airfield systems complex will be demolished following the commissioning of the new facilities.

126. **Air traffic control tower.** The proposed new tower is a 25-m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and mechanical plant room. The existing tower will be demolished following the commissioning of the new facilities.

Northern Territory

RAAF Base, Darwin

127. RAAF Base Darwin is located north-east of the city of Darwin, Northern Territory, and is one of the RAAF's forward operating bases. The runway is shared with Darwin International Airport under a Joint User Deed and operates 24 hours per day. RAAF Joint Battlefield Airspace Controllers provide air traffic services to both military and civil Regular Public Transport aircraft.
128. Although there is a radar facility at RAAF Base Darwin, there is currently no dedicated sensor equipment building as portable containers currently house the sensor equipment and backup power supply.
129. The existing tower at RAAF Base Darwin, constructed c.1997, has an eye height of 40m and serves both military and civilian aircraft using the site and is required to remain operational throughout the works.
130. The proposed works include a new sensor equipment building, construction of a new air traffic control tower and refurbishment and modifications to the airfield systems complex facilities. A plan showing the location of the proposed works is at Attachment 14.
131. **Sensor Equipment Building.** The sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room.
132. **Airfield systems complex.** The proposed airfield system complex upgrade will include a substantial extension to the building to accommodate the Phase 3 Equipment whilst the existing equipment remains operational. There will also be additional office space for approach control administration functions, new electrical connections, generator and an

uninterruptable power supply. Minor upgrades will be made in the existing building primarily to 'make good' following the removal of the redundant air traffic control equipment.

133. **Air traffic control tower.** The proposed new tower is a 50m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and plant room. A 50m tower is required at Darwin due to difficulties viewing the aerodrome movement areas in a shorter tower. The existing tower will be demolished following the commissioning of the new facility.

RAAF Base Tindal

134. RAAF Base Tindal is located approximately 15 km east southeast of the town of Katherine, Northern Territory.
135. The current radar sensor is located off site at Hill 202. Due to poor mains power supply to the site, the proposed new sensor will be located on base.
136. The existing tower at RAAF Base Tindal, constructed c.1988, is now in poor condition and has functional, spatial and regulatory inadequacies. Similarly, the airfield systems complex has functional, expansion and regulatory inadequacies.
137. The proposed works include a new sensor equipment building on the northern side of the base. The works also include the construction of a new air traffic control tower and airfield systems complex to accommodate the Phase 3 equipment. A plan showing the location of the proposed works is at Attachment 15.
138. **Sensor equipment building.** The new sensor equipment building will be a single-storey structure housing a generator, uninterruptible power supply room, switch room and communications room. The existing sensor equipment building at Hill 202 will not be demolished as it has continuing operational radio transmitter and receiver capability requirements.

- 139. **Airfield systems complex.** The proposed airfield systems complex will be a single-storey facility with air traffic control and maintenance functions. The existing airfield systems complex will not be demolished as it is planned to be reused as an administration building.
- 140. **New air traffic control tower.** The proposed new tower is a 25m high multi-level facility accommodating a control cabin, external observation deck and a crew rest area, toilet, kitchenette and mechanical plant room. The existing tower will be demolished following the commissioning of the new facility.

Zoning and Local Approvals

- 141. No Native Title/Indigenous Land Use Agreement issues are anticipated for this project.
- 142. No land acquisitions are anticipated for this project.
- 143. Arrangements will be required to enter into a new lease area to facilitate the RAAF Base Darwin tower and a utility building which will house electrical services. The preferred site will require approximately 720m² of additional land to be leased from Darwin International Airport. Consultation with Darwin International Airport undertaken to date has not identified this as a risk.
- 144. The preferred site endorsed for the Townsville tower and airfield systems complex will require an amendment to the existing Bureau of Meteorology lease agreement, primarily in relation to the location of the Remote Balloon Launcher located in the area. Detailed consultation with Bureau of Meteorology representatives has identified that this change will not impact on their capability.

Planning and Design Concepts

- 145. Planning and design concepts related to the air traffic control tower, airfield systems complex and sensor equipment building facilities have been developed during the Design phase of the project.
- 146. For air traffic control towers, design concepts are functionally based with the buildings designed to meet the requirements of the users. The design concept comprises a core box structure (lift, stair and service risers) with an amenities floor, control room and

observation deck and a lightweight roof. The design concept is an enhanced arrangement to that recently adopted for the new tower at RAAF Base East Sale. A common design has been adopted across all sites, except RAAF Base Darwin tower, with a floor height in the cabin of 24.950m. A '25m tower' drawing is located at Attachment 16. At RAAF Base Darwin a similar design has been adopted but with a floor height of 49.950m. A '50m tower' drawing is located at Attachment 17.

147. The design concept for airfield systems complex facilities is generally a single level building for most sites. At Army Aviation Centre Oakey and RAAF Base Richmond however, site constraints dictate the buildings will need to be of two-storey construction. The design and layout of these facilities are unique to each site and reflect the existing site layout, the individual requirements at each site and prevalent environmental conditions. The key requirements to be accommodated by these facilities are the technical needs of the Phase 3 equipment and the functional needs of the air traffic control technicians and operators. The reliability requirements for the electrical supply to the Phase 3 equipment have had a major influence over the design.
148. For the sensor equipment buildings, which are often in remote locations, a simplistic practical and durable design has been adopted. The design concept for sensor equipment buildings is influenced by the requirement for communications equipment and power to support the Phase 2 equipment. Where possible, existing facilities have been reused, particularly for support functions.

Structural Design

149. The structural design of the proposed buildings takes into account local geotechnical conditions and are in accordance with all relevant Australian Standards and Codes. Appropriately qualified and experienced geotechnical and structural engineers have been engaged in the design of the proposed facilities.

Materials and Furnishings

150. The Material selection is based on suitability for purpose, durability, low maintenance and compliance with relevant codes and standards. The use of exposed structure requiring maintenance to protective coatings has been minimised.

Hydraulic Services

151. Water will be supplied to the proposed tower and airfield systems complex facilities through connections to the existing water mains at each site. This service will comply with Commonwealth, State and Territory legislation, the Building Code of Australia, relevant Work Place Health and Safety requirements, AS/NZS 3666 (*Air-Handling and Water Systems of Buildings Set*) series and the AS/NZS 3500 (*Plumbing and Drainage Set*) series.

Electrical Services

152. The electrical supply to the proposed facilities will be from the existing electrical networks on each site. Investigations have confirmed that there is adequate capacity on the network for the new facilities at all sites. This will be supported by local emergency generators and uninterrupted power supply to provide continuity of service for the air traffic management and control capability in the event of a mains power failure.
153. The electrical design has been undertaken in accordance with all relevant Australian Standards, all applicable Legislation, Regulations, Codes of Practice and Guidance Publications and Defence requirements.

Fire Protection

154. Fire hydrant, detection and first attack systems such as extinguishers and hose reels will be provided in accordance with the requirements of the *National Construction Code – Building Code of Australia* and *Defence Manual of Fire Protection Engineering*.
155. Buildings and facilities forming part of the Project will comply with the bushfire provisions of *Defence Manual of Fire Protection Engineering* Chapters 6 and 27 and

relevant Australian Standards. Bushfire reports will be prepared where required for proposed new and altered buildings.

Acoustics

156. The main acoustic issues associated with the tower and airfield systems complex designs include control of aircraft noise intrusion; control of reverberation noise; speech privacy between adjoining spaces; and control of noise from mechanical services.
157. Based on the current tower design, noise intrusion during aircraft movements will occur through the tower glazing, tower façade, external doors, tower roof and any services penetrations. Acoustic attenuation has been incorporated into the tower cabin through the selection of materials, particularly:
 - a. carpet on the floors and walls to below the glazing;
 - b. the ceiling lining is acoustically absorptive material;
 - c. all doors are appropriately rated to acoustic requirements; and
 - d. all penetrations through the tower envelope are to be fully sealed air tight.

Landscaping

158. All proposed landscape works are designed to enhance the working environment and their surroundings by providing well lit pedestrian access links between the different entry points of the facilities and create pleasant outdoor spaces through screening, shading and external area design.
159. Landscape works will be carried out in accordance with best practice techniques to ensure best value for money outcomes and highest likelihood of vegetation survival.
160. The landscape plan and scope will be developed further in consultation with the respective Regional Environmental and Sustainability Officers at each Base.

Other Civil Works

161. The proposed building platform and grading levels for each site will be designed based on the following:
- a. to optimise the bulk earthworks where possible, so as to minimise the importation of fill material onsite and the disposal of surplus spoil offsite;
 - b. in conjunction with the proposed stormwater drainage system, in particular to achieve the required minimum freeboards to stormwater runoff from upstream catchments that will be diverted around the proposed site;
 - c. minimum and maximum grades for the required uses and applications, considering vehicle and pedestrian access;
 - d. surface grading will ensure overland flow paths are to be directed away from buildings and other built areas; and
 - e. consideration of the specific earthworks requirements of the site, including those identified from on-site geotechnical investigations.
162. The proposed roads, hardstands and carparks will be designed in accordance with all relevant Australian Standards and AustRoads Guides.

Environmental Sustainability of the Project

163. The Commonwealth is committed to Ecologically Sustainable Development and the reduction of greenhouse gas emissions. Defence reports annually to Parliament on its energy management performance and on its progress in meeting the energy efficiency targets established by the Government as part of its commitment to improve Ecologically Sustainable Development. Defence also implements policies and strategies in energy, water and waste to improve natural resource efficiency and to support its commitment to the reduction of energy consumption, potable water consumption and waste diversion to landfill.

164. This project has addressed Commonwealth policy by adopting cost-effective and Ecologically Sustainable Development practices as a key objective in the design of the new facilities.
165. The ecologically sustainable measures for the project are balanced with other requirements for Defence buildings, including security, heritage and workplace health and safety considerations, to ensure that Defence's operational capability is not compromised. All buildings are designed and will be constructed, operated and maintained to ensure that they use energy efficiently.
166. To achieve this, buildings⁴ will comply with:
- a. Section J Energy Efficiency Provisions of Volume One of the *Building Code of Australia, National Construction Code 2014*;
 - b. Part 3.12 *Drainage* of Volume Two of the *Building Code of Australia, National Construction Code 2014*; and
 - c. The Energy Efficiency in Government Operations policy; and
167. Other Ecologically Sustainable Development initiatives to be implemented within the scope of the Project include:
- a. adoption of a general water strategy which is applicable to all sites and each of the different building types (both new constructions and refurbishments);
 - b. target 10% improvement on minimum deemed-to-satisfy requirements of Section J⁵ Energy Efficiency Provisions of Volume One of the *Building Code of Australia* for thermal performance of external walls, roofs and windows where applicable;

⁴ Air Traffic Control Towers will not comply fully with Section J of the BCA due to the operational requirement to use single glazing in the cabins. Double glazing creates distortions that are unacceptable for safe Air Traffic Control operations.

⁵ Ibid

- c. integrated lighting design with target consumption of 6W/m² for lighting with maximum of 8W/m² where applicable;
- d. provision of zoned separate light switching with individual spaces to be individually switched and with presence detection control where appropriate (i.e. rest area, kitchenette, w/c). All multi-switch panels will be clearly labelled;
- e. consideration of CO₂ demand control ventilation in spaces having high but variable occupancy levels, and also to allow for introduction of minimum design outside air rates when occupancy level is low;
- f. provision of separate digital energy metering for occupied areas and all energy sources supplying the building (e.g. electricity, gas) will be electronically metered and linked to the Base Management Systems (where applicable) in accordance with the requirements of the Building Code of Australia and the Defence Sub-metering Program; and
- g. light coloured finish to roof material will be applied to minimise heat absorption.

Reuse of Existing Structures

168. Pending the outcome of the RAAF Base Williamtown Environmental Protection and Biodiversity Conservation Act referral⁶, the extant c.1960 Williamtown tower may be retained on heritage grounds. Although the existing tower is not suitable for reuse as an air traffic control tower, Defence has planned and costed adaptive reuse of the tower solely as a Fire Watch tower. If retained, the extent of the work will include be limited to refurbishment of finishes within the tower and improvements to existing services which are showing signs of dilapidation.

Demolition and Disposal of Existing Structures

169. As part of the project, existing facilities are proposed to be demolished. These facilities are specialised and as such there is no ability to reuse them for other functions. Demolishing

⁶ Referral submitted to the Department of Environment September 2014.

facilities reduces the ongoing maintenance and operation costs for Defence. Demolition works under the project will include:

- a. RAAF Base Amberley - air traffic control tower;
- b. AAC Oakey - air traffic control tower and airfield systems complex;
- c. RAAF Base Townsville - air traffic control tower and airfield systems complex;
- d. RAAF Base Richmond - air traffic control tower and airfield systems complex;
- e. RAAF Base Williamtown - air traffic control tower⁷ and airfield systems complex;
- f. RAAF Base East Sale - air traffic control tower;
- g. RAAF Base Pearce - air traffic control tower and airfield systems complex;
- h. RAAF Base Darwin - air traffic control tower; and
- i. RAAF Base Tindal - air traffic control tower.

Provisions for People with Disabilities

170. Access and facilities for the disabled will be provided in consultation with the Defence Centre for Diversity Expertise and in accordance with the Building Code of Australia, Australian Standard AS1428 *Design for access and mobility* and the Defence policy 'Disabled Access and Other Facilities for Disabled Persons'. These standards lay out the design and construction requirements to comply with the *Disability Discrimination Act 1992*.

Childcare Provisions

171. There are no requirements for additional childcare facilities as a result of this project.

⁷ Pending EPBC Referral determination.

Work Health and Safety Measures

172. The proposed facilities will comply with the requirements of the *Work Health and Safety Act 2011*, the Department of Defence *Work Health and Safety Manual* and operate in accordance with an approved Work Health and Safety Plan.
173. The Australian Government is committed to improving work health and safety outcomes in the building and construction industry. The construction Contractor engaged to construct the work will hold Work Health and Safety accreditation from the Office of the Federal Safety Commissioner under the Australian Government Building and Construction Occupational Health and Safety Accreditation Scheme.
174. The design for the works has been developed in accordance with the safety in design provisions of the *Work Health and Safety Act 2011*.
175. The construction of the works will be managed in accordance with the *Work Health and Safety Act 2011*.
176. All construction sites will be appropriately secured to prevent public access or access by unauthorised Defence personnel during the construction period.

Cost Effectiveness and Public Value

Project Budget

177. The estimated out-turn cost of the project is \$409.9 million, excluding Goods and Services Tax. The cost estimate includes all construction costs, management and design fees, furniture fittings and equipment, contingencies and escalation allowances.
178. The Operating Costs are anticipated to increase due to the addition of new facilities and infrastructure, which will increase the associated facilities maintenance, cleaning and utilities expenses.

Details of Project Delivery System

179. A Project Management/Contract Administrator has been appointed from the Defence Infrastructure Panel by the Commonwealth to manage the project works and to administrate contracts during the Planning Phase.
180. A two stage open tender procurement process was used to engage a Managing Contractor, using the Department of Defence Managing Contractor Contract. During the Planning Phase the Managing Contractor is responsible for ensuring the design of the facilities are fit for purpose, and ensures that significant contractor buildability knowledge is transferred into the design phase to mitigate Delivery Phase program risks.
181. Subject to Parliamentary approval of the project, satisfactory performance of the Managing Contractor in the Planning Phase, and reaching agreement on the Delivery Phase costs and program, the current Managing Contractor may be engaged for the Delivery Phase.
182. Under the Managing Contractor Contract, the Managing Contractor does not itself undertake construction, with construction work let to subcontractors on a competitive basis to maximise value for money.
183. Defence and the Managing Contractor will actively promote opportunities for local small-to-medium enterprises through the construction trade packages. The Managing Contractor is required to deliver all works in accordance with, but not limited to, Building Code 2013 guidelines, National Construction Code – Building Code of Australia, relevant Australian Standards, relevant Defence Policy, and Workplace Health and Safety Legislation.

Construction Program

184. Subject to Parliamentary approval of the Project, construction is expected to commence in early 2016 at RAAF Base Amberley. Works at the other sites will progressively commence from late 2016. All works are anticipated to be completed by the end of 2021.

Public Value

- 185. The project will meet an important National Air Traffic Management capability need by directly supporting the Defence components of the OneSKY Australia program.
- 186. The proposed works will provide workplaces that are fit for purpose and allow personnel to undertake their duties, roles and responsibilities safely in an environment that meets the specific task. The works are also expected to improve personnel morale and impact positively on recruitment and retention, which will have a flow on impact to capability support levels.
- 187. The project will also employ a diverse range of skilled consultants, contractors and construction workers that could also include opportunities for up-skilling and job training to improve individual skills and employability on future projects.

Revenue

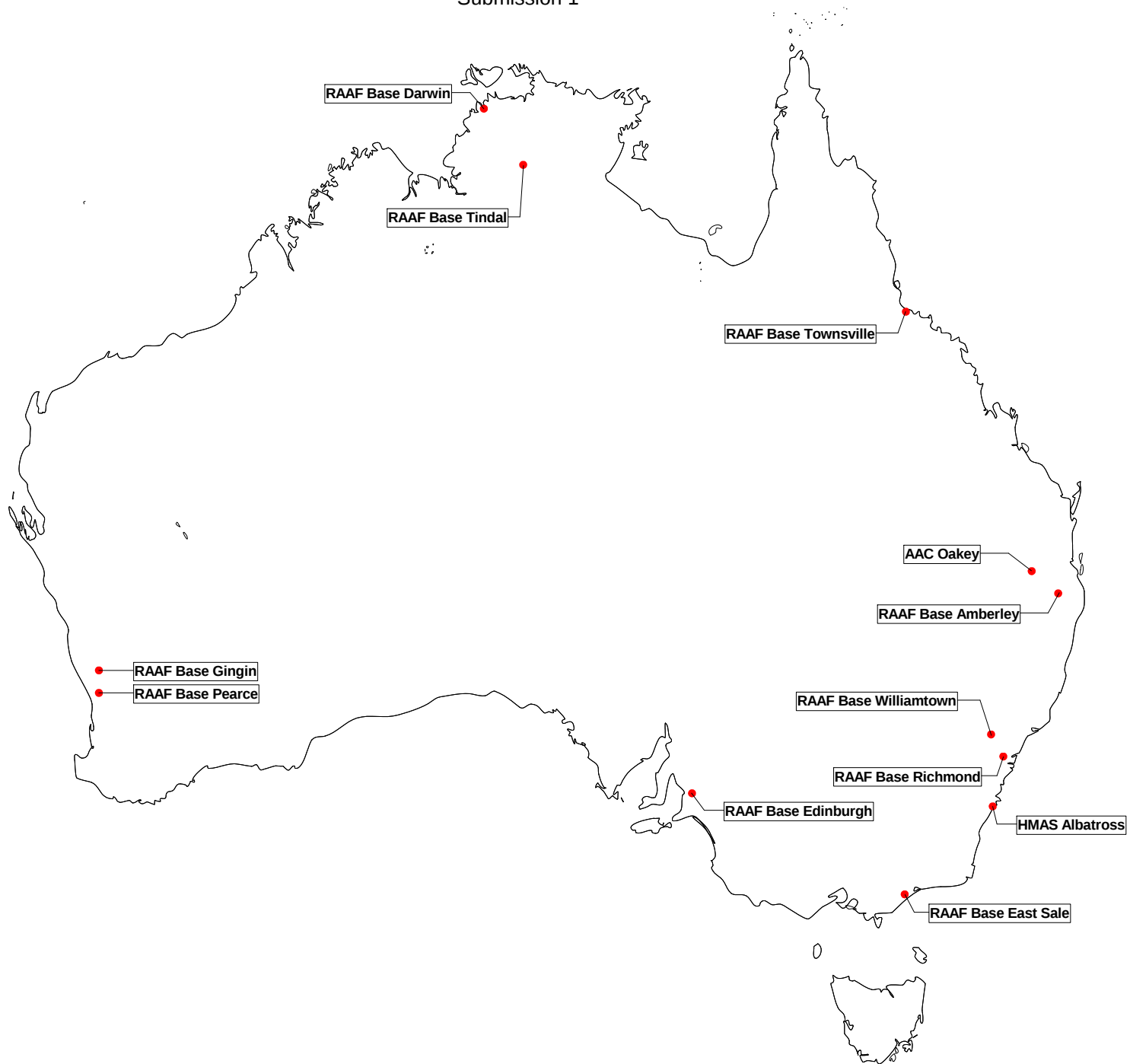
- 188. No revenue is expected to be derived from the project.

Attachment 01: Stakeholder List

Stakeholder or Group	Name/Title
Federal Member (RAAF Base Richmond)	Ms Louise Markus MP Member for Macquarie
Federal Member (RAAF Base Williamtown)	Ms Sharon Claydon MP Member for Newcastle
Federal Member (HMAS Albatross)	Ms Ann Sudmalis MP Member for Gilmore
NSW State Premier	Mike Baird MLA Premier and Minister for Western Sydney Member for Manly
NSW Roads and Maritime	Andrew Constance MLA Minister for Transport and Infrastructure Member for Bega
State Member (RAAF Base Richmond)	Mr Dominic Francis Perrottet, MP Member for Hawkesbury
State Member (RAAF Base Williamtown)	Ms Kate Rebecca Washington MLA Member for Port Stephens
State Member (HMAS Albatross)	Mr Gareth Ward MLA Member for Kiama
Federal Member (RAAF Base Darwin)	Ms Natasha Griggs MP Member for Solomon
Federal Member (RAAF Base Tindal)	Mr Warren Snowdon MP Member for Lingiari
NT Chief Minister	Adam Giles MLA Chief Minister Minister for Tourism Minister for Northern and Central Australia Minister for Economic Development and Major Projects Minister for Indigenous Affairs
NT Department of Transport	Minister for Police, Fire and Emergency Services Minister for Education Minister for Transport Minister for Infrastructure Minister for Veterans Support Member for Brennan
State Member (RAAF Base Darwin)	Mr David William Tollner MLA Treasurer Minister for Lands and Planning Minister for Mines and Energy Member for Fong Lim

State Member (RAAF Base Tindal)	Willem Welstra Van Holthe MLA Deputy Chief Minister Minister for Primary Industries and Fisheries Minister for Land Management Minister for Essential Services Minister for Public Employment Member for Katherine
Federal Member (RAAF Base Amberley)	Mr Shayne Neumann MP Member for Blair
Federal Member (AAC Oakey)	Mr Ian Macfarlane MP Member for Groom Minister for Industry and Science
Federal Member (RAAF Base Townsville)	Mr Ewen Jones MP Member for Herbert
QLD State Premier	Annastacia Palaszczuk MP State Premier Minister for the Arts Member for Inala
QLD Department of Transport and Main Roads	Mark Bailey MP Minister for Main Roads, Road Safety and Ports Minister for Energy and Water Supply Member for Yeerongpilly
State Member (RAAF Base Townsville)	Mr Scott Stewart MP Member for Townsville
State Member (RAAF Base Amberley)	Mr Jim Madden MP Member for Ipswich West
State Member (AAC Oakey)	Mr Pat Weir MP Member for Condamine
Federal Member (RAAF Woomera)	Rowan Ramsay MP Member for Grey
Federal Member (RAAF Base Edinburgh)	Nick Champion MP Member for Wakefield
SA State Premier	Jay Weatherill MP Premier Member for Cheltenham
SA Department of Planning, Transport and Infrastructure	Stephen Mullighan MHA Minister for Transport and Infrastructure Minister Assisting the Minister for Planning Minister Assisting the Minister for Housing and Urban Development Member for Lee
State Member (RAAF Woomera)	Mr Eddie Hughes MP Member for Giles
State Member (RAAF Base Edinburgh)	Ms Leesa Vlahos MP Member for Taylor

Federal Member (RAAF Base East Sale)	Darren Chester MP Member for Gippsland
VIC State Premier	The Honourable Daniel Andrews MP Premier of Victoria
Vicroads	Luke Donellan MLA Minister for Roads and Road Safety Minister for Ports Member for: Narre Warren North
State Member (RAAF Base East Sale)	Mr Danny O'Brien MP Member for Gippsland South
Federal Member (RAAF Base Pearce and RAAF Gingin)	The Honourable Christian Porter MP Parliamentary Secretary to the Prime Minister Member for Pearce
WA State Premier	Colin Barnett MLA Premier of Western Australia Minister for State Development
WA Main Roads Western Australia	Dean Cambell Nalder MLA Minister for Transport Member for Alfred Cove
Legislative Assembly Member (RAAF Base Pearce)	Mr Francesco (Frank) Angelo Alban MLA Member for Swan Hills
Legislative Assembly Member (RAAF Gingin)	Mr Ronald (Shane) Shane Love MLA Parliamentary Secretary to the Minister for Regional Development; Lands Member for Moore

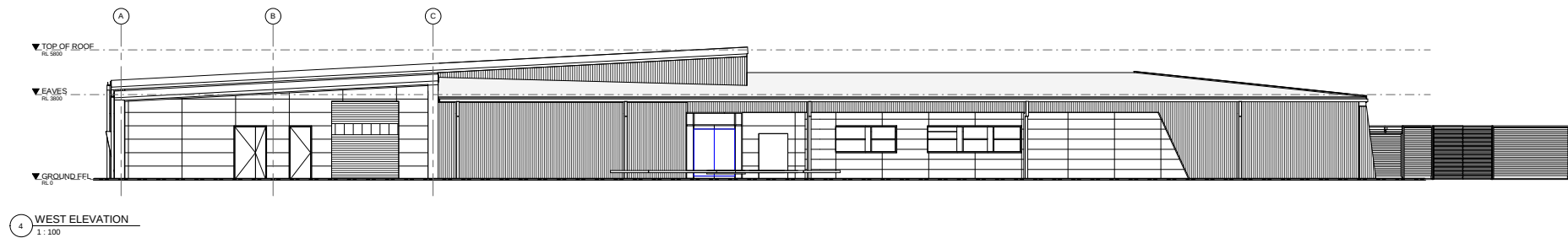
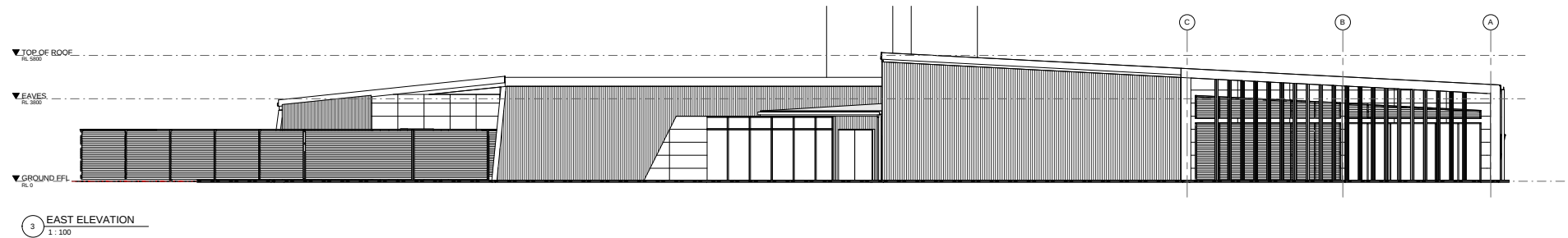
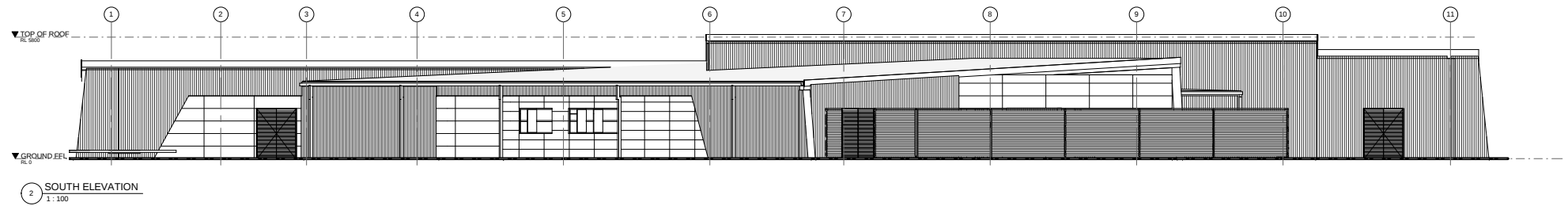
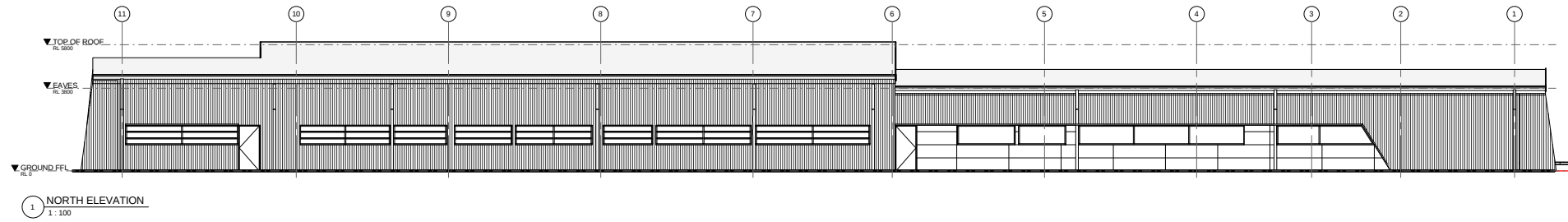


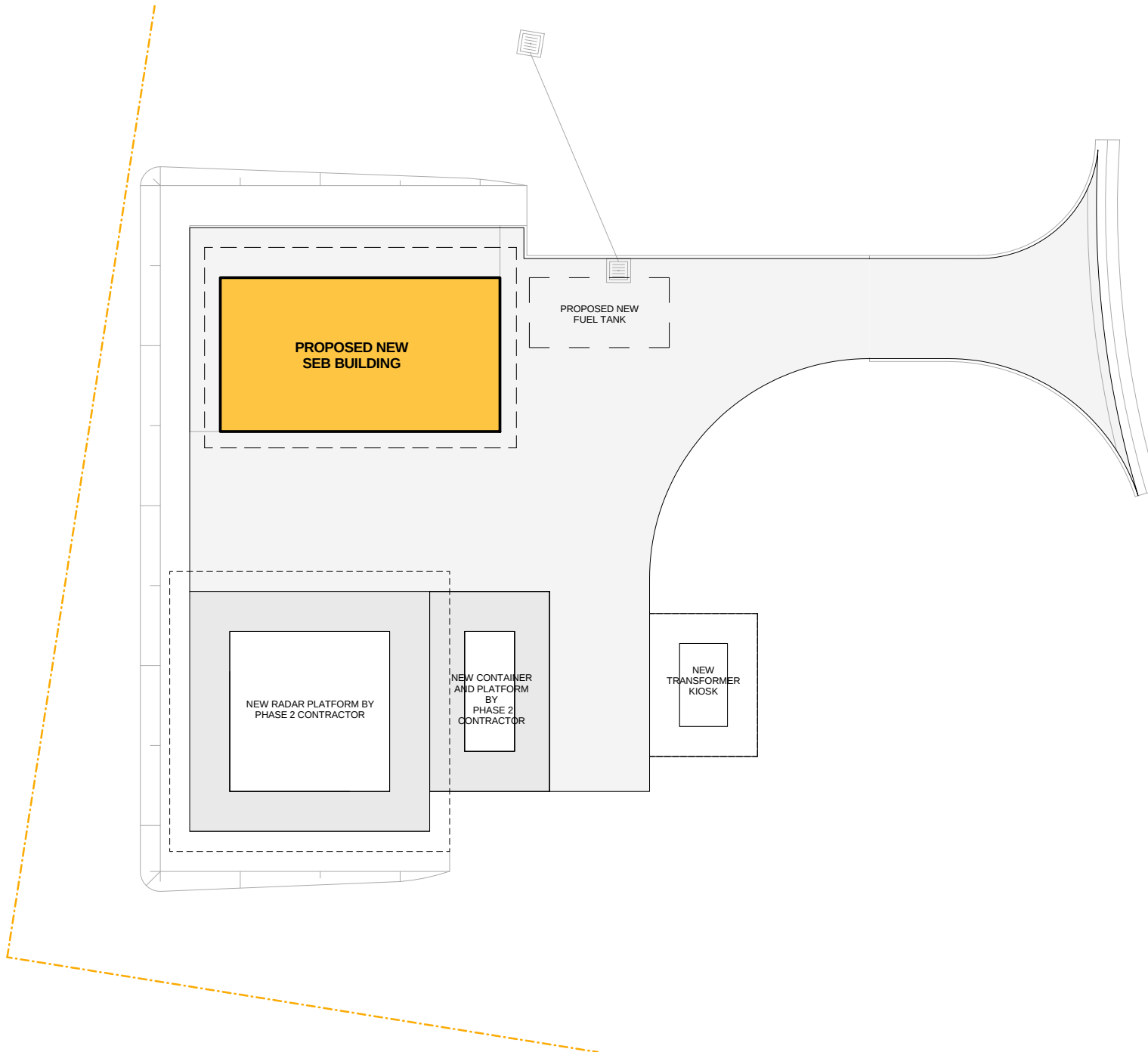






AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
Submission 1

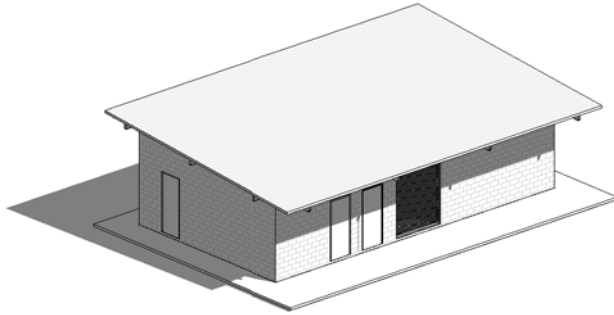




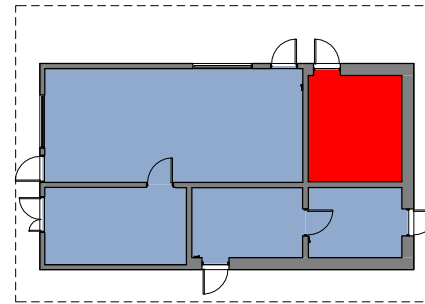
LEGEND

PLANT

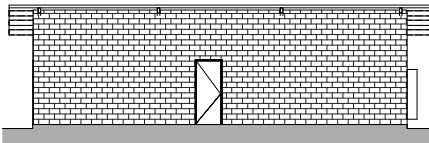
ATC OPERATIONS



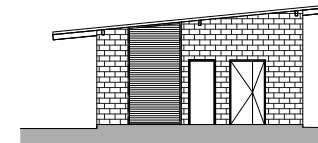
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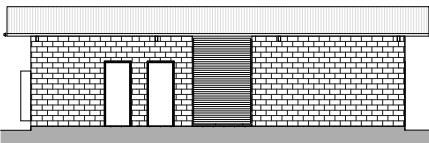
GROUND FLOOR PLAN
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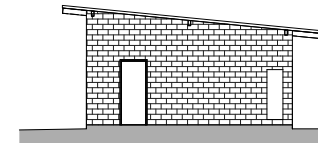
NORTH ELEVATION
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EAST ELEVATION
1:100

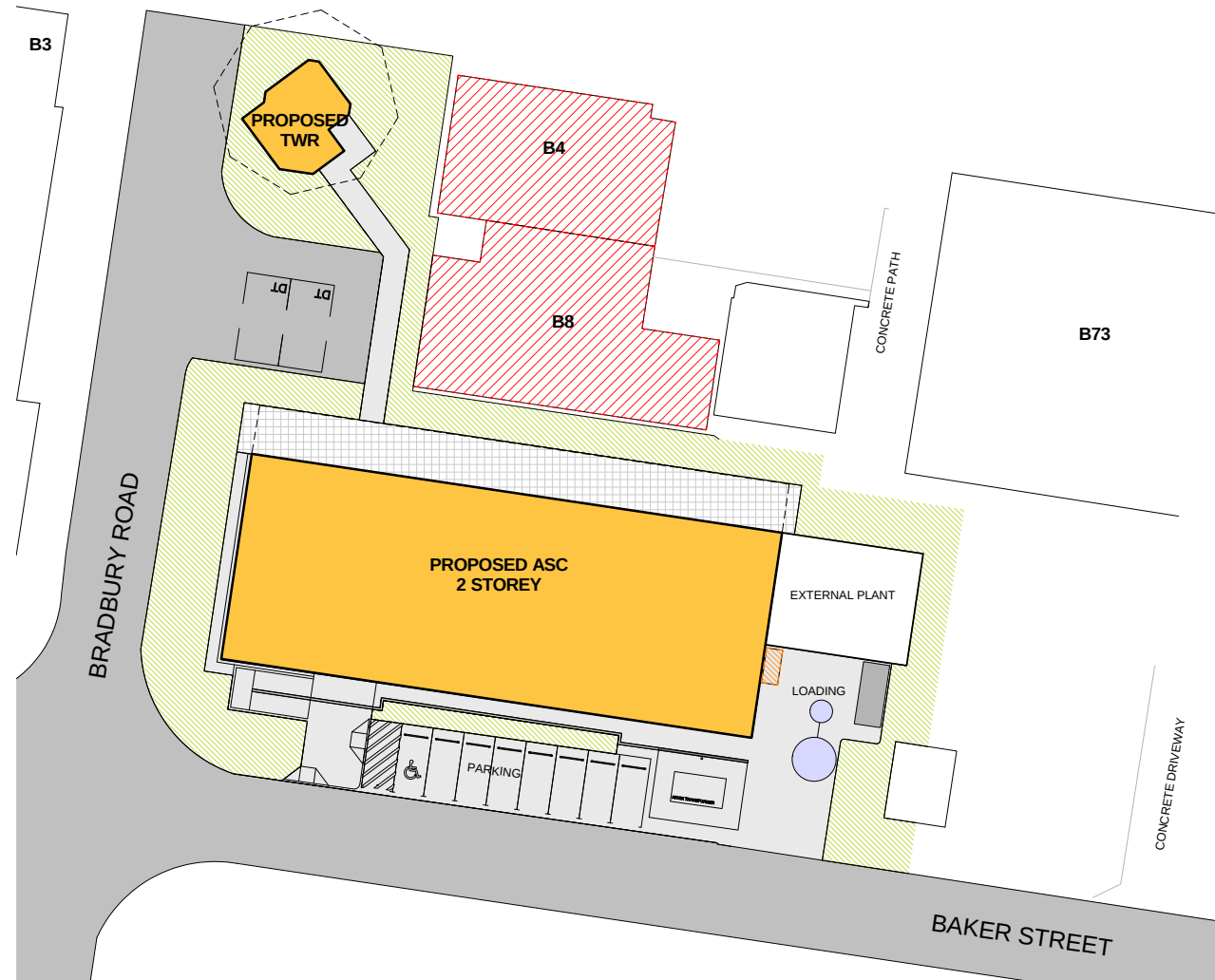


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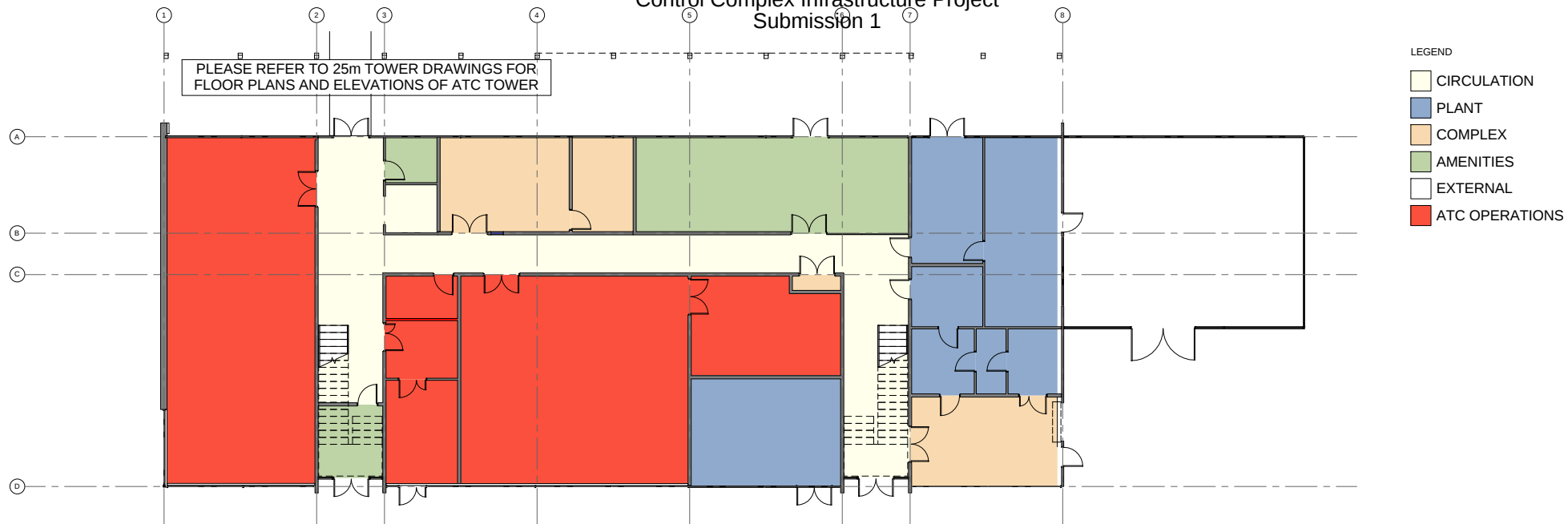


WEST ELEVATION
1:100

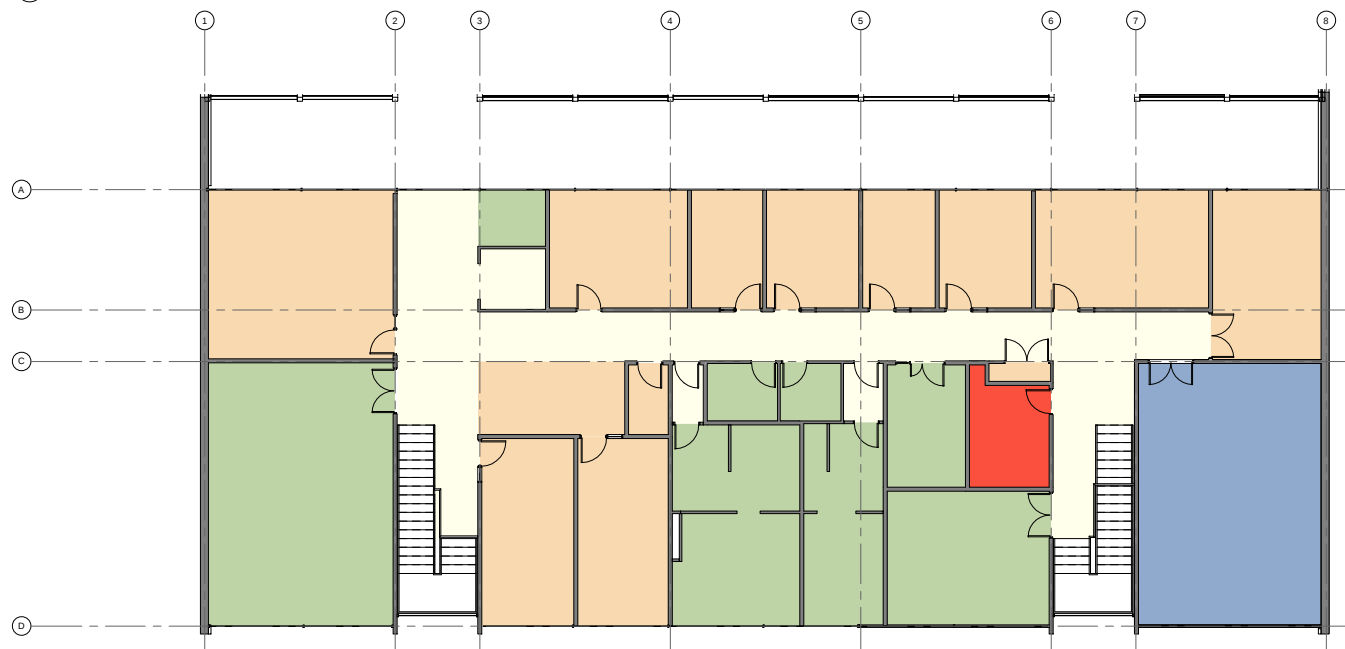




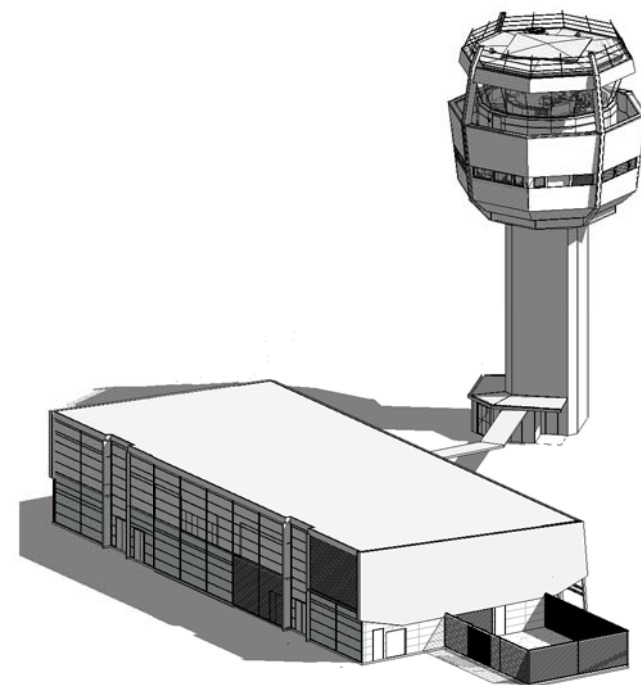
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
Submission 1

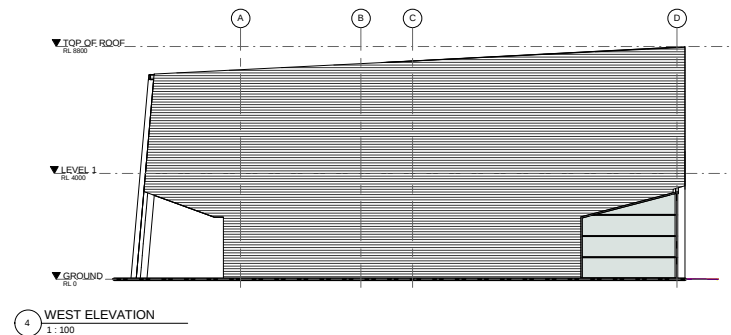
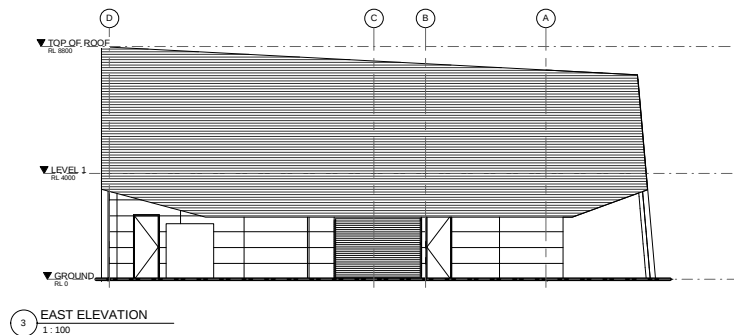
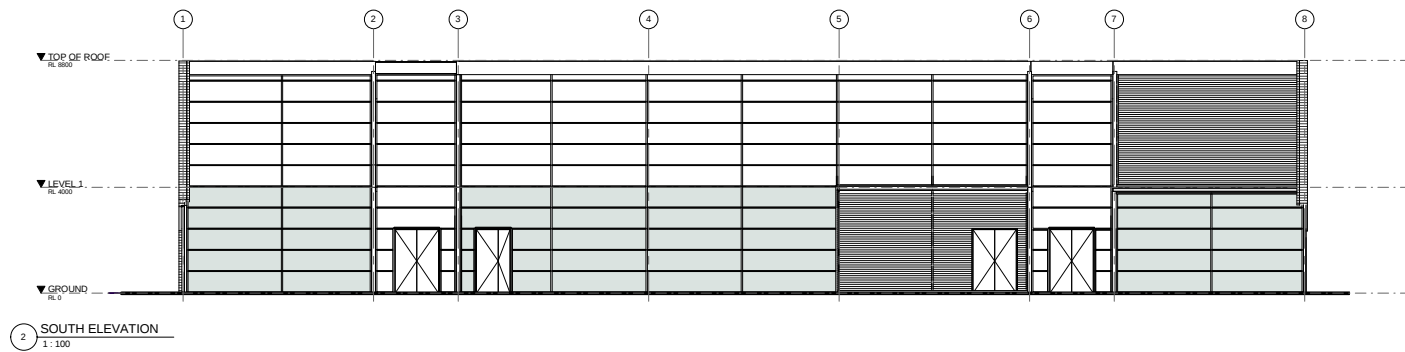
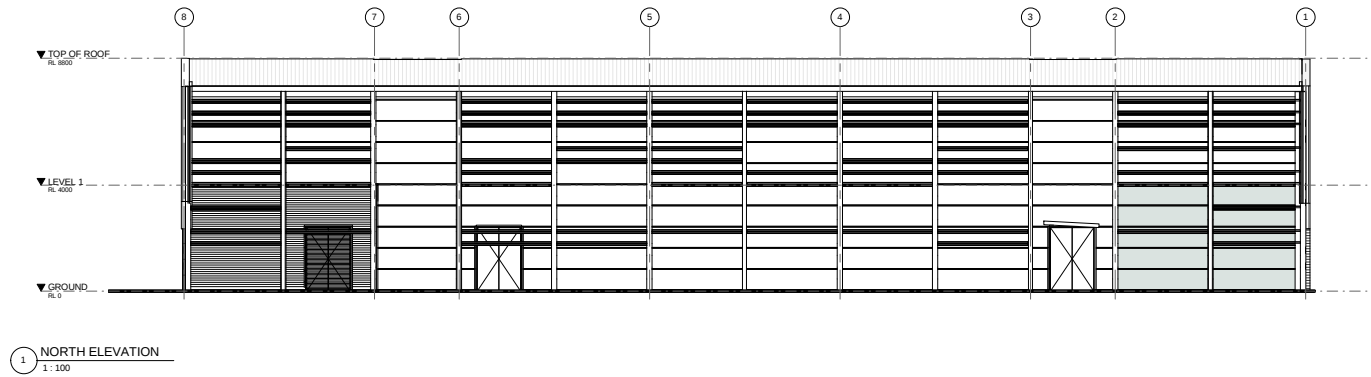


1 PROPOSED GROUND FLOOR PLAN
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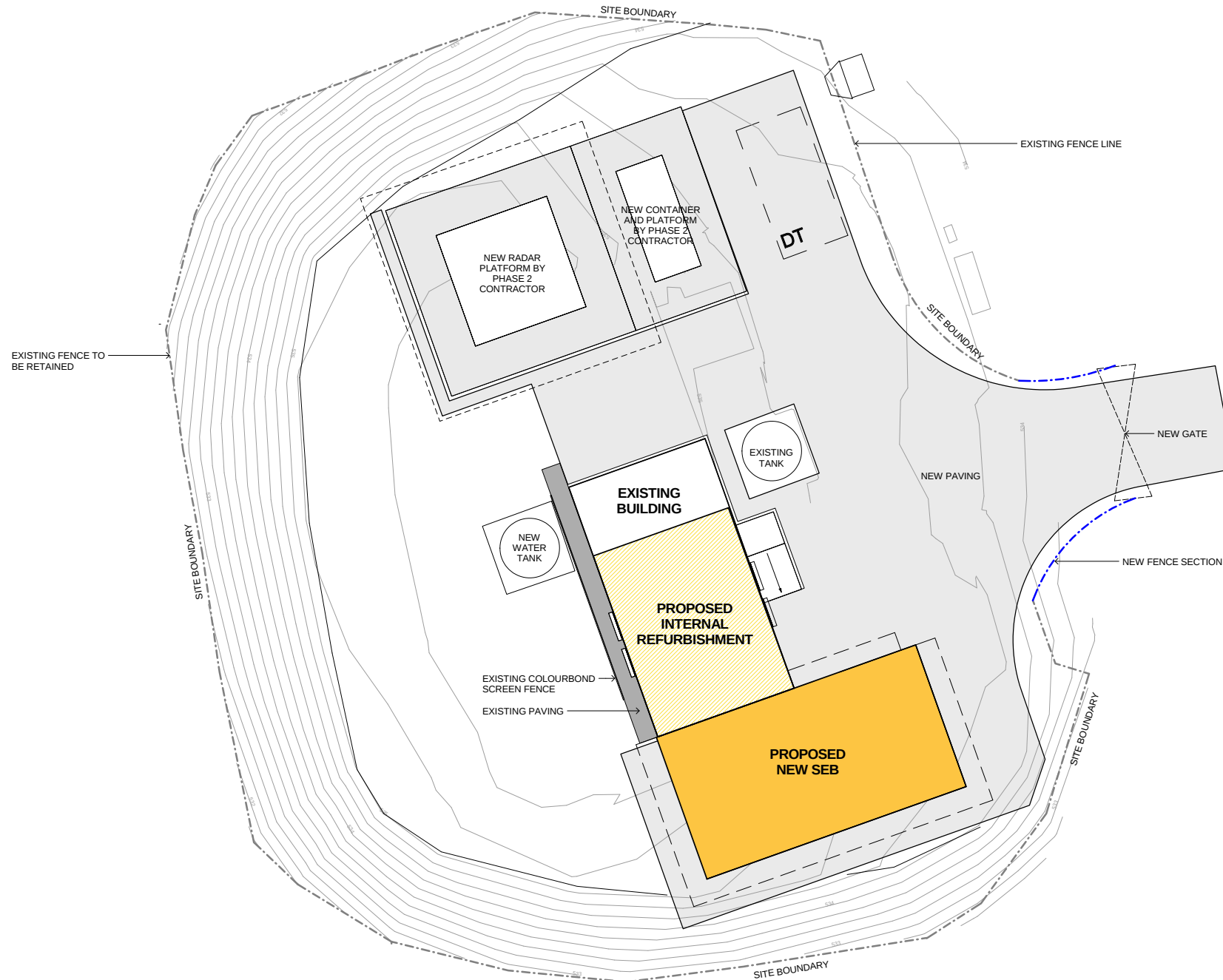
2 PROPOSED LEVEL 1 FLOOR PLAN
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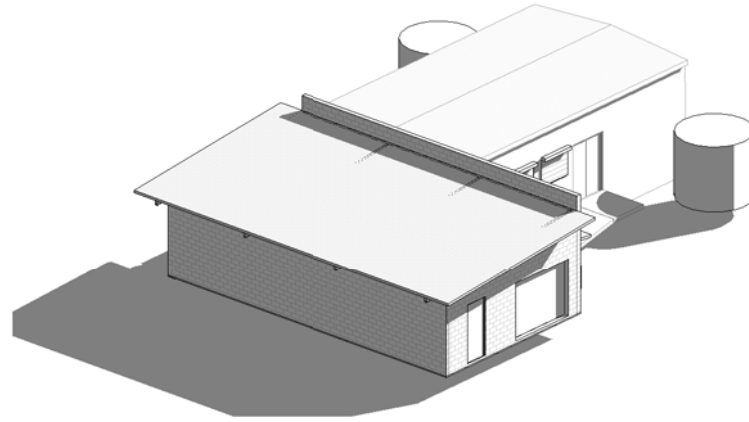




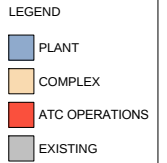
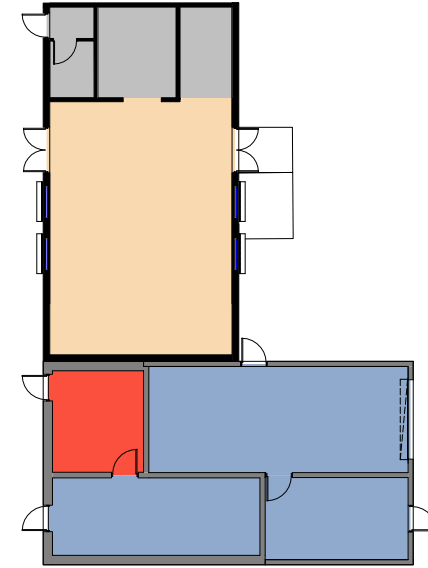


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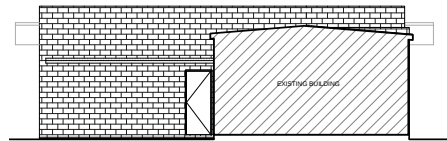




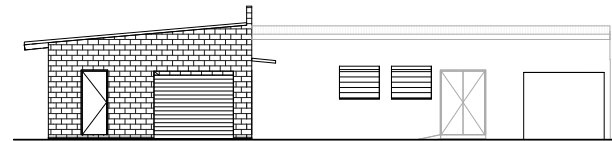
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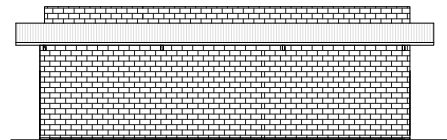
2 PROPOSED GROUND FLOOR PLAN
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3 NORTH ELEVATION
1:100



4 EAST ELEVATION
1:100

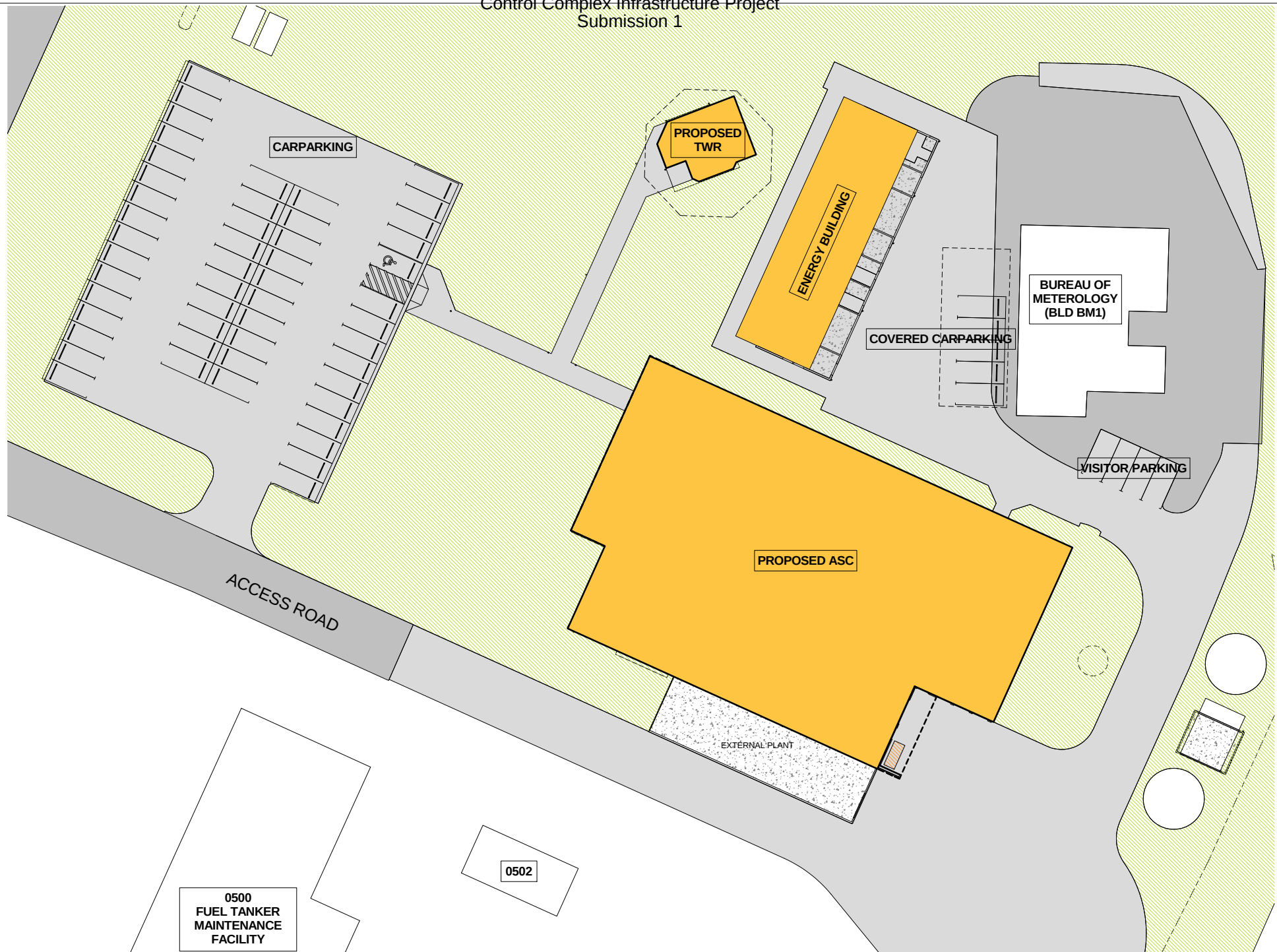


5 SOUTH ELEVATION
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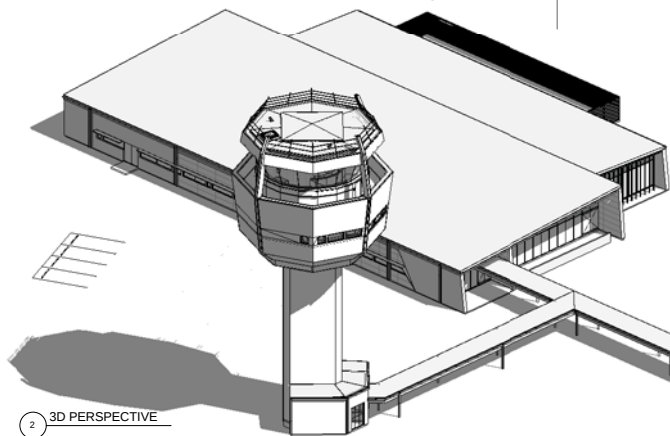


6 WEST ELEVATION
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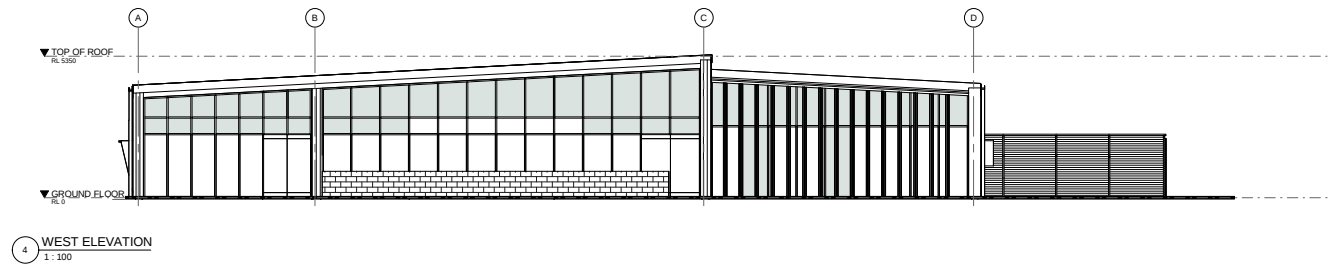
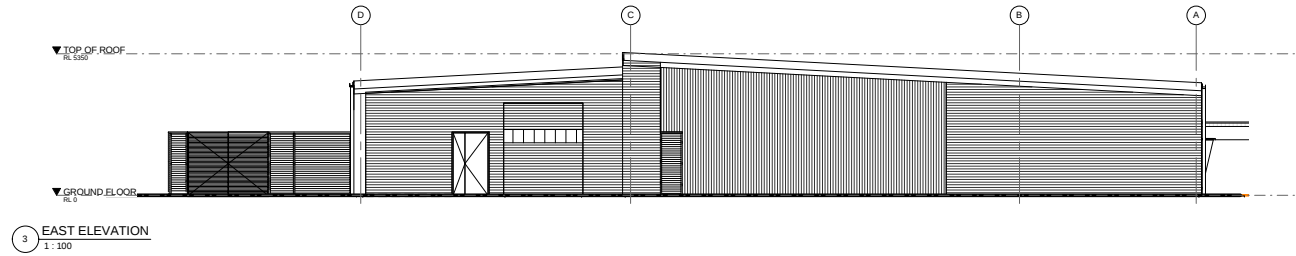
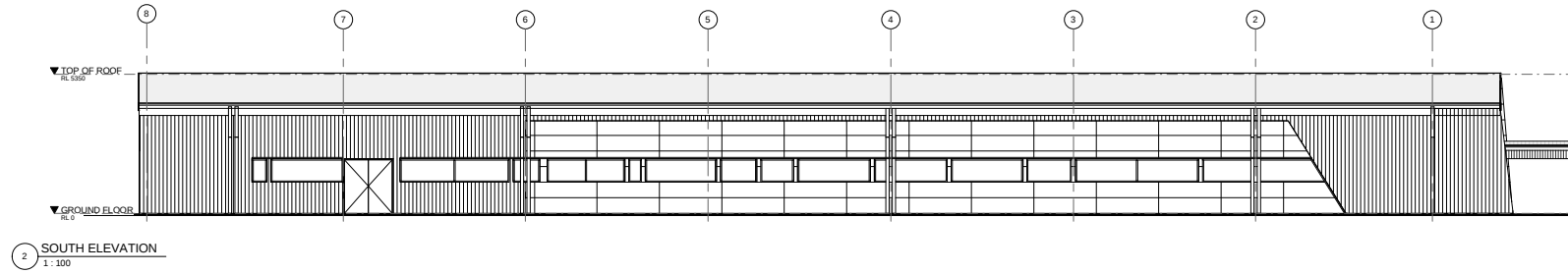
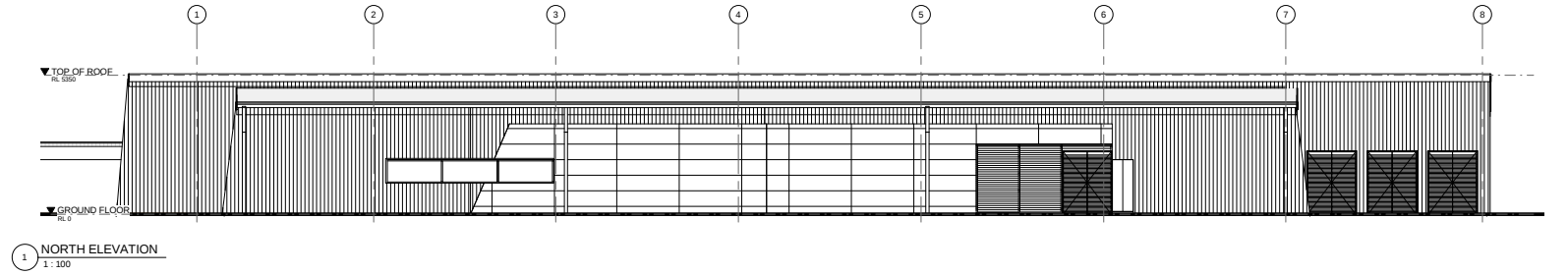


PLEASE REFER TO 25m TOWER
DRAWINGS FOR FLOOR PLANS AND
ELEVATIONS OF ATC TOWER

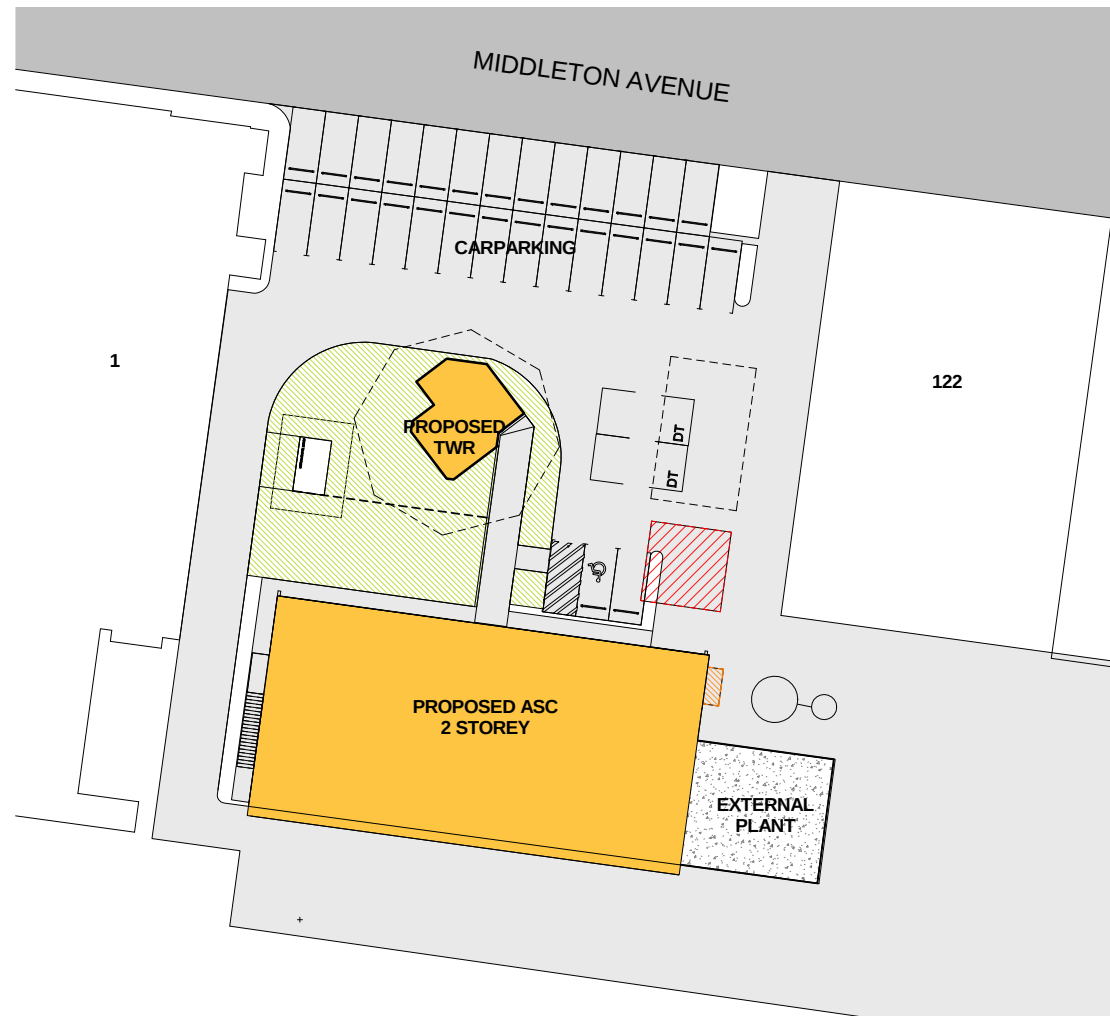


2 3D PERSPECTIVE

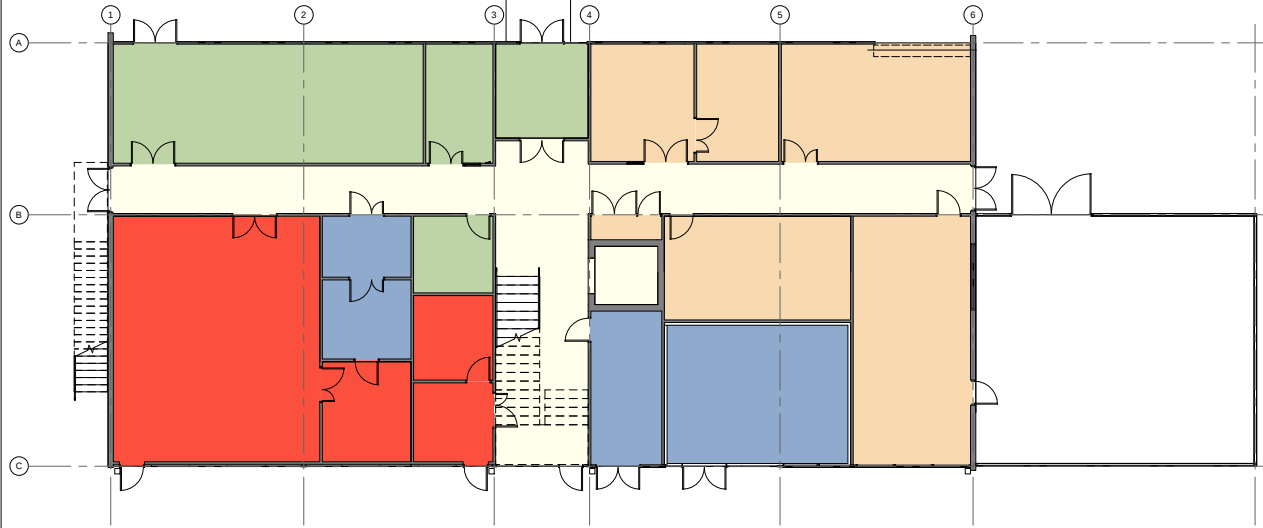
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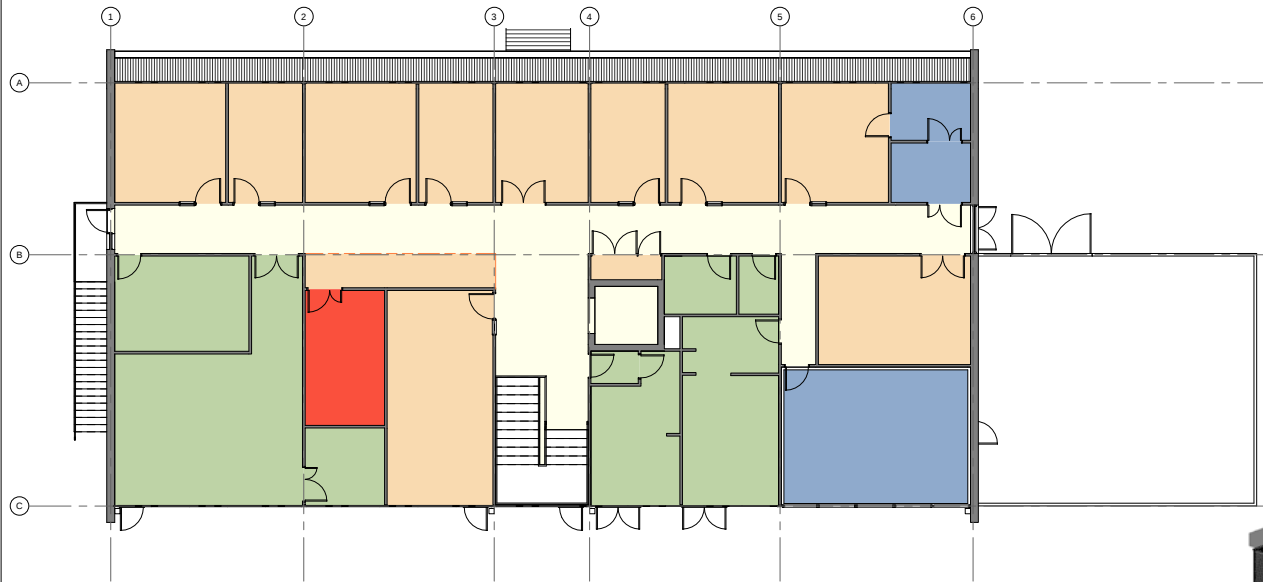


PLEASE REFER TO 25m TOWER DRAWINGS FOR
FLOOR PLANS AND ELEVATIONS OF ATC TOWER

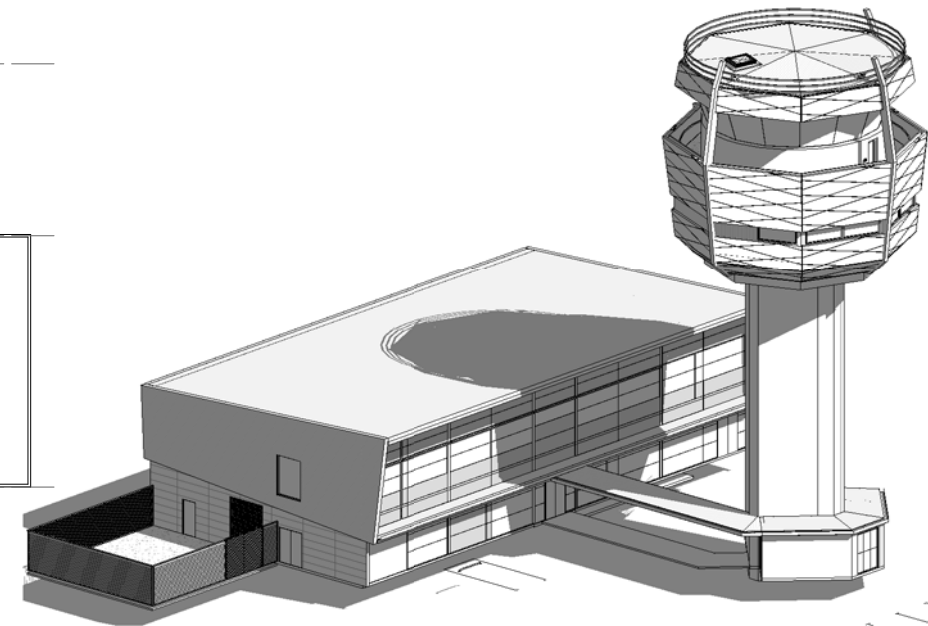


- LEGEND
- CIRCULATION
 - PLANT
 - COMPLEX
 - AMENITIES
 - EXTERNAL
 - ATC OPERATIONS

1 PROPOSED GROUND FLOOR PLAN
1:100

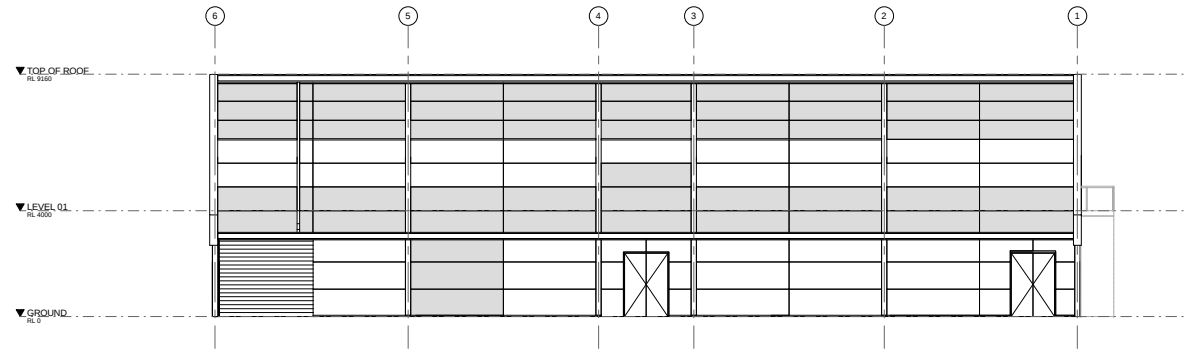


2 PROPOSED LEVEL 1 FLOOR PLAN
1:100

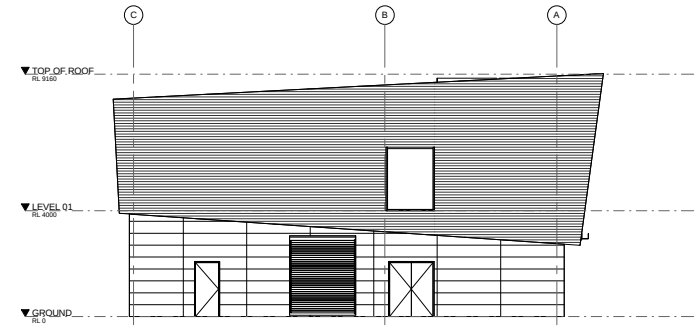


3 3D PERSPECTIVE

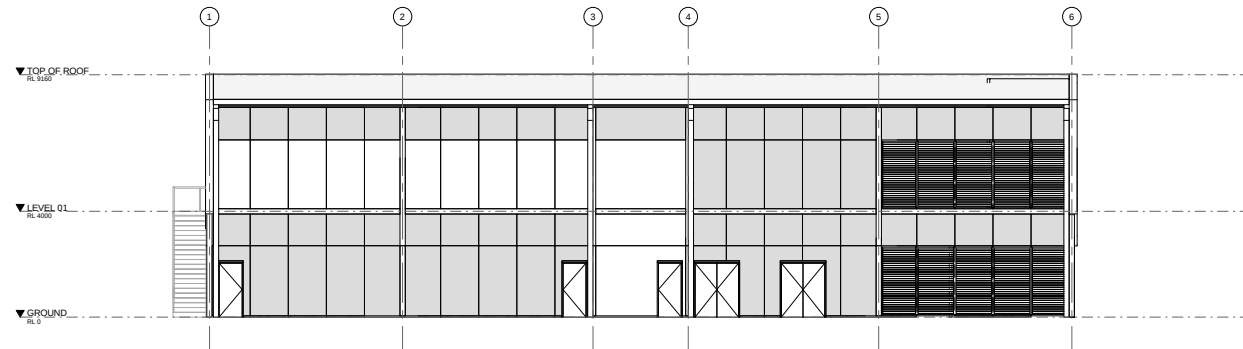
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
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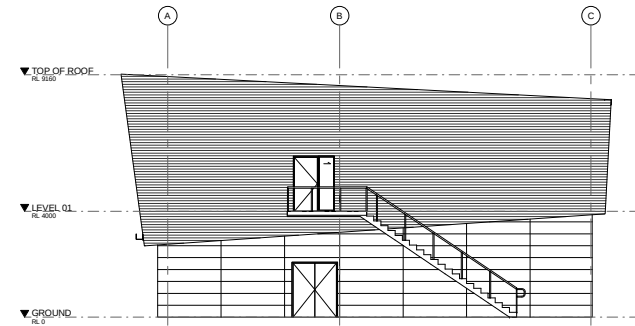
1 NORTH ELEVATION
1:100



3 EAST ELEVATION
1:100

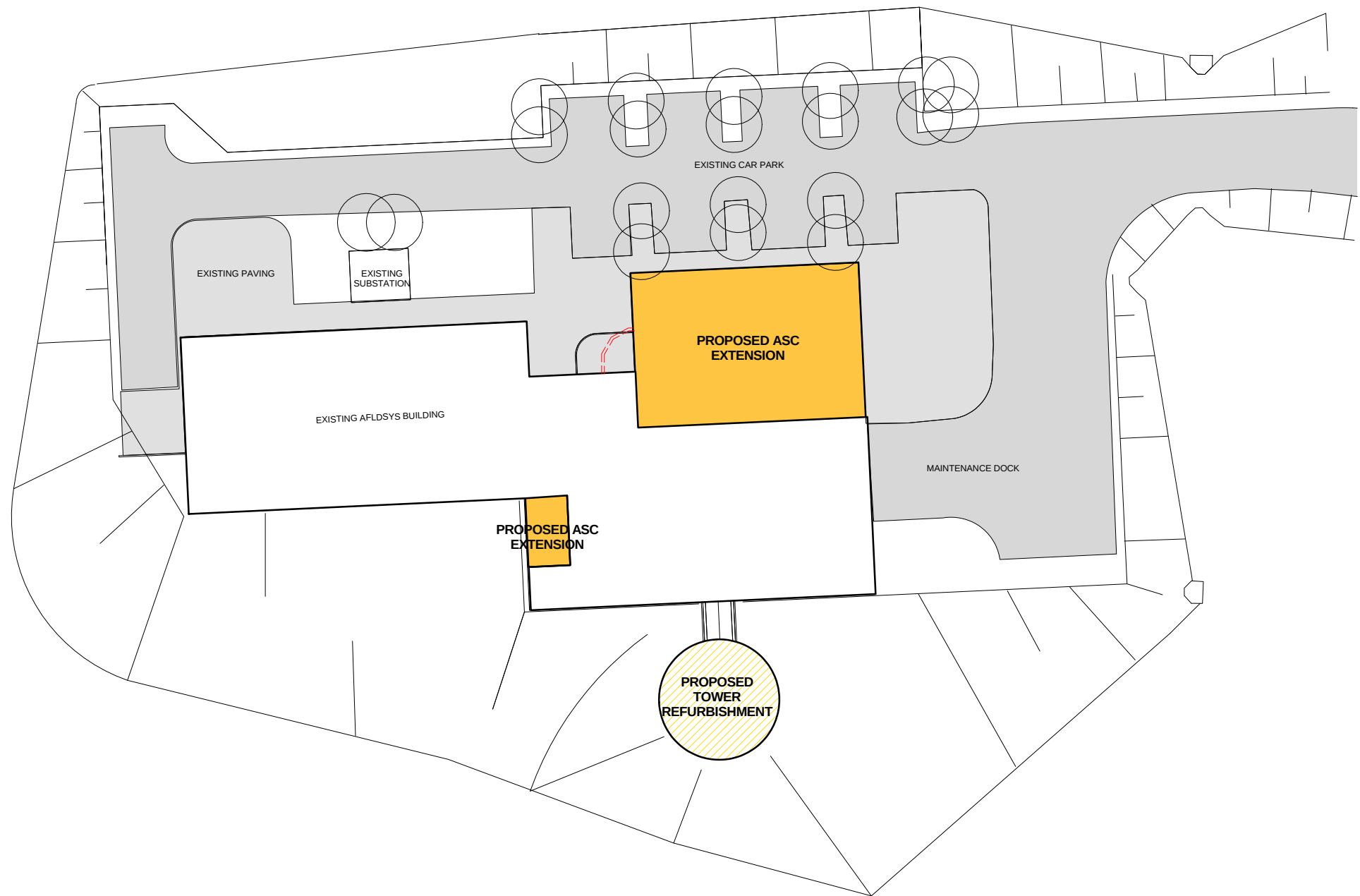


2 SOUTH ELEVATION
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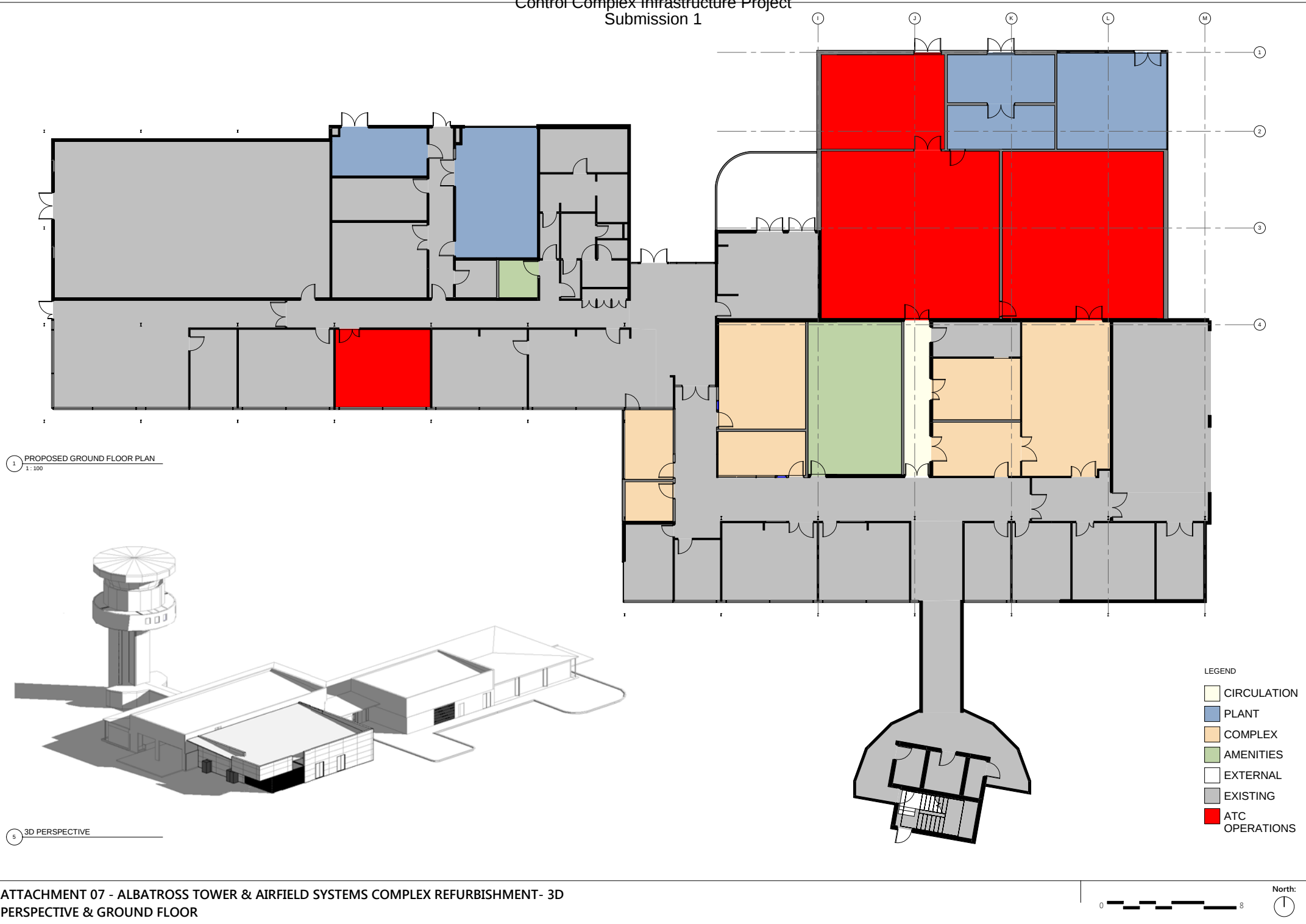


4 WEST ELEVATION
1:100

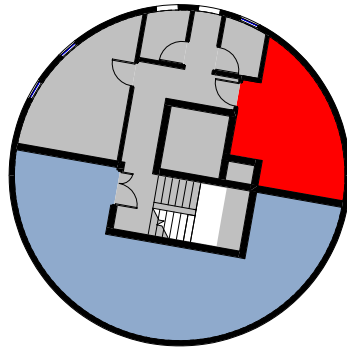




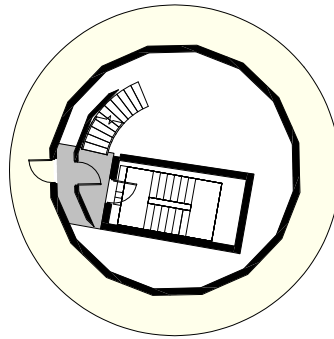
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic Control Complex Infrastructure Project
Submission 1



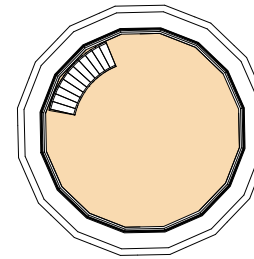
- LEGEND
- PLANT
 - EXISTING
 - ATC OPERATIONS
 - CIRCULATION
 - COMPLEX



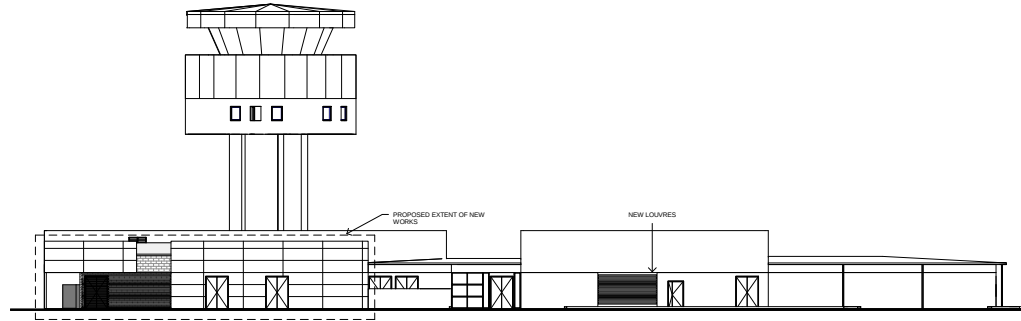
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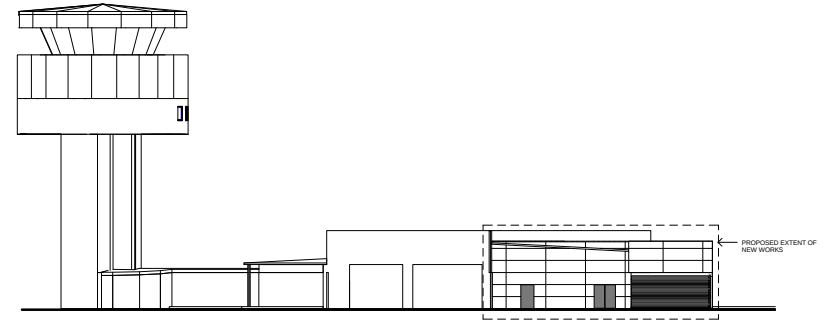
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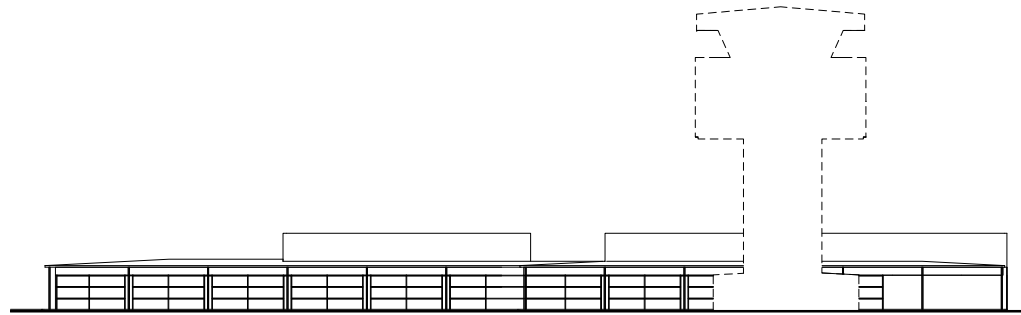
3 PROPOSED CONTROL CABIN FLOOR PLAN
1:100



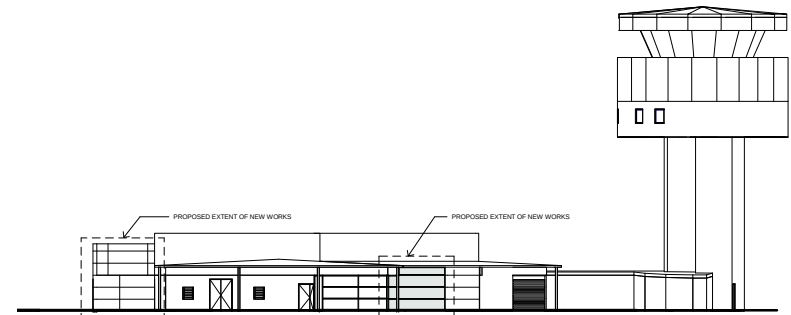
2 NORTH ELEVATION
1:200



1 EAST ELEVATION
1:200

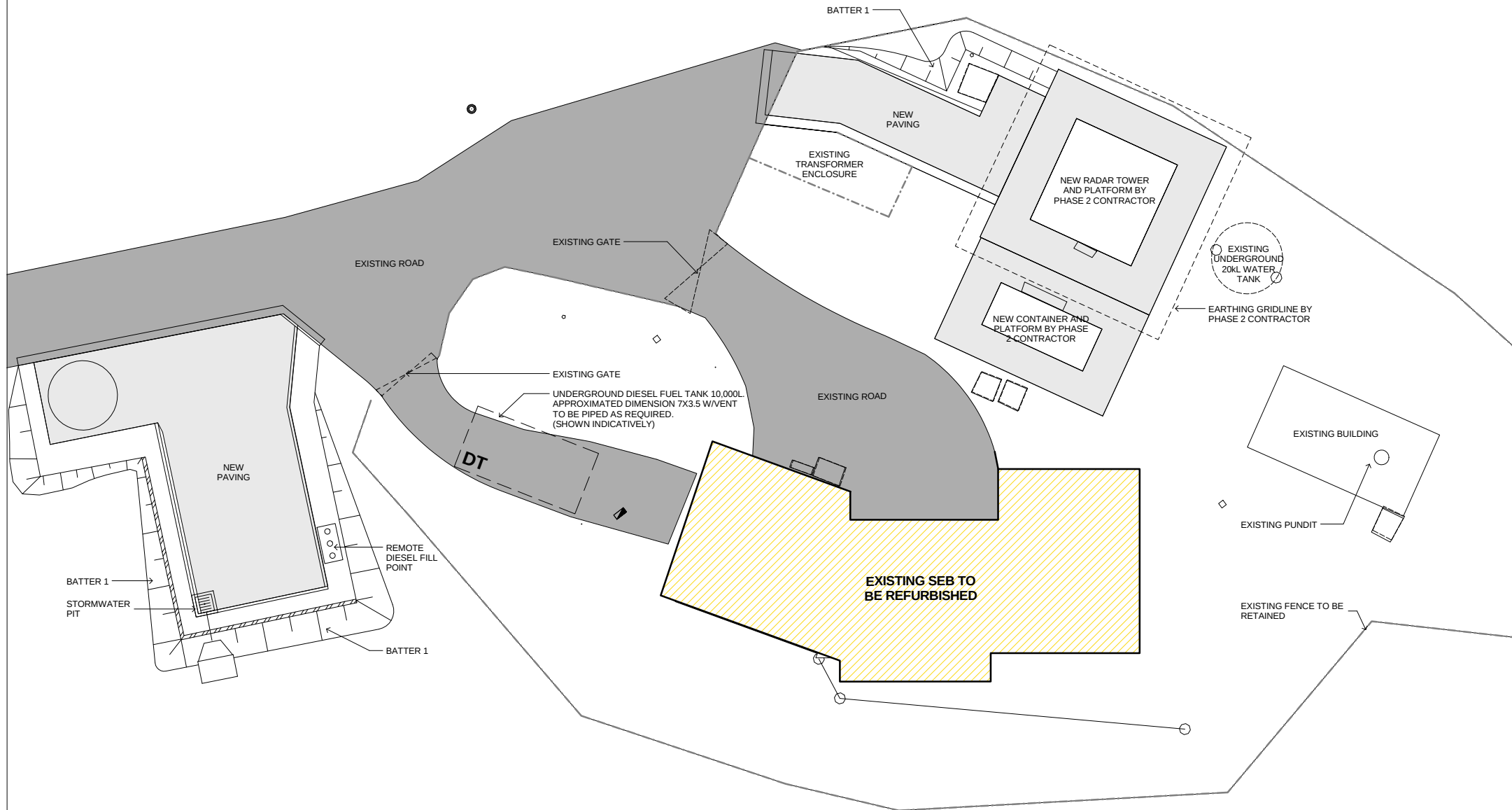


3 SOUTH ELEVATION
1:200



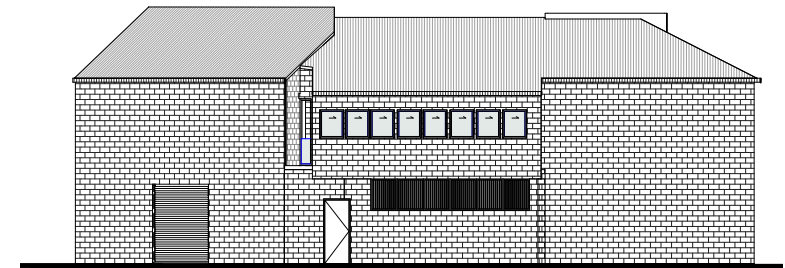
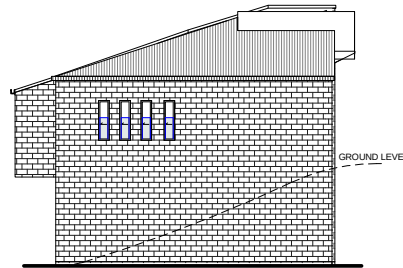
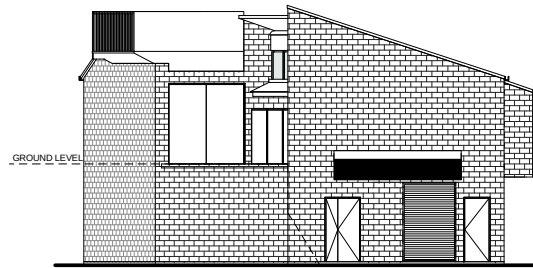
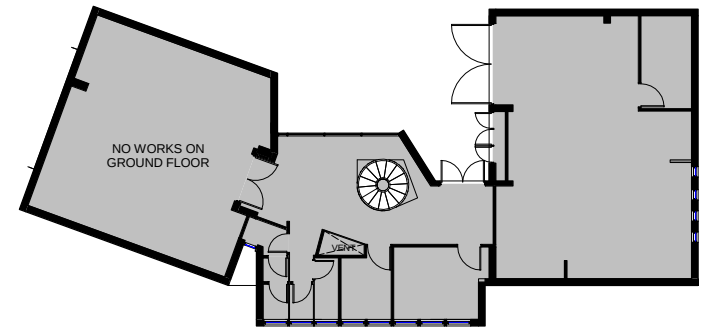
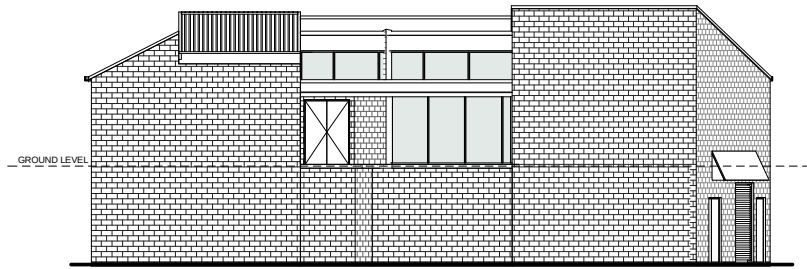
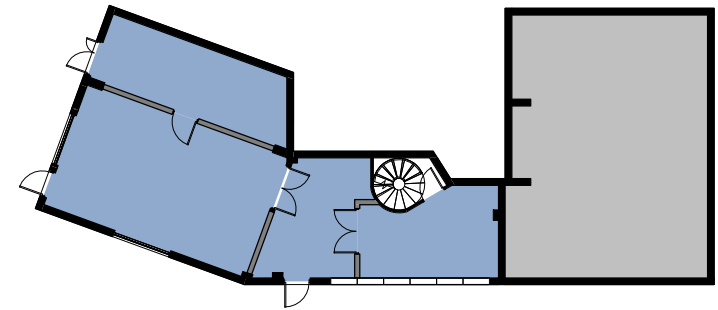
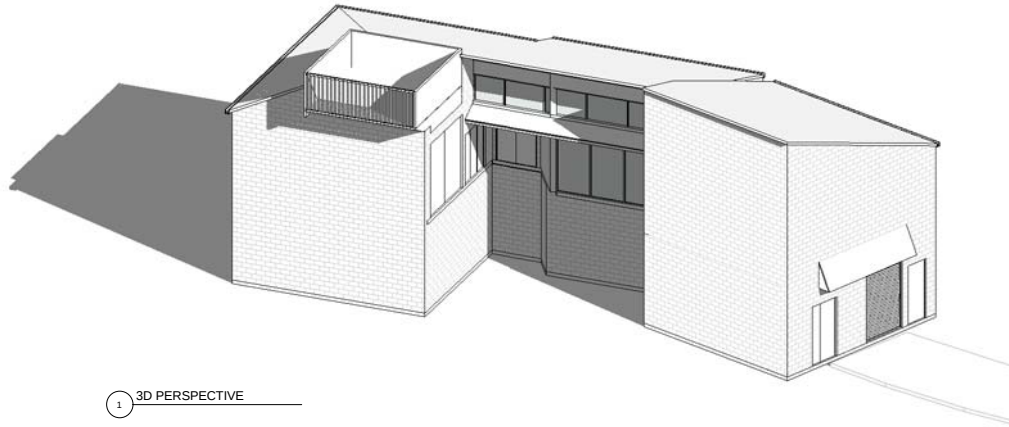
4 WEST ELEVATION
1:200

AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
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LEGEND

PLANT
EXISTING



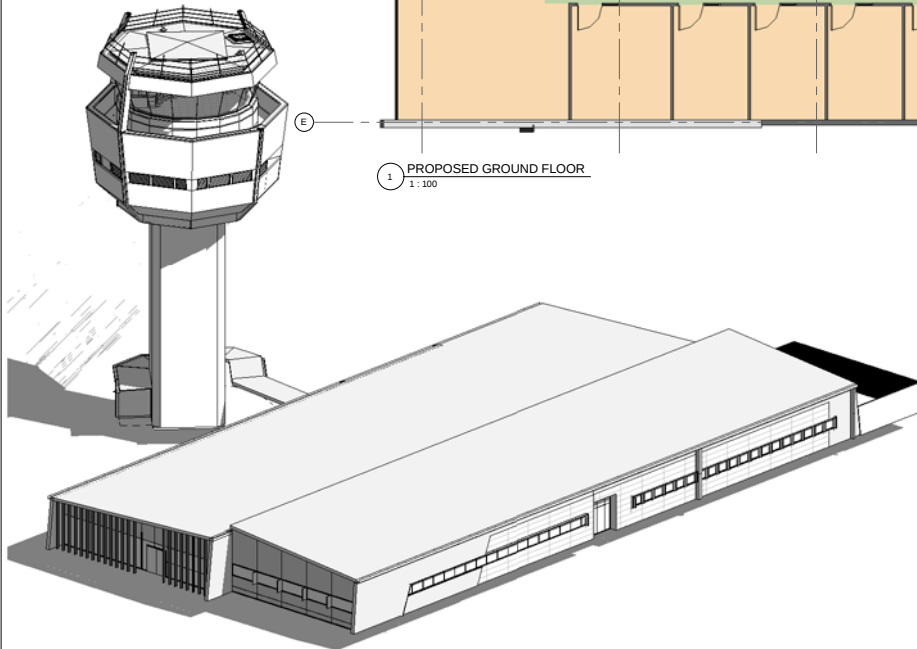
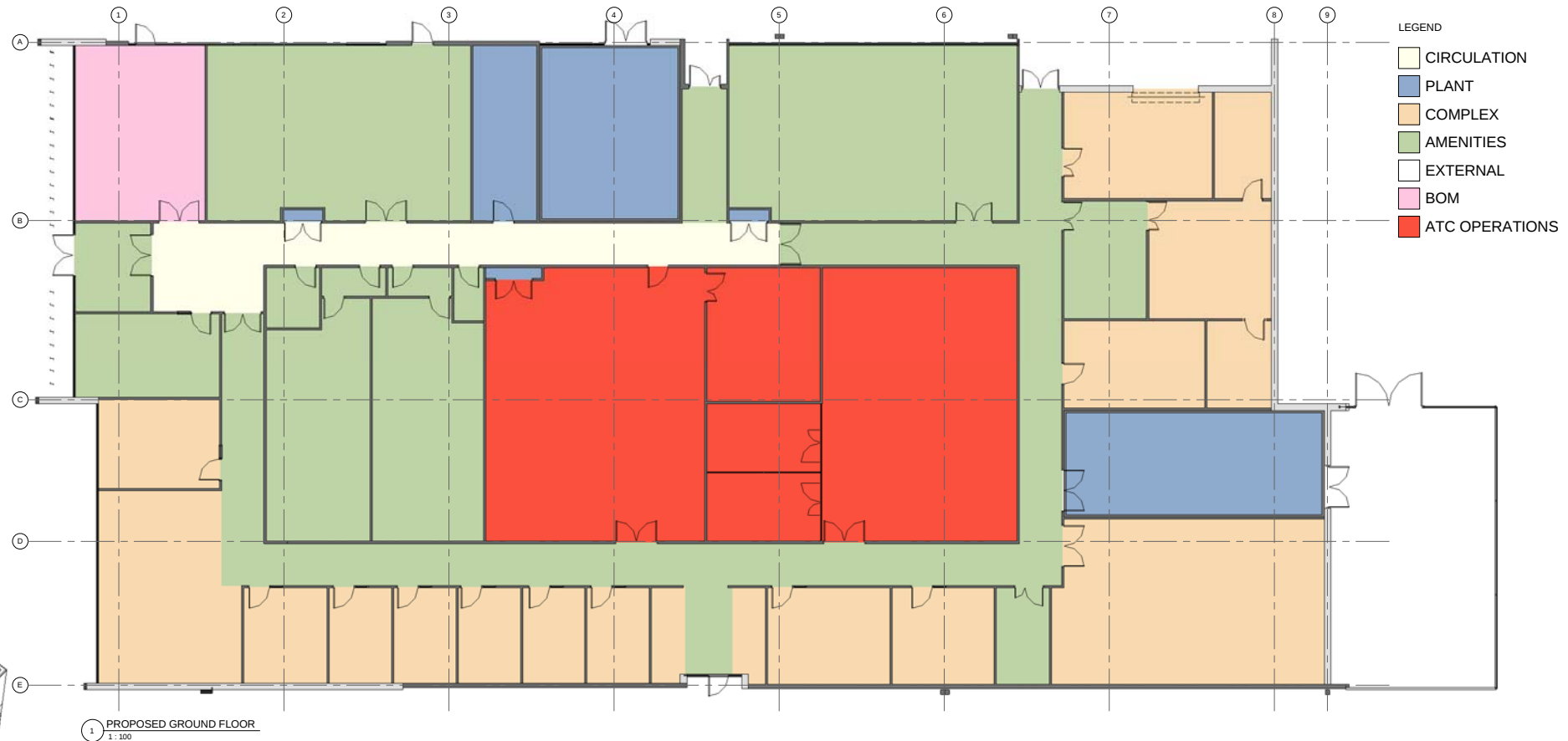




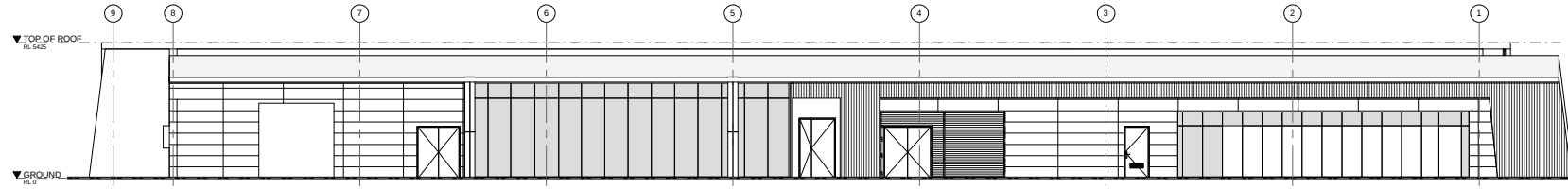
Control Complex Infrastructure Project

Submission 1

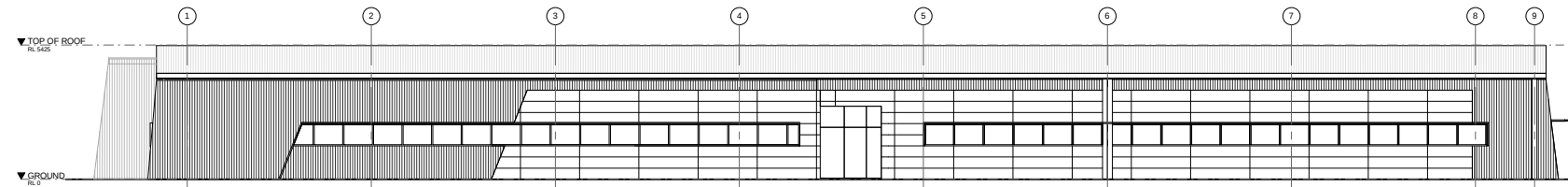
PLEASE REFER TO 2D TOWER DRAWINGS FOR FLOOR PLANS AND ELEVATIONS OF ATC TOWER



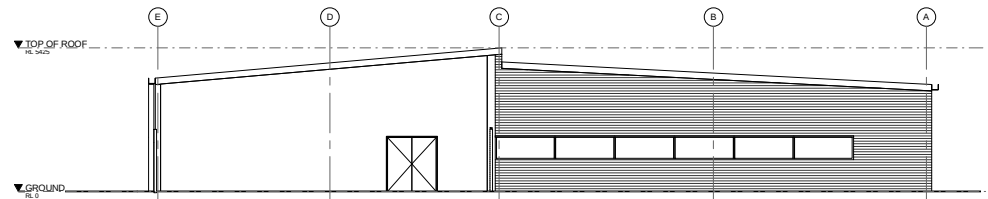
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
Submission 1



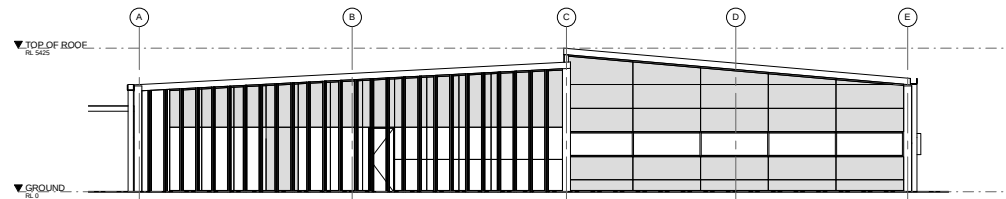
1 NORTH ELEVATION
1 : 100



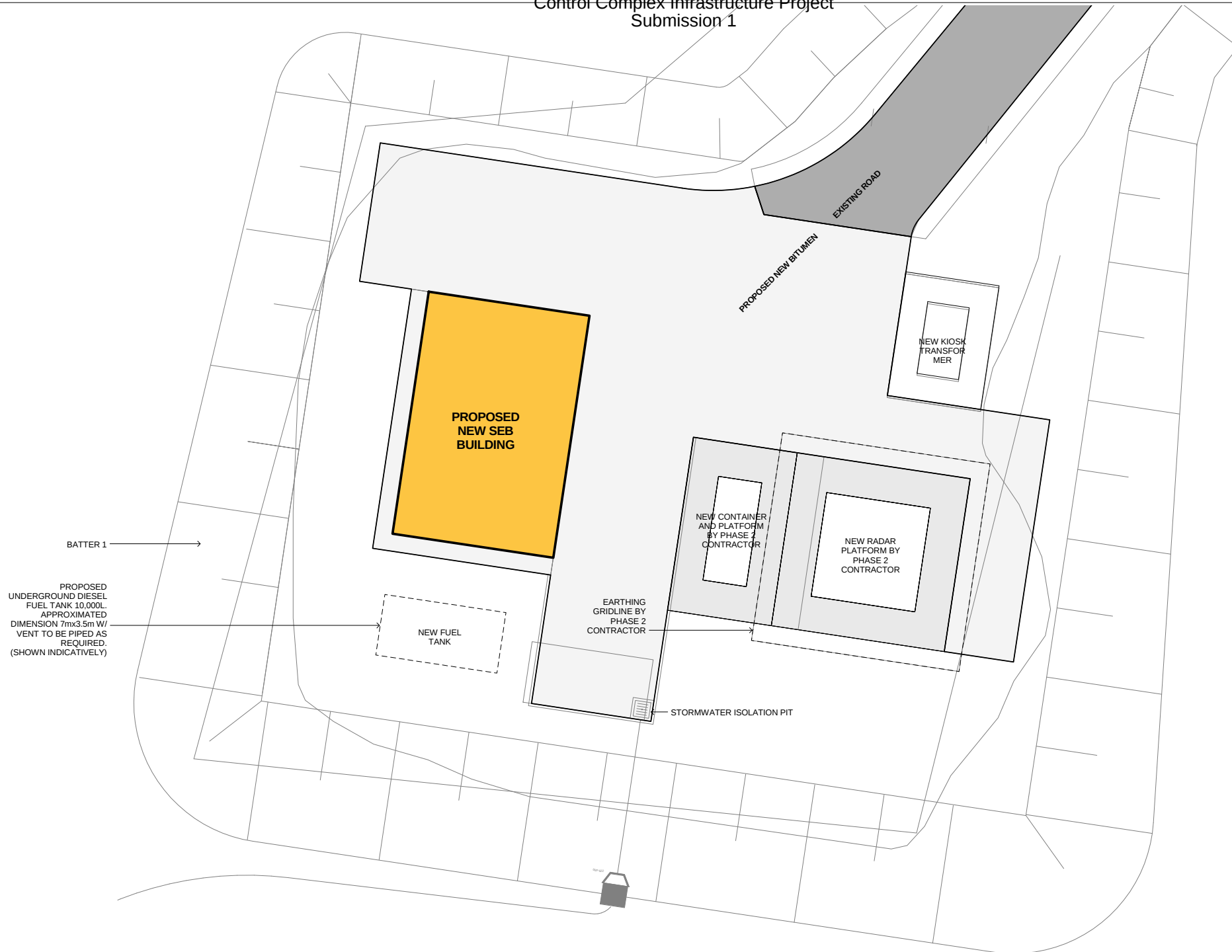
2 SOUTH ELEVATION
1 : 100



3 EAST ELEVATION
1 : 100

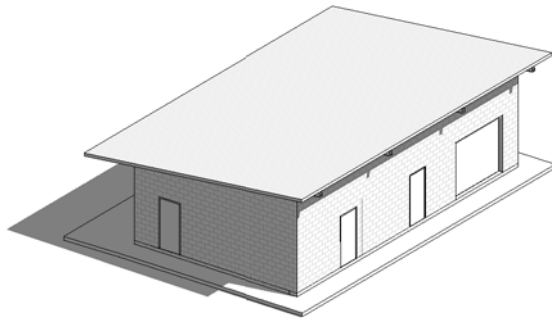


4 WEST ELEVATION
1 : 100

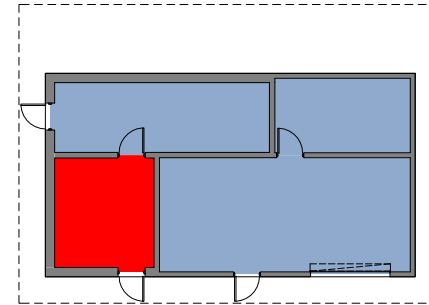


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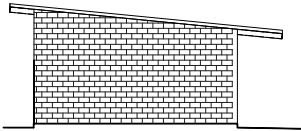
LEGEND
■ PLANT
■ ATC OPERATIONS



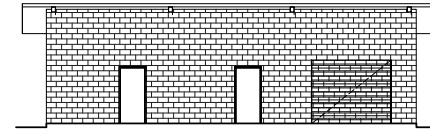
1 3D PERSPECTIVE VIEW



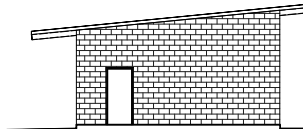
2 PROPOSED GROUND FLOOR PLAN
1:100



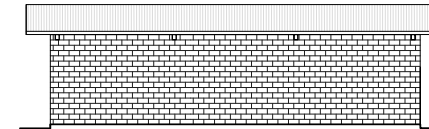
3 NORTH ELEVATION
1:100



4 EAST ELEVATION
1:100



5 SOUTH ELEVATION
1:100



6 WEST ELEVATION
1:100

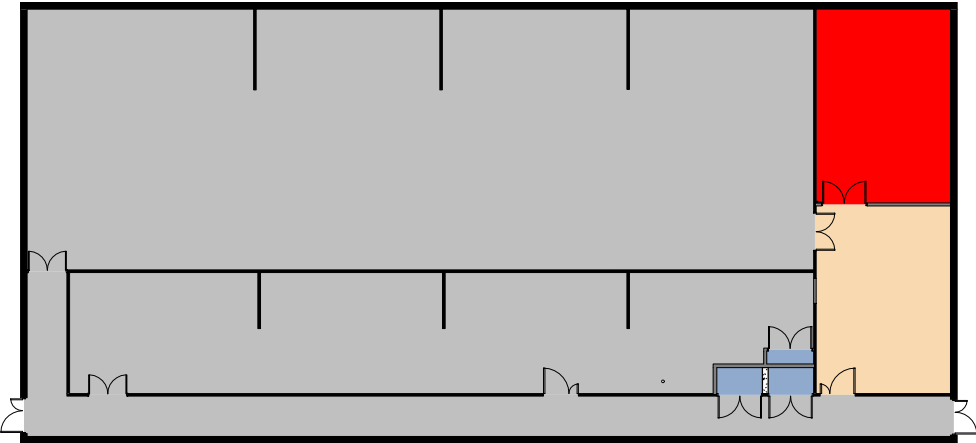


- LEGEND
- ATC OPERATIONS
 - EXISTING
 - EXTERNAL
 - PLANT

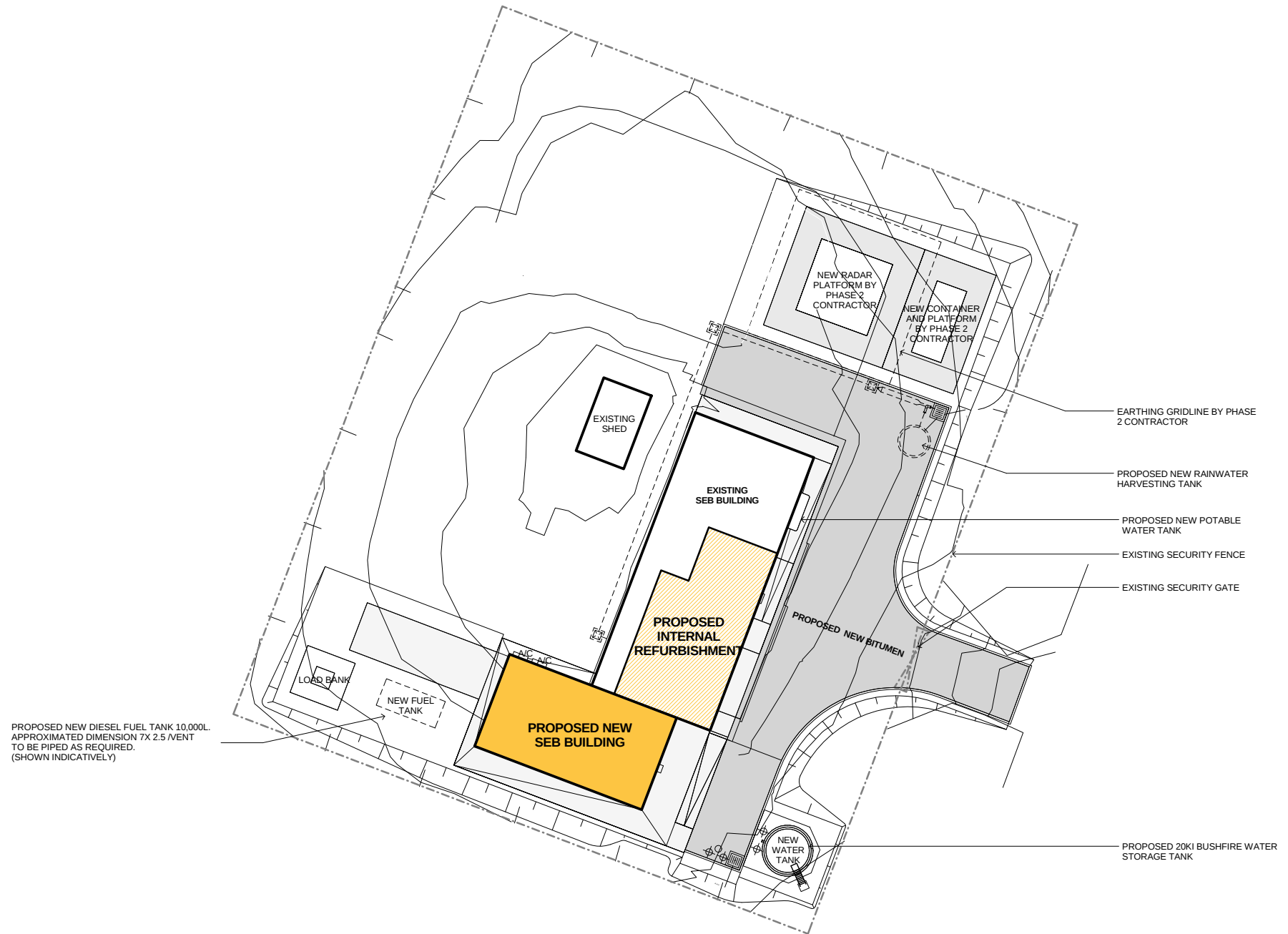


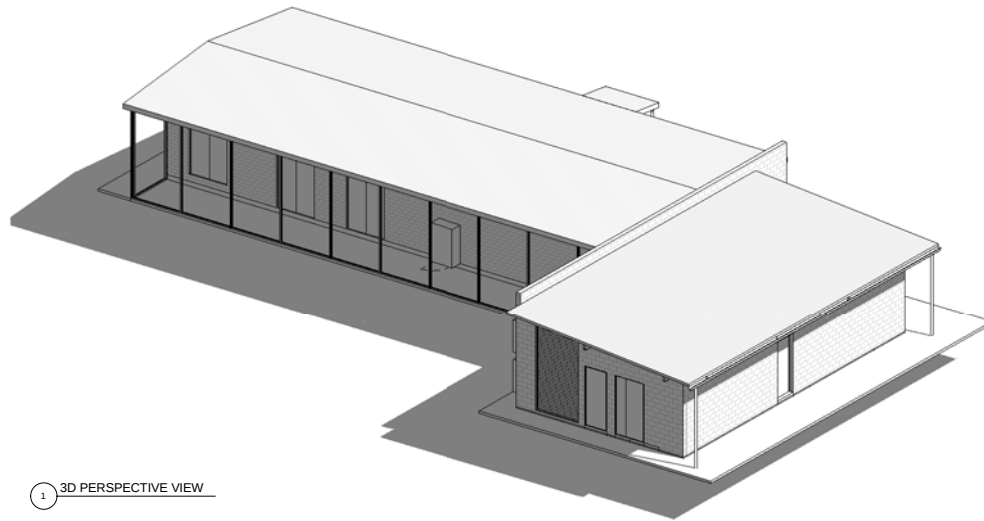
LEGEND

- ATC OPERATIONS
- COMPLEX
- EXISTING
- PLANT

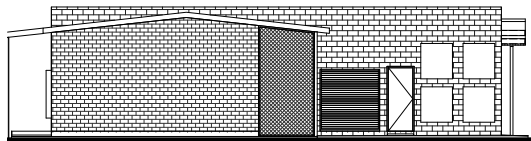




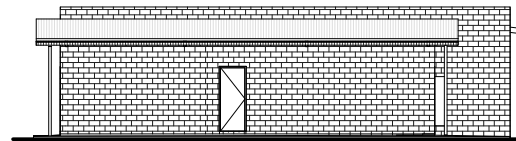




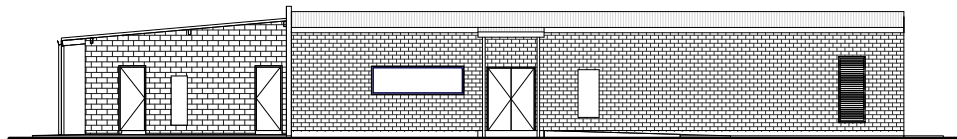
1 3D PERSPECTIVE VIEW



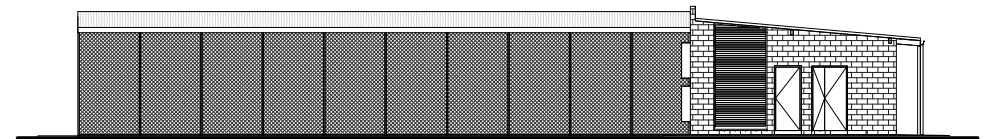
3 NORTH ELEVATION
1:100



4 SOUTH ELEVATION
1:100



5 EAST ELEVATION
1:100



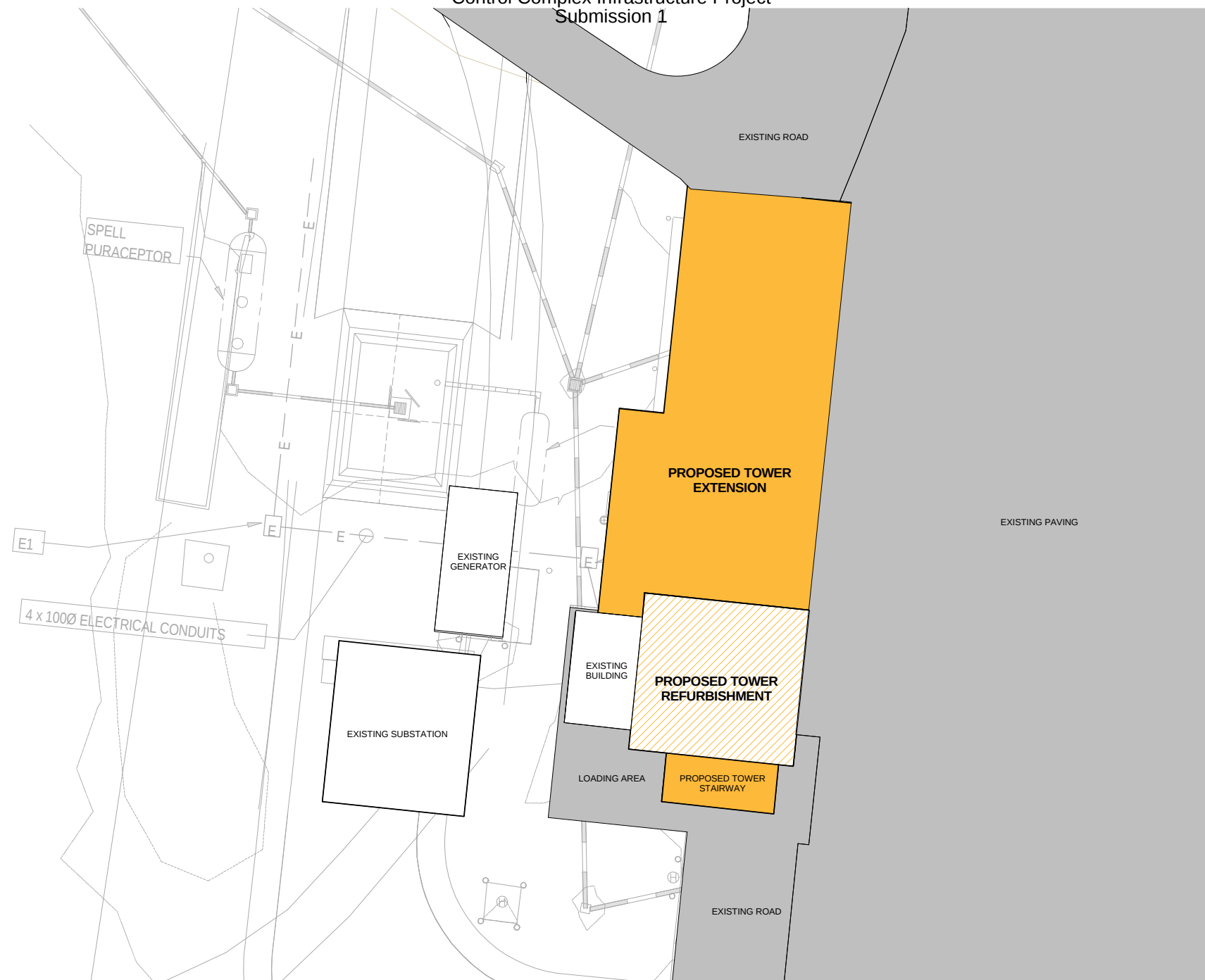
6 WEST ELEVATION
1:100



2 PROPOSED GROUND FLOOR PLAN
1:100





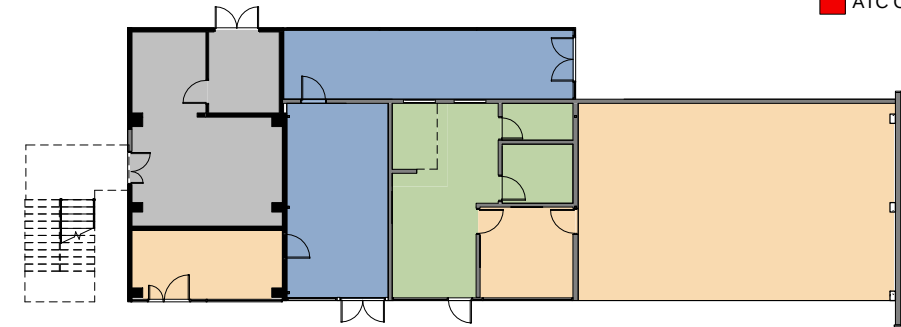


LEGEND

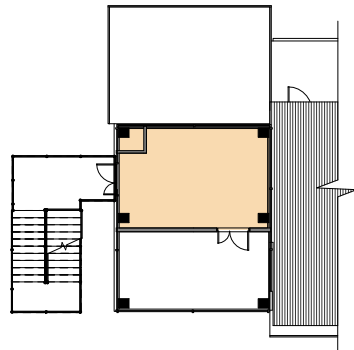
- PLANT
- COMPLEX
- AMENITIES
- EXTERNAL
- EXISTING
- CIRCULATION
- ATC OPERATIONS



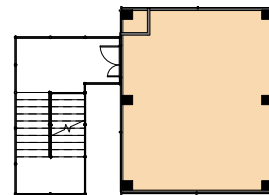
2 3D PERSPECTIVE



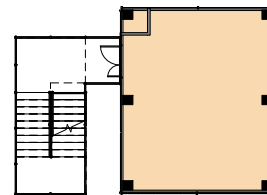
1 PROPOSED GROUND FLOOR PLAN
1:100



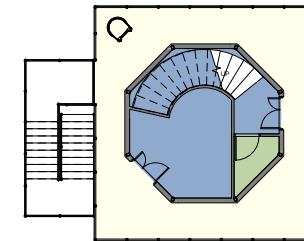
3 PROPOSED LEVEL 1 FLOOR PLAN
1:100



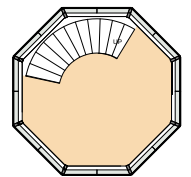
4 PROPOSED LEVEL 2 FLOOR PLAN
1:100



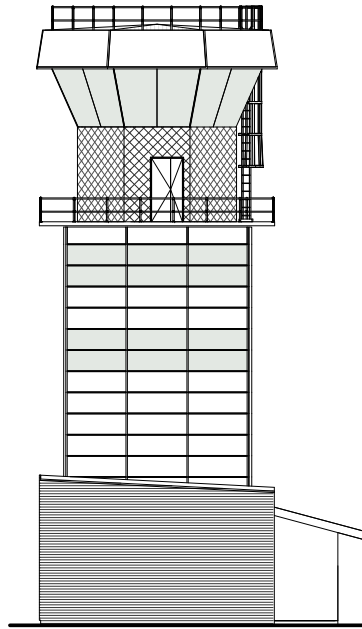
5 PROPOSED LEVEL 3 FLOOR PLAN
1:100



6 PROPOSED OBS. DECK FLOOR PLAN
1:100



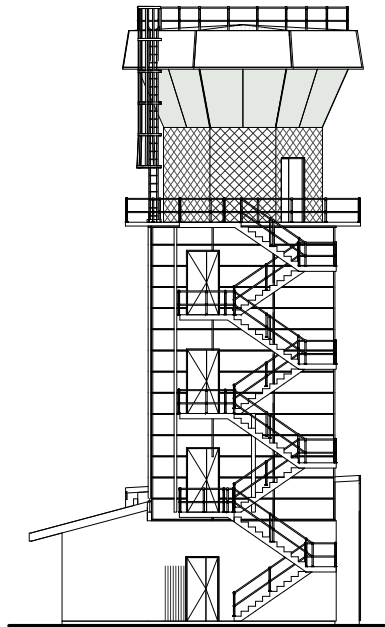
7 PROPOSED CONT. CABIN FLOOR PLAN
1:100



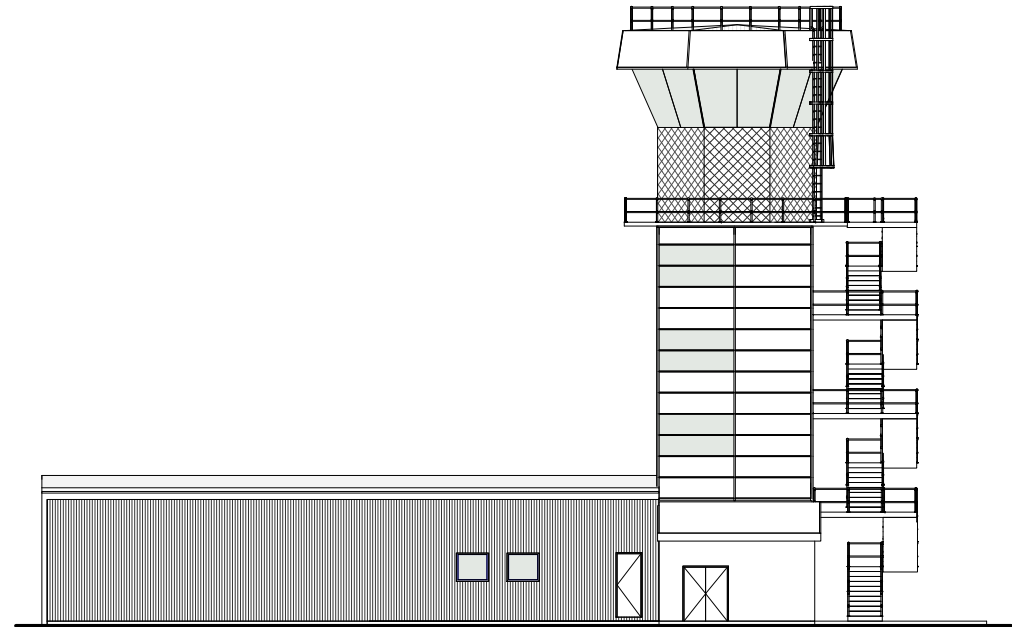
1 NORTH ELEVATION
1:100



2 EAST ELEVATION
1:100

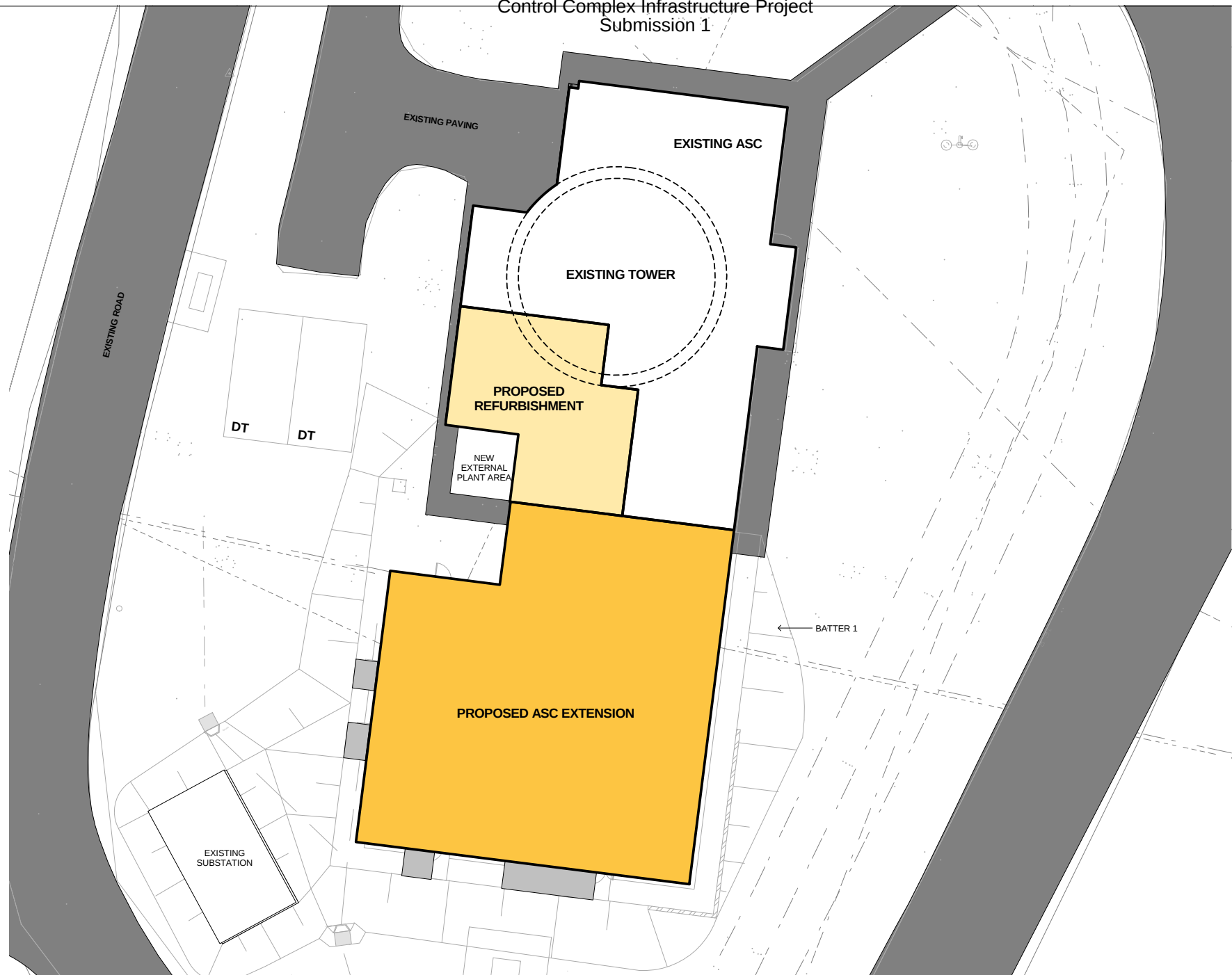


3 SOUTH ELEVATION
1:100

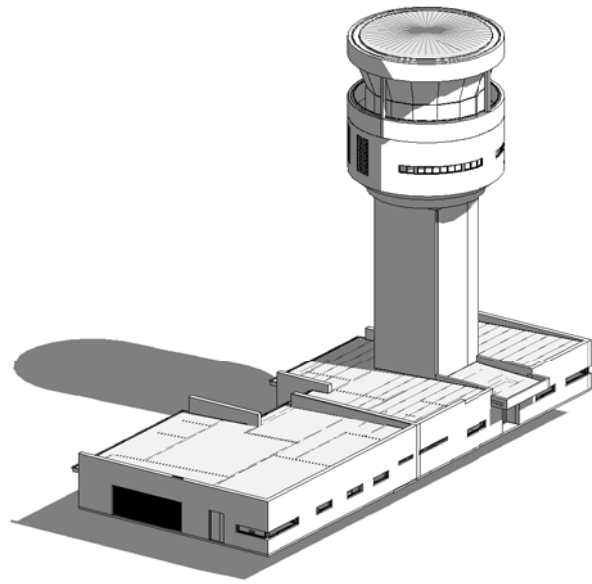


4 WEST ELEVATION
1:100

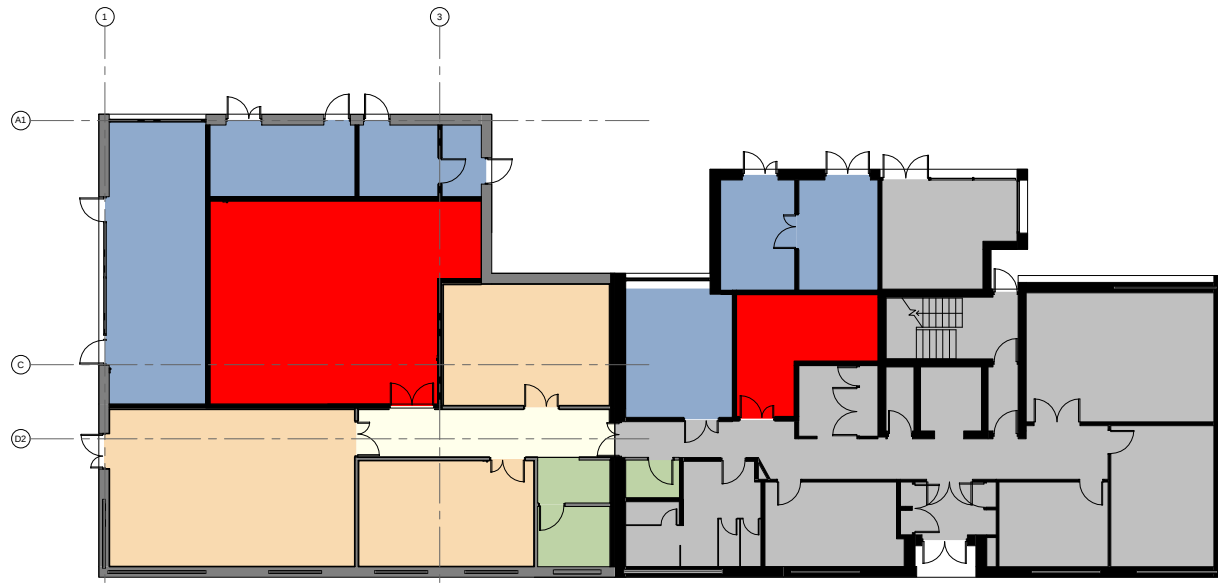




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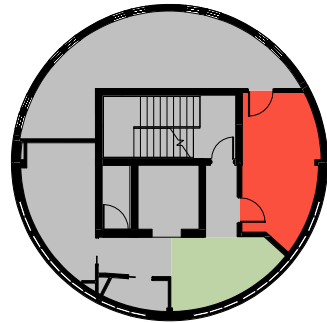


2 3D PERSPECTIVE VIEW

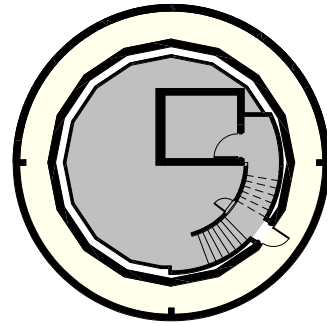


1 PROPOSED GROUND PLAN
1:100

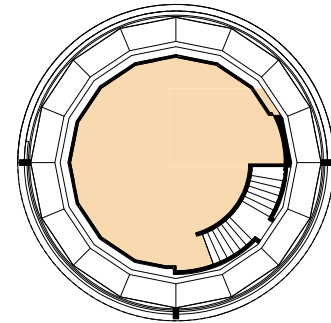
- Legend
- AMENITIES
 - ATC OPERATIONS
 - CIRCULATION
 - COMPLEX
 - EXISTING
 - EXTERNAL
 - PLANT



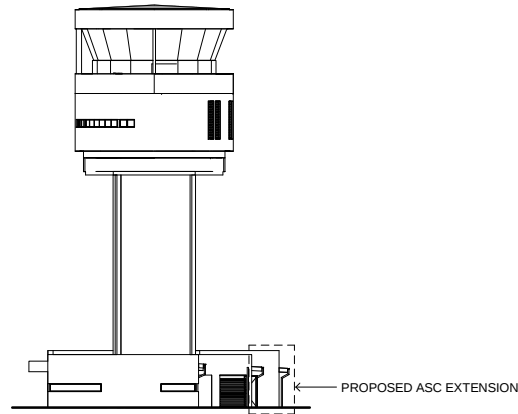
3 PROPOSED LEVEL 1 (STAND DOWN) FLOOR PLAN
1:100



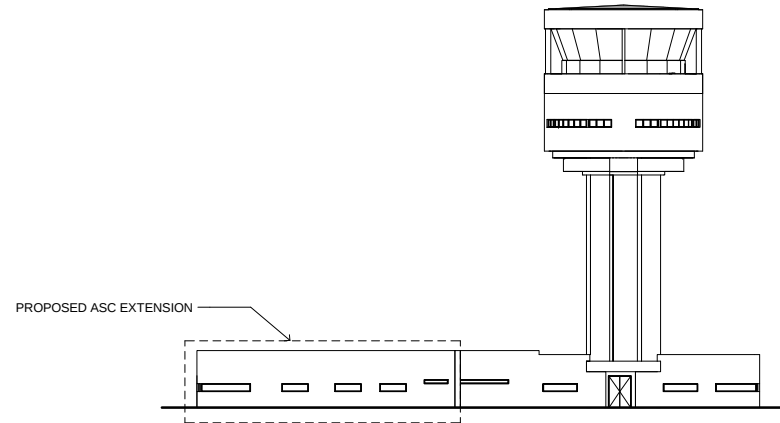
4 PROPOSED LEVEL 2 (OBSERVATION DECK) FLOOR PLAN
1:100



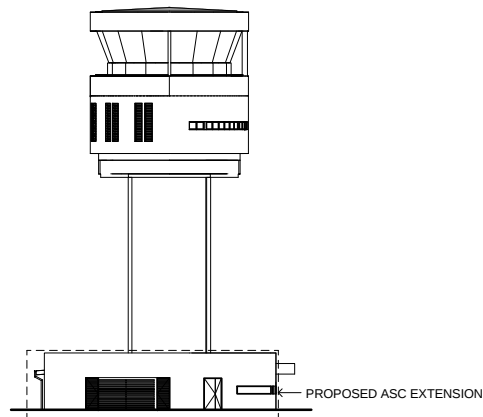
5 PROPOSED LEVEL 3 (CONTROL CABIN) FLOOR PLAN
1:100



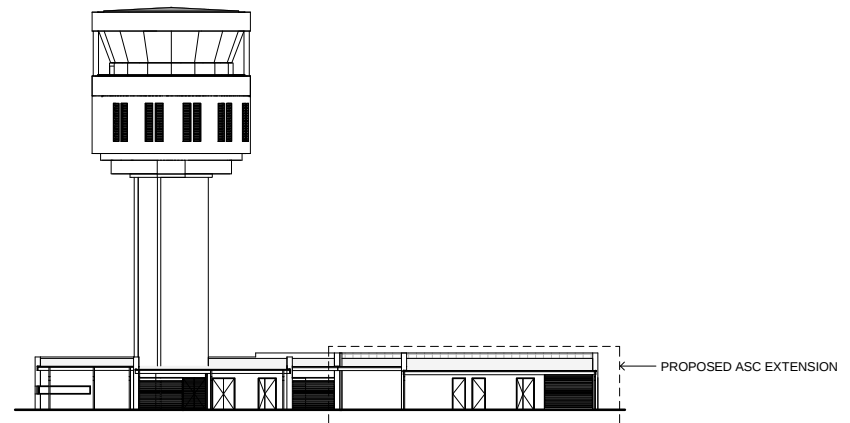
1 NORTH ELEVATION
1:200



2 EAST ELEVATION
1:200

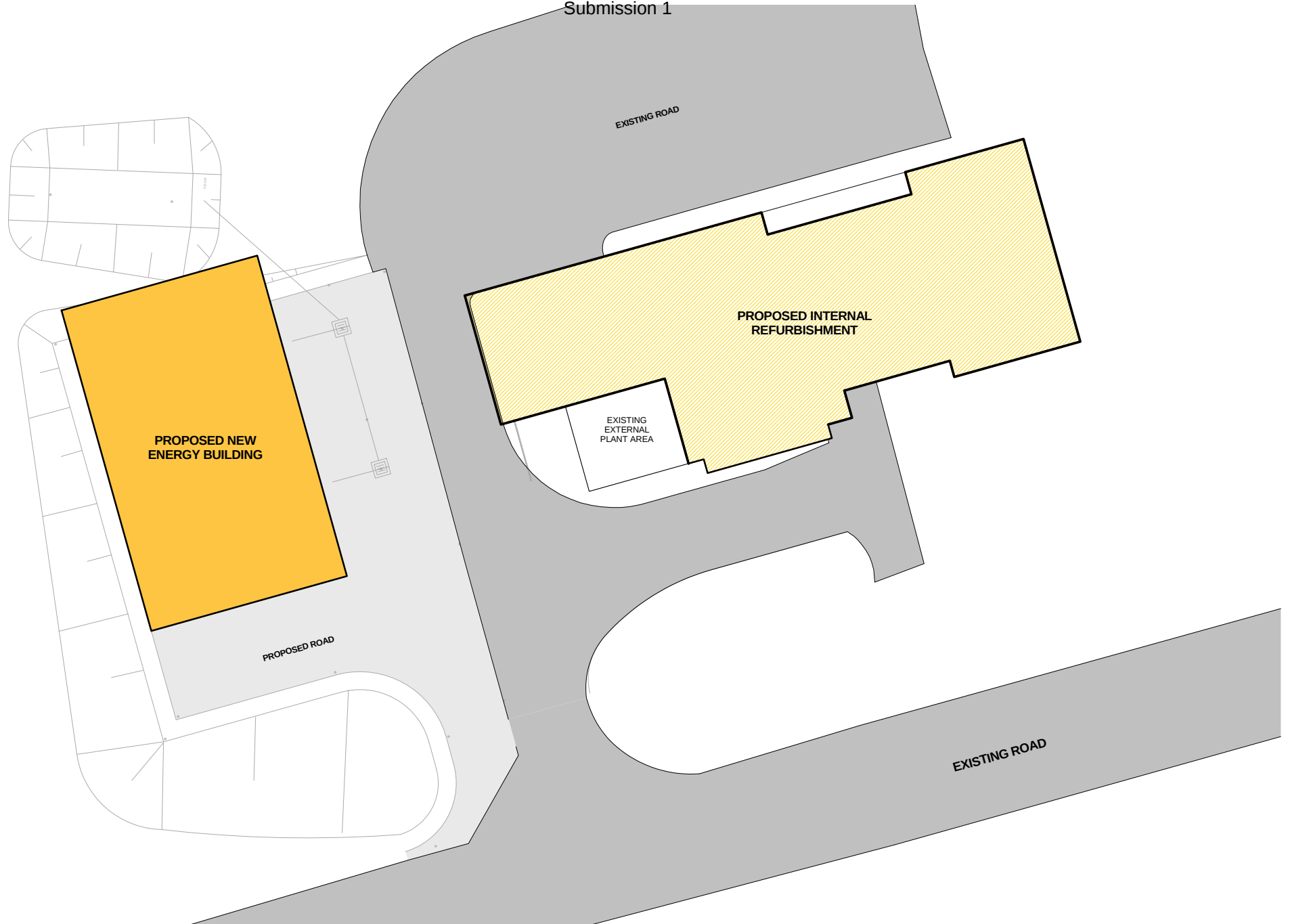


3 SOUTH ELEVATION
1:200



4 WEST ELEVATION
1:200



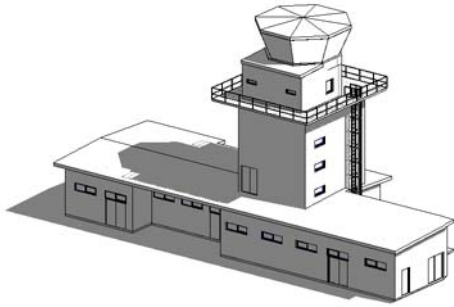


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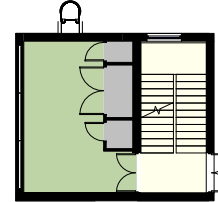
LEGEND

- AMENITIES
- ATC OPERATIONS
- CIRCULATION
- COMPLEX
- EXISTING
- EXISTING PLANT AREA
- PLANT

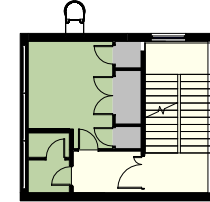
1 3D PERSPECTIVE VIEW



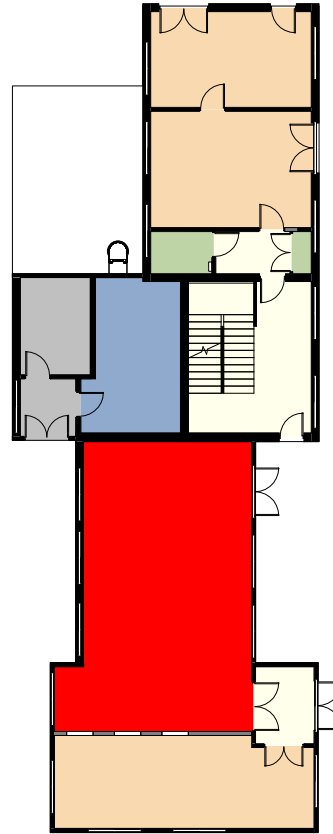
4 PROPOSED LEVEL 1(KITCHENETTE) FLOOR PLAN
1:100



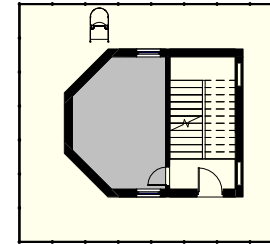
5 PROPOSED LEVEL 2 (CREW REST) FLOOR PLAN
1:100



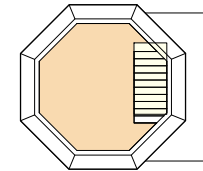
3 PROPOSED ASC GROUND FLOOR PLAN
1:100

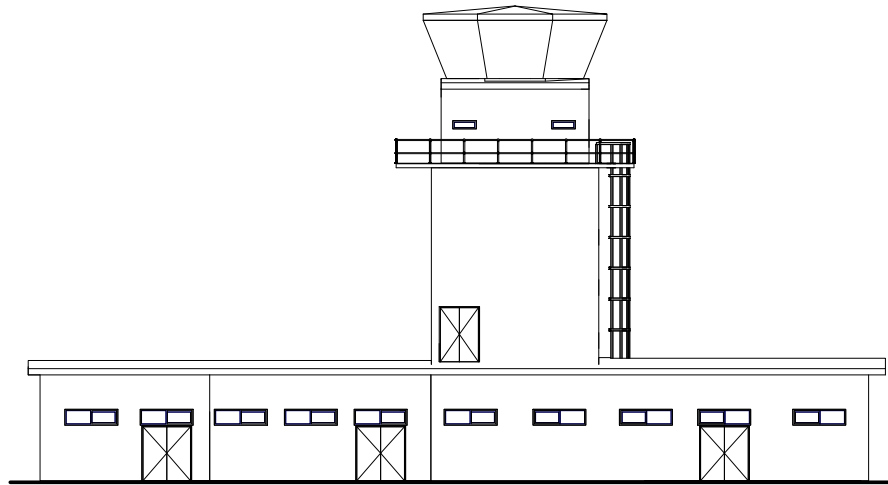


6 PROPOSED LEVEL 3 (OBSERVATION DECK) FLOOR PLAN
1:100

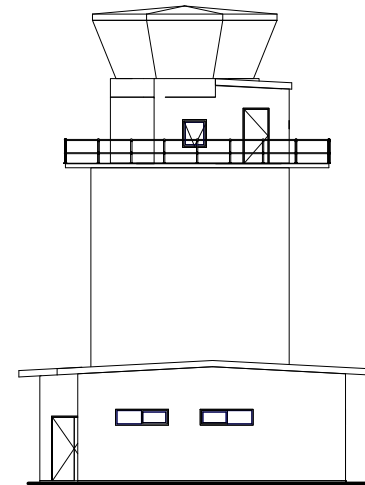


7 PROPOSED LEVEL 4 (CONTROL CABIN) FLOOR PLAN
1:100

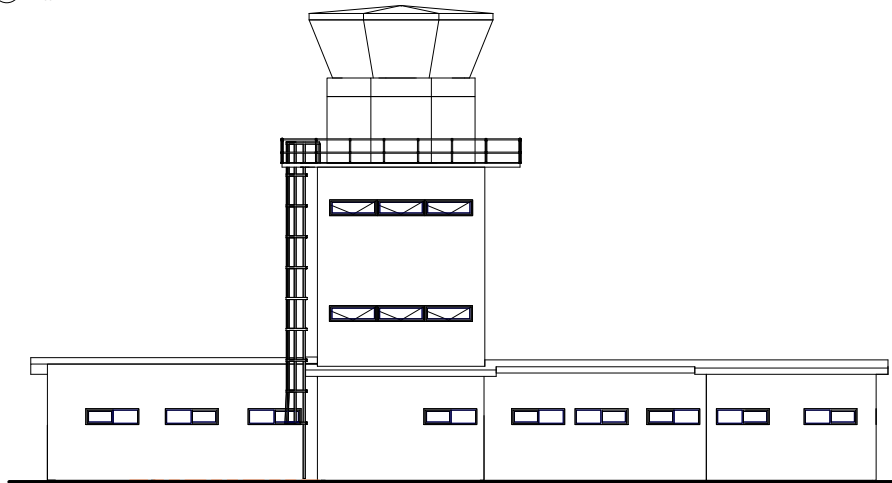




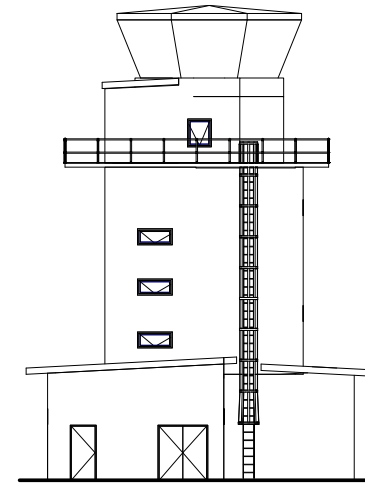
1 NORTH ELEVATION
1:100



2 EAST ELEVATION
1:100

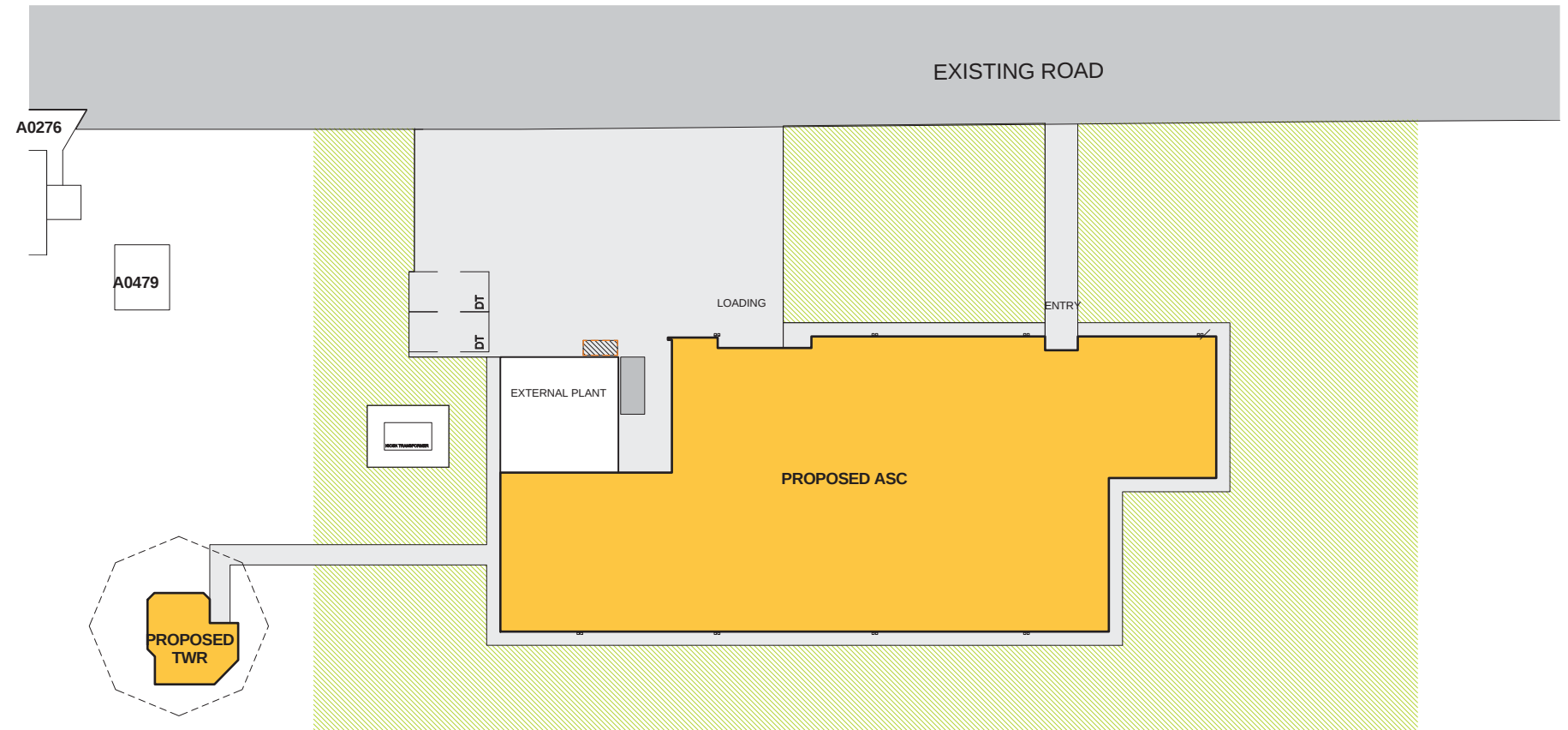


3 SOUTH ELEVATION
1:100

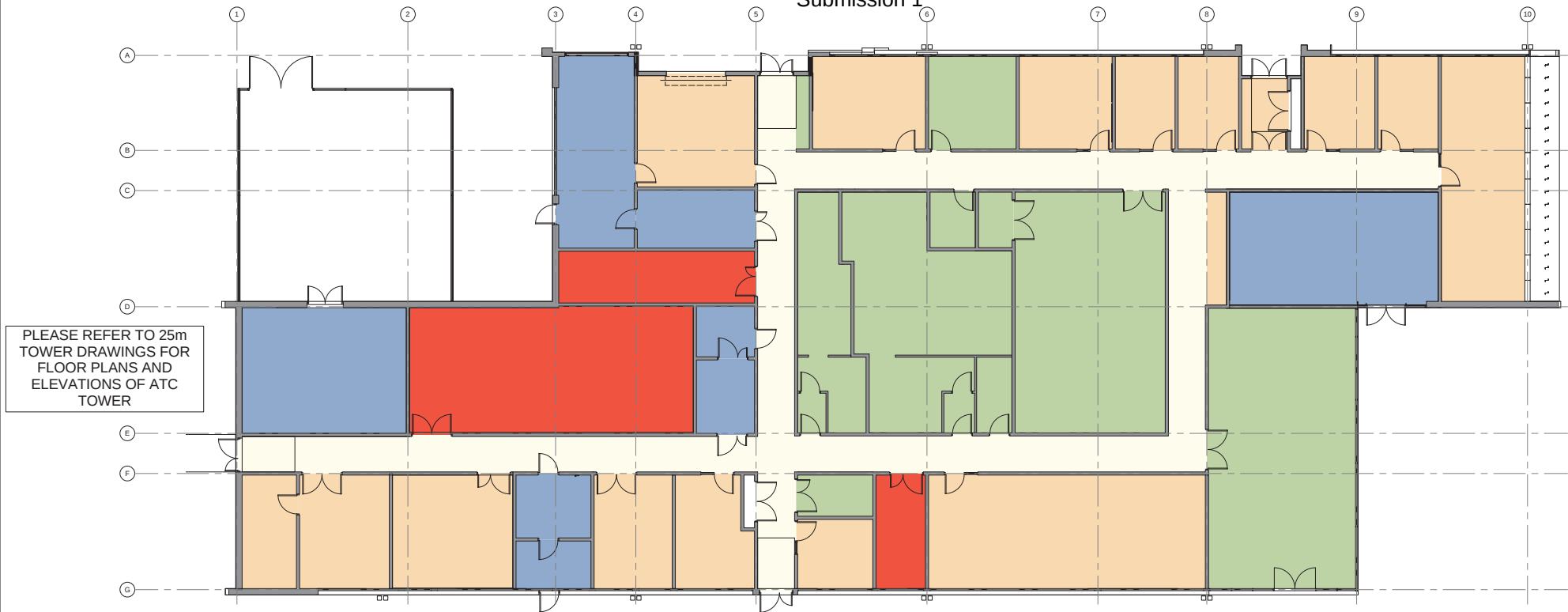


4 WEST ELEVATION
1:100





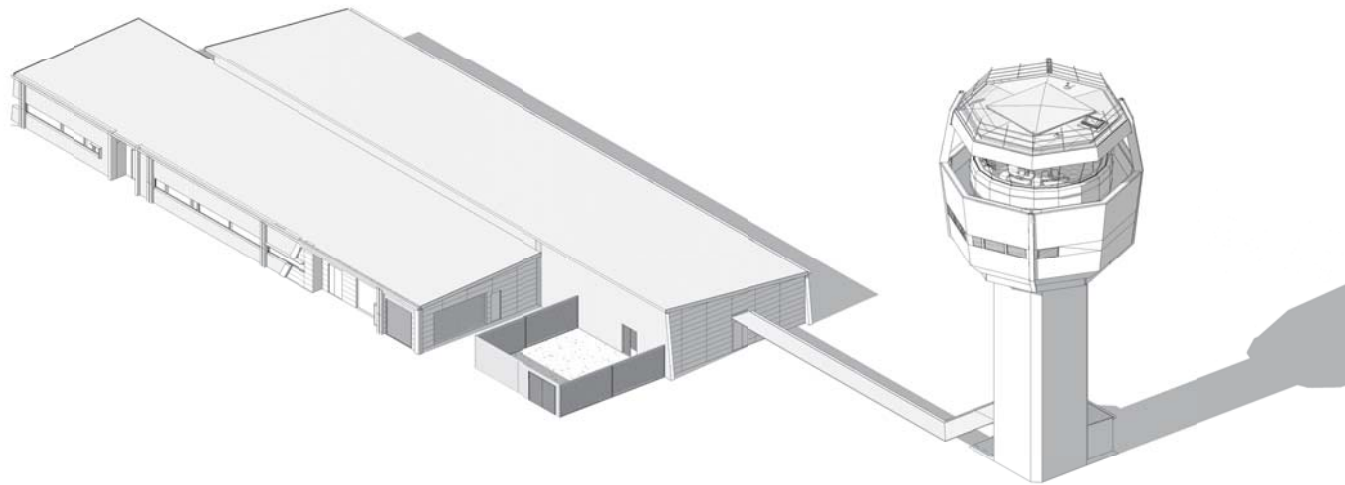
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic Control Complex Infrastructure Project
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1 PROPOSED GROUND FLOOR PLAN
1:100

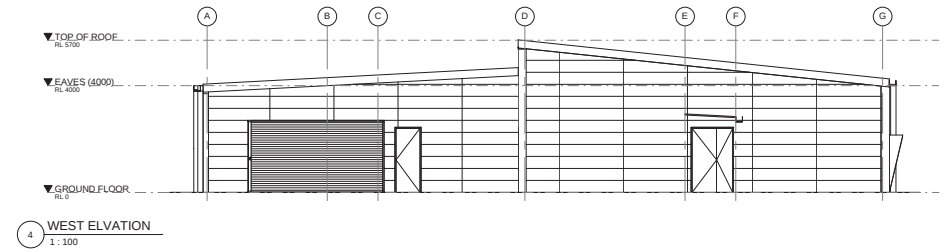
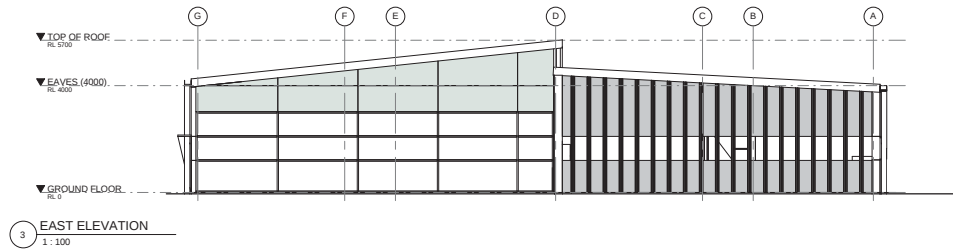
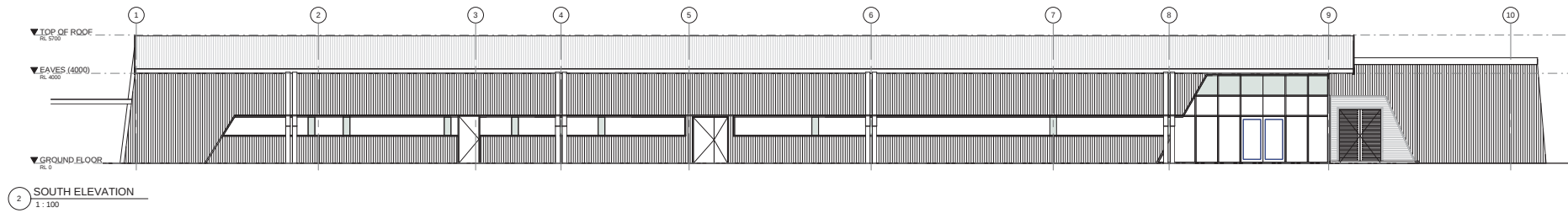
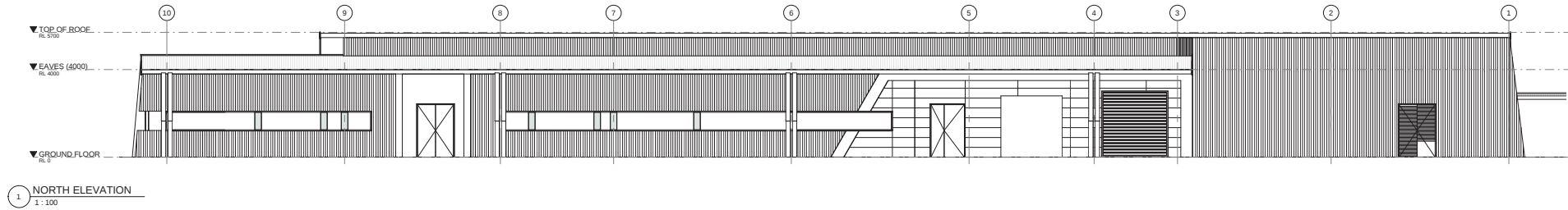
LEGEND

- CIRCULATION
- PLANT
- COMPLEX
- AMENITIES
- EXTERNAL
- ATC OPERATIONS



2 3D PERSPECTIVE

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Control Complex Infrastructure Project
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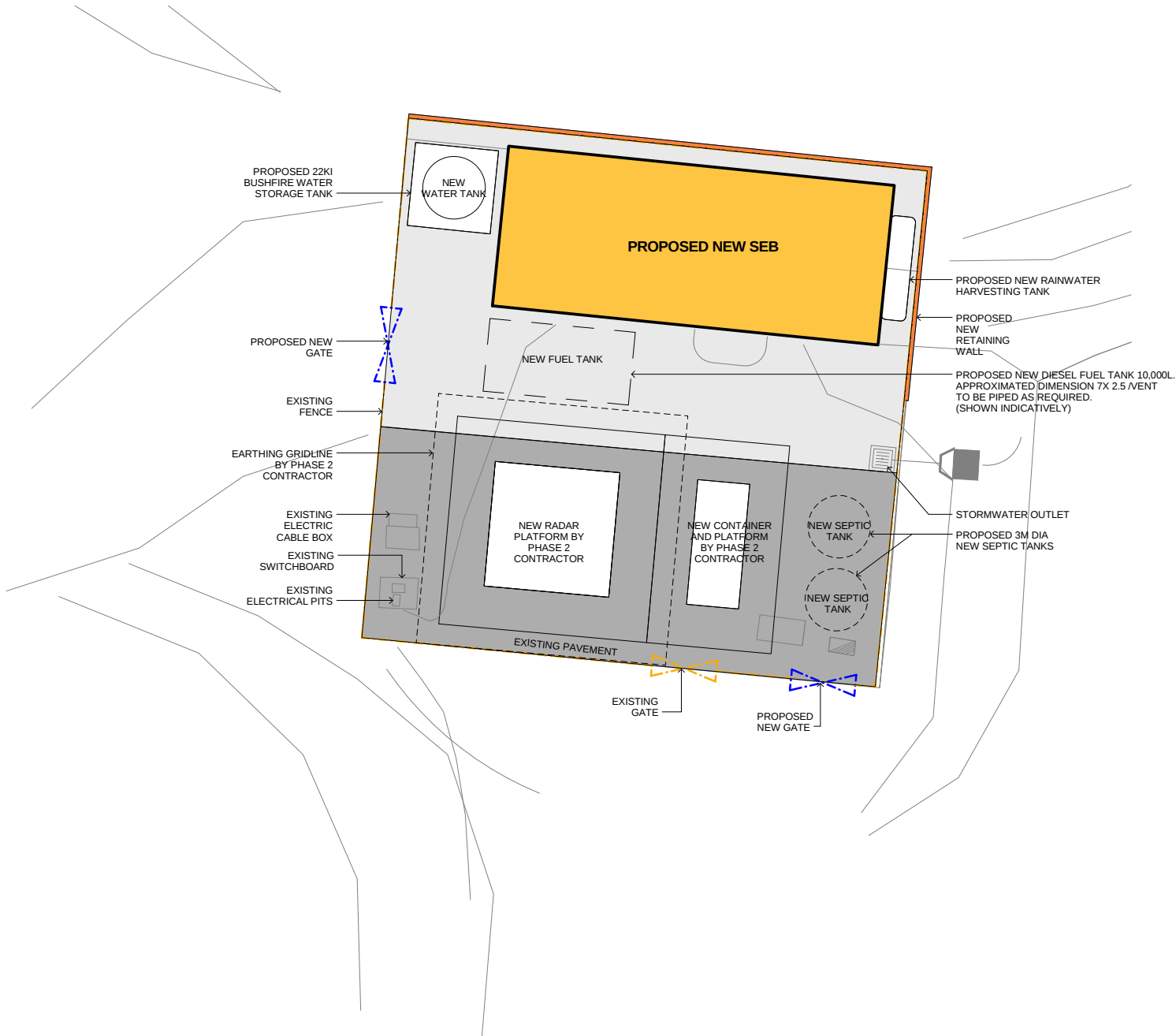


Submission 1

PROPOSED SEB

PROPOSED ASC 32KM

CREIGTON ROAD

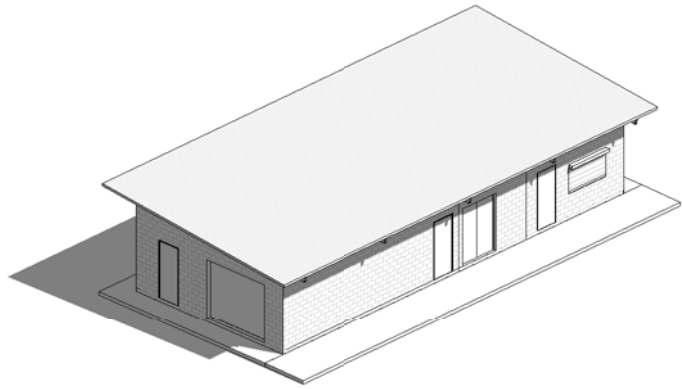


AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic Control Complex Infrastructure Project

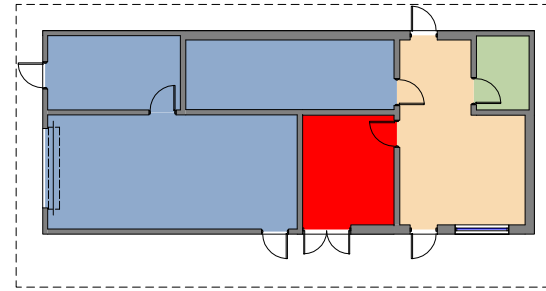
Submission 1

LEGEND

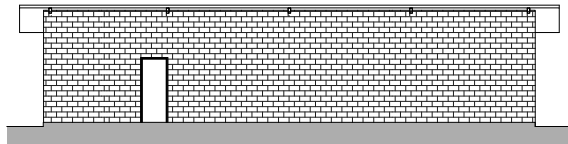
- PLANT
- COMPLEX
- AMENITIES
- ATC OPERATIONS



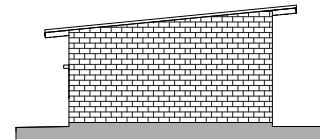
1 3D PERSPECTIVE VIEW



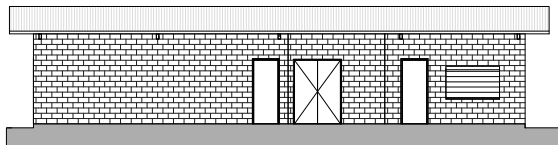
2 PROPOSED GROUND FLOOR PLAN
1:100



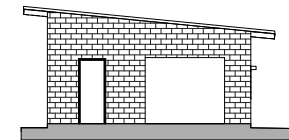
3 NORTH ELEVATION
1:100



4 EAST ELEVATION
1:100

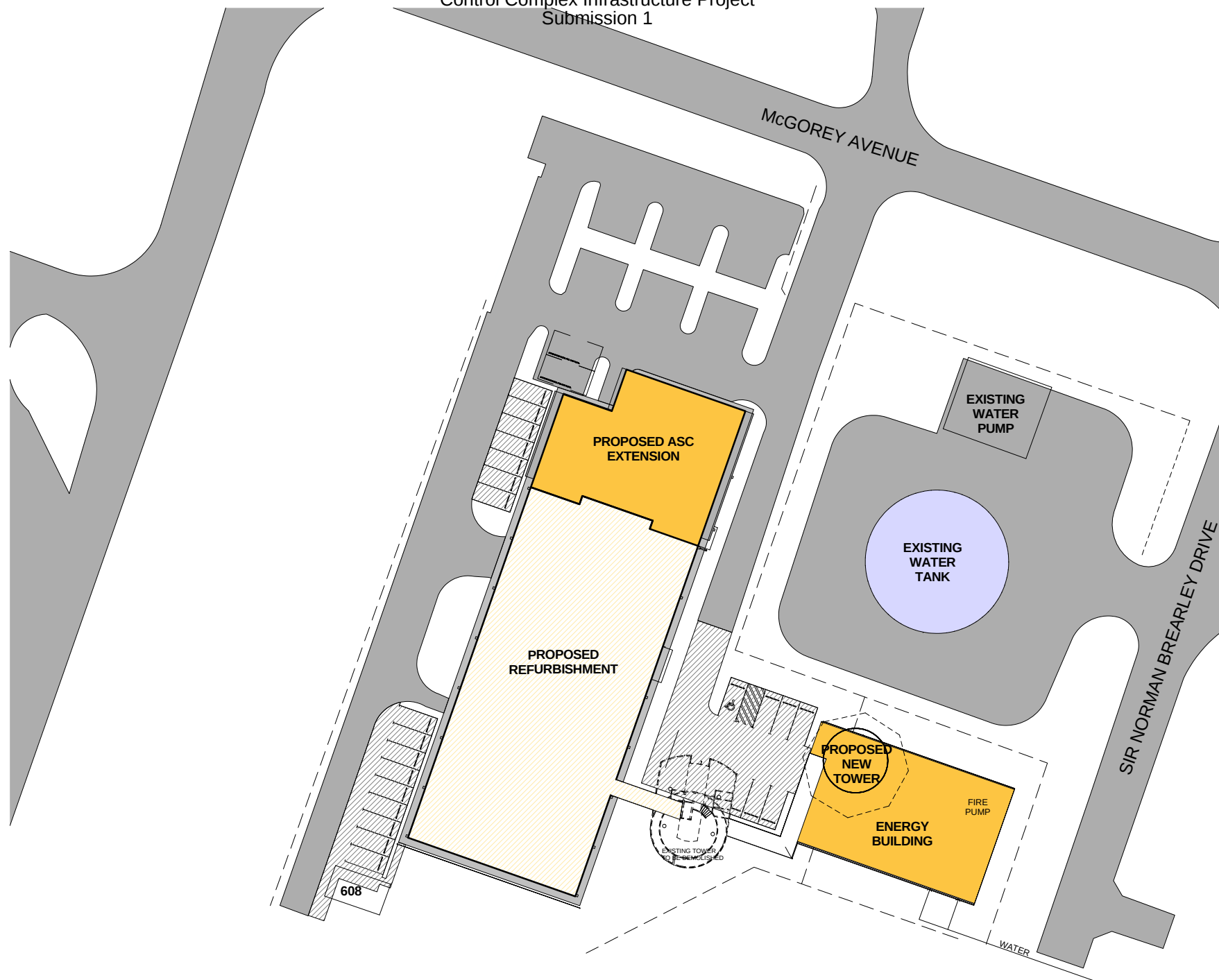


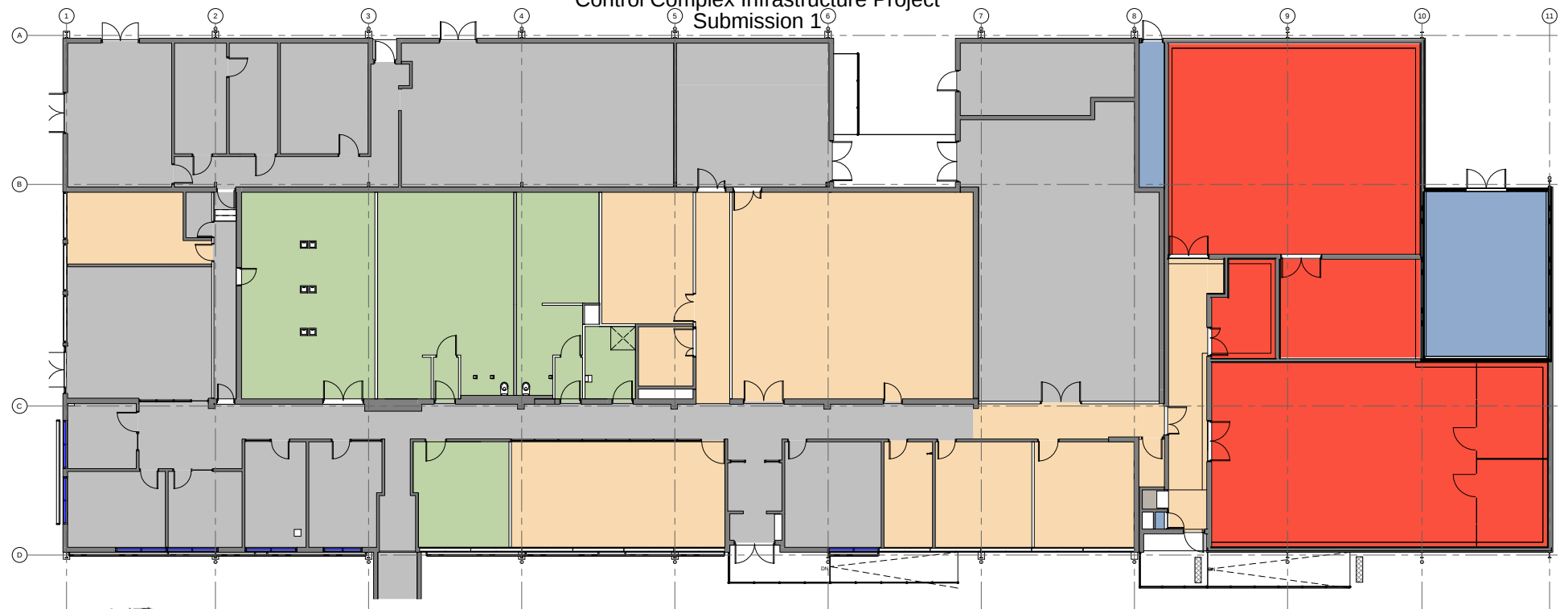
5 SOUTH ELEVATION
1:100



6 WEST ELEVATION
1:100







1 PROPOSED GROUND FLOOR PLAN
1 : 100

LEGEND

PLANT

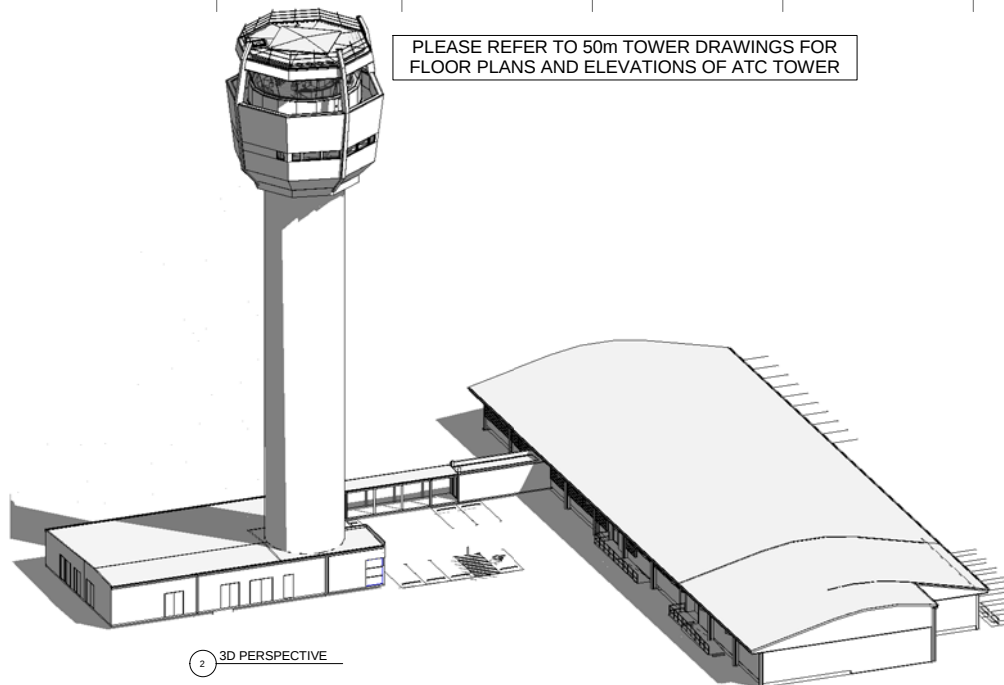
TRAFFIC

COMPLEX

ATC OPERATIONS

AMENITIES

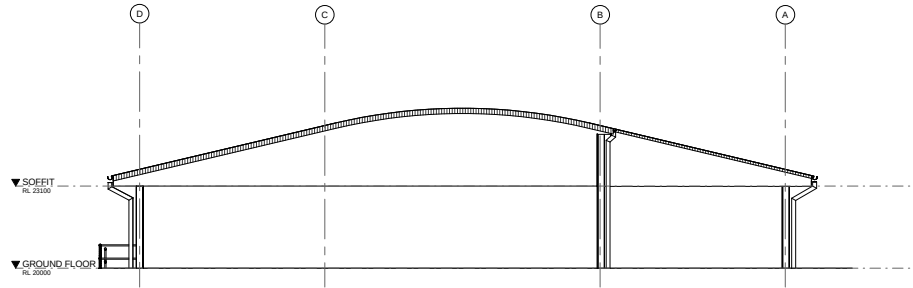
 EXISTING



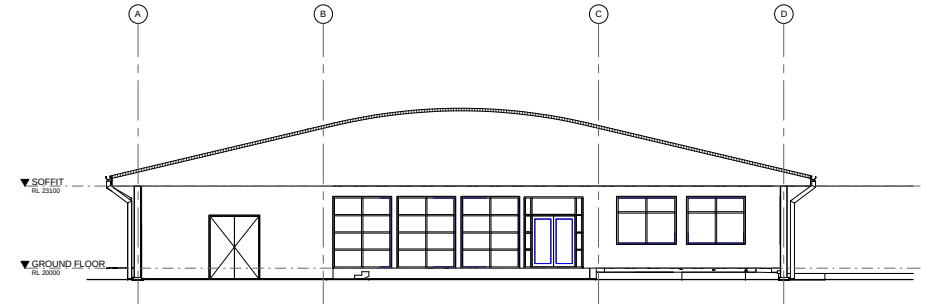
2 3D PERSPECTIVE



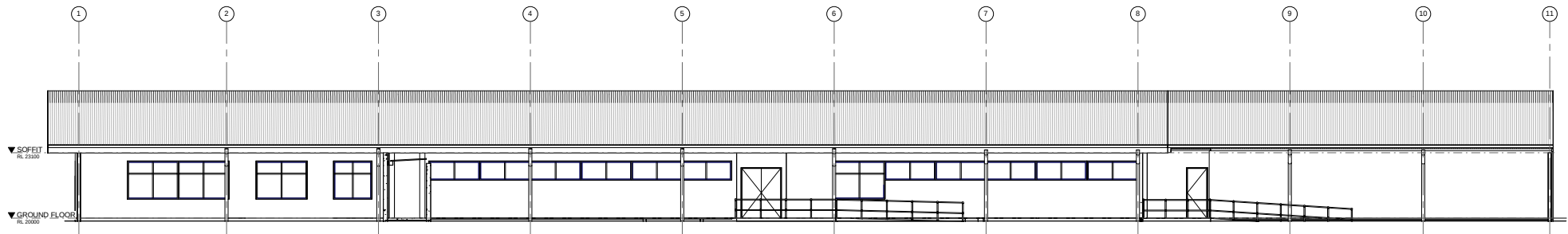
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
Submission 1



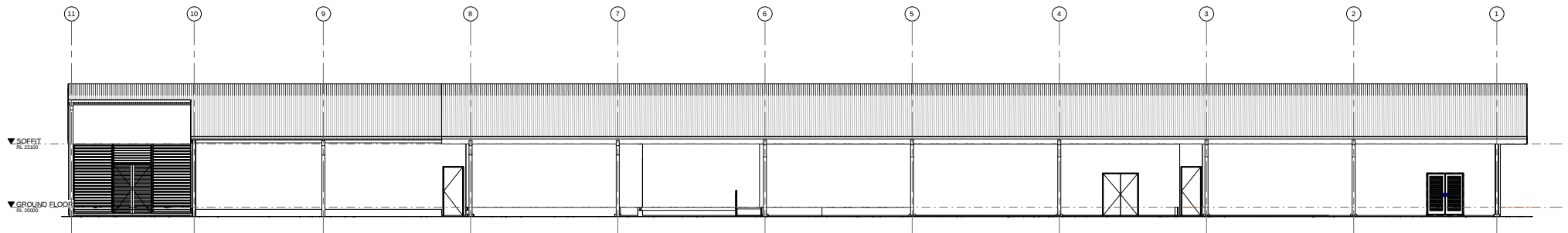
1 NORTH ELEVATION
1:100



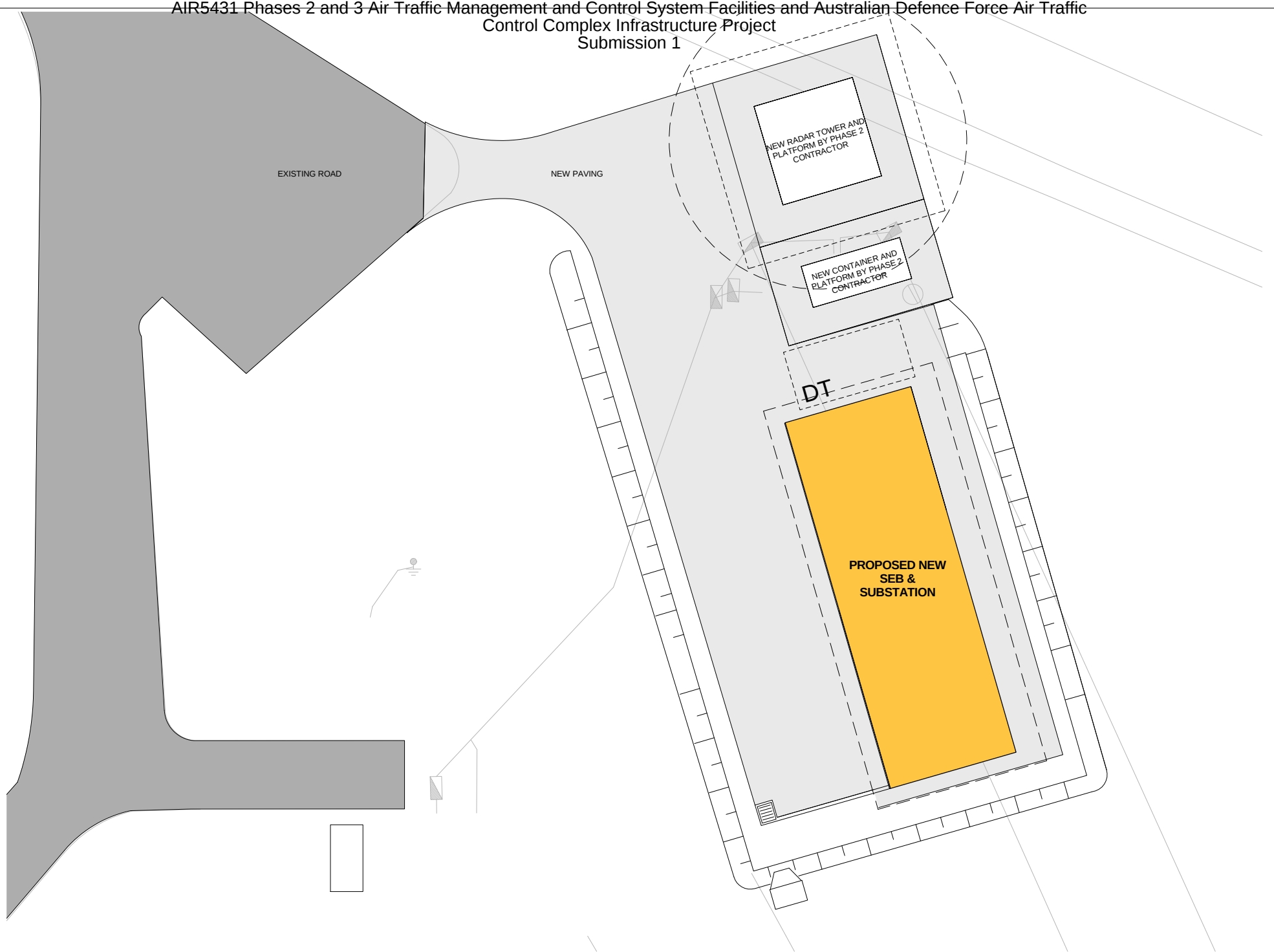
2 SOUTH ELEVATION
1:100



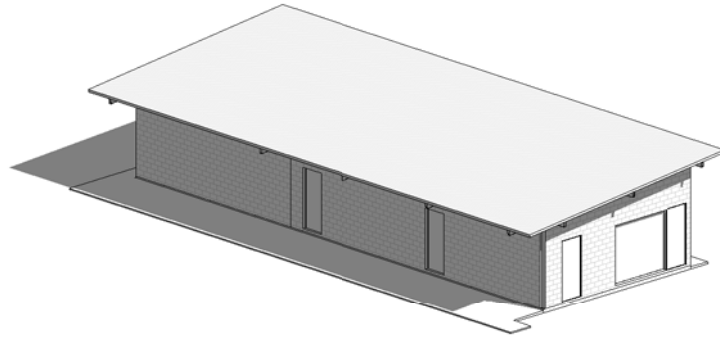
3 EAST ELEVATION
1:100



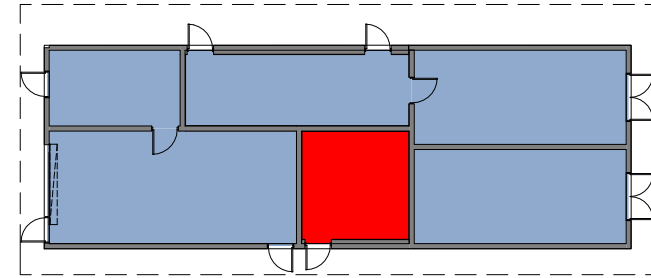
4 WEST ELEVATION
1:100



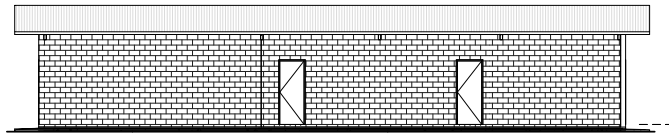
LEGEND
 PLANT
 ATC OPERATIONS



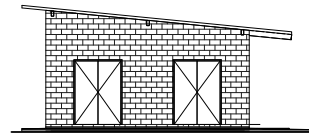
1 3D PERSPECTIVE



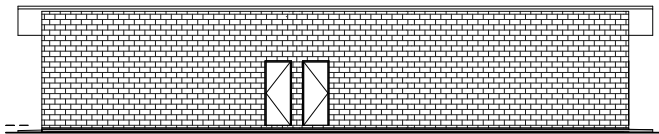
2 PROPOSED GROUND FLOOR PLAN
1:100



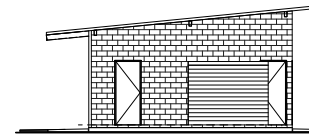
3 NORTH ELEVATION
1:100



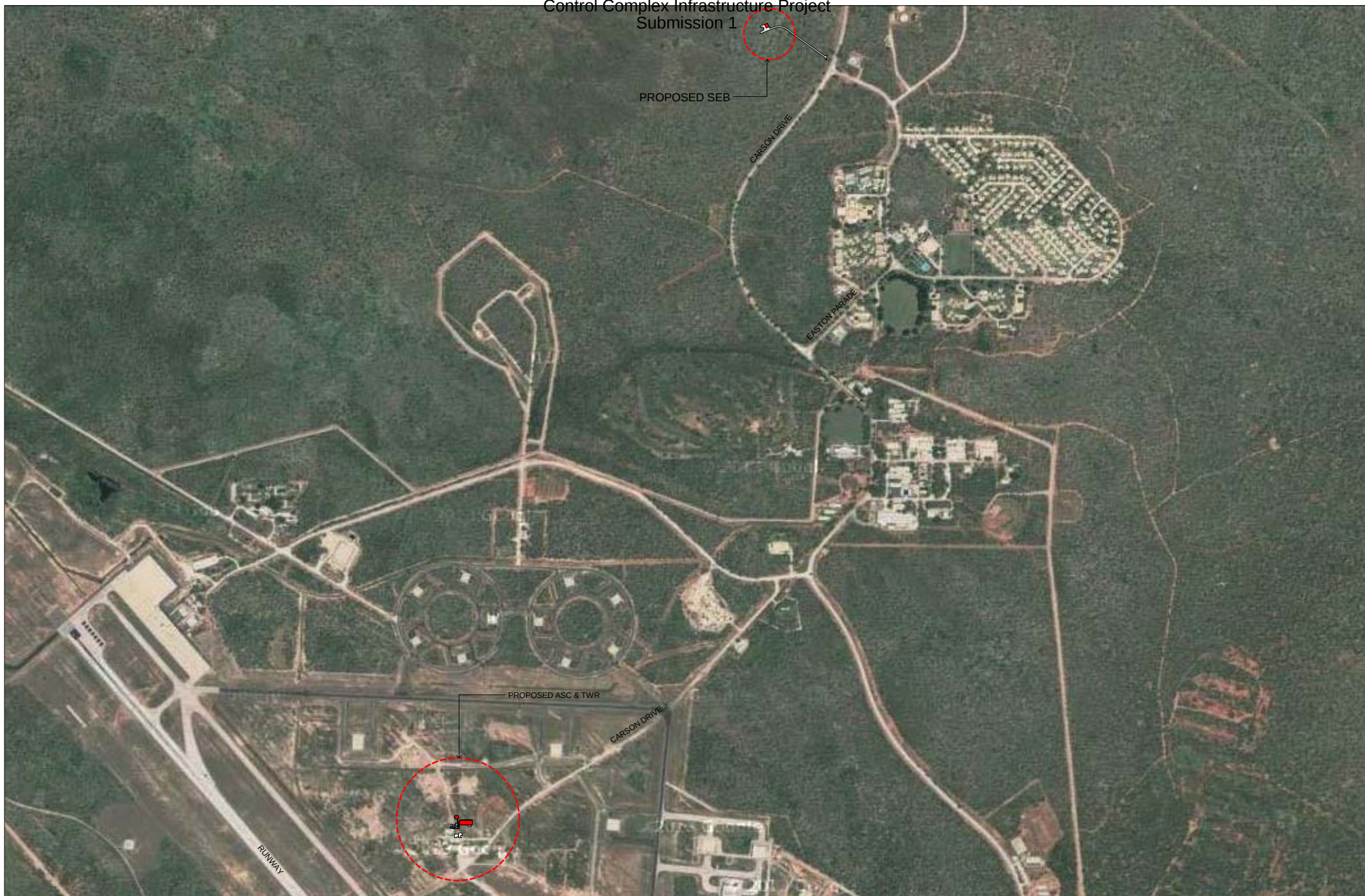
4 EAST ELEVATION
1:100

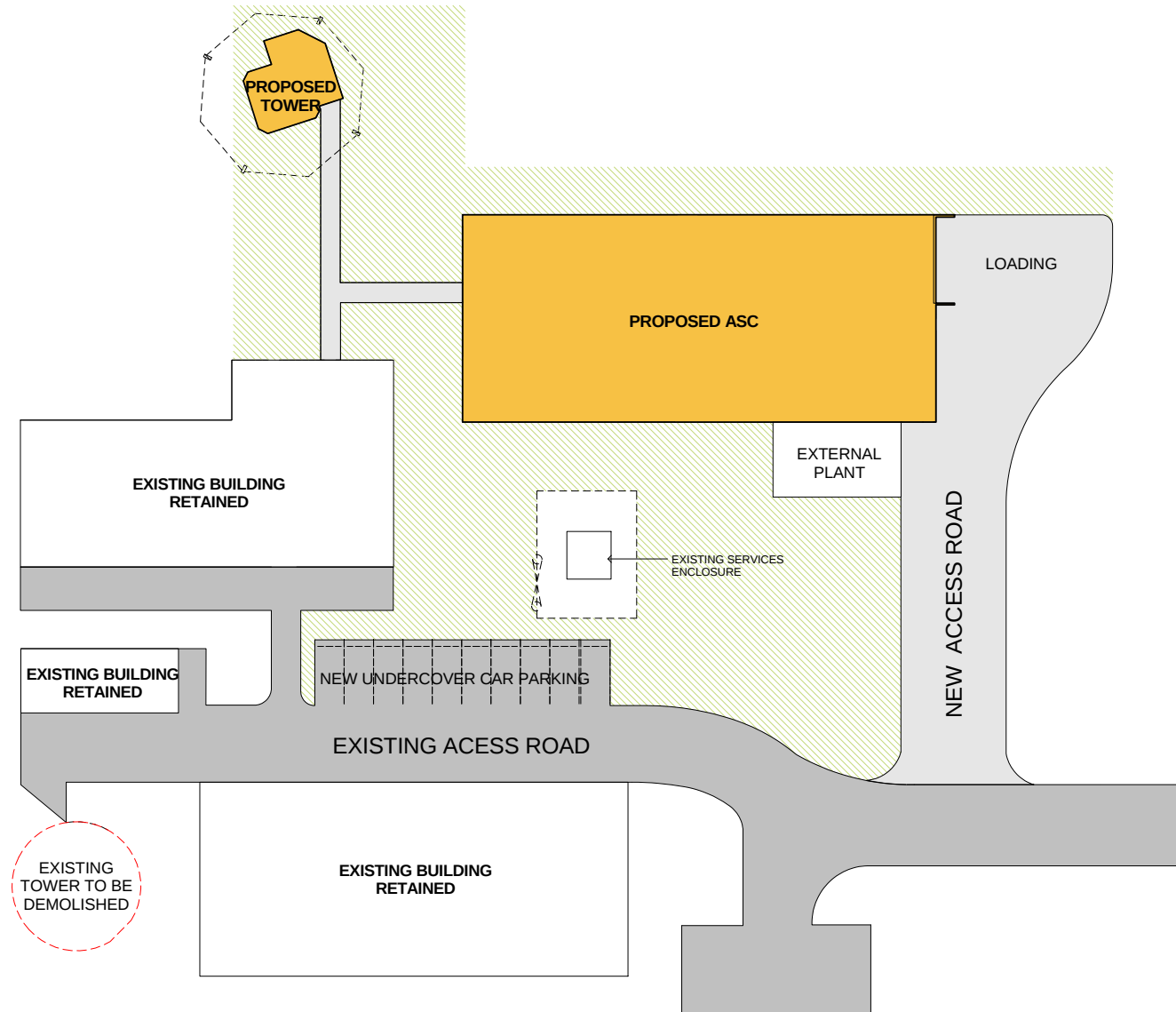


5 SOUTH ELEVATION
1:100



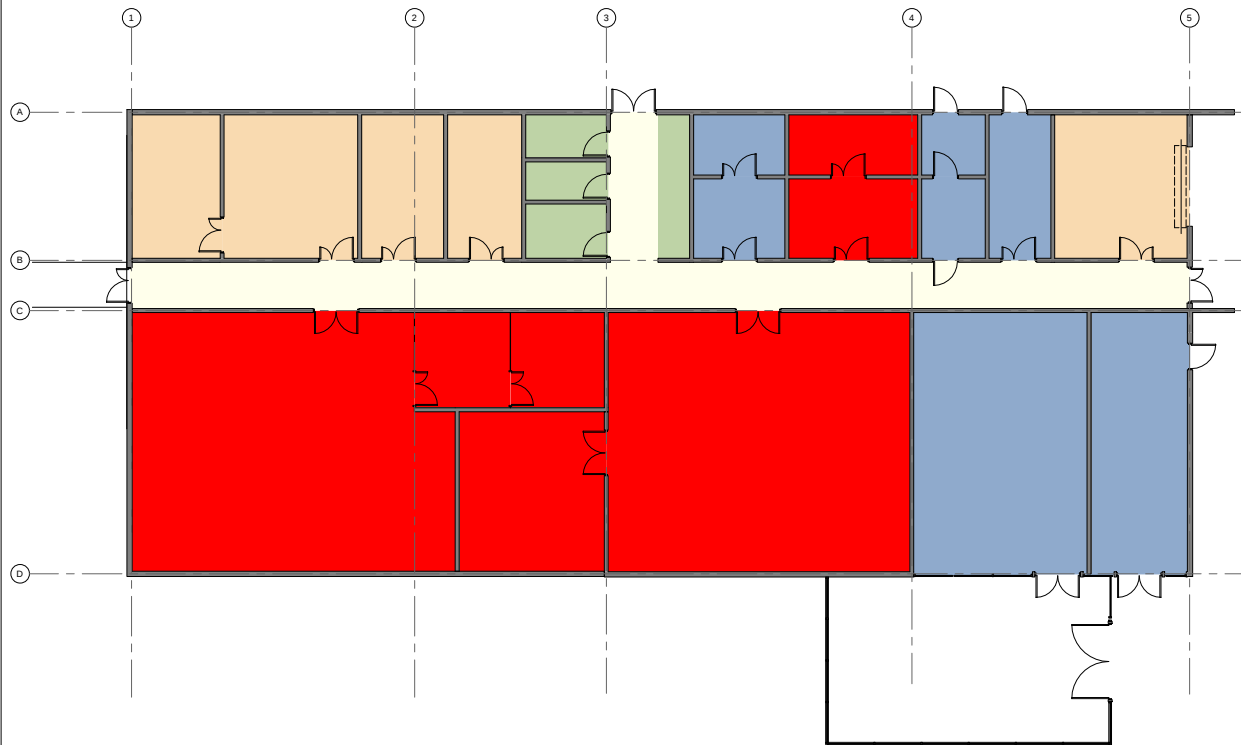
6 WEST ELEVATION
1:100



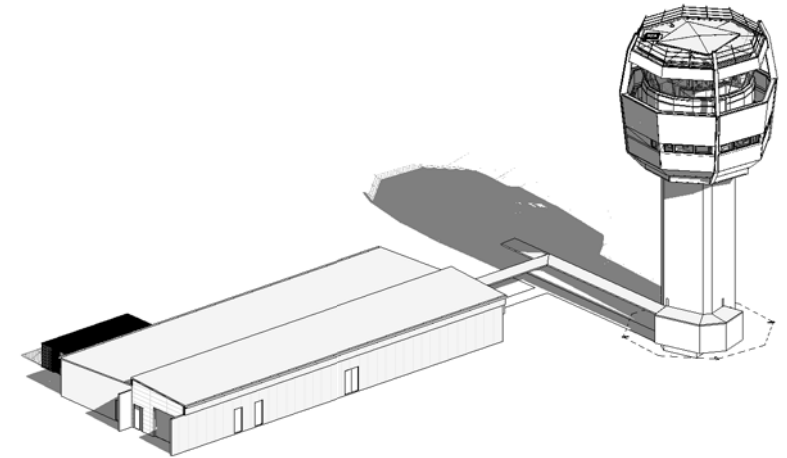


LEGEND

- CIRCULATION
- PLANT
- COMPLEX
- AMENITIES
- EXTERNAL
- ATC OPERATIONS



1 PROPOSED GROUND FLOOR PLAN
1:100



2 3D PERSPECTIVE

NEW RADAR TOWER PLATFORM
BY PHASE 2 CONTRACTOR

NEW CONTAINER AND PLATFORM BY
PHASE 2 CONTRACTOR

PROPOSED
NEW SEE

NEW PAVING

NEW GATE

NEW ACCESS ROAD

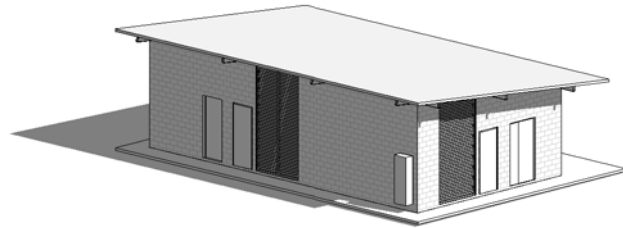
CARSON DRIVE

NEWHAM CIRCUIT

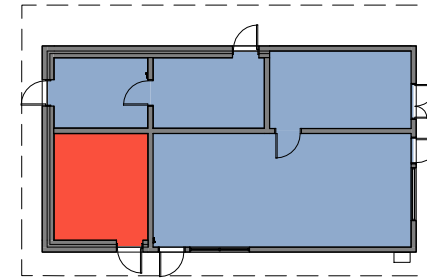
LEGEND

PLANT

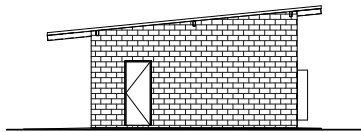
ATC OPERATIONS



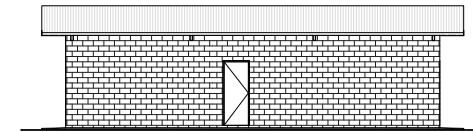
6 3D PERSPECTIVE



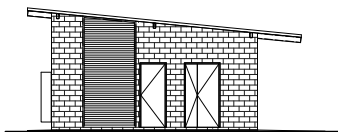
1 PROPOSED GROUND FLOOR PLAN
1:100



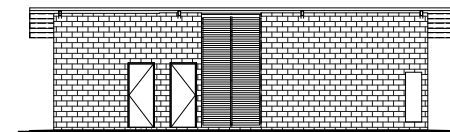
2 NORTH ELEVATION
1:100



3 EAST ELEVATION
1:100



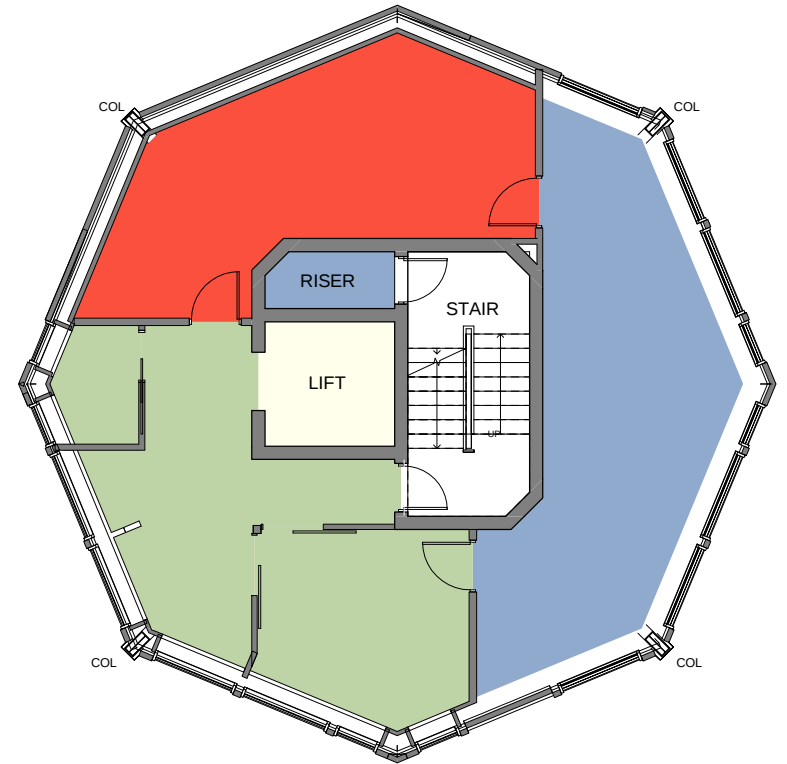
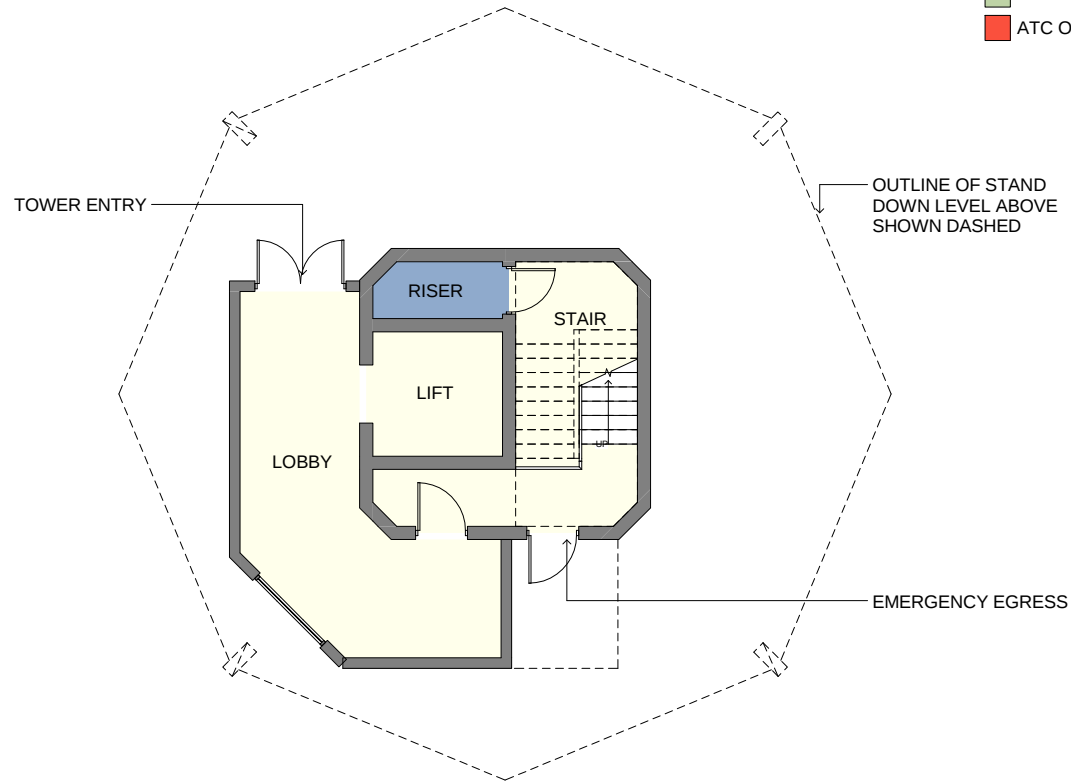
4 SOUTH ELEVATION
1:100

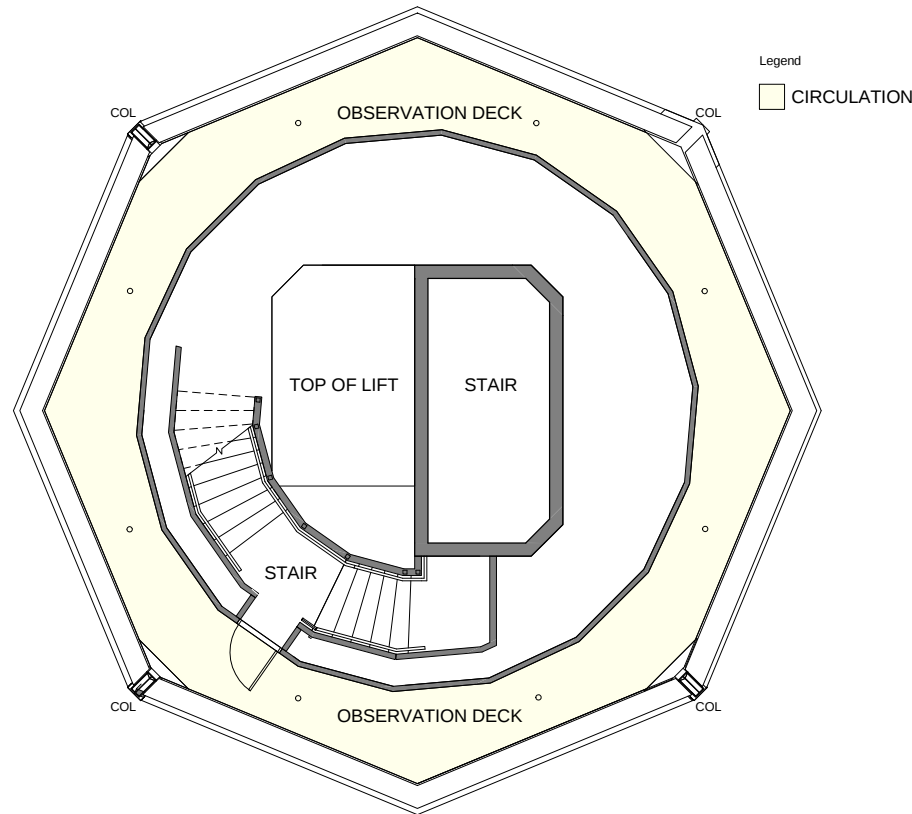


5 WEST ELEVATION
1:100

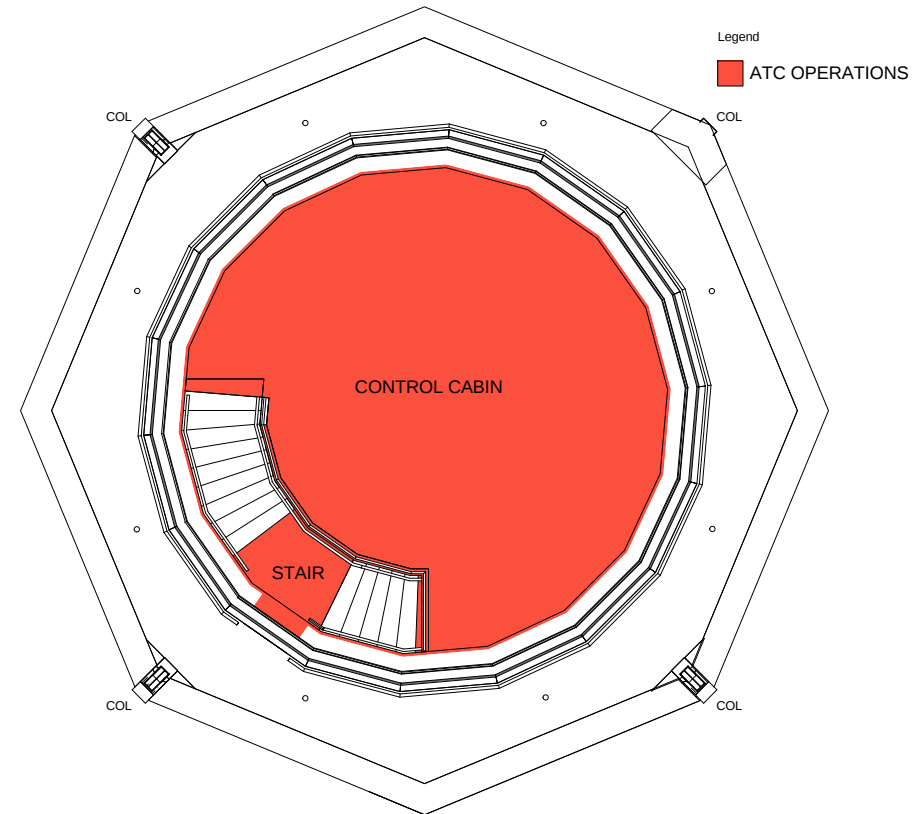
Legend

- CIRCULATION
- PLANT
- AMENITIES
- ATC OPERATIONS



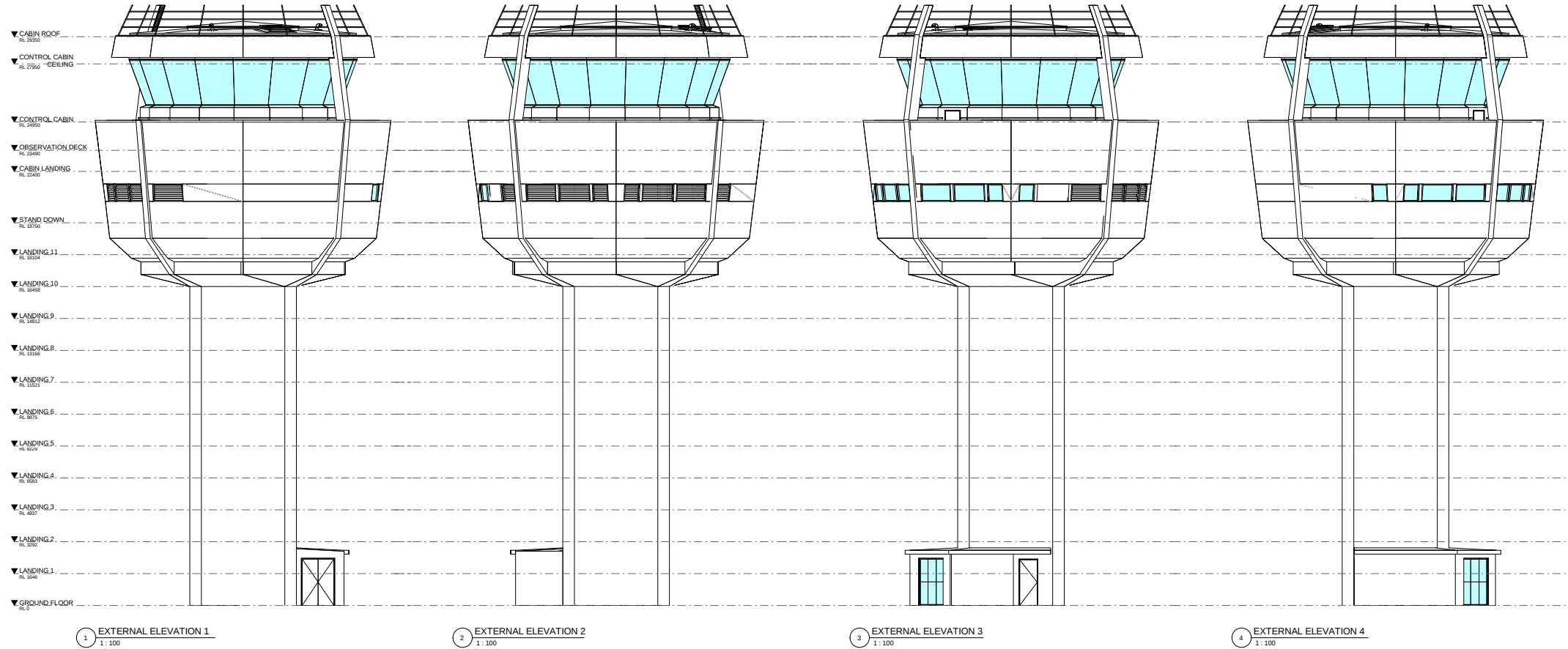


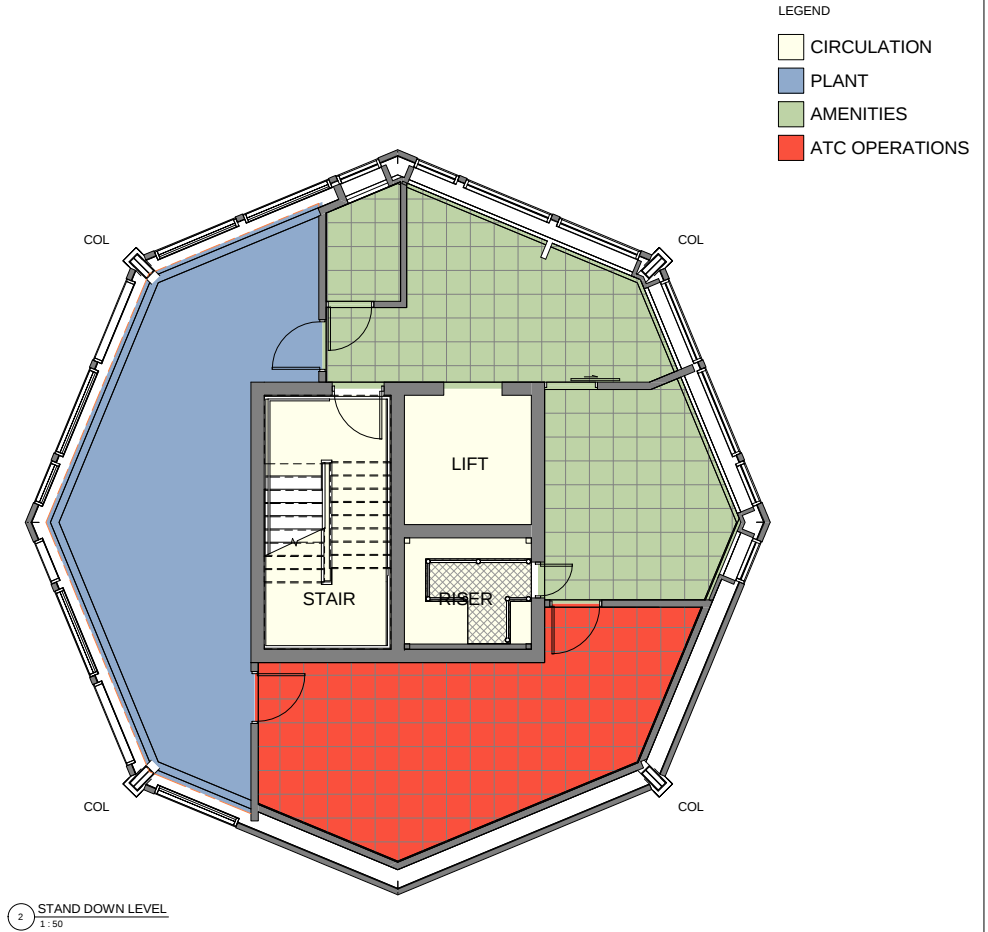
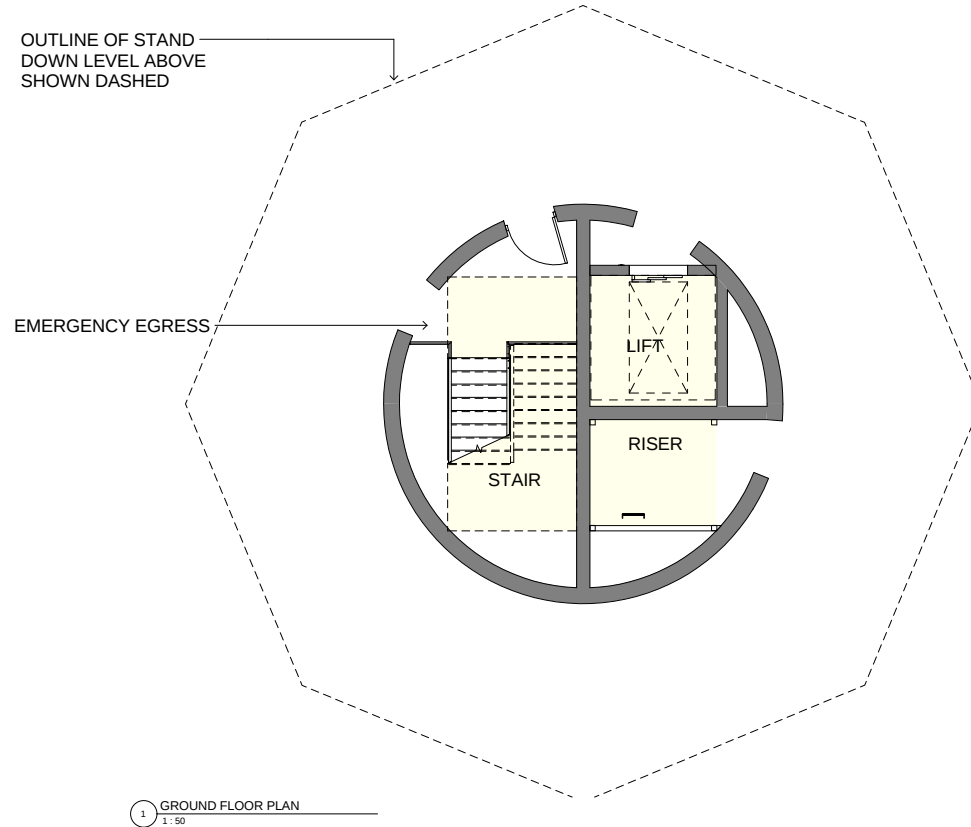
1 OBSERVATION DECK
1:50

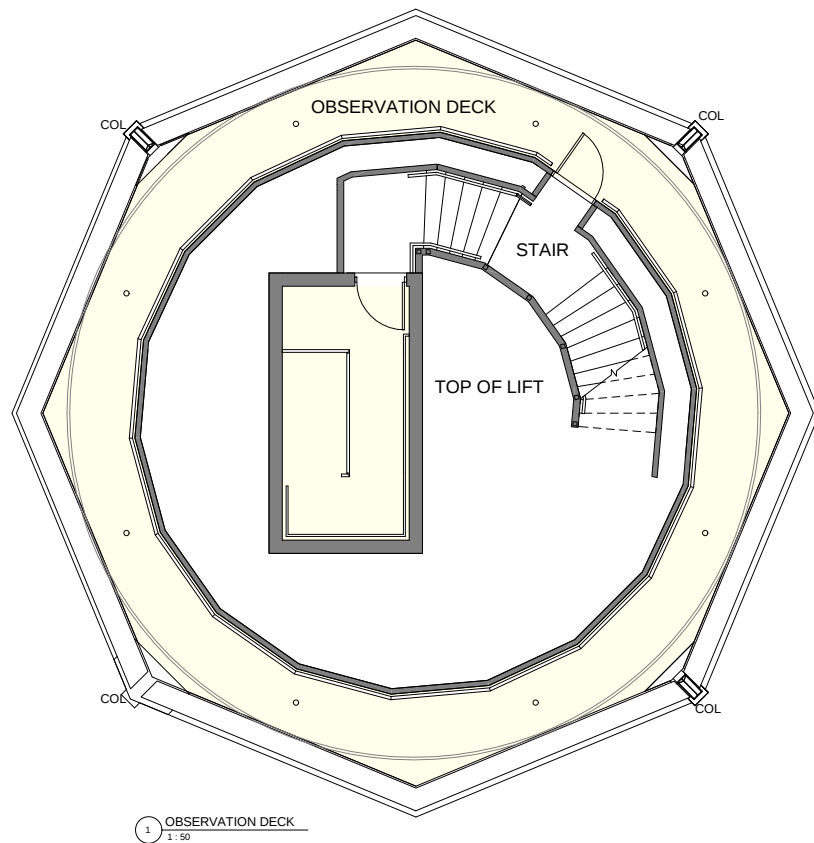


2 CONTROL CABIN
1:50

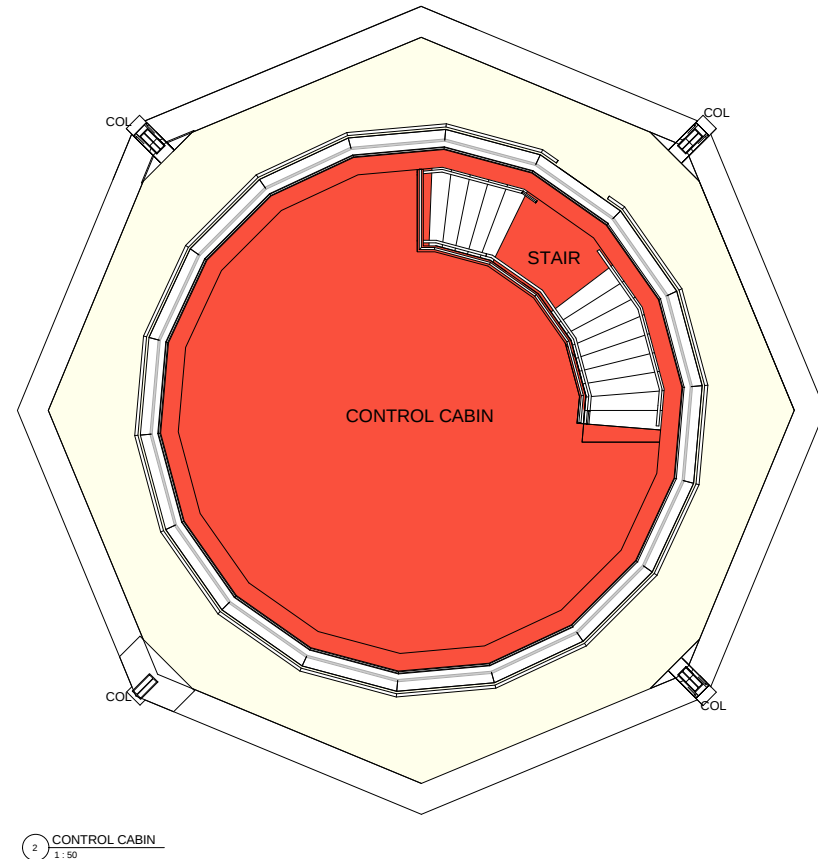
AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
Submission 1



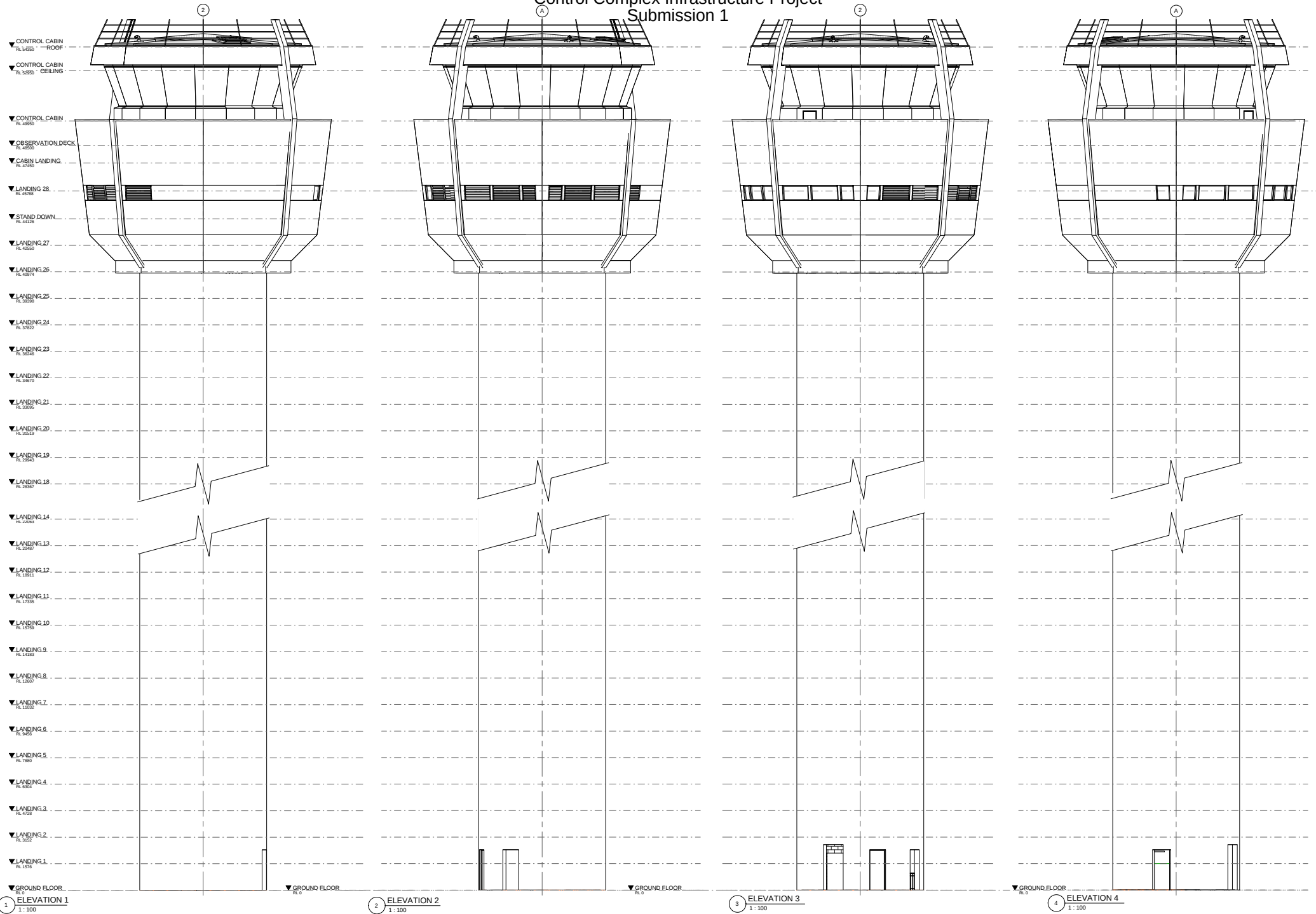




LEGEND
CIRCULATION
ATC OPERATIONS



AIR5431 Phases 2 and 3 Air Traffic Management and Control System Facilities and Australian Defence Force Air Traffic
Control Complex Infrastructure Project
Submission 1



ATTACHMENT 17 - 50m TOWER ELEVATIONS

0 8