

Submission No. 1  
(Inquiry into Super Hornet Facilities)

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**Australian Government**  

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**Department of Defence**

**AUSTRALIAN SUPER HORNET FACILITIES PROJECT**  
**RAAF BASE AMBERLEY**  
**QUEENSLAND**

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

**DEPARTMENT OF DEFENCE**  
**CANBERRA, ACT**

**MAY 2008**

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## **ACRONYMS AND ABBREVIATIONS**

ESD	Ecologically Sustainable Development
RAAF	Royal Australian Air Force

## **PART A – IDENTIFICATION OF THE NEED**

### **INTRODUCTION**

1. This evidence to the Parliamentary Standing Committee on Public Works presents a proposal for the Australian Super Hornet Facilities Project at the Royal Australian Air Force (RAAF) Base Amberley, Queensland.

### **PROJECT OBJECTIVES**

2. The Australian Super Hornet Facilities Project is one of a number of capital works projects rebuilding RAAF Base Amberley to provide the necessary new, expanded and modified facilities and infrastructure to support future capability at RAAF Base Amberley. Facilities proposed as part of the Australian Super Hornet Facilities Project will initially support No 82 Wing's No 1 Squadron, No 6 Squadron and No 278 Squadron transition from F-111 to F/A-18F Super Hornets for an expected ten year period from 2010.

### **BACKGROUND**

3. In March 2007, the then Minister for Defence announced the acquisition of twenty four F/A-18F Super Hornet aircraft and associated equipment by the Australian Defence Force as a Bridging Air Combat Capability.

4. No 82 Wing has responsibility for command and control of part of the Australian Defence Force's air combat capability. The Wing is currently equipped to discharge its responsibilities through its F-111 aircraft fleet. F-111 operations are conducted by No 1 Squadron and No 6 Squadron out of RAAF Base Amberley. These squadrons will be converted to operate the Super Hornet aircraft. The first four aircraft are scheduled to arrive in Australia in March 2010. The next 12 aircraft are scheduled to arrive by the end of 2010 and the remaining aircraft are due to arrive by the end of 2012.

5. A detachment of No 278 Squadron and a contractor, Thales, are currently responsible for F-111 trade and aircrew training at RAAF Base Amberley. No 278 Squadron and a contractor will provide similar training for the Australian Defence Force Super Hornet aircrew and aircraft maintenance staff.

6. RAAF Base Amberley has been a major military airfield since 1938. The American Air Corps comprising of approximately 2,000 personnel were stationed at the Base during the 1940s.

The site became a major RAAF bomber base following World War II, with *Lincoln* bombers originally based at the site, followed by *Canberra* bombers. During the post war period, a major realignment of the main runways was undertaken, with *Wirraway*, *Vampire* and *Meteor* aircraft stationed on-site during the 1950s. The United States military again used the Base during the Vietnam War period. Additional accommodation and working facilities, including a runway extension, were constructed in the late 1960s and early 1970s. Australia commenced its procurement of the F-111s in 1963, with the first six aircraft arriving at RAAF Base Amberley on 1 June 1973; the twenty-fourth aircraft was delivered on 31 October that same year. Two base redevelopments were completed between 1999 and 2007. The third stage of redevelopment is underway and due for completion by late 2010.

## **NEED FOR THE WORK**

7. As the home base for No 82 Wing, RAAF Base Amberley is able to provide full operational and maintenance support for the Precision Strike element of the Air Combat Group. RAAF Base Amberley also supports elements of the Strategic Lift capability with the introduction of the Multi-Role Tanker Transport and C-17 Heavy Lift Aircraft. The change in aircraft specification, operations, maintenance and training, and corresponding changes in unit roles and organisational structure, necessitates the investment in airfield facilities and infrastructure at RAAF Base Amberley. The Australian Super Hornet Facilities Project will contribute to future capability at RAAF Base Amberley by supporting:

- a. No 82 Wing (including No 1 Squadron and No 6 Squadron) for Headquarters, maintenance, logistics and operations functions;
- b. No. 278 Squadron Technical Training Flight – Amberley for trade training functions; and
- c. Defence Contractors operating the Simulator and Intermediate Level Maintenance facilities.

8. No 82 Wing and its squadrons are currently accommodated in a variety of facilities that range from construction in the 1960s to the most recent in the 1990s. Whilst the older buildings have been progressively modified to enable them to support No 82 Wing's operations, all facilities require further works in order to support future No 82 Wing capability. The older buildings generally do not comply with the latest structural codes, the Building Code of Australia, Defence's Manual of Fire Protection Engineering, current Occupational Health and Safety Acts or environmental legislation.

9. Maintenance support is currently conducted in a number of facilities at the Base. This proposal presents an opportunity to consolidate some of the maintenance support activities into a new facility.

10. This proposal supports Defence Output 4: Air Force Capabilities; and specifically 4.1: Capability for Air Combat Operations.

## **DESCRIPTION OF THE PROPOSAL**

11. This proposal involves 11 discreet project elements:

- a. new accommodation for No 1 Squadron;
- b. modification and upgrades to existing accommodation for No 6 Squadron;
- c. expansion of the existing common use Operational Level Maintenance facility;
- d. new shelters for Ground Support Equipment and external fuel tank storage;
- e. a new flight training simulator facility and reconfiguration of the existing F-111 technical training facility;
- f. modification of the existing F-111 shelters, including fire detection and environmental upgrades;
- g. minor modifications of the existing No 82 Wing Headquarters building and Operational Maintenance Store warehouse;
- h. upgrading the existing Engine Run Up and Testing facilities for the new aircraft type;
- i. upgrading the existing aircraft wash facility;
- j. new and refurbished maintenance facilities for Intermediate Level Maintenance; and
- k. upgrades to associated site works and engineering services.

## **OPTIONS CONSIDERED**

12. Defence considered the viability of adaptively re-using or refurbishing the No 1 Squadron hangar and working accommodation to reduce the need for new construction. The option to re-use the existing No 1 Squadron hangar facility was deemed to not be cost effective because of the extent of works required to rectify the structural deficiencies, functional inadequacy and non-conformances with current codes and standards.

## **ENVIRONMENTAL IMPACTS**

13. The implementation of the proposal outlined in this evidence aligns with the broad principles of Ecologically Sustainable Development. All works contracts will bind the contractors to achieving Ecologically Sustainable Development objectives and targets.

14. An Initial Environmental Review has been prepared during the development of the Project, to determine the extent and nature of any environmental issues relating specifically to these works. The Initial Environmental Review did not identify any significant environmental issues or concerns associated with facilities proposed as part of the Australian Super Hornet Facilities Project. The environmental issues that were identified by the Initial Environment Review process will be addressed by the project. This project will be managed in accordance within the Defence Environmental Management framework, including compliance with the relevant provisions of the RAAF Base Amberley Environmental Management System.

15. The Managing Contractor will be required to produce a Construction Environmental Management Plan. The Contractor's environmental procedures for construction activities will be adhered to as a contractual obligation, and compliance with the approved plan will be periodically audited throughout the project. Environmental Clearance Certificates will be issued locally though the Regional Environmental Officer prior to any construction activities on site.

## **HERITAGE CONSIDERATIONS**

16. RAAF Base Amberley is included on the Commonwealth Heritage List. While heritage listed facilities exist at RAAF Base Amberley, none of the identified heritage assets require modification or removal as part of this project.

## **STAKEHOLDER CONSULTATION**

17. The following persons or organisations have been consulted in relation to the Australian Super Hornet Facilities Project to date:

- a. Department of Environment, Water, Heritage and the Arts; and
- b. Department of Climate Change.

18. The following persons or organisations will be consulted in relation to the Australian Super Hornet Facilities Project:



- a. Australian Koala Foundation;
- b. Ipswich City Council;
- c. Federal Member for Blair; and
- d. Member for Ipswich West.

**REVENUE**

- 19. No revenue will be derived from this proposal

## PART B – TECHNICAL INFORMATION

### PROJECT LOCATION

20. All the proposed works are within RAAF Base Amberley which is located approximately 8 km west of the City of Ipswich, at the western edge of the Brisbane Metropolitan Area. The site of the proposed works is Commonwealth owned and Defence controlled. A location plan is at Attachment 1.

### PROJECT SCOPE

21. The proposed Australian Super Hornet Facilities Project includes 11 separate project elements. A site plan of the proposed works is at Attachment 2. Each project element is summarised below and detailed further in the proposed facilities layout plans at Attachments 3-12.

22. **Project Element 1 – New No 1 Squadron Facility.** No 1 Squadron is currently accommodated in Building 363 which consists of a hangar with two annexes of three stories attached on the western and eastern sides. The hangar facility is approximately 40 years old (circa 1968) and the annexes were added to the hangar approximately 7 years later (circa 1975). The facility does not have a Secure Area which is required to support No 82 Wing operations and does not meet current structural codes. Building services within the hangar, particularly for fire suppression and noise attenuation, do not meet current Australian or Defence Standards. It is not economically viable to re-use Building 363.

23. The new role of No 1 Squadron will be to provide effective F/A-18F Super Hornet strike and reconnaissance forces capable of all weather operations against land, sea and air targets. To support this requirement, the proposed new facility will consist of the following two elements:

- a. **Headquarters Facility.** A new headquarters facility is to be provided to allow the squadron to operate in a Top Secret and Secret environment including upgrades to the Information and Communications Technology systems.
- b. **Hangar Facility.** A new maintenance and flight line facility, attached to the Headquarters facility, consisting of a hangar floor for up to four F/A-18F aircraft, flight line, maintenance and logistic working accommodation, is to be provided to allow the squadron to maintain its aircraft. Foam suppression, or an alternative fire engineered solution, will be installed in the hangar area to protect the aircraft. The

hangar floor will be surfaced with an epoxy coating. Aircraft power and compressed air systems will be installed.

24. The long term retention of Building 363 in its current capacity imposes an occupational health and safety risk and will continue to impact on maintenance costs. Building 363 will be demolished under this project and the space is to be made available for other flight line facilities, discussed under Project Element 4.

25. **Project Element 2 – Modified and upgraded No 6 Squadron Facilities.** No 6 Squadron is currently accommodated in Building 373 which consists of a hangar with two annexes of two stories attached on the western and eastern sides. The hangar facility is approximately 30 years old (circa 1978) and the annexes were added to the hangar approximately 20 years later (circa 1998). Building services within the hangar generally meet current Australian or Defence Standards. A major upgrade to the hanger structure is required to meet current Australian Standards.

26. The new role of No 6 Squadron will be to train F/A-18F Super Hornet aircrew to a mission ready standard. To support this requirement, the following works are proposed:

- a. **Headquarters Facility.** Minor reconfiguration of the existing space to provide additional dedicated training rooms. The air conditioning system is to be upgraded.
- b. **Hangar Facility.** The existing hangar facility, consisting of a hangar floor for up to four F/A-18F aircraft, flight line, maintenance and logistic working accommodation is to be suitably configured to allow the squadron to maintain its aircraft. The hangar floor is to be resurfaced with an epoxy coating and is to be provided with upgraded aircraft power and compressed air systems. An additional Briefing room and one office will be provided.

27. **Project Element 3 – Expanded Common Use Operational Level Maintenance Facilities.** Currently, No 6 Squadron is responsible for a number of common use maintenance functions across No 82 Wing. The facilities which support these functions include:

- a. Ground Support Equipment annex, attached to Building 373;
- b. Stand Off Weapons building;
- c. Electronic Warfare Self Protection building;
- d. Alternate Mission Equipment Maintenance Section building; and

- e. Engine Run Up and Testing facilities.

28. Additional facilities are required to support ejection seat and gunnery maintenance and storage requirements, including a Copper - Beryllium decontamination room. This requirement will be met by extending the Alternate Mission Equipment Maintenance Section facility. A new compass calibration pad is to be surveyed and line markings are to be provided. Additional facilities required for Ground Support Equipment storage and at the Engine Run Up and Testing facilities are discussed under Project Elements 4 and 8 respectively.

29. **Project Element 4 – New Ground Support Equipment Shelter and External Fuel Tank Storage.** Ground Support Equipment is currently being held in the end parking bay in each of the aircraft shelters under make shift arrangements, reducing the number of shelters available for aircraft parking. The existing F-111 external fuel tanks have two dedicated storage shelters located in the vicinity of the site for the proposed new No 1 Squadron facility. The aircraft shelters will be required to accommodate the new aircraft and therefore the Ground Support Equipment requires alternate shelters. The new aircraft will have more external fuel tanks than currently used by the F-111.

30. Additional dedicated storage space for Ground Support Equipment and the external fuel tanks will be constructed in the area currently occupied by Building 363, which will be demolished under Project Element 1.

31. **Project Element 5 - New and Reconfigured Training Facilities.** Currently, both aircrew simulator and maintenance training is conducted in Building 361. The original building is approximately 30 years old (circa 1977). A major extension to this building was undertaken as part of the RAAF Base Amberley Redevelopment Stage 1 Project circa 2000 to house common use Base training classrooms. There is asbestos in the older part of the building. There is limited space to introduce a second simulator under the current arrangements and use of the building without affecting F-111 training which will continue up to late 2010.

32. The transition to a new aircraft type will not change the role of No 278 Squadron, which currently provides aircrew and technical training in support of Air Combat Group operations. However, there will be a period of overlap while training on the current aircraft continues until the withdrawal of the F-111. Due primarily to the overlap in transitioning, this building will be

programmed for modifications to support the trade training requirements but new facilities are required for the aircrew training. To support this requirement, the following facilities are proposed:

- a. **Aircrew Training Simulator Facility.** A new facility is to be provided for Tactical Operational Flight Trainers in Top Secret rated simulator rooms with a computer based training room, briefing rooms and simulator maintenance. The maintenance requirements consist of electrical and mechanical workshops, offices, a software/modelling room, heavy equipment store, document library/store and flammable liquid store.
- b. **Trade Training Facility.** The existing training facility is to be suitably reconfigured to allow for training using Integrated Visual Environment Maintenance Trainer systems, computer based training and aircraft practical training.

33. **Project Element 6 – Modified Aircraft Shelters.** Three aircraft shelters, Assets 623, 624 and 396, are located on the F-111 Apron. Assets 623 and 624 were built approximately 32 years ago (circa 1975). The requirement is to modify Assets 623 and 624 to meet statutory requirements including upgrades to the fire detection and environmental systems. Other than an upgrade to the fire detection system, no works are proposed for Asset 396. Aircraft parked in this shelter will be supported by use of mobile Ground Support Equipment.

34. **Project Element 7 – Modified Headquarters No 82 Wing Facilities.** No 82 Wing is currently accommodated in Building 838. The facility is approximately 7 years old (circa 2000), built under the RAAF Base Amberley Redevelopment Stage 1 Project. There is a Top Secret planning room and a Secret conference/briefing room for up to 20 personnel located within the building, however there is no capability to undertake secure video conferencing.

35. The transition from F-111 to the F/A-18F Super Hornets will not change the current role of No 82 Wing, namely to prepare for and conduct effective air strike, reconnaissance and close air support operations. However, there will be an increase in manning levels. To support this requirement, it is proposed to provide additional office accommodation for approximately ten staff and the provision of a video conferencing capability.

36. The Operational Maintenance Stores Warehouse is currently located in Building 357. The requirement is to reconfigure Building 357 to provide additional office spaces, open plan office accommodation, a secure (lockable) storage area, a large compactus, and general storage space.

37. **Project Element 8 – Upgraded Engine Run Up and Testing Facilities.** Located on the eastern side of the main runway, this element of the existing engine test facilities consists of two bays and four associated buildings/facilities. The bays are surrounded by an earth bund that has been covered with reinforced concrete, with precast tilt up concrete panels mounted on the top to satisfy blast/noise attenuation requirements. These were provided under the RAAF Base Amberley Redevelopment Stage 1 Project (circa 2000). Engine Test Cell 2 has a cradle arrangement under shelter to conduct uninstalled engine tests (i.e. off the aircraft), whilst the other bay, Engine Test Cell 3, is used to conduct installed engine tests (i.e. mounted in the aircraft). Test Cell 2 will not be required for F/A-18F Super Hornet aircraft.

38. The requirement is to provide the necessary modifications to the Engine Test Cell 3 to suit the future No 82 Wing aircraft dimensions and noise attenuation requirements, including the F/A-18F Super Hornet and its F414-GE-400 engine.

39. **Project Element 9 – Upgraded Aircraft Wash Facility.** Whilst an aircraft wash facility exists and is adjacent to Building 363, the facility has environmental and functional shortcomings. The requirement is build a new facility on the existing site which meets the relevant environmental standards. This will include measures to minimise potable water consumption.

40. **Project Element 10 – New and Refurbished Intermediate Level Maintenance Facilities.** The majority of the F-111 Intermediate Level Maintenance is conducted by contractors at RAAF Base Amberley. The current role of these support contractors is to provide effective Intermediate Level Maintenance to support the conduct of F-111 strike and reconnaissance operations. Excepting the change in aircraft type, and the possibility of an associated change of contractor, this role will remain unchanged with the transition from F-111 to F/A-18F Super Hornet aircraft.

41. It is intended that most of the functions that are required to support No 82 Wing will be provided from existing facilities with some modifications where outlined below:

- a. **Non-destructive Inspection Shop and Composite Repair Shop – Building 834.** These facilities are currently operated by Boeing. Minor internal services modifications for the provision of special power supply are required for these facilities.

- b. **Fuel Systems Repair Facility – Building 289.** In order to support the F/A-18F Super Hornet, this facility requires minor modification to accommodate the new 480 gallon external fuel tank test system and upgrade for Air Refuelling Store service and repair.

42. In addition to the minor modifications outlined above, it is proposed to provide a new purpose built workshop with hydraulic/pneumatic, tyre and wheel, avionics and aviation life support Intermediate Level Maintenance functions for use by Australian Defence Force, Australian Public Service or contractor staff. This proposal will enable the required facility to be delivered without impacting on the current maintenance operations required for the F-111. This proposal allows a number of maintenance functions to be located in the vicinity of the operational squadrons, improving work flow and reducing travel times and distances for aircraft components requiring maintenance.

43. **Project Element 11 – Upgrades to associated Site Works and Engineering Services.** This project element supports all the other project elements with the necessary engineering services including communications, sewer, water and electricity supply. The proposed services provide new and upgraded connections to the trunk engineering services provided under RAAF Base Amberley Redevelopment Stage 2 and 3 projects.

#### **SITE SELECTION**

44. The selection of sites for each project element has been undertaken in accordance with Defence Estate Planning policy requirements. A Technical Site Selection Board was conducted and addressed Australian Defence Force policy, environment, heritage and operational considerations.

45. The selected siting locations for all project elements are consistent with the RAAF Base Amberley Zone and Precinct Plan.

#### **SITE DESCRIPTION**

46. All works are located within the boundaries of RAAF Base Amberley. This property is Commonwealth owned and Defence controlled land. The locations for the majority of project elements are in or around the existing No 82 Wing controlled facilities.

## **ZONING AND APPROVALS**

47. All works referred to in this evidence are, or would be constructed within the designated boundaries of RAAF Base Amberley. The land is designated “Defence Special Purposes”. No civilian authority design or construction approvals are required, although the works will comply with the relevant Standards and Regulations as applicable.

## **LAND ACQUISITION**

48. This proposal does not require the acquisition of additional land.

## **APPLICABLE CODES AND STANDARDS**

49. Where appropriate, the design and construction of the proposed works and services will conform to the relevant sections of the applicable Building Codes and Standards including:

- a. Building Code of Australia;
- b. current Australian Standards and Codes;
- c. Commonwealth and State legislation;
- d. Defence Manual of Fire Protection Engineering;
- e. Defence Facilities Communications Cabling Standard;
- f. relevant Defence Security Publications; and
- g. occupational health, safety and welfare legislation and the Defence Occupational Health and Safety Manual.

50. An Accredited Building Surveyor will be required to certify that the design and finished construction of the proposed facilities meet the requirements of the Building Code of Australia, relevant Australian Standards and codes, the Defence Manual of Fire Protection Engineering and any additional State, Local Government and Defence requirements.

51. The Contractor will be required to produce a Project Quality Plan. This plan will clearly show how the building codes, Australian Standards and any additional Defence requirements in relation to security, fire protection and fire safety will be met and how the required standards for construction and installation are to be maintained.

## **PLANNING AND DESIGN CONCEPTS**

52. The proposed designs provide a safe, efficient and pleasant workplace, and represent value for money. The designs offer good economy in relation to floor area, construction techniques,



buildability and finishes, while achieving the necessary functional requirements, work flow patterns and work environment required to fulfil the function of the space.

53. The designers have considered, during the preliminary design stage, the implications and estimates of costs for designs, materials, construction techniques, finishes, equipment and energy systems which will deliver economy on a life cycle costing basis.

54. In selection of services and associated equipment, the capital cost has been balanced against forecast operational and maintenance costs. Operating costs comparisons have been undertaken during life cycle costing analysis in the design process prior to the selection of mechanical plant. Particular consideration has been given to energy efficient design solutions employing passive solar energy and water re-use initiatives.

55. The design, structure, servicing, and siting of buildings has been determined to ensure that future expansion is possible. This is of particular importance in sizing and terminating in-ground engineering services. New mechanical plants are modular to ensure flexibility.

56. Maximum flexibility has been incorporated for the new internal office accommodation facilities. Except where the need for security or noise reduction dictates otherwise, minimum use has been made of structural internal walls or columns. In general terms, internal walls in office areas are demountable partitions or workstation type to facilitate economic rearrangement. Building services are compatible with this requirement.

57. This project will:

- a. make maximum use of existing infrastructure to minimise capital facilities costs;
- b. adopt conventional construction techniques and materials, commonly used by the construction industry in regional Australia, with due regard given to climatic conditions; and
- c. utilise readily available and durable materials that combine long life with minimum maintenance and are sympathetic with the existing buildings, landscaping and precinct.

58. The building works and services will be fully fitted out, with all communications, light fittings, partitions, floor treatments and furniture. Facilities will incorporate building management systems, metering and other provisions to measure and monitor energy use and to allow regular

energy audits. Each new facility will be connected to the Regional Utility Management System for site wide utilities monitoring and management.

## **STRUCTURE**

59. Structural design will take into account the highly reactive soils and weather conditions encountered in the Amberley area. Proposed new facilities will generally be steel framed structures with concrete floor slabs, brick faces or equivalent external walls, and a metal roof appropriate to the environment. Internal walls would generally be non-load bearing frames lined with plasterboard to provide for maximum flexibility in future floor layout.

## **MATERIALS AND FINISHES**

60. Materials and finishes will be selected from those readily available locally for their functionality, durability, low maintenance and Ecologically Sustainable Development properties.

## **MECHANICAL SERVICES**

61. New facilities will generally be air-conditioned and the selection of building services and associated equipment would be required to achieve an economic balance between capital cost and operation and maintenance costs. Selection would be based upon a life cycle costing analysis and particular consideration would be given to energy efficient design solutions employing passive solar energy. New facilities would incorporate building management systems, metering and other provisions to measure and monitor energy use and to allow regular energy audits where practicable. Mechanical plant would incorporate a modular system to ensure flexibility.

## **HYDRAULIC SERVICES**

62. New facilities will be connected to the upgraded water and sewage infrastructure constructed as part of RAAF Base Amberley Redevelopment Stage 2 Project within RAAF Base Amberley.

## **ELECTRICAL SERVICES**

63. Lighting, power, lightning protection and fire detection will be provided in accordance with the relevant Australian Standards and any additional Defence requirements. Electrical infrastructure and switchboards will have modest spare capacity to allow for any future growth or demand. Fire detection systems, indication panels, emergency and exit lighting will be provided to suit the existing site systems.

## **CIVIL WORKS**

64. None of the proposed sites for new facilities present any particular civil engineering problem, but each will be the subject of further survey and geotechnical investigation during the design phase. The foundation design will take into account the highly reactive soils and weather conditions encountered in the Amberley area.

## **ACOUSTICS**

65. Airbases are particularly noisy environments, especially near the aircraft flight line. In these areas, building sound attenuation will be provided through construction techniques and materials and will generally be supplemented by personal aural protection when personnel are outside. Sound attenuation is particularly important in classrooms and working accommodation and the building façade design will meet the intent of Australian Standard 2021-2000 Acoustics – Australia Standard Noise Intrusion – Building Siting and Construction.

66. The steady noise level in an occupied room generated by all components of the air conditioning and ventilation plant shall not exceed the maximum levels recommended by Australian Standard 2107. Short term noise intrusion into occupied spaces from occasional but regular sources shall not exceed a noise level 5 dB below the maximum level recommended in Australian Standard 2107 for the particular area. Vibration isolation of mechanical plant and equipment will limit vibration levels in the building to comply with the recommended vibration levels as set out in Australian Standard 2670.2 and Australian Standard 2763 and any additional Defence requirements.

## **WATER AND ENERGY CONSERVATION MEASURES**

67. The Commonwealth is committed to Ecologically Sustainable Development (ESD) and the reduction of greenhouse gas emissions. Defence reports annually to Parliament on its energy management performance in accordance with the Energy Efficiency in Government Operations Policy and on its progress in meeting the energy efficiency targets established by the government as part of its commitment to improve ESD. Defence also implements policies and strategies in energy, water and waste to improve natural resource efficiency and to support its commitment in the reduction of energy consumption, potable water consumption and waste diversion to landfill. This project has addressed these requirements by adopting cost effective ESD, as a key objective in the design development and delivery of new facilities and major refurbishments.

68. The ESD targets and measures for the project have been balanced with other requirements for Defence buildings (e.g. security, heritage considerations, Occupation Health and Safety) to

ensure that, first and foremost, Defence's operational capability is not compromised.

69. The selection of major building and services systems such as Heating Ventilation Air-Conditioning systems will be based upon a life cycle costing analysis and particular consideration will be given to energy and water efficient design solutions.

70. All buildings included in this project will be designed, constructed, operated and maintained to ensure that they use energy efficiently. To achieve this, as a minimum, the buildings, as applicable to the classification of each building, will comply with:

- a. the Energy Efficiency in Government Operations policy;
- b. Part I2 and Section J of Volume One of the Building Code of Australia;
- c. Part 3.12 of Volume Two of the Building Code of Australia; and
- d. Defence Green Building Requirements Part 1.

71. All buildings will comply with the relevant energy efficiency provisions in the Building Code of Australia, except where there are energy efficiency requirements imposed by Defence that are of a higher standard. In this project, each new building is subject to the higher standards of the Defence Green Building Requirements Part 1 which requires a 20 per cent improvement on the Building Code of Australia minimum energy efficiency performance requirements. For this project, Green Star rating tool standard will be used as a framework to guide design.

72. Defence has adopted the principles of the Energy Efficiency in Government Operations policy in relation to office accommodation. For those office buildings that have a floor area of greater than 2000 m<sup>2</sup>, and that comprise less than 100 per cent of the total building area, the whole building will target 4.5 stars Australian Building Green Rating and separate digital on market status metering will be installed. An energy management plan will be developed for implementation by Defence. Where available, fit for purpose and cost-effective appliances will be United States Environmental Protection Agency 'Energy Star' compliant with power management features enabled at the time of supply.

73. For all other mixed-use buildings that have office floor area of less than 2000m<sup>2</sup>, separate digital on market status metering will be installed and office lighting will not exceed 10 W/m<sup>2</sup>. Where available, fit for purpose and cost-effective appliances will be United States Environmental Protection Agency 'Energy Star' compliant with power management features enabled at the time of supply.

74. Each new building will be modelled to determine the predicted energy consumption, and design targets will be determined for each building, depending on the building classification. Energy management is a key aspect in the design of the new facilities and the initiatives which will be included are:

- a. orientating the buildings to minimise east and west solar gain;
- b. installing a Building Management System in each building, linked to the site wide Regional Utilities Management System;
- c. in-building load control devices such as motion sensors where practical;
- d. natural ventilation and mixed mode systems wherever possible;
- e. installation of ceiling fans in selected areas to enhance comfort without the use of air conditioning;
- f. separate digital energy metering for tenanted areas and building services;
- g. energy efficient lighting (T5 fluorescent light fittings in office areas) supplemented by energy efficiency techniques such as occupancy sensing and after-hours automatic shut-off controls; and
- h. energy efficient appliances.

75. Efficient water use is a key aspect of the design. Key water saving measures will include:

- a. all tapware and fittings compliant with the Water Efficiency Labelling Standards scheme to provide a minimum of a 3 Star water conservation rating;
- b. pressure limiting valves to limit pressure at all appliances;
- c. provision for separate internal and external reticulation of cold water to all toilets and urinal flushing for future connection to non-potable water supply infrastructure;
- d. sub-metering of all major water supplies to each new building; and
- e. rainwater harvesting from the new construction roof areas complete with storage tanks and pressure pumping to supply localised landscaping, wash down areas and toilet flushing.

76. The Department of Climate Change has been consulted with respect to these energy efficiency requirements.

## **MASTER PLANNING & FUTURE DEVELOPMENT**

77. Each of the project elements will be constructed on sites consistent with the RAAF Base Amberley Zone and Precinct Plan dated March 2007.

## **PROVISIONS FOR PEOPLE WITH DISABILITIES**

78. Access and facilities for disabled personnel will be provided in accordance with the Defence Infrastructure Management requirements for Disabled Access and Other Facilities for Disabled Persons, the Building Code of Australia and relevant Australian Standards.

## **HERITAGE ISSUES**

79. This project does not impact upon the heritage values at RAAF Base Amberley.

## **CHILDCARE PROVISIONS**

80. This project will not significantly increase the base population or affect the requirement for childcare place. No additional childcare facilities are being provided under this project.

## **FIRE PROTECTION**

81. All construction and fire protection requirements will, as a minimum, be in accordance with the provisions of the Building Code of Australia, the Defence Manual of Fire Protection Engineering and all other applicable Codes and Standards.

## **SECURITY**

82. In accordance with Government initiatives to improve physical security arrangements across Government Departments, advice from designated security authorities will be incorporated in the design solutions for the proposed facilities as appropriate. The security threat assessment will be reviewed during the detailed design phase and the facilities would be secured as appropriate to the classification level required for activities conducted.

83. Security protection will be provided in accordance with the Defence Security Manual. This requires high levels of base physical security including full wire enclosures/compounds, remote sensor systems and security guards, including dogs. The physical security of aircraft and uninstalled sub-systems (software and hardware) also has significant facilities implications, including the requirements for armouries and secure storage and maintenance areas.

## **OCCUPATIONAL HEALTH AND SAFETY**

84. The proposed facilities will comply with the requirements of the Occupational Health and Safety Act 1991, the Department of Defence Occupational Health and Safety Manual and relevant Queensland Government Occupational Health and Safety legislation and operate in accordance with an approved Occupational Health and Safety Plan.

85. The Australian Government is committed to improving occupational health and safety outcomes in the building and construction industry. In accordance with Section 35(4) of the Building and Construction Industry Improvement Act 2005 (Cth), the Managing Contractor holds full OH&S accreditation from the Office of the Federal Safety Commissioner under the Australian Government Building and Construction Occupational Health and Safety Accreditation Scheme.

86. All construction sites will be appropriately secured to prevent public access during the construction period. No special or unusual public safety risks have been identified.

## **LANDSCAPING**

87. Landscaping works would be directed toward the restoration of areas disturbed during construction and general improvement of the built environment. Precautions would be taken to avoid compromising existing environmental sensitivities by adopting landscaping practices in keeping with local environmental conditions. Landscaping design will have regard to minimising potable water usage.

## **COMMUNITY IMPACT**

88. This proposal will employ skilled construction workers in the Brisbane area over the construction period. The project will generate a significant amount of short-term employment predominantly in the building, construction and unskilled labour markets. Significant numbers of personnel are expected to be directly employed on construction activities that would also generate some off-site job opportunities from the manufacture and distribution of materials over the construction period. Defence anticipates that local building sub-contractors would be employed on a large proportion of the construction works. This will provide a positive economic impact to small and medium enterprises in the region.

89. Construction traffic routes will be managed to minimise any disruption to the local communities during the construction period. Each of the sites is located well within the base boundaries and construction activities will not cause any disruption to residents adjacent to the base.

## **PROJECT COSTS**

90. The estimated out-turned cost of this project is \$117.1 million (excluding GST). This cost estimate includes the construction costs, management and design fees, furniture, fittings and equipment, contingencies and an escalation allowance.

91. A modest increase in net operating costs is expected due to the construction of the new facilities and the associated increases in facilities maintenance, cleaning and utilities expenses.

## **PROJECT DELIVERY SYSTEM**

92. The proposed delivery system is by a Managing Contractor Contract. This project delivery system has been selected on the basis of the scope, the risk of disruption of base activities, the value of the works and any interdependencies with other concurrent projects. A Project Manager has been engaged to represent Defence, co-ordinate the works and act as Contract Administrator.

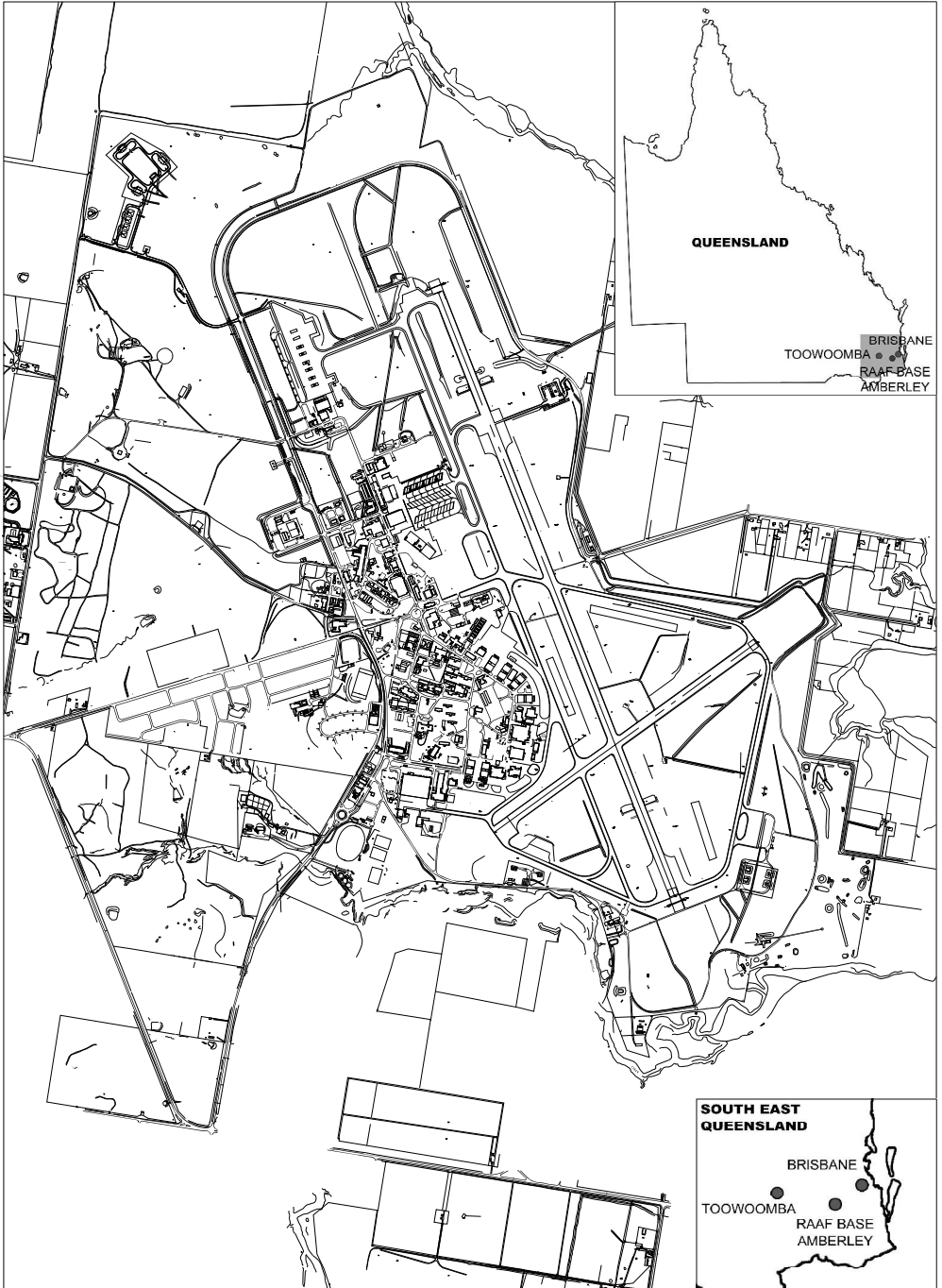
## **PROJECT SCHEDULE**

93. Subject to Parliamentary clearance of the project, construction of the first elements is expected to commence in early 2009. All major works are expected to be complete by late 2010.



## ATTACHMENTS

- Attachment 1: RAAF Base Amberley Location Plan
- Attachment 2: RAAF Base Amberley Site Plan
- Attachment 3: Project Element 1 – New No 1 Squadron Facility Site Plan
- Attachment 4: Project Element 1 – New No 1 Squadron Facility Ground Floor Plan
- Attachment 5: Project Element 1 – New No 1 Squadron Facility First Floor Plan
- Attachment 6: Project Element 2 – Modified and upgraded No 6 Squadron Facilities Site Plan
- Attachment 7: Project Element 2 – Modified and upgraded No 6 Squadron Facilities Ground Floor Plan
- Attachment 8: Project Element 2 – Modified and upgraded No 6 Squadron Facilities First Floor Plan
- Attachment 9: Project Element 3 – Expanded Common Use Operational Level Maintenance Facilities Site Plan
- Attachment 10: Project Element 3 – Expanded Common Use Operational Level Maintenance Facilities Floor Plan
- Attachment 11: Project Element 5 - New Simulator Facility Site Plan
- Attachment 12: Project Element 5 - New Simulator Facility Floor Plan
- Attachment 13: Project Element 5 - Reconfigured Trade Training Facilities Site Plan
- Attachment 14: Project Element 5 - Reconfigured Trade Training Facilities Floor Plan
- Attachment 15: Project Element 6 – Modified Aircraft Shelters Site Plan
- Attachment 16: Project Element 7 – Modified Headquarters No 82 Wing Facilities Site Plan
- Attachment 17: Project Element 7 – Modified Headquarters No 82 Wing Facilities Floor Plan
- Attachment 18: Project Element 7 – Operational Maintenance Stores Warehouse Site Plan
- Attachment 19: Project Element 7 – Operation Maintenance Stores Warehouse Floor Plan
- Attachment 20: Project Element 10 – New and Refurbished Intermediate Level Maintenance Facilities Site Plan
- Attachment 21: Project Element 10 – New Intermediate Level Maintenance Facilities Floor Plan



QUEENSLAND

BRISBANE  
TOOWOOMBA  
RAAF-BASE  
AMBERLEY

SOUTH EAST  
QUEENSLAND

BRISBANE  
TOOWOOMBA  
RAAF BASE  
AMBERLEY

RAAF BASE AMBERLEY  
LOCATION PLAN

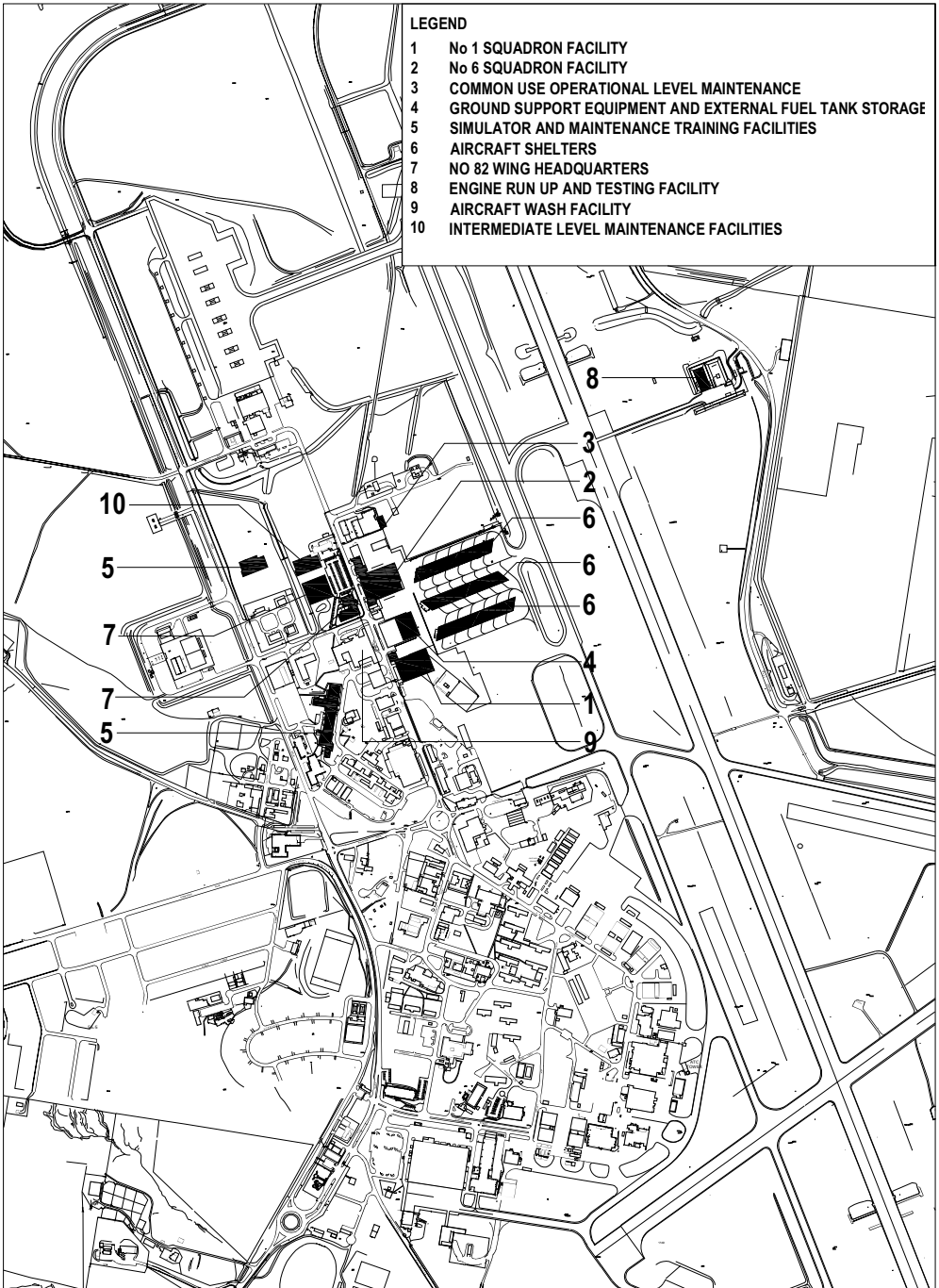


CONRAD  
GARGETT  
ARCHITECTURE



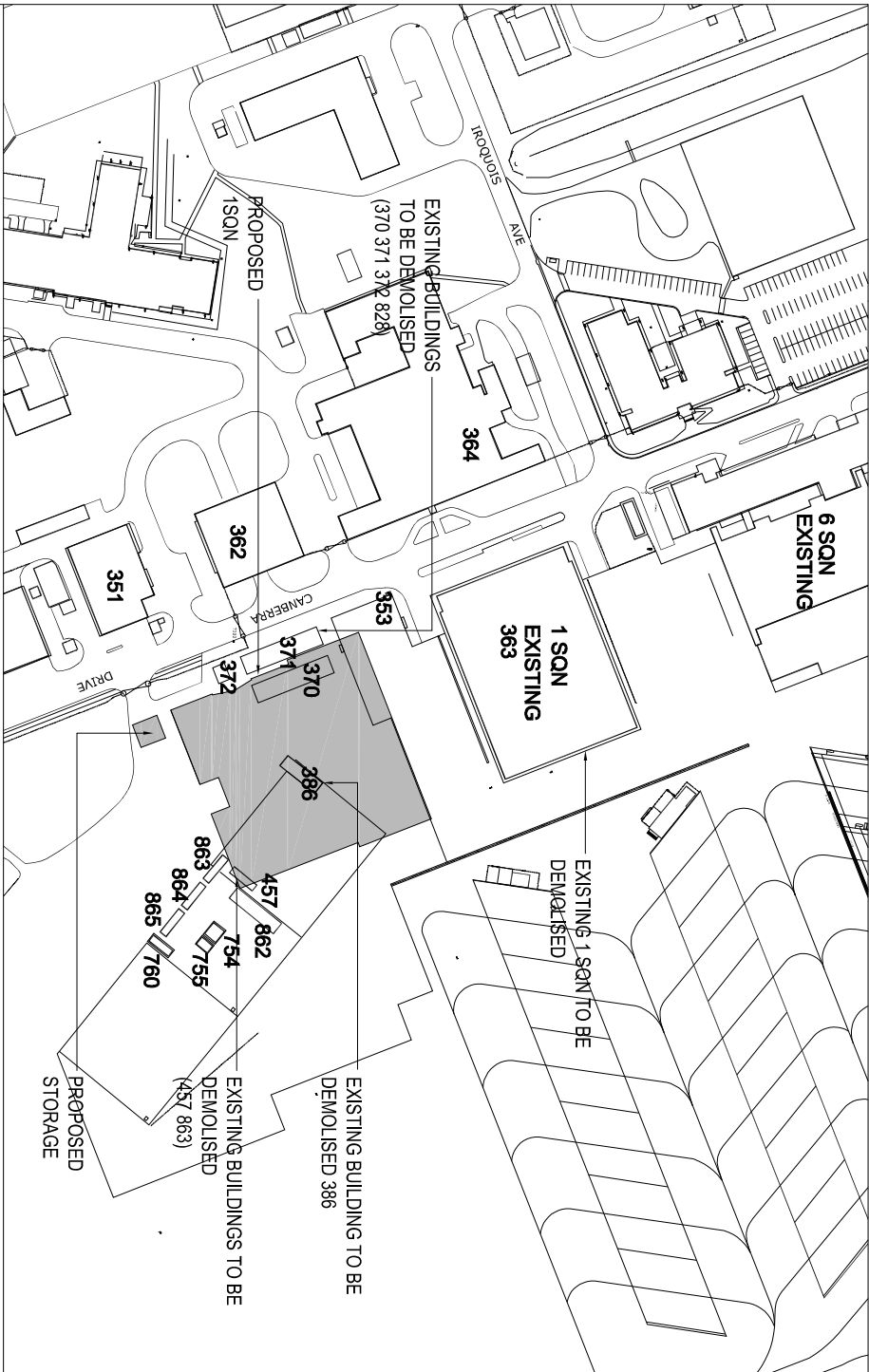
**LEGEND**

- 1 No 1 SQUADRON FACILITY
- 2 No 6 SQUADRON FACILITY
- 3 COMMON USE OPERATIONAL LEVEL MAINTENANCE
- 4 GROUND SUPPORT EQUIPMENT AND EXTERNAL FUEL TANK STORAGE
- 5 SIMULATOR AND MAINTENANCE TRAINING FACILITIES
- 6 AIRCRAFT SHELTERS
- 7 NO 82 WING HEADQUARTERS
- 8 ENGINE RUN UP AND TESTING FACILITY
- 9 AIRCRAFT WASH FACILITY
- 10 INTERMEDIATE LEVEL MAINTENANCE FACILITIES

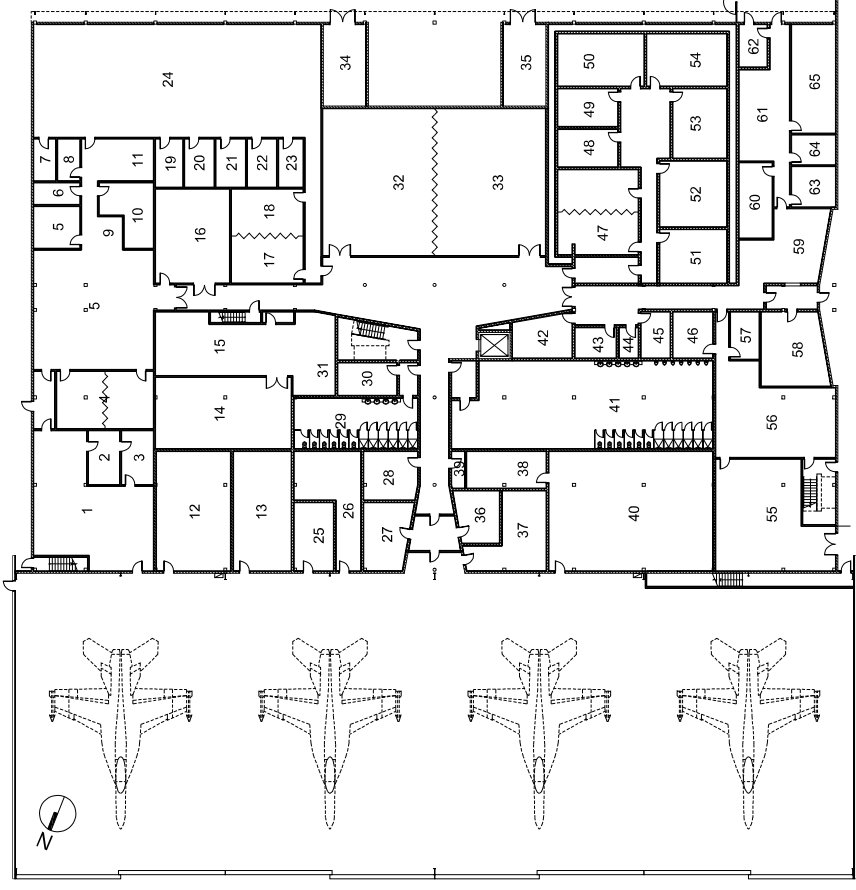




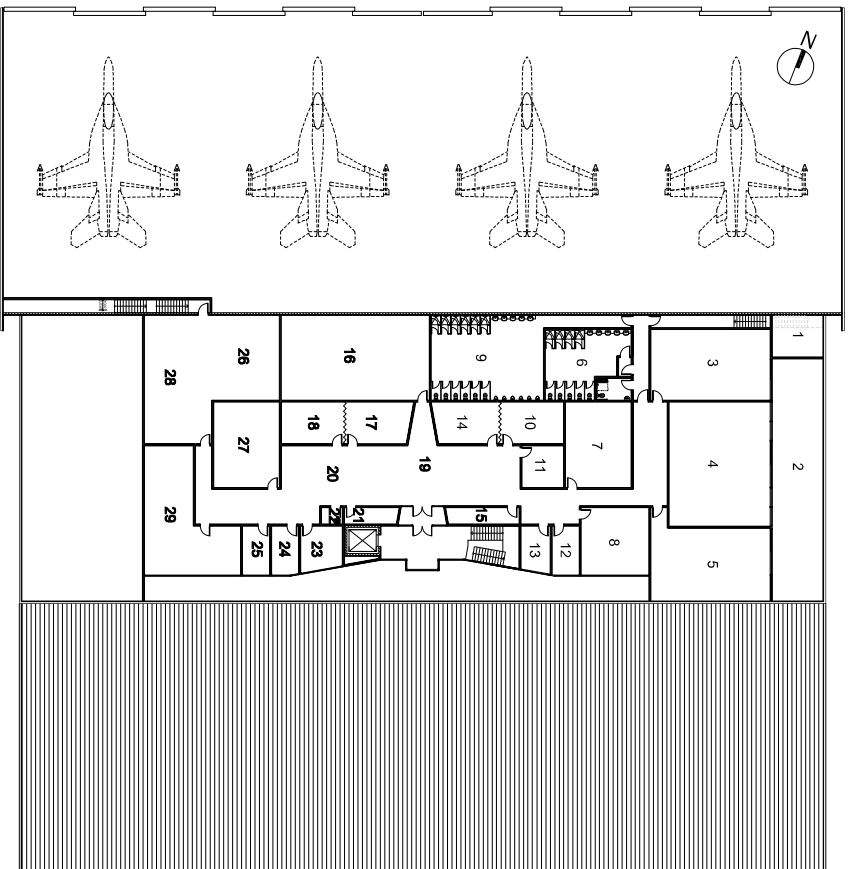
**PROJECT ELEMENT 1  
NEW NO. 1 SQUADRON FACILITY SITE PLAN**



NO	ROOM NAME	LEGEND	
1	GUNNERY	36	PLANT ROOM
2	SNCO ARM	38	400 HZ CONV
3	SNCO ARM	37	EQUIP RETURN
4	AKCREW MAINT DEBRIEF	38	STRUCTURES STORE
5	FLIGHTLINE DESK W/COORD	39	SEALANTS STORE
6	W/OE	40	STRUCTURES WORKSHOP
7	RESOURCE ROOM	41	ABLUTIONS MALE
8	SYSTECH	42	CO
9	QUALITY SAFETY	43	SENGO
10	MAINT COORD	44	ABLUTIONS PWD
11	AVIONICS	45	FIRST AID ROOM
12	PUBLICATIONS	46	LOGO
13	AIRCRAFT WORKSHOP	47	BRIEFING
14	TOOL STORE	48	READING
15	FABRIC WORKSHOP	49	TAPE DEBRIEF
16	LIFE SPT/ING/MAINT/STORE	50	JMPS/MISSION REHEARSAL
17	DOCUMENT STORE	51	PLANNING 3
18	BRIEFING ROOM 2	52	PLANNING 4
19	BRIEFING ROOM 1	53	HOT SWAP
20	SNCO AV	54	JMPS MISSION REHEARSAL
21	SNCO/AV	55	CONSUMABLE STORE
22	SNCO/ATECH	56	EQUIP SECTION STAFF
23	LAUNDRY	57	SNCO EQUIP
24	STORE	58	CONFERENCE ROOM
25	OXYGEN WORKSHOP	59	ORDERLY ROOM
26	CONSUMABLE AND RI	60	CLASSIFIED ARCHIVE ROOM
27	AVIONICS WORKSHOP	61	RESOURCE ROOM
28	BRIEFING ROOM	62	RECYCLING ROOM
29	ABLUTIONS FEMALE	63	ADMINS
30	COMMS	64	SNCO ADMIN
31	ADMIN	65	CREW ROOM
32	MAIN BRIEFING ROOM	66	FLAMMABLE GOODS STORE
33	CREW ROOM	67	HAZARDOUS WASTE STORE
34	PLANT ROOM		

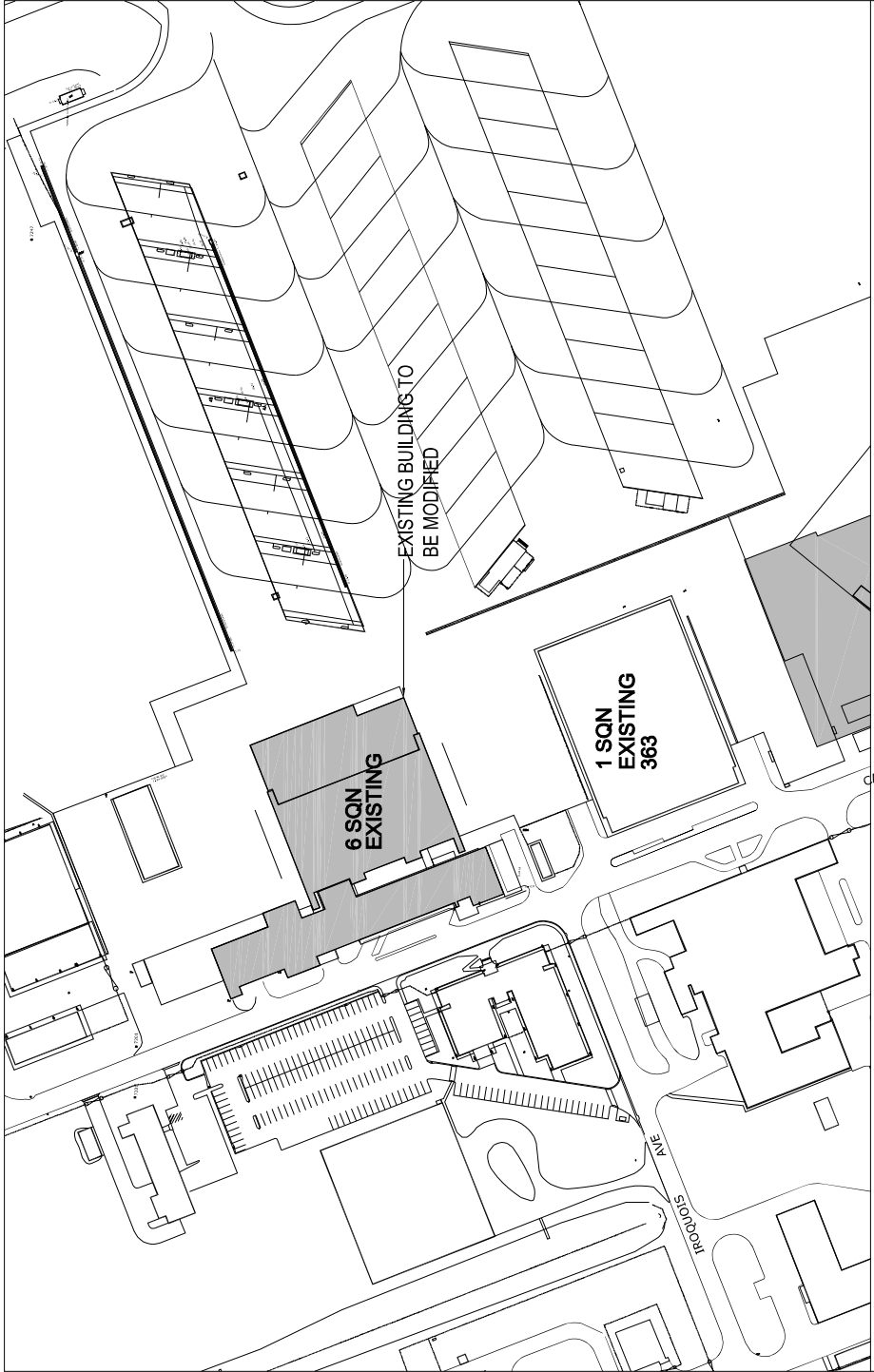


PROJECT ELEMENT 1  
NEW NO 1 SQUADRON FACILITY GROUND FLOOR PLAN



LEGEND	
NO.	ROOM NAME
1	PLANT
2	ROOF TERRACE
3	A FLT AIRCREW
4	ARCREW ROOM
5	B FLT AIRCREW
6	ABLUTONS FEMALE
7	PLANNING ROOM 1
8	JMPS
9	ABLUTONS MALE
10	FLT BRIEFING ROOM A1
11	OPS STORAGE
12	A FLT CDR
13	B FLT CDR
14	FLT BRIEFING ROOM B1
15	COMMS
16	ACMI/ VIDOON
17	FLT BRIEFING ROOM 2A
18	FLT BRIEFING ROOM 2B
19	OPS TASKING
20	OPS PROGRAMMING
21	OPS STORAGE
22	CLEANER
23	OX
24	FOI
25	INTELO
26	H.W.U
27	PLANNING ROOM 2
28	MECHANICAL PLANT
29	GLAS



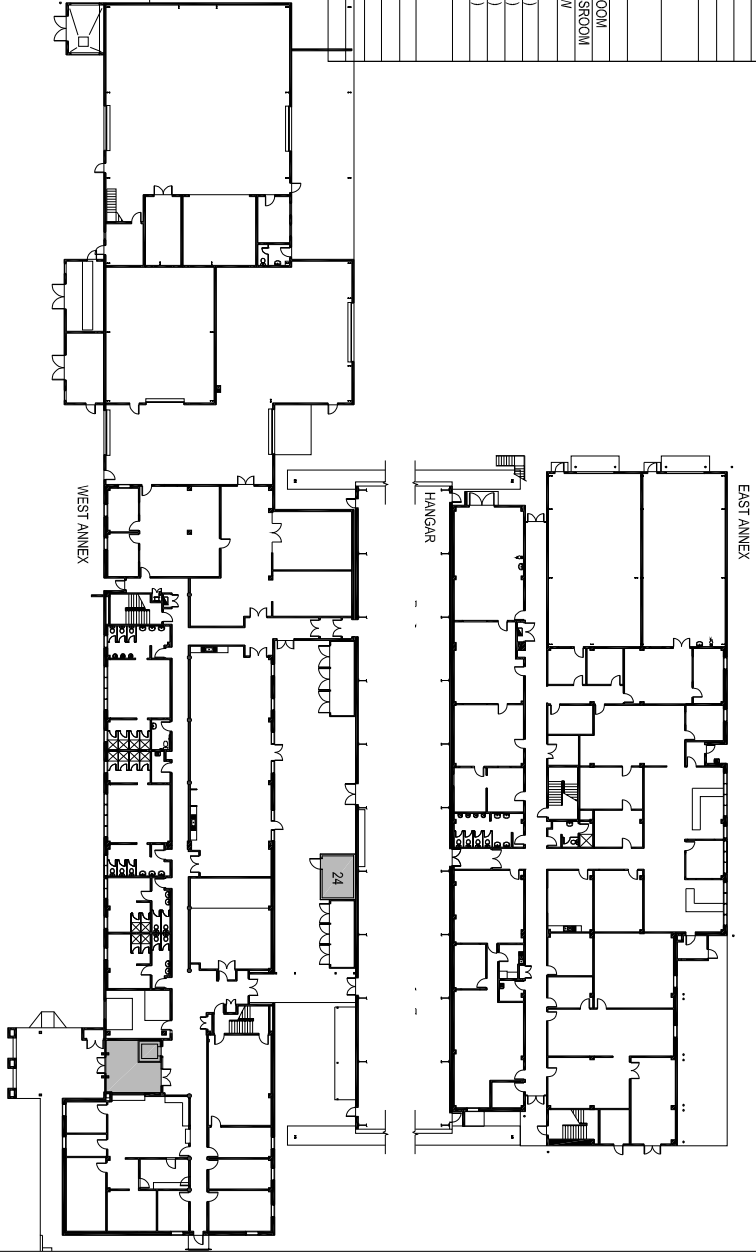


PROJECT ELEMENT 2  
 MODIFIED AND UPGRADED NO 6 SQUADRON FACILITIES SITE PLAN



**LEGEND**

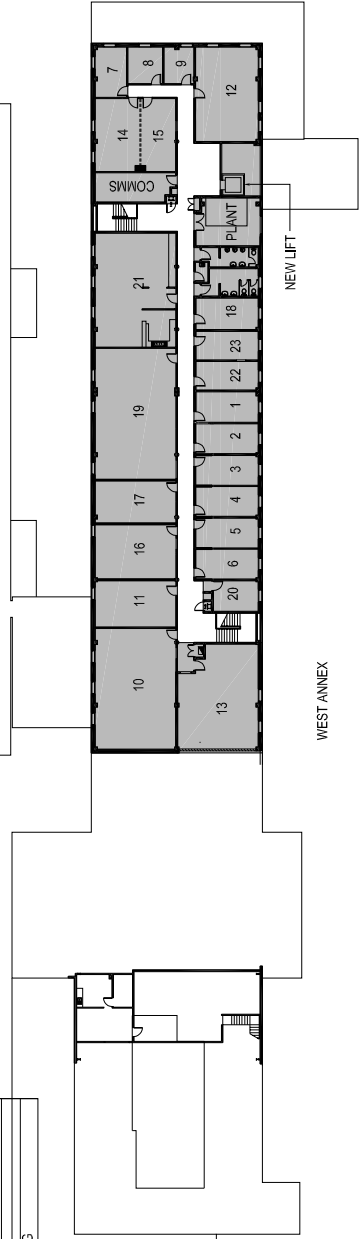
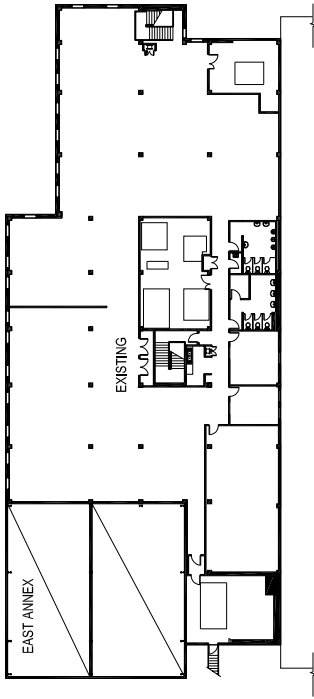
NOI	ROOM NAME
1	A FLT INSTRUCTOR 1
2	A FLT INSTRUCTOR 2
3	A FLT INSTRUCTOR 3
4	A FLT INSTRUCTOR 4
5	A FLT INSTRUCTOR 5
6	A FLT INSTRUCTOR 6
7	A FLT INSTRUCTOR 7
8	A FLT INSTRUCTOR 8
9	A FLT INSTRUCTOR 9
10	A FLT INSTRUCTOR 10
11	A FLT INSTRUCTOR 11
12	A FLT INSTRUCTOR 12
13	A FLT INSTRUCTOR 13
14	A FLT INSTRUCTOR 14
15	A FLT INSTRUCTOR 15
16	A FLT INSTRUCTOR 16
17	A FLT INSTRUCTOR 17
18	A FLT INSTRUCTOR 18
19	A FLT INSTRUCTOR 19
20	A FLT INSTRUCTOR 20
21	A FLT INSTRUCTOR 21
22	A FLT INSTRUCTOR 22
23	A FLT INSTRUCTOR 23
24	A FLT INSTRUCTOR 24



PROJECT ELEMENT 2  
 MODIFIED AND UPDATED NO 6 SQUADRON FACILITIES GROUND FLOOR PLAN



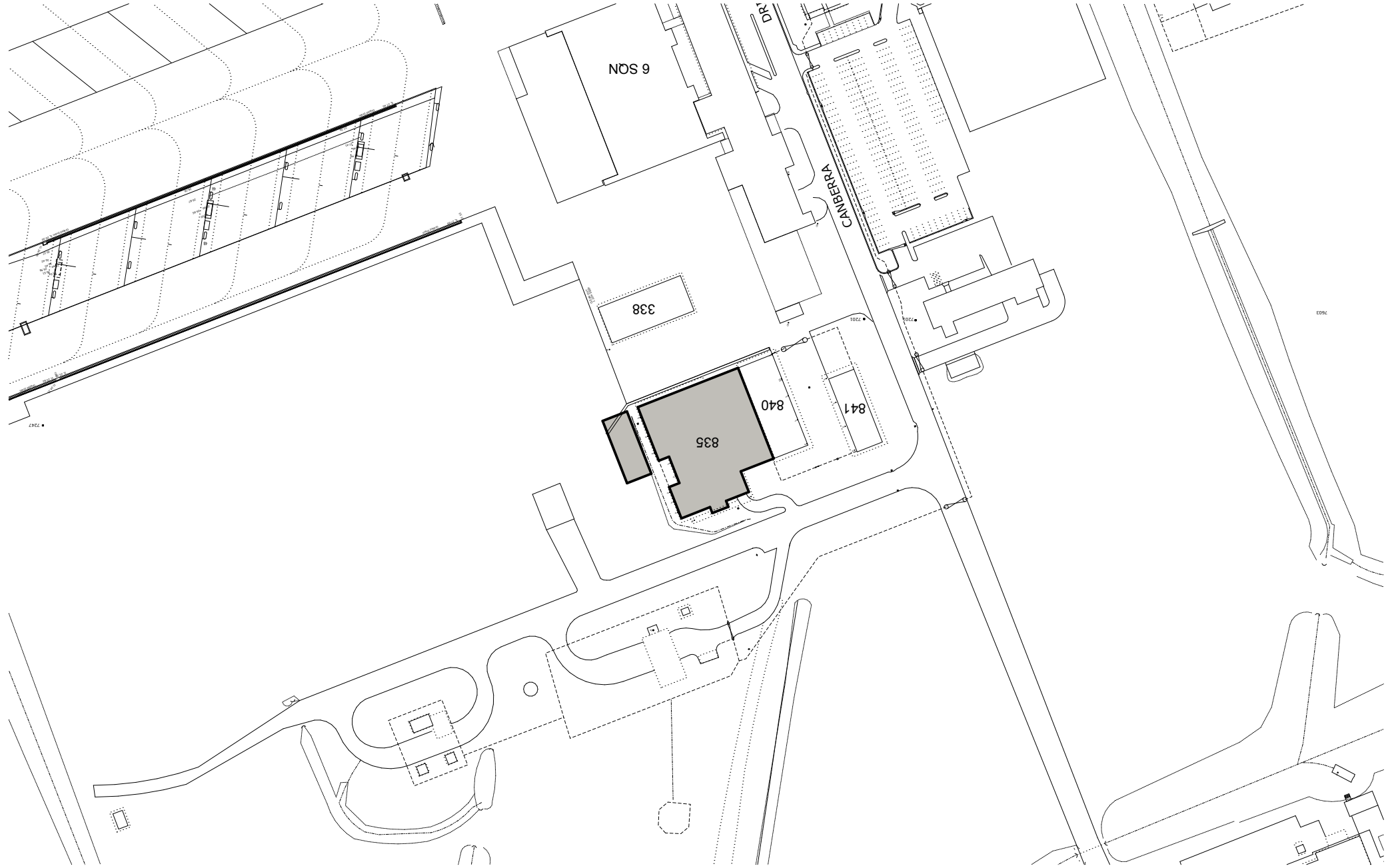
LEGEND	
NO	ROOM NAME
1	A FLT INSTRUCTOR 1
	A FLT INSTRUCTOR 2
2	A FLT INSTRUCTOR 3
	A FLT INSTRUCTOR 4
3	A FLT INSTRUCTOR 5
	A FLT INSTRUCTOR 6
4	A FLT INSTRUCTOR 7
	A FLT INSTRUCTOR 8
5	A FLT INSTRUCTOR 9
	B FLT INSTRUCTOR 1
6	B FLT INSTRUCTOR 2
	B FLT INSTRUCTOR 3
7	B FLT INSTRUCTOR 4
	B FLT INSTRUCTOR 5
8	B FLT INSTRUCTOR 6
	B FLT INSTRUCTOR 7
9	B FLT INSTRUCTOR 8
	B FLT INSTRUCTOR 9
10	A FLT STUDENT CLASSROOM
	A FLT REFRESHER CLASSROOM
11	A FLT REFRESHER CLASSROOM
	B FLT STUDENT AIRCREW
12	B FLT STUDENT AIRCREW
	PIT ROOM (1)
13	PIT ROOM (1)
	FLT BRIEFING ROOM 1 (1)
14	FLT BRIEFING ROOM 1 (1)
	FLT BRIEFING ROOM 2 (1)
15	FLT BRIEFING ROOM 2 (1)
	FLT BRIEFING ROOM 3 (1)
16	FLT BRIEFING ROOM 3 (1)
	FLT BRIEFING ROOM 4 (1)
17	FLT BRIEFING ROOM 4 (1)
	INTELO (1)
18	INTELO (1)
	GIA PLANNING (1)
19	GIA PLANNING (1)
	PLANNING
20	PLANNING
	FCL
21	FCL
	CREW ROOM
22	CREW ROOM
	A FLT CDR
23	A FLT CDR
	B FLT CDR
24	B FLT CDR
	RECYCLING
	RECYCLING

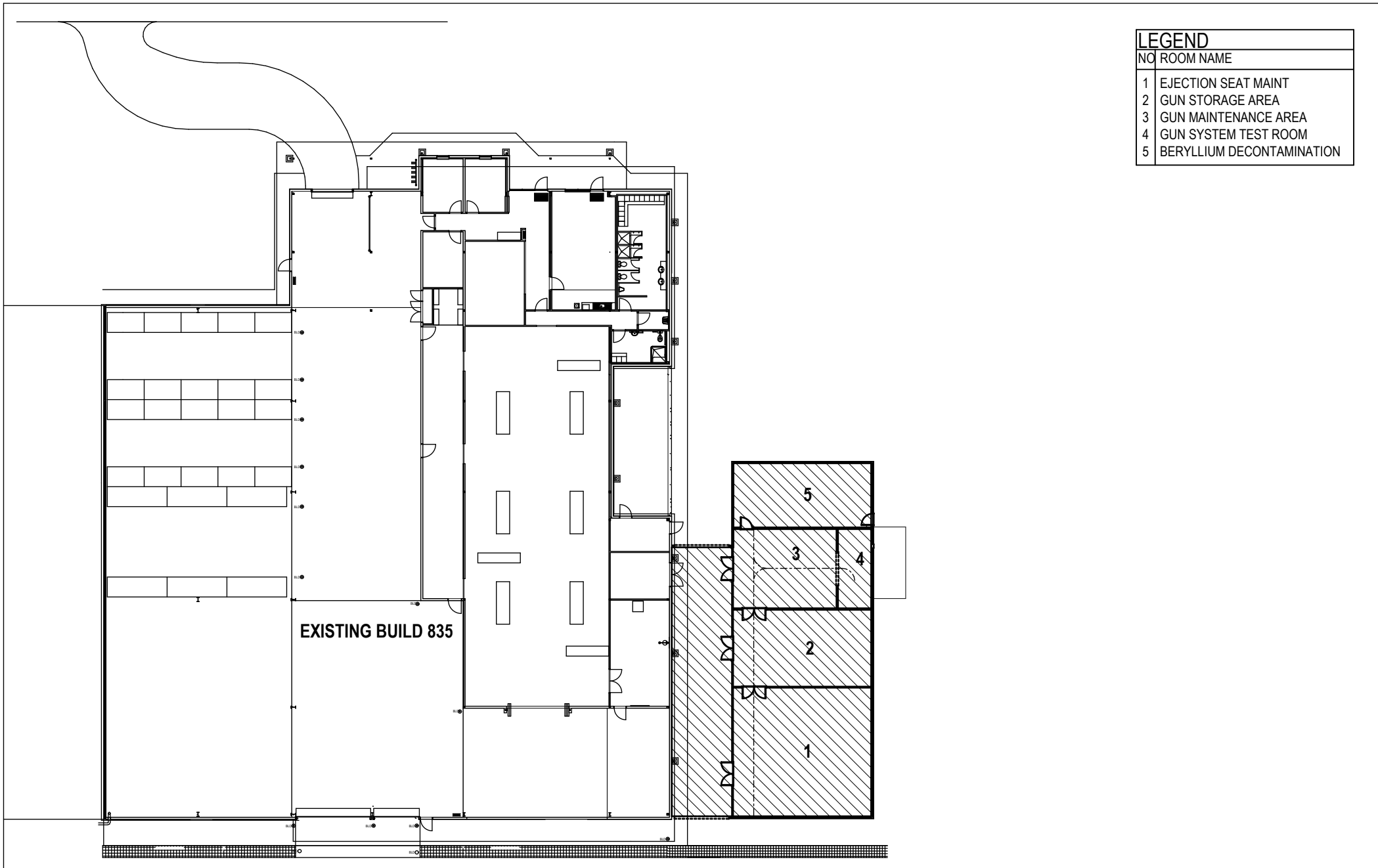


PROJECT ELEMENT 2  
 MODIFIED AND UPGRADED NO 6 SQUADRON FACILITIES FIRST FLOOR PLAN



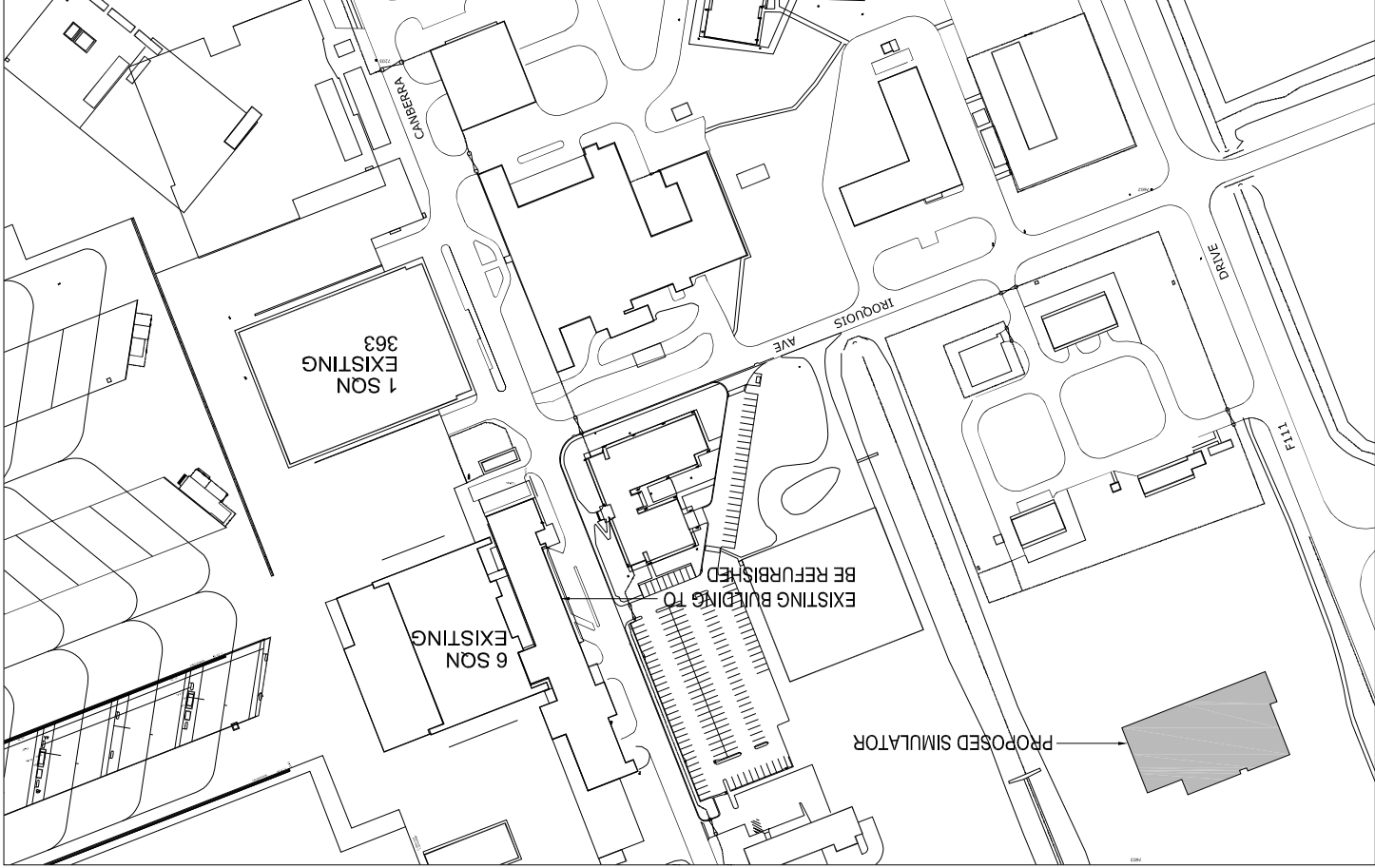
PROJECT ELEMENT 3 - EXPANDED COMMON USE OPERATIONAL  
LEVEL MAINTENANCE FACILITIES SITE PLAN





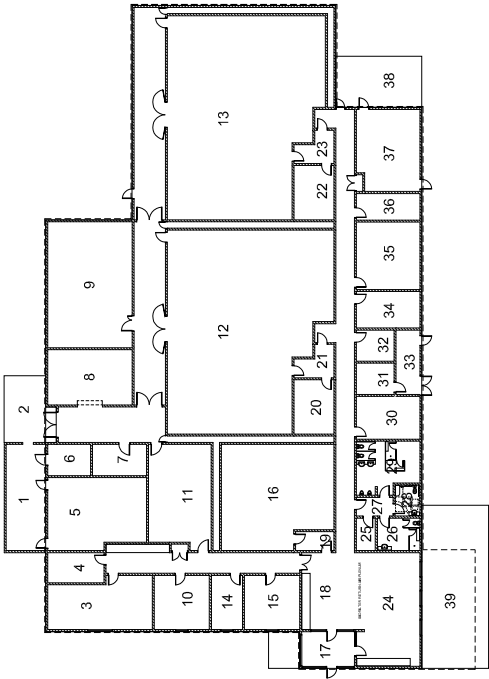


PROJECT ELEMENT 5  
NEW SIMULATOR FACILITY SITE PLAN





LEGEND	
NO	ROOM NAME
1	DECK PLANT
2	LOADING DOCK
3	CONTRACTOR AIRCREW INSTRUCTION
4	MAINTENANCE MANAGER
5	PLANT ROOM 2
6	RECYCLEABLE WASTE STORE
7	MECHANICAL WORKSHOP
8	HEAVY EQUIPMENT STORE
9	ACCOUNTABLE STORE
10	MAINTENANCE OFFICE
11	ELECTRICAL WORKSHOP
12	TOFT 1
13	TOFT 2
14	TRAINING CENTRE MANAGER
15	SOFTWARE AND MODELLING
16	AIRCREW CLASSROOM
17	AIR LOCK
18	ENTRY FOYER
19	ACOUSTIC LOCK
20	DEBRIEF ROOM 2
21	ACOUSTIC LOCK
22	DEBRIEF ROOM 2
23	ACOUSTIC LOCK
24	STAFF & STUDENT LUNCHROOM
25	CLEANER
26	FEMALE ABLUTIONS
27	AIR LOCK
28	PWD ABLUTIONS
29	MALE ABLUTIONS
30	RESOURCES ROOM
31	UPS
32	CONTRACTORS COMMS
33	SWITCH ROOM
34	DEFENCE COMMS (DRN)
35	DOCUMENT AND LIBRARY STORE
36	STORE
37	PLANT ROOM 1
38	PLANT DECK
39	OUTDOOR COVERED AREA



PROJECT ELEMENT 5  
NEW SIMULATOR FACILITY FLOOR PLAN

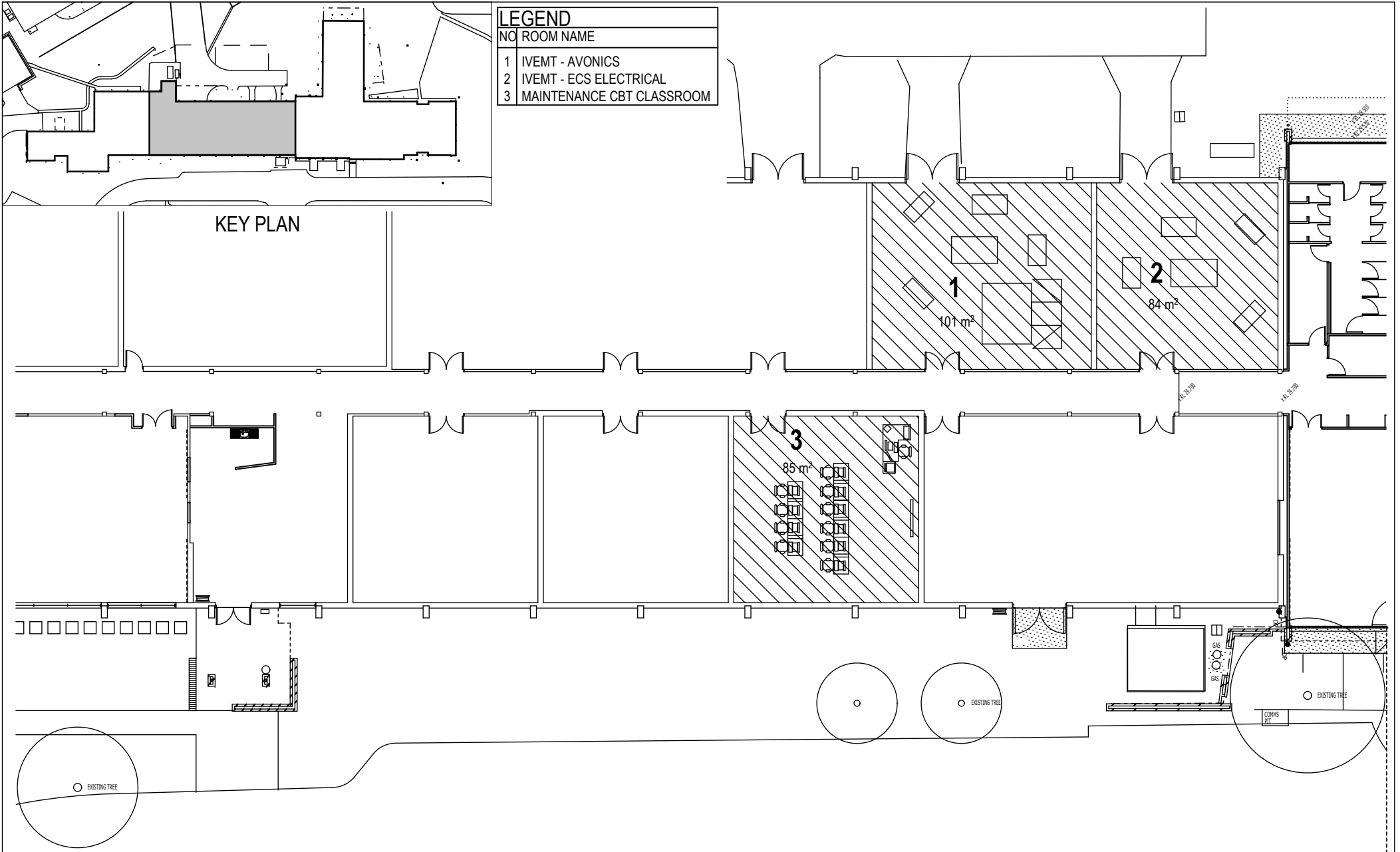


PROJECT ELEMENT 5 - RECONFIGURED  
TRADE TRAINING FACILITIES SITE PLAN

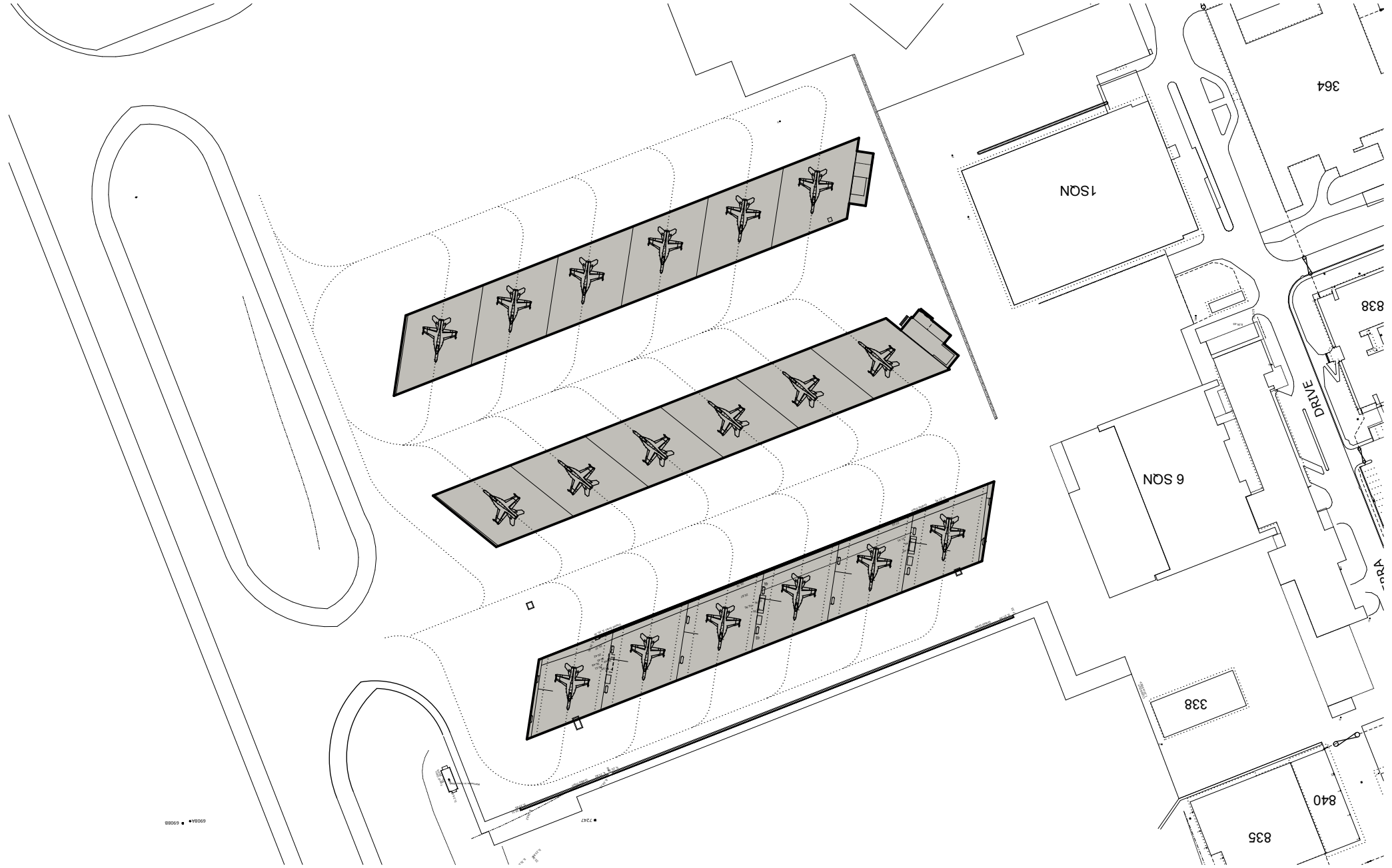


LEGEND	
NO	ROOM NAME
1	IVEMT - AVONICS
2	IVEMT - ECS ELECTRICAL
3	MAINTENANCE CBT CLASSROOM

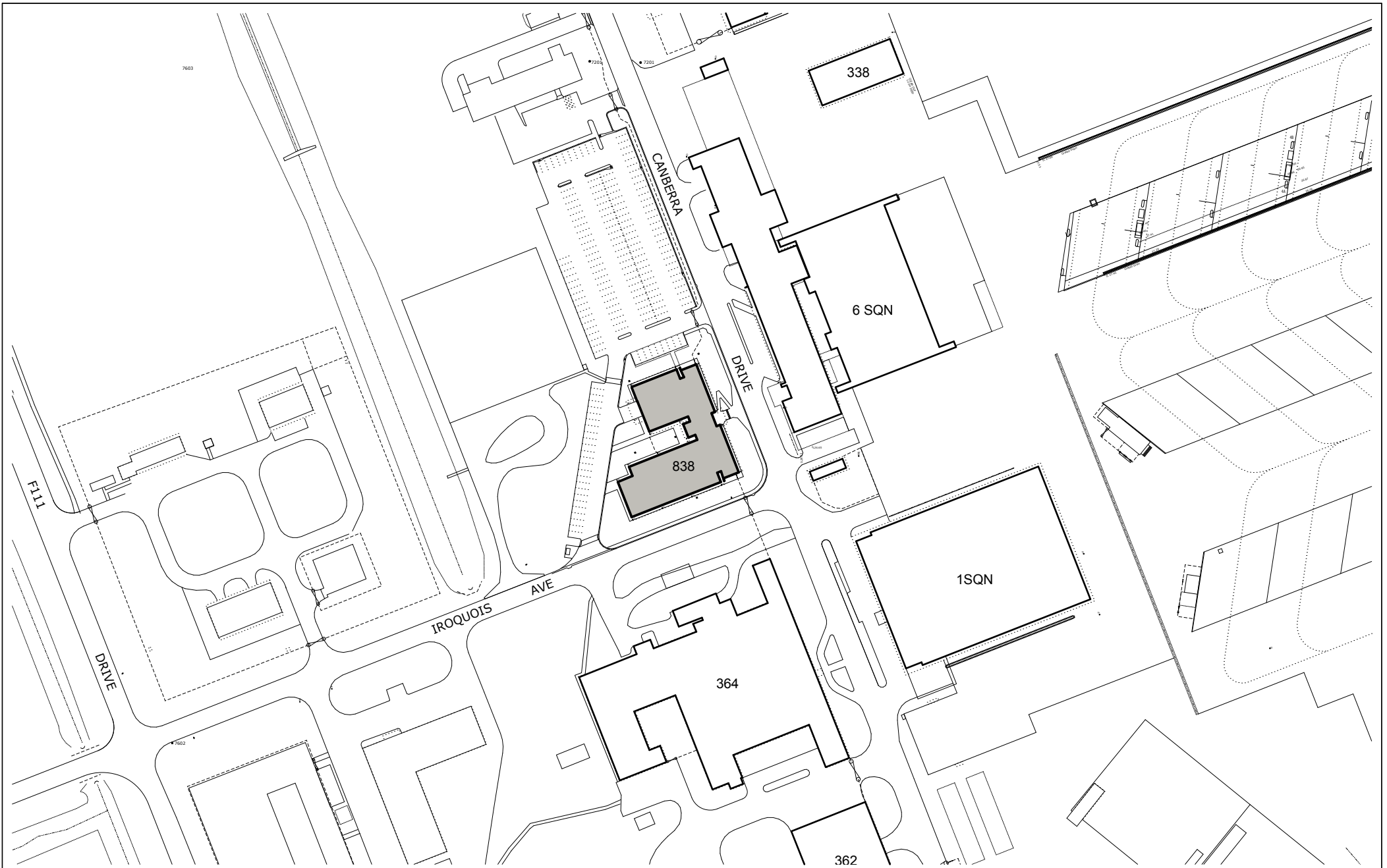
KEY PLAN



# PROJECT ELEMENT 6 - MODIFIED AIRCRAFT SHELTER SITE PLAN



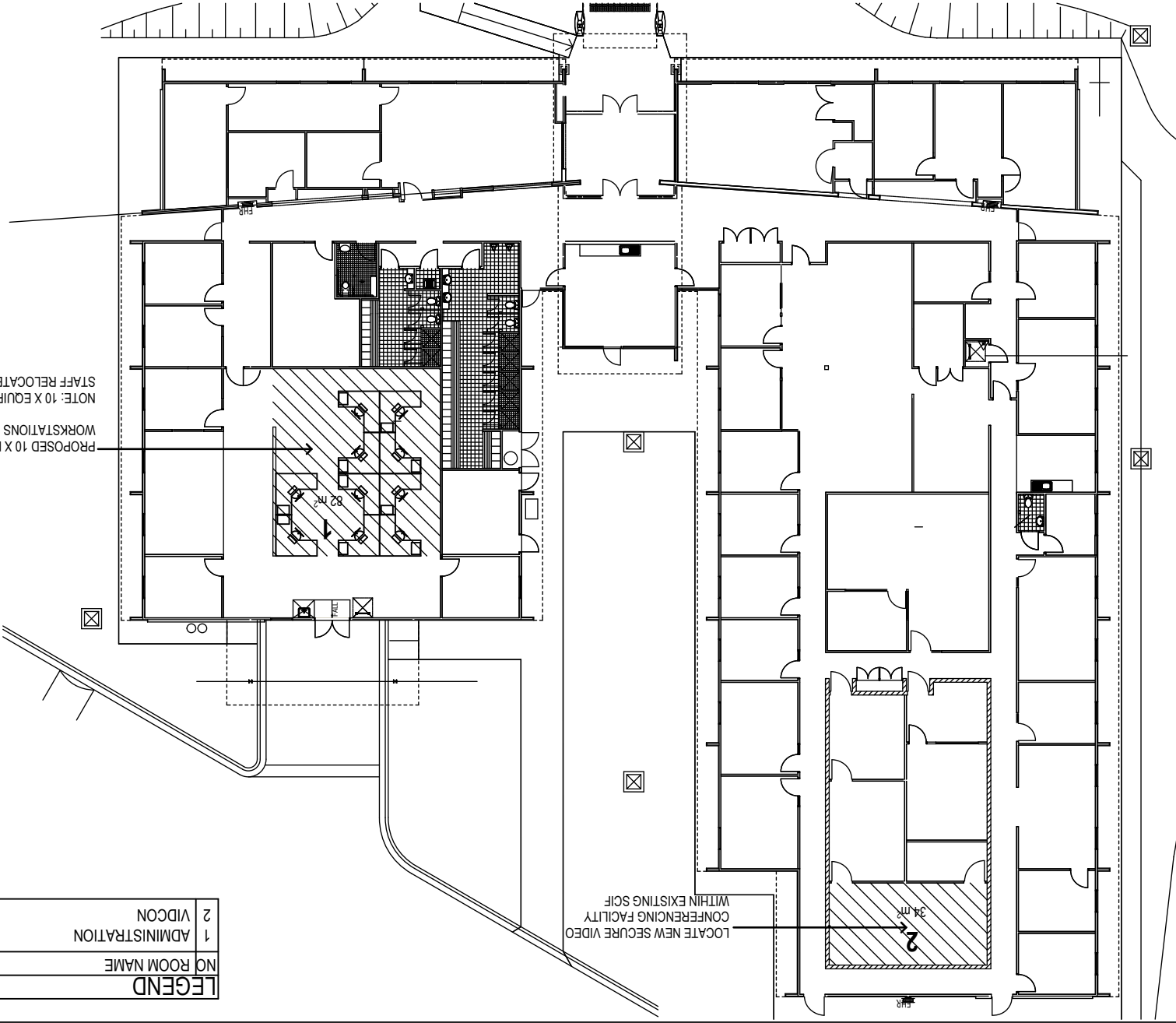




PROJECT ELEMENT 7 - MODIFIED HEADQUARTERS  
 No. 82 WING FACILITIES SITE PLAN



PROJECT ELEMENT 7 - MODIFIED HEADQUARTERS  
No. 82 WING FACILITIES FLOOR PLAN

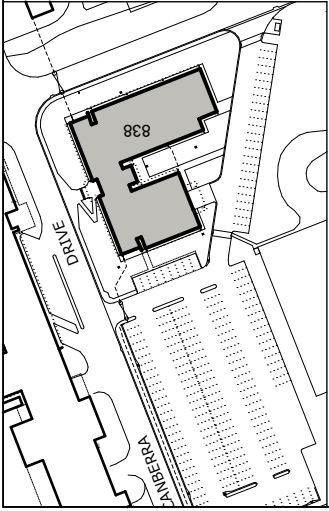


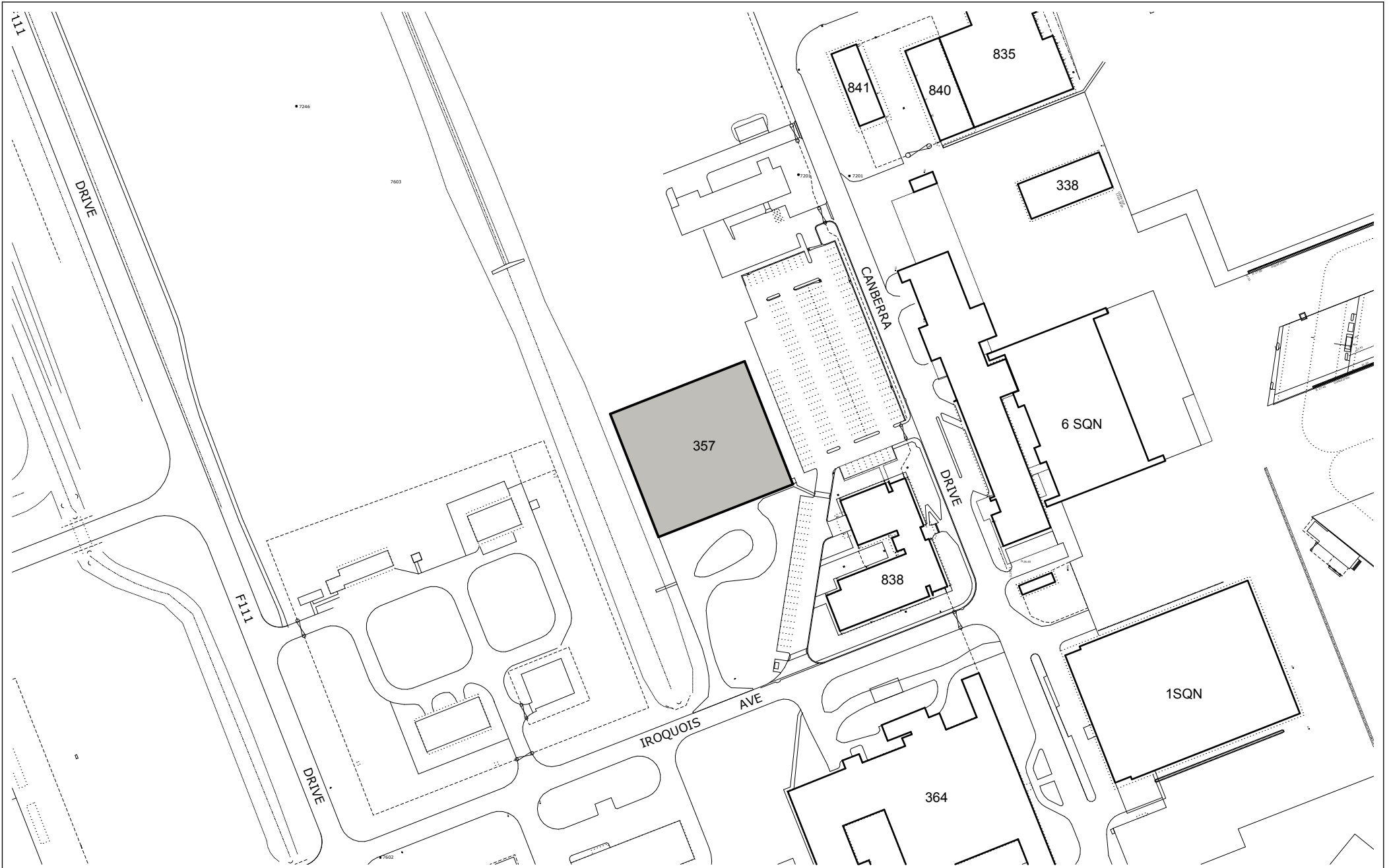
NOTE: 10 X EQUIPMENT MAINTENANCE  
STAFF RELOCATED TO OM STORE

PROPOSED 10 X NEW OPEN PLAN  
WORKSTATIONS

LOCATE NEW SECURE VIDEO  
CONFERENCE FACILITY  
WITHIN EXISTING SCIF

LEGEND	
NO ROOM NAME	
1 ADMINISTRATION	
2 VIDCON	



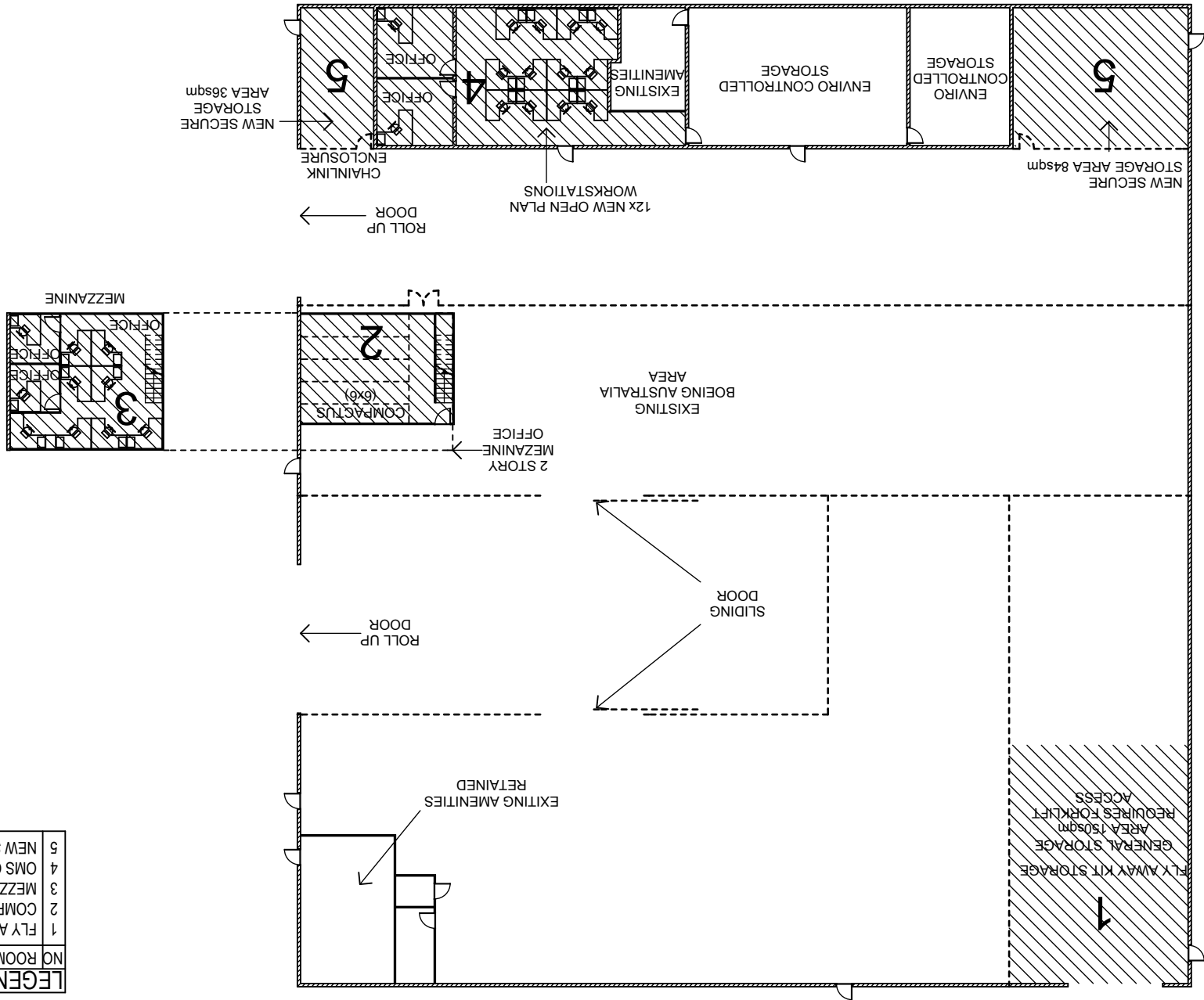




# PROJECT ELEMENT 7 - OPERATIONAL MAINTENANCE STORES WAREHOUSE FLOOR PLAN

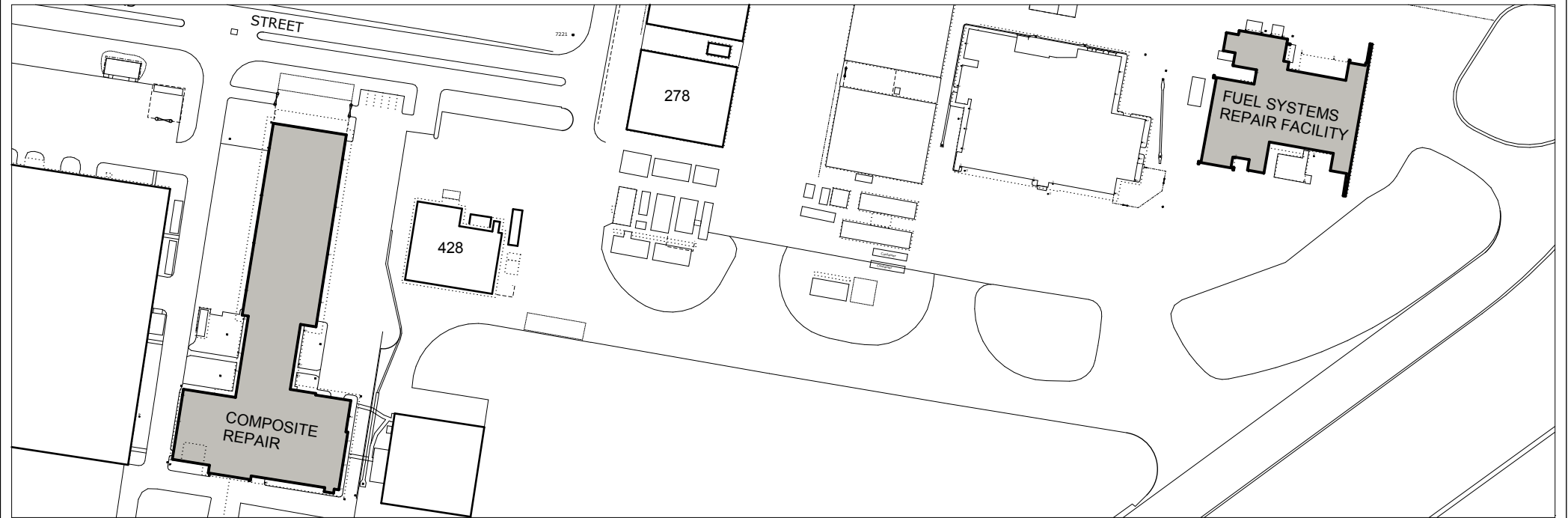
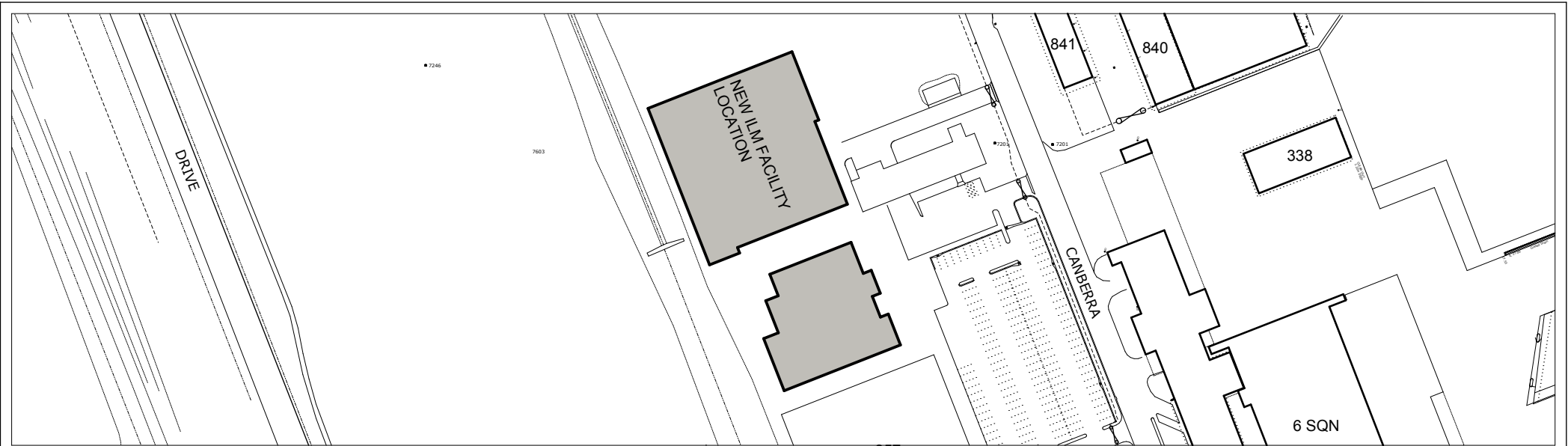


CONRAD GARGETT ARCHITECTURE

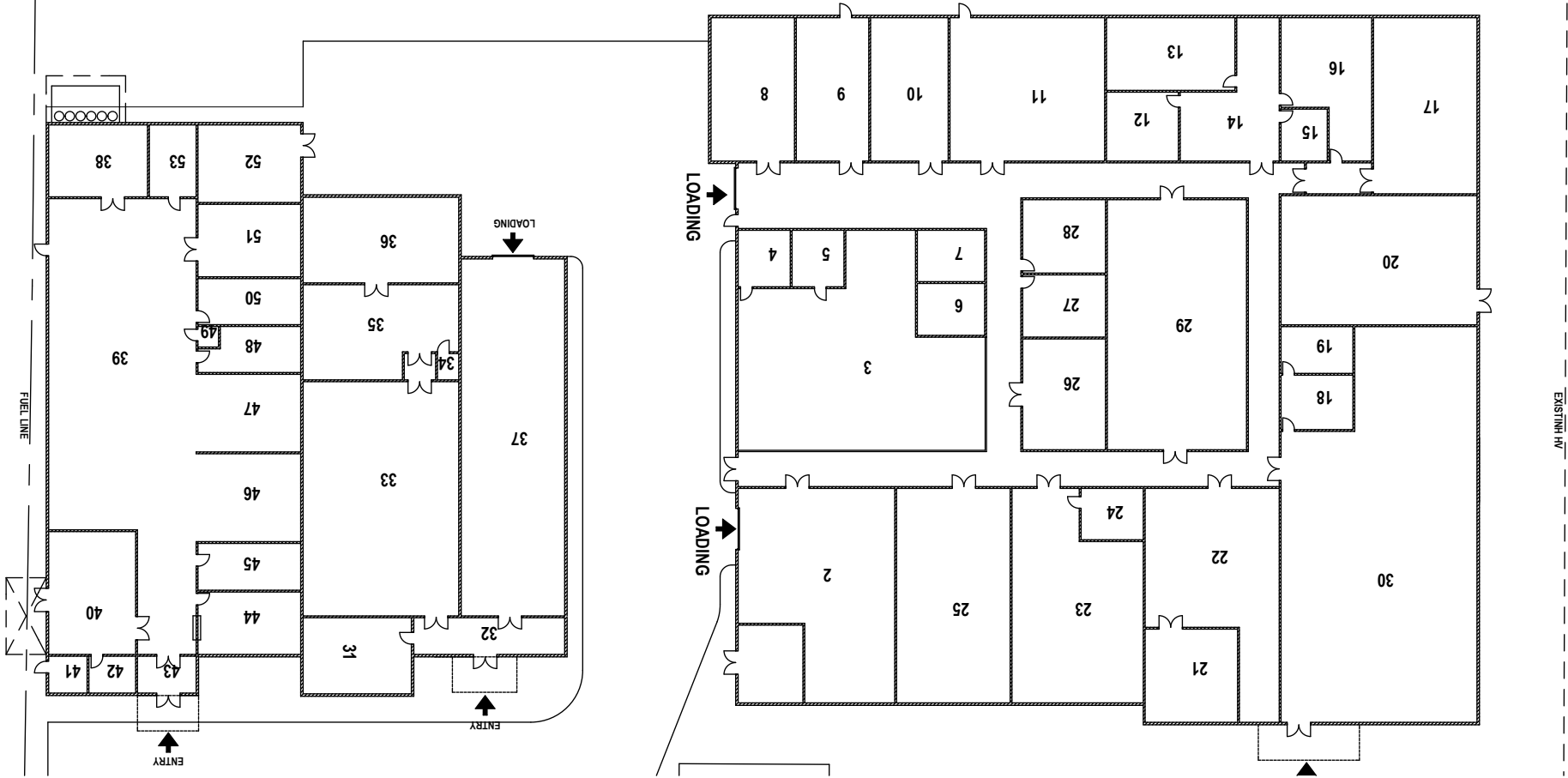


NO	ROOM NAME
1	FLY AWAY KIT STORAGE
2	COMPACTUS
3	MEZZANINE OMS OFFICE SPACE
4	OMS OFFICE SPACE
5	NEW SECURE STORAGE

**LEGEND**



# PROJECT ELEMENT 10 - NEW INTERMEDIATE LEVEL MAINTENANCE FACILITIES FLOOR PLAN



NO	ROOM NAME	NO	ROOM NAME	NO	ROOM NAME	NO	ROOM NAME
11	DIVISION/TEST EQUIPMENT STORAGE	34	CLEANING EQUIPMENT	23	COMMUNICATIONS/NAVIGATION SHOP	1	FLIR/OPTICAL SHOP
10	ECM SHOP	33	HYD./PNEUM. DISASSEMBLY/CLEANING	22	ELECTRIC SHOP	2	FACILITY MECHANICAL EQUIPMENT ROOM
9	INERTIAL NAV. SHOP	32	LOBBY	21	CSD/GENERATOR TEST SHOP	3	SUPPLY SUPPORT
8	AVIONICS CORROSION CONTROL	31	AMENITIES	20	FACILITY MECHANICAL EQUIPMENT ROOM	4	SUPPLY RESPONSE SECTION
7	PRODUCTION CONTROL OFFICE	<b>HYDRAULICS/PNEUMATICS</b>		19	QA TECHNICAL LIBRARY	5	CLASSIFIED SECURE STORAGE
6	SUPPLY SUPPORT SECTION OFFICER	30	ADMIN / PERSONNEL SUPPORT	18	QUALITY ASSURANCE (QA)	6	SUPPLY SUPPORT SECTION OFFICER
5	CLASSIFIED SECURE STORAGE	29	CASS SHOP	17	MODULE TEST AND REPAIR SHOP	7	AVIONICS CORROSION CONTROL
4	SUPPLY RESPONSE SECTION	28	PRE-EXPENDED BIN ROOM	16	PME ELECTRICAL/ELECTRONIC SHOP	8	AVIONICS CORROSION CONTROL
3	SUPPLY SUPPORT	27	TOOL SHOP	15	PME OFFICE	9	INERTIAL NAV. SHOP
2	FLIR/OPTICAL SHOP	26	MISSION COMPUTER SHOP	14	PME SCHEDULING	10	ECM SHOP
1	FACILITY MECHANICAL EQUIPMENT ROOM	25	APG-65/73 CASS WRA AND RELATED TPS	13	PME PHYSICAL/MECHANICAL SHOP	11	DIVISION/TEST EQUIPMENT STORAGE
	<b>AVIONICS</b>	24	COMSEC/CRYPTO SHOP	12	CABLE/CONNECTOR REPAIR SHOP		
		35	HYD./PNEUM. ASSEMBLY ROOM				
		36	HYD./PNEUM. TEST ROOM				
		37	TYRE AND WHEEL				
		<b>AVIATION LIFE SUPPORT</b>					
		48	MEN'S TOILET				
		49	CLEANING GEAR				
		50	WOMEN'S TOILET				
		51	WASH ROOM				
		52	MECHANICAL EQUIPMENT ROOM				
		53	FITTING ROOM - FORM FITTING HELMET				
		45	PRODUCTION CONTROL				
		46	SEWING AND FABRICATION ROOM				
		47	SURVIVAL EQUIPMENT ROOM				
		48	MEN'S TOILET				
		49	CLEANING GEAR				
		50	WOMEN'S TOILET				
		51	WASH ROOM				
		52	MECHANICAL EQUIPMENT ROOM				
		53	FITTING ROOM - FORM FITTING HELMET				
		45	PRODUCTION CONTROL				
		46	SEWING AND FABRICATION ROOM				
		47	SURVIVAL EQUIPMENT ROOM				
		48	MEN'S TOILET				
		49	CLEANING GEAR				
		50	WOMEN'S TOILET				
		51	WASH ROOM				
		52	MECHANICAL EQUIPMENT ROOM				
		53	FITTING ROOM - FORM FITTING HELMET				