
SPRINKLER SYSTEM SPECIFICATION

30 Loftus Rd Yennora

Issue **B**

Date **02.02.21**

RG Fire Consultancy

14 Narrabeen St Narrabeen NSW 2101
Phone: 0419 409 119

Email: richard@rgfire.com.au
FPAS Accredited Designer (**No. FSD1661**) NSW & Vic

Document History

Revision	Date	Amendments
A	22/04/20	DA submission
B	02/02/21	Water supplies & sprinklers amended



CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

INDEX

SPRINKLER SYSTEM SPECIFICATION.....	1
1 - INTRODUCTION.....	4
1.1 INTRODUCTION.....	4
2 GENERAL CONTRACT CONDITIONS.....	5
2.1 CONTRACT	5
2.2 DEFINITIONS	5
2.3 CONDITIONS OF CONTRACT	6
2.4 NO VARIATION CONTRACT	6
2.5 TIME	6
2.6 INSURANCE	6
2.7 ACCESS	7
2.8 CO-OPERATION	7
2.9 SETTING OUT	7
2.10 SUPERVISION & SITE MEETINGS.....	7
2.11 DRAWINGS	8
2.11.1 Tender Drawings.....	8
2.11.2 Shops Drawings.....	8
2.11.3 As-Installed Drawings.....	8
2.11.4 Block plans.....	9
2.11.5 Base Line data	9
2.12 REGULATIONS, FEES & NOTICES.....	9
2.13 MATERIALS AND WORKMANSHIP.....	9
2.14 ALTERNATIVES	10
2.15 SAMPLES	10
2.16 PROTECTION OF PLANT & MATERIALS.....	10
2.17 PROTECTION OF PROPERTY	10
2.18 DAMAGE TO FINISHES	10
2.19 INSPECTION & TESTS	11
2.20 OCCUPATION	11
2.21 NOTICE OF PRACTICAL COMPLETION.....	11
2.22 PERFORMANCE GUARANTEE	11
2.23 WARRANTY	12
2.24 DEFECTS LIABILITY	12
2.25 FINAL LOCATION AND UNIFORMITY.....	12
2.26 OPERATING AND MAINTENANCE INSTRUCTIONS.....	13
3 ASSOCIATED WORK & INFORMATION	15
3.1 GENERAL	15
3.2 EXTENT OF WORK	15
3.3 WORK BY OTHERS	16
3.4 FIRE STOPPING & RESEALING	17
3.5 ADDITIONAL ALLOWANCES.....	17
4 FIRE SPRINKLER SYSTEM.....	18
4.1 GENERAL	18
4.2 BASIS OF DESIGN.....	18
4.3 WET PIPE CONTROL VALVE ASSEMBLY.....	18
4.4 SPRINKLER JACKING PUMP	18
4.5 SPRINKLER MAINS BOOSTER PUMPS	19
4.6 DIESEL UNIT	20
4.7 DIESEL ENGINE COOLING	20
4.8 PRESSURE SWITCHES	21
4.9 ALARM GONG.....	21
4.10 SPRINKLER HEADS	21
4.11 SPRINKLER GUARDS	22
4.12 SPARES	22
4.13 AIR RELEASE VALVES.....	22
4.14 REMOTE TEST VALVE	22
4.15 ALARM SIGNAL MONITORING	22
4.16 STORAGE TANK EQUIPMENT.....	22

5	PIPING & VALVES	24
5.1	PIPING	24
5.1.1	General	24
5.1.2	Materials	24
5.2	PIPING INSTALLATION	24
5.3	FLEXIBLE DROPPERS	25
5.4	DRAINING	25
5.5	PIPE JOINTS	25
5.5.1	Joints - Screwed	25
5.5.2	Joints- Welded	25
5.5.3	Demountable - Joints	26
5.5.4	Flanged Type Joints	26
5.5.5	Forged Steel Fittings	26
5.5.6	Cast Iron Flanges	26
5.5.7	Mechanical Grooved Couplings	26
5.5.8	Jointing Material	27
5.5.9	Union Type Joints	27
5.5.10	Copper Pipe	27
5.6	PIPE BENDS AND SUPPORTS	27
5.7	CLEANING AND TESTING OF PIPEWORK	28
5.8	VALVES	28
5.8.1	General	28
5.8.2	Valve Schedule	29
5.9	LABELS	30
5.10	VALVE MONITORING	31
6	PAINTING	32
6.1	PAINTING GENERAL	32
6.1.1	Surface Preparation	32
6.1.2	Masking, Protection etc.	33
6.1.3	Materials to be Used	33
7	ELECTRICAL WORK & WIRING INSTALLATION	34
7.1	EXTENT OF WORK	34
7.2	GENERAL	34
7.3	METHOD OF WIRING	35
8	SCHEDULE OF RATES	39
8.1	GENERAL	39
8.1.1	Additional Sprinklers (at any stage of the Fire Protection Contract)	39
8.1.2	General	39
9	SCHEDULE OF PRICES	40
9.1	GENERAL	40



CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

1 - INTRODUCTION

1.1 INTRODUCTION

The following is a brief description only of the proposed sprinkler services for the site:

- The project involves the installation of a fire sprinkler system and occupant warning system to existing warehouses A and B and associated office areas.
- Sprinkler system water supplies (486KL effective capacity water storage tank, dual diesel booster pumps and 150mm main to valve sets).
- Fully co-ordinated design and documentation.



2 GENERAL CONTRACT CONDITIONS

2.1 CONTRACT

This Design and Construct Contract provides for the design, supply, installation, testing and commissioning and maintenance of the sprinkler system and occupant warning system required for 30 Loftus Rd Yennora.

The fire services included as part of this Contract are:

- Sprinkler system throughout all areas to AS 2118.1-2017.
- Occupant warning system to AS 1670.1-2018
- Full design and documentation

The Contract includes the provision of all design, materials, labour, cartage, freights, tools, plant, appliances and all other works necessary though not specifically mentioned, to the true intent and meaning of this specification and the accompanying drawing, to the entire satisfaction of the Project Manager/Consulting Engineers.

The tender offer being sought for this contract is a Design & Construct submission.

It shall be recognised that the Fire Consultants have prepared the tender documentation contained herein with best intentions in mind. The tender documents describe the scope of work and design status as currently identified. It shall be accepted, as a contract condition, that the Contractor shall facilitate evolution of the design to meet the Principals and other parties needs as they become better identified.

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO MOD2021/0084**

The Contractor shall ensure that appropriately skilled personnel are available to undertake all design works associated with this contract.

2.2 DEFINITIONS **MODIFIED DATE: 08/04/2021**

In constructing this specification, the following words shall have the meaning assigned to them below unless there is something in the subject or context inconsistent with such construction:

Project Manager Plan Project Management

Contractor shall mean the nominated contractor performing the work as specified in this specification and as shown on the accompanying drawings.

Consulting Engineer shall mean RG Fire Consultancy

Approved where the term "approved" is used in this specification it shall be taken to mean approved or selected by the Project Managers/Consulting Engineers. The Project Managers/Consulting Engineers will be the sole judge and will determine what is and what is not approved and items mentioned as being approved shall be formally accepted by the Project Manager/Consulting Engineers before the Contractor orders same or uses same.

2.3 CONDITIONS OF CONTRACT

The works shall be carried out in accordance with this specification and the accompanying drawings and General Head Conditions of Contract.

The Contractor will be employed, instructed and paid by the Project Manager and will be required to conform strictly to the general organisation and discipline of the job as imposed by the Project Manager. The Contractor shall commence work, deliver materials and stage operations in such a manner as to suit the Project Manager's construction program.

The Contractor or supplier nominated to carry out the work or supply the items specified herein shall be expected to sign a Contract or supply agreement with the Project Manager.

2.4 NO VARIATION CONTRACT

The Contractor shall not be entitled to any variations in contract price for works specified within the Specification under this contract.

The Contractor must allow for all costs associated with completion of the works as specified, whether resulting from design development, construction circumstances, coordination, or conditions of approval imposed by the relevant Authorities.

The Contractor shall only be entitled to a variation in contract price, after specific request for change beyond the specified SUMMER WORKS has been issued in writing, directly and exclusively from the Project Manager CITY COUNCIL

2.5 TIME

The successful Contractor shall be required to complete the Project Manager's construction program.

The Contractor shall prepare in co-operation with the Project Manager and for inclusion in a time and progress schedule, a chart indicating commencing and finishing dates for the various sections of the work. The Contractors shall place men on the job immediately as required by the Contractor and by accepting the Contract will be deemed to have unconditionally guaranteed completion in accordance with the Contractor's time program.

Should the Contractor require to work his tradesmen in excess of normal working hours to attain the time schedule, he will be deemed to have made the necessary provisions in his tender and no compensation will be authorised for any additional costs involved.

If completion of the work is delayed for reasons as set out in the Contract conditions, the Contractor will consider written claims for extension of time in accordance with the provisions of that clause.

2.6 INSURANCE

The Contractor and Project Manager will effect and maintain an insurance policy, insuring the works against loss and damage for the full reinstatement value. The policy will cover equipment, materials and works, whether existing, temporary, or permanent, in the course or erection or completed and on site or adjacent. The policy will not cover the Contractor's plant, machinery or tools, or any mechanically propelled vehicles, all of which items will be the responsibility of the Contractor.

Any loss suffered by the Contractor and coming within any exclusion provision of or any loss excess prescribed by the Contractor's insurance policy, shall never the less remain to be borne by the Contractor.

The Contractor shall effect Public Liability Insurance and Workers Compensation, or Employers Liability Insurance in accordance with the requirements of the Contract conditions, and extended to include the name of the Contractor as principal.

The amount of Public Liability and Employers Liability insurance shall be unlimited for each and every claim.

2.7 ACCESS

The Contractor will be allowed access to the site during the hours worked by the Contractor, and shall make special arrangements with the Contractor should he require to work at other than those hours. Access shall be restricted to such entrances, routes and ways as the Contractor may direct.

2.8 CO-OPERATION

The Contractor shall co-operate with Contractors in all trades and so carry out this works as to cause the least inconvenience to others.

2.9 SETTING OUT

The Contractor shall thoroughly examine the specification and drawings, check up all dimensions immediately after the Contract is awarded, and shall obtain such measurements and information as may be required to carry out the work to the complete satisfaction of the Project Managers/Consulting Engineers.

The Contractor shall provide datum set-out lines and levels to facilitate setting out by the Contractor.

2.10 SUPERVISION & SITE MEETINGS

The Contractor shall supervise fully the whole of the works of this Contract and including the works of any Contractors and suppliers.

For this purpose, and in addition to a General Foreman, he shall provide an approved, responsible, efficient Supervisor who shall be empowered to receive and carry out instructions from the Contractor. The Supervisor shall be appointed to run and control the project and his duties in respect of the project shall be to supervise and co-ordinate the works of all persons engaged under this Contract.

The Contractor shall arrange regular site meetings at a frequency dictated by the progress of the works. Such meetings shall be attended by the Contractor's Supervisor when required by the Project Managers or Contractor.

2.11 DRAWINGS

2.11.1 Tender Drawings

The performance based drawings, as scheduled, are issued as a guide only and shall be considered to be diagrammatic and approximate. The drawings and specifications are intended to be mutually explanatory and complete, but all work called for by one, even if not by the other, shall be fully executed.

Should the documents be in conflict, the Contractor will be deemed to have included for the larger quantity and/or the more expensive components, as applicable.

The Contractor will be deemed to have included for redesign, together with additional pipework and fittings as a result of co-ordination with other trades and structure.

2.11.2 Shops Drawings

The Contractor shall be responsible for the preparation of all necessary co-ordinated design, manufacturing and installation shop drawings covering the services included under this Contract. The Contractor shall confirm final installation dimensions by the site measurement to ensure satisfactory set-out and co-ordination with the structure and other services.

All such shop drawings shall be submitted in reproducible negative form. Such drawings shall be submitted to the Contractor for checking and then to the Project Managers and Consulting Engineers for review. Manufacture and/or installation as applicable shall not be commenced prior to the Project Manager's or Consulting Engineer's review.

Shop drawings shall include the following services:

- Architectural layout including the following, where applicable;
- All air conditioning ductwork suitably shaded;
- Electrical lighting layout including all cable trays and bus ducting;
- Structure including all beams, columns and set-downs;
- All pipe sizes, and associated levels together with detail sections as appropriate;
- Quantities of all types of sprinklers.
- Hazard, design density, area of operation and operating sprinklers used by calculations.

The Project Manager/Consulting Engineers are not to be regarded as the Contractor's checking agents. Review of the shop drawings is in principle only without prejudice to the responsibility of the Contractor for the proper design, co-ordination, installation and operation of the services.

The preparation of shop drawings shall be scheduled to enable the necessary approvals to be gained and for the program for installation of the services. Delays caused by late submission, incorrectness or inadequacy of shop drawings will not be recognised as a reason for variations to the contract time or Contract sum.

The shop drawings shall be submitted in pdf form through the Project Managers for distribution within five (5) working days prior to commencement of installation.

2.11.3 As-Installed Drawings

On completion of the works, and prior to the issue of the Notice of Practical Completion, the Contractor shall supply all as-built drawings in approved electronic form showing the complete

services installation as-installed. The Contractor shall also provide three (3) sets of prints of these drawings, bound into the Operating and Maintenance Instructions or in a separate folder.

2.11.4 Block plans

Provide block plans as required by AS 2118 installed in the form of a permanent diagram, which is water resistant and fade resistant. The block plans shall be issued for approval to the Consulting engineers prior to installing.

2.11.5 Base Line data

The Contractor shall provide all required baseline data as required by AS 2118 but not limited to:

- Stop valve schedule
- Pressure gauge schedule
- Sprinkler riser pipe design criteria
- Labelling of all valves
- SSVI plate

2.12 REGULATIONS, FEES & NOTICES

The services installations covered by this Contract shall be complete with all equipment necessary for their satisfactory operation, control, maintenance, and safety under all normal conditions of service, and shall comply in every respect with the regulations and by-laws of all Authorities having jurisdiction, including the latest requirements of the following, as applicable:

Local Council
Department of Industrial Relations
Sydney Water
SAA Wiring Rules
Fire and Rescue NSW
Department of Local Government
Scientific Services Laboratories
All relevant Australian Standards and Building Code of Australia.

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084
MODIFIED DATE: 08/04/2021**

The Contractor shall obtain and fill in all notices required by the various Authorities when necessary and pay all fees in connection therewith, and shall submit for approval all necessary drawings and obtain all consents required to permit execution of the works.

2.13 MATERIALS AND WORKMANSHIP

Unless indicated otherwise the whole of the materials used in this work shall be new, of first quality and of approved manufacture and type. All materials shall be to the approval of the Project Managers/Consulting Engineers. No approval of the Project Managers/Consulting Engineers shall be deemed an acceptance of materials or workmanship not complying with the requirements of this Contract.

The whole of the workmanship shall be first-class, neat and to the entire satisfaction of the Project Managers/Consulting Engineers.

The installation throughout shall comply in every respect with the various codes published by the Standards Association of Australia, together with any additional requirements which may be specified herein.

2.14 ALTERNATIVES

Generally, tenderers shall adhere to the types of plant and equipment detailed in the drawings and specification. When these requirements preclude tenderers from offering plant of their standard manufacture, alternatives may be submitted for approval.

Unless such alternatives are accepted in writing by the Project Managers/Consulting Engineers through the Contractor, the Contractor shall comply with detailed requirements of the Specification.

2.15 SAMPLES

The Contractor shall submit to the Contractor samples of selected equipment and fittings to be used in the works for approval by the Project Managers/Consulting Engineers.

Generally the following samples shall be submitted:

One (1) of each type of sprinkler head and escutcheon plate.

2.16 PROTECTION OF PLANT & MATERIALS

The Contractor shall be entirely responsible for all apparatus, equipment and appurtenances furnished by him or his Contractor in connection with the works.

Special care shall be taken to protect all such goods in a suitable manner.

The protection shall include covers to prevent moisture, grit, plaster and other foreign substances from entering the working parts of plant and equipment. Seal and protect all open ends of ductwork, piping and conduit, as applicable, whilst in storage and during course of installation, and protect adequately all electrical and control equipment.

All materials, goods and equipment under this Contract must be complete, intact and in new order when the Project Manager takes over the responsibility for the works, and it shall be the liability of the Contractor to safeguard such materials, goods and equipment until then.

2.17 PROTECTION OF PROPERTY

Services shall be installed before plastering, false ceilings and/or bulkheads are completed and all ductwork, piping and conduit, as applicable, and other concealed services shall be fixed in position before decorative work, floor finishes and/or painting are carried out.

The Contractor shall be responsible for any damage to finished work on site caused by the execution of the work of his Contractor and shall pay all rectification costs involved. Rectification of damage to the works of other trades shall not be undertaken by the Contractor but will be arranged by the Contractor to be carried out by the appropriate person, firm or Authority at the expense of the Contractor.

2.18 DAMAGE TO FINISHES

The Contractor shall be responsible for the refinishing or replacement of any part of his installation damage prior to the installation being taken over by the Project Manager.

2.19 INSPECTION & TESTS

The Project Manager/Consulting Engineers may at any time during the progress of the works, test and examine any material used and inspect the workmanship employed and may reject any material and workmanship that are not in accordance with the specification and drawings. The Contractor shall provide such assistance as may be required by the Project Managers/Consulting Engineers to carry out tests including facilities for inspection at works. On completion the installation shall be tested in the presence of the Consulting Engineers by the Contractor and passed over by the Authorities having jurisdiction over the works.

Three (3) copies of all approvals and tests certificates issued by the Authorities shall be submitted to the Contractor.

All plant and equipment having electrical connections shall be tested for insulation and earth resistance and passed by the Supply Authority. The Consulting Engineers shall be given seven (7) days written notice of commencement of final tests.

The Contractor shall provide all fees, labour, materials and instruments required by the purpose of carrying out tests and shall make good at his own expense any defects disclosed during tests.

2.20 OCCUPATION

The Project Manager reserves the right to take over any completed portion of the works for the purpose of installing equipment and fittings or for occupation and the Contractor shall co-operate with the Contractor and the Project Manager and shall arrange his works to this end as required.

Such entry and occupation shall not provide grounds for extension of time or compensation and shall not relieve the Contractor of his responsibility to complete the Contract.

Where partial occupation occurs, the guarantee, warranty and defects liability period for the relevant sections of the services installations will operate from the date of such occupation.

2.21 NOTICE OF PRACTICAL COMPLETION

When, in the opinion of the Project Managers/Consulting Engineers, the building and the works are practically completed, the Project Managers will issue to the Contractor and Project Manager a Notice of Practical Completion stating the date upon which the works were practically completed. This date shall be the date from which the guarantee, warranty and defects liability period shall operate.

This notice will not be issued until the systems have been properly commissioned and until the Contractor has supplied Operating and Maintenance Instructions and as-installed drawings as specified.

2.22 PERFORMANCE GUARANTEE

By accepting the Contract, the Contractor will be deemed to have guaranteed the performance of the installations under normal working conditions for a period of twelve (12) months from the date of practical completion of the works.

Should the installation or any part thereof fail to fulfil the requirements of this specification, performance of the relevant equipment shall be corrected by the Contractor at his own expense or the equipment will be liable to rejection.

The Contractor shall be responsible for the replacement of any portion of the installation so rejected and for all costs incurred thereby, including the costs of any associated works of other trades. The guaranteed period for the replacement portion shall then be extended to cover twelve (12) months trouble free performance.

2.23 WARRANTY

All plant, equipment and materials supplied under this Contract shall be covered by twelve (12) months warranty against faulty manufacture, workmanship and/or materials. The Contractor shall be responsible for the rectification and/or replacement of any portion of the installation which fails under warranty.

The warranty period shall commence as from the date of practical completion or replacement, as applicable, but extension of the period shall be made in respect of replaced portions only.

2.24 DEFECTS LIABILITY

The Contractor shall be responsible for rectification of all defects in the work due to faulty materials and/or workmanship, for a period of twelve (12) months after all work is completed and handed over. Such defects shall be made good immediately on receipt by the Contractor of advice from the Contractor.

Any defects discovered during the defects liability period which are due to default or negligence of the Contractor in the performance of his obligations shall extend the period to enable such defects to be made good by the Contractor, and to allow the whole work after being made good in every respect to be proved satisfactory.

Should the Contractor fail to commence to rectify defects within seven (7) days of written notice so to do, the Contractor will have the right to have all such defects rectified by others at the risk and expense of the Contractor.

If any defect requiring attention under this clause is of such a nature as to endanger or prevent the operation of any service, the Contractor shall, on telephone advice from the Contractor, Project Manager or Consulting Engineers, arrange for the necessary work to be carried out immediately. If the Contractor is unable so to do, the Contractor will have the right to have such defects rectified by others at the risk and expense of the Contractor.

2.25 FINAL LOCATION AND UNIFORMITY

This Contractor shall thoroughly examine the specifications and drawings and check on all dimensions immediately after this contract is awarded and shall obtain such measurement and information as may be required to carry out the work.

The location shown on the drawings for all equipment and accessories are approximate only. The final locations will be determined on site to comply with site requirements and relevant Standard and Codes of Practice.

In general, and where practical, locate equipment to a pattern formed by columns, beams, batons, and other services.

All sprinklers, detectors etc. shall be installed clear of light fittings and other ceiling mounted fixtures.

2.26 OPERATING & MAINTENANCE INSTRUCTIONS

The Contractor shall provide operating and maintenance instruction manuals which shall comprise a description of each installation, its operation and the regular operating and maintenance routines to be adopted.

Three (3) sets of these instruction manuals shall be provided, printed on A4 size paper adequately bound to the Project Manager's approval into volumes with rigid covers of plastic finish to withstand continual usage.

Manuals shall include:

General Description of Systems and Equipment:

Include brief overall description of systems and design references.

Details Description of Systems and Equipment:

Include detailed description of each individual system and the equipment involved.

Starting and Stopping:

Include detailed information, in a logical sequence, for starting and stopping all equipment. The system shall be in a state after a normal emergency operation.

Controls:

Include full technical details of the control systems for normal and emergency operation of the system, including all control settings and tolerances.

Equipment Schedule:

Include schedule of equipment showing quantity, location, type, supplier etc. and a valve schedule.

Procedures to reset any ancillary equipment that may have been activated.

Schedule of Suppliers:

A schedule of all suppliers with addresses and telephone numbers.

Maintenance of Systems and Equipment:

Include maintenance duties in general, daily and all other periodic maintenance, lubrication chart and spare parts list.

Manufacturer's Literature:

Include manufacturer's data or maintenance and operation of all equipment installed. Do not include irrelevant data that does not pertain to the model of equipment actually installed. Such irrelevant information shall be erased from data sheets, etc.

Include any miscellaneous charts, graphs, descriptions, data, etc. needed for complete maintenance and operating instruction of all systems and equipment installed.

Drawing List:

Prepare complete drawing list of all "As-Installed Drawings".

The supply of all necessary information for the satisfactory operation and maintenance of the services shall form part of this Contract.



3 ASSOCIATED WORK & INFORMATION

3.1 GENERAL

The Works to be executed under this contract shall comprise the design, supply, installation and testing of the fire protection services.

The Tenderer shall make all necessary site visits to ascertain site conditions and extent of work.

Tenderers shall submit a Fixed Price based on the contract program.

3.2 EXTENT OF WORK

- An automatic fire sprinkler system designed and installed in accordance with AS 2118.1 - 2017 and complying with the requirements of Fire & Rescue NSW and Building Code of Australia
- An occupant warning system designed and installed in accordance with AS 1670.1-2018 and complying with the requirements of Fire & Rescue NSW and Building Code of Australia
- The primary painting of all pipes and metal surfaces other than galvanised surfaces. The finish painting of all exposed pipework
- The delivery to site and off loading of all items necessary for this contract. (Include on and off loading of material hoist, if used)
- Fire rating of penetrations
- The necessary worksheets, drawings, quantity lists and associated information for the production of all prefabricated work to be supplied, manufactured and delivered to site by the Contractor
- The testing of the complete sprinkler and OWS installation
- All associated fees, permits, costs and charges for the relevant works
- 12 months maintenance of the installed works in accordance with AS 1851 – 2012.
- On final completion, the Contractor shall forward the Completion Certificate, as installed drawings and Operating and Maintenance manuals to the Project Manager.

The only exclusions are those listed under Clause "Work By Others".

The Contractor shall ensure that the work is complete with all components and associated minor items necessary for satisfactory operation and maintenance with the exception only of those items listed under Clause "Work By Others".

3.3 WORK BY OTHERS

The work to be done by the Project Manager to enable the specified Contract Works to be performed is specified herein after. The Project Manager is required to bear the cost of such work and Tenderers are not to include same in their Tender Price.

The Contractor shall supply, provide and bear the cost of detail drawings for the guidance of others and shall be responsible for the setting out in conjunction there with and the supply of templates.

The Contractor shall supply all equipment and services to carry out the following specific items of work:

Works to be carried out by Builder

Construction of fire pump room

Lockable (003) wire mesh enclosure with colorbond roof around sprinkler alarm valves.

All civil works associated with excavation of landscaped area to accommodate new tank and pump room inclusive of all shoring, battering and retaining walls of existing grassed area.

Provision of tank base to suppliers specifications including of survey of area, structural engineers report and certification.

Clear openings through the building structures for passage of conduit, pipes etc., to Contractor's detail.

All cuttings, patchings, framing-up, turning in and making good etc. associated with the building structure for the passage of pipes etc. Details shall be supplied by the Contractor. Note: All pipe penetrations through tanks shall be fireproof non setting compound by the Contractor.

MODIFIED DATE: 08/04/2021

Provision of all holes in ceilings.

Provision of required signwriting on sprinkler pump room and sprinkler valve enclosure.

Works to be carried out by Electrical Contractor

Provision of 240V power (essential supply) to the diesel pump control panels terminating in coiled tails

Provision of 240V GPO in pump room and sprinkler valve room.

Provision of emergency lighting in pump room and sprinkler valve enclosure.

Works to be carried out by Hydraulics Contractor

Provision of sprinkler test drain capable of draining 25L/sec over a 10 minute duration located in sprinkler valve enclosure.

3.4 FIRE STOPPING & RESEALING

Fire stopping of openings in floors, ceilings and walls where pipework and wiring passes through shall be sealed to prevent transmission of fire and smoke from one fire isolated area to another. All pipework to be treated as detailed in Clause 4.2 Piping Installation.

The sealing material for wiring shall be "Fire Research" - Fire barrier panels, fire pillows or similar approved materials.

Small holes, considered that clearance is sufficient to transmit fire and smoke, fire retardant sealant shall be used around the wiring, such as a fire stop putty or similar material.

3.5 ADDITIONAL ALLOWANCES

Allow for the provision of the following additional fixtures within the tender quotation for final co-ordination with services and structure:

- 25 exposed sprinklers
- 15 below ceiling sprinklers
- 6 emergency warning speakers



4 FIRE SPRINKLER SYSTEM

4.1 GENERAL

This section of the specification covers the supply and installation of the various components of the Fire Sprinkler System.

4.2 BASIS OF DESIGN

The arrangement and sizes of sprinkler pipework and spacing of sprinkler heads shall be generally as shown on the drawings, and shall be in accordance with the Requirements of Australian Standard AS 2118.1 – 2017, BCA and Fire & Rescue NSW.

4.3 WET PIPE CONTROL VALVE ASSEMBLY

Supply and install 2 wet control valve assembly to the location shown, the valve assembly shall include the following:

A monitored sprinkler stop valve which shall isolate the water supply to the whole installation.

An alarm check valve which is normally closed, which shall be arranged to operate whenever the water pressure falls in the sprinkler system. The valve shall also incorporate means for admitting water to the local and monitoring alarm system.

A dual jump type control valve incorporating a 50mm drain valve and a 15mm test valve, draining into test drain.

Pressure gauges to indicate water pressure either side of the alarm check valve, complete with shut off cocks, or non-loss connectors.

Pressure switches as necessary to operate the alarm system via a new connection to the FIP.

Valved connections for the system jacking pump.

Water system proving equipment including testing element. Throttling valves shall be provided on both sides of testing element.

Sprinkler system block plan

"Sprinkler Stop Valve Inside" Plate.

4.4 SPRINKLER JACKING PUMP

Supply and install one (1) electric jacking pump, located adjacent the installation valves.

The pump shall be a closed coupled centrifugal or turbine type with cast iron casing, bronze impeller and stainless steel shaft. The pump shall have a capacity of 22 litres/min. at a discharge pressure at least 120 greater than the maximum town main pressure.

The pump shall be manually controlled by a push button station in the valve area and arranged so that the pump will only run while the start button is depressed and will stop as soon as the button is released.

4.5 SPRINKLER MAINS BOOSTER PUMPS

Supply and install in the location shown a primary and secondary diesel sprinkler pumps to boost the water through the sprinkler system maintaining the required pressure at the highest sprinkler head.

Booster pumps shall be in accordance with Australian Standard AS 2941.

Pump construction shall be cast iron casing, bronze impeller and stainless steel shaft.

Gland areas shall be packed stuffing box type or mechanical seals.

The Sub-Contractor is to ensure that all pumps will withstand maximum suction pressures on gland areas, and maximum allowable casing working pressures as listed by the relevant pump manufacturer's limitations.

The working pressure limitations must take into account suction pressure and shut-off (closed valve) pressure of each pump.

The tenderer shall submit details of the type of seal or packing that he proposes stating its limitations together with anticipated maximum system pressures.

The pump shall be direct flexible coupled to its motor via a rigid and bush type flexible coupling.

The coupling shall be suitably guarded and comply to Department of Industrial Relations requirements.

Where drip-proof electric motors are used, the coupling guard shall be fitted with a splash shield.

Coupling guards shall be hot dip galvanised.

Pump base plates shall be fabricated mild steel and must incorporate lifting eye bolts for transportation and site unloading. Rubber isolating pads shall be provided between the base plate and plinth.

Where back pull-out pumps are used, the pump must be fitted with rear bearing support bracket.

All pumps to be fitted with metallic flexible connections to both suction and delivery outlets.

The pump shall be of the centrifugal type, either split or solid casing.

The casing shall be tested to a head equal to twice the shut off head of the pump plus the static head of the system.

The impeller shall be of bronze construction shrouded single entry type, hydraulically and statically balanced.

Bearings shall be of the ball or roller bearing of the self-aligning type capable of taking any residual end-thrust.

The shaft shall be of stainless steel, with mechanical seals, complete with flush water strainers, differential pressure gauges, and shut off cocks on each line. Strainers shall be of high efficiency type with replaceable cartridges.

4.6 DIESEL UNIT

The diesel drivers shall be limited to the following manufacturer:

- John Deere
- Cummins
- Detroit

Alternative manufacture may be submitted for approval.

Unit shall incorporate eight (8) hour continuous fuel tank fitted with dual level indicator, vent, filler cap, sedimentor condensation trap/strainer, lockable fuel cock. Fuel tank support frame should be designed to incorporate temporary transportation brackets and final site fixing facilities in which separate fuel tank from pump unit making it vibration free. Incorporated on the stand would be necessary instrumentation as per AS 2118 and AS 2941 enclosed completely in a dust-proof front visible enclosure and spring-mounted.

The diesel exhaust manifold must incorporate condensation drain and suitable flexible vibration dampener and suitably insulated.

Supply muffler (as recommended by engine supplier, for fitting by the Sub-Contractor), noise rated for domestic applications.

The battery enclosure must be situated on the floor as near as practicable to starter motor to eliminate - Voltage drop and should not be subject to vibration.

The black steel diesel exhaust pipework is to be suitably lagged where pipe is within 2.5 metres above floor level or where accessible.

The diesel exhaust line is to be fitted with a catalytic converter and discharged to atmosphere or adjacent to carpark return air grill.

Battery enclosure to be manufactured to suitable size allowing ventilating. Top cover to be wood (dressed and lacquered). Cover to be labelled using engraved plastic labels stating contents and voltage.

Diesel pumps shall be provided with radiator heating with thermo-stat set to operate at 10 degrees Celcius.

4.7 DIESEL ENGINE COOLING

Coolant Circulation: The engine cooling system shall be the closed-circuit type, including a circulating pump driven by the engine, and a reliable engine jacket temperature regulating device. Water shall be taken from the discharge of the pump, taken off prior to the pump discharge valve. Threaded rigid piping shall be used for this connection. The pipe connection shall include a manual shut-off valve, an approved flushing type strainer in addition to the one

that may be part of the pressure regulating valve, a pressure/thermo-static regulating valve, an automatic electric solenoid valve, and a second manual shut-off valve.

A pressure gauge shall be installed in the cooling water supply system on the engine side of the last manual valve.

A by-pass line with manual valve and a flush type strainer shall be installed around the manual shut-off valve, strainer, pressure regular and solenoid valve.

Waste Outlet: An outlet shall be provided for the waste water line and the discharge line shall not be less than one size larger than the inlet line. The outlet line shall be short, shall provide discharge into a visible open waste cone by Hydraulics Sub-Contractor and shall have no valves in it.

4.8 PRESSURE SWITCHES

Pressure switches shall be the normally closed ON-OFF type with operating range to suit the pressures involved. Each switch shall have independent adjustment for the cut in point and operating differential.

4.9 ALARM GONG

Supply and install where indicated or as directed by the Project Manager water driven gong as required, arranged to operate whenever the alarm-check valve opens.

The alarm gong shall be of an approved type, 250mm diameter, having a totally concealed striker movement, with a bronze rotor and steel bearings. Provision shall be made for lubricating the rotor mechanism.

The water connection from the alarm check valve shall be provided with an isolating valve securing in the open position.

Exhaust water to discharge to drain.

4.10 SPRINKLER HEADS

Sprinkler heads shall be of appropriate temperature rating for positions indicated and installed in a pattern approved by the Project Manager. All sprinkler heads shall be approved by Scientific Services Laboratories.

Tenderers shall base their price on the number of heads shown on the drawings. However, they must submit a Schedule of Rates per head for each type of sprinkler. These prices will be used for determining extras or deductions from the contract price caused by an addition to or a reduction of the number of sprinkler heads actually installed.

The type of sprinkler heads shall be as follows:

- Warehouse A – K25 storage mode
- Warehouse B – K16 control mode to be utilised as roof protection supplemented by in-rack sprinklers with future fit-out
- Semi-recessed chrome glass bulb head with white two piece escutcheon plate in ceiling areas. Note deflector to be set 25 mm below bottom of plate.

- Standard brass finish, glass bulb sprinklers for plantrooms, concealed space and such areas where pipework is exposed.

4.11 SPRINKLER GUARDS

In areas where sprinkler heads are liable to damage, and if the head is less than 2.2 metres from finished floor level, the head shall be protected by a wire mesh guard. The wire mesh shall not obstruct the normal function of the sprinkler heads. The guards shall be of cadmium plated steel of robust construction.

Where sprinkler heads are located in racking they shall be positioned so as not to interfere with the on/off loading of stock and be provided with purpose made galvanised guards suitably installed to afford the sprinkler maximum protection.

4.12 SPARES

The Contractor shall supply a set spare sprinkler heads of each type and temperature rating, in a suitable box, fixed on the wall adjacent to the control valve position. A spanner for each type of sprinkler head shall be provided.

4.13 AIR RELEASE VALVES

The Contractor shall provide air release valves at the high point of each installation to allow entrapped air to escape. Discharge if any is to be piped to a suitable drain.

4.14 REMOTE TEST VALVE

The Contractor shall provide a remote test valve with AS 2118 required signage and discharging into hydraulic drain line.

4.15 ALARM SIGNAL MONITORING

Allow to provide privatised monitoring for a single brigade input on a one year agreement basis. The system monitoring shall comply with the requirements of AS 1670.3, AS 4428.6, AS 4418.2 and AS 2118. Provide alarm signalling equipment complying with AS 4428.6 to transmit the sprinkler or detector signal to an approved monitoring service provider. Allow to provide a back-up telephone link to service provider. Provide details of proposed monitoring service provider inclusive of all service costs for a 12 month period.

4.16 STORAGE TANK EQUIPMENT

Provide a sectional galvanised circular steel cold water storage tank. The tank shall have an effective capacity of approx. 486 000 litres to cater for 60 minute storage mode sprinkler operation and 90 minute roof/in-rack protection.

The new storage tank shall comply with AS 2304-2019 and incorporate the following requirements:

The anti-vortex plate shall have an outside minimum diameter of 400 mm and locate 150 mm from the base of the tank.

Tank walls shall be constructed with flat steel sheeting with minimum 3 mm thickness.

A PVC liner should be used that is no less than 0.75 mm thick that is compatible with the quality of the water.

The liner is to be supported at the top of the tank by bolting through reinforced eyelets on maximum 300 mm spacing.

The liner is to be supported at the bottom of the tank by the reinforced concrete pad and a layer of polyester matting which extends 300 mm up the side of the bottom shell. The liner shall not be bonded to the tank.

The storage tank shall be complete with;

- Galvanised steel panels.
- Externally bolted construction.
- 316 grade stainless steel internal bracing rods.
- 1 x cold water inlet provided in infill box so that ball valve is accessible from top of tank
- 1 x cold water outlet.
- 1 x overflow outlet
- 1 x drain outlet.
- 1 x level indicator
- Tank roof constructed from colorbond steel with harness attachment hook.
- 600mm square tank sliding roof access panel.
- Galvanised external steel access ladder with 003 lockable ladder guard to prevent un-authorised access..
- 316 SS internal access ladder.
- Fire brigade suction outlet
- High/low level alarms
- Permanent sign affixed to tank indicating effective capacity, diameter, height, year of install, supplier and tank model number.

The Sub-Contractor shall provide all facilities for the complete compliance and functioning of the tank.

The tank base shall provide minimum 100 Mpa compaction.



5 PIPING & VALVES

5.1 PIPING

5.1.1 General

The extent of the fire services pipework to be supplied and installed under this Contract is as follows:

All sprinkler system piping.

All drain piping from equipment and connecting into the Contractor's drains, as shown on the drawing.

5.1.2 Materials

Piping and pipe fittings shall conform to the following table and be suitable for the pressures involved.

<u>DUTY</u>	<u>MATERIALS</u>
Sprinkler pipework above Control Valves.	AS 1074 black tubing.
Sprinkler pipe below ground	AS 1074 galvanised tubing 'denso' wrapped or Blue Brute Class 16.
Sprinkler flexible droppers	AS 2118-2017
Drains.	AS 1074 galvanised tubing.

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

Where piping is exposed above ground, the piping shall conform to AS 1074 galvanised tubing.

All steel piping shall be completely free of rust and black steel piping painted externally before delivery to site. Care shall be taken to ensure that the piping stored on site is located away from damp locations to avoid the formation of rust.

Where pipework is subjected to higher than normal pressures the Contractor shall provide and install pipework and fittings suitable for such pressures in accordance with Australian Standard.

Pipe sizes shown on the drawings are nominal pipe sizes for the material used.

5.2 PIPING INSTALLATION

Grouting in the pipes where they pass through walls or floors will not be permitted.

Where pipework passes through building structures, sleeves shall be provided, sized to give a minimum of 13mm gap fully around the pipe. The length of collar is to suit the thickness of the structure; sleeves shall be 3mm copper for copper pipes and galvanised for other pipework.

Pipework passing through fire walls shall be sealed with fibrefran rope or other approved non-asbestos material, tamped tightly in the annular space between the pipe and the sleeve, with not less than two complete turns of fibrefran rope.

All metal sleeves shall be supplied and fixed in their exact locations by the Contractor, unless such sleeves are required to be built in where the Contractor shall supply the sleeves only. See clause "Work by Other Trades".

5.3 FLEXIBLE DROPPERS

Allow to provide stainless steel, braided flexible hoses to supply all below ceiling sprinklers. The minimum sizes shall be DN 25 for ordinary and high hazard. Flexible droppers shall be installed and fixed to the ceiling grid and comply with AS 2118 and the suppliers requirements.

5.4 DRAINING

Drain cocks, valves or plugs shall be supplied and installed to allow pipework containing trapped water to be drained which cannot normally be drained at sprinkler control valves.

Every drain shall be secured shut in such manner as to prevent interference by unauthorised persons.

All drains shall be made by welding a socket into the pipe. A 25mm cock with a male hose union to take a standard 20mm hose shall be fitted.

5.5 PIPE JOINTS

5.5.1 Joints - Screwed

Screwed pipe threads shall be in accordance with AS B53 - 1961 British Standard Pipe Threads.

Male threads shall be tapered and cut long enough to screw to full depth of female threads (sockets).

Screwed joints shall be sealed with a non-hardening material such as teflon tape, spun yarn of New Zealand flax, white hemp yard or sintered PTFE mixed with a soft setting mineral lubricant, inert non-toxic, and solvent free.

5.5.2 Joints- Welded

All welded joints shall be made by approved industry standard. Filler metal for welding shall be of an approved quality.

Steel fittings shall be fusion welded with a filler rod in compliance with AS 1588 - Filler Rods for Welding.

Except where dictated by the type of pipe fitting or valve, steel piping over 50mm dia. may be welded.

Pipework shall be shop fabricated wherever possible. Where welding is carried out on site, the provisions of AS 1674 - 1990 "Australian Standard Rules for Fire Precautions in cutting and welding operations" shall be observed.

All site welding shall be carried out in accordance with AS 1674 - SAA Cutting and Welding Safety Code.

5.5.3 Demountable - Joints

Unless otherwise approved or directed by the Superintendent, de-mountable joints in piping shall be of the type specified herein. The number of de-mountable joints shall be kept to a minimum consistent with good engineering practice and shall only be provided as follows:

Where piping may have to be dismantled for maintenance purposes.

Where approved for ease of assembly.

At all connections to pumps, equipment, valves as applicable, instruments and gauges.

Demountable joints shall be of the flanged type for pipe of size 50mm and greater and shall be of the union type for pipe up to 40mm, except that union type joints shall not be installed in ceilings and similar concealed spaces.

5.5.4 Flanged Type Joints

Flanges shall be of an approved proprietary manufacture and the pressure ranges up to 1400 kPa the minimum acceptable flange dimensions shall be to Table 'E' of AS 2129. Pipework shall be flanged where maximum design pressure exceeds 1000 kPa on the upstream side of control valves.

Where components of plant and equipment are provided with heavier flanges and/or provide with raised faces, the mating flange on the pipe shall match the mating flange on the component.

In making the joints, flanges shall be pulled up evenly and tightly with galvanised mild steel bolts of correct diameter, length and number, with washers under the nuts.

In making the joint an approved jointing compound or gasket shall be applied to each joint face.

Jointing material or gaskets shall be of approved performed proprietary manufacture or type suitable for the service and/or duty conditions applicable and shall have thickness of not less than 0.8mm. Durable rubber insert or rings are acceptable.

5.5.5 Forged Steel Fittings

Flanges for black steel pipe shall be of the best quality forged steel and shall be welded on square with the run of pipe.

Plain flanges shall have a thickness of not less than 12mm. Flanges of the screwed boss type for pipes up to and including 100 NB shall be acceptable.

Flanges shall be machined on the joint faces, under bolt heads and to the correct diameter.

5.5.6 Cast Iron Flanges

Flanges for galvanised steel pipe and cast iron pipe shall be of machined quality cast iron, or the screwed boss type and shall be machined on the joint faces and under bolt heads and to the correct diameter.

Flanges shall be screwed on square with the run of pipe and the screwed joint on galvanised steel pipe shall be sealed with an approved jointing compound.

5.5.7 Mechanical Grooved Couplings

Pipes may be jointed by mechanical grooved couplings comprising an approved combination of couplings, gaskets and grooves. Grooves shall not be cut into pipes and rolled grooves shall be dimensionally compatible with couplings.

Gaskets shall be suitable for continuous service for both air and water in the temperature range - 40C to 150C and shall be pliable, smooth and free of obvious porosity and mould flash.

When coupling is assembled, gaskets shall be fully enclosed within the housing of the coupling.

Couplings and associated gaskets shall be selected and installed to suit maximum anticipated installation pressures.

5.5.8 Jointing Material

Unless otherwise directed or approved the jointing material used in the works for application to faces of flanges shall be as follows:

For flanged joints connect to pumps, valves and similar equipment approved jointing compound shall be used, the compound shall contain not less than 50% sintered PTFE mixed with a soft setting, mineral lubricant, inert, non-toxic and solvent free.

For all other flanged joints approved jointing compound suitable for durable rubber insertion rings may be used in lieu of above.

5.5.9 Union Type Joints

Generally: Unions shall be of an approved proprietary manufacture and shall have ground face joints with not less than 3mm draw on the joint faces.

Forged Steel Unions: Unions for steel pipes (either black steel or galvanised steel) shall be sealed with an approved jointing compound. Threads on pipes shall be tapered and the components screwed together to make a tight joint.

5.5.10 Copper Pipe

Joints in copper pipes shall be silver soldered using welding rod containing not less than 15% silver equal to Comweld Alloy 115 (brown tip). Joints using capillary fittings shall be Yorkway or equal.

5.6 PIPE BENDS AND SUPPORTS

All steel pipe bends shall be made either by forming the straight pipe to shape by cutting and welding, or by the use of standard fittings.

Pipes which are at all liable to be grasped as a hand hold, stood upon or similarly misused, are in every case to be supported.

Where vertical pipes are exposed in rooms, they shall be secured at floor and ceiling; pipes up to 25mm shall have at least two intermediate supports.

Where pipe supports are exposed to the weather, they shall be 'hot dipped galvanised', unless otherwise specified.

5.7 CLEANING AND TESTING OF PIPEWORK

All cleaning and testing of pipework shall be carried out as early as possible after installation of each section of pipe but definitely before any joints are concealed, ceilings installed, or finishing trades have commenced.

All service pipework shall be thoroughly washed out and the system operated with a full flow of water until all foreign matter is removed.

Temporary connections to supply and drain shall be carried out as required and all equipment shall be by-passed during the cleaning and testing period.

All pipework shall be tested hydro-statically to 1400 kPa or 400 kPa greater than the maximum installation pressure whichever is the greater. The pressure in each test shall be maintained with pump disconnected for a minimum period of 24 hours.

After testing, each section of pipework shall be left full of water to prevent internal corrosion. If valves are used to seal off the tested section of the pipe, they shall be provided with a spigot for welding on the next section of pipe.

All cleaning and testing for final inspection shall be carried out in the presence and to the fully satisfaction of the Contractor.

Any instruments not capable of standing the test pressure shall be removed before testing and tested later at normal pressures.

5.8 VALVES

5.8.1 General

Provide all valves as shown on the drawings and as necessary for the safe and proper operation of the system. Valves shall be line sized unless noted otherwise. Valves shall be screwed or flanged to adjoining pipework as specified for the piping in the particular system.

Valves and materials shall be suitable for the design pressures and temperatures and for the service conditions applicable. The design pressure shall be the maximum pressure the valves are subjected to including maximum towns main and shut-off head the pump.

All valves bodies shall be free from porosity and other defects and shall have wall thickness sufficient to withstand the maximum installation pressures without damage or distortion.

All valves shall be identified with the Manufacturer's name and figure number and with the valve size.

All valves of the one type shall be of the one manufacturer.

Valves shall be applied according to the particular manufacturer's written recommendations.

Any brass or gunmetal components shall be a type not subject to de-zincification.

All valve stems shall have stuffing box type packed glands unless noted otherwise. Gland packings shall be suitable for the particular service. O-ring stem seals are not acceptable.

Figure numbers in table refer to JOHN catalogue to indicate the standard required, unless noted otherwise.

Abbreviations are as follows:

BSP	British Standard screw thread.
BST 'H'	British Standard flanges, table "H"
BR	bronze to AS 1565 yield 96.5 mPa, elongation 15% minimum.
SS	stainless steel yield 386 mPa minimum, elongation 15% minimum grade 316.
CI	cast iron to BS 1452 grade 14.
CS	cast steel to BS 592 grade A, ultimate tensile stress 430 Newtons/sq.mm minimum, elongation 22% minimum.
GM	Gun Metal to BS 1400 LG2.
MB	manganese bronze to BS 250 grade A, ultimate tensile stress 465 Newtons/sq.mm minimum, elongation 20% minimum.
NKL	nickel - base copper - tin alloy for valve seats.
SMH	arsenically inhibited bronze, Alloy SMH (Extruded Metals P/L).
OS	stem screw outside valve body, not in fluid.
IS	stem screw inside valve body, in fluid.
SG	spheroidal graphite cast iron to AS G9 SNG 24/17. Ultimate tensile stress 370 mPa minimum elongation 17% minimum.

5.8.2 Valve Schedule

Throttling Duty

65-80mm diameter Globe type John Fig 511 or equal BSP ends, BR body, SS disc and seat, MB stem screwed bonnet OS stem.

100mm and over diameter Globe type, John Fig 201 or equal, BST 'E' ends, CI body, BR disc and seat, MB stem, bolted bonnet OS stem.

Backflow valve

150mm AMES 3000SS with multi-turn butterfly valves or rising spindle gate valves.

Isolating Duty

15-50mm diameter Gate type John Fig 59m or equal, BSP end, BR body, BR disc and seat, SMH stem, screwed bonnet OS stem.

65mm and over diameter Gate type John Fig 601 or equal, BST 'E' ends, CI body, BR disc and seat, SMH stem, bolted bonnet, OS stem.

Non-Return Duty

15-50mm diameter Horizontal check type John Fig 4B or equal BSP ends, BR body, SS disc and seat, screwed bonnet.

65-100mm and over diameter Horizontal check type John Fig 404 or equal, BST 'E' ends, CI body, NKL disc and seat, Bolted bonnet.
or Wafer check type John fig. 430

150mm and over diameter Horizontal and vertical check type, John Fig 420 or equal BST 'E' ends, CI body, BR disc and seat BR stem, Bolted bonnet.

Gauge Cocks

10mm diameter taper plug type, John Fig 73 or equal, BSP ends, BR body, BR disc and seat.

Solenoid Test Valves

Mack NT Series or equal, normally closed, GM body and bonnet nut, PTFE Piston ring and valve, SS Pilot valve, MB Piston.

Strainers

Strainers shall be Y-type of bronze construction with BSP taper screwed ends up to 50 NB and cast iron or steel flanged 65 NB and above suitable for the pressure of the system.

Basket shall be perforated stainless steel or bronze sheet as tabled below:

Strainers shall be line sized and designed for a pressure drop of not more than 10 kPa at full flow when clean;

Strainers shall have screwed caps for basket removal.

The design of the strainer shall provide even flow through the basket and the basket section shall project well clear of the line of pipe. Strainers shall be manufactured by M.E. Mack & Co. Pty. Ltd. or equal.

5.9 LABELS

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084
MODIFIED DATE: 08/04/2021**

All instruments, gauges, indicators, control equipment, valves, contactors, switches, starters, relays and cable terminals on switchboards, etc. installed as part of this work shall be clearly labelled and identified with the correct associated function.

Labels, except where otherwise specified, shall be of laminated plastic with neatly engraved uppercase red letters on white background. Plastic labels shall be attached by screw or rivet fixing.

Punch machine type strip lettering and stick-on markings will not be approved.

Lettering, except where otherwise specified, shall be not less than 15mm high. Lettering for items installed in switchboards and on control panels shall be not less than 10mm high unless otherwise approved or directed.

A brass disc, approximately 32mm diameter and 1.2mm thick shall be provided for each valve installed in the works. The discs shall be secured to the valves with heavy gauge copper wire.

Discs for Valves shall be stamped with an identification number or letter to correspond with the related fire control room instruction board.

All sprinkler pipe risers shall be identified with traffolyte stickers positioned on all levels.

5.10 VALVE MONITORING

All valves controlling the water supply to the sprinkler system shall be fitted with valve monitoring devices and connected to the fire indicator board. The valves to be monitored include, but not limited to:

- Installation stop valves
- All valves within pump room
- Tank isolating valve

An approved anti-tamper "Type A" monitoring device shall be used and shall automatically protect the integrity of the monitoring device and associated wiring upon any attempt to tamper with or by-pass the installation. The anti-tamper monitoring device shall be installed in a neat and concealed manner arranged to operate against the valve turn wheel or sliding pointer indication arm.

Visual indication together with associated alarms shall be provided for each valve on the fire indicator board.

The fire indication panel shall provide an alarm as required by AS 2118. Sub-Contractor to allow for all wiring as required.



6 PAINTING

6.1 PAINTING GENERAL

The Contractor shall carry out the painting of all equipment supplied in this Contract in the manner as described below. He shall also take all precautions against rusting or corrosion of all parts of his plant.

The Contractor shall allow for painting the external surface of all items of machinery, apparatus, equipment, fittings, piping, hangers, brackets, supports and bases installed as part of this Contract. All sheetmetal control cabinets switchboards and distribution board enclosures and similar shall be painted internally and externally.

Exposed pipework shall be painted with one coat of suitable metal primer, and two (2) finishing coats of an approved colour. The colour shall be as directed by the Contractor. Piping in valve enclosures, plantrooms, service corridors etc., shall be painted "signal red".

Piping in false ceiling spaces, pipe ducts and other non visible areas, in general need not be finish coated. (See clause "Surface Preparation". However, all brackets and hangers in these areas shall be given a priming coat prior to installation, with the exception of galvanised surfaces which are not required to be prime coated.

All hangers, brackets and sections of equipment which are inaccessible after installation shall be painted before they are installed.

Surfaces liable to be splashed or come in contact with oil shall be painted with an oil resistant enamel of an approved colour.

No painting shall be carried out during very hot, dusty, wet or frosty weather and painting shall be done only on surfaces which are thoroughly dry.

Excepting where otherwise specified or approved, all paints and finishes shall be applied by brush when carried out on site.

Skilled labour and efficient equipment in first class order shall be employed for all painting and preparation work.

6.1.1 Surface Preparation

All surfaces shall be thoroughly prepared prior to painting and the primer used shall be suitable for the relevant surface.

The surface preparation shall include the following:

All masonry or concrete surfaces shall be smoothed and any cracks or depressions cut out and filled with an approved non-shrink filling compound. The surface shall be brushed free of dust and loose particles.

Galvanised or zinc sprayed steel surfaces and all non-ferrous services shall be cleaned of all dirt and grease and shall be given an application of PVC/Zinc chromate self-etching primer or similar before being prime coated.

All black iron or steel surfaces shall be cleaned of all rust and scale by wire brushing and all grease, flux, etc., removed. They shall be treated with an approved phosphoric acid preparation for complete rust removal.

All cast iron surfaces such as pumps etc., shall be fully degreased.

All black steel piping shall be painted externally before delivery to site.

6.1.2 Masking, Protection etc.

Finished surfaces adjacent to work being painted shall be masked wherever necessary to avoid defacement.

Any walls, beams, columns and other elements or equipment which are not to be painted shall be protected where necessary to avoid defacement.

Masks made by this Contractor's painters on building surfaces, shall be removed by the Contractor. However, all costs shall be borne by this Contractor.

6.1.3 Materials to be Used

All paints and/or painting materials must be of first quality manufacture and shall comply strictly to the requirements of the relevant Australian Standard.



7 ELECTRICAL WORK & WIRING INSTALLATION

7.1 EXTENT OF WORK

Details of the various major components of electrical equipment are specified elsewhere. In addition the Fire Protection Sub-Contractor shall provide all necessary circuit breakers, starters, relays, motor isolating switches, test switches and interlocks to achieve the functions specified in the specification.

The Fire Protection Sub-Contractor shall carry out all necessary wiring as indicated below:

- All wiring associated with the occupant warning and fire indicator panel.
- * Wiring from fire indicator panel to the ASE.
- * All wiring associated with the sprinkler valves including pressure switches, monitoring etc.

The whole of the work, including all extra-low voltage and signal circuits, shall be carried out in accordance with this specification, the drawings listed in the specification, Australian Standard 1670 - 1995 (Auto Fire Alarm Installations), the Australian Standard No. 3000 (SAA Wiring Rules), the Supply Authorities' Regulations and further instructions may be given during the progress of the work by and to the satisfaction of the Contractor.

The person or persons engaged in carrying out the electrical wiring work shall hold a current electrical contractor's licence for carrying out the work under the direct supervision of a person so licensed. A licensed electrician shall be engaged to carry out the electrical wiring work is in progress.

The installation shall be complete in every respect. All conductors, conduits and accessories necessary for safe and proper operation of the plant shall be supplied and installed to the satisfaction of the Builder, whether individually specified herein or not.

7.2 GENERAL

All wiring shall be carried out on the "loop-in" and "loop-out" system and no joints shall be made except at outlets.

All wiring shall be concealed unless otherwise specified or shown on the drawings. Generally where electrical wiring in an area is concealed the fire alarm wiring shall also be concealed.

Wiring may be surface mounted in areas without ceilings (such as service ducts and the like) surface mounted in steel conduit in plantrooms and surface mounted in PVC conduit in carparks, but otherwise no wiring shall be surface mounted without written approval.

Where cables must be surface mounted, they shall be installed in such a manner as to conform with any pattern formed panelling, beams, battens, columns and the like, and in all cases shall be as unobtrusive as possible. All surface mounted cables shall be enclosed in approved duct or conduit as specified.

7.3 METHOD OF WIRING

7.3.1 General

Install all wiring in accordance with an approved colour code, so that all wires are readily distinguishable.

All detector wiring shall be completely separated from 240 volt wiring and where it crosses 240 volt wiring a separating bridge of rigid non-conducting material shall be supplied and installed between the fire alarm and 240 volt wiring (AS 3000). In general, detector cables must be so spaced from all other wiring or otherwise protected, such that the magnitude of induced voltage in the detector circuit cannot cause a false alarm.

The minimum size of conductors shall be as follows:

240 volt	2.5 sq. mm.
D.C. wiring	0.75 sq. mm (stranded)
Wiring to remote indicators	0.75 sq. mm (flexible)
Multicore Cables	0.50 sq. mm (stranded)

However, the Sub-Contractor shall size each circuit, with due regard to voltage drop, as well as the above minimum conductor size. If large cables are required on any circuit these shall be marked on the shop drawings sent for review.

No detector wiring shall be taken through the battery compartment of the fire indicator panel.

Bare conductors twisted together to form a connection at terminals of detectors, terminal strips, etc., will not be accepted.

7.3.2 T.P.S. Wiring

Where T.P.S. wiring is specified, the wiring shall consist of PVC insulated, red P.V.C. sheathed, 0.6/1K.V grade cable (red T.P.S.).

All T.P.S. cables shall be supported in false ceiling spaces by rigid PVC saddles. Where T.P.S. cables are to be surface mounted, they shall be installed in accordance with AS 3000>

7.3.3 Wiring in Conduit

Other than red T.P.S. enclosed in conduit in certain locations, all wiring in a conduit system shall consist of P.V.C. insulated 0.6/1K.V grade stranded copper cables. All conduits enclosing single insulated cables must be mechanically continuous back to the indicator panel. In addition, if steel conduits are employed, they must be electrically continuous back to the indicator panel.

7.3.4 Terminations

Connection of cables to studs or under screw heads, shall be by means of approved type of insulated crimp lugs fastened with the correct crimping tool, to Manufacturer's recommendations.

7.4 CONDUITS

7.4.1 General

All conduit shall be Class 'B' to comply with the Australian Standard Specification and shall be not less than nom. 20mm diameter. Conduit and fittings shall be free from internal and external burrs and projections.

All conduits shall be installed and fixed in position before cables are drawn in. Where conduits are to be concealed in concrete, they shall be laid above and below reinforcement and so fixed that pouring of concrete will not disturb them. Conduits so fixed, or exposed to weather shall be temporarily plugged with a suitable cap to prevent entry to water or foreign matter until cables are drawn and fittings installed.

In any case, conduits shall be pulled through with a brush or plug of cloth to ensure them clean and dry before cabling.

All conduit work shall be prepared for a draw-in system and boxes shall be placed at each outlet to allow conductors to be drawn in.

Where conduits are installed in concrete and brickwork and otherwise not accessible after installation, intermediate boxes, elbows and tees shall not be used, and easy sets in conduit shall be used. Minimum radius of sets in concrete slabs shall be 150mm radius.

Where conduits are surface, or concealed but readily accessible, they shall be run neatly square with the building members and inspection fittings and draw in boxes shall be used throughout to ensure a complete draw-in system.

Between any two adjacent outlets, there shall not be more than four (4) normal bends, or their equivalent.

Conduits shall be sized such that the number of conductors installed does not exceed 75% of the number permitted by AS 3000.

Where surface mounted conduits are installed in car parks, plantrooms and areas where conduits may be susceptible to mechanical damage they shall be of steel.

MODIFIED DATE: 08/04/2021

7.4.2 Rigid PVC Conduits

Wherever rigid PVC conduit is installed, rigid PVC expansion couplings shall be supplied and installed at 7500mm intervals (maximum) in interior locations, and 3750mm in high temperature areas, such as roof spaces.

Expansion couplings shall be of a type that prevents entry of slurry into conduits.

All joints shall be effectively glued so that there are no "DRY" joints.

Each conduit passing through expansion joints in building shall be laid to two sections joined together with PVC flexible conduit extends 300mm on each side of the expansion joints. This flexible conduit shall be wholly enclosed within a protective sleeve consisting of PVC conduit with at least 3mm clearance all round, and the ends of the protective sleeve shall be closed to prevent entry of concrete or other foreign matter. Multiple conduits passing through expansion joints must be separated by a minimum of 100mm spacing.

All rigid PVC conduit shall be saddled to allow for expansion, at intervals not exceeding 600mm.

All outlet boxes shall be PVC. No holes shall be knocked out or drilled except those used for the entry of conduits, and boxes shall be of suitable size to accommodate fittings, wiring and conduits to be connected.

7.4.3 Flexible PVC Conduit

Where flexible lines are required in a conduit system - such as for connections to detector in ducts - then standard electrical grade flexible PVC conduit shall be used, minimum size 20mm. Each end of each flexible conduit shall be fitted with a clamp type adaptor, giving an external conduit thread, which shall be screwed into corresponding internal conduit threads in the conduit system, and the piece of equipment to be connected.

7.4.4 Steel Conduit

Where steel conduits are specified to be used, they shall be galvanised.

Should any conduit not fully meet the specification in respect of gauge, bore, etc., and if any cracking, peeling etc. of galvanising occurs during installation, the whole of the conduit from the particular batch (both installed, and to be installed) may be rejected.

All conduit ends shall be internally bevelled by reaming, to prevent damage to cable insulation.

All joints in screwed conduit embedded in concrete or brick shall be painted with rust resisting paint prior to jointing of conduits.

Each conduit passing through expansion joints in the building shall be laid in two sections, joined together with PVC covered flexible conduit extends 300mm on each side of the expansion joints. This flexible conduit shall be wholly enclosed within a flexible PVC conduit sleeve with at least 3mm clearance all round, and ends of the protective sleeve shall be closed to prevent entry of concrete, or other foreign matter. Multiple conduits passing through expansion joints must be separated by a minimum of 100mm spacing.

The entire steel conduit system shall be continuous and electrically continuous.

All outlet boxes shall be cast iron or pressed steel, of suitable size to accommodate wiring and conduits to be connected. No holes shall be knocked out or drilled except those required for the entrance of conduits.

Steel conduits shall be tightly saddled, at intervals not exceeding 1500mm.

7.4.5 Flexible Steel Conduit

Where flexible links are required in a steel conduit system such as for connections to detectors in ducts, then flexible steel conduits may be used (minimum size 20mm). Each end of each section of flexible conduit shall be fitted with an approved adaptor giving an external conduit thread, which shall be screwed into corresponding internal threads in the conduit system and the piece of equipment connected.

Joints in wiring will not be allowed within ducts. All edges of ducts against which cables can bear, shall be bushed. Tees, bends, crosses and the like shall be of the same manufacture as the duct.

8.4.4 System Speakers

The various types of loud speakers shall be supplied and installed in locations as shown on drawings.

Generally, flush type loud speakers shall be installed throughout the building where false ceilings are fitted and horn type speakers would be installed throughout such areas without ceilings.

The loud speakers shall be compatible to either 70 or 100 volt line.

The speakers shall be wired in a ring main manner and the inaudible tone generated in the Remote Amplifier Module is to monitor the total speaker circuit wiring.



8 SCHEDULE OF RATES

8.1 GENERAL

The following rates will be used to price approved variations, and shall include all costs, profit and sales tax associated with the design, supply, installation, testing and commissioning of such works. The rate shall also allow for all materials, workshop drawing alterations, labour, cartage, freight, tools, plant scaffolding, painting, appliances etc.

8.1.1 Additional Sprinklers (at any stage of the Fire Protection Contract)

The rate shall include; sprinkler head, escutcheon plate, all pipework, fittings, hangers, workshop drawing revision and painting.

Storage mode sprinkler \$

Control mode sprinkler \$

Below ceiling sprinkler \$

8.1.2 General

One (1) of installation recharge and drain down \$

FULL NAME OF TENDERER:

SIGNATURE OF TENDERER:

WITNESS: DATE:



9 SCHEDULE OF PRICES

9.1 GENERAL

Design and documentation	\$
Fire Sprinkler System	\$
Sprinkler tank	\$
Sprinkler booster pumps	\$
Occupant warning system	\$
12 Months Maintenance	\$
TOTAL	\$

FULL NAME OF TENDERER:

SIGNATURE OF TENDERER:

WITNESS: DATE:



RG FIRE CONSULTANCY

14 Narrabeen St
Narrabeen NSW 2101
M: 0419 409 119

e: richard@rgfire.com.au

FPAS Accredited Designer (No. FSD1661) NSW & Vic
ABN 51 080 369 820

2nd February 2020
Plan Management
PO Box 43
Mortdale NSW 2223

30 Loftus Rd Yennora (Project) Certificate of Compliance for Fire Services

I, Richard George, on behalf of RG Fire Consultancy Pty Ltd, Professional and Qualified Fire Services Engineers, certify in accordance with clause A5.2 of the Building Code of Australia 2019 - Vol. 1 (BCA) that the design for the above Project is compliant with the requirements of the BCA.

This certification is given in relation to the design drawings listed in the table in section 3 below and is subject to the following:

1. Scope of Works – Fire Services

The services included under this Certificate are as follows:

- a) Fire Sprinkler System
- b) Occupant Warning System

2. Relevant Design Standards

In preparing the design for the Project, we have relied on the following standards:

Standard No	Description
AS 2118.1-2017	Automatic fire sprinkler systems – Part 1 General systems
AS 1670.1-2018	Fire detection, warning, control & intercom systems
BCA E1.5	Sprinklers
BCA E2.2a cl. 7	Building occupant warning system

3. Design Drawings

Drawing No.	Description	Revision	Dated
F01	Sprinklers system – Warehouse A & B	E	02/02/2021
F02	Sprinkler system – Detail sheet	D	02/02/2021

Yours faithfully



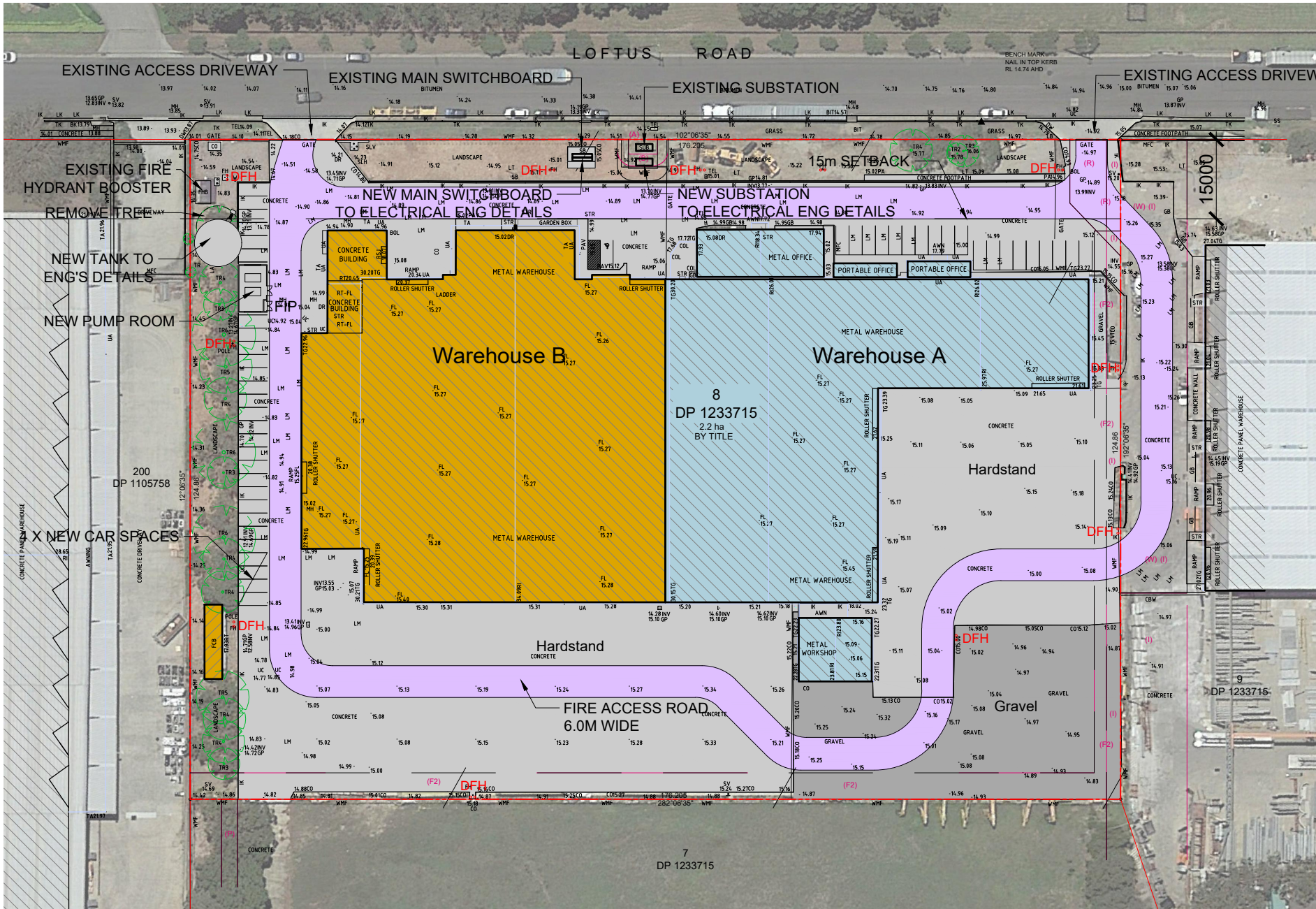
Richard George

Fire services engineer

Competent Fire Safety Practitioner

FPAS Design Accreditation No: FSD 1661 (NSW & Vic. Wet & Dry fire services)

FPAS Fire Safety Assessment Accreditation No: F001661A



Fire Access Road - 6.0m wide

DFH Double Fire Hydrants

AREA SCHEDULE

	A	B	Total
Warehouse	3,332sqm	4,141sqm	7,473sqm
Office	254sqm	469sqm	723sqm
Total	3,586sqm	4,610sqm	8,196sqm

Site Area = 2.2Ha (By Title)



CUMBERLAND
CITY COUNCIL

THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084

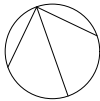
MODIFIED DATE: 08/04/2021

SITE PLAN

EASEMENT(S) - ENCUMBERANCE(S) AFFECTING SUBJECT PROPERTY

- (A) - EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE (VIDE DP1258374)
- (B) - RESTRICTION ON USE OF LAND (VIDE DP1258374)
- (I) - EASEMENT TO DRAIN WATER 10.675 AND 15.24 METRES WIDE (VIDE DP 533033)
- (F2) - EASEMENT FOR FLOOD MITIGATION WORKS 5 WIDE & VARIABLE (VIDE DP 1233715)
- (P) - EASEMENT TO DRAIN WATER 1.5 & 3 WIDE (VIDE DP 1233715)
- (R) - RIGHT OF ACCESS 9.6 WIDE & VARIABLE (VIDE DEALING AM754799)
- (W) - RIGHT OF ACCESS 12.58 WIDE (VIDE DP 1233715)

TIM FARRELL PTY LTD



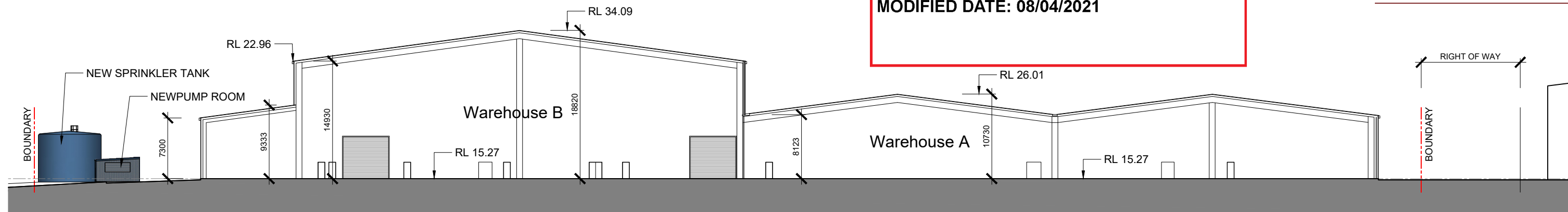


CUMBERLAND
CITY COUNCIL

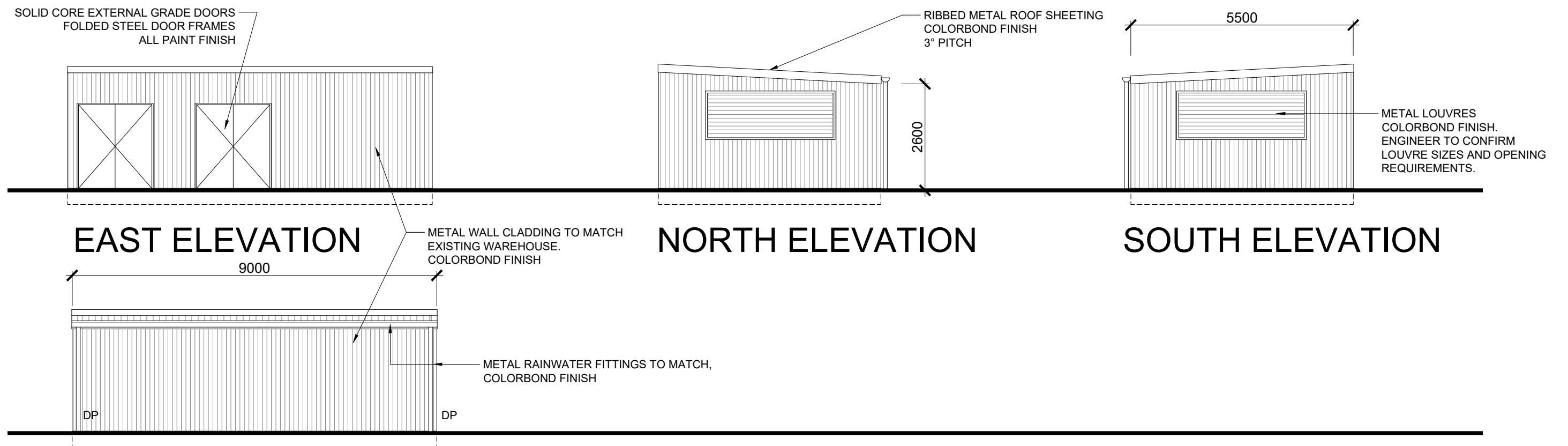
THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084

MODIFIED DATE: 08/04/2021

ONE
FIVE
ONE
PROPERTY



SECTION A - A



WEST ELEVATION

NEW PUMP ROOM

TIM FARRELL PTY LTD

Tim Farrell Pty Ltd
T: +61 2 9614 4500
tf@tfa.co www.tfa.co
ABN 92 138 300 740
Tim Farrell No.6257
Document Set ID: 6741004
Version: 1, Version Date: 10/03/2021

© This Drawing is protected
by copyright and can only
be used for the purpose for
which it was issued.

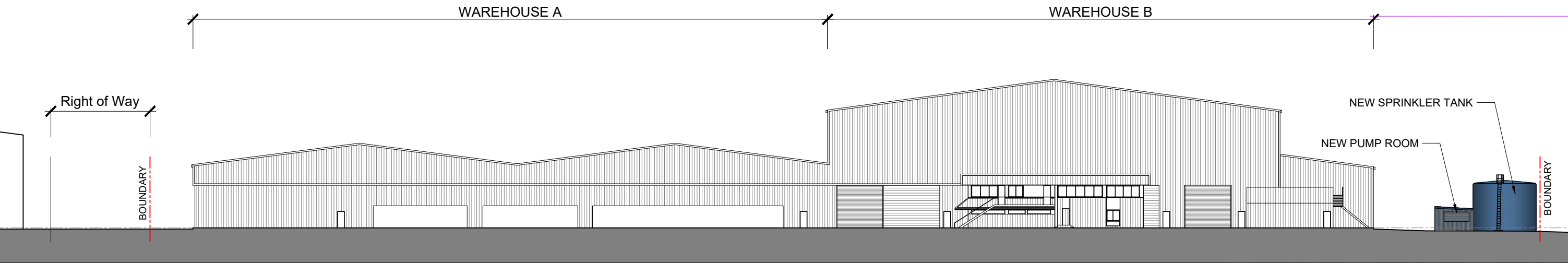
ISSUE C
ISSUE B
ISSUE A
PUMP ROOM ADDED
ISSUED FOR DA
ISSUED FOR REVIEW

29/01/2021
03/08/2020
02/07/2020



Project
FIRE SERVICES UPGRADE
Location
30 LOFTUS ROAD YENNORA, NSW
Project Number
1984
Scale
1:500 @ A3 + 100 @ A3

Drawing Title
SECTIONS + PUMP ROOM
Date
29 JANUARY 2021
Drawing Number
LTS-1.03(C)

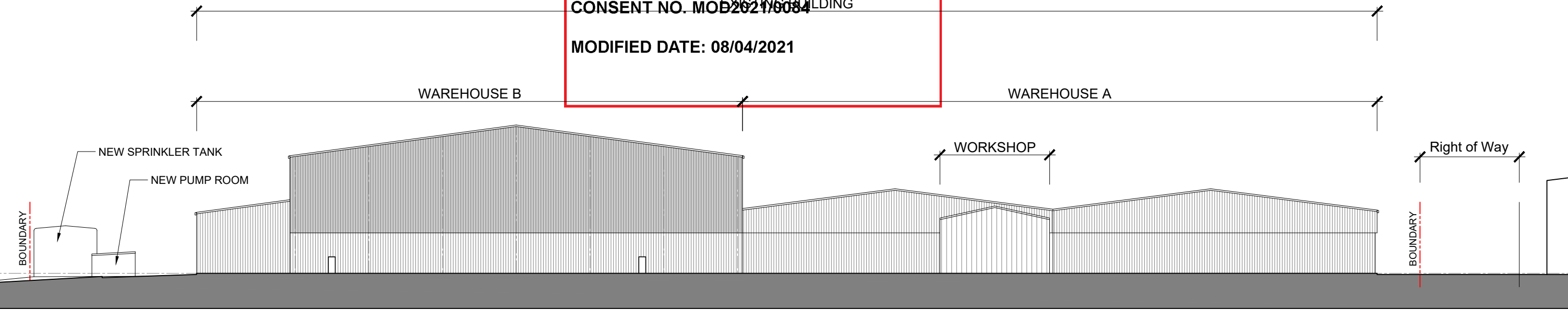


NORTH ELEVATION

 CUMBERLAND
CITY COUNCIL

THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD 2021/0084

MODIFIED DATE: 08/04/2021



SOUTH ELEVATION

TIM FARRELL PTY LTD

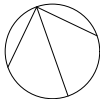
Tim Farrell Pty Ltd
T: +61 2 9614 4500
Document Set ID: 6741604
Version: 1, Version Date: 10/03/2021

© This Drawing is protected
by copyright and can only
be used for the purpose for
which it was issued.

ISSUE C
ISSUE B
ISSUE A

SPRINKLER TANK AND PUMP ROOM ADDED
ISSUED FOR DA
ISSUED FOR REVIEW

29/01/2021
03/08/2020
02/07/2020



Project
FIRE SERVICES UPGRADE
Location
30 LOFTUS ROAD YENNORA, NSW
Project Number
1984
Scale
1:500 @ A3

Drawing Title
ELEVATIONS
Date
29 JANUARY 2021
Drawing Number
LTS-1.04(C)

30 LOFTUS ROAD, YENNORA



HYDRAULIC SERVICES

DRAWING SCHEDULE

- H01 COVER SHEET & LEGEND
- H02 SITE PLAN
- H03 FLOOR PLAN
- H03 FIRE HOSE REEL COVERAGE
- H04 FLOOR PLAN
- H04 FIRE HYDRANT COVERAGE

LEGEND

— SW —

STORMWATER

— S —

SUBSOIL

— SD —

SEWER DRAINAGE

— V —

VENT PIPE

— C —

COLD WATER

— RWR —

RAINWATER REUSE

— H —

HOT WATER

— G —

GAS

— F —

FIRE HYDRANT

— FR —

FIRE HOSE REEL

— HL —

HIGH LEVEL SERVICE

— e —

EXISTING SERVICE

ST 100

→

FLOW TO ABOVE

ST 100

←

FLOW TO BELOW

SWP

→

STORMWATER GRATED PIT

GTD

→

GRATED TRENCH DRAIN

SV

→

STOP VALVE

BV

→

BALANCING VALVE

SVI

→

STOP VALVE IN PATHBOX

TMV

→

THERMOSTATIC MIXING VALVE

HT

→

HOSE TAP

WM

→

WATER METER

TD

→

TUNDISH PENETRATING SLAB

FW

→

FLOOR WASTE

BTFW

→

BASKET TRAP FLOORWASTE

BT

→

BOUNDARY TRAP

OG

→

OVERFLOW GULLY

CO

→

CLEAR OUT

DFH

→

DOUBLE FIRE HYDRANT

FHR

→

STREET HYDRANT

FR

→

FIRE HOSE REEL

RPZD

→

DOUBLE CHECK VALVE

RPZD

→

REDUCED PRESSURE ZONE DEVICE

GM

→

GAS METER

BR

→

BOUNDARY REGULATOR

GSSOB

→

GAS SAFETY SHUT OFF BUTTON

GSSOSV

→

GAS SAFETY SHUT OFF SOLENOID VALVE

GSSOR

→

GAS SAFETY SHUT OFF RESET BUTTON

BV

→

BOOSTER VALVE

B

BASIN

BT

BOUNDARY TRAP

BTFW

BASKET TRAP FLOORWASTE

CO

CLEAROUT

CW

COLD WATER

DFH

DOUBLE FIRE HYDRANT

DP

DOWNPIPE

DWG NO.

DRAWING NUMBER

EX or e

EXISTING

FHR

FIRE HOSE REEL

FW

FLOOR WASTE

GAS

GAS

GTD

GRATED TRENCH DRAIN

HL

HIGH LEVEL

HT

HOSE TAP

HW

HOT WATER

HWU

HOT WATER UNIT

IL

INVERT LEVEL

MR

MAIN ROOF

OFG

OVERFLOW GULLY

PA

PEDESTRIAN AWNING

RL

REDUCED LEVEL

RPZD

REDUCED PRESSURE ZONE DEVICE

SHR

SHOWER

SK

SINK

ST

STACK

SWP

STORMWATER PIT

TD

TUNDISH

TTD

TRAPPED TUNDISH

TMV

THERMOSTATIC MIXING VALVE

VP

VENT PIPE

WC

WATER CLOSET

WM

WATER METER

C

CUMBERLAND CITY COUNCIL

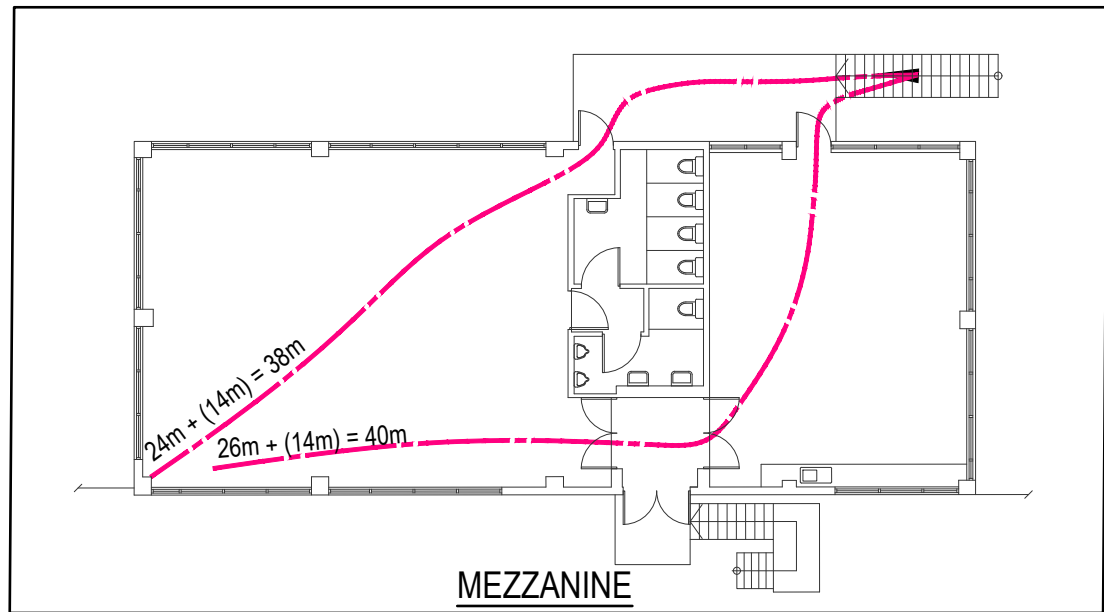
THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084

MODIFIED DATE: 08/04/2021

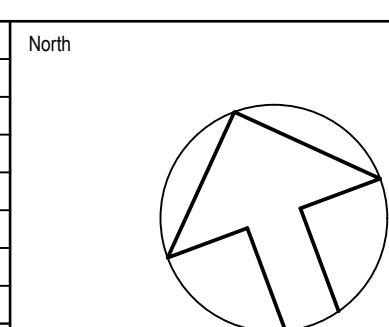
			North			Architect			Client			Hydraulic Consultant			Project			Drawing			Issue		
															30 LOFTUS ROAD YENNORA			HYDRAULIC SERVICES COVER SHEET & LEGEND			PRELIMINARY ISSUE: NOT FOR CONSTRUCTION		
						Australia New Zealand						UNIT 19, 18 WURROOK CIRCUIT, CARINGBAH NSW 2229									Date: 30.06.20		
						Building Measurement Specialist						PO BOX 284, GYMEA NSW 2227									Scale: NTS		
						3D Laser Scanning						PHONE No (02) 9526 1923									Drawn: POK		
						ph. 02 9629 9377						EMAIL: paul@inlinehs.com.au www.inlinehydraulicservices.com.au									Design: PM		
						www.realsolve.com.au															Drawing No.		
																					No in set: -		
																					2019-0408		
																					H01 / P3		



Issue		PRELIMINARY ISSUE: NOT FOR CONSTRUCTION	
Date:	30.06.20	Project No.	2019-0408
Scale:	1:200		
Drawn:	POK	Drawing No.	H03 / P3
Design:	PM		
No in set:	-		



P3	02.02.21	DEVELOPMENT APPLICATION			
P2	04.08.20	DEVELOPMENT APPLICATION			
P1	30.06.20	PRELIMINARY ISSUE			
No.	Date	Details	No.	Date	Details
Amendments			Amendments		



Architect
Australia | New Zealand

REALSERVE

Start confident.

Building Measurement Specialist
Consulting Land Surveyors
3D Laser Scanning

ph. 02 9629 9377
www.realservice.com.au

Client	
--------	--

Hydraulic Consultant

IN LINE
HYDRAULIC SERVICES

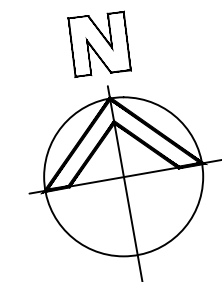
UNIT 19, 18 WURROOK CIRCUIT, CARINGBAH NSW 2225
PO BOX 284, GYMEA NSW 2227
PHONE NO (02) 9526 1923
EMAIL : paul@inlinenhs.com.au www.inlinehydraulicservices.com.au

Project
30 LOFTUS ROAD
YENNORA

Drawing
HYDRAULIC SERVICES
FLOOR PLAN
FIRE HYDRANT COVERAGE

Issue		PRELIMINARY ISSUE: NOT FOR CONSTRUCTION	
Date:	30.06.20	Project No. 2019-0408	
Scale:	1:200		
Drawn:	POK		
Design:	PM	Drawing No. H04 / P3	
No in set:	-		

DO NOT SCALE





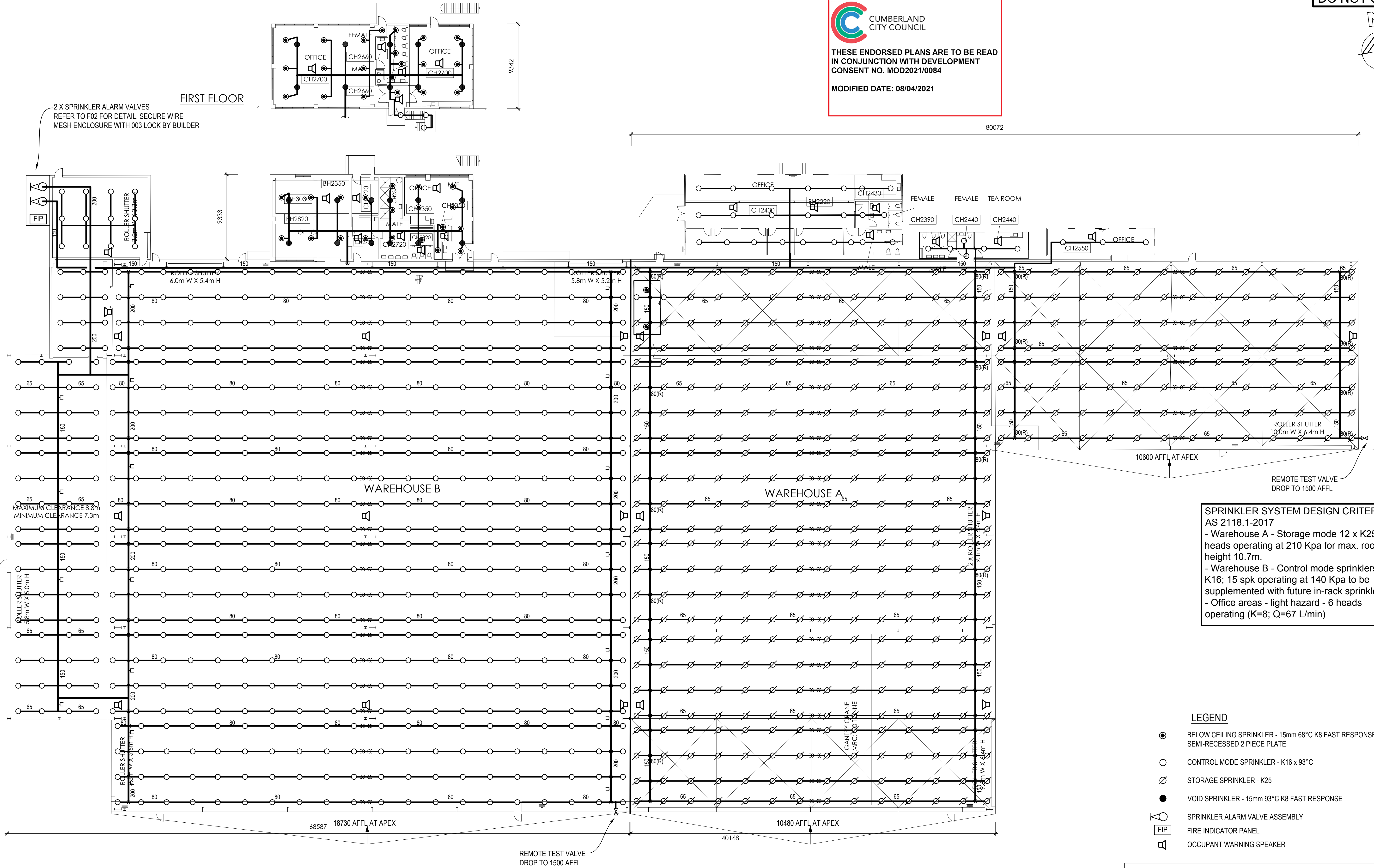
CUMBERLAND
CITY COUNCIL

THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084

MODIFIED DATE: 08/04/2021

FIRST FLOOR

2 X SPRINKLER ALARM VALVES
REFER TO F02 FOR DETAIL. SECURE WIRE
MESH ENCLOSURE WITH 003 LOCK BY BUILDER



SPRINKLER SYSTEM DESIGN CRITERIA
AS 2118.1-2017

- Warehouse A - Storage mode 12 x K25 heads operating at 210 Kpa for max. roof height 10.7m.
- Warehouse B - Control mode sprinklers - K16; 15 spk operating at 140 Kpa to be supplemented with future in-rack sprinklers
- Office areas - light hazard - 6 heads operating (K=8; Q=67 L/min)

- LEGEND**
- BELOW CEILING SPRINKLER - 15mm 68°C K8 FAST RESPONSE WHITE SEMI-RECESSED 2 PIECE PLATE
 - CONTROL MODE SPRINKLER - K16 x 93°C
 - ⊗ STORAGE SPRINKLER - K25
 - VOID SPRINKLER - 15mm 93°C K8 FAST RESPONSE
 - ⊕ SPRINKLER ALARM VALVE ASSEMBLY
 - ⊞ FIP FIRE INDICATOR PANEL
 - ⊞ OCCUPANT WARNING SPEAKER

THIS IS A DESIGN & CONSTRUCT CONTRACT
THE FIRE CONTRACTOR SHALL ALLOW FOR
FULL CO-ORDINATED DESIGN TO ACHIEVE
AUSTRALIAN STANDARD COMPLIANCE

REV	REVISION DETAILS	BY	APP	DATE
E	WH A CHANGED TO STORAGE MODE & WH B TO HIGH HAZARD	RG	RG	2-2-21
D	FOR DA - WAREHOUSE A & B NAMING CORRECTED	RG	RG	4-8-20
C	FOR DA	RG	RG	2-8-20
B	TENDER ISSUE	RG	RG	1-6-20
A	PRELIMINARY	RG	RG	16-4-20

This drawing designed by CFSP: Richard George
FPAS accredited designer No. - FSD1661
Fire services designed to following:
- AS 2118.1-2017 - Automatic Fire Sprinkler Systems - General Requirements

Richard George
Date: 17/4/20

Project Management:

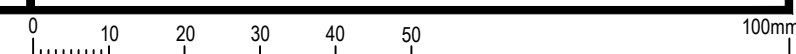


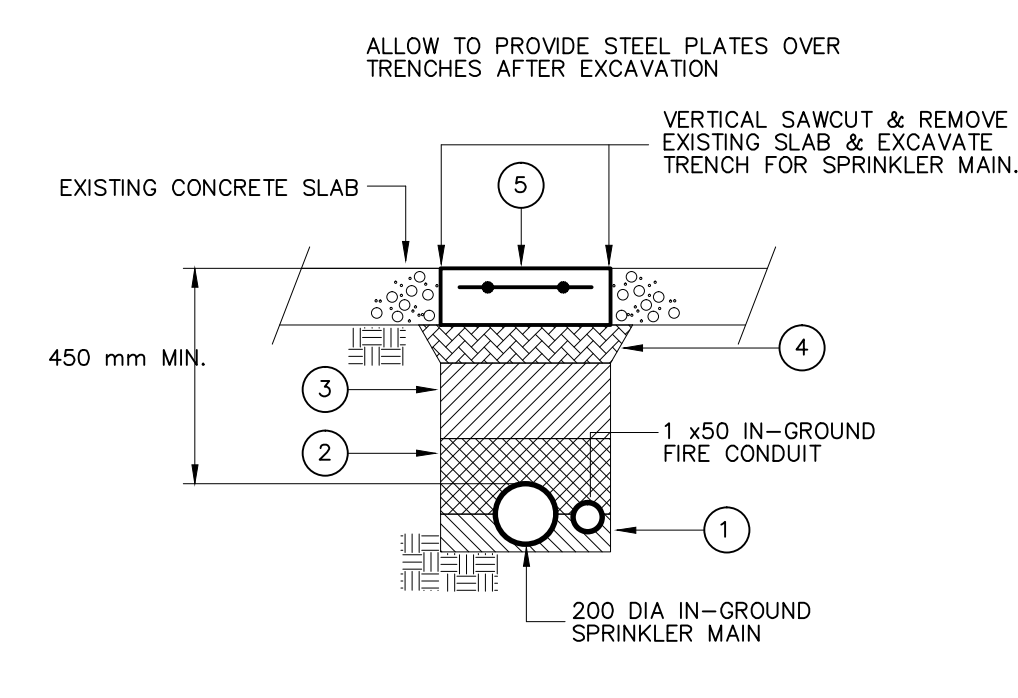
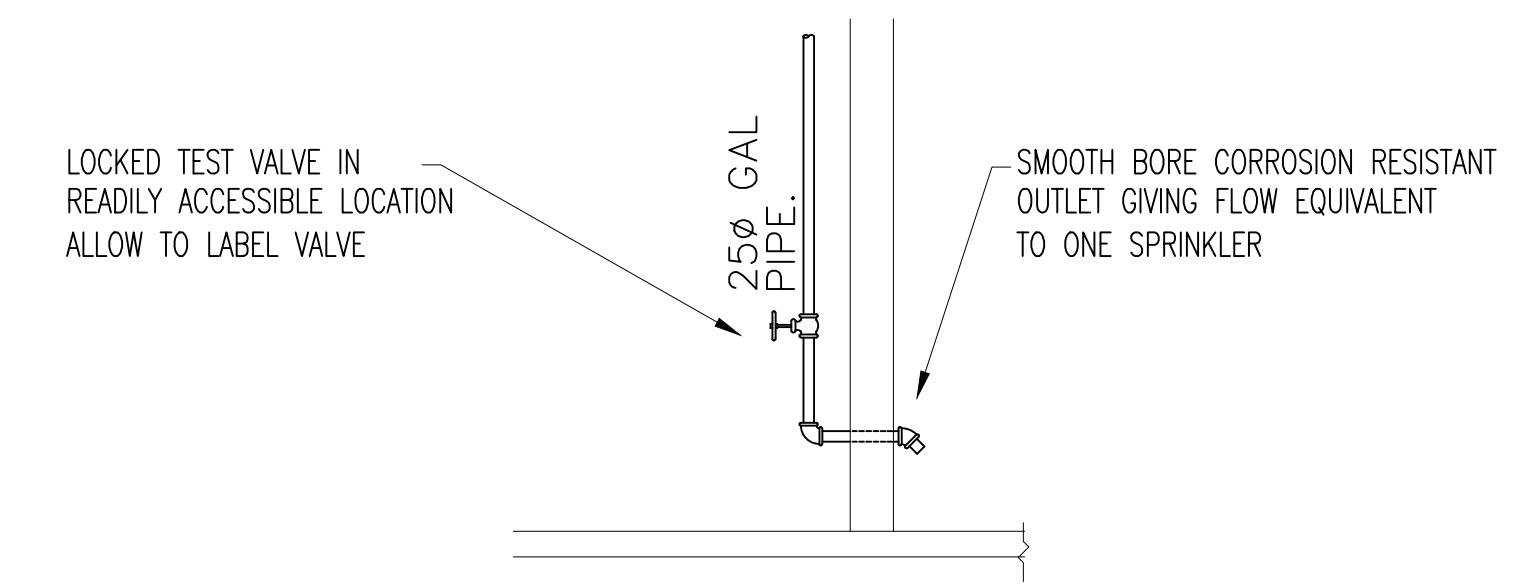
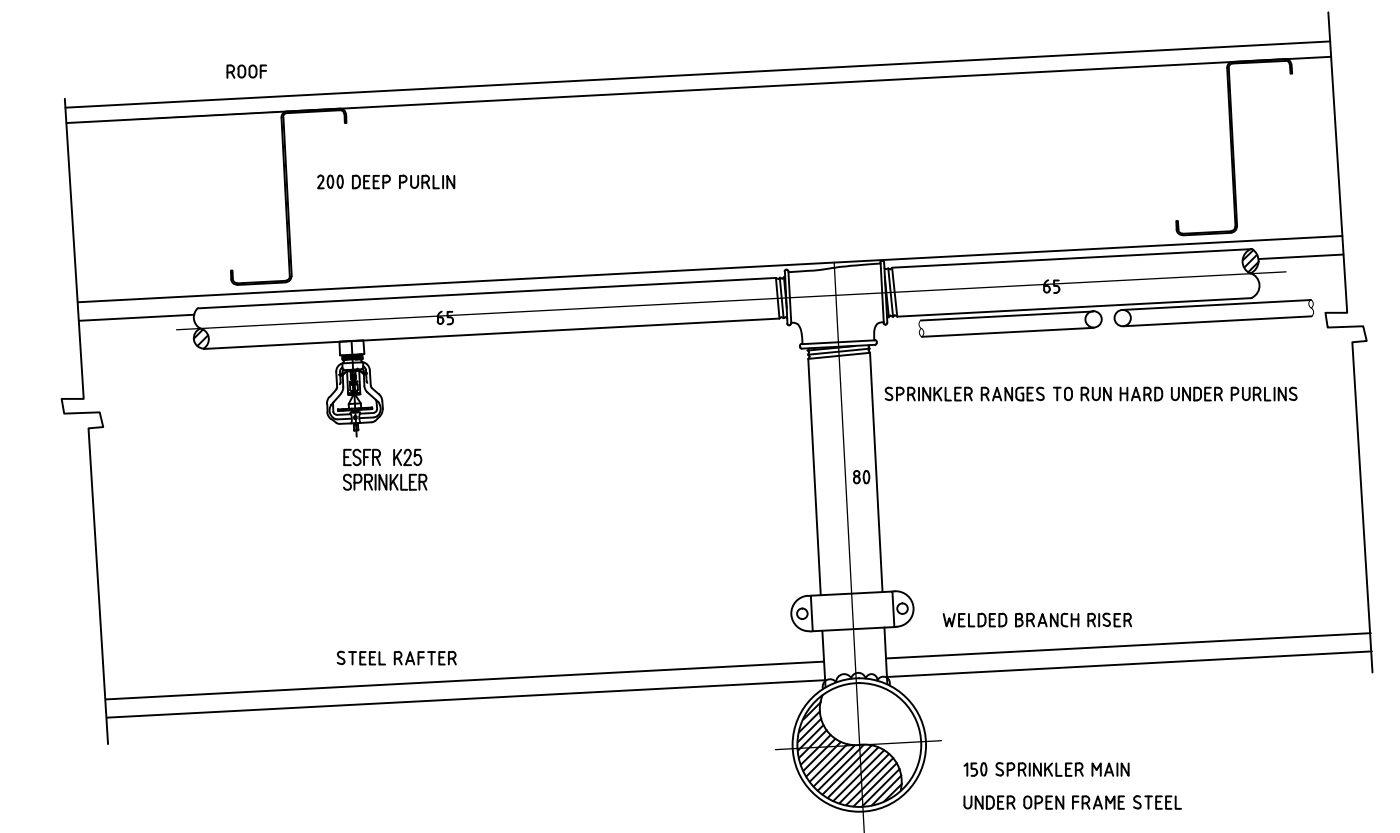
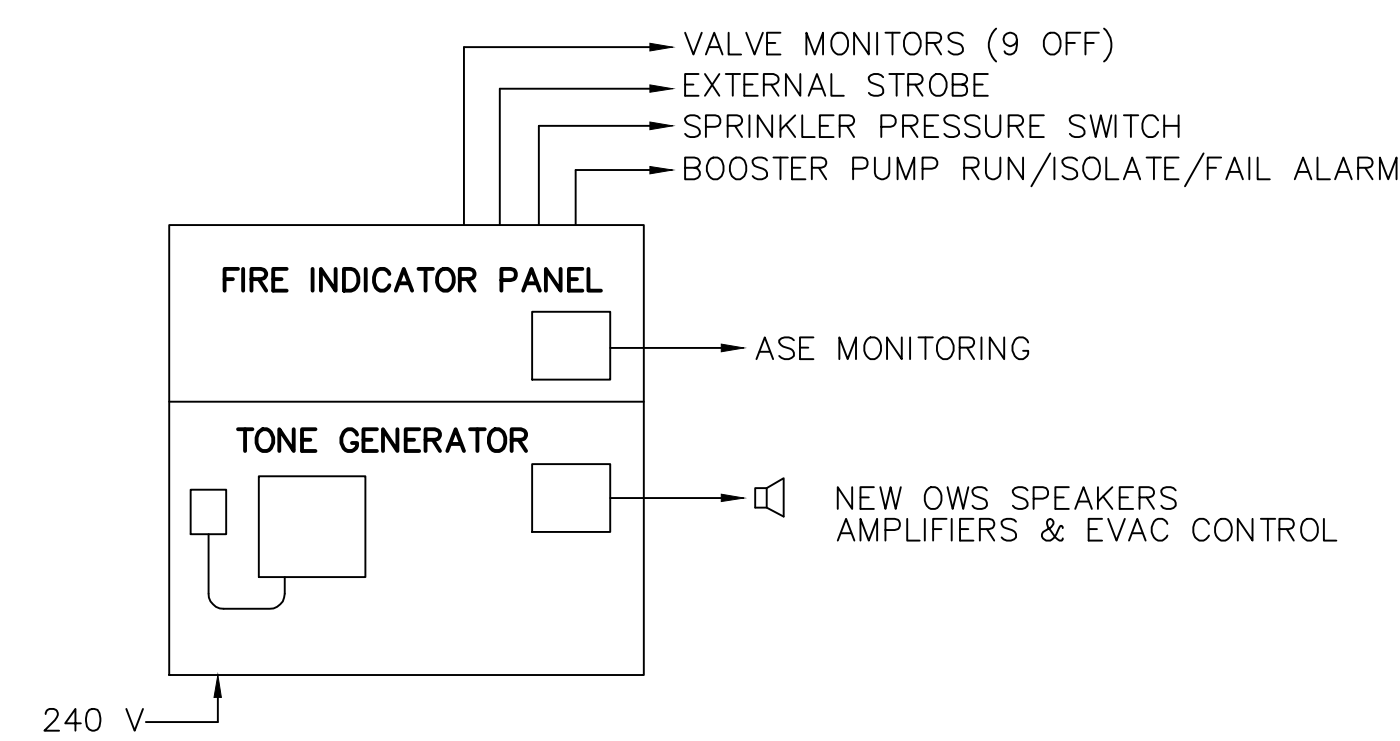
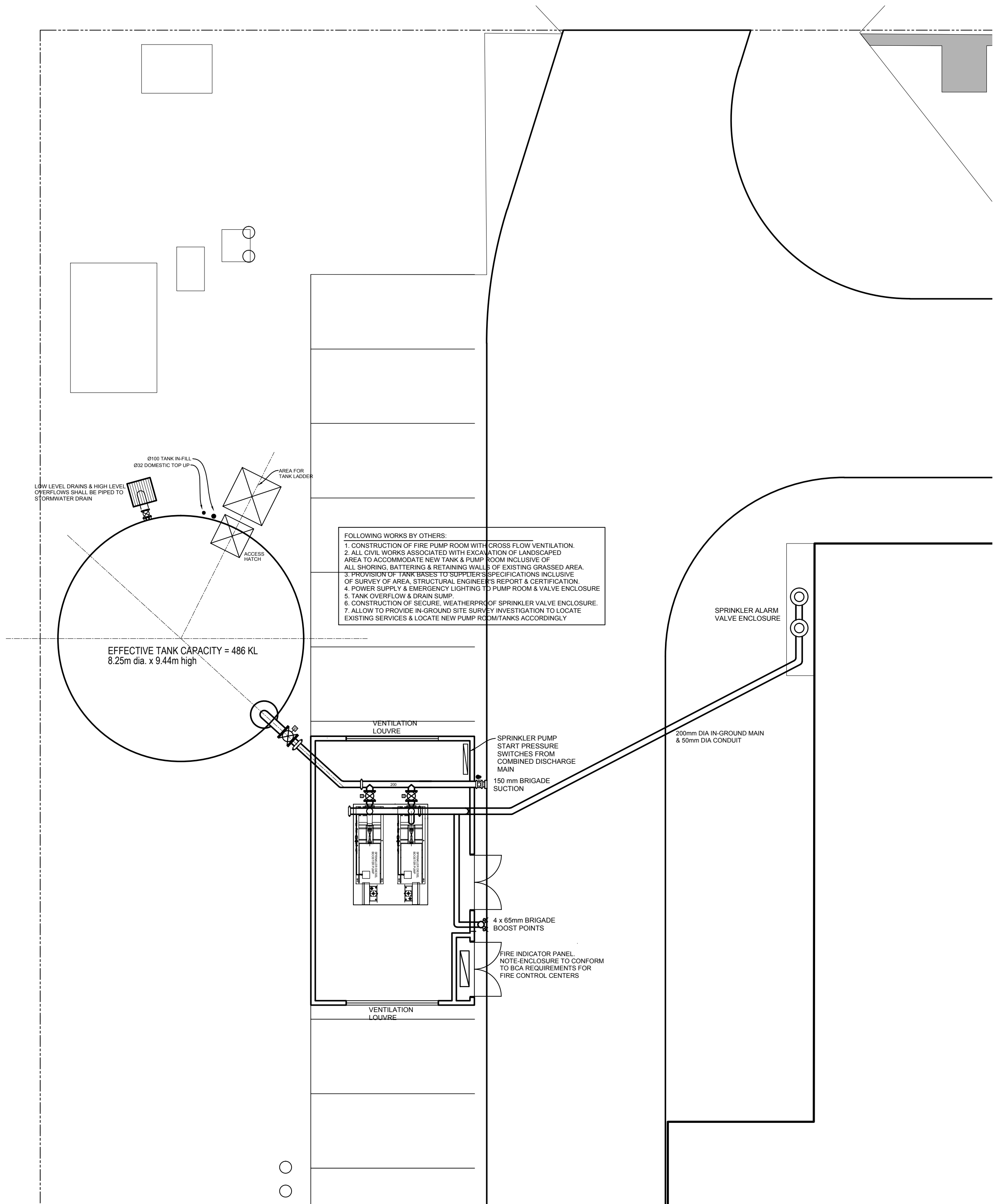
DESIGN BY:
RG FIRE CONSULTANCY
14 NARRABEEN ST NARRABEEN
TELEPHONE 0419 409 119
EMAIL - richard@rgfire.com.au
FPAS Design Accreditation No. FSD 1661

PROJECT:
**30 LOFTUS RD
YENNORA**

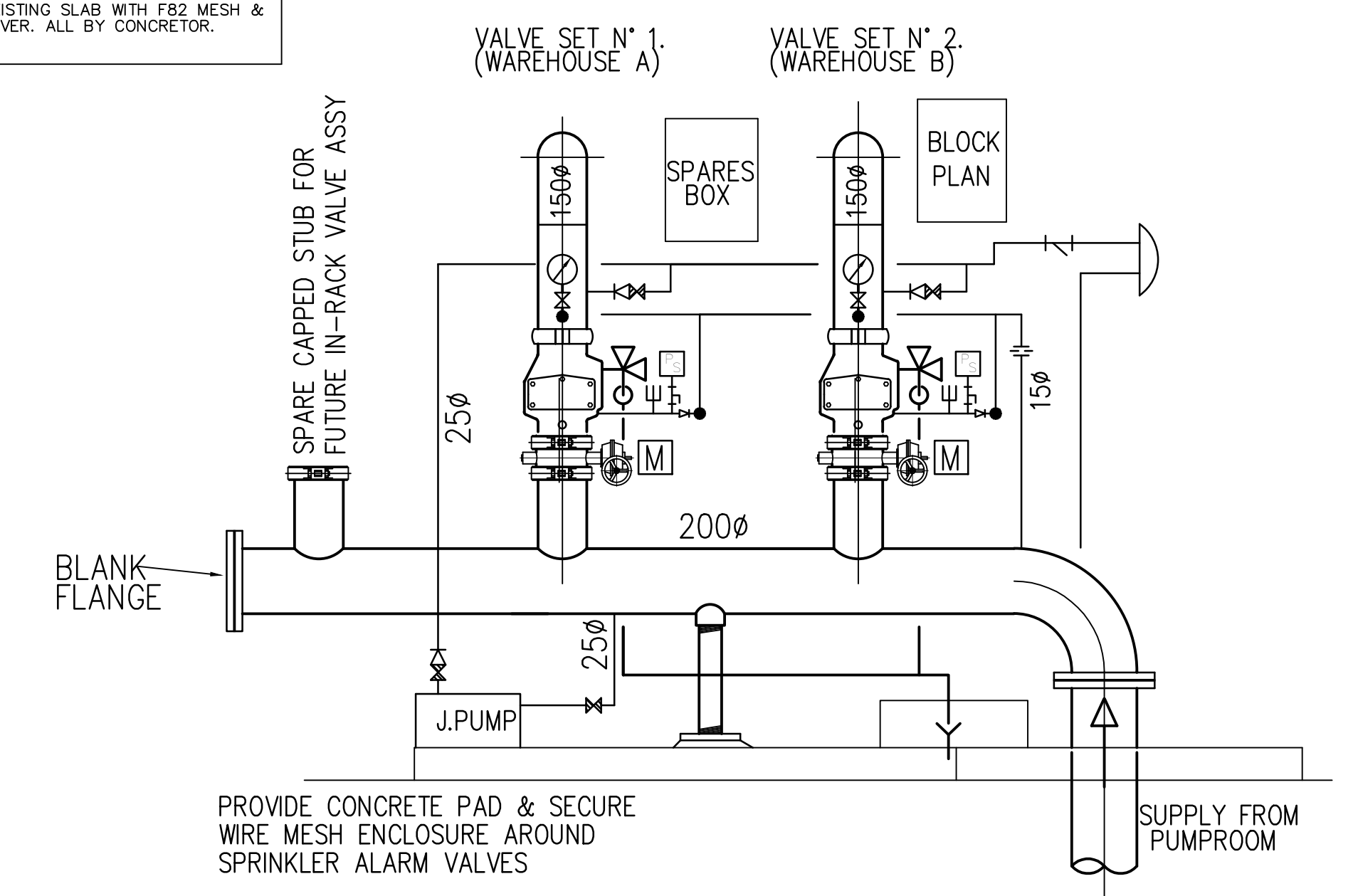
DRAWING TITLE:
**SPRINKLER SYSTEM
WAREHOUSE A & B**

DATE: APRIL 20	DRAWN: RG
SCALE: 1:200	DESIGN: RG
PROJECT No. —	DRAWING No: F01
	ISSUE: E





ITEM	DESCRIPTION
1	75mm COARSE BEDDING SAND
2	200mm COARSE BEDDING SAND WASHED IN & COMPACTED
3	200mm COARSE BEDDING SAND WASHED IN & COMPACTED IF REQUIRED TO ACHIEVE DEPTH OF COVER.
4	100mm N32 (32MPa) CONCRETE & VIBRATED IN BY CONCRETOR.
5	NEW N32 CONCRETE THICKNESS TO MATCH EXISTING SLAB WITH F82 MESH & 50mm COVER. ALL BY CONCRETOR.



THIS IS A DESIGN & CONSTRUCT CONTRACT
THE FIRE CONTRACTOR SHALL ALLOW FOR
FULL CO-ORDINATED DESIGN TO ACHIEVE
AUSTRALIAN STANDARD COMPLIANCE

REV	REVISION DETAILS	BY	APP	DATE
D	WATER SUPPLIES REVISED TO TANK & PUMPS	RG	RG	2-2-21
C	FOR DA	RG	RG	2-8-20
B	TENDER ISSUE	RG	RG	1-6-20
A	PRELIMINARY	RG	RG	16-4-20

This drawing designed by CFSP: Richard George
FPAS accredited designer No. - FSD1661
Fire services designed to following:
- AS 2118.1:2017 - Automatic Fire Sprinkler Systems - General Requirements
Date: 17/4/20

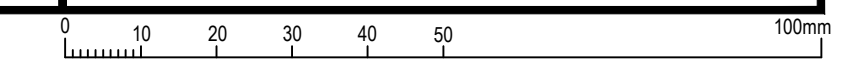
Project Management:

DESIGN BY:
RG FIRE CONSULTANCY
14 NARRABEEN ST NARRABEEN
TELEPHONE 0419 409 119
EMAIL - richard@rgfire.com.au
FPAS Design Accreditation No. FSD 1661

PROJECT:
**30 LOFTUS RD
YENNORA**

DRAWING TITLE:
**SPRINKLER SYSTEM
DETAIL SHEET**

DATE: APRIL 20
SCALE: NTS
PROJECT No. -
DRAWING No: F02
ISSUE: D
DRAWN: RG
DESIGN: RG



ARBORICULTURAL IMPACT ASSESSMENT

30 Loftus Road,
Yennora
NSW



Treerepairs
12 Gore Street,
Greenwich, NSW, 2065
treerepairs@gmail.com
Mobile: 0449610919
ABN: 17441140433

REPORT COMMISSIONED BY PLAN PROJECT MANAGEMENT
C/O ACTION TREE MANAGEMENT
REPORT PREPARED BY NICK MAYNARD

TABLE OF CONTENTS

1. DISCLAIMER.....	3
2. SCOPE OF WORK	4
3. EXECUTIVE SUMMARY.....	5
4. METHODOLOGY	6
5. SITE DETAILS.....	7
5.1 SITE LOCATION MAP	7
5.2 SITE AERIAL IMAGE - TREE LOCATION.....	7
6. TREE SCHEDULE	8
7. DISCUSSIONS	9
7.1 DEVELOPMENT PROPOSAL	9
7.2 LEGISLATION REVIEWED FOR THIS ASSESSMENT	9
7.3 TREE VALUE & SIGNIFICANCE	9
7.4 CONSTRUCTION IMPACTS.....	10
7.5 TREE PROTECTION ZONES	10
7.6 TREE PROTECTION METHODS	10
8. CONCLUSIONS.....	11
9. RECOMMENDATIONS	11
10. REFERENCES.....	11
9. APPENDICES.....	12
APPENDIX 1- DEFINITION OF HEALTH CLASSIFICATIONS	12
APPENDIX 2 - DEFINITIONS OF TREE AGE CLASSIFICATIONS.....	12
APPENDIX 3 - DEFINITION CATEGORIES OF TREE STRUCTURE.....	13
APPENDIX 4 - USEFUL LIFE EXPECTANCY (ULE) CATEGORIES	13
APPENDIX 5 - LANDSCAPE SIGNIFICANCE CATEGORIES.....	14
APPENDIX 6 - DEVELOPMENT IMPACT CATEGORIES.....	16
APPENDIX 7 - USEFUL LIFE EXPECTANCY (ULE) CATEGORIES	16
APPENDIX 8 - CALCULATING THE DBH	17
APPENDIX 9 - CALCULATING THE SRZ.....	17
APPENDIX 10 - CALCULATING THE TPZ.....	17
APPENDIX 11 - SITE SURVEY: TREE LOCATION	18
APPENDIX 12 - SITE PLAN: TREE LOCATION	18
APPENDIX 13 - SUBJECT TREE IMAGE.....	20
12. AUTHORS QUALIFICATIONS & EXPERIENCE	21



CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

1. DISCLAIMER

This document in its entirety is for the exclusive use of the client of Treerepairs only.

Treerepairs will not be held liable for any use or interpretations from any other person or third party. This report remains the intellectual property of Treerepairs and any individual or company must have written consent prior to its use for any other purpose.

All inspections and assessments were carried out using Visual Tree Assessment methods (VTA) from ground level only and do not include the use of diagnostic devices.

Although great care is taken to accurately diagnose the condition of the tree, using accepted industry practices; the arborist is limited in determining the exact structural integrity of the tree by interpreting mainly exterior features.

There are multiple factors both physical and environmental such as extreme climatic events and conditions that could lead to possible structural failures in trees which would not have been possible to predict or identify from VTA methods and assessments.

Any protection or preservation methods recommended are not a guarantee of tree survival or safety but have been recommended to improve vigour or reduce risk only.

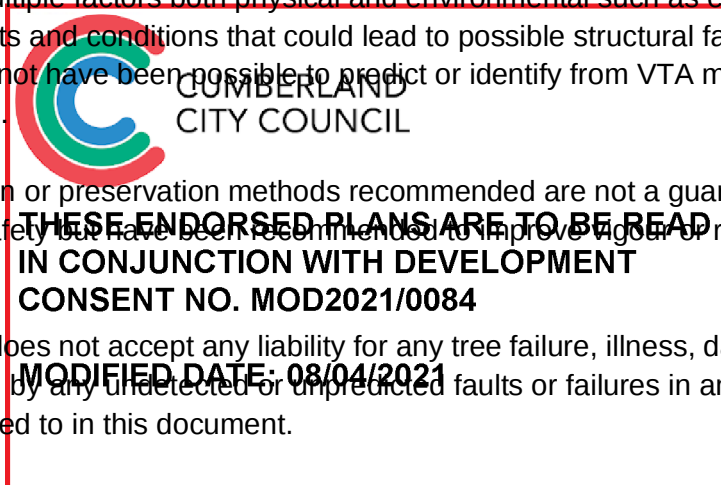
Treerepairs does not accept any liability for any tree failure, illness, damage or injury caused by any undetected or unpredicted faults or failures in any tree or part thereof referred to in this document.

Treerepairs accepts no responsibility for any failure, loss or decline, damage or injury caused by any tree covered in this document due to any meteorological or other unforeseen events.

It is the clients' responsibility to maintain on going inspections and assessments of trees covered in this document and obtain the services of suitably qualified arborists to carry out the work where necessary.

Any arboricultural works recommended should be carried out according to the Australian Standard 'AS:4070-2009 Protection of Trees on Development Sites' and 'AS:4373-2007 Pruning of Amenity Trees'.

This document and its recommendations are only valid for 12 months from the document's submission date of the document.



2. SCOPE OF WORK

On the 12th February 2021, Action Tree Management commissioned Treerepairs to prepare an Arboricultural Impact Assessment (AIA) for one tree located at 30 Loftus Road, Yennora.

The assessed AIA area is an 'Industrial Area' within the Local Government Area (LGA) of Cumberland City Council.

As part of this AIA, a standard arboricultural survey was conducted on 1 x Tallowwood (*Eucalyptus microcorys*). The remaining site trees will not be impacted by the proposed development.

The survey identified tree species while assessing tree condition and estimating its age.

The subject trees physical parameter has been measured, and has had its heritage, ecological and amenity value determined. Based on these findings an unbiased retention value was able to be awarded to the surveyed tree.

The combined collected data from the survey was used together with formulas outlined in the Australian Standard 'AS:4970-2009 Protection of Trees on Development Sites' to calculate the subject trees Structural Root Zone (SRZ) and the Tree Protection Zone (TPZ).

The SRZ has been provided to identify areas where subterranean encroachments will compromise structural roots, and weaken the trees anchoring to the ground.



3. EXECUTIVE SUMMARY

This Arboricultural Impact Assessment (AIA) has been prepared for 30 Loftus Road, Yennora. This site lies in the Local Government Area (LGA) Cumberland City Council.

The proposed development of this site includes the construction of 'New Sprinkler Tank and Pump Room'. To facilitate this construction Tree 1 will require removal. Refer to Appendix 12 for details.

An arboricultural survey was conducted on 12th February 2021 and concerns one tree only.

The remaining site trees will not be impacted but a survey of these trees, which include height and spread have been provided in Appendix 11.

The tree assessed is subject to the requirements of 'Holroyd Development Control Plan 2013'.

A summary of tree impacts during the proposed development is as follows:

Tree 1: Tallowwood (*Eucalyptus*)

Tree 1 is a site tree that is to be removed to facilitate the development proposal.

Tree 1 has been awarded a 'Low - Moderate' retention value.

Tree 1 will require council consent before it can be removed and should be assessed for removal as part of the sites DA.



4. METHODOLOGY

This report is based on the tree data collected from the subject site, and data estimated from adjoining Third-Party sites.

An arboricultural survey/assessment was performed on 12th February 2021.

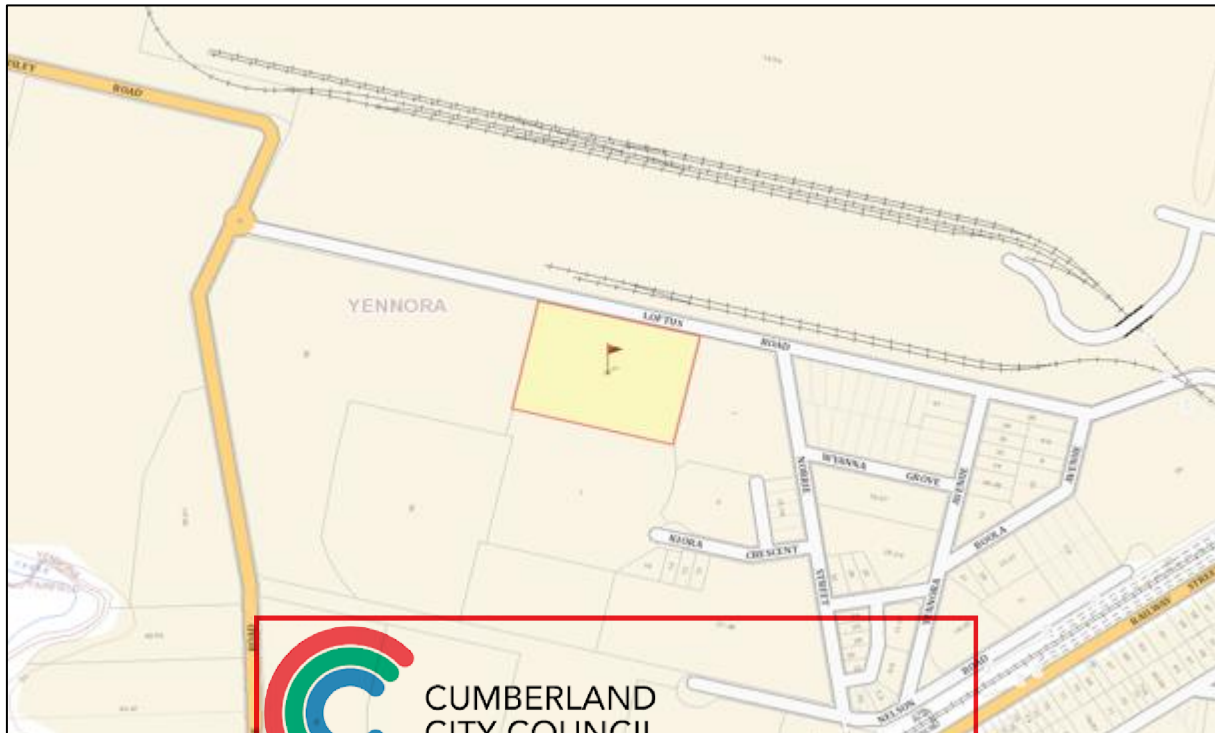
All data and arboricultural observations presented within this Arboricultural Impact Assessment were collected using the following methods:

- Site plans supplied on behalf of the client on 12th February 2021,
- No root mapping, ground excavations, soil sampling, woody tissue testing or dissecting, or any other kind of invasive testing was performed for this report,
- Tree inspections were conducted by means of Visual Tree Assessment (VTA),
- All inspections and measuring tasks were performed from ground level,
- All trees are provided with an identification number for reference purposes,
- Trees were identified using NSW Flora Online (The National Herbarium of NSW, Royal Botanical Gardens, Sydney),
- Observations of tree health, vigour and condition were made by using canopy spread, canopy cover, canopy density, foliage size, foliage colour, extension growth, epicormic growth, presence of dieback, presence and volume of deadwood and the presence of any major pests or diseases as indicators,
- Each tree was visually inspected for the presence of wildlife, existing wildlife habitat, and any wildlife habitat opportunities,
- Tree diameter at Breast Height (DBH) was calculated by measuring tree stem circumference at 1.4m above ground level, then dividing that by Pi,
- Tree canopy spread was measured in meters in all cardinal directions,
- Height of all trees was estimated from extensive prior experience,
- Useful Life Expectancy (ULE) methodology was used to find relative ratings for each tree within and around the site,
- Landscape Significance for each tree within and around the site was determined by assessing their Heritage, Ecological and Amenity values,
- Retention Values were determined for site trees only using the determined ULE and Landscape Significance rating results as a primary consideration,
- Site maps and aerial images were sourced 12th February 2021 by N. Maynard.



5. SITE DETAILS

5.1 SITE LOCATION MAP



SITE MAP 1: Site location Location (NSW Sixmaps 2021.)

5.2 SITE AERIAL IMAGE - TREE LOCATION



AERIAL IMAGE 1: Tree Location (NSW Sixmaps 2021).

6. TREE SCHEDULE

	GENUS & SPECIES	COMMON NAME	AGE CLASS	HT (m)	DBH (cm)	CANOPY SPREAD (m)				GENERAL HEALTH & VIGOUR	GENERAL STRUCTURE & FORM	USEFUL LIFE EXPECTANCY (ULE)	LANDSCAPE SIGNIFICANCE			RETENTION VALUE	SRZ RADIUS (m)	TPZ RADIUS (m)	PROPOSED ACTION
						N	E	S	W				HERITAGE	ECOLOGICAL	AMENITY				
1	<i>Eucalyptus microcorys</i>	Tallowwood	Mature	10	40	3	3	4	4	Fair / Good	Fair / Fair	Under 5 Years	Low	Low	Low - Moderate	Low - Moderate	2.25	4.80	Remove & Replenish

TABLE 1: Tree schedule (Data collected February 2021).



7. DISCUSSIONS

7.1 DEVELOPMENT PROPOSAL

The proposed development of this site includes the removal of 1 x Tallowwood (*Eucalyptus microcorys*) to allow for the construction of 'New Sprinkler Tank and Pump Room'.

7.2 LEGISLATION REVIEWED FOR THIS ASSESSMENT

In order to ensure all legal requirements are met when determining which trees can be retained or removed on this development site a number of Local Government Area (LGA) Policies and documents were reviewed:

- Holroyd Development Control Plan 2013,
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017,
- Environmental Protection and Biodiversity Conservation Act 2016.

7.3 TREE VALUE & SIGNIFICANCE

7.3.1 Useful Life Expectancy (ULE)

The Useful Life Expectancy (ULE) assessment was developed by Jeremy Barrell in 1996. The objective of an ULE assessment is to determine the relative value of an individual tree for the purpose of informing future management options.

ULE is the safe 'with an acceptable level of risk' life expectancy of a tree modified by economic considerations. Trees that remain in an amenity landscape can have their ULE managed by regular tree maintenance and inspections.

The subject tree was awarded a 'low' ULE due to a number of factors which include a documented history of 'significant limb/branch failure', a documented 'decline in health' and documented site 'subterranean plumbing issues'.

7.3.2 Landscape Significance

The subject tree has had its landscape significance rated. This value can be fairly subjective and have known to be assessed inaccurately for deceptive purposes. To ensure a consistent evaluation approach the assessment criteria tabled in Appendix 5 has been used in this report.

The determined value helps give an understanding of the relative significance this tree holds in this particular area. The significance of this individual tree within this landscape can be determined by combination of amenity, environmental and heritage factors, which include the importance and value it offers the local area and the community, as a whole.

It has been determined that the subject tree holds no heritage value, no heritage significance or no association with any heritage item. It has also been determined that the subject tree is not classified as being part of a vulnerable, threatened or endangered ecological community that provides habitat for native fauna or fauna classified as vulnerable or threatened under the Biodiversity Conservation Act 2016.

7.33 Retention Value

The site assessed for this report have been assigned a 'Low' retention value.

A trees retention value is increased or diminished based on its sustainability in the landscape, which is expressed within a trees ULE.

A tree that has a high Landscape Significance rating, but low remaining ULE, has a diminished value for retention and therefore has appropriate the Retention Value assigned. Conversely trees with a low Landscape Significance rating, even with a long remaining ULE, are considered to have a diminished value for retention.

7.4 CONSTRUCTION IMPACTS

7.41 Specific Activities Impacting Tree

The subject has been proposed for removal.

7.5 TREE PROTECTION ZONES

7.51 TPZ Encroachment

TPZ distances are designed to preserve sufficient root mass so as to avoid any (permanent) reduction of tree health resulting from development and construction works.

As the subject has been proposed for removal this has not been considered.

7.6 TREE PROTECTION METHODS

7.61 TPZ Information

As the subject tree has been proposed for removal the installation of physical tree protection will not be required.



8. CONCLUSIONS

One tree been assessed for this Arboricultural Impact Assessment.

The remaining site trees are growing a sufficient distance from the proposed works that there expected to be no impacts.

The subject tree is subject to the requirements of 'Holroyd DCP 2013.

The following conclusions have been made for the subject tree.

TREE 1

Tree 1 is a site tree that has been nominated for removal as part of the sites DA.

9. RECOMMENDATIONS

Recommendations are based on conclusions made that are in accordance with the Australian Standard AS:4970-2009 Protection of Trees on Development Sites.

- It has been recommended all legal requirements within this LGA regarding the removal of Tree 1 be respected.
- In the interest of best horticultural practices, it has been recommended that adequate tree replenishment for Tree 1's removal be incorporated into the development proposal (minimum of three replacement trees).
- Contractors undertaking tree works on this site must have appropriate qualifications and expertise in relation to removing or pruning trees. All tree work performed on this site must comply with AS:4373-2007 Pruning of Amenity Trees.

10. REFERENCES

1. Standards Australia - Pruning of Amenity Trees (AS:4373-2007).
2. Barrell, J. (1996), Safe Useful Life Expectancy of Trees (SULE). Barrell Tree Care. UK.



9. APPENDICIES

APPENDIX 1- DEFINITION OF HEALTH CLASSIFICATIONS

TERM	DEFINITION
EXCELLENT	The tree is demonstrating excellent or exceptional growth. The tree should exhibit a full canopy of foliage and be free of pest and disease problems.
GOOD	The tree is demonstrating good or exceptional growth. The tree should exhibit a full canopy of foliage and have only minor pest or disease problems.
FAIR	The tree is in reasonable condition and growing well. The tree should exhibit an adequate canopy of foliage. There may be some deadwood present in the crown. Some grazing by insects or possums may be evident.
POOR	The tree is not growing to its full capacity; extension growth of the laterals is minimal. The canopy may be thinning or sparse. Large amounts of deadwood may be evident throughout the crown. Significant pest & disease problems may be evident or symptoms of stress indicating tree decline.
VERY POOR	The tree appears to be in a state of decline. The tree is not growing to its full capacity. The canopy may be very thin and sparse. A significant volume of deadwood may be present in the canopy or pest and disease problems may be causing a severe decline in tree health.
DEAD	The tree is completely dead and exhibits no new growth or live tissue.

TABLE 2: Definitions of tree health class.

APPENDIX 2 - DEFINITIONS OF TREE AGE CLASSIFICATIONS

THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT

CONSENT NO. MOD2021/0084

MODIFIED DATE: 08/04/2021

AGE CLASS	DEFINITION
YOUNG	Tree being in its early life stages of existence, progress, growth, development, or maturity. Approximately 0 – 5 years old.
SEMI-MATURE	Tree is around halfway complete in its natural growth and development stages. It is beginning to take on the characteristic of a fully development tree of the same species, taking into consideration of its growing environment. Approximately 5 – 15 years.
MATURE	Tree is complete in its major natural growth and development. As plant it is pertaining to, or characteristic of full development. Approximately. 15 – 60 years.
OVER MATURE	Tree has completed its natural growth or development. Tree has been maturing for some time and exhibits signs of decline or structural weakening due to its age. Approximately. 30 – 120 years
DECLINE	Tree has completed its life cycle and is dying. Approx. Less than 5 years to live.

TABLE 3: Definitions used in categorising Tree Age Class.

APPENDIX 3 - DEFINITION CATEGORIES OF TREE STRUCTURE

TERM	DEFINITION
GOOD	The tree has a well-defined and balanced crown. Branch unions appear to be strong, with no defects evident in the trunk or the branches. Major limbs are well defined. The tree is considered a good example of the species.
FAIR	The tree has some minor problems in the structure of the crown. The crown may be slightly out of balance, and some branch unions may be exhibiting minor structural faults. If the tree has a single trunk, it may be on a slight lean or exhibiting minor defects.
POOR	The tree may have a poorly structured crown. The crown may be unbalanced or exhibit large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. The tree may have suffered root damage.
VERY POOR	The tree has a poorly structured crown. The crown is unbalanced or exhibits large gaps with possibly large sections of deadwood. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at point of attachment. Branches may exhibit large cracks that are likely to fail in the future. Tree may have suffered major root damage.
FAILED	The tree has a very poorly structured crown. A section of the tree has failed or is in imminent danger of failure.

TABLE 4: Definitions used in categorising tree structure.

APPENDIX 4 - USEFUL LIFE EXPECTANCY (ULE) CATEGORIES

CATEGORY	DEFINITION
UNSAFE & REMOVE	The tree is considered dangerous in the location and has no significant amenity value.
LESS THAN 5 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and have value for up to five years, but will need to be replaced. During this period, normal inspections and maintenance will be required. If possible, replacement trees should be planted.
5 – 10 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for up to ten years. During this period, normal inspections and maintenance will be required.
10 – 20 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for up to twenty years. During this period, normal inspections and maintenance will be required.
20 – 40 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for up to forty years. During this period, normal inspections and maintenance will be required.
GREATER THAN 40 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for greater than forty years. During this period, normal inspections and maintenance will be required.

TABLE 5: Categories for Useful Life Expectancy (ULE).

APPENDIX 5 - LANDSCAPE SIGNIFICANCE CATEGORIES

CATEGORY	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
SIGNIFICANT	The subject site is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed as a Significant Tree.	The subject tree is scheduled as a Threatened Species as defined under the Biodiversity Conservation Act 2016.	The subject tree has a very large live crown size exceeding 100m ² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree is a Commemorative Planting having been planted by an important historical person(s) or to commemorate an important historical event.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna.	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
		The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
HIGH	The tree has a strong historical association with a Heritage Item (building/structure/art efact/garden etc.) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown exceeding 60m ² ; crown density exceeding 70%, very good representative of the species in terms of form & branching habit, is aesthetically distinctive and makes positive contribution to the visual character and the amenity of value of the area.

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084
MODIFIED DATE: 08/04/2021**

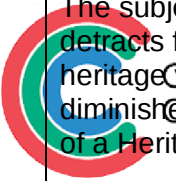
MODERATE	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value.	The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal with a crown density of at least 70% (normal); the subject tree is visible from the street and/or surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
LOW	 The subject tree detracts from heritage values or diminishes the value of a Heritage Item. THESE ENDORSED PLANS ARE TO BE READ IN CONJUNCTION WITH DEVELOPMENT CONSENT NO. MOD2021/0084 MODIFIED DATE: 08/04/2021	The subject tree is possibly scheduled under the provisions of this Development Control Plan due to its position relative to buildings or other structures.	The subject tree has a small live crown size of less than 25m² and can be replaced within the short term (5- 10 years) with new tree planting.
VERY LOW	The subject tree is causing damage to a Heritage Item.	The subject tree is listed as an Environment Weed Species in the Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties and has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50%.

TABLE 6: Landscape significance categories.

APPENDIX 6 - DEVELOPMENT IMPACT CATEGORIES

GOOD	The tree has a well-defined and balanced crown. Branch unions appear to be strong, with no defects evident in the trunk or the branches. Major limbs are well defined. The tree is considered a good example of the species.
FAIR	The tree has some minor problems in the structure of the crown. The crown may be slightly out of balance, and some branch unions may be exhibiting minor structural faults. If the tree has a single trunk, it may be on a slight lean or exhibiting minor defects.
POOR	The tree may have a poorly structured crown. The crown may be unbalanced or exhibit large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. The tree may have suffered root damage.
VERY POOR	The tree has a poorly structured crown. The crown is unbalanced or exhibits large gaps with possibly large sections of deadwood. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at point of attachment. Branches may exhibit large cracks that are likely to fail in the future. Tree may have suffered major root damage.
FAILED	The tree has a very poorly structured crown. A section of the tree has failed or is in imminent danger of failure.

TABLE 7: Development impact categories.

CUMBERLAND
CITY COUNCIL

APPENDIX 7 - USEFUL LIFE EXPECTANCY (ULE) CATEGORIES

CATEGORY	DEFINITION
UNSAFE & REMOVE	The tree is considered dangerous in the location and has no significant amenity value.
LESS THAN 5 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and have value for up to five years, but will need to be replaced. During this period, normal inspections and maintenance will be required. If possible, replacement trees should be planted.
5 – 10 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for up to ten years. During this period, normal inspections and maintenance will be required.
10 – 20 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for up to twenty years. During this period, normal inspections and maintenance will be required.
20 – 40 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for up to forty years. During this period, normal inspections and maintenance will be required.
GREATER THAN 40 YEARS	The tree, under normal circumstances and without extra stresses being imposed on it, should be safe and of value for greater than forty years. During this period, normal inspections and maintenance will be required.

TABLE 8: Tree retention categories.

APPENDIX 8 - CALCULATING THE DBH

To determine the Diameter at Breast Height (DBH) of a tree, measure its Circumference at Breast Height (CBH) at 1.4m above the ground. The trees circumference is then divided by π (3.1415) to give the trees DBH.

$$DBH = CBH \div \pi$$

DBH for multi-stemmed trees = Measure DBH for all stems. Consolidate all calculated DBHs into a single index then square root of the final DBH.

APPENDIX 9 - CALCULATING THE SRZ

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings.

It is important to note that the SRZ is not related to tree health. It refers to the physical volume of roots required for the tree to remain stable in the ground. It is in no way related to the physiological requirements of the tree but is the minimum volume of roots required for a tree to remain standing (Mattheck & Breloer 1994).

$$SRZ \text{ radius} = (DBH \times 50)^{0.42} \times 0.64$$

APPENDIX 10 - CALCULATING THE TPZ

Calculating and defining a TPZ is the principal means of protecting trees on development sites. It is a combination of both root and crown area that is requiring protection. It is an area isolated from construction disturbance, so that a tree can remain viable.

The TPZ will always incorporate the structural root zone within it. A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required).

The TPZ for palms, cycads and tree is not calculated using this method. For these plants, the TPZ should not be less than 1 meter outside the crown spread.

$$TPZ \text{ Radius} = DBH \times 12$$



LOFTUS ROAD

CUMBERLAND CITY COUNCIL

THESE ENDORSED PLANS ARE TO BE READ IN CONJUNCTION WITH DEVELOPMENT CONSENT NO. MOD2021/0084

MODIFIED DATE: 08/04/2021

GENERAL / SPECIFIC NOTES

THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN. THE INFORMATION SHOWN ON THIS PLAN OR IN THE ASSOCIATED CAD FILE IS SUPPLIED ON THE CONDITION THAT THESE GENERAL NOTES ARE ALWAYS IN CONJUNCTION WITH ANY COPY OR EXTRACT OF THE CAD/COPYDATA FILE.

INFORMATION SHOWN ON THE SUPPLIED HARD COPIES TAKES PRECEDENCE OVER ANY DIGITAL OR ELECTRONIC DATA.

THIS PLAN HAS BEEN PREPARED FOR FEATURE LEVEL PURPOSES ONLY OVER THE SUBJECT SURVEY AREA.

LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (AHD) THE ORIGIN OF WHICH IS 59M 154608 RL 15.56 AHD (SOURCE: ECOM 29-03-2020).

THE LOCATION OF PROPERTY BOUNDARIES ARE INDICATIVE. BOUNDARIES HAVE BEEN FORMED FROM SURVEY MEASUREMENTS & REGISTERED PLANS OBTAINED FROM NSW LAND REGISTRY SERVICES AND REPRESENT TITLE DIMENSIONS.

ANY CONSTRUCTION OR WORKS RELYING ON OPTICAL RETRACKING FROM BOUNDARIES WILL REQUIRE ADDITIONAL BOUNDARY SURVEY & A RE-ASSESSMENT BOUNDARY WITHOUT HAVING PRIOR TO COMMENCEMENT OF ANY WORKS. REALSERVE WILL NOT BE HELD RESPONSIBLE FOR ANY ISSUES RESULTING FROM NON COMPLIANCE WITH THIS ADVICE.

THE LOCATION OF EASEMENTS HAVE BEEN COMPILED FROM PLANS & RECORDS OBTAINED FROM NSW LRS AND ARE SUBJECT TO ADDITIONAL SURVEY IF LOCATION IS DIFFERENTIAL SURVEY.

THE LOCATION OF ADJOINING BUILDING FEATURES HAVE BEEN OBTAINED WHERE VISIBLE FROM THE SUBJECT PROPERTY. ANY ADDITIONAL INFORMATION REQUIRED IS SUBJECT TO ADDITIONAL SURVEY & ACCESS BEING GRANTED TO ADJOINING PROPERTIES.

THE LOCATION LEVELS OF BUILDING ROOFS AND ROOF FEATURES HAVE BEEN DETERMINED BY INDIRECT METHODS (WHERE VISIBLE) & ARE QUOTE TO APPROXIMATELY.

THE RECORDS OF THE SERVICE AUTHORITIES HAVE NOT BEEN INVESTIGATED, ONLY THOSE SERVICES VISIBLE / APPARENT AT THE TIME OF SURVEY HAVE BEEN SHOWN.

SCHEDULE OF ABBREVIATIONS

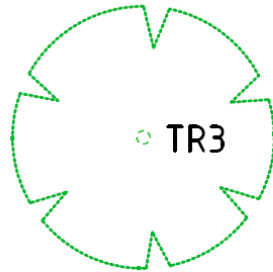
AWN - Awnings
BK - BACK KERB
BTT - BUTTRESS
BOL - BOLLARD
CBW - CONCRETE BLOCK WALL
CO - CONCRETE
DR - DRAIN
DW - DRAINAGE
FCB - FIBROUS CEMENT BUILDING
FH - FIRE HYDRANT
FHB - FIRE HYDRANT BOOSTER
FL - FLOOR LEVEL
GB - GARDEN BORDER
GP - GATE PIT
H - INVERT KERB
INV - INVERT
LH - LIP KERB
LM - LINE MARKING (APPROX SPACING)
LT - LIGHT POLE
MFC - METAL FENCE
MH - MANHOLE
PAV - PAVING
RI - ROOF RIDGE (APPROX HEIGHT)
RT - ROOF (APPROX HEIGHT)
RSL - ROLLED STEEL JOIST
SB - SWITCH BOARD
STR - STAIR
SS - STREET SIGN
SUB - SUB STATION
SV - STOP VALVE
TA - TOP ANNING (APPROX HEIGHT)
TAP - WATER TAP
TG - TOP GUTTER (APPROX HEIGHT)
TK - TOP KERB
UA - UNDERGROUND ANNING (APPROX HEIGHT)
UC - UNCLASSIFIED PT
WMP - WIRE MESH FENCE

EASEMENTS - ENCUMBRANCES AFFECTING SUBJECT PROPERTY

(A) - EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE (WIDE DP 258374)
(B) - RESTRICTION ON USE OF LAND (WIDE DP 258374)
(C) - EASEMENT TO DRAIN WATER (WIDE AND 15.24 METRES WIDE (WIDE DP 530333)
(D) - EASEMENT FOR FLOOD MITIGATION WORKS 3 WIDE A VARIABLE WIDE (WIDE DP 1233715)
(E) - EASEMENT TO DRAIN WATER 1.5 A WIDE (WIDE DP 133715)
(F) - RIGHT OF ACCESS 5.0 WIDE A VARIABLE (DEALING MATH7470)
(G) - RIGHT OF ACCESS 12.58 WIDE (WIDE DP 1233715)

TR - TREE APPROX. 0.10 TRUNK 2.0 SPREAD & HEIGHT
TSP - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR3 - TREE APPROX. 0.30 TRUNK 3.0 SPREAD & HEIGHT
TR4 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR5 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR6 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR7 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR8 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR9 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR10 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR11 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR12 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR13 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR14 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR15 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR16 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR17 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR18 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR19 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR20 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR21 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR22 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR23 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR24 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR25 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR26 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR27 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR28 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR29 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR30 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR31 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR32 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR33 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR34 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR35 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR36 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR37 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR38 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR39 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR40 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR41 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR42 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR43 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR44 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR45 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR46 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR47 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR48 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR49 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR50 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR51 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR52 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR53 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR54 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR55 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR56 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR57 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR58 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR59 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR60 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR61 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR62 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR63 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR64 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR65 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR66 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR67 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR68 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR69 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR70 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR71 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR72 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR73 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR74 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR75 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR76 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR77 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR78 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR79 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR80 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR81 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR82 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR83 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR84 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR85 - TREE APPROX. 0.40 TRUNK 3.0 SPREAD & HEIGHT
TR86 - TREE APPROX.

SCREENSHOT DETAILS FROM APPENDIX 11: Noting easements and details/measurements of the existing trees on site.



TR : TREE APPROX. 0.1Ø TRUNK 2 SPREAD & HEIGHT
TR2 : TREE APPROX. 0.4Ø TRUNK 8 SPREAD & HEIGHT
TR3 : TREE APPROX. 0.3Ø TRUNK 6 SPREAD & HEIGHT
TR4 : TREE APPROX. 0.4Ø TRUNK 8 SPREAD & HEIGHT
TR5 : TREE APPROX. 0.5Ø TRUNK 10 SPREAD & HEIGHT
TR6 : TREE APPROX. 0.6Ø TRUNK 12 SPREAD & HEIGHT

EASEMENT(S) - ENCUMBRANCE(S) AFFECTING SUBJECT PROPERTY

- (A) - EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE (VIDE DP1258374)
- (B) - RESTRICTION ON USE OF LAND (VIDE DP1258374)
- (I) - EASEMENT TO DRAIN WATER 10.675 AND 15.24 METRES WIDE (VIDE DP 533033)
- (F2) - EASEMENT FOR FLOOD MITIGATION WORKS 5 WIDE & VARIABLE (VIDE DP 1233715)
- (P) - EASEMENT TO DRAIN WATER 1.5 & 3 WIDE (VIDE DP 1233715)
- (R) - RIGHT OF ACCESS 9.6 WIDE & VARIABLE (VIDE DEALING AM754799)
- (W) - RIGHT OF ACCESS 12.58 WIDE (VIDE DP 1233715)

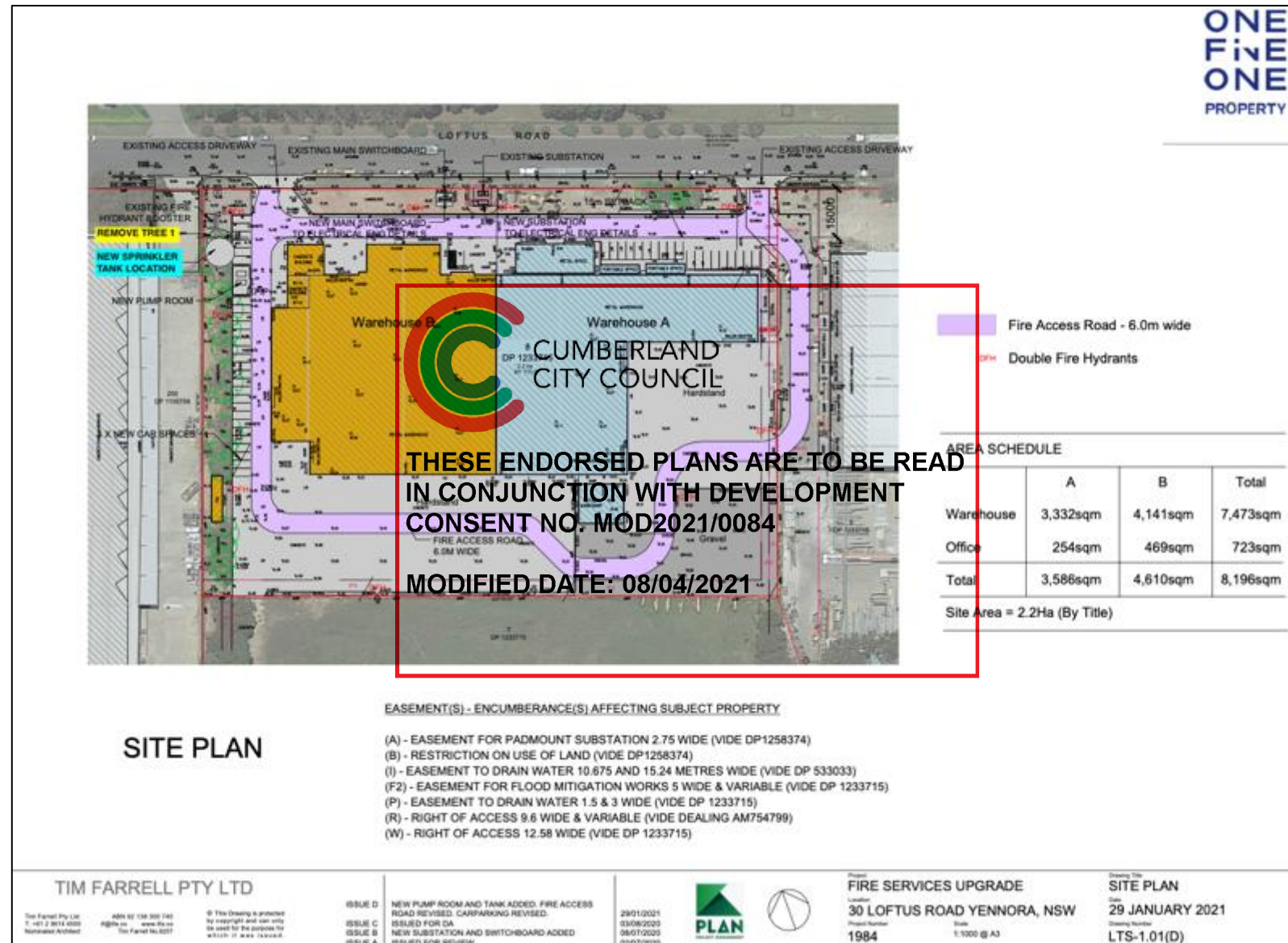


CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

APPENDIX 12 - SITE PLAN: TREE LOCATION



PLAN 2: Site Plan indicating tree location & proposed 'Sprinkler Tank & Pump House' (Plan supplied by client February 2021).

APPENDIX 13 - SUBJECT TREE IMAGE



IMAGE 1: Tree 1 (N.Maynard February 2021).



CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

12. AUTHORS QUALIFICATIONS & EXPERIENCE

The author of this document is a qualified and full-time practicing Consulting Arborist.

- Diploma of Arboriculture.
- AQF Level 5 Arborist.
- Director - Treerepairs - 8 years.
- Over 22 years arboricultural experience as a Tree Contractor and Consulting Arborist.
- 20 years Climbing Arborist with both National and International experience.

If further information relating to the content of this report is required, please do not hesitate to contact the author of this report, Nick Maynard on 0449 610 919.

Yours sincerely,



Nick Maynard





CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

30 Loftus Road, Yennora NSW 2161

STATEMENT OF ENVIRONMENTAL EFFECTS

Section 4.55 Modification of Development Consent Application

Prepared for: Cumberland City Council | Project No. 200012

Date: 22 February 2021 | Status: Final

Town Planning Consultants

Office 1300 057 046

Email admin@conciseplan.com.au

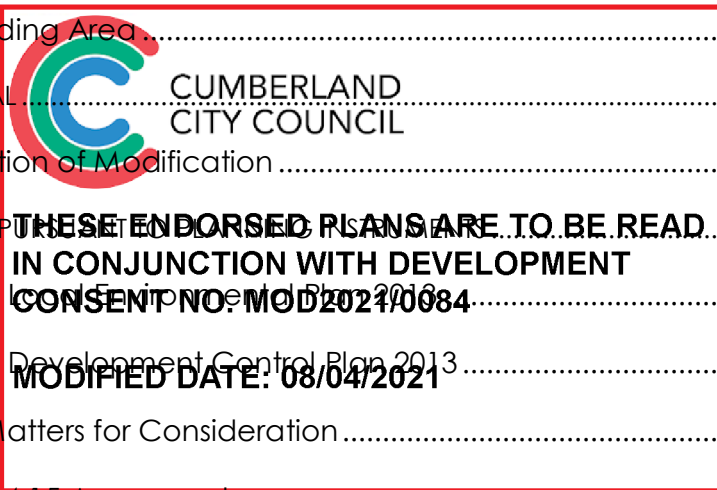
Address PO Box 603, Engadine NSW 2233

ABN 42 612 150 526



TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	BACKGROUND	5
3.	SITE & CONTEXT ANALYSIS.....	5
3.1.	Existing Building and Associated Structures	6
3.2.	Land Zoning	8
3.3.	Heritage.....	10
3.4.	Neighbouring Buildings	10
3.5.	Surrounding Area	13
4.	THE PROPOSAL.....	14
4.1.	Description of Modification	14
5.	EVALUATION OF THE PROPOSAL.....	17
5.1.	Holroyd Local Environment Plan 2016.....	17
5.2.	Holroyd Development Control Plan 2013	18
5.3.	Other Matters for Consideration	25
5.4.	Section 4.15 Assessment	25
6.	CONCLUSION.....	27



DOCUMENT CONTROL TABLE

Document Reference:	PR200026-2		
Date:	Version:	Author:	Checked By:
22 February 2021	Final	Danielle Long	Adam Mainey

Reproduction of this document or any part thereof is not permitted without prior written permission of Concise Planning Pty Ltd;

1. INTRODUCTION

This Statement of Environmental Effects (SEE) has been prepared to accompany a Section 4.55 Application to Cumberland City Council relating to DA Consent No. DA2020/0488, determined by Cumberland City Council on 29 September 2020.

This Statement has been prepared in accordance with the following:

- DA Consent (DA2020/0488) determined by Cumberland City Council on 29 September 2020.
- Statement of Available Pressure and Flow, prepared by Sydney Water, dated 21 April 2020.
- Email from Richard George of RG Fire Consultancy, dated 28 January 2021.
- DA Endorsed Statement of Environmental Effects, prepared by Concise Planning Pty Ltd, dated 17 August 2020.
- DA Endorsed Sprinkler System Specification, prepared by RG Fire Consultancy, dated 01 June 2020.
- BCA Capability Statement, prepared by Concise Certification Pty Ltd, dated 03 August 2020
- Certificate of Compliance for Fire Services, prepared by RG Fire Consultancy, dated 05 August 2020.
- Survey Plan showing Select Features and Levels Lot 8 in DP 1233715 No. 30 Loftus Road Yennora, prepared by Real Serve dated 31 March 2020.
- Arboricultural Impact Assessment, prepared by Treerepairs, dated 17 February 2021.
- DA Endorsed Plans, prepared by Tim Farrell Pty Ltd, including:

Drawing	Description:	Revision/Date:
LTS01.01 (C)	Site Plan	03 August 2020
LTS01.02 (B)	Floor Plans	03 August 2020

- DA Endorsed Plans, prepared by RG Fire Consultancy, including:

Drawing	Description:	Revision/Date:
F01 D	Sprinkler System Warehouse A & B	04 August 2020
F02 C	Sprinkler System Detail Sheet	02 August 2020

- DA Endorsed Plans, prepared by Inline Hydraulic Services, including:

Drawing	Description:	Revision/Date:
H01/P2	Cover Sheet and Legend	04 August 2020
H02/P2	Site Plan	04 August 2020
H03/P2	Floor Plan Fire Hose Reel Coverage	04 August 2020
H04/P2	Floor Plan Fire Hydrant Coverage	04 August 2020

- Updated Architectural Plans, prepared by Tim Farrell Pty Ltd, including:

Drawing	Description:	Date:
LTS-1.01 (D)	Site Plan	29 January 2021
LTS-1.02 (E)	Floor Plans	09 February 2021
LTS-1.03 (C)	Sections and Pump Room	29 January 2021
LTS-1.04 (C)	Elevations	29 January 2021

- Updated Fire Services Plans, prepared by RG Fire Consultancy, including:

Drawing	Description:	Revision/Date:
F01 E	Sprinkler System Warehouse A & B	02 February 2021
F02 D	Sprinkler System Detail Sheet	02 February 2021

- Updated Hydraulic Plans prepared by Inline Hydraulic Services, including:

Drawing	Description:	Revision/Date:
H01/P3	Cover Sheet and Legend	02 February 2021
H02/P3	Site Plan	02 February 2021
H03/P3	Floor Plan Fire Hose Reel Coverage	02 February 2021
H04/P3	Floor Plan Fire Hydrant Coverage	02 February 2021

- Updated Sprinkler System Specification (Revision B), prepared by RG Fire Consultancy, dated 02 February 2021.
- Updated Certificate of Compliance for Fire Services, prepared by RG Fire Consultancy, dated 02 February 2021.

This Statement of Environmental Effects (SEE) relates to a Section 4.55 application by Concise Planning Pty Ltd to amend Development Consent No. DA2020/0488, made on the 29 September 2020, which granted approval for a *Fire Services Upgrade including installation of a building occupant warning system, new fire sprinkler system and new fire hydrant system.*

This application has been prepared and submitted under Section 4.55 (2) of the Environmental Planning and Assessment Act 1979 to seek the amendment of Condition 2 of DA Consent No. DA2020/0488, which relates to the approved plans and supporting documents.

Condition 2 of Development Consent (DA2020/0488) states:

2. **DAGCA02 - Approved Plans and Supporting Documents**
The development must be carried out in accordance with the following endorsed plans and documents, except as otherwise provided by the Development Consent.

Reference Dwg No.	Title/Description	Prepared By	Date/s
Issue C, LTS-1.01(C)	Site Plan	Plan Project Management	3 August 2020
Issue B, LTS-1.02(B)	Floor Plan	Plan Project Management	3 August 2020
Final - PR200026	Statement of Environmental Effects	Concise planning	17 August 2020
-	BCA Capability Statement	Concise Certification	3 August 2020
-	Certificate of Compliance for Fire Services	RG Fire Consultancy	5 August 2020
Issue C, drawing F01	Sprinkler System Layout	Plan Project Management	4 August 2020
Issue C, drawing F02	Sprinkler System Detail	Certificate of Compliance for Fire Services	2 August 2020
Issue A	Sprinkler System Specification	RG Fire Consultancy	1 June 2020
H01/P2 to H04/P2	Hydraulic Services Plan	RealServe	4 August 2020

(Reason: To confirm and clarify the details of the approval)

The purpose of this report is to outline the proposed modification to the above Development Consent conditions. Part 4 of this report outlines the proposed modification to Condition 2.

This statement addresses issues arising from the proposed development in light of the following planning controls:

- Environmental Planning and Assessment Act 1979;

- Environmental Planning and Assessment Regulation 2000;
- Holroyd Local Environmental Plan 2013;
- Holroyd Development Control Plan 2013;
- Provisions of Section 4.15 of the Environmental Planning and Assessment Act 1979.
- Provisions of Section 4.55 of the Environmental Planning and Assessment Act 1979.

The assessment relies upon the following information:

- The subject land is zoned IN1 General Industrial under the Holroyd Local Environmental Plan 2013.
- The immediate context of the site and surrounding character.
- The relevant provisions of the Holroyd DCP 2013 for general provisions, industrial controls and public notification.

2. **BACKGROUND**

DA2020/0488 recently gave consent for a voluntary fire services upgrade at No. 30 Loftus Road Yennora. This upgrade was sought due to a recognition that current services were deficient in terms of compliance with the Building Code of Australia and relevant Australian Standards.

Having regard to correspondence with the principal BCA consultant and Fire Services Engineers it was determined that new fire services were required in order to bring the existing system into compliance with current Australian Standards. This previous application involved upgrading the existing system to provide an adequate level of life safety and protection of the buildings.

Following the determination of the above mentioned application, the applicant has been advised by RG Fire Consultancy Pty Ltd that the DA2020/0488 is capable of providing the required flow rates to supply the sprinkler system in accordance with the relevant Australian Standard.

In this regard, the applicant seeks to modify existing DA consent DA2020/0488 to include the construction of new on-site water storage and booster pumps in order to provide the required flow rates.

**CUMBERLAND
CITY COUNCIL**
**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084
MODIFIED DATE: 08/04/2021**

3. **SITE & CONTEXT ANALYSIS**

2.1 **Subject Site Description**

The site is legally described as Lot 8 in Deposited Plan 1233715 and is known as No. 30 Loftus Road, Yennora. The area of the site is approximately 2.2 ha.

The subject site is located in Yennora; and is located on the southern side of Loftus Road approximately 0.6 km north east of Fairfield, 0.7 km south west of Guildford, 1.2 km south east of Smithfield and is located within the Local Government Area (LGA) of Cumberland. Figure 1 illustrates the context of the site within the locality.

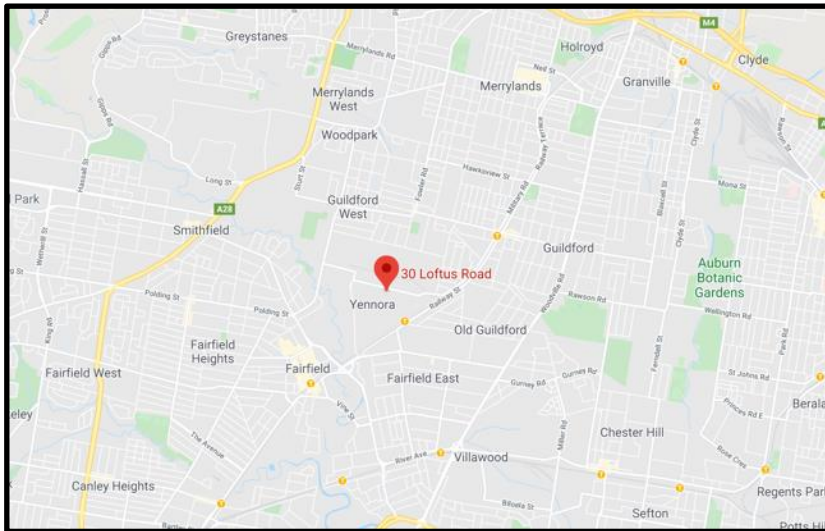


Figure 1: Map location of site (Google Maps, 2020)

3.1. Existing Building and Associated Structures

The subject site is occupied by an existing two storey warehouse building of masonry and metal construction (see Figure 2), along with associated attached offices (some of which are portable) and storage/garage areas. The site is currently divided into two separate tenancies known as Warehouse A and B. The tenancies are separated by an internal wall within the building, and a chain link fence separating the front of the site from the rear. The fence follows the line of the internal wall division. Figure 3 depicts the site in the vicinity of the tenancy division (see yellow line indicating approximate location of division).

Warehouse A features a metal roof consisting of two gables facing the primary road of Loftus Road, while Warehouse B features a single gable towards Loftus Road. In addition to the warehouses and attached buildings, the rear setback areas of each warehouse include a detached building.

The buildings generally contain a single-storey floor plan, while an exception being the office associated with Warehouse B, which also includes a first floor. The warehouses are assessable by both pedestrians and vehicles via entry doors and roller doors at the ground floor level. In addition to the above, Warehouse B office is accessible via external stairs to the first floor.

The main building (not including attached offices/storage/garage) has a setback from the primary road of approximately 30 metres. The attached development within this front setback area has a setback of approximately 18 metres. The setback of the building (and attached development) from the eastern side boundary is approximately 5 m, approximately 20 m from the western side boundary, and 30 m from the rear boundary.

In addition to the above, the detached building with the setback of Warehouse A has a setback from the rear boundary of approximately 20 m. The detached building within the setback of Warehouse B is located in close proximity from the western side boundary, with a setback of approximately 3 m from this boundary, and a setback of approximately 22 m from the rear boundary.

The front setback area contains vehicular access to the site, with a driveway at each side of the overall allotment for each warehouse tenancy. In addition to the above, the front setback areas include hardstand parking areas and a landscaping buffer; while the rear setback contains hardstand parking area, gravel and soft landscaping along the western perimeter.

Signage visible from the public domain indicates that Warehouse A is currently operated by Porter Group, a heavy equipment hire company. Warehouse B is currently vacant.



Figure 2: 30 Loftus Road; viewed from Loftus Road (Google Maps, 2020)



Figure 3: [left] 30 Loftus Road showing area in vicinity of tenancy division; viewed from Loftus Road [right] Warehouse B – currently vacant (Concise Planning, 2020)



Figure 4: [left] Warehouse A [right] Warehouse B; as viewed from Loftus Road (Source: Concise Planning Pty Ltd, 2020)



Figure 5: Looking towards the subject site for the proposed works which are the subject of the current 4.55 Application - as viewed from Loftus Road (Source: Concise Planning Pty Ltd, 2020, Google, 2021)



Figure 6: Looking towards the subject site for the proposed works which are the subject of the current 4.55 Application - as viewed from subject site driveway (Source: Plan Project Management, 2021)

3.2. Land Zoning

The subject site is zoned IN1 General Industrial under the Holroyd Local Environmental Plan 2013 (HLEP2013) (Figure 7). Clause 2.3 of the HLEP2013 sets out the land use table for the IN1 General Industrial zone as follows (**emphasis added**):

2 Permitted without consent

Nil

3 Permitted with consent

Depots; Freight transport facilities; Garden centres; General industries; Hardware and building supplies; Industrial training facilities; Kiosks; Light industries; Liquid fuel depots; Neighbourhood shops; Oyster aquaculture; Places of public worship; Roads; Take away food and drink premises; Tank-based aquaculture; **Warehouse or distribution centres; Any other development not specified in item 2 or 4**

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Eco-tourist facilities; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function centres; Health services facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home businesses; Home industries; Home occupations; Home occupations (sex services); Industries; Information and education facilities; Jetties; Livestock processing industries; Marinas; Mooring pens; Moorings; Pond-based aquaculture Recreation facilities (major); Registered clubs; Research stations; Residential accommodation; Restricted premises; Sawmill or log processing works; Sex services premises; Stock and sale yards; Tourist and visitor accommodation; Veterinary hospitals; Water recreation structures; Wharf or boating facilities

The proposed fire services upgrade is intended to increase the level of safety and protection of property within the context of the existing site uses at No. 30 Loftus Road Yennora.

Warehouse A

Warehouse A is used for the sales and hire of construction equipment such as loaders and excavators. Vehicle sales and hire premises are characterised as follows by the Dictionary of the Holroyd LEP 2013:

vehicle sales or hire premises means a building or place used for the display, sale or hire of motor vehicles, trailers, boats, trailers, agricultural machinery and the like, whether or not accessories are sold or displayed there.

Note.

Vehicle sales or hire premises are a type of **retail premises**

It is noted that neither *retail premises* nor *vehicle sales or hire premises* is listed explicitly under the HLEP2013 IN1 Land Use Table (above). In this regard, as the development is not specified in item 2 or 4; the existing use is considered to be permitted with consent under the HLEP2013.

Warehouse B

Warehouse B is currently a vacant warehouse. Warehouses are permitted with consent under the provisions of the HLEP2013.

In summary; as outlined above, the existing site uses are permissible with consent under the HLEP2013. It is recognised that the proposed fire services upgrade is being undertaken in order to support the existing site uses, and as such it is considered that the proposed development is permissible with consent under the provisions of the HLEP2013.

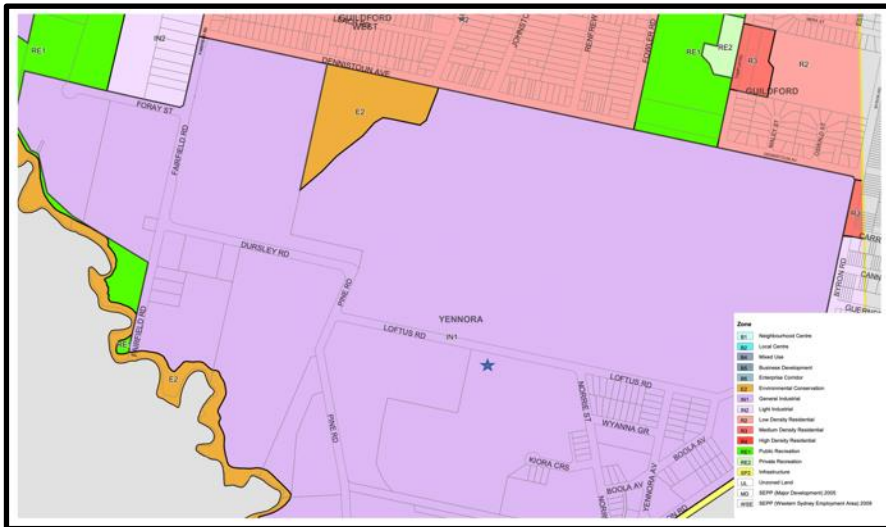


Figure 7: Land Zoning Map. Extract from Holroyd Local Environmental Plan 2013 (Source: NSW Legislation, 2020).

3.3. Heritage

The subject site is not listed as an item of environmental heritage, nor is it located within a heritage conservation area under the provisions of the Holroyd Local Environmental Plan 2013. Figure 8 presents an extract from the Heritage Map which forms part of the HLEP2013, illustrating the physical relationship of the subject site to the surrounding heritage items.

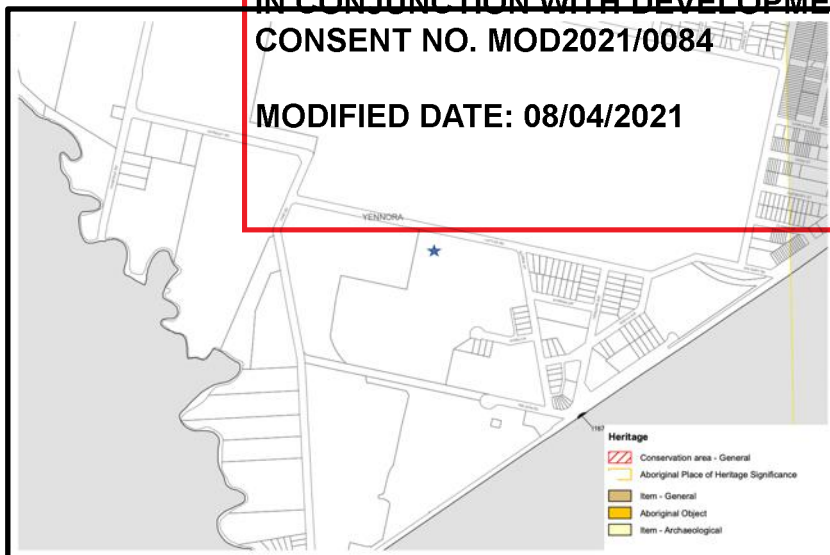


Figure 8: Heritage Map. Extract from Holroyd Local Environmental Plan 2013 (Source: NSW Legislation, 2020).

3.4. Neighbouring Buildings

As stated above, the subject site is located within an industrial area in Yennora and is surrounded by a number of warehouse buildings with industrial uses. Figure 9 provides an aerial view and illustrates the configuration of the site and its relationship to adjoining developments.



Figure 9: Relationship of the site to adjoining properties (Source: Six Maps, 2020).

No. 38 Pine Road (west)

To the west of the subject site is an irregularly shaped corner allotment, known as No. 38 Pine Road (Figure 10). The site is bound by Pine Road to the west and Loftus Road to the north and has an area of approximately 7 ha. The site contains an existing 10,000 sqm, 2-storey industrial building with box guttered roof. According to the aerial view of the site, the site is bounded by Loftus Road to the north and Pine Road to the west; the site appears to be currently operated by multi-modal freight and logistics company DB Schenker.

The site is bounded by a fence running along the perimeter of both primary and secondary road boundaries. Setback areas of both the primary and secondary roads contain soft landscaping and driveways/hardstand areas.



Figure 10: 38 Pine Road, as viewed from Loftus Road (Source: Concise Planning, 2020)

No. 1 Norrie Street (east)

To the east of the subject site is a No. 1 Norrie Street (Figure 11); a corner allotment of approximately 1.5 ha bounded to the east by Norrie Street and to the north by Loftus Road. The lot is accessible via

both Loftus Road and Norrie Street and consists of a two-storey warehouse building. The building is primarily of masonry construction, with the exception of a glassed office-space area located in the vicinity of the Loftus Road setback. The setback from the Loftus Road boundary contains a fenced concrete car parking area.

Signage visible from both Loftus Road and Norrie Street indicates that the site is operated by XL Precast, a manufacturer of precast concrete walls, columns and floors.

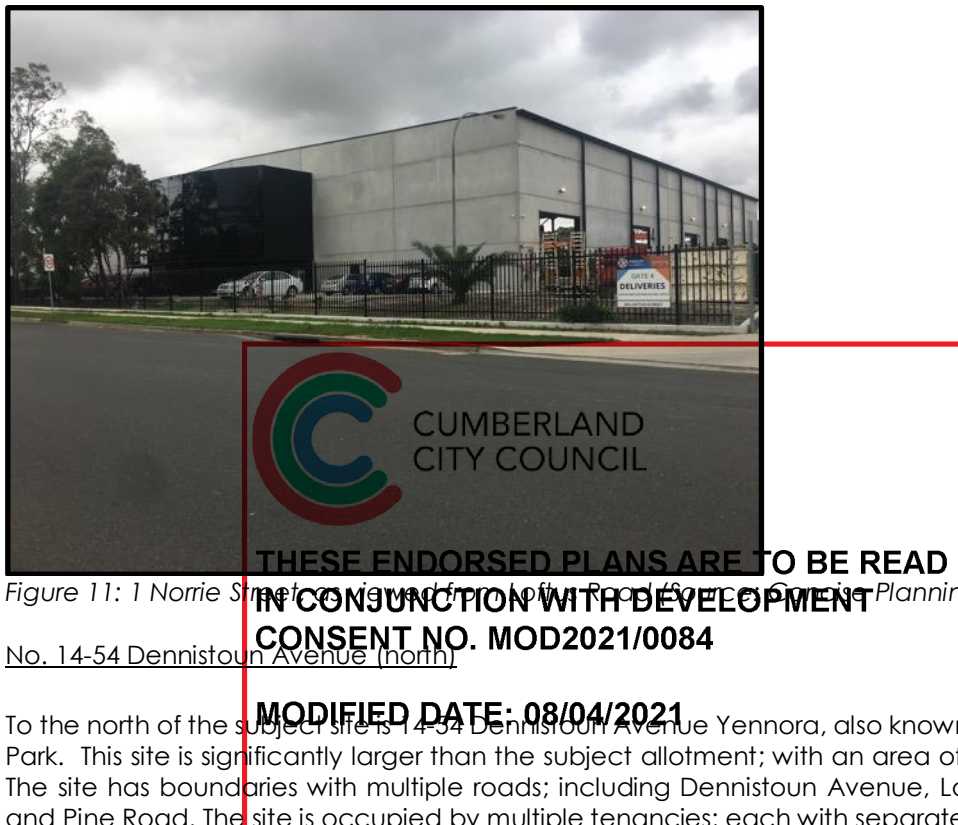


Figure 11: 1 Norrie Street, as viewed from Loftus Road (Source: Concise Planning, 2020).

No. 14-54 Dennistoun Avenue (north)

To the north of the subject site is 14-54 Dennistoun Avenue Yennora, also known as Yennora Distribution Park. This site is significantly larger than the subject allotment; with an area of approximately 70.4 ha. The site has boundaries with multiple roads; including Dennistoun Avenue, Loftus Road, Byron Road, and Pine Road. The site is occupied by multiple tenancies; each with separate truck entrances.

The Holroyd Development Control Plan 2013 contains a chapter pertaining specifically to Yennora Distribution Park (being *Chapter 9 Yennora Distribution Park within Part D: Industrial Controls*), and notes that it is one of the most significant industrial sites in Sydney.

Viewed from Loftus Road, the site contains warehouse buildings of masonry and metal construction, as well as infrastructure relating to intermodal-modal freight management; including railway lines and overhead shipping container hoists. The site also contains hard-stand parking areas. The front setback area in the vicinity of the subject site is buffered from Loftus Road via soft landscaping, trees and sloping terrain.

It may be relevant to note that this site was recently the subject of DA 2019/144/1 which (like the proposal which is the subject of this application) involved the installation of a sprinkler water storage tank. The tank at Dennistoun road involved a setback of 12 m from secondary road Byron Road (Figure 13).



Figure 12: No. 14-54 Dennistoun Avenue, as viewed from Loftus Road (Source: Concise Planning, 2020).

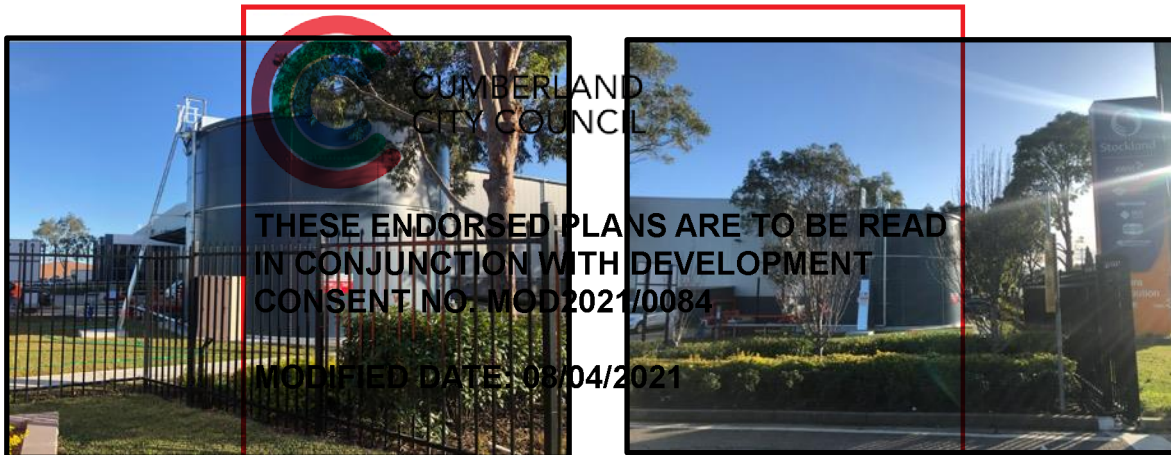


Figure 13: [left] Sprinkler Tank (recently approved under DA 2019/144/1) at No. 14-54 Dennistoun Avenue, as viewed from Byron Road, [right] as viewed from internal driveway (Source: Plan Project Management, 2021).

No. 7 Kiora Crescent Yennora (south)

The allotment to the rear of the subject site is approximately 2.6 ha in size and appears to be currently vacant (zoned IN1 General Industrial).

3.5. Surrounding Area

Locality

As described earlier, the subject site is located within an IN1 General Industrial zone under the Holroyd Local Environmental Plan 2013. The subject site has a primary road boundary of Loftus Road. The street character immediately surrounding the subject site consists primarily of industrial buildings and associated infrastructure.

Street Pattern

The area in which the subject site is located is characterised by a coarse-grained urban development pattern; consisting of a grid-like pattern of streets servicing large lots in order to accommodate industrial developments.

Loftus Road is the primary road and is a two-way street. Parking is available and not time limited. Small no stopping zones are associated with truck ingress/egress driveways. Untimed parking is available immediately in front of the subject site on both sides of Loftus Road.



Figure 14: Loftus Road [left] looking west from subject site; [right] looking east from subject site (Source: Concise Planning, 2020).

4. THE PROPOSAL

4.1. Description of Modification

This section of the report should be read in conjunction with:

- Updated Architectural Plans, prepared by Tim Farrell Pty Ltd dated 29 January 2021 and 09 February 2021.
- Updated Sprinkler System Specification, prepared by RG Fire Consultancy, dated 02 February 2021
- Hydraulic Services Plans, prepared by Inline Hydraulic Services, dated 02 February 2021
- Arboricultural Impact Assessment, prepared by Treerepairs, dated 17 February 2021.
- Fire Services Drawings, prepared by RG Fire Consultancy, dated 02 February 2021

As outlined in Section 1 of this report, this application seeks to modify Condition 2 of Development Consent No. DA2020/0488. Under the provisions of Section 4.55 (2) of the Environmental Planning and Assessment Act 1979. It is requested that the Development Consent conditions be amended as per below.

Condition 2 of Development Consent (DA2020/0488) states:

2. DAGCA02 - Approved Plans and Supporting Documents

The development must be carried out in accordance with the following endorsed plans and documents, except as otherwise provided by the conditions of this consent.

Reference/Dwg No	Title/Description	Prepared By	Date/s
Issue C, LTS-1.01(C)	Site Plan	Plan Project Management	3 August 2020
Issue B, LTS-1.02(B)	Floor Plan	Plan Project Management	3 August 2020

Final - PR200026	Statement of Environmental Effects	Concise Planning	17 August 2020
-	BCA Capability Statement	Concise Certification	3 August 2020
-	Certificate of Compliance for Fire Services	RG Fire Consultancy	5 August 2020
Issue C, drawing F01	Sprinkler System Layout	Plan Project Management	4 August 2020
Issue C, drawing F02	Sprinkler System Detail	Certificate of Compliance for Fire Services	2 August 2020
Issue A	Sprinkler System Specification	RG Fire Consultancy	1 June 2020
H01/P2 to H04/P2	Hydraulic Services Plan	RealServe	4 August 2020

(Reason: To confirm and clarify the details of the approval)

In this regard, it is requested that Condition 2 of the Development Consent be amended to **replace the endorsed plans and documents table with the following (as indicated in red):**

THESE ENDORSED PLANS ARE TO BE READ IN CONJUNCTION WITH DEVELOPMENT CONSENT NO. MOD2021/0084

2. DAGCA02

The development must be carried out in accordance with the following endorsed plans and documents, except as otherwise provided by the conditions of this consent:

MODIFIED DATE: 08/04/2021

Reference/Dwg No	Title/Description	Prepared By	Date/s
LTS - 1.01 (D)	Site Plan	Tim Farrell Pty Ltd	29 January 2021
LTS - 1.02 (E)	Floor Plans	Tim Farrell Pty Ltd	09 February 2021
LTS - 1.03 (C)	Sections and Pump Room	Tim Farrell Pty Ltd	29 January 2021
LTS - 1.04 (C)	Elevations	Tim Farrell Pty Ltd	29 January 2021
Final - PR200026	Statement of Environmental Effects	Concise Planning	17 August 2020
Final - PR200026-2	Statement of Environmental Effects Section 4.55 Modification of Development Consent Application	Concise Planning	22 February 2021
-	BCA Capability Statement	Concise Certification	03 August 2020
-	Certificate of Compliance for Fire Services	RG Fire Consultancy	02 February 2021
Issue E, drawing F01	Sprinkler System Layout	RG Fire Consultancy	02 February 2021
Issue D drawing F02	Sprinkler System Detail	RG Fire Consultancy	02 February 2021

Issue B	Sprinkler System Specification	RG Fire Consultancy	02 February 2021
H01/P3 to H04/P3	Hydraulic Services Plans	Inline Hydraulic Services	02 February 2021

The purpose of the modification of Condition 2 of the Development Consent is to permit changes to the approved plans and specifications to allow for the addition of on-site water storage and booster pumps.

These have been deemed necessary following advice received by the applicant via email from Richard George of RG Fire Consultancy Pty Ltd on 28 January 2021. Richard's email (a copy of this email accompanies this application) appears as follows:

Lydia,

~~The proposed high hazard sprinkler system requires on site water storage and booster pumps as the towns main is not capable of providing the required flow rates.~~

~~The sprinkler system for K25-L3-FR storage sprinklers requires a flow rate of 105 L/sec. The sprinkler code AS 2118 requires the towns main to provide simultaneous flow rates for the sprinklers and hydrant systems therefore for the towns main to be suitable it would need to provide a flow rate of 125 L/sec.~~

~~The 150 mm water main in Loftus Rd is only capable of providing a maximum flow rate of 67 L/sec as shown on attached Sydney Water pressure statement.~~

~~Revised specification and certificate to be issued when drawings upgraded to suit.~~

Regards

Richard George
RG Fire Consultancy Pty Ltd
M: 0419 409 119
FPAS Design Accreditation No: FSD 1661
FPAS Fire Safety Assessment Accreditation No: F001661A

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084
MODIFIED DATE: 08/04/2021**

Please note: The Sydney Water pressure statement (dated 21 April 2020) confirming the maximum permissible flow of 67 litres a second also accompanies this application.

In accordance with the advice, the plans and specifications have been amended to incorporate:

- Construction of a new pump room and new sprinkler tank.

The following changes to the approved design are also required in order to accommodate the proposed new pump room and sprinkler tank:

- Minor revision of the position of the proposed fire brigade access road.
- Removal and replacement of four (4) car parking spaces.
- Minor reduction in the size of one (1) car parking space.
- Removal of one (1) existing tree.

The proposed changes to the approved design have been assessed in relation to the relevant planning controls below:

5. EVALUATION PURSUANT TO PLANNING INSTRUMENTS

The application has taken into consideration relevant provisions of Holroyd Local Environmental Plan 2013 and Holroyd Citywide Development Control Plan 2013.

5.1. Holroyd Local Environmental Plan 2013

The following provisions of the LEP are relevant to the proposal:

LEP Part 2 .1 Land Use Zoning

Clause 2.1 of the HLEP2013 outlines the requirements for Land Zoning. The site is located within the IN1 General Industrial zone. General industries are permitted with the consent of Council within the land use zone. The objectives of the IN1 General Industrial zone are as follows:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.

By increasing the level of safety for existing users of the site along with increasing the level of protection for property; the proposed fire services upgrade (including the proposed design modification of on-site water storage and pumps) is considered to support all zone objectives relating to the provision and protection of industrial/warehouse land uses.

LEP Part 4.3 Height of Buildings

Clause 4.3 of the HLEP2013 outlines the requirements for the Height of Buildings. There is no provision for maximum height for the site under the HLEP2013 (Figure 15). The proposed new sprinkler system includes a new sprinkler valve and fire indicate panel enclosure with a height of 1350 mm.

In addition to the above, measurements of the architectural plans indicate that the proposed addition of new sprinkler tank will have a height of 6.78 m and pump room will have a height of 3.12 m .

In this regard it is considered that the proposed development complies with the requirements of Clause 4.3 of the HLEP2013.

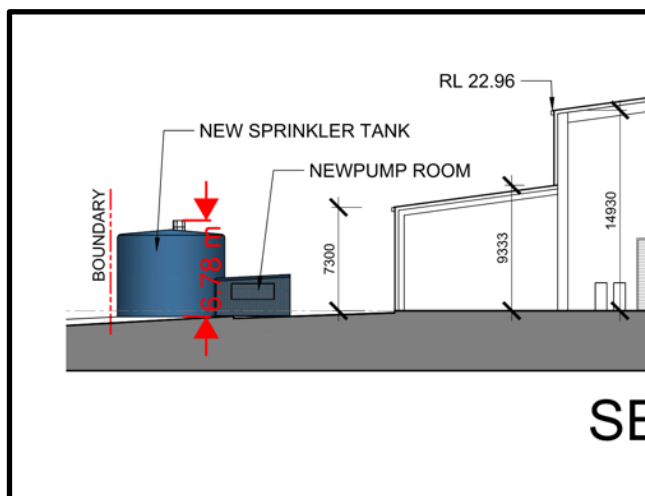



**CUMBERLAND
CITY COUNCIL**

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

Figure 15: Height of Buildings Map. Extract from Holroyd Local Environmental Plan 2013 (Source: NSW Legislation, 2020).



CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

Figure 16: Proposed Height of Sprinkler Tank as Measured on the Architectural Plans (Source: Tim Farrell Pty Ltd, 2021).

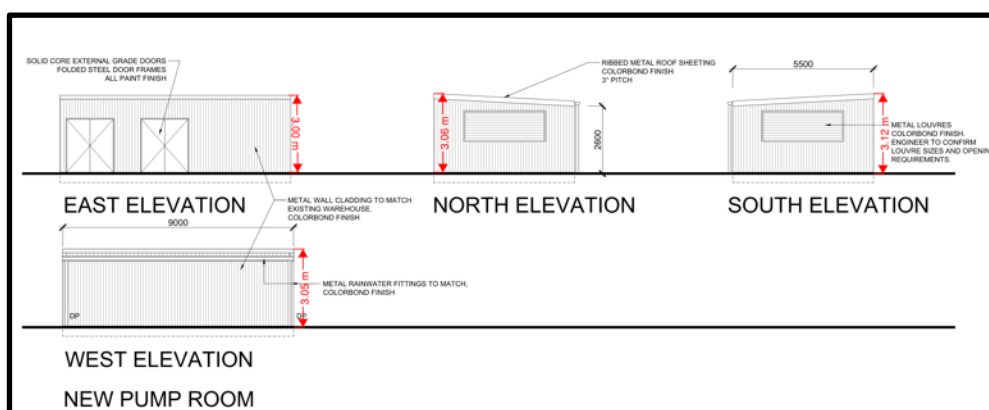


Figure 17: Proposed Height of Pump Room as measured on the Architectural Plans (Source: Tim Farrell Pty Ltd, 2021).

There are no other relevant provisions identified in the Holroyd Local Environmental Plan 2013 that are applicable to the proposed development.

5.2. Holroyd Development Control Plan 2013

PART A General Controls

3. Car Parking - 3.1 Minimum Parking Spaces

This clause sets out minimum carparking requirements for various types of development. The Architectural Plans indicate that four (4) car spaces will be removed to accommodate the proposed development, which will be replaced by four (4) new car spaces located further to the south.

Whilst the proposed development does not involve a change of use (and will not involve a change in the total number of parking spaces available on site), the Architectural Plans indicate that a car space will be reduced in size to the extent that it will be suitable only for a "small car".

This reduction in the size of a car parking space is proposed in order to allow the positioning of the proposed new sprinkler tank and pump room in a reasonable location conducive to fire and life safety and the overall efficient operation of the site.

In this regard, an assessment of the proposed development with regard to this clause may be considered relevant to the proposed development.

The relevant HDCP2013 DCP table has been reproduced below:

Industrial			
Use	Measure	Minimum Spaces Required	Maximum Spaces Required
Factories (including amenities)	GFA	1 per 70m ²	n/a
	+ GFA of offices	+ 1 per 40m ²	
Warehouses (including amenities)	GFA	1 per 300m ²	
	+ GFA of offices	+ 1 per 40m ²	

Measurements of the Architectural Plans (Figure 18 below) indicate the following Gross Floor Areas applying to the subject site:

GFA Calculations for Subject Site		
Warehouse Area (including amenities)	6799.82 / 300 m ²	22.67 spaces
Office Area	634.92 / 40 m ²	15.87 spaces
Total		38.54 spaces (rounded up to 39 spaces)

The calculations above indicate a required parking rate for the site of 39 spaces. The Architectural Plans (below) indicate that the proposed development includes a total of 47 car parking spaces.

In this regard, the following calculation have been applied to the subject development:

- **Required:** 39 spaces.
- **Proposed:** 47 spaces (- 1 space*) = 46 spaces. (46-39 = 7 extra spaces)

* **Note:** The small car space has been removed from carparking totals as the modified space does not comply with the dimensional requirements under Clause 3.3.1 (Dimensions and Gradients) of the HDCP2013. Notwithstanding, it is recognised that the car space complies with the small car space dimension requirements under AS 2890.1-2004.

In this regard, despite the reduction in size of a car parking space, it is considered that the proposed development complies with the requirements of this clause.



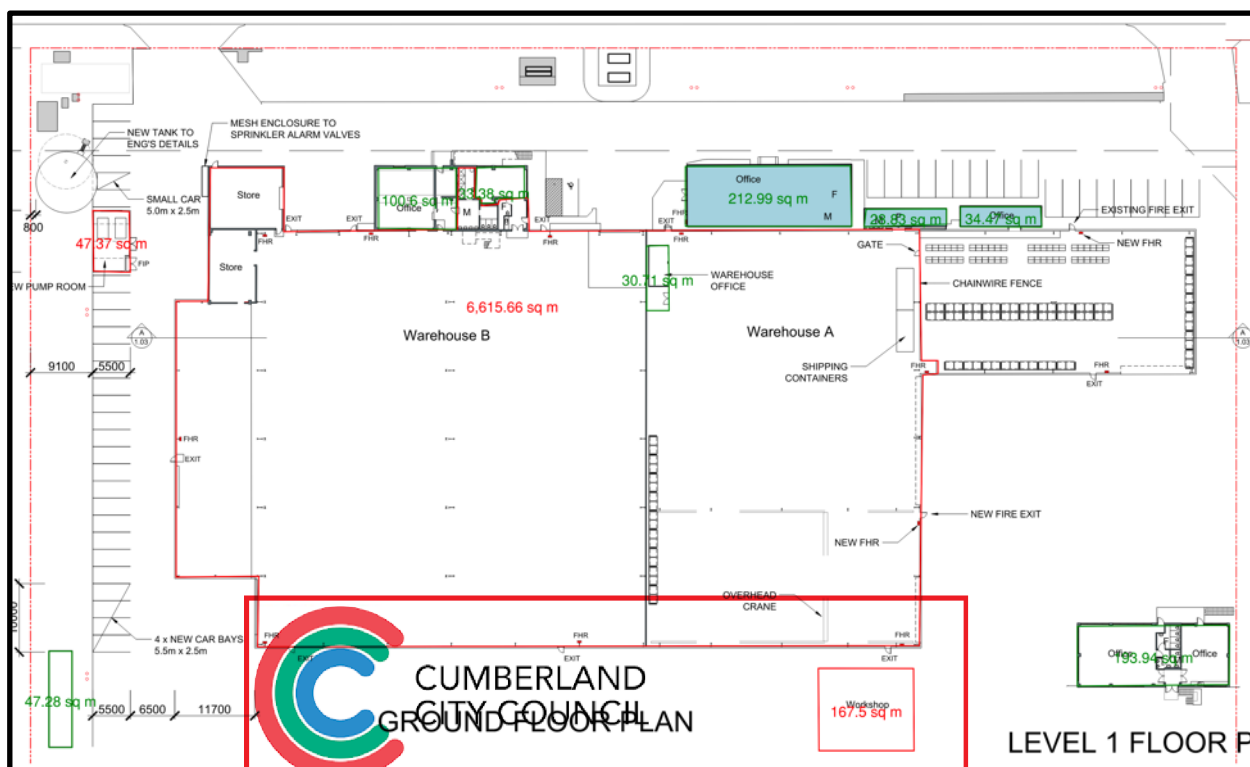


Figure 19: Architectural Plans including GFA measurement markups (Source: Tim Farrell Pty Ltd, 2021, with markups by Concise Planning 2021).

4.2 Development Works including Existing Trees and Landscaping

This clause is intended to guide the management of trees within the area covered by the HDCP2013. As the proposed development involves the removal of one (1) tree in order to accommodate the new sprinkler tank and pump room, it is considered that this clause applies to the proposed development.

Clause	Provision	Compliance Comment
C1	All proposals and development works shall comply with Australian Standard 4970-2009 – Protection of Trees on Development Sites.	This application is accompanied by an Arboricultural Impact Statement (AIS), prepared by Treerepairs, dated 17 February 2021. The recommendations (Part 9 of the AIS accompanying this application) refer to Australian Standard 4970-2009 – Protection of Trees on Development Sites. In this regard, it is anticipated that the recommendations of the AIS will be incorporated into the Conditions of Consent applying to the proposed development.

C2	<i>Development shall be designed to incorporate existing trees identified through Council's Tree Retention Assessment in Appendix J as having medium to high retention values, with adequate setbacks to any works and protection measures stipulated in accordance with AS4970-2009 to ensure their long term survival.</i>	The proposed development is the result of balancing a number of factors, including the requirement to provide an appropriate level of life safety provisions. The proponent has been advised by RG Fire Consultancy that the sprinkler booster, tank and pumps are required to be visible from the point of entry to the site in order to ensure that the Fire Brigade have unimpeded access upon entry to the site. Notwithstanding this, the location of the proposed tank and pump house has been designed to minimise impact on site trees and landscaped area as much as possible. In this regard, this application is accompanied by an Arboricultural Impact Statement (AIS), prepared by Treerepairs, dated 17 February 2021. The conclusions (Part 8 of the AIS accompanying this application) note that one (1) tree will be removed from the subject site to accommodate the proposed development, and that the remaining site trees are growing a sufficient distance from the proposed works that there are expected to be no impacts. In this regard, it is considered that the proposed development has been designed with consideration given to existing trees. It is recognised that incorporation of one (1) existing tree into the proposed development was not possible, due to the competing need to accommodate the proposed development which is considered necessary to provide an adequate level of life safety protection at the site. Notwithstanding the above, the AIS accompanying this application includes a list of recommendations, which includes offset replantings elsewhere on site. It is anticipated that the recommendations of the above-
----	---	---



CUMBERLAND
CITY COUNCIL

**THESE ENDORSED PLANS ARE TO BE READ
IN CONJUNCTION WITH DEVELOPMENT
CONSENT NO. MOD2021/0084**

MODIFIED DATE: 08/04/2021

		mentioned AIS will be incorporated into the Conditions of Consent associated with this development application.
C3	Development proposals must consider existing trees situated on adjacent properties with adequate setbacks to any works and protection measures stipulated in accordance with AS4970-2009 to ensure their long term survival.	Not applicable. The provided Survey Plan does not indicate significant existing trees situated on adjacent properties.
C4	Vehicular driveways shall be located a minimum of 3 metres from the outside edge of the trunk measured 1 metre above the existing ground level of any street tree to be retained.	Not applicable. The Architectural Plans do not indicate a new vehicular driveway within 3 metres from the outside edge of a tree trunk.
C5	Development shall not impact trees on public land.	Not applicable. The proposed development will not impact trees on public land.
C6	THESE ENDORSED PLANS ARE TO BE READ IN CONJUNCTION WITH DEVELOPMENT CONSENT NO. MOD2021/0084 Modified Date: 08/04/2021 Trees identified as requiring no action are to be retained with Council tree retention assessment in Appendix J should be retained with adequate setbacks to any development works to ensure their long term survival.	The application is accompanied by an Arboricultural Impact Statement (AIS), prepared by Treerepairs, dated 17 February 2021. The document notes that the tree requiring removal to accommodate the proposed development is a "Tallowwood (Eucalyptus)" which has been assigned a Low-Moderate retention value. Notwithstanding this, as outlined in the notes related to C1 above, the proposed development is the design outcome of balancing a number of factors, including the requirement to provide an appropriate level of life safety. The development has been designed to minimise impacts on trees as far as possible (whilst prioritising life safety). In this regard, the abovementioned AIS includes recommendations (Part 9), which refer to <i>Australian Standard 4970-2009 – Protection of Trees on Development Sites</i>. The above-mentioned recommendations include offset re-

		plantings on site (a minimum of three replacement trees). In this regard, it is anticipated that the recommendations of the above mentioned AIS will be incorporated into the Conditions of Consent applying to the proposed development.
C7	Notwithstanding the above, Council may decide not to consent to the removal of a prescribed tree or vegetation where: • The tree is, or helps form, a prominent part of the streetscape, or • Has cultural/heritage significance, or • Provides a significant visual screen, or • Is an important habitat for wildlife, or • The tree is within a remnant or riparian vegetation. CUMBERLAND CITY COUNCIL Note: Council may consider concessions to the standards contained within this development control plan in order to encourage the retention of suitable existing trees. THESE ENDORSED PLANS ARE TO BE READ IN CONJUNCTION WITH DEVELOPMENT CONSENT NO. MOD2021/0084 MODIFIED DATE: 08/04/2021	Due to the unique circumstances of the proposed development, it is considered that the removal of the subject tree will be considered appropriate for the following reasons: • The nature of the proposed development (necessary in order to provide an acceptable level life safety protection via the provision of essential fire safety measures). • The fact that placing the pump room and sprinkler tank elsewhere on site would impact on safety (as recommended to the client by RG Fire Consultancy, see response above at C2). • An Arboricultural Impact Statement, dated 17 February 2021 has been prepared to assist with minimising and/or offsetting impact on trees as far as practicable, whilst still accommodating the proposed development. In summary, it is considered that the requirement to provide life safety via essential fire safety measures outweighs the technical non-compliance with this clause, and that reasonable mitigation of potential impact has been considered and can be implemented as part of this proposal.
C8	Council may require a Tree Management Plan (TMP) to be prepared by a consulting arborist (AQF Level 5) in accordance with Australian Standard 4970-2009 – Protection of Trees on Development Sites, and submitted with development proposals where existing trees are to be retained.	Noted.

--	--	--

PART D Industrial Development

DCP Part D Industrial Controls

Part D of the HDCP2013 applies to This Part applies to development on land zoned Industrial under Holroyd Local Environmental Plan 2013 and for development types permissible within Industrial zones as detailed within this Part. The relevant provisions are as follows:

2.4 Building Design and Appearance

Objectives

The objectives of this part include ensuring that new buildings are both functional and contribute to a visually pleasing, harmonious environment for employees and adjoining uses.

Compliance Comment

The proponent has advised that the right hand tank will be constructed of galvanised steel, which will be painted to match existing buildings on the lot.

The Architectural Plans indicate that the proposed pump room will be finished with metal wall cladding, ribbed metal roof sheeting and will be a Colorbond finish painted to match the existing warehouse.

The proposed development is not a main industrial building and is relatively small in scale within the context of both the allotment and large lot industrial area.

It is considered that the use of colours which are sympathetic to the existing development on the lot will ensure that the proposed development

It should also be noted that the design and appearance of the proposed development will be in character with existing development in the local area, with similar tanks recently approved at neighbouring development No. 14-54 Dennistoun Avenue (see Section 3.4 above).

2.5. Setbacks

Objectives

The objectives of this part include providing pleasant visual amenity and reducing the likelihood of any negative acoustic impacts on neighbouring allotments. The relevant clauses are as follows:

Clause	Provision	Compliance Comment
C4	Minimum 1 metre setback is required to at least one side boundary	Complies. The existing site involves setbacks in excess of the requirements of this clause.

		Measurements of the architectural plans indicate that the eastern side setback is approximately 6 metres, and this will be maintained following the proposed development.
C12	The following building lines apply to the principal street frontage of land zoned General Industrial IN1 and Light Industrial IN2 within Holroyd City. They are based on a conversion from the previous imperial measures into metric. Note: Smaller lot sizes tend to require setbacks smaller than 15 metre. Buildings of greater bulk and scale on larger lots, and located opposite residential zones, tend to require setbacks larger than 15 metres. Yennora Industrial Area Fairfield Road (south of Dursley Road) Pine Road, Loftus Road (between Pine Road and Norrie Street) – 150 metres THESE ENDORSED PLANS ARE TO BE READ IN CONJUNCTION WITH DEVELOPMENT CONSENT NO. MOD2021/0084	Compiles. The Architectural Plans indicate that the proposed development will be setback 15 m from the principal street frontage.

MODIFIED DATE: 08/04/2021

5.3. Other Matters for Consideration

Comment was obtained by this office from Concise Certification who advised that as there are no BCA non-compliances with proposed new additions, no updated to BCA compliance report needed.

5.4. Section 4.15 Assessment

1 (a) (i) Environmental Planning Instruments

The proposed development is permitted with the consent of Council under the Holroyd Local Environmental Plan 2013. The proposal meets the objectives and relevant development standards of the Holroyd Local Environmental Plan 2013 and accordingly, approval is supported as discussed in detail within this Statement of Environmental Effects (SEE).

1 (a) (ii) Draft Environmental Planning Instruments

There are no known draft environmental planning instruments that are applicable to the subject site.

1 (a) (iii) Development Control Plan

The proposed development complies with all relevant provisions under the Holroyd Development Control Plan 2013.

1 (a) (iv) The Regulations

The proposal satisfies the relevant provisions of the Environmental Planning and Assessment Regulation 2000. The Environmental Planning and Assessment Regulation 2000 has Building Code of Australia (BCA) requirements. These requirements will be satisfied at the time of the Construction Certificate (CC).

1 (b) Likely Impacts of Development

(i) *Impact on the Natural Environment:*

The proposed development involves the provision of essential fire safety measures which should be taken into account when considering potential impact on the natural environment. In addition to the above, this application is accompanied by an Arboricultural Impact Assessment, prepared by Treerepairs, dated 17 February 2021 which outlines potential impacts on the natural environment and recommended mitigation measures anticipated to be incorporated into conditions of consent relating to the proposed development.

(ii) *Impact on the Built Environment:*

The proposed fire services upgrade will have minimal impact on the built environment and will not increase excessive bulk or scale on the Loftus Road streetscape.

(iii) *Social and Economic Impacts in the Locality:*

The proposed development will have a positive social and economic impact on the area. The proposed development will result in positive economic impacts by supporting the overall economic activities of current and future tenants on the Loftus Road. The proposed development contributes positively to the site by increasing the existing level of safety and protection to both life and property.

1 (c) Suitability of the site for the proposed development

Having regard to the characteristics of the site and its location, the proposed development is considered to be appropriate in that:

- The land is zoned to permit the works;
- The nature and form of the proposed development is broadly consistent with the development controls which apply to the site.
- The size and dimensions of the land are suitable for the scale of the works;
- The site has access to all utility services to accommodate demand for water, electricity, gas and telecommunications.

The development is not expected to result in any unacceptable or material environmental impacts, nor will it impinge on the amenity of adjoining tenancies and is therefore considered that the site is suitable to accommodate the proposed development.

1 (d) Any submission made

Cumberland Council will undertake a notification period in accordance with their policies.

1 (e) The public interest

The proposed development is considered to be in the wider in the public interest for the following reasons:

- It is consistent with the objectives of the Environmental Planning and Assessment Act 1979, specifically because it represents the economic and orderly development of land.
- The proposal is in accordance with the Holroyd Local Environmental Plan 2013 and the Holroyd Development Control Plan 2013.
- The proposal provides a responsive design in terms of relationship to adjoining development and establishes an appropriate streetscape and human scale through the adoption of sound urban design principles;

6. CONCLUSION

This Application for Modification of DA Consent No. DA2020/0488 seeks approval for a sprinkler tank and pump room as part of the previously-approved voluntary fire services upgrade at No. 30 Loftus Road Yennora.

The aim of this report has been to:

- Describe the proposal;
- Illustrate compliance of the proposal with relevant statutory considerations;
- Provide an assessment of the likely environmental impacts of the proposed development.

The proposed development has been assessed in accordance with the provisions of:

- Holroyd Local Environmental Plan 2013.
- Holroyd Citywide Development Control Plan 2013.
- Section 4.15 of the Environmental Planning and Assessment Act 1979.

Having regard to the aforementioned assessments it is considered that the proposed development is acceptable and that it should be approved.



Danielle Long
Planning Regulations Consultant



Adam Mainey - Director
Bach of Urban and Regional Planning (Hons)
Grad Diploma of Building Surveying

