

# HYDRAULIC SERVICES SPECIFICATION for

Cooee Lodge
Fire Hydrant Tank and Pump
Installation

Project No: MN8247

Client: Gilgandra Shire Council

Prepared By: Nazly Shammas Marline Newcastle Pty Ltd



# **Report Details**

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# 1 GENERAL HYDRAULIC REQUIREMENTS

# 1.1 GENERAL

### Scope of Works

The following list identifies the work to be undertaken by the Contractor along with accompanying drawings, clauses, and briefs. The listed items are not intended to limit or exclude any items required by the contract documents

- Supply and install a fire hydrant system that is fully compliant with the requirements of the BCA, AS 2419.1 AS 3500 and AS 2441.
- Cold water to the proposed 2x 108,000L fire tanks will supply through the new 100mm supply bifurcated off fire services as noted on drawings (connect downstream of existing DDCV assembly) to supply the fire hydrant tank make-up requirements of 5 litres per second.
   Contractor to provide all pipework and material required to complete the work.
- Provide new 2 x 150mm tank bellmouth anti-vortex suction points
- Provide & install 150mm 1 x large bore suction and dual small bore suction points adjacent new booster valve.
- Provide and install two fire hydrant pumps as scheduled in accordance with BCA, AS29141 and AS2419 in weatherproof pump room/ cabinet.
- Contractor to connect the 100mm fire hydrant pump discharge test line back to the tank as noted on detail drawing.
- Connect 150mm diameter tank overflow discharge over new 450 square stormwater pit to the kerb as noted on drawings.
- Provide and install new 150mm tank model booster valve adjacent suction points. Booster valve assembly shall be located not less ta 10m away from any high voltage equipment / substation.
- Provide and install 2 x equal volume fire hydrant storage tanks each having an effective capacity of 108,000 litres complete with all necessary ancillary equipment including, but not limited to, tank filling valves, quick fill valves, drains, overflows, volume level indicators, access ladders, access hatches and signage.
- Coordinate structural engineer with regard to construction of tank base elevated 150mm above surrounding ground level.
- Extend the new fire hydrant system and interconnect with the existing fire hydrant system as scheduled on drawings. Contractor to coordinate with council for cut in.
- Saw cut, remove and dispose of bitumen, concrete etc as well as excess spoils.
- Contractor is responsible for the returfing, Irrigation and top dressing of areas affected by the excavation.
- Provide required electrical services to the pumproom. Contractor to coordinate with site supervisor for power and the required work shall be done by a qualified electrical contractor.

### **AUTHORITIES**

The whole of the work shall be carried out by or under the full supervision of a fully licensed contractor in accordance with the drawings and specification, and to the satisfaction of the Company and to the Standards and Regulations of any authority having jurisdiction over the works and in particular those listed below:

- Natural Gas Company
- Local Water & Sewer Authority
- NSW Fire Brigades
- Department of Health
- Building Code of Australia
- Local Municipal Council
- Workcover Authority of NSW



- Department of Industrial Relations

Pay the relevant authorities all fees and charges legally demandable including:

- Inquiry fees
- Commencement of work fees
- Road opening fees
- Service connection fees

The Sub-Contractor shall submit evidence that:

- Requirements of authorities relating to the work under the contract have been ascertained prior to the commencement of the hydraulic services installation
- Fees to authorities, if any, have been paid and all types of approvals obtained.
- Certificates of compliance with regard to the extent of the installation. Such certificates have to be obtained on completion of the installation.
- All fittings, pipes, accessories and the like used in the works shall bear approval marks where and as required by the regulatory authorities.
- Test certificates for all essential service fittings. Be provided prior to completion.

### **Precedence**

Requirements of individual technical worksections of the specification override conflicting requirements in this worksection.

### REFERENCED DOCUMENTS

### **Current editions**

Use referenced documents which are editions, with amendments, current 3 months before the closing date for tenders, except where other editions or amendments are required by statutory authorities.

### Contractual relationships

Responsibilities and duties of the principal, contractor and Superintendent are not altered by requirements in referenced documents.

### **General standards**

Fire hydrants: To AS 2419

Coldwater: To AS 3500

# INTERPRETATION

# **General**

Unless the context otherwise requires, the following definitions apply:

- Supply: "Supply", "furnish" and similar expressions mean "supply only".
- Provide: "Provide" and similar expressions mean "supply and install".
- Approved: "Approved", "reviewed", "directed", "rejected", "endorsed" and similar expressions mean "approved (reviewed, directed, rejected, endorsed) in writing by the Superintendent".
- Give notice: "Give notice", "submit", "advise", "inform" and similar expressions mean "give notice (submit, advise, inform) in writing to the Superintendent".
- Obtain: "Obtain", "seek" and similar expressions mean "obtain (seek) in writing from the Superintendent".
- Proprietary: "Proprietary" mean identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Samples: Includes samples, prototypes and sample panels.

### **Technical**

Zinc-coated steel: Includes zinc-coated steel, zinc/iron alloy-coated steel, and aluminium/zinc-coated steel.



Pipe: Includes pipe and tube.

### Tests

Except where otherwise defined in referenced documents, the following definitions apply:

- Pre-completion tests: Tests carried out before completion tests.
  - . Type tests: Tests carried out on an item identical with a production item, before delivery to the site.
  - . Production tests: Tests carried out on the purchased equipment, before delivery to the site.
  - . Site tests: Tests carried out on site.
- Completion tests: Acceptance tests and final tests.
  - . Acceptance tests: Tests carried out on completed installations or systems and, except for final tests, before the date for practical completion, to demonstrate that the installation or system, including components, controls and equipment, operates correctly, safely and efficiently, and meets performance and other requirements.
  - . Final tests: Acceptance tests carried out before completion of the maintenance period.

### Maintenance period

Co-extensive with the defect's liability period.

### **CONTRACT DOCUMENTS**

### General

Diagrammatic layouts: Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only, except where figured dimensions are provided or calculable. Before commencing work, obtain measurements and other necessary information.

### 1.2 QUALITY

### **INSPECTION**

All inspections shall be to the relevant authorities' requirements.

### **Notice**

Witness points: If notice of inspection is to be given in respect of parts of the works, advise if and when those parts are to be concealed.

Hold points: If notice of inspection is to be given in respect of parts of the works, do not conceal those parts without approval.

Minimum notice for inspections to be made: 4 hours for on-site inspectors, otherwise 2 working days.

Concealed services: Give notice so that inspection may be made of services to be concealed.

Item	Туре	Criteria
Concealment of Service	W	Do not conceal service until they have been tested and witnessed by Superintendent.
Commissioning	W	Provide notice at least 2 days prior to final commissioning of services.

### 1.3 MATERIALS AND COMPONENTS

# **GENERAL**

# **Proprietary items**

Implication: Identification of a proprietary item does not necessarily imply exclusive preference for the item so identified but indicates the necessary properties of the item.

Alternatives: If alternatives are proposed, submit proposed alternatives and include samples, available technical information, reasons for proposed substitutions and cost. If necessary, provide an English translation. State if provision of proposed alternatives will necessitate alteration to other parts of the works and advise consequent costs.



### Manufacturers' or suppliers' recommendations

General: Select, if no selection is given, and transport, deliver, store, handle, protect, finish, adjust, prepare for use, and provide manufactured items in accordance with the current written recommendations and instructions of the manufacturer or supplier.

Instructions: Submit the recommendations and instructions, and advise of conflicts with other requirements.

Project modifications: Advise of activities that supplement, or are contrary to, manufacturer's or suppliers' written recommendations and instructions.

Product certification: If products must comply with product certification schemes, provide them in accordance with the certification requirements.

### **Sealed containers**

If materials or products are supplied by the manufacturer in closed or sealed containers or packages, bring the materials or products to point of use in the original containers or packages.

### Consistency

For the whole quantity of each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

### 1.4 EXECUTION

### **INSTALLATION**

### General

General: Install equipment and services plumb, fix securely and organise reticulated services neatly. Allow for movement in both structure and services.

Arrangement: Arrange services so that services running together are parallel with each other and with adjacent building elements. Under suspended ground floors, keep services at least 150 mm clear above ground surface, additional to insulation, and ensure access is not impeded.

Lifting: Provide permanent fixtures attached to the equipment, for lifting heavy items of equipment, as recommended by the manufacturer.

# **SERVICES CONNECTIONS**

# Statutory authorities' requirements

If the authorities elect to perform or supply part of the works, make the necessary arrangements. Install equipment supplied, but not installed, by the authorities.

### **Fees**

If fees are required by the authority to carry out the necessary work, pay all fees required.

### **Connections**

Connect to Gilgandra Shire Council's main as indicated on the drawings. Contractor to coordinate with council for service cut in.

# SYSTEM INTEGRATION

### General

Interconnect system elements so that the installations perform their designated functions.

### **FINISHES**

### **Piping**

General: Finish exposed piping, including fittings and supports, as follows: leave unpainted.

Paint hydrant booster assembly and hydrant standpipes signal red.

Valves: Finish valves to match connected piping. Valves to be clockwise close.

# **PIPING**

### Cleaning

General: Before installation, remove loose scale, burrs, fins and obstructions.



Protection: During construction, prevent the entry of foreign matter into the piping system by temporarily sealing the open ends of pipes and valves with purpose-made covers of pressed steel or rigid plastic.

### Installation

General: Install piping in straight lines at uniform grades with no sags. Arrange to prevent air locks. Provide sufficient unions, flanges and isolating valves to allow removal of piping and fittings for maintenance or replacement of plant.

Arrangement: Arrange and support piping so that it remains free from vibrations whilst permitting necessary movements. Minimise the number of joints.

Spacing: Provide at least 25 mm clear between pipes and between pipes and building elements, additional to insulation.

Dissimilar metals: Join dissimilar metals with fittings of electrolytically compatible material.

### Support system

General: Provide proprietary support systems of galvanized or zinc-coated steel construction.

Vertical pipes: Provide anchors and guides to maintain long pipes in position and supports to balance the mass of the pipe and its contents.

### **MARKING**

### General

General: Mark equipment, piping and valves, to provide a ready means of identification.

### Contents

General: Match terminology of record drawings.

### **Piping**

Identify throughout its length, install warning tap above all pipework.

# 1.5 COMPLETION

### **GENERAL**

# Contractor's submissions

Within 2 weeks after practical completion, submit 4 copies of work as executed drawings and Maintenance manual documents.

### **Warranties**

General: Name the principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Commencement: Commence warranty periods at practical completion or at acceptance of installation, if acceptance is not concurrent with practical completion.

Approval of installer: If installation is not by manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's written approval of the installing firm.

### **WORK AS EXECUTED DRAWINGS**

### General

Submit record drawings. Show the "as installed" locations of building elements, plant and equipment. Show off-the-grid dimensions where applicable.

### **Services**

Show dimensions, types and location of equipment and piping in relation to permanent site features and other underground services. Include relationship to building structure and other services, and changes made during commissioning and the maintenance period. Include diagrammatic drawings of each system showing piping and principal items of equipment.

### **Format**

Use the same borders and title block as the contract drawings.



# **OPERATION AND MAINTENANCE MANUALS**

### General

General: Submit operation and maintenance manuals for installations.

Authors and compilers: Personnel experienced in the maintenance and operation of equipment and systems installed, and with editorial ability.

Subdivision: By installation or system, depending on project size.

Referenced documents: If referenced documents or technical worksections require that manuals be submitted, include corresponding material in the operation and maintenance manuals.

### **Format**

A4 size loose leaf, in commercial quality, 4 ring binders with hard covers, each indexed, divided and titled. Include the following features:

- Pagination: Number pages consecutively.
- Cover: Identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL", to spine. Identify title of project, volume number, volume subject matter, and date of issue.
- Ring size: 50 mm maximum, with compressor bars.
- Text: Manufacturers' printed data, including associated diagrams, or typewritten, single-sided on bond paper, in clear concise English.
- Dividers: Durable divider for each separate element, with typed description of system and major equipment components. Clearly print short titles under laminated plastic tabs.
- Drawings: Fold drawings to A4 size and accommodate them in the binders so that they may be unfolded without being detached from the rings. Provide with reinforced punched binder tabs.

### **Contents - services**

Include the following in addition to Contents - general:

- Installation description: General description of the installation.
- Systems descriptions: Technical description of the systems installed, written to ensure that the principal's staff fully understand the scope and facilities provided. Identify function, normal operating characteristics, and limiting conditions.
- Systems performance: Technical description of the mode of operation of the systems installed.
- Equipment descriptions:
  - . Manufacturers' technical literature for equipment installed, assembled specifically for the project, excluding irrelevant matter. Mark each product data sheet to clearly identify specific products and component parts used in the installation, and data applicable to the installation.
  - . Supplements to product data to illustrate relations of component parts. Include typed text as necessary.
- Operation procedures:
  - . Safe starting up, running-in, operating and shutting down procedures for systems installed. Include logical step-by-step sequence of instructions for each procedure.
  - . Control sequences and flow diagrams for systems installed.
  - . Legend for colour-coded services.
  - . Schedules of fixed and variable equipment settings established during commissioning and maintenance.
  - . Procedures for seasonal changeovers.
- Maintenance procedures:
  - . Schedule of normal consumable items, local sources of supply, and expected replacement intervals.
  - . Instructions for use of tools and testing equipment.
  - . Emergency procedures, including telephone numbers for emergency services, and procedures for fault finding.



- Certificates:
  - . Copies of test certificates for the installation and equipment used in the installation.
  - . Test and balancing reports.
- Drawings:
  - . Charts of valve tag numbers, with location and function of each valve, keyed to diagrams.

# Timing and quantity

Final copies: Submit 3 seats of final volumes within 2 weeks after practical completion. Incorporate feedback from review and from training of principal's staff, including preparation and insertion of additional data.

# **TRAINING**

### General

Operation and maintenance manuals: Use items and procedures listed in the final draft operation and maintenance manuals as the basis for instruction. Review contents with the principal's staff in detail.

Format: Conduct training at agreed time, at system or equipment location.

### Operation

Immediately after practical completion, explain and demonstrate to the principal's staff the purpose, function and operation of the installations.

### Maintenance

Immediately after practical completion, explain and demonstrate to the principal's staff the purpose, function and maintenance of the installations.

### **COMMISSIONING**

### Reports

Submit reports indicating observations and results of tests and compliance or non-compliance with requirements.

# **Notice**

Give sufficient notice for inspection to be made of the commissioning of the installation.

### **COMPLETION TESTS**

### General

Carry out acceptance tests and final tests.

Internal: To AS 2107 External: To AS 1055.1

# Hydraulic site tests

Preparation for pressure testing: Securely anchor pipes and fittings in position to prevent movement during tests. Leave pipe joints exposed to enable observation during tests. Disconnect equipment which is not designed to carry the test pressure.

### **Functional checks**

Residual current devices: Verify earth leakage tripping times and currents.

# **MAINTENANCE**

### General

General: During the maintenance period, carry out periodic inspections and maintenance work as recommended by manufacturers of supplied equipment, and promptly rectify faults.

Emergencies: Attend emergency calls promptly.

### Site control

Report to the principal's designated representative on arriving at and before leaving the site.



### Maintenance records

General: Submit, in binders which match the manuals, loose leaf log book pages designed for recording completion activities including operational and maintenance procedures, materials used, test results, comments for future maintenance actions and notes covering the condition of the installation. Include completed log book pages recording the operational and maintenance activities performed up to the time of practical completion.

Number of pages: The greater of 100 pages or enough pages for the maintenance period and a further 12 months.

Certificates: Include test and approval certificates.

Service visits: Record comments on the functioning of the systems, work carried out, items requiring corrective action, adjustments made and name of service operator. Obtain the signature of the principal's designated representative.

Referenced documents: If referenced documents or technical worksections require that log books or records be submitted, include this material in the maintenance records.

Certification: On satisfactory completion of the installation, submit certificates stating that each installation is operating correctly.

### 2 WATER SERVICES

### 2.1 GENERAL

# **CROSS REFERENCES**

### General

Refer to the General requirements worksection.

### **STANDARDS**

# Water supply

General: To AS/NZS 3500.1.2.

### 2.2 QUALITY

### **INSPECTION**

### Witness points

Give sufficient notice so that inspection may be made at the following stages:

- Excavated surfaces.
- Concealed or underground services.

### Site tests

Test system for leaks, including pipe joints, valve seats, tap washers and strainers. Repair as necessary, replace if damaged, and retest.

# **SAMPLES**

# General

Submit samples of accessories not specified as proprietary items, including but not limited to the following:

- Pipework
- Valves
- Instruments, including gauges.
- Means of identification, including adhesive labels and engraved disks or plates.

# **SUBMISSIONS**

# **Works As Executed Drawings**

Submit drawings and schedules showing the layout and details of the as installed system, including

- location, type, grade and finish of piping, fittings, valves, meters and pipe supports;
- details of control panels including control and power diagrams;



### 2.3 MATERIALS AND COMPONENTS

### **AUTHORISED PRODUCTS**

### **Standard**

To SAA MP52, unless otherwise required by the statutory authority.

### 2.4 EXECUTION

### RETICULATION

# Fire hydrant system

Provide the cold water supply system, installed from Gilgandra Shire Council's Water Supply as shown on drawings to the draw-off points.

# Fire hydrant system schedule

Pipeline location	Material	Nominal size	Jointing method
All inground	Class 18 Blue Brute	As drawings	Rubber Ring

### **FITTINGS AND ACCESSORIES**

### General

Provide the fittings necessary for the proper functioning of the water supply system, including valves, backflow prevention devices, gauges and automatic controls and alarms.

Isolating valves schedule

Location	Function	Description
As drawings	Isolation	Brass - loose valve
As drawings	Hydrant main isolation valves	Butterfly valves or Gate valves

Note: All valves to be clockwise close

# 2.5 COMPLETION

### **GENERAL**

### Charging

On completion of installation, commissioning, testing and disinfection, fill the system with water, turn on control and isolating valves and the energy supply and leave the water supply system in full operational condition.

# 3 HYDRANTS

# 3.1 GENERAL

### **CROSS REFERENCES**

### General

Refer to the General requirements worksection.

# **DESIGN**

# General

Standard: To AS 2419.1.

# 3.2 QUALITY

### INSPECTION

# Witness and Hold points

Give sufficient notice so that inspection may be made of the following if required by regulative authority:

- Connection branch to Authority water main.
- Pipes installed in trenches including all thrust blocks.
- Fire brigade booster valve installed and ready for operational test.



### 3.3 MATERIALS AND COMPONENTS

# **AUTHORISED PRODUCTS**

### General

Provide equipment listed in the SSL Register of Accredited Products - Fire Protection Equipment.

### FIRE HYDRANT SYSTEMS

### General

System: To AS 2419.1.

Below-ground metal seated isolating valves: To AS/NZS 2638.1.

Below-ground resilient seated isolating valves: To AS/NZS 2638.2.

Above-ground isolating valves: To AS 3579.

Fire brigade booster connection: To AS 2419.3.

### **Above-ground pipes**

Material: Galvanised mild steel with screwed/ victaulic fittings. All pipe work shall be red colour coded incorporating all fire protection features.

### **FIRE HYDRANT PUMPS**

### General

System: To AS 2941.

Provide and install two fire hydrant pumps as scheduled in accordance with BCA, AS29141 and AS2419 in weatherproof pump room.

Contractor to provide required electrical services and emergency lighting to pump room to comply with AS 2941.

The electrical installation associated with pump system shall comply with AS/NZS 3000.

# FIRE HYDRANT SUCTION POINTS AND BOOSTER VALVES

General

System: To AS 2419.

Provide new 2 x 100mm tank suction points and 1 x large suction from tank to adjacent new booster valve

Provide and install new 100mm tank model booster valve adjacent suction points

### **FIRE HYDRANT TEST DRAIN**

# General

System: To AS 2419 and AS 3500.

Contractor to connect the 100mm fire hydrant pump discharge test line back to the tank as noted on detail drawing.

Connect 150mm tank overflow to street kerb, through adaptors to Council approval, as necessary.

# **FIRE HYDRANT TANKS**

# General

System: To AS 2304 and AS 2419.

Provide and install 2 x equal volume fire hydrant storage tanks each having an effective capacity of 108,000 litres complete with all necessary ancillary equipment including, but not limited to, tank filling valves, quick fill valves, drains, overflows, volume level indicators, access ladders, access hatches and signage.

Coordinate structural engineer with regard to construction of tank base elevated 150mm above surrounding ground level



# FIRE HYDRANT BLOCK PLAN

General

System: To AS 2419

Provide and install new fire hydrant block plans at booster assembly and main entry to the building.

# 3.4 EXECUTION

**INSTALLATION** 

General

System: To AS 2419.1.

# 3.5 COMPLETION

**COMMISSIONING** 

General

System: To AS 2419.1.

Fire hydrant valves: To AS 2419.2.



# 4 TENDER PRICE BREAKDOWN FOR HYDRAULIC SERVICES

Provide a tender estimate breakdown as part of the overall tender price. The breakdown is to include the following:

WORK DESCRIPTION	TENDER PRICE
Fire Hydrant Pumps	\$
Fire Hydrant Pump Room	\$
Booster Assembly	\$
Fire Hydrants	\$
Fire Water Storage Tanks	\$
Fixtures and Fittings	\$
Additional Pipework	\$
Trenching	\$
Commissioning	\$
Maintenance During Warranty Period	\$
Manuals & As-Built Drawings	\$
Other	\$
	\$
	\$
	\$
	\$
Subtotal	\$
GST	\$
TOTAL	\$

Signed	
Name	
Company	
Date	