REF Report:

Balranald Key Worker Accommodation

NSW Health Infrastructure

22 December 2022

→ **The Power of Commitment**

Project name		Balranald Key Worker Accommodation					
Document title		REF Report: | Balranald Key Worker Accommodation					
Project number		12596507					
File name		**https://projectsportal.ghd.com/sites/pp09_08/balranaldkeyworkerac/_layouts/15/DocIdRedir.aspx?ID=12596507-46470-11**					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
	A	S. Tudio, C. Peiris	T Little		T Little		22/12/22

GHD Pty Ltd | ABN 39 008 488 373

16 Marcus Clarke Street, Level 7

Canberra, Australian Capital Territory 2601, Australia

T +61 2 6113 3200 | **F** +61 2 6113 3299 | **E** cbrmail@ghd.com | **ghd.com**

Contents

Appendices

1. Introduction

GHD has been engaged by NSW Health Infrastructure to prepare the REF documentation for the Key Worker Accommodation proposed for the Balranald Hospital site.

1.1 Purpose of this report

This report is prepared for NSW Health Infrastructure to assess and report on the Electrical and Hydraulics services Review of Environmental Factors (REF) which forms part of the SSDA approvals process.

1.2 Scope and limitations

This report: has been prepared by GHD for NSW Health Infrastructure and may only be used and relied on by NSW Health Infrastructure for the purpose agreed between GHD and NSW Health Infrastructure as set out in this report.

GHD otherwise disclaims responsibility to any person other than NSW Health Infrastructure arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at no additional cost if necessary.

1.3 Assumptions

The assumptions made in preparing this report are detailed in the following discipline sections.

– Information provided by NSW Health Infrastructure is accurate
– Information provided by Council is accurate

2. Utility Services

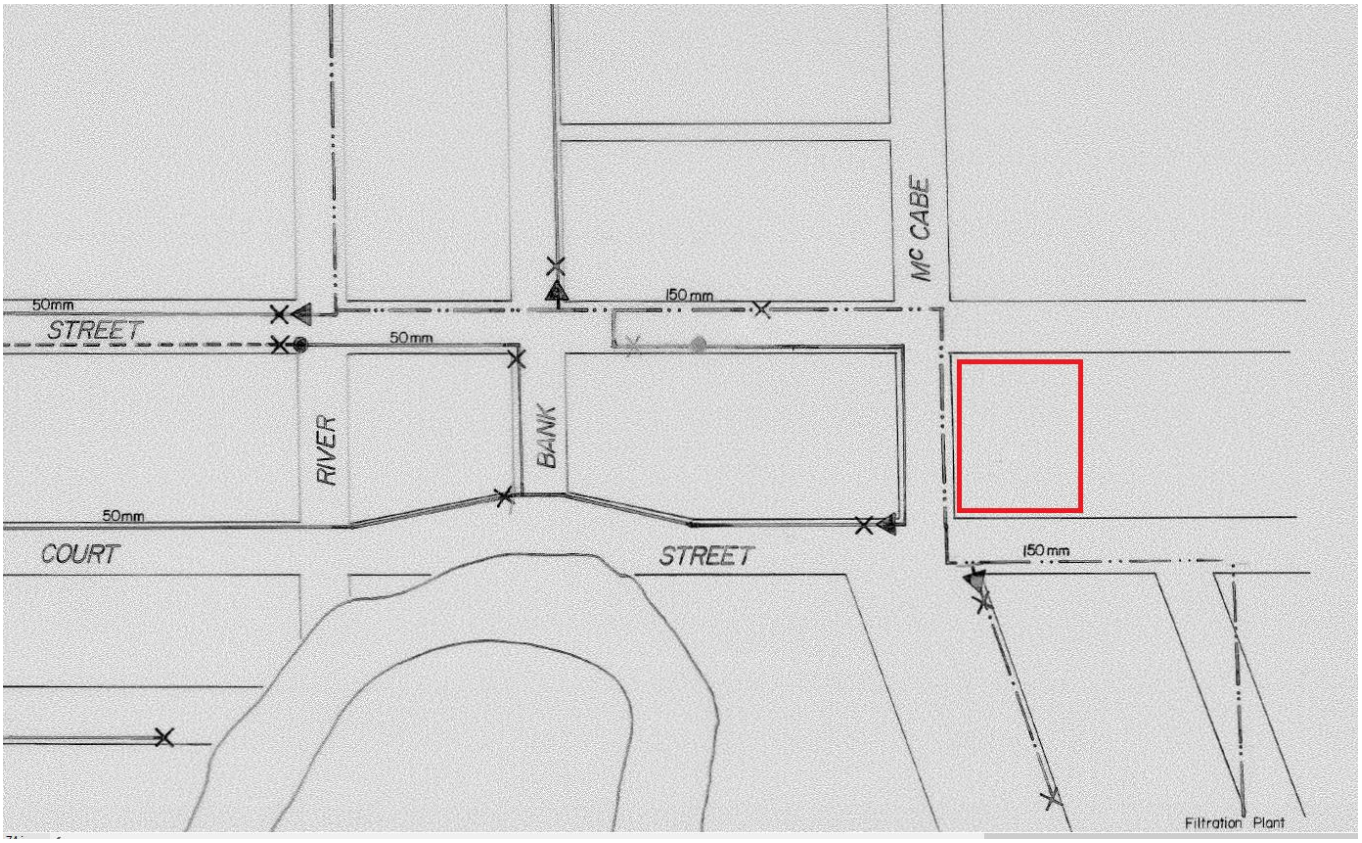
The report should be read in conjunction with sketch 12596507-SK-E01-RA for electrical related services and sketch 12596507-SK-H01-RA for hydraulics related services.

2.1 Water

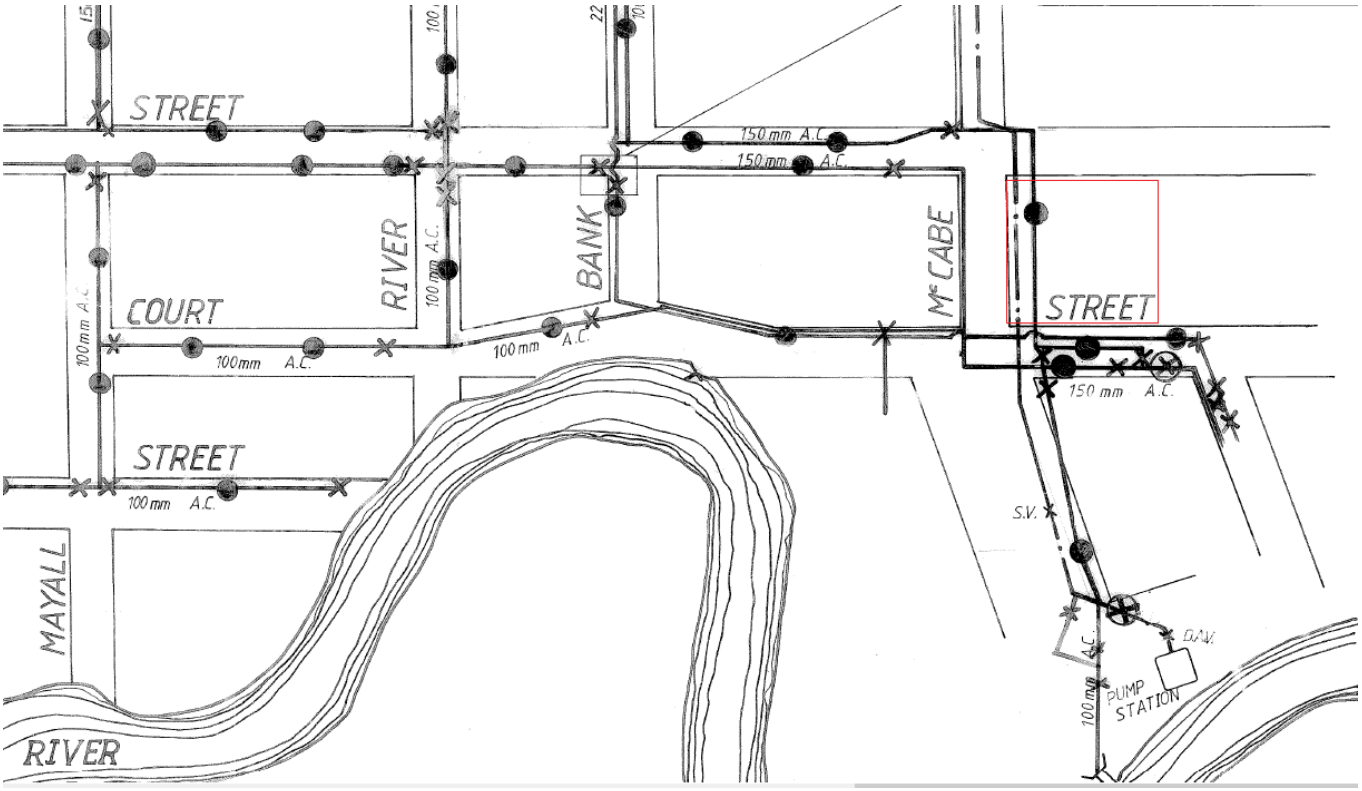
a. The availability and feasibility of providing water appropriate to the scale of the development and the land use zone in which it is occurring:

The site is an empty lot at Balranald Hospital. According to the Council, there are 150mm filtered and raw water mains running along the nature strips on McCabe Street (Sturt Highway). The raw watermain pipe material is made of asbestos cement (AC), and the filtered water is made of polyvinyl chloride (PVC). Both are operating normally, and there are no service issues as advised by the Council. It is feasible to connect the proposed key worker accommodation to the Council's filtered and raw water mains.

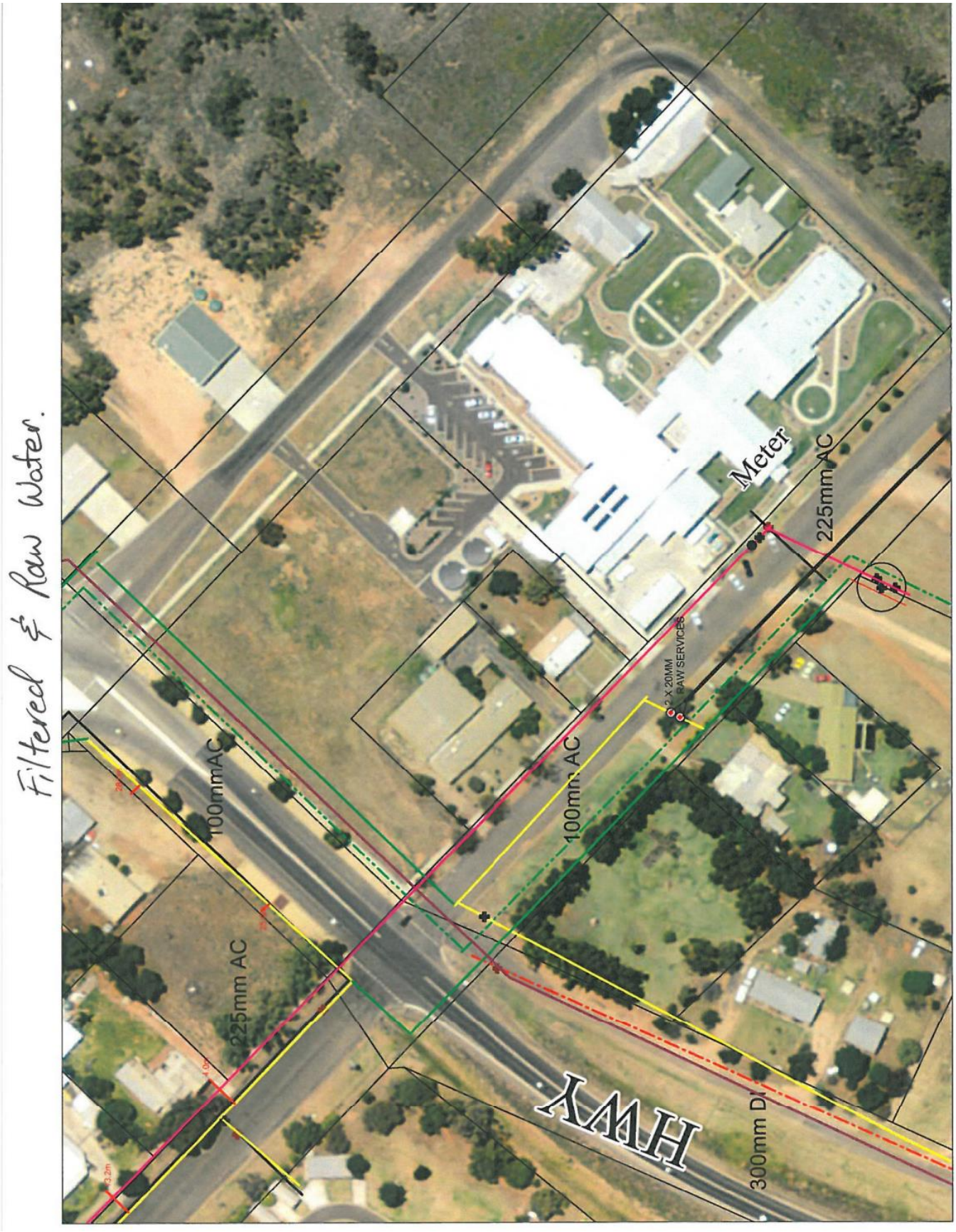
Filtered water main



Raw water main



GHD has also referenced the following drawing SKMBT_C652D13040413310 provided by Council:



b. The availability and location of existing services in relation to the site:

Both watermains are accessible and the location is not an issue. The proposed Key Worker Accommodation can make use of both filtered and raw water mains. The raw water will be used in the irrigation and gardening, while the filtered water will be used in the buildings.

The site currently has no water infrastructure within the block boundary however the Council can carry out the work connecting both water mains to the property.

c. The estimated demand on these services by the proposed development:

The preliminary estimated demand for the proposed Key Worker Accommodations is approximately 200 fixture units which calculates a probable simultaneous flow of 1.80 litres/second. The 120 fixtures units will be connected to the filtered water, while the 80 fixtures units will be connected to the raw water, with a probable simultaneous flow rate of 1.20 litres/second and 0.83 litres/second, respectively.

d. The capacity of existing services and ability to service the development:

The pressure and flow rates within these water mains are unknown. This will be confirmed upon receipt of an authority pressure and flow enquiry.

e. The method of connecting the proposed development to these services:

The method of connection will be a typical connection to the authority water main located in McCabe Street via an in-ground isolation sluice valve. There will be two supply lines to the site, one from the authority filtered water main which is to connect to the main water meter assembly, and one from the authority raw water main which is to connect to the raw water meter assembly where each form these assemblies are to have backflow prevention valves.

f. Whether any augmentation of these services will be required:

The site currently has no provisions. A detailed design will be required, as well as an application with fees for approval by the local water authority.

g. The proposed location for any extensions or augmentation to these services including the area required any specifications, and any necessary easements to protect/access the services:

We understand that there are no requirements for extension or augmentation of the Council water main, including easements, due to the service being accessible from McCabe Street.

2.2 Sewer

a. The availability and feasibility of providing sewer appropriate to the scale of the development and the land use zone in which it is occurring:

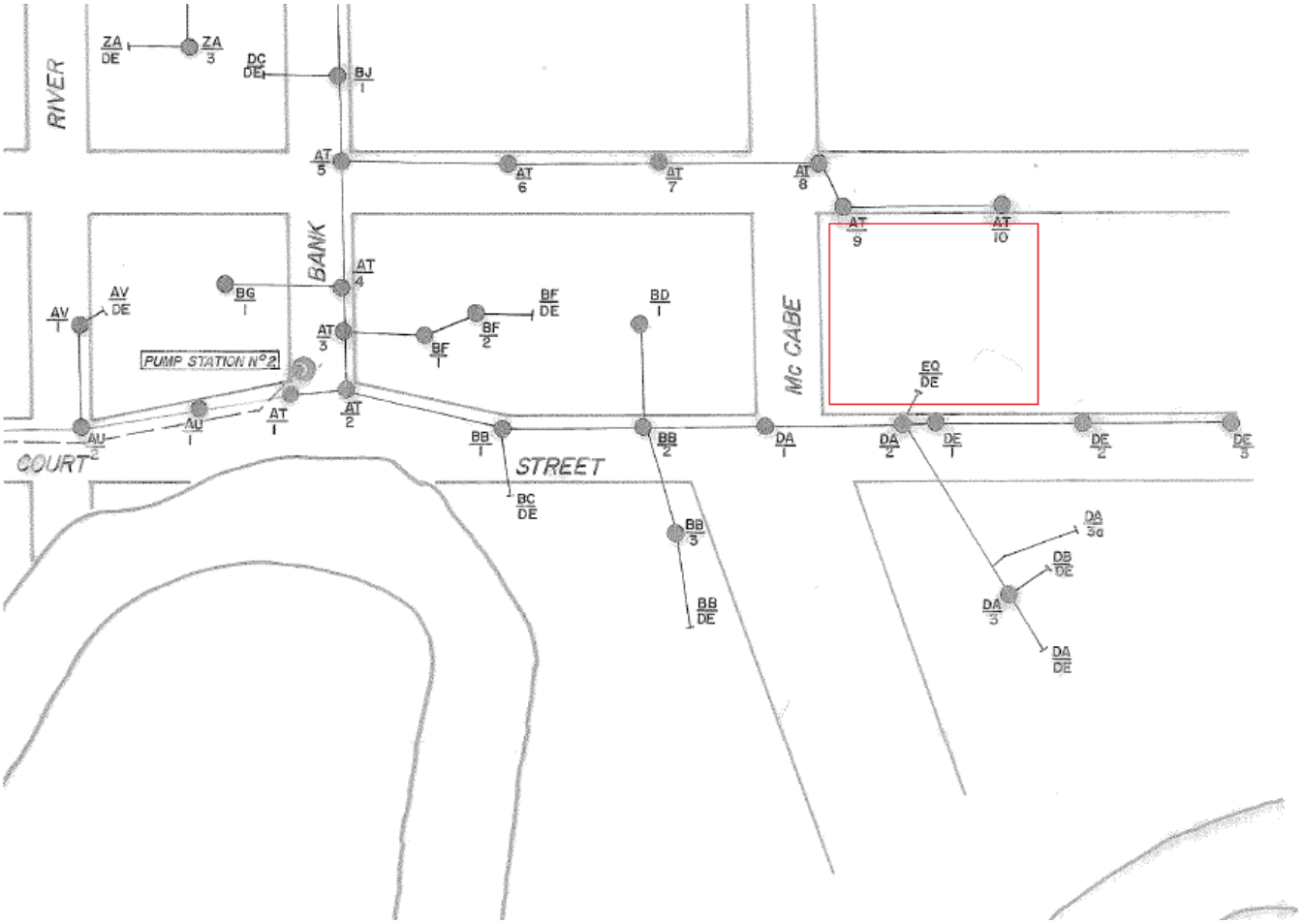
As advised by the Council, the sewer mains are located on both sides of Market Street and Court Street. The sewer main has been recently been and now in good condition.

Sewer section from Manhole AT9 to AT10 is 150mm pipe VC (vitreous clay)

Sewer section from Manhole DA1 to DA2 is 150mm pipe VC (vitreous clay)

Sewer section from Manhole DE1 to DE3 is 150 mm pipe PVC

Sewer section from Manhole DA2 to EQDE is 150mm pipe VC (vitreous clay) for the existing ambulance building



b. The availability and location of existing services in relation to the site:

The site currently has no sewer provision within the block boundary, however as stated by the Council, the sewer connection from the main will be done by Council workers and will typically be 100mm PVC pipe unless requested otherwise.

c. The estimated demand on these services by the proposed development:

The preliminary estimated demand for the proposed Key Workers Accommodation equates to approximately 184 fixtures units which calculates to the requirements of a 150mm at 1.00% fall connection and estimated sewer flow of 3.52 litres/second.

d. The capacity of existing services and ability to service the development:

The condition of the existing authority is in good condition as per Council. The sewer main is constructed of vitreous clay pipe and have enough capacity to service the accommodations.

e. The method of connecting the proposed development to these services:

The method of connection will be a standard connection to the authority sewer main located on Market Street. The sewer will be connected to the Council spur pipe (branch line) and extended into the property in 150mm DWV complete with a service access riser to finished ground level for Council access. The sewer drainage will then extend and reticulate throughout the site, connecting to the various accommodation fixtures.

f. Whether any augmentation of these services will be required:

We understand that no augmentation of the authority sewer main is required.

g. The proposed location for any extensions or augmentation to these services including the area required any specifications, and any necessary easements to protect/access the services:

We understand that there are no requirements for extension or augmentation of the authority sewer main, including easements, because the service is accessible from Market Street.

2.3 Stormwater (roof water)

a. The availability and feasibility of providing stormwater appropriate to the scale of the development and the land use zone in which it is occurring:

The current site is flat, with a typical gradient of approximately 0.16% from the centre to the northern and southern sides. Since the site is located near the creeks, the typical freeboard for residential development due to flooding from waterways, such as rivers or creeks is 500mm, according to NSW Department of Planning, Industry and Environment. A lower freeboard or an alternative approach to freeboard may be used where the consequences to people and property of low probability flood events are assessed as minor through the flood risk management process. By raising the floor level, reasonable falls can be achieved at the site, assisting in the management of overland flow and the prevention of ponding.

Stormwater runoff from the new accommodation roof will be captured by a new pit and pipe system that will be connected to the main trunk drainage network located in Market Street and driveway leading to the Balranald hospital.

b. The availability and location of existing services in relation to the site:

GHD have no services drawings of the exact location, size, or depth of the authority main other than the site survey showing the locations of the drainage pit along the site. The stormwater main trunk is assumed to run adjacent to the sewer main.

c. The estimated demand on these services by the proposed development:

AS/NZS 3500.3 will be used as the design basis for calculating roofwater flows, gutter and downpipe size. Calculations will be based on a 1:100 year storm event with a failsafe overflow off the road if box gutters and large areas with valley gutter collection larger than 20m2 are included.

The water flow calculation for the eaves gutters will be based on 1:20 year flows and will include free edge overflow to ensure that gutter overtopping does not result in water entering the building.

According to the current DA concept design drawings, the estimated design flow of roof water is approximately 5.7 litres/second per accommodation.

d. The capacity of existing services and ability to service the development:

Stormwater runoff from the roof will be collected via a new pipe and pit system, which will eventually connect to the existing main trunk drainage network located in Market Street and driveway leading to the existing hospital building.

e. The method of connecting the proposed development to these services:

The connection will be made using a DWV piping reticulation system that connects to site pits and site reticulation with final disposal into the authority trunk main.

f. Whether any augmentation of these services will be required:

This is not applicable.

g. The proposed location for any extensions or augmentation to these services including the area required any specifications, and any necessary easements to protect/access the services:

Because the service is accessible from Market Street and the driveway leading to the site, we believe there is no need for authority water main extensions or augmentation, including easements.

2.4 Fire

a. The availability and feasibility of providing water appropriate to the scale of the development and the land use zone in which it is occurring:

As per site inspection, there is an existing fire (hydrants and sprinkler) booster pumps and tanks with a capacity of 200,000 litres located at the site's southern side, supplying the hospital. The applicable Australian Standard does not require the calculation of total pressure and flow rate for all systems. Based on this statement, the

accommodation's fire protection system is feasible and can be connected to the existing fire booster pumps and tanks.

b. The availability and location of existing services in relation to the site:

The site currently has no fire protection system provision within the block boundary, but since the fire booster pumps and tanks are available and located near the proposed site. The accommodation's fire protection system can be supported.

c. The estimated demand on these services by the proposed development:

According to AS 2419.1:2021, the site fire hydrant will have a probable flow and residual requirement based on a fire compartment floor area of less than 1000 m² which determines a flow rate of 10 litre/second at 250 kPa.

The key workers accommodation is classified as a class 3 building by the NCC. Therefore, the facility will be sprinkled in accordance with AS 2118.4: 2012, which requires four sprinklers to operate at 48 litre/second in the most disadvantage area, in a flow rate of 192 lire/second at 220 kPa.

d. The capacity of existing services and ability to service the development:

The maximum working pressure of the existing fire booster pumps is 780 kPa. The system commissioning test is 20 L/s at 700 kPa at the most hydraulically disadvantageous hydrant. The hydraulic calculation at the sprinkler protected area control valves is 253 l/min at 306 kPa. The ability to support the proposed accommodation is sufficient.

e. The method of connecting the proposed development to these services:

The method of connection will be a typical connection to the existing hydrant line located at the site's southern side by an in-ground isolation sluice valve.

f. Whether any augmentation of these services will be required:

The hydrant and sprinkler line will need to be extended to the accommodation's site in order to comply with the fire hydrant coverage as per AS 2419.1.2021 and sprinkler requirements as per AS 2118.4:2012. External fire hydrants must be placed in a location that allows pedestrian access to the building. It should be positioned not less than 10m from the building it is protecting.

Compliance with the applicable standards will necessitate a detailed calculation.

g. The proposed location for any extensions or augmentation to these services including the area required any specifications, and any necessary easements to protect/access the services:

There will be a need for the fire water main to be extended or augmented because the service is connected to the exiting hospital. This will necessitate the addition of on-site fire infrastructure to the accommodation.

2.5 Gas

a. The availability and feasibility of providing water appropriate to the scale of the development and the land use zone in which it is occurring:

As per site inspection, there is an existing liquefied petroleum gas (LPG) tank on site that supplies the hospital commercial kitchen, which is located on the site's southern side adjacent to the fire water tank.

GHD understands that the existing gas tank capacity is only for the hospital commercial kitchen and that connecting to it is not feasible.

b. The availability and location of existing services in relation to the site:

GHD does not have any services drawings indicating the exact location, tank capacity, pipe size and depth of the gas line. The LPG regulator and isolation valve are located near the dirty linen in the hospital's back of house.

c. The estimated demand on these services by the proposed development:

Based on the architectural internal layout, it is assumed that the intention is to install three-burner ceramic glass electric cooktops. Thus, there is no need for gas demand.

d. The capacity of existing services and ability to service the development:

This is not applicable.

e. The method of connecting the proposed development to these services:

This is not applicable.

f. Whether any augmentation of these services will be required:

This is not applicable.

g. The proposed location for any extensions or augmentation to these services including the area required any specifications, and any necessary easements to protect/access the services:

This is not applicable.

2.6 Electricity

a. The availability and feasibility of providing electricity services appropriate to the scale of the development and the land use zone in which it is occurring:

Two options are proposed to service the site:

1. Option 1: The hospital is provided with a padmount substation (SUB17119) and generator on site at the Court Street side of the building. A new connection to the existing Hospital MSB, located within the rear freestanding structure, is proposed. It has not yet been verified if the whole MSB is generator backed or if portions are load shed. Chassis A of the MSB contains 2 spare 250 A frame breaker slots for new connections. A new trench with pits and conduits will be required to route the submain out to the new KWS site switchboard. The trench may be shared with the comms services but housed in separate power and comms pits and conduits. This new site switchboard will supply the local distribution boards for each unit and site infrastructure such as lighting.
2. Option 2: At the corner of Court Street and Sturt Highway a 315 kVA pole mount transformer (SUB17196) has been installed to supply the area. Overhead LV and HV infrastructure is located on the opposite side of Court Street to the site. A new overhead supply from Court Street to a new external site MSB with separate retail meter for the KWA block only may be a slightly more cost-effective solution to the above but provides no generator-backed supplies. The new MSB will supply the accommodation blocks and site as per the above option. Both blocks 45 and 47 adjacent the KWA block are connected by overhead supplies from Court Street.

a. The availability and location of existing services in relation to the site:

The site currently has no electrical infrastructure within the block boundary. The hospital site adjacent is provided with carpark lighting with poles and bollards with one pole on the KWA site boundary that will light a portion of the pathway between the sites.

The hospital has a power factor correction (PFC) unit located adjacent the MSB. Readings at the time of inspection indicates 0.98. The new works are not expected to affect the PFC in any significant manner.

Two LED streetlighting poles are in the verge of the Sturt Highway side.

The ambulance station and accommodation block adjacent are provided with their own dedicated overhead street supplies from Court St.

b. The estimated demand on these services by the proposed development:

The estimated maximum demand for the site is approximately 78 A per phase or 54 kW.

There is no reduction in load expected at the hospital or other locations due to the works.

c. The capacity of existing services and ability to service the development:

The existing MSB is provided with two multi-function meters. The two options for site supply are proposed until the metering for the site can be assessed. Confirmation will be required from Essential Energy for substation capacity which will be subject to an ASP Level 3 request for an increase in load.

d. The method of connecting the proposed development to these services:

The site plan provides the proposed routes and connection points to the new site. An underground services survey will be required to verify inground services around the gas tank, rear of the hospital and around the ambulance entry driveway.

Option 1 nominates the path out of the MSB room and across the existing hospital site to a new site switchboard.

Option 2 provides a nominally located overhead supply from Court St to a new site MSB with retail meter.

e. Whether any augmentation of these services will be required:

Confirmation will be required from Essential Energy for capacity.

f. The proposed location for any extensions or augmentations to these services including the area required any specifications, and any necessary easements to protect/access the services:

None at this stage.

2.7 Telecommunications

Existing carrier lead-in cabling appears to enter the Hospital site from Court St then into the main communications room for the site, within Wing C. A separate lead-in from Market St services the GPs in Wing A. The KWA site is surrounded by 4 additional Telstra pits in the verge.

It is anticipated that a new fibre link will be taken from the hospital communications room to service the KWA buildings via a new trench with pits and conduits as required. The pathway may be co-located with the power connection to the site if Option 1 power supply is adopted.

A new rack will be housed within one of the buildings to provide wireless access points within the buildings and external units along the pedestrian path and to permit additional fixed connections as required.

If no Hospital connected services are required for the accommodation buildings, a new lead-in from an adjacent Telstra pit can be provided with minimal disruption.

ghd.com

The Power of Commitment