



DOCUMENT CONTROL SHEET

Title	Services Infrastructure Report
Project	HammondCare Greenwich
Description	Hydraulic and Electrical Services
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Prepared By

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1. EXECUTIVE SUMMARY

This Services Infrastructure report is submitted to the Department of Planning, Industry and Environment (DPIE) in support of a State Significant Development Application (SSD-13619238) for the redevelopment of Greenwich Hospital into an integrated hospital and seniors living facility on land identified as 97-115 River Road, Greenwich (the site). The extent of the site is shown below.



The subject proposal is for the detailed design and construction of the facility following its concept approval under SSD-8699. Specifically, SSD-13619238 seeks approval for the following:

- Demolition of the existing hospital building and associated facilities at the site;
- Construction of a new hospital facility and integrated healthcare campus comprising of hospital, residential aged care, seniors housing, overnight respite, across:
 - A new main hospital building up to RL 80.0;
 - Two new seniors living buildings, Northern building up to RL 56.36, and Southern building up to RL 60.65;
 - A new 2-3 respite care building up to RL 56.9;
- Construction of associated site facilities and services, including pedestrian and vehicular access and basement parking;
- Site landscaping and infrastructure works; and
- Preservation of Pallister House which will continue to host dementia care and administrative functions.

The purpose of this report it to identify the existing infrastructure (Utilities) on the site and identify the associated requirements for these utilities to service the proposed development. This shall include details around demolition and the staged construction works.

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), the Secretary's Environmental Assessment Requirements (SEARs) for SSD-13619238 were issued on 24 February, 2021. This report has been prepared to respond to the following SEARs:

SEAR	Relevant section of report
 Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site. Identify any infrastructure upgrades required off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained. Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development. 	Section 2 Existing Infrastructure Section 3 Proposed Infrastructure



2. EXISTING INFRASTRUCTURE

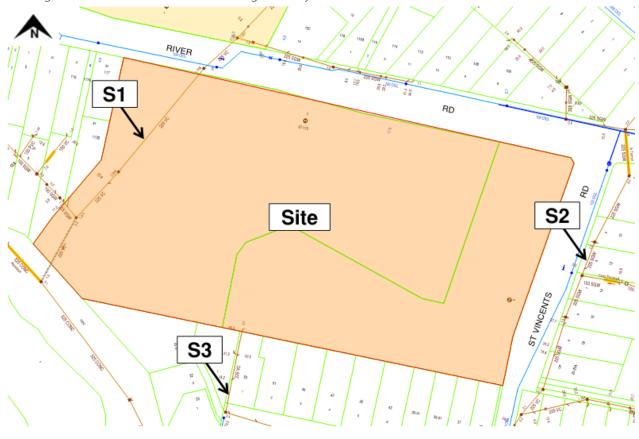
2.1 HYDRAULIC INFRASTRUCTURE

2.1.1 SEWER DRAINAGE

The site is serviced by the following authority sewer mains which surround and extend through the site, as per the following:

- Ø225mm authority sewer main extending through the western portion of the site (S1);
- Ø225mm authority sewer main extending through St Vincent's Road (S2); and
- Ø225mm authority sewer main extending through the southern portion of the site (S3).

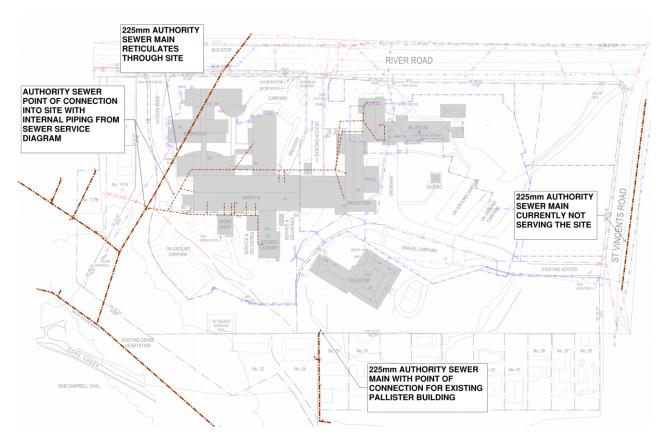
The diagram below illustrates the surrounding authority sewer mains:



DBYD - Sydney Water hydromap (sewer infrastructure)

As captured in the image below, currently the sewer drainage from the majority of the site discharges to the 225mm authority sewer main (S1), which reticulates through the site. The exception is the sewer drainage for the Pallister building which discharges to the 225mm authority sewer main (S3) on the southern portion of the site.

The 225mm authority sewer main S2 is currently not serving the existing site.



Existing Sewer Infrastructure

2.1.2 POTABLE WATER

The existing site has frontage to the following authority water mains:

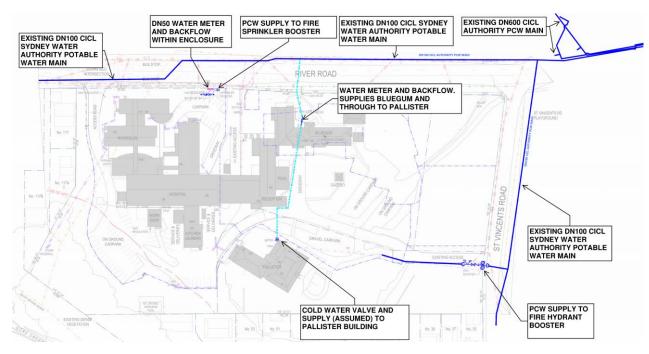
- Ø100mm CICL main in River Road (W1);
- Ø600mm CICL main in corner of River Road and St Vincent's Road (W2); and
- Ø100mm CICL main in St Vincent's Road (W3)

The pressure test results for each of the Botany Rd water mains can be found in the appendices of this report.

The diagram below illustrates the surrounding authority water mains:



DBYD - Sydney Water hydramap (water infrastructure)



Existing Potable Water Infrastructure

As shown in the figure above, the site currently is supplied with potable cold water by the authority water mains W1 and W2. There are 2x connections to the water main W1 in River Road, with one of them extending to the fire sprinkler booster and the site water meter that supplies the existing hospital and Riverglen buildings, and the other connection extending to a water meter that supplies the Bluegum and Pallister buildings.

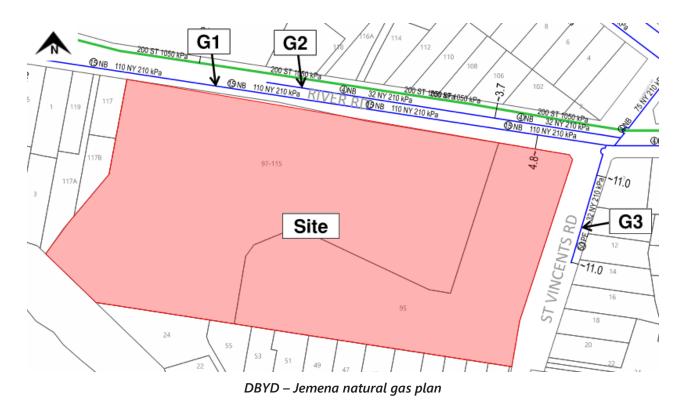
The existing fire hydrant booster for the site is currently connected to the water main W3 in River Road.

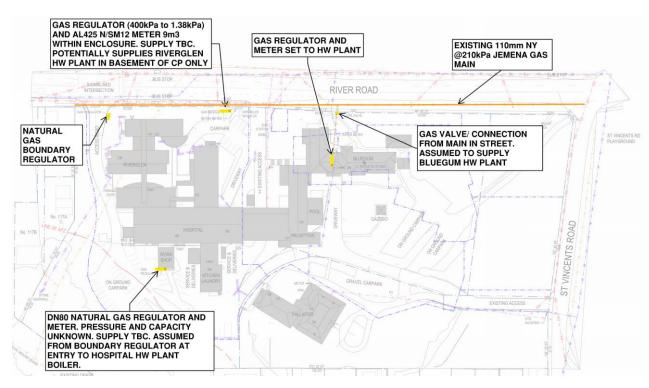
2.1.3 GAS SERVICES

The existing site has frontage to the following authority natural gas mains:

- Ø110mm NY, 210kPa main in River Road (G1);
- Ø32mm NY, 210kPa main in River Road (G2); and
- Ø32mm NY, 210kPa main St Vicent's Road (G3).

The diagram below illustrates the location of the authority gas main:





Existing Gas Infrastructure

2.2 ELECTRICAL AND COMMUNICATIONS INFRASTRUCTURE

2.2.1 EXISTING SUBSTATIONS, EASEMENTS AND SWITCHBOARDS

SUBSTATION

The site is currently being serviced by an existing substation (2386). The figure below shows the AUSGRID network map for this substation and the surrounding area.

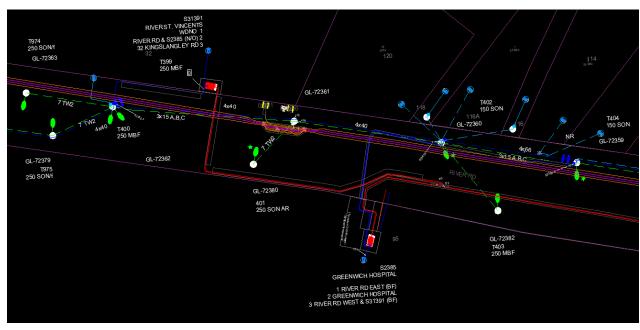


Figure 2.2 – Extract from AUSGRID Network map (27/04/2021).

We can see from the above network map that existing High Voltage Endeavour Energy network reticulates along River Road and into the current Greenwich site to supply the existing kiosk substation. We can also see that the substation on HammondCare's land also supports the LV street network on River Road. This LV provides power to street lights and residential houses on the opposite side of the road.

When this substation is removed and new substation/s are provided for our future works, we will be required as part of the certified Level 3 design to either support the existing LV electrical supplies off another substation or support them off our new substation. This will be part of the design process, staging arrangements, and co-ordination with AUSGRID.

There is also an existing electrical easement that encompasses both the existing kiosk substation and the Ausgrid cables that reticulate within HammondCare's property. These easements will require relinquishment as part of the Ausgrid coordination works with the new substations.



Figure 2.3 – Existing Substation (2386)

MAIN SWITCHBOARD

This substation has a direct supply to the HammondCare external site main switchboard which is located just south of the existing substation.

The existing main switch board consists of 4 segments. The first two segments are the incoming consumer mains, service protection device and the authority meter. The site existing NMI is NCCC004669 – K 160.

The last 2 segments will house the circuit breakers that feed the reminder of the site. Whilst JHA did have the Authority keys to gain access to the authority sections of the main switchboard. HammondCare did not have (or could not locate) the key for the private sections on the main switchboard.

JHA will require access to this section of the main switchboard to confirm and de risk the project of existing electrical feeds when the staged demolition works begin.







Figure 2.3 – Existing Main Switchboard

Figure 2.4 – Authority Section and Meter

2.2.2 EXISTING TELECOMMUNICATIONS.

The existing site has a main communications room in the lower western end of the hospital building. This main communications rooms is where all other existing communication distributors are connected via fibres. The multiple racks in the room also houses the following equipment.

- Fibre connections to other distributors
- General CAT6 connections to nearby hospital areas.
- MATV Modulators
- FOXTEL Digital tuners
- Servers
- CCTV NVR.

It should also be noted that the lead in telecommunication services do not reticulate directly into this room. There is a separate communications room that HammondCare have labelled PABX room where the following services are installed.

- Telstra Fibre Leadin
- NBN Fibre Leadin
- Existing copper phone services.

Please see Figure 2.5 for a mark-up of the existing communication services.

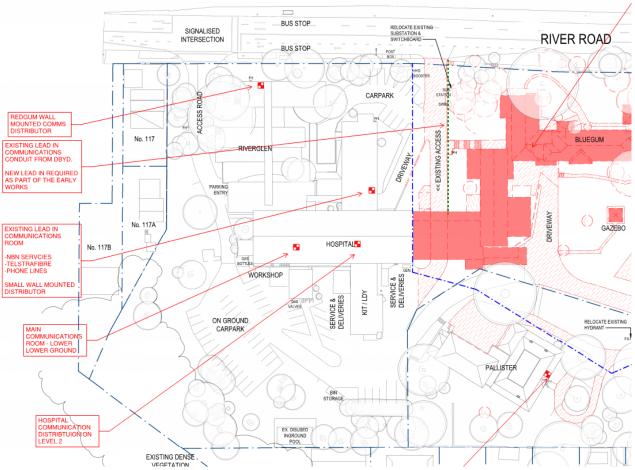


Figure 2.5 – Existing Communications

As we can see from the green line in Figure 2.5. The incoming communication conduits (NBN and Telstra) fall within the stage 1 works. This will be addressed in the proposed works stage.

3. PROPOSED INFRASTRUCTURE AND REQUIRED STAGING

3.1 HYDRAULIC INFRASTRUCTURE

3.1.1 SEWER DRAINAGE

3.1.1.1 Staging of works

The current staging of works for the proposed development consists of:

- Stage 1: Early Works: Demolition of Bluegum building and eastern portion of the existing hospital
- Stage 2:
 - o Stage 2.1: Demolition of small area to the north of existing Pallister building
 - o Stage 2.2: Construction of Health building
- Stage 3:
 - o Stage 3.1: Demolition of Riverglen and western portion of the existing hospital
 - o Stage 3.2: Construction of Seniors Living South building
- Stage 4: Construction of the Seniors Living North building
- Stage 5: Construction of the Respite building

Due to this staging of works, the intent for the sewer drainage infrastructure is the following:

- Stage 1: Locate and remove the existing site sewer from the Bluegum building and eastern side of the existing hospital, capping the service off for the stage 2.1 demolition works
- Stage 2:
 - o Stage 2.1: No sewer infrastructure changes proposed to this stage
 - Stage 2.2: Provide new drainage services for the new hospital, which will be extended to a new/extended connection to be provided to the 225mm authority sewer main in St Vincent's Road (S2) or the Southern connection (S3) following formal confirmation by Sydney Water Authority
- Stage 3:
 - o Stage 3.1: Locate and remove the existing site sewer from Riverglen building and western portion of the existing hospital
 - o Stage 3.2: Options to either concrete encase the existing DN225 OR divert the 225mm authority sewer in the western portion of the site (S1) to outside of the proposed basement level area of the Seniors Living buildings. Both options will provide 1x new sewer manhole connection for the Seniors Living North building and 1x for the Seniors Living South building. Provide private sewer extension into Seniors Living South building.
- Stage 4: Provide private sewer extensions into Seniors Living North building.
- Stage 5: Provide new private drainage services for the Respite building, extending to the new private sewer service constructed in stage 2.2, which connect to the sewer main S2.

Therefore, as mentioned, the sewer drainage for the site is proposed to be divided into three authority sewer mains connections, with the Seniors Living North and South connection to the sewer main S1 in the western side of the site; the Hospital and Respite building connecting to the sewer main S2 in the eastern side of the site; and the sewer connection for the Pallister building being retained without any proposed changes, connecting to the sewer main S3 in the southern side of the site or the S3 existing connection to the South.

A Water Servicing Coordinator (WSC) has been engaged to apply for a Feasibility Study with Sydney Water, upon which suitability for the proposed works mentioned above will be provided.

3.1.1.2 Load Estimation - sewer

A preliminary wastewater discharge analysis has been undertaken and the following estimated loads have been calculated:

- Average daily discharge:
 - o Seniors Living North and South buildings Connection to authority sewer main S1: 19.0 kL/day;
 - o Health and Respite buildings Connection to authority sewer main S2: 36.3 kL/day.
- Average flow:
 - o Seniors Living North and South buildings Connection to authority sewer main S1: 6.71L/s;
 - o Health and Respite buildings Connection to authority sewer main S2/S3: 4.00L/s.

3.1.2 WATER SUPPLY

3.1.2.1 Connection Points

The proposed works for potable water supply will be based on the staging of works described in section 3.1.1.1 above. For potable water supply, the intent is as per the following:

- Stage 1: Retain the existing site fire sprinkler booster and the site water meter supplying the existing hospital and Riverglen buildings. Remove the Sydney water Authority water meter and cold water supply that reticulates through the site to supply the Bluegum and Pallister buildings.
- Stage 2:
 - o Stage 2.1: Connect temporarily the water supply to the Pallister building to the existing hospital kitchen. Retain the existing fire hydrant booster connection;
 - o Stage 2.2:
 - Option 1:

Retain the existing site water meter supplying the existing Riverglen and hospital buildings and extend to also supply the new hospital, and provide a new combined fire hydrant and fire sprinkler booster assembly. This option although preferable is pending confirmation from Sydney Water if existing supply pipe is sufficient for the additional loads. If this is not approved, the option 2 below is proposed;

Option 2:

Extend the existing 600mm CICL authority potable cold water main via 150mm or 200mm extension, W2 past the front corner of the site. A new site water meter with backflow device which shall also feed the combined fire hydrant and fire sprinkler booster assembly would be extended from this location privately to the water meters located in the water meter room in the carpark in level 1 of the Health building. Extend water supply from the meter room to each level in the Health building.

- Stage 3:
 - o Stage 3.1:
 - Option 1:

Remove the existing water supply pipes to the existing hospital, Riverglen building and remaining old site. Retain the existing site water meter, pending confirmation with Sydney Water if pipe supply and meter are sufficient to cater for the additional loads as mentioned;

- Option 2: No additional works required at this stage.
- o Stage 3.2: Extend the potable cold water supply from the water meter room to supply the Senior Living South building.
- Stage 4: Extend the potable cold water supply from the water meter room to supply the Senior Living North building.
- Stage 5: Extend the potable cold water supply from the water meter room to supply the Respite building.



3.1.2.2 Load Estimation – water

A preliminary water usage analysis has been undertaken and the following estimated loads have been calculated:

- Average daily demand:
 - o Health building: 42.20 kL/day
 - o Seniors Living North building: 12.47 kL/day
 - o Seniors Living South building: 11.38 kL/day
 - o Commercial Kitchen/Café in Health building: 0.50 kL/day
 - o Common area (rainwater top-up): 2.78 kL/day
 - o Respite building: 2.71 kL/day
- Average flow (PSD):
 - o Health building: 5.93 L/s
 - o Seniors Living North building: 4.55 L/s
 - o Seniors Living South building: 4.36 L/s
 - o Commercial Kitchen/Café in Health building: 0.39 L/s
 - o Common area (rainwater top-up): 4.17 L/s
 - o Respite building: 0.64 L/s
 - o Probable simultaneous demand for the site: 11.40 L/s

3.1.3 ADEQUACY OF POTABLE COLD WATER AND SEWER AUTHORITIES INFRASTRUCTURE

Results obtained from Sydney Water regarding water main W1 flow and pressured can be found in the appendices section of this report.

As mentioned, a Water Servicing Coordinator (WSC) has been engaged to apply for a Feasibility Study with Sydney Water, upon which further review of the proposed works will be provided and this will allow JHA to proceed with the most feasible option from those mentioned above.

Requirement for pressure boosting pumps and tanks will be provided upon results of this application, depending on which water main the proposed development will be connected to.

3.1.4 GAS SUPPLY

The proposed works for gas supply will be based on the staging of works described in section 3.1.1.1 above. For gas supply, the intent is as per the following:

- Stage 1: Disconnect existing gas supply to Bluegum building. Retain gas boundary regulators and gas meters supplying Riverglen and hospital buildings.
- Stage 2:
 - o Stage 2.1: No gas infrastructure changes proposed to this stage Stage 2.2: Upgrade the existing site gas incoming supply to cater for the site final loads and reconnect to the existing Riverglen meter temporarily. Extend gas supply to the gas meters in the proposed gas meter room located in the carpark level 1 of Health building. Extend gas supply from the meter room to each required level in the Health building.
- Stage 3:
 - o Stage 3.1: Decommission the existing gas meter set that supplied the Riverglen building, provide new boundary regulator and retain pipework to the new hospital. Decommission existing gas boundary regulator and gas meter that supplied the existing kitchen/hospital;
 - o Stage 3.2: Extend gas supply from the gas meter room to the Seniors Living South building;

- Stage 4: Extend gas supply from the gas meter room to the Seniors Living North building;
- Stage 5: Extend gas supply from the gas meter room to the Respite building.

Confirmation from Jemena will be required to assess if the proposed works as mentioned above are suitable and feasible.



3.2 ELECTRICAL INFRASTRUCTURE

3.2.1 ELECTRICAL DEMAND LOADINGS

A maximum demand has been completed for the new proposed works on the site. This includes a breakup for each new building.

Maximum Demand	Amps per phase
Hospital Building	1922.80
Respite Building	77.06
Senior Living North	477.97
Senior Living South	515.21
Pallister House	N/A
Total	2993.04

It should be noted that JHA have used the following allowances for their early Maximum demand calculations.

- Hospital 90VA/M2 For hospitals Health infrastructure NSW require 100VA/M2 and allow it to be reduced to 85 VA/M2 with energy efficiency considerations.
- Senior Living Has been based on A/C in ILUs, Induction Cooktop and Gas hot water service.
- The site has been provided with a small allowance for electrical vehicle chargers.

Pallister House above has not been included in the overall site demand as it is currently fed from its own dedicated supply. JHA however would suggest consolidating its supply onto the new site arrangement and Main switchboard.

3.2.2 SUBSTATIONS

HammondCare Greenwich falls within the AUSGIRD operational area for power. In consideration of the development's expected power requirements above in the maximum demand calculations, JHA can see that there will be a minimum requirement for two (2) new substations as part of these works. This is likely to be an arrangement of 1000kVA and 1500kVA substations.

JHA has already submitted an application to AUSGIRD for the new required substation. JHA has accredited Level 3 ASP designers that will be carrying out the design works in co-ordination with AUSGIRD for this project.

HV FEEDER CONNECTIONS & RETICULATION

To provide suitable electrical supply connections to the proposed development, it is proposed the existing Ausgrid high voltage feeders located within the River Road footpath will be utilised to connect the new Ausgrid kiosk substations proposed along the River Road frontage of the site. This arrangement is subject to suitable spare capacity in the existing HV feeders and Ausgrid design acceptance.

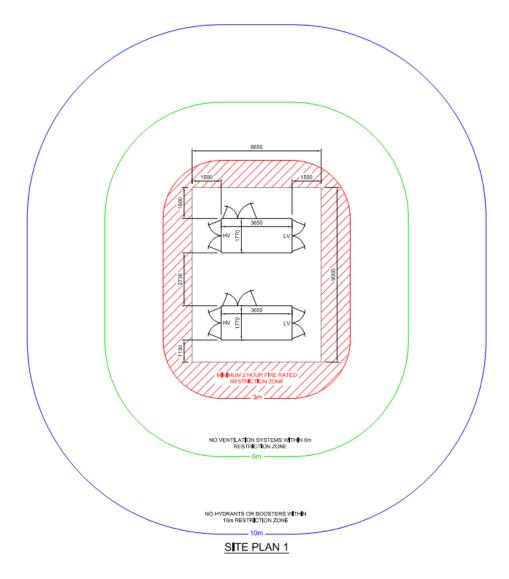
High voltage joints are proposed to be installed within the River Road Street footpath to the existing high voltage feeders and new cabling installed underground to the new substation infrastructure within the site, under a new easement in favour of Ausgrid.

AUSGRID SUBSTATION ARRANGEMENTS

The design team has considered a number of options for substation locations and have developed a suitable location for a twin kiosk substation option along River Road in the corner of Stage 1.

The following are general spatial requirements/principles adopted for the proposed kiosk substations:

- The kiosk substation must have unimpeded access for AUSGRID personnel and vehicles, directly from a public street. Access from the public road to the substation must not be fenced or enclosed.
- The substation easement area is to be made flat and batter to easement be no greater than 1:4
- 24hr/7day week access is to be provided from river road to the substation from the boundary for heavy vehicle movement and personnel access to the substation
- All works are to be in accordance with the site specific Ausgrid Design Information Package, Ausgrid Network Standards, and a certified Level 3 design





3.2.3 STAGING OF WORKS

The current staging of works for the proposed development consists of:

- Stage 1: Early Works: Demolition of Bluegum building and eastern portion of the existing hospital
- Stage 2
 - o Stage 2.1: Demolition of small area to the north of existing Pallister building
 - o Stage 2.2: Construction of Health building
- Stage 3:
 - o Stage 3.1: Demolition of Riverglen and western portion of the existing hospital
 - o Stage 3.2: Construction of Seniors Living South building
- Stage 4: Construction of the Seniors Living North building
- Stage 5: Construction of the Respite building

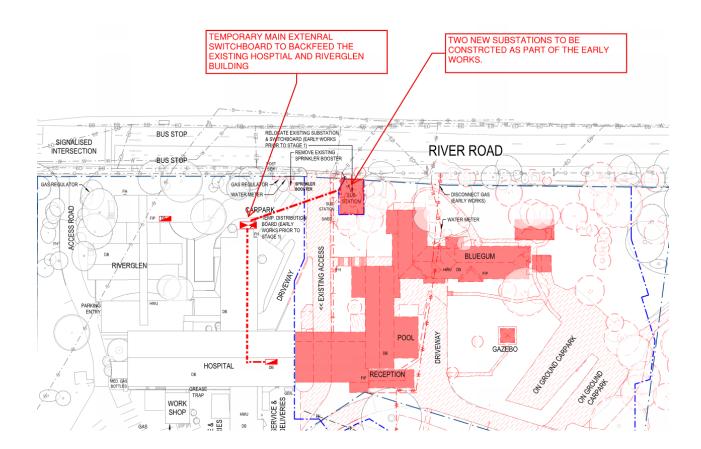
3.2.4 STAGING – SUBSTATIONS AND MAIN SWITCHBOARDS

A major item identified for this project is that the existing substation and site main switchboard fall with the demolition works for stage 1.

This requires that we establish either the new substations and provide a new mains to the existing main distribution board to support the hospital that will remain operational as the stage 1 area is being cleared and then the new building being constructed.

Please see the sketch mark-up of the proposed stages works below.

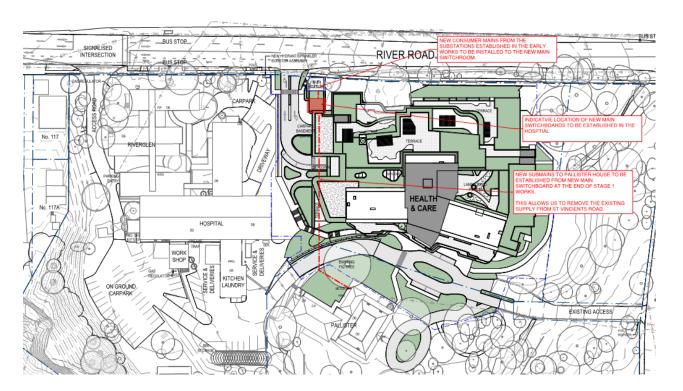
STAGE 1 - ELECTRICAL EARLY WORKS



As part of the Stage 1 works the following will be completed:

- Established two new substations in their permanent location
- Installed a temporary main distribution board outside of the stage 1 works where the new consumer mains from the new substations will be connected to a temporary board.
- Installed temporary submains from the new temporary main board back to the existing hospital building main distribution board. This hospital board currently support the remaining switchboard in the hospital building and Riverglen.
- Demolition works in the stage 2 footprint to make ready for the construction of the new hospital. As part of these works all exiting electrical equipment will be isolated and made safe for removal

ELECTRICAL STAGE 2.2 WORKS



As part of the Stage 2.2 works the following will be completed:

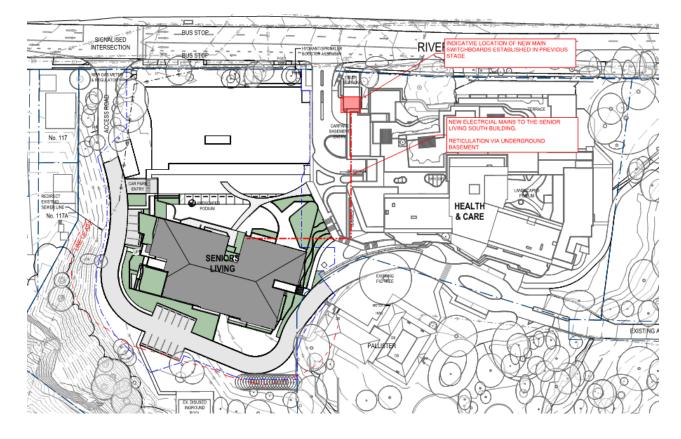
- Construct a new main switch room with two large main switchboards in the basement of the new hospital building.
- Install and connect new consumer mains from the established substations.
- Towards the end of stage 2 installed and connect new submains from the new main switchboards to the existing Pallister house.
- Remove existing electrical supply from St Vincent's road to Pallister house.
- Pending the duration between the completion of Stage 2.2 and Stage 3.1 (Demolition Works) a temporary submain from the new main switchboard may need to be run to the temporary main board that supports the existing hospital.

ELECTRICAL STAGE 3.1 WORKS



Stage 3.1 will be the demolition works in the stage 3 footprint to make ready for the construction of the two senior living buildings. As part of these works all exiting electrical equipment will be isolated and made safe for removal.

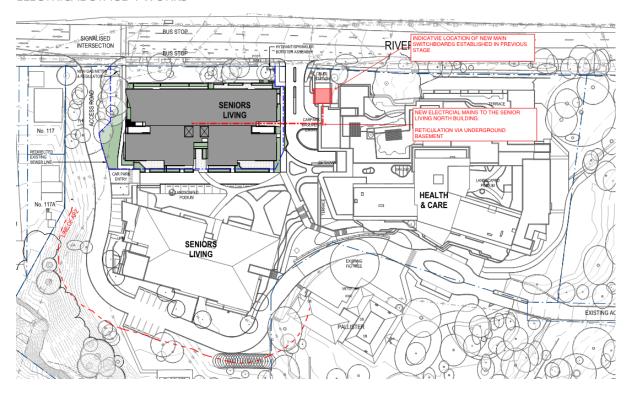
ELECTRICAL STAGE 3.2 WORKS



As part of the Stage 3.2 works the following will be completed:

• Provide and install new submains to the Senior Living South buildings.

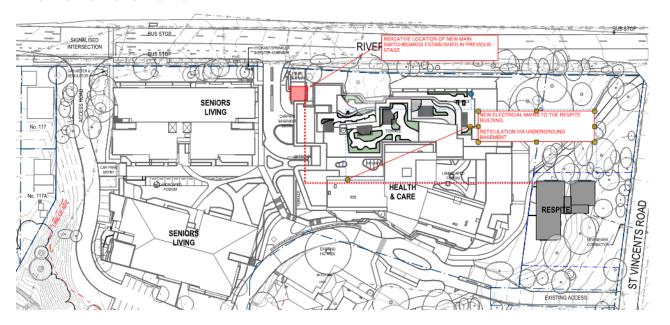
ELECTRICAL STAGE 4 WORKS



As part of the Stage 4 works the following will be completed:

• Provide and install new submains to the Senior Living North building.

ELECTRICAL STAGE 5 WORKS



As part of the Stage 5 works the following will be completed:

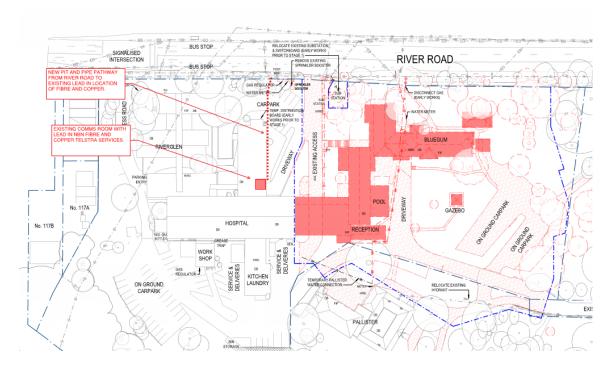
• Provide and install new submains to the 2 Story respite building

3.2.5 STAGING – COMMUNICATIONS AND NBN

We can see from the existing DBYD plan and mark-up in section 2.2.2 of this report that the incoming pit and pipe for NBN and Telstra runs through the Stage 1 demolition works. So as per of the staged works we will include a new pit and pipe outside of this area.

Please see the sketch mark-up of the proposed staged works below.

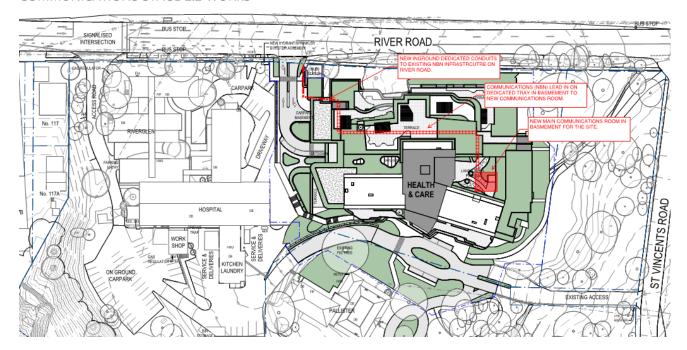
COMMUNICATIONS EARLY WORKS – STAGE 1



As part of the Stage 1 works the following will be completed:

- Establish new pit and pipe pathway for NBN to existing main communications room.
- demolition works in the Stage 1 footprint to make ready for the construction of the new hospital. As part of these works all exiting communications equipment will be isolated and made safe for removal.

COMMUNICATIONS STAGE 2.2 WORKS



As part of the Stage 2.2 works the following will be completed:

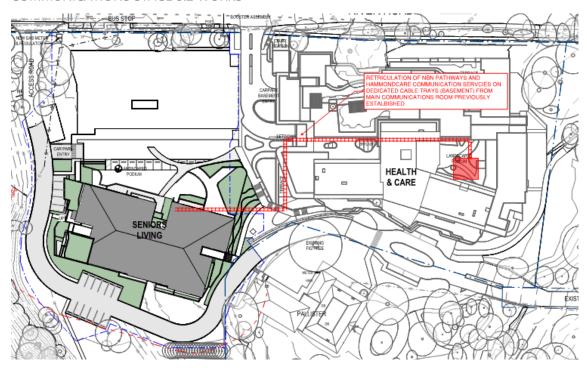
- Construct a new main Communications room for the site. This room shall house all NBN major equipment for incoming telecommunications.
- Reticulation of NBN lead in will be a hybrid of in ground conduits and cable trays in the basement.
- Pending the duration between the completion on Stage 2 and Stage 3.1 (Demolition works) a temporary fibre from the new main communications room may need to be run to the old main communications room.

COMMUNICATIONS STAGE 3 WORKS

Stage 3.1 will be the demolition works in the Stage 3 footprint to make ready for the construction of the two senior living buildings. As part of these works all existing communications equipment will be isolated and made safe for removal.



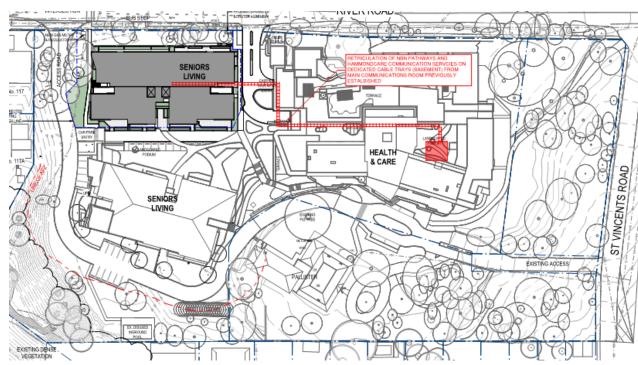
COMMUNICATIONS STAGE 3.2 WORKS



As part of the Stage 3.2 works the following will be completed:

- Install and run the remaining NBN pathways and HammondCare communication services on existing and new trays to the senior living south building.
- Riser cupboards will be provided within the senior livings building to reticulate and house NBN pathways and private HammondCare fibre and structured cabling.

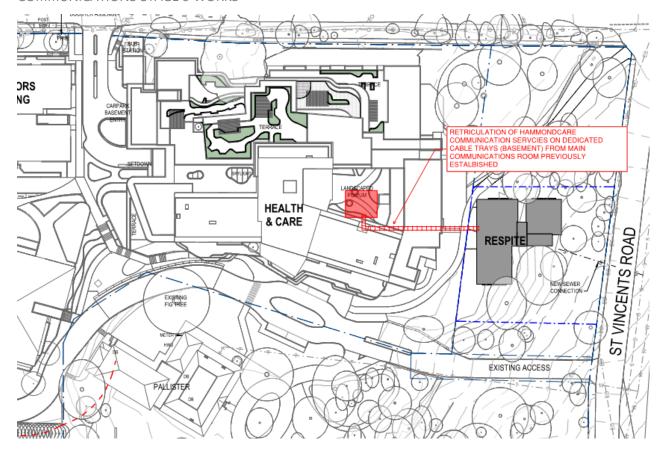
COMMUNICATIONS STAGE 4 WORKS



As part of the Stage 4 works the following will be completed:

- Install and run the remaining NBN pathways and HammondCare communication services on existing and new trays to the senior living north building.
- Riser cupboards will be provided within the senior livings building to reticulate and house NBN pathways and private HammondCare fibre and structured cabling.

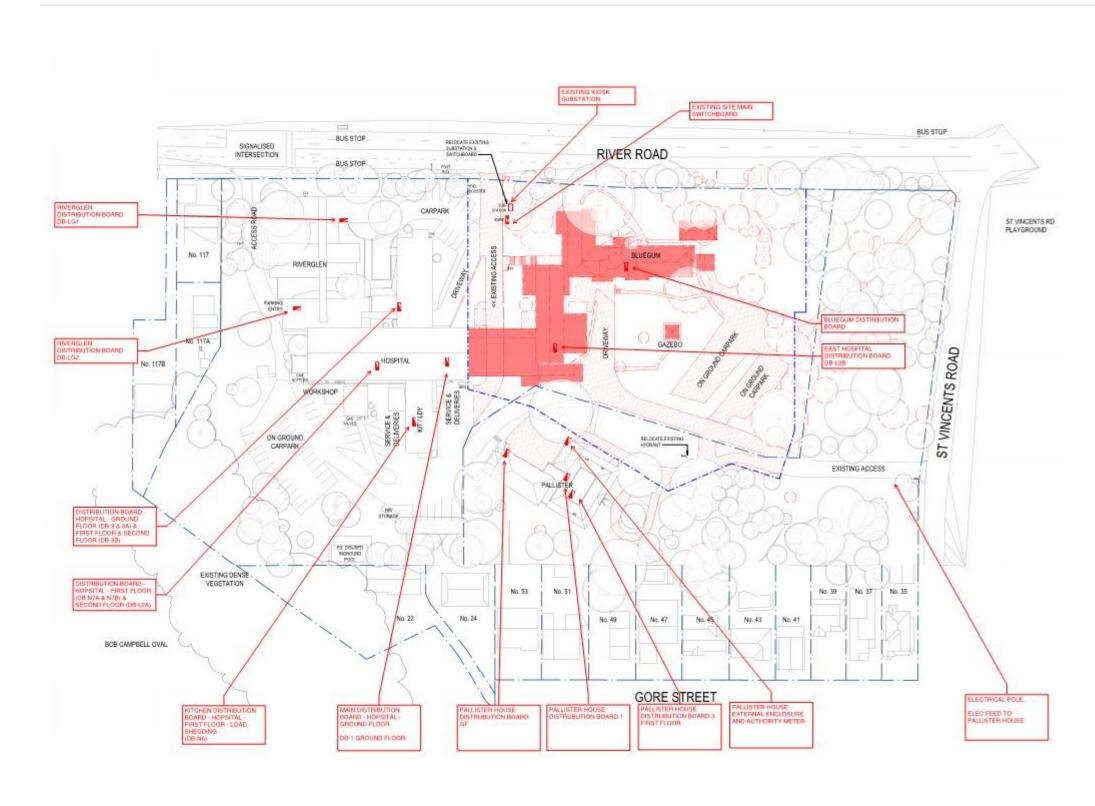
COMMUNICATIONS STAGE 5 WORKS



As part of the Stage 5 works the following will be completed:

• Install and run new services on trays in the basement for the new Respite building.

4. APPENDIX A – SITE EXISTING ELECTRICAL LAYOUT



5. APPENDIX B – PRESSURE AND FLOW INQUIRY RESULTS

ASSUMED CONNECTION DETAILS

Street Name: River Road	Side of Street: North
Distance & Direction from Nearest Cross Street	185 metres West from St Vincents Road
Approximate Ground Level (AHD):	43 metres
Nominal Size of Water Main (DN):	100 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	85 metre head
Minimum Pressure	57 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow I/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	56
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5 10 14	53 36 15
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5 10	48 30
Maximum Permissible Flow	14	Ö

(Please refer to reverse side for Notes)



6. APPENDIX C – EXISTING HYDRAULIC SERVICES PLAN

