TAYLORS

Urban Development | Built Environments
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Engineering Servicing Advice

PMP Printing Precinct
209-211 Carinish Road and
31-49 Browns Road
Clayton

June 2019
Version G

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1 INTRODUCTION

The Victorian Planning Authority (VPA) is working with Monash Council to prepare a Comprehensive Development Plan (CDP) for the PMP Printing site in Clayton, Victoria.

2 COMMISSION

Taylors has been engaged to undertake a utility servicing assessment for the PMP Printing Precinct. The assessment is required to investigate the following services:

- Water;
- Sewer;
- Recycled Water;
- Power;
- Gas; and
- Telecommunications

For each utility service element, an assessment is required in the context of the existing and future development of the site identifying the relevant authority, existing servicing infrastructure, future servicing needs and relevant considerations for planning of the site.

The assessment is to include stakeholder engagement, research, options development, report preparation with supporting documentation such as plans and cross sections where appropriate.

3 SITE DESCRIPTION

Located 18km south-east from Melbourne's CBD, the PMP Printing precinct has a site area of approximately 10-hectares in size and is located on the corner of Carinish Road and Browns Road, Clayton. It is currently used for manufacturing, specifically printing production.

Given the project's strategic position within the Monash National Employment and Innovation Cluster, as well as being close to existing community assets such as the Clayton Train Station, Monash Medical Centre, Clayton Activity Centre and Monash Education Precinct means the site is appropriate for re-development.

Re-development of the site is also supported within the Plan Melbourne 2017–2050 document which highlights the need for an increased percentage of housing within Melbourne's established suburbs to create a city of 20-minute neighbourhoods close to existing services, jobs and public transport. A Context Plan is provided in Figure 1.

- **PMP Printing Site:** 8.16 hectares (2 lots consisting of the main land holdings of 209-211 Carinish Road and 31-49 Browns Road). This area consists of the main PMP Printing factory and ancillary uses.
- **Properties along Bendix Drive:** 1.14 hectares (12 lots between 11 - 57 Bendix Drive). This area consists of a number of factoryettes under various ownerships providing a mix of textile, automotive, logistics and construction materials operations and services.

The subject site is currently zoned as Industrial 1 Zone (IN1Z) under the Monash Council Planning Scheme and the land is affected by a Design and Development Overlay (DDO1).

Figure 1 – Context Plan

4 PROPOSAL

It is understood that the proposed redevelopment of the precinct is expected to deliver approximately 1,000 new dwellings and approximately 20,000 square metres of commercial floorspace.

5 INVESTIGATION

Our investigation into the availability of services to the above-mentioned development included a desktop and field survey. The desktop survey comprised obtaining existing service information from the following sources:

Monash Council	United Energy (Electricity)
South East Water	Melbourne Water
Telstra	Land Channel Victoria
National Broadband Network Co (NBN Co)	NearMap.com
Multinet Gas	Site Visits

6 LIMITATIONS AND ASSUMPTIONS

This investigation has been scoped and undertaken as a desktop study to provide preliminary advice on the anticipated servicing works at the proposed development site. There are limitations on the level of detail that is able to be given due to the nature of this review. Desktop studies such as this are reliant on information that is made available from service authorities, with an assumption that it provides an accurate representation of existing site conditions. Taylors have also excluded internal private services from this investigation as it is assumed that the majority of these services will be removed and/or damaged during the demolition of existing facilities on the Subject Site. Additionally, the condition and age of these existing private services is unknown and is unlikely to be suitably located for future development of the Subject Site.

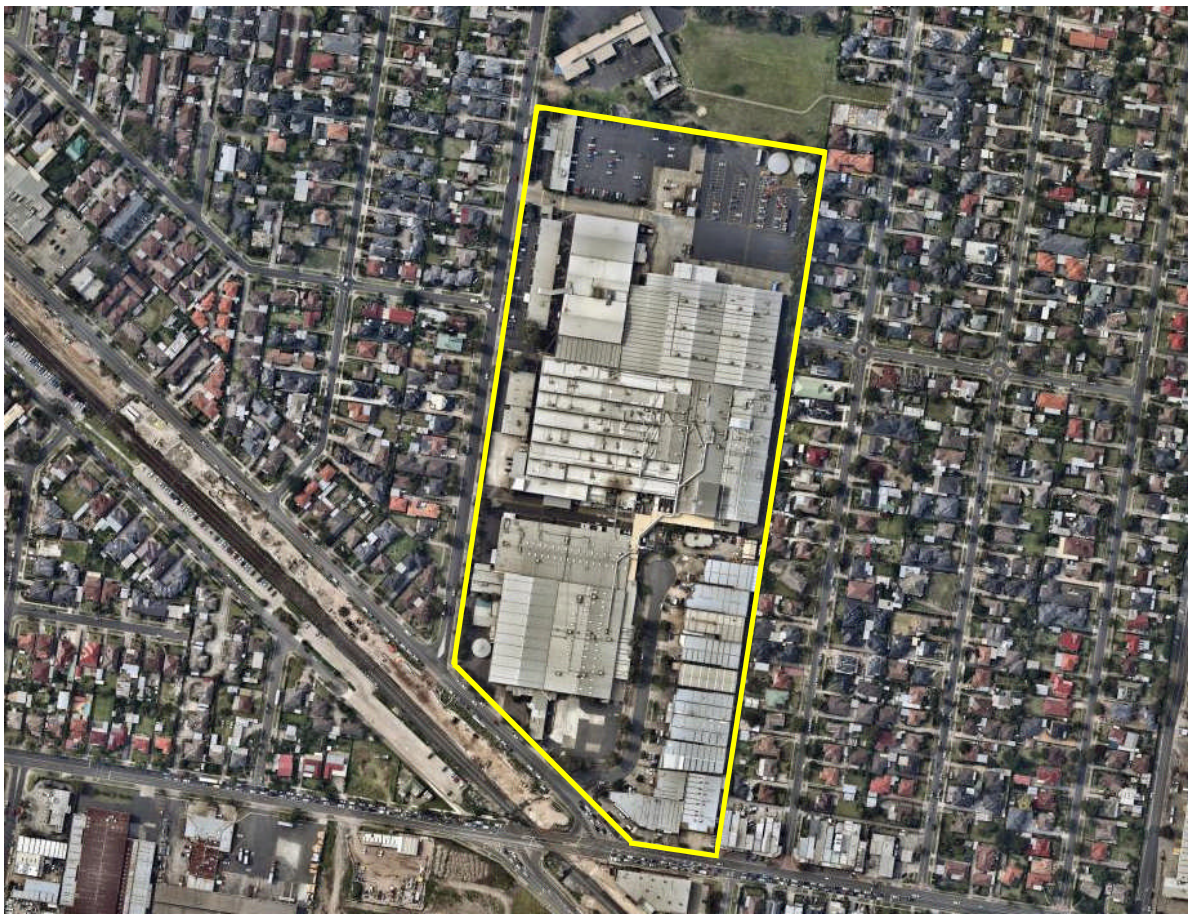


Figure 2 – Aerial Photograph, Nearmap, February 2017

Figure 3 – Draft Urban Structure Plan

7 FINDINGS & DISCUSSION

7.1 ROADWORKS

The responsible authority for existing roads is the Monash Council. Carinish and Browns Road and Bendix Drive are currently owned and maintained by the Council. Taylors is not aware of any planned changes in road status for these roads or transfer of ownership to VicRoads. Centre Road is a State Arterial Road which is owned and maintained by VicRoads.

Access to the proposed development is proposed via Browns Road and Bendix Drive. The internal road network is yet to be determined.

Existing Conditions

- Browns Road is an 8.6m wide sealed carriageway with kerb & channel and 1.4m wide footpaths on both sides. There is a 2m wide naturestrip on the eastern side and a 4.4m wide naturestrip on the western side. Browns Road is a 20m wide road reserve.
- Carinish Road is a 10.6m wide sealed carriageway with kerb & channel on both sides, and a 1.5m wide footpath and 2.4m wide naturestrip adjacent to the Subject Site. Carinish Road is a 20m wide road reserve.
- Bendix Drive is a 9.3m wide sealed carriageway with kerb & channel and 1.4m wide footpaths and 2.9m wide naturestrips on both sides. Bendix Drive is a 20m wide road reserve.

All proposed roads within the subdivision must be designed and constructed in accordance with the requirements of the Monash Council and to Victorian Planning Authority (VPA) / IDM Design Manual Standards. Road reserve widths and road pavement widths are specified in the VPA / IDM Design Manual for subdivisional works and are dependent on road hierarchy, anticipated traffic loads and urban design requirements from Tract Consultants.

Further traffic engineering advice in respect to this development is provided in a report prepared by Cardno.

7.2 STORMWATER DRAINAGE

Monash Council and Melbourne Water are the responsible authorities for stormwater drainage for the Subject Site. Typically, Council owns and maintains property and road drainage, while Melbourne Water owns and maintains large infrastructure designed to convey flows from catchments greater than 60 hectares.

Existing Conditions

The site falls from a high point in the north-west corner of the land; approximately 62 m Australia Height Datum (AHD), towards the southern boundary; approximately 55 m (AHD) at an average grade of 2%. With the exception of the northern portion of the Subject Land, the site is largely impervious having been either paved or built upon.

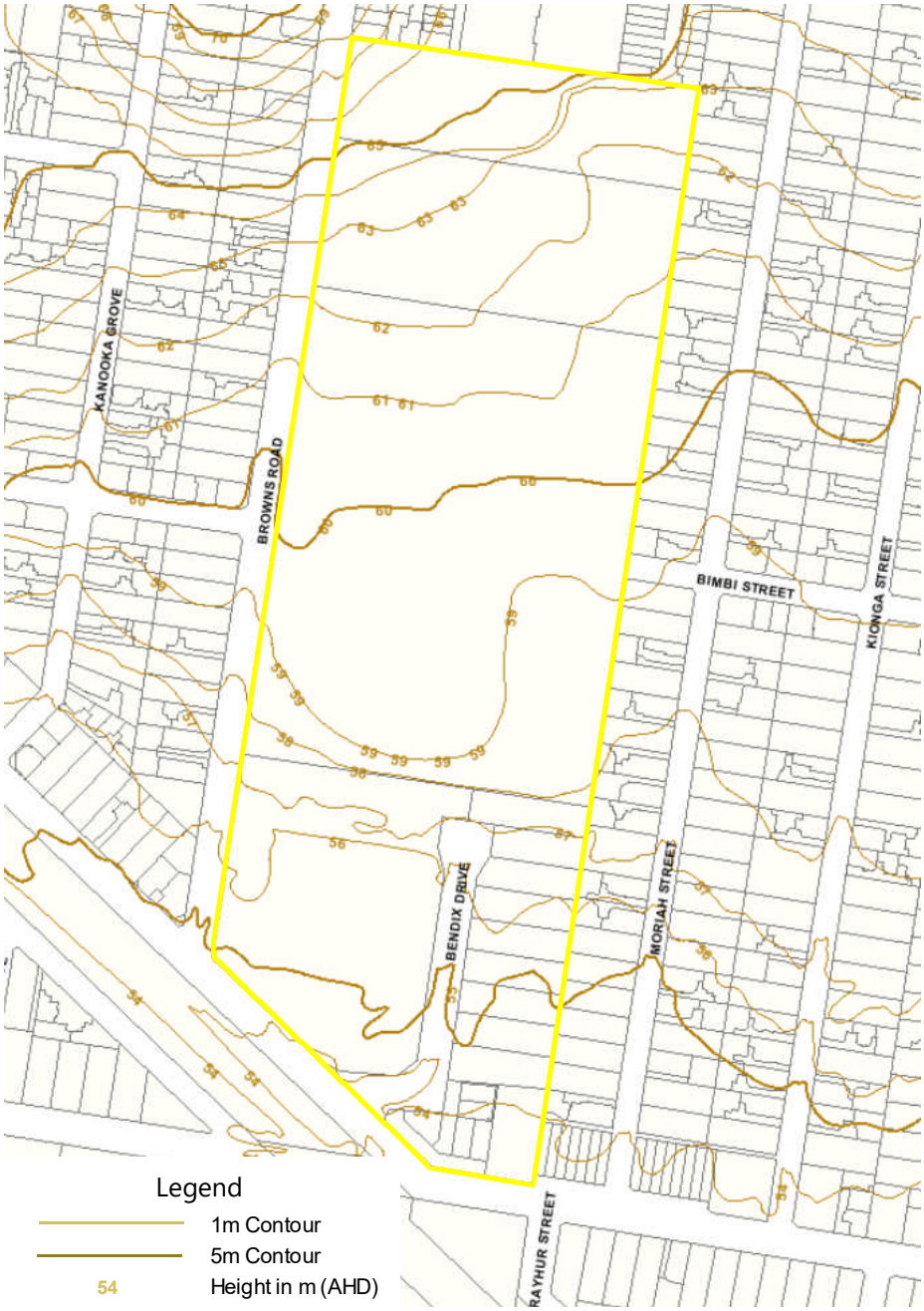


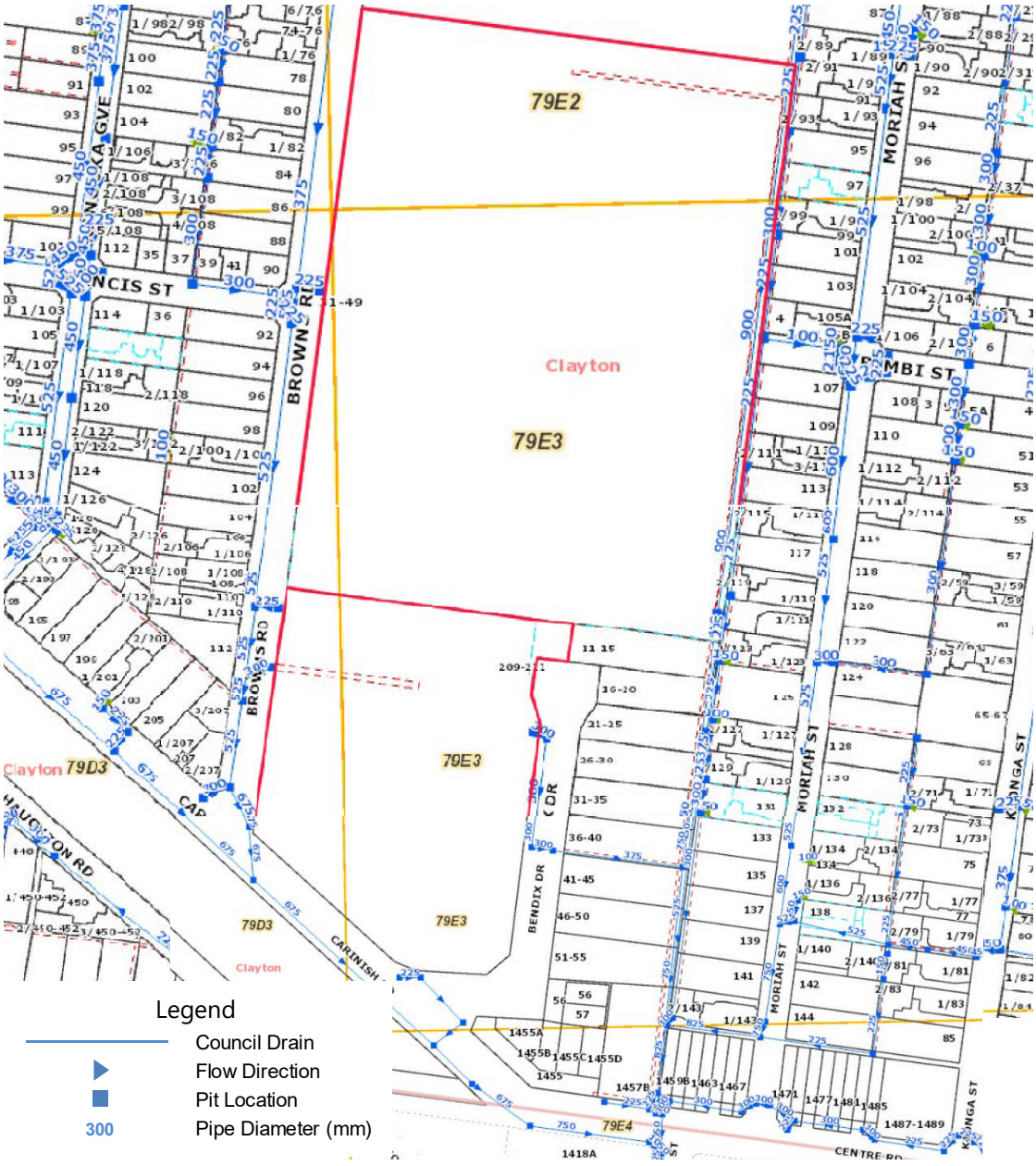
Figure 4 - Topography of the Subject Land

Monash Council has provided information showing the location of existing stormwater drains which shows an existing 900mm diameter drain conveying flows from north to south of the subject land located within an easement along the eastern side of 31-49 Browns Road. A 525mm diameter drain is located on the western side of Browns Road, and north of Francis Street it reduces in size to 375 mm diameter. This drain discharges into a 675mm diameter drain on the south side of Carinish Road, adjacent to the railway reserve. Additionally, a 300mm diameter drain is present in Bendix Drive. The subject land has multiple connection points to each of the drains mentioned above. A plan detailing the location of the existing Council and Melbourne Water drains is presented in Appendix A.

It is evident that given the location of public assets throughout the subject land, there is likely to be a substantial network of internal stormwater drains connecting the existing roof and carpark catchments to the Council drainage network. It is likely that pipes forming part of the internal network will be decommissioned and removed as a part of the demolition of the buildings on the Subject Land.

The greater catchment, including the Subject Site, discharges into a 1750mm diameter Melbourne Water main drain at the intersection of Centre Road and Rayhur Street.

Further stormwater management advice in respect to this development is provided in a report by Alluvium.



7.3 WATER SUPPLY - Drinking and Recycled

The responsible authority for water supply is South East Water (SEW).

Existing Conditions
South East Water has provided information showing the location of existing water main infrastructure which shows an existing 150mm diameter cast iron mains on the east side of Bendix Drive and the north side of Carinish Road. These mains were constructed in 1978.

Additionally, a 150 mm diameter uPVC main is present on the western side of Browns Road. This main was constructed in 1997 to replace an older asbestos cement main. The PVC main in Browns Road runs the full extent of the Subject Site frontage to the north where it connects to Wright Street.

Despite there being water storage tanks located on the subject land (most likely for fire services), there is likely to be numerous private water services constructed to AS 3500 traversing the Subject Land. As these services are private (including the fire services), these will be abandoned and or decommissioned as a part of the demolition of the existing buildings. The age and condition of these pipes is unknown and considered not suitable for connection to a new development.

Reticulated recycled water is currently not available to the site and there are no plans for South East Water to make these assets available to the area. While authority reticulation is not available, it may be feasible to harvest stormwater for reuse on landscaped areas or for toilet flushing.

The current process defined in the South East Water Land Development Policy will require the developer to apply for conditions from SEW for reticulation of water throughout the proposed development and enter a deed agreement for the design and delivery of the works.

Existing Capacity
The existing 150 mm diameter drinking water main located in Browns Road has sufficient capacity to service initial development. Based on the information provided, South East Water's preliminary hydraulic assessment indicates that the existing water mains would be able to cater for a maximum of 1,300 lots. Further investigation would be required to assess system upgrade options beyond the maximum 1,300 lots.

Upgrade Potential
In order to provide drinking water facilities to a maximum 1,500 lots in the proposed development, it will be necessary to augment the existing 150 mm diameter water main in Browns Road to a 225 mm diameter water main from the existing 280 mm diameter Polyethylene main in Wright Street to the north of the subject site. This could be done by replacing the existing main in Browns Road or by duplicating with a secondary main however available space in the existing road reserves will need to be considered for duplication.

Precinct Benefit
Upgrading the existing 150 mm diameter main in Browns Road will have minor benefits in flow rates and supply pressures to dwellings along Browns Road.

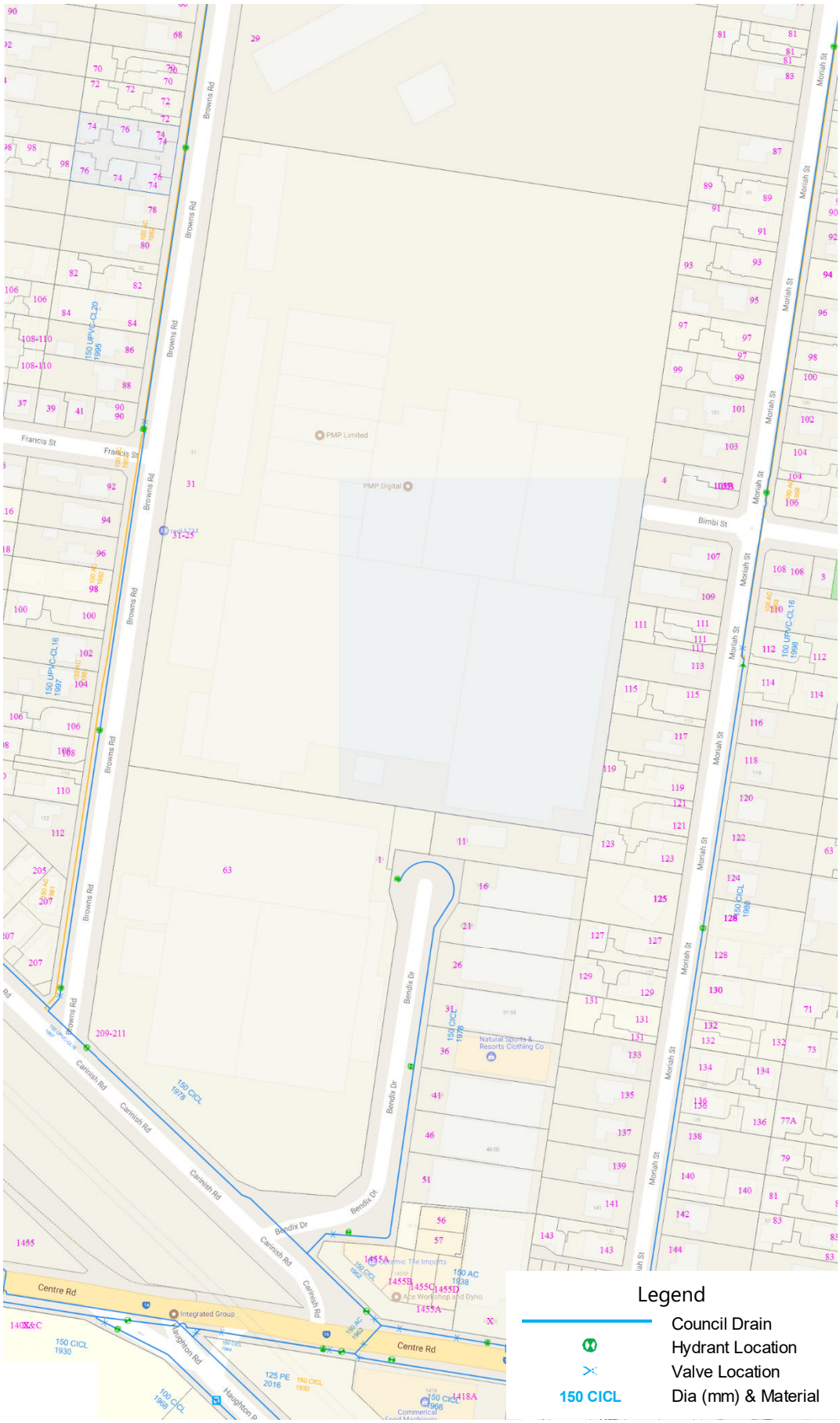


Figure 6 – Existing water main infrastructure

7.4 SEWERAGE

The responsible authority for sewer reticulation is South East Water (SEW).

Existing Conditions
South East Water has provided information showing the location of existing sewer main infrastructure which shows existing DN375 mm vitrified clay sewer main flowing from north to south, located within an easement, along the eastern boundary of 31-49 Browns Road. The sewer is approximately 4 to 5 metres deep which is sufficient to fully control the site. This sewer was constructed in 1960.

209-211 Carinish Road is serviced via a DN225 mm vitrified clay sewer on the north side of Carinish Road and extends approximately 60 metres along the western side of Browns Road. The sewer does not continue north along Browns Road. The sewer is approximately 3 to 4 metres deep which is sufficient to fully control the site. This sewer flows from north to south and ultimately connects to the DN375 mm sewer that runs down through 31-49 Browns Road to Centre Road. This sewer was constructed in 1963.

Private sewers internal to the Subject Site, servicing each building, will have been constructed in accordance with AS 3500. As these sewers are private, they will be abandoned and or decommissioned as a part of the demolition of the existing buildings. The age and condition of these pipes is unknown and considered not suitable for connection to a new development.

The current process defined in the South East Water Land Development Policy will require the developer to apply for conditions from SEW for reticulation of sewer throughout the development and enter a deed agreement for the design and delivery of the works.

Existing Capacity
The existing 225 mm diameter sewer main located in Carinish Road and the existing 375 mm diameter sewer main located to the east of the subject site do not have capacity to service the proposed development. This is due to the existing sewer crossing under the railway corridor south of the subject site that is at capacity and cannot take any additional sewer flows.

Upgrade Potential
In order to service the proposed development, significant sewer infrastructure upgrades are required as a part of South East Water's Capital Works programme between 2018 and 2023. These capital works include a 375 mm diameter sewer main to be constructed along Rayhur Street, south east towards an existing 375 mm diameter sewer main located in Kombi Street. Once commissioned, the proposed 375mm diameter sewer will have capacity for up to 1,600 lots in this development and for upstream flows. Timing of the sewer upgrade will need to be closely coordinated with South East Water.

Taylors has sought advice from South East Water in May 2019 and confirms the outfall sewer is still currently planned under South East Water’s Capital Work programme and is due for completion between 2018-2023 however it has not progressed beyond the planning phase.

Precinct Benefit
The proposed 375 mm diameter sewer upgrade in Rayhur Street will provide capacity for future dwellings within the precinct and improve serviceability for South East Water as the sewer network will not be running at or above capacity.

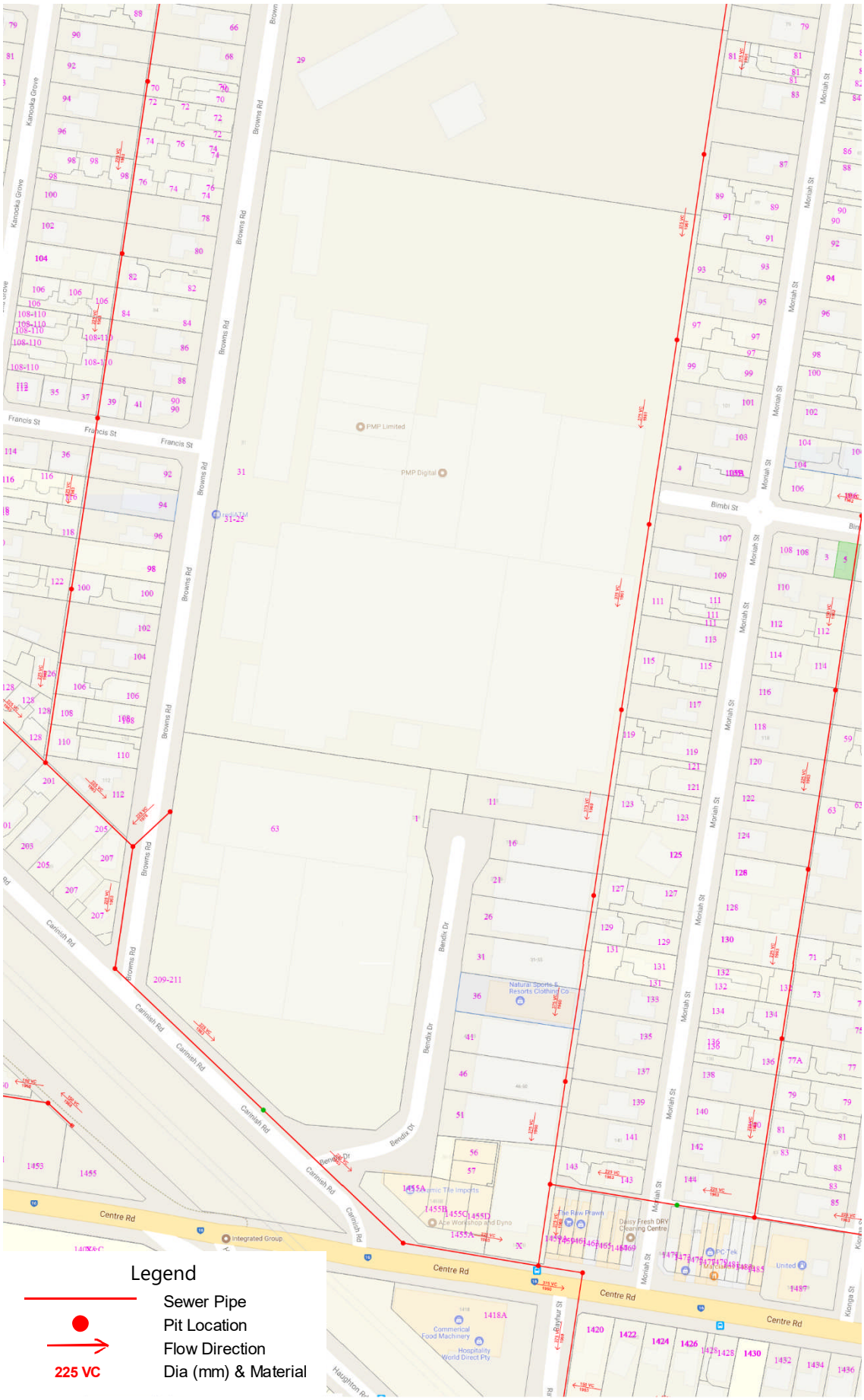


Figure 7 – Existing Sewer Network

7.5 ELECTRICITY

United Energy is the responsible authority for the provision of electricity supply to the proposed development.

Existing Conditions
Overhead high voltage electricity infrastructure is located on the eastern side of Browns Road and the northern side of Carinish Road. Additionally, overhead high voltage supply is present in Bendix Drive and supplies to a pole inside 209-211 Carinish Road and then into 31-49 Browns Road via a private underground 22kV cable. Two private substations within the 31-49 Browns Road property are fed by the private HV Cable. The Subject Site is an HV Customer which means they have 2 points of high voltage supply and are metered at HV rates.

Plans provided by United Energy do not show any High Voltage underground cables in the surrounding streets. The only underground cables present are low voltage and are supplying adjacent houses. Care should be taken when excavating in naturestrips, especially on the eastern side of Browns Road where several LV cables are present (Likely depth 600 - 1000mm depth).

The Subject Site's electrical supply comes from the Springvale/Springvale West Zone Substation at 907A Princes Highway, Springvale. High Voltage overhead feeders run along both sides of Centre Road from the zone substation to the Subject Site.

Currently the Springvale Zone Substation is approaching peak reliable operating capacity and requires augmentation in coming years to cope with increasing electricity demands. One project which is scheduled to commence in the summer of 2017/18 is the addition of a third 66/22 kV transformer at Notting Hill and new distribution feeders which could potentially be used to 'offload' Springvale.

The development will be provided with underground reticulated electricity supply in accordance with United Energy's normal subdivisional development guidelines. Substation reserves are likely to be required within the proposed development to provide adequate low voltage electrical supply to all allotments.

Existing Capacity
The existing PMP site has a peak demand of approximately 4 MVA, supplied by feeder SVW42 (the HV feeder in Browns Road). The second feeder connected to PMP is SV34 (the HV feeder in Bendix Court) and is a reserve feeder only and has no spare capacity, as most of this feeder's capacity is utilised by Monash Hospital. All other feeders within close vicinity are also heavily loaded with large customers.

The new development can be supplied by the existing feeder SVW42 if the demand requirement does not exceed 4 MVA.

An industry standard 'rule of thumb' is to allow 4-5 kVA per dwelling when estimating potential peak loads for a new development site. Following this rule, the current supply to the site could support between 800 and 1000 dwellings. During Taylors meeting with Zinfra, it was established that this old rule was conservative when consideration is given to modern, energy efficient appliances. It was suggested that an allowance of 3 kVA per dwelling with an upper limit of 4 kVA would be more realistic. This would potentially support between 1,000 and 1,300 dwellings.

To confirm the expected peak demand for the proposed development, a peak loading and diversity study will need to be conducted by an Electrical Engineer.

Upgrade Potential
The expected yield of the proposed development is 1,000 dwellings, plus commercial space, so it is expected that the existing supply should be sufficient, however if a supply above 4 MVA is required, the closest HV feeder with spare capacity is SV16, but this will require extending the feeder to the Subject Site and the potential need to negotiate another cable crossing the rail corridor with VicTrack and Metro Rail. Such an upgrade is estimated to cost $250K-$500K and may only yield a further 1 MVA of supply. Alternatively, an entirely new feeder could be brought from the Springvale Zone Substation along Centre Road, at an estimated cost of $2.5M. A new feeder can supply up to 12MVA which would be far more than is required by the proposed development.

Taylors have also sought advice from Zinfra and AGL regarding potential alternative energy supplies to supplement the 4 MVA available in feeder SVW42. The two alternative energy options that have been considered are Solar and Co-Generation.

Co-Generation is the process of combusting a fuel, in the case of the Subject Site it would be natural gas, to produce electricity and the by product, heat, can be used to warm houses, water etc… As the site has access to high pressure gas it would be feasible to create additional power in this fashion. The draw back with Co-Generation, while being extremely efficient, it does still rely on fossil fuels to generate electricity, and the gas must be purchased from the supplier. The initial cost expenditure to install a Co-Generation unit has been estimated by AGL at $3M, plus the supply of gas.

A more viable alternative to Co-Generation is Solar power generation. Using traditional photo-voltaic cells (solar panels), energy from the sun is converted to electricity and can be sent to the grid for use or stored in battery banks for later use during peak times. The batteries can also be topped up from the Grid in off-peak periods.

The main advantage of Solar over Co-Gen is the process of generating electricity does not rely on fossil fuels. To produce 2 MVA of power, a 1.6-megawatt solar system would be required. This would cost approximately $1.6-2M to install. Batteries to store excess power for a system of this size would start at approximately $2M.

Ongoing maintenance of this system would be a very small fraction of the installation cost. The disadvantage of a solar system of this size is the physical space it would require installing the solar panels. A rule of thumb is for every kilowatt of power 10 sq.m is required. Therefore, one megawatt would require 10,000 sq.m or 1 hectare of area.

The current proposed masterplan provides approximately 1.38 hectares of roof space that can be suitably used for solar panel installation. Taylors estimates half of this roof area would be used for building plant, ie… air conditioners, elevator shaft equipment etc… leaving approximately 0.69 hectares of roof space for solar panels. Based on this very simple approach, approximately 0.69 megawatts of power (0.86 MVA) could be produced which would be enough to service approximately 200 to 250 residential dwellings.

It should be noted that the VPA cannot enforce the use of solar panels and will be at the discretion of landowners and developers.

Precinct Benefit
The supply of an additional feeder would provide greater network capacity to the precinct and surrounding dwellings and reduce the likelihood of service interruptions during peak load periods.

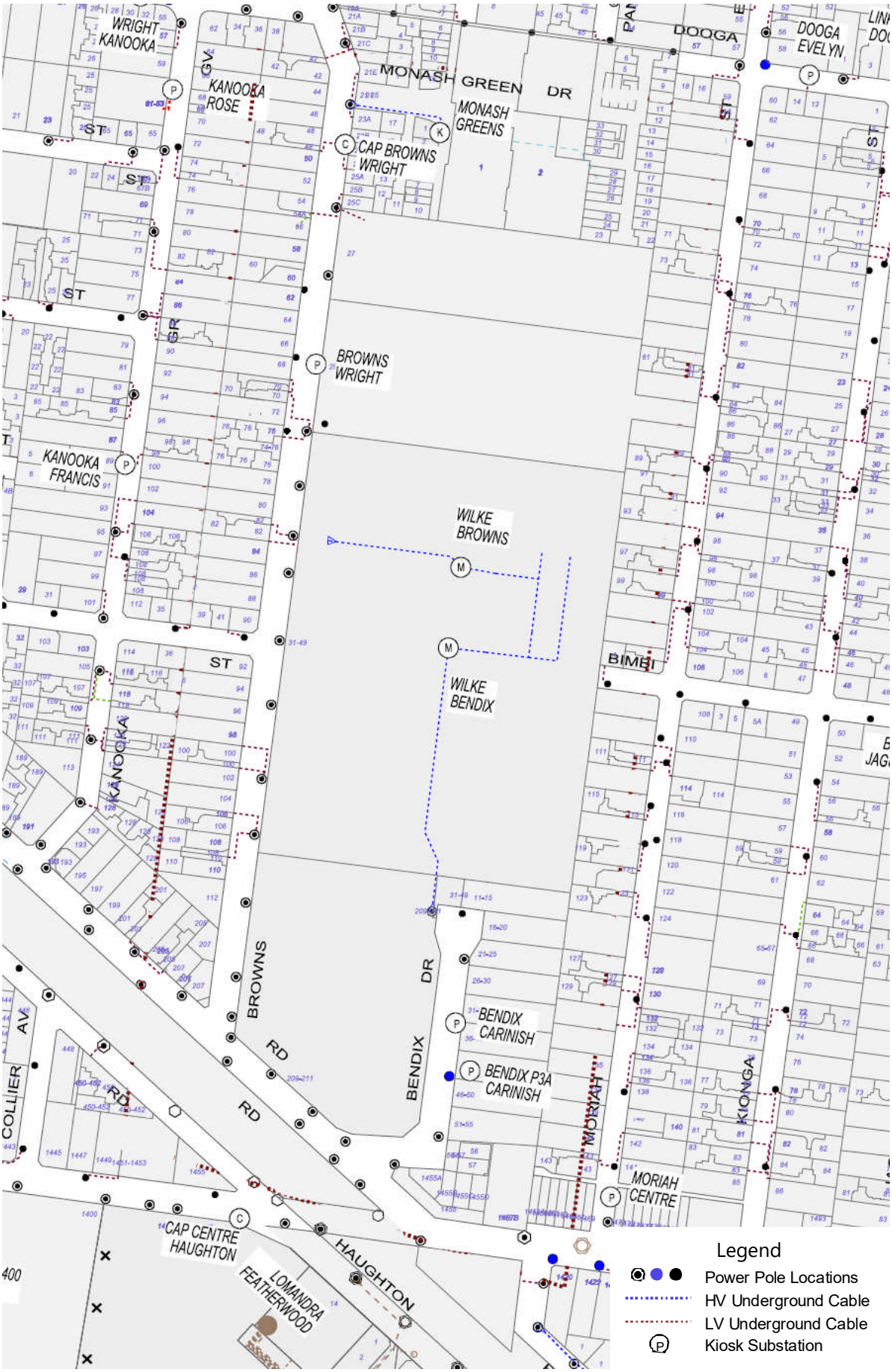


Figure 8 – Existing Electricity Supply Network

7.6 TELECOMMUNICATION SERVICES

There are three identified telecommunications service providers in the streets adjacent to the Subject Site. Telstra, Optus and Uecomm. NBN Co does not currently own any assets in the adjoining streets however has commenced build preparations south of Centre Road.

Existing Conditions
Telstra is the main telecommunications infrastructure owner surrounding the Subject Site. Telstra has mains cable in Carinish and Browns Road and local network cables in Bendix Drive. Additionally, a distribution pillar is located within the north naturestrip in Carinish Road, approximately 75 metres south of Browns Road.

Optus have provided plans which show Optic Fibre cable and conduits present in Carinish Road and Browns Road. The plans show current connectivity to the PMP Printing site. A section of Optus infrastructure is shared in a Telstra conduit along Browns Road. This will become important during asset relocations as both Telstra and Optus will require notification and coordination.

Uecomm have also provided plans which shows fibre optic cable connecting to existing PMP Printing building. The fibre is supplied overhead along Browns Road and drops down power pole 637677 on the eastern side of Browns Road, where it runs north along the naturestrip approximately 15 metres prior to entering the site.

Upgrade Potential
Preliminary consultation with National Broadband Network Co was undertaken and confirms that NBN service is currently available in the vicinity of the subject land. As the proposed development will comprise more than 100 dwellings, and NBN rollout has commenced in the immediate area, NBN Co is likely to accept the application to supply the development. A formal application to NBN Co, with development plan, will be required to confirm acceptance. NBN Co have advised that as their existing network is only 800 metres away from the subject site, there will be no Backhaul Charge required for the proposed development.

The developer's responsibilities will include:

- Design of pit and pipe infrastructure to NBN's specifications and standards and submit to NBN for review prior to installation
- Installation of pit and pipe infrastructure to NBN's specifications and standards
- Payment of NBN deployment contributions

Precinct Benefit
Depending on timing of the proposed development construction, the bring forward of NBN infrastructure will see the surrounding dwellings connected to the NBN network much sooner than current expectation for the area.

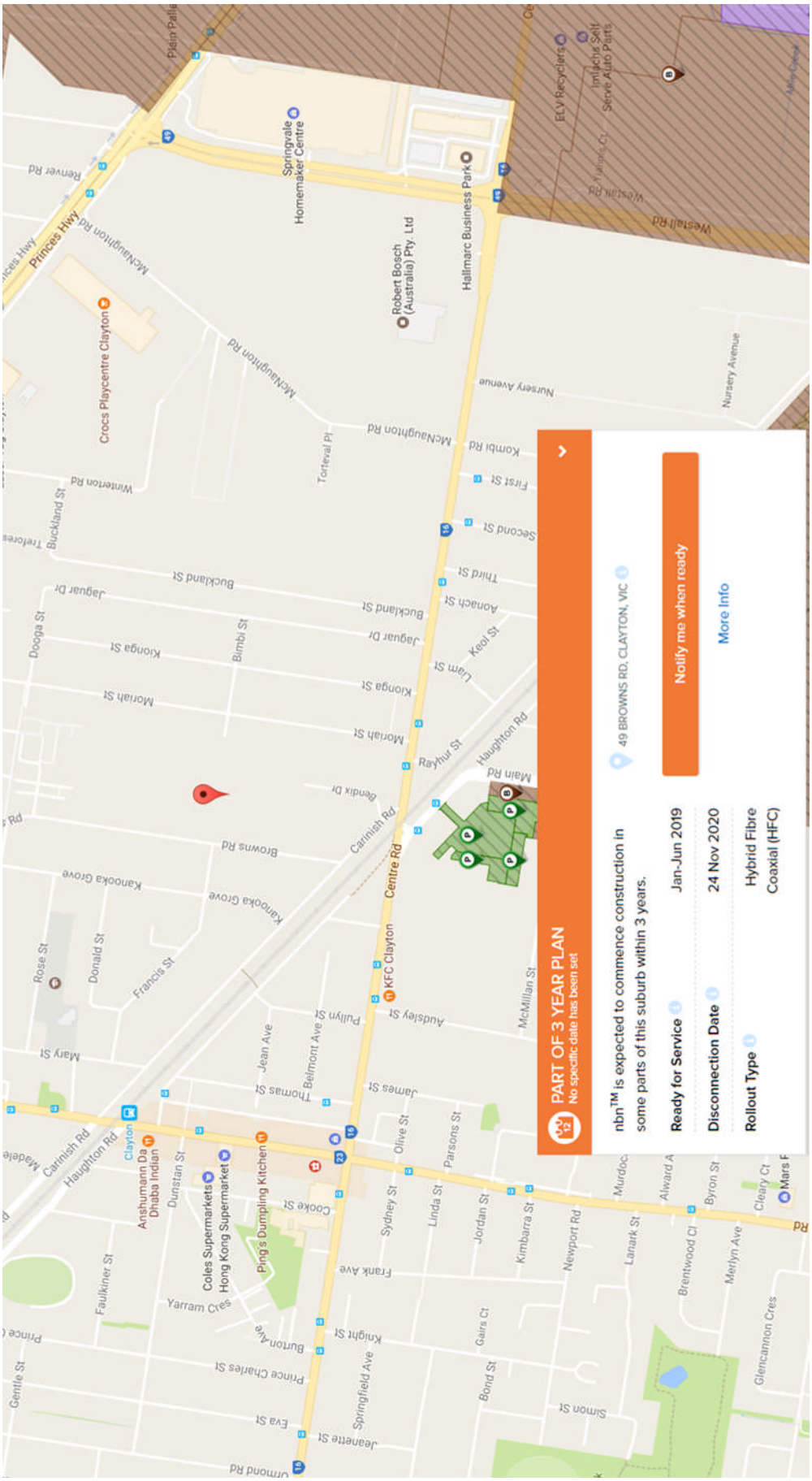


Figure 9 – NBN Co Rollout Map

7.7 GAS

Multinet Gas is the responsible authority for the provision of gas supply to the proposed development.

Existing Conditions
Multinet has provided information showing the location of existing gas main infrastructure which shows an existing High Pressure (100-515 kPa) DN150 mm plastic coated steel main on the eastern side of Browns Road. This main was constructed in 1982. There are several tapings from this main to the existing buildings on the Subject Site. Adjacent to Francis Street, after a tapping into 31-49 Browns Road, the main reduces to a DN80 mm plastic coated steel main, however it does remain at High Pressure and continues north past the Subject Site.

Additionally, a Medium Pressure (7-200 kPa) DN100 mm steel main is located on the western side of Browns Road. This main was constructed in 1961. There is a taping into 31-49 Browns Road indicated on the Multinet Plans.

There is also significant gas main infrastructure in Carinish Road and the Railway corridor to the south of the Subject Site. A pressure regulator (P2-108) is shown on the plans to be located in the footpath adjacent to the title boundary approximately 25m east of Browns Road.

Existing Capacity
Taylors has met with Comdain Infrastructure who are the Civil Contractor that manages Multinet Gas' network operations and maintenance. Michael O'Donnell (Comdain) has advised that the existing High Pressure 150 mm diameter main on the eastern side of Browns Road will have sufficient capacity for up to 1,500 dwellings.

The existing pressure regulators and meters within the PMP Printing site will need to be removed. An allowance of $100,000 per regulator should be allowed for in feasibility costings.

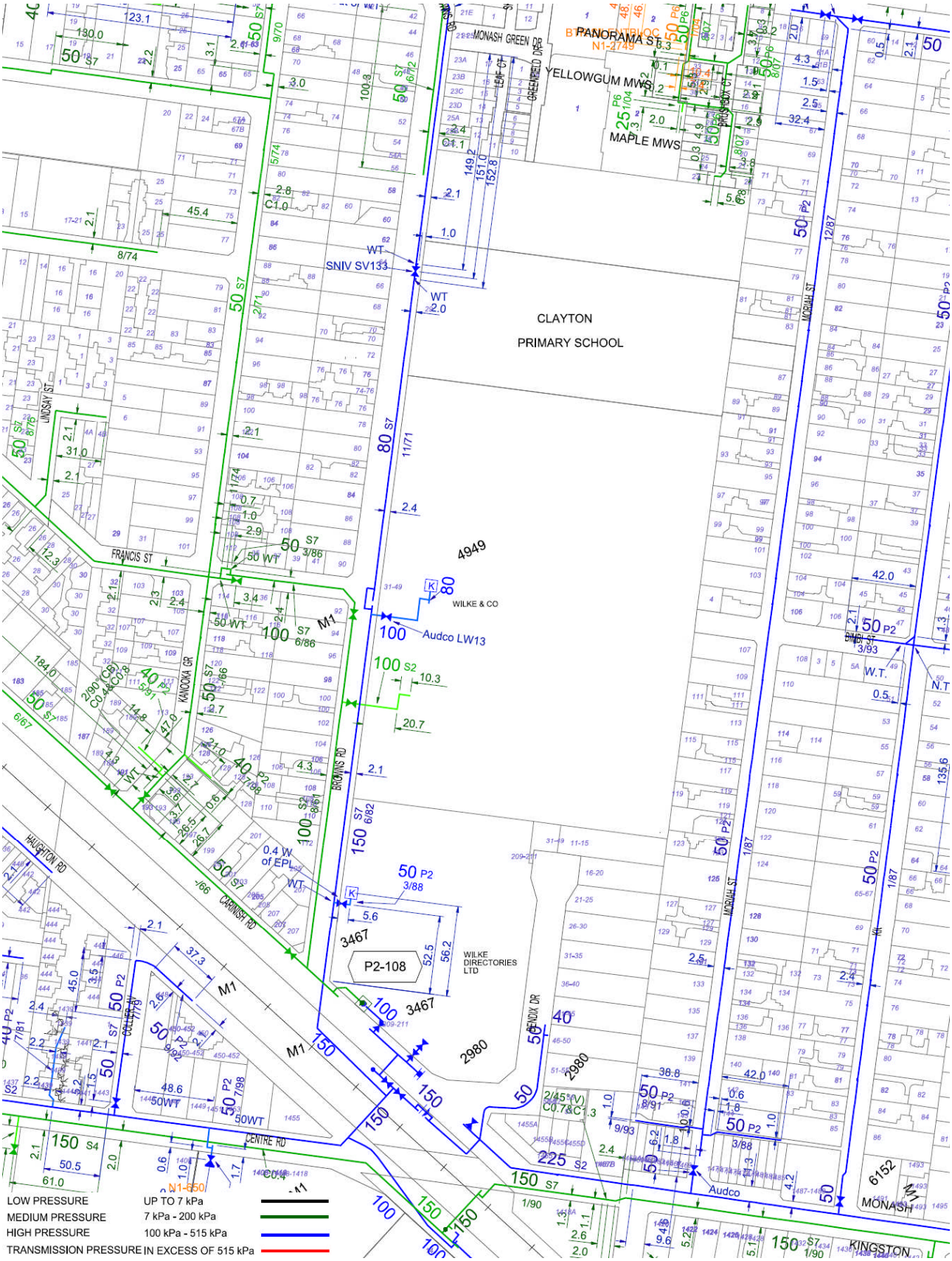


Figure 10 – Existing Gas Supply Network

8 CONCLUSION

This preliminary desktop investigation has identified the availability, location and size of the following services:

- Water;
- Sewer;
- Recycled Water;
- Power;
- Gas; and
- Telecommunications

For each utility service element, an assessment (including stakeholder engagement, research, options development) has been undertaken to identify the relevant authority, existing servicing infrastructure, future servicing needs and relevant considerations for planning of the site in the context of the existing and future development.

This report comprises 20 pages and should not be reproduced except in full.

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