Engineering Servicing Report
for
LandCorp
on
Cockburn Central West

pritchard francis

providing the right solution

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Job No: 12-251

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April 2013

Revision	Description	Date
0	Issued for input into the Local Structure Plan	19 April 2013
1	Amended and Reissued for Local Structure Plan	1 May 2013

Table of Contents

1 Introduction

At the request of LandCorp, Pritchard Francis Pty Ltd has prepared this report to determine the engineering opportunities and constraints for the development of Cockburn Central West.

The landholding has an area of approximately 32.8 hectares bound by North Lake Road to the north, Beeliar Drive to the south, Poletti Road to the west and Midgegooroo Avenue to the east. The site is located to the west of the existing Cockburn Central Town Centre and Cockburn Train Station and comprises of:

- Lot 1 North Lake Road, Cockburn Central.
- Lot 53 North Lake Road, Cockburn Central.
- Lot 54 Poletti Road, Cockburn Central.
- Lot 55 North Lake Road, Cockburn Central.
- Lot 804, Beeliar Drive, Cockburn Central.
- Lot 1001 Beeliar Drive, Cockburn Central.
- Lot 9504 Beeliar Drive, Cockburn Central.

The following report is based on the Activity Centre Structure Plan (P5002 - STR02, Rev C), shown in Figure 1.2 prepared by Cardno on 28 February 2013.

The following sections contain the findings from desktop investigations of existing services, opportunities and constraints associated with the development of residential lots in the landholding which is shown below in Figure 1.1.

Figure 1.1: Aerial photograph of the site

Figure 1.2: Activity Centre Structure Plan – Plan 1

2 Landform and Soils

2.1 Existing Site Conditions

The current site is vacant of any built structures and contains many mature trees and vegetation, majority of which will have to be removed to allow for the proposed development of the site. There is an existing wetland on the site, however it is our understanding that the wetland is of low retention value.

On the western side of the landholding is a Western Power Easement, with 330kV transmission lines running parallel to Poletti Road. Any works undertaken in this easement will require liaison and approval from Western Power and any proposed infrastructure will require specials investigations to be carried out to determine whether they are suitable for construction in the easement.

On the northern side of the landholding is an ATCO High Pressure Gas Easement parallel to North Lake Road. There is also an open drain running south of North Lake Road which currently conveys 100 year floods in the region.

2.2 Geology

Geological conditions vary over the site. A review of the 1:50 000 Environmental Geology Series maps of Fremantle indicate the site consists of:

- Sand – Well drained when dry and vegetation free, with drainage disposal only a problem in areas with a high groundwater table.
- Sand over silt and clay – Sand layers are of variable thickness and properties are modified by the underlying material. These areas generally have a high water table and are prone to flooding.
- Sandy silt – High water table, prone to flooding, differential settlement may occur.

A review of the map indicates predominately sand in the higher areas and sandy silt in the low lying areas. Sandy areas are of higher permeability than the sandy silt areas. It is recommended that a detailed site specific geotechnical investigation be undertaken by a certified geotechnical engineer to confirm site conditions and the geological development constraints. This will allow better planning for the site area and ensure maximum utilisation of material is achieved.

2.3 Topography

The levels on the site vary from RL 40.0m, along Beeliar Drive to the south of the landholding to RL 22.75m at the base of the wetland area located on the eastern boundary of the landholding. The site grades steeply on the south east corner as the levels transition from the higher levels on Beeliar Drive to the low lying wetland.

Design levels on the site are constrained where access into Cockburn Central West is proposed at Poletti Road, Midgegooroo Avenue and North Lake Road. Where no access for vehicles is to be provided from the existing roads, particularly Beeliar Drive and portions of Poletti Road, there is potential to amend levels and batter or install retaining walls to accommodate level differences, while ensuring levels are not too far below existing road levels to retain

commercial exposure of future developments. Lowering of the lots will reduce the imported fill required onto the site while providing a screening from the industrial area to the west.

A site specific survey will be required to be undertaken by a certified surveyor prior to construction to confirm the existing site levels, for both this land, surrounding areas and tie-in points.

2.4 Earthworks and Retaining Walls

Importation of fill will be required to create a site suitable for development. Where possible the proposed design level will integrate with the existing topography, grading higher lying ground on the southern side of the site down to tie in with the lower levels at the proposed basin on the north east of the site. Design levels of lots are to be set with an appropriate clearance to groundwater levels, typically 1.5m. Please refer to the attached Preliminary Earthworks Plan in Appendix A for details of approximate road levels.

Retaining walls are proposed on the southern side of the main oval to integrate the levels of the higher ground adjacent to Beeliar Drive with the proposed design levels of the oval.

Consideration should be given to minimise import of fill required by battering into the development as well as grading of parcels of land to better suit the natural topography of the area. As there is a high level of building articulation, with buildings addressing both roads and public open spaces, the lots can be stepped, with people entering one or two storeys above on the higher side of the development lot.

3 Ground Water and Surface Water

3.1 Groundwater Levels

The Department of Water's Ground Water Atlas indicates that the water table sits at RL 24-25 based on historical maximum ground water levels. In lower lying areas of the development, fill will be required to provide sufficient clearance between building pads and the groundwater table. Based on the current requirements this level will be 1.5m above the maximum groundwater table.

Site conditions will need to be confirmed by an environmental consultant and geotechnical engineer prior to any detailed design.

3.2 Surface Water

Surface water will be collected in the roadway drainage systems by using pits and pipes for storm events up to 5 years. For storm events in excess of 5 years, stormwater will traverse through the site using overland flow paths with an outfall into an existing drain, on the southern side of North Lake Road, once 1 in 10 year storm capacity has been reached.

4 Proposed Infrastructure

4.1 Stormwater Drainage

This project will be designed and documented in accordance with all relevant standards and codes of practice related to the design requirements of this project, but in general will be governed by the Australian Rainfall and Runoff Guidelines 2001, and Australian Runoff Quality 2006 as well as the City of Cockburn's requirements.

Post development residential and commercial lots stormwater drainage can be managed via localised soakwells, where the ground condition permits, however will be minimised as much as possible. Stormwater runoff from road reserves will be conveyed into designated areas, via pit and pipe systems. A stormwater drainage basin will be located on the North East side of the site. It is intended that the existing wetland be filled and developed. The majority of the sites stormwater shall be directed to the proposed basin however a small portion of the higher ground shall be collected in Parcel 11. The size and location of this drainage basin will be determined at detailed design stage.

The stormwater strategy will be dependent on the geological conditions on the site as well as the contributing catchment to the drainage basin located onsite. The detailed design will be carried out in accordance with the Urban Water Management Plan (UWMP) and Local Water Management Strategy (LWMS) at detailed design stage. Consideration will also be given to Water Sensitive Urban Sensitive Design (WSUD) and further investigation into methods of treatment of stormwater at source. Pit and pipe stormwater drainage shall be minimised as much as possible. Any stormwater drainage employed on site shall also manage flood and inundation risks by providing adequate clearance from 1 in 100 ARI flood levels.

4.2 Sewer Reticulation

Water Corporation Dial-Before-You-Dig plans have been obtained and are attached in Appendix B of this report. The plans show that there is an existing 225mm PVC sewer main in North Lake Road to the north of the proposed development, as well as 225mm PVC sewer in Poletti Road to the west of the landholding.

Pritchard Francis has made contact with the Water Corporation who have advised that the site is situated in the Water Corporation's Jandakot Sewer District. No wastewater infrastructure is presently on the site and therefore will need to be planned, designed and built to service the development. Water Corporation's planning assumes that the site will be gravitated towards the 500mm sewer that presently terminates at the intersection of North Lake Road and Polletti Road near the north west corner of the site.

The Water Corporation have also advised that they are due to review its planning for this area in the next year or two. This review will need to assess the cumulative impact of the Cockburn Central West Development to determine whether further headworks upgrades will be required in the future. Further liaison with the Water Corporation will be required during detailed design to confirm servicing and resolve any upgrades required.

4.3 Water Reticulation

Water Corporation Dial-Before-You-Dig plans have been obtained and are attached in Appendix B of this report. These plans show that there are existing water mains surrounding the development. It is anticipated that water will be

provided to the proposed subdivision via the interconnection of the existing 400mm main in Poletti Drive and the 150mm main in Midgegooroo Avenue.

Pritchard Francis has made contact with the Water Corporation who have advised the Corporation's long term planning appears to have made allowance for servicing this land from the surrounding distribution network. They have advised that it is likely that reticulation mains can be extended to at least serve the initial stages of the development. However, in the absence of up to date water scheme planning they will not provide advice on how much of the development can be served or what upgrades, if any are required.

Water Corporation Planning Engineers are currently undertaking a capacity review of the Thompson Lake Water Scheme which will lead to a full scheme review in the next one or two years. This review will determine if additional distribution mains or system upgrades are required to service this development. Further liaison with the Water Corporation will be required during the detailed design stage of the development when they will hopefully have more information.

4.4 Gas Supply

Dial-Before-You-Dig plans have been received from ATCO Gas and are attached in Appendix C of this report. The plans show existing gas reticulation surrounding the proposed development, as well as 300mm high pressure main running through the site parallel to North Lake Road on the northern boundary of the site. A 17.5m exclusion zone from the high pressure gas main to any structures will be created along the sites northern boundary as shown on the structure plan. Pritchard Francis has contacted ATCO Gas and have received confirmation that the existing infrastructure can serve the proposed development.

4.5 Electrical Supply

Western Power's Dial-Before-You-Dig plans have been obtained and are attached in Appendix D of this report. Western Power's Network Capacity Mapping indicates that there is capacity available in the area. We anticipate that as part of the development additional switchgears and transformers will be required to reinforce the network to allow for the high density expansion of the area.

The existing overhead power lines running parallel to Midgegooroo Avenue will be required to be undergrounded as part of the development work to make way for the proposed development. Liaison will be required with Western Power at the detailed design stage for this work to be co-ordinated.

Existing overhead high voltage power lines protected by an easement running parallel to Poletti Road will be remaining in place and any work in the power line easement will have to be separately negotiated with Western Power.

4.6 Communications

It is anticipated communication will be provided to the site by NBN Co as a development of this site fits in with the criteria for providing service to the site. An application will be made to NBN Co at the detailed design stage to confirm this. Until this application is made NBN Co will not provide any information.

4.7 Parking

Parking is to be predominantly designated short term parking spaces, located within the Western Power easement as well as short term parking surrounding the ovals. Parking surrounding the ovals is to be short term in nature and for visitors of residents, businesses within the area and recreational users.

Western Power is currently in the process of undertaking line surveys and clearances calculations that will provide constraints for the design of parking under these transmission lines and a report will be issues by Western Power. Norman Disney Young have also been commissioned to undertake EMF, EPR and LFI studies for the power lines.

4.8 Staging

Stage 1 Forward Works

During Stage 1, necessary earthworks will be carried out including stripping topsoil from entire site, over excavating playing fields to bury topsoil and cut to fill necessary for the early stages of works. Pending Western Power approval, fill from the Western Power easement will be cut for use as fill elsewhere on site.

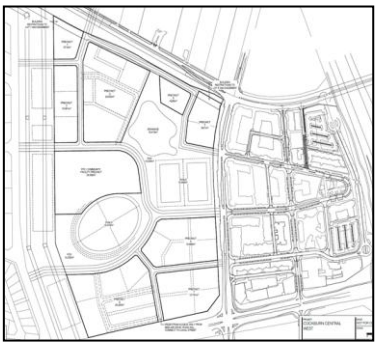

Figure 4.1: Stage 1

Stage 1A – Civil Works for Oval and Community Facilities

This stage of works will include construction of roads, drainage, extension of services to the site from existing infrastructure located North West of the site on North Lake Road, earthworks, retaining walls and other works associated with development of the main oval and support precinct area. Pending Western Power approval, carparks located within the Western Power easement will be constructed.

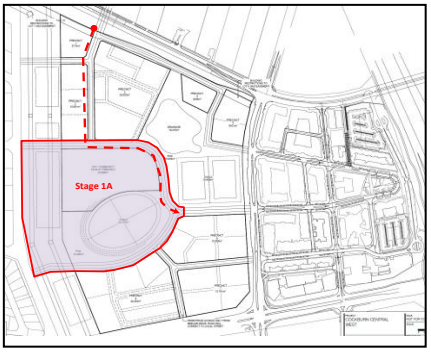

Figure 4.2: Stage 1A

Stage 1B – Civil Works for POS Drainage

This stage of works will include civil works such as roads, drains, sewer, water, power, gas, communication and infrastructure required to service the proposed POS drainage area and playing fields. Works will also include servicing for lots being released in this stage.

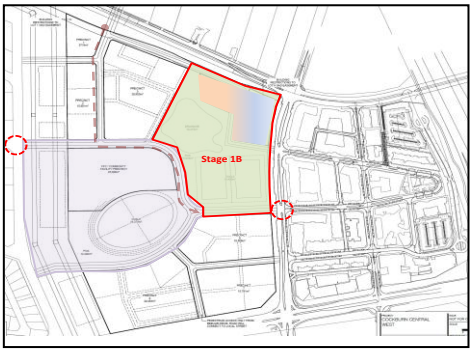

Figure 4.3: Stage 1B

Stage 2, 3A – 3C – Development Release – Vision Completion

Civil works including the provision of water, sewer, roads, drains, walls and authority services required to release these stages will be undertaken. Completion of earthworks will be undertaken as required.

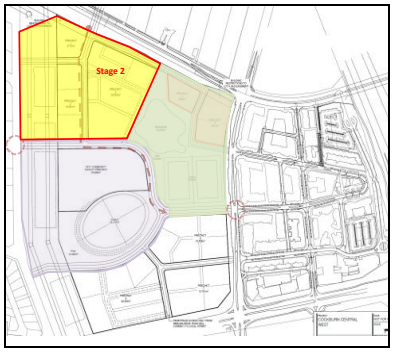

Figure 4.4: Stage 2

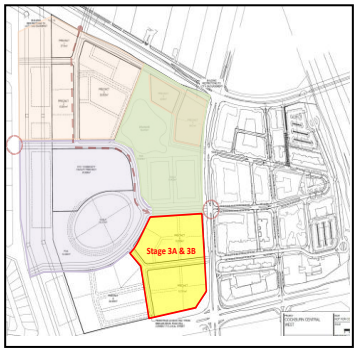

Figure 4.5: Stage 3A & 3B

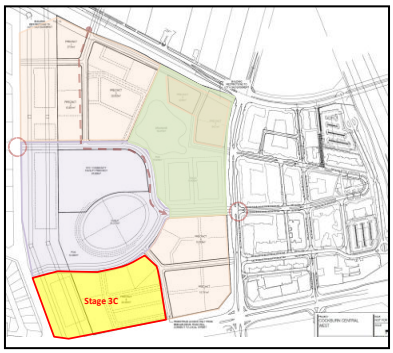

Figure 4.6: Stage 3C

5 Conclusion

This report confirms that the proposed development is capable of being served with all of the essential services. Based on the information available at the time of this report, geological conditions of the site should not present any constraints to the development, however a geotechnical investigation will be required to confirm this.

Confirmation will be required from service authorities at detailed design stage on the actual capacities of existing infrastructure and any upgrades that may be required to serve the proposed subdivision. Further surveys and geotechnical investigations will be required prior to any detailed design and commencement of any construction work on site.

Appendices

Appendix A: **Preliminary Earthworks Plan**

Appendix B: **Water Corporation Dial-Before-You-Dig**

Appendix C: **ATCO Gas Dial-Before-You-Dig Plans**

Appendix D: **Dial-Before-You-Dig Western Power**

Appendix A: Preliminary Earthworks Plan

NORTH

BUILDING RESTRICTIONS TO LOT 6 GAS EASEMENT

MIDGEGOOROO ROAD

EX 27.00 EX 28.20 EX 32.00

PRECINCT 5 8421m²

PRECINCT 4 4286m²

PRECINCT 3 28,803m²

PRECINCT 1 5719m²

PRECINCT 2 10,901m²

PRECINCT 6 18,606m²

PRECINCT 7 15,791m²

PRECINCT 8 29,283m²

OVALS 15,400m²

OVALS 18,378m²

FFC / COMMUNITY FACILITY PRECINCT 26,000m²

POS 12,292m²

BEELIAR DRIVE

NORTH LAKE ROAD

EXISTING OPEN DRAIN

POLLETTI ROAD

EX 24.50

EX 36.50

BUILDING RESTRICTIONS TO LOT 1 GAS EASEMENT

EX 32.00 EX 29.50

LEGEND:

- 33.73 ROAD OR FINISHED SURFACE LEVEL
- EX33.73 EXISTING ROAD OR FINISHED SURFACE LEVEL
- EXISTING 0.50m CONTOUR
- ROAD GRADE
- ONE WAY CROSSFALL

REV	DATE	DESCRIPTION	REV	DATE	DESCRIPTION
A	19.04.13	PRELIMINARY ISSUE ONLY			

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SCALE U.N.O. 20m 0m 20m 40m — 1:1000

DATE APRIL 2013 | DESIGNED KP

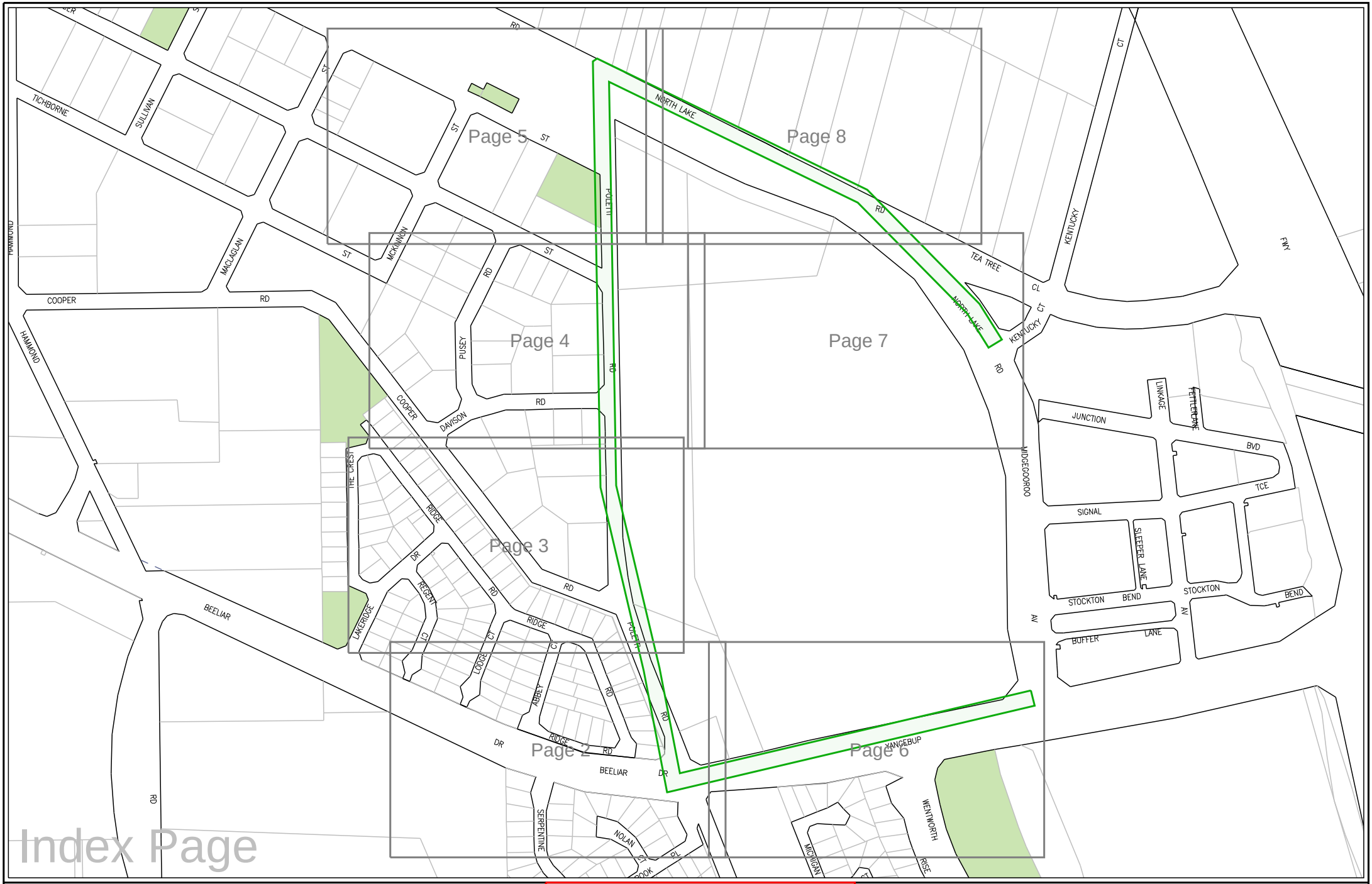
DRAWN GW | CHECKED KP

CLIENT & JOB LANDCORP
COCKBURN CENTRAL WEST

TITLE PRELIMINARY EARTHWORKS PLAN

SHEET SIZE A1 | JOB No. 12-251 | DRG No. SK.15 | REVISION A

Appendix B: Water Corporation Dial-Before-You-Dig



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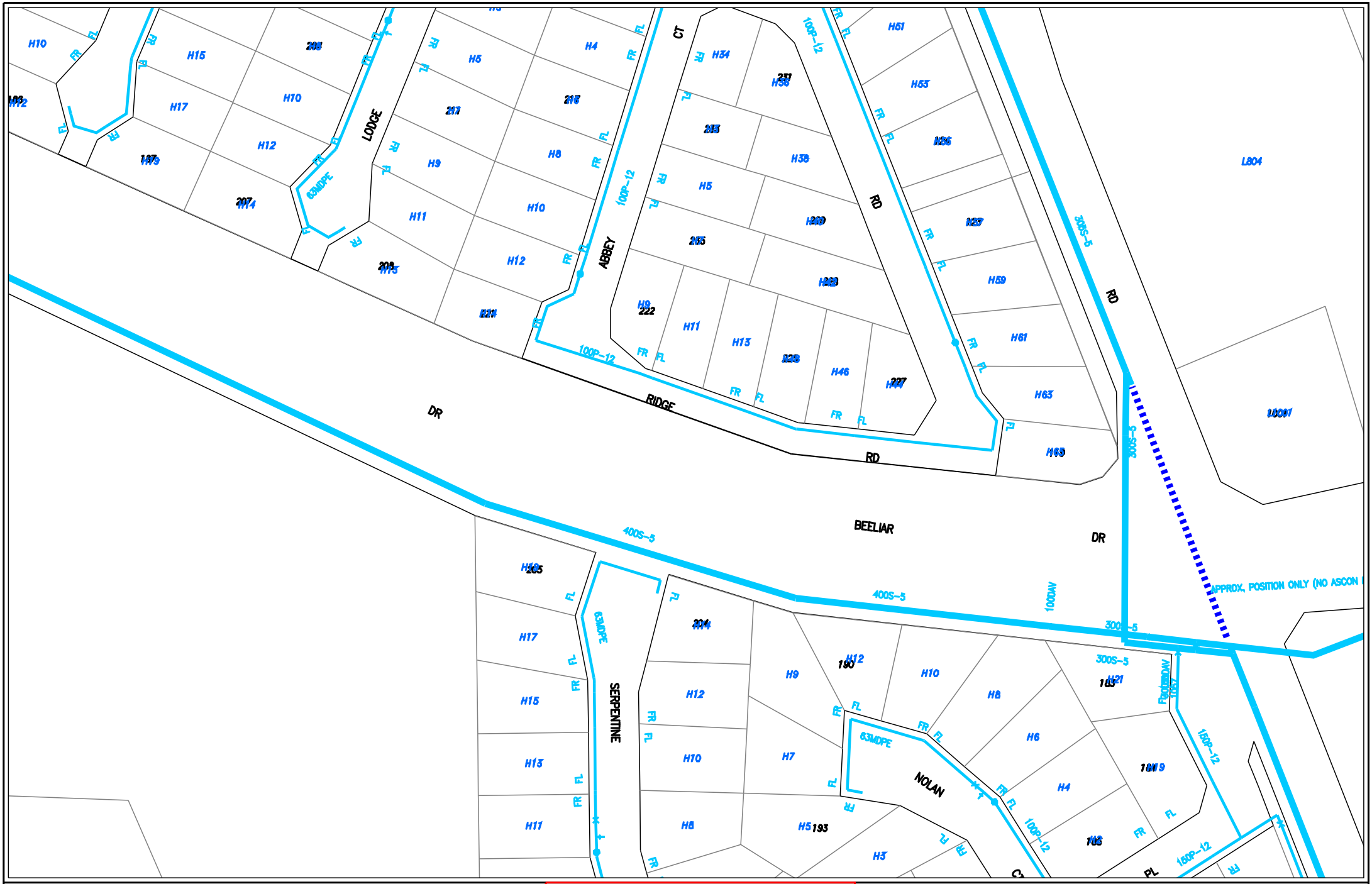

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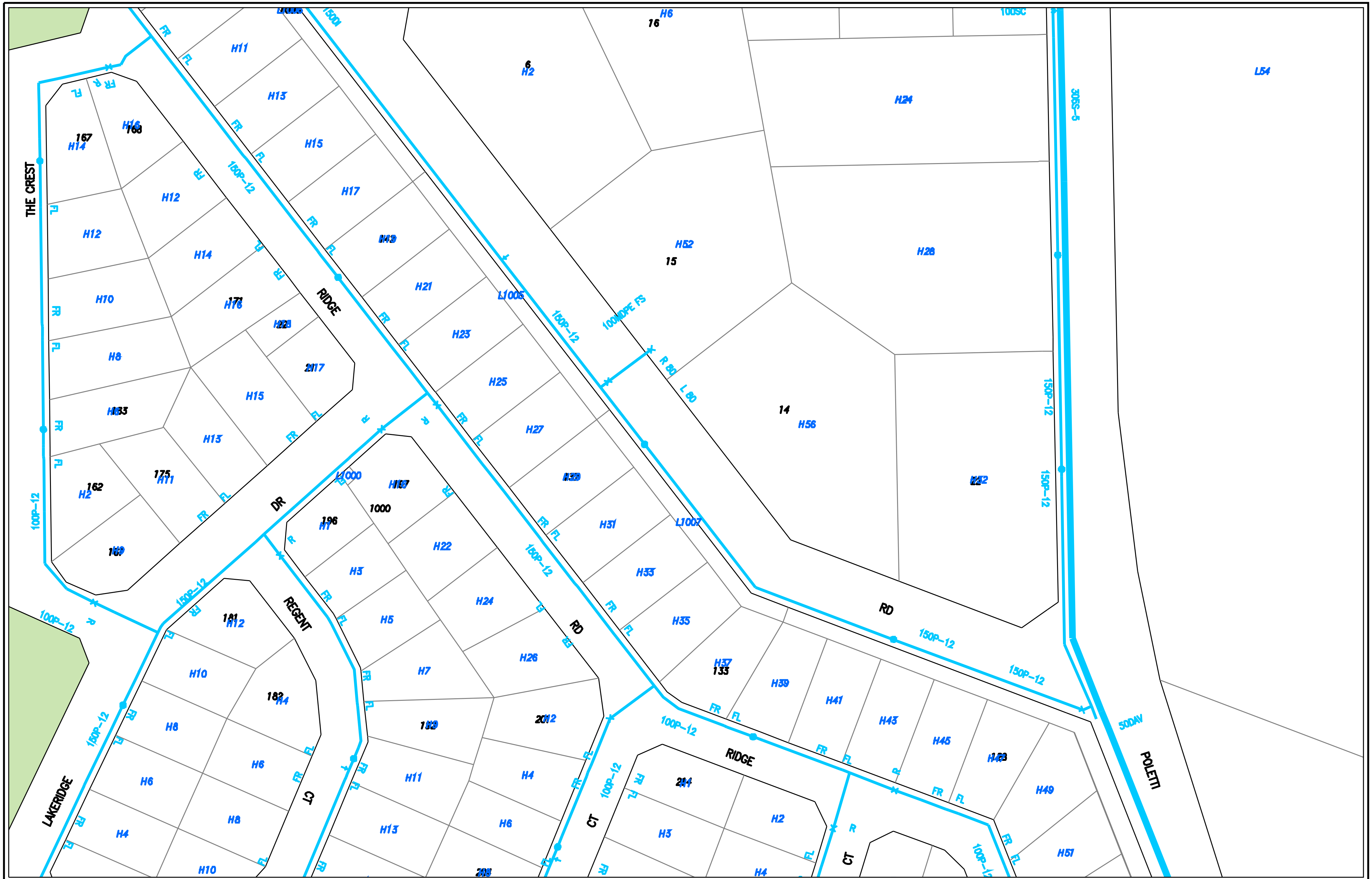

WATER CORPORATION

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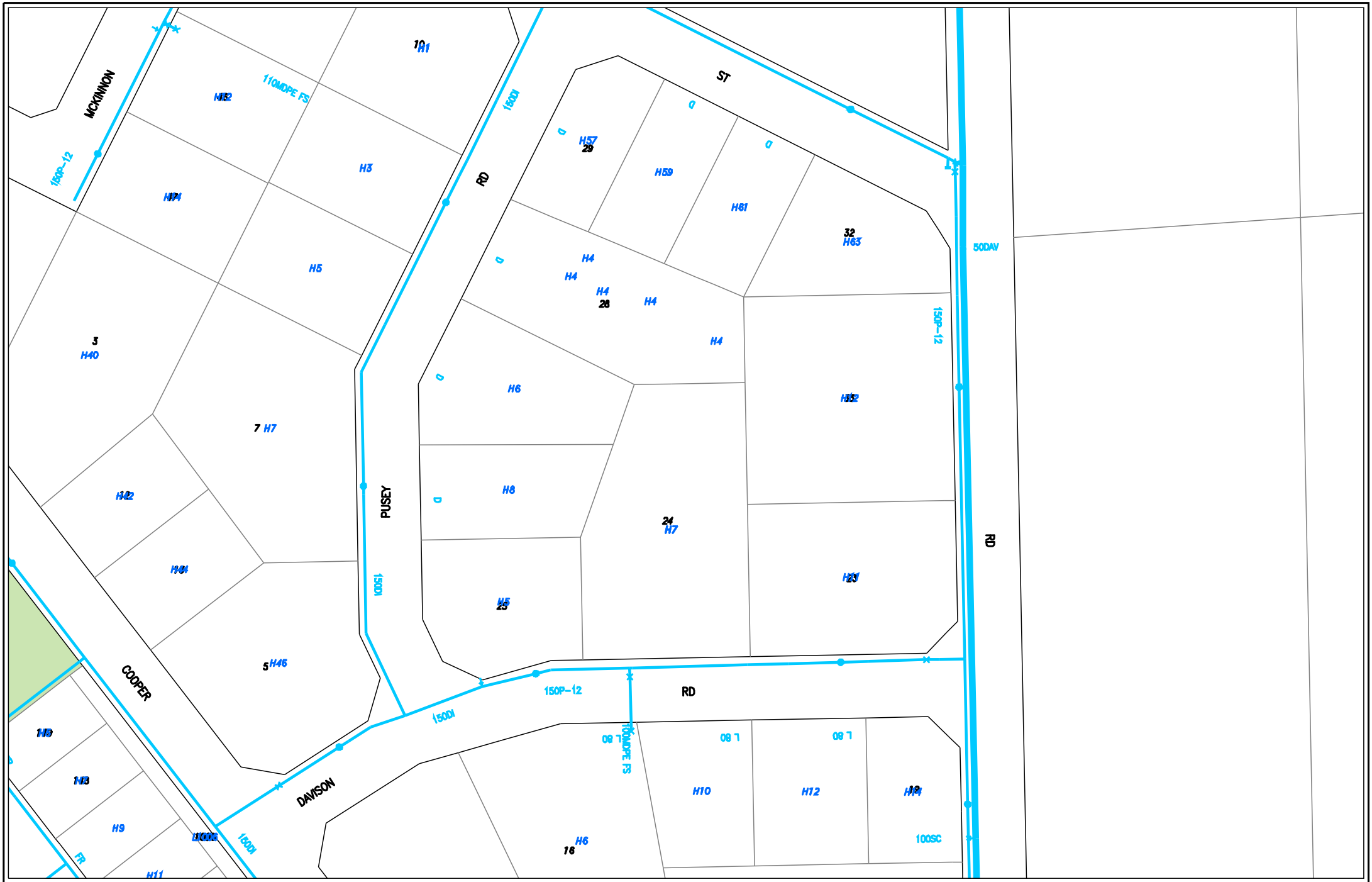

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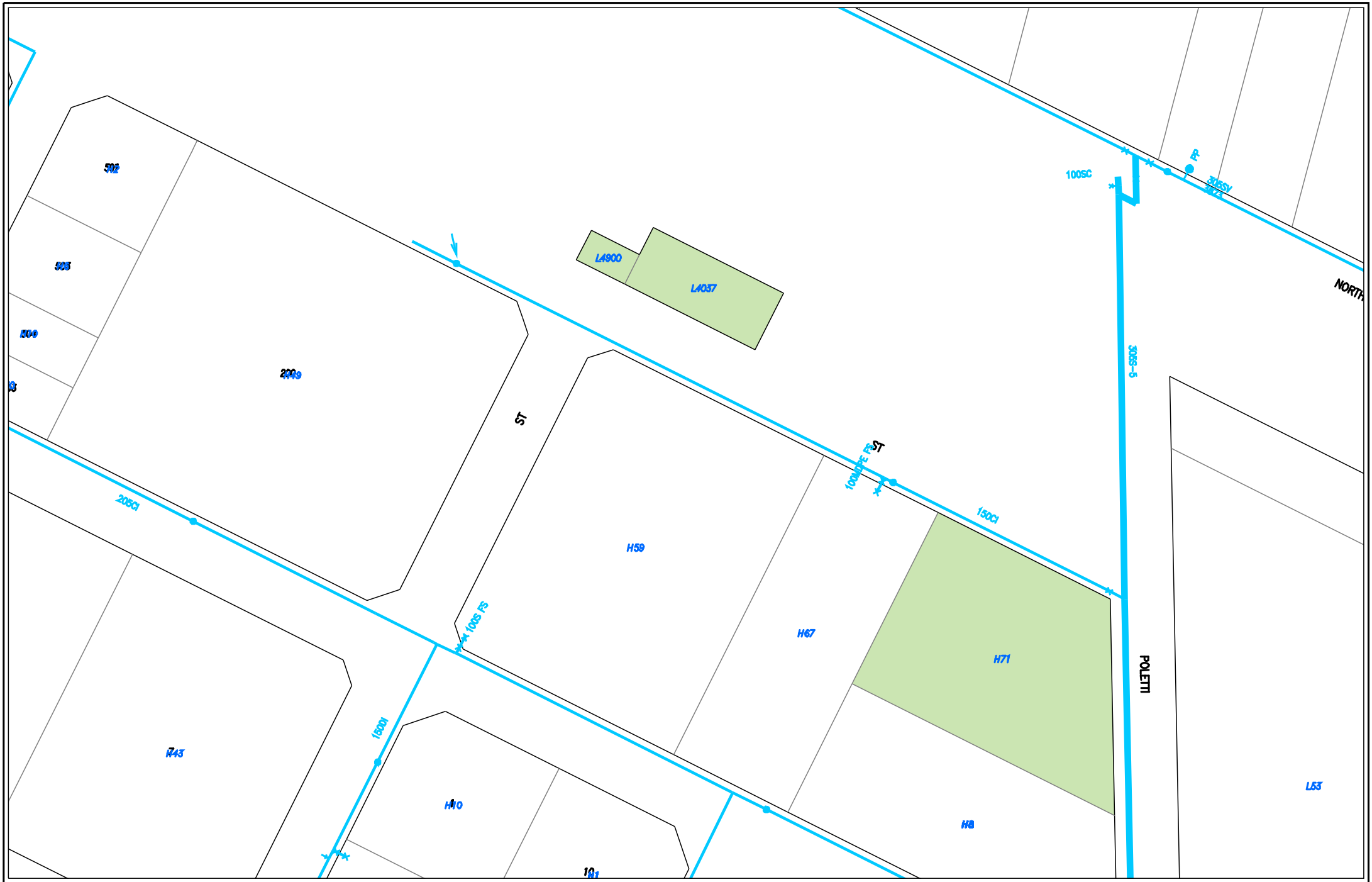

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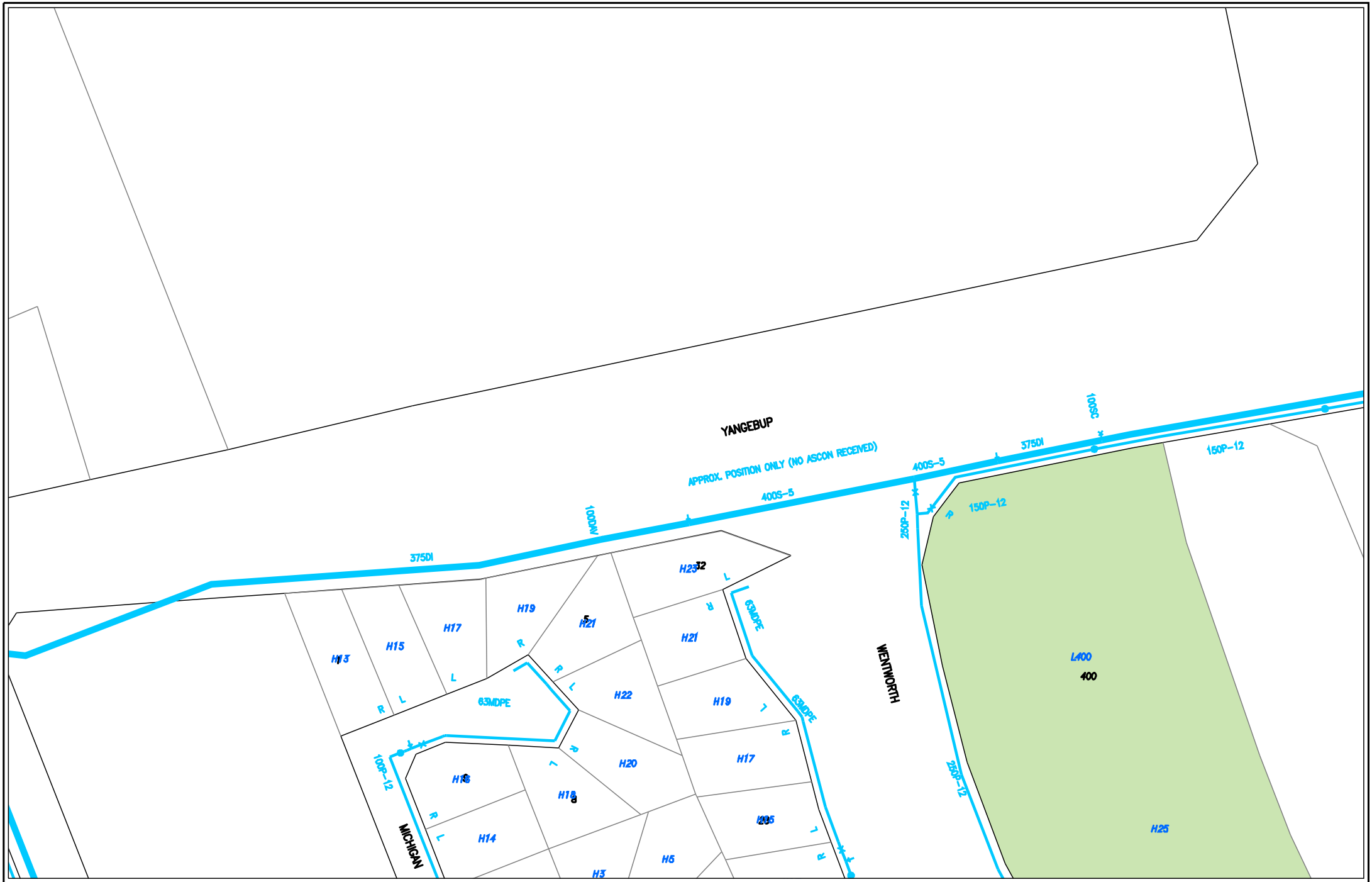

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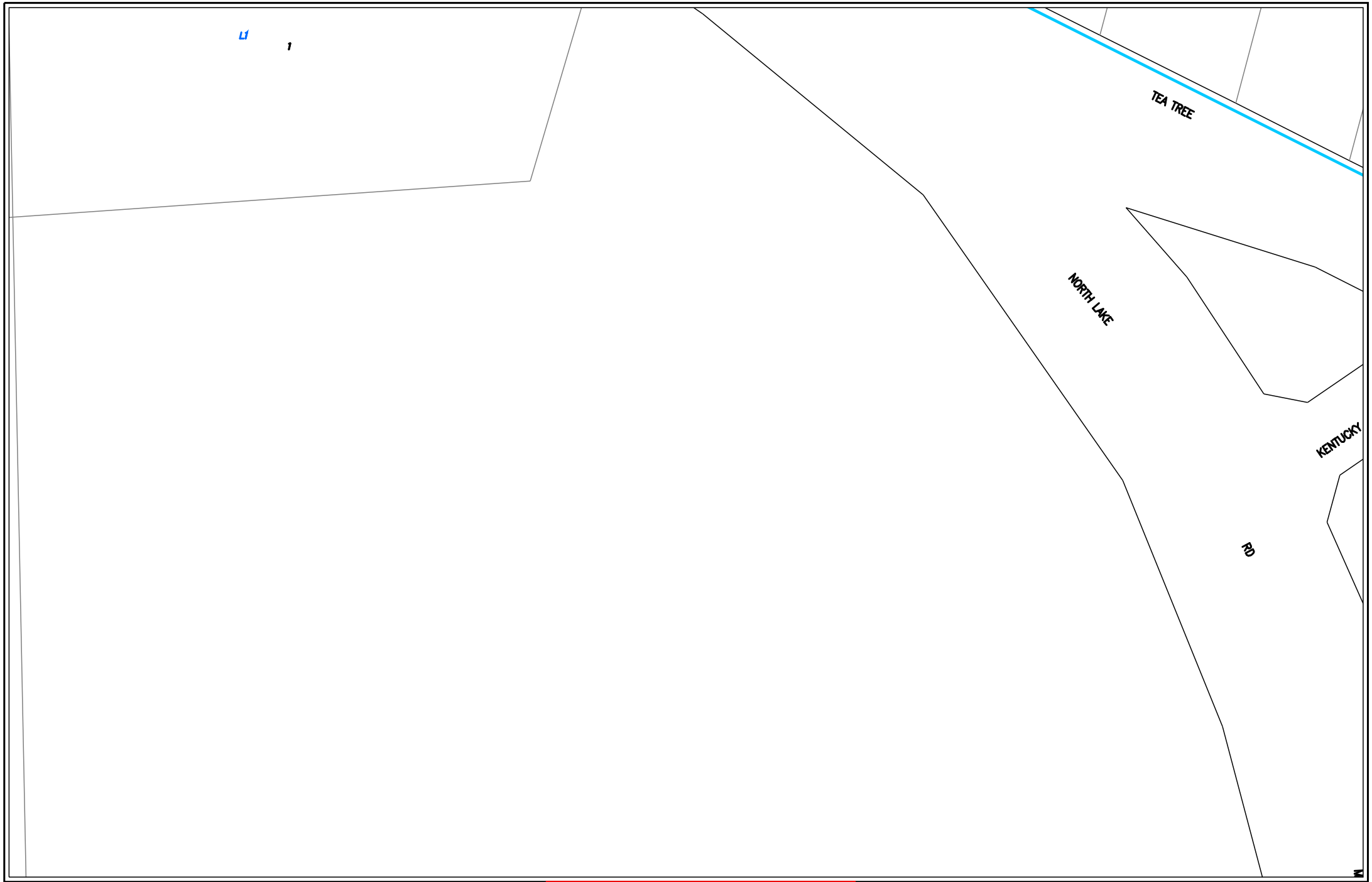

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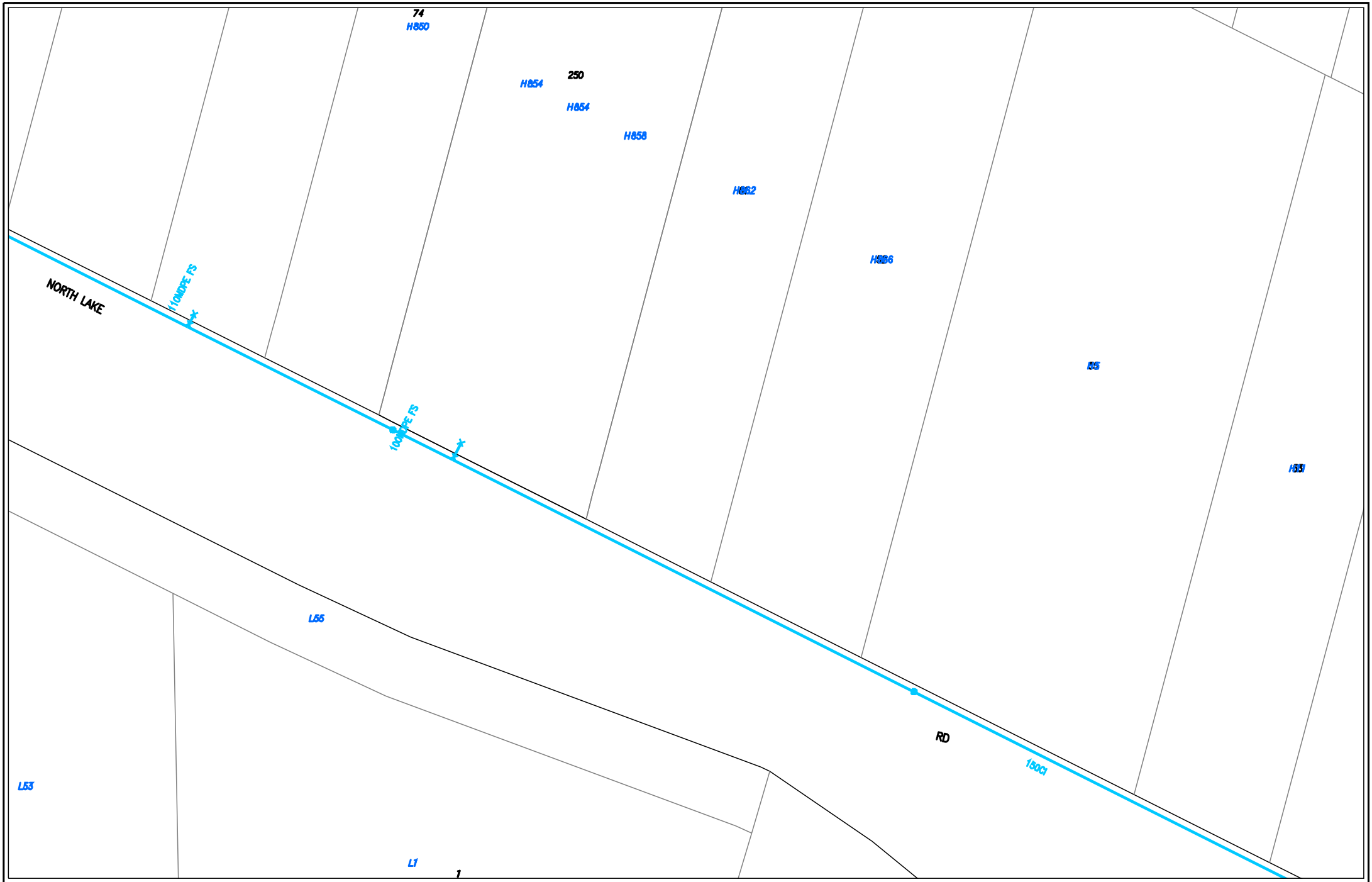

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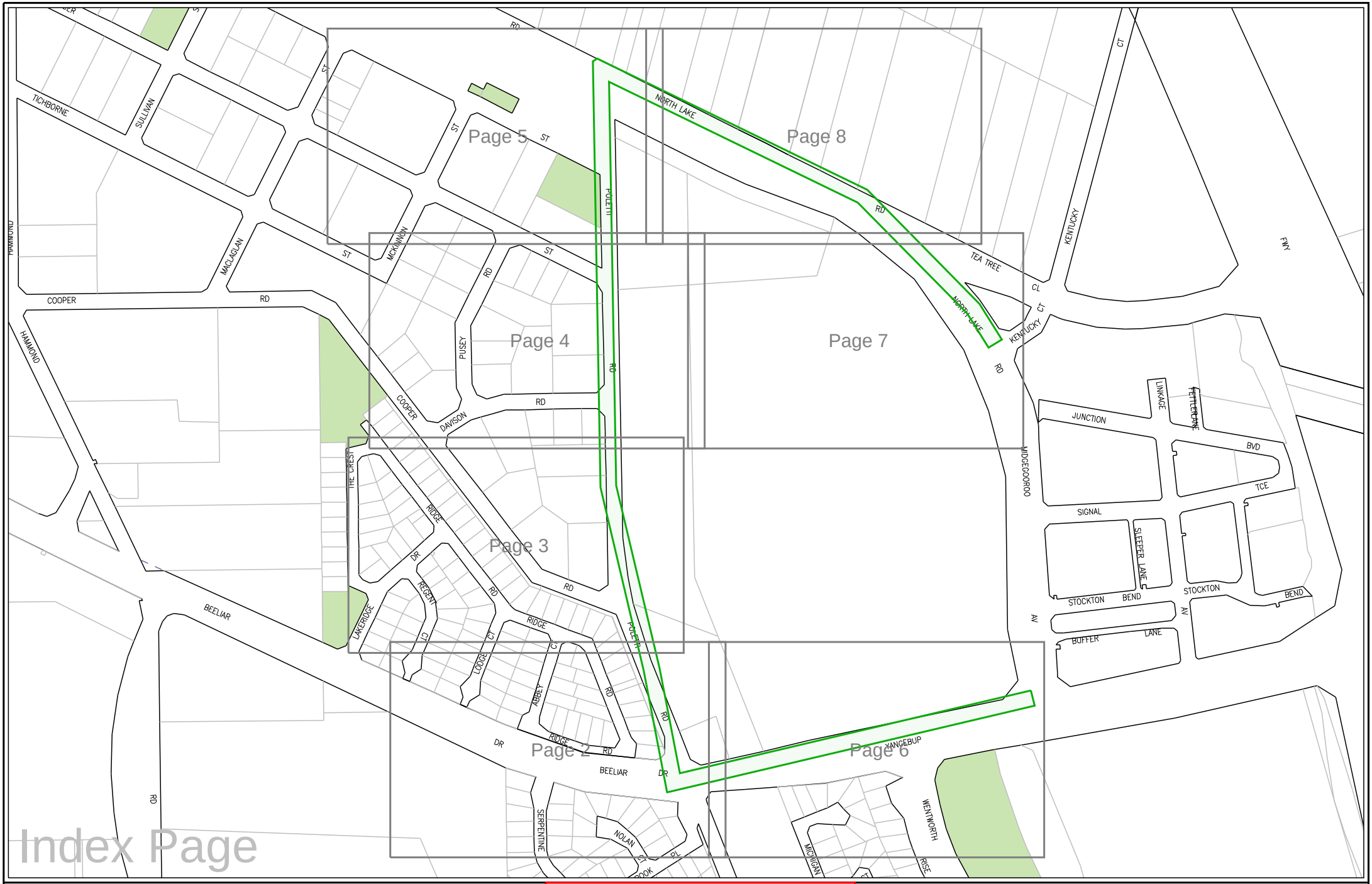

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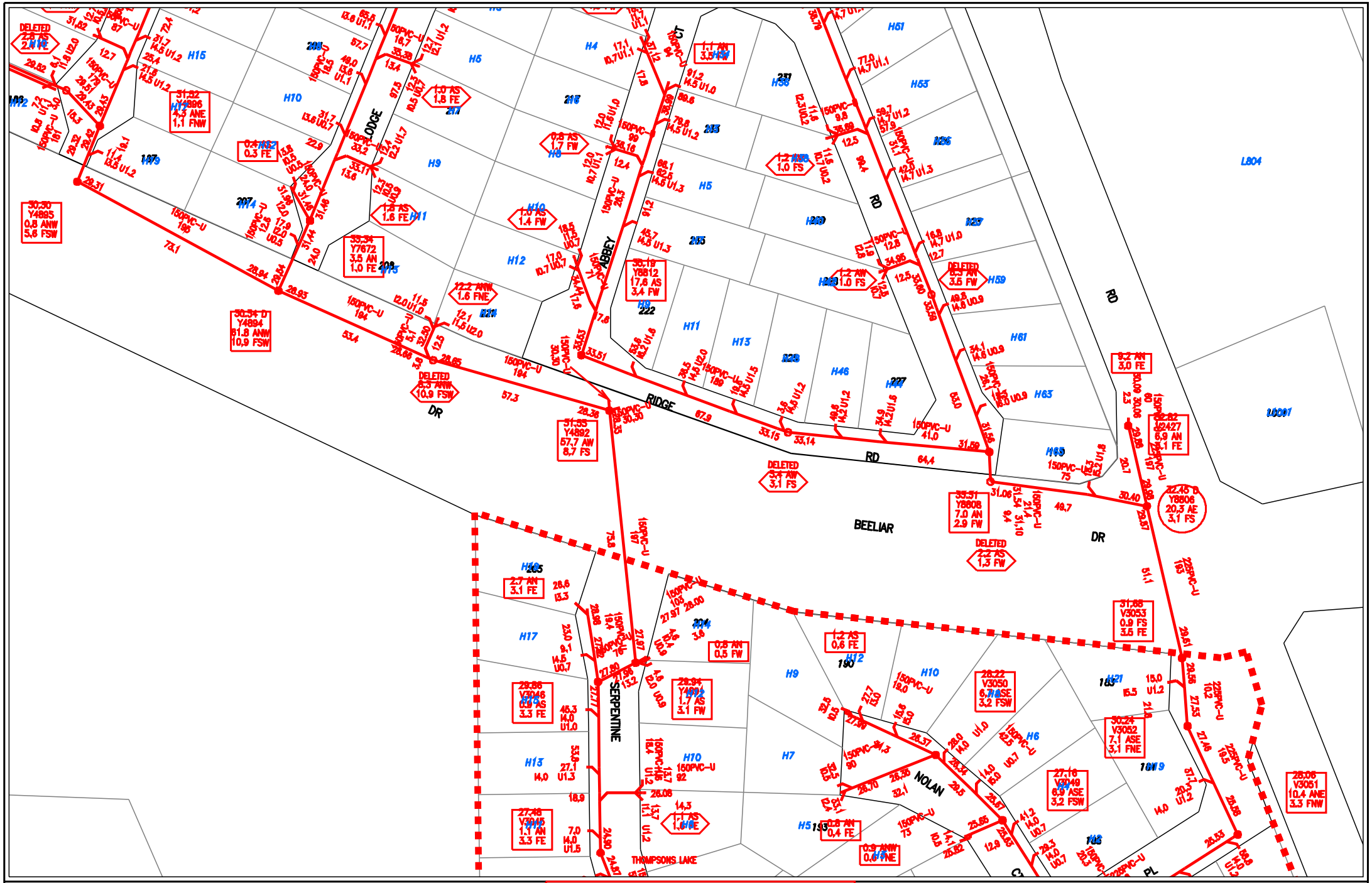

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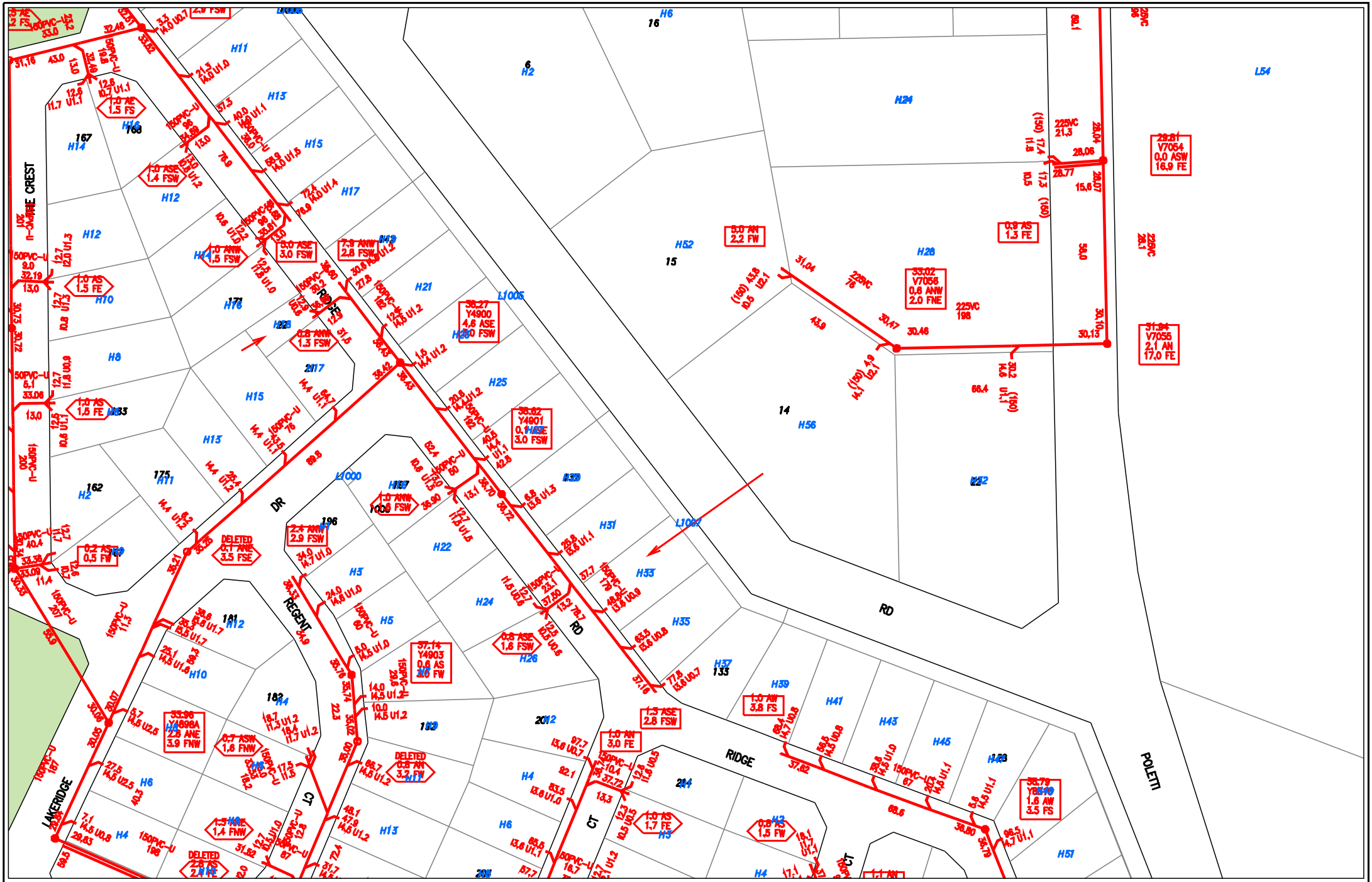

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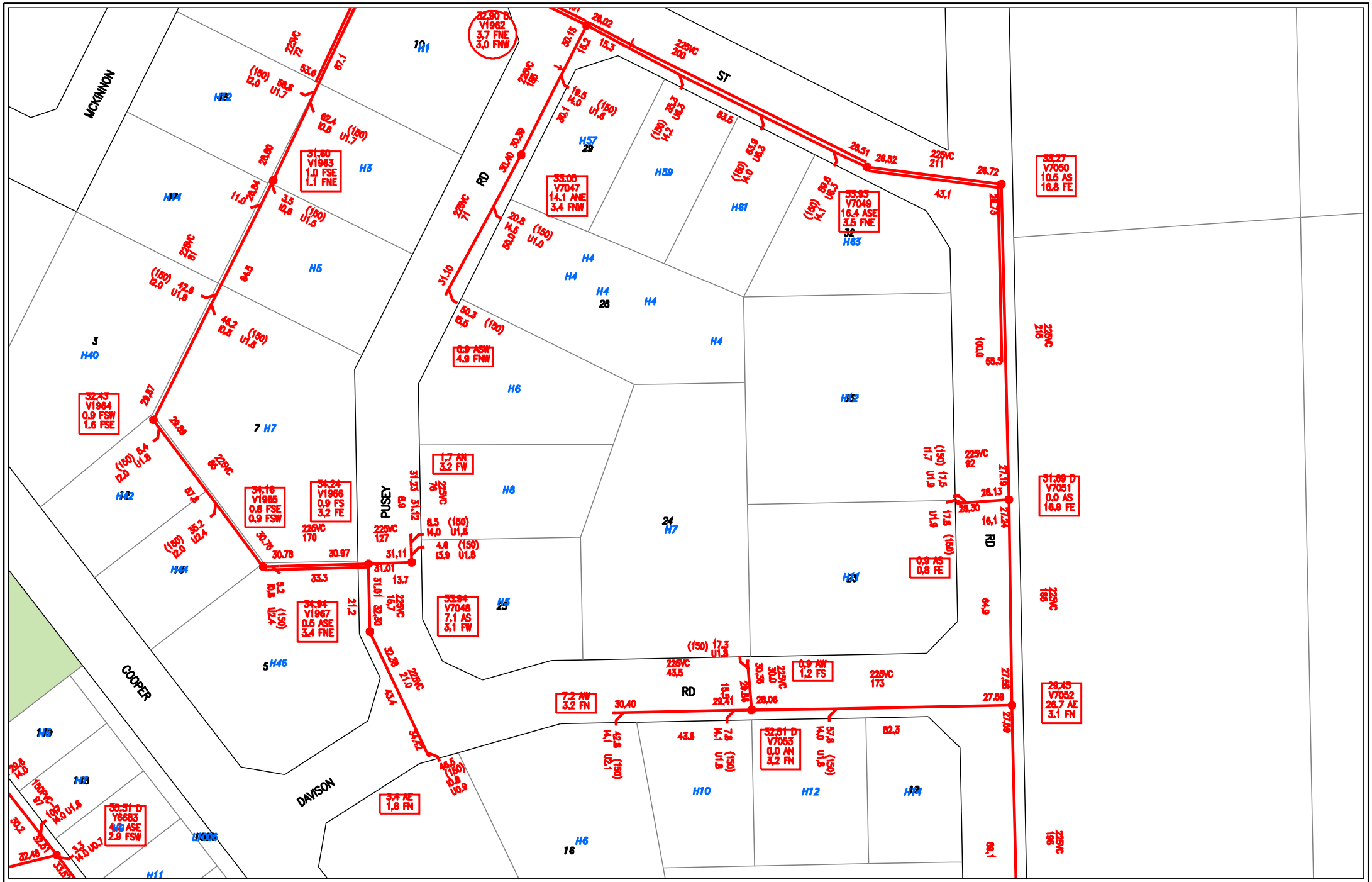

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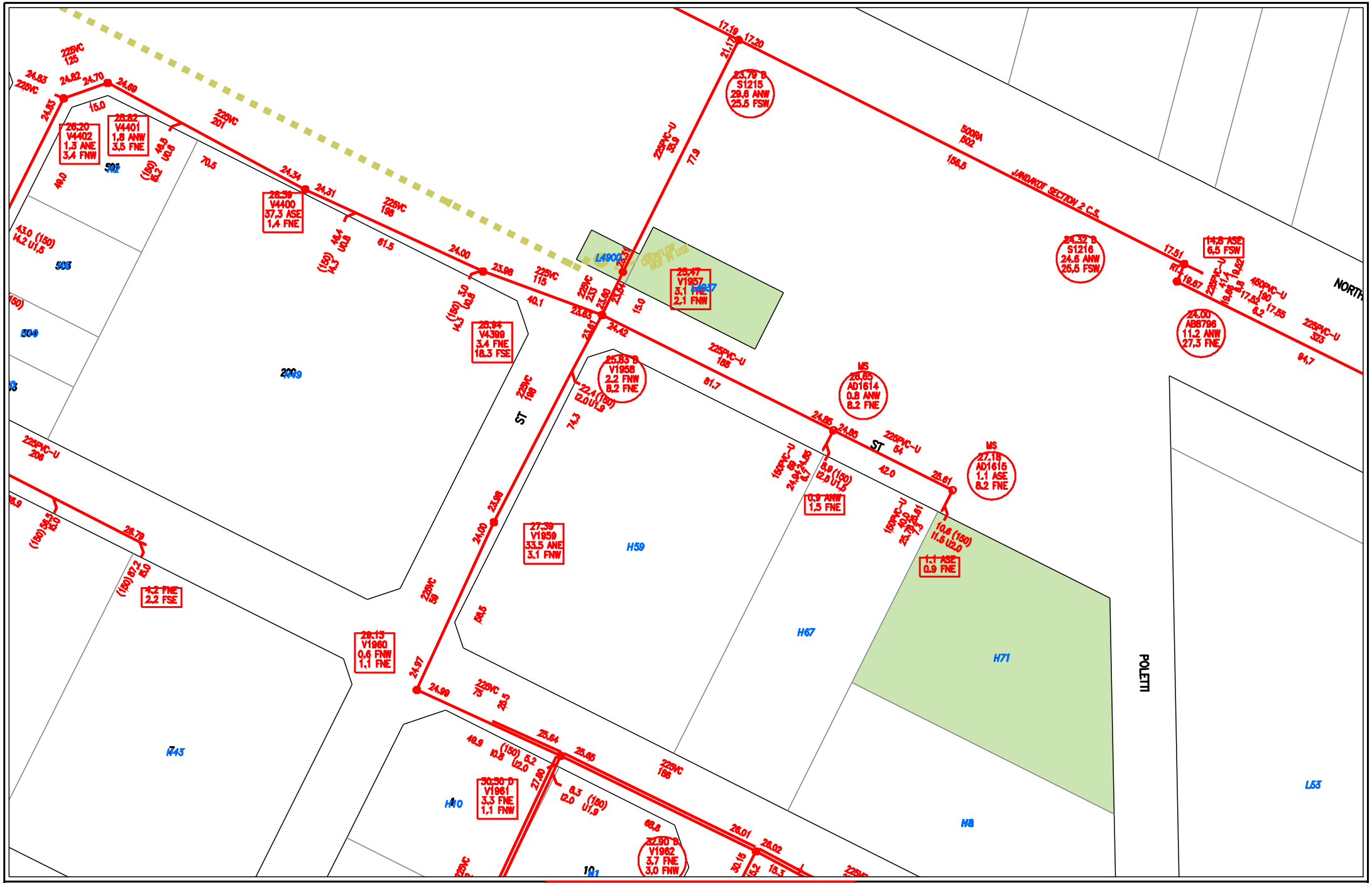

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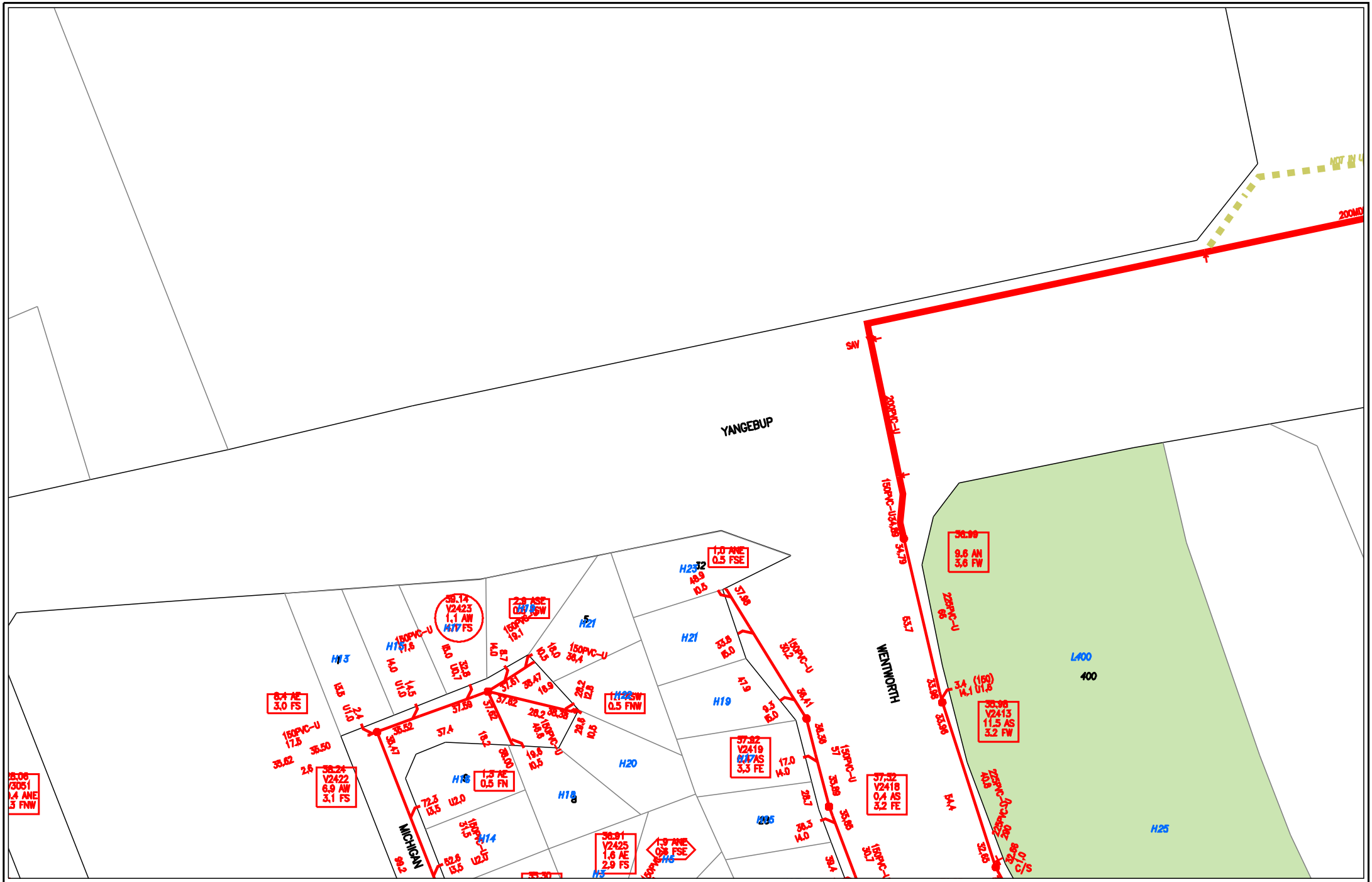

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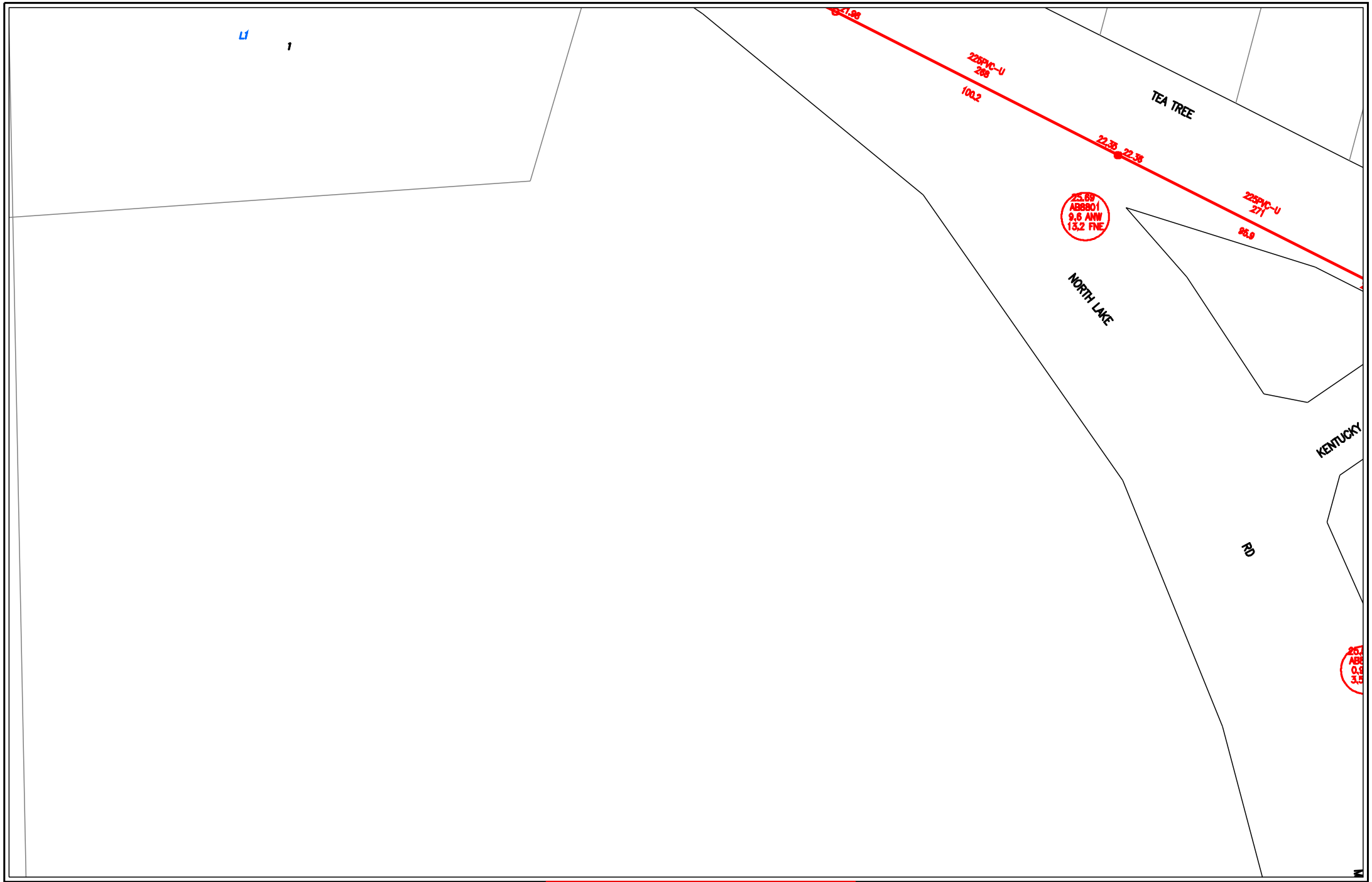

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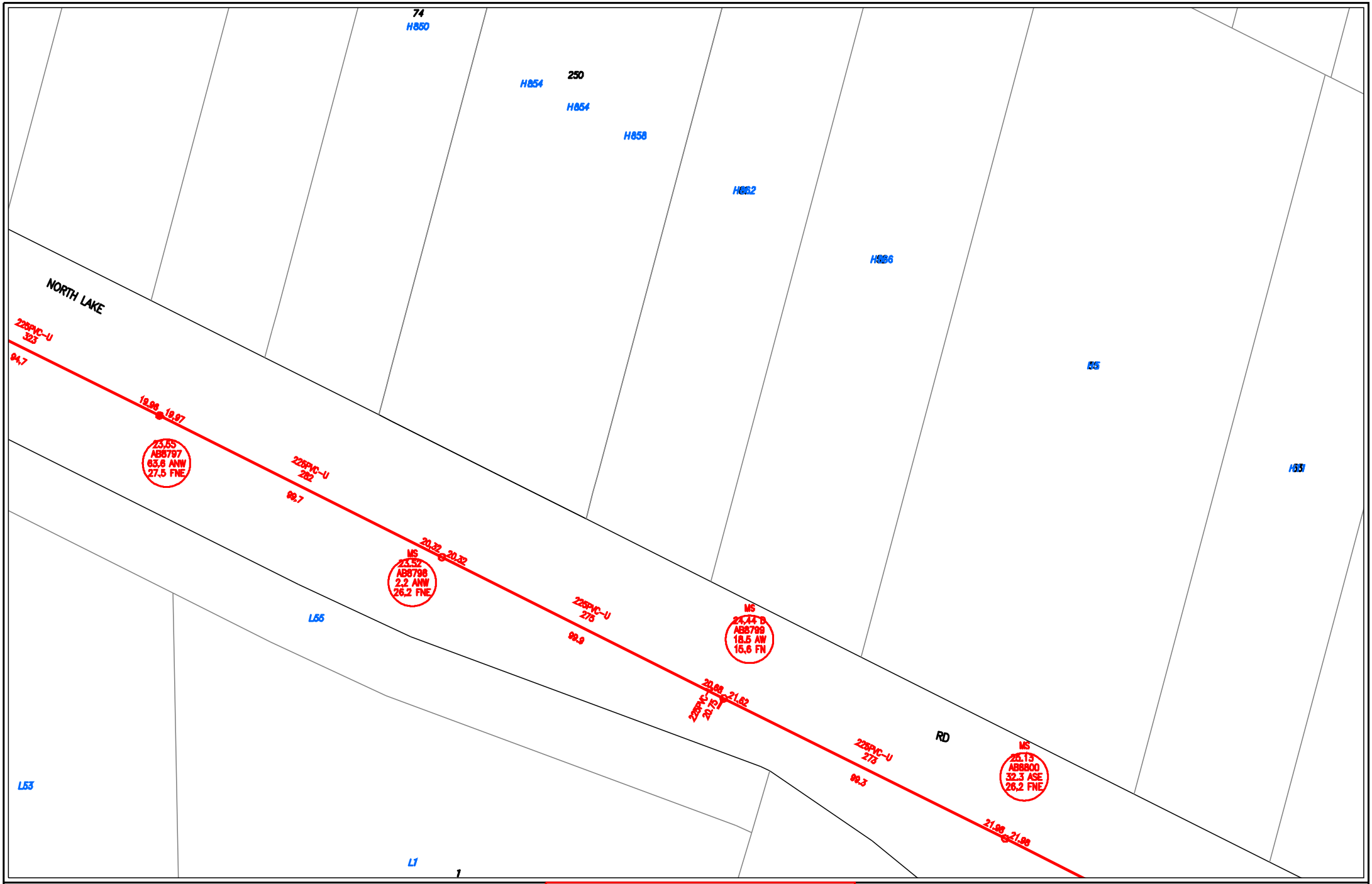

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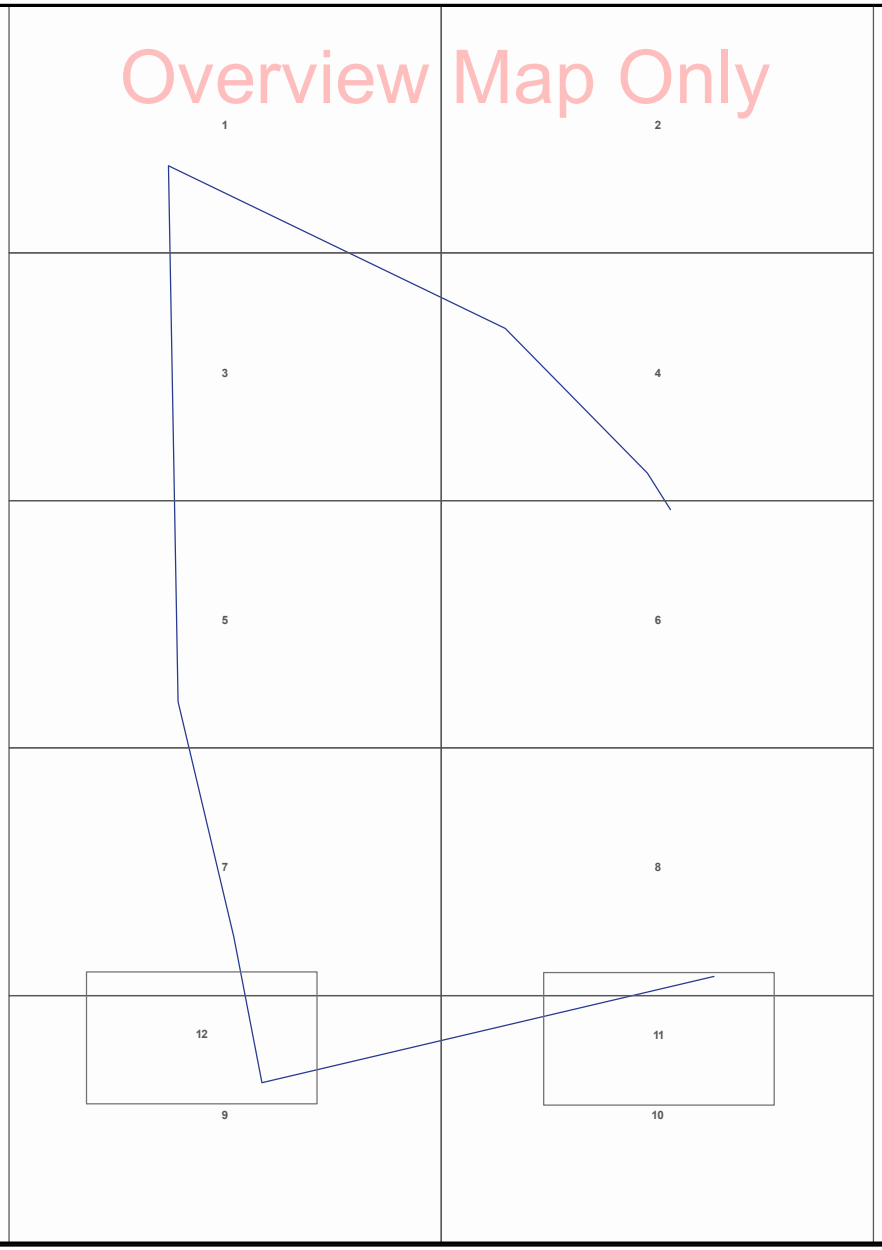
Sewer

WARNING - CRITICAL PIPELINE
Refer to ***Information Brochure Damage Prevention*** and ***Legend*** for details

Appendix C: ATCO Gas Dial-Before-You-Dig Plans

WARNING - HIGH PRESSURE PIPELINE IN THE VICINITY.

No excavations within 15 metres of this asset are permitted without prior approval from ATCO Gas Australia PH 1300 926 755



Meters
0 62.5 125 250

Sequence No:26632715 Map Tile: Overview Scale: 1:7,502

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

Please read all **warnings**, conditions and information on the attached "Underground Asset Details" information sheet. This plan is issued subject to that information and those conditions and **warnings** (including, but not limited to, the "NO HOT WORKS" warning). Plans are current for only **30 days** from date of request, indicative only and not warranted to be accurate. It is your responsibility to carefully locate underground assets and follow safe work practises and procedures (eg pot-holing). ATCO Gas Australia will seek compensation for damage caused to assets.

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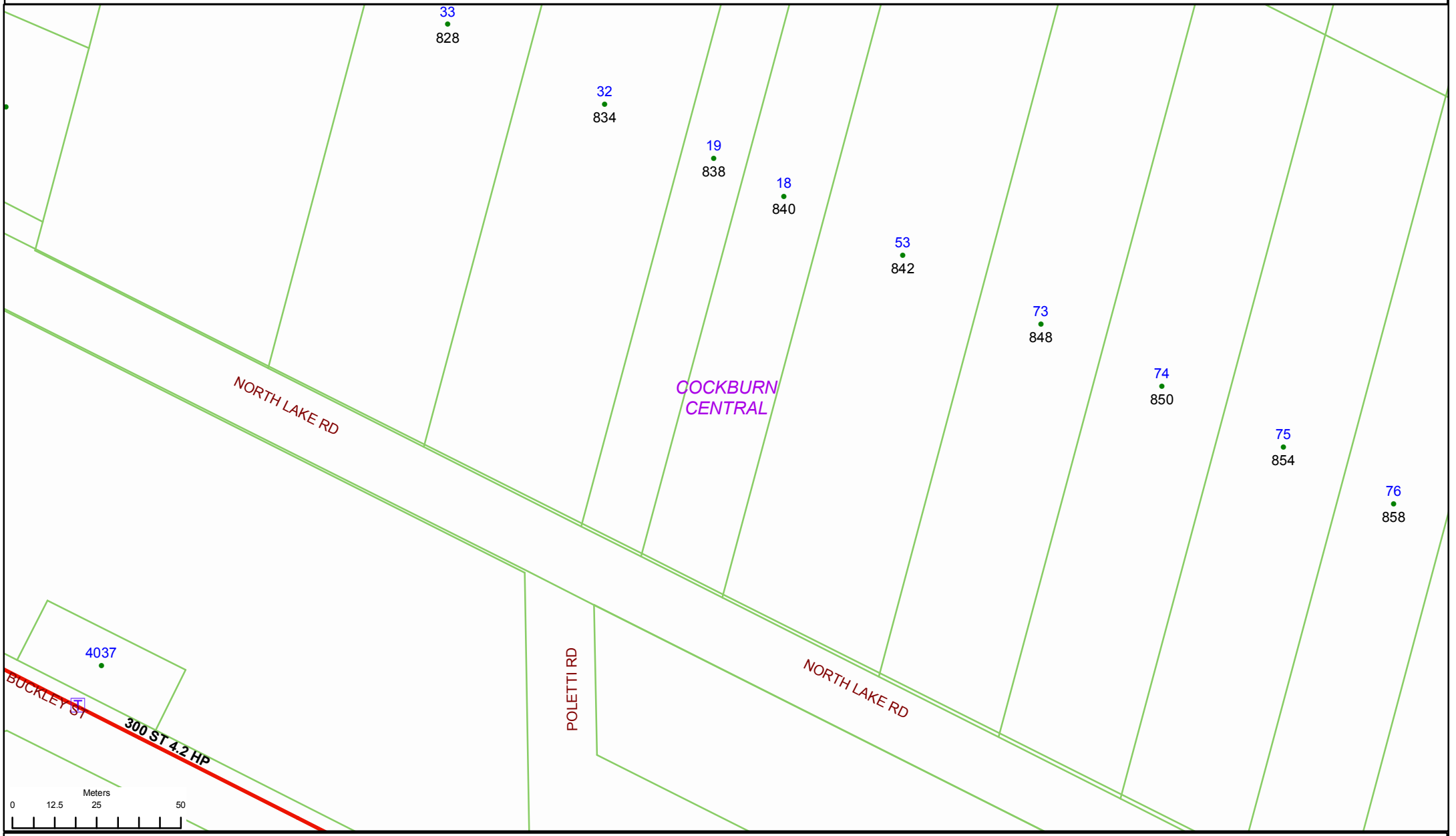

Sequence No:26632715 Map Tile: 1 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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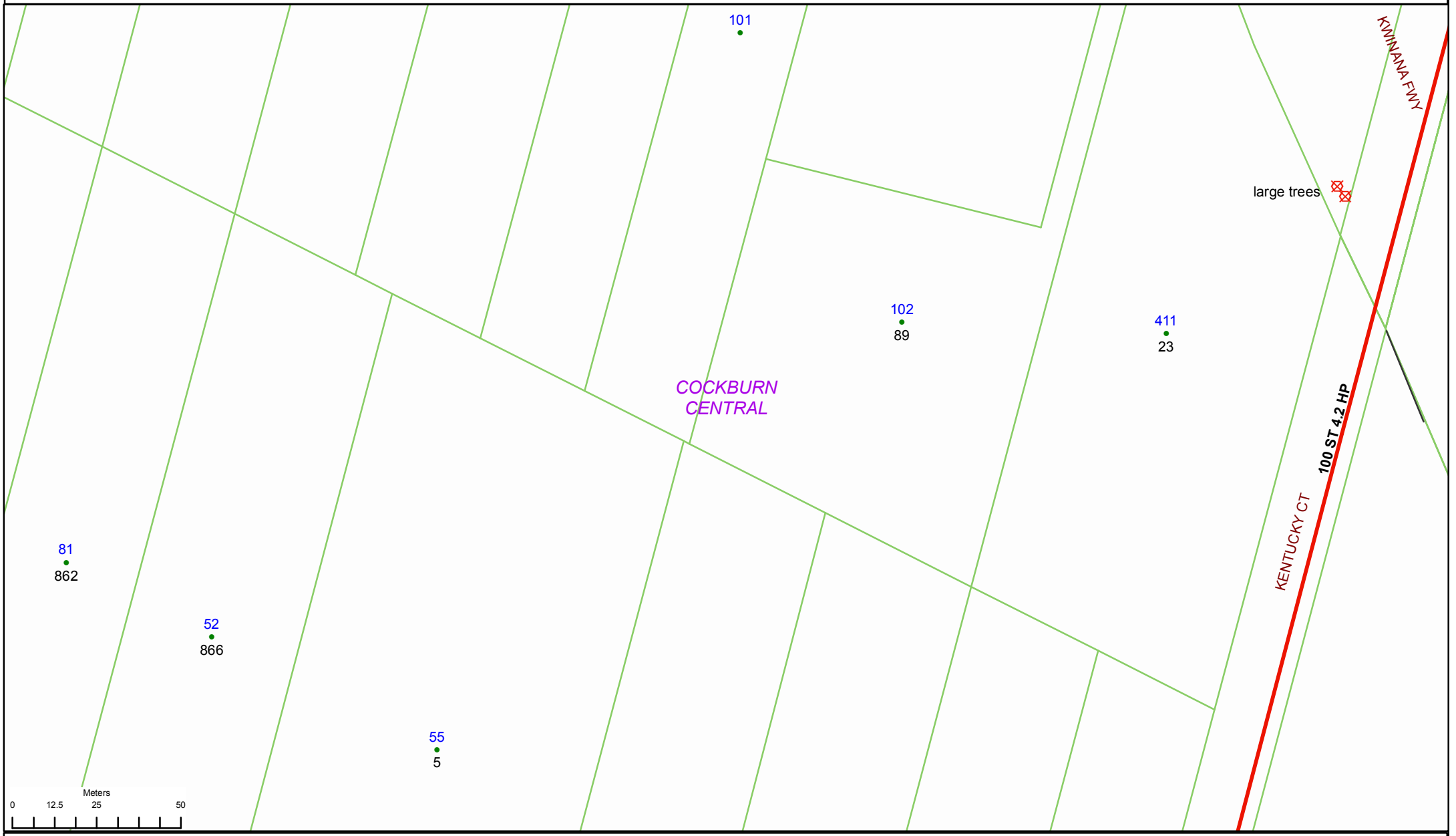

Sequence No:26632715 Map Tile: 2 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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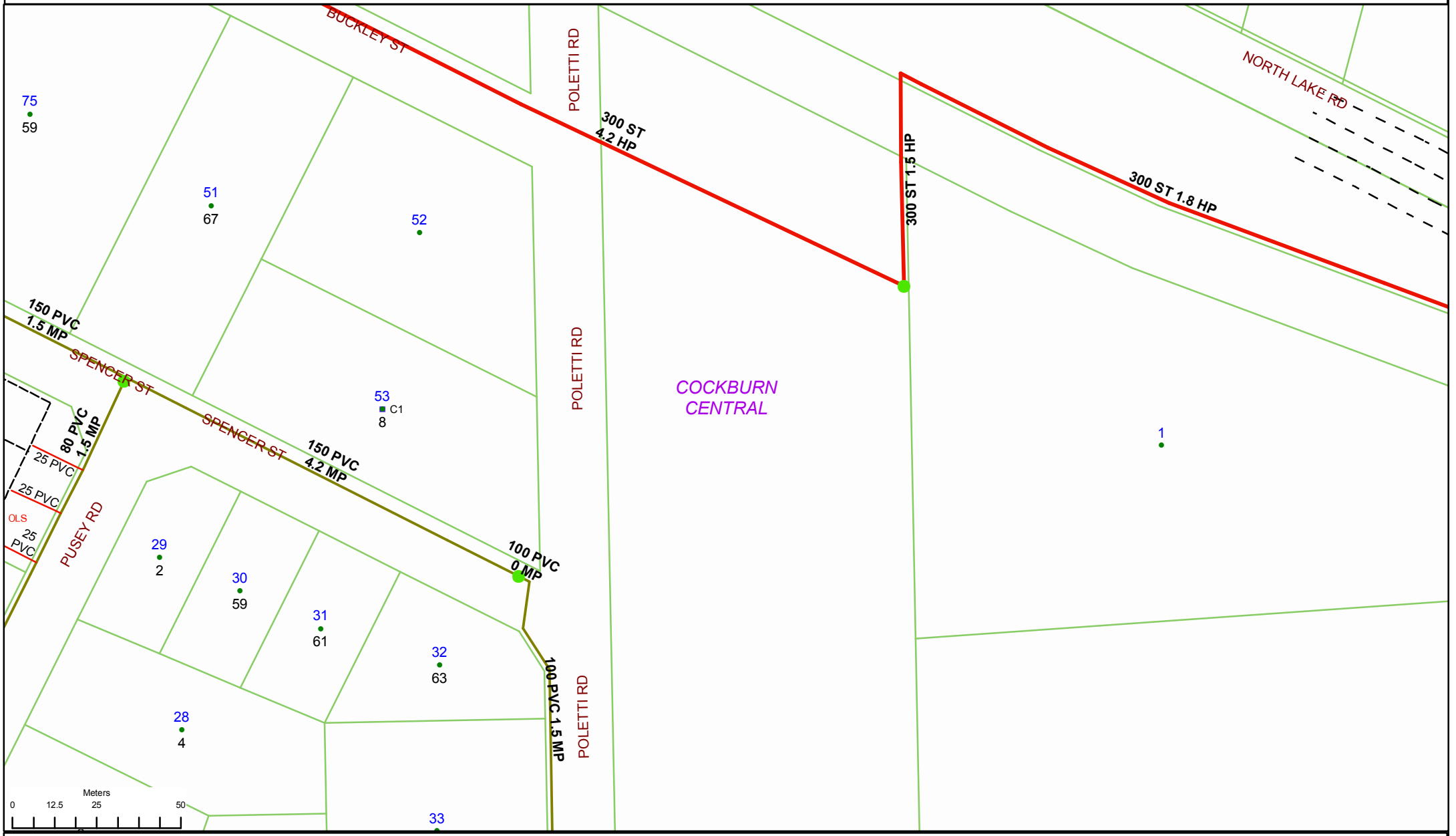

Sequence No:26632715 Map Tile: 3 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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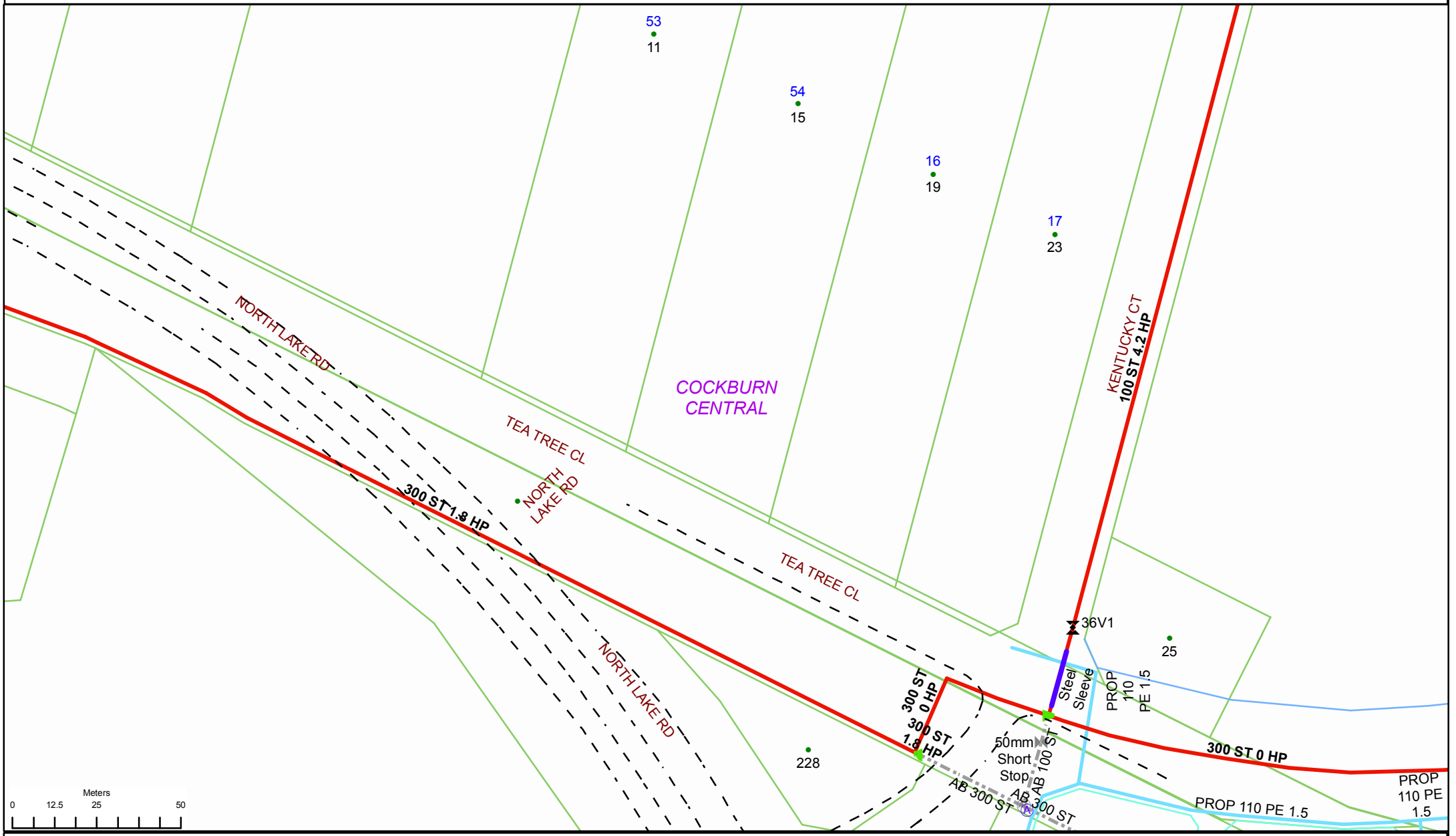

Sequence No:26632715 Map Tile:4 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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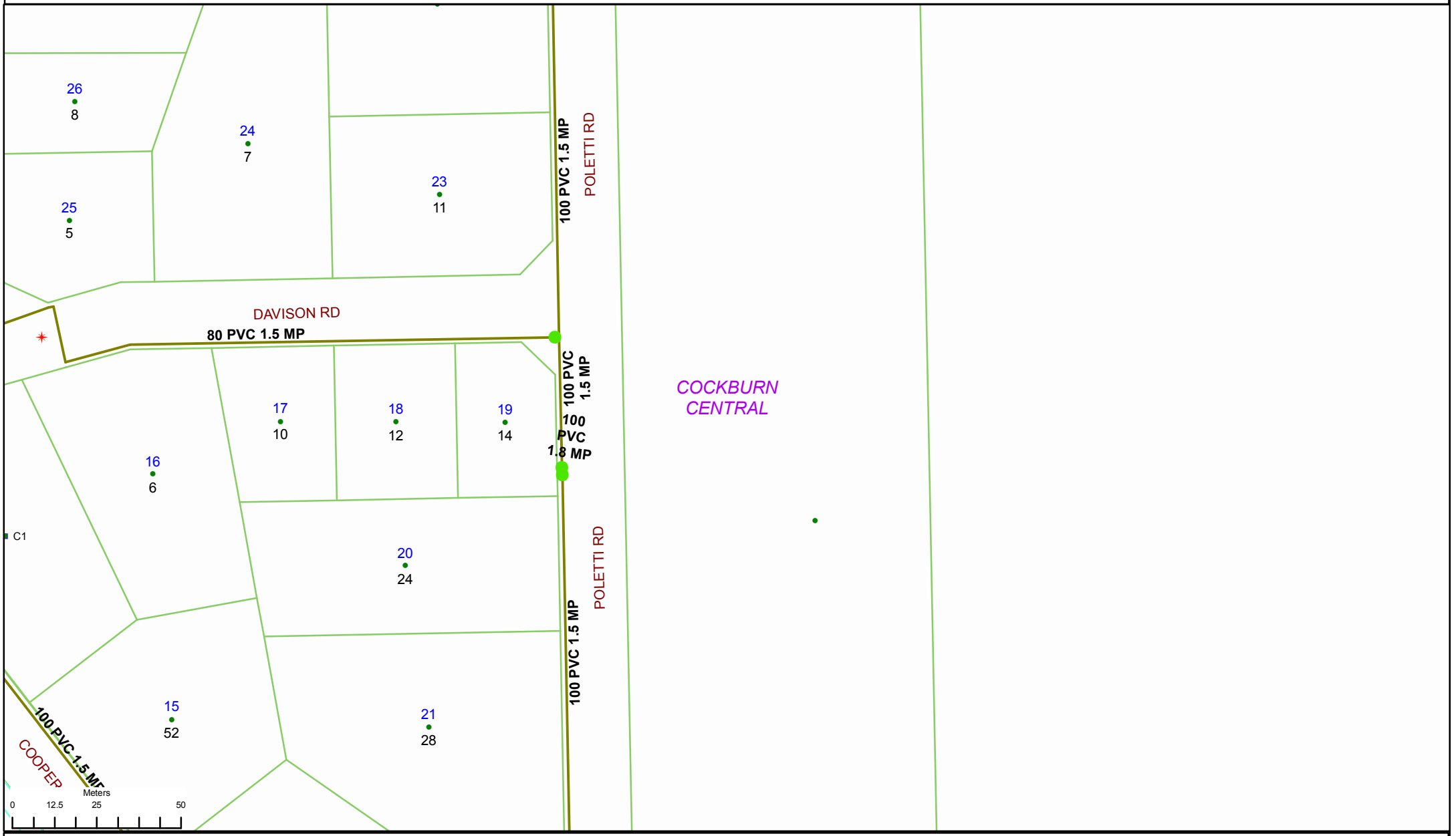

Sequence No:26632715 Map Tile: 5 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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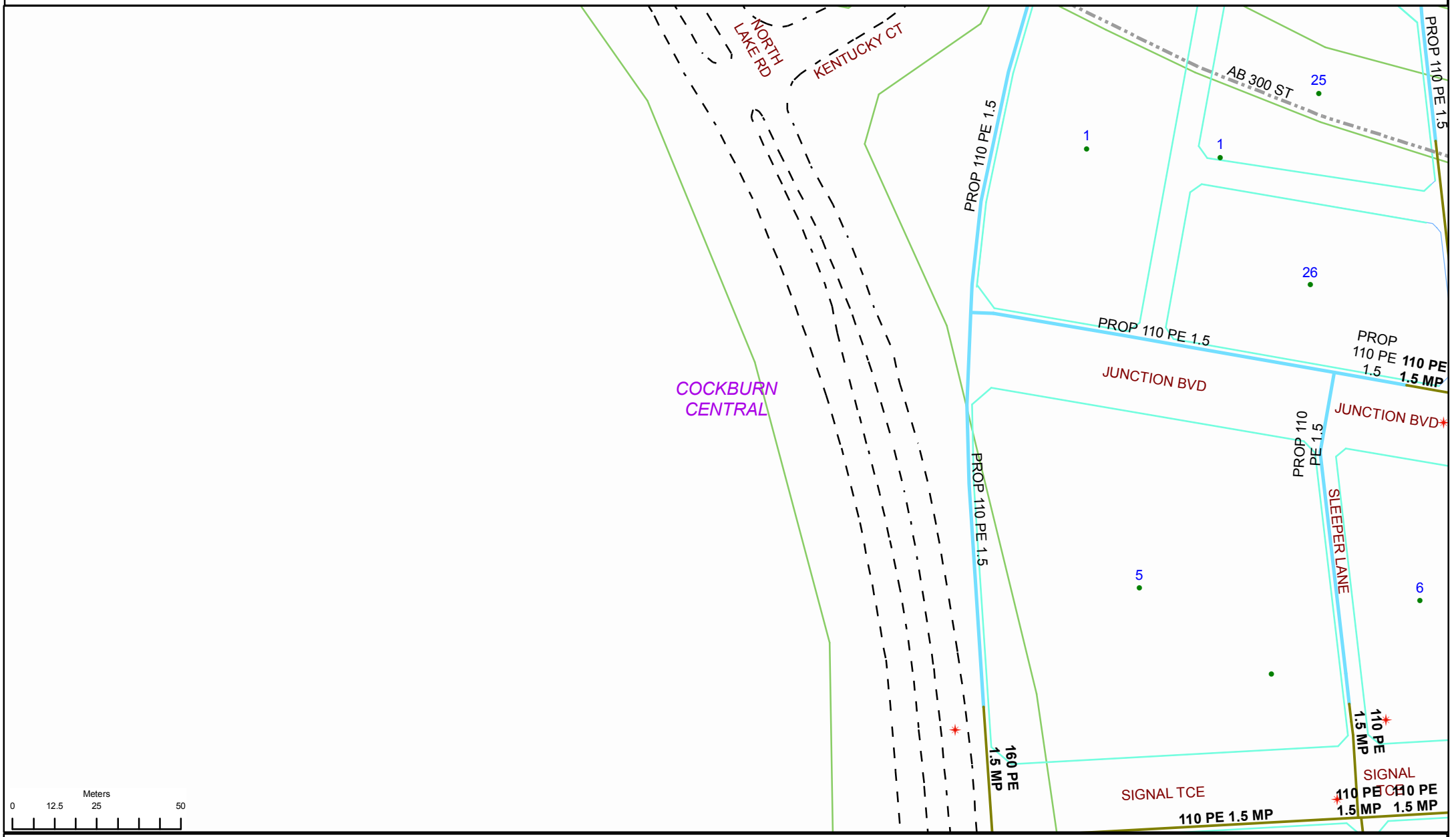

Sequence No:26632715 Map Tile: 6 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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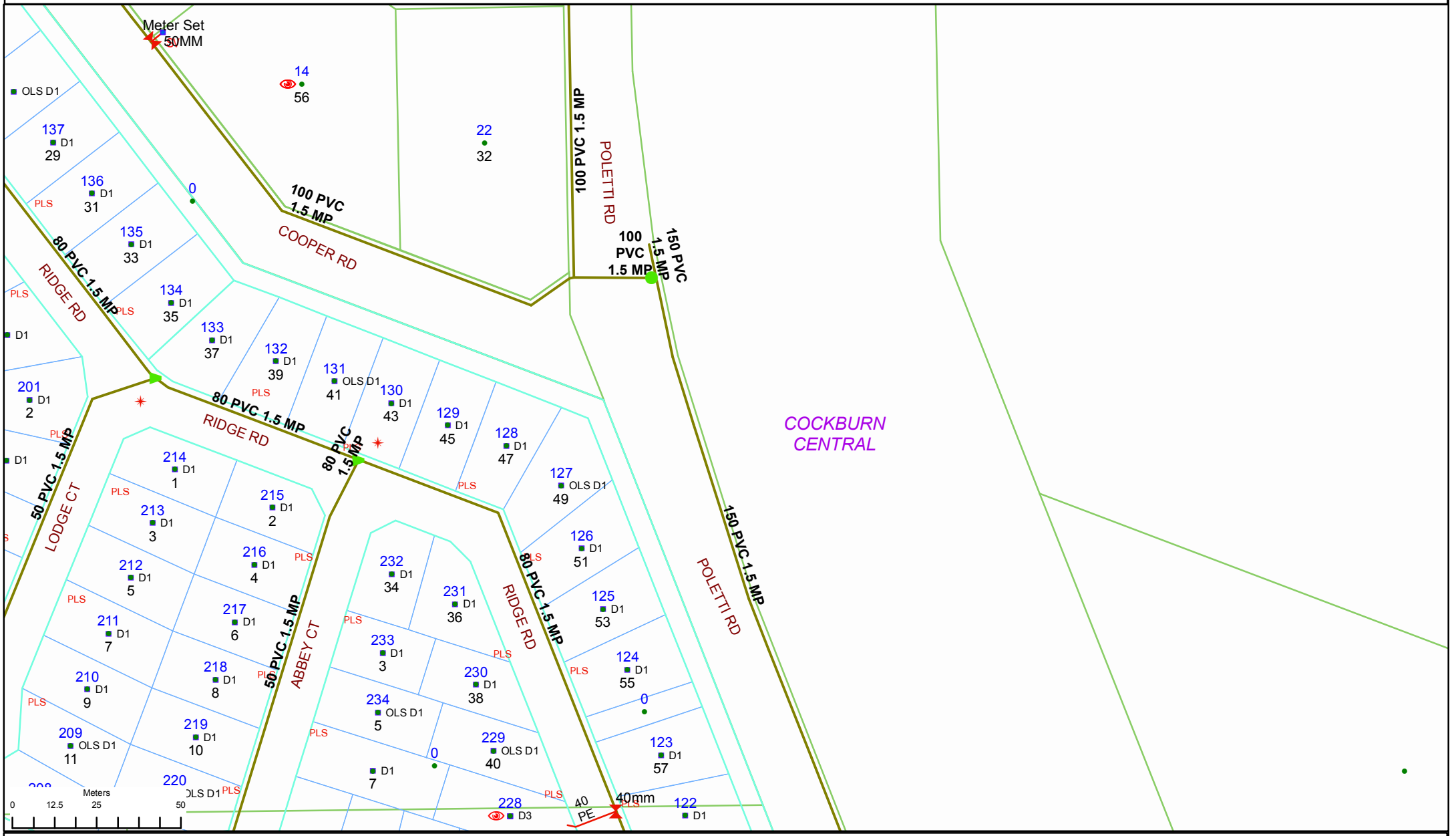

Sequence No:26632715 Map Tile:7 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

N W E S

ATCO Gas AUSTRALIA

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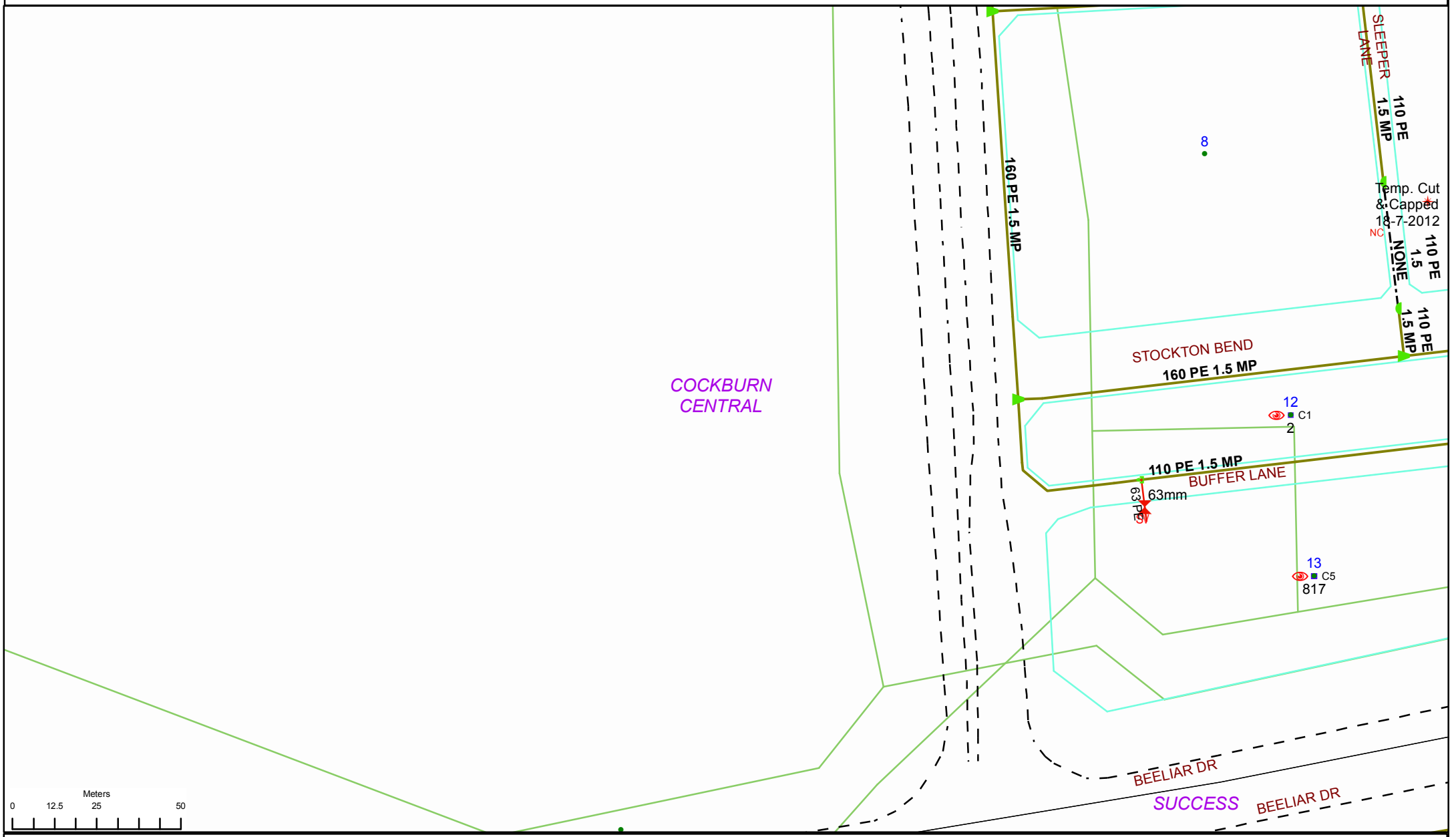

Sequence No:26632715 Map Tile: 8 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

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ATCO Gas AUSTRALIA

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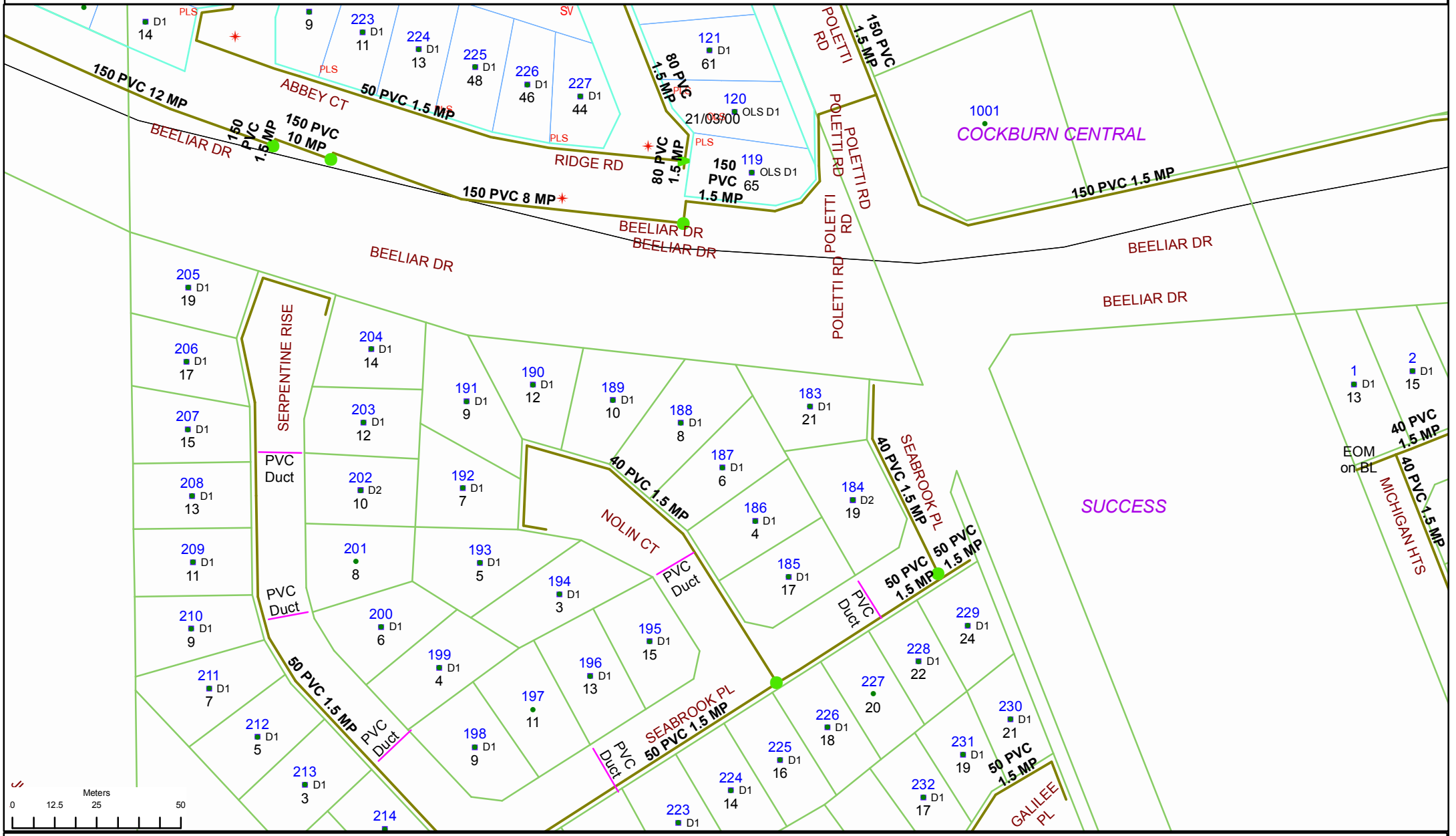

Sequence No:26632715 Map Tile: 9 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

N W E S

ATCO Gas AUSTRALIA

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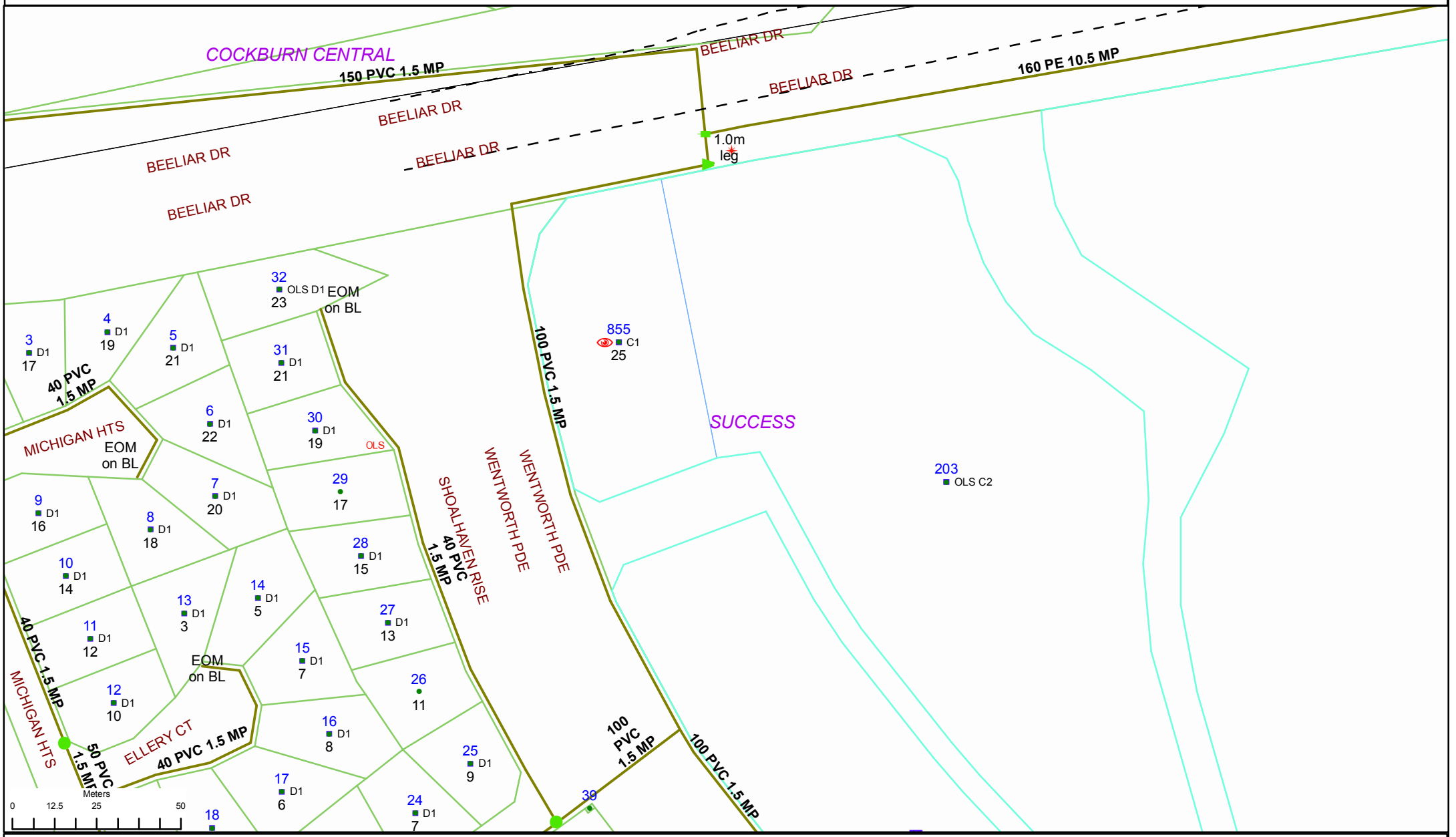

Sequence No:26632715 Map Tile: 10 Scale: 1:1,500

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

N W E S

ATCO Gas AUSTRALIA

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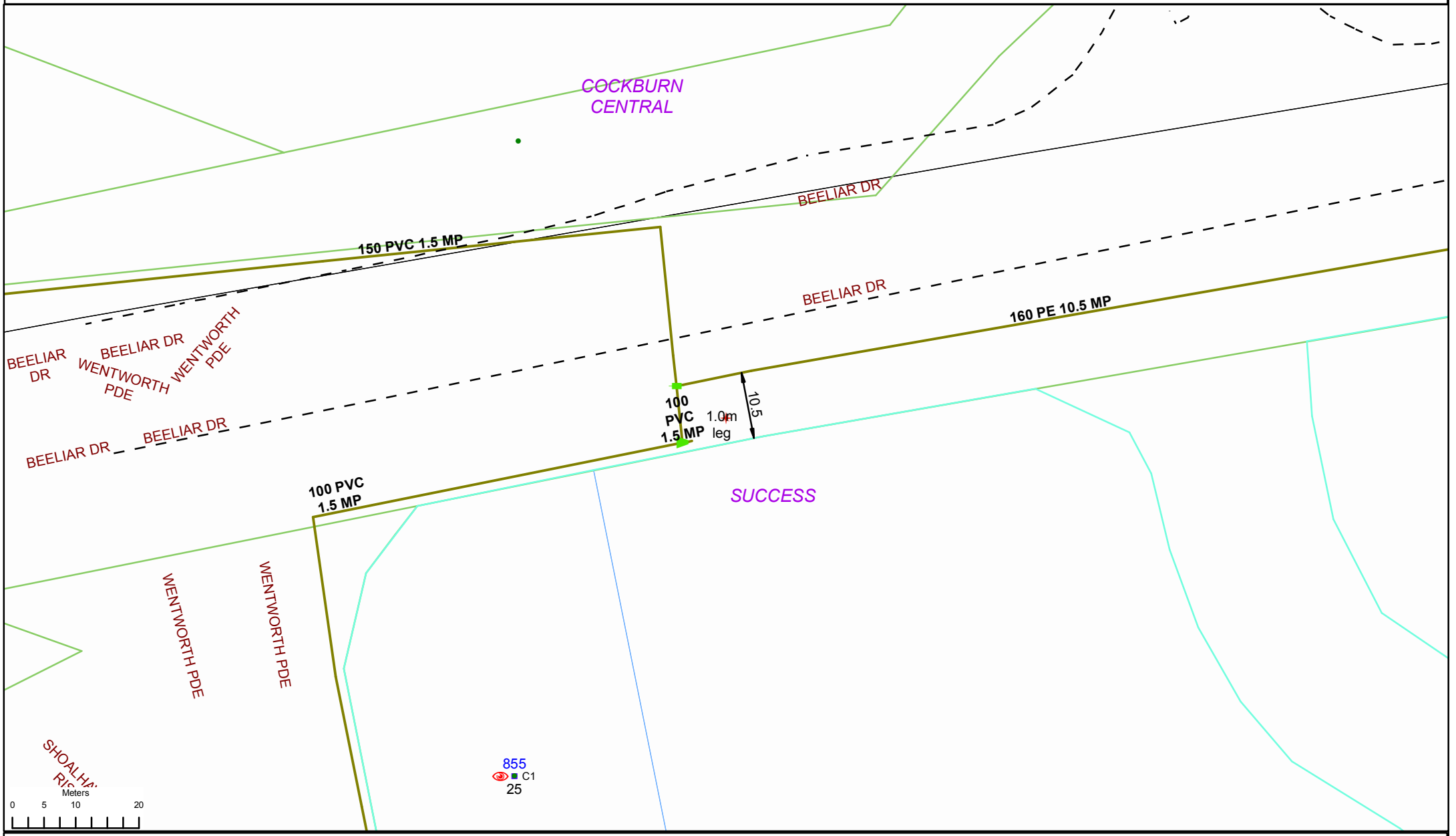

Sequence No:26632715 Map Tile: 11 Scale: 1:800

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

N W E S

ATCO Gas AUSTRALIA

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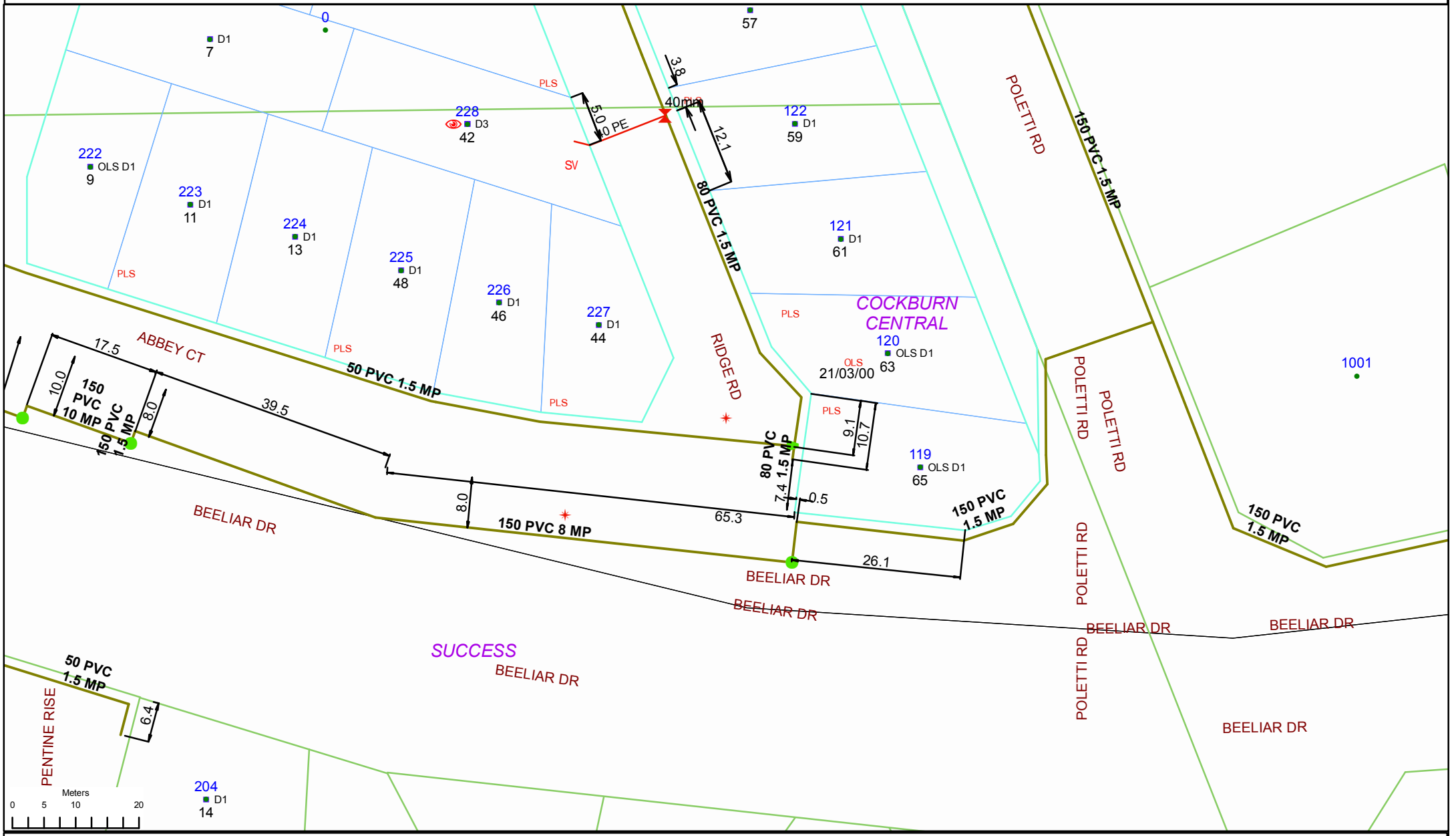

Sequence No:26632715 Map Tile: 12 Scale: 1:800

Job No: 5809714 Date: 09/10/2012 Location: N Lake Rd

N W E S

ATCO Gas AUSTRALIA

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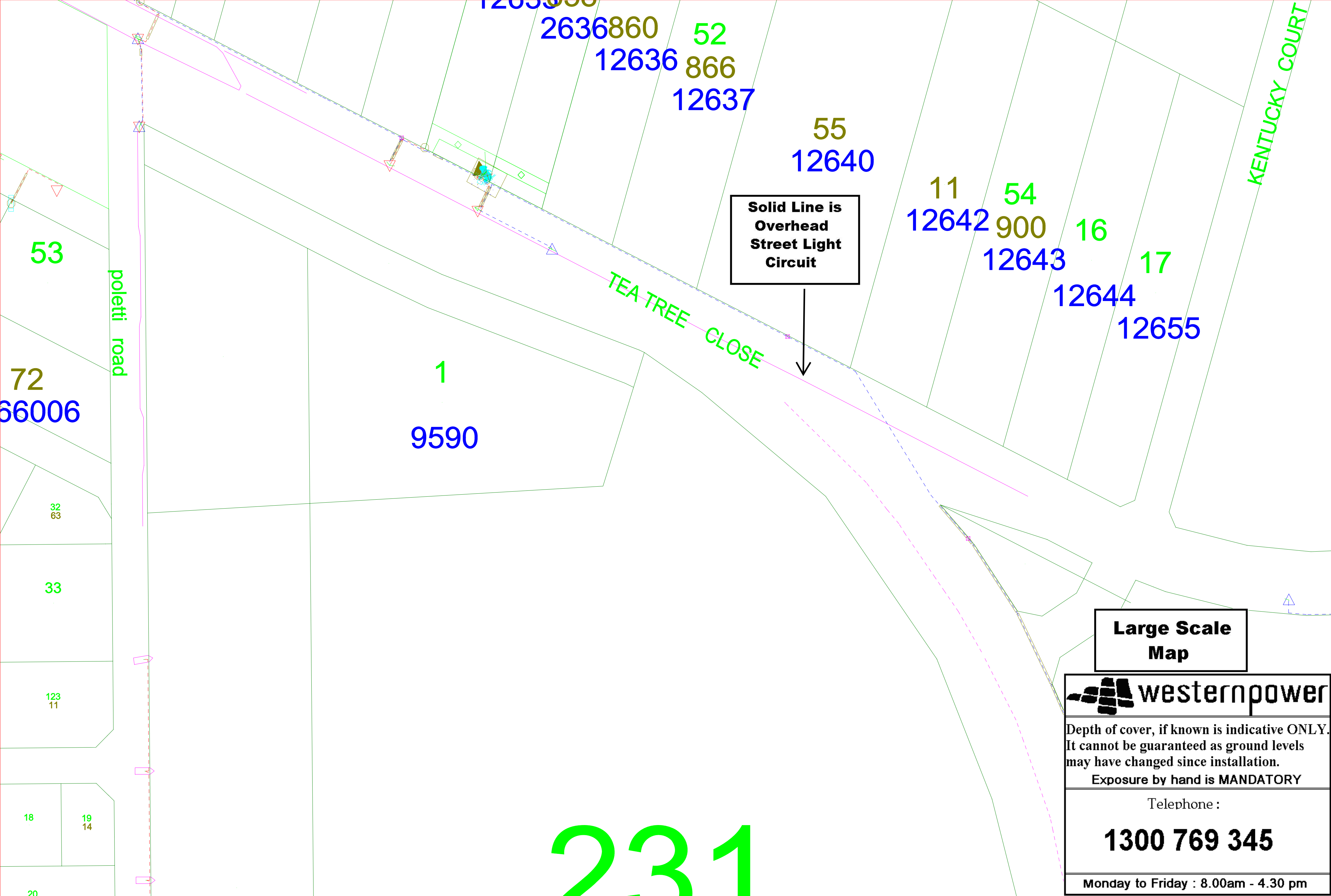
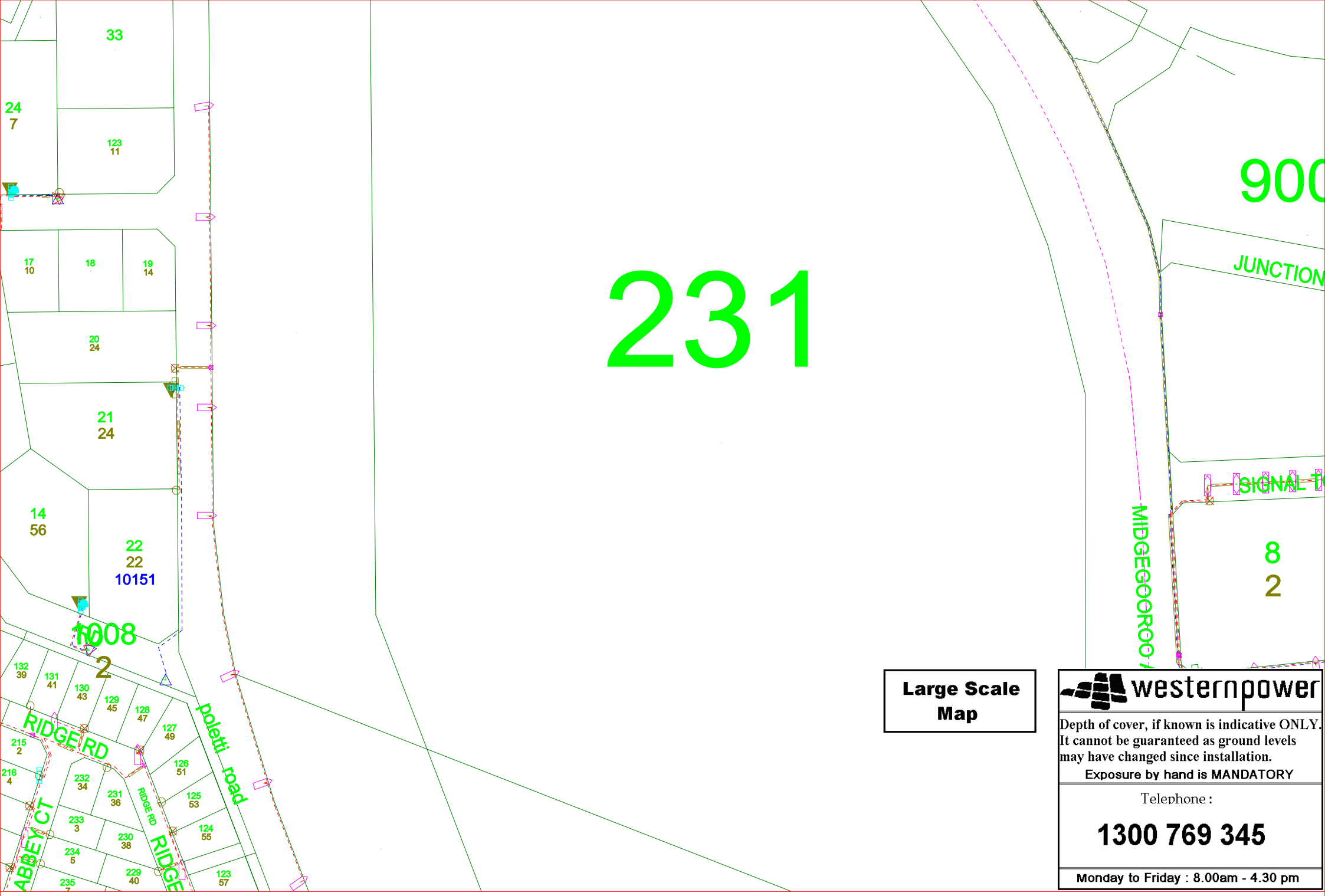
Appendix D: Dial-Before-You-Dig Western Power


Solid Line is Overhead Street Light Circuit
TEA TREE CLOSE
KENTUCKY COURT
poletti road
2636860
12636
52
866
12637
55
12640
11
12642
54
900
16
12643
17
12644
12655
53
72
66006
1
9590
32
63
33
123
11
18
19
14
20
231
Large Scale Map
westernpower
Depth of cover, if known is indicative ONLY. It cannot be guaranteed as ground levels may have changed since installation.
Exposure by hand is MANDATORY
Telephone :
1300 769 345
Monday to Friday : 8.00am - 4.30 pm

Document Set ID: 5552576
Version: 1, Version Date: 03/02/2017



Large Scale Map

westernpower

Depth of cover, if known is indicative ONLY. It cannot be guaranteed as ground levels may have changed since installation.

Exposure by hand is MANDATORY

Telephone :

1300 769 345

Monday to Friday : 8.00am - 4.30 pm

26632712 Printed: Tue Oct 09 12:22:21 2012 User: n041037

32°07'34"S, 115°51'04"E MGA (Zone 50): (39163081,644499377) Scale: 1:2500 Profile: #DBYD (Modified)

Document Set ID: 5552576
Version: 1, Version Date: 03/02/2017

Pritchard Francis Pty Ltd

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PO Box 2150
Subiaco WA 6904

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Facsimile: (08) 9192 8038

broome@pfeng.com.au

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