

Document control

Title: Preliminary Site Investigation - Herne Bay Tunnel and Construction Support Areas					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
January 2023	1	50% Draft Issued for client comment	X. Jin	L. Phuah	S. Richardson
February 2023	2	100% Draft issued for client comment	X. Jin	L. Phuah	S. Richardson
March 2023	3	100% Draft issued to client for pre-lodgement	X. Jin	L. Phuah	S. Richardson
April 2023	4	Draft final report issued to client for consent lodgement	X. Jin	L. Phuah	S. Richardson
June 2023	5	Final report incorporating client comments for consent lodgement	L. Phuah	S. Richardson	S. Richardson

Distribution:

Watercare Services Limited	1 electronic copy
Tonkin & Taylor Ltd (FILE)	1 electronic copy

Table of contents

1	Introduction	1
1.1	Project background	2
1.2	Project overview	2
1.3	Scope of work	3
2	Site description	4
2.1	Geology	9
2.2	Hydrogeology and hydrology	10
3	Site history	12
3.1	Aerial photograph review	12
3.1.1	Alignment, connecting pipes and shaft locations	12
3.1.2	CSA1	13
3.1.3	CSA2	13
3.2	Council contamination enquiry	13
3.2.1	Alignment and shaft locations	13
4	Potential for ground contamination	16
5	Conceptual site model	18
6	Implications for the proposed works	19
6.1	Construction implications	19
6.2	Regulatory implications	19
6.2.1	NESCS	19
7	Conclusions	20
8	Applicability	21
Appendix A	Development plans	
Appendix B	Aerial photographs	
Appendix C	Council contamination enquiry	

1 Introduction

Tonkin & Taylor Ltd (T+T) has been commissioned by Watercare Services Limited (Watercare) to undertake a Preliminary Site Investigation (PSI) for the proposed Herne Bay Tunnel Alignment and Construction Support Areas (CSAs). The tunnel alignment is being proposed between Marine Parade and Sarsfield Road at the southwestern corner of Point Erin Park (94 Shelley Bay Road). The extent of the proposed tunnel alignment and property boundaries (where applicable) are presented below in Figure 1.1.

This desktop study was undertaken in accordance with our proposal for a ground contamination technical assessment for the proposed Herne Bay Tunnel dated 6 December 2022. This report has been prepared in general accordance with the requirements for a PSI referred to in the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) and as outlined in the Ministry for Environment's (MfE's) Contaminated Land Management Guidelines No.1¹.

The persons undertaking, managing, reviewing, and certifying this investigation are suitably qualified and experienced practitioners as defined in the NESCS Users' Guide².



Figure 1.1: Approximate Herne Bay Tunnel alignment shown in purple, connecting pipes to engineered overflow points in red and construction support areas shown in yellow (Source: Topomaps NZ)

¹ Ministry for the Environment, updated 2021, Contaminated land management guidelines No. 1: Reporting on Contaminated Sites in New Zealand.

² Ministry for the Environment. 2012. Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment

1.1 Project background

Watercare Services Limited (Watercare) is New Zealand's largest water and wastewater utility provider, responsible for the planning, maintenance, and operation of water and wastewater services to communities throughout Auckland and the northern Waikato regions. Watercare has supplied wholesale water supply and wastewater services since 1991 and is a Council Controlled Organisation (CCO), wholly owned by the Auckland Council.

As a lifeline utility, Watercare's services are vital for life, ensuring the safety and wellbeing of communities and helping them to flourish. Watercare's key services are:

- The collection, treatment, and distribution of drinking water from various dams, rivers and groundwater sources;
- The collection, treatment, and disposal of wastewater at various wastewater treatment plants;
- The transfer, treatment, and disposal of trade wastes; and
- The provision of commercial laboratory services.

Watercare is responsible for the management of over 410 million litres of wastewater daily, which is collected, treated, and disposed of in environmentally responsible ways. The wastewater network operated by Watercare consists of over 8,000 kilometres of pipes and 518 pump stations, directing wastewater to 18 treatment plants throughout the region.

Watercare is continually reviewing its activities and identifying maintenance, replacement, upgrading and new infrastructure projects to ensure it meets customer's needs, business objectives and statutory requirements. New infrastructure is frequently required across the region to cater for Auckland's growing population, to upgrade our assets, and to improve the security of its services.

Over the coming 20 years, Auckland's population is expected to grow by 29%, adding another 476,000 people to the current population of 1.7 million. To build a resilient water and wastewater system for this growing population, and ensure reliability of service, Watercare will invest about \$18.5 billion in renewing and upgrading critical assets over the next 20 years.

1.2 Project overview

Watercare is working jointly with Auckland Council in delivering a programme of infrastructure improvement works to reduce wastewater overflows and improve water quality at local beaches. The programme of works is known as the Western Isthmus Water Quality Improvement Programme (WIWQIP).

To build a resilient wastewater system and ensure reliability of service and reduced overflows, Watercare is proposing to construct a new wastewater trunk sewer for the Herne Bay catchment, to connect into the proposed Central Interceptor(CI) tunnel extension to Point Erin Park.

The scope of the works involves:

- Installation of approximately 1.5 km of 2.1 m internal diameter trunk sewer line, constructed via a tunnel-boring machine (TBM);
- Installation of approximately 150 m of 600 mm diameter trunk sewer within Marine Parade, constructed via open-cut trenching;
- Construction of 8x primary tunnel shafts, ranging in diameter from 3.5 m to 11 m, along with 4x 3.5 m diameter intercepting shafts;
- Installation of 4x interception pipes and 11x connections to existing engineered overflow points (EOPs);

- Establishment of two CSAs in public reserves; and
- Relocation and reinstatement of utilities as required.

The resource consent application is prepared for the activities described above, hereafter referred to as 'the Project'.

1.3 Scope of work

The scope of work for this PSI comprises:

- Review of available aerial photographs from online databases such as Auckland Council Geomaps and Retrolens;
- Review of reports held by T+T relevant to the proposed project work area;
- Request and review of an Auckland Council contamination enquiry report of the proposed project works area; and
- Preparation of this report summarising the above items and potential ground contamination implications including consenting requirements.

2 Site description

Received plans (attached as Appendix A) indicate that the proposed tunnel alignment for the Herne Bay Tunnel will commence at Shaft 1, opposite Point Erin Park and continue to the west within the road reserve of Sarsfield Street for approximately 610 m. It will then continue to the south within Wallace Street for approximately 80 m, then west within Argyle Street, until it meets the intersection with Herne Bay Road. The proposed tunnel will then travel a short distance to the south along Herne Bay Road, until the intersection with Upton Street, where it turns west along Upton Street, until it meets the intersection with Marine Parade and Annan Street. The final segment of the tunnel will travel for approximately 200 m the south-west within Marine Parade, where it will terminate. It is understood that the alignment is proposed to generally travel through the middle of the road corridor.

Eight shaft locations along the tunnel direction are proposed to provide entry (thrust shafts) for the tunnel boring machine (TBM) and to retrieve the TBM (receiving shafts). These will be constructed as the project progresses and are listed in Table 2.1 below.

Four connecting pipes are also proposed as shown in Appendix A, to connect the Herne Bay Tunnel to existing engineered outflow points (EOPs), being:

- An 80 m long, 300 mm diameter extension to the north beneath Hamilton Road;
- A 190 m long, 300 mm diameter extension to the south beneath Sentinel Road;
- A 220 m long, 450 mm diameter extension that extends west along Stack Street, turns north along Wairangi Street and turns west along River Terrace; and
- A 75 m long, 300 mm diameter extension that extends north within Herne Bay Road.

The EOP points associated with these pipelines are identified below in Table 2.2 and further shown in Figure 2.1 and Appendix A.

Two CSAs are proposed at the following locations in support of the construction of the alignment:

- Western half of Salisbury Reserve (19 Salisbury Street) (CSA1); and
- 94A and 94B Shelly Beach Road (also known as the ‘McConnell Dowell’ or ‘bridge’ site) (CSA2)

It is understood that topsoil will be stripped from these locations and hardfill imported to form a working surface for the storage of plant and materials. These CSAs will be referred to herein as CSA1 and CSA2 and are shown in Figure 2.2 and Figure 2.3 below. These CSAs are further identified Table 2.3.

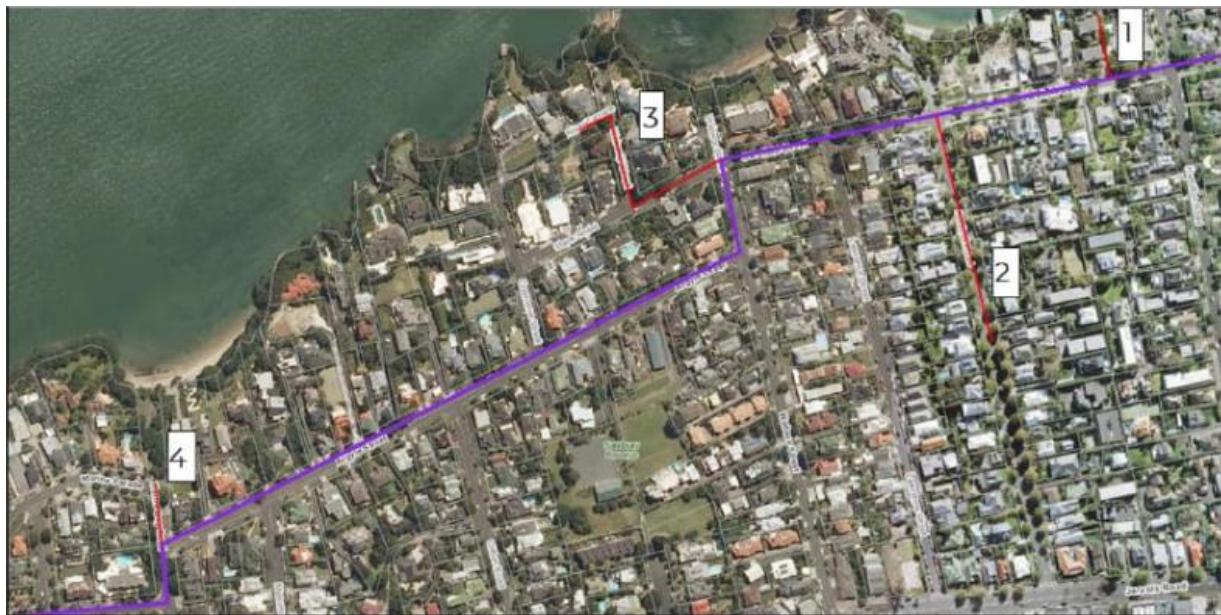


Figure 2.1: Connecting pipes shown in red (Source: WSP)



Figure 2.2: CSA1, western half of Salisbury Reserve site shown in red (Source: Auckland Council Geomaps)



Figure 2.3: CSA2, also known as the McConnell Dowell or Bridge site shown in red (Source: WSP)

Table 2.1: Shaft locations

Shaft Number	Shaft Location	Minimum shaft dept (m)	Shaft diameter (m)	Coordinates NZTM	
				X	Y
Shaft 1	Southwestern corner of Point Erin Park (94 Shelly Beach Road)	11.47	13	1755122.275	5921377
Shaft 2	Road berm adjacent 60 and 66A Sarsfield Street	13.9	9	1754512.837	5921240
Shaft 3	Road berm adjacent the intersection of Sarsfield Street and Sentinel Road	17.31	13	1754523.148	5921160
Shaft 4	Road berm adjacent the intersection of Wallace Street and Sarsfield Street	17.47	9	1754046.493	5920915
Shaft 5	Road berm adjacent the intersection of Argyle Street and Wallace Street	19.01	13	1754036.05	5920868
Shaft 6	Road berm adjacent the intersection of Argyle Street and Hern Bay Road	7.37	9	1753847.338	5920856
Shaft 7	Road berm adjacent the intersection Upton Street and Hern Bay Road	5.48	9	1753818.065	5920809
Shaft 8	Road berm adjacent the intersection Marine Parade, Short Street, Upton Street and Annan Street.	1.89	3.5	1753734.392	5920699

Table 2.2: EOP locations

Shaft Number	Shaft Location	Minimum shaft dept (m)	Shaft diameter (m)	Coordinates NZTM	
				X	Y
EOP195	59 Hamilton Road	2.31	3.5	1754888.885	5921316
SE01	59 Hamilton Road	17.8	3.5	1754894.405	5921322
EOP197	1 Marine Parade	3.57	3.5	1754025.288	5920995
EOP198	22 Marine Parade	4.85	3.5	1753815.632	5920806
EOP199	Cnr Bella Vista Rd & Marine Parade	2.5	3.5	1753729.088	5920673
EOP200	28 SENTINEL RD	2.66	3.5	1754731.301	5921096
EOP201	91 SARSFIELD ST (SARSFIELD Wastewater Pump Station (WWPS))	4.06	3.5	1754599.322	5921267
SE03	91 SARSFIELD ST (SARSFIELD WWPS)	8.97	3.5	1754601.21	5921263
SE02	80 SARSFIELD ST	13.39	3.5	1754694.73	5921284
EOP202	69 HAMILTON RD	1.1	3.5	1754880.067	5921402
EOP740	45 ARGYLE ST	4.11	3.5	1754224.363	5921013
SE04	45 ARGYLE ST	6.93	3.5	1754224.409	5921010
EOP1019	15 CREMORNE ST	1.79	3.5	1754366.45	5921285
EOP1019 WWMH01	12 STACK ST	7.24	3.5	1754433.59	5921207
EOP1019 WWMH01	1 WAIRANGI ST	4.91	3.5	1754414.549	5921285

Table 2.3: CSA site identification

CSA Number	CSA Address	Lot and DP Numbers	Approximate CSA Area
1	Western portion of Salsbury Reserve (19 Salisbury Street)	PT DP 16520, ALLOT 52 SEC 8, Lot 4 DP 22075, Lot 1 DP35983	3,900
2	94A & 94B Shelly Beach Road	SEC 2 SO 469767	6,500

2.1 Geology

Published geology³ shown below in Figure 2.4 indicates that the proposed tunnel alignment (including shaft locations), along with the CSA1 is underlain by sediments of the East Coast Bays Formation (ECBF) described as alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grits.

Natural Pleistocene and Holocene deposits are expected in some of the low-lying parts of the alignment. Made ground (fill) may also be encountered at or near the ground surface in this urban environment.

CSA2 has been reclaimed from the former shoreline. The reclamation fill has been described as containing recompacted clay with gravel sized materials and sometimes including demolition debris. Investigations⁴ undertaken by Aurecon in 2017 for the St Mary's Bay – Masefield Beach Water Quality Improvement Project indicates that:

- Topsoil was encountered from the surface of the site to depths of 0.15 m - 0.2 m below ground level (m bgl);
- Hydraulic fill comprising of gravel, silty sand and clayey silts with organics were encountered underneath the topsoil layer. The hydraulic fill layer was observed to be between 3.35 m – 3.9 m thick and extend to depths of up to 5.25 m bgl; and
- Tauranga group deposits were observed underlying the hydraulic fill to the termination depth of the boreholes at approximately 15 m bgl.



Figure 2.4: Published geology map of alignment, connecting pipes, CSA1 and CSA2 Option 1 and surrounding area (source: Kermode).

³ Kermode, L.O. 1992: Geology of the Auckland Urban Area. Scale 1:50,000, Institute of Geological & Nuclear Sciences geological map 2. 1 sheet + 63p. Institute of Geological and Nuclear Sciences Ltd. Lower Hutt, New Zealand.

⁴ Aurecon, 26 April 2018. St Marys Bay – Masefield Beach Water Quality Improvement Project, Detailed Site Investigation. Prepared for Auckland Council. Aurecon ref: 255303.

2.2 Hydrogeology and hydrology

Groundwater flow is inferred to follow topography to the north towards the Waitematā Harbour. Groundwater flows are to be assessed during planned geotechnical investigations and have not been considered as part of this assessment.

The council online database (Geomaps) (refer Figure 2.5) indicates that numerous flow paths intersect the proposed tunnel alignment and discharge north towards the harbour. The database also shows that the southwestern end of Point Erin Park near Shaft 1 and CSA2 are located in a floodplain and flood prone area respectively.

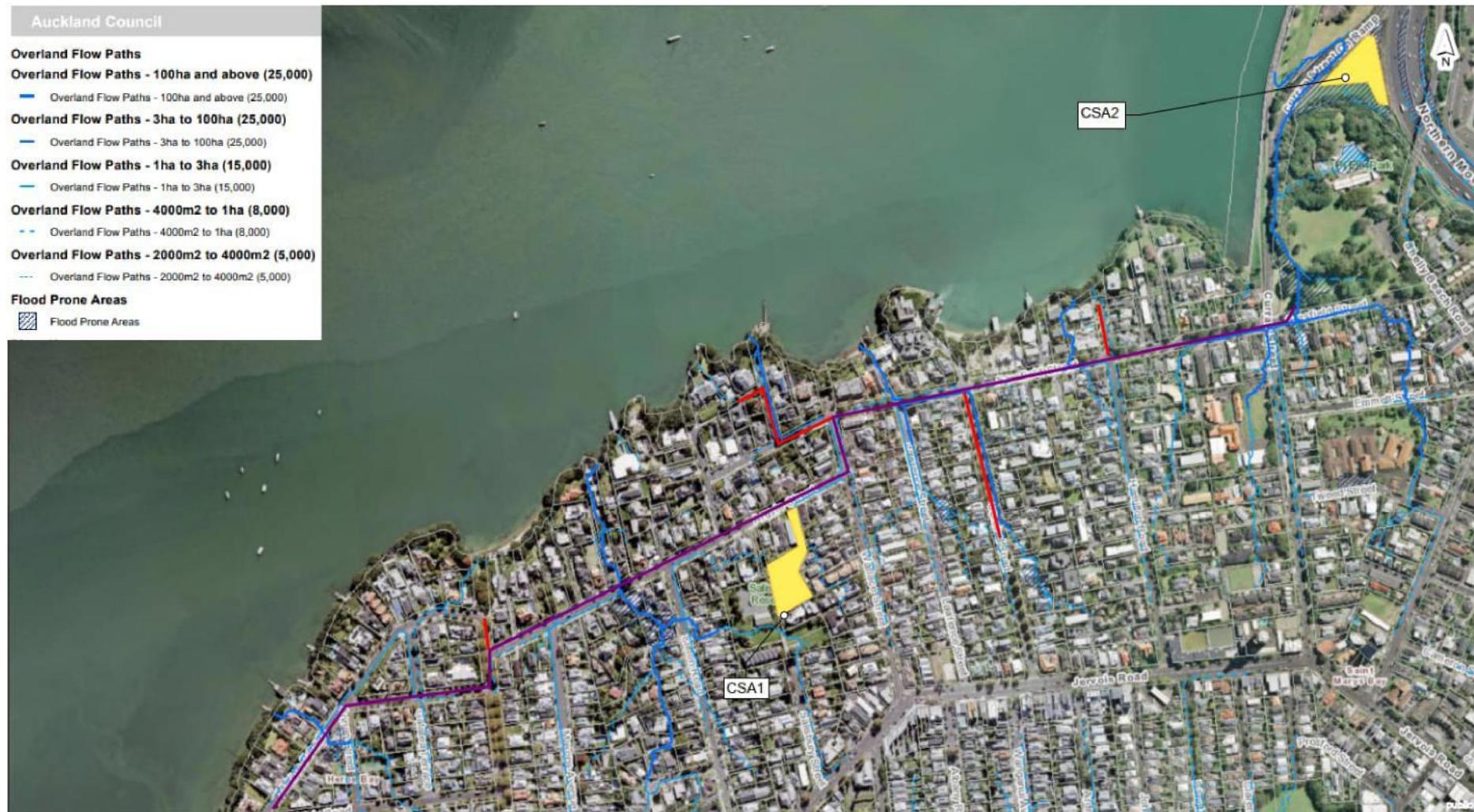


Figure 2.5: Overland flow paths and flood plains for the alignment, connecting pipes and CSAs (Source: Auckland Council Geomaps)

3 Site history

Historical information relating to the proposed tunnel alignment and CSAs was collected from a variety of sources including Auckland Council GeoMaps, Retrolens, and Auckland Council contamination enquiry. The information presented documents onsite activities, and comments on readily observable surrounding land use where relevant. The information that has been reviewed is summarised in this section. Aerial photographs are attached as Appendix B.

3.1 Aerial photograph review

3.1.1 Alignment, connecting pipes and shaft locations

Historic aerial photographs indicate that the area within and surrounding the proposed alignment and connecting pipelines was urbanised since at least 1940 (shown below in Figure 3.1). The surrounding site use has remained predominantly residential land use and subject to intensification between earliest aerials from 1940 to present. The archaeological assessment⁵ undertaken for the proposed Herne Bay Tunnel project indicates that surrounding coastline was fished by various iwi and the surrounding land was purchased by the Crown from Ngāti Whātua in 1840.

Higher resolution aerial photographs were reviewed for the shaft and EOP locations and presented in Appendix B. The aerial photographs indicate these locations comprised sealed roads since at least the 1940s.



Figure 3.1: 1940 Aerial Photograph, Herne Bay alignment shown in purple, connecting pipes to EOPs in red CSA1 and CSA2 Option 1 highlighted in yellow (Source: Auckland Council Geomaps).

⁵ Clough and Associates Ltd. Watercare Services Ltd, Herne Bay Tunnel, Herne Bay – Auckland: Archaeological Assessment

3.1.2 CSA1

Historic aerial photographs indicate that the CSA1 site has remained open space since at least 1940. A square area (refer Section 3.1.2) located towards the middle of CSA1 was redeveloped between 1940 and 1959 and used as a bowling pavilion. An online search⁶ shows that Herne Bay Petanque Club was formed in 1994 and uses the bowling pavilion for their activities. A small circular structure was developed north of this sports/recreational area between the 1990s and early 2000s. The reviewed aerial photograph of CSA1 can be found in Appendix B.

3.1.3 CSA2

Historic aerial photographs show that the site was reclaimed from the Waitematā Harbour between 1950 and 1955. The site has remained undeveloped or used for recreational purposes since its reclamation until the 2010s. Aerial photographs from 2001 and 2010 indicate that the site was converted into a construction yard between aerials and subsequently returned to recreational use by 2017. We understand that the site has also been used as a CSA for the proposed St Mary's Bay and Point Erin stormwater tunnel which commenced circa 2018. Since the completion of the Point Erin stormwater tunnel, the site has returned to being used for recreational purposes.

3.2 Council contamination enquiry

3.2.1 Alignment and shaft locations

A council contamination enquiry for the proposed tunnel alignment and CSA sites was received from Auckland Council on 14 December 2022. The contamination enquiry identified a number of residential properties adjacent to the alignment may be subject to HAIL activities. However, a follow up email from Auckland Council⁷ indicates that the properties listed were likely to be accidentally ‘tagged’ in an older Council System and it is unlikely any HAIL activities have taken place on those properties.

An updated contamination enquiry was received on 15 February 2023. A copy of this council contamination enquiry is presented in Appendix C. This enquiry indicated that 80 Curran Street (Masefield Reserve) located approximately 70 m north/downgradient of the tunnel alignment have possibly been subject to HAIL activities. 80 Curran Street was identified as a council owned closed landfill (Masefield Reserve). No other publicly available information is available for this closed landfill.

The contamination enquiry also identified 2 Argyle Street and 18 Cremorne Street as possibly also been subject to HAIL activities. The contamination enquiry did not specify what HAIL activities are associated with the properties and specific contamination enquiries for each property would need to be ordered to confirm. Historic aerial review for both 2 Argyle Street and 18 Cremorne Street indicated that both properties have remained residential in land use since at least the earliest aerial photograph in 1940. The two properties are also not directly downgradient from the proposed works, and as such will not pose a contamination risk to the proposed tunnel works. As such, these properties have not been considered further in this assessment.

The council contamination enquiry also indicated no pollution incidents along the alignment. Numerous wastewater overflows were identified, however these occurred on the coast and not within the proposed tunnel alignment and CSAs.

⁶ <https://www.hernebaypetanque.nz/club-history> (viewed 14 February 2023)

⁷ 15 December 2022. Re: Service Order -8279006661 -CL Report urgent E Mail. From Fran Osten (Auckland Council) to Xiao Jin (T+T)

3.2.2 CSA1

A council contamination enquiry for CSA1 was received on council on 17 January 2023. The council contamination enquiry indicated no pollution incidents within the CSA1 site.

The council contamination report indicates that the site has been possibly subjected to HAIL activity A.10 (persistent pesticide bulk storage or use including sports turfs market gardens, orchards, glass houses or spray sheds) as council records indicated a consent was granted in 1958 for a bowling pavilion. This coincides with the square area observed on site and appearing between 1940 and 1959.

A copy of the contamination enquiry is presented in Appendix C.

3.2.3 CSA2

A council contamination enquiry for CSA2 was received from council on 15 February 2023. The council contamination enquiry indicated that there were no pollution incidents within the property boundary.

The council contamination enquiry has indicated the site as having possibly been subject to HAIL Item (G.5) – Waste disposal to land citing that the property was subject to reclamation in the 1950s with soil sampling undertaken in 2017 indicating heavy metals above background levels, low levels of PAHs and the presence of asbestos in the fill material.

A copy of the contamination enquiry is presented in Appendix C.

3.3 Intrusive ground contamination investigation information

The following previous investigations relevant to the proposed works at the CSA2 site were reviewed and are summarised below. No previous investigation information was located for CSA1.

3.3.1 CSA2

One (1) intrusive investigation report relevant to the project works area at CSA2 site was reviewed as follows:

- Aurecon, 26 April 2018. St Marys Bay – Masefield Beach Water Quality Improvement Project, Detailed Site Investigation. Prepared for Auckland Council. Aurecon ref: 255303.

As part of this investigation in 2018, soil samples were collected from two boreholes (BH08 and BH27) advanced within the CSA1 site boundary. Samples were collected from the underlying fill and natural material ranging from 0.3 m – 2.6 m in depth. Sample results indicated:

- The presence of heavy metals and polycyclic aromatic hydrocarbons (PAH) above Auckland background concentrations for non-volcanic soils; and
- The presence of asbestos within the fill material.

It is noted that topsoil was not tested as part of the investigation from the CSA2 area.

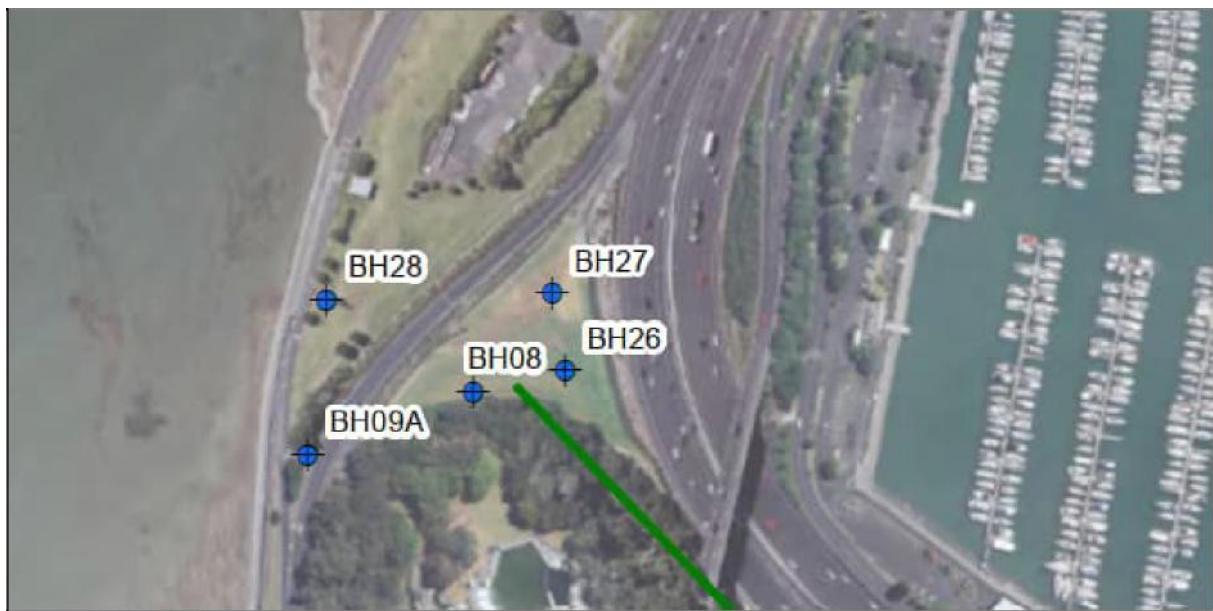


Figure 3.2: Sampling plan for the Masefield Beach pipeline within CSA2 (Source: Aurecon)

4 Potential for ground contamination

This investigation has identified that activities with the potential to have resulted in ground contamination are unlikely to have occurred along the proposed alignment but may have occurred in the proposed CSA1 and CSA2 sites. The activities, potential contaminants and an assessment of the likelihood, potential magnitude and possible extent of contamination are presented in Table 4.1 below. The potential for the activities to have resulted in contamination of the project works areas for the Herne Bay Tunnel are dependent not only on the type of activity that occurred on and adjacent to the proposed works area but also the potential for migration of contamination to the works areas (affected by wind, topography and distance to the area of proposed works).

Table 4.1: Potential HAIL activities

Land Use/Activity	Address/location with respect to Project	Potential Contamination	Likelihood, magnitude and extent of contamination	HAIL reference
Bowling green/pavilion	19 Salisbury Street/CSA1	Metals (As, Cu, Pb) and organochlorine pesticides (OCPs)	Contaminants if present are likely to be limited to surface soils at CSA1. Relatively low levels and consistent concentrations of contaminants would be expected across the maintained areas of the pavilion.	HAIL A.10
Reclamation and filling of the development area	94A & 94B Shelly Beach Road/CSA2	Wide range depending on the source of the fill. Typical contaminants, if sourced from industrial areas, include metals and PAH	Historical aerial photographs, council contamination enquiry have confirmed that the CSA2 was reclaimed from the former shoreline in the 1950s. Intrusive investigations indicate the fill contains contaminants (heavy metals, PAH) at levels that exceed background concentrations, and the presence of asbestos are present within the fill material.	HAIL Category I
Council owned closed landfill	Masefield Reserve, 80 Curran Street/70 m north of the proposed tunnel	Depends on type of landfill. Typical contaminants include heavy metals, asbestos, PAH, TPH and leachate/landfill gas as by-product	The Masefield Reserve Closed landfill is identified as a medium risk landfill via Auckland Council closed landfill website. However, given that the proposed alignment is upstream of the closed landfill and that there are no obvious preferential pathways for the migration of leachate/landfill gas, we consider the risk of contaminant	Assessed as not a HAIL, in the context of this project.

Land Use/Activity	Address/location with respect to Project	Potential Contamination	Likelihood, magnitude and extent of contamination	HAIL reference
			migration from the closed landfill to the works area to be low.	

5 Conceptual site model

A conceptual model is defined by the Ministry for the Environment in the contaminated land management guidelines. It sets out known and potential sources of contamination, potential exposure pathways, and potential receptors. For there to be an effect from the proposed activity there must be a contamination source and a mechanism (pathway) for contamination to affect human health or the environment (receptor).

The conceptual model, developed for the proposed tunnel alignment and CSAs for the Herne Bay Tunnel, takes into account the available information about the sites, and our understanding of the potential effects on human health and the environment resulting from the proposed works along alignment and at the CSAs. The model is presented below.

The desktop study indicates that the likely source of contamination is anticipated to comprise chemical contaminants in near surface soil primarily associated with the HAIL activities identified at CSA1 and CSA2.

Receptors of identified contamination may include:

- i People – ground investigation workers, construction works and adjacent site workers, disposal site operators, the general public and future users of the site; and
- ii Environment – flora and fauna of the local water courses in the vicinity of the project area, and at disposal destinations.

The pathways by which the contamination sources can affect the receptors during the project works include:

- Direct contact by workers;
- Contaminant migration to people or the environment via dust;
- Contaminant migration to the environment via stormwater at the site or at a disposal site.

6 Implications for the proposed works

The implications from the findings of the desktop study are set out in the following sections.

6.1 Construction implications

Given the findings of the PSI, further soil testing is likely required by landfill operators to establish disposal options for soils requiring removal from within CSAs and potentially along the tunnel alignment. If soil testing finds contaminants at concentrations which may present a risk to human health and/or the environment, ground contamination specific controls will be required during soil disturbance.

The appropriate controls and procedures to address contaminants in soil would need to be documented in a Site Management Plan (SMP) for the Contractor.

6.2 Regulatory implications

6.2.1 NESCS

The NESCS sets out nationally consistent planning controls appropriate to district and city councils for assessing contaminants in soil with regard to human health. The NESCS applies to specific activities on land where a HAIL activity *has or is more likely than not to have occurred*.

The findings of this desktop study indicates that it is *more likely than not* that no HAIL activities have occurred along the proposed alignment but may have occurred within CSA1 and CSA2. Given the potential HAIL characteristics of the CSAs and absence of a Detailed Site Investigation (DSI), it may be prudent to apply for a discretionary activity resource consent under Regulation 11 of the NESCS.

We understand that a DSI and SMP will be provided in support of a resource consent under the NESCS during the application process.

This approach is supported by Auckland Council⁸.

6.2.2 AUP

Due to the scale of the proposed Herne Bay Tunnel project, it is unlikely that the works will meet the permitted activity requirements for soil disturbance. Soil testing (or a DSI) will be required, particularly in areas where HAIL activities were identified, to determine if soil concentrations exceed the permitted activity (PA) soil acceptance criteria on Table E30.6.1.4.1 of the AUP.

If results exceed the PA criteria, a controlled activity consent will be required. Similar to the NESCS, a discretionary consent under Rule E30.4.1 (A6) will be required if a DSI is not undertaken. A SMP will be required in support of a consent under Chapter E30 of the AUP. Given that further soil testing (or a DSI) for CSA1 and CSA2 is unlikely to be available at lodgement of consent, as a precautionary approach, a consent under Rule E30 of the AUP should be applied for.

⁸ 23 March 2023. Herne Bay Trunk Sewer – Council specialist comments. From William Hung (Watercare) to Xiao Jin (T+T)

7 Conclusions

T+T has been commissioned by Watercare to undertake a PSI for the proposed Herne Bay Tunnel Alignment and CSAs. The main findings of this assessment, which has been prepared for Watercare in support of the proposed alignment are:

- A review of the site surrounding and available historical information indicates that it is *more likely than not* that no HAIL activities have occurred along the proposed alignment but may have occurred in CSA1 and CSA2. Any resultant ground contamination from the HAIL activities is likely localised in the shallow soils within the CSA areas;
- A consent under the NESCS is unlikely to be required for soil disturbance within the proposed alignment but is likely required for soil disturbance within CSA1 and CSA2. We understand that a DSI and SMP will be provided in support of a resource consent under the NESCS during the application process;
- A resource consent will be required under chapter E30 of the AUP if soil contamination is found at concentrations above the permitted activity criteria. A SMP will likely be required in support of a consent under the AUP. Given that further soil testing (or a DSI) for CSA1 and CSA2 is unlikely to be available at lodgement of consent, it may be prudent to apply for a resource consent under chapter E30 of the AUP as a precautionary approach; and
- Based on experience, the contaminants identified in this PSI can be easily managed during the proposed works, such that the DSI can be undertaken at a later date when construction details are confirmed. If a DSI is not undertaken for consenting purposes, discretionary consents will be required under the NESCS and AUP.

8 Applicability

This report has been prepared for the exclusive use of our client Watercare Services Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that this report will be used by Auckland Council in undertaking its regulatory functions in connection with the Herne Bay Tunnel project.

Recommendations and opinions contained in this report are based on the information reviewed. The nature and continuity of the subsoil away from the information reviewed is inferred and it must be appreciated that actual conditions may vary from the assumed model.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:

Xiao Jin
Contaminated Land Consultant

Authorised for Tonkin & Taylor Ltd by:

Shannon Richardson
Project Director

Report reviewed by:

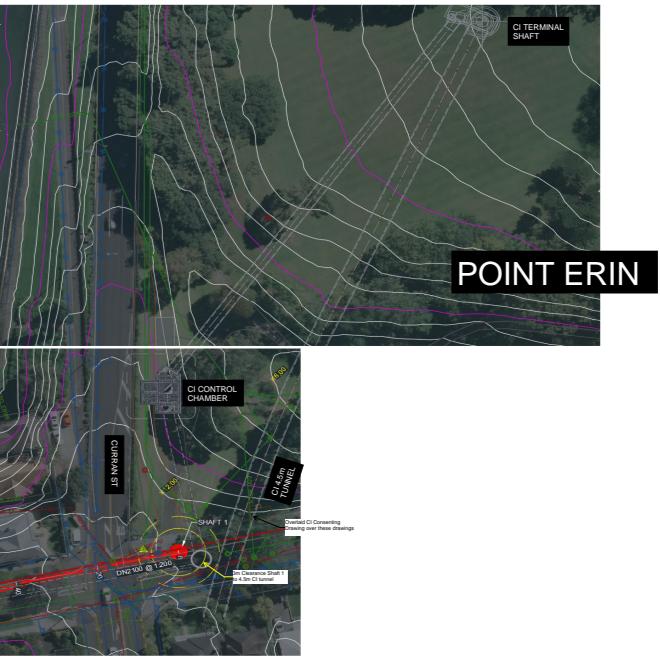
Lean Phuah
Senior Environmental Engineer

XIJI

\\\ttgroup.local\files\aklprojects\1090120\1090120.2000\issueddocuments\appendix e1 - psi v.2_final.docx

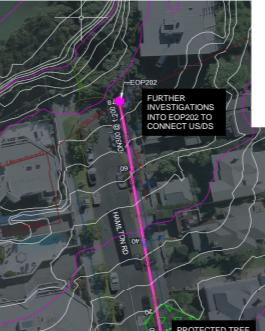
Appendix A Development plans

Herne Bay Trunk Sewer Shaft Locations - For Ground Investigation only - all shaft locations and depths are indicative							
Location	Name	DTI (M)	Min. Investigation Depth (M)	Coordinates (NZTM)	X	Y	DIAMETER SHAFT (M)
Cnr Bella Vista Rd & Marine Parade	EOP199	2.5		5	1753729.088	5920673	3.5
Marine Parade	Shaft 8	1.89		3	1753734.392	5920699	3.5
22 MARINE PARADE	EOP198	4.85		7	1753815.632	5920806	3.5
22 MARINE PARADE	SHAFT 7	5.48		7	1753818.065	5920809	9
33 MARINE PARADE	SHAFT 6	7.37		10	1753847.338	5920856	9
34 HERNE BAY RD	SHAFT 5	19.01		21	1754036.05	5920868	13
1 MARINE PARADE	EOP197	3.57		6	1754025.288	5920995	3.5
72 ARGYLE ST	SHAFT 4	17.47		20	1754046.493	5920915	9
45 ARGLYE ST	EOP740	4.11		6	1754224.363	5921013	3.5
45 ARGLYE ST	SE04	6.93		9	1754224.409	5921010	3.5
50 WALLACE ST	SHAFT 3	17.31		20	1754523.148	5921160	13
15 CREMORNE ST	EOP1019	1.79		3	1754366.45	5921255	3.5
1 WAIRANGI ST	EOP1019 WWMH02	4.91		7	1754414.549	5921285	3.5
12 STACK ST	EOP1019 WWMH01	7.24		10	1754433.59	5921207	3.5
58 WALLACE ST	SHAFT 2	13.9		16	1754512.837	5921240	9
91 SARSFIELD ST (SARSFIELD WWPS)	EOP201	4.06		6	1754599.322	5921267	3.5
91 SARSFIELD ST (SARSFIELD WWPS)	SE03	8.97		11	1754601.21	5921263	3.5
28 SENTINEL RD	EOP200	2.66		5	1754731.301	5921096	3.5
80 SARSFIELD ST	SE02	13.39		16	1754694.73	5921284	3.5
59 HAMILTON RD	EP195	2.31		5	1754888.885	5921316	3.5
69 HAMILTON RD	EP202	1.1		3	1754880.067	5921402	3.5
59 HAMILTON RD	SE01	17.8		20	1754894.405	5921322	3.5
ERIN POINT	SHAFT 1	11.47		14	1755122.275	5921377	13

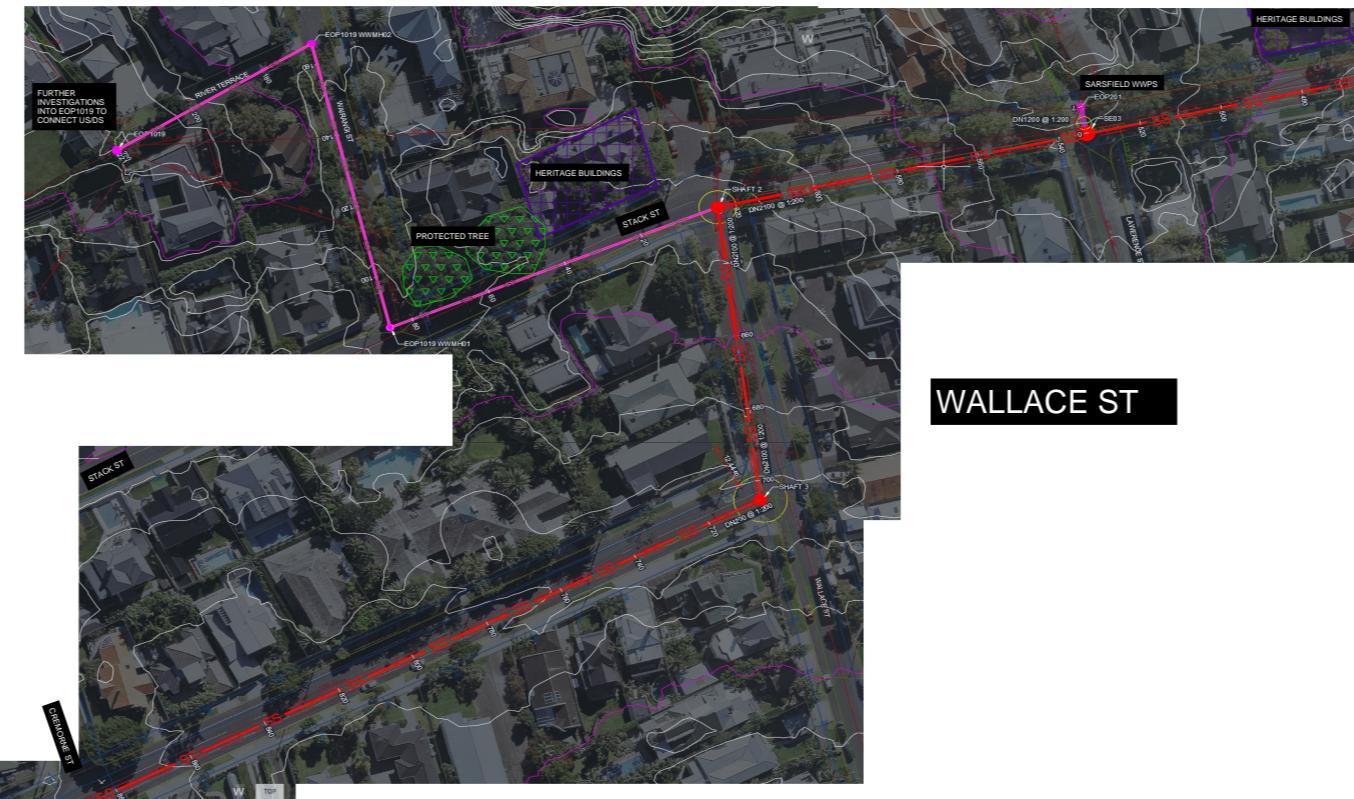


POINT ERIN

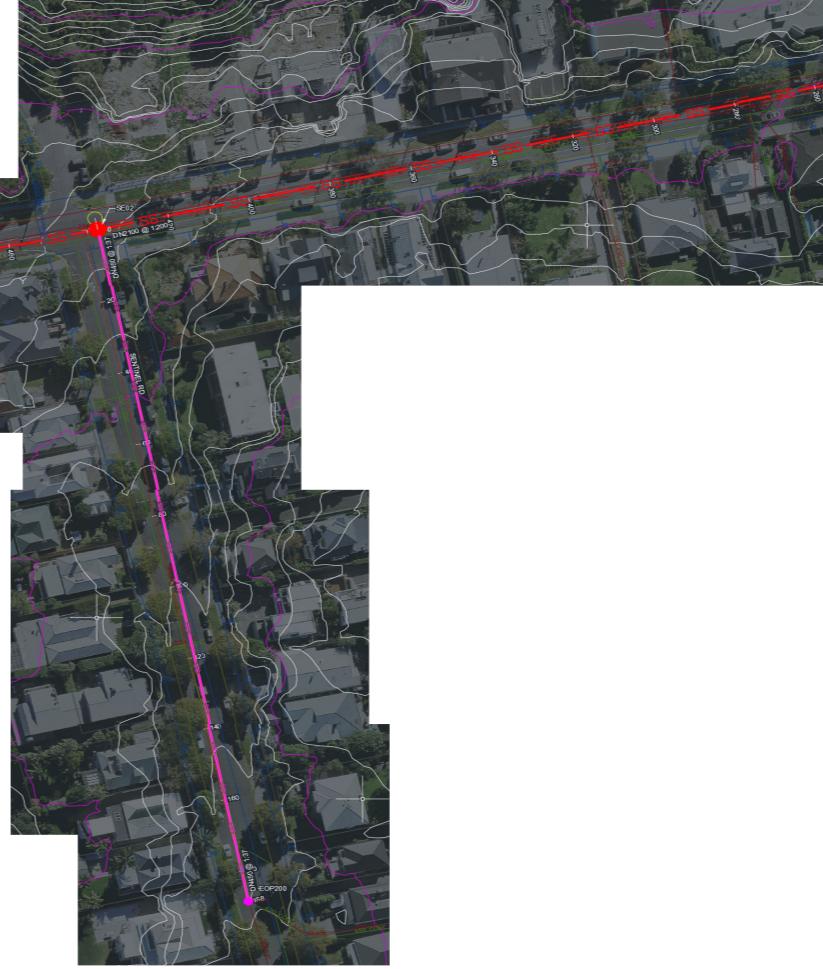
HORNE BAY



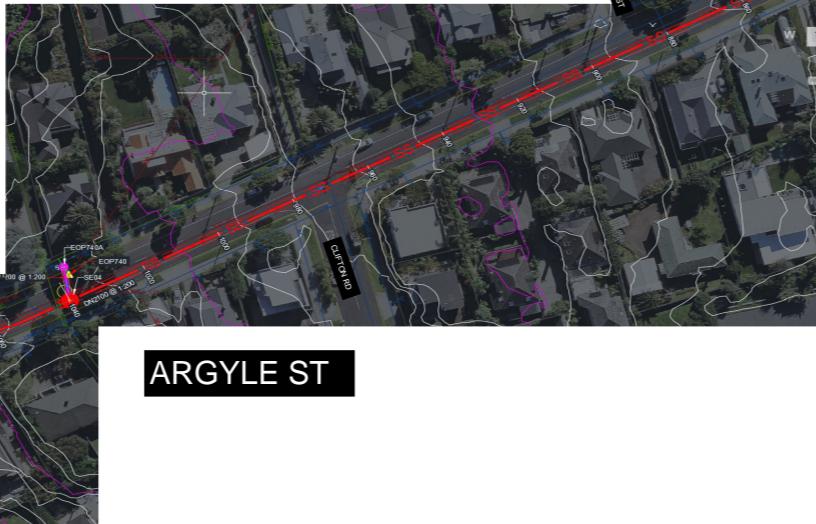
SARSFIELD ST



WALLACE ST



HERNE BAY



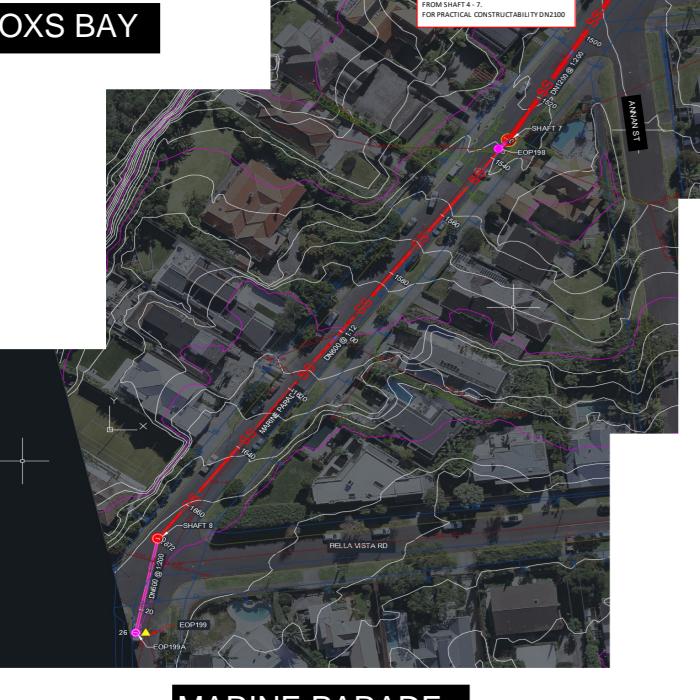
ARGYLE ST



HERNE BAY RD

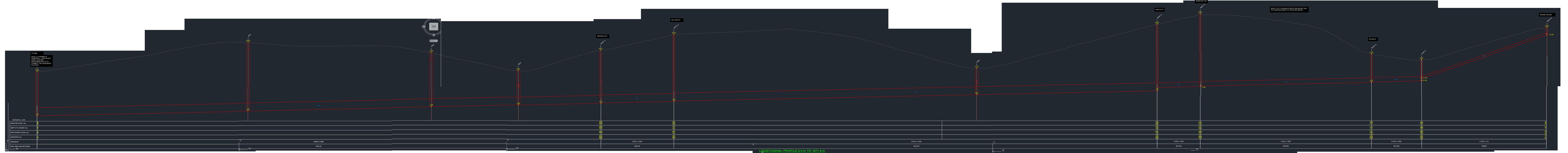
UPTON ST

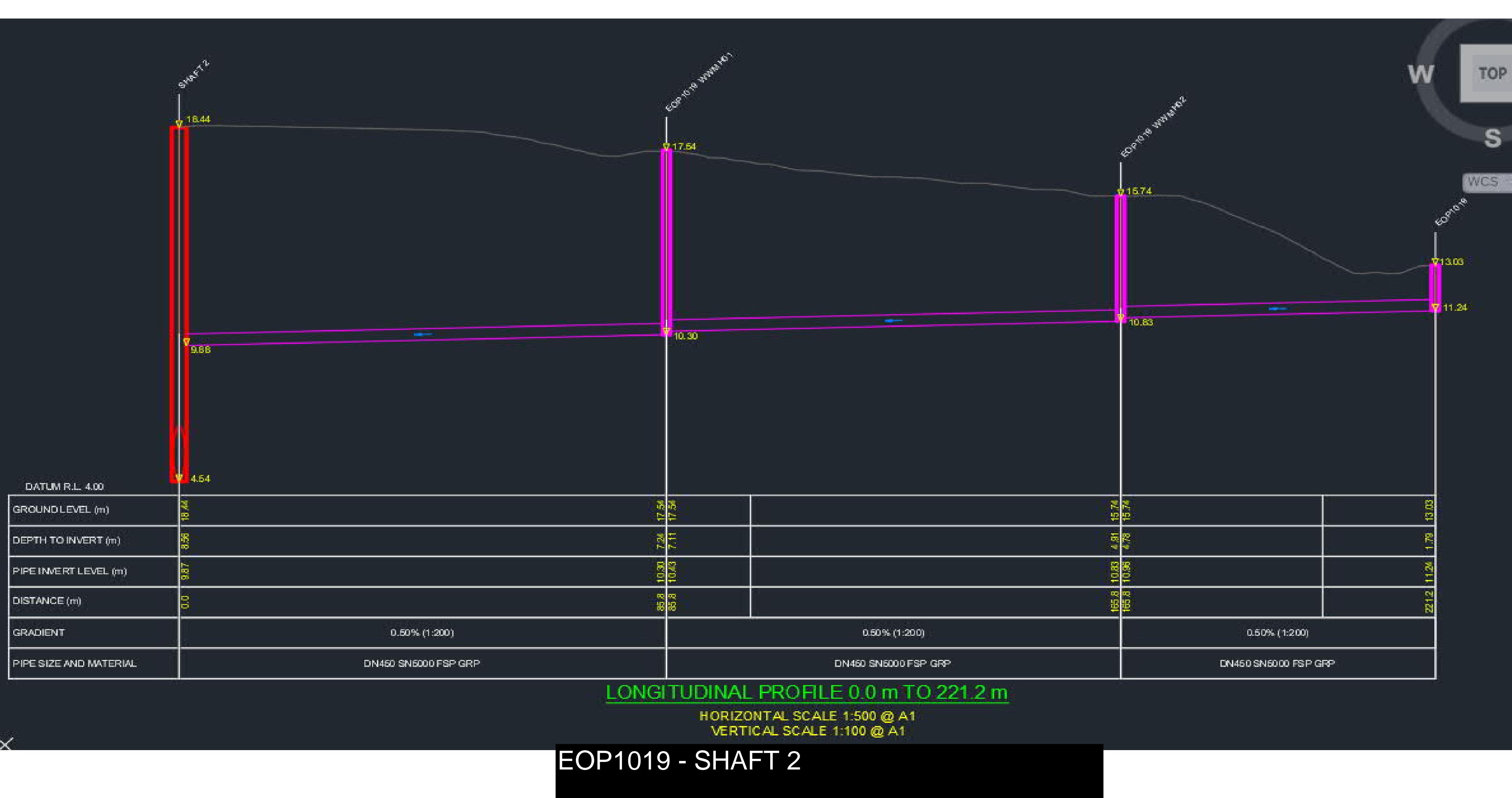
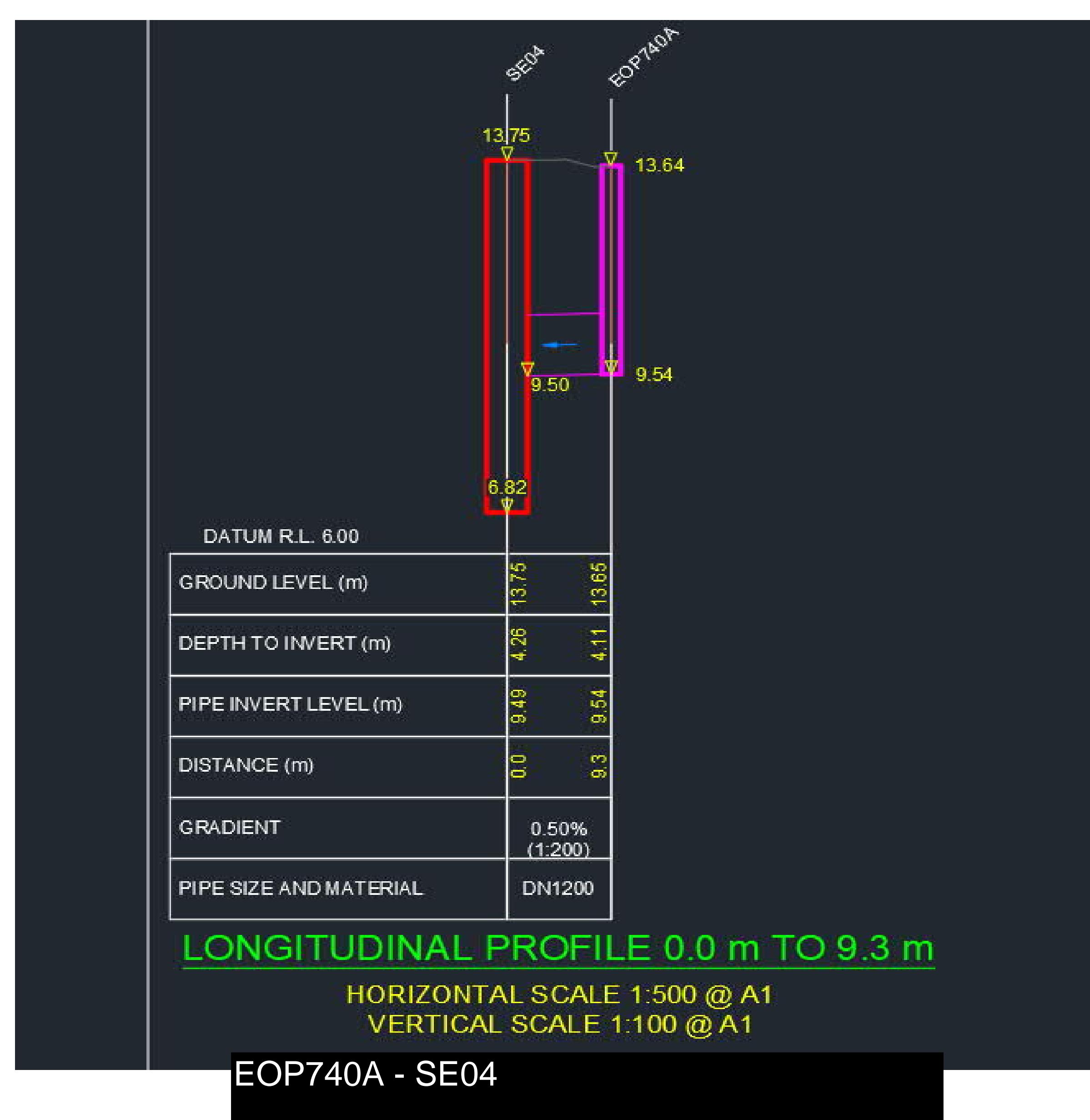
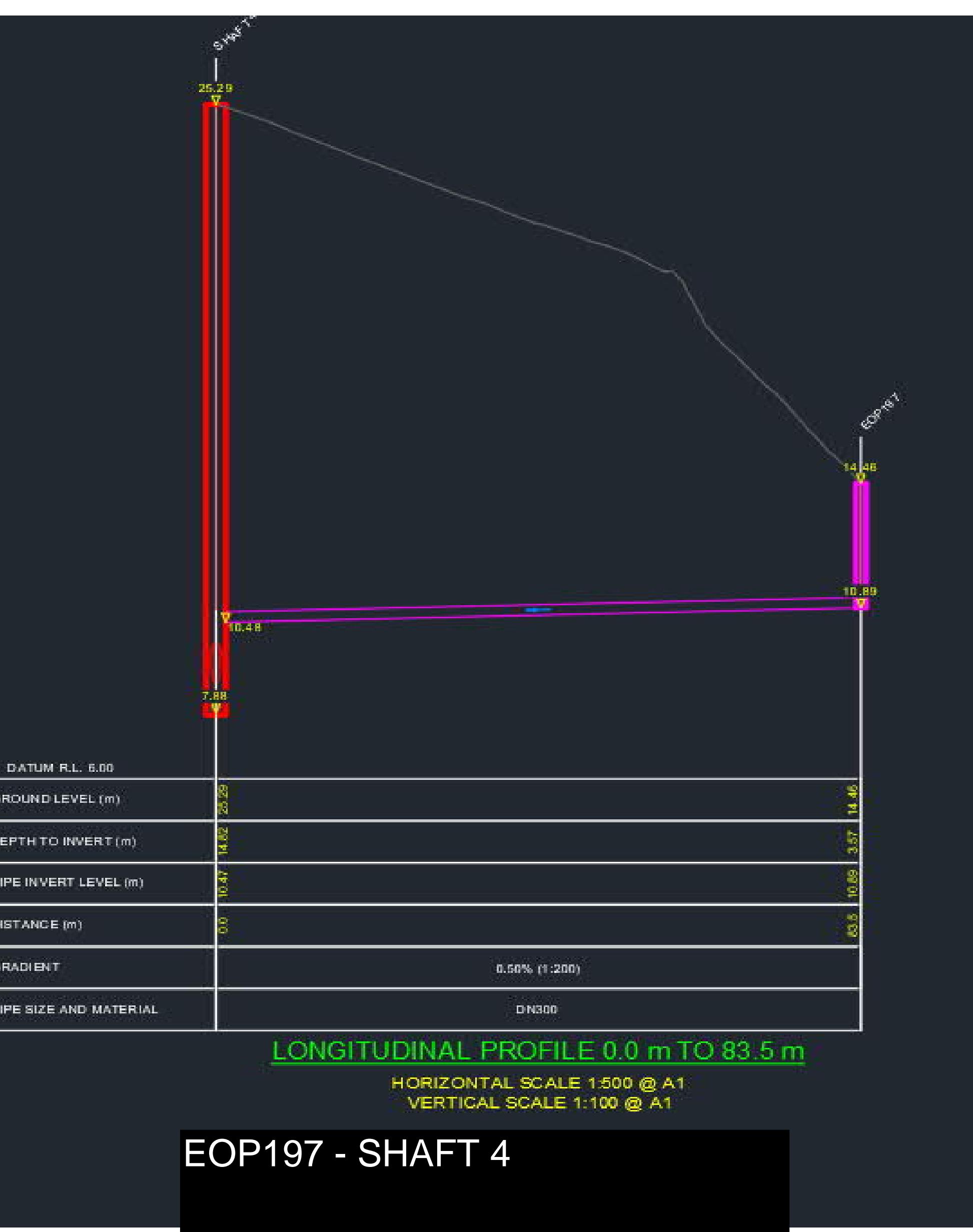
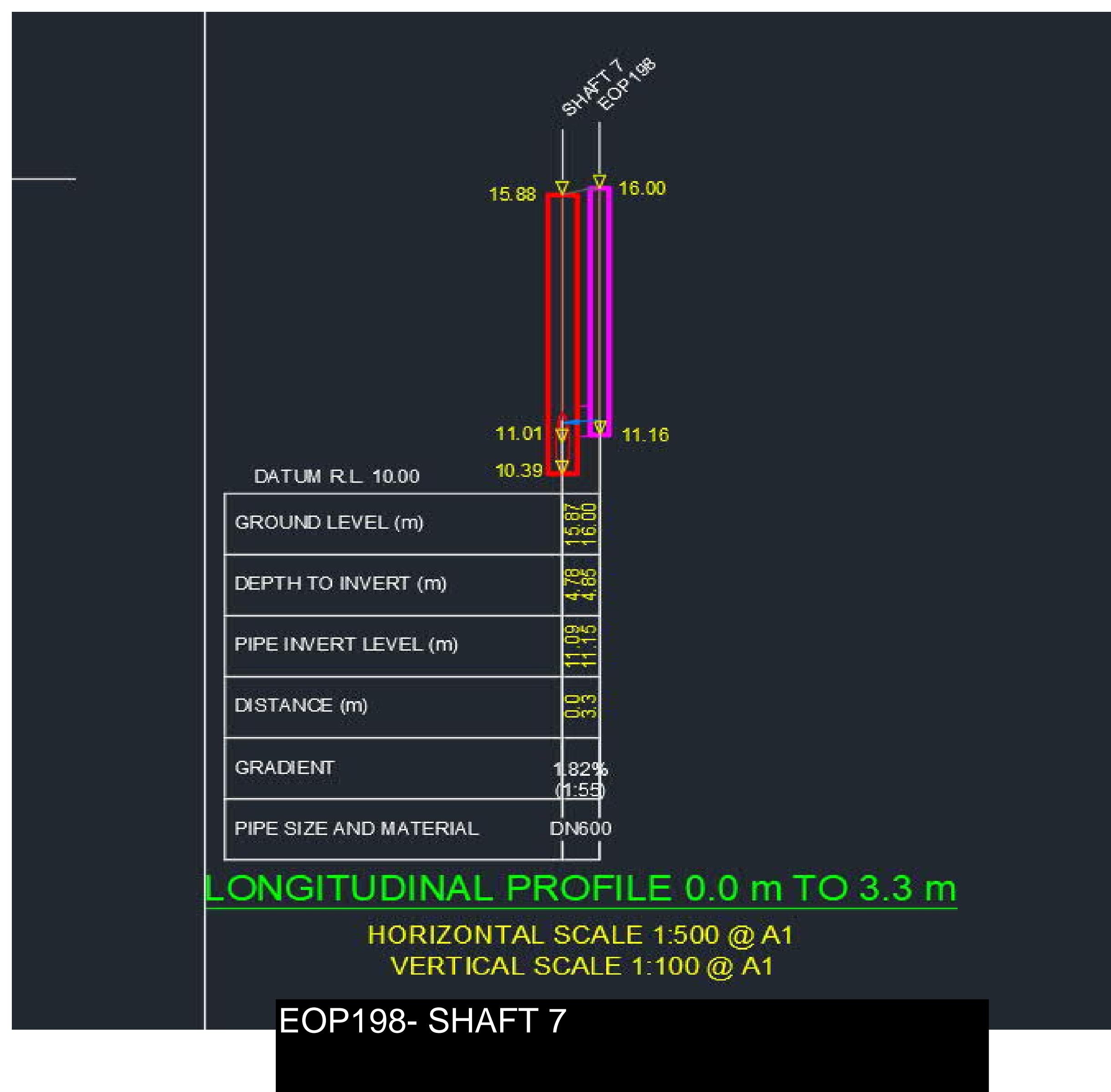
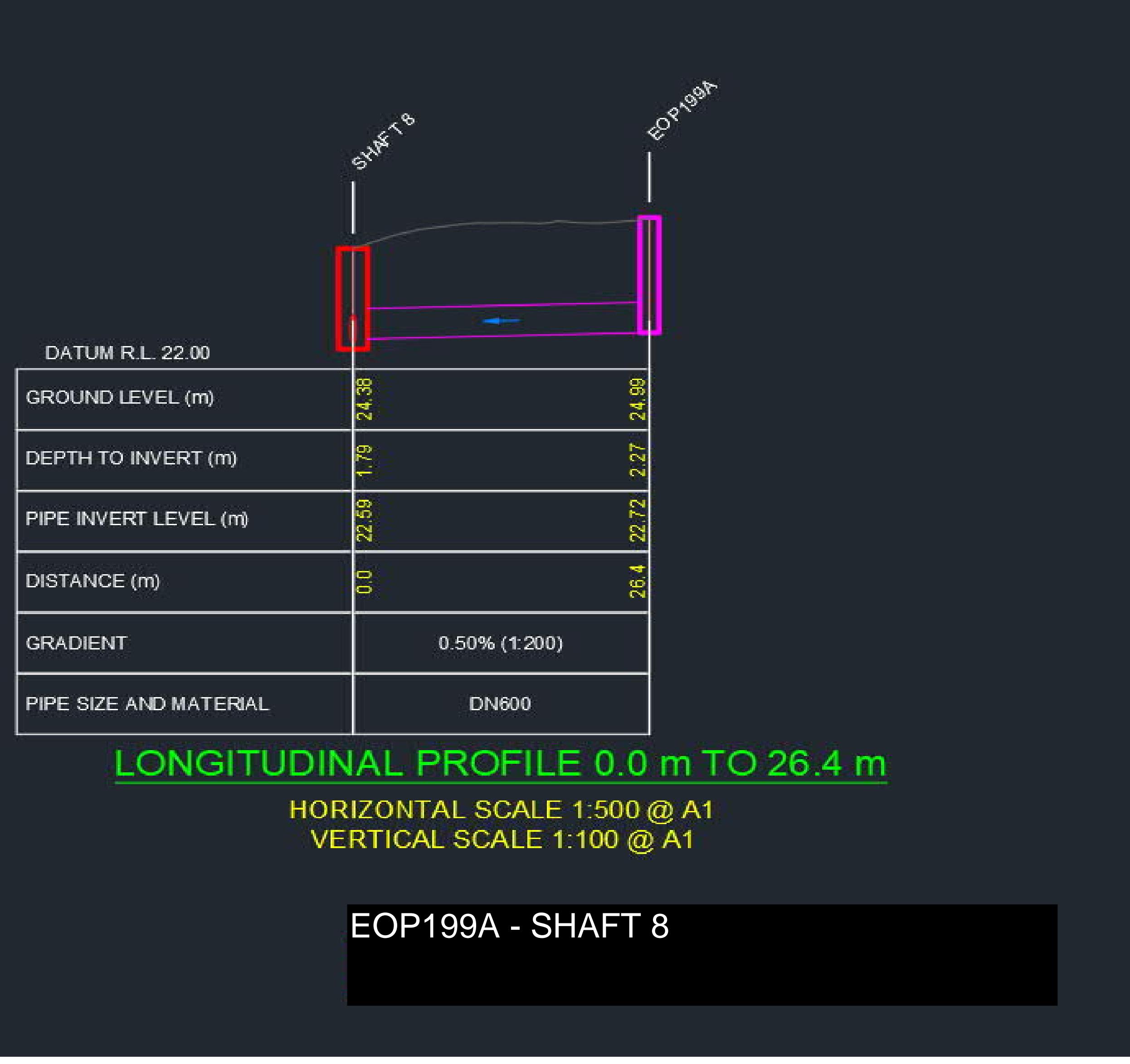
COXS BAY

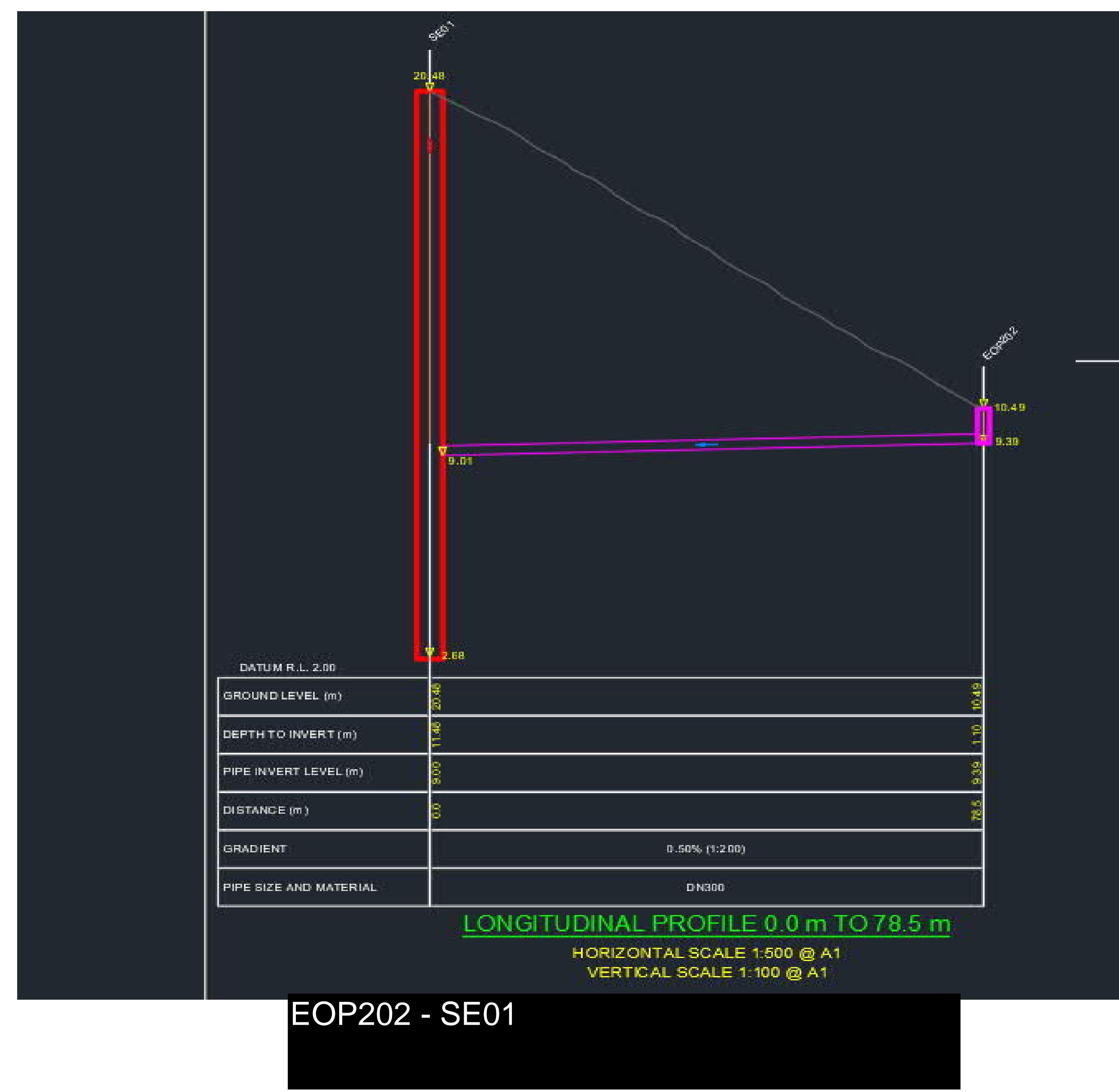
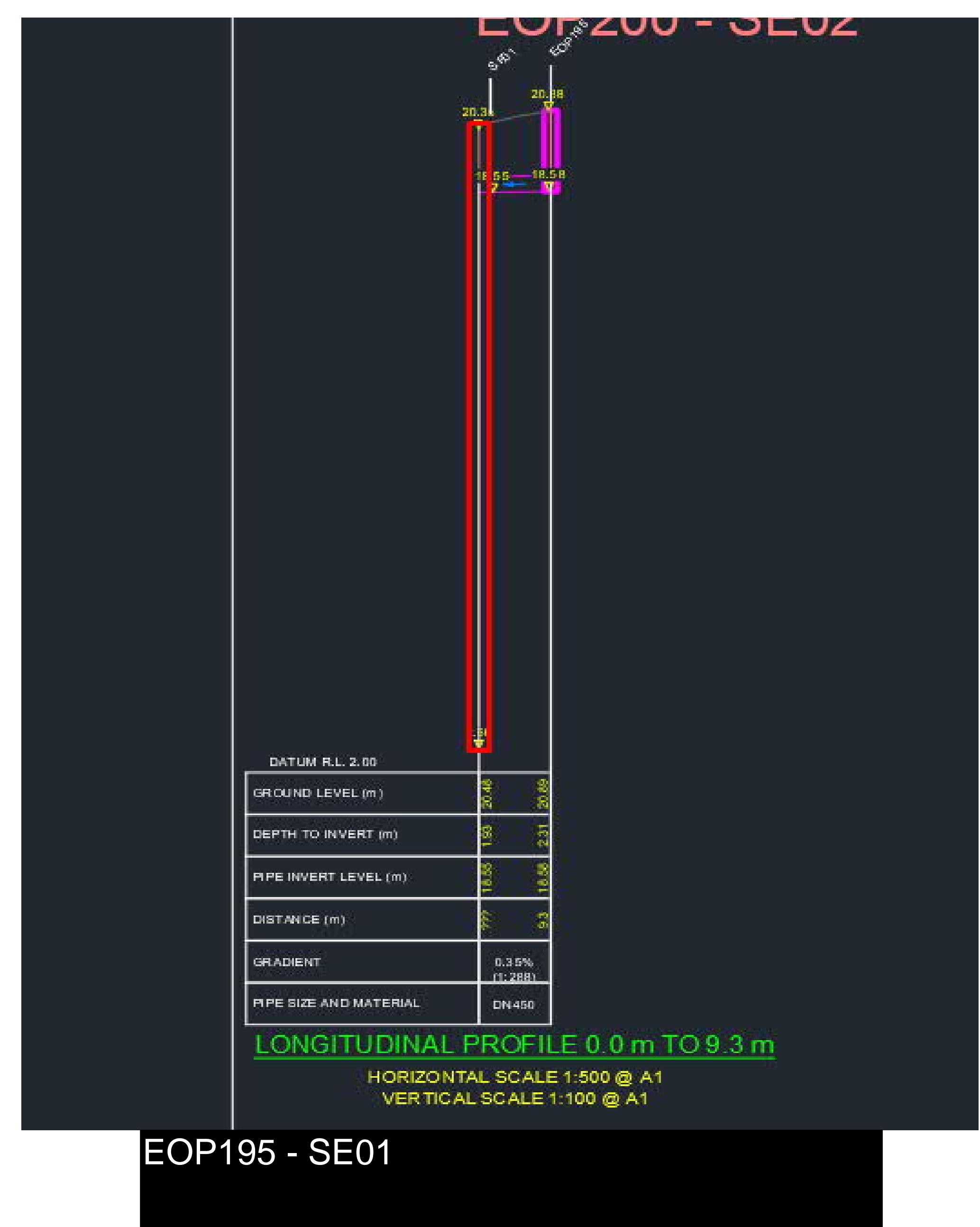
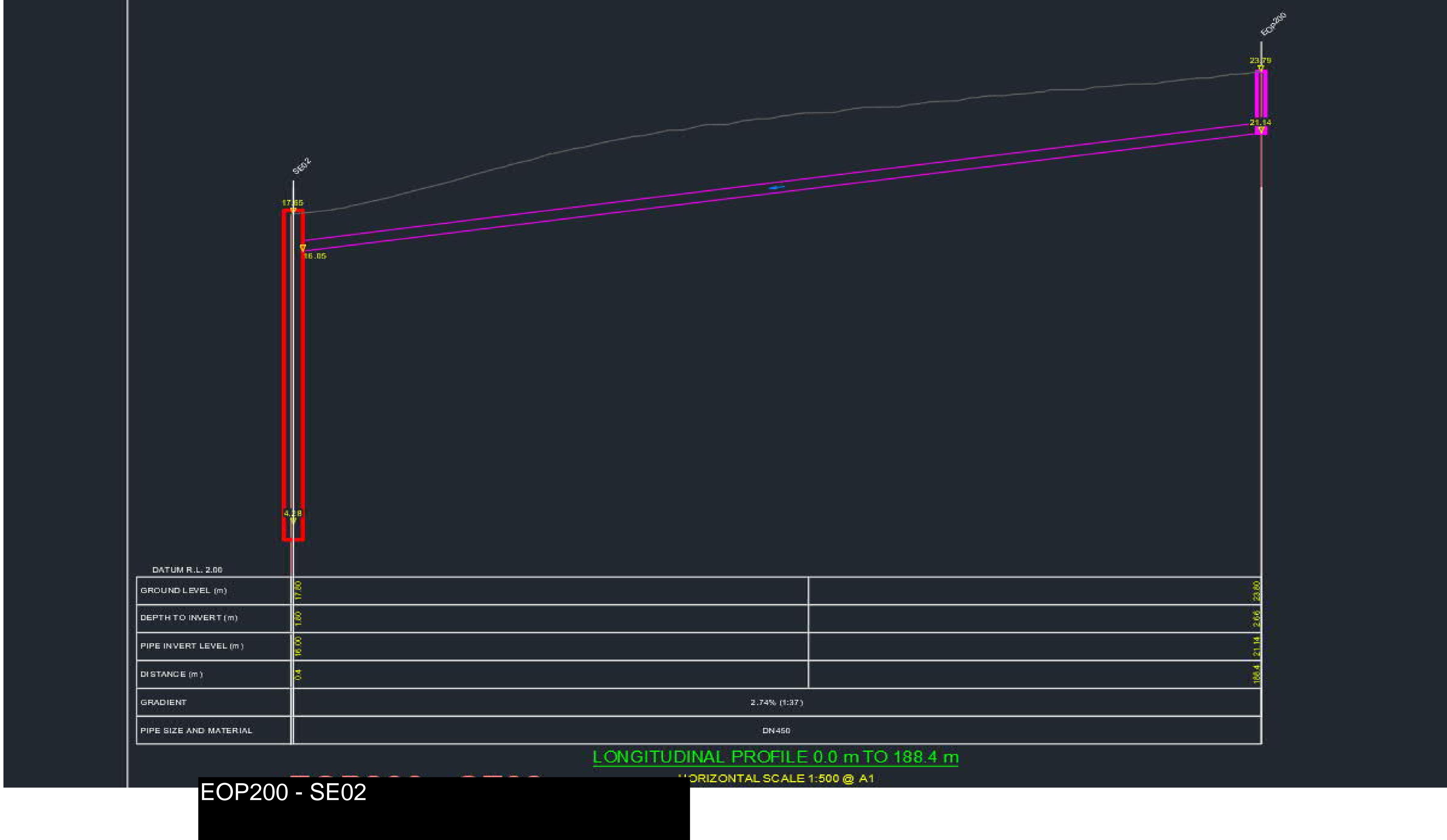
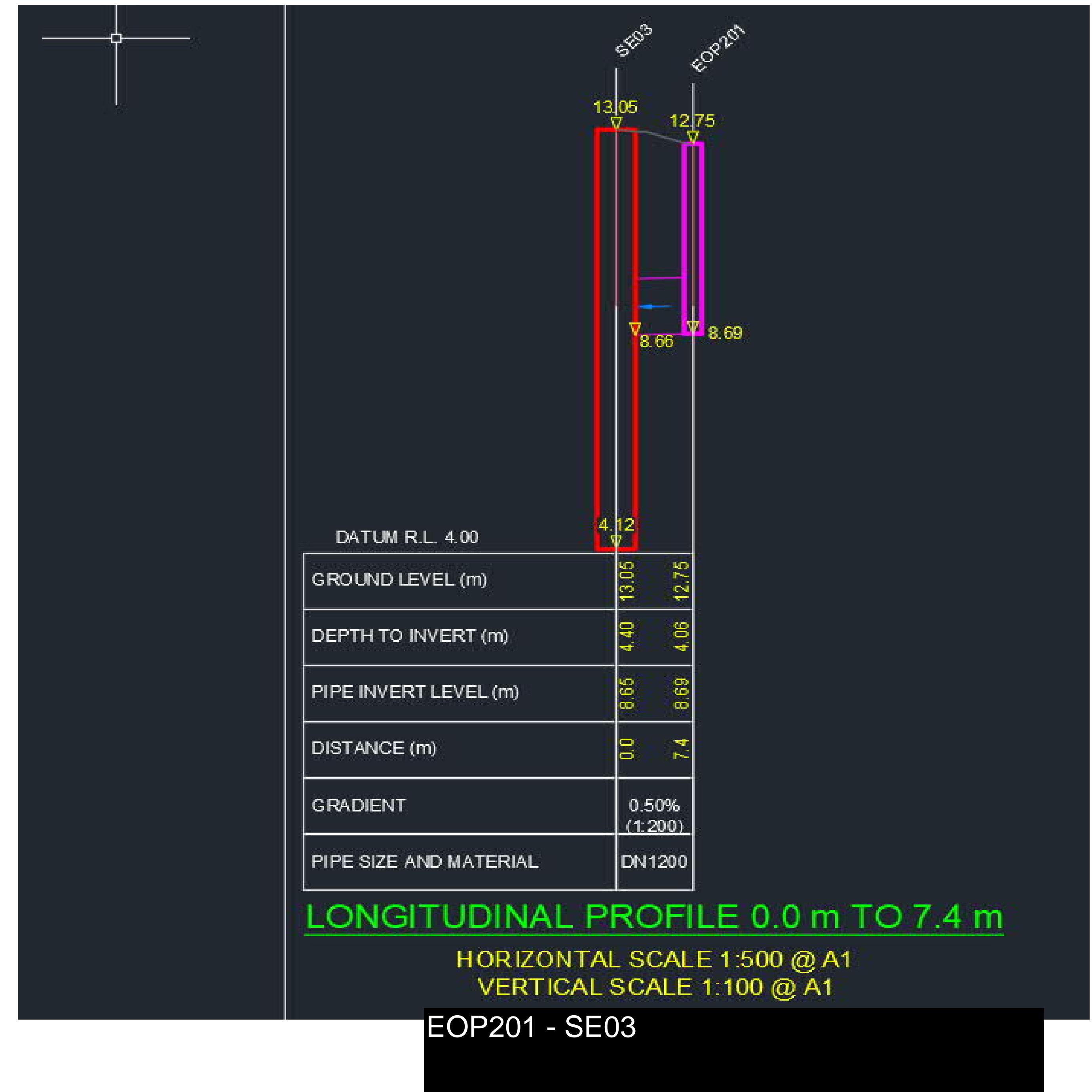


MARINE PARADE

+









PLAN
SCALE 1:2000 @ A1

NOTES:

1. REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION.
2. COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
3. LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
4. DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION.
6. DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
7. NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
8. TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT.

1:2000@ A1 0 20 40 60 80 100 120 140 160 180 200 m
1:4000@ A3

KEY:	
PARCEL BOUNDARY	—
EXISTING WATER SUPPLY	W
EXISTING LOCAL SEWER	WSL
EXISTING TRANSMISSION SEWER	—
EXISTING STORMWATER	SW
EXISTING GROUND PROFILE	—
EXISTING EOP	—
PROPOSED LOCAL SEWER	—
PROPOSED TUNNEL SEWER	—
PROPOSED SEWER MANHOLE	—
PROPOSED SHAFT	●
PROPOSED HERITAGE BUILDING	■
PROPOSED NOTABLE TREE	▲
TUNNEL 2.5m WIDE CORRIDOR	—
PROPOSED CONSTRUCTION AREA	■

				DESIGNED	G.I.P	02-23
				DES. APPROVED	C.STOKES	02-23
				DRAWN	G.I.P	02-23
				DWG. APPROVED	M.KUDIC	02-23
				WSL DESIGN MGMT	B.DEVILLIERS	—
				WSL PROJ. LEAD	—	—
1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	G.I.	MK	WSL PROJ. LEAD	—
ISSUE DATE		AMENDMENT	BY APPD.	BY	DATE	

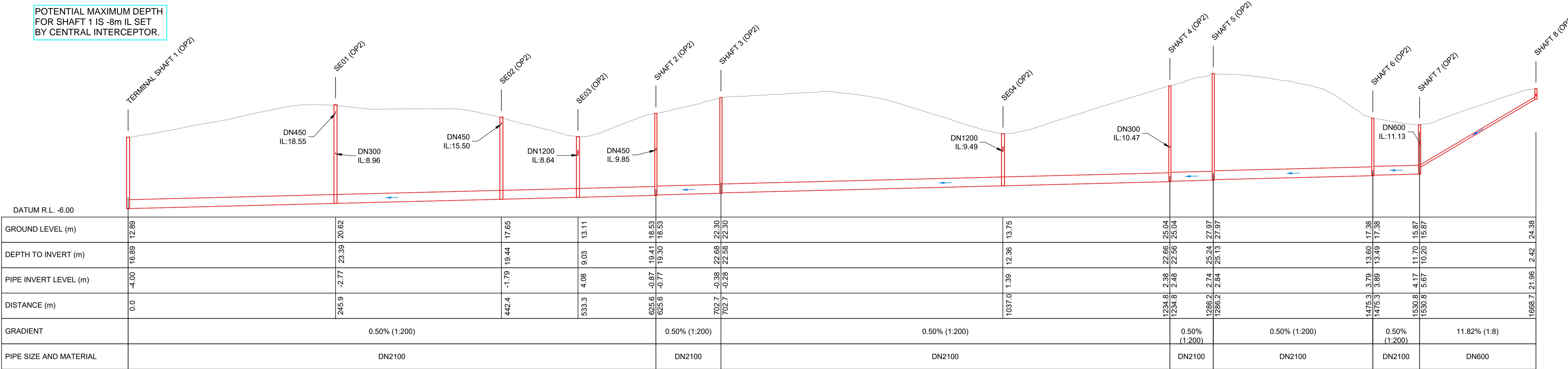


COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

HERNE BAY TRUNK SEWER UPGRADE
MARINE PARADE TO PT ERIN
PROJECT OVERVIEW – PLAN

DRAFT

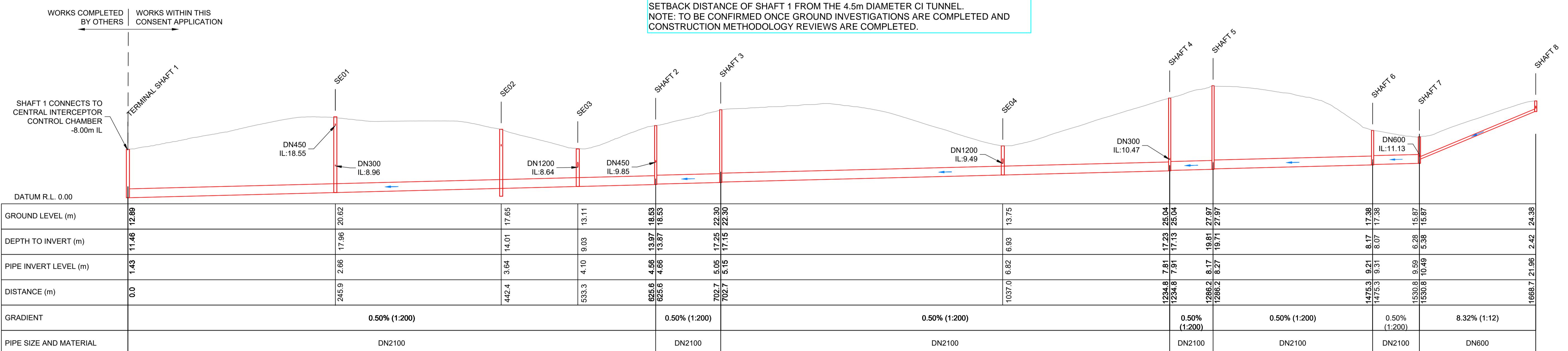
CAD FILE W-SL007.001	DATE 16-02-2023
ORIGINAL SCALE A1	CONTRACT No.
1:2000	1
REF. No.	W-SL007.01
DWG. No.	W-SL007 001
ISSUE	1



HERNE BAY SEWER TRUNK MAIN LONGITUDINAL SECTION

OPTION

OPTION 1 IS ASSUMED TO BE THE PROBABLE DEPTH OF HERNE BAY TRUNK SEWER BASED ON SET LEVELS FROM CENTRAL INTERCEPTOR TUNNELS AND VERTICAL SETBACK DISTANCE OF SHAFT 1 FROM THE 4.5m DIAMETER CI TUNNEL.
NOTE: TO BE CONFIRMED ONCE GROUND INVESTIGATIONS ARE COMPLETED AND CONSTRUCTION METHODOLOGY REVIEWS ARE COMPLETED.



HERNE BAY SEWER TRUNK MAIN LONGITUDINAL SECTION

OPTION 2

NOTES:

1. REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION
 2. COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
 3. LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
 4. DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
 5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION
 6. DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
 7. NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
 8. TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT

OPTION 2 IS ASSUMED TO BE THE MINIMUM DEPTH OF HERNE BAY TRUNK SEWER BASED ON HYDRAULIC REQUIREMENTS TO CAPTURE EOP FLOWS.
NOTE: TO BE CONFIRMED ONCE GROUND INVESTIGATIONS AND SURVEY ARE COMPLETED AND CONSTRUCTION METHODOLOGY REVIEWS ARE COMPLETE.

					DESIGNED	G.IP
					DES. APPROVED	C.STOKES
					DRAWN	G.IP
					DWG. APPROVED	M.KUDOIC
					WSL DESIGN MGMT.	B.DEVILLIERS
1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	GI	MK	WSL PROJ. LEAD	-
ISSUE	DATE	AMENDMENT	BY	APPD.		BY



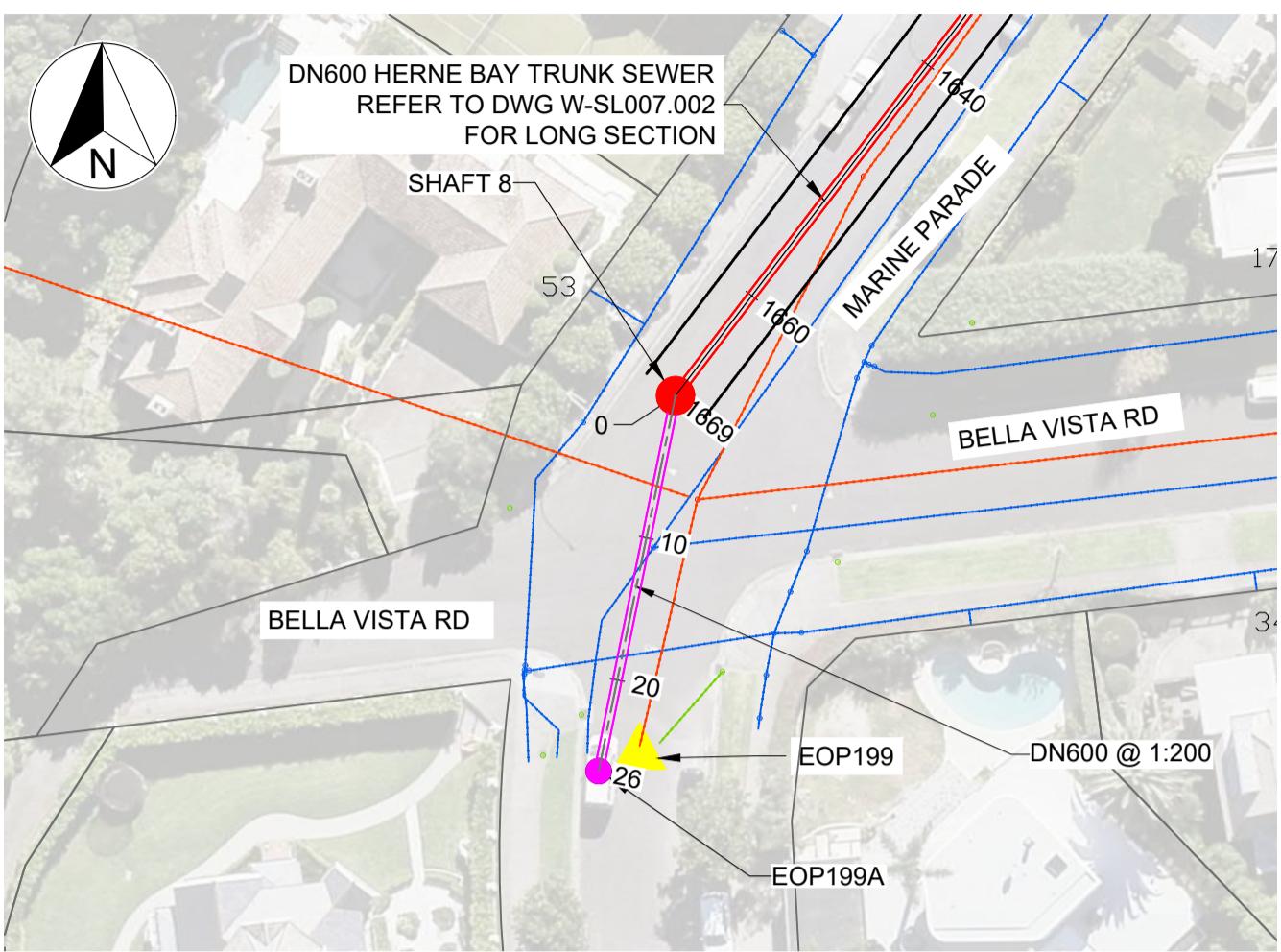
COPYRIGHT — This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

HERNE BAY TRUNK SEWER UPGRADE

MARINE PARADE TO PT ERIN

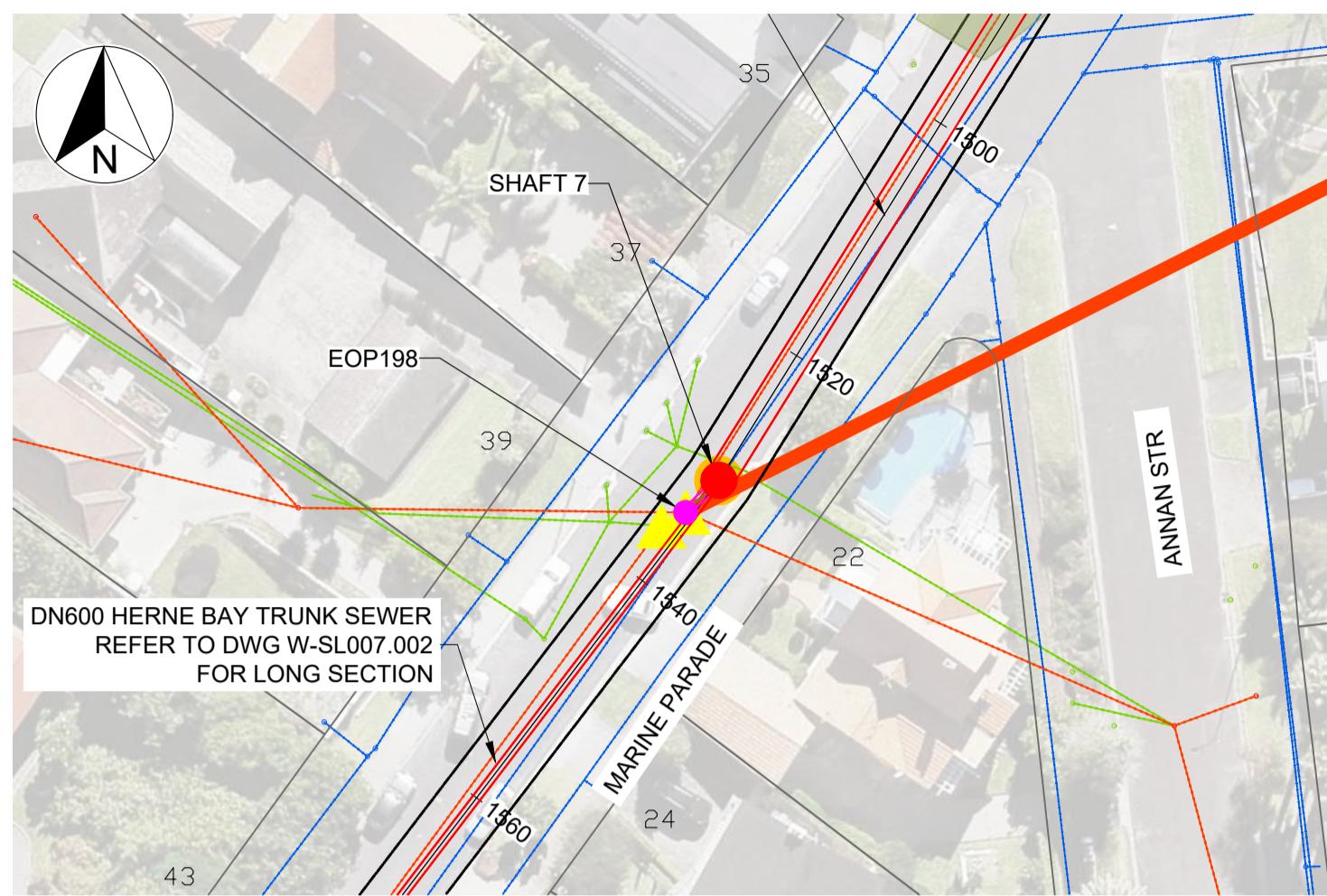
LONGITUDINAL SECTION – TRUNK SEWER

CAD FILE	W-SL007.002	DATE	16-02-023
ORIGINAL SCALE	A1 1:2000	CONTRACT No.	1
REF. No.	W-SL007.01		
DWG. No.	W-SL007 .002		ISSUE 1

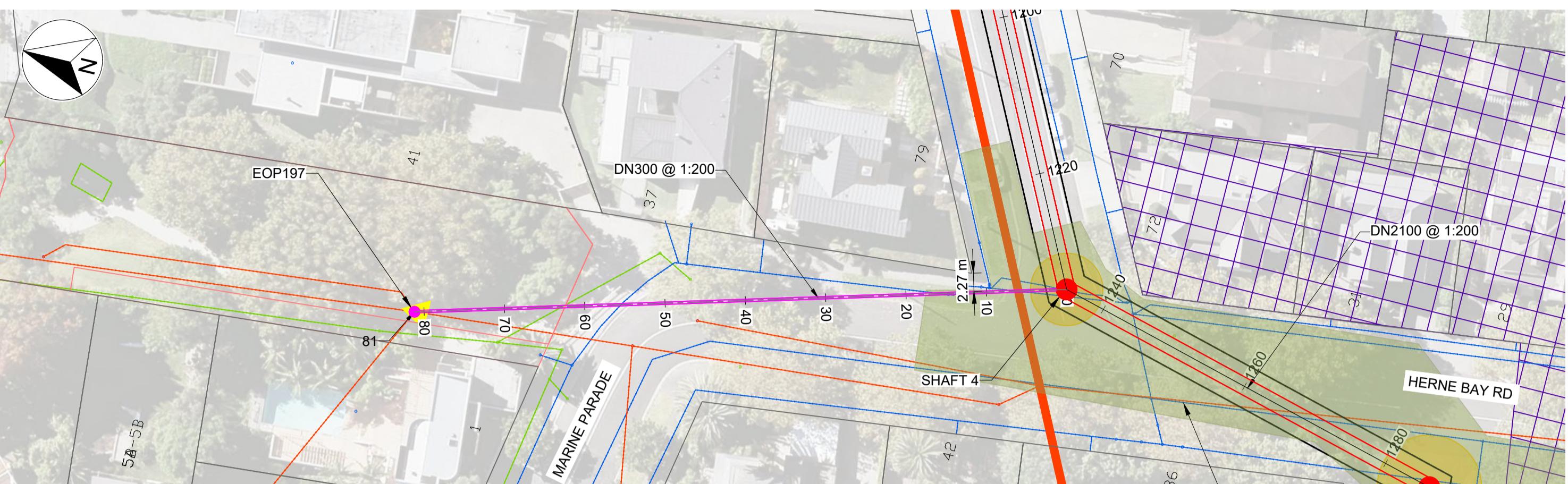


PLAN - EOP 199 - SHAFT 8

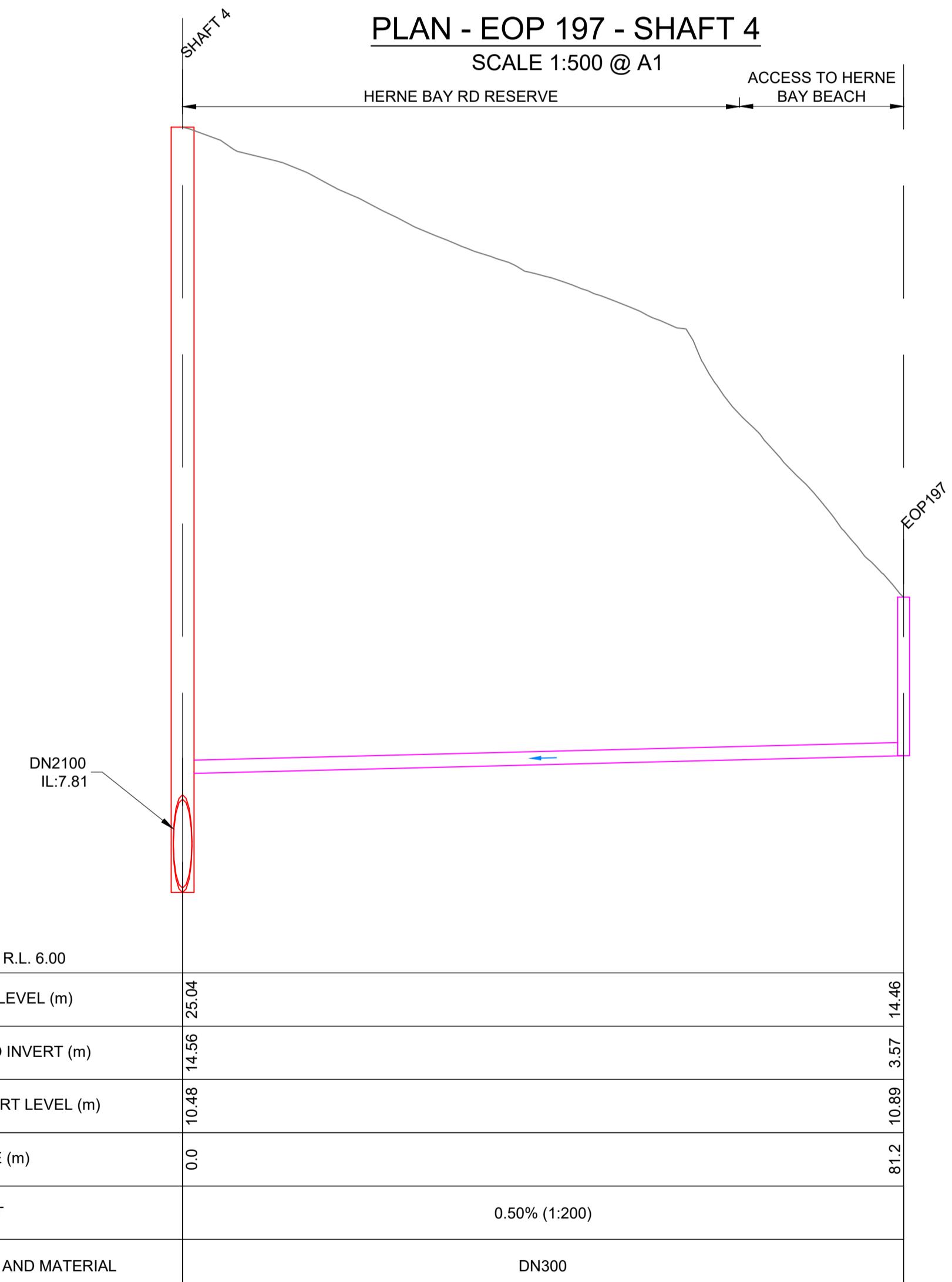
SCALE 1:500 @ A1



PLAN - EOP 198 - SHAFT 7



PLAN - EOP 197 - SHAFT 4



LONGITUDINAL SECTION

EOP 197 - SHAFT 4

1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	
SUE	DATE	AMENDMENT	

NOTE

1. REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION
 2. COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
 3. LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
 4. DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
 5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION.
 6. DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
 7. NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
 8. TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT.



-
-
DATE

COPYRIGHT – This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

HERNE BAY TRUNK SEWER UPGRADE MARINE PARADE TO PT ERIN

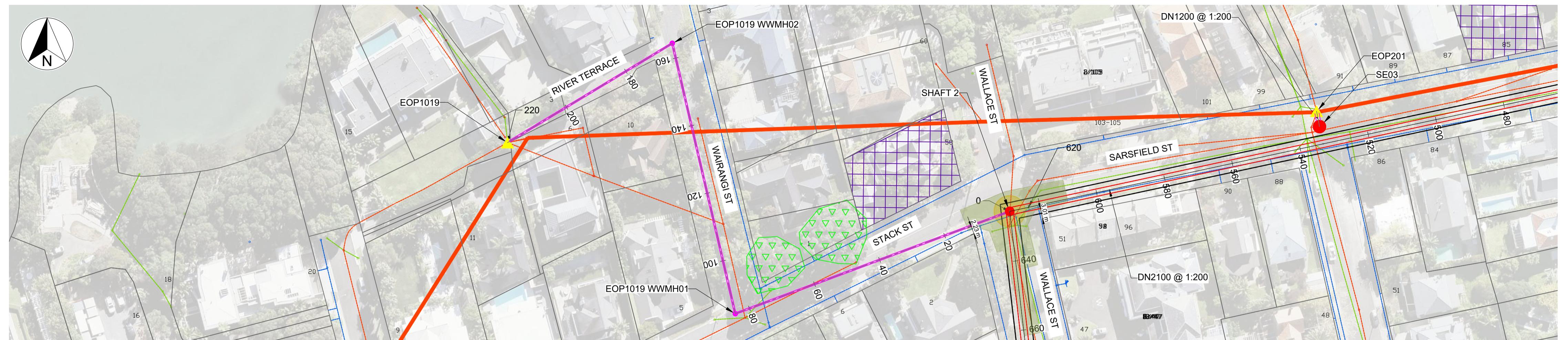
LONGITUDINAL SECTIONS – LOCAL NETWORK SHEET 1

DRAFT

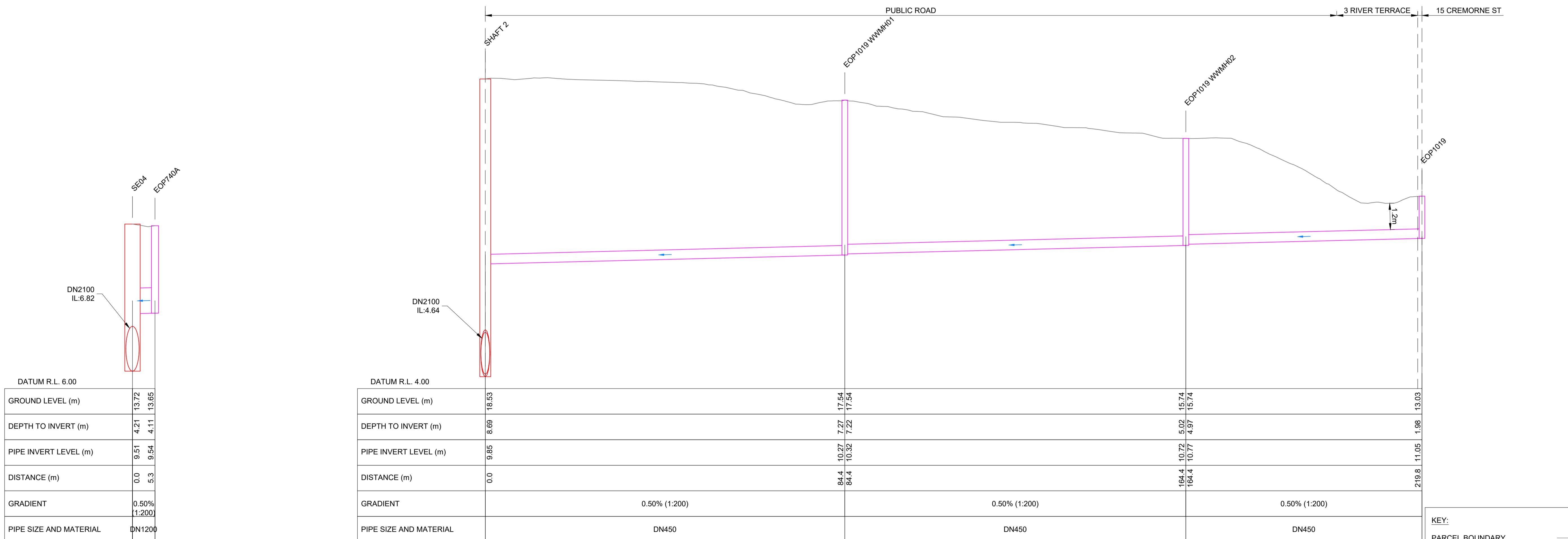
AD FILE	W-SL007.003	DATE	16-02-2023
ORIGINAL SCALE	A1 1:500	CONTRACT No.	1
EF. No.	W-SL007.01		
WG. No.	W-SL007 .003		
	ISSUE	1	



PLAN - EOP 740 - SE04
SCALE 1:500 @ A1



PLAN - EOP 1019 - SHAFT 2
SCALE 1:750 @ A1



LONGITUDINAL SECTION
EOP 740 - SE04
SCALE 1:500 1:100V @ A1

NOTES:

- REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION
- COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
- LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
- DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION.
- DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
- NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
- TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT.

LONGSECTIONS SHOWN HERE ARE
FOR DESIGN OPTION 1 IN W-SL007.002

LONGITUDINAL SECTION
EOP 1019 - SHAFT 2
SCALE 1:500H 1:100V @ A1

1:500@ A1 [0 5 10 15 20 25 30 35 40 45 50] m
1:100@ A3 [0 1 2 3 4 5 6 7 8 9 10] m
1:150@ A1 [0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15] m
1:200@ A3 [0 1 2 3 4 5 6 7 8 9 10] m
1:150@ A1 [0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15] m
1:300@ A3 [0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15] m

KEY:
PARCEL BOUNDARY
EXISTING WATER SUPPLY
EXISTING LOCAL SEWER
EXISTING TRANSMISSION SEWER
EXISTING STORMWATER
EXISTING GROUND PROFILE
EXISTING EOP
PROPOSED LOCAL SEWER
PROPOSED TUNNEL SEWER
PROPOSED SEWER MANHOLE
PROPOSED SHAFT
PROPOSED HERITAGE BUILDING
PROPOSED NOTABLE TREE
TUNNEL 2.5m WIDE CORRIDOR
PROPOSED CONSTRUCTION AREA

			DESIGNED	G.I.P	02-23
			DES. APPROVED	C.STOKES	02-23
			DRAWN	G.I.P	02-23
			DWG. APPROVED	M.KUDIC	02-23
			WSL DESIGN MGMT	B.DEVILLIERS	-
			WSL PROJ. LEAD	-	-
1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	G.I.	MK	
ISSUE DATE		AMENDMENT	BY APPD.	BY	DATE

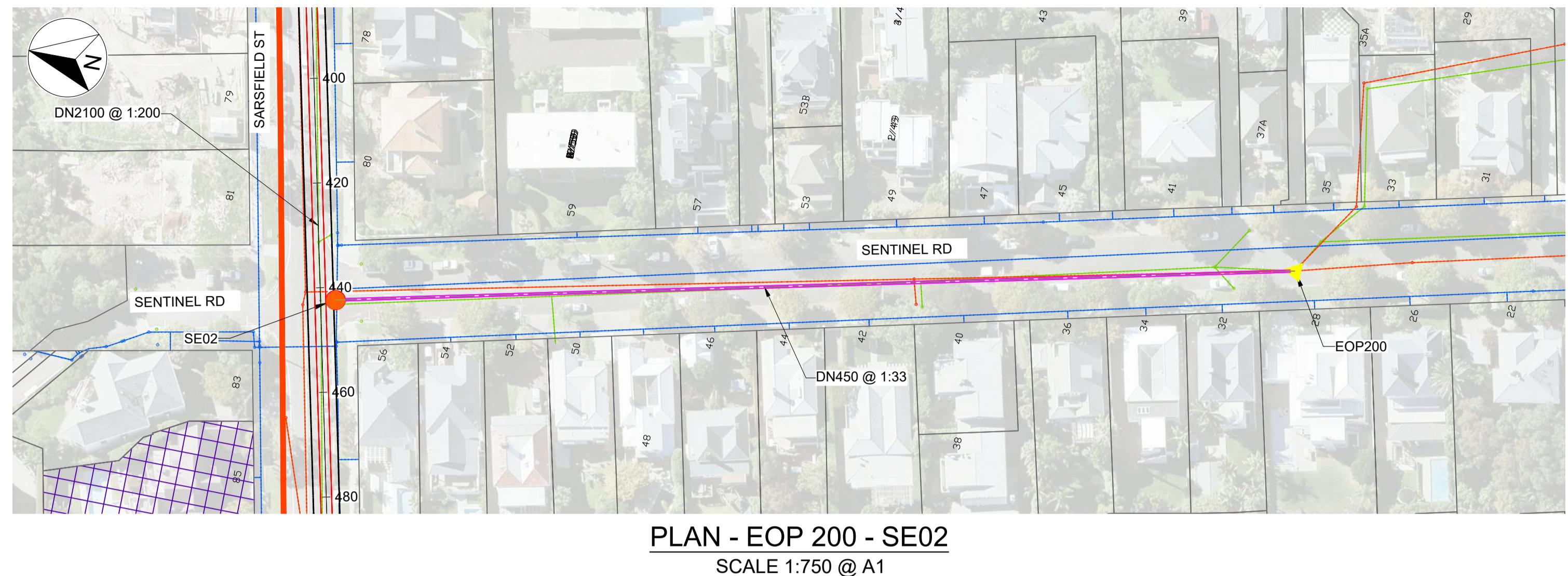
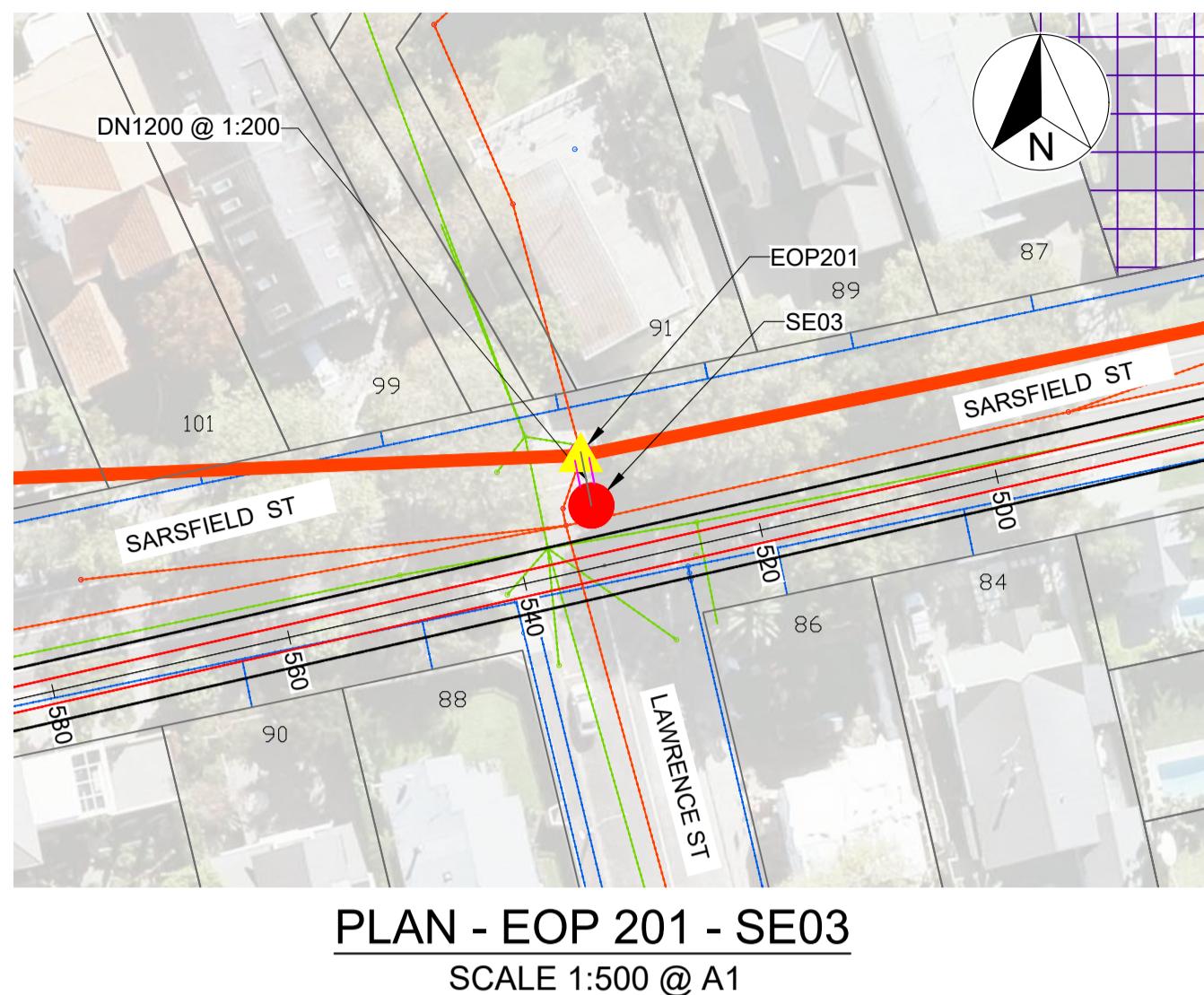


COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

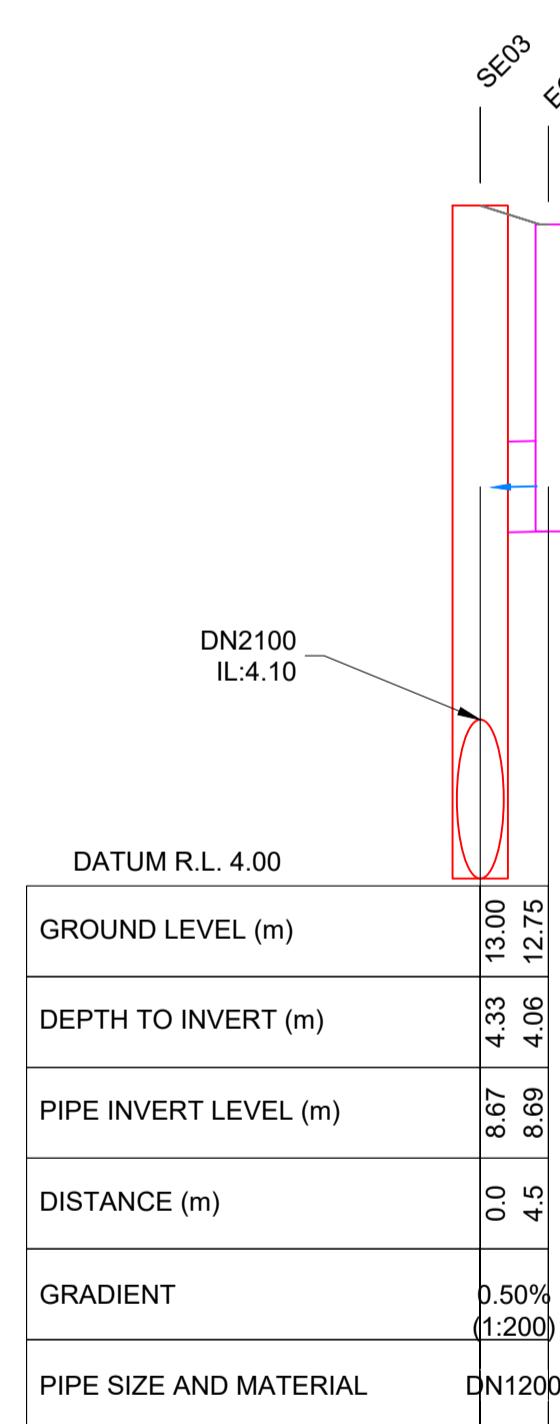
HERNE BAY TRUNK SEWER UPGRADE
MARINE PARADE TO PT ERIN
LONGITUDINAL SECTIONS - LOCAL NETWORK SHEET 2

DRAFT

CAD FILE	W-SL007.004	DATE	16-02-2023
ORIGINAL SCALE	A1 1:2000	CONTRACT No.	1
REF. No.	W-SL007.01		
DWG. No.	W-SL007.004	ISSUE	1



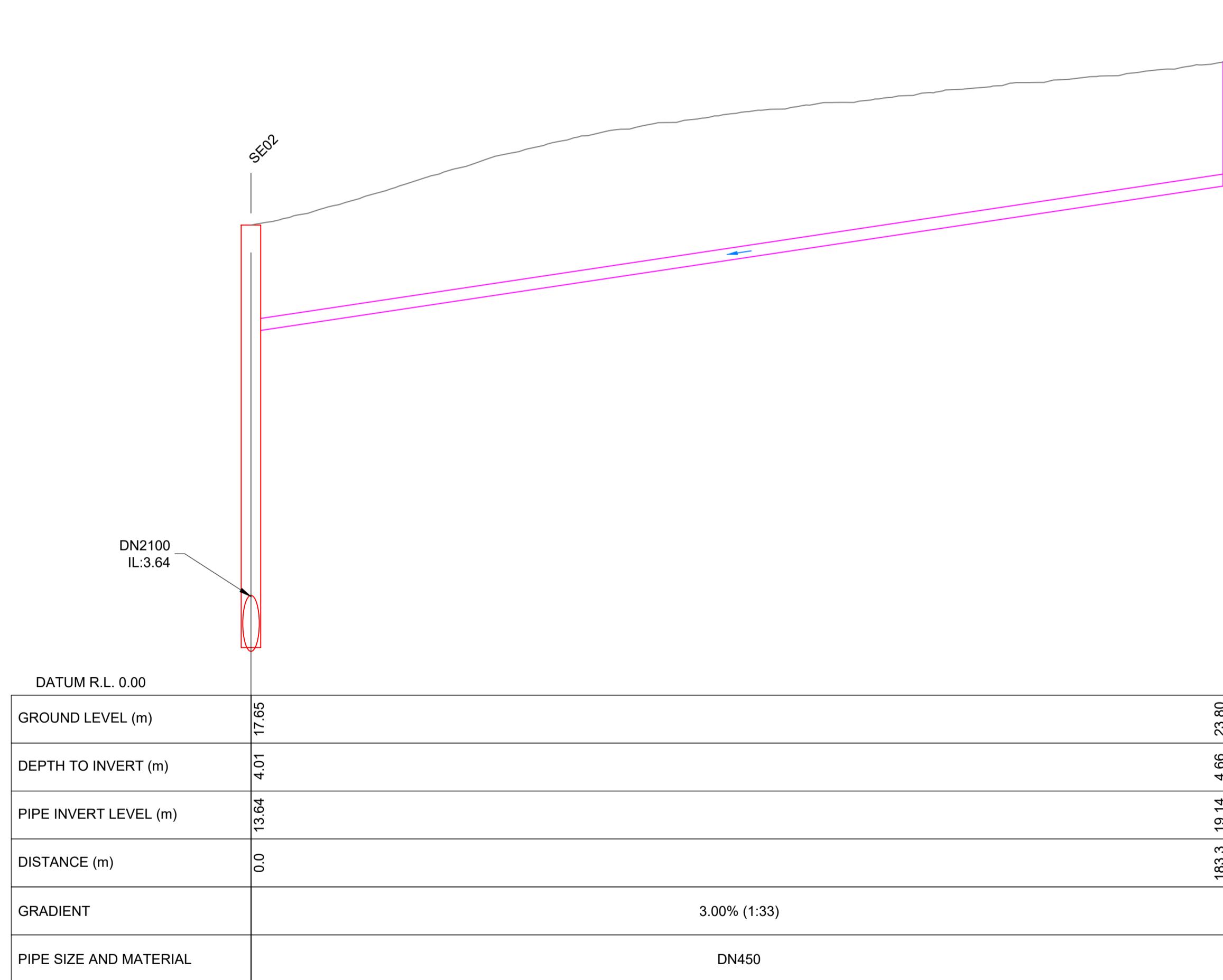
LONGSECTIONS SHOWN HERE
ARE FOR DESIGN OPTION 1 IN
W-SL007.002



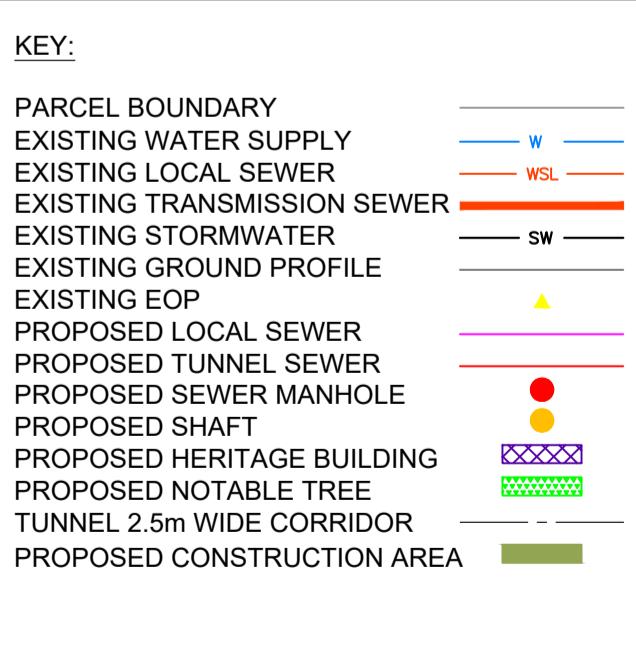
LONGITUDINAL SECTION
EOP201 - SE03
SCALE 1:500H 1:100V @ A1

NOTES:

- REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION
- COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
- LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
- DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION.
- DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
- NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
- TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT.



LONGITUDINAL SECTION
EOP200 - SE02
SCALE 1:750H 1:150V @ A1



			DESIGNED	G.I.P	02-23
			DES. APPROVED	C.STOKES	02-23
			DRAWN	G.I.P	02-23
			DWG. APPROVED	M.KUDIC	02-23
			WSL DESIGN MGMT	B.DEVILLIERS	-
			WSL PROJ. LEAD	-	-
1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	GI	MK	DATE
ISSUE DATE		AMENDMENT	BY APPD.	BY	DATE

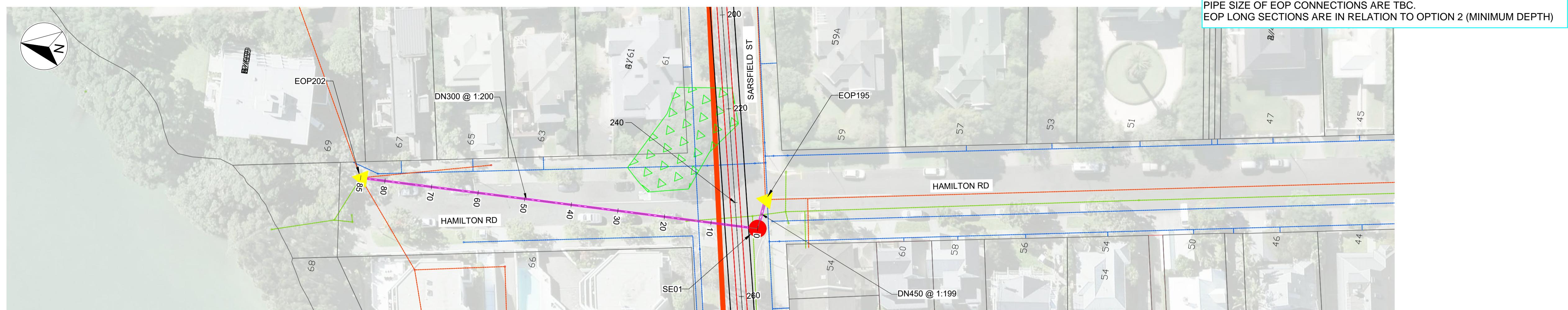


COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

HERNE BAY TRUNK SEWER UPGRADE
MARINE PARADE TO PT ERIN
LONGITUDINAL SECTIONS - LOCAL NETWORK SHEET 3

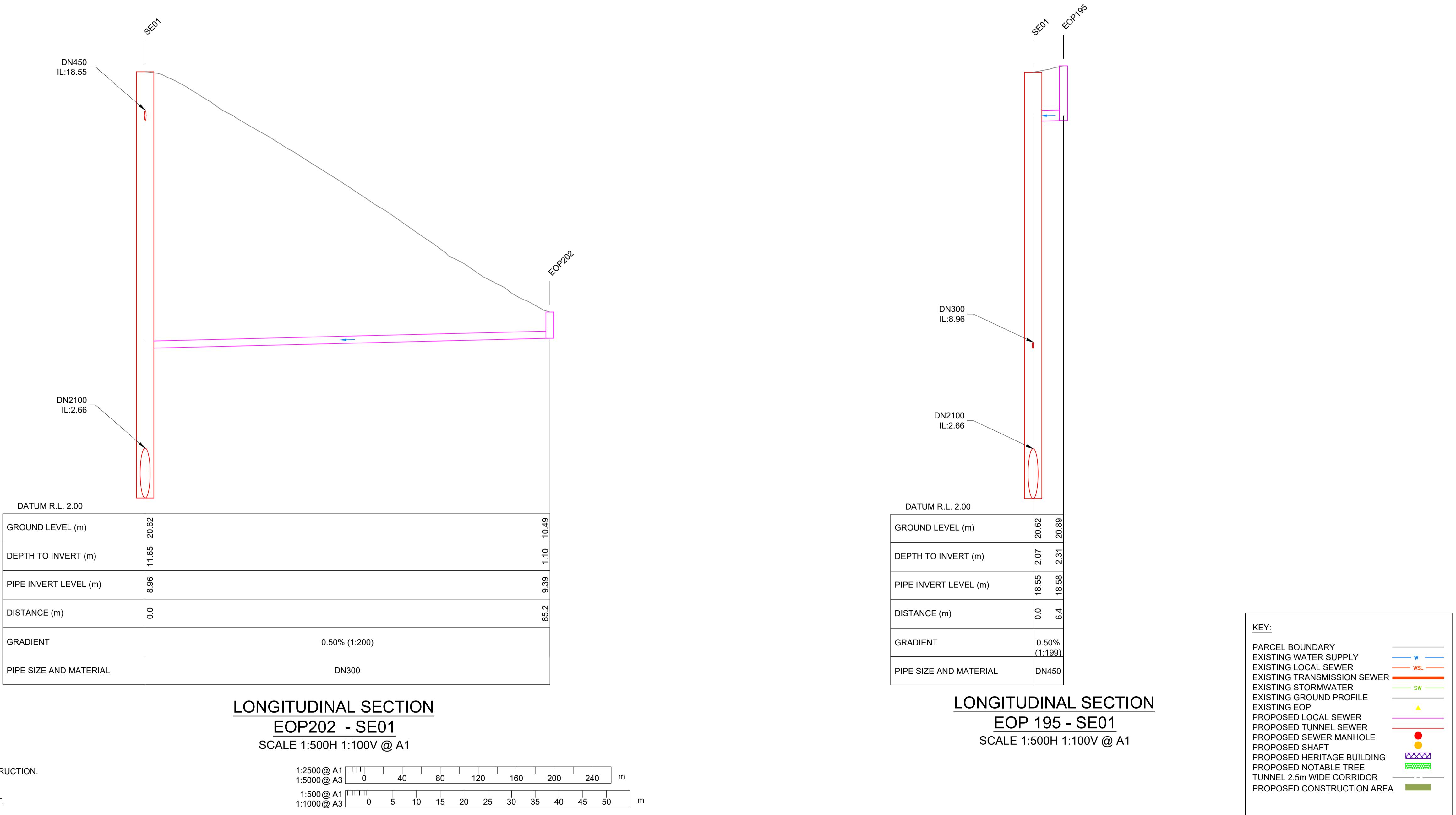
DRAFT

CAD FILE	W-SL007.005	DATE	16-02-2023
ORIGINAL SCALE	A1 1:2000	CONTRACT No.	1
REF. No.	W-SL007.01		
DWG. No.	W-SL007.005	ISSUE	1



PLAN - EOP202 AND EOP 195 - SE01

SCALE 1:500 @ A1



					DESIGNED	G.IP
					DES. APPROVED	C.STOKES
					DRAWN	G.IP
					DWG. APPROVED	M.KUDOIC
					WSL DESIGN MGMT.	B.DEVILLIERS
1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION		GI	MK	WSL PROJ. LEAD
ISSUE	DATE	AMENDMENT		BY	APPD.	BY



COPYRIGHT – This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

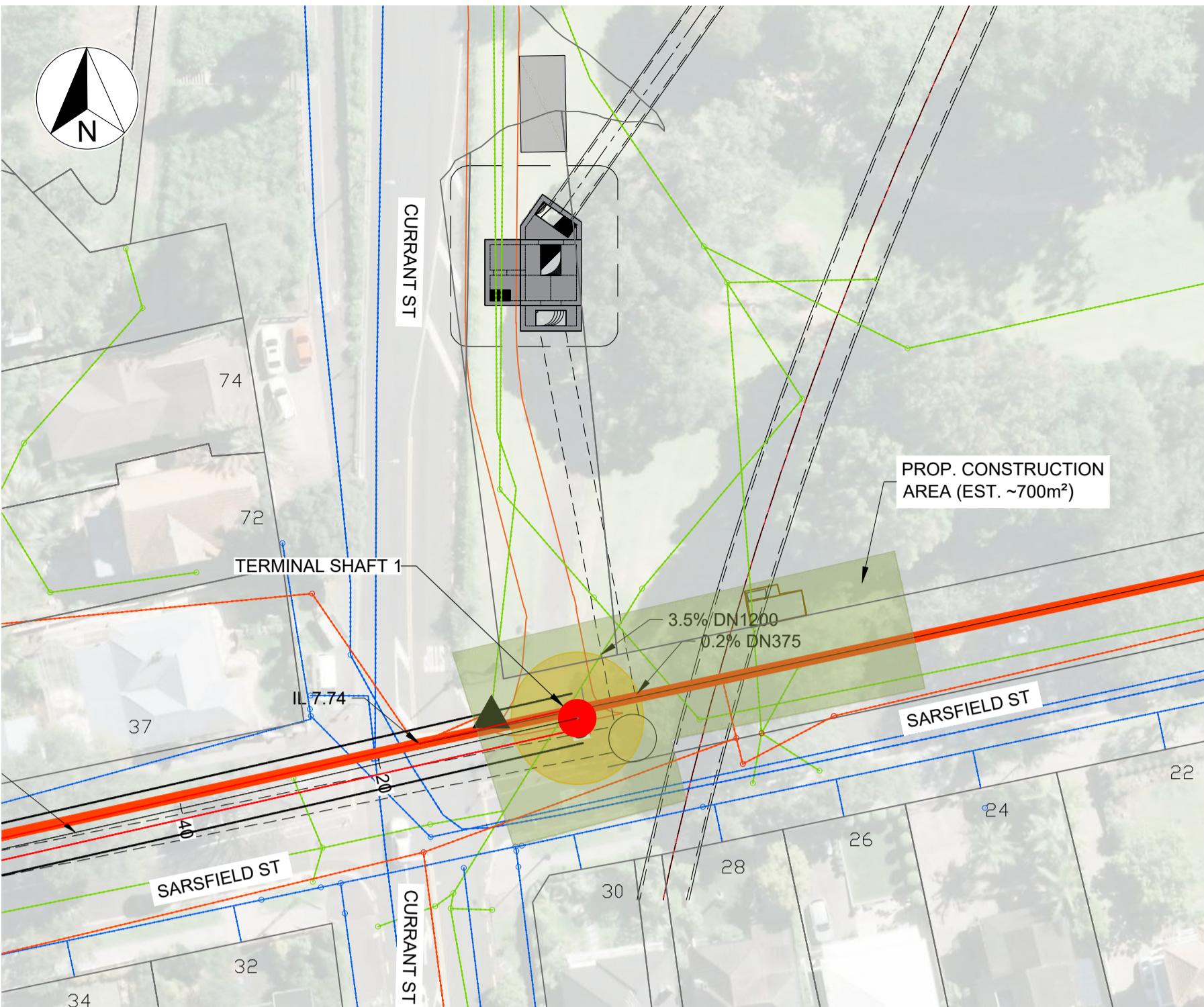
HERNE BAY TRUNK SEWER UPGRADE

HAMILTON ROAD, HERNE BAY

LONGITUDINAL SECTIONS – LOCAL NETWORK SHEET 4

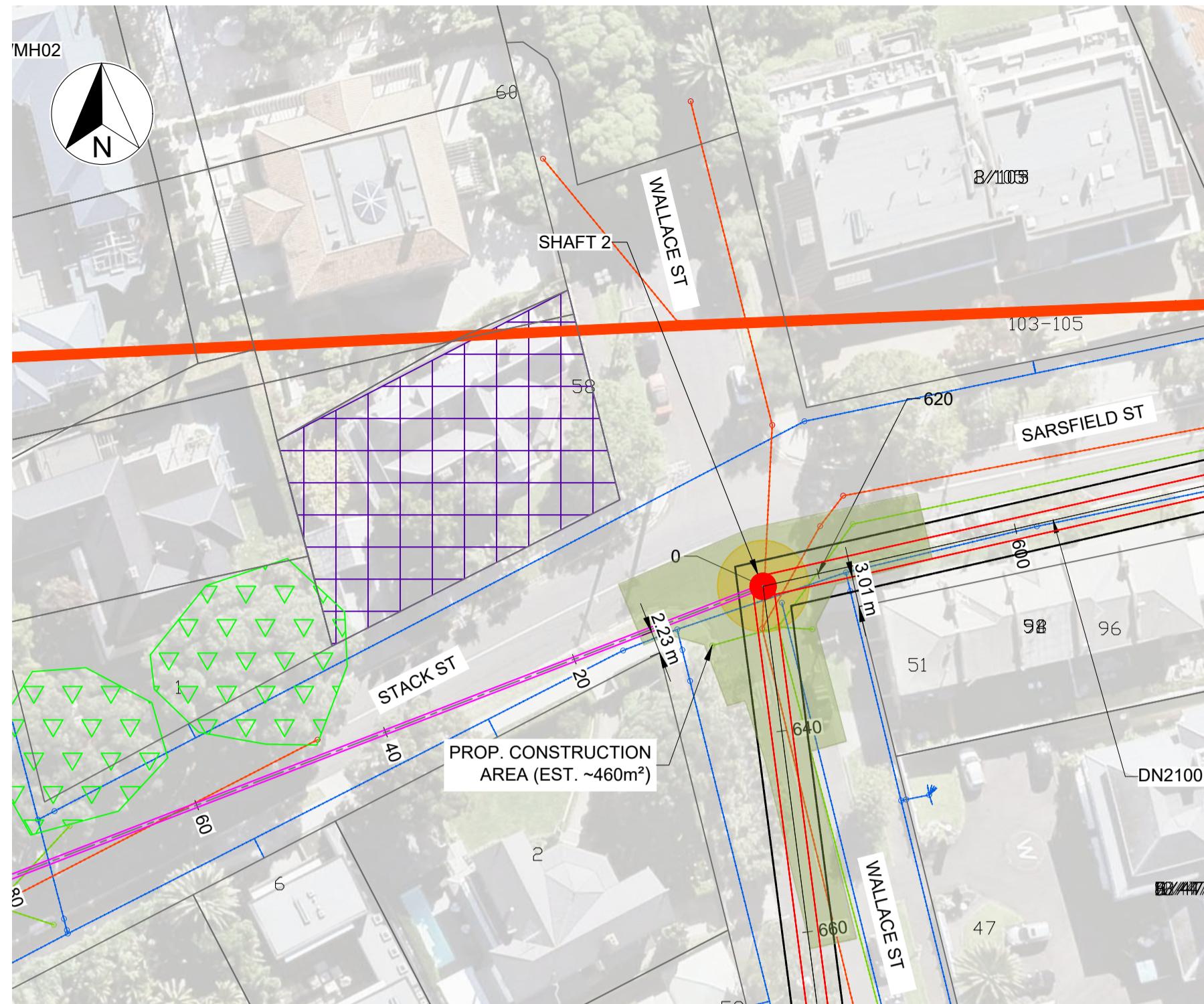
DRAFT

CAD FILE	W-SL007.006	DATE	16-02-2023
ORIGINAL SCALE	A1	CONTRACT No.	
	1:2000		1
EF. No.	W-SL007.01		
WG. No.	W-SL007 .006	ISSUE	1



SHAFT 1 LOCATION

SCALE 1:500 @ A1



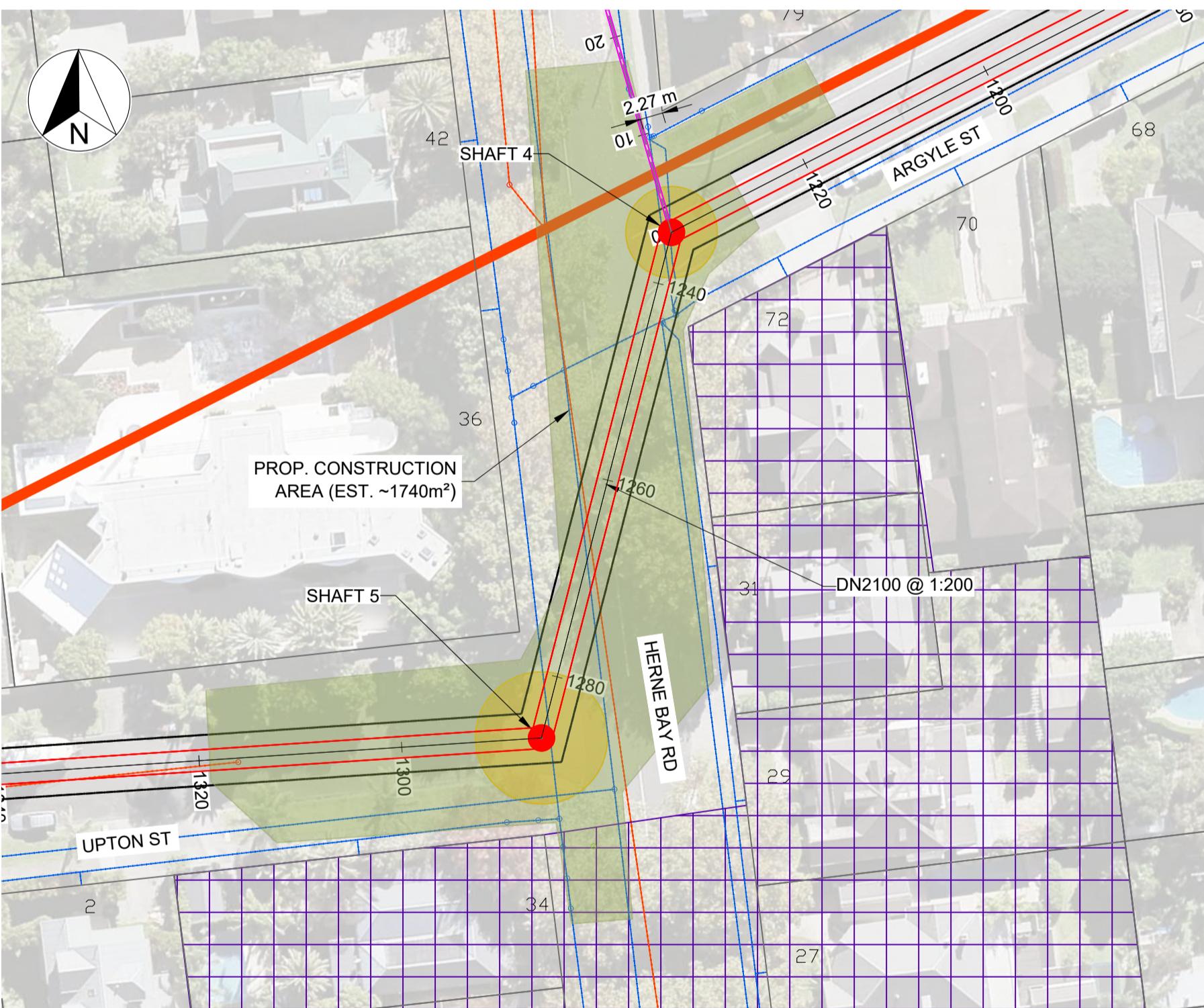
SHAFT 2 LOCATION

SCALE 1:500 @ A1



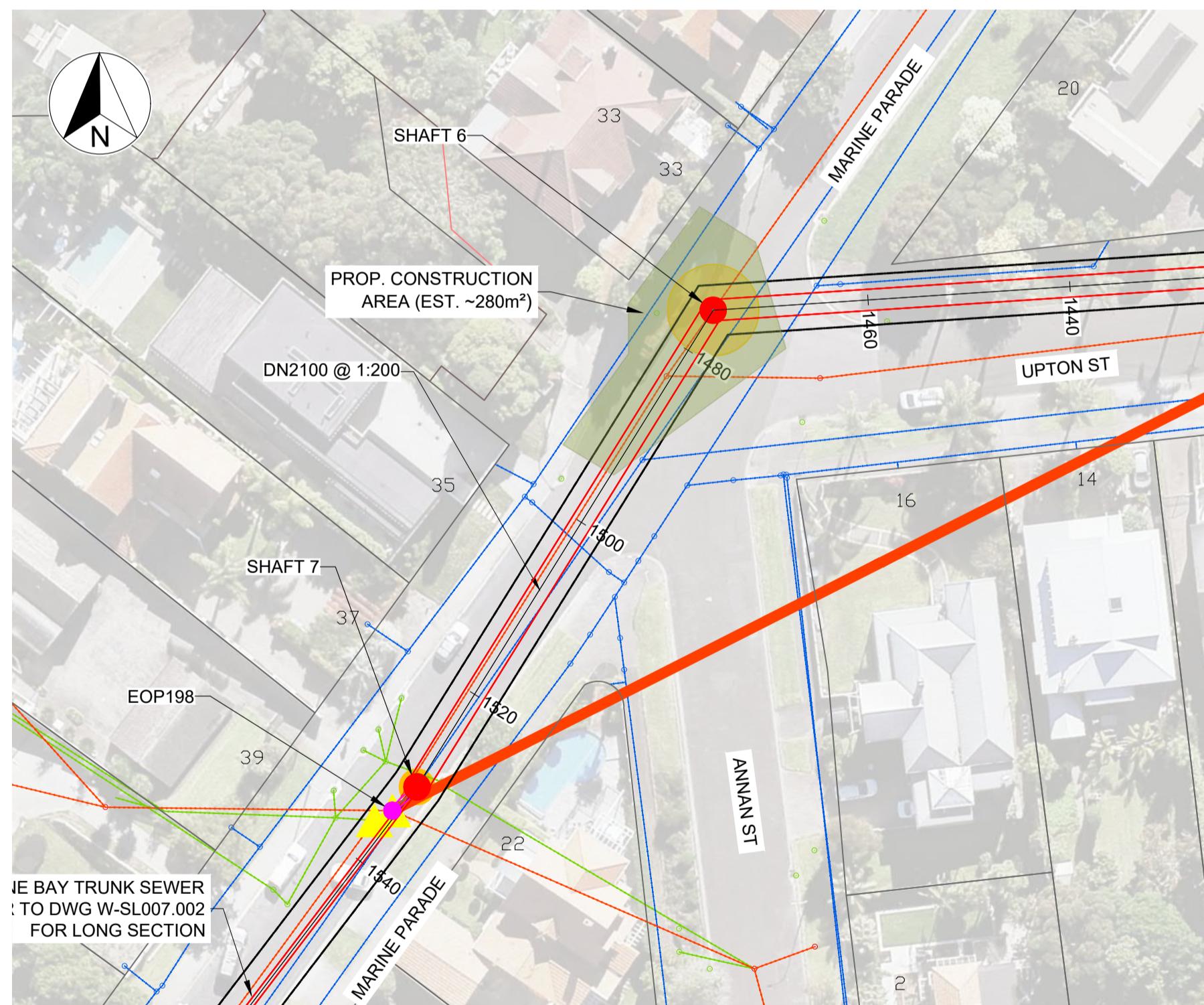
SHAFT 3 LOCATION

SCALE 1:500 @ A1



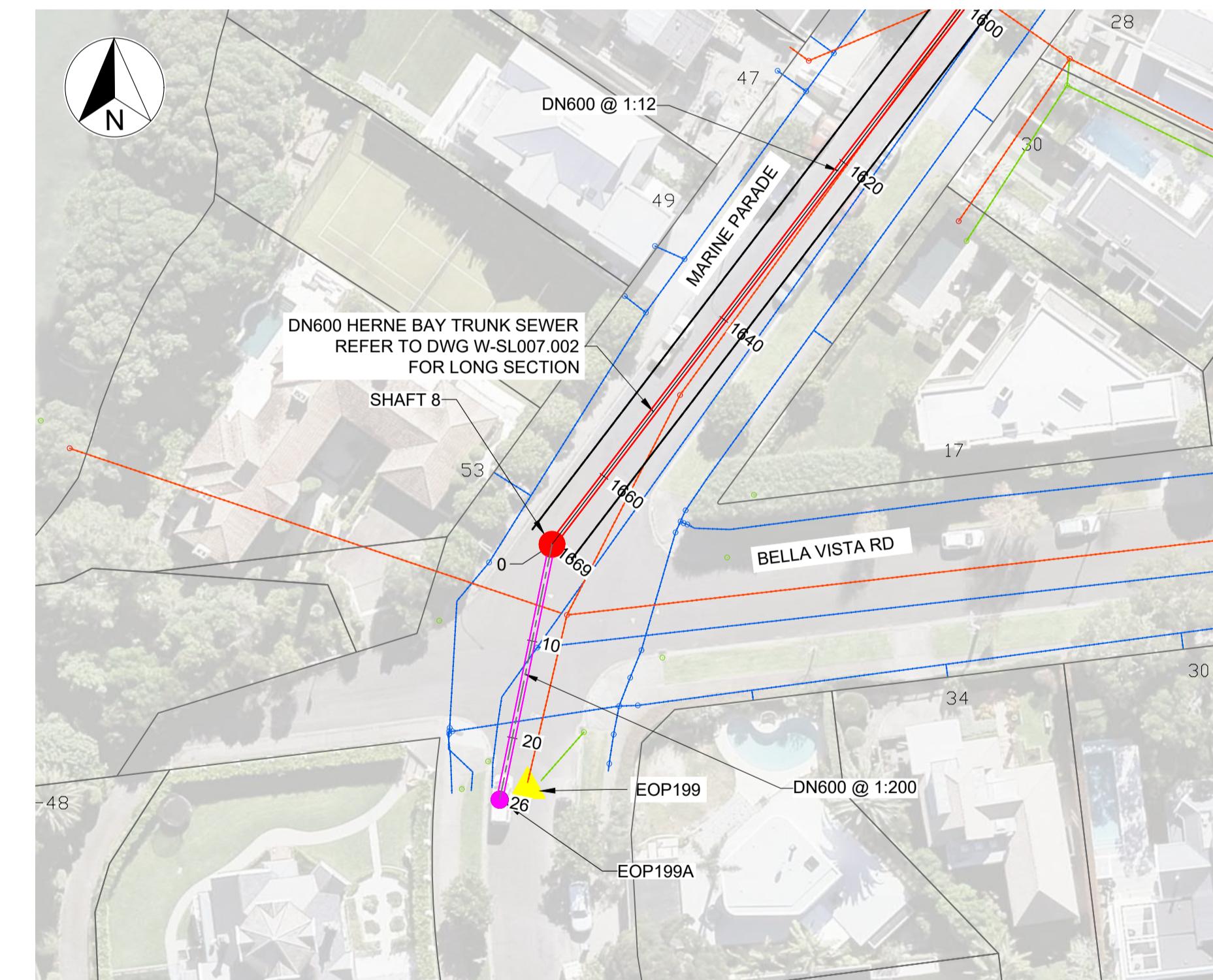
SHAFT 4 & 5 LOCATION

SCALE 1:500 @ A1



SHAFT 6 & 7 LOCATION

SCALE 1:500 @ A1



SHAFT 8 LOCATION

SCALE 1:500 @ A1

NOTES:

- REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION
- COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
- LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
- DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION.
- DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
- NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
- TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT.

1:500 @ A1 1:1000 @ A3 0 5 10 15 20 25 30 35 40 45 50 m

KEY:	
PARCEL BOUNDARY	
EXISTING WATER SUPPLY	
EXISTING LOCAL SEWER	
EXISTING TRANSMISSION SEWER	
EXISTING STORMWATER	
EXISTING GROUND PROFILE	
EXISTING EOP	
PROPOSED LOCAL SEWER	
PROPOSED TUNNEL SEWER	
PROPOSED SEWER MANHOLE	
PROPOSED SHAFT	
PROPOSED HERITAGE BUILDING	
PROPOSED NOTABLE TREE	
TUNNEL 2.5m WIDE CORRIDOR	
PROPOSED CONSTRUCTION AREA	

			DESIGNED	G.JP	02-23
			DES. APPROVED	C.STOKES	02-23
			DRAWN	G.JP	02-23
			DWG. APPROVED	M.KUDIC	02-23
			WSL DESIGN MGMT	B.DEVILLIERS	-
			WSL PROJ. LEAD	-	-
1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	GI	MK	BY APPD.
ISSUE DATE		AMENDMENT	BY	APPD.	DATE

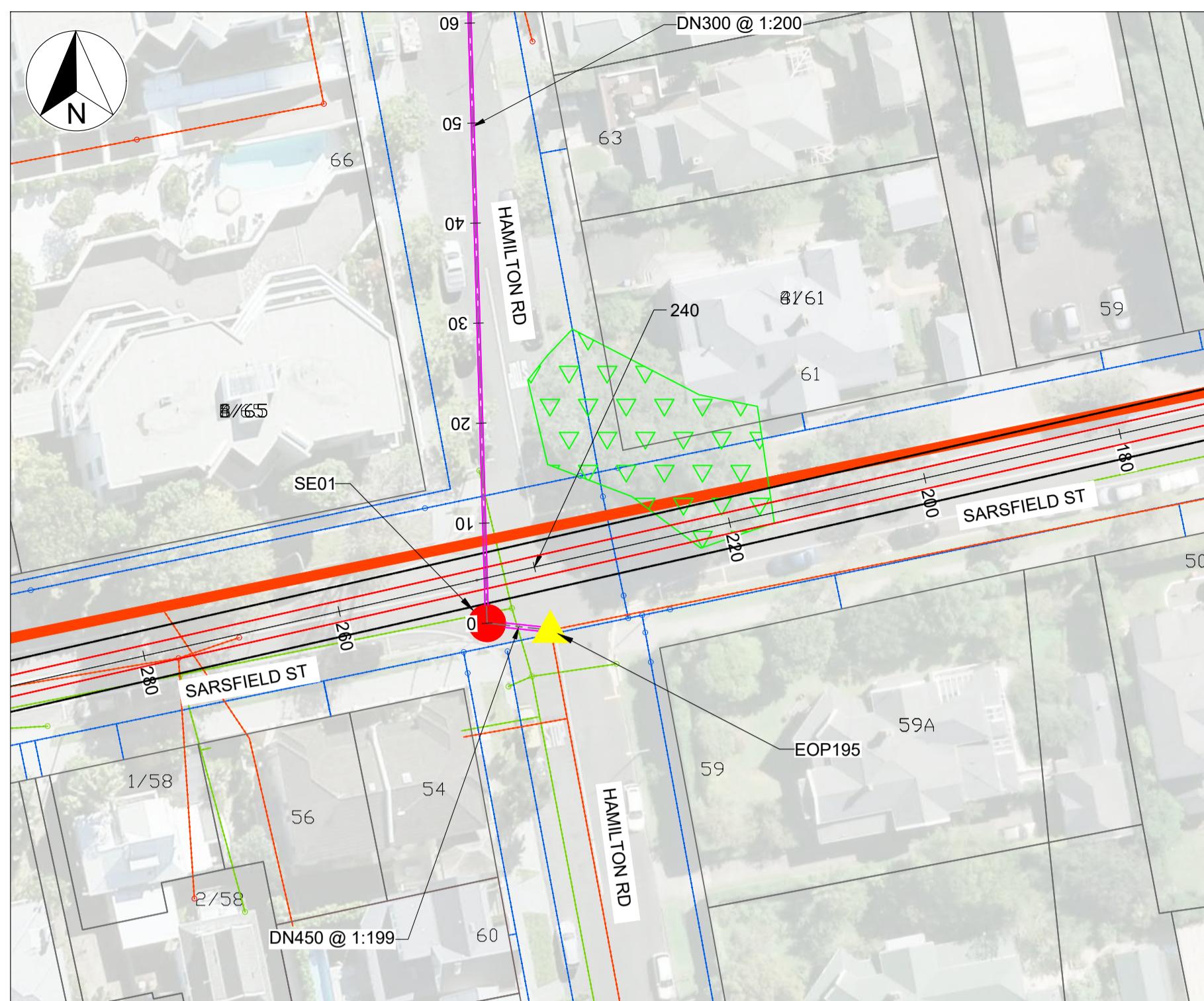


COPYRIGHT - This drawing, the design concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

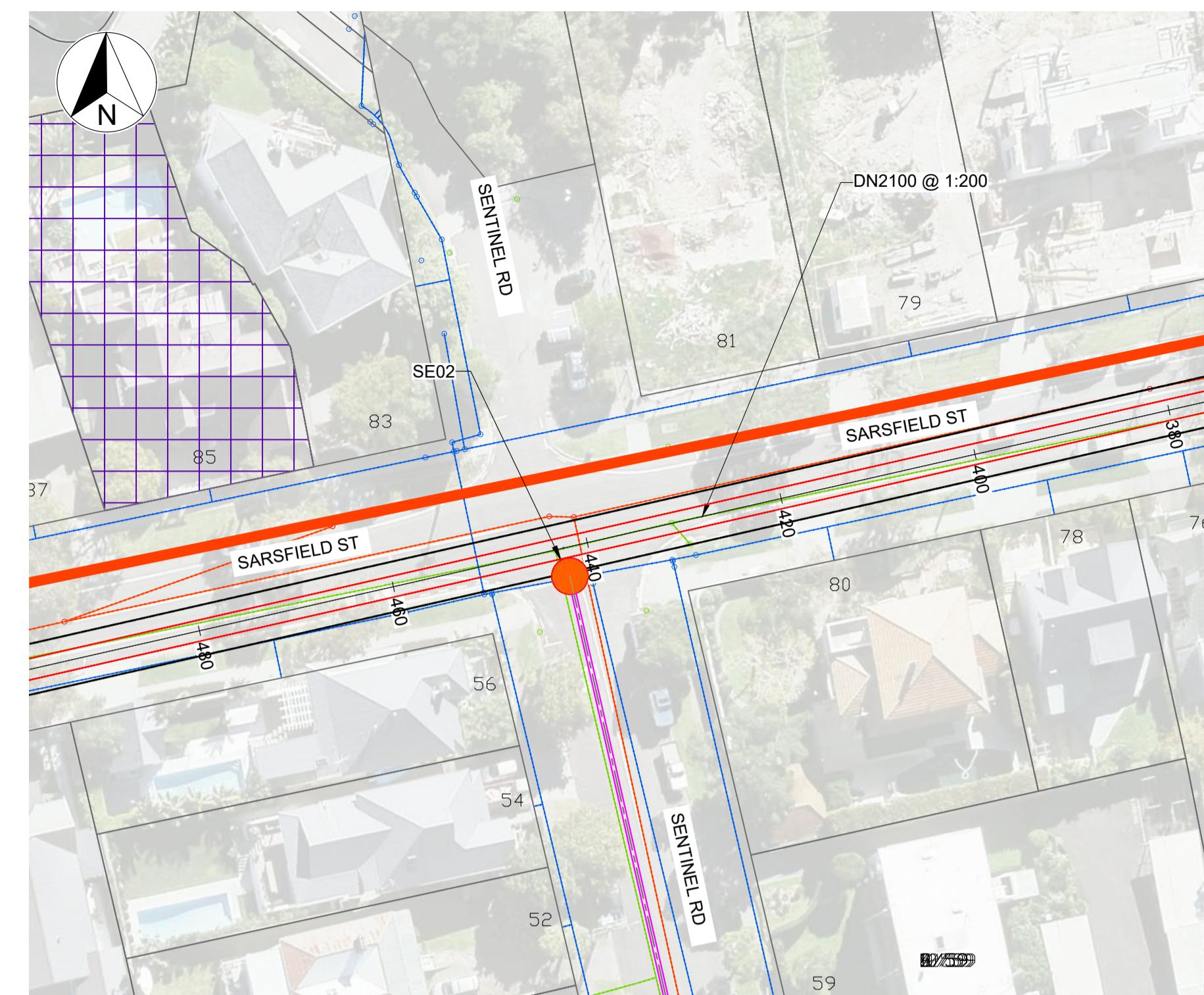
HERNE BAY TRUNK SEWER UPGRADE
HAMILTON ROAD, HERNE BAY
CONSTRUCTION PLAN – TUNNEL SHAFT LOCATIONS

DRAFT

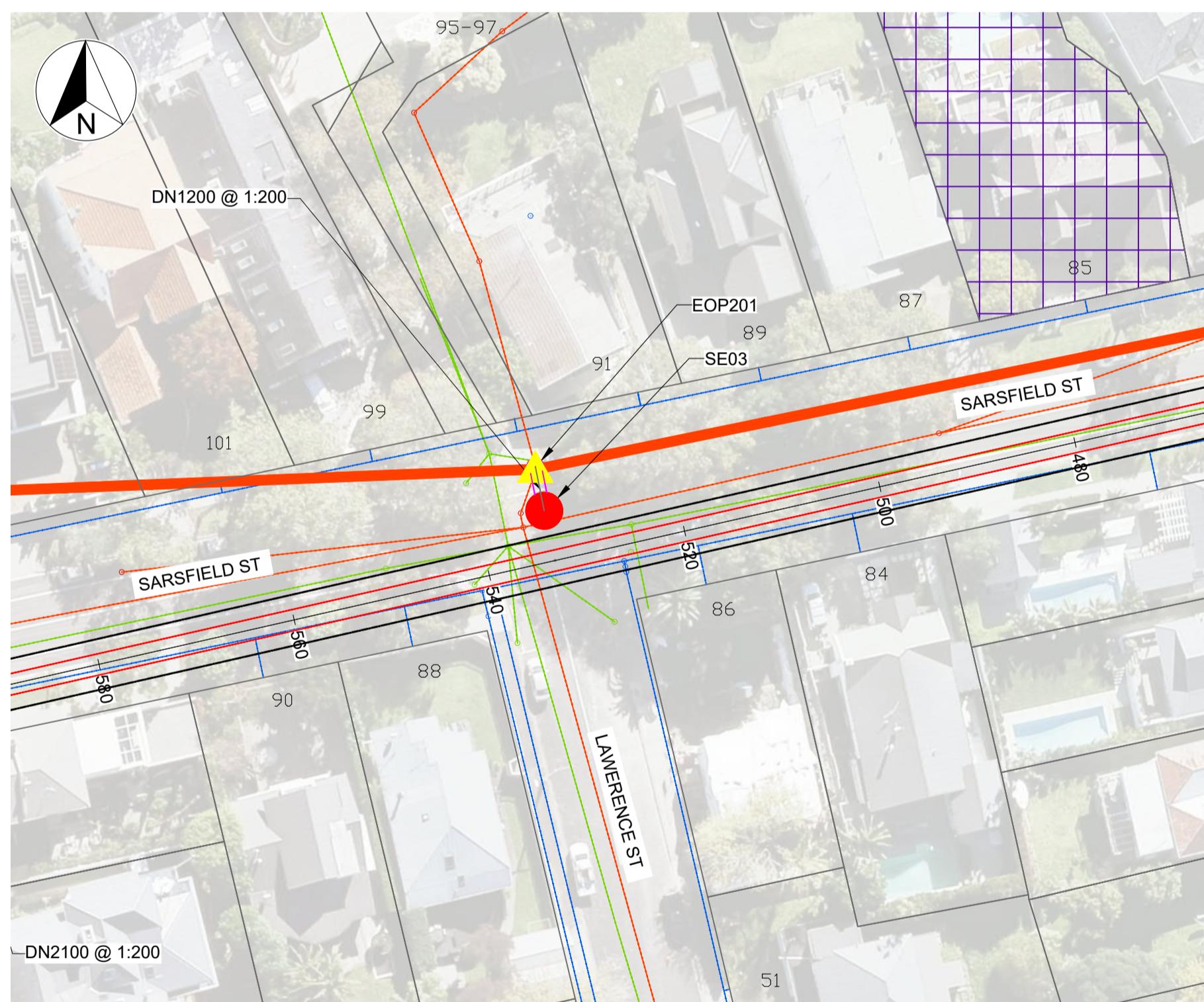
CAD FILE W-SL007.007	DATE 16-02-2023
ORIGINAL SCALE A1 1:2000	CONTRACT No. 1
REF. No. W-SL007.01	
DWG. No. W-SL007.007	ISSUE 1



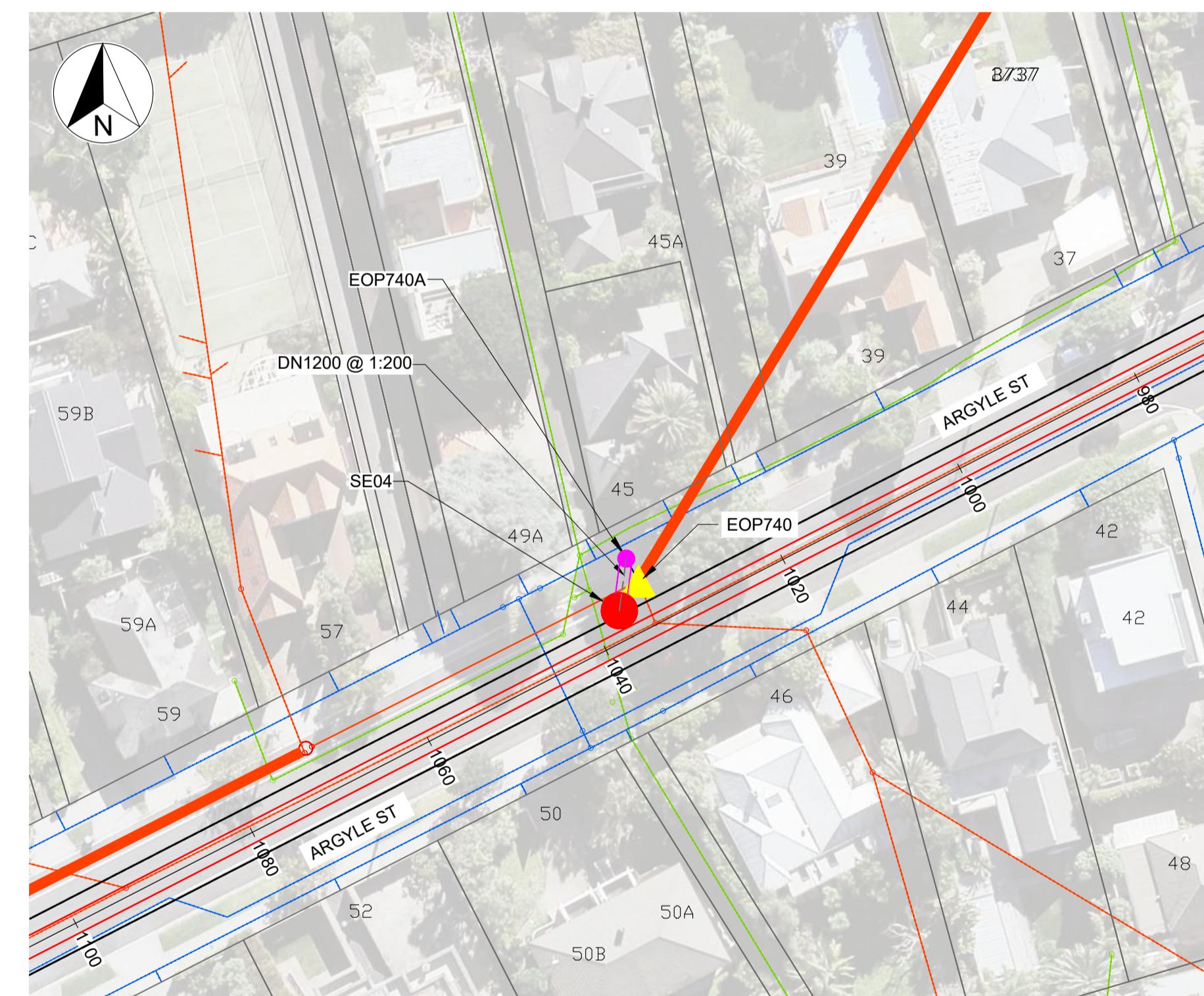
SHAFT SE01
SCALE 1:500 @ A1



SHAFT SE02
SCALE 1:500 @ A1



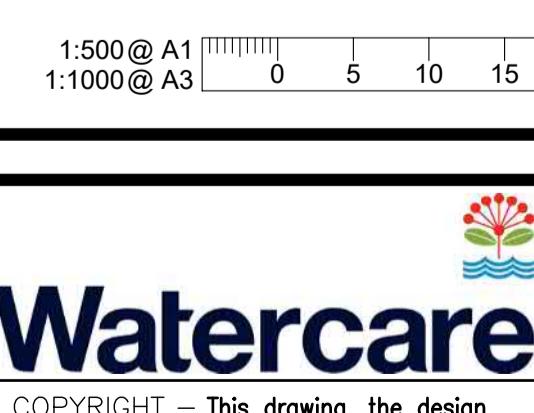
SHAFT SE03
SCALE 1:500 @ A1



SHAFT SE04
SCALE 1:500 @ A1

NOTES:

1. REFER TO SHEET W-SL007.002 FOR PROPOSED TRUNK SEWER LONG SECTION.
2. COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR 2000 CIRCUIT.
3. LEVELS ARE IN TERMS OF METRES AUCKLAND 1946 LOCAL VERTICAL DATUM.
4. DIMENSIONS / DISTANCE ARE IN METRES UNLESS STATED OTHERWISE.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES PRIOR TO CONSTRUCTION.
6. DESIGN AT CONCEPT STAGE AND SUBJECT TO CHANGE THROUGH DESIGN PROCESS.
7. NO SURVEY OF THE EXISTING UTILITIES AND FEATURES HAVE BEEN CARRIED OUT.
8. TUNNEL ALIGNMENT SHOWN WITH 2.5m WIDE CORRIDOR EITHER SIDE OF PROPOSED ALIGNMENT.



DESIGNED G.I.P 02-23
DES. APPROVED C.STOKES 02-23
DRAWN G.I.P 02-23
DWG. APPROVED M.KUDIC 02-23
WSL DESIGN MGMT B.DEVILLIERS -
WSL PROJ. LEAD - -
BY APPD. BY DATE

1:500 @ A1 1:1000 @ A3 0 5 10 15 20 25 30 35 40 45 50 m

KEY:	
PARCEL BOUNDARY	
EXISTING WATER SUPPLY	
EXISTING LOCAL SEWER	
EXISTING TRANSMISSION SEWER	
EXISTING STORMWATER	
EXISTING GROUND PROFILE	
EXISTING EOP	
PROPOSED LOCAL SEWER	
PROPOSED TUNNEL SEWER	
PROPOSED SEWER MANHOLE	
PROPOSED SHAFT	
PROPOSED HERITAGE BUILDING	
PROPOSED NOTABLE TREE	
TUNNEL 2.5m WIDE CORRIDOR	
PROPOSED CONSTRUCTION AREA	

1	16.02.23	DRAFT ISSUED FOR CONSENT APPLICATION	G1	MK	DESIGNED	G.I.P	02-23
					DES. APPROVED	C.STOKES	02-23
					DRAWN	G.I.P	02-23
					DWG. APPROVED	M.KUDIC	02-23

ISSUE DATE	AMENDMENT	BY APPD.	BY	DATE
------------	-----------	----------	----	------

HERNE BAY TRUNK SEWER UPGRADE
HAMILTON ROAD, HERNE BAY
CONSTRUCTION PLAN – INTERCEPTION SHAFT LOCATIONS

DRAFT

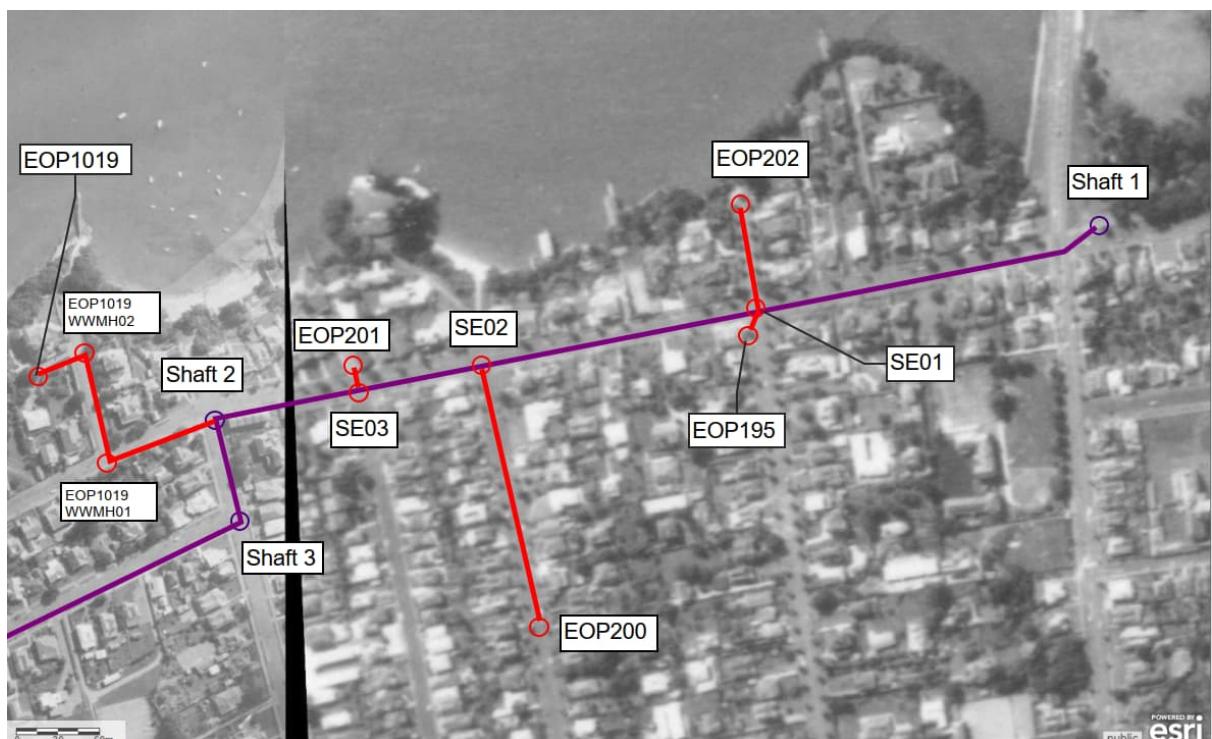
CAD FILE W-SL007	DATE 16-02-2023
ORIGINAL SCALE A1 1:2000	CONTRACT No. 1
REF. No. W-SL007.01	
DWG. No. W-SL007.008	ISSUE 1

Appendix B Aerial photographs

B1 Aerial photography for Shafts 1 – 3, alignment and connecting pipes



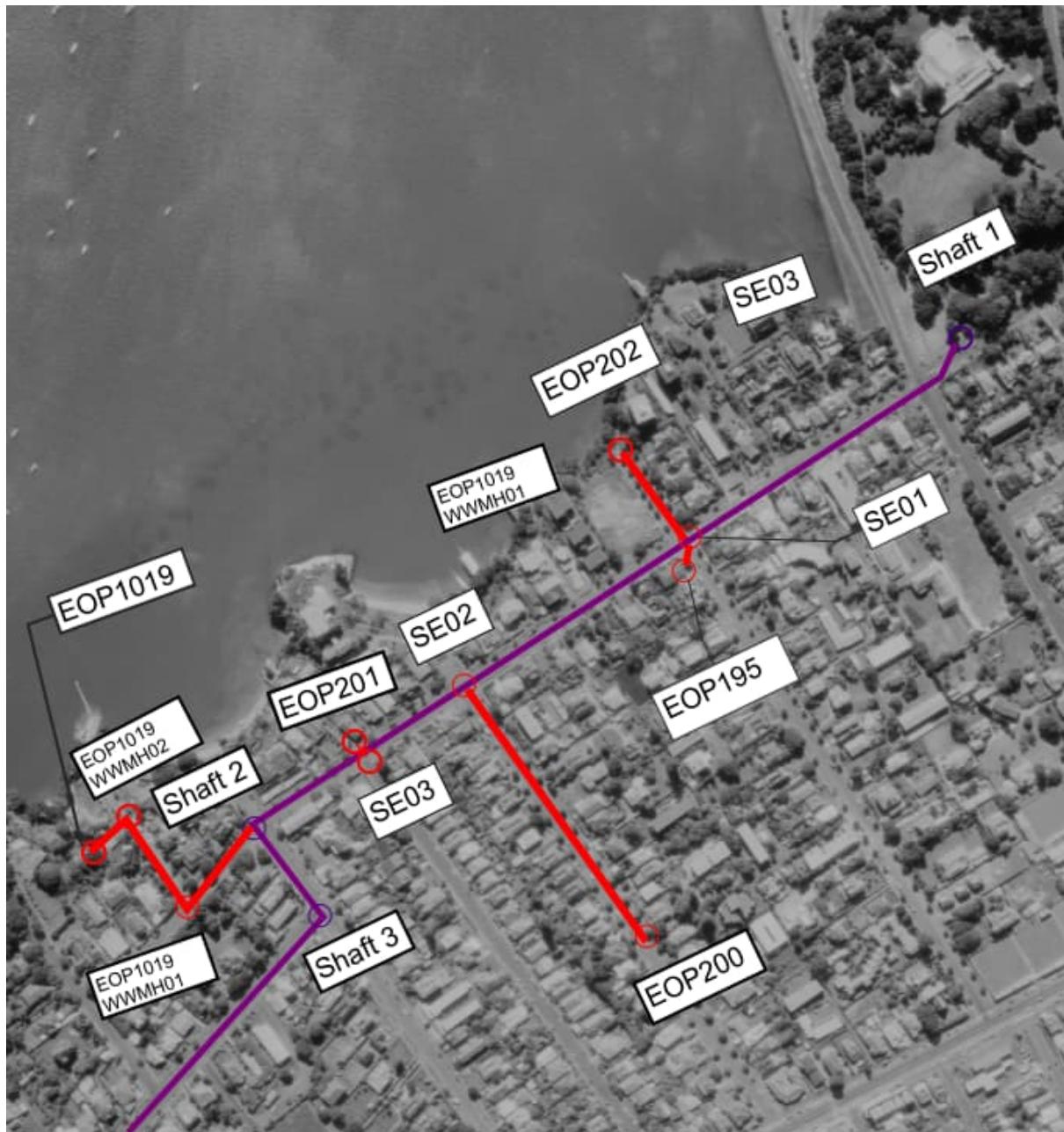
Photograph Appendix B.1: 1940 Aerial photograph (Source: Auckland Council Geomaps)



Photograph Appendix B.2: 1959 Aerial photograph (Source: Auckland Council Geomaps)



Photograph Appendix B.3: 1972 Aerial photograph (Source: Retrolens (SN3552 Run 4600 Picture 9))



Photograph Appendix B.4: 1986 Aerial photograph (Source: Retrolens SN8653 Run T Picture 12)



Photograph Appendix B.5: 2001 Aerial photograph (Source: Auckland Council Geomaps)



Photograph Appendix B.6: 2017 Aerial photograph (Source: Auckland Council Geomaps)

B2 Aerial photography for Shafts 4 - 8, alignment and connecting pipes



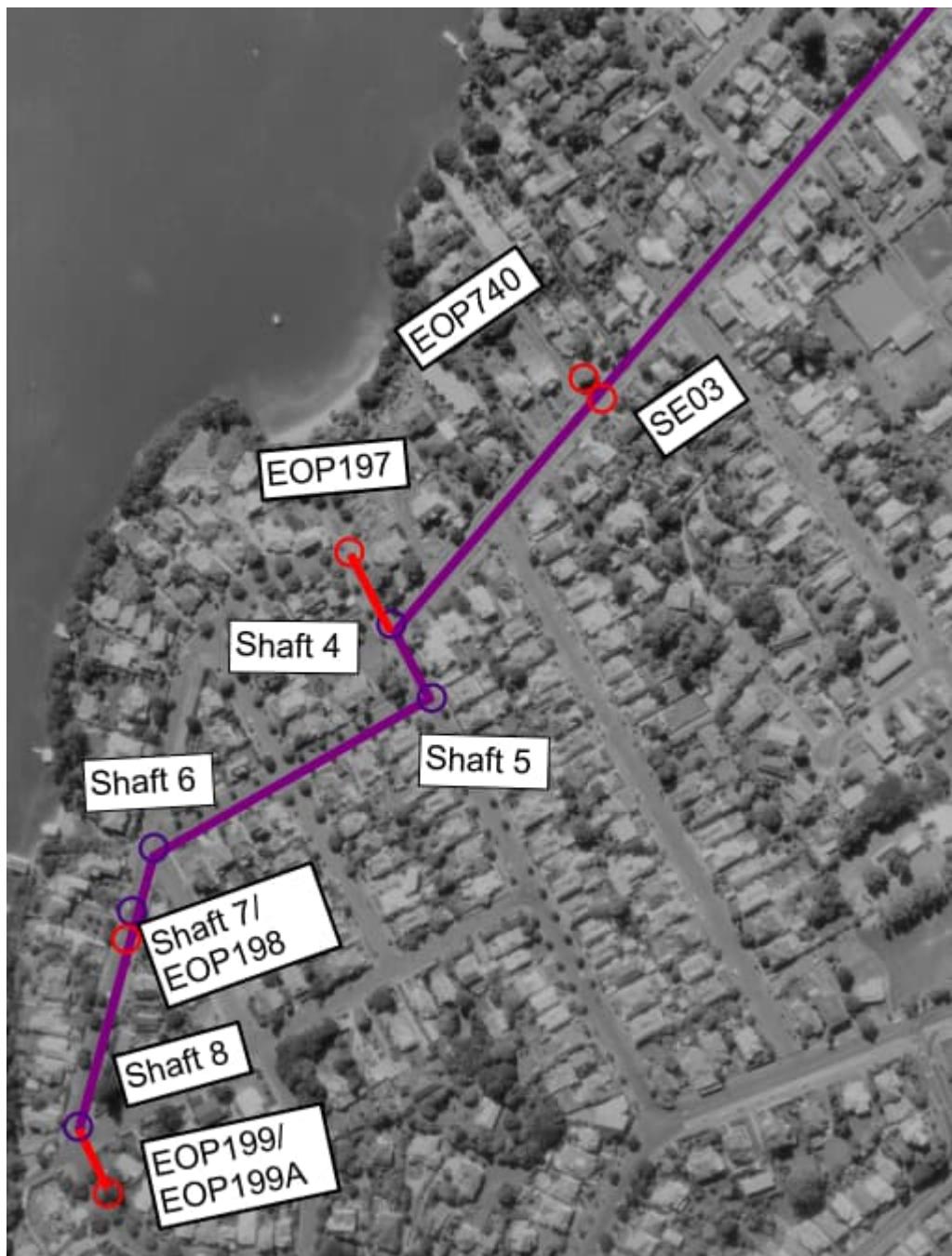
Photograph Appendix B.7: 1940 Aerial photograph (Source: Auckland Council Geomaps)



Photograph Appendix B.8: 1959 Aerial photograph (Source: Auckland Council Geomaps)



Photograph Appendix B.9: 1972 Aerial photograph (Source: Retrolens (SN3552 Run 4600 Picture 9))



Photograph Appendix B.10: 1986 Aerial photograph (Source: Retrolens SN8653 Run T Picture 12)



Photograph Appendix B.11: 2001 Aerial photograph (Source: Auckland Council Geomaps)



Photograph Appendix B.12: 2017 Aerial photograph (Source: Auckland Council Geomaps)

B3 CSA1



Photograph Appendix B.13: 1940 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Auckland Council)



Photograph Appendix B.14: 1959 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Auckland Council)



Photograph Appendix B.15: 1972 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: RetrolensSN3552 Run 4600 Picture 9)



Photograph Appendix B.16: 1986 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: RetrolensSN8652 Run T Picture 12)

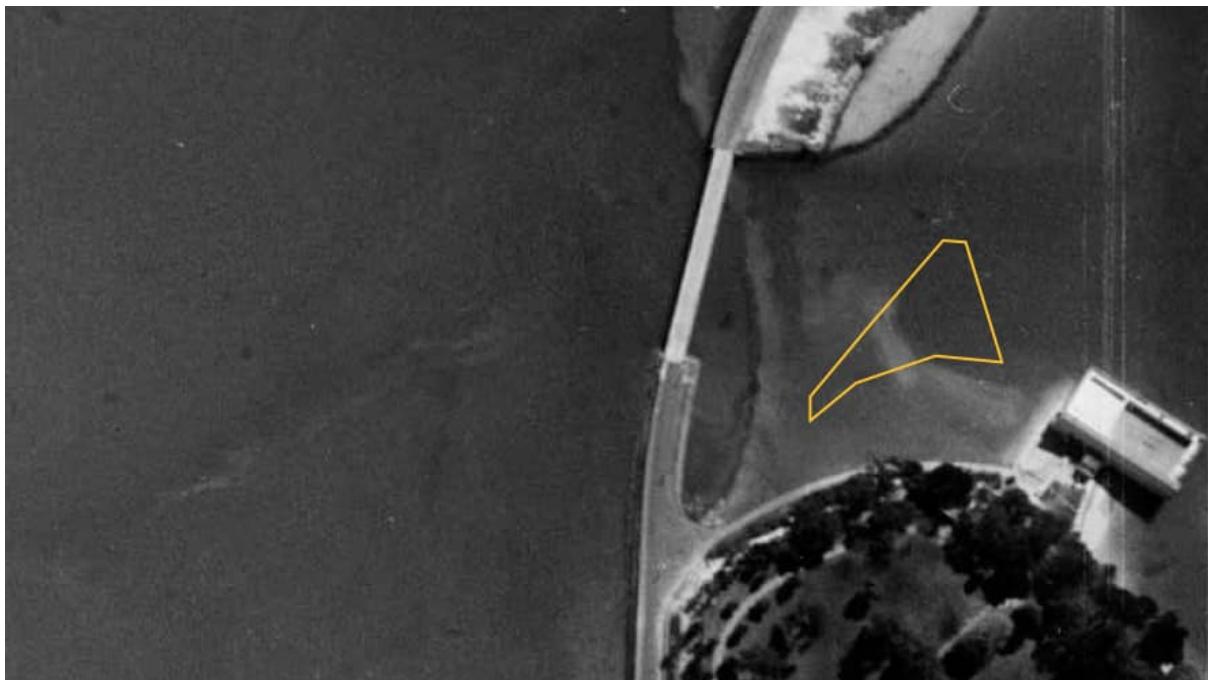


Photograph Appendix B.17: 2001 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Auckland Council)



Photograph Appendix B.18: 2017Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Auckland Council)

B4 CSA2



Photograph Appendix B.19: 1950 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Retrolens)



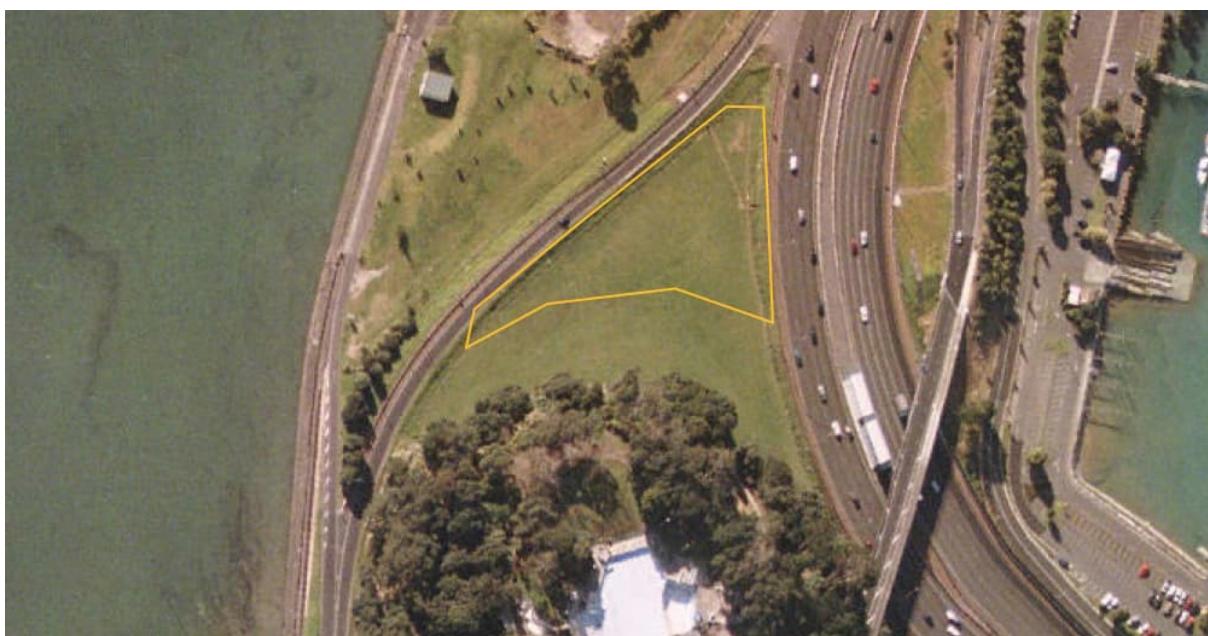
Photograph Appendix B.20: 1959 Aerial photograph with CSA2 Option 1 outlined in yellow (Source: Auckland Council)



Photograph Appendix B.21: 1970 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Retrolens)



Photograph Appendix B.22: 1981 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Retrolens)



Photograph Appendix B.23: 2001 Aerial photograph with adjacent tunnel allignment in red and CSA1 outlined in yellow (Source: Auckland Council)



Photograph Appendix B.24: 2011 Aerial photograph with adjacent tunnel alignment in red and CSA1 outlined in yellow (Source: Auckland Council)



Photograph Appendix B.25: 2017 Aerial photograph with adjacent tunnel alignment in red and CSA1 outlined in yellow (Source: Auckland Council)

Appendix C Council contamination enquiry

15 February 2023

Tonkin & Taylor Limited
PO Box 5271
AUCKLAND 1141

Attention: Xiao Jin

Dear Xiao

Site Contamination Enquiry – Herne Bay Tunnel

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

<https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx>.

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

Council's records indicate the following sites have possibly been subject to activities that fall within the HAIL:

- 2 Argyle Street
- 18 Cremorne Street
- 80 Curran Street

Please see the tab 'Property Notes From SAP' within Attachment A for more information.

Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information

The Council database was searched for records of the following activities within the specified search area:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

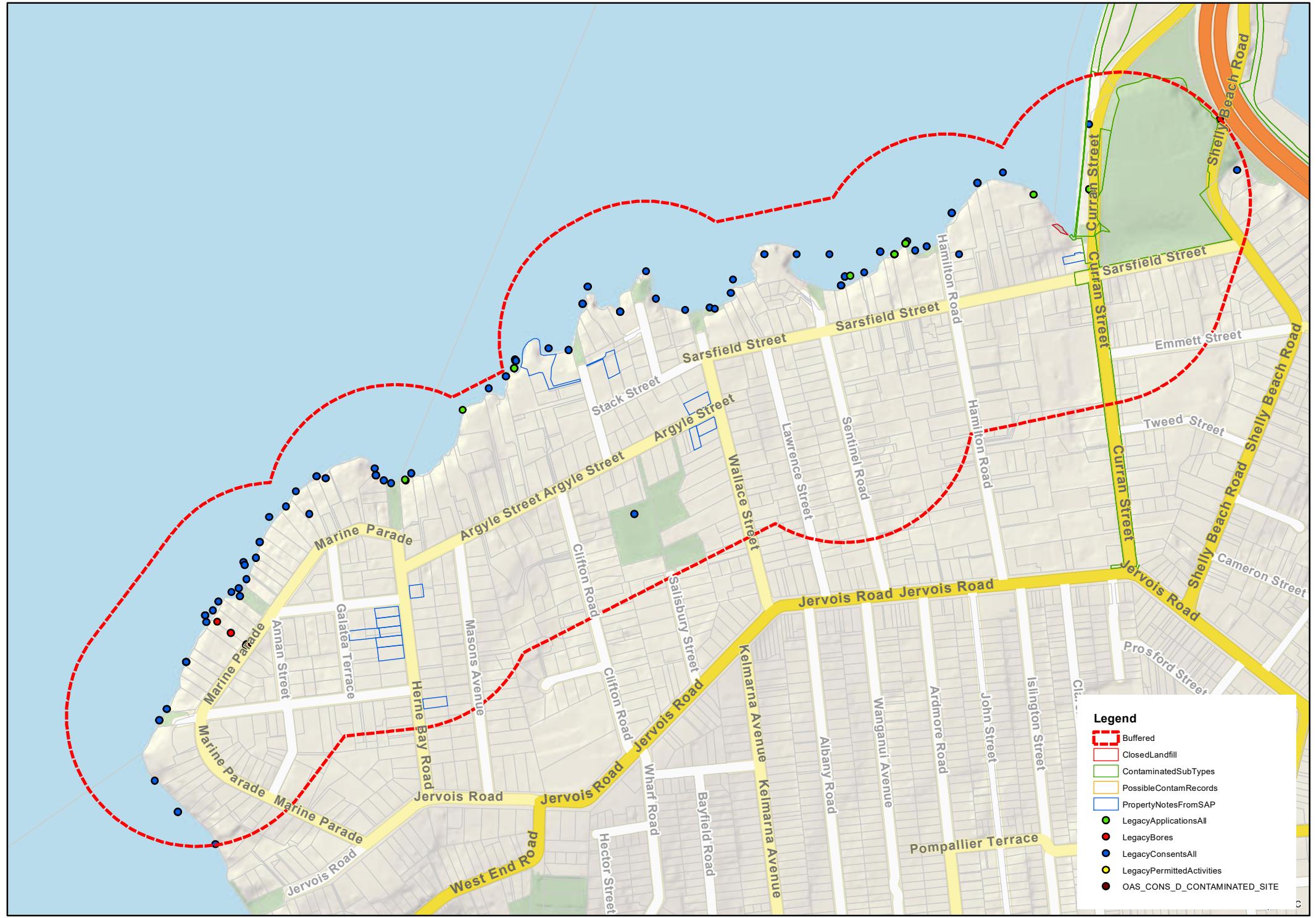
If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for \$228 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

**Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council**



17 January 2023

Tonkin & Taylor Limited
PO Box 5271
AUCKLAND 1141

Attention: Xiao Jin

Dear Xiao

Site Contamination Enquiry – Part Salisbury Reserve, Herne Bay

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

<https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx>

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

Council's records indicate this site has possibly been subject to the following activity that fall within the HAIL:

- HAIL Item (A.10) – Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds.

Council records indicate consent was granted in 1958 for a bowling pavilion.

Due to the age of the buildings on site the potential for asbestos and/or lead paint may need to be considered.

Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities
- Identified HAIL activities

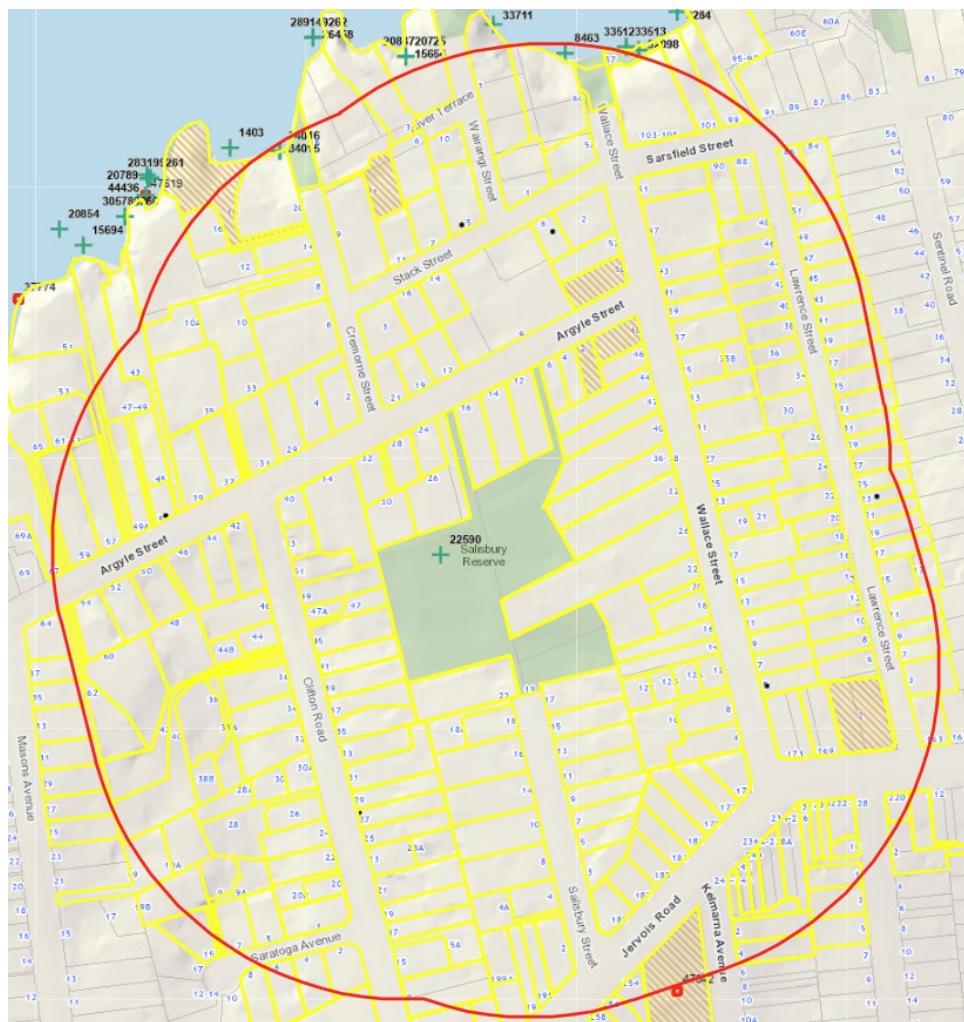


Figure 1: Selected Consents, Incidents and HAIL activities within approximately 200m of the subject site

Legend:

All Consents 	Closed Landfill (Auckland Council owned) 
All Applications 	Closed Landfill (Privately owned) 
All Permitted Activities 	All Incidents 
All Bores 	HAIL activities 

Relevant details of any pollution incidents and consents and HAIL activities are appended to this letter (Attachment A). Please refer to the column titled 'Property Address' on the spreadsheet to aid in identifying corresponding data on the map.

For any identified HAIL sites, please refer to the tab "HAIL activities" for more information (Column C and D include HAIL activity details where these are available).

Please note:

The HAIL activity hatching in Figure 1 only reflects whether a site has been identified as a HAIL site (both verified and non-verified) by the Council and the type of HAIL associated with the site. This does not confirm whether the site has been formally investigated or the contamination status of the property (e.g. contaminated, remediated etc.). Additionally, due to limitations within Council's records, the specific HAIL activity is not included in the data for all properties. For further information on any of these known HAIL sites, a subsequent site contamination enquiry can be lodged for the specific property (up to 5 adjacent properties can be covered in one request).

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for \$228 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

**Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council**

15 February 2023

Tonkin & Taylor Limited
PO Box 5271
AUCKLAND 1141

Attention: Xiao Jin

Dear Xiao

Site Contamination Enquiry – 94B Shelly Beach Road, Ponsonby

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

<https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx>

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

Council's records indicate this site has possibly been subject to the following activity that fall within the HAIL:

- HAIL Item (G.5) - Waste disposal to land (excluding where biosolids have been used as soil conditioners)

Council records indicate the site was subject to reclamation in the 1950s. A soil sample undertaken in 2017 indicated heavy metals above background levels, low levels of PAHs and the presence of asbestos in fill material.

Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities
- Identified HAIL activities

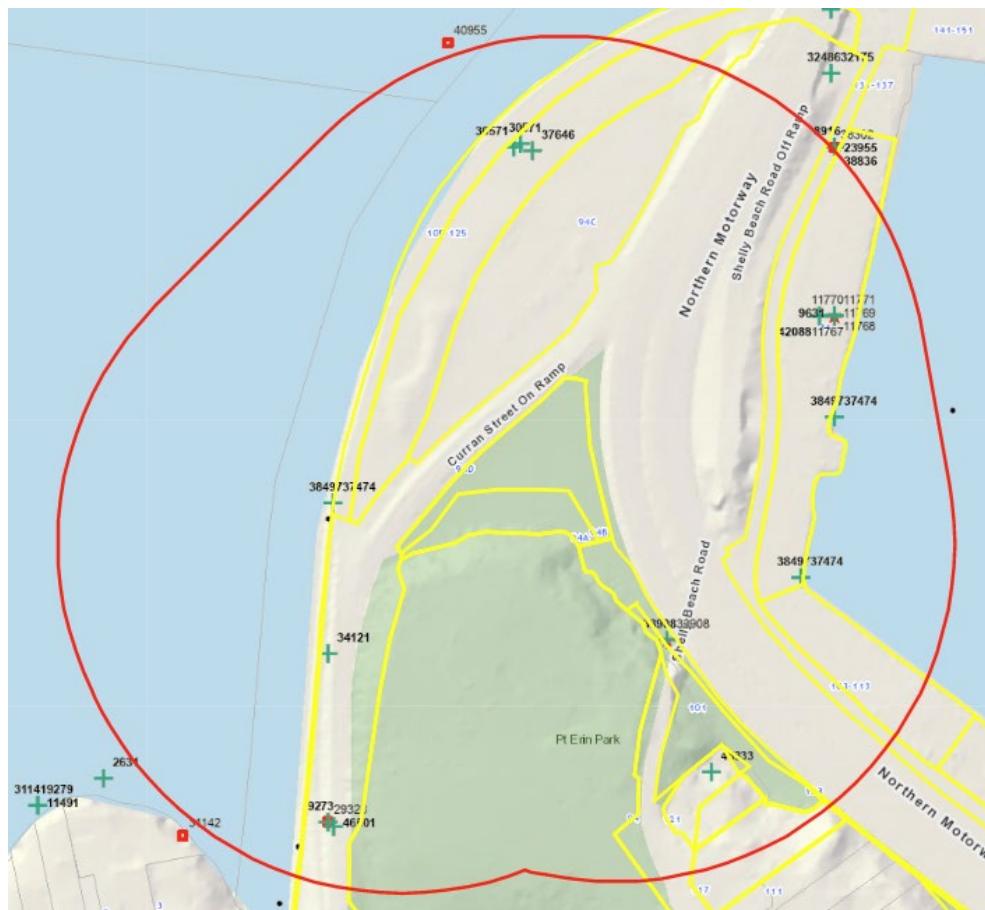


Figure 1: Selected Consents, Incidents and HAIL activities within approximately 200m of the subject site

Legend:

All Consents		Closed Landfill (Auckland Council owned)	
All Applications		Closed Landfill (Privately owned)	
All Permitted Activities		All Incidents	
All Bores		HAIL activities	

Relevant details of any pollution incidents and consents and HAIL activities are appended to this letter (Attachment A). Please refer to the column titled 'Property Address' on the spreadsheet to aid in identifying corresponding data on the map.

For any identified HAIL sites, please refer to the tab "HAIL activities" for more information (Column C and D include HAIL activity details where these are available).

Please note:

The HAIL activity hatching in Figure 1 only reflects whether a site has been identified as a HAIL site (both verified and non-verified) by the Council and the type of HAIL associated with the site. This does not confirm whether the site has been formally investigated or the contamination status of the property (e.g. contaminated, remediated etc.). Additionally, due to limitations within Council's records, the specific HAIL activity is not included in the data for all properties. For further information on any of these known HAIL sites, a subsequent site contamination enquiry can be lodged for the specific property (up to 5 adjacent properties can be covered in one request).

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for \$228 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

**Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council**

www.tonkintaylor.co.nz