ENGINEERING SERVICES REPORT

FOR THE

PROPOSED RESIDENTIAL DEVELOPMENT

ON

ERVEN R/2958, R/2224 & R/8343, HOUT BAY

Prepared for:

OAKHURST LIFESTYLE ESTATE (PTY) LTD

Prepared by:

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1. TERMS OF REFERENCE

EKCON (Pty) Ltd has been appointed by Oakhurst Lifestyle Estate (Pty) Ltd to investigate and report on the effect of the proposed consolidation and rezoning, of a portion of erf 2958 (2.629ha), a portion of erf R/2224 (77.9524ha) and a portion of erf R/8343 (0.199ha), Houtbay on the surrounding civil engineering services infrastructure.

2. CONSOLIDATION AND REZONING

Erf R/2958 is currently zoned as Single Residential Zone 1 Conventional Housing (SR1). Erf R/2224 has split zoning, Single Residential 1 Zoning 1 Conventional Housing (SR1) from the northern boundary of the property southwards up to the 152-m contour and Rural Zoning (RU) from the 152-m contour southwards. Erf R/8343 has been zoned subdivisional area for single residential and private road, Single Residential Zone 1, and private open space, Open Space Zone 3. Once the consolidation is completed and a new erf is formed the proposed development site will be re-zoned to subdivisional area overlay, comprising Community Zoning 2: Regional (CO2) and Open Space Zoning: Special Open Space Zone 3. It should be noted that the area of the development site set aside for the future High-Level Road and excluded from any physical development, is not being rezoned here to any of the above-mentioned zonings, and will retain its present zoning of Single Residential Zoning 1: Conventional Housing (SR1). Refer to Figure 1 for the existing zoning as per city of Cape Town Map Viewer access on 2022-02-16.

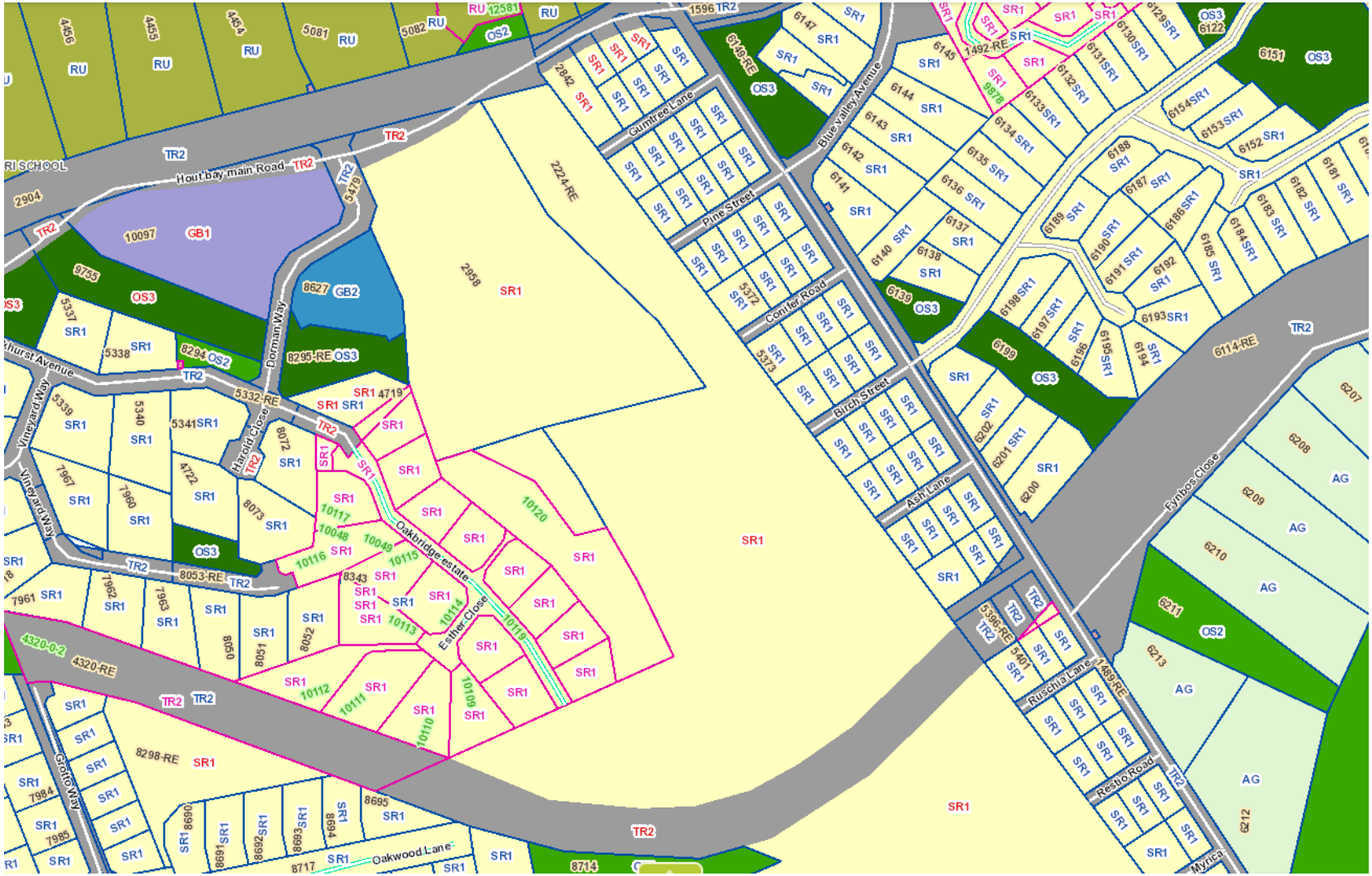


FIGURE 1: EXISTING SINGLE RESIDENTIAL ZONING (SR1) OF ERVEN 2958 AND R/2224 –

SOURCE CITY OF CAPE TOWN MAP VIEWER ACCES 2022-02-16

3. SITE LOCATION AND EXISTING CONDITIONS

3.1 LOCATION

The site is on the western slopes of the Constantia Mountain Range stretching southward between the Vlakkenberg (east) and Skoorsteenkop (west) mountain peaks, south of Hout Bay Main Road.

The Bokkemanskloof River flows in a north westerly direction through the proposed development site.

The development site is bound to the north by Hout Bay Road, the south by erf R/2444 (after consolidation) and to the east by single residential homes and secondary roads leading off Blue Valley Avenue. The development site straddles the Bokkemanskloof River to the west and is further bound by the Oakbridge Estate on Erf 10049.

The proposed development site is in the jurisdiction of the City of Cape Town's South Peninsula Administration.

Figure 2 shows the location of the proposed development site.

3.2 TOPOGRAPHY

The development site slopes in a north westerly direction at 16% for the south-eastern portion of the site and flattening to 10% at the northern westerly portion of the site. The development site has an elevation drop of 52m from the south-eastern corner to the north-western corner along Hout Bay Main Road.

3.3 EXISTING CONDITIONS AND STRUCTURES

The portion of erf R/2224 which will form part of the proposed development accommodates four structures, a dwelling house, former labourer's cottage, former stable building as well as the Old Dairy building. The first three buildings will be demolished, while the Old Dairy building will be retained and repurposed.

The portion of erf R/2958 and R/8343 which will form part of the proposed development do not accommodate any buildings. There is however an existing farmer's dam located at the south-eastern corner of erf R/8343, which will be upgraded as part of the future stormwater infrastructure. The remainder of erven comprise open veld areas with some large trees.

FIGURE 2: LOCALITY PLAN OF ERF R/2958 AND ERF R/2224, OAKHURST LIFESTYLE ESTATE, HOUT BAY

3.4 EXISTING SERVICES AT AND NEAR THE DEVELOPMENT SITE

3.4.1 EXISTING SERVICES AT THE DEVELOPMENT SITE

Refer to drawing P3126-C-001.

A survey conducted in December 2021, shows that there is a 160mm dia foul sewer pipeline located along the north-eastern boundary flowing in a northly direction towards Hout Bay Main Road. The foul sewer collects runoff from residential houses off Blue Valley Avenue. The foul sewer is located within a 3m servitude.

3.4.2 EXISTING WATER INFRASTRUCTURE NEAR THE DEVELOPMENT SITE

Refer to drawing P3126-C-900.

To the east there are existing water mains located along each of the side streets (Gumtree, Pine, Conifer, Birch, Ash, Restio, Myrica, Saffron) branching perpendicular off Blue Valley Avenue. There are 2 water mains located along Blue Valley Avenue.

To the north there are 3 existing water mains located along Hout Bay Main Road namely, 150mm, 160mm and 300mm diameters.

To the west there is an existing 110mm diameter water main network located along Dorman Way, Oakwood Close, River Walk and Whittlers Way.

To the southwest there is an existing 110mm diameter water main network located along Grotto Way, Oakhurst Avenue, Greenacres and Whittlers Way.

To the south is an existing 600mm diameter bulk water supply line located within a services servitude.

3.4.3 EXISTING FOUL SEWER SERVICES NEAR THE DEVELOPMENT SITE

Refer to drawing P3126-C-700.

To the northwest there is an existing 160mm diameter sewer line servicing erf 8627 which flows in a north westerly direction towards the Oakhurst Farm Stall development on erf 10097.

It should be noted that for the council approved Oakbridge Estate Development on erf 10049 a 160mm diameter foul sewer network is proposed along the eastern boundary of the Oak bridge development flowing in northerly direction.

Along the eastern boundary of the development site, various 110mm diameter foul sewer lines connect to the existing 160mm diameter pipe as mentioned in Section 3.4.1

3.4.4 EXISTING ROAD INFRASTRUCTURE NEAR THE DEVELOPMENT SITE

Refer to drawing P3126-C-300.

Blue Valley Avenue is located parallel to the eastern boundary of the development site. Several side streets (Gumtree, Pine, Conifer, Birch, Ash, Restio, Myrica, Saffron) branch perpendicular to the west from Blue Valley Avenue and terminate on the eastern boundary of erf R/2224. Blue Valley Avenue and all side streets are categorised as Class 5: Local Streets.

Dorman Way and Oakhurst Avenue is located northwest of the development and will provide access to Hout Bay Main Road. Oakhurst Avenue which will be extended southward as a private road with the development of Oakbridge Estate over Erf 10119 will terminate on the north-western boundary of the development site.

Hout Bay Main Road is located to the north of the development site and is categorised as a Class 3 Minor Arterial Road.

3.4.5 EXISTING STORMWATER INFRASTRUCTURE AND FEATURES NEAR AND AT THE DEVELOPMENT SITE

INFRASTRUCTURE NEAR THE DEVELOPMENT SITE

Refer to Stormwater Management Plan by Graeme McGill Consulting, *OAKHURST LIFESTYLE ESTATE, ERVEN R/2958 & RE-2224, HOUT BAY dated 2021-12-14*...

To the east, there is an existing stormwater pipe network in Blue Valley Avenue conveying runoff in a northerly direction towards Hout Bay Main Road and discharging in the Disa River.

To the north, there is an existing roadside kerb and gutter in Hout Bay Main Road collecting sheet flow from erven R/2958 and R/2224. The runoff is discharged in a south-westerly direction towards the Bokkemanskloof River where it crosses Hout Bay Main Road.

To the west, there is an existing stormwater pipe network in Dorman Way conveying runoff in a northerly direction. The runoff is eventually discharged downstream of Hout Bay Main Road in the Bokkemanskloof River.

To the southwest, there is an existing stormwater pipe network discharging runoff from Oakwood Close and River Walk upstream of the development site into the Bokkemanskloof River.

INFRASTRUCTURE AND FEATURES AT THE DEVELOPMENT SITE

Refer to Stormwater Management Plan by Graeme McGill Consulting, *OAKHURST LIFESTYLE ESTATE, ERVEN R/2958 & RE-2224, HOUT BAY dated 2021-12-14.*..

The Bokkemanskloof River flows through the centre of RE-2224 from the mountainous region in the south. The Bokkemanskloof River intersects Erf R/2958 at the south-western property boundary, before continuing beneath Dorman Way and Main Road and on to the Disa River. A floodline study was done by Graeme McGill Consulting as part of the Stormwater Management Plan.

On erf R/2224 is an existing bridge opening consisting of 4 No. Ø900mm culverts with a length of 15m.

Further downstream at Dorman Way is an existing bridge opening, which consists of 1 No. 1,7m(W) x 1,8m(H) concrete box culvert spanning 18,5m.

At the downstream end of the development site, at Main Road, are two existing Ø300mm conduits crossing Main Road leading to an unlined earth channel which continues to Disa River.

The existing Ø300mm pipe discharges downstream of Main Road into an existing natural trapezoidal channel. The channel is overgrown with grass and reeds, with the outlet and inlet headwalls blocked with sediment.

There are 2 existing dams at the development site. Existing Dam 1 is positioned in the south-east corner of Erf R/2958. The current state of the dam is that it is overgrown with grass and shrubs. There is an existing vertical concrete wall along the southern edge of the dam, which is in a poor condition. Existing Dam 2 is positioned near the Old Dairy building on R/ 2224. The dam is surrounded by trees along the northern and eastern embankments with overgrown grass in the surroundings

<u>NATURAL STORMWATER FEATURES</u>

The Bokkemanskloof River flows through the development site along the western boundary. At the pipe track to the south, the upstream Bokkemanskloof River Catchment is 1,96km^2.

4. PROPOSED DEVELOPMENT

An SDP for the development site has been provided by Frankenfeld & King Architects. This report is based on Revision 13 dated 05-04-22. The unit number and capita numbers from the SDP for the Oakhurst Lifestyle Estate Development are summarised in Table 1.

TABLE 1: DEVELOPMENT UNITS AND CAPITA INFORMATION

Land use	Unit Type	Beds / area	Unit Capita	Unit Quantity	Total Units
Oakhurst Single Residential Units	1	3	5	18	29
	2	2	4	6	
	3	2	4	4	
	4	2	4	1	
Oakhurst Group Units - Type XYZ	X	2	4	12	36
	Y	2	3	12	
	Z	2	4	12	
Oakhurst Group Units - Type X1 Z1	X1	2	4	20	40
	Z1	2	4	20	
Oakhurst Care Units	A1	2	2	5	34
	A2	1	1	11	
	B1	1	1	8	
	B2	1	1	7	
	B3	1	1	2	
	B4	1	1	1	
Administration Building and Clubhouse	1	1300 m²			
Open Space	1	10 000m²			

Figures 3 shows the proposed Site Development Plan by Frankenfeld & King Architects for the Oakhurst Lifestyle Estate Development.

The development site will be developed in 6 Phases. The development phases are shown in Figure 4 by J Paul Van Wyk Urban Economists and Planners.

All the design presented in this report is based on the “The Neighbourhood Planning and Design Guide” (Red Book) Version 1.1 published in 2019 by the Department of Human Settlements.

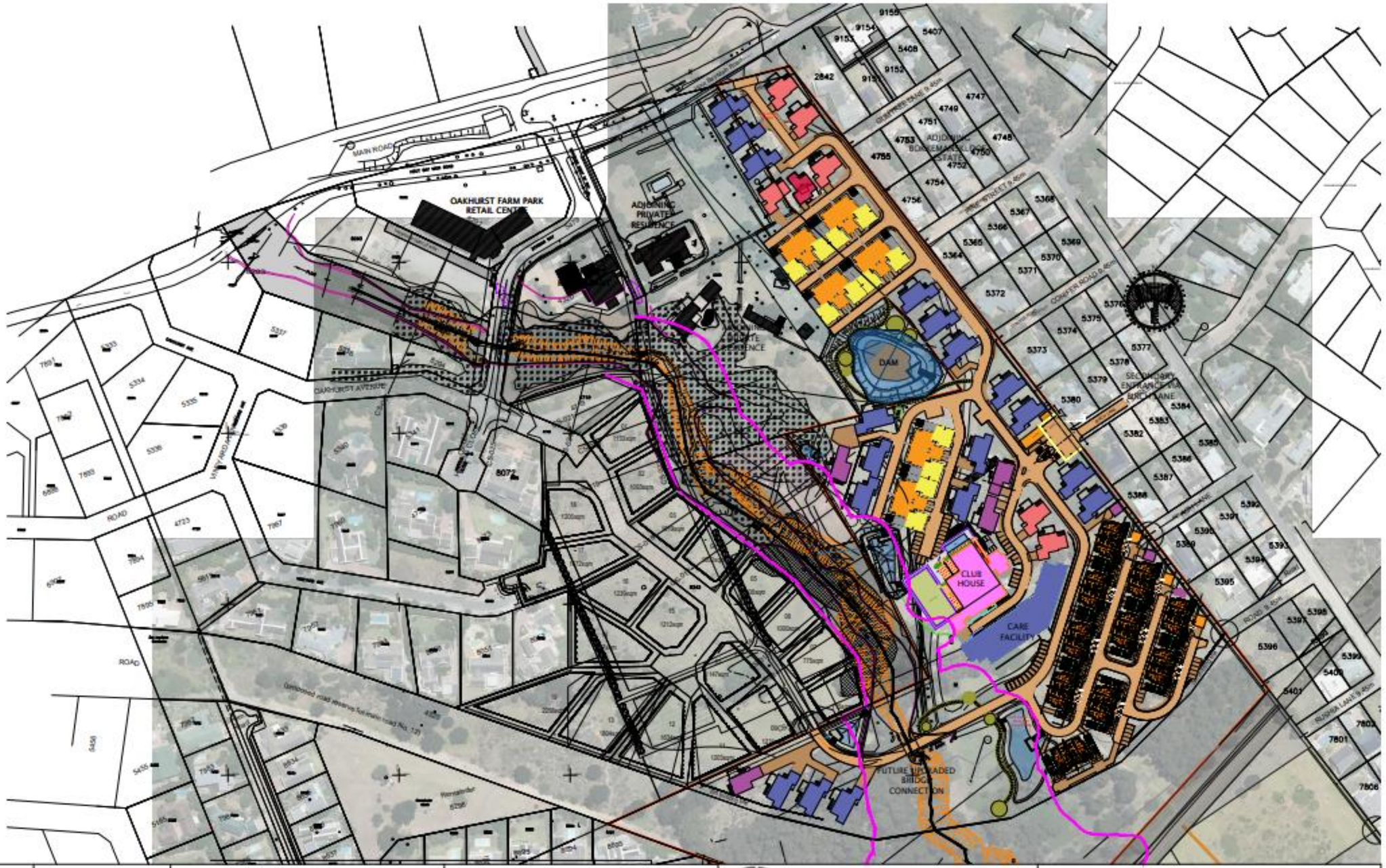


FIGURE 3: PROPOSED SITE DEVELOPMENT PLAN OF CONSOLIDATED ERVEN PORTION OF ERVEN R/2958, ERF R/2224 AND R/8343, OAKHURST LIFESTYLE ESTATE, HOUT BAY

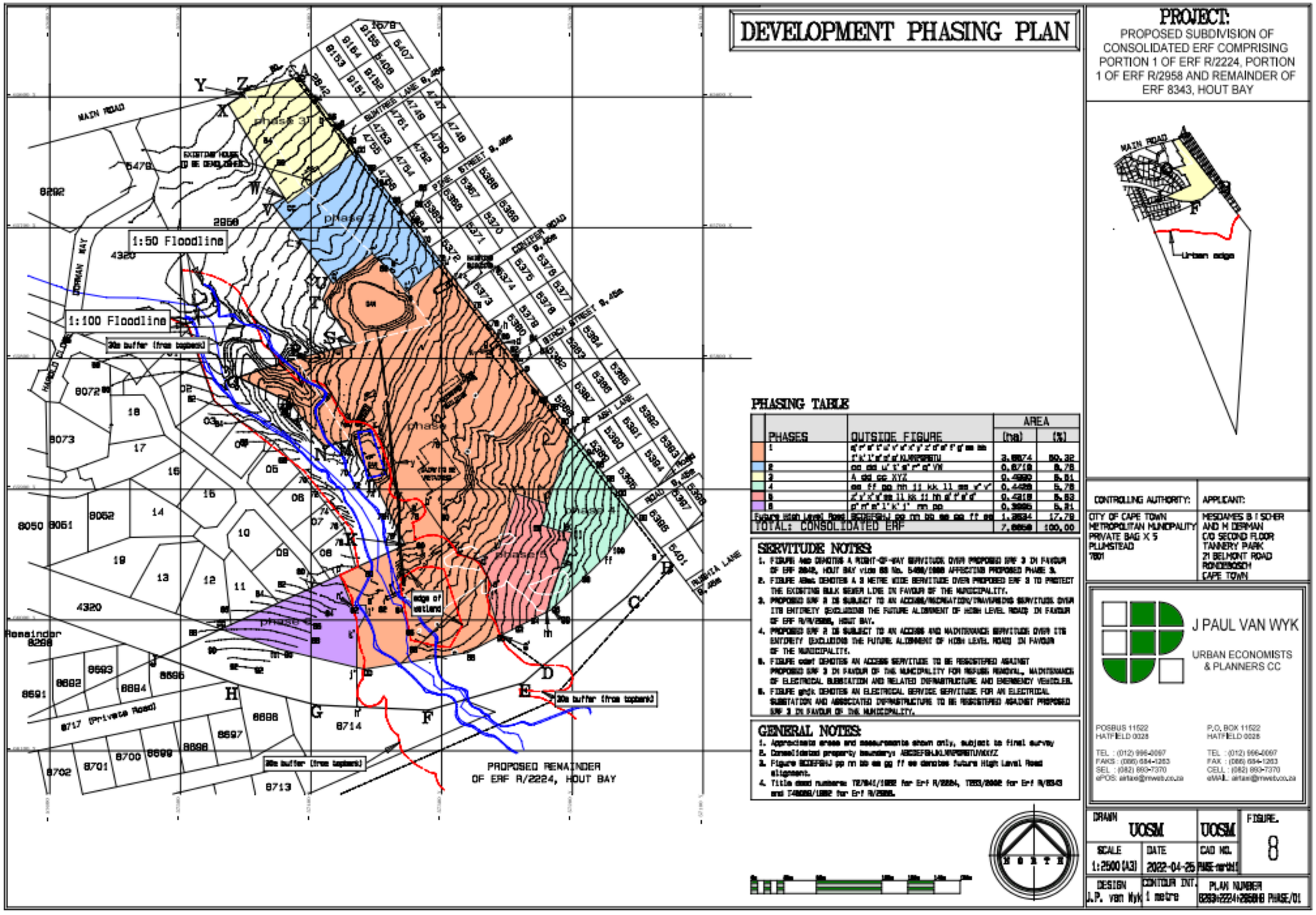


FIGURE 4: PROPOSED DEVELOPMENT PLAN PHASING PLAN, OAKHURST LIFESTYLE ESTATE, HOUT BAY

4.1 RELEVANT STANDARDS AND DESIGN GUIDELINES

South African code of practices/standards have been used during the design and throughout. The following pertinent standards and guidelines have been specifically adopted and used for this project:

- SANS 10400: The application of the National Building Regulations
- SANS 0400: National building regulations and building standards act
- SANS 1200 (sections revised to SANS 2001): Standardized specification for Civil Engineering Construction
- The Neighbourhood Planning and Design Guide (Red Book)
- City of Cape Town's Management of Urban Storm Policy

4.2 WATER DEMAND CALCULATIONS

4.2.1 WATER DEMAND

Refer to drawing P3126-C-900.

The Average Annual Daily Water Demand (AADD), Total Average Annual Daily Water Demand (TAADD) and instantaneous (peak) demand from the development site were calculated as follows:

1. The AADD for each land use type was selected as per Tables J.2 and J.4. The AADD varied between 0.45kl/d and 0.70kl/d. The AADD for the Administration/ club house building and open spaces were selected as 0.60kl/d/100m² and 12kl/d/ha respectively. The AADD for the development is 94.7kl/d
2. The TAADD was calculated by adjusting the AADD by 20% to account for real losses resulting in a TAADD of 113.64kl/day.
3. The TAADD was used to calculate a peak hour demand (P_{hour}) of 5.31l/s as per Table J.9.

Table 2 is a summary of the water demand calculations for the development.

Internal fire hydrants will be provided in terms of SANS 10400. At a minimum, hydrants will be spaced at a maximum of 200m radii. Flow of 20l/s at 3bar pressure is required for the operation of these hydrants. It was assumed that the proposed development is in a high-risk area.

TABLE 2: WATER DEMAND CALCULATION SUMMARY

Land use	Unit Type	Beds / area	Unit Capita	Unit Quantity	Total Capita	Table	Type	Demand (kl/u/d)	AADD (kl/d)	TAADD (Includes 20% losses) (kl/d)	P_{hour} from Table J9	Peak Demand (kl/d)	Peak Demand (l/s)
Oakhurst Single Residential Units	1	3	5	18	90	J2	Residential Stand (RS)	0.70	12.60	15.12	4.60	69.55	0.81
	2	2	4	6	24		RS	0.70	4.20	5.04	4.60	23.18	0.27
	3	2	4	4	16		RS	0.70	2.80	3.36	4.60	15.46	0.18
	4	2	4	1	4		RS	0.70	0.70	0.84	4.60	3.86	0.04
Oakhurst Group Units - Type XYZ	X	2	4	12	48	J2	Group Housing (GH)	0.45	5.40	6.48	4.60	29.81	0.35
	Y	2	3	12	36		GH	0.45	5.40	6.48	4.60	29.81	0.35
	Z	2	4	12	48		GH	0.45	5.40	6.48	4.60	29.81	0.35
Oakhurst Group Units - Type X1 Z1	X1	2	4	20	80		GH	0.45	9.00	10.80	4.60	49.68	0.58
	Z1	2	4	20	80		GH	0.45	9.00	10.80	4.60	49.68	0.58
Oakhurst Care Units	A1	2	2	5	10	J2	Care Centres (CC) (kl/bed)	0.60	3.00	3.60	4.60	16.56	0.19
	A2	1	1	11	11		CC	0.60	6.60	7.92	4.60	36.43	0.42
	B1	1	1	8	8		CC	0.60	4.80	5.76	4.60	26.50	0.31
	B2	1	1	7	7		CC	0.60	4.20	5.04	4.60	23.18	0.27
	B3	1	1	2	2		CC	0.60	1.20	1.44	4.60	6.62	0.08
	B4	1	1	1	1		CC	0.60	0.60	0.72	4.60	3.31	0.04
Administration building and Club house	1	1300				J4	Offices	0.60	7.80	9.36	3.30	30.89	0.36
Open Space	1	1				J4	Sports ground - low	12.00	12.00	14.40	1.00	14.40	0.17
							Total		94.7	113.64		458.74	5.31

4.2.2 CAPACITY ANALYSIS

A capacity analysis has been requested by Ekcon to the City of Cape Town. The capacity analysis will be based on this Services Report.

4.2.3 CONNECTION TO EXISTING EXTERNAL SYSTEM

Refer to drawing P3126-C-900.

It is proposed to use the same connection point and route as the council approved development on erf 10049 (Oakbridge development). It is proposed to connect the to the existing 110mm diameter water main in Grotto Way at the bell mouth which is located to the west of the development site. This has been workshopped with the officials from the City of Cape Town and they are in favour of connecting at this point.

If the Oakhurst Lifestyle Estate Development initiates before the Oakbridge development, a 110mm uPVC Class 12 pipe will be laid within a 2m wide services servitude in erf R/4320 to the development site. A T-piece with an end cap will be allowed for the Oakbridge Development to connect. The Oakbridge Development will place its bulk water meter within its development boundary of erf 10049 downstream of the T-Piece.

The Bulk water meter for the Oakhurst Lifestyle Estate development will be placed within the development boundary on erf R/2224.

Figure 5 shows the proposed connection point relative to the development site.

It has however come to our attention that the watermain for the proposed connection point is experiencing issues with reliability and continuity of service. We are therefore in consultation with the City of Cape Town to verify if this will be long term problem and if an alternative connection point from the east along Blue Valley Avenue should be considered.

4.2.4 INTERNAL DISTRIBUTION SYSTEM

Refer to drawing P3126-C-900.

The proposed development will be provided with 110mmØ Class 12 watermains internally up to contour elevation RL59.35m. At contour elevation RL59.35m the static head is 90m relative to the connection point head (RL148.35m).

Below this elevation 110mmØ uPVC Class 16 watermains will be provided as well as Pressure Reducing Valve at contour elevation RL59.35m.

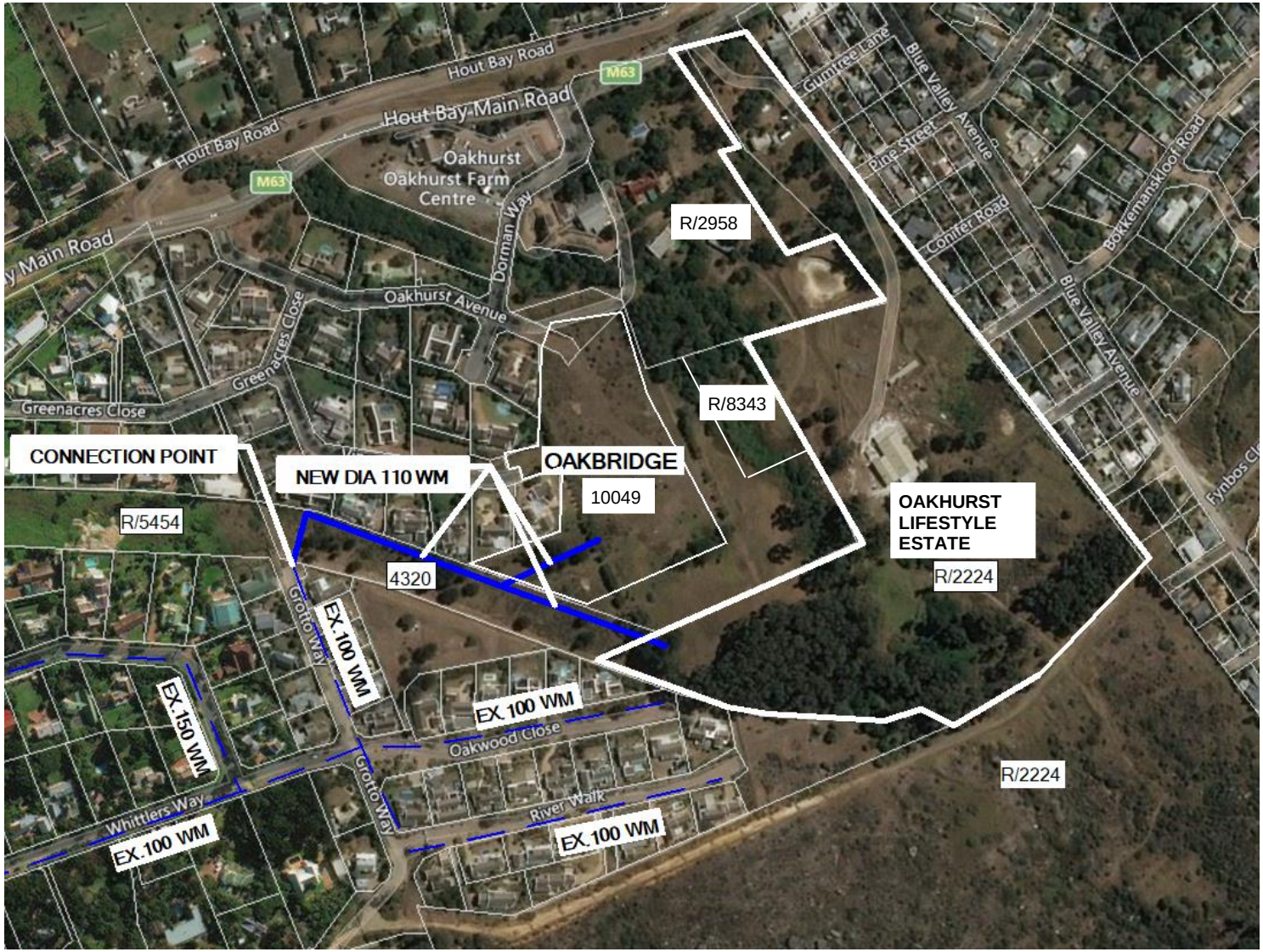


FIGURE 5: PROPOSED WATER MAIN CONNECTION TO EXSTING WATER NETWORK IN GROTTO WAY

4.3 SEWERAGE DEMAND CALCULATIONS

Refer to drawing P3126-C-700.

4.3.1 SEWER FLOW

As per Table K.4, of the Red Book, the unit Peak Daily Dry Weather Flow (PDDWF) typically ranges from 0.60 to 0.80kl/day/unit for retirement villages. Using an average of 0.70kl/day/unit equates to 70% of AADD. The total PDDWF is 56.56kl/day.

Incorporating an instantaneous peak factor of 2.20, the Instantaneous Peak Dry Weather Flow (IPDWF) is 1.52l/s excluding infiltration. The groundwater infiltration flow is estimated to be 0,24l/s or 20.79kl/d. The total IPDWF including infiltration is therefore: 1.76l/s.

In terms of the design Instantaneous Peak Wet Weather Flow (IPDWF) an allowance of 30% spare capacity is made for stormwater ingress resulting in an IPDWF of 2.29l/s. Table 3 is summary of the sewage demand calculations.

4.3.2 CAPACITY ANALYSIS

A capacity analysis has been requested by Ekcon to the City of Cape Town. The capacity analysis will be based on this Services Report.

4.3.3 INTERNAL SEWER NETWORK

The internal sewer network will be water borne gravity sanitation system. Main sewer lines will be 160mmØ uPVC pipes (Class 34) with 110mmØ erf connections.

Foul Sewer pipe to be in the road reserve.

4.3.4 CONNECTION TO EXTERNAL SEWER NETWORK

Due to Bokkemanskloof River dividing the development site into an eastern and western portion in terms of foul sewer planning, the development requires two foul sewer connection points. Connection point 1 is located at the north-eastern corner and Connection Point 2 is located on erf 10049 (Oakbridge Estate).

A notarial tie will be required between the two developments regarding Connection Point 2.

TABLE 3: SEWER DEMAND CALCULATION SUMMARY

Land use	Unit Type	Beds / area	Unit Capita	Unit Quantity	Total Capita	PDDWF (70% of AADD)	Table K.8. Peak factor	IDPWF (Excluding infiltration) (l/s)	IDPWF (Including infiltration) (l/s)	IPWWF (l/s)
Oakhurst Single Residential Units	1	3	5	18	90	8.82	2.20	0.22		
	2	2	4	6	24	2.94	2.20	0.07		
	3	2	4	4	16	1.96	2.20	0.05		
	4	2	4	1	4	3.78	2.20	0.10		
Oakhurst Group Units - Type XYZ	X	2	4	12	48	3.78	2.20	0.10		
	Y	2	3	12	36	3.78	2.20	0.10		
	Z	2	4	12	48	3.78	2.20	0.10		
Oakhurst Group Units - Type X1 Z1	X1	2	4	20	80	6.30	2.20	0.16		
	Z1	2	4	20	80	6.30	2.20	0.16		
Oakhurst Care Units	A1	2	2	5	10	2.10	2.20	0.05		
	A2	1	1	11	11	4.62	2.20	0.12		
	B1	1	1	8	8	3.36	2.20	0.09		
	B2	1	1	7	7	2.94	2.20	0.07		
	B3	1	1	2	2	0.84	2.20	0.02		
	B4	1	1	1	1	0.42	2.20	0.01		
Administration building and Club house	1	1300	0	0	0	5.46	2.20	0.14		
Open Space	1	1	0	0	0	NA	NA	NA		
					Total	59.71		1.52	1.76	2.29

Note:

1. Groundwater infiltration rate of 0.04l/min/m/dia was selected as per Table K.10 of the Red Book.
2. Total of 160mm dia and 110mm dia pipe lengths of 1500m and 1100m were selected for groundwater infiltration calculations.
3. Total groundwater infiltration rate (0.24l/s) was calculated as: Infiltration rate (L/min/m/dia) × Pipe length (m) × Pipe diameter (m) ÷ 60 sec
4. IDPWF (Incl. groundwater infiltration) = IDPWF + 0.24
5. IPWWF = IDPWF (Incl. groundwater infiltration) * 1.30.
6. IPDWWF allows for 30% increase for stormwater inflow.

4. STORMWATER

Refer to the Stormwater Management Plan by Graeme McGill Consulting, *OAKHURST LIFESTYLE ESTATE, ERVEN R/2958 & RE-2224, HOUT BAY dated 2021-12-14.*

In summary the proposed stormwater system has been designed to mimic the pre-development run-off conditions of this site and treat the stormwater to achieve the quality standards as per City of Cape Town requirements. Attenuation and treatment standards are achieved using two existing dams, a further 3 attenuation ponds, permeable paving, and bio-infiltration treatment areas.

5. ROADS AND ACCESS

(Please refer to drawing P3126-C-300 Roads and Stormwater)

Oakhurst Avenue which will be extended southward as a private road with the development of Oakbridge Estate over Erf 10119 will terminate on the north-western boundary of the development site will provide the main access to the development.

The main access road will traverse from the north-western boundary, cross the Bokkemanskloof river towards the eastern boundary, turn north and run parallel to the eastern boundary past Birch Street up to the northern boundary of the site.

A new bridge will be constructed over the Bokkemanskloof river to accommodate this main access road.

The internal roads will be bricked paved Class 5 \Low Order Access Streets and maximum use will be made of on-site resources to limit the environmental impact of the road construction.

Access to the development will temporarily be from Birch Street until the bridge construction over the river and the construction of the Oakhurst Avenue extension are completed.

The permanent access, via Oakhurst Avenue, will be obtained via the Gatehouse of the Oakbridge development on erf 10119.

The Access at Birch Street will be closed off to residents once the Oakhurst Avenue access becomes active and will then only provide access to refuse removal vehicles.

The Traffic Impact Assessment completed by ITS Solutions in March 2022 confirmed that both accesses mentioned above, together with the additional trip generation would have no significant impact on the external road network and recommended that the development be approved.

The report did however note that the delay currently being caused at the Dorman Way/Hout Bay Main Road intersection due to vehicles struggling to turn right would be increased and recommended that a roundabout be introduced at this point to address this problem.

6. REFUSE REMOVAL

Refuse removal facilities will be provided, and arrangements made for collection in accordance with the Integrated Waste Management Policy of the City of Cape Town and the guidelines for minimum requirements for waste collections and waste storage areas/rooms published by the solid waste management department.

All internal refuse will be collected and stored in the refuse room at the eastern boundary near Birch Lane. An access servitude will be registered in favour of the City of Cape Town for refuse removal at the access for the refuse vehicle movement and collection to take place on site before exiting the site onto Birch Street.

It is proposed that a refuse vehicle will enter the secondary access, drive up to the gatehouse and then reverse to the refuse room. Once loaded, the vehicle will make a left-hand turn and exit through Birch Street. Figure 6 by Frankenfeld & King Architects shows the vehicle turning circles for entering and exiting the refuse area.

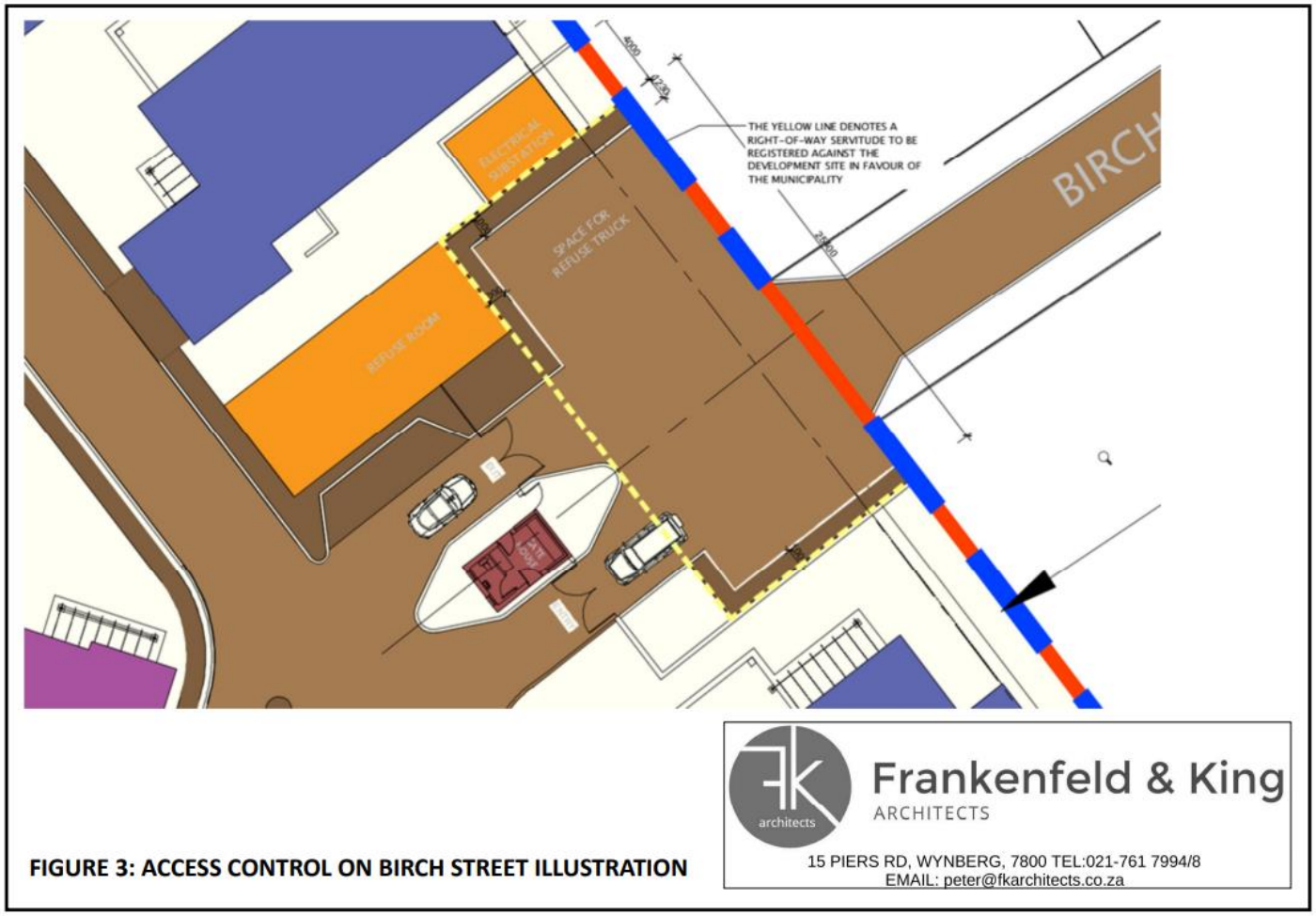


FIGURE 3: ACCESS CONTROL ON BIRCH STREET ILLUSTRATION

FIGURE 6 REFUSE VEHICLE TURNING CIRCLE

7. DEVELOPMENT CONTRIBUTIONS

As per the City of Cape Town's policy the development will be subject to development contributions towards the provision of bulk infrastructure services per development phase, as per the approved phasing and development plans.

The estimated Development Contributions for the development is R 4 384 666-02 (excluding any credits for existing rights) with annual escalation applicable per phase up to the date of payment. The amount payable will therefore be the amount as calculated per phase at the time of payment.

The Development Contributions will be payable per phase prior to building plan approval and will either be directly paid to the City of Cape Town or used for the upgrading of roads and bulk infrastructure as required by the City of Cape Town by means of a Services Agreement between the Developer and the City of Cape Town.

The Services Agreement and final terms of payment of the Development Contributions will be concluded with the City of Cape Town prior to building plan approval.

8. SERVITUDES

The following servitudes will be required for the development:

- A Right of way and Access servitude over the main access road over the planned Oakridge Estate development on erf 10049 in Favour of Oakhurst Lifestyle Estate (Pty) Ltd
- A 2m wide engineering services servitude over the Remainder of Erf R/4230 for the bulk water connection in favour of the City of Cape Town. (See drawing P3126-C-900 Rev B)
- A 3m wide engineering services servitude of 43m long for the bulk sewer connection for phase 6 of the development in favour of Oakhurst Lifestyle Estate (Pty) Ltd (See drawing P3126-C-700 Rev B)

9. ENGINEERING SERVICES PHASING

Due to the site topography and development phasing plan (See Figure 4) the roads and services infrastructure for the development will be installed in the following sequence to ensure that each phase will be able to function independently upon completion and issuing of its occupancy certificate. (Refer to drawings P3126-C-301 Rev B, P3126-C-701, P3126-C901 attached)

The roads and stormwater services to be installed that will be required per phase as per the development phasing plan are as follows:

- Phase 1 – Roads and Stormwater to phase 1 and phase 6
- Phase 2 - Roads and Stormwater to phase 2
- Phase 3 - Roads and Stormwater to phase 3
- Phase 4- Roads and Stormwater to phase 4 and phase 5

The bulk water reticulation services to be installed that will be required per phase as per the development phasing plan are as follows:

- Phase 1 – The bulk water connection to the development as well as the water reticulation to phase 1
- Phase 2 – Water reticulation to phase 2
- Phase 3 - Water reticulation to phase 3
- Phase 4- Water reticulation to phase 4 and phase 5
- Phase 6 - Water reticulation to phase 6

The bulk sewer reticulation services to be installed that will be required per phase as per the development phasing plan are as follows:

- Phase 1 – Sewer reticulation to phases 1,2 and phase 3.
- Phase 2 – Sewer reticulation to phase 4 and phase 5
- Phase 6 - Sewer reticulation to phase 6

10. TELECOMMUNICATION

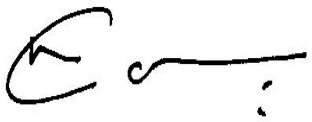
As there are various ECASA licence holders for telecommunication suppliers a coordination meeting will be held with the various role players to give them the opportunity to install their required infrastructure during the construction phase of the development.

It is planned to phase the development and detailed plans to determine the extent and timing of the construction of different components of the infrastructure are being prepared. This sequencing will be workshopped with the relevant departments at the City in order for each phase to be properly serviced.

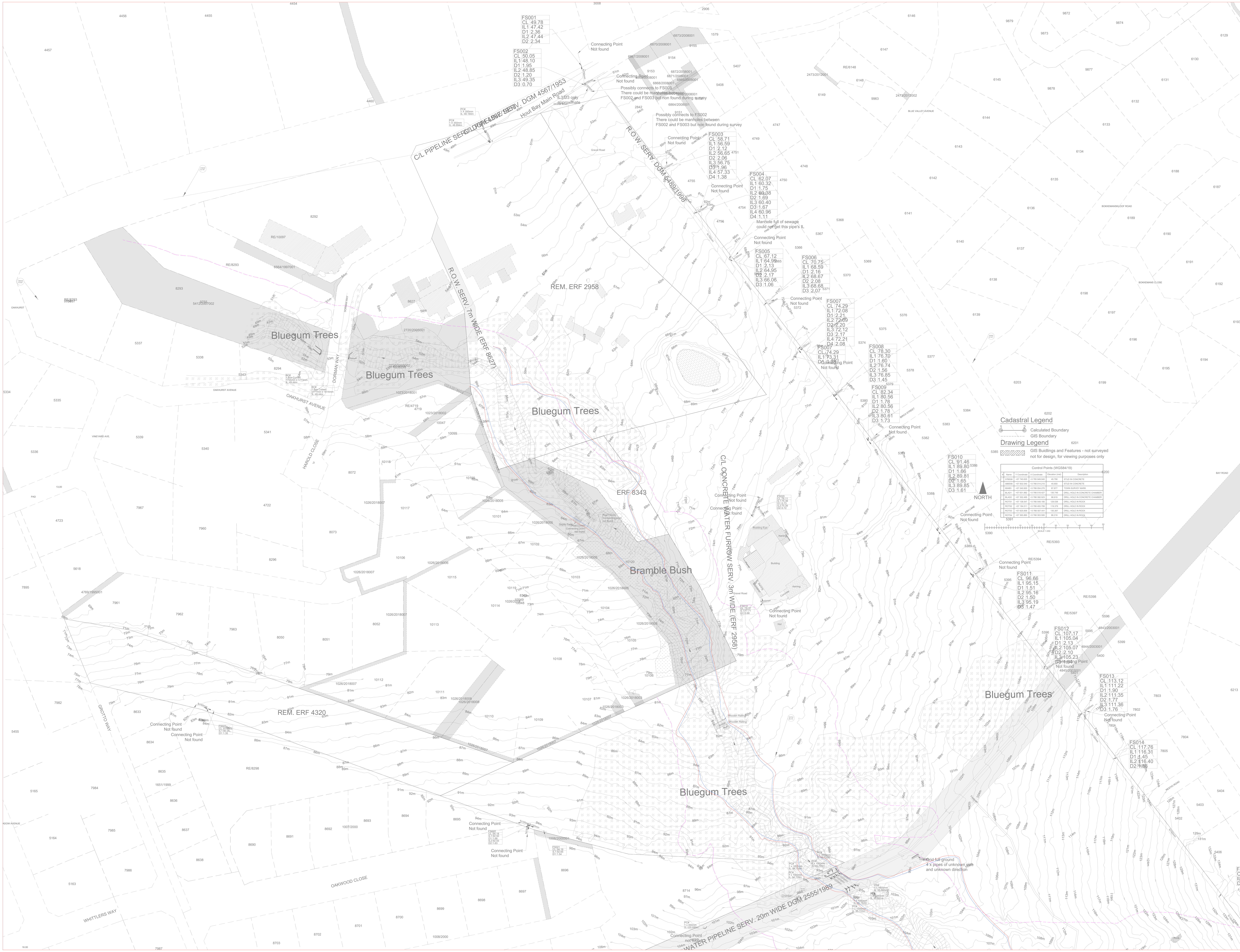
11. CONCLUSION

From the above we confirm that there are sufficient civil engineering services available in the vicinity of the proposed development for the development proposed.

The capacity confirmation from the City of Cape Town of the sewer and water network will be provided as soon as it becomes available.



MW CASPER Pr Tech Eng
for EKCON (Pty) Ltd



Cadastral Legend

1 — 2 Calculated Boundary

GIS Boundary

Drawing Legend

GIS Buidlings and Features - not surveyed not for design, for viewing purposes only

Control Points (WGS84/19)					
#	Name	Y Coordinate	X Coordinate	Elevation (msl)	Description
	57BS56	+57 740.620	+3 765 949.040	45.790	STUD IN CONCRETE
	58BS56	+57 832.540	+3 766 014.210	45.650	STUD IN CONCRETE
	60AB3	+57 240.920	+3 766 054.270	87.877	TOWN SURVEY MARK
	BLAD1	+57 631.882	+3 766 518.427	130.749	DRILL HOLE IN CONCRETE CHAMBER
	BLAD2	+57 352.495	+3 766 392.523	98.919	DRILL HOLE IN CONCRETE CHAMBER
	ROTS1	+57 138.547	+3 766 549.185	129.038	DRILL HOLE IN ROCK
	ROTS2	+57 184.511	+3 766 493.799	119.379	DRILL HOLE IN ROCK
	ROTS3	+57 625.856	+3 766 507.441	130.267	DRILL HOLE IN ROCK
	ROTS4	+57 365.860	+3 766 303.595	86.218	DRILL HOLE IN ROCK

LEGEND:

1:50-YEAR FLOODLINE BY GMC

1:100-YEAR FLOODLINE BY GMC

WETLAND BUFFER

REV.	DATE	COMMENT
B	2022-02-28	FOR INFORMATION
A	2022-02-17	FOR INFORMATION

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OAKHUST LIFESTYLE ESTATE PTY (LTD)

CLIENT

OAKHUST LIFESTYLE ESTATE

PROJECT

SITE SURVEY AND EXISTING SERVICES

DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
A0 1:750	2022	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

B
REVISION

P3126 - C - 001
DRAWING NUMBER

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STORMWATER LEGEND:

(blue line)	1:50-YEAR FLOODLINE BY GMC
(red line)	1:100-YEAR FLOODLINE BY GMC
(magenta line)	WETLAND BUFFER
—S—○—S—	NEW STORMWATER MANHOLE
—S——S—	NEW STORMWATER PIPE CLASS 100D

ROADS LEGEND:

- NEW MK 10 KERB
- NEW MK 10 DROPPED KERB
- NEW CK5 KERB AND CHANNEL
- NEW C1 CHANNEL
- PERMEABLE PAVING

REV.	DATE	COMMENT
B	2022-02-28	FOR INFORMATION
A	2022-02-17	FOR INFORMATION

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PROJECT

ROAD AND STORMWATER LAYOUT
DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
1:600	2022	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

REVISION: B
DRAWING NUMBER: P3126 - C - 300

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PHASING:

- SW — PHASE 1
- SW — PHASE 2
- SW — PHASE 3
- SW — PHASE 4

STORMWATER LEGEND:

- 1:50-YEAR FLOODLINE BY GMC
- 1:100-YEAR FLOODLINE BY GMC
- WETLAND BUFFER
- NEW STORMWATER MANHOLE
- NEW STORMWATER PIPE CLASS 100D

ROADS LEGEND:

- NEW MK 10 KERB
- NEW MK 10 DROPPED KERB
- NEW CK5 KERB AND CHANNEL
- NEW C1 CHANNEL
- PERMEABLE PAVING

REV.	DATE	COMMENT
A	2022-04-28	FOR INFORMATION

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ROAD AND STORMWATER PHASING LAYOUT
DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
1:600	2022	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

A
REVISION

P3126 - C - 301
DRAWING NUMBER

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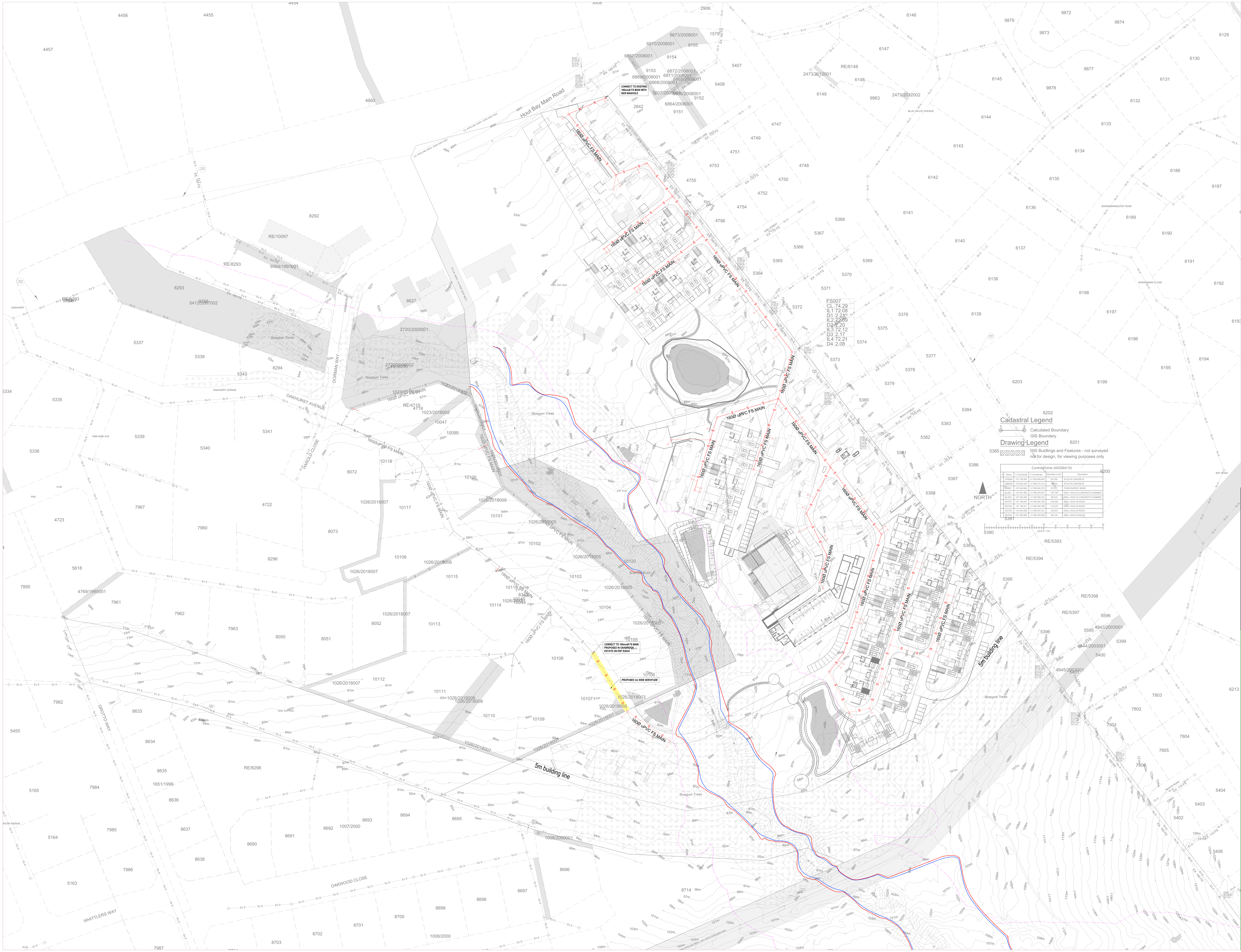

STORMWATER LEGEND:

- 1:50-YEAR FLOODLINE BY GMC
- 1:100-YEAR FLOODLINE BY GMC
- WETLAND BUFFER

SERVICES LEGEND:

- SEWER RODDING EYE
- NEW SEWER MANHOLE
- NEW CLASS 34 uPVC FOUL SEWER
- 110mmØ CLASS 34 uPVC FOUL SEWER ERF CONNECTION
- EXISTING FOUL SEWER

REV.	DATE	COMMENT
B	2022-04-28	FOR INFORMATION
A	2022-02-17	FOR INFORMATION

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PROJECT

FOUL SEWER LAYOUT
DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
1:600	2022	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

B
REVISION

P3126 - C - 700
DRAWING NUMBER

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Cadastral Legend

1 — 2 Calculated Boundary

GIS Boundary

Drawing Legend

GIS Buidlings and Features - not surveyed not for design, for viewing purposes only

Control Points (WGS84/19)					
#	Name	Y Coordinate	X Coordinate	Elevation (msl)	Description
	57BS56	+57 740.620	+3 765 949.040	45.790	STUD IN CONCRETE
	58BS56	+57 832.540	+3 766 014.210	45.650	STUD IN CONCRETE
	60AB3	+57 240.920	+3 766 054.270	87.877	TOWN SURVEY MARK
	BLAD1	+57 631.882	+3 766 518.427	130.749	DRILL HOLE IN CONCRETE CHAMBER
	BLAD2	+57 352.495	+3 766 392.523	98.919	DRILL HOLE IN CONCRETE CHAMBER
	ROTS1	+57 138.547	+3 766 549.185	129.038	DRILL HOLE IN ROCK
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	ROTS3	+57 625.856	+3 766 507.441	130.267	DRILL HOLE IN ROCK
	ROTS4	+57 365.860	+3 766 303.595	86.218	DRILL HOLE IN ROCK

PHASING:

- PHASE 1
- PHASE 2
- PHASE 3

STORMWATER LEGEND:

- 1:50-YEAR FLOODLINE BY GMC
- 1:100-YEAR FLOODLINE BY GMC
- WETLAND BUFFER

SERVICES LEGEND:

- SEWER RODDING EYE
- NEW SEWER MANHOLE
- NEW CLASS 34 uPVC FOUL SEWER
- 110mmØ CLASS 34 uPVC FOUL SEWER ERF CONNECTION
- EXISTING FOUL SEWER

REV.	DATE	COMMENT
A	2022-04-28	FOR INFORMATION

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PROJECT

FOUL SEWER PHASING LAYOUT
DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
1:600	2022	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

B
REVISION

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DRAWING NUMBER

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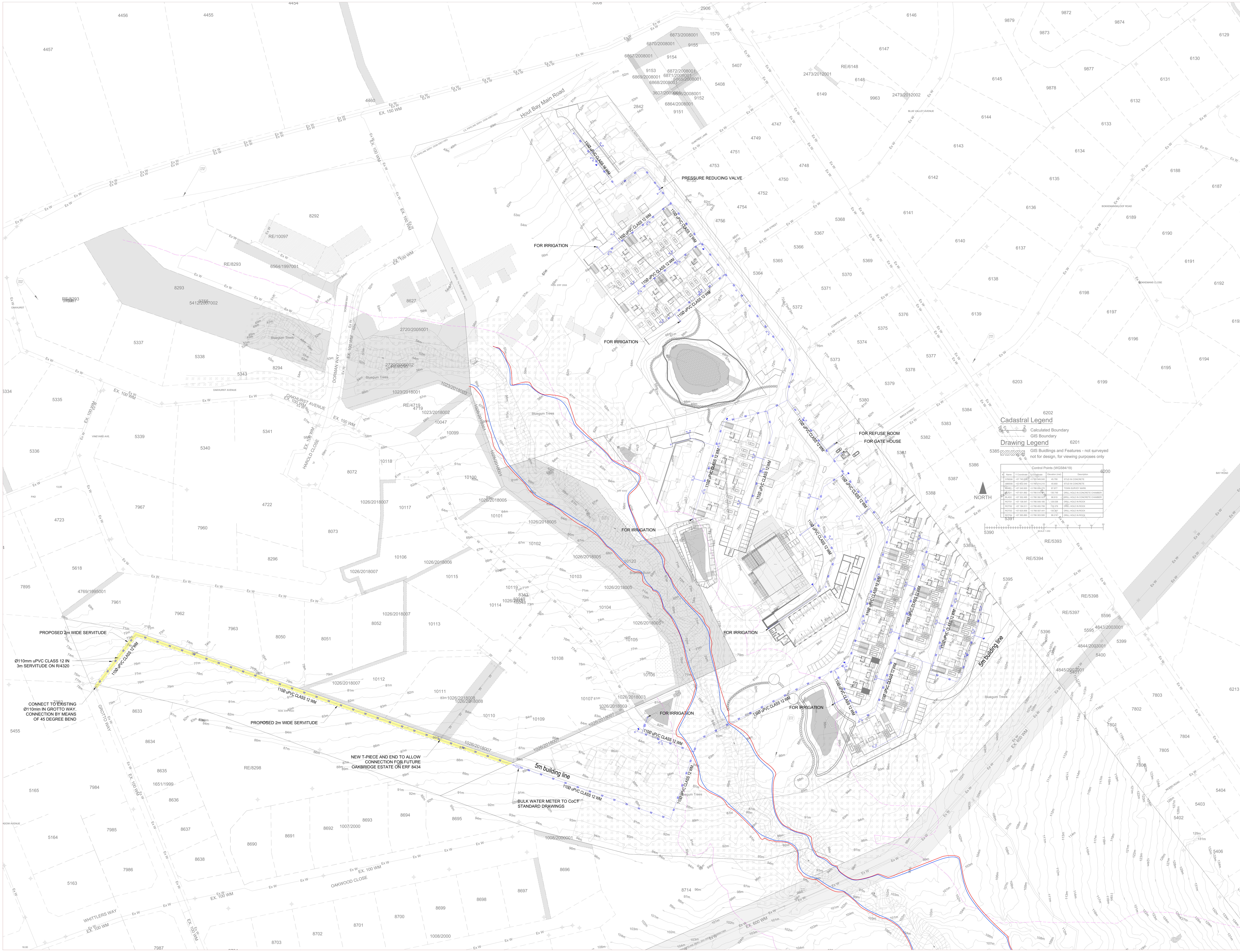

Hout Bay Main Road
PRESSURE REDUCING VALVE
FOR IRRIGATION
FOR IRRIGATION
FOR IRRIGATION
FOR IRRIGATION
FOR IRRIGATION
FOR IRRIGATION
FOR REFUSE ROOM
FOR GATE HOUSE
OAKHURST AVENUE
DORMAN WAY
HAROLD CLOSE
GROTTO WAY
OAKWOOD CLOSE
WHITTLERS WAY
PROPOSED 2m WIDE SERVITUDE
Ø110mm uPVC CLASS 12 IN
3m SERVITUDE ON R/4320
CONNECT TO EXISTING
Ø110mm IN GROTTO WAY.
CONNECTION BY MEANS
OF 45 DEGREE BEND
110Ø uPVC CLASS 12 WM
PROPOSED 2m WIDE SERVITUDE
NEW T-PIECE AND END TO ALLOW
CONNECTION FOR FUTURE
OAKBRIDGE ESTATE ON ERF 8434
5m building line
BULK WATER METER TO CoCT
STANDARD DRAWINGS
Cadastral Legend
Calculated Boundary
GIS Boundary
Drawing Legend
GIS Buildings and Features - not surveyed
not for design, for viewing purposes only
Control Points (WG084/19)
NORTH

STORMWATER LEGEND:

- 1:50-YEAR FLOODLINE BY GMC
- 1:100-YEAR FLOODLINE BY GMC
- WETLAND BUFFER

SERVICES LEGEND:

- Ex W — EXISTING WATER PIPE
- W — NEW WATER PIPE
- WATER ISOLATING VALVE
- PEDESTAL TYPE FIRE HYDRANT
- BULK WATER METER
- HANDWHEEL VALVE (RHC)
- DOUBLE ERF CONNECTION (CoCT STANDARD DETAIL
- SINGLE ERF CONNECTION (CoCT STANDARD DETAIL
- PRESSURE REDUCING VALVE

REV.	DATE	COMMENT
B	2022-02-28	FOR INFORMATION
A	2022-02-17	FOR INFORMATION

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PROJECT

WATER LAYOUT
DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
1:600	2022-02-17	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

B
REVISION

P3126 - C - 900
DRAWING NUMBER

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PHASING:

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5

STORMWATER LEGEND:

- 1:50-YEAR FLOODLINE BY GMC
- 1:100-YEAR FLOODLINE BY GMC
- WETLAND BUFFER

SERVICES LEGEND:

- EXISTING WATER PIPE
- NEW WATER PIPE
- WATER ISOLATING VALVE
- PEDESTAL TYPE FIRE HYDRANT
- BULK WATER METER
- HANDWHEEL VALVE (RHC)
- DOUBLE ERF CONNECTION (CoCT STANDARD DETAIL
- SINGLE ERF CONNECTION (CoCT STANDARD DETAIL
- PRESSURE REDUCING VALVE

REV.	DATE	COMMENT
A	2022-04-28	FOR INFORMATION

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PROJECT

WATER PHASING LAYOUT
DRAWING TITLE

SCALE	DATE	DESIGNED	APPROVED
1:600	2022	J.A. VENTER	W. CASPER

INFORMATION	YES
COSTING	NO
TENDER	NO
FOR CONSTRUCTION	NO

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REVISION

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