

LIFESTYLE VILLAGE FOR
ELLENRUST PROPERTIES CC

SERVICES REPORT
FOR CIVIL ENGINEERING SERVICES FOR THE
DEVELOPMENT OF A LIFESTYLE VILLAGE ON ERF 4784,
STILL BAY WEST

HESRIV-474

Revision 2

OCTOBER 2020

PREPARED BY:

CLIENT:

ELLENRUST PROPERTIES CC
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DOCUMENT CONTROL

DATE	REVISION	COMMENT
17 October 2019	0	Civil Services Report
18 October 2019	1	Water Tank to be reduced to 1000 l
26 October 2020	2	Additional SW information

ABBREVIATIONS

AADD	:	Annual Average Daily Demand (water)
AADWF	:	Annual Average Dry Weather Flow (sewer)
PWWF	:	Peak Wet Weather Flow (sewer)
CES	:	Community Engineering Services
GLS	:	GSL Consulting Engineers
HM	:	Hessequa Municipality
ha	:	hectare
HCE	:	Hessequa Consulting Engineers CC
kℓ	:	kilolitre
kℓ/d	:	kilolitre per day
ℓ/c/d	:	kilolitre per capita per day
m	:	metres
masl	:	metres above mean sea level
Mℓ	:	mega litre
m ³	:	cubic metre, i.e. one kilolitre
mm	:	millimetre
TWL	:	Top of Water Level (Dam or Reservoir)
VAT	:	Value added tax
WTW	:	Water Treatment Works
WWTW	:	Waste Water Treatment Works

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INTRODUCTION

Hessequa Consulting Engineers was appointed by Ellenrust Properties CC for the planning and design of civil engineering services for the development of a Lifestyle Village on Erf 4784, Still Bay West. This report is based on preliminary/final designs. Hessequa Municipality, in the Tender Document, confirmed that Hessequa Municipality will be responsible for the provision of access to site as well as bulk water and sewer connection points on site.

The report discusses the design criteria and specifications that will be applied to civil engineering services required for the development.

The area is situated to the north east of the existing Hessequa Municipal Offices in Still Bay.

EXTEND OF THE DEVELOPMENT

The proposed development consists of the following:

- 120 Residential Units
- 8 Assisted Living Units
- 32 Bed Frail care Unit

CIVIL ENGINEERING SERVICES

Proposed designs are based on the design standards of the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* as published by the CSIR as well as the minimum requirements of Hessequa Municipality.

All materials and workmanship shall comply with the specifications as set out in the South African National Standards for Civil Engineering (SANS).

1.1 ROADS

Access to the proposed development will from the MR331/MR332(Main Road) intersection. Urban Engineering completed a Traffic Impact Assessment for the proposed access at the MR331/MR332 intersection. Hessequa Municipality to mitigate the most favourable/feasible alternative for the upgrading of the MR331/MR332 intersection to cater in the existing and future traffic demands. Ellenrust Properties CC will design and construct the 6m wide access road from the existing/new MR331/MR332 intersection up to the boundary of erf 4784.

Internal roads to be finished with segmented paving. Roads widths will be 5.5m wide with mountable combination kerbing (CK5) on one side and mountable kerbing (MK10) on opposite side of road. Bellmouth's will be constructed with 8m radiuses and consist of CK5 or MK10 kerbs. All Upper Selected and Sub-Base materials to be imported from commercial sources.

The basis of the road and pavement design for the proposed development is set out in the table below:

Parameter	Residential Access way (Class 5d)
Category	UC
Traffic Class	E0
Structural Design Traffic	< 0.2 x 10 ⁶
Surface Treatment	60mm interlocking segmented paving.
Upper Selected and Sub-Base from commercial sources	150mm G5 (95% MAASHTO) on 150mm G7 (93% MAASHTO) on 150mm Roadbed prep Insitu Material (90% MAASHTO)
Sub-grade (No geotechnical have been conducted at this stage.	-
Carriage Way Width	5.5m
Design Speed	30 km/h
Maximum Gradient	16% over 30m max
Minimum Gradient	0.45%
Cross Fall	2%
Bell mouths	8m Radius

1.2 STORMWATER

1.2.1 Major Systems

The stormwater system forms an integral part of the road and urban planning layout. The system rests on three legs, the minor system, the major system and an emergency system. This proposed development is not affected by any flood line.

Free drainage of all roads will be in a North Eastern direction. An existing 600mm Stormwater main is located along the north western boundary. Stormwater will be collected and channelled in a conventional manner via kerb inlet structures, manholes and stormwater pipes to the existing stormwater infrastructure. (See Drawing HESRIV-474-SW1b). The existing 600mm diam. stormwater main crosses Paling Street and exits into an existing natural drainage area. Street 1 forms a low point at chainage 378 and therefore a double stormwater inlet structure is placed in this position. To support the stormwater infra structure an open stormwater channel is proposed to channel any overflow stormwater during flood conditions (Emergency System). At the exit of the channel a Reno Mattress will dissipate energy and spread stormwater, within the development boundary, over a 6m width.

The proposed development is an up-market retirement village. The upkeeping of infrastructure and establishment of a safe and clean environment is of the utmost importance for the success of this type of development. No pollution of the environment is envisaged. Except for roofs all other open surfaces will have different levels of permeability. Roads will be constructed with segmented paving and flower beds and grass surfaces will assist in the maximising of surface drainage and revitalisation of the groundwater.

1.2.2 Minor Systems and Stormwater Design

Stormwater infrastructure will be constructed in accordance with the standard requirements and specifications as agreed with the Hessequa Municipality.

Stormwater runoff from the erven will gravitate towards the internal road network. Surface runoff from roadways will be collected via kerb inlets into a piped stormwater system which will discharge into the existing stormwater main. No servitudes will be required for new stormwater infra structure.

The minor storms will be catered for in the pipe system while major storms will be routed to public open spaces to the north of the proposed development. The emergency system recognizes failure of the minor and major system by storms greater than provided for in major system or in the event of malfunction of the minor system by providing continuous overland flow routes to minimize flooding of residential areas.

The following measures are proposed to mitigate the impact of post development stormwater runoff on the existing infrastructure downstream from the proposed development:

- a) Installation of 1 000 kℓ water tanks at each residential unit will contribute to the attenuation of initial runoffs.
- b) Public Open Spaces will be utilised as recreation areas as well as stormwater retention areas where the concentration of stormwater runoff will be minimised through the application of landscaping techniques, i.e. by creating grass lined swales, undulations and depressions.
- c) The in-situ material consists of sand with underlying sandstone and therefore no ponding is envisaged.

Design criteria adopted for the development with regard to stormwater infrastructure is summarised as follows:

Runoff rates will be determined according to the Rational Method.

Flood recurrence interval	:	2 years
Pipe material	:	Concrete
Pipe class	:	75D / 100D
Pipe diameters	:	min 375mm Ø up to 450mm Ø diameter as required
Bedding	:	Class C
Inlets	:	Kerb and drop inlets as required
Manholes	:	Point of deflections on pipes

1.3 WATER

1.3.1 WATER CONNECTION

The proposed development will connect to an existing 150mm water main in Main Road. The internal reticulation will consist of 110 & 75mm diameter pipework to accommodate the installation of fire hydrants. (See Drawing HESRIV-474-W1)

1.3.2 WATER DEMAND

In accordance with the design standards of the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* the total water demand will be as follows:

• Residential Unit : 120 Units @ 800 l/d/unit	=	96,0 kℓ/d
• Assisted Living Unit : 8 Units @ 250 l/unit/d	=	2,0 kℓ/d
• Nursing Home : 32 Beds @ 150 l/bed/d	=	<u>4,8</u> kℓ/d
TOTAL (Annual Average Daily Demand)		102,8 kℓ/d

The proposed development falls in the Low Risk Group 1.

Fire flow criteria (Low risk) = 15 l/s @ 7 m for 2 hours. The placement of fire hydrants will be done in accordance with the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* and the requirements of Hessequa Municipality. (Disaster Management)

The required storage capacity for Fire Flow is 108m³.

1.3.3 INTERNAL WATER RETICULATION

New 75 and 110mm class 12 MPVC water mains complete with isolating valves, fire hydrants and erf connections will be provided. Erf connections will be made with HDPE PE80 PN12,5 pipes and terminate with an end cap. Typical details are shown on drawing HESRIV-474-W2.

The basis of the water reticulation design for the proposed development is summarised in the table below:

Table 2 Water Reticulation Design Criteria	
PARAMETER	GUIDELINE
Pipe materials for erf connections	HDPE PE80 PN12,5
Pipe materials for reticulation mains	MPVC (Class 12)
Minimum diameter for reticulation mains	75mm
Minimum diameter for erf connections serving two erven	25mm branching to 2 x 20mm
Minimum diameter for erf connections serving one erf	20mm Polycop
Valve	75mm AVK (open clockwise)
Fire Hydrants	75 mm AVK London V
Water meters	Elster Kent (Water meter to be installed by Hessequa Municipality with Building Plan approvals.)

1.4 SEWER MAINS

1.4.1 WASTEWATER FLOW

In accordance with the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* it is expected that 70% of the Average annual water daily demand will end up in the wastewater system.

The annual average dry weather flow (AADWF) equals 70% of 102,8 kl/d = 72 kl/d = 0,83 l/s.

To determine the Peak Wet Weather Flow (PWWF) a peak factor of 2,5 was taken in consideration with an expected stormwater infiltration of 15%. The PWWF equals 2,386 l/s.

1.4.2 SEWER RETICULATION

A waterborne sewer reticulation system comprising of 160mm class 34 PVC sewer mains with solid shaft fibre cement manholes complete with ductile iron double lipped manhole covers is proposed. (See Drawing HESRIV-474-S1) Sewage will gravitate to the most northern corner of the site and connect via a 193m long 160mm diam. link sewer to an existing sewer manhole in Paling Street.

Each new unit will be provided with a 110mm Ø Class 34 uPVC connection with end cap terminating one meter inside each erf boundary. Typical details are shown on drawing HESRIV-474-S2.

1.4.3 DESIGN CRITERIA

The following minimum design criteria shall be applicable to sewer pipework:

- Design parameters: Average daily flow as per Red Book for the different housing categories
Peak factor – Harmon formula : Extraneous flow – 15% : Minimum velocity – 0.7m
- Minimum cover to pipes: 0.80m
- Minimum pipe size: 110mm diameter for house connections: 160mm diameter for sewer mains
- Minimum gradients: 110mm diameter house connection 1:60: main lines at 80% capacity as follows :

Number of Dwelling/units	Grade
Less than 6	1:80
6 to 10	1:100

- House connection depth shall generally be 1.0m but at least be able to drain 80% of an erf.
- Maximum manhole spacing of 80m.

1.5 ELECTRICAL SLEEVES

The position of electrical sleeves (110 & 160mm Class 34 PVC) is indicated on Drawing HESRIV-474-R3. The electrical reticulation and street lighting will be handled by the Electrical Engineer.

1.6 SOLID WASTE

All household waste to be delivered to the central solid waste collection area for collection by Hessequa Municipality and discharging at the Melkhoutfontein solid waste dump site.

The estimated solid waste generated per day, fully developed, is as follows:

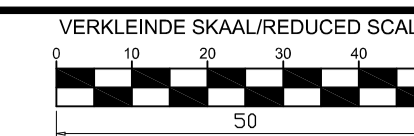
$3,5\text{kg} \times \text{person/d} (248 \text{ persons}) = 0,868 \text{ ton/day} = 0,651 \text{ m}^3/\text{day} (\text{volume}).$

GIDEON PEPLER Pr Tech Eng
HESSEQUA CONSULTING ENGINEERS

29 October 2020

ANNEXURE A : DRAWINGS

- HESRIV-474-R1 : STREET LAYOUT
- HESRIV-474-R2 : KERB LAYOUT AND ROAD MARKINGS
- HESRIV-474-W1 : WATER RETICULATION
- HESRIV-474-W2 : WATER RETICULATION TYPICAL DETAILS
- HESRIV-474-S1b : SEWER LAYOUT
- HESRIV-474-S2 : SEWER RETICULATION TYPICAL DETAILS
- HESRIV-474-SW1b : STORMWATER LAYOUT
- HESRIV-474-R6 : STREET AND STORMWATER TYPICAL DETAILS
- HESRIV-474-R3 : ELECTRICAL DUCT LAYOUT



Notas/Notes

Wysiging/Amendment

Nr. No.	Datum Date	Nagesien Checked	Deur By	Beskrywing Description
a	9/6/20	gp	gp	Change sewer reticulation
b	11/6/20	gp	gp	New layout - Street 4



P.O. BOX 577
RIVERSDALE 6670
22 HEIDELBERG ROAD RIVERSDALE
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Ontwerp Designed	Geteken Drawn	Nagesien Checked
GP	GP	

Pr Tech Eng
Raadgewende Ingenieur Consulting Engineer Datum/Date

Klien/Client Datum/Date

ELLENRUST PROPERTIES CC

Projek/Project
PROPOSED LIFESTYLE VILLAGE

Tekening Beskrywing/Drawing description
SEWER NETWORK LAYOUT

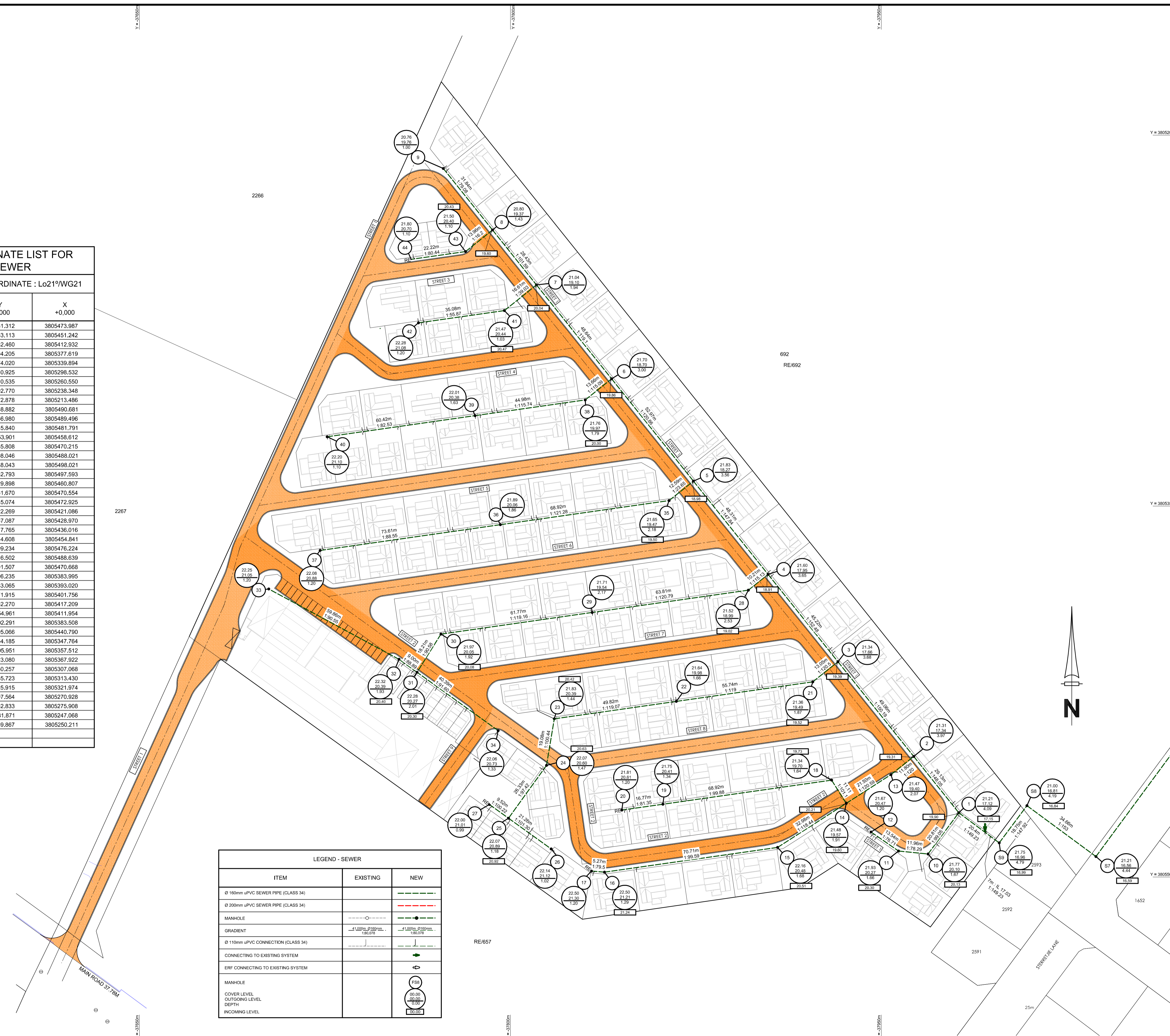
Skala/Scale Datum/Date
1:750 SEPTEMBER 2019

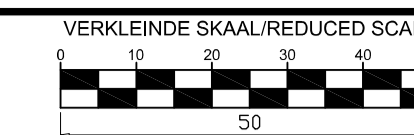
Tekening nommer/Drawing number
HESRIV-474-S1b

CO-ORDINATE LIST FOR SEWER

POINT No.	COORDINATE : Lo21°WG21	
	Y +0,000	X +0,000
1	-37981.312	3805473.987
2	-37963.113	3805451.242
3	-37932.460	3805412.932
4	-37904.205	3805377.619
5	-37874.020	3805339.894
6	-37840.925	3805298.532
7	-37810.535	3805260.550
8	-37792.770	3805238.348
9	-37772.878	3805213.486
10	-37968.882	3805490.681
11	-37956.980	3805489.496
12	-37945.840	3805481.791
13	-37953.901	3805458.612
14	-37935.808	3805470.215
15	-37908.046	3805488.021
16	-37838.043	3805498.021
17	-37832.793	3805497.593
18	-37929.898	3805460.807
19	-37861.670	3805470.554
20	-37845.074	3805472.925
21	-37922.269	3805421.086
22	-37867.087	3805428.970
23	-37817.765	3805436.016
24	-37814.608	3805454.841
25	-37799.234	3805476.224
26	-37816.502	3805488.639
27	-37791.507	3805470.668
28	-37896.235	3805383.995
29	-37833.065	3805393.020
30	-37771.915	3805401.756
31	-37762.270	3805417.209
32	-37754.961	3805411.954
33	-37702.291	3805383.508
34	-37795.066	3805440.790
35	-37864.185	3805347.764
36	-37795.951	3805357.512
37	-37723.080	3805367.922
38	-37830.257	3805307.068
39	-37785.723	3805313.430
40	-37725.915	3805321.974
41	-37797.564	3805270.928
42	-37762.833	3805275.908
43	-37781.871	3805247.068
44	-37759.867	3805250.211

ITEM	EXISTING	NEW
Ø 160mm uPVC SEWER PIPE (CLASS 34)	---	---
Ø 200mm uPVC SEWER PIPE (CLASS 34)	---	---
MANHOLE	○	○
GRADIENT	4.100mm @ 100mm	4.100mm @ 100mm
Ø 110mm uPVC CONNECTION (CLASS 34)	---	---
CONNECTING TO EXISTING SYSTEM	→	→
ERP CONNECTING TO EXISTING SYSTEM	→	→
MANHOLE		FS
COVER LEVEL	00.00	00.00
OUTGOING LEVEL	00.00	00.00
DEPTH	0.00	0.00
INCOMING LEVEL	00.00	00.00





Notas/Notes

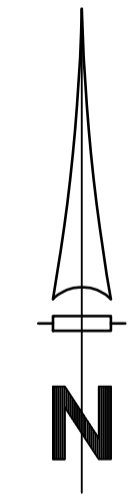
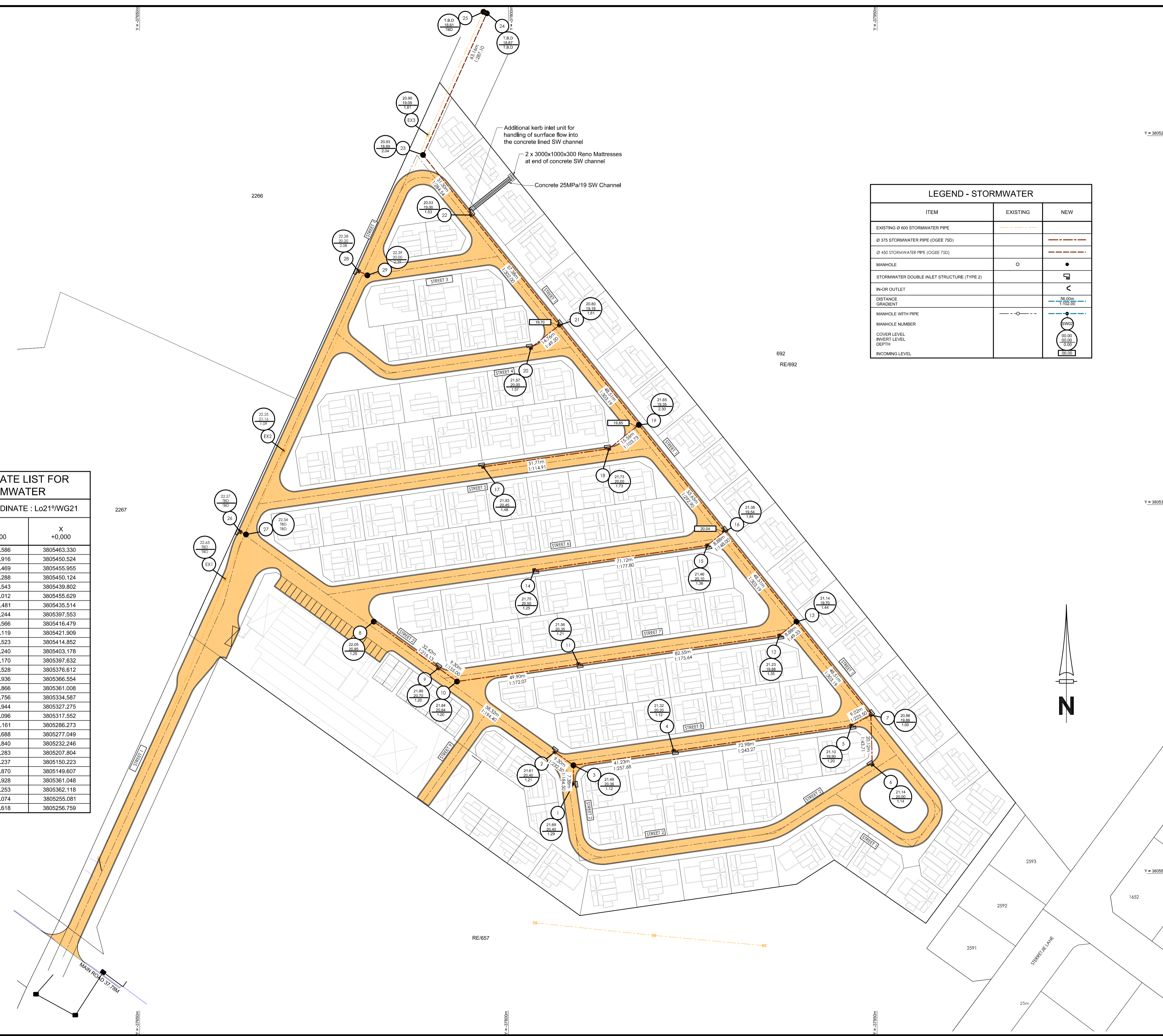
LEGEND - STORMWATER		
ITEM	EXISTING	NEW
EXISTING Ø 600 STORMWATER PIPE	---	---
Ø 375 STORMWATER PIPE (OGEE 750)	---	---
Ø 450 STORMWATER PIPE (OGEE 750)	---	---
MANHOLE	○	●
STORMWATER DOUBLE INLET STRUCTURE (TYPE 2)	⊕	⊕
IN-OR OUTLET		<
DISTANCE		56.00m
GRADIENT		1:102.99
MANHOLE WITH PIPE	○	○
MANHOLE NUMBER		EW00
COVER LEVEL		60.00
INVERT LEVEL		50.00
INCOMING LEVEL		60.00

Wysigting/Amendment

Nr. No.	Datum	Nagesien	Deur	Beskrywing
		Checked	By	Description
a	11/6/20	gp	gp	New layout - Street 4
a	26/10/20	gp	gp	Stormwater amended

CO-ORDINATE LIST FOR STORMWATER

POINT No.	COORDINATE : Lo21°WG21	
	Y +0,000	X +0,000
1	-37826.586	3805463.330
2	-37818.916	3805450.524
3	-37826.469	3805455.955
4	-37867.288	3805450.124
5	-37939.543	3805439.802
6	-37948.012	3805455.629
7	-37947.481	3805435.514
8	-37745.244	3805397.553
9	-37771.566	3805416.479
10	-37779.119	3805421.909
11	-37828.523	3805414.852
12	-37910.240	3805403.178
13	-37917.170	3805397.632
14	-37810.528	3805376.612
15	-37880.936	3805366.554
16	-37867.866	3805361.008
17	-37789.756	3805334.587
18	-37840.944	3805327.275
19	-37853.096	3805317.552
20	-37809.161	3805286.273
21	-37820.688	3805277.049
22	-37784.840	3805232.246
23	-37765.283	3805207.804
24	-37791.237	3805150.223
25	-37789.870	3805149.607
26	-37690.928	3805361.048
27	-37693.253	3805362.118
28	-37739.074	3805255.081
29	-37742.618	3805256.759



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Onwerp	Geteken	Nagesien
Designed	Drawn	Checked
AA	AA	

Pr Tech Eng
Raadgewende Ingenieur
Consulting Engineer

Datum/Date
Klient/Cient

Klient/Cient
ELLENRUST PROPERTIES CC

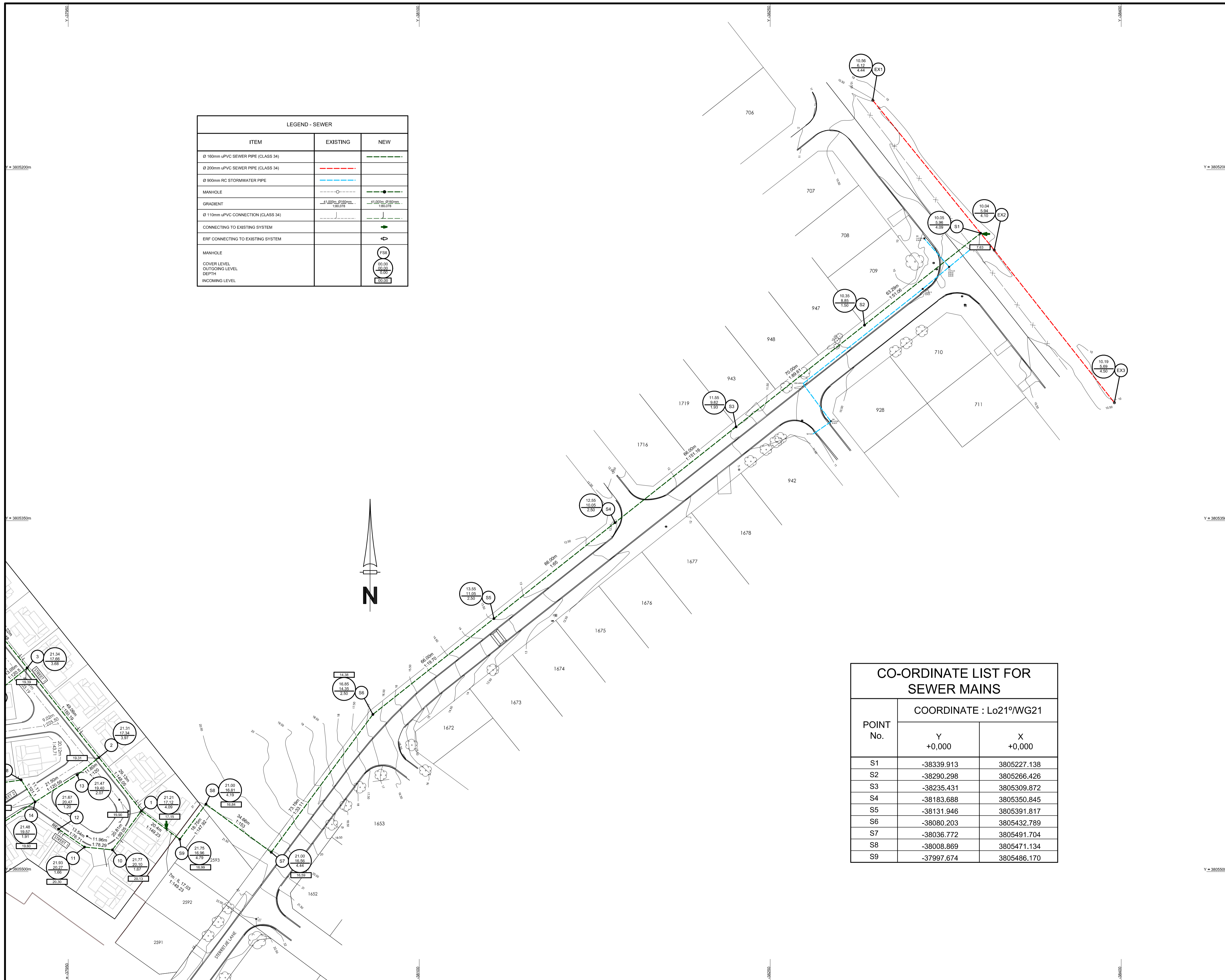
Projek/Project
PROPOSED LIFESTYLE VILLAGE

Tekening Beskrywing/Drawing description
STORMWATER LAYOUT

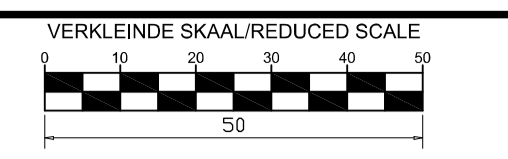
Skaal/Scale
1:750

Datum/Date
SEPTEMBER 2019

Tekening nommer/Drawing number
HESRIV-474-SW1b



LEGEND - SEWER		
ITEM	EXISTING	NEW
Ø 100mm uPVC SEWER PIPE (CLASS 34)	---	---
Ø 200mm uPVC SEWER PIPE (CLASS 34)	---	---
Ø 900mm RC STORMWATER PIPE	---	---
MANHOLE	○	○
GRADIENT	4.00m Ø100mm 1:90.078	4.00m Ø100mm 1:90.078
Ø 110mm uPVC CONNECTION (CLASS 34)	---	---
CONNECTING TO EXISTING SYSTEM	---	---
ERF CONNECTING TO EXISTING SYSTEM	---	---
MANHOLE		FS
COVER LEVEL		00.00
OUTGOING LEVEL		00.00
DEPTH		00.00
INCOMING LEVEL		00.00



Notas/Notes

Wysigting/Amendment				
Nr No.	Datum Date	Nageien Checked	Deur By	Beskrywing Description



P.O. BOX 577
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Ontwerp Designed	Gekopen Drawn	Nageien Checked
GP	GP	

Pr Tech Eng
Raadgewende Ingenieur Consulting Engineer Datum/Date

Kliënt/Client Datum/Date



Projek/Project
UPGRADING OF SEWER INFRASTRUCTURE AND WATER INFRASTRUCTURE IN STILL BAY

Tekening Beskrywing/Drawing description

PROPOSED BULK SEWER LAYOUT

Skaal/Scale 1:750 Datum/Date JUNE 2020

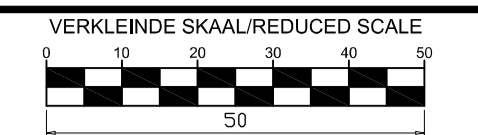
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CO-ORDINATE LIST FOR SEWER MAINS

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	Y +0,000	X +0,000
S1	-38339.913	3805227.138
S2	-38290.298	3805266.426
S3	-38235.431	3805309.872
S4	-38183.688	3805350.845
S5	-38131.946	3805391.817
S6	-38080.203	3805432.789
S7	-38036.772	3805491.704
S8	-38008.869	3805471.134
S9	-37997.674	3805486.170



LEGEND - WATER		
ITEM	EXISTING	NEW
Ø 75 mm EXISTING PIPE	— 75mm —	— 75mm —
Ø 75 mm PIPE uPVC CLASS 12	— 75mm —	— 75mm —
Ø 110 mm PIPE uPVC CLASS 12	— 110mm —	— 110mm —
WATER VALVE	⊞	⊞
FIRE HYDRANT	⊙	⊙
CONNECTING TO EXISTING SYSTEM	—	—
ERF CONNECTION TO EXISTING SYSTEM	—	—
SINGLE ERF CONNECTION	—	—
DOUBLE ERF CONNECTION	—	—
BEND		90°
T-PIECE		45°
REDUCER		100/150
ENDCAP		⊞



Notas/Notes

Wysigting/Amendment				
Nr. No.	Datum Date	Nagesien Checked	Deur By	Beskrywing Description
a	11/6/20	gp	gp	New layout - Street 4



P.O. BOX 577
RIVERSDALE 6670
22 HEIDELBERG ROAD RIVERSDALE
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Ontwerp Designed	Geteken Drawn	Nagesien Checked
AA	AA	

Pr. Tech. Eng.
Raadgewende Ingenieur Consulting Engineer Datum/Date

Klient/Client Datum/Date

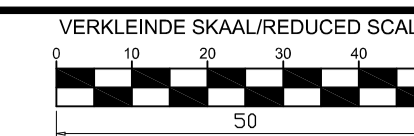
Klient/Client
ELLENRUST PROPERTIES CC

Projek/Project
PROPOSED LIFESTYLE VILLAGE

Tekening Beskrywing/Drawing description
WATER RETICULATION LAYOUT

Skaal/Scale Datum/Date
1:750 SEPTEMBER 2019

Tekening nommer/Drawing number
HESRIV-474-W1a



Notas/Notes

Wysiging/Amendment

Nr. No.	Datum Date	Nagesien Checked	Deur By	Beskrywing Description
a	9/6/20	gp	gp	Change sewer reticulation
b	11/6/20	gp	gp	New layout - Street 4



P.O. BOX 577
RIVERSDALE 6670
22 HEIDELBERG ROAD RIVERSDALE
CELL : 083 447 9297
TEL/FAX : 028 713 4030



Ontwerp Designed	Geteken Drawn	Nagesien Checked
GP	GP	

Pr Tech Eng
Raadgewende Ingenieur Consulting Engineer Datum/Date

Klien/Client Datum/Date

ELLENRUST PROPERTIES CC

Projek/Project
PROPOSED LIFESTYLE VILLAGE

Tekening Beskrywing/Drawing description
SEWER NETWORK LAYOUT

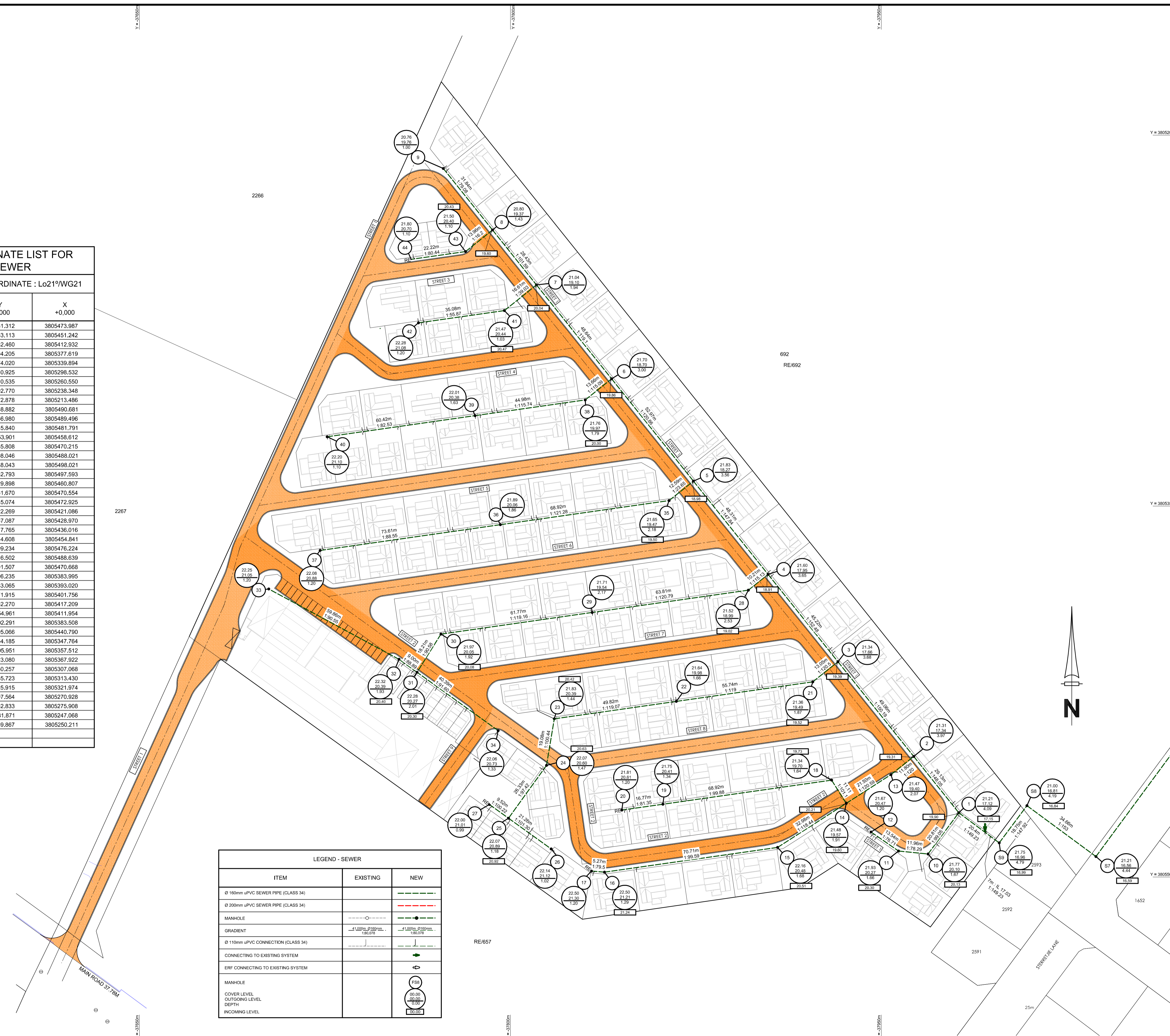
Skala/Scale Datum/Date
1:750 SEPTEMBER 2019

Tekening nommer/Drawing number
HESRIV-474-S1b

CO-ORDINATE LIST FOR SEWER

POINT No.	COORDINATE : Lo21°WG21	
	Y +0,000	X +0,000
1	-37981.312	3805473.987
2	-37963.113	3805451.242
3	-37932.460	3805412.932
4	-37904.205	3805377.619
5	-37874.020	3805339.894
6	-37840.925	3805298.532
7	-37810.535	3805260.550
8	-37792.770	3805238.348
9	-37772.878	3805213.486
10	-37968.882	3805490.681
11	-37956.980	3805489.496
12	-37945.840	3805481.791
13	-37953.901	3805458.612
14	-37935.808	3805470.215
15	-37908.046	3805488.021
16	-37838.043	3805498.021
17	-37832.793	3805497.593
18	-37929.898	3805460.807
19	-37861.670	3805470.554
20	-37845.074	3805472.925
21	-37922.269	3805421.086
22	-37867.087	3805428.970
23	-37817.765	3805436.016
24	-37814.608	3805454.841
25	-37799.234	3805476.224
26	-37816.502	3805488.639
27	-37791.507	3805470.668
28	-37896.235	3805383.995
29	-37833.065	3805393.020
30	-37771.915	3805401.756
31	-37762.270	3805417.209
32	-37754.961	3805411.954
33	-37702.291	3805383.508
34	-37795.066	3805440.790
35	-37864.185	3805347.764
36	-37795.951	3805357.512
37	-37723.080	3805367.922
38	-37830.257	3805307.068
39	-37785.723	3805313.430
40	-37725.915	3805321.974
41	-37797.564	3805270.928
42	-37762.833	3805275.908
43	-37781.871	3805247.068
44	-37759.867	3805250.211

LEGEND - SEWER		
ITEM	EXISTING	NEW
Ø 160mm uPVC SEWER PIPE (CLASS 34)	---	---
Ø 200mm uPVC SEWER PIPE (CLASS 34)	---	---
MANHOLE	○	○
GRADIENT	4.100mm @ 100mm	4.100mm @ 100mm
Ø 110mm uPVC CONNECTION (CLASS 34)	---	---
CONNECTING TO EXISTING SYSTEM	→	→
ERP CONNECTING TO EXISTING SYSTEM	→	→
MANHOLE		FS
COVER LEVEL		0.00
OUTGOING LEVEL		0.00
DEPTH		0.00
INCOMING LEVEL		0.00





water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

WESTERN CAPE REGION
PRIVATE BAG X16, SANLAMHOF, 7532
Tel.: 021 941 6187, E-mail: lyonsh@dws.gov.za

Enquiry: H. Lyons
File number: 27/2/1/H590/104/1

Hessequa Local Municipality - Stilbaai
Private Bag X 29
RIVERSDALE
6670

Dear Sir/Madam

APPLICATION FOR WATER USE LICENCE APPLICATION IN TERMS OF SECTION 40 AND 41 OF THE NATIONAL WATER ACT, 1998 (ACT 36 OF 1998): DISPOSING OF WASTE IN A MANNER WHICH MAY DETRIMENTALLY IMPACT ON A WATER RESOURCE:ERF 657: STILBAAI

Your Water Use Licence Application has reference.

Attached please find the original Water Use Licence with number 21/H90E/EG/4715 dated 24 October 2016 that was issued with regard to the above-mentioned application.

Please ensure that all conditions within the Licence are adhered to.

Water use charges or waste discharge charge charges or levies will be imposed from time to time by the responsibly authority or the Department in terms of the National Water Act, 1998 (Act 36 of 1998).

If you need further information, you are welcome to contact this office.

Yours faithfully

REGIONAL HEAD: WESTERN CAPE
DATE: 07 NOVEMBER 2016



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria, 0001, Sedibeng Building, 185 Francis Baard Street, Pretoria,
Tel: (012) 336 7500 Fax (012) 323-4472 / (012) 326 2715

LICENCE IN TERMS OF CHAPTER 4 OF THE
NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

I, **Sifiso Mkhize**, in my capacity as Director-General (Acting) in the Department of Water and Sanitation, acting under authority of the powers delegated to me by the Minister of Water and Sanitation, hereby authorise the following water use in respect of this licence. **This licence hereby supersedes the Exemption granted in terms of Section 21 of the Water Act, 1956 (Act 54 of 56).**

SIGNED: 

DATE: 24/10/2016

LICENCE NO: 21/H90E/EG/4715
FILE NO: 27/2/1/H590/104/1

- 1. Licensee **Hessequa Local Municipality**
Postal Address Private Bag X 29
RIVERSDALE
6670
- 2. Water Use
 - 2.1 Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource, subject to the conditions set out in Appendices I and II.
- 3. Property on which the use will be exercised
 - 3.1 Erf 657, Stilbaai

B 07474

4. Registered owner of the Property

Owner of the property on which the water will be exercised is shown in Table 1.

Table 1: Summary of registered owner of the Property

Water Use	Coordinates	Property Description	Title Deed No.	Property Owner
21(g)	S 34°23'31.58" E 21°24'46.12"	Erf 657, Stilbaai	T13983/1963	Hessequa Local Municipality

5. Licence and Review Period

- 5.1 This licence is valid for a period of five (5) years from the date of issuance and may be reviewed every three (3) years.

6. Definitions

"Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998) shall bear the same meaning when used in this licence".

"The Department" means the Department of Water and Sanitation.

"The BG-CMA" means the Breede-Gouritz Catchment Management Agency.

"The Responsible Authority" means Chief Executive Officer: Breede-Gouritz Catchment Management Agent (BG-CMA), Private Bag X 3055, Worcester, 6849.

8 Description of the activity

This licence authorises Hessequa Local Municipality to dispose and store treated wastewater into a irrigation dam of maximum capacity of 6 300 m³ (six thousand three hundred cubic metres) and to supply Stilbaai Golf Club with a maximum volume of 2000 m³/d (two thousand cubic metres per day) of treated wastewater from Still Bay Wastewater Treatment Works (WWTW) for irrigation purposes. Authorisation for irrigation of the golf course is issued under General Authorisation in a letter issued to Still Bay Golf Course Club in March 2016. The Stilbaai Wastewater Treatment Works & its associated activities are located on Erf 657, Still Bay. The plant and its associated activities are situated within the Breede-Gouritz Water Management Area, in quaternary catchment H90E.

5

APPENDIX I

General conditions for the licence

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).
2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.
3. The Licensee must immediately inform the Responsible Authority of any change of name, address, premises and/or legal status.
4. If the property/ies in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Responsible Authority within 60 days of the said change taking place.
5. If a Water User Association is established in the area to manage the resource, membership of the Licensee to the Association is compulsory.
6. The Licensee shall be responsible for any water use charges and/or levies imposed by a Responsible Authority.
7. While effect must be given to the Reserve as determined in terms of the Act, where a lower confidence determination of the Reserve has been used in issuance of this licence, the licence conditions may be amended should a higher confidence reserve be conducted.
8. The licence shall not be construed as exempting the Licensee from compliance with the provisions of any other applicable Act, Ordinance, Regulation or By-law.
9. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other provisions of the Act, as amended from time to time.
10. The Licensee must conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit shall be submitted to the Responsible Authority within one month of the finalization of the audit.
11. The Licensee must appoint an independent external auditor to conduct an audit every two years on compliance with the conditions of this licence. Both these audits may be subjected to external audit.
12. If the water use described in this licence is not exercised within 3 years of the date of the licence, the authorization will be withdrawn. Upon commencement of the water use, the Licensee must inform the relevant authority in writing.
13. Flow metering, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than two years. Calibration certificates shall be available for inspection by the Responsible Authority or his representative upon request.
14. Any incident that causes or may cause water pollution shall be reported to the Responsible Authority or his/her designated representative within 24 hours.

5

APPENDIX II

Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource

1. QUANTITY OF WASTEWATER TO BE DISPOSED

1.1 The Licensee is authorised to store and dispose of water containing waste into an irrigation dam of a maximum capacity of six thousand three hundred cubic metres (6 300 m³) and to supply Stilbaai Golf Club with a maximum of two thousand cubic metres per day (2000 m³/d) for irrigation of 14 ha of kikuyu grass on Erf 2488 as listed in Table 2.

Table 2. Waste Disposal facilities

Activity	Capacity (m ³)	Co-ordinate	Properties	Purpose
Disposal of treated wastewater into Irrigation Dam	6 300	S 33°59'43.2" E 22°25'19.6"	Erf 464	Disposal and storage of waste or water containing waste for re-use

1.2 The quantity of wastewater authorised to be disposed in terms of this licence must not be exceeded without approval from the Responsible Authority.

1.3 The quality of the treated effluent disposed into irrigation Dam from Stilbaai WWTWs must not exceed the following limits as specified in Table 3.

Table 3: Quality of wastewater to be discharged

Variable	Limit
pH	5.5 – 9.5
Nitrate/ Nitrites (as N) in mg/l	15
Ammonia (as N) in mg/l	6
Chemical oxygen demand in mg/l	75
<i>E coli</i> per 100ml	150
Orthophosphate (as P) in mg/l	10
Suspended solids in mg/l	25
Chlorine as Free Chlorine in (mg/l)	0.25
Electrical Conductivity (mS/m)	70
Oil or grease	2.5

2 FURTHER STUDIES AND INFORMATION REQUIREMENTS

2.1 The Licensee must develop an action plan to address the hydraulic capacity and the method of disposal of the final treated effluent. The plan must cover the following but not limited:

2.1.1 The capacity upgrade(s) of the plant with timeframes to cater for the current and future inflows including influx during holiday seasons.

2.1.2 The plan must include the water balance indicating where/how the treated effluent will be disposed.



- 2.2 The plan must be endorsed by Council and all the future development will not be permitted in Stilbaai until the hydraulic capacity and the method of disposal of the effluent has been addressed by the Licensee.

3. MONITORING

3.1 Monitoring for Quality and Quantity

- 3.1.1 The quantity of treated effluent discharged into the irrigation Dam River shall be metered and recorded daily and this should include the quantity of treated effluent supplied to the Stilbaai Golf Club.
- 3.1.2 The quality of treated effluent discharged into the irrigation Dam shall be sampled and analysed monthly.
- 3.1.3 Flow metering, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than two years. Calibration certificates shall be available for inspection by the Responsible Authority or his representative upon request.

3.2 Monitoring points

Monitoring for quality and flow shall only be carried out at the monitoring points indicated below:

3.2.1. Monitoring points for flow:

3.2.1.1 at the inlet point of the WWTWs; and at the discharge point into the irrigation dam.

3.2.2. Monitoring points for quality:

3.2.2. 1 at the outlet point where the treated effluent is discharged into the irrigation dam for storage and disposal.

- 3.2.3 The monitoring points shall not be changed without prior notification to and written approval by the Responsible Authority.

3.3 Groundwater monitoring

- 3.3.1 The Licensee shall design the groundwater monitoring programme and it must be submitted to the Responsible Authority for approval within six months of the date of issuance of this licence.
- 3.3.2 The Licensee must conduct groundwater monitoring on a quarterly basis and the results must be submitted to the Provincial Head.
- 3.3.3 The Licensee shall analyse the quality of all boreholes in the groundwater quality network, quarterly based on the impact of the facility:
- 3.3.4 If ground water pollution have occurred or may possibly occur, the licensee must conduct necessary investigations and implement additional monitoring and rehabilitation measures which must be to the satisfaction of the Responsible Authority.

4. METHODS OF SAMPLING AND ANALYSIS

- 4.1 Sampling and analysis shall, wherever applicable, be carried out in accordance with methods prescribed by, and obtainable from, the South African Bureau of Standards (SABS), in terms of the Standards Act, Act 30 of 1982, or any other method approved in writing by the Provincial Head.
- 4.2 The methods of analysis shall not be changed without prior notification to, and written approval by the Responsible Authority.
- 4.3 Sample analysis must be conducted by a recognized analytical laboratory, accredited to analyze the relevant constituents in the wastewater, or approved by the Responsible Authority to perform the analyses.

5. STORMWATER

- 5.1 Storm water leaving the Licensee's premises shall in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas of a combination thereof which is produced, used, stored dumped or spilled on the premises.
- 5.2 The Licensee must ensure that no stormwater will ingress into the wastewater system and that no wastewater ingress into the stormwater system.
- 5.3 Wastewater impoundments must be designed, constructed and managed to ensure that there is sufficient capacity to contain the 1:50 year flood event, with a minimum of 0.8 m freeboard. Freeboard will be defined as the difference between the water level and the crest of the overflow.
- 5.4 Stormwater shall be diverted from the impoundments and roads and shall be managed in such a manner as to disperse runoff and to prevent the concentration of the stormwater flow and Wastewater systems must be properly maintained on a continuous basis.
- 5.5 Cut-off drains shall be provided around the WWTW to prevent storm-water ingress into the surrounding of the works. These drains shall be designed to contain the maximum runoff, which could be expected over a period of 24 hours with a frequency of once in every 20 years.
- 5.6 The Licensee shall conduct regular inspections to ensure that stormwater does not ingress into the wastewater system.

6. SLUDGE MANAGEMENT

- 6.1 Sewage sludge from the drying beds and other solid sewage waste, for instance grit and screenings, shall be handled, stored, transported, utilized or disposed of in such a manner as not to cause any odour, flies, health hazard, secondary pollution or other nuisance Sewage sludge shall be disposed of according to the first edition document titled "Guidelines for the Utilization and Disposal of Wastewater sludge, Water Research Commission Report No TT 261/06, March 2006, as amended from time to time., to the satisfaction of the Responsible Authority and in accordance with the requirements of section 20(1) of the Environment Conservation Act, 1989 (Act 73 of 1989).
- 6.2 Sewage sludge or any other solid sewage waste may be alienated for utilisation or disposal thereof, only in terms of a written agreement and provided that the responsibility for complying with the requirements contained in this Licensee is accepted by the Licensee and such other party, jointly and separately.



7. PIPELINES

- 7.1 The pipelines used for the conveyance of waste or water containing waste shall be painted in a conspicuous colour or manufactured of a coloured material distinctly different from the colour of the pipelines in which drinking water is flowing to avoid the possibility of any cross-connections of the different pipelines.
- 7.2 All stop-valves and taps on the pipelines conveying the waste or water containing waste shall be of a type that can be opened and closed by means of a loose wrench. This wrench shall be in the safekeeping of a responsible member of the staff to prevent unauthorised use thereof.
- 7.3 Notices manufactured of a durable weatherproof material warning against the use of water containing waste for drinking and washing purposes shall be displayed at prominent places where the water containing waste is being reused and at all taps. Such notices shall be worded in the official languages applicable in the area.
- 7.4 The Licensee must inspect the pipelines conveying the water containing waste and the pumping facilities on a weekly basis to check for leaks or malfunctions and records shall be kept of such inspections.
- 7.5 The Licensee shall have the full length of the pipeline surveyed on an annual basis to monitor the integrity of the pipeline. The results of the survey shall be reported in writing to the Responsible Authority

8. PUMP STATIONS AND MANHOLES

- 8.1 The Licensee shall develop and implement a scheduled monitoring and maintenance plan for all sewage pump stations and manholes under its control.
- 8.2 All pump stations shall have an emergency containment facility with sufficient capacity to ensure untreated effluent retention up to a 24-hour period.
- 8.3 The Licensee must supply the co-ordinates of all the pump stations in the area of jurisdiction before the first review of the Licence.
- 8.4 The Licensee shall ensure that manholes are covered at all times with a suitable cover that cannot be removed by unauthorized persons and manhole covers should be of a material that is less prone to theft.
- 8.5 Existing WWTWs lines and manholes situated within the 1:100 year flood lines shall be sealed adequately to ensure minimal ingress of water during any rainfall event.

9. FENCING, NOTICES AND DRAINS

- 9.1 The site of the Wastewater Treatment shall be adequately fenced to prevent the entry of animals and unauthorised persons.
- 9.2 Notices manufactured of durable weatherproof material prohibiting unauthorised entry and warning against the use of water containing waste for drinking and washing purposes shall be displayed at prominent places along the fence and at entrance gates. Such notices shall be worded in the official languages applicable in the area.

10. MALFUNCTIONS/ABNORMAL CONDITIONS

- 10.1 Accurate and up-to-date records shall be kept of all system malfunctions resulting in the disposal of water containing waste not in accordance with the requirements of this licence. The records shall be tabulated under the following headings with a full explanation of all the contributory circumstances:
- 10.1.1 Operating errors



- 10.1.2 Mechanical failures (including design, installation or maintenance)
 - 10.1.3 Environmental factors (e.g. floods)
 - 10.1.4 Loss of supply services (e.g. power failure)
 - 10.1.5 Other causes
- 10.2 The Licensee must, within 14 days, or a shorter period of time, as specified by the Provincial Head, from the occurrence or detection of any incident referred above, submit an action plan, which must include a detailed time schedule, to the satisfaction of the Responsible Authority of measures taken to:
- 10.2.1 Correct the impacts resulting from the incident;
 - 10.2.2 Prevent the incident from causing any further impacts; and
 - 10.2.3 Prevent a recurrence of a similar incident.

11. CONTINGENCY PLANS AND INCIDENT REPORTING

- 11.1 The Licensee must develop and implement an Emergency and Contingency Plan.
- 11.2 The Licensee must implement and promote an environmental call and reporting centre where the following can be reported:
- 11.2.1 Illegal disposals of waste and/or littering;
 - 11.2.2 Broken, ruptured or leaking pipelines wasting potable water;
 - 11.2.3 Open or leaking taps on the property of the Licensee;
 - 11.2.4 Open manholes;
 - 11.2.5 Leaking or broken pipes;
 - 11.2.6 Possible offenders of any environmental regulations, by-laws and/or ordinances;
 - 11.2.7 Any other aspect that might hamper the effective management of the water resources.
- 11.3 The Licensee must compile an environmental call and reporting centre protocol, that must be included in the Plan, and which will investigate every complaint within 24 hours of it being reported.
- 11.4 The Licensee must rectify all valid issues reported within 7 days of the issue being reported to the Licensee. All incidents shall be recorded in an incident register which will include reasons for non-rectification of issues raised
- 11.5 Statistical summary of malfunctions and incidents shall be included in the Annual Report.

12. AUDITING

- 12.1 The reports generated by the auditors must be submitted to the Responsible Authority by the end of March every year.

13. REPORTING

- 13.1 The information required in terms of condition 3 must be submitted quarterly to the Responsible Authority, under reference **27/2/1/H590/104/1**, within one month of the close of the period concerned.
- 13.2 The occurrence of any incident, which causes or may cause water pollution, shall immediately be reported to the Responsible Authority.



14. OPERATIONS

- 14.1 The sewage purification works shall be supervised and controlled by a suitably qualified and experienced employee of the licensee who shall have under his control an adequate number of operators who have been classified in terms of regulation 2834 dated 27 December 1985 (or any update thereto) and in terms of section 26 of the Act, to ensure proper functioning of the works and processes at all times.
- 14.2 Suitably qualified and experienced mechanical and electrical artisans shall be available to be called in for inspection and maintenance of the plant.

[END OF LICENCE]

JANUARIE 2018

A.L. ABBOTT AND ASSOCIATES (PTY) LTD

(Reg. No. 1982/004379/07)

Doc.No. 5.10/1 Rev.4

Consulting Analytical & Industrial Chemists
Specialists in Water & Waste Water Treatment
Telephone (021)448 6340/1
After Hours (0833263887)
Telefax (021)448 6342
e-Mail Address :
info@alabbott.co.za



T0276

No. 1, Vine Park
Vine Road
7925
P.O. Box 483
WOODSTOCK, CAPE
7915

Certificate of Analysis

HESSEQUA MUNICIPALITY - TENDER NO. HES-WRS 04/1415

Hessequa Final Effluents

STILBAAI

DATE SAMPLED : 2018/01/29
DATE RECEIVED : 2018/01/31
DATE ANALYSIS
COMMENCED : 2018/01/31

OUR REF. : 2018/01/29/3317
REPORT NO. : 776

	Sample Number	3317	
Mthd ALA No.	Analyses	Results	General Limit (Full)
19	pH (at 25 °C)	7.74	5.5-9.5
9	Conductivity (mS/m) (at 25 °C)	285	70.0 Above Intake - 150 Max
6A	Total Suspended Solids (mg/l)	11	25
95	Ammonia Nitrogen (mg/l as N)	20.9	6.0
100	Nitrate & Nitrite Nitrogen (mg/l as N)	1.8	15.0
Calc	Nitrate Nitrogen (mg/l as N)	0.40	N/A
99	Nitrite Nitrogen (mg/l as N)	1.4	15.0 (sum of NO ₂ & NO ₃ -N)
101	Ortho Phosphate (mg/l as P)	6.3	10.0
2	Chemical Oxygen Demand (mg/l)	82.8	75.0 After Removal of Algae
66	Free Chlorine (mg/l)	<0.05	0.25
84	E.coli (count per 100 ml)	15	1000
86	Faecal Coliforms (count per 100 ml)	15	1000

N. VAN BINSBERGEN (Pr.Sci.Nat.)
DIRECTOR
08 February 2018

TO: HESSEQUA MUNICIPALITY
PO BOX 29
RIVERSDALE
6670

Att: JASON SOLOMONS

Sampler : M.Van Rhyn

This report relates only to the samples tested and is issued subject to the company's standard terms and conditions of business.

FEBRUARIE 2018

A.L. ABBOTT AND ASSOCIATES (PTY) LTD

(Reg. No. 1982/004379/07)

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Doc.No. 5.10/1 Rev.4

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P.O. Box 483
WOODSTOCK, CAPE
7915

Certificate of Analysis

HESSEQUA MUNICIPALITY - TENDER NO. HES-WRS 04/1415

Hessequa Final Effluents

STILBAAI

DATE SAMPLED : 2018/02/26
DATE RECEIVED : 2018/02/28
DATE ANALYSIS
COMMENCED : 2018/02/28

OUR REF. : 2018/02/26/6395
REPORT NO. : 1634

	Sample Number	6395	
Mthd ALA No.	Analyses	Results	General Limit (Full)
19	pH (at 25 °C)	8.28	5.5-9.5
9	Conductivity (mS/m) (at 25 °C)	260	70.0 Above Intake - 150 Max
6A	Total Suspended Solids (mg/l)	19	25
95	Ammonia Nitrogen (mg/l as N)	0.38	6.0
100	Nitrate & Nitrite Nitrogen (mg/l as N)	0.27	15.0
Calc	Nitrate Nitrogen (mg/l as N)	<0.20	N/A
99	Nitrite Nitrogen (mg/l as N)	<0.20	15.0 (sum of NO2 & NO3-N)
101	Ortho Phosphate (mg/l as P)	3.7	10.0
2	Chemical Oxygen Demand (mg/l)	62.8	75.0 After Removal of Algae
66	Free Chlorine (mg/l)	<0.05	0.25
84	E.coli (count per 100 ml)	1	1000
86	Faecal Coliforms (count per 100 ml)	1	1000


JOSE DA SILVA (Cert.Sci.Nat.)
TECHNICAL MANAGER
07 March 2018

TO: HESSEQUA MUNICIPALITY
PO BOX 29
RIVERSDALE
6670

Att: JASON SOLOMONS

Sampler: M.Van Rhyn

This report relates only to the samples tested and is issued subject to the company's standard terms and conditions of business.