

SHELL SUMMIT ROAD

PROPOSED FILLING STATION ON THE REMAINING EXTENT OF PORTION 123 (A PORTION OF PORTION 38) OF THE FARM KNOPJESLAAGTE 385 JR.

OUTLINE SERVICES SCHEME REPORT (WATER AND SEWER)

APRIL 2013

Issue 1

WSP SA Civil and Structural Engineers (Pty) Ltd.

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1. INTRODUCTION

Plan Associates approached *WSP SA Civil and Structural Engineers (Pty) Ltd* to assist in the establishment township on the Remaining Extent of Portion 123 (A portion of portion 38) of the farm Knopjeslaagte 385-JR, for the purposes of establishing a filling station (See **Appendix A** for the S.G Diagram). The appointment is for the compilation of a services report, (specifically for water and sewer), for the proposed development. The report investigates whether the proposed development can be serviced economically with the existing resources and infrastructure.

The site measures **xxxxx**ha in total and is located on the corner of Summit Road and Stirrup Road, Briddle Park, in the jurisdiction of the City of Johannesburg Metropolitan Municipality area. Refer to **Figure 1** for the locality plan.

Developer: **Shell SA Marketing (Pty) Ltd**

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Epsom Downs

Bryanston

2021

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(Title Deed – **Appendix B**)

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Bryanston

2021

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Consulting Engineers:

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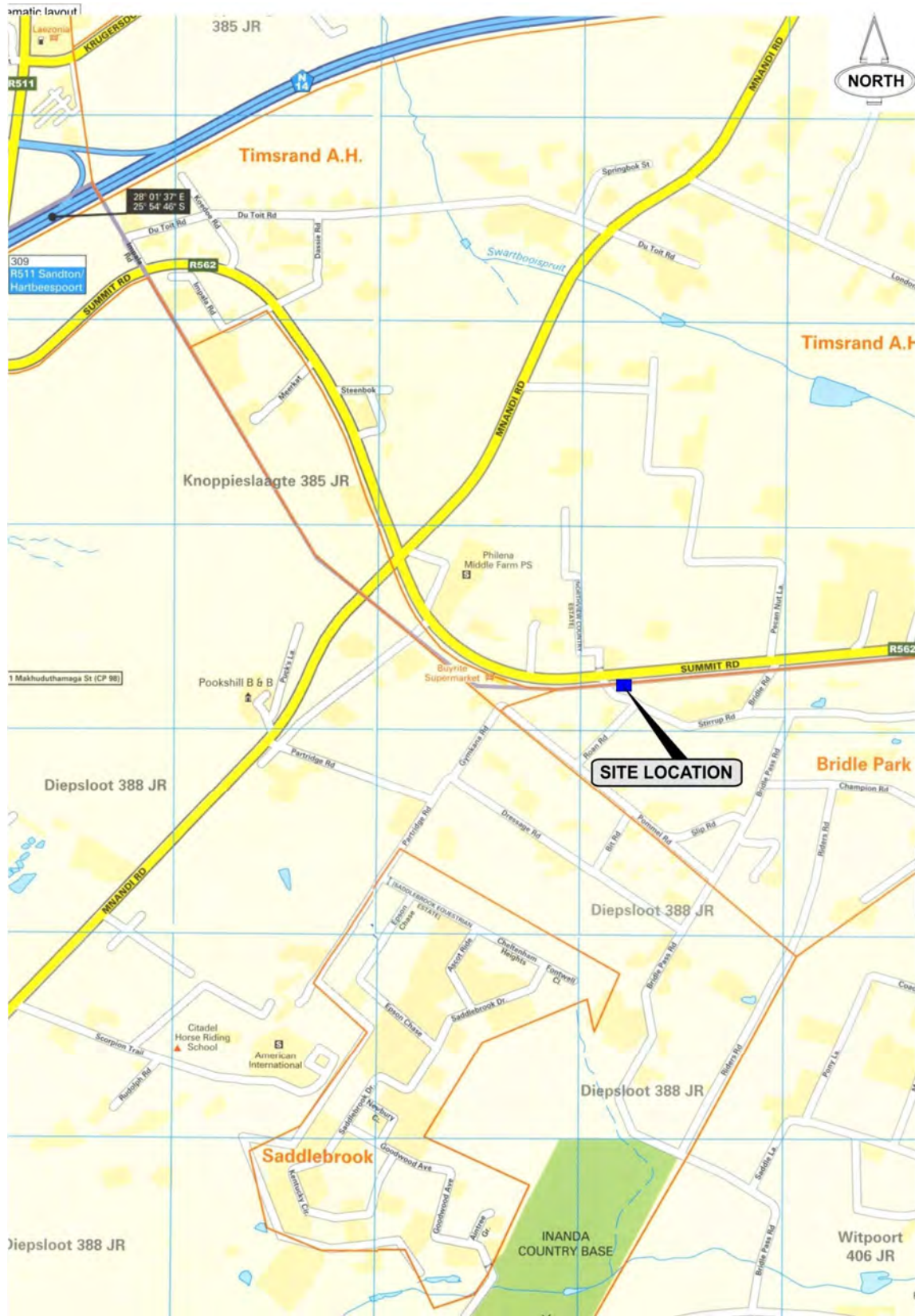
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Figure 1 – Site Locality Plan (Not to scale)



2. CIVIL ENGINEERING SERVICES

2.1 WATER

WSP Group Africa (Pty) Ltd/WSP Civil & Structural Engineers Division appointed GLS Consulting to evaluate the existing infrastructure in the development area and the impact of the development. Refer to **Appendix C** for the report.

The proposed development is currently located within the Blue Hills (PRV 1) water sub-district. It should be noted that a 600mm diameter Rand Water bulk pipeline is also located in Stirrup Road, which supplies Diepsloot. See **Appendix D** for the existing water network (GLS Figure SS_W1).

A connection to the existing 160mm diameter pipe along Stirrup Road in the vicinity of Point A is proposed to serve the development via a new 160mm diameter pipe to be installed.

The existing system analysis, including the additional peak demand of the proposed development ($4 \times \text{AADD} = 0.04 \text{ l/s}$), confirms that the peak residual pressure at the proposed connection point would be approximately 45m. This peak pressure is greater than the minimum pressure criteria of 24 m (as in accordance with JW's Modelling Guidelines) confirming that no upgrading is required to meet the minimum pressure criteria.

The total cost for the connection of the new pipeline(s) from the development to the existing systems cannot be obtained yet (or discussed) since the SDP is not yet finalised.

2.1.1 ESTIMATED WATER CONSUMPTION

(The estimated water consumption calculations for this report are based on the GLS findings and recommendations).

To note is that the development is located within the Blue Hills (PRV1) water sub-district. GLS Consulting compiled a water master plan for the Blue Hills and Diepsloot Water Sub-Districts (Ref. JWAT-C-0160-01-00-1029) for Johannesburg Water (JW) in October 2009. The report and the latest hydraulic models (2013-02) formed the bases of the water impact study undertaken for the proposed development.

The water demand for the proposed development, assuming a unit demand of 0.4 kl/day per 100m² floor area as per the JW Design Guidelines, is estimated to be 0.86 kl/d. The demand translates into a peak demand of 0.04 l/s assuming a peak factor of 4 to be applicable.

The required fire flow was assumed to be 50 l/s with a minimum pressure of 15 m when assuming this development falls within the medium risk category. It should be noted that this is

a deviation of the JW Design Guidelines which requires a total fire flow of 100 l/s for business/commercial developments, but this is considered stringent. The model confirms that the fire flow of 50 l/s cannot be supplied through the existing system. Therefore, on-site storage tanks and other fire protection measures as in accordance with SANS 10252-1:2004 will be required.

The "Ultimate Scenario" of the existing water services taking into account the proposed development is that it will be supplied directly from the proposed Pretoriusrand Reservoir (Estimated TWL to be 1562 masl) in which case the peak pressure at the proposed connection point will be 26m, only marginally more than the minimum requirement. However, it should be noted that substantial upgrading is required for the ultimate scenario to achieve the re-zoning as per above-mentioned master plan.

Therefore, the existing as well as the future systems can accommodate the anticipated peak demand of the proposed development, with upgrading only required for the ultimate scenario.

2.2 SEWER

The development is also located in the northern Sewer Sub-Basin for which GLS Consulting compiled a Sewer Network Analysis Report in September 2010 (Ref. JWAT-C-0187-00-01-0810).

There is currently no sewage reticulation in the vicinity of the proposed development to which it can connect. There is also no nearby sewer reticulation in the City of Tshwane Metro. JW also does not have any plans, as far as we know, to construct any sewers in this area as it is located outside the current urban development boundary.

Therefore it is recommended that a suitable on-site solution such as a septic tank and/or French drain be considered/investigated to handle all sewage effluent subject to local soil conditions and municipal guidelines.

Also, the total cost for the connection of the new pipeline from the development to the existing system will not be discussed since the SDP is not yet finalised.

2.2.1 ESTIMATED SEWER FLOW

The estimated unit sewer flow for the proposed garage is 0.22 kl/100m², as per JW Design Standard Guidelines. The area to be developed is 215m², thus the estimated sewage flow contribution is 0.48 kl/d.

2.3 EXISTING DISTRIBUTION NETWORKS UPGRADES

These are the upgrades as recommended by GLS Consulting's report (**Annexure C**)

2.3.1 The following are the adjustments to the master plan as per GLS report in order to accommodate the proposed development:

2.3.1.1 Water Network

The only upgrading will be required for the '*Ultimate Scenario*' where the proposed development will be part of the proposed Pretoriusrand Reservoir (TWL = 1562 masl) in which case the peak pressure at the proposed connection point will be 26m, only marginally more than the minimum requirement.

No upgrading for the '*Current scenario*' is required to meet the minimum pressure criteria.

2.3.1.2 Sewer Network

No upgrades needed since there is no sewage reticulation in the vicinity of the proposed development.

Cost estimate for the upgrading will be dealt with after the SDP is approved.

3. CONCLUSIONS

All the required engineering services, in respect of **water and sewer** can be supplied economically to the proposed development.

There is spare capacity available in the water system to supply the proposed development with no upgrading required.

A fire flow of 50 l/s cannot be supplied through the existing system. Therefore, on-site storage tanks and other fire protection measures as in accordance with SANS 10252-1:2004 will be required. Alternatively extensive upgrading to the Blue Hills PRV water system will be required.

A 160mm diameter connection to the water system in Stirrup Road Is proposed to supply the development.

The current bulk distribution system has adequate spare capacity to accommodate the peak flow of the development.

It is recommended that a suitable on-site sewage solution such as a septic tank and/or French drain be considered to handle sewage effluent subject to local soil conditions and municipal guidelines as there is no sewer reticulation in the vicinity of the site and none is planned in the near future as the site is located outside the current urban development boundary.

The total budget amount for these services as per this document is not included since the SDP is yet finalised.

Appendices

Appendix A	S.G Diagram
Appendix B	Title Deed
Appendix C	Technical report stating upgrades required in the distribution networks in the vicinity of the development, prepared by GLS Consulting.
Appendix D	Figure SS_W1
Appendix E	Figure SS_S1

Appendix A


S.G Diagram

Appendix B

Title Deed

214
278 Charles Street Brooklyn, Pretoria, 0181

SEELREG STAMP DUTY
FOOI FEES	R500,00

Prepared by me

CONVEYANCER
CZ LOMBARD

VERBIND	MORTGAGED
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DATUM DATE	15 08 / 05
REGISTRAR	

DEED OF TRANSFER

BE IT HEREBY MADE KNOWN THAT

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CHRISTOFFEL ZANDSPRUIT LOMBARD

appeared before me, REGISTRAR OF DEEDS at PRETORIA, he the said
Appearer being duly authorised thereto by a Power of Attorney signed at
PRETORIA on 24 MAY 2005 and granted to him by

BRIDGET TILLS
Born on 26 June 1951
Married, which marriage is governed by the laws of ENGLAND and
assisted herein by her husband Adrian Clyde Tills insofar as needs
be

NE

And the Appearer declared that his said principal had truly and legally sold on 21 March 2005 and that he, the said Appearer, in his capacity aforesaid, did, by these presents, cede and transfer to and on behalf of

MICHAEL MAKGALE GWANGWA
Identity Number 690301 5310 08 8
and
MMABATHO JENNIFER GWANGWA
Identity Number 720622 0396 08 5
Married in community of property to each other

their Heirs, Executors, Administrators or Assigns, in full and free property

PORTION 243 (A PORTION OF PORTION 229) of the farm
KNOPJESLAAGTE 385
REGISTRATION DIVISION J.R., PROVINCE OF GAUTENG;

MEASURING 4.4504 (FOUR COMMA FOUR FIVE ZERO FOUR)
HECTARES

FIRST registered by Certificate of Registered Title No T3088/1974 with diagram annexed thereto and held by Deed of Transfer T67777/2003 and Deed of Transfer T164494/2004

SUBJECT TO the following conditions:

- A. "Behalwe met die skriftelike toestemming van die Administrateur as Beherende Gesag soos in Wet No 21 van 1940 –
- (i) Mag die grond slegs vir woon en landboudoeleindes gebruik word. Op die grond, of op enige behoorlike goedgekeurde onderverdeling daarvan, mag daar nie meer geboue wees as een woonhuis tesame met die buitegeboue wat gewoonweg vir gebruik in verband daarmee nodig is en sulke geboue en bouwerke as wat vir landboudoeleindes nodig mag wees nie.
 - (ii) Mag geen winkels of besigheid of nywerheid van watter aard ookal op die grond geopen of gebruik word nie; en
 - (iii) Mag geen gebou of bouwerk van watter aard ookal binne 'n afstand van 95 meter vanaf die middellyn van enige publieke pad opgerig word nie.



B. ONDERHEWIG aan 'n Serwituut van reg van weg ten gunste van die Algemene publiek soos geskep in Notariële Akte van Serwituut Nr K154/74S met kaart daaraan geheg, geregistreer op 25 Januarie 1974 en welke serwituut op die gedeelte hierionder gehou aangetoon word deur figuur AabcF op kaart LG A7527/73 geheg aan Sertifikaat van Geregistreerde Title No T3088/74 gedateer 25 Januarie 1974."

SUBJECT to such conditions as are mentioned or referred to in the aforesaid Deed/s.

WHEREFORE the Appearer, renouncing all right and title which the said

BRIDGET TILLS, Married as aforesaid

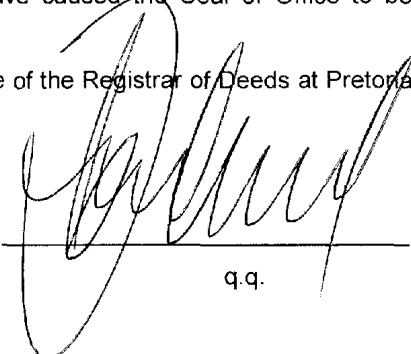
heretofore had to the premises, did in consequence also acknowledge her to be entirely dispossessed of, and disentitled to the same, and that by virtue of these presents, the said

**MICHAEL MAKGALE GWANGWA and
MMABATHO JENNIFER GWANGWA, Married as aforesaid**

their Heirs, Executors, Administrators or Assigns, now are and henceforth shall be entitled thereto, conformably to local custom, the State, however reserving its rights, and finally acknowledging the purchase price to be the sum of R1 800 000.00 (ONE MILLION EIGHT HUNDRED THOUSAND RAND)

IN WITNESS WHEREOF, I the said Registrar, together with the Appearer q.q., have subscribed to these presents and have caused the Seal of Office to be affixed thereto.

THUS DONE AND EXECUTED at the Office of the Registrar of Deeds at Pretoria on


q.q.

15 08 /05

In my presence


REGISTRAR OF DEEDS



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For Information Only

Appendix C

Technical report stating upgrades required in the distribution networks in the vicinity of the development, prepared by GLS Consulting

4 April 2013

WSP SA CIVIL AND STRUCTURAL ENGINEERS (PTY) LTD

34 Bouvardia Avenue
Lynnwood Ridge
Pretoria
0081
South Africa

13 Elektron Street, Techno Park
PO Box 814, Stellenbosch 7599
South Africa

Attention: Mr. S Mashamba

Dear Sir

**WATER AND SEWER IMPACT INVESTIGATION FOR PROPOSED SHELL FILLING STATION:
SUMMIT ROAD**

As requested we have investigated the capacity of the existing water and sewer systems to serve the proposed development and comment as follows:

1. EXTENT OF DEVELOPMENT

The location of the proposed Shell filling station and layout of existing water and sewer services in the vicinity of the site is indicated on Figures SS_W1 and SS_S1 respectively.

The proposed Shell filling station will have an estimated floor area of 215m². No car wash is planned.

We confirm that the development is located within the City of Johannesburg municipal boundary (on the edge of this boundary), but located outside the current urban development boundary.

2. BACKGROUND

The proposed development is located within the Blue Hills (PRV 1) water sub-district. GLS compiled a water master plan for the Blue Hills and Diepsloot Water Sub-Districts (Ref. JWAT-C-01060-01-00-10209) for Johannesburg Water (JW) in December 2009. This report and the latest hydraulic models (2013-02) formed the basis of the water impact study undertaken for the proposed development.

The development is also located in the Northern Sewer Sub-Basin for which GLS Consulting compiled a Sewer Network Analysis Report in September 2010 (Ref. JWAT-C-0-187-00-01-0810).

3. WATER SYSTEM

3.1 Water Demand

The water demand for the proposed development, assuming a unit demand of 0.4 kl/day per 100 m² floor area as per the JW Design Guidelines, is estimated to be 0.86 kl/d. This demand translates into a peak demand of 0.04 l/s assuming a peak factor of 4 to be applicable. This peak demand was used in the hydraulic analysis undertaken herewith.

3.2 Existing Water Services, Available Capacity and Proposed Connection Points

Figure SS_W1 has reference.

Current Scenario:

The proposed development is currently located within the Blue Hills (PRV 1) water sub-district. It should be noted that a 600 mm Ø Rand Water bulk pipelines is also located in Stirrup Road, which supplies Diepsloot.

A connection to the existing 160 mm Ø pipe along Stirrup Road in the vicinity of point A is proposed to serve the development via a new 160 mm Ø pipe to be installed.

The existing system analysis, including the additional peak demand of the proposed development ($4 \times \text{AADD} = 0.04 \text{ l/s}$), confirms that the peak residual pressure at the proposed connection point would be approximately 45m. This peak pressure is greater than the minimum pressure criteria of 24 m (as in accordance with JW's Modelling Guidelines) confirming that no upgrading is required to meet the minimum pressure criteria.

An alternative option is to apply for a direct RW connection to the 600 mm Ø bulk pipeline, in which case both peak flow and fire flow could be supplied, but this option will most likely not be approved.

Ultimate Scenario:

Ultimately, the proposed development will be part of the proposed Pretoriusrand Reservoir (TWL = 1562 masl) in which case the peak pressure at the proposed connection point will be 26m, only marginally more than the minimum requirement. However, it should be noted that substantial upgrading is required for the ultimate scenario to achieve the re-zoning as per above-mentioned master plan.

Therefore, the existing as well as the future systems can accommodate the anticipated peak demand of the proposed development, with upgrading only required for the ultimate scenario.

3.3 Reservoir Capacity and Bulk Supply

The Blue Hills water sub-district is currently supplied directly from the Rand Water system through the Centurion (Blue Hills) Rand Water connection, thus there currently no reservoir storage provided.

However, JW's long term plan is to build the 20Ml Pretoriusrand Reservoir, which would then provide the required storage.

3.4 Fire Flow Analysis

The required fire flow is assumed to be 50 l/s with a minimum pressure of 15 m when assuming this development falls within the medium risk category. It should be noted that this is a deviation of the JW Design Guidelines which requires a total fire flow of 100 l/s for business / commercial developments, but this is considered too stringent. The model confirms that the fire flow of 50 l/s cannot be supplied through the existing system. Therefore, on-site storage tanks and other fire protection measures as in accordance with SANS 10252-1:2004 will be required.

4. SEWER SYSTEM

4.1 Sewage Flow

The estimated unit sewer flow for the proposed garage is $0.22 \text{ kl}/100 \text{ m}^2$, as per JW Design Standard Guidelines. The area to be developed is 215 m^2 , thus the estimated sewage flow contribution is 0.48 kl/d .

4.2 Existing Sewer Services, Available Capacity and Proposed Connection Point

Figure SS_S1 has reference.

There is currently no sewage reticulation in the vicinity of the proposed development to which it can connect. There is also no nearby sewer reticulation in the City of Tshwane Metro. JW also does not have any plans, as far as we know, to construct any sewers in this area as it is located outside the current urban development boundary.

Therefore it is recommended that a suitable on-site solution such as a septic tank and/or french drain be considered/investigated to handle all sewage effluent subject to local soil conditions and municipal guidelines.

5. SUMMARY

In conclusion, we summarise:

1. There is currently spare capacity available in the water system to supply the proposed development with no upgrading required.
2. The model confirms that a fire flow of 50 l/s cannot be supplied through the existing system. Therefore, on-site storage tanks and other fire protection measures as in accordance with SANS 10252-1:2004 will be required. Alternatively extensive upgrading to the Blue Hills PRV water system will be required.
3. A 160 mm Ø connection to the water system in Stirrup Road is proposed to supply the development.
4. The current bulk distribution system has adequate spare capacity to accommodate the peak flow of the development.
5. It is recommended that a suitable on-site sewage solution such as a septic tank and/or French drain be considered to handle sewage effluent subject to local soil conditions and municipal guidelines as there is no sewer reticulation in the vicinity of the site and none is planned in the near future as the site is located outside the current urban development boundary.

We trust you find the above sufficient in terms of your request.

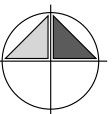
Yours faithfully
GLS CONSULTING (PTY) LTD
REG. NO.: 2007/003039/07



Per: MR JK COMPION
(Director)

Appendix D

Existing water layout (Figure SS_W1)



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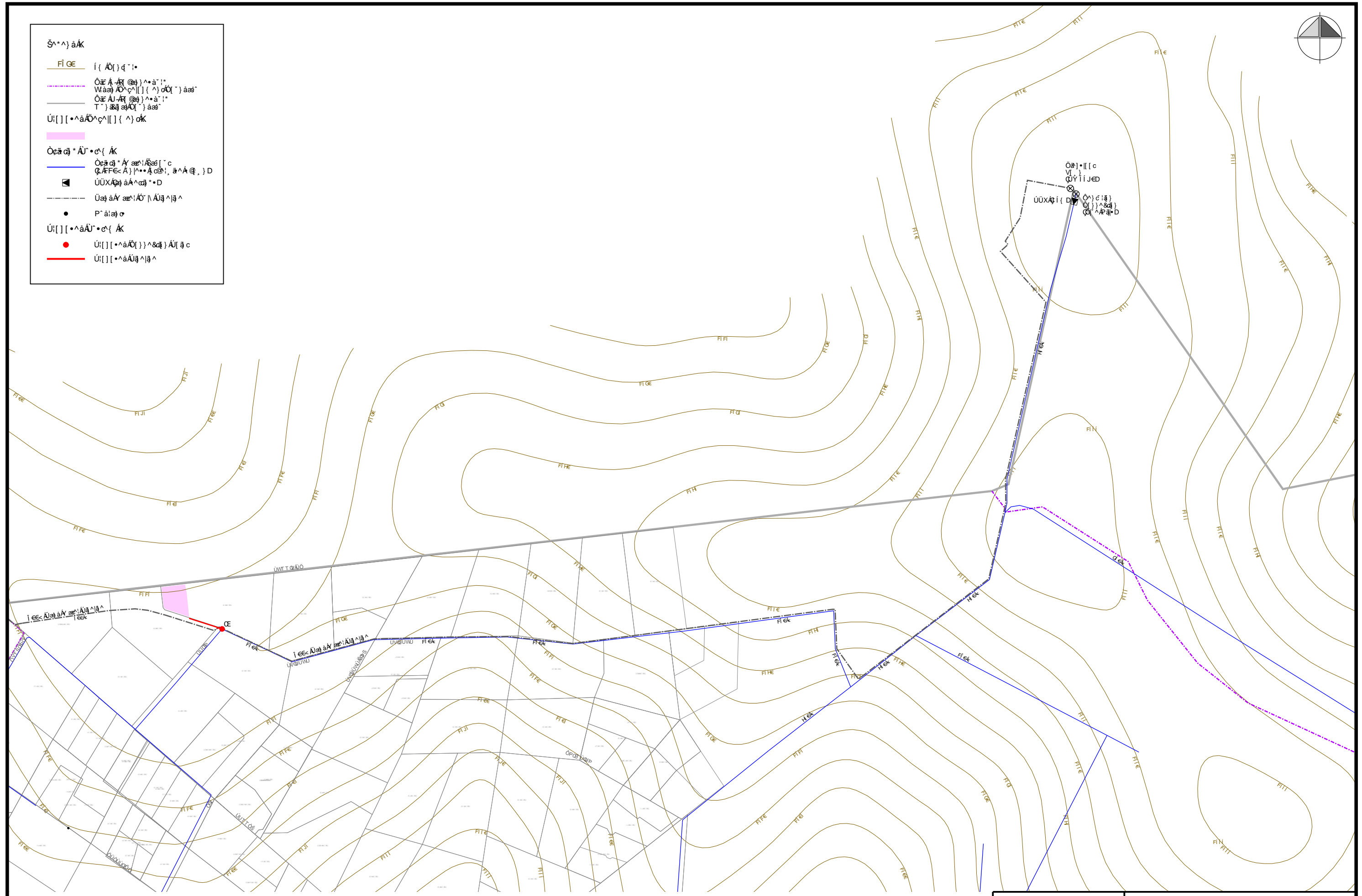
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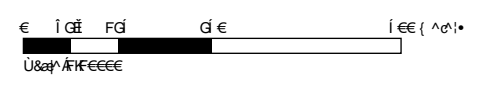
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Appendix E

Existing sewer layout (Figure SS_S1)

