

DISCLAIMER:

NO PART OF THE DOCUMENTS PROVIDED BY THE MUNICIPALITY OR THE APPLICANT, MAY BE COPIED, REPRODUCED OR IN ANY FORM PUBLISHED OR USED IN A MANNER THAT WILL INFRINGE ON INTELLECTUAL PROPERTY RIGHTS OF THE APPLICANT.



20 AUGUST 2026



YOUR REF.:

OUR REF.: TPH26720

Tel: (012) 809 2229
E-mail: bea@tph.co.za

**CITY OF TSHWANE METROPOLITAN MUNICIPALITY
THE STRATEGIC EXECUTIVE DIRECTOR:
CITY PLANNING, DEVELOPMENT AND REGIONAL SERVICES
PO BOX 3242
PRETORIA
0001**

PO Box 11437
Silver Lakes
0054

Tijger Vallei Office Park
Block 9, 1st Floor
78 Pony Street
Silver Lakes
0054

ONLINE SUBMISSION

APPLICATION IN TERMS OF SECTION 16(1) OF THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024) FOR THE REZONING OF ERF 439 GARSFONTEIN

The registered owner of the above-mentioned property instructed our office to submit an application with your Municipality, for the rezoning of Erf 439 Garsfontein to "Business 4" for Office and Retail Industry (with an amended definition), with 60% coverage, 0.36 FAR and height of 10 meters.

Attached for your attention is the following:

1. A copy of this letter addressed to the Strategic Executive: City Planning and Development.
2. A copy of payment for the rezoning application to the amount of R11 000-00 being the application fees, PLUS R3 270-00 promulgation fees.
3. A copy of the application forms COT F/1, COT F/2 and the COT F/10 checklist.
4. A copy of the completed Schedule 33 form.
5. A copy of the Power of Attorney and Company Resolution.
6. A copy of the Company Report.
7. A copy of the Motivational Memorandum.
8. A copy of the draft Annexure L.
9. A copy of the draft Amendment Scheme Map.
10. A copy of the Locality Plan, Zoning and Land Use Plans.
11. A copy of the proposed Site Plan.
12. A copy of the registered Title Deed.
13. A copy of the Zoning Certificate.
14. A copy of the list of surrounding property owners.
15. Proof of consultation with Engineering Departments.
16. A copy of the Services Provision Details Report for Roads & Stormwater compiled by Leras Consulting Engineers dated August 2026.

We trust you find this in order.

Kind regards,

**B.E. FLETCHER (PR. PLN A/1202/2001)
THE TOWN PLANNING HUB CC**





Internet Banking
Standard Bank Centre
5 Simmonds Street, Johannesburg, 2001
P.O. Box 7725, Johannesburg, 2000
Telephone: 0860 123 000
International: +27 11 299 4701
Fax: +27 11 631 8550
Website: www.standardbank.co.za

Dear City Of Tshwane (a)

We confirm that the following payment has been made into your account from THE TOWN PLANNING HUB CC:

Reference number	260824BBC00008782C00008781
Beneficiary name	City Of Tshwane (a)
Bank name	ABSA BANK
Beneficiary account number	XXXXXX8263
Beneficiary branch number	632005
Beneficiary reference	LU63023800439REZ
Amount	R 14270.00
Payment date and time	2026/08/24 08:33:09

If you need more information or have any questions about this payment, please contact:

THE TOWN PLANNING HUB CC

Payments to Standard Bank accounts may take up to one business day to reflect.

Payments to other banks may take up to three business days.

Please check your account to confirm you have received this payment.

Yours sincerely,

The Internet Banking Team

**APPLICATION FORM TO BE SUBMITTED FOR ANY APPLICATION AND/OR REQUEST WITH
THE APPLICANT AND OWNER DETAILS AS REQUIRED IN TERMS OF THE CITY OF
TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024)**

APPLICANT DETAILS			
Please indicate the type of applicant:			
Individual	☐	Legal Entity / Other	☒
Applicant Details: Individual			
Title	N/A		
Initial			
First Name(s)			
Surname			
Preferred Name			
ID Number			
Marital status if the owner is the applicant	Single/not married ☐	In community of property	☐
	Out of community of property	☐	
Applicant Details: Legal Entity / Other			
Name	THE TOWN PLANNING HUB CC		
Registration number	1999/010392/23		
Representative name	BEATRIX ELIZABETH FLETCHER		
Physical Address of the Applicant			
Physical Address (Work)			
Address Line 1 (street no.)	1		
Address Line 2 (street name)	COLE ROAD		
Township	SHERE AH	Postal Code	0084
Specify City	PRETORIA		
Physical Address (Home)			
Address Line 1 (street no.)	N/A		
Address Line 2 (street name)			
Township		Postal Code	
Specify City			
Postal Address of the Applicant			
Postal Type	PO Box ☒	Physical Address (Home)	☐
	Private Bag ☐	Physical Address (Work)	☐
Postal Number	PO BOX 11437		
Township	SILVER LAKES	Postal Code	0054
Specify City	PRETORIA		
Communication Details of the Applicant			
E-Mail Address	bea@tph.co.za		
Cell Phone	082 807 2030		

Home Phone	N/A
Work Phone	012 809 2229
Preferred method of communication – please indicate	EMAIL

OWNER DETAILS			
Please indicate the type of applicant:			
Individual	☐	Legal Entity / Other	☒
Owner Details : Individual			
Title			
Initials			
First name			
Surname			
Preferred name			
ID Number			
Marital status	Single/not married ☐	In community of property ☐	
	Out of community of property ☐		
Owner Details: Legal Entity/other			
Name	MULTI-PRINT PRINTERS CC		
Registration number	1987/017729/23		
Representative name	Patrick Vergne		
Physical Address of the Owner			
Physical Address (Work)			
Address Line 1 (street no.)	678		
Address Line 2 (street name)	Windsor Road		
Township	GARSFONTEIN	Postal Code	0081
Specify City	PRETORIA		
Physical Address (Home)			
Address Line 1 (street no.)	N/A		
Address Line 2 (street name)			
Township		Postal Code	
Specify City			
Postal Address of the Owner			
Postal Type	PO Box ☒	Physical Address (Home)	☐
	Private Bag ☐	Physical Address (Work)	☐
Postal Number	PO BOX 934		
Township	GARSFONTEIN	Postal Code	0042
City	PRETORIA		
Communication Details of the Owner			
E-Mail Address	patrick@multiprintdigital.co.za		
Cell Phone	082 440 6137		
Home Phone	-		
Work Phone	N/A		

Preferred method of communication – please indicate	EMAIL
FOR OFFICIAL USE	
Receipt Amount	
Receipt Number	
Payment Date	
Application Form Date	

I, **BEATRIX ELIZABETH FLETCHER** being the applicant described herein, declare that the above information is correct.

I, hereby confirm that I have signed and completed the declaration as contemplated in Schedule 33 to the City of Tshwane Land Use Management By-law, 2016 (Amended 2024) which is attached hereto and initialled by me for identification purposes.

SIGNATURE  DATE: 20 AUGUST 2026

APPLICATION FORM FOR A REZONING APPLICATION IN TERMS OF SECTION 16(1) AND AS REQUIRED IN TERMS OF SCHEDULE 3 TO THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024)

PROPERTY INFORMATION

Complete this section for each property (make a separate copy for each property).

Township / Agricultural Holding / Farm	GARSFONTEIN		
Erf/Plot/Farm No.	439	Portion (e.g. /R/1)	N/A
Ward	44		
Street name	WINDSOR ROAD		
Street number	678	Planning Region	6

REZONING DETAILS

Land Use Scheme	TSHWANE LAND USE SCHEME, 2024		
Adopted Zoning	"RESIDENTIAL 1"		
Property Size (m ²)	1 240m ²		
Adopted Height (Scheme)	10 METERS		
Adopted Density (Scheme)	N/A		
Adopted Coverage (Scheme)	TABLE E, COVERAGE ZONE 5		
Adopted Floor Area Ratio (FAR)	TABLE C, FAR ZONE 21 = N/A		
Adopted Annexure No.	N/A		
Adopted Amendment Scheme No.	N/A		
Present Land Value	R1 450 000		
Bond (Yes/No)	NO		
If yes specify Bond Account No.	N/A		
Bondholder's Name(s)	N/A		
Existing Development	PRINTING HOUSE, OFFICES AND RETAIL INDUSTRY USES		
Title Deed/ Notarial Deed No.	T2378/2001		
Restrictive Title Deed Condition paragraph No.	N/A		
Proposed Use Zone	9: "BUSINESS 4"		
Proposed Primary Right	OFFICE AND RETAIL INDUSTRY (WITH AN AMENDED DEFINITION)		
Proposed number of units	N/A		
Proposed density	N/A		
Proposed Density (m ² /units per ha)	N/A		
Proposed Height (m/storey)	CLAUSE 26 – 10 METERS		
Proposed coverage (%)	CLAUSE 27 – 60%		
Proposed Floor Area Ratio (FAR)	CLAUSE 25 – 0.36		
Estimate project value	N/A		
Applicant responsible to request comments from external departments/institutions?	Yes	No	N/A

REQUIRED DOCUMENTS

Proof of payment of application fees	X	Cover Letter	X	Application Form COT: F/1	X
Power of Attorney	X	Company/Close Corporation/Trust resolution	X	Proof of Members of Company /Close Corporation/Trust	X
Proof of Marital Status of the Owner	-	Bondholders Consent	-	Motivating Memorandum	X
EIA executive Summary if relevant	-	Draft amendment scheme (annexure)	X	Draft amendment scheme map	X
Locality Plan	X	Land use plan	X	Zoning Plan	X
Site Plan	X	Registered Title Deed and/or notarial deed	X	Zoning certificate	X
List of adjoining owners	X	Form COT: F/10	X	Proof of engagement with the service engineering departments	X

I, **BEATRIX ELIZABETH FLETCHER** being the applicant described herein, declare that the above information is correct.

I, hereby confirm that I have signed and completed the declaration as contemplated in Schedule 33 to the City of Tshwane Land Use Management By-law, 2016 (Amended 2024) which is attached hereto and initialled by me for identification purposes.

SIGNATURE



DATE: 20 AUGUST 2026

LIST OF ATTACHMENTS AND SUPPORTING DOCUMENTS REQUIRED IN TERMS OF THE SCHEDULES TO THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024) AS SUBMITTED BY THE APPLICANT AND CHECKLIST FOR MUNICIPAL USE

PROPERTY(IES) DESCRIPTION: **ERF 439 GARSFONTEIN**

APPLICATION TYPE: **APPLICATION FOR THE REZONING TO “BUSINESS 4” FOR OFFICE AND RETAIL INDUSTRY (WITH AN AMENDED DEFINITION)**

Checklist: to be completed by the Applicant				Checklist: for Official Use only		
YES	NO	ANNEXURE OR PAGE REFERENCE	DOCUMENT ATTACHED	YES	NO	NA
X			Proof of payment of the application fees			
X			Cover letter			
X			Completed Application form of the relevant application (for Division of Township – per Division)			
X			Power of Attorney			
X			Company/ Close corporation/Trust resolution			
X			Proof of Members of Company/Close Corporation/ Trust			
	X		In the instance of the owner being a company: CM 29 form			
	X		In the instance of a close corporation: CK 1 or 2 forms			
	X		In the instance of a Trust: Letter of appointment of the Trustees			
	X		Proof of marital status			
	X		Bondholder's consent			
X			Motivational Memorandum			
X			List of adjoining owners with their names and full contact details, as well as a map indicating the locality of the adjoining owners			
X			Draft annexure			
X			Draft amendment scheme map			
	X		Statement of conditions			
X			Locality Plan			
X			Land use plan			
X			Zoning Plan			
X			Site Plan			
	X		Township layout plan (for Division of Township – per Division)			
	X		Phasing plan superimposed on the original approved townships			
X			Zoning certificate			
X			Registered Title Deed and/or Notarial Deed			
	X		Township Name Reservation Letter			
	X		Conveyancer's Certificate (for Division of Township – per Division)			
	X		Land Surveyor Certificate (for Division of Township – per Division)			
	X		Proposed design/layout plan			
	X		Proposed subdivision plan			
	X		Proposed consolidation plan			
	X		Proposed simultaneous Subdivision and consolidation Plan			
	X		GDARD comments and/or declaration by an appointed			

Checklist: to be completed by the Applicant				Checklist: for Official Use only		
YES	NO	ANNEXURE OR PAGE REFERENCE	DOCUMENT ATTACHED	YES	NO	NA
			environmental specialist on the NEMA process and/or EIA executive summary			
	X		Geotechnical Report in colour			
	X		Transport Impact Report in colour			
	X		Services availability report(s) (roads and stormwater) in colour			
	X		Services availability report(s) (water and sanitation) in colour			
	X		Services availability report(s) (electricity) in colour			
	X		Retail Study in colour			
	X		Architectural drawings/draft site development plans and Landscape Framework Plans			
	X		Noise Impact assessment			
	X		List of conditions to be removed, amended or suspended in the Title Deed			
	X		Proof of submission of the application to the Department of Mineral Resources and Energy (DMRE) or compliance with section 54 of Act 28 of 2002			
	X		Approved conditions of Establishment			
	X		Proof of compliance with section 16(5)(b)(iv) of this By-law			
	X		Amended Township layout plan			
	X		Amended conditions of establishment			
	X		Amended draft amendment scheme annexure			
	X		Amended draft amendment scheme map			
	X		For extension of boundaries – the General Plan of the original township			
	X		For extension of boundaries – comments from the Surveyor-General on whether the new erf/erven can be inserted on the General Plan			
X			Form COT: F/1			
X			Application Form relevant to the application such as COT: F/2, COT: F/3, COT: F/4, COT: F/6, COT: F/7, COT: F/8 COT: F/9, COT: F/34, COT: F/36, COT: F/37, COT: F/38			
	X		Form COT: F/5 (for Division of Township – per Division)			
X			Form COT: F/10			
X			Proof of engagement with Municipal Engineering Services departments Form COT: F/33			

I, **BEATRIX ELIZABETH FLETCHER** being the applicant described herein, declare that the above information is correct.

I, hereby confirm that I have signed and completed the declaration as contemplated in Schedule 33 to the City of Tshwane Land Use Management By-law, 2016 (Amended 2024) which is attached hereto and initialled by me for identification purposes.

SIGNATURE



DATE: 20 AUGUST 2026

SCHEDULE 33

DECLARATION FOR THE SUBMISSION OF A LAND DEVELOPMENT APPLICATION AS CONTEMPLATED IN THIS BY-LAW READ WITH THE COT FORMS TO BE COMPLETED TO BE ATTACHED TO COT: F/1

PROPERTY INFORMATION

Complete this section for each property (make a separate copy for each property).

Township / Agricultural Holding / Farm	GARSFONTEIN		
Erf/Plot/Farm No.	439	Portion (e.g. /R/1)	N/A
Ward	44		
Street name	WINDSOR ROAD		
Street number	678	Planning Region	6

The declaration as set out hereunder shall be signed or signed electronically with the submission of a land development application, as contemplated in the various sections in terms of this By-law, by the Applicant.

1. I, the assigned, hereby being the applicant described herein, declare that all the information I provide is true and correct.
2. I, hereby acknowledge and understand that the documents that accompany my land development application are those compulsory documents that are required for the purposes of a complete application in terms of the provisions of section 16(1)(b) and (c), read with the relevant Schedules for the specific application to this By-law and Regulation 14(1)(i) of the Regulations of the Act, as amended from time to time, as well as the applicable forms thereof.
3. I, hereby acknowledge and confirm that in terms of section 26 of this By-law I have made payment of the application fee as per the Council's approved charges and tariffs, which fee has been paid into the account of the Municipality, as directed by the Department responsible for Planning and Development, including providing a reference number as directed, failing which if it is found that the payment has not been made or incorrectly made, or the referencing for proof of payment is incorrect the application shall be regarded as incomplete and be rejected;
4. I, hereby acknowledge and understand that in terms of Regulation 14(1)(i) of the Regulations of the Act, read with section 16(1)(b) and (c) of this By-law, the electronic submission and the compulsory documents submitted as referred to above and the allocation of the electronic item number, in terms of section 16(1)(b) of this By-law, shall be regarded as confirmation that all the compulsory documents have been submitted.
5. I, hereby acknowledge that, should all the required documentation have been submitted, but it is incorrect or has not been submitted to the satisfaction of the Municipality, or it does not comply with the requirements of the Municipality, the Municipality may elect not to consider the application as contemplated in section 16(1)(c) of this By-law and it may be rejected.
6. I, hereby acknowledge and understand that having successfully submitted the land development application in terms hereof, I shall be obliged to proceed with the public participation process within 28 days or such further period as the Municipality may allow in terms of the provisions of section 16(1)(f) of the By-law or any other relevant provision.
7. I, hereby acknowledge and understand that having undertaken public participation in terms of section 16(1)(f) of the By-law or any other relevant provision, I am obliged to provide proof of the public participation done, within 28 days, or such further period as the Municipality may allow, from the closing date of the period contemplated in section 16(1)(f) of the By-law.
8. I, hereby acknowledge and understand that the provisions of this By-law shall apply to all land development applications, including but not limited to the additional documentation or information that may be required by the Municipality for the purposes of considering the application and to take an informed decision on the application.

9. I, hereby acknowledge and understand that, should the application be found to be incomplete as a result of compulsory or additional documentation not having been submitted in a timely manner, the application may be rejected or deemed to be refused, whichever is applicable, without further consideration or refunding of the application fees as contemplated in section 26 of this By-law.
10. I, hereby acknowledge and understand that the provision of false or misleading information is an offence in terms of section 30 of this By-law.
11. I, acknowledge and understand that having submitted the application electronically or otherwise, I unconditionally give permission to the Municipality to communicate with me or give notices as may be required by the By-law, by means of e-mail correspondence to the e-mail address provided to the Municipality.
12. I, hereby confirm and agree that the e-mail address provided is my e-mail address for any communication that I will receive from the Municipality, and I confirm that I have control and management over this e-mail address.
13. Having confirmed that the e-mail address shall be used as the means of communication, I further acknowledge and confirm that the date on which e-mailed correspondence is sent by the Municipality is the date that will be used for the purposes of calculating any days in terms of the provision of the By-law or other legislation.
14. I, hereby acknowledge and understand that in corresponding with me, by means of an electronic system, electronic media or otherwise, any discussions, interpretation, support or advice given with regard to the policies of the Municipality, specifically including the Regionalized Spatial Development Frameworks and the By-law or related to a specific land development application, shall only be regarded as general remarks, *inter alia* due to the fact that there are interdependencies with other departments that must provide input and information on the application that may not be available. Therefore, such remarks shall not be binding on municipal officials, the Municipality or any decision-making body of the Municipality.
15. I, hereby acknowledge and understand that decisions on the interpretation of the policies, frameworks and legislation, and the consideration of land development applications remain within the sole preserve of the decision-making bodies of the Municipality and shall be dealt with, at the time, on the merits of the application before them.
16. I, hereby acknowledge and understand that by receiving the comments from engineering service departments, these comments may be subject to change and may result in conditions to be imposed as part of the consideration and/or approval of the land development application.
17. I, hereby acknowledge and understand that it is the duty of the applicant to attend to the comments from engineering service departments and to provide proof that he/she has done so, to the Municipality for purposes of considering the land development application.
18. I, hereby acknowledge and understand that the Municipality may contact the owner at any time regarding the land development application.
19. I, hereby acknowledge and understand that the Municipality will only be able to consider or evaluate the land development application when all information has been received, all comments have been submitted and all objections and responses have been exchanged, which will place the Municipality in a position to consider the application.
20. I, hereby acknowledge and understand that the time period for actions to be taken by the applicant with reference to Regulation 16(3) of the Regulations of the Act, shall not be calculated as part of the time period for the administrative phase of a land development application.
21. The person making the declaration shall provide a signature, capacity in which it is signed and date for purposes of completing the declaration or in the case of an electronic submission, confirm the content.

SIGNED ON THIS 20th DAY OF AUGUST 2026, in my capacity as TOWN PLANNER / APPLICANT

FULL NAME: BEATRIX ELIZABETH FLETCHER

SIGNATURE

(For physical submission if not as part of the electronic submission)

A handwritten signature in black ink, appearing to read 'BEATRIX FLETCHER', written over a dotted line.

RESOLUTION OF THE MEMBERS OF MULTI-PRINT PRINTERS CC (REG NR CK/1987/017729/23) HELD AT Pretoria ON THE 21 DAY OF April 2026

Decide:

That the lawful agent of the Company applies to the competent authority for application(s) for Council Consent and/or Rezoning and/or Appeal in respect of the under-mentioned properties:

ERF 439 GARSFONTEIN

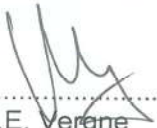
AND THAT: Patrick Vergne with ID no 71 05 19 52 53 083.

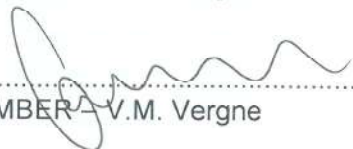
being duly authorised thereto under and by virtue of a resolution of the Member of the Company to draft and sign all such documents, and in general to do all to execute this Resolution.

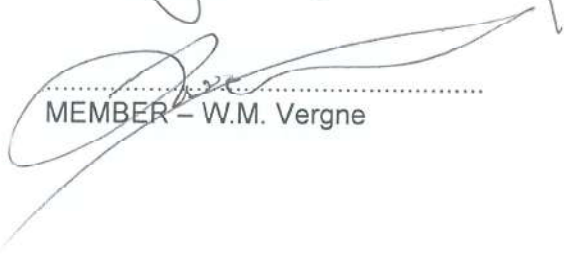
The Company hereby ratify, allow and confirm all and whatsoever the said authorised shall lawfully do, or cause to be done.

The intention of the application is to apply to the City of Tshwane Metropolitan Municipality for the rezoning of the property to obtain "Retail Industry" land use rights.

CERTIFIED A TRUE COPY:


.....
MEMBER – P.E. Vergne


.....
MEMBER – V.M. Vergne


.....
MEMBER – W.M. Vergne

SPECIAL POWER OF ATTORNEY

I, the undersigned,

Patrick Vergne with ID no 7105195253083

duly authorised by a resolution of the Members of **MULTI-PRINT PRINTERS CC (REG NR CK/1987/017729/23)** do hereby nominate, constitute and appoint **B.E. FLETCHER (ID NR: 7505090058083)** of the firm **THE TOWN PLANNING HUB CC (REGISTRATION NR: CK1999/010392/23)** and/or any employee of the Close Corporation with power of substitution, to be my lawful Agent in my name, place and stead, for Council Consent and/or Rezoning and/or Appeal in respect of the under-mentioned property/ies:

ERF 439 GARSFONTEIN

and to take all such steps, do all such acts, sign all such documents and appoint or involve all such persons as may be requisite or necessary in order to give effect to the powers hereby granted and, for effecting the aforesaid purposes, to do or cause to be done whatsoever shall be requisite, as fully and effectually, as I might or could do if personally present and acting herein - hereby ratifying, allowing and confirming all and whatsoever the said Agent shall lawfully do, or cause to be done.

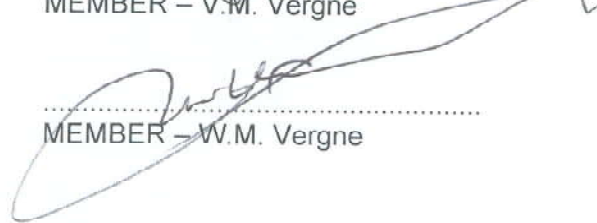
The intention of the application is to apply to the City of Tshwane Metropolitan Municipality for the rezoning of the property to obtain "Retail Industry" land use rights.

Signed at Pretoria on this 21 day of April 2026, in the presence of the undersigned witnesses.

SIGNATORY:

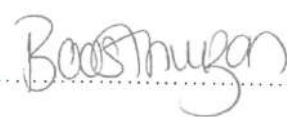

.....
MEMBER - P.E. Vergne


.....
MEMBER - V.M. Vergne


.....
MEMBER - W.M. Vergne

WITNESS:

1. 
.....

2. 
.....



This report is compiled exclusively from the very latest data directly supplied to WinDeed by the Companies and Intellectual Property Commission (CIPC).

Any personal information obtained from this search will only be used as per the Terms and Conditions agreed to and in accordance with applicable data protection laws including the Protection of Personal Information Act, 2013 (POPI), and shall not be used for marketing purposes.

SEARCH CRITERIA

Search Date	2026/04/13 09:26	Company Name	multi-print
Reference	TPH26720	Company Name Search Type	Starts with
Report Print Date	2026/04/13 09:27	Information Source	COMPANIES AND INTELLECTUAL PROPERTY COMMISSION

COMPANY SUMMARY

Name	MULTI-PRINT PRINTERS	Status	IN BUSINESS
Registration Number	1987/017729/23	Registration Date	1987/08/06

MEMBERS AND OTHER SUMMARY (3)

ACTIVE

Name	ID/Reg. Number	Type	Status
VERGNE, PATRICK EDUARD	7105195263082	MEMBER	ACTIVE
VERGNE, VERNON MAURICE	6701015208082	MEMBER	ACTIVE
VERGNE, WILHELMUS MARINUS	3803025110184	MEMBER	ACTIVE

INACTIVE

No Inactive directors to display

ACCOUNTING OFFICER SUMMARY (3)

ETIENNE ROUX

HENRY PETER BEATH

J P LOUW

COMPANY INFORMATION

Enterprise Name	MULTI-PRINT PRINTERS	Status	IN BUSINESS
Registration Number	1987/017729/23	Enterprise Type	CLOSE CORPORATION
Tax Number	9570337643	Business Start Date	1987/08/06
Short Name	-	Registration Date	1987/08/06
Translated Name	-	Financial Year End	2
Old Registration Number	871772923	Financial Effective Date	1987/08/06
Conv. Enterprise Number	-	CK Date Received	-

DISCLAIMER

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Region	GAUTENG	CK Date	-
Country	-	Date of Type	1987/08/06
Country of Origin	-		
Issued Shares	-		
Issued Capital	-		
Authorized Shares	-		
Authorized Capital	-		
Industry Code	88		
Industry	OTHER BUSINESS ACTIVITIES		
Principal Business	PRINTING		
Registered Address	678 WINDSOR ROAD GARSFONTEIN 0042	Postal Address	P O BOX 934 GARSFONTEIN 0042

MEMBERS AND OTHER (3)			
VERGNE, PATRICK EDUARD			1 of 3 Members
Name	PATRICK EDUARD	Status	ACTIVE
Surname	VERGNE	Type	MEMBER
Initials	P E	Appointment Date	1992/09/15
ID/Passport Number	7105195263082	Resignation Date	-
Date of Birth	-	Member Size (%)	49
Profession	-	Member Contribution (R)	49
Country of Residence	-		
Residential Address	CARLA'S PLACE MARCEL CRESCENT SIX FOUNTAINS ESTATE 0042		
Postal Address	P O BOX 934 GARSFONTEIN 0042		
VERGNE, VERNON MAURICE			2 of 3 Members
Name	VERNON MAURICE	Status	ACTIVE
Surname	VERGNE	Type	MEMBER
Initials	V	Appointment Date	1988/02/23
ID/Passport Number	6701015208082	Resignation Date	-
Date of Birth	1967/01/01	Member Size (%)	49
Profession	-	Member Contribution (R)	49
Country of Residence	SOUTH AFRICA		
Residential Address	349 FARRELL STREET BROOKLYN 0181		
Postal Address	P O BOX 934 GARSFONTEIN 0042		
VERGNE, WILHELMUS MARINUS			3 of 3 Members

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Name	WILHELMUS MARINUS	Status	ACTIVE
Surname	VERGNE	Type	MEMBER
Initials	W M	Appointment Date	1988/02/23
ID/Passport Number	3803025110184	Resignation Date	-
Date of Birth	1938/02/03	Member Size (%)	2
Profession	-	Member Contribution (R)	2
Country of Residence	-		
Residential Address	NO 16 A SOTOGRADE STREET SILVER LAKES 0081		
Postal Address	P O BOX 934 GARSFONTEIN 0042		

REPRESENTATIVE TRUSTEES

No representative trustees to display

INTER VIVO TRUSTS

No inter vivo trusts to display

TESTAMENTARY TRUSTS

No testamentary trusts to display

OTHER TRUSTEES

No trustees to display

ACCOUNTING OFFICERS (3)

ETIENNE ROUX

1 of 3 Accounting Officers

Profession Code	THE SOUTH AFRICAN INSTITUTE OF PROFESSIONAL ACCOUNTANTS	Postal address	P O BOX 2288 MONTANA PARK 0159
Profession Number	7691	Status	RESIGN
Registration entry date	-	Profession	ACC
Expiry date	-	Start date	-
Reference number	-	End date	-
Fine letter	-	CM31 completed	-
Business address	-	CM31 received	-

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HENRY PETER BEATH			2 of 3 Accounting Officers
Profession Code	THE SOUTH AFRICAN INSTITUTE OF PROFESSIONAL ACCOUNTANTS	Postal address	P O BOX 1546 GROENKLOOF 0027
Profession Number	6759	Status	CURRENT
Registration entry date	-	Profession	ACC
Expiry date	-	Start date	-
Reference number	-	End date	-
Fine letter	-	CM31 completed	-
Business address	-	CM31 received	-
J P LOUW			3 of 3 Accounting Officers
Profession Code	PA-SA	Postal address	P O BOX 15873 SINOVILLE 0129
Profession Number	-	Status	RESIGN
Registration entry date	1997/11/21	Profession	ACC
Expiry date	-	Start date	1996/05/30
Reference number	6070	End date	-
Fine letter	-	CM31 completed	-
Business address	-	CM31 received	-

CAPITAL INFORMATION
No capital information to display

HISTORY (41)	
Effective Date	Change Type
2025/09/09	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5442902801)
2024/08/27	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5415384868)
2023/08/29	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5393373315)
2022/08/19	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5371518460)
2021/08/31	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5351716828)

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2020/09/29	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5307141411)
2020/03/06	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5232143202)
2018/09/27	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 5139733596)
2016/10/28	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 555626153)
2015/10/16	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 530050176)
2014/08/07	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 59111900)
2013/08/20	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 54171110)
2012/06/18	NATURE OF BUSINESS CHANGE (SIC CODE) (88)
2012/06/18	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = WILHELMUS MARINUSSTATUS : = ACTIVE)
2012/06/18	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = VERNON MAURICESTATUS : = ACTIVE)
2012/06/18	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = PATRICK EDUARDSTATUS : = ACTIVE)
2012/06/18	NATURE OF BUSINESS CHANGE (SIC CODE) (88)
2012/06/18	POSTAL ADDRESS CHANGE (P O BOX 934GARSFONTEIN0042)
2012/06/18	REGISTERED ADDRESS CHANGE (678 WINDSOR ROADGARSFONTEIN0042)
2012/06/18	AUDITOR/ACC OFFICER CHANGE

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	(CHANGE RECORDNAME : = ETIENNE ROUXSTATUS : = RESIGN)
2012/06/18	AUDITOR/ACC OFFICER CHANGE (ADD RECORDNAME : = HENRY PETER BEATHSTATUS : = CURRENT)
2012/06/18	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CC AMENDMENTS LOG NO. 335 - MEMBERS ADDRESS)
2010/10/19	AR IN DEREGISTRATION (DEREGISTRATION FOR ANNUAL RETURN NON COMPLIANCE. REGISTRATION MONTH = 8 - AR NON COMPLIANCE DATE = 01/10/2009 - 6 MONTHS AFTER = 03/06/2010.)
2009/09/25	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = PATRICK EDUARDSTATUS : = ACTIVE)
2009/09/25	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = VERNON MAURICESTATUS : = ACTIVE)
2009/09/25	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = WILHELMUS MARINUSSTATUS : = ACTIVE)
2009/09/25	NATURE OF BUSINESS CHANGE (SIC CODE) (8)
2009/09/21	AUDITOR/ACC OFFICER CHANGE (ADD RECORDNAME : = ETIENNE ROUXSTATUS : = CURRENT)
2009/09/21	AUDITOR/ACC OFFICER CHANGE (CHANGE RECORDNAME : = J P LOUWSTATUS : = RESIGN)
2009/09/21	REGISTERED ADDRESS CHANGE (225 MIRCA AVENUESINOVILLE0182)
2009/09/21	POSTAL ADDRESS CHANGE (P O BOX 15873SINOVILLE0129)
2009/09/21	NATURE OF BUSINESS CHANGE (SIC CODE) (8)
2001/11/19	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = PATRICK EDUARDSTATUS : = ACTIVE)
2001/11/19	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (CHANGE RECORDSURNAME/INSTIT : = VERGNEFIRST NAMES : = WILHELMUS MARINUSSTATUS : = ACTIVE)
1998/05/27	REGISTERED ADDRESS CHANGE

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	(SUITE 110B INFOTECH BUILDING1090 ARCADIA STREETHATFIELD0182)
1998/05/27	POSTAL ADDRESS CHANGE (P O BOX 12072HATFIELD0129)
1996/05/30	REGISTERED ADDRESS CHANGE (P O BOX 12072HATFIELD0028)
1996/05/30	POSTAL ADDRESS CHANGE (SUITE 110B INFOTECH BUILDING1090 ARCADIA STREETHATFIELD0028)
1996/05/30	REGISTERED ADDRESS CHANGE (SUITE 602 VLOER 6HATFIELD FORUM OOSARCADIASTRAAT 10770083 HATFIELD0028)
1996/05/30	POSTAL ADDRESS CHANGE (POSBUS 8447PRETORIA0028)
1988/02/23	DIRECTOR/MEMBER/SECRETARY/TRUST/BOTH DIRECTOR AND OFFICER (NO INFORMATION TO DISPLAY)

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MOTIVATION IN SUPPORT OF AN APPLICATION SUBMITTED IN TERMS OF SECTION 16(1) OF THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024) FOR THE REZONING OF -

ERF 439 GARSFONTEIN

PREPARED FOR: MULTI PRINT PRINTERS CC

BY: THE TOWN PLANNING HUB CC

Tel: (012) 809 2229
E-mail: bea@tph.co.za

PO Box 11437
Silver Lakes
0054

Lombardy Corporate Park
Block B, 1st Floor
Cole Road
Shere AH
0084



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MOTIVATION IN SUPPORT OF AN APPLICATION SUBMITTED IN TERMS OF SECTION 16(1) OF THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024) FOR THE REZONING OF ERF 439 GARSFONTEIN

1. THE APPLICATION

Application is made in terms of Section 16(1) of the City of Tshwane Land Use Management By-Law, 2016 (Amended 2024) for the rezoning of **ERF 439 GARSFONTEIN** from “Residential 1” to “Business 4” for Office and Retail Industry (with an amended definition).

The property is being used as a printing shop, offices and associated retail industry uses for the last 25 years. The intention of the application is to legalise the existing land use rights.

2. GENERAL INFORMATION

2.1 Local Authority

City of Tshwane Metropolitan Municipality.

2.2 Property Description

Erf 439 Garsfontein

2.3 Registered Owner

The property is registered in the name of Multi-Print Printers CC.

2.4 Property Size

The property measures 1 240m² in extent.

2.5 Locality

The property is situated at 678 Windsor Road, Garsfontein. See below aerial image and locality plan submitted with the application.



2.6 Existing Zoning

The property is zoned “Residential 1” in terms of the Tshwane Land Use Scheme, 2024.

Refer to the attached zoning certificate.

2.7 Existing Land Use

The property is used as a printing shop with associated retail industry uses. The land use is accommodated within the existing building.

2.8 Deed of Transfer

The property is registered under Title Deed No. T2378/2001.

2.9 Bond

The property is not bonded by any financial institution.

3. MOTIVATION

3.1 Background

The application site was purchased in 2001 by Multi-Print Printers CC. Since the purchase of the property, it has been used as a printing facility and ancillary retail industry uses. The property owner wishes to rezone the property to comply with the legislation and existing Land Use Scheme.



To accommodate the desired land uses on site, the property must be rezoned to allow for Office and Retail Industry (with an amended definition). This application relates to the rezoning of the property to “Business 4” for Office and Retail Industry (with an amended definition) in terms of Section 16(1) of the City of Tshwane Land Use Management By-Law, 2016 (Amended 2024).

The proposed rezoning will legalise the existing land uses on the property.

From there this application.

3.2 Immediate area / surroundings

The property is situated in a mixed-use area.

The surrounding land uses are summarised as follows:

- North: Retail and Dwelling House
- East: Dwelling House, Dental Laboratory and Dwelling Units
- South: Church, Beauty Salon, Educational and Dwelling House
- West: Dwelling House, Tattoo Shop and Beauty Salon

Kindly refer to the land use plan attached.

3.3 Need and Desirability

The property was purchased in 2001 by Multi-Print Printers CC. The printing facility has been operational for the last 25 years from the property without any complaints from the neighbours. The property falls within a mixed-use zone, and the land use falls within the planning of the Municipality for the area.

The need and desirability of the application will be measured against the following policy documentation.

- Spatial Planning and Land Use Management Act, Act 16 of 2013
- Gauteng Spatial Development Framework, 2030
- Tshwane Integrated Development Plan, 2017/21
- City of Tshwane Metropolitan Spatial Development Framework, 2021
- Regional Spatial Development Framework 2025: Region 6

3.3.1 Spatial Planning and Land Use Management Act, Act 16 of 2013 (SPLUMA)

The introduction of the SPLUMA requires for all land development applications to comply and be motivated in accordance with same.



This application complies with the objectives and development principles of SPLUMA which will be elaborated on further below.

Section 7

7. The following principles apply to spatial planning, land development and land use management:

(a) The Principle of spatial justice, whereby –

- (i) Past spatial and other development imbalances must be redressed through improved access to and use of land;**
- (ii) Spatial development frameworks and policies at all spheres of government must address the inclusion of persons and areas that were previously excluded, with an emphasis on informal settlements, former homeland areas and areas characterised by widespread poverty and deprivation;**
- (iii) Spatial planning mechanisms, including land use schemes, must incorporate provisions that enable redress in access to land by disadvantages communities and persons;**
- (iv) Land use management systems must include all areas of a municipality and specifically include provisions that are flexible and appropriate for the management of disadvantaged areas, informal settlements and former homeland areas;**
- (v) Land development procedures must include provisions that accommodate access to secure tenure and the incremental upgrading of informal areas; and**
- (vi) A Municipal Planning Tribunal considering an application before it may not be impeded or restricted in the exercise of its discretion solely on the ground that the value of land of property is affected by the outcome of the application;**

This application is for the rezoning of the property to accommodate Office and Retail Industry (with an amended definition) uses to allow for a printing shop on the property. The approval of this application will indicate the support of the City of Tshwane towards planning practices that support the need to be more flexible and inclusionary. The application site is situated in an area earmarked for mixed use development.

(b) The principle of spatial sustainability, whereby spatial planning and land use management systems must –

- (i) Promote land development that is within the fiscal, institutional and administrative means of the Republic;**
- (ii) Ensure that special consideration is given to the protection of prime and unique agricultural land;**
- (iii) Uphold consistency of land use measures in accordance with environmental management instruments;**
- (iv) Promote and stimulate the effective and equitable functioning of land markets;**
- (v) Consider all current and future costs to all parties for the provision of infrastructure and social services in land developments;**



- (vi) Promote land development in locations that are sustainable and limit urban sprawl; and**
- (vii) Result in communities that are viable;**

This application complies with the above principle. The site is not viable agricultural land in any form. The proposed application will support the functioning of land markets in the area and the owner intends to comply with the post approval conditions that might be applicable to the property. The application does not result in urban sprawl and will result in a more viable and compact community.

(c) The principle of efficiency, whereby –

- (i) Land development optimises the use of existing resources and infrastructure;**
- (ii) Decision-making procedures are designed to minimise negative financial, social, economic or environmental impacts; and**
- (iii) Development application procedures are efficient and streamlined and timeframes are adhered to by all parties;**

This application complies with the above principle, specifically the optimal use of existing services infrastructure. The owner wishes to finalise the application timeously and obtain approved building plans as soon as possible.

(d) The principle of spatial resilience, whereby flexibility in spatial plans, policies and land use management systems are accommodated to ensure sustainable livelihoods in communities most likely to suffer the impacts of economic and environmental shocks; and

The Municipal- and Regional Spatial Development Frameworks, Municipal By-Laws as well as the Town Planning Scheme available to applicants in the City of Tshwane allow for applications such as this within the City of Tshwane. Although the site does not fall within an environmentally sensitive area, its support will allow for sound economic affairs in the city.

(e) The principle of good administration, whereby –

- (i) All spheres of government ensure an integrated approach to land use and land development that is guided by the spatial planning and land use management systems embodied in this Act;**
- (ii) All government departments must provide their sector inputs and comply with any prescribed requirements during the preparation or amendment of spatial development frameworks;**
- (iii) The requirements of any law relating to land development frameworks;**
- (iv) The preparation and amendment of spatial plans, policies, land use schemes as well as procedures for development applications, include transparent processes of public participation that afford all parties the opportunity to provide inputs on matters affecting them; and**
- (v) Policies, legislation and procedures must be clearly set in order to inform and empower members of the public.**



This application complies with the above principle; the application pertains to the rezoning of the erf to allow for the existing land use on the property in accordance with the Scheme. The development is in line with the land uses identified in the Regional Spatial Development Framework, as will be discussed under point 3.3.5. All the required internal departments will have the opportunity to provide comments on the application.

Section 42

42.(1) In considering and deciding an application a Municipal Planning Tribunal must-

- (c) (i) the public interest;**
- (ii) the constitutional and transformation imperatives and the related duties of the State;**
- (iii) the facts and circumstances relevant to the application;**
- (iv) the respective rights and obligations of all those affected;**
- (v) the state and impact of engineering services, social infrastructure and open space requirements; and**
- (vi) the effect of the land development application on the environment.**

- **Public interest:**

The application pertains to the proposed rezoning of the erf to allow for an existing printing house, offices and retail industry uses on the property. The business has been in operation for the last 25 years from the same property. The proposed rezoning will not have a negative impact on the surrounding properties or the amenities of the area. The required advertising procedures will be adhered to, should any person be aggrieved by the application they will be able to lodge comments thereon.

- **Constitutional and transformation imperatives and the related duties of the State:**

The application has no bearing on the State.

- **Facts and circumstances relevant to the application:**

The property owner has used the property as a printing house for 25 years. The owner was served with a contravention notice and consulted our company immediately to rectify the transgression. The property owner wishes to rezone the property to legalise the existing land use in terms of the Land Use Scheme. The proposed rezoning will allow for the office and retail industry (with an amended definition) uses on the property. The land use can be accommodated within the existing building.

The application is situated in a “Mixed Use” zone. The proposed development is in line with the future spatial planning of the city.



This application relates to the rezoning of the property to “Business 4” for Office and Retail Industry (with an amended definition) in terms of Section 16(1) of the City of Tshwane Land Use Management By-Law, 2016 (Amended 2024).

- Respective rights and obligation of all those affected:
The application will be duly advertised, and anyone aggrieved by the application will be allowed the opportunity to give their input.
- State and impact of engineering services, social infrastructure and open space requirements:
Any impact on the on the engineering services will be confirmed during the circulation of the application to the various Municipal Departments. All required engineering upgrades will be done before proclamation of the rights.
- The effect of the land development application on the environment:
This point can be seen as omissible as the application site is situated within a built-up area and no sensitive environmental areas will be affected.

In general, the rights of the surrounding property owners will be taken into account. The required advertising will take place timeously together with the site notices to be placed on the property. The required letters will be sent out to the surrounding property owners where after our office will remain open for any discussion and input from the affected parties in terms of development controls and design of the buildings.

The proposed application will not have a negative impact on the surrounding properties or character of the area and is inline with the planning of the street.

3.3.2 Gauteng Spatial Development Framework, 2030 (GSDF)

The Gauteng Spatial Development Framework, 2030 has been adopted and is a development tool that proposed to align development, not only within the City of Tshwane but across the province.

“The Spatial Development Vision

The Gauteng of 2030 is an integrated, connected space that provides for the needs of all who are born in or drawn to the province. Economic growth is spread widely, beyond the core areas, to nodes and multi-modal activity corridors. These nodes and corridors provide safe, high-intensity and high-density mixed land-use settlements, where the young and old are able to walk, cycle and relax in public spaces. A range of public transport modes ensures affordable, province-wide interconnectedness and access to the full spectrum of



economic, cultural and educational opportunities, placing the province on a far more sustainable growth trajectory. ...” Page ix, GSDF 2030

In order to make the above spatial vision a reality, various spatial development principles were identified of which one is that of ‘liveability’ and the subsequent need to increase economic development / potential in the city.

“To realise the spatial development vision, all developments in the province need to adhere to six spatial development principles: (i) liveability, (ii) concentration, (iii) connectivity, (iv) conservation, (v) diversity, and (vi) viability.” Page ix, GSDF 2030

This application supports the vision by conforming to the development principles, i.e.:

- Liveability:** The proposed development is ensuring the economic growth of the area and the city within which its residents reside. Having access to various business activities within the city boundary is crucial to ensure sustainability in the city.
- Concentration:** The development will support consolidation and economic development in an area where a concentration of land uses is proposed. The application area is located within a Mixed-Use zone.
- Connectivity:** The development will be enhancing connectivity of the city. The development will ensure greater accessibility to economic opportunities.
- Conservation:** The properties are not affected by any environmental sensitivities or constraints.
- Diversity:** The area is diverse in characteristics; the development will be supporting the general growth of the area as a business type development.
- Viability:** The development will continue to support the economic growth of the area and of the City by providing a specialised service.

The limitation of urban sprawl is not only a provincial problem, but also applies specifically to local municipalities. Their actions and decisions directly affect the form and shape of cities in terms of its sustainability and liveability. The application sites are within the urban edge and earmarked for mixed use development by the city.

In short, it can be concluded that the Gauteng Spatial Development Framework of 2030 has very strong views on the densification of the cities located in the province, where these developments’ intention should be to create a more **sustainable and integrated Gauteng City Region**.

3.3.3 Tshwane Integrated Development Plan, 2017/21

The vision for the City of Tshwane has been relooked and adapted over recent years –



“A prosperous capital city through fairness, freedom and opportunity.

Strategy implementation towards achieving the new vision for 2030 is anchored around service delivery excellence and innovation; growing the economy and creating jobs; promoting a safe and healthy city; promoting social cohesion, inclusion and diversity; and fostering participation, collaboration and diversity.” Page 4, IDP 2017/21

In order for the City and the coalition government (since the 2021 elections) to achieve their vision, the City has several strategic priorities which are as follows:

- *“Prioritization of the electrical grid and water infrastructure.*
- *Provide stringent financial management and oversight.*
- ***A business-friendly city that promotes employment and economic growth.***
- *Enhancing city safety, security, and emergency services.*
- *Maintaining a clean and protected natural environment.*
- *Maintenance and expansion of road infrastructure and public transportation.*
- *A caring city that supports the vulnerable and provides social relief.*
- *Modernization and digitization of city processes.*
- *A professional public service that drives accountability and transparency.*
- *Creating a healthy and vibrant city.”* Pages 52, IDP 2023/24 Review

Each of the aforementioned strategic priorities that the City identified need to be realised. Although all the priorities are not relevant to land use management, the ones that do filter down to spatial planning and how it affects the city and are relevant to this application is discussed below.

“A business-friendly city that promotes employment and economic growth.”

This statement can be relevant to many businesses and sectors, to public and private sectors. In terms of this application and land use management in general, the section does elaborate on the need for the municipality to “*ensure planning applications are dealt with in terms of legislated timeframes*” (page 54). This has been a challenge for some time.

This submission adheres to all the documentation required to be submitted, to ensure from an applicant’s point of view that all information is on the table to allow the municipality to process the application as soon as possible.



In terms of Spatial Planning, the IDP makes reference to the Gauteng Spatial Development Framework, 2030 that is discussed in this memorandum.

This development will enhance growth of the City of Tshwane's economy as follows:

- Job opportunities will be secured;
- The Municipality will receive a higher income from the possible services and property tax;
- The infrastructure of this area might be enhanced (roads and services).

This application thus complies with the spatial planning vision of the IDP for the City of Tshwane. In terms of the IDP 2017/21, there is no reason why the proposed rezoning should not be supported by the City of Tshwane.

3.3.4 City of Tshwane Metropolitan Spatial Development Framework, 2021

The MSDF can be seen as an interpretation of the desired spatial form that the city aims at achieving through growth and development within its boundaries. It is mainly used for long-term planning but also the medium term in some instances. It gives guidance and tools to be used for land use planning to ensure integration of the physical and economic environment.

This vision can be achieved through higher density urban development, **greater mixing of compatible land uses** and focussed concentration of high-density residential land uses and **intensification of other non- residential land uses** in nodes (also known as agglomeration of uses), around transit stations / intermodal transport facilities and along activity corridors.

“Spatial Vision

A Spatially Efficient Capital City that is Sustainable, Competitive and Resilient:

Sustainability: Optimising the use of land through compaction, densification, infill and consolidation will result in a city with spatially integrated equal opportunities.”

Resilience: Being innovative and adaptable while maximising spatial opportunities and, in turn, maximising economic growth opportunities through strategic investment decisions.” Page 116-117, MSDF 2021

The spatial directive above will be achieved by this development through the nature and locality of the application site. The nature of the land use – being retail industry in a mixed-use area will contribute to the competitiveness of the City of Tshwane.

It is evident that the Provincial and Metropolitan policy documentation are in line with each other as the majority of its directives and spatial structuring elements are similar. The application is in line with the metropolitan planning for the City of Tshwane in terms of the type of land use applied for and the location thereof in relation to the rest of the city.

3.3.5 Regionalized Municipal Spatial Development Framework, 2025: Region 6 (RSDF)

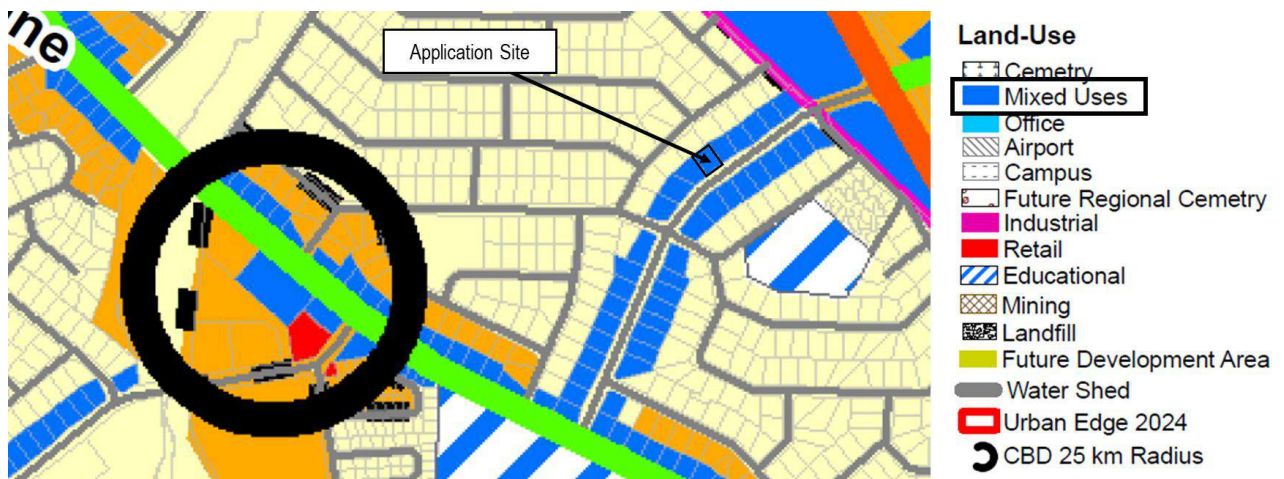
The application site is located within Region 6 of the City of the City of Tshwane.

The property is situated in a “Mixed Use” zone east of the Garsfontein Node. The Mixed-Use zone supports offices, commercial, industries and retail land uses:

“Refers to land uses such as offices/ commercial/ residential/ industrial/ retail/ entertainment/ institutional etc. It also refers to a mix of uses within a specific area (node or corridor). The advantage of mixed uses is that access and convenience are increased as transportation distances are decreased. The combination depends on the specific area. A mixed-use could refer to retail at street level, institutional on the floor above and residential on the upper floors, or only use per erf. Principles regarding retail, commercial and industrial uses / rights are still applicable as indicated in this document. Mixed land use in an industrial area could include industry, commercial, housing and retail uses. In nodal areas the scale of the mixed use will be more than that for example in the activity streets. Infill and redevelopment along activity streets and corridors within existing neighbourhoods are encouraged.” Page 78-79, RSDF Region 6

The purpose of the application is to ensure sustainable economic services are provided within an area earmarked for mixed use and industrial development. The proposed development is a positive contribution to the growth of the economy of the region.

Below is an extract from the RSDF Map, indicating the location of the application sites:





Being situated in a “Mixed Use” zone close to the Garsfontein Node the proposed development can be categorised as a compatible land use which will not detract from the character of the area. The land use is accommodated in the existing building, therefore the land use will not detract from the character of the area. The application is in line with the planning for the area and the vision of the City of Tshwane.

3.4 Engineering Services

Water & Sanitation

Preliminary comments were received from the Department of Water and Sanitation stating:

DEPARTMENT / DIVISION/SECTION/NAME	Water and Sanitation	
DATE OF ENGAGEMENT	This Division will support this application. Development charges will be payable	
COMMENTS FROM THE DEPARTMENT		
NAME OF THE ENGINEERING TECHNICIAN	Cinthia Mofokeng	
SIGNATURE		

Traffic Engineering

Preliminary comments were received from the Department of Traffic Engineering Department stating:

“This section has no objection to the proposed application, following comments apply:

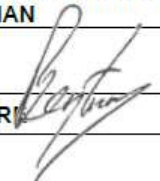
- 1. Access should be according to municipal standards.*
- 2. Parking should be provided as per ratios in the Tshwane land-use scheme 2024 and the layout should be according to municipal standards.*
- 3. Should the development trips exceed 51, a TIA report will have to be submitted to this section.”*

The proposed development will not generate more than 51 trips, therefore a Traffic Impact Assessment will not be required.

Electricity

Preliminary comments were received from the Department of Energy and Electricity stating:



DEPARTMENT / DIVISION/SECTION/NAME	ENERGY & ELECTRICITY	
DATE OF ENGAGEMENT	21/04/2026	
COMMENTS FROM THE DEPARTMENT	In order, application will be supported.	
NAME OF THE ENGINEERING TECHNICIAN	R. BREYTENBACH	
	21/04/2026	
	SIGNATURE	DATE

Roads and Stormwater

Preliminary comments were received from the Roads & Stormwater Department stating:

Good day,

For: **Proof of Engagement Form [COT F33]**.

Transport Infrastructure Planning requires that a hard copy services report must be submitted to this Section after the application was submitted at, and NAPS number received from Economic Development and Spatial Planning.

The report must be compiled by a professional civil engineer and must include all the information as required in the document entitled: "Roads and Transport – content requirements for service reports", available from the Department, and must address the following:

- (a) Stormwater master planning, if applicable;
- (b) The outcome of an accepted stormwater assessment;

I trust you will find the above in order. You are welcome to contact me should you require any further information.

Regards,

The departmental engagement forms are attached for ease of reference.

4. DEVELOPMENT PROPOSAL

The following development controls are proposed:

Zoning:	"Business 4"
Permitted Land Use:	Office and Retail Industry (with an amended definition)
Density:	Not Applicable
Coverage:	Clause 27 – 60%
FAR:	Clause 25 – 0.36
Height:	Clause 26 – 10 meters
Street building lines:	Clause 9
Building lines:	Clause 12
Parking:	As per Scheme

The proposed development controls align the proposed land use on the properties with the Tshwane Land Use Scheme, 2024.



6. CONCLUSION

The property is being used as a printer shop, offices and related light industrial uses. The intention of the application is to obtain land use rights for “Business 4” including retail industry and light industry. The rezoning will result in the legalisation of the existing land use on the property.

THE TOWN PLANNING HUB CC

**ANNEXURE L
OF THE TSHWANE LAND USE SCHEME, 2024**

NOT YET PROMULGATED

PROPERTY DESCRIPTION: ERF 439 GARSFONTEIN

1	Use Zone number	9
2	Use Zone	BUSINESS 4
3	Uses permitted	Office and Retail Industry
4	Uses with Consent Use	Table B, Column (4), all other uses excluded from Column (3)
5	Uses not permitted	Table B, Column (5)
6	Definitions	Retail Industry: For the purposes of this Scheme, Retail Industry means land and buildings used for the retail sale of consumer services, limited to instant printing and copying, and may include a workshop ancillary to the primary retail use, for the processing and finishing of printed material, including but not limited to laminating, binding, folding, trimming, guillotining, mounting, packaging, vinyl application and similar finishing processes associated with the retail printing service. Other: Clause 5
7	Density	N/A
8	Floor Area Ratio	Clause 25 – 0.36
9	Height	Clause 26 – 10 meters
10	Coverage	Clause 27 – 60%
11	Parking requirements	Clause 28, Table G Instant printing and copying: 4 parking spaces per 100m ² of the Net Floor Area Workshop: 1 parking space per 100m ² of the Net Floor Area
12	Street Building Lines	Clause 9
13	Side Building Lines and Rear Building Lines	Clause 12, Table A
14	Children's playground	Clause 14(11)
15	Paving of traffic areas	Clause 28(6)
16	Access to the Property	Clause 7(1)

SIGNED BY

DATE

**ANNEXURE L
OF THE TSHWANE LAND USE SCHEME, 2024**

NOT YET PROMULGATED

PROPERTY DESCRIPTION: ERF 439 GARSFONTEIN

17	Loading and off-loading facilities	Clause 29, Table H
18	Physical Barrier and screen wall	Clause 18(3)
19	Health measures	Clause 18(7)
20	Outdoor advertising	Clause 30(2)
21	Site Development Plan and Landscape Development Plan	Clause 31
22	Geological conditions	Clause 19(2)
23	Open Space	Not applicable
24	General conditions: (1) In addition to the above conditions, the Property and Buildings thereon are further subject to the general provisions of the Tshwane Land Use Scheme, 2024.	

SIGNED BY

DATE

TSHWANE LAND USE SCHEME

2024

DRAFT AMENDMENT SCHEME NUMBER

SHEET

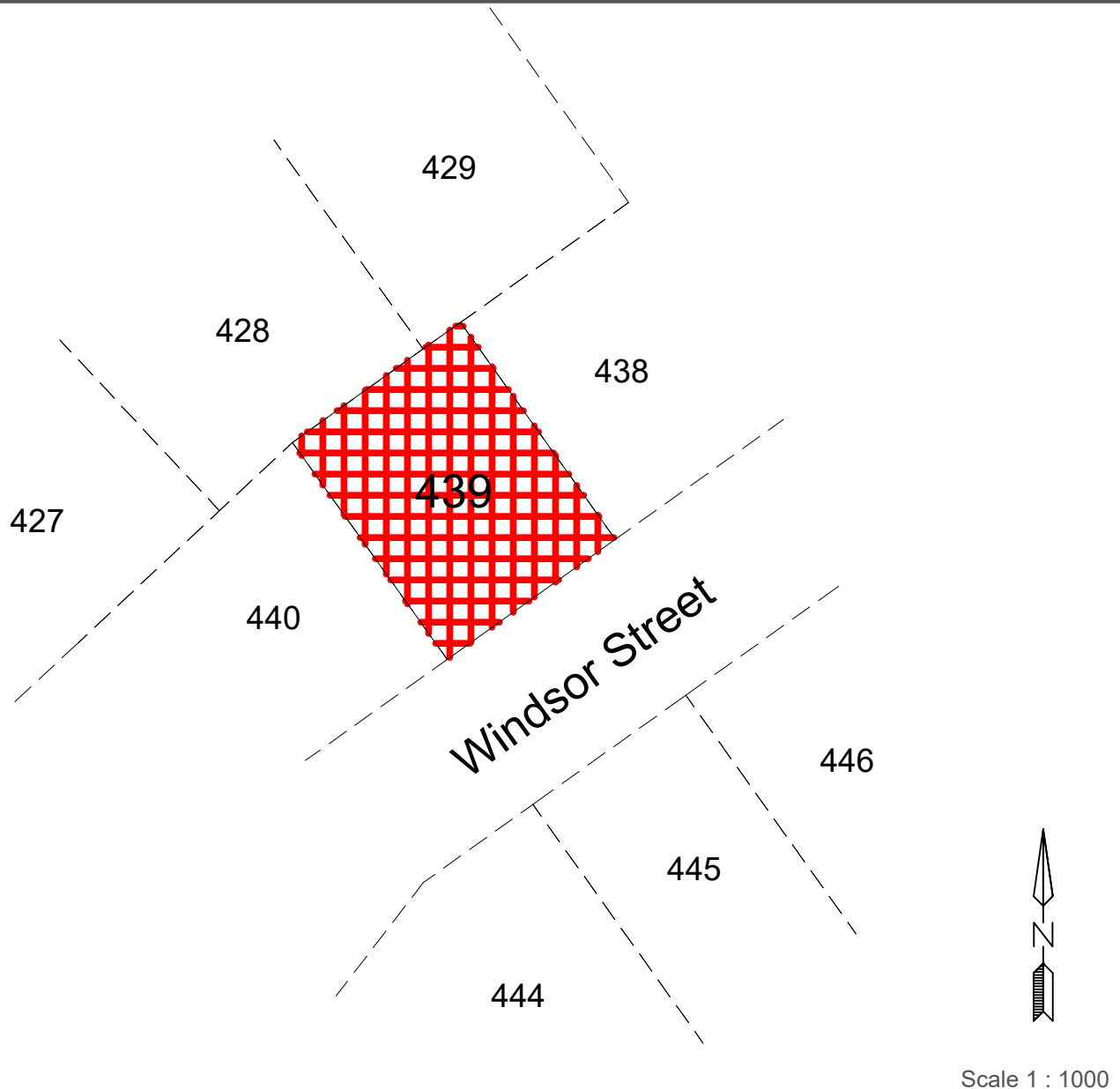
1

OF

1

SHEETS

PROPERTY DESCRIPTION: Erf 439, Garsfontein



USE ZONE



Business 4

REFERENCE

GENERAL

----- Building Line

Line of No Access

----- Township Boundary

PO BOX 11437
SILVER LAKES
0054
TEL: (012) 809 2229

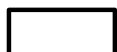


SIGNED BY APPLICANT

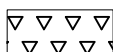
DATE

LAND USE PLAN

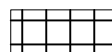
Erf 439, Garsfontein



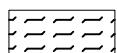
The Site



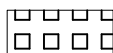
Beauty Salon



Office



Dwelling House



Tattoo Shop



Dwelling Units



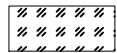
School / Educational Centre



Guest House



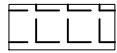
Printing Shop



Retail



Dental Laboratory



Church



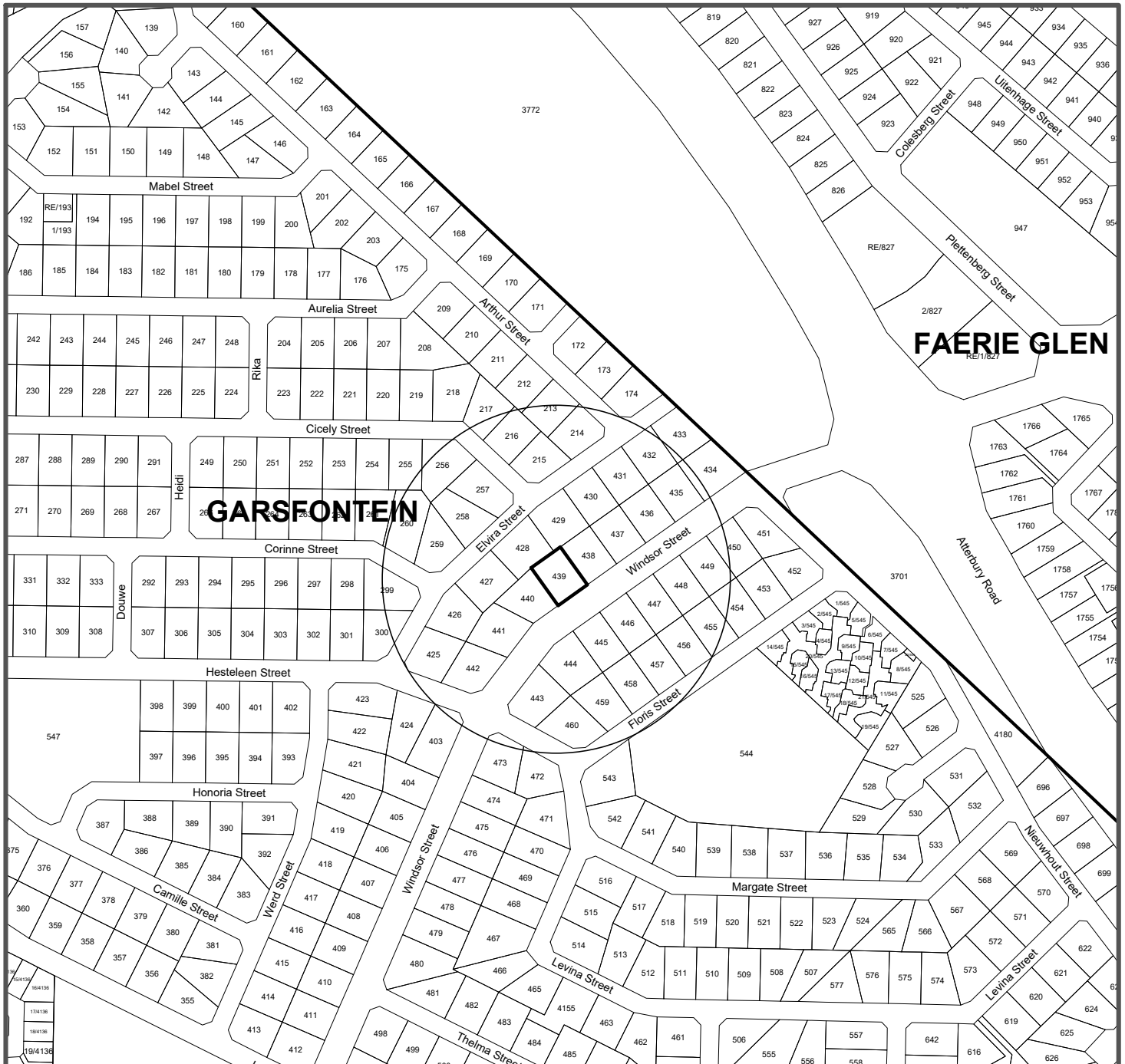
Auto Repair Workshop



Scale 1:3000

LOCALITY PLAN

Erf 439, Garsfontein



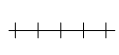
The Site



Township Boundary



Road



Railway



Railway Station



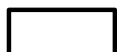
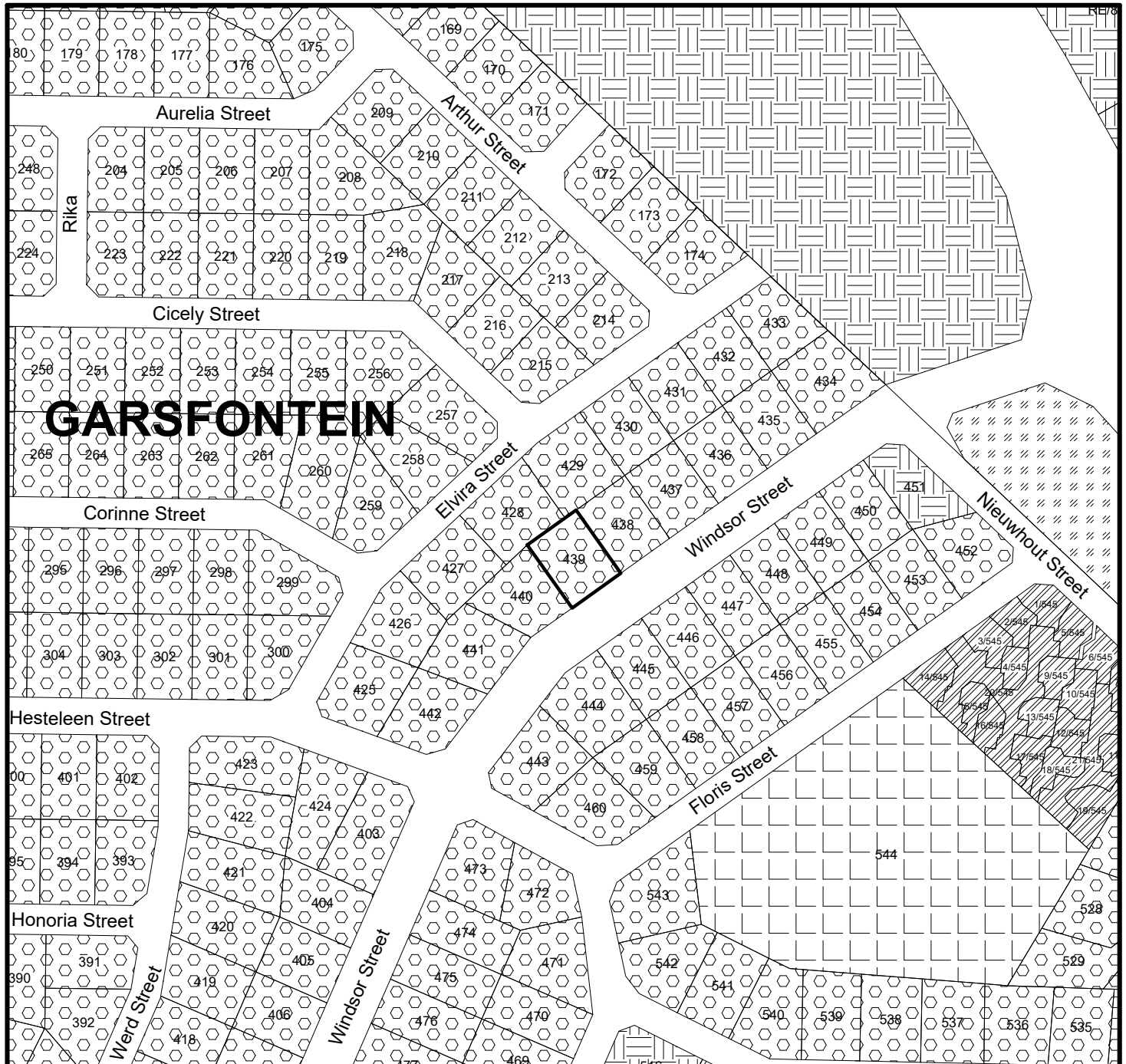
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PO BOX 11437
SILVER LAKES
0054
TEL: (012) 809 2229



ZONING PLAN

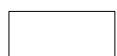
Erf 439, Garsfontein



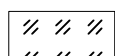
The Site



Special



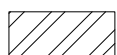
Existing Streets



Business 3



Residential 1



Residential 2



Educational

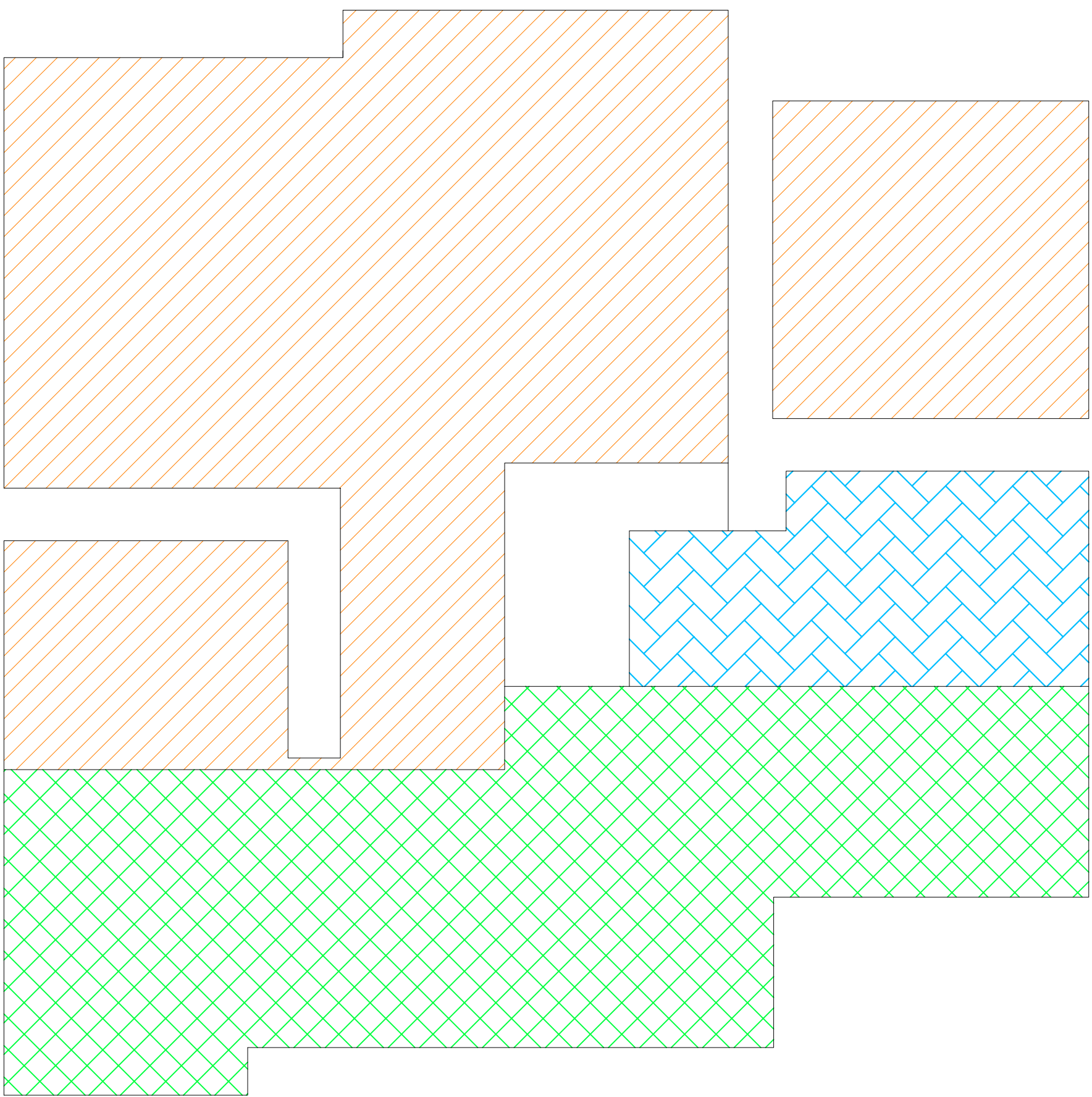
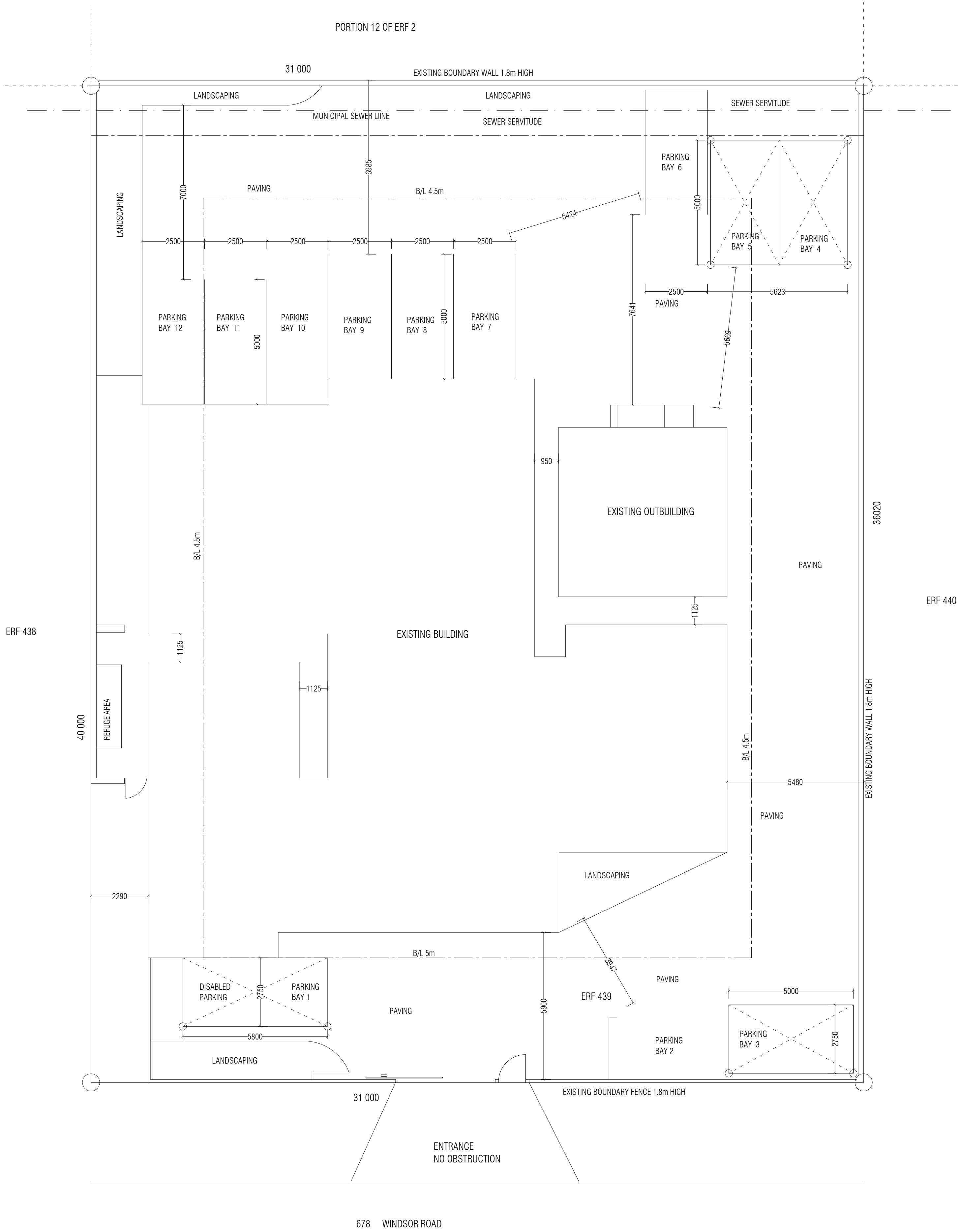


Scale 1:3000



THE TOWN PLANNING HUB CC

changing landscapes



PARKING BAY CALCULATION		REQUIRED	
OFFICE SPACE = 4 BAYS/100m ²			
OFFICE SPACE	144m ²		
	= 144/100		
	= 1.44 x 4		
TOTAL PARKING REQUIRED	= 5.76	6	
WORK SHOP = 1 BAYS/100m ²			
WORKSHOP SPACE	246m ²		
	= 246/100		
	= 2.46 x 1		
TOTAL PARKING REQUIRED	= 2.46	3	
RETAIL INDUSTRY = 4 BAYS/100m ²			
RETAIL INDUSTRY SPACE (INSTANT PRINTING AND COPYING)	41m ²		
	= 41/100		
	= 0.41		
	= 0.41 x 4		
	= 1.64	2	
TOTAL BAYS REQUIRED		11	
TOTAL BAYS PROVIDED		12	

SITE AREA	= 1240	m ²
MAIN BUILDING	= 397	
OUTBUILDING	= 46	
SHADE NETTING (CARPORTS)	= 60	
REFUGE AREA (COVERED)	= 3.4	
TOTAL COVERAGE	(397+46+60+3.4)	= 506.4
ZONING = BUSINESS 4		
PERMITTED LAND USE =TABLE B COLUMN (3) , + RETAIL INDUSTRY		
DENSITY = N/A		
COVERAGE =45% ALLOWED (506.4/1240)x100 = 41 %		
F.A.R =0.45 ALLOWED =443/1240 = 0.357		
HEIGHT = 10m ALLOWED		



SDP
SCALE 1:100

G ARCH 3D DESIGNS Ltd.Pty

PROFFESIONAL
ARCHITECTURAL
DRAFTSMAN:

GORDON VISAGIE
0798857230

SACAP REGISTERED

PAD24748889

CLIENT:

MULTI-PRINT PRINTERS CC
ERF 439
GARSFONTEIN

SDP

DRG no: 2026.06.09 - 1031 1 OF 1

REV 3

IN-DEED/DEED

SEELREG
STAMP DUTY

HAMMOND POPE INC

340.00

1560

TEL: 011-874-1800

Prepared by me,

J. Heunis
Conveyancer
HEUNIS, J W

VERBIND		MORTGAGED		000035948 / 2021	
VIR FOR R 365 000.00		GEMANSSELLEER		CANCELLED	
B 02212-2001		<i>[Signature]</i>		REGISTRAR	
15 01 2001		REGISTRATEUR/REGISTRAR			

2021-05-31

DEED OF TRANSFER NO:

T.0000002378.12001

BE IT HEREBY MADE KNOWN:

THAT ~~JOHAN WILHELM HEUNIS~~ HANS RUDOLF STRAEULI

appeared before me, REGISTRAR OF DEEDS at Pretoria the said Appearer, being duly authorised thereto by a Power of Attorney granted to him by:-

CORNELIA GERTRUIDA GRAVETT
Identity Number 600318 0103 08 5
Unmarried

dated the 3rd day of NOVEMBER 2000 signed at PRETORIA

ROBINSON S
DATA METER

ERAG. 100.000.000
DATA METER

and the said appearer declared that his Principal had truly and legally sold on 11th OCTOBER 2000 and that he, in his capacity as aforesaid, did, by these presents, cede and transfer to and on behalf of-

MULTI-PRINT PRINTERS CC

CK/1987/017729/23

its successors in title or assigns,

in full and free property:

ERF 439 GARSFONTEIN TOWNSHIP
Registration Division JR, Province GAUTENG

IN EXTENT 1 240 (ONE THOUSAND TWO HUNDRED AND FORTY) Square Metres;

FIRST transferred by Deed of Transfer No. T12269/1976 and held by Deed of Transfer No. T37032/1997.

SUBJECT to the following conditions:

- A. "SUBJECT to the reservation of four-fifths (4/5ths) share in the Mineral Rights in favour of JAN FRANCOIS SCHUTTE, MARTHA SALOMINA DOROTHEA GEY VAN PITTIUS, born SCHUTTE, married out of community of property to JAN HENDRIK FREDERIK EDUARD RUDOLF GLAUDIUS GEY VAN PITTIUS, CAREL JACOBUS ERASMUS SCHUTTE, and ANNA MARIA MARGARETHA SCHUTTE, (Spinster of full age) and the remaining one-fifth (1/5th) share in favour of MARTHA LOUISA DU PLESSIS, born SCHUTTE, married out of community of property to STEPHANUS HENDRIK DU PLESSIS.

Certificate of Mineral Rights No 398/1924-S registered on the 25th July, 1924, has been issued in respect of the 3/5th share of MARTHA LOUISA DU PLESSIS, born Schutte, married out of community of property to STEPHANUS HENDRIK DU PLESSIS, MARTHA SALOMINA DOROTHEA GEY VAN PITTIUS, born Schutte, married out of community of property to JAN HENDRIK FREDERIK EDUARD RUDOLF GLAUDIUS GEY VAN PITTIUS, and ANNA MARIA MARGARETHA VAN LEEUWEN, born Schutte, married out of community of property to ALBERTUS JAN VAN LEEUWEN;

AND Certificate of Mineral Rights No. 399/1924-S registered on the 25th July, 1924, has been issued in respect of the 2/5ths share of JAN FRANCOIS SCHUTTE and CAREL JACOBUS ERASMUS SCHUTTE.

Both the aforementioned Certificates of Mineral Rights Nos. 398/1924-S and 399/1924-S were issued in respect of Portion 57 (MARY ANN) (portion of portion 48) of the farm GARSFONTEIN 374, Registration Division J.R., Transvaal, in extent 86,0815 Hectares."

- B. ONDERHEWIG aan die volgende verdere voorwaardes:-

MD

0

- (a) "The erf is subject to a servitude, 2 metres wide, in favour of the local authority, for sewerage and other municipal purposes, along one only of its boundaries other than a street boundary as determined by the local authority.
- (b) No building or other structure shall be erected within the aforesaid servitude area and no largerooted trees shall be planted within the area of such servitude or within 2 metres thereof.
- (c) The local authority shall be entitled to deposit temporarily on the land adjoining the aforesaid servitude such material as may be excavated by it during the course of the construction, maintenance or removal of such sewerage mains and other works as it in its discretion may deem necessary and shall further be entitled to reasonable access to the said land for the aforesaid purposes subject to any damage done during the process of the construction, maintenance or removal of such sewerage mains and other works being made good by the local authority."

SUBJECT to such conditions as are mentioned in the aforesaid deed.

WHEREFORE the appearer, renouncing all the right and title the said-

CORNELIA GERTRUIDA GRAVETT
Unmarried

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 -

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CK/1987/017729/23

its successors in title or assigns, now is 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 R365 000,00 (THREE HUNDRED AND SIXTY FIVE 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

15 01 2001



q.q. Signature of Appearer

In my presence,



REGISTRAR OF DEEDS





Economic Development and Spatial Planning

3rd Floor | Middestad Building | 252 Thabo Sehume Street | Pretoria | 0002

PO Box 440 | Pretoria | 0001

Tel: 012 358 7988

Email: geoinfoservice@tshwane.gov.za | www.tshwane.gov.za | www.facebook.com/CityOfTshwane

Generated by: TSHWANE\JanaN

Date 2026/06/10

TO WHOM IT MAY CONCERN

ZONING CERTIFICATE IN TERMS OF THE TSHWANE LAND USE SCHEME, 2024 (TLUS)

PROPERTY LIS KEY (GIS KEY): 023800439

ZONING KEY: 023800439

SPLIT ZONING: Not Applicable

PROPERTY DESCRIPTION: Erf 439 GARSFONTEIN (678 WINDSOR ROAD)

The following zoning information must be read with the **Clauses and Schedules of the Tshwane Land Use Scheme, 2024 (TLUS)**.

A. USE ZONE 1: RESIDENTIAL 1

USES PERMITTED IN TERMS OF TABLE B (COLUMN 3) OF THE TLUS	USES WITH CONSENT USE IN TERMS OF TABLE B (COLUMN 4) OF THE TLUS	USES NOT PERMITTED IN TERMS OF TABLE B (COLUMN 5) OF THE TLUS
Consulate Dwelling House Additional Dwelling House in areas described in Schedule 11, Schedule 12, Schedule 13 and Schedule 14 Embassy Home Enterprise subject to Schedule 9	Apartment Building Backpackers Commune Guest House Institution Medical Consulting Room which does not comply with Schedule 9 Parking Site adjacent to Use Zone 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18 and 28 Place of Day Care for the Aged which does not comply with Schedule 9 Place of Child Care which does not comply with Schedule 9 Place of Instruction which does not comply with Schedule 9 Place of Public Worship Retail Industry which does not comply with Schedule 9 Retirement Centre Social Hall Sport and Recreation Ground Veterinary Clinic which does not comply with Schedule 9 Veterinary Hospital Wall of Remembrance in conjunction with a Place of Public Worship	All other uses not listed in Columns (3) and (4)

B	ANNEXURE L	Not Applicable
C	MINIMUM ERF SIZE	1000
D	UNITS PER HA	Not Applicable
E	DENSITY	Not Applicable

Economic Development and Spatial Planning • Ekonomiese Ontwikkeling en Ruimtelike Beplanning • Lefapha la Tshwane se Lefapha la Polane
ya Sebaka • UmNyango wezokuThuthuthukiswa kwezomNotho namaPlani weeNdawo • Kgoro ya Tlhabollo ya Ikonomi le Thulaganyo ya Mafelo •
Muhasho wa Mveledziso ya Ekonomi na Vhupulani ha Fhethu • Ndzawulo ya Nhluvukiso wa Ikonomi na Vupulani bya Ndhawu • Umnyango
Wezokuthuthukiswa Komnotho Nokuhlelwa Kwendawo

On request, this document can be provided in another official language.

Document Ref: 023800439_20260610_155528268_1

F	FLOOR AREA RATIO	Table C, FAR Zone 21, subject to Clause 25
G	HEIGHT	Table D, Height Zone 10, subject to Clause 26
H	COVERAGE	Table E, Coverage Zone 5, subject to Clause 27
I	OTHER APPROVALS	Not Applicable
J	BUILDING LINES	Streets: Subject to Schedule 1 Rear and Side: Subject to Clause 12
K	SCHEDULE 5	Not Applicable
L	ATTACHED DOCUMENTS	Schedule 1-P14

In case of any discrepancy on the property description of the Zoning Certificate, Annexure L, Other Approvals and Schedules 1 and 5, relevant SG diagrams should be obtained for proper interpretation.

Disclaimer:

In the case of any other approval linked to this zoning certificate and numbered in row "I" the validity of this document(s) need to be verified as the rights may have lapsed.



f: GROUP HEAD: ECONOMIC DEVELOPMENT AND SPATIAL PLANNING

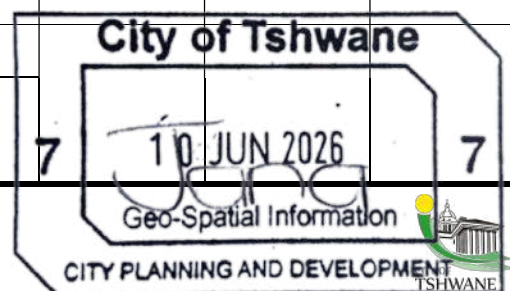
SCHEDULE 1: BUILDING LINES, ACCESS AND PHYSICAL BARRIERS

Township, Agricultural Holdings or Farms	Erf/ Property	Position applicable	Building line(s) in Metres for all storeys except where otherwise indicated	Road / boundary where access is not permitted	Boundaries to which access is limited	Boundaries: Physical barrier required
(1)	(2)	(3)	(4)	(5)	(6)	(7)
listed on pages 45 to 53 in this Schedule 1						
Florauna		All streets	8			
Florauna X1		Brits Road	16			
		All other streets	5			
Florauna X2		All streets	6			
Florauna X5	All erven except Erf 598)	All streets	3,5			
G						
Garsfontein		All streets	5			
Garsfontein X1		All streets	5			
Garsfontein X2		Road 0148	14			
		Menlyn Drive	14			
		All other streets	5			
Garsfontein X3		Menlyn Drive	14			
		All other streets	5			
Garsfontein X4		Road 0148	10			
		All other streets	5			
Garsfontein X5		Menlyn Dive	14			
		All other streets	5			
Garsfontein X6		Menlyn Drive	14			
		All other streets	5			
Garsfontein X7		All streets	6			
Garsfontein X8		All streets	5			
Garsfontein X10		All streets	5			
Garsfontein X11		All streets (except as stated in Annexures T (B)1679 and (B)1680)	3,5			
Garsfontein X12		Road 321 and Road 102-2	16			
		All other streets	6			
Garsfontein X14		All streets	3,5			
Garsfontein X15		All streets	3,5			
Garston Agricultural Holdings		All streets	30			
Georgeville		Watermeyer Street	12			
		All other streets	7,5			
Gezina		All streets	3,5			
Glen Lauriston		All streets	9			
Glen Lauriston X1		All streets	7,5			
Groenkloof		All streets	3,5			
Groenkloof X1		All streets	6			
Groenkloof 358-JR		George Storrar Drive	9			
		Florence Ribeiro Avenue (Koningin Wilhelmina Avenue)	3,5			

TSHWANE LAND USE SCHEME, 2024: SCHEDULE 1

Adopted: 08 May 2024

Comes into operation: 01 July 2024



LIST OF SURROUNDING PROPERTIES – ERF 439 GARSFONTEIN

OWNER: VAN DER WESTHUIZEN FRANCOIS ERF 440 GARSFONTEIN 674 WINDSOR ROAD GARSFONTEIN 0081	
OWNER: DE LA PORT OCTAVIA RADYN ERF 428 GARSFONTEIN 677 ELVIRA STREET GARSFONTEIN 0081	
OWNER: BOODHOO SADHANAND ERF 429 GARSFONTEIN 681 ELVIRA STREET GARSFONTEIN 0081	
OWNER: DU PREEZ ANNELLE ERF 438 GARSFONTEIN 682 WINDSOR ROAD GARSFONTEIN 0081	
OWNER: PIETERSEN JACO ERF 446 GARSFONTEIN 677 WINDSOR ROAD GARSFONTEIN 0081	
OWNER: VENTER JULIAN ERF 445 GARSFONTEIN 673 WINDSOR ROAD GARSFONTEIN 0081	
OWNER: ROWE JESSE LOUIS ERF 444 GARSFONTEIN 669 WINDSOR ROAD GARSFONTEIN 0081	

Dane Botha

From: Ben M. Seete <BenS@TSHWANE.GOV.ZA>
Sent: Thursday, 07 May 2026 19:26
To: Dane Botha
Subject: RE: Pre-Consultation: Erf 439 Garsfontein - R&S

Good afternoon

This section has no objection to the proposed application, following comments apply:

1. Access should be according to municipal standards.
2. Parking should be provided as per ratios in the Tshwane land-use scheme 2024 and the layout should be according to municipal standards.
3. Should the development trips exceed 51, a TIA report will have to be submitted to this section.

Kind regards,
Ben Seete
Engineering Technician
Traffic impact assessment management
C De Wet Building
175 Es'kia Mphahlele Drive
Room CD021
012 358 0556/064 680 1291

From: Dane Botha <dane@tph.co.za>
Sent: Tuesday, 05 May 2026 07:43
To: Ben M. Seete <BenS@TSHWANE.GOV.ZA>
Subject: RE: Pre-Consultation: Erf 439 Garsfontein - R&S

Dear Ben,

Application will be made in terms of Section 16(1) of the City of Tshwane Land Use Management By-Law, 2016 (Amended 2024) for the rezoning of **Erf 439 Garsfontein** from "Residential 1" to "Business 4" including "Retail Industry".

Following our conversation yesterday (04 May 2026), could you please advise whether departmental pre-consultation comments may be provided.

Kind regards,

Dané Botha

The Town Planning Hub CC
Tel: (012) 809 2229
Website: www.tph.co.za

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From: Dane Botha <dane@tph.co.za>
Sent: Tuesday, 28 April 2026 10:13
To: 'Ben M. Seete' <BenS@TSHWANE.GOV.ZA>
Subject: RE: Pre-Consultation: Erf 439 Garsfontein - R&S

Dear Ben,

Application will be made in terms of Section 16(1) of the City of Tshwane Land Use Management By-Law, 2016 (Amended 2024) for the rezoning of **Erf 439 Garsfontein** from "Residential 1" to "Business 4" including "Retail Industry".

Could you please advise whether departmental pre-consultation comments may be provided.

Kind regards,

Dané Botha

The Town Planning Hub CC
Tel: (012) 809 2229
Website: www.tph.co.za

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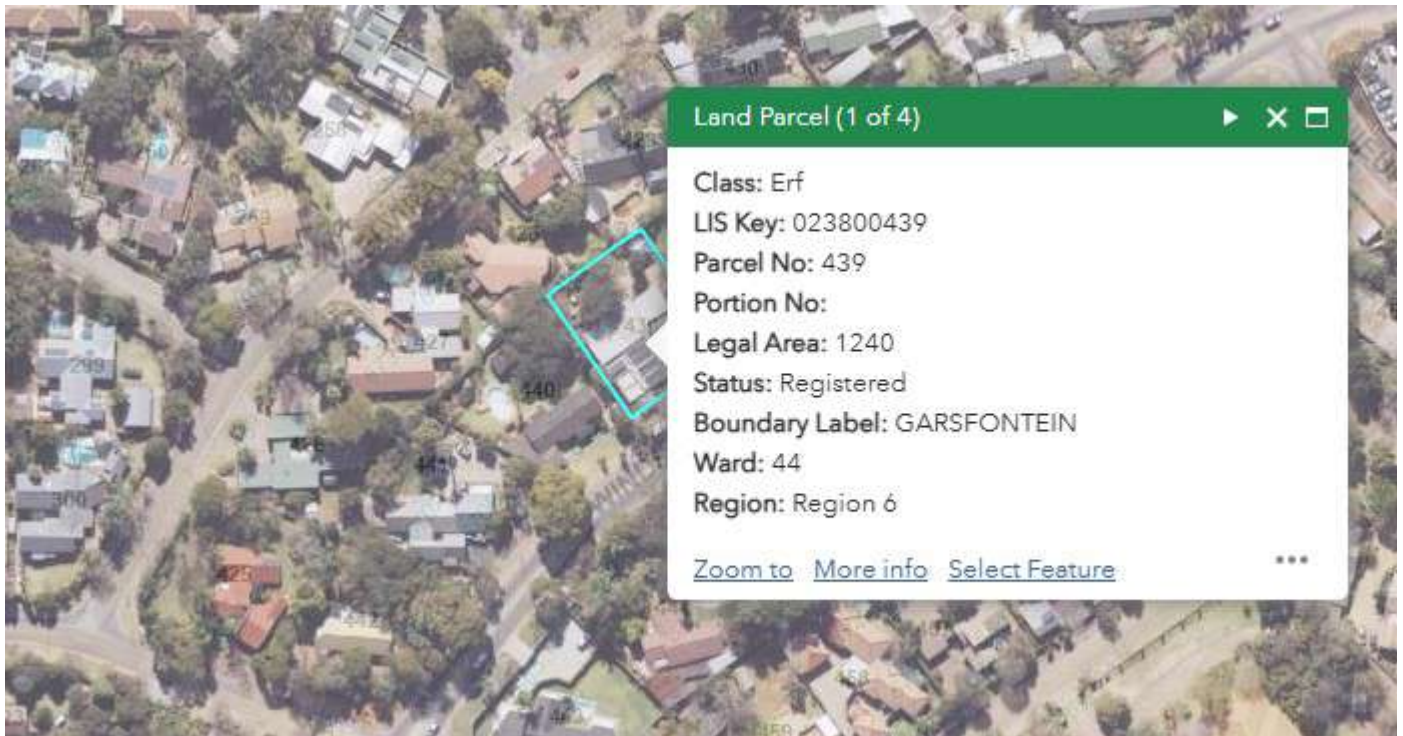
From: Dane Botha <dane@tph.co.za>
Sent: Tuesday, 14 April 2026 09:42
To: 'Ben M. Seete' <BenS@TSHWANE.GOV.ZA>
Subject: Pre-Consultation: Erf 439 Garsfontein - R&S

Dear Ben,

Application will be made in terms of Section 16(1) of the City of Tshwane Land Use Management By-Law, 2016 (Amended 2024) for the rezoning of **Erf 439 Garsfontein** from "Residential 1" to "Business 4" including "Retail Industry".

The existing building is used as a printing facility.

The intention of the application is to formalise the existing land use on the property. The proposed zoning is "Business 4" with 80% Coverage and 1.0 FAR. The Coverage and FAR will be reduced with the Site Plan and formal application.



Please provide us with your departmental 'pre-consultation' comments in this regard.

Kind regards,

Dané Botha

The Town Planning Hub CC

Tel: (012) 809 2229

Website: www.tph.co.za

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PROOF OF ENGAGEMENT WITH MUNICIPAL ENGINEERING SERVICES DEPARTMENTS RESPONSIBLE FOR THE PROVISION OF MUNICIPAL INFRASTRUCTURE SERVICES ON THE AVAILABILITY OF ENGINEERING SERVICES AS CONTEMPLATED IN SECTION 16(1)(l)(iii)(aa) OF THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024).

Such proof may be in such format as the respective engineering services departments may determine, however in the absence thereof the following can be used as a guideline.

APPLICANTS INFORMATION

Name	The Town Planning Hub CC
Address	Lombardy Corporate Park, 1 Cole Road, Shere AH
Contact Number	012 809 2229
E-Mail Address	dane@tph.co.za

PROPERTY DESCRIPTION:

Suburb / Farm Name	Garsfontein
Erf / Portion number	439
Erf / Erven Sizes	1 240m ²

EXISTING ZONING:

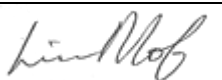
Existing Zoning	Residential 1
Land Use Rights	Dwelling House
Height	10 meters
Coverage	50%
FAR	N/A
Parking requirements	As per Scheme

EXISTING CONSENT USES / PERMISSIONS:

N/A

DETAILS OF THE PROPOSED APPLICATION:

Application Type	Rezoning application
Proposed Land Use	Business 4 including Retail Industry
Other: FAR/AREA	Height = 10 meters Coverage = 80% FAR = 1.0

DEPARTMENT / DIVISION/SECTION/NAME	Water and Sanitation	
DATE OF ENGAGEMENT	This Division will support this application. Development charges will be payable	
COMMENTS FROM THE DEPARTMENT		
NAME OF THE ENGINEERING TECHNICIAN	Cinthia Mofokeng	
SIGNATURE		

Beverley Oosthuizen

From: Johans Janse van Rensburg <JohansvR@TSHWANE.GOV.ZA>
Sent: 19 June, 2026 9:23 AM
To: Beverley Oosthuizen
Subject: RE: Pre-consultation (Erf 439, Garsfontein)

Good day,

For: **Proof of Engagement Form [COT F33]**.

Transport Infrastructure Planning requires that a hard copy services report must be submitted to this Section after the application was submitted at, and NAPS number received from Economic Development and Spatial Planning.

The report must be compiled by a professional civil engineer and must include all the information as required in the document entitled: "Roads and Transport – content requirements for service reports", available from the Department, and must address the following:

- (a) Stormwater master planning, if applicable;
- (b) The outcome of an accepted stormwater assessment;

I trust you will find the above in order. You are welcome to contact me should you require any further information.

Regards,



Johans Janse van Rensburg
Regional Land Use Assessment

Roads and Transport | Room CD 02 8 | 2nd Floor | C De Wet Building | 175 Es'kia Mphahlele Drive
| PO Box 440 | Pretoria | 0001 | www.tshwane.gov.za | Fraud Hotline: 080 874 9263

Tel: 012 358 8079 | Cell: 082 775 6465 | Fax: 012 358 7999 | Email: johansvr@tshwane.gov.za

From: Beverley Oosthuizen <tph@tph.co.za>
Sent: Friday, June 19, 2026 8:36 AM
To: Johans Janse van Rensburg <JohansvR@TSHWANE.GOV.ZA>
Subject: Pre-consultation (Erf 439, Garsfontein)
Importance: High

Morning Johans

Hope you well.

With reference to the aforementioned property. Attached please see the following documentation in order for your department to supply comments in compliance with the pre-consultation process for the proposed rezoning.

- Proposed Site Plan
- Completed F/33 form

Should you require any additional information please let me know.

Look forward to hearing from you.

Beverley Oosthuizen

The Town Planning Hub CC

Tel: (012) 809 2229

Website: www.tph.co.za

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PROOF OF ENGAGEMENT WITH MUNICIPAL ENGINEERING SERVICES DEPARTMENTS RESPONSIBLE FOR THE PROVISION OF MUNICIPAL INFRASTRUCTURE SERVICES ON THE AVAILABILITY OF ENGINEERING SERVICES AS CONTEMPLATED IN SECTION 16(1)(l)(iii)(aa) OF THE CITY OF TSHWANE LAND USE MANAGEMENT BY-LAW, 2016 (AMENDED 2024).

Such proof may be in such format as the respective engineering services departments may determine, however in the absence thereof the following can be used as a guideline.

APPLICANTS INFORMATION

Name	The Town Planning Hub CC
Address	Lombardy Corporate Park, 1 Cole Road, Shere AH
Contact Number	012 809 2229
E-Mail Address	dane@tph.co.za

PROPERTY DESCRIPTION:

Suburb / Farm Name	Garsfontein
Erf / Portion number	439
Erf / Erven Sizes	1 240m ²

EXISTING ZONING:

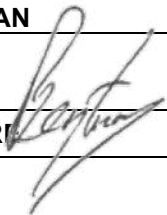
Existing Zoning	Residential 1
Land Use Rights	Dwelling House
Height	10 meters
Coverage	50%
FAR	N/A
Parking requirements	As per Scheme

EXISTING CONSENT USES / PERMISSIONS:

N/A

DETAILS OF THE PROPOSED APPLICATION:

Application Type	Rezoning application
Proposed Land Use	Business 4 including Retail Industry
Other: FAR/AREA	Height = 10 meters Coverage = 80% FAR = 1.0

DEPARTMENT / DIVISION/SECTION/NAME	ENERGY & ELECTRICITY	
DATE OF ENGAGEMENT	21/04/2026	
COMMENTS FROM THE DEPARTMENT	In order, application will be supported.	
NAME OF THE ENGINEERING TECHNICIAN	R. BREYTENBACH	
	21/04/2026	
	DATE	

CITY OF TSHWANE

REZONING APPLICATION ON ERF 439

GARSFONTEIN

SERVICES PROVISION DETAILS REPORT

(PART 2)

FOR

ROADS AND STORMWATER

Item No.:

-

Rev00

August

2026



DOCUMENT CONTROL PAGE

<u>DOCUMENT PREPARED BY:</u>	
Name of Company	LERAS Consulting Engineers (Pty) Ltd
Contact Person	Stefan Henning
Contact No.	082 567 3091
E-mail	admin@lerasconsulting.co.za

<u>CLIENT:</u>	
Name of Entity	Multi Print Printers
Contact Person	Patrick Vergne
Contact No.	082 440 6137
E-mail	patrick@multiprintdigital.co.za

<u>APPLICANT:</u>	
Name of Entity	The Town Planning Hub cc
Contact Person	Bea Fletcher
Contact No.	082 807 2030
E-mail	bea@tph.co.za

<u>FOR SUBMISSION TO:</u>	
Local Authority	City of Tshwane (Roads and Transport Department)
Contact Person	Johans Janse van Rensburg
Contact No.	012 358 8079 / 082 775 6465
Address	Roads and Transport Department Room Cd 02 8, 2nd Floor C de Wet Building 175 Es'kia Mphahlele Drive PRETORIA 0001
E-mail	johansvr@tshwane.gov.za

<u>REVISIONS</u>				
Revision No.	Date	Revision Details / Status	Prepared by:	Reviewed / Approved by:
00	18/08/2026	Report to be Circulated to relevant Authorities	S. Henning	S. Henning

<u>APPROVAL</u>			
Author Name	Author Signature	Approver Name	Approver Signature
S. Henning	 18 August 2026	S. Henning	 18 August 2026

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1. INTRODUCTION

LERAS Consulting Engineers (Pty) Ltd was appointed by Mr. Patrick Vergne of Multi Print Printers for the compilation of a Services Provision Details Report (Part 2) for Roads and Stormwater for the Rezoning Application on Erf 439 Garsfontein, City of Tshwane.

For the purpose of this report, we will refer to the Rezoning Application on Erf 439 Garsfontein, as the Proposed Development.

2. PROFESSIONAL TEAM

The members of the professional team are as follows:

<u>Description</u>	<u>Name of Entity</u>	<u>Contact Person (s)</u>
Client	Multi Print Printers	Patrick Vergne
Applicant	The Town Planning Hub cc	Bea Fletcher
Town Planner		
Civil Engineer	LERAS Consulting Engineers (Pty) Ltd	Stefan Henning

3. LOCATION OF THE PROPOSED DEVELOPMENT AND FLOOD LINES

The Proposed Development is located on Erf 439 Garsfontein within the City of Tshwane.

The Proposed Development is bounded by Erf 438 Garsfontein to the north-east. The south-eastern boundary of the Proposed Development is formed by Windsor Road, the south-western boundary by Erf 440 Garsfontein and the north-western boundary by Erven 428 & 429 Garsfontein.

The Proposed Development will, to the best of our knowledge, not be affected by any 1:50- and 1:100-year flood lines.

Refer to Annexure A, Drawing No. 1054/100/01/00 for a locality plan.

4. LAND USES

4.1 Existing Land Use

The existing land use for the Proposed Development is summarized in Table 4.1.1.

Table 4.1.1: Existing Land Use

<u>Erf No.</u>	<u>Existing Zoning</u>	<u>Erf Size (m²)</u>	<u>Existing Coverage / FAR</u>	<u>Existing Floor Area (m²)</u>	<u>Existing No. of Units</u>
439	Residential 1	1 240.00	- / -	-	1.00

4.2 Proposed Land Uses

The proposed land use for the Proposed Development is summarized in Table 4.2.1.

Table 4.2.1: Proposed Land Use

<u>Erf No.</u>	<u>Proposed Zoning</u>		<u>Erf Size (m²)</u>	<u>Proposed Coverage / FAR</u>	<u>Proposed Floor Area (m²)</u>	<u>Proposed Floor Area Split (m²)</u>
439	Business 4 (Office and Retail Industry)	Office Space	1 240.00	60% / 0.36	446.40	144.00
		Light Industry				246.00
		Retail Industry				41.00

Refer to Annexure B for the proposed 'Annexure L'.

Refer to Annexure C for the preliminary Site Development Plan.

5. GEOTECHNICAL REPORT

5.1 General

A Geotechnical Report is not available for the Proposed Development at this stage.

6. TRAFFIC ASPECTS

6.1 Trip Generation

The peak hour trip generation and the trip generation adjustment factors for the Proposed Development are derived using Table 3.3 from the COTO TMH 17 Volume 1 – South African Trip Data Manual.

The traffic parameters applicable to the Existing and Proposed Development are shown in Tables 6.1.1 and 6.1.2 below.

Table 6.1.1: Peak Hour Trip Generation for the Existing Land Use

Code	Existing Land Use	No. of Units	Trip Generation Rate		Directional Split (in out)		Existing Trips Generated			
			AM	PM	AM	PM	AM		PM	
							In	Out	In	Out
210	Single Dwelling Units	1.00	1.00	1.00	25:75	70:30	1.00	1.00	1.00	1.00
Total							2.00		2.00	

Table 6.1.2: Peak Hour Trip Generation for the Proposed Development

Code	Proposed Land Use	Floor Area (m²)	Trip Generation Rate		Directional Split (in: out)		New Trips Generated			
			AM / Saturday	PM / Sunday	AM	PM	AM		PM	
							In	Out	In	Out
816	Office	144.00	2.10	2.10	85:15	20:80	3.00	1.00	1.00	3.00
110	Service Industry	287.00	0.90	0.90	75:25	25:75	2.00	1.00	1.00	2.00
Total							7.00		7.00	

The Proposed Development will generate approximately 14.00 additional peak hour single directional trips.

According to Table 6.1.3 below as depicted in the Manual for Traffic Impact Studies (RR 93/635) published by the Department of Transport dated 1995, if less than 50 peak hour single direction trips are generated, no Traffic Impact Study nor Traffic Impact Statement will be required for the Proposed Development.

We are therefore of the opinion that no Traffic Impact Study or Traffic Impact Statement is required for the Proposed Development.

Table 6.1.3: Threshold value for a Traffic Impact Study / Statement

<u>Recommended Threshold</u>	
(i)	More than 150 peak hour trips (a) - prepare a Traffic Impact Study
(ii)	Less than 150 and more than 50 peak hour trips - prepare a Traffic Impact Statement
(iii)	<u>Less than 50 peak hour trips - no study required</u> Discretion of the responsible authority (b)
(a)	<i>Refers to peak direction “trip-ends” which includes primary and pass-by trips</i>
(b)	<i>Based on the discretion of the responsible local authority, a Traffic Impact Study or Statement may be required e.g. if the development is located in a sensitive area, even though less than 50 peak hour trips are generated. Alternatively, only a Traffic Impact Statement may be required although the development generates more than 150 trips, but is for example located in an insensitive area</i>

7. CIVIL ENGINEERING SERVICES

7.1 Design Standards

The design standards to be followed for the design of the infrastructure will be based on the Standard construction details and design standards for roads and stormwater drainage infrastructure”, latest edition, as well as the “Standard Specification for Municipal Civil Engineering Works”, 3rd Edition, 2005.

7.2 Design Software

The relevant civil engineering services will be designed by using a combination of AutoCAD Civil3D and iDAS design software programs.

7.3 Ownership of Services

The City of Tshwane will take over and be responsible for the maintenance of all the external civil engineering services.

The owner of the Proposed Development and / or his successor in title will take over and be responsible for the maintenance of the internal civil engineering services.

8. ROADS

8.1 General

The Proposed Development is bounded by Windsor Road to the south-east. According to the latest CoT Roads Master Plan of the area, Windsor Road is currently classified as a Class U4_a Non-residential Collector Road.

Refer to Annexure D, Drawing No. 1054/400/01/00 for details.

Refer to Annexure E for details.

8.2 Access to the Proposed Development

Access to the Proposed Development is currently gained directly from Windsor Road via an existing paved access way.

It is proposed that the existing access way be utilized as is for the Proposed Development. Should it be found that this existing access way does not comply with the relevant CoT design standards and specifications, it will have to be upgraded accordingly.

Refer to Annexure D, Drawing No. 1054/400/01/00 for details.

Refer to Annexure E for details.

8.3 Classification of Roads

The classification of the roads is shown in Table 8.3.1 below.

Table 8.3.1: Classification of Roads

<u>Description</u>	<u>Class No.</u>	<u>Function</u>
Windsor Road	Class U4_a	Non-residential Collector
Access Road	U5_d	Access Way

8.4 Geometric Design Standards

Details of the proposed road class are shown in Table 8.4.1 below.

Table 8.4.1: Class U5_d – Access Way

<u>Design speed</u>	40km/h
<u>Minimum centre line radii</u>	45m
<u>Minimum gradient</u>	0,67%
<u>Favoured maximum gradient</u>	12%
<u>Maximum grade/grade length</u>	16% over 50m
<u>Minimum K-value: Crest</u>	2
<u>Minimum K-value: Sag</u>	4

8.5 Pavement Design

The proposed pavement design will be based on anticipated traffic volumes and the in-situ material. The design life of the proposed pavement is 20 years provided that the pavement will be maintained to sustain its skid resistance and permeability during the design life of the pavement.

The pavement design proposed is shown in Table 8.5.1 below, should it be required.

Table 8.5.1: Pavement Design of Proposed Access Way

Wearing Course	80mm paving blocks.
Sub-base	150mm thick stabilized natural gravel compacted to 95% of modified AASHTO density. Minimum UCS = 1 200kPa at 95% of modified AASHTO density – C4
Base	150mm thick natural gravel compacted to 95% of modified AASHTO density. Minimum CBR = 25 at 95% of modified AASHTO density. Treated with PERMA-ZYME 11X – G6 (in-situ or imported)
Fill (where required)	150mm thick layers compacted to 93% of modified AASHTO density. Minimum CBR = 7 at 93% of modified AASHTO density – G9

9. STORMWATER DRAINAGE

9.1 General

The natural drainage pattern of the Proposed Development is from the south-west to the north-east.

9.2 Existing Stormwater Infrastructure

An existing 450mmØ stormwater pipe is located parallel to and on the north-eastern side of Windsor Road, ±82m east of the Proposed Development.

An existing 450mmØ stormwater pipe is located at the intersection between Elvira Road and Cicely Road, ±160m north-west of the Proposed Development.

Refer to Annexure D, Drawing No. 1054/500/01/00 for details.

Refer to Annexure F for details.

9.3 Estimated Stormwater Run-off

It should be noted that the Proposed Development has already been developed (Res 1) which changed the stormwater run-off characteristic from pre-development run-off conditions to post-development run-off conditions.

For the purposes of this report, three (3) scenario run-off calculations will be analysed and discussed. These scenarios are as follow:

- i. Pre-Development Run-off Calculations for the Proposed Development
- ii. Current-Development Run-off Calculations for the Proposed Development
- iii. Post-Development Run-off Calculations for the Proposed Development

The anticipated stormwater run-off calculation results for each of the above-mentioned scenarios for the Proposed Development are shown in Tables 9.3.1 to 9.3.3 below.

Table 9.3.1: Scenario i: Estimated Stormwater Run-off for the Pre-Development conditions of the Proposed Development

<u>Flood Return Period (Years)</u>	<u>Pre-Development Factor</u>	<u>Pre-Development run-off (m³/s)</u>
<u>1:2</u>	0.199	0.006
<u>1:5</u>	0.219	0.010
<u>1:20</u>	0.267	0.017

Table 9.3.2: Scenario ii: Estimated Stormwater Run-off for the Current-Development conditions of the Proposed Development

<u>Flood Return Period (Years)</u>	<u>Current-Development Factor</u>	<u>Current-Development run-off (m³/s)</u>
<u>1:2</u>	0.757	0.032
<u>1:5</u>	0.757	0.044
<u>1:20</u>	0.757	0.063

Table 9.3.3: Scenario iii: Estimated Stormwater Run-off for the Post-Development conditions of the Proposed Development

<u>Flood Return Period (Years)</u>	<u>Post-Development Factor</u>	<u>Post-Development run-off (m³/s)</u>
<u>1:2</u>	0.800	0.034
<u>1:5</u>	0.800	0.046
<u>1:20</u>	0.800	0.066

Refer to Annexure G for the relevant Stormwater Run-off Calculations.

9.4 Hydrology

9.4.1 General

The hydrological data to be used in the design of the stormwater drainage system for Section 2 of the Proposed Development is summarised in Tables 9.4.2.1 to 9.4.4.1 below.

9.4.2 Pre-Development Hydrologic Data

Hydrological data used in the calculation of the flood peaks are summarized in Table 9.4.2.1 below.

Table 9.4.2.1: Hydrological Data

Hydrological Data	
Flood return period	1:5 years for stormwater pipe systems
	1:20 years for the combined stormwater pipe and road systems
Average yearly rainfall	±750mm
Area Dolomite	0%
Drainage Area	Total Catchment Area
Time of concentration	±9.408min
Point rainfall (1:2 years)	±14.77mm
Point rainfall (1:5 years)	±20.37mm
Point rainfall (1:20 years)	±29.11mm
Design method	Rational method for smaller catchment areas
<i>Minimum time of concentration and run-off co-efficient according to: Tshwane Council requirements and Design Manual</i>	

9.4.3 Current-Development Hydrologic Data

Hydrological data used in the calculation of the flood peaks are summarized in Table 9.4.3.1 below.

Table 9.4.3.1: Hydrological Data

<u>Hydrological Data</u>	
Flood return period	1:5 years for stormwater pipe systems
	1:20 years for the combined stormwater pipe and road systems
Average yearly rainfall	±750mm
Area Dolomite	0%
Drainage Area	Total Catchment Area
Time of concentration	±2.65min (minimum of 5.0min was used)
Point rainfall (1:2 years)	±10.16mm
Point rainfall (1:5 years)	±14.02mm
Point rainfall (1:20 years)	±20.03mm
Design method	Rational method for smaller catchment areas
<i>Minimum time of concentration and run-off co-efficient according to: Tshwane Council requirements and Design Manual</i>	

9.4.4 Post-Development Hydrologic Data

Hydrological data used in the calculation of the flood peaks are summarized in Table 9.4.4.1 below.

Table 9.4.4.1: Hydrological Data

Hydrological Data	
Flood return period	1:5 years for stormwater pipe systems
	1:20 years for the combined stormwater pipe and road systems
Average yearly rainfall	±750mm
Area Dolomite	0%
Drainage Area	Total Drainage Area
Time of concentration	±2.65min (minimum of 5.0min was used)
Point rainfall (1:2 years)	±10.16mm
Point rainfall (1:5 years)	±14.02mm
Point rainfall (1:20 years)	±20.03mm
Design method	Rational method for smaller catchment areas
<i>Minimum time of concentration and run-off co-efficient according to: Tshwane Council requirements and Design Manual</i>	

9.4.5 Design Standards

Table 9.4.5.1 lists the standards to be used in the design of the stormwater drainage system.

Table 9.4.5.1: Stormwater Design Standards

Design Element	Specification
Minimum pipe size	Minimum of 450mm diameter
Pipe Type	Interlocking Joint Pipes. Pipe class will be specified according to, CoT Standard Details and Requirements, PLN003
Minimum pipe gradient	0.67%
Stormwater details	In accordance with the latest edition of the Standard Construction Details and Design Standards for Roads and Stormwater Drainage Infrastructure as well as the Standard Specification for Municipal Civil Engineering Works, 3rd Edition, 2005

9.4.6 Anticipated Additional Stormwater run-off to be generated by the Proposed Development

The anticipated additional stormwater run-off which will be generated by the Proposed Development is shown in Table 9.4.6.1 below.

Table 9.4.6.1: Anticipated Additional Stormwater Run-off to be generated

<u>Description</u>	<u>Run-off (m³/s)</u>
Scenario iii (1:20 Year Post-Development conditions)	0.066
Scenario i (1:20 Year Pre-Development conditions)	0.017
Anticipated Additional Stormwater Run-off	0.049

It is clear from Table 9.4.6.1 above that $\pm 0.049 \text{ m}^3/\text{s}$ of additional stormwater will be generated by the Proposed Development due to the increase in impermeable areas throughout.

Refer to Annexure G for the relevant Stormwater Run-off Calculations.

9.5 Proposed Stormwater Management

9.5.1 General

The Stormwater Master Plan for the area was received from Mr. Pieter Odendaal of the Integrated Stormwater Planning Department of CoT on 27 July 2026.

Refer to Annexure F for details.

9.5.2 Proposed Internal Stormwater Infrastructure

9.5.2.1. General

The natural topography of the area does not make it possible for the Proposed Development to connect to the existing municipal stormwater infrastructure located parallel to and on the north-eastern side of Windsor Road. It is therefore proposed that Sustainable Urban Drainage Solutions (SuDS) be implemented for the Proposed Development, by means of Rainwater Harvesting.

The Alternative Technology for Storm Water Management: The South African Guidelines for Sustainable Drainage Systems (WRC Report No. TT 558/13, May 2013) was used for the design specification of the proposed Rainwater Harvesting Tanks.

9.5.2.2. Proposed Rainwater Harvesting Tanks

Several rainwater harvesting tanks are proposed for the Proposed Development as part of the stormwater management measures.

Further to this, it is proposed that new gutters be installed for all the roof areas (new and existing) within the Proposed Development. These proposed gutters should be sloped in such a way that the run-off generated by the roof areas can be discharged through downpipes into the strategically placed rainwater harvesting tanks.

These proposed rainwater harvesting tanks will be designed to accommodate two (2) consecutive post-development 1:20 year flood return period storms as per the standards and specification of the City of Tshwane Municipality. A 25mm Ø outlet will be installed for each of the proposed rainwater harvesting tanks to discharge the stormwater run-off at a controlled rate. A 90° bend facing upwards will be installed at these outlets to act as energy dissipaters and mitigate possible erosion.

An emergency overflow will also be installed at the top of each of the rainwater harvesting tanks should a storm larger than two (2) consecutive post-development 1:20 year flood return period occurs. Down pipes will be installed from the top of the outlets up to the bottom of the tank where a 90° bend facing upwards will be installed to act as energy dissipaters and mitigate possible erosion.

Grids / sieves will be installed on all the gutter downpipes discharging into the proposed rainwater harvesting tanks to prevent any unwanted debris from entering the tank and possibly restricting the inflow and outflow of the stormwater run-off.

Furthermore, it is proposed that sufficient weep holes be introduced along the north-western and north-eastern boundaries of the Proposed Development, should a storm event larger than the anticipated 1:20 year post-development flood return period occur.

The proposed internal stormwater reticulation for the Proposed Development was designed for a post-development 1:20-year flood return period and an average run-off coefficient of 80.00% ($C = 0.800$) was allowed.

Refer to Annexure D, Drawing No. 1054/500/01/00 and 1054/520/02/00 for details.

9.5.2.3. Rainwater Harvesting Tank Design

The details of the Rainwater Harvesting tanks are shown in Table 9.5.2.3.1 below.

Table 9.5.2.3.1: Rainwater Harvesting Tank Details

<u>Rainwater Harvesting Tank Type</u>		<u>Cumulative Roof Area (m²)</u>	<u>*Stormwater Run- Off Volume (m³)</u>	<u>Required Rainwater Harvesting Tank (ℓ)</u>
<u>JoJo Tank or Similar approved</u>	Roof Area No.01	66.912	1.025	2 400ℓ
	Roof Area No.02	36.103	0.553	1 500ℓ
	Roof Area No.03	35.218	0.540	1 500ℓ
	Roof Area No.04	91.963	1.409	3 000ℓ
	Roof Area No.05	60.912	0.933	2 000ℓ
	Roof Area No.06	109.904	1.684	4 750ℓ
	Roof Area No.07	23.000	0.352	750ℓ
	Roof Area No.08	23.000	0.352	750ℓ
Total		447.001	6.848	16 650ℓ

** The rainwater harvesting tanks were designed to accommodate two (2) consecutive post-development 1:20 year flood return-period storms as per the standards and specification of the City of Tshwane Municipality.*

The Alternative Technology for Storm Water Management: The South African Guidelines for Sustainable Drainage Systems (WRC Report No. TT 558/13, May 2013) was used for the roof run-off calculations.

Refer to Annexure H for details.

9.5.2.4. Rainwater Harvesting Tank Outflow

The calculated outflow rates from the proposed rainwater harvesting tanks are as shown in Table 9.5.2.4.1 below.

Table 9.5.2.4.1: Rainwater Harvesting Tank Outflow Rate

<u>Description</u>	<u>Calculated Stormwater Run-off Outflow Rate (m³/s)</u>
Rainwater Harvesting Tank Position 1	0.0011
Rainwater Harvesting Tank Position 2	0.0007
Rainwater Harvesting Tank Position 3	0.0012
Rainwater Harvesting Tank Position 4	0.0010
Rainwater Harvesting Tank Position 5	0.0011
Rainwater Harvesting Tank Position 6	0.0006
Total Stormwater Run-off Outflow	0.0057

In Table 9.4.6.1 above, it was indicated that the additional stormwater to be generated by the Proposed Development is 0.049m³/s. Based on the calculated outflow rates of the proposed rainwater harvesting tanks, it can be seen that the stormwater discharged from the proposed rainwater harvesting tanks is less than the additional stormwater run-off that will be generated by the Proposed Development.

Refer to Annexure I for details.

9.5.2.5. Maintenance

The following maintenance will have to be performed to prevent blockages of the proposed rainwater harvesting tanks and weep holes:

- The proposed gutters and downpipes must be kept clean of debris
- Sediment must be removed from inside of the rainwater harvesting storage tanks
- The sieves at the inlets of the rainwater harvesting storage tanks will need to be cleaned weekly
- Rainwater harvesting storage tanks need to be flushed / emptied
- Clean weep holes weekly

Refer to Annexure J for the Signed Maintenance Schedule.

Refer to Annexure K for the Signed Acceptance Letter.

9.5.3 Proposed External Stormwater Infrastructure

We are of the opinion that no external stormwater infrastructure is required for the Proposed Development.

Refer to Annexure D, Drawing No. 1054/500/01/00 and 1054/520/02/00 for details.

9.5.4 Stormwater Master Plan Infrastructure

We are of the opinion that no Stormwater Master Plan infrastructure is required for the Proposed Development.

Refer to Annexure D, Drawing No. 1054/500/01/00 and 1054/520/02/00 for details.

Refer to Annexure F for details.

9.5.5 Boundary Road Stormwater

We are of the opinion that no boundary road stormwater infrastructure is required for the Proposed Development.

Refer to Annexure D, Drawing No. 1054/500/01/00 and 1054/520/02/00 for details.

9.5.6 Stormwater from Higher Lying Properties

We are of the opinion that no stormwater infrastructure for higher lying areas is required for the Proposed Development.

Refer to Annexure D, Drawing No. 1054/500/01/00 and 1054/520/02/00 for details.

10.DEVELOPMENT CHARGES

The Development Charges for the roads and stormwater engineering services payable to the City of Tshwane will be determined with the compilation of the services agreements. The estimated Development Charges are shown in Table 10.1 below.

Table 10.1: Estimated Development Charges

<u>Description</u>	<u>Amount (R) (VAT Included)</u>
Roads	R42 341.50
Stormwater	R0.00
<u>Total</u>	R42 341.50

11. COST ESTIMATES

11.1 Roads and Stormwater

The cost estimates for the construction of the proposed roads- and stormwater infrastructure are shown in Tables 11.1.1 to 11.1.5 below. All tariffs listed below include Preliminary and General costs, Professional Fees and VAT.

Table 11.1.1: Total Services Provision Cost (Table 1)

1. TOTAL SERVICE PROVISION COST			
Description	Size and length	Tariff	COST (incl.)
1.1 ROADS			
1.1.1 Access Road to development ¹	-	R0.00	R0.00
1.1.2 Class 3 roads, or other roads with access restrictions ²	-	R0.00	R0.00
1.1.3 Road upgrading outside development boundary in terms of TIS	-	R0.00	R0.00
1.1.4 Internal roads network ³	-	R0.00	R0.00
1.1.6 Widened new boundary road ⁴	-	R0.00	R0.00
1.1.7 New Walkways	-	R0.00	R0.00
1.2 STORMWATER			
1.2.1 Stormwater connection ⁵	-	R0.00	R0.00
1.2.2 Stormwater system to provide for external (higher lying) stormwater through the development ⁶	-	R0.00	R0.00
1.2.3 Internal stormwater reticulation ⁷	16 650ℓ of Rainwater Harvesting Tanks	R7.50 / ℓ	R124 875.00
	±83m of new Gutters	R175.00 / m	R14 525.00
1.2.4 Drainage of access road ⁸	-	R0.00	R0.00
1.2.5 Drainage of Class 3 roads, or other roads with access restriction ⁸	-	R0.00	R0.00
	-	R0.00	R0.00
1.2.6 Drainage of boundary roads ⁹	-	R0.00	R0.00
1.2.7 Stormwater Master Plan Upgrades	-	R0.00	R0.00
TOTAL SERVICES PROVISION COST			R139 400.00

Table 11.1.2: Internal Services (Developer Cost) (Table 2)

2. INTERNAL SERVICES (Developer cost)			
Description	Size and length	Tariff	COST (incl.)
1.1 ROADS			
1.1.1 Access Road to development ¹	-	R0.00	R0.00
1.1.2 Class 3 roads, or other roads with access restrictions ²	-	R0.00	R0.00
1.1.3 Road upgrading outside development boundary in terms of TIS	-	R0.00	R0.00
1.1.4 Internal roads network ³	-	R0.00	R0.00
1.1.6 Widened new boundary road ⁴	-	R0.00	R0.00
1.1.7 New Walkways	-	R0.00	R0.00
1.2 STORMWATER			
1.2.1 Stormwater connection ⁵	-	R0.00	R0.00
1.2.2 Stormwater system to provide for external (higher lying) stormwater through the development ⁶	-	R0.00	R0.00
1.2.3 Internal stormwater reticulation ⁷	16 650ℓ of Rainwater Harvesting Tanks	R7.50 / ℓ	R124 875.00
	±83m of new Gutters	R175.00 / m	R14 525.00
1.2.4 Drainage of access road ⁸	-	R0.00	R0.00
1.2.5 Drainage of Class 3 roads, or other roads with access restriction ⁸	-	R0.00	R0.00
	-	R0.00	R0.00
1.2.6 Drainage of boundary roads ⁹	-	R0.00	R0.00
1.2.7 Stormwater Master Plan Upgrades	-	R0.00	R0.00
TOTAL INTERNAL SERVICES			R139 400.00

Table 11.1.3: External Services (CoT Cost) (Table 3)

3. EXTERNAL SERVICES (CoT cost)			
Description	Size and length	Tariff	COST (incl.)
1.1 ROADS			
1.1.1 Access Road to development ¹	-	R0.00	R0.00
1.1.2 Class 3 roads, or other roads with access restrictions ²	-	R0.00	R0.00
1.1.3 Road upgrading outside development boundary in terms of TIS	-	R0.00	R0.00
1.1.4 Internal roads network ³	-	R0.00	R0.00
1.1.6 Widened new boundary road ⁴	-	R0.00	R0.00
1.1.7 New Walkways	-	R0.00	R0.00
1.2 STORMWATER			
1.2.1 Stormwater connection ⁵	-	R0.00	R0.00
1.2.2 Stormwater system to provide for external (higher lying) stormwater through the development ⁶	-	R0.00	R0.00
1.2.3 Internal stormwater reticulation ⁷	-	R0.00	R0.00
1.2.4 Drainage of access road ⁸	-	R0.00	R0.00
1.2.5 Drainage of Class 3 roads, or other roads with access restriction ⁸	-	R0.00	R0.00
	-	R0.00	R0.00
1.2.6 Drainage of boundary roads ⁹	-	R0.00	R0.00
1.2.7 Stormwater Master Plan Upgrades	-	R0.00	R0.00
TOTAL EXTERNAL SERVICES			R0.00

Table 11.1.4: Boundary Services (Shared Cost) (Table 4)

<u>Description</u>	<u>Size and Length</u>	<u>Tariff (R)</u>	<u>Developer Cost (R) (VAT Included)</u>	<u>CoT Cost (R) (VAT Included)</u>
Existing constructed boundary road contribution	T.B.C.	R2 100.00 / m ²	T.B.C.	T.B.C.
New boundary road	-	R0.00	R0.00	R0.00
New boundary road drainage	-	R0.00	R0.00	R0.00
Boundary Services			T.B.C.	T.B.C.
Total			T.B.C.	

Table 11.1.5: Summary of Costs

<u>Item</u>	<u>Developer Cost (R)</u>	<u>CoT Cost (R)</u>
Internal Services (as per Table 2)	R139 400.00	R0.00
External Services (as per Table 3)	R0.00	R0.00
Boundary Services (as per Table 4)	T.B.C.	T.B.C.
Development Charges	R42 341.50	R0.00
Total	R181 741.50	R0.00

12. CONSTRUCTION PERIOD

The anticipated construction period for the external civil engineering services will be determined once the scope of work is confirmed.

Construction will commence once the services agreements are signed by all affected parties and the construction drawings are approved.

13. CONCLUSION

We trust that the above report meets with your requirements. Please contact us should you require any additional information.

A handwritten signature in black ink, appearing to be "Stefan Henning", written over a horizontal line.

Stefan Henning Pr. Tech. Eng.
for LERAS Consulting Engineers (Pty) Ltd

Date: 18 August 2026

ANNEXURE A : LOCALITY PLAN



NOTES AND SPECIFICATIONS

GENERAL

- 1 ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
- 2 ALL DIMENSIONS ARE IN MILLIMETERS. (UNLESS OTHERWISE SPECIFIED)
- 3 DO NOT SCALE FROM THIS DRAWING.
- 4 ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
- 5 ALL CONSTRUCTION TO BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4, THIRD EDITION 2005 AND THE STANDARD CTMM DETAIL DRAWINGS
- 6 THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE ARCHITECT DRAWINGS, (IF APPLICABLE)
- 7 THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
- 8 THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY MANAGER OF THEROADS & TRANSPORT DEPARTMENT, IN NO WAY REMOVES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT
- 9 THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE ROADS & TRANSPORT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
- 10 FINAL POSITION OF SERVICES TO BE DETERMINED ON SITE.

ROADS:

- 1 KERBING TO BE AS PER STANDARD DETAIL PLANS A AND B AND SECTION 10 OF VOLUME 1 OF CONTRACT DOCUMENT.
- 2 TRAFFIC CONTROL MUST COMPLY WITH THE REQUIREMENTS OF THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL (THIRD EDITION).
- 3 VERTICAL AND HORIZONTAL ALIGNMENT TO FOLLOW THE EXISTING ROAD SURFACE, WITH A MINIMUM CROSS FALL OF 2% (IF APPLICABLE)

STORM WATER:

- 1 MINIMUM PIPE DIAMETER TO BE 450mm.
- 2 MINIMUM FALL TO BE 1:150.
- 3 PIPE BEDDING TO BE CLASS B UNLESS OTHERWISE SPECIFIED.
- 4 ALL EXCAVATIONS AND BEDDING MUST BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE LAYING OF ANY PIPES.
- 5 CLEAN EXISTING STORM WATER INLETS AND REPAIR WHERE NECESSARY (IF APPLICABLE)

LEGEND:

PROPOSED DEVELOPMENT BOUNDARY

PROPOSED DEVELOPMENT

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

DESIGNED
S.S. HENNING

DRAWN
S.S. HENNING

SIGNATURE
S.S. HENNING

DATE: 17/08/2026

DESIGN CHECKED BY
S.S. HENNING

INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT

SIGNATURE
S.S. HENNING

DATE: 17/08/2026

PROJECT STATUS

CONCEPT DRAWING

TENDER DRAWING

APPROVED FOR CONSTRUCTION DRAWING

AS BUILT DRAWING

PROJECT ENGINEER (CONSULTANT)
S.S. HENNING

2023301662

17/08/2026

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

PROJECT ENGINEER (CITY OF TSHWANE)

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

STRUCTURAL ENGINEER (CITY OF TSHWANE)

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

INSPECTOR OF WORKS (CITY OF TSHWANE)

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

CONSULTANT DETAIL

LERAS CONSULTING ENGINEERS (PTY) LTD
PO BOX 1345
HATFIELD
0028

Tel: 082 567 3091
admin@lerasconsulting.co.za

CITY OF TSHWANE
ROADS AND TRANSPORT DEPARTMENT

GROUP HEAD
Mr Letlankane P. (Pheko)
P.O. BOX 1409
PRETORIA
0001

CITY OF TSHWANE

ACTING DIVISIONAL HEAD
Mr Lebepe M.T. (Thabo)
P.O. BOX 1409
PRETORIA
0001

DRAWING APPROVED BY ACTING EXECUTIVE DIRECTOR
Mr Lebepe M.T. (Thabo)

SIGNATURE: _____ DATE: _____

REZONING OF ERF 439
GARSFONTEIN

LOCALITY PLAN

WAYLEAVE NO.: -

CONTRACT No.:
1054

PROJECT No.:
1054

DATE:
17/08/2026

SCALE:
N.T.S.

ORIGINAL PAPER SIZE:
A1

DRAWING NO:
1054-100-01-00

SHEET NO:
1 OF 1

REVISION

ANNEXURE B : ‘ANNEXURE L’

**ANNEXURE L
OF THE TSHWANE LAND USE SCHEME, 2024**

NOT YET PROMULGATED

PROPERTY DESCRIPTION: ERF 439 GARSFONTEIN

1	Use Zone number	9
2	Use Zone	BUSINESS 4
3	Uses permitted	Office and Retail Industry
4	Uses with Consent Use	Table B, Column (4), all other uses excluded from Column (3)
5	Uses not permitted	Table B, Column (5)
6	Definitions	Retail Industry: For the purposes of this Scheme, Retail Industry means land and buildings used for the retail sale of consumer services, limited to instant printing and copying, and may include a workshop ancillary to the primary retail use, for the processing and finishing of printed material, including but not limited to laminating, binding, folding, trimming, guillotining, mounting, packaging, vinyl application and similar finishing processes associated with the retail printing service. Other: Clause 5
7	Density	N/A
8	Floor Area Ratio	Clause 25 – 0.36
9	Height	Clause 26 – 10 meters
10	Coverage	Clause 27 – 60%
11	Parking requirements	Clause 28, Table G Instant printing and copying: 4 parking spaces per 100m ² of the Net Floor Area Workshop: 1 parking space per 100m ² of the Net Floor Area
12	Street Building Lines	Clause 9
13	Side Building Lines and Rear Building Lines	Clause 12, Table A
14	Children's playground	Clause 14(11)
15	Paving of traffic areas	Clause 28(6)
16	Access to the Property	Clause 7(1)

SIGNED BY

DATE

**ANNEXURE L
OF THE TSHWANE LAND USE SCHEME, 2024**

NOT YET PROMULGATED

PROPERTY DESCRIPTION: ERF 439 GARSFONTEIN

17	Loading and off-loading facilities	Clause 29, Table H
18	Physical Barrier and screen wall	Clause 18(3)
19	Health measures	Clause 18(7)
20	Outdoor advertising	Clause 30(2)
21	Site Development Plan and Landscape Development Plan	Clause 31
22	Geological conditions	Clause 19(2)
23	Open Space	Not applicable
24	General conditions: (1) In addition to the above conditions, the Property and Buildings thereon are further subject to the general provisions of the Tshwane Land Use Scheme, 2024.	

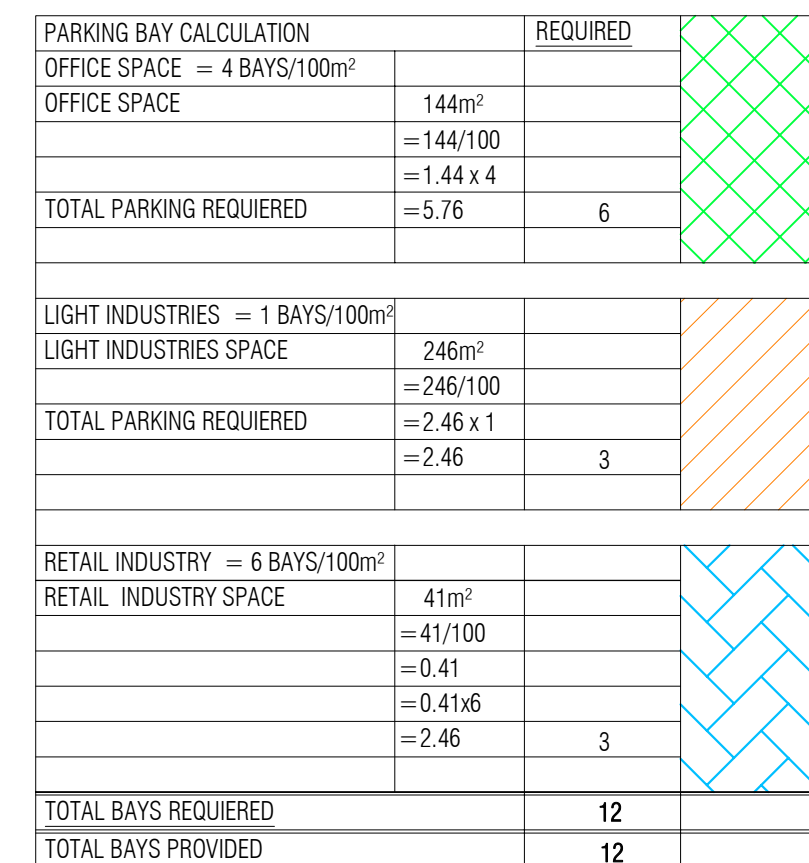
SIGNED BY

DATE

ANNEXURE C: PRELIMINARY SITE DEVELOPMENT PLAN



678 WINDSOR ROAD



G ARCH 3D DESIGNS Ltd.Pty		
PROFFESIONAL ARCHITECTURAL DRAFTSMAN:	GORDON VISAGIE 0798857230	



DRG no:	2026.06.09 - 1031 1 OF 1	REV 2
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ANNEXURE D: ENGINEERING LAYOUT DRAWINGS



NOTES AND SPECIFICATIONS

GENERAL

1 ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.

2 ALL DIMENSIONS ARE IN MILLIMETERS. (UNLESS OTHERWISE SPECIFIED)

3 DO NOT SCALE FROM THIS DRAWING.

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10 FINAL POSITION OF SERVICES TO BE DETERMINED ON SITE.

ROADS:

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2 TRAFFIC CONTROL MUST COMPLY WITH THE REQUIREMENTS OF THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL (THIRD EDITION).

3 VERTICAL AND HORIZONTAL ALIGNMENT TO FOLLOW THE EXISTING ROAD SURFACE, WITH A MINIMUM CROSS FALL OF 2 % (IF APPLICABLE)

STORM WATER:

1 MINIMUM PIPE DIAMETER TO BE 450mm.

2 MINIMUM FALL TO BE 1:150.

3 PIPE BEDDING TO BE CLASS B UNLESS OTHERWISE SPECIFIED.

4 ALL EXCAVATIONS AND BEDDING MUST BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE LAYING OF ANY PIPES.

5 CLEAN EXISTING STORM WATER INLETS AND REPAIR WHERE NECESSARY, (IF APPLICABLE)

LEGEND:

PROPOSED DEVELOPMENT BOUNDARY

PROPOSED DEVELOPMENT

EXISTING ASPHALT SURFACED ROAD

EXISTING PAVED ACCESS WAY

EXISTING ACCESS WAY

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

DESIGNED
S.S. HENNING

DRAWN
S.S. HENNING

DATE: 17/08/2026

DATE: 17/08/2026

DESIGN CHECKED BY
S.S. HENNING

INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT

DATE: 17/08/2026

DATE: 17/08/2026

PROJECT STATUS

CONCEPT DRAWING

TENDER DRAWINGS

APPROVED FOR CONSTRUCTION DRAWINGS

AS BUILT DRAWINGS

PROJECT ENGINEER (CONSULTANT)

2023301662

17/08/2026

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

PROJECT ENGINEER (CITY OF TSHWANE)

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

STRUCTURAL ENGINEER (CITY OF TSHWANE)

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

INSPECTOR OF WORKS (CITY OF TSHWANE)

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

INITIALS AND SURNAME

SIGNATURE AND P. No.

DATE

CONSULTANT DETAIL

LERAS

CONSULTING ENGINEERS

LERAS CONSULTING ENGINEERS (PTY) LTD

PO BOX 1340

HATFIELD

0028

Tel: 082 567 3091

admin@lerasconsulting.co.za

CITY OF TSHWANE

ROADS AND TRANSPORT DEPARTMENT

GROUP HEAD
Mr Letlorkane P. (Pheko)
P.O. BOX 1409
PRETORIA
0001

ACTING DIVISIONAL HEAD
Mr Lebepe M.T. (Thabo)
P.O. BOX 1409
PRETORIA
0001

DRAWING APPROVED BY ACTING EXECUTIVE DIRECTOR
Mr Lebepe M.T. (Thabo)

SIGNATURE:

DATE:

LOCATION OF PROJECT:

REZONING OF ERF 439
GARSFONTEIN

DESCRIPTION OF PROJECT

ROADS :
GENERAL LAYOUT

WAYLEAVE NO. : -

CONTRACT No. :
1054

PROJECT No. :
1054

DATE :
17/08/2026

SCALE :
1:500

ORIGINAL PAPER SIZE :
A1

DRAWING NO. :
1054-400-01-00

SHEET NO. :
1 OF 1

REVISION



- ### NOTES AND SPECIFICATIONS
- #### GENERAL
- 1 ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
 - 2 ALL DIMENSIONS ARE IN MILLIMETERS. (UNLESS OTHERWISE SPECIFIED)
 - 3 DO NOT SCALE FROM THIS DRAWING.
 - 4 ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
 - 5 ALL CONSTRUCTION TO BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4, THIRD EDITION 2005 AND THE STANDARD CTMM DETAIL DRAWINGS.
 - 6 THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE ARCHITECT DRAWINGS, (IF APPLICABLE)
 - 7 THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4, THIRD EDITION 2005 AND THE STANDARD CTMM DETAIL DRAWINGS.
 - 8 THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY MANAGER OF THEROADS & TRANSPORT DEPARTMENT, IN NO WAY REMOVES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT.
 - 9 THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE ROADS & TRANSPORT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
 - 10 FINAL POSITION OF SERVICES TO BE DETERMINED ON SITE.
- #### ROADS:
- 1 KERBING TO BE AS PER STANDARD DETAIL PLANS A AND B AND SECTION 10 OF VOLUME 1 OF CONTRACT DOCUMENT.
 - 2 TRAFFIC CONTROL MUST COMPLY WITH THE REQUIREMENTS OF THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL (THIRD EDITION).
 - 3 VERTICAL AND HORIZONTAL ALIGNMENT TO FOLLOW THE EXISTING ROAD SURFACE, WITH A MINIMUM CROSS FALL OF 2 % (IF APPLICABLE)
- #### STORM WATER:
- 1 MINIMUM PIPE DIAMETER TO BE 450mm.
 - 2 MINIMUM FALL TO BE 1:150.
 - 3 PIPE BEDDING TO BE CLASS B UNLESS OTHERWISE SPECIFIED.
 - 4 ALL EXCAVATIONS AND BEDDING MUST BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE LAYING OF ANY PIPES.
 - 5 CLEAN EXISTING STORM WATER INLETS AND REPAIR WHERE NECESSARY (IF APPLICABLE)

- #### LEGEND:
- PROPOSED DEVELOPMENT BOUNDARY
 - ROOF FLOW ARROW
 - PROPOSED GUTTER FLOW ARROW
 - SHEET FLOW FLOW ARROW
 - PROPOSED GUTTER / DOWN PIPE
 - PROPOSED OUTFLOW PIPE
 - PROPOSED WEEP HOLE
 - PROPOSED RAINWATER HARVESTING TANK

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

DESIGNED S.S. HENNING	DRAWN S.S. HENNING
SIGNATURE	SIGNATURE
DATE: 17/08/2026	DATE: 17/08/2026
DESIGN CHECKED BY S.S. HENNING	INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT
SIGNATURE	SIGNATURE
DATE: 17/08/2026	DATE: 17/08/2026

PROJECT STATUS			
☒ CONCEPT DRAWING	☐ TENDER DRAWINGS	☐ APPROVED FOR CONSTRUCTION	☐ AS BUILT DRAWING
PROJECT ENGINEER (CONSULTANT)			
S.S. HENNING	2023301662	17/08/2026	
INITIALS AND SURNAME	SIGNATURE AND P. NO.	DATE	
PROJECT ENGINEER (CITY OF TSHWANE)			
INITIALS AND SURNAME	SIGNATURE AND P. NO.	DATE	
STRUCTURAL ENGINEER (CITY OF TSHWANE)			
INITIALS AND SURNAME	SIGNATURE AND P. NO.	DATE	
INSPECTOR OF WORKS (CITY OF TSHWANE)			
INITIALS AND SURNAME	SIGNATURE AND P. NO.	DATE	

CONSULTANT DETAIL



LERAS CONSULTING ENGINEERS (PTY) LTD
PO BOX 1340
HATFIELD
0028

Tel: (082 567 3091)
admin@lerasconsulting.co.za

CITY OF TSHWANE
ROADS AND TRANSPORT DEPARTMENT

GROUP HEAD
Mr Letlankane P. (Pheko)
P.O. BOX 1409
PRETORIA
0001

ACTING DIVISIONAL HEAD
Mr Lebepe M.T. (Thabo)
P.O. BOX 1409
PRETORIA
0001

DRAWING APPROVED BY ACTING EXECUTIVE DIRECTOR
Mr Lebepe M.T. (Thabo)

LOCATION OF PROJECT:

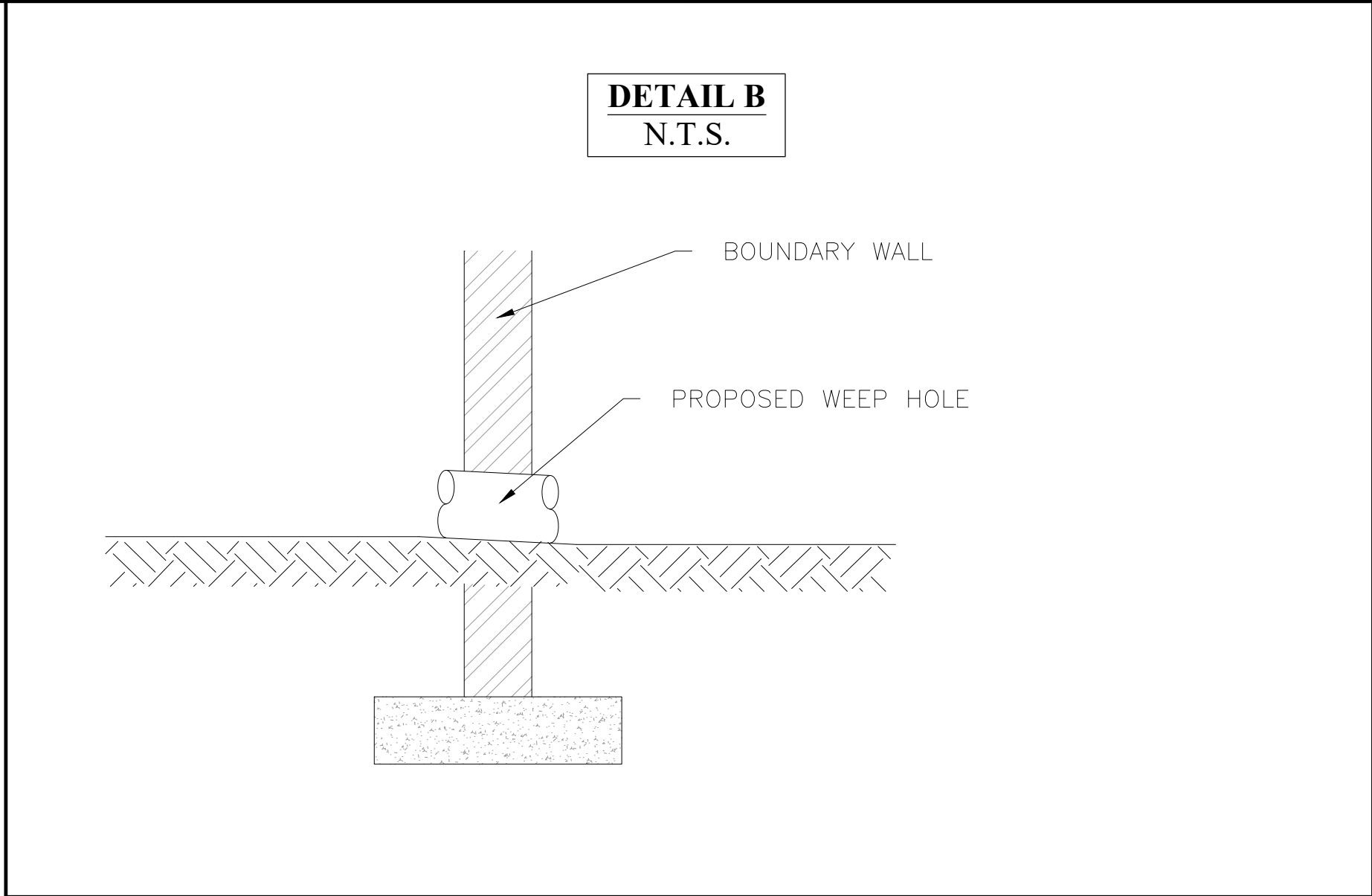
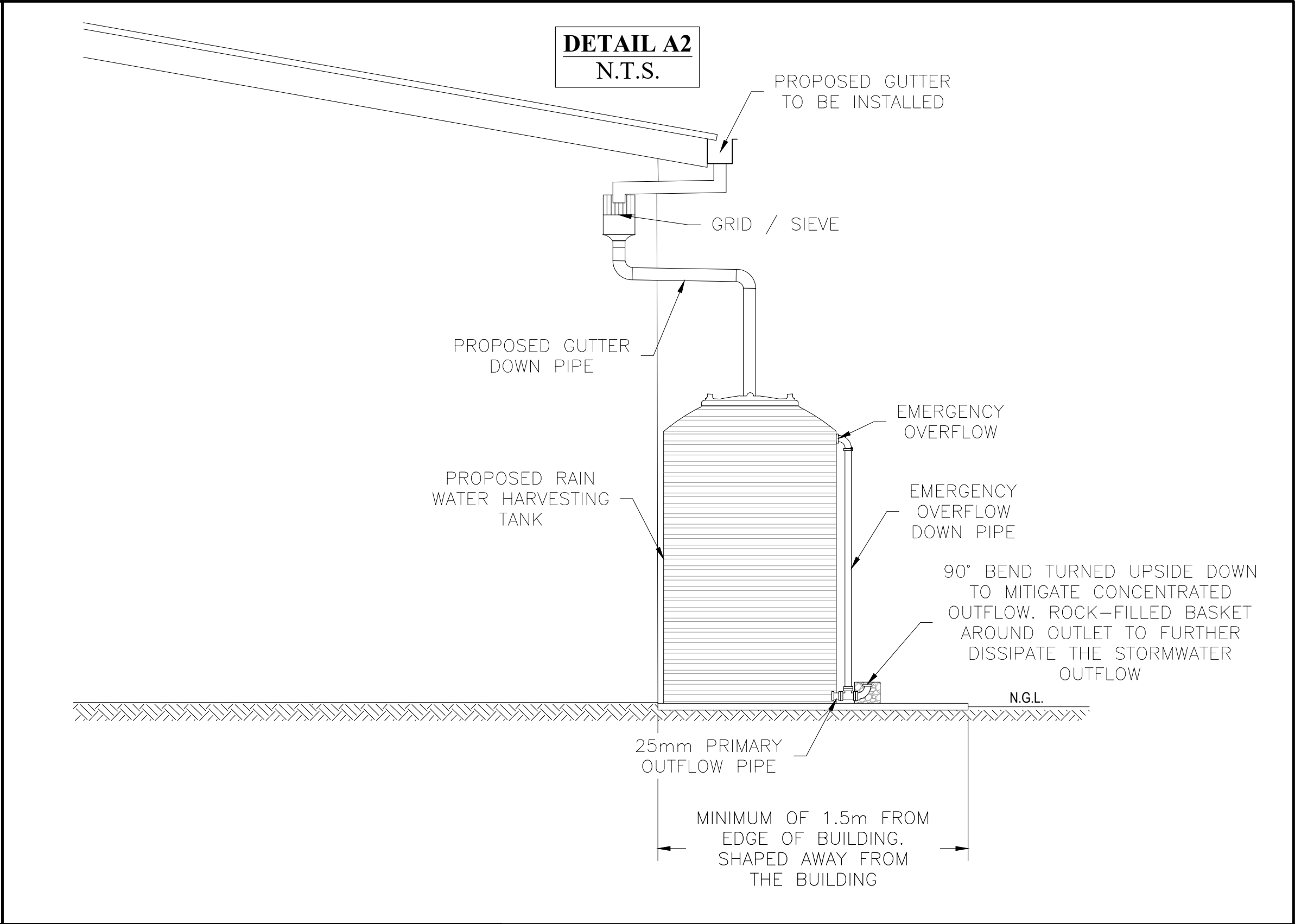
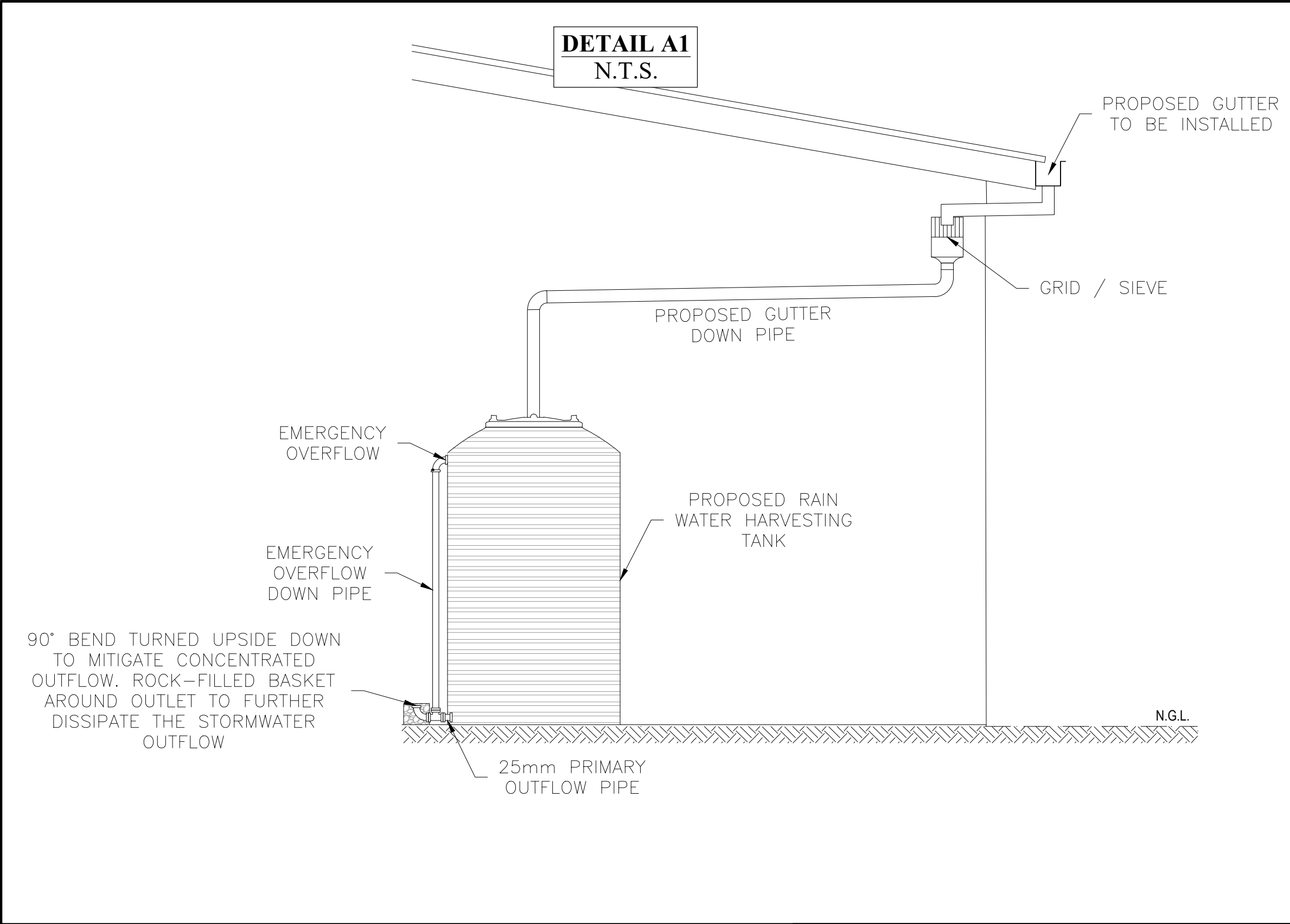
REZONING OF ERF 439
GARSFONTEIN

DESCRIPTION OF PROJECT

**STORMWATER :
GENERAL LAYOUT**

WAYLEAVE NO.:-

CONTRACT No. : 1054	PROJECT No. : 1054
DATE : 17/08/2026	SCALE : 1:250
DRAWING NO. 1054-500-01-00	ORIGINAL PAPER SIZE: A1
SHEET NO: 1 OF 1	REVISION



NOTES AND SPECIFICATIONS

GENERAL

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ROADS:

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- 3 VERTICAL AND HORIZONTAL ALIGNMENT TO FOLLOW THE EXISTING ROAD SURFACE, WITH A MINIMUM CROSS FALL OF 2 % (IF APPLICABLE)

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- 4 ALL EXCAVATIONS AND BEDDING MUST BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE LAYING OF ANY PIPES.
- 5 CLEAN EXISTING STORM WATER INLETS AND REPAIR WHERE NECESSARY (IF APPLICABLE)

LEGEND:

AMENDMENTS

NR.	DATE	APPROVED	DESCRIPTION	PAR.

DESIGNED S.S. HENNING	DRAWN S.S. HENNING
SIGNATURE DATE: 17/08/2026	SIGNATURE DATE: 17/08/2026
DESIGN CHECKED BY S.S. HENNING	INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT
SIGNATURE DATE: 17/08/2026	SIGNATURE DATE: 17/08/2026

PROJECT STATUS

☒ CONCEPT DRAWING	☐ TENDER DRAWINGS	☐ APPROVED FOR CONSTRUCTION DRAWINGS	☐ AS BUILT DRAWINGS
PROJECT ENGINEER (CONSULTANT)	2023301662	17/08/2026	
S.S. HENNING	SIGNATURE AND P. No.	DATE	
INITIALS AND SURNAME			
PROJECT ENGINEER (CITY OF TSHWANE)			
INITIALS AND SURNAME	SIGNATURE AND P. No.	DATE	
STRUCTURAL ENGINEER (CITY OF TSHWANE)			
INITIALS AND SURNAME	SIGNATURE AND P. No.	DATE	
INSPECTOR OF WORKS (CITY OF TSHWANE)			
INITIALS AND SURNAME	SIGNATURE AND P. No.	DATE	

CONSULTANT DETAIL



LERAS CONSULTING ENGINEERS (PTY) LTD
PO BOX 1345
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Tel: 082 567 3091
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CITY OF TSHWANE ROADS AND TRANSPORT DEPARTMENT

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Mr Lebepe M.T. (Thabo)
P.O. BOX 1409
PRETORIA
0001

DRAWING APPROVED BY ACTING EXECUTIVE DIRECTOR
Mr Lebepe M.T. (Thabo)

SIGNATURE: DATE:

REZONING OF ERF 439 GARSFONTEIN

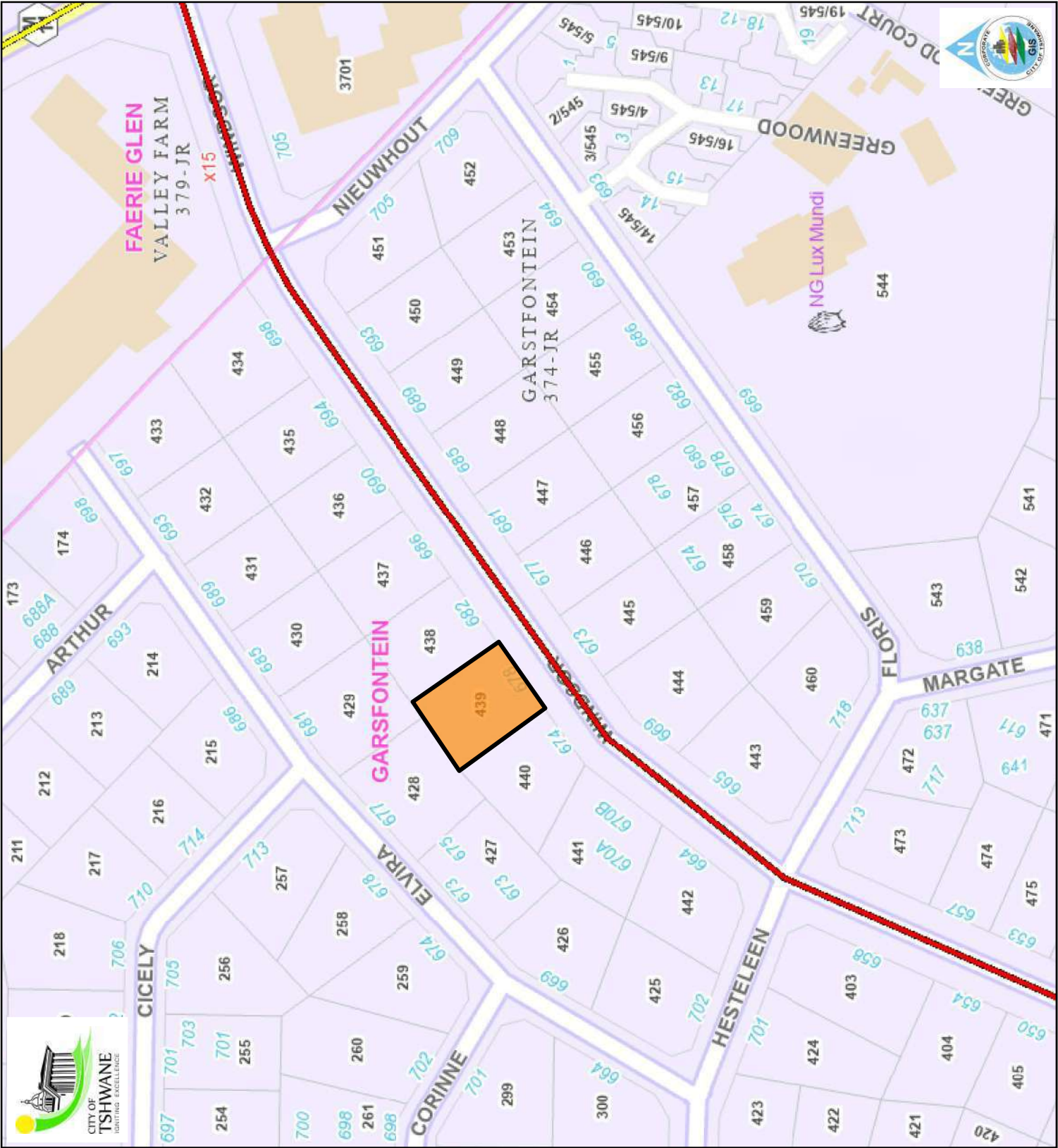
DESCRIPTION OF PROJECT

STORMWATER : RAINWATER HARVESTING TANK DETAILS

WAYLEAVE NO: -

CONTRACT No. : 1054		PROJECT No. : 1054	
DATE : 7/08/2026	SCALE : N.T.S.		ORIGINAL PAPER SIZE: A1
DRAWING NO. 1054-520-01-00		SHEET NO: 1 OF 1	REVISION 0

ANNEXURE E: CoT ROADS MASTER PLAN



A4 Landscape - RMP

Legend

Road Master Plan

- U1 Class 1_Primary metropolitan distributor
- U2 Class 2_Metropolitan distributor
- U3/A Class 3_District distributor
- U3 Class 3_District distributor
- U4 Class 4(a)_Collector (non-residential)
- U4 Class 4(b)_Collector (Residential)
- Class 5(a)_Local street (Non-residential)
- Class 5(b)_Local street (Residential)
- De-Classification_U1
- De-Classification_U2
- De-Classification_U3
- De-Classification_U4(a)
- De-Classification_U4(b)
- De-Classification_U5(a)
- De-Classification_U5(b)
- Proposed Class 3/A_District distributor
- Proposed_U1 Class 1_Primary metropolitan distributor
- Proposed_U2 Class 2_Metropolitan distributor
- Proposed_U3 Class 3_District distributor
- Proposed_U4 Class 4(a)_Collector (Non-residential)
- Proposed_U4 Class 4(b)_Collector (Residential)
- Proposed_Class 5(a)_Local street (Non-residential)
- Proposed_Class 5(b)_Local street (Residential)

Base map

- Tshwane Regions
- Wards
- Municipal Boundary
- Suburb Boundary
- Farm Boundary
- Open Space
- Dam
- River
- Freeway
- Main Road
- Street
- Main Railway
- Gautrain

Compiled & issued by: Corporate GIS, (egis@tshwane.gov.za)
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Date: 2026/08/17

Meters

0 100

ANNEXURE F: EXISTING STORMWATER SERVICES AND CoT STORMWATER MASTER PLAN



- ## NOTES:
1. All flow values indicated depicts the proposed 1-in-20-year design flow.
 2. Final conduit sizing will depend on site survey and available road flow capacity, as applicable. All conduit sizing to be verified by the CoT.
 3. SMP routes are an indication of proposed stormwater routes and not the final alignment of such systems. The actual alignment will be based on proper design.
 4. Flood lines, where indicated, are shown for information purposes only. All flood lines must be certified by a professional engineer with development applications.

This document is issued as a planning guideline, and is not an indication of existing or proposed services. All information must be verified with the Department: Roads and Transport.

Anyone using this document must take note that this is a planning document, and is subject to continuous change and updates. Although every care has been taken in the compilation of this document, the City of Tshwane will not be held liable for any damages as a result of any discrepancies, inaccuracies, or changes/amendments to this document.

Coordinate System: WG29
Projection: Transvers Mercator
Datum: Hartebeesthoek 1994

STORMWATER MASTER PLAN

ORIGINAL PAPER SIZE:
A2

SHEET: 1 of 1



CITY OF TSHWANE METROPOLITAN MUNICIPALITY

ROADS AND TRANSPORT DEPARTMENT
TRANSPORT INFRASTRUCTURE DESIGN & CONSTRUCTION DIVISION
Transport, Roads & Stormwater Infrastructure Technical Information Management



Legend Stormwater Network

- Roads_Stormwater.SDE.Outlets
- Roads_Stormwater.SDE.Culvert
- Roads_Stormwater.SDE.Channel
- Roads_Stormwater.SDE.Pipes
- Roads_Stormwater.SDE.JunctionPoints
- <all other values>

ST

- Junction Box
- Manhole

Roads_Stormwater.SDE.Inlets

- <all other values>

ST

- Grid Inlet
- Kerb Inlet
- Veld Inlet

NOTES :

NO CIVIL SERVICES MUST BE ENCROACH UPON

THIS DRAWING MUST NOT BE USED AS AN CONSTRUCTION DOCUMENT, BUT FOR

TITLE :

GARSTFONTEIN

STORMWATER INFORMATION :

NB : STORM WATER INFRASTRUCTURE MUST BE VERIFIED ON SITE.

REF NO :	-----
SCALE :	NOT TO SCALE
DRAWN :	M.N. MSIZA
SIGNATURE :	
DATE :	28 JULY 2026

ANNEXURE G: STORMWATER RUN- OFF CALCULATIONS

RATIONAL METHOD

Description of catchment		Rezoning of Erf 439 Garsfontein							
River detail		Pre-Development Run-off : Total Catchment Area							
Calculated by		S.S. Henning			Date		17/08/2026		
Physical characteristics									
Size of catchment (A)		0.00124 km ²		Rainfall region		INLAND			
Longest watercourse (L)		0.051664 km		Area distribution factors					
Average slope (S _{av})		0.077423 m/m		Rural (α)		Urban (β)		Lakes (γ)	
Dolomite area (D%)		0 %		100%		0%		0%	
Mean annual rainfall (MAR)		750 mm							
Surface roughness coefficient (r)		0.3							
Rural (C₁)				Urban (C₂)					
Surface slope	%	Factor	C_s	Description	%	Factor	C₂		
Vleis and pans	0	0.03	0.00	Lawns					
Flat areas	90	0.08	0.07	Sandy, flat (<2%)	0	0.1	0		
Hilly	10	0.16	0.02	Sandy, steep (>7%)	0	0.2	0		
Steep areas	0	0.26	0.00	Heavy soil, flat (<2%)	0	0.17	0		
Total	100	-	0.09	Heavy soil, steep (<7%)	0	0.35	0		
Permeability	%	Factor	C_p	Residential areas					
Very permeable	5	0.04	0.00	Houses	0	0.5	0		
Permeable	30	0.08	0.02	Flats	0	0.7	0		
Semi-permeable	45	0.16	0.07	Industry					
Impermeable	20	0.26	0.05	Light industry	0	0.8	0		
Total	100	-	0.15	Heavy industry	0	0.8	0		
Vegetation	%	Factor	C_v	Business					
Thick bush and plantation	0	0.04	0.00	City centre	0	0.7	0		
Light bush and farm-lands	50	0.11	0.06	Suburban	0	0.7	0		
Grass lands	50	0.21	0.11	Streets	0	0.95	0		
No vegetation	0	0.28	0.00	Maximum flood	0	1	0		
Total	100	-	0.16	Total (C ₂)	0	-	0		
Time of concentration (T_c)				Notes:					
Overland Flow		Defined watercourse							
$T_C = 0,604 \left(\frac{rL}{\sqrt{S_{av}}} \right)^{0,467}$		$T_C = \left(\frac{0,87L^2}{1000S_{av}} \right)^{0,385}$							
0.157	hours (min=0.25)	0.000	hours						
Run-off coefficient									
Return period (years), T	2	5	10	20	50	100			
Run-off coefficient, C ₁ (C ₁ =C _s +C _p +C _v)	0.398	0.398	0.398	0.398	0.398	0.398			
Adjusted for dolomitic areas, C _{1D} (C _{1D} =C ₁ (1-D%) + C ₁ D%(Σ(D _{factor} x C _S %)))	0.398	0.398	0.398	0.398	0.398	0.398			
Adjustment factor for initial saturation, F _t	0.500	0.550	0.600	0.670	0.830	1.000			
Adjusted run-off coefficient, C _{1T} (C _{1T} =C _{1D} x F _t)	0.199	0.219	0.239	0.267	0.330	0.398			
Combined run-off coefficient C _T (C _T =αC _{1T} + βC ₂ + γC ₃)	0.199	0.219	0.239	0.267	0.330	0.398			
Rainfall									
Return period (years), T	2	5	10	20	50	100			
Point rainfall (mm), P _T	14.77	20.37	24.62	29.11	35.66	41.14			
Point intensity (mm/hour), P _{IT} (=P _T /T _C)	94.2	129.9	157.0	185.6	227.4	262.4			
Area reduction factor (%), ARF _T	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%			
Average intensity (mm/hour), I _T (I _T =P _{IT} x ARF _T)	94.2	129.9	157.0	185.6	227.4	262.4			
Return period (years), T	2	5	10	20	50	100			
Peak _ flow (m ³ / s), Q _T = $\frac{C_T I_T A}{3,6}$	0.006	0.010	0.013	0.017	0.026	0.036			

RATIONAL METHOD

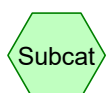
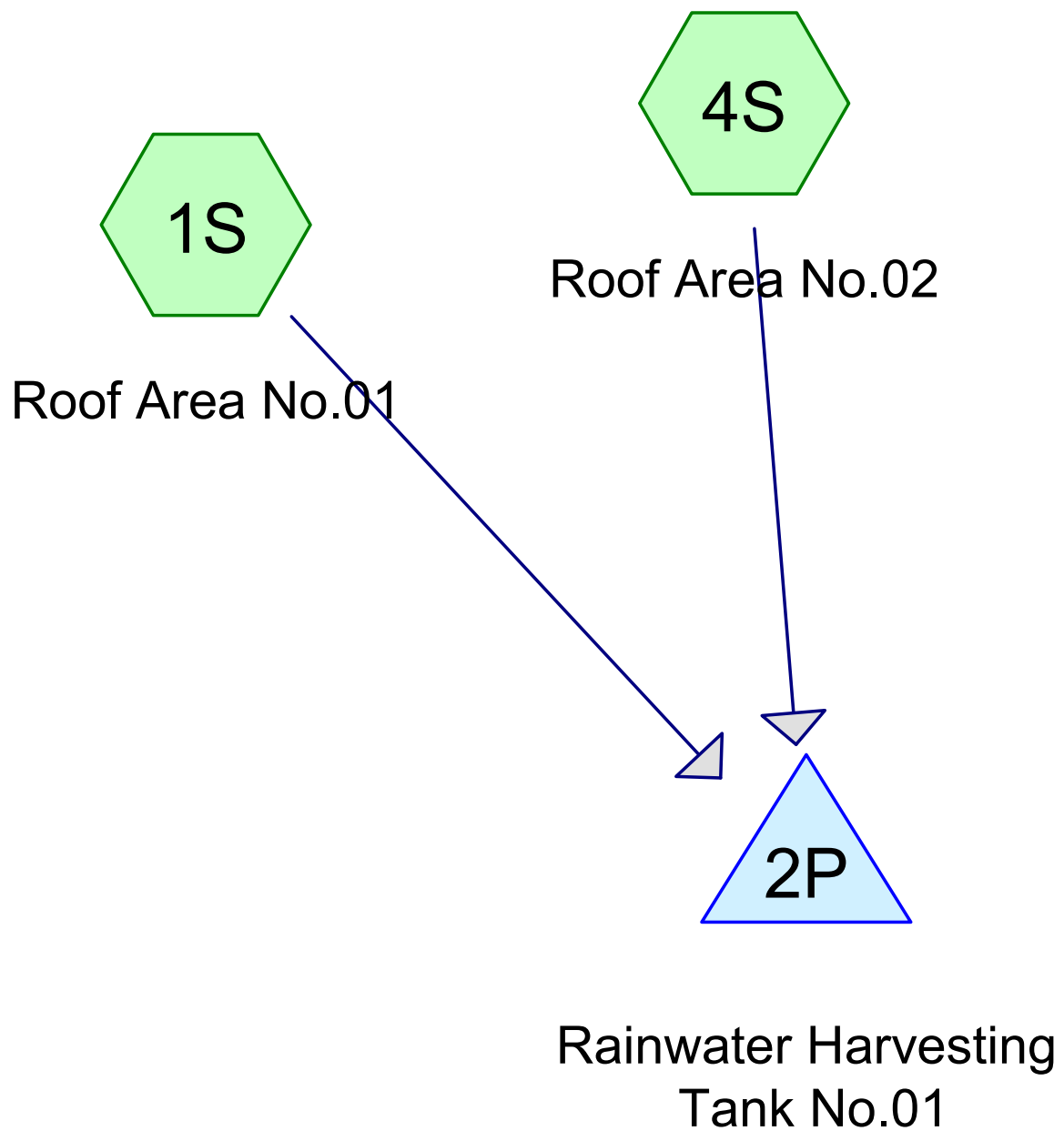
Description of catchment								Rezoning of Erf 439 Garsfontein											
River detail								Current-Development Run-off : Total Catchment Area											
Calculated by								S.S. Henning				Date		17/08/2026					
Physical characteristics																			
Size of catchment (A)				0.00124 km ²		Rainfall region				INLAND									
Longest watercourse (L)				0.051664 km		Area distribution factors													
Average slope (S _{av})				0.077423 m/m		Rural (α)				Urban (β)		Lakes (γ)							
Dolomite area (D _%)				0 %		0%				100%		0%							
Mean annual rainfall (MAR)				750 mm															
Surface roughness coefficient (r)				0.02															
Rural (C₁)								Urban (C₂)											
Surface slope		%		Factor		C_s		Description		%		Factor		C₂					
Vleis and pans		0		0.03		0.00		Lawns											
Flat areas		0		0.08		0.00		Sandy, flat (<2%)		0		0.1		0					
Hilly		0		0.16		0.00		Sandy, steep (>7%)		0		0.2		0					
Steep areas		0		0.26		0.00		Heavy soil, flat (<2%)		4		0.17		0.0068					
Total		0		-		0.00		Heavy soil, steep (<7%)		0		0.35		0					
Permeability		%		Factor		C_p		Residential areas											
Very permeable		0		0.04		0.00		Houses		36		0.5		0.18					
Permeable		0		0.08		0.00		Flats		0		0.7		0					
Semi-permeable		0		0.16		0.00		Industry											
Impermeable		0		0.26		0.00		Light industry		0		0.8		0					
Total		0		-		0.00		Heavy industry		0		0.8		0					
Vegetation		%		Factor		C_v		Business											
Thick bush and plantation		0		0.04		0.00		City centre		0		0.7		0					
Light bush and farm-lands		0		0.11		0.00		Suburban		0		0.7		0					
Grass lands		0		0.21		0.00		Streets		60		0.95		0.57					
No vegetation		0		0.28		0.00		Maximum flood		0		1		0					
Total		0		-		0.00		Total (C ₂)		100		-		0.7568					
Time of concentration (T_c)								Notes:											
Overland Flow				Defined watercourse															
$T_c = 0,604 \left(\frac{rL}{\sqrt{S_{av}}} \right)^{0,467}$				$T_c = \left(\frac{0,87L^2}{1000S_{av}} \right)^{0,385}$															
0.044 hours (min=0.25)				0.000 hours															
Run-off coefficient																			
Return period (years), T								2		5		10		20		50		100	
Run-off coefficient, C ₁ (C ₁ =C _s +C _p +C _v)								0.000		0.000		0.000		0.000		0.000		0.000	
Adjusted for dolomitic areas, C _{1D} (C _{1D} =C ₁ (1-D _%)+C ₁ D _% (Σ(D _{factor} × C _s %)))								0.000		0.000		0.000		0.000		0.000		0.000	
Adjustment factor for initial saturation, F _t								0.500		0.550		0.6		0.670		0.830		1.000	
Adjusted run-off coefficient, C _{1T} (C _{1T} =C _{1D} × F _t)								0.000		0.000		0.000		0.000		0.000		0.000	
Combined run-off coefficient C _T (C _T =αC _{1T} + βC ₂ + γC ₃)								0.757		0.757		0.757		0.757		0.757		0.757	
Rainfall																			
Return period (years), T								2		5		10		20		50		100	
Point rainfall (mm), P _T								10.16		14.02		16.93		20.03		24.53		28.30	
Point intensity (mm/hour), P _{IT} (=P _T /T _c)								121.9		168.2		203.2		240.3		294.4		339.6	
Area reduction factor (%), AR _{FT}								100.0%		100.0%		100.0%		100.0%		100.0%		100.0%	
Average intensity (mm/hour), I _T (I _T =P _{IT} × AR _{FT})								121.9		168.2		203.2		240.3		294.4		339.6	
Return period (years), T								2		5		10		20		50		100	
Peak _ flow(m ³ / s), Q _T = $\frac{C_T I_T A}{3,6}$								0.032		0.044		0.053		0.063		0.077		0.089	

RATIONAL METHOD									
Description of catchment				Rezoning of Erf 439 Garsfontein					
River detail				Post-Development Run-off : Total Catchment Area					
Calculated by				S.S. Henning		Date		17/08/2026	
Physical characteristics									
Size of catchment (A)		0.00124 km ²		Rainfall region			INLAND		
Longest watercourse (L)		0.051664 km		Area distribution factors					
Average slope (S _{av})		0.077423 m/m		Rural (α)		Urban (β)		Lakes (γ)	
Dolomite area (D _%)		0 %		0%		100%		0%	
Mean annual rainfall (MAR)		750 mm							
Surface roughness coefficient (r)		0.02							
Rural (C ₁)				Urban (C ₂)					
Surface slope	%	Factor	C _s	Description	%	Factor	C ₂		
Vleis and pans	0	0.03	0.00	Lawns					
Flat areas	0	0.08	0.00	Sandy, flat (<2%)	0	0.1	0		
Hilly	0	0.16	0.00	Sandy, steep (>7%)	0	0.2	0		
Steep areas	0	0.26	0.00	Heavy soil, flat (<2%)	0	0.17	0		
Total	0	-	0.00	Heavy soil, steep (<7%)	0	0.35	0		
Permeability	%	Factor	C _p	Residential areas					
Very permeable	0	0.04	0.00	Houses	0	0.5	0		
Permeable	0	0.08	0.00	Flats	0	0.7	0		
Semi-permeable	0	0.16	0.00	Industry					
Impermeable	0	0.26	0.00	Light industry	100	0.8	0.8		
Total	0	-	0.00	Heavy industry	0	0.8	0		
Vegetation	%	Factor	C _v	Business					
Thick bush and plantation	0	0.04	0.00	City centre	0	0.7	0		
Light bush and farm-lands	0	0.11	0.00	Suburban	0	0.7	0		
Grass lands	0	0.21	0.00	Streets	0	0.95	0		
No vegetation	0	0.28	0.00	Maximum flood	0	1	0		
Total	0	-	0.00	Total (C ₂)	100	-	0.8		
Time of concentration (T _c)				Notes:					
Overland Flow		Defined watercourse							
$T_c = 0,604 \left(\frac{rL}{\sqrt{S_{av}}} \right)^{0,467}$		$T_c = \left(\frac{0,87L^2}{1000S_{av}} \right)^{0,385}$							
0.044	hours (min=0.25)	0.000	hours						
Run-off coefficient									
Return period (years), T	2	5	10	20	50	100			
Run-off coefficient, C ₁ (C ₁ =C _s +C _p +C _v)	0.000	0.000	0.000	0.000	0.000	0.000			
Adjusted for dolomitic areas, C _{1D} (C _{1D} =C ₁ (1-D _%)+C ₁ D _% (Σ(D _{factor} x C _s %)))	0.000	0.000	0.000	0.000	0.000	0.000			
Adjustment factor for initial saturation, F _t	0.500	0.550	0.6	0.670	0.830	1.000			
Adjusted run-off coefficient, C _{1T} (C _{1T} =C _{1D} x F _t)	0.000	0.000	0.000	0.000	0.000	0.000			
Combined run-off coefficient C _T (C _T =αC _{1T} + βC ₂ + γC ₃)	0.800	0.800	0.800	0.800	0.800	0.800			
Rainfall									
Return period (years), T	2	5	10	20	50	100			
Point rainfall (mm), P _T	10.16	14.02	16.93	20.03	24.53	28.30			
Point intensity (mm/hour), P _{IT} (=P _T /T _c)	121.9	168.2	203.2	240.3	294.4	339.6			
Area reduction factor (%), ARFT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%			
Average intensity (mm/hour), I _T (I _T =P _{IT} x ARF _T)	121.9	168.2	203.2	240.3	294.4	339.6			
Return period (years), T	2	5	10	20	50	100			
Peak _ flow(m ³ / s), Q _T = $\frac{C_T I_T A}{3,6}$	0.034	0.046	0.056	0.066	0.081	0.094			

ANNEXURE H: ROOF RUN-OFF CALCULATIONS

Roof Area Run-off Calculations								
Roof Area	R (mm)	A (m ²)	C	FE	V (l)	V (m ³)	V (m ³ /s)	Volume Required (2 Storms) (m ³)
Area 1	20.025	66.912	0.850	0.900	1025.036	1.025	0.0034	2.050
Area 2	20.025	36.103	0.850	0.900	553.066	0.553	0.002	1.106
Area 3	20.025	35.218	0.850	0.900	539.509	0.540	0.002	1.079
Area 4	20.025	91.963	0.850	0.900	1408.787	1.409	0.005	2.818
Area 5	20.025	60.912	0.850	0.900	933.114	0.933	0.003	1.866
Area 6	20.025	109.904	0.850	0.900	1683.625	1.684	0.006	3.367
Area 7	20.025	23.000	0.850	0.900	352.340	0.352	0.001	0.705
Area 8	20.025	23.000	0.850	0.900	352.340	0.352	0.001	0.705

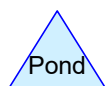
ANNEXURE I: RAINWATER HARVESTING TANK OUTFLOW CALCULATIONS



Subcat



Reach



Pond



Link

Routing Diagram for Rainwater Harvesting Tank Design No.01

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Rainwater Harvesting Tank Design No.01

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 1S: Roof Area No.01

Runoff = 0.0043 m³/s @ 0.08 hrs, Volume= 0.001 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.01

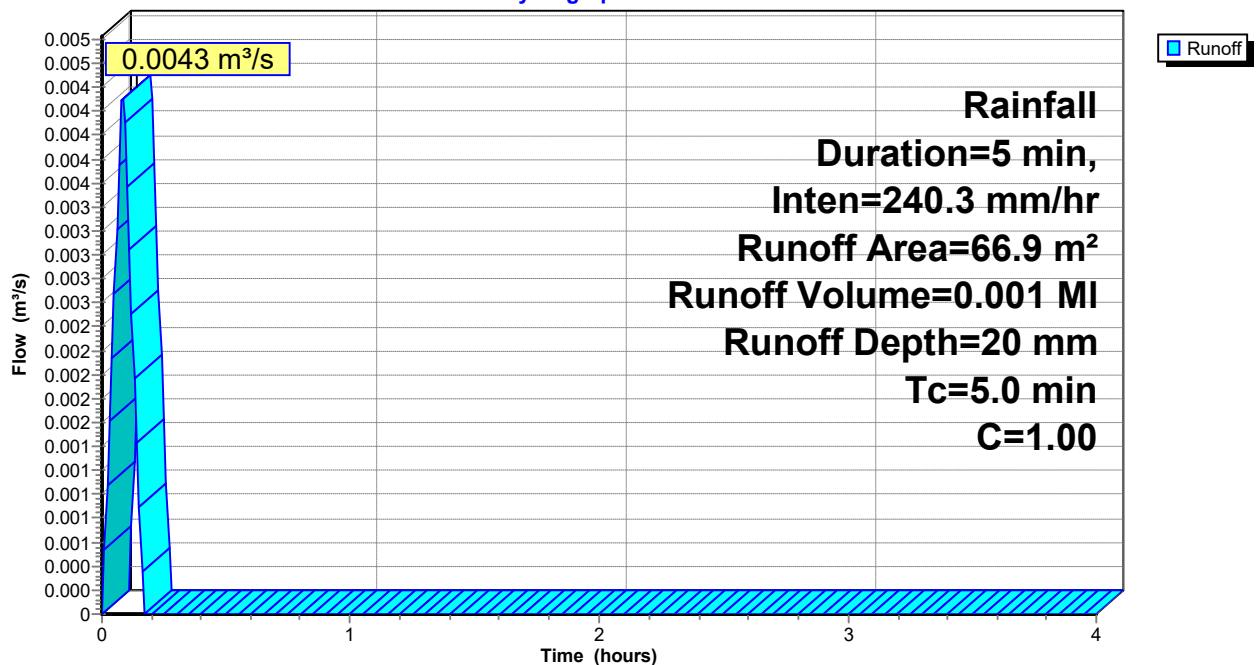
Runoff by Rational method, Rise/Fall=1.0/1.0 xT_c, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
66.9	1.00	
66.9		100.00% Impervious Area

T _c (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 1S: Roof Area No.01

Hydrograph



Rainwater Harvesting Tank Design No.01 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Subcatchment 1S: Roof Area No.01

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0027	2.50	0.0000
0.10	0.0036	2.55	0.0000
0.15	0.0009	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.01

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 4S: Roof Area No.02

Runoff = 0.0023 m³/s @ 0.08 hrs, Volume= 0.001 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.01

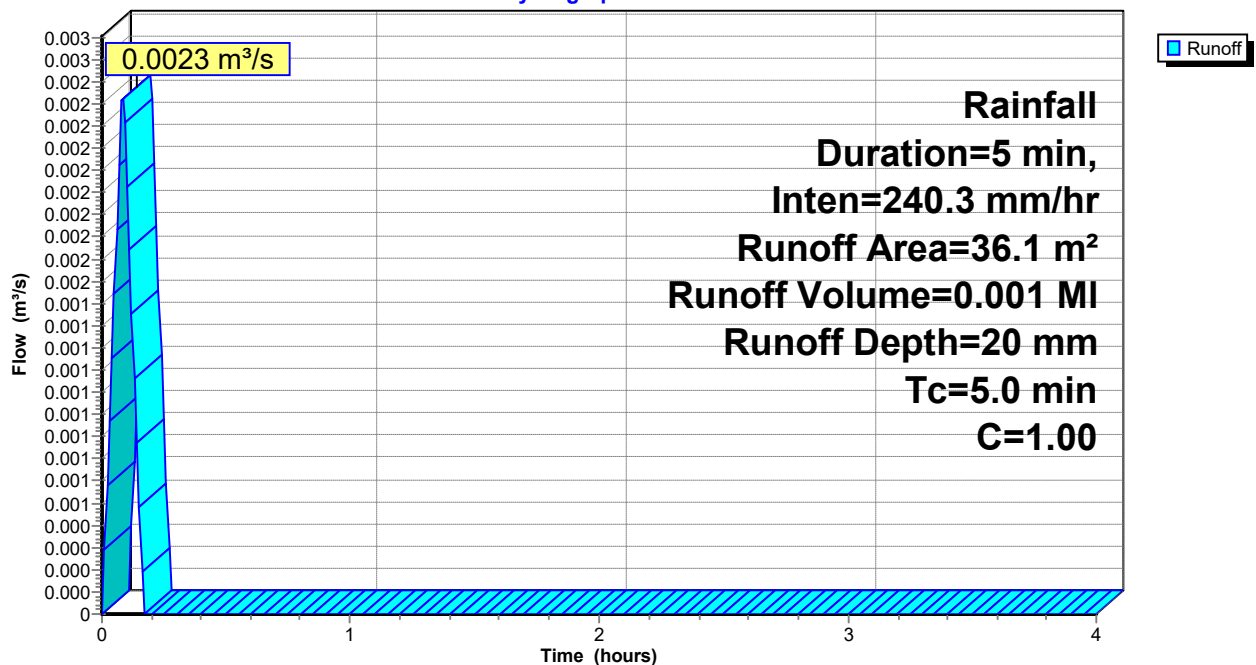
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
36.1	1.00	
36.1		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 4S: Roof Area No.02

Hydrograph



Rainwater Harvesting Tank Design No.01*Rainfall Duration=5 min, Inten=240.3 mm/hr*Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

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Hydrograph for Subcatchment 4S: Roof Area No.02

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0014	2.50	0.0000
0.10	0.0019	2.55	0.0000
0.15	0.0005	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.01 Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Pond 2P: Rainwater Harvesting Tank No.01

Inflow Area = 0.0103 ha, 100.00% Impervious, Inflow Depth = 20 mm
 Inflow = 0.0066 m³/s @ 0.08 hrs, Volume= 0.002 MI
 Outflow = 0.0011 m³/s @ 0.15 hrs, Volume= 0.002 MI, Atten= 83%, Lag= 4.2 min
 Primary = 0.0011 m³/s @ 0.15 hrs, Volume= 0.002 MI

Routing by Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.733 m @ 0.15 hrs Surf.Area= 2.3 m² Storage= 1.7 m³

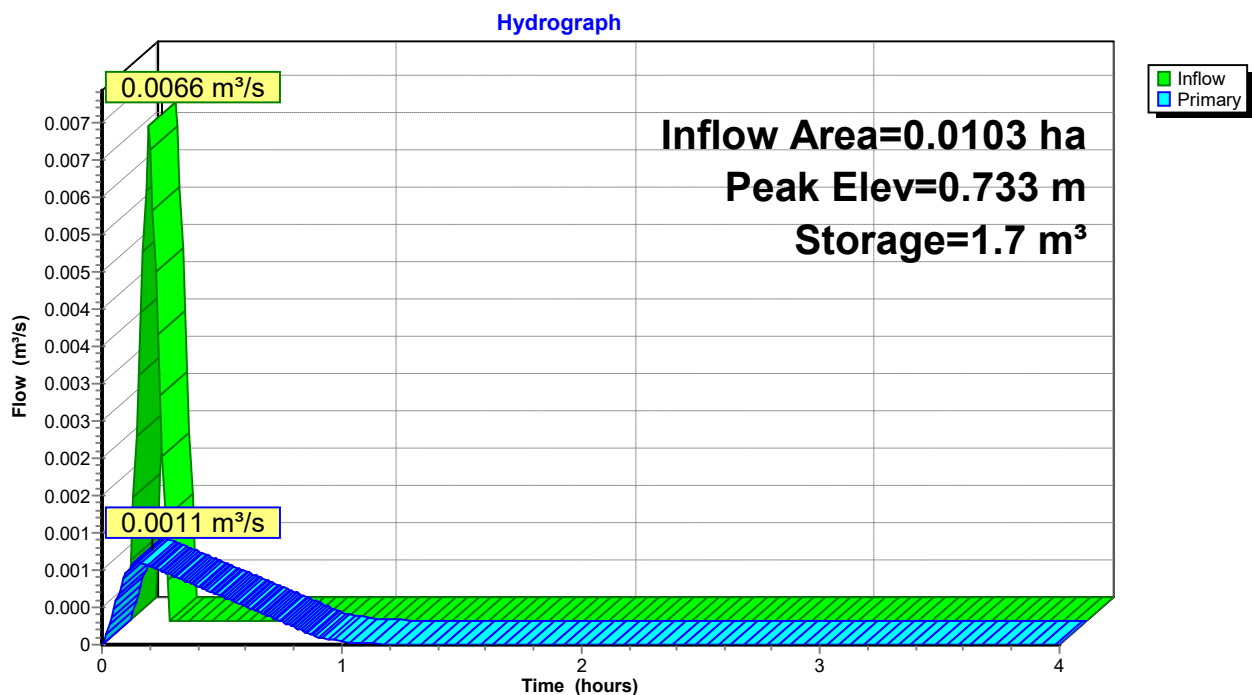
Plug-Flow detention time= 17.9 min calculated for 0.002 MI (100% of inflow)

Center-of-Mass det. time= 17.7 min (22.7 - 5.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.0 m ³	1.20 mD x 1.78 mH Vertical Cone/Cylinder x 2

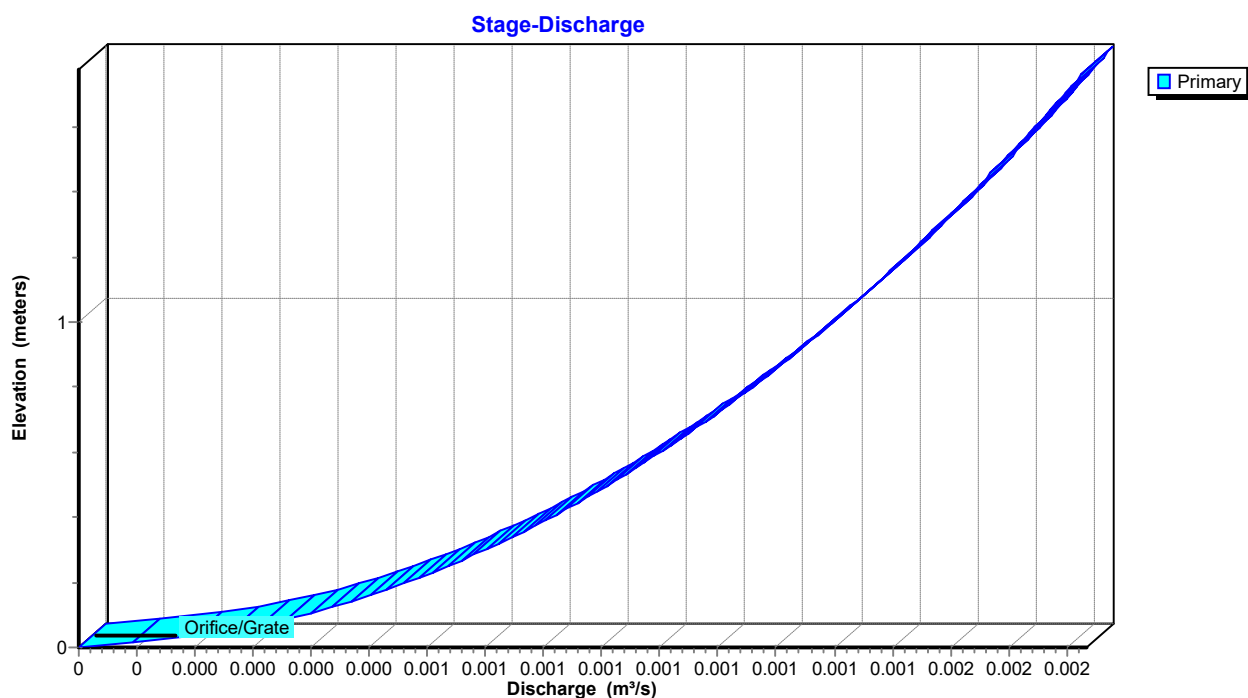
Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	25 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.0011 m³/s @ 0.15 hrs HW=0.732 m (Free Discharge)
 ←1=Orifice/Grate (Orifice Controls 0.0011 m³/s @ 2.25 m/s)

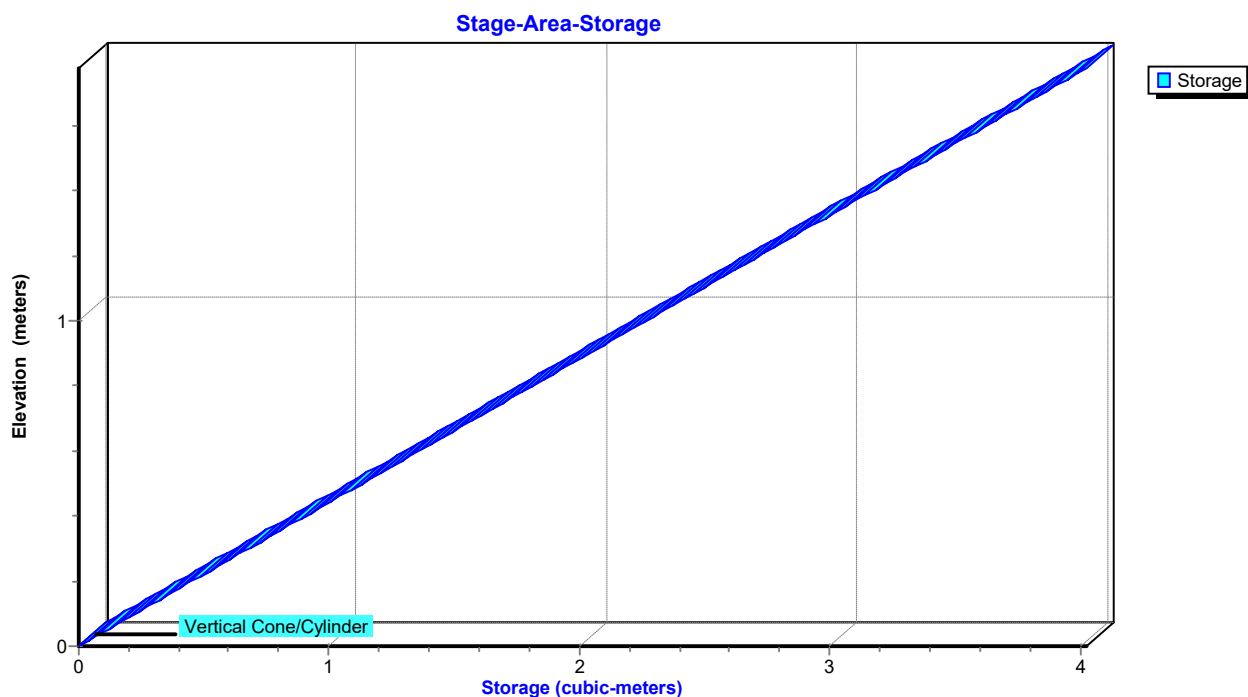
Pond 2P: Rainwater Harvesting Tank No.01

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Pond 2P: Rainwater Harvesting Tank No.01



Pond 2P: Rainwater Harvesting Tank No.01



Rainwater Harvesting Tank Design No.01 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Pond 2P: Rainwater Harvesting Tank No.01

Time (hours)	Inflow (m ³ /s)	Storage (cubic-meters)	Elevation (meters)	Primary (m ³ /s)
0.00	0.0000	0.0	0.000	0.0000
0.10	0.0055	1.2	0.543	0.0009
0.20	0.0000	1.5	0.666	0.0011
0.30	0.0000	1.2	0.509	0.0009
0.40	0.0000	0.8	0.373	0.0008
0.50	0.0000	0.6	0.259	0.0006
0.60	0.0000	0.4	0.167	0.0005
0.70	0.0000	0.2	0.096	0.0004
0.80	0.0000	0.1	0.047	0.0002
0.90	0.0000	0.0	0.020	0.0001
1.00	0.0000	0.0	0.009	0.0000
1.10	0.0000	0.0	0.004	0.0000
1.20	0.0000	0.0	0.002	0.0000
1.30	0.0000	0.0	0.001	0.0000
1.40	0.0000	0.0	0.000	0.0000
1.50	0.0000	0.0	0.000	0.0000
1.60	0.0000	0.0	0.000	0.0000
1.70	0.0000	0.0	0.000	0.0000
1.80	0.0000	0.0	0.000	0.0000
1.90	0.0000	0.0	0.000	0.0000
2.00	0.0000	0.0	0.000	0.0000
2.10	0.0000	0.0	0.000	0.0000
2.20	0.0000	0.0	0.000	0.0000
2.30	0.0000	0.0	0.000	0.0000
2.40	0.0000	0.0	0.000	0.0000
2.50	0.0000	0.0	0.000	0.0000
2.60	0.0000	0.0	0.000	0.0000
2.70	0.0000	0.0	0.000	0.0000
2.80	0.0000	0.0	0.000	0.0000
2.90	0.0000	0.0	0.000	0.0000
3.00	0.0000	0.0	0.000	0.0000
3.10	0.0000	0.0	0.000	0.0000
3.20	0.0000	0.0	0.000	0.0000
3.30	0.0000	0.0	0.000	0.0000
3.40	0.0000	0.0	0.000	0.0000
3.50	0.0000	0.0	0.000	0.0000
3.60	0.0000	0.0	0.000	0.0000
3.70	0.0000	0.0	0.000	0.0000
3.80	0.0000	0.0	0.000	0.0000
3.90	0.0000	0.0	0.000	0.0000
4.00	0.0000	0.0	0.000	0.0000

Rainwater Harvesting Tank Design No.01*Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Stage-Discharge for Pond 2P: Rainwater Harvesting Tank No.01

Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)
0.000	0.0000	0.490	0.0009	0.980	0.0013	1.470	0.0016
0.010	0.0000	0.500	0.0009	0.990	0.0013	1.480	0.0016
0.020	0.0001	0.510	0.0009	1.000	0.0013	1.490	0.0016
0.030	0.0002	0.520	0.0009	1.010	0.0013	1.500	0.0016
0.040	0.0002	0.530	0.0009	1.020	0.0013	1.510	0.0016
0.050	0.0003	0.540	0.0009	1.030	0.0013	1.520	0.0016
0.060	0.0003	0.550	0.0010	1.040	0.0013	1.530	0.0016
0.070	0.0003	0.560	0.0010	1.050	0.0013	1.540	0.0016
0.080	0.0003	0.570	0.0010	1.060	0.0013	1.550	0.0016
0.090	0.0004	0.580	0.0010	1.070	0.0013	1.560	0.0016
0.100	0.0004	0.590	0.0010	1.080	0.0013	1.570	0.0016
0.110	0.0004	0.600	0.0010	1.090	0.0014	1.580	0.0016
0.120	0.0004	0.610	0.0010	1.100	0.0014	1.590	0.0016
0.130	0.0004	0.620	0.0010	1.110	0.0014	1.600	0.0016
0.140	0.0005	0.630	0.0010	1.120	0.0014	1.610	0.0016
0.150	0.0005	0.640	0.0010	1.130	0.0014	1.620	0.0017
0.160	0.0005	0.650	0.0010	1.140	0.0014	1.630	0.0017
0.170	0.0005	0.660	0.0010	1.150	0.0014	1.640	0.0017
0.180	0.0005	0.670	0.0011	1.160	0.0014	1.650	0.0017
0.190	0.0005	0.680	0.0011	1.170	0.0014	1.660	0.0017
0.200	0.0006	0.690	0.0011	1.180	0.0014	1.670	0.0017
0.210	0.0006	0.700	0.0011	1.190	0.0014	1.680	0.0017
0.220	0.0006	0.710	0.0011	1.200	0.0014	1.690	0.0017
0.230	0.0006	0.720	0.0011	1.210	0.0014	1.700	0.0017
0.240	0.0006	0.730	0.0011	1.220	0.0014	1.710	0.0017
0.250	0.0006	0.740	0.0011	1.230	0.0014	1.720	0.0017
0.260	0.0006	0.750	0.0011	1.240	0.0014	1.730	0.0017
0.270	0.0007	0.760	0.0011	1.250	0.0015	1.740	0.0017
0.280	0.0007	0.770	0.0011	1.260	0.0015	1.750	0.0017
0.290	0.0007	0.780	0.0011	1.270	0.0015	1.760	0.0017
0.300	0.0007	0.790	0.0012	1.280	0.0015	1.770	0.0017
0.310	0.0007	0.800	0.0012	1.290	0.0015	1.780	0.0017
0.320	0.0007	0.810	0.0012	1.300	0.0015		
0.330	0.0007	0.820	0.0012	1.310	0.0015		
0.340	0.0007	0.830	0.0012	1.320	0.0015		
0.350	0.0008	0.840	0.0012	1.330	0.0015		
0.360	0.0008	0.850	0.0012	1.340	0.0015		
0.370	0.0008	0.860	0.0012	1.350	0.0015		
0.380	0.0008	0.870	0.0012	1.360	0.0015		
0.390	0.0008	0.880	0.0012	1.370	0.0015		
0.400	0.0008	0.890	0.0012	1.380	0.0015		
0.410	0.0008	0.900	0.0012	1.390	0.0015		
0.420	0.0008	0.910	0.0012	1.400	0.0015		
0.430	0.0008	0.920	0.0012	1.410	0.0015		
0.440	0.0009	0.930	0.0012	1.420	0.0015		
0.450	0.0009	0.940	0.0013	1.430	0.0016		
0.460	0.0009	0.950	0.0013	1.440	0.0016		
0.470	0.0009	0.960	0.0013	1.450	0.0016		
0.480	0.0009	0.970	0.0013	1.460	0.0016		

Rainwater Harvesting Tank Design No.01 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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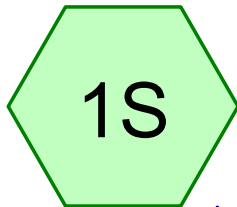
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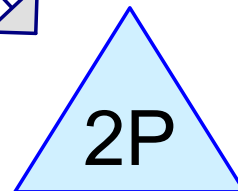
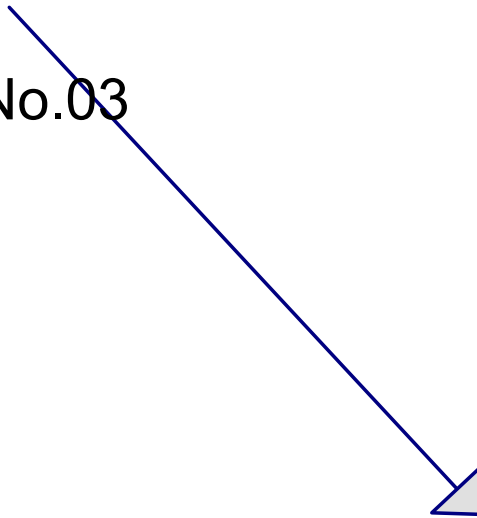
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Stage-Area-Storage for Pond 2P: Rainwater Harvesting Tank No.01

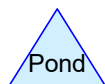
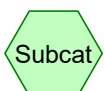
Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)
0.000	0.0	0.980	2.2
0.020	0.0	1.000	2.3
0.040	0.1	1.020	2.3
0.060	0.1	1.040	2.4
0.080	0.2	1.060	2.4
0.100	0.2	1.080	2.4
0.120	0.3	1.100	2.5
0.140	0.3	1.120	2.5
0.160	0.4	1.140	2.6
0.180	0.4	1.160	2.6
0.200	0.5	1.180	2.7
0.220	0.5	1.200	2.7
0.240	0.5	1.220	2.8
0.260	0.6	1.240	2.8
0.280	0.6	1.260	2.9
0.300	0.7	1.280	2.9
0.320	0.7	1.300	2.9
0.340	0.8	1.320	3.0
0.360	0.8	1.340	3.0
0.380	0.9	1.360	3.1
0.400	0.9	1.380	3.1
0.420	1.0	1.400	3.2
0.440	1.0	1.420	3.2
0.460	1.0	1.440	3.3
0.480	1.1	1.460	3.3
0.500	1.1	1.480	3.3
0.520	1.2	1.500	3.4
0.540	1.2	1.520	3.4
0.560	1.3	1.540	3.5
0.580	1.3	1.560	3.5
0.600	1.4	1.580	3.6
0.620	1.4	1.600	3.6
0.640	1.4	1.620	3.7
0.660	1.5	1.640	3.7
0.680	1.5	1.660	3.8
0.700	1.6	1.680	3.8
0.720	1.6	1.700	3.8
0.740	1.7	1.720	3.9
0.760	1.7	1.740	3.9
0.780	1.8	1.760	4.0
0.800	1.8	1.780	4.0
0.820	1.9		
0.840	1.9		
0.860	1.9		
0.880	2.0		
0.900	2.0		
0.920	2.1		
0.940	2.1		
0.960	2.2		



Roof Area No.03



Rainwater Harvesting
Tank No.02



Routing Diagram for Rainwater Harvesting Tank Design No.02

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Rainwater Harvesting Tank Design No.02

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 1S: Roof Area No.03

Runoff = 0.0023 m³/s @ 0.08 hrs, Volume= 0.001 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.02

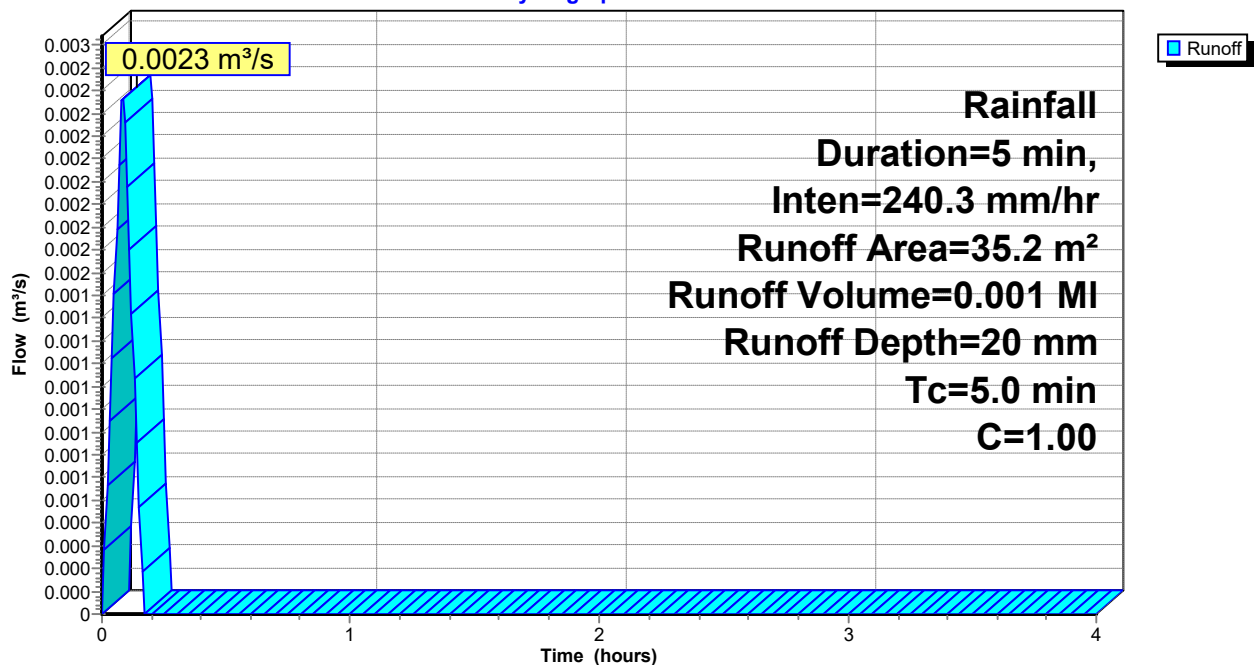
Runoff by Rational method, Rise/Fall=1.0/1.0 xT_c, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
35.2	1.00	
35.2		100.00% Impervious Area

T _c (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 1S: Roof Area No.03

Hydrograph



Rainwater Harvesting Tank Design No.02 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Subcatchment 1S: Roof Area No.03

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0014	2.50	0.0000
0.10	0.0019	2.55	0.0000
0.15	0.0005	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.02 Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Pond 2P: Rainwater Harvesting Tank No.02

Inflow Area = 0.0035 ha, 100.00% Impervious, Inflow Depth = 20 mm
 Inflow = 0.0023 m³/s @ 0.08 hrs, Volume= 0.001 MI
 Outflow = 0.0007 m³/s @ 0.14 hrs, Volume= 0.001 MI, Atten= 69%, Lag= 3.6 min
 Primary = 0.0007 m³/s @ 0.14 hrs, Volume= 0.001 MI

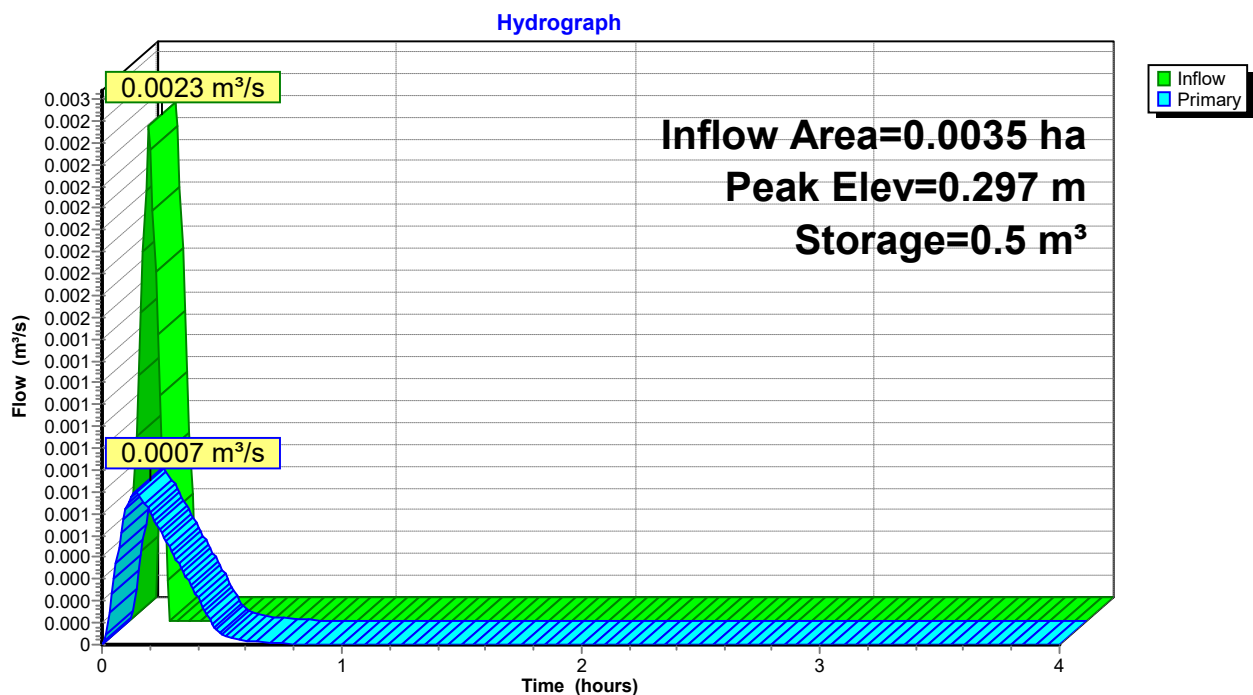
Routing by Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.297 m @ 0.14 hrs Surf.Area= 1.6 m² Storage= 0.5 m³

Plug-Flow detention time= 8.3 min calculated for 0.001 MI (100% of inflow)
 Center-of-Mass det. time= 8.4 min (13.4 - 5.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	1.9 m ³	1.41 mD x 1.20 mH Vertical Cone/Cylinder

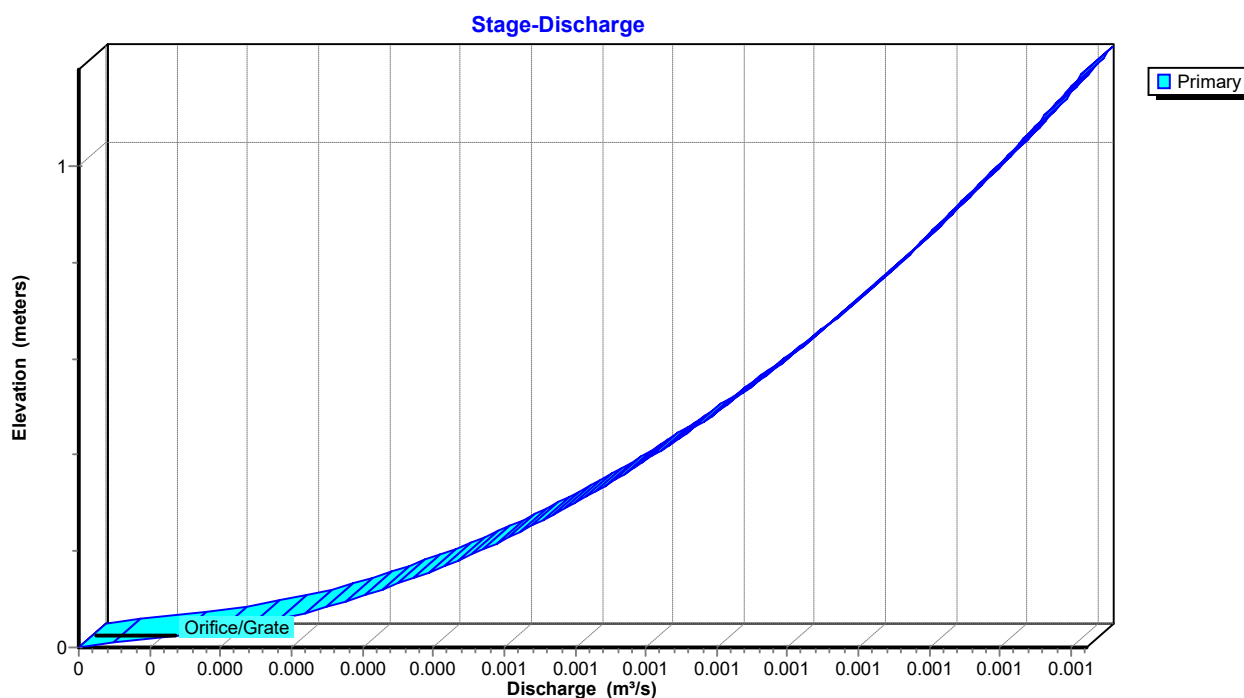
Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	25 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.0007 m³/s @ 0.14 hrs HW=0.297 m (Free Discharge)
 ←1=Orifice/Grate (Orifice Controls 0.0007 m³/s @ 1.42 m/s)

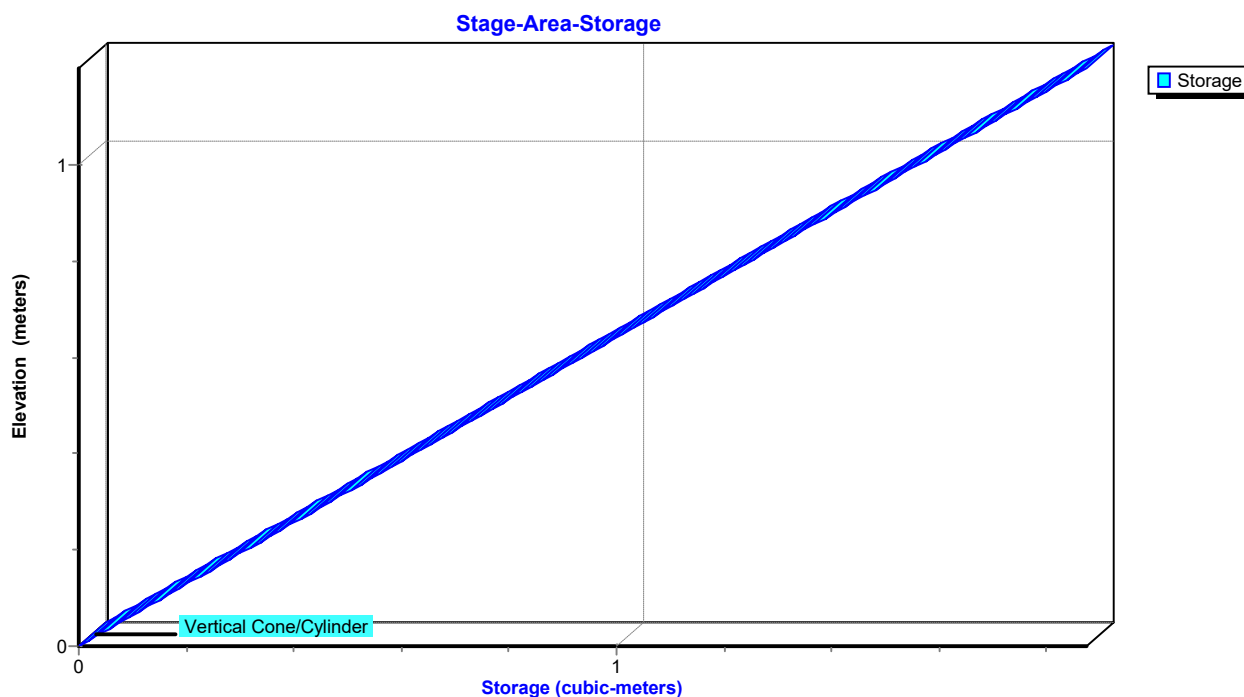
Pond 2P: Rainwater Harvesting Tank No.02

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Pond 2P: Rainwater Harvesting Tank No.02



Pond 2P: Rainwater Harvesting Tank No.02



Rainwater Harvesting Tank Design No.02 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Pond 2P: Rainwater Harvesting Tank No.02

Time (hours)	Inflow (m ³ /s)	Storage (cubic-meters)	Elevation (meters)	Primary (m ³ /s)
0.00	0.0000	0.0	0.000	0.0000
0.10	0.0019	0.4	0.237	0.0006
0.20	0.0000	0.4	0.229	0.0006
0.30	0.0000	0.2	0.112	0.0004
0.40	0.0000	0.1	0.040	0.0002
0.50	0.0000	0.0	0.012	0.0000
0.60	0.0000	0.0	0.005	0.0000
0.70	0.0000	0.0	0.002	0.0000
0.80	0.0000	0.0	0.001	0.0000
0.90	0.0000	0.0	0.000	0.0000
1.00	0.0000	0.0	0.000	0.0000
1.10	0.0000	0.0	0.000	0.0000
1.20	0.0000	0.0	0.000	0.0000
1.30	0.0000	0.0	0.000	0.0000
1.40	0.0000	0.0	0.000	0.0000
1.50	0.0000	0.0	0.000	0.0000
1.60	0.0000	0.0	0.000	0.0000
1.70	0.0000	0.0	0.000	0.0000
1.80	0.0000	0.0	0.000	0.0000
1.90	0.0000	0.0	0.000	0.0000
2.00	0.0000	0.0	0.000	0.0000
2.10	0.0000	0.0	0.000	0.0000
2.20	0.0000	0.0	0.000	0.0000
2.30	0.0000	0.0	0.000	0.0000
2.40	0.0000	0.0	0.000	0.0000
2.50	0.0000	0.0	0.000	0.0000
2.60	0.0000	0.0	0.000	0.0000
2.70	0.0000	0.0	0.000	0.0000
2.80	0.0000	0.0	0.000	0.0000
2.90	0.0000	0.0	0.000	0.0000
3.00	0.0000	0.0	0.000	0.0000
3.10	0.0000	0.0	0.000	0.0000
3.20	0.0000	0.0	0.000	0.0000
3.30	0.0000	0.0	0.000	0.0000
3.40	0.0000	0.0	0.000	0.0000
3.50	0.0000	0.0	0.000	0.0000
3.60	0.0000	0.0	0.000	0.0000
3.70	0.0000	0.0	0.000	0.0000
3.80	0.0000	0.0	0.000	0.0000
3.90	0.0000	0.0	0.000	0.0000
4.00	0.0000	0.0	0.000	0.0000

Rainwater Harvesting Tank Design No.02 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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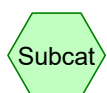
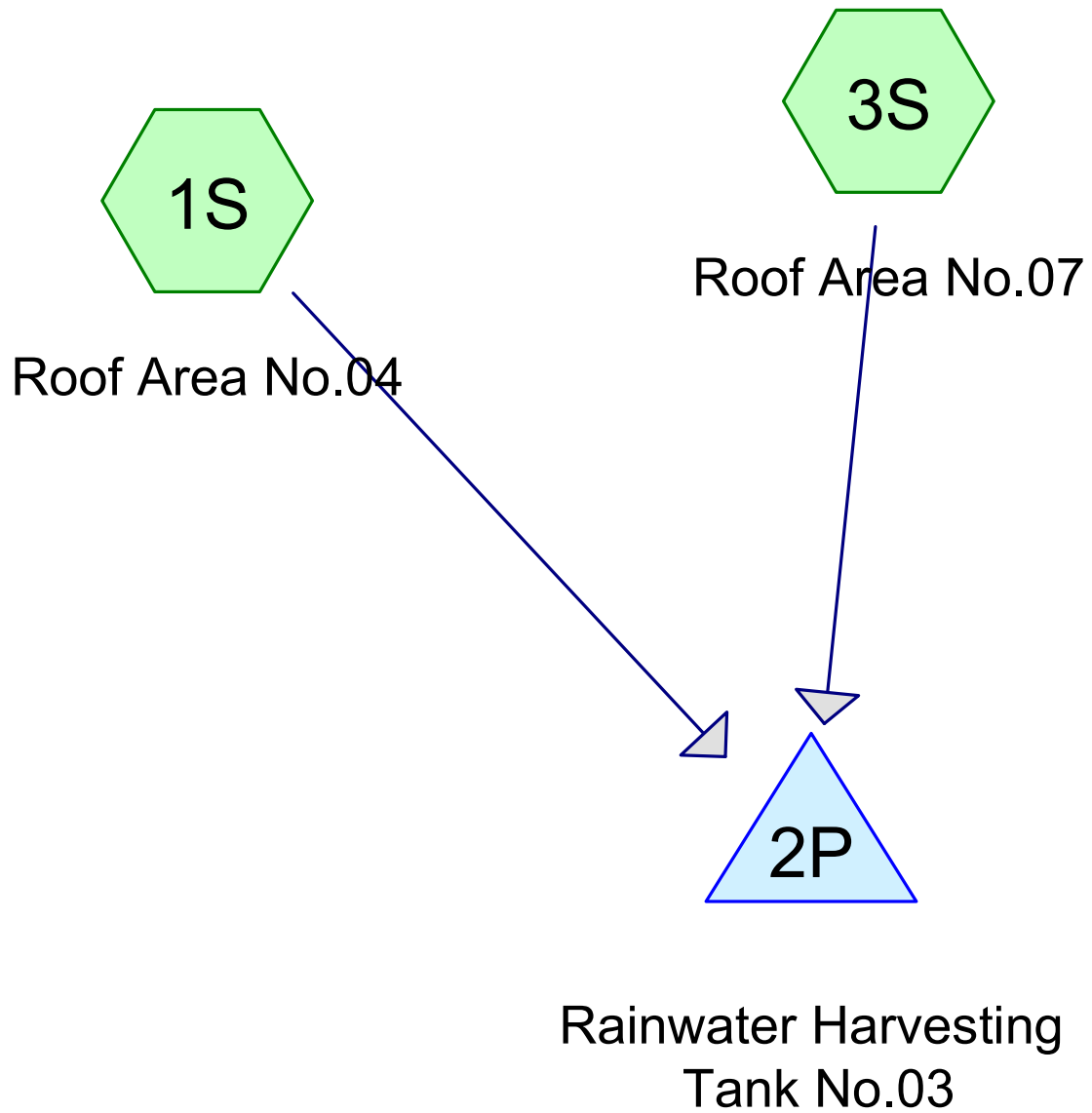
Stage-Discharge for Pond 2P: Rainwater Harvesting Tank No.02

Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)
0.000	0.0000	0.490	0.0009	0.980	0.0013
0.010	0.0000	0.500	0.0009	0.990	0.0013
0.020	0.0001	0.510	0.0009	1.000	0.0013
0.030	0.0002	0.520	0.0009	1.010	0.0013
0.040	0.0002	0.530	0.0009	1.020	0.0013
0.050	0.0003	0.540	0.0009	1.030	0.0013
0.060	0.0003	0.550	0.0010	1.040	0.0013
0.070	0.0003	0.560	0.0010	1.050	0.0013
0.080	0.0003	0.570	0.0010	1.060	0.0013
0.090	0.0004	0.580	0.0010	1.070	0.0013
0.100	0.0004	0.590	0.0010	1.080	0.0013
0.110	0.0004	0.600	0.0010	1.090	0.0014
0.120	0.0004	0.610	0.0010	1.100	0.0014
0.130	0.0004	0.620	0.0010	1.110	0.0014
0.140	0.0005	0.630	0.0010	1.120	0.0014
0.150	0.0005	0.640	0.0010	1.130	0.0014
0.160	0.0005	0.650	0.0010	1.140	0.0014
0.170	0.0005	0.660	0.0010	1.150	0.0014
0.180	0.0005	0.670	0.0011	1.160	0.0014
0.190	0.0005	0.680	0.0011	1.170	0.0014
0.200	0.0006	0.690	0.0011	1.180	0.0014
0.210	0.0006	0.700	0.0011	1.190	0.0014
0.220	0.0006	0.710	0.0011	1.200	0.0014
0.230	0.0006	0.720	0.0011		
0.240	0.0006	0.730	0.0011		
0.250	0.0006	0.740	0.0011		
0.260	0.0006	0.750	0.0011		
0.270	0.0007	0.760	0.0011		
0.280	0.0007	0.770	0.0011		
0.290	0.0007	0.780	0.0011		
0.300	0.0007	0.790	0.0012		
0.310	0.0007	0.800	0.0012		
0.320	0.0007	0.810	0.0012		
0.330	0.0007	0.820	0.0012		
0.340	0.0007	0.830	0.0012		
0.350	0.0008	0.840	0.0012		
0.360	0.0008	0.850	0.0012		
0.370	0.0008	0.860	0.0012		
0.380	0.0008	0.870	0.0012		
0.390	0.0008	0.880	0.0012		
0.400	0.0008	0.890	0.0012		
0.410	0.0008	0.900	0.0012		
0.420	0.0008	0.910	0.0012		
0.430	0.0008	0.920	0.0012		
0.440	0.0009	0.930	0.0012		
0.450	0.0009	0.940	0.0013		
0.460	0.0009	0.950	0.0013		
0.470	0.0009	0.960	0.0013		
0.480	0.0009	0.970	0.0013		

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Stage-Area-Storage for Pond 2P: Rainwater Harvesting Tank No.02

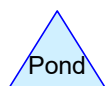
Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)
0.000	0.0	0.490	0.8	0.980	1.5
0.010	0.0	0.500	0.8	0.990	1.5
0.020	0.0	0.510	0.8	1.000	1.6
0.030	0.0	0.520	0.8	1.010	1.6
0.040	0.1	0.530	0.8	1.020	1.6
0.050	0.1	0.540	0.8	1.030	1.6
0.060	0.1	0.550	0.9	1.040	1.6
0.070	0.1	0.560	0.9	1.050	1.6
0.080	0.1	0.570	0.9	1.060	1.7
0.090	0.1	0.580	0.9	1.070	1.7
0.100	0.2	0.590	0.9	1.080	1.7
0.110	0.2	0.600	0.9	1.090	1.7
0.120	0.2	0.610	1.0	1.100	1.7
0.130	0.2	0.620	1.0	1.110	1.7
0.140	0.2	0.630	1.0	1.120	1.7
0.150	0.2	0.640	1.0	1.130	1.8
0.160	0.2	0.650	1.0	1.140	1.8
0.170	0.3	0.660	1.0	1.150	1.8
0.180	0.3	0.670	1.0	1.160	1.8
0.190	0.3	0.680	1.1	1.170	1.8
0.200	0.3	0.690	1.1	1.180	1.8
0.210	0.3	0.700	1.1	1.190	1.9
0.220	0.3	0.710	1.1	1.200	1.9
0.230	0.4	0.720	1.1		
0.240	0.4	0.730	1.1		
0.250	0.4	0.740	1.2		
0.260	0.4	0.750	1.2		
0.270	0.4	0.760	1.2		
0.280	0.4	0.770	1.2		
0.290	0.5	0.780	1.2		
0.300	0.5	0.790	1.2		
0.310	0.5	0.800	1.2		
0.320	0.5	0.810	1.3		
0.330	0.5	0.820	1.3		
0.340	0.5	0.830	1.3		
0.350	0.5	0.840	1.3		
0.360	0.6	0.850	1.3		
0.370	0.6	0.860	1.3		
0.380	0.6	0.870	1.4		
0.390	0.6	0.880	1.4		
0.400	0.6	0.890	1.4		
0.410	0.6	0.900	1.4		
0.420	0.7	0.910	1.4		
0.430	0.7	0.920	1.4		
0.440	0.7	0.930	1.5		
0.450	0.7	0.940	1.5		
0.460	0.7	0.950	1.5		
0.470	0.7	0.960	1.5		
0.480	0.7	0.970	1.5		



Subcat



Reach



Pond



Link

Routing Diagram for Rainwater Harvesting Tank Design No.03

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Rainwater Harvesting Tank Design No.03

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 1S: Roof Area No.04

Runoff = 0.0059 m³/s @ 0.08 hrs, Volume= 0.002 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.03

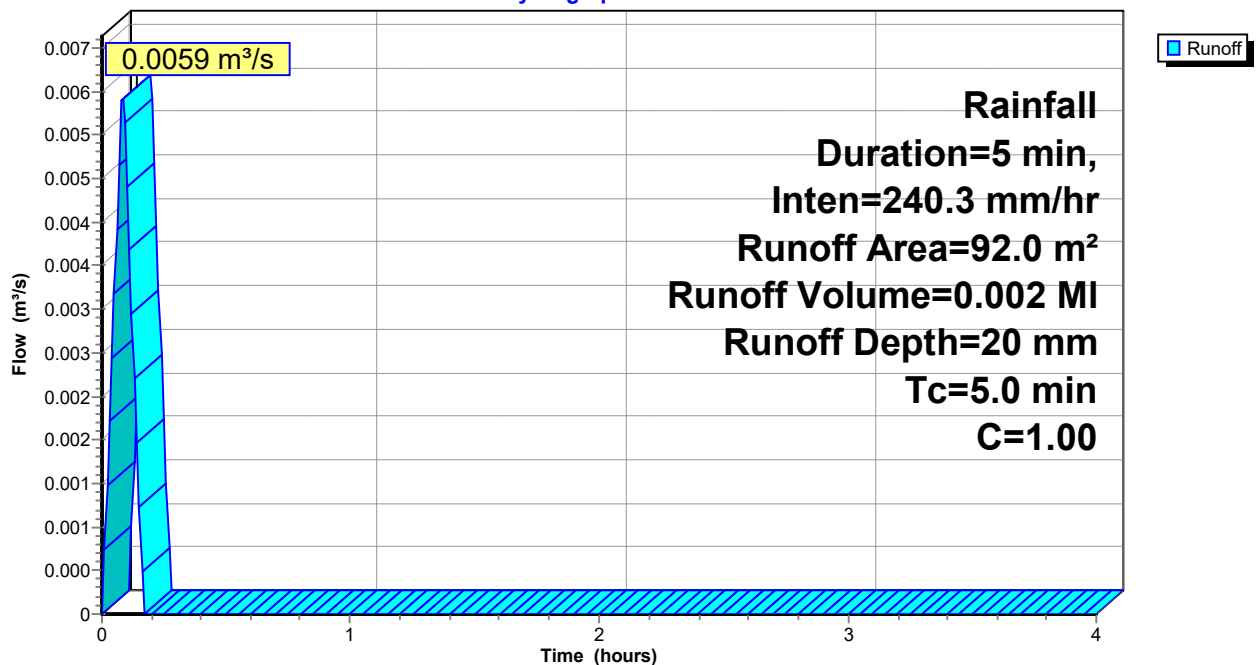
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
92.0	1.00	
92.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 1S: Roof Area No.04

Hydrograph



Rainwater Harvesting Tank Design No.03*Rainfall Duration=5 min, Inten=240.3 mm/hr*Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

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Hydrograph for Subcatchment 1S: Roof Area No.04

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0037	2.50	0.0000
0.10	0.0049	2.55	0.0000
0.15	0.0012	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.03

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 3S: Roof Area No.07

Runoff = 0.0015 m³/s @ 0.08 hrs, Volume= 0.000 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.03

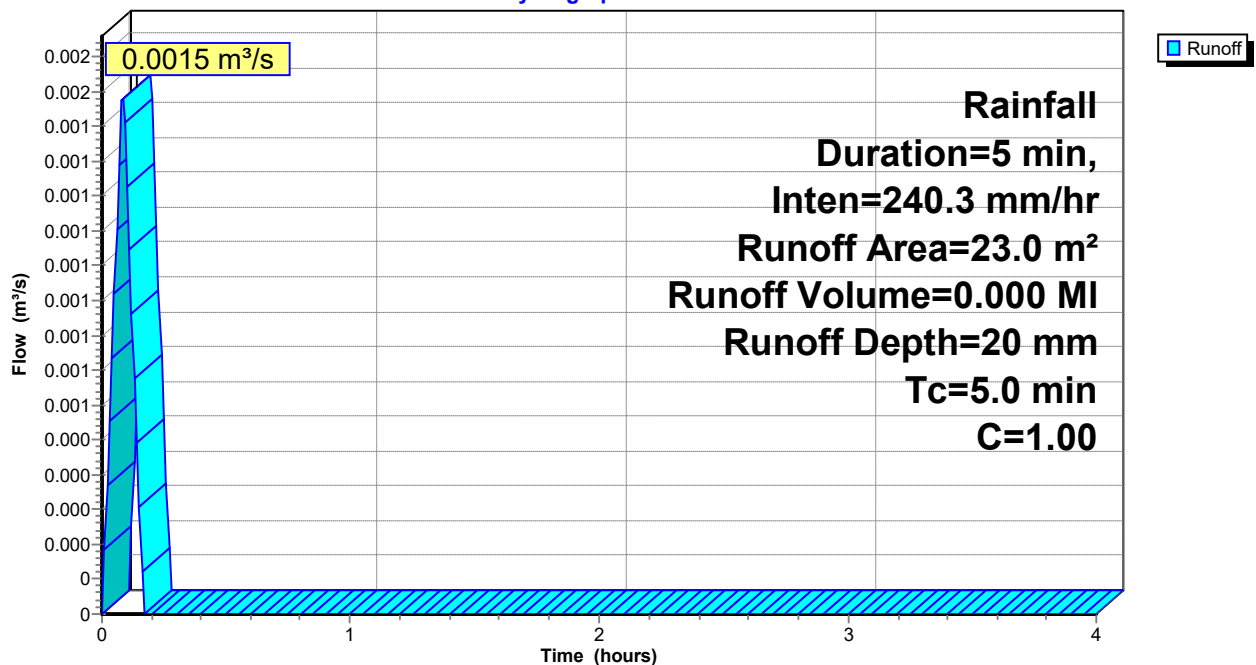
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
23.0	1.00	
23.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 3S: Roof Area No.07

Hydrograph



Rainwater Harvesting Tank Design No.03*Rainfall Duration=5 min, Inten=240.3 mm/hr*Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

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Hydrograph for Subcatchment 3S: Roof Area No.07

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0009	2.50	0.0000
0.10	0.0012	2.55	0.0000
0.15	0.0003	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.03 Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Pond 2P: Rainwater Harvesting Tank No.03

Inflow Area = 0.0115 ha, 100.00% Impervious, Inflow Depth = 20 mm
 Inflow = 0.0074 m³/s @ 0.08 hrs, Volume= 0.002 MI
 Outflow = 0.0012 m³/s @ 0.15 hrs, Volume= 0.002 MI, Atten= 84%, Lag= 4.3 min
 Primary = 0.0012 m³/s @ 0.15 hrs, Volume= 0.002 MI

Routing by Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.827 m @ 0.15 hrs Surf.Area= 2.3 m² Storage= 1.9 m³

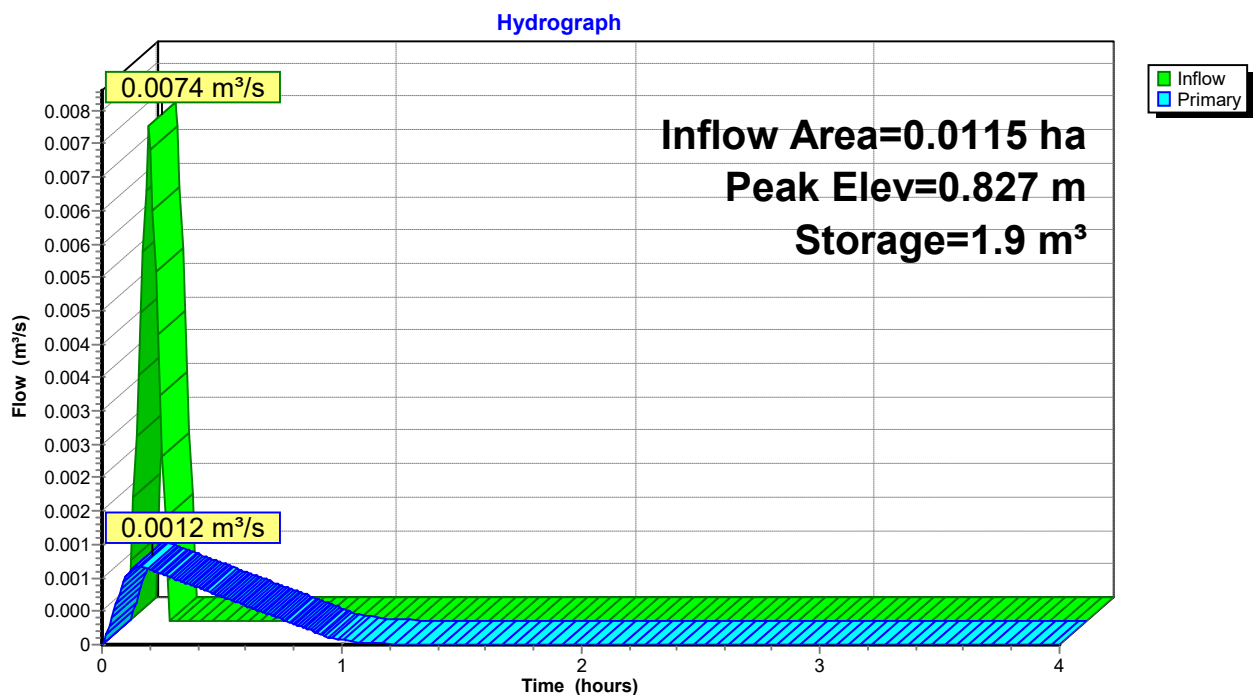
Plug-Flow detention time= 18.9 min calculated for 0.002 MI (100% of inflow)

Center-of-Mass det. time= 18.7 min (23.7 - 5.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.0 m ³	1.20 mD x 1.78 mH Vertical Cone/Cylinder x 2

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	25 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.0012 m³/s @ 0.15 hrs HW=0.825 m (Free Discharge)
 ←1=Orifice/Grate (Orifice Controls 0.0012 m³/s @ 2.40 m/s)

Pond 2P: Rainwater Harvesting Tank No.03

Rainwater Harvesting Tank Design No.03

Rainfall Duration=5 min, Inten=240.3 mm/hr

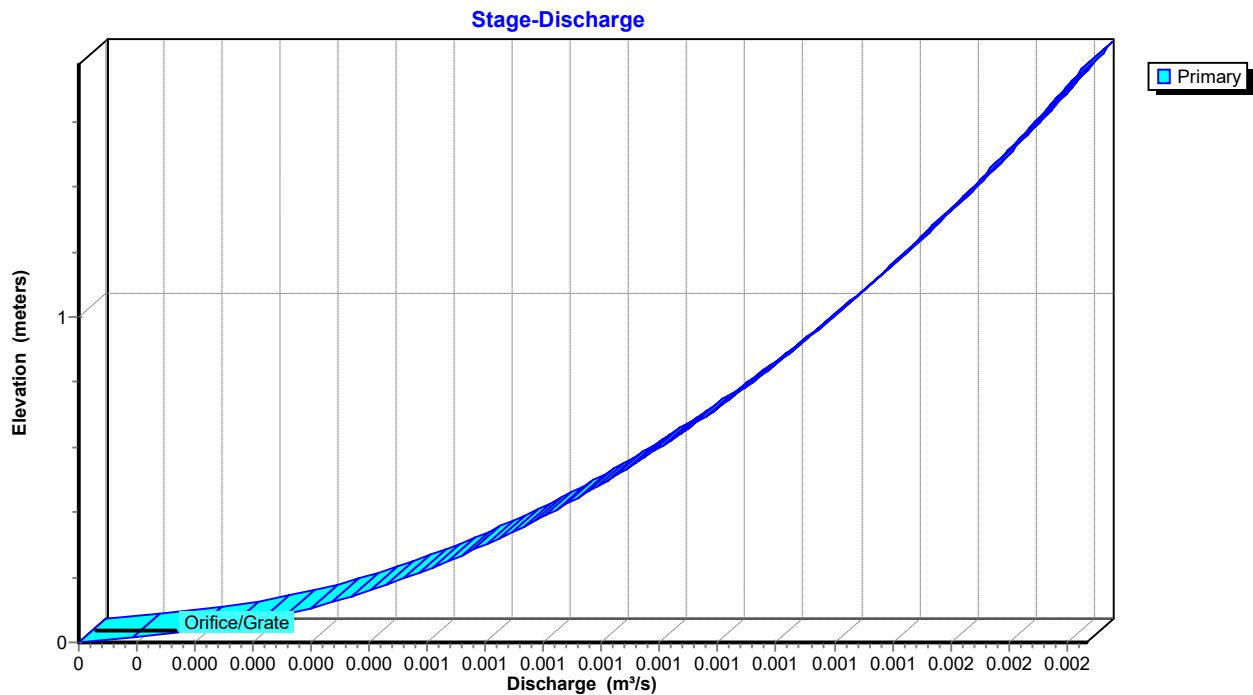
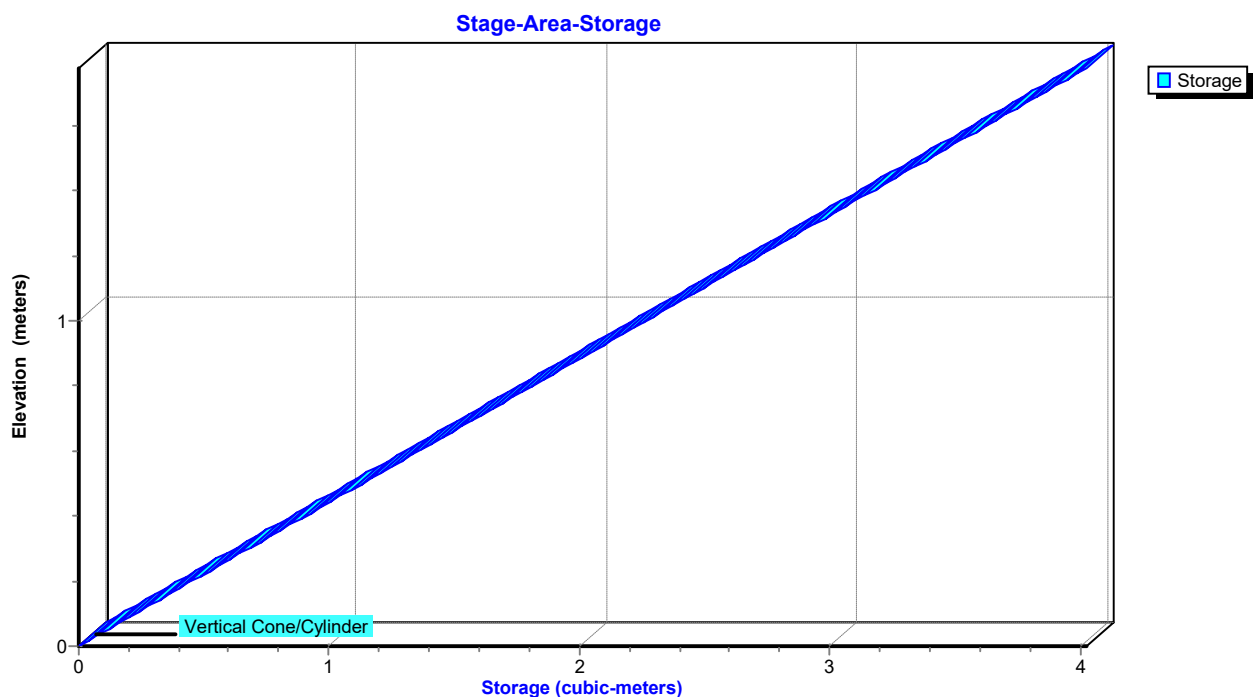
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Pond 2P: Rainwater Harvesting Tank No.03**Pond 2P: Rainwater Harvesting Tank No.03**

Rainwater Harvesting Tank Design No.03*Rainfall Duration=5 min, Inten=240.3 mm/hr*Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

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Hydrograph for Pond 2P: Rainwater Harvesting Tank No.03

Time (hours)	Inflow (m ³ /s)	Storage (cubic-meters)	Elevation (meters)	Primary (m ³ /s)
0.00	0.0000	0.0	0.000	0.0000
0.10	0.0061	1.4	0.610	0.0010
0.20	0.0000	1.7	0.756	0.0011
0.30	0.0000	1.3	0.588	0.0010
0.40	0.0000	1.0	0.441	0.0009
0.50	0.0000	0.7	0.316	0.0007
0.60	0.0000	0.5	0.212	0.0006
0.70	0.0000	0.3	0.130	0.0004
0.80	0.0000	0.2	0.070	0.0003
0.90	0.0000	0.1	0.031	0.0002
1.00	0.0000	0.0	0.013	0.0001
1.10	0.0000	0.0	0.006	0.0000
1.20	0.0000	0.0	0.002	0.0000
1.30	0.0000	0.0	0.001	0.0000
1.40	0.0000	0.0	0.000	0.0000
1.50	0.0000	0.0	0.000	0.0000
1.60	0.0000	0.0	0.000	0.0000
1.70	0.0000	0.0	0.000	0.0000
1.80	0.0000	0.0	0.000	0.0000
1.90	0.0000	0.0	0.000	0.0000
2.00	0.0000	0.0	0.000	0.0000
2.10	0.0000	0.0	0.000	0.0000
2.20	0.0000	0.0	0.000	0.0000
2.30	0.0000	0.0	0.000	0.0000
2.40	0.0000	0.0	0.000	0.0000
2.50	0.0000	0.0	0.000	0.0000
2.60	0.0000	0.0	0.000	0.0000
2.70	0.0000	0.0	0.000	0.0000
2.80	0.0000	0.0	0.000	0.0000
2.90	0.0000	0.0	0.000	0.0000
3.00	0.0000	0.0	0.000	0.0000
3.10	0.0000	0.0	0.000	0.0000
3.20	0.0000	0.0	0.000	0.0000
3.30	0.0000	0.0	0.000	0.0000
3.40	0.0000	0.0	0.000	0.0000
3.50	0.0000	0.0	0.000	0.0000
3.60	0.0000	0.0	0.000	0.0000
3.70	0.0000	0.0	0.000	0.0000
3.80	0.0000	0.0	0.000	0.0000
3.90	0.0000	0.0	0.000	0.0000
4.00	0.0000	0.0	0.000	0.0000

Rainwater Harvesting Tank Design No.03*Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Stage-Discharge for Pond 2P: Rainwater Harvesting Tank No.03

Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)
0.000	0.0000	0.490	0.0009	0.980	0.0013	1.470	0.0016
0.010	0.0000	0.500	0.0009	0.990	0.0013	1.480	0.0016
0.020	0.0001	0.510	0.0009	1.000	0.0013	1.490	0.0016
0.030	0.0002	0.520	0.0009	1.010	0.0013	1.500	0.0016
0.040	0.0002	0.530	0.0009	1.020	0.0013	1.510	0.0016
0.050	0.0003	0.540	0.0009	1.030	0.0013	1.520	0.0016
0.060	0.0003	0.550	0.0010	1.040	0.0013	1.530	0.0016
0.070	0.0003	0.560	0.0010	1.050	0.0013	1.540	0.0016
0.080	0.0003	0.570	0.0010	1.060	0.0013	1.550	0.0016
0.090	0.0004	0.580	0.0010	1.070	0.0013	1.560	0.0016
0.100	0.0004	0.590	0.0010	1.080	0.0013	1.570	0.0016
0.110	0.0004	0.600	0.0010	1.090	0.0014	1.580	0.0016
0.120	0.0004	0.610	0.0010	1.100	0.0014	1.590	0.0016
0.130	0.0004	0.620	0.0010	1.110	0.0014	1.600	0.0016
0.140	0.0005	0.630	0.0010	1.120	0.0014	1.610	0.0016
0.150	0.0005	0.640	0.0010	1.130	0.0014	1.620	0.0017
0.160	0.0005	0.650	0.0010	1.140	0.0014	1.630	0.0017
0.170	0.0005	0.660	0.0010	1.150	0.0014	1.640	0.0017
0.180	0.0005	0.670	0.0011	1.160	0.0014	1.650	0.0017
0.190	0.0005	0.680	0.0011	1.170	0.0014	1.660	0.0017
0.200	0.0006	0.690	0.0011	1.180	0.0014	1.670	0.0017
0.210	0.0006	0.700	0.0011	1.190	0.0014	1.680	0.0017
0.220	0.0006	0.710	0.0011	1.200	0.0014	1.690	0.0017
0.230	0.0006	0.720	0.0011	1.210	0.0014	1.700	0.0017
0.240	0.0006	0.730	0.0011	1.220	0.0014	1.710	0.0017
0.250	0.0006	0.740	0.0011	1.230	0.0014	1.720	0.0017
0.260	0.0006	0.750	0.0011	1.240	0.0014	1.730	0.0017
0.270	0.0007	0.760	0.0011	1.250	0.0015	1.740	0.0017
0.280	0.0007	0.770	0.0011	1.260	0.0015	1.750	0.0017
0.290	0.0007	0.780	0.0011	1.270	0.0015	1.760	0.0017
0.300	0.0007	0.790	0.0012	1.280	0.0015	1.770	0.0017
0.310	0.0007	0.800	0.0012	1.290	0.0015	1.780	0.0017
0.320	0.0007	0.810	0.0012	1.300	0.0015		
0.330	0.0007	0.820	0.0012	1.310	0.0015		
0.340	0.0007	0.830	0.0012	1.320	0.0015		
0.350	0.0008	0.840	0.0012	1.330	0.0015		
0.360	0.0008	0.850	0.0012	1.340	0.0015		
0.370	0.0008	0.860	0.0012	1.350	0.0015		
0.380	0.0008	0.870	0.0012	1.360	0.0015		
0.390	0.0008	0.880	0.0012	1.370	0.0015		
0.400	0.0008	0.890	0.0012	1.380	0.0015		
0.410	0.0008	0.900	0.0012	1.390	0.0015		
0.420	0.0008	0.910	0.0012	1.400	0.0015		
0.430	0.0008	0.920	0.0012	1.410	0.0015		
0.440	0.0009	0.930	0.0012	1.420	0.0015		
0.450	0.0009	0.940	0.0013	1.430	0.0016		
0.460	0.0009	0.950	0.0013	1.440	0.0016		
0.470	0.0009	0.960	0.0013	1.450	0.0016		
0.480	0.0009	0.970	0.0013	1.460	0.0016		

Rainwater Harvesting Tank Design No.03 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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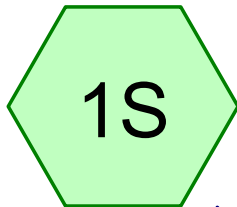
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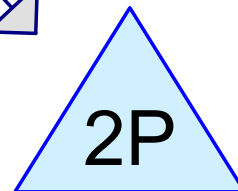
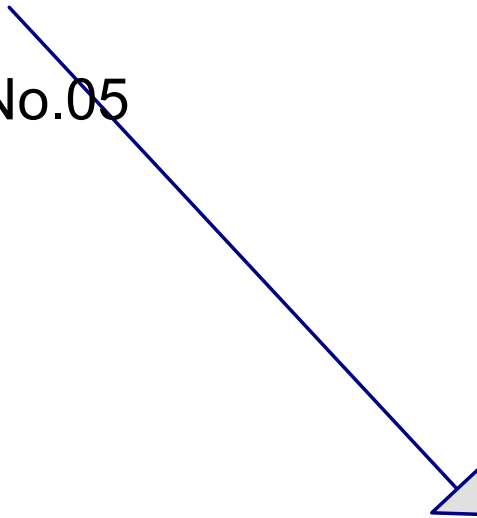
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Stage-Area-Storage for Pond 2P: Rainwater Harvesting Tank No.03

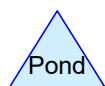
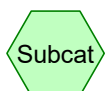
Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)
0.000	0.0	0.980	2.2
0.020	0.0	1.000	2.3
0.040	0.1	1.020	2.3
0.060	0.1	1.040	2.4
0.080	0.2	1.060	2.4
0.100	0.2	1.080	2.4
0.120	0.3	1.100	2.5
0.140	0.3	1.120	2.5
0.160	0.4	1.140	2.6
0.180	0.4	1.160	2.6
0.200	0.5	1.180	2.7
0.220	0.5	1.200	2.7
0.240	0.5	1.220	2.8
0.260	0.6	1.240	2.8
0.280	0.6	1.260	2.9
0.300	0.7	1.280	2.9
0.320	0.7	1.300	2.9
0.340	0.8	1.320	3.0
0.360	0.8	1.340	3.0
0.380	0.9	1.360	3.1
0.400	0.9	1.380	3.1
0.420	1.0	1.400	3.2
0.440	1.0	1.420	3.2
0.460	1.0	1.440	3.3
0.480	1.1	1.460	3.3
0.500	1.1	1.480	3.3
0.520	1.2	1.500	3.4
0.540	1.2	1.520	3.4
0.560	1.3	1.540	3.5
0.580	1.3	1.560	3.5
0.600	1.4	1.580	3.6
0.620	1.4	1.600	3.6
0.640	1.4	1.620	3.7
0.660	1.5	1.640	3.7
0.680	1.5	1.660	3.8
0.700	1.6	1.680	3.8
0.720	1.6	1.700	3.8
0.740	1.7	1.720	3.9
0.760	1.7	1.740	3.9
0.780	1.8	1.760	4.0
0.800	1.8	1.780	4.0
0.820	1.9		
0.840	1.9		
0.860	1.9		
0.880	2.0		
0.900	2.0		
0.920	2.1		
0.940	2.1		
0.960	2.2		



Roof Area No.05



Rainwater Harvesting
Tank No.04



Routing Diagram for Rainwater Harvesting Tank Design No.04

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Rainwater Harvesting Tank Design No.04

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 1S: Roof Area No.05

Runoff = 0.0039 m³/s @ 0.08 hrs, Volume= 0.001 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.04

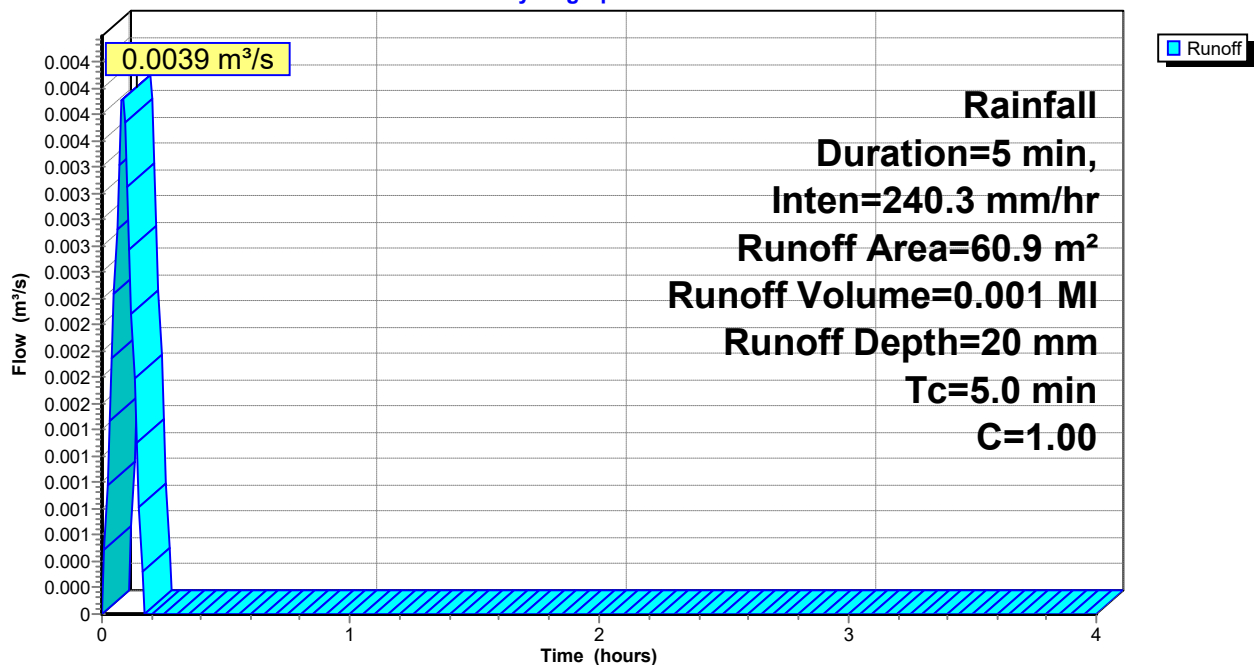
Runoff by Rational method, Rise/Fall=1.0/1.0 xT_c, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
60.9	1.00	
60.9		100.00% Impervious Area

T _c (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 1S: Roof Area No.05

Hydrograph



Rainwater Harvesting Tank Design No.04 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Subcatchment 1S: Roof Area No.05

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0024	2.50	0.0000
0.10	0.0033	2.55	0.0000
0.15	0.0008	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.04 Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Pond 2P: Rainwater Harvesting Tank No.04

Inflow Area = 0.0061 ha, 100.00% Impervious, Inflow Depth = 20 mm
 Inflow = 0.0039 m³/s @ 0.08 hrs, Volume= 0.001 MI
 Outflow = 0.0010 m³/s @ 0.15 hrs, Volume= 0.001 MI, Atten= 76%, Lag= 3.9 min
 Primary = 0.0010 m³/s @ 0.15 hrs, Volume= 0.001 MI

Routing by Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.554 m @ 0.15 hrs Surf.Area= 1.6 m² Storage= 0.9 m³

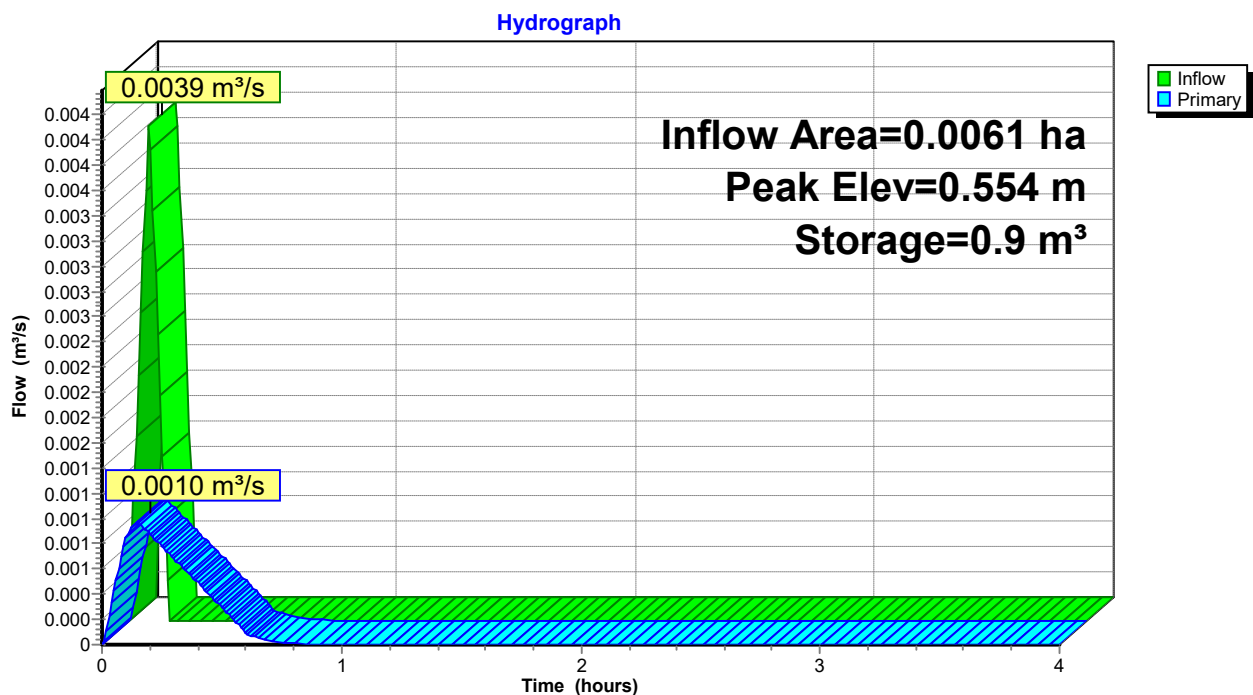
Plug-Flow detention time= 11.0 min calculated for 0.001 MI (100% of inflow)

Center-of-Mass det. time= 11.1 min (16.1 - 5.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	2.3 m ³	1.42 mD x 1.45 mH Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	25 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.0010 m³/s @ 0.15 hrs HW=0.553 m (Free Discharge)
 ←1=Orifice/Grate (Orifice Controls 0.0010 m³/s @ 1.95 m/s)

Pond 2P: Rainwater Harvesting Tank No.04

Rainwater Harvesting Tank Design No.04

Rainfall Duration=5 min, Inten=240.3 mm/hr

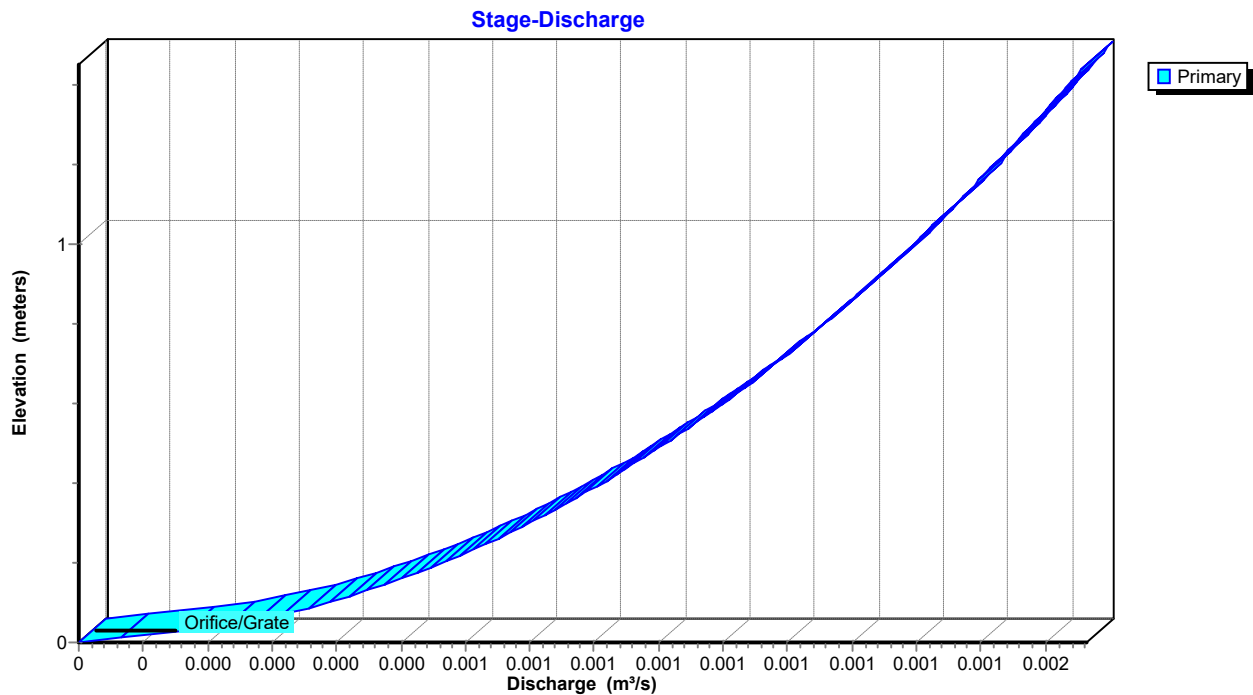
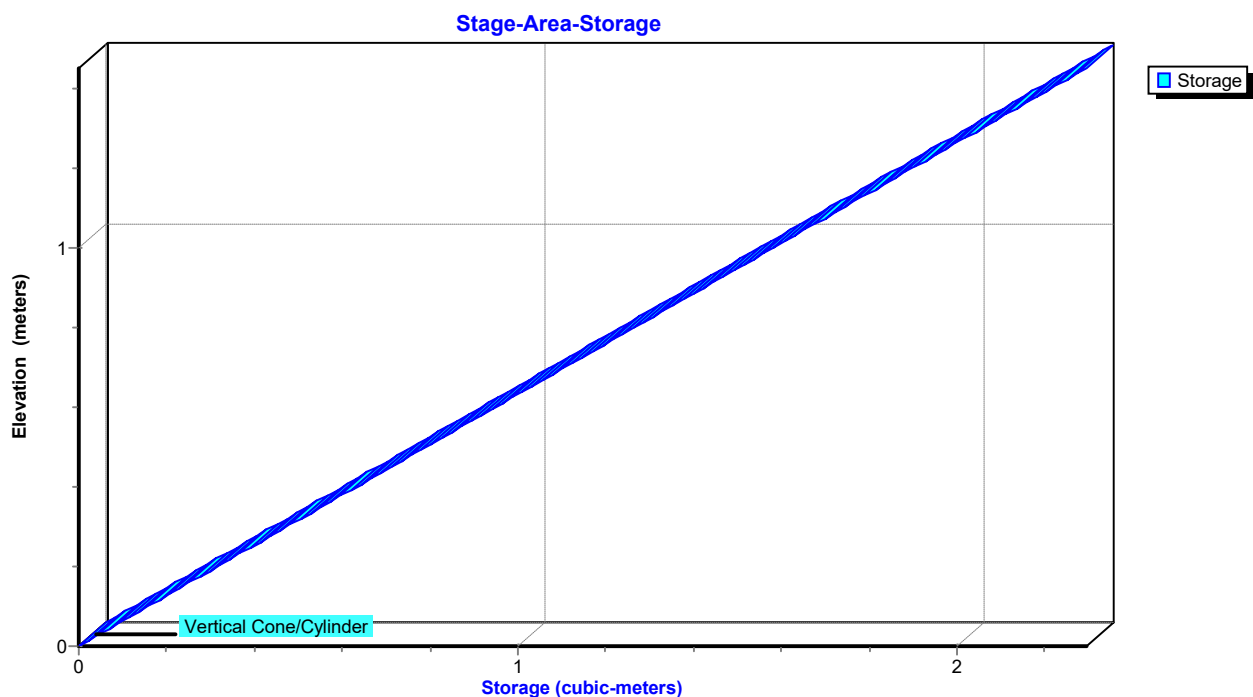
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Pond 2P: Rainwater Harvesting Tank No.04**Pond 2P: Rainwater Harvesting Tank No.04**

Rainwater Harvesting Tank Design No.04 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Pond 2P: Rainwater Harvesting Tank No.04

Time (hours)	Inflow (m ³ /s)	Storage (cubic-meters)	Elevation (meters)	Primary (m ³ /s)
0.00	0.0000	0.0	0.000	0.0000
0.10	0.0033	0.7	0.427	0.0008
0.20	0.0000	0.7	0.465	0.0009
0.30	0.0000	0.5	0.288	0.0007
0.40	0.0000	0.2	0.154	0.0005
0.50	0.0000	0.1	0.064	0.0003
0.60	0.0000	0.0	0.019	0.0001
0.70	0.0000	0.0	0.007	0.0000
0.80	0.0000	0.0	0.002	0.0000
0.90	0.0000	0.0	0.001	0.0000
1.00	0.0000	0.0	0.000	0.0000
1.10	0.0000	0.0	0.000	0.0000
1.20	0.0000	0.0	0.000	0.0000
1.30	0.0000	0.0	0.000	0.0000
1.40	0.0000	0.0	0.000	0.0000
1.50	0.0000	0.0	0.000	0.0000
1.60	0.0000	0.0	0.000	0.0000
1.70	0.0000	0.0	0.000	0.0000
1.80	0.0000	0.0	0.000	0.0000
1.90	0.0000	0.0	0.000	0.0000
2.00	0.0000	0.0	0.000	0.0000
2.10	0.0000	0.0	0.000	0.0000
2.20	0.0000	0.0	0.000	0.0000
2.30	0.0000	0.0	0.000	0.0000
2.40	0.0000	0.0	0.000	0.0000
2.50	0.0000	0.0	0.000	0.0000
2.60	0.0000	0.0	0.000	0.0000
2.70	0.0000	0.0	0.000	0.0000
2.80	0.0000	0.0	0.000	0.0000
2.90	0.0000	0.0	0.000	0.0000
3.00	0.0000	0.0	0.000	0.0000
3.10	0.0000	0.0	0.000	0.0000
3.20	0.0000	0.0	0.000	0.0000
3.30	0.0000	0.0	0.000	0.0000
3.40	0.0000	0.0	0.000	0.0000
3.50	0.0000	0.0	0.000	0.0000
3.60	0.0000	0.0	0.000	0.0000
3.70	0.0000	0.0	0.000	0.0000
3.80	0.0000	0.0	0.000	0.0000
3.90	0.0000	0.0	0.000	0.0000
4.00	0.0000	0.0	0.000	0.0000

Rainwater Harvesting Tank Design No.04*Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Stage-Discharge for Pond 2P: Rainwater Harvesting Tank No.04

Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)
0.000	0.0000	0.490	0.0009	0.980	0.0013
0.010	0.0000	0.500	0.0009	0.990	0.0013
0.020	0.0001	0.510	0.0009	1.000	0.0013
0.030	0.0002	0.520	0.0009	1.010	0.0013
0.040	0.0002	0.530	0.0009	1.020	0.0013
0.050	0.0003	0.540	0.0009	1.030	0.0013
0.060	0.0003	0.550	0.0010	1.040	0.0013
0.070	0.0003	0.560	0.0010	1.050	0.0013
0.080	0.0003	0.570	0.0010	1.060	0.0013
0.090	0.0004	0.580	0.0010	1.070	0.0013
0.100	0.0004	0.590	0.0010	1.080	0.0013
0.110	0.0004	0.600	0.0010	1.090	0.0014
0.120	0.0004	0.610	0.0010	1.100	0.0014
0.130	0.0004	0.620	0.0010	1.110	0.0014
0.140	0.0005	0.630	0.0010	1.120	0.0014
0.150	0.0005	0.640	0.0010	1.130	0.0014
0.160	0.0005	0.650	0.0010	1.140	0.0014
0.170	0.0005	0.660	0.0010	1.150	0.0014
0.180	0.0005	0.670	0.0011	1.160	0.0014
0.190	0.0005	0.680	0.0011	1.170	0.0014
0.200	0.0006	0.690	0.0011	1.180	0.0014
0.210	0.0006	0.700	0.0011	1.190	0.0014
0.220	0.0006	0.710	0.0011	1.200	0.0014
0.230	0.0006	0.720	0.0011	1.210	0.0014
0.240	0.0006	0.730	0.0011	1.220	0.0014
0.250	0.0006	0.740	0.0011	1.230	0.0014
0.260	0.0006	0.750	0.0011	1.240	0.0014
0.270	0.0007	0.760	0.0011	1.250	0.0015
0.280	0.0007	0.770	0.0011	1.260	0.0015
0.290	0.0007	0.780	0.0011	1.270	0.0015
0.300	0.0007	0.790	0.0012	1.280	0.0015
0.310	0.0007	0.800	0.0012	1.290	0.0015
0.320	0.0007	0.810	0.0012	1.300	0.0015
0.330	0.0007	0.820	0.0012	1.310	0.0015
0.340	0.0007	0.830	0.0012	1.320	0.0015
0.350	0.0008	0.840	0.0012	1.330	0.0015
0.360	0.0008	0.850	0.0012	1.340	0.0015
0.370	0.0008	0.860	0.0012	1.350	0.0015
0.380	0.0008	0.870	0.0012	1.360	0.0015
0.390	0.0008	0.880	0.0012	1.370	0.0015
0.400	0.0008	0.890	0.0012	1.380	0.0015
0.410	0.0008	0.900	0.0012	1.390	0.0015
0.420	0.0008	0.910	0.0012	1.400	0.0015
0.430	0.0008	0.920	0.0012	1.410	0.0015
0.440	0.0009	0.930	0.0012	1.420	0.0015
0.450	0.0009	0.940	0.0013	1.430	0.0016
0.460	0.0009	0.950	0.0013	1.440	0.0016
0.470	0.0009	0.960	0.0013	1.450	0.0016
0.480	0.0009	0.970	0.0013		

Rainwater Harvesting Tank Design No.04 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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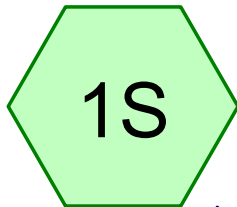
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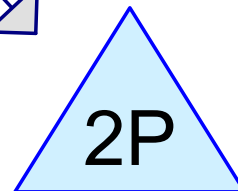
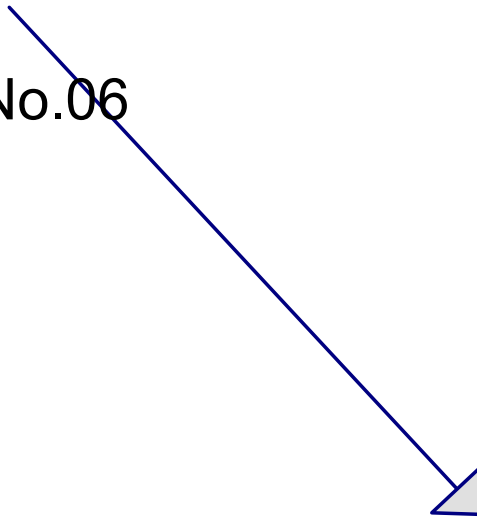
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Stage-Area-Storage for Pond 2P: Rainwater Harvesting Tank No.04

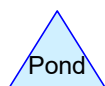
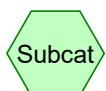
Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)
0.000	0.0	0.490	0.8	0.980	1.6
0.010	0.0	0.500	0.8	0.990	1.6
0.020	0.0	0.510	0.8	1.000	1.6
0.030	0.0	0.520	0.8	1.010	1.6
0.040	0.1	0.530	0.8	1.020	1.6
0.050	0.1	0.540	0.9	1.030	1.6
0.060	0.1	0.550	0.9	1.040	1.6
0.070	0.1	0.560	0.9	1.050	1.7
0.080	0.1	0.570	0.9	1.060	1.7
0.090	0.1	0.580	0.9	1.070	1.7
0.100	0.2	0.590	0.9	1.080	1.7
0.110	0.2	0.600	1.0	1.090	1.7
0.120	0.2	0.610	1.0	1.100	1.7
0.130	0.2	0.620	1.0	1.110	1.8
0.140	0.2	0.630	1.0	1.120	1.8
0.150	0.2	0.640	1.0	1.130	1.8
0.160	0.3	0.650	1.0	1.140	1.8
0.170	0.3	0.660	1.0	1.150	1.8
0.180	0.3	0.670	1.1	1.160	1.8
0.190	0.3	0.680	1.1	1.170	1.9
0.200	0.3	0.690	1.1	1.180	1.9
0.210	0.3	0.700	1.1	1.190	1.9
0.220	0.3	0.710	1.1	1.200	1.9
0.230	0.4	0.720	1.1	1.210	1.9
0.240	0.4	0.730	1.2	1.220	1.9
0.250	0.4	0.740	1.2	1.230	1.9
0.260	0.4	0.750	1.2	1.240	2.0
0.270	0.4	0.760	1.2	1.250	2.0
0.280	0.4	0.770	1.2	1.260	2.0
0.290	0.5	0.780	1.2	1.270	2.0
0.300	0.5	0.790	1.3	1.280	2.0
0.310	0.5	0.800	1.3	1.290	2.0
0.320	0.5	0.810	1.3	1.300	2.1
0.330	0.5	0.820	1.3	1.310	2.1
0.340	0.5	0.830	1.3	1.320	2.1
0.350	0.6	0.840	1.3	1.330	2.1
0.360	0.6	0.850	1.3	1.340	2.1
0.370	0.6	0.860	1.4	1.350	2.1
0.380	0.6	0.870	1.4	1.360	2.2
0.390	0.6	0.880	1.4	1.370	2.2
0.400	0.6	0.890	1.4	1.380	2.2
0.410	0.6	0.900	1.4	1.390	2.2
0.420	0.7	0.910	1.4	1.400	2.2
0.430	0.7	0.920	1.5	1.410	2.2
0.440	0.7	0.930	1.5	1.420	2.2
0.450	0.7	0.940	1.5	1.430	2.3
0.460	0.7	0.950	1.5	1.440	2.3
0.470	0.7	0.960	1.5	1.450	2.3
0.480	0.8	0.970	1.5		



Roof Area No.06



Rainwater Harvesting
Tank No.05



Routing Diagram for Rainwater Harvesting Tank Design No.05

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Rainwater Harvesting Tank Design No.05

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 1S: Roof Area No.06

Runoff = 0.0071 m³/s @ 0.08 hrs, Volume= 0.002 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.05

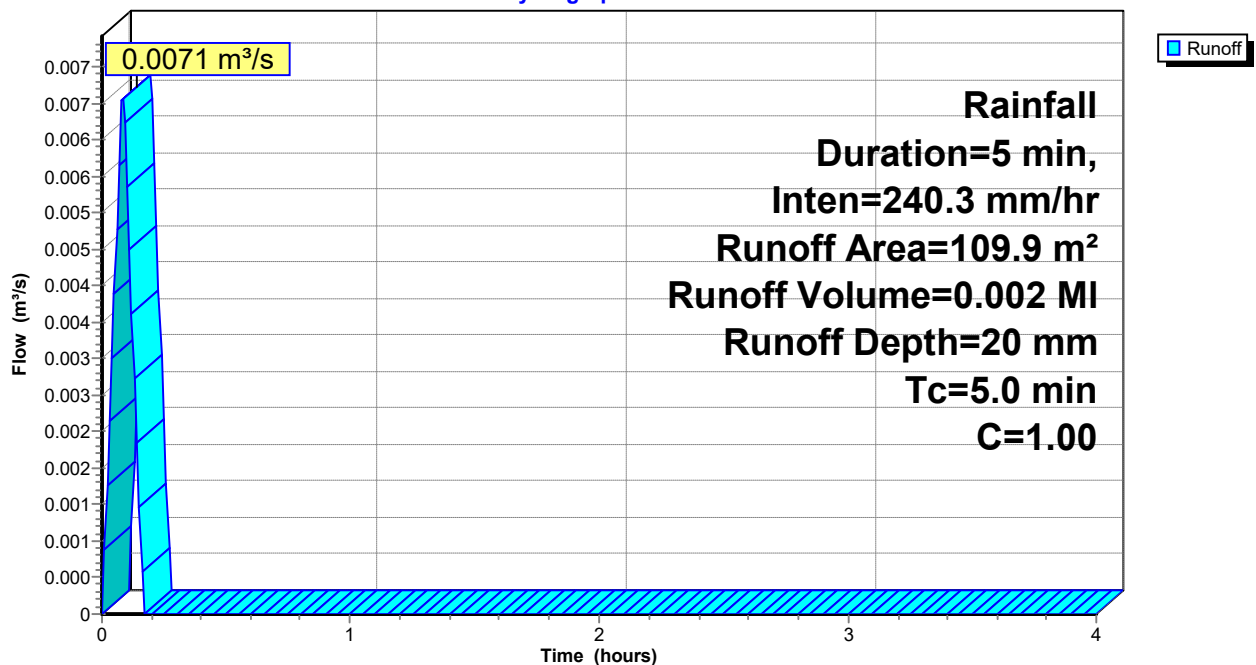
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
109.9	1.00	
109.9		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 1S: Roof Area No.06

Hydrograph



Rainwater Harvesting Tank Design No.05*Rainfall Duration=5 min, Inten=240.3 mm/hr*Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

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Hydrograph for Subcatchment 1S: Roof Area No.06

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0044	2.50	0.0000
0.10	0.0059	2.55	0.0000
0.15	0.0015	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

Rainwater Harvesting Tank Design No.05 Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Pond 2P: Rainwater Harvesting Tank No.05

Inflow Area = 0.0110 ha, 100.00% Impervious, Inflow Depth = 20 mm
 Inflow = 0.0071 m³/s @ 0.08 hrs, Volume= 0.002 MI
 Outflow = 0.0011 m³/s @ 0.15 hrs, Volume= 0.002 MI, Atten= 84%, Lag= 4.3 min
 Primary = 0.0011 m³/s @ 0.15 hrs, Volume= 0.002 MI

Routing by Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.787 m @ 0.15 hrs Surf.Area= 2.3 m² Storage= 1.8 m³

Plug-Flow detention time= 18.5 min calculated for 0.002 MI (100% of inflow)

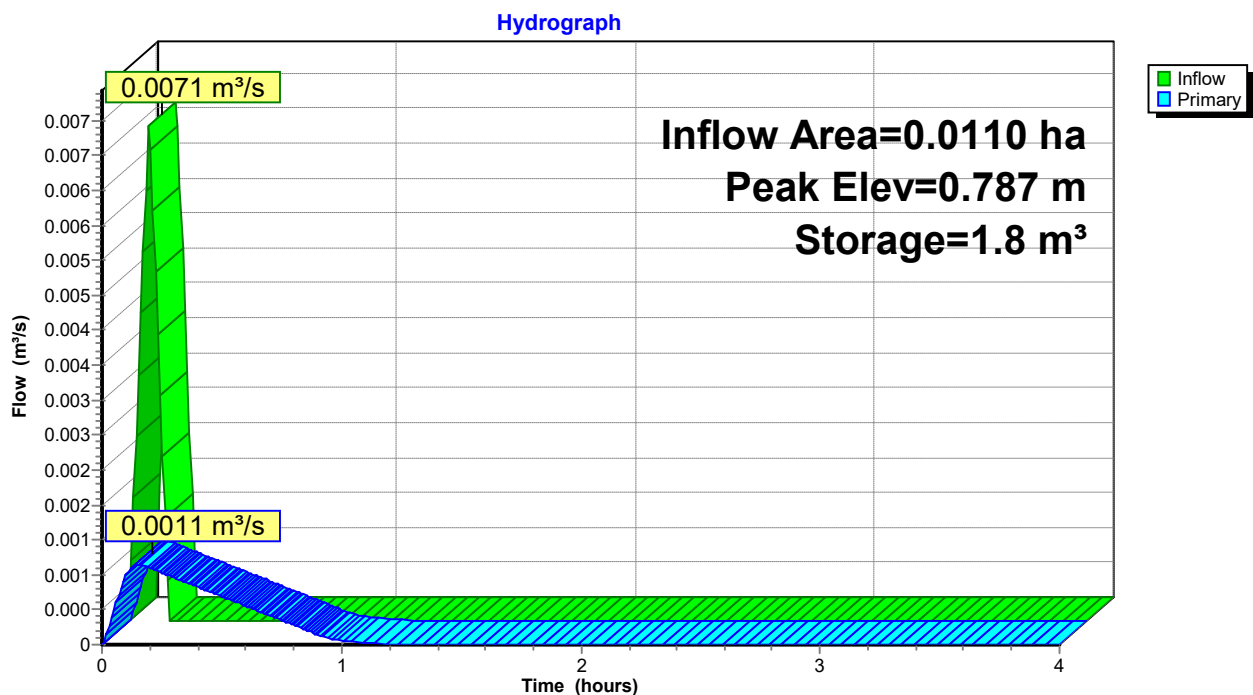
Center-of-Mass det. time= 18.3 min (23.3 - 5.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	4.0 m ³	1.20 mD x 1.78 mH Vertical Cone/Cylinder x 2

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	25 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

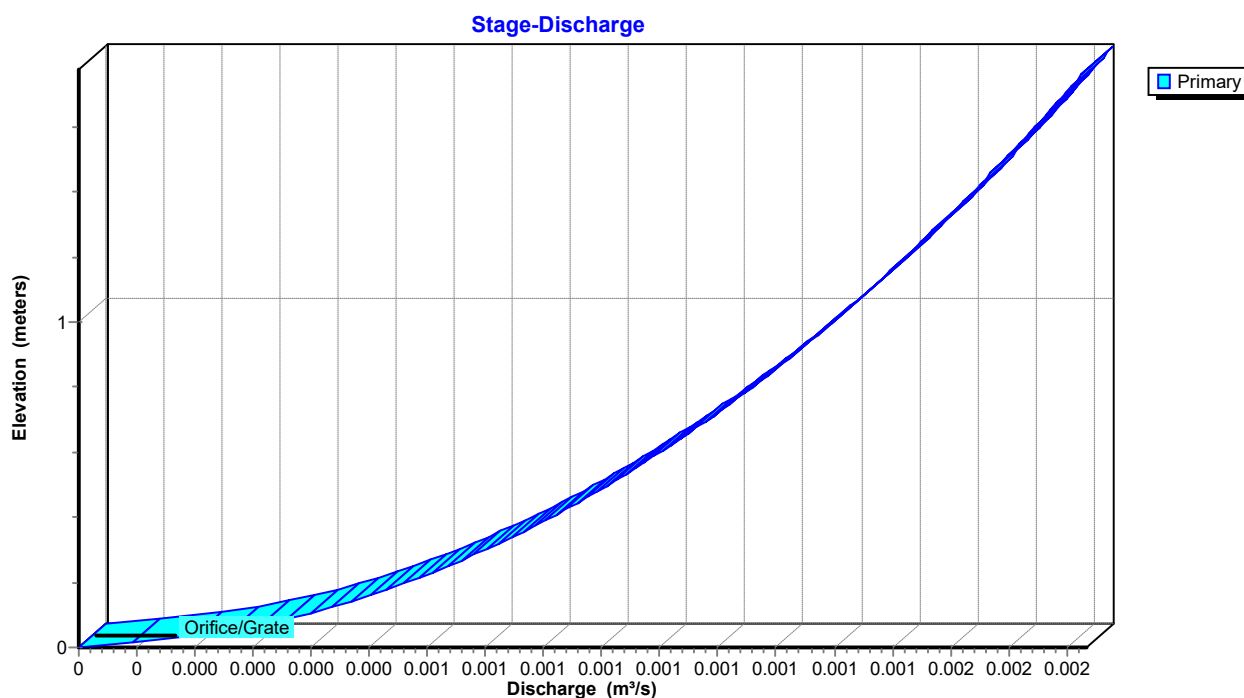
Primary OutFlow Max=0.0011 m³/s @ 0.15 hrs HW=0.785 m (Free Discharge)

←1=Orifice/Grate (Orifice Controls 0.0011 m³/s @ 2.34 m/s)

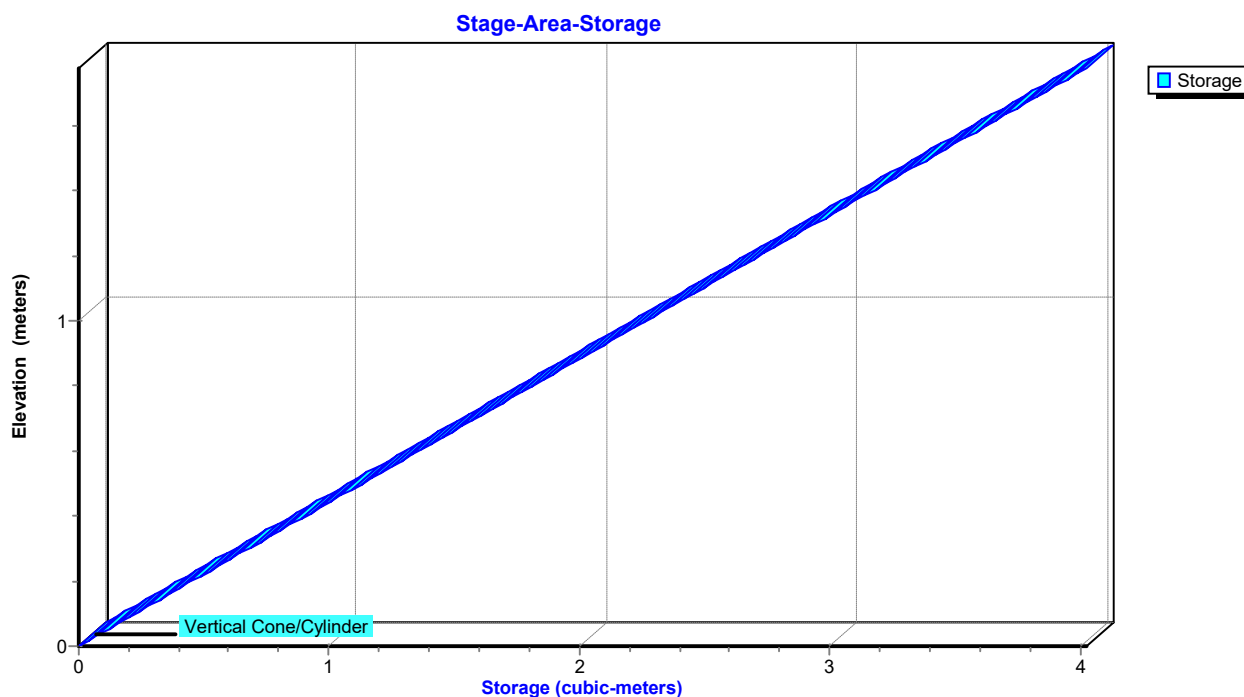
Pond 2P: Rainwater Harvesting Tank No.05

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Pond 2P: Rainwater Harvesting Tank No.05



Pond 2P: Rainwater Harvesting Tank No.05



Rainwater Harvesting Tank Design No.05 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Pond 2P: Rainwater Harvesting Tank No.05

Time (hours)	Inflow (m ³ /s)	Storage (cubic-meters)	Elevation (meters)	Primary (m ³ /s)
0.00	0.0000	0.0	0.000	0.0000
0.10	0.0059	1.3	0.581	0.0010
0.20	0.0000	1.6	0.718	0.0011
0.30	0.0000	1.3	0.554	0.0010
0.40	0.0000	0.9	0.412	0.0008
0.50	0.0000	0.7	0.292	0.0007
0.60	0.0000	0.4	0.193	0.0006
0.70	0.0000	0.3	0.115	0.0004
0.80	0.0000	0.1	0.060	0.0003
0.90	0.0000	0.1	0.026	0.0001
1.00	0.0000	0.0	0.011	0.0001
1.10	0.0000	0.0	0.005	0.0000
1.20	0.0000	0.0	0.002	0.0000
1.30	0.0000	0.0	0.001	0.0000
1.40	0.0000	0.0	0.000	0.0000
1.50	0.0000	0.0	0.000	0.0000
1.60	0.0000	0.0	0.000	0.0000
1.70	0.0000	0.0	0.000	0.0000
1.80	0.0000	0.0	0.000	0.0000
1.90	0.0000	0.0	0.000	0.0000
2.00	0.0000	0.0	0.000	0.0000
2.10	0.0000	0.0	0.000	0.0000
2.20	0.0000	0.0	0.000	0.0000
2.30	0.0000	0.0	0.000	0.0000
2.40	0.0000	0.0	0.000	0.0000
2.50	0.0000	0.0	0.000	0.0000
2.60	0.0000	0.0	0.000	0.0000
2.70	0.0000	0.0	0.000	0.0000
2.80	0.0000	0.0	0.000	0.0000
2.90	0.0000	0.0	0.000	0.0000
3.00	0.0000	0.0	0.000	0.0000
3.10	0.0000	0.0	0.000	0.0000
3.20	0.0000	0.0	0.000	0.0000
3.30	0.0000	0.0	0.000	0.0000
3.40	0.0000	0.0	0.000	0.0000
3.50	0.0000	0.0	0.000	0.0000
3.60	0.0000	0.0	0.000	0.0000
3.70	0.0000	0.0	0.000	0.0000
3.80	0.0000	0.0	0.000	0.0000
3.90	0.0000	0.0	0.000	0.0000
4.00	0.0000	0.0	0.000	0.0000

Rainwater Harvesting Tank Design No.05 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Stage-Discharge for Pond 2P: Rainwater Harvesting Tank No.05

Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)
0.000	0.0000	0.490	0.0009	0.980	0.0013	1.470	0.0016
0.010	0.0000	0.500	0.0009	0.990	0.0013	1.480	0.0016
0.020	0.0001	0.510	0.0009	1.000	0.0013	1.490	0.0016
0.030	0.0002	0.520	0.0009	1.010	0.0013	1.500	0.0016
0.040	0.0002	0.530	0.0009	1.020	0.0013	1.510	0.0016
0.050	0.0003	0.540	0.0009	1.030	0.0013	1.520	0.0016
0.060	0.0003	0.550	0.0010	1.040	0.0013	1.530	0.0016
0.070	0.0003	0.560	0.0010	1.050	0.0013	1.540	0.0016
0.080	0.0003	0.570	0.0010	1.060	0.0013	1.550	0.0016
0.090	0.0004	0.580	0.0010	1.070	0.0013	1.560	0.0016
0.100	0.0004	0.590	0.0010	1.080	0.0013	1.570	0.0016
0.110	0.0004	0.600	0.0010	1.090	0.0014	1.580	0.0016
0.120	0.0004	0.610	0.0010	1.100	0.0014	1.590	0.0016
0.130	0.0004	0.620	0.0010	1.110	0.0014	1.600	0.0016
0.140	0.0005	0.630	0.0010	1.120	0.0014	1.610	0.0016
0.150	0.0005	0.640	0.0010	1.130	0.0014	1.620	0.0017
0.160	0.0005	0.650	0.0010	1.140	0.0014	1.630	0.0017
0.170	0.0005	0.660	0.0010	1.150	0.0014	1.640	0.0017
0.180	0.0005	0.670	0.0011	1.160	0.0014	1.650	0.0017
0.190	0.0005	0.680	0.0011	1.170	0.0014	1.660	0.0017
0.200	0.0006	0.690	0.0011	1.180	0.0014	1.670	0.0017
0.210	0.0006	0.700	0.0011	1.190	0.0014	1.680	0.0017
0.220	0.0006	0.710	0.0011	1.200	0.0014	1.690	0.0017
0.230	0.0006	0.720	0.0011	1.210	0.0014	1.700	0.0017
0.240	0.0006	0.730	0.0011	1.220	0.0014	1.710	0.0017
0.250	0.0006	0.740	0.0011	1.230	0.0014	1.720	0.0017
0.260	0.0006	0.750	0.0011	1.240	0.0014	1.730	0.0017
0.270	0.0007	0.760	0.0011	1.250	0.0015	1.740	0.0017
0.280	0.0007	0.770	0.0011	1.260	0.0015	1.750	0.0017
0.290	0.0007	0.780	0.0011	1.270	0.0015	1.760	0.0017
0.300	0.0007	0.790	0.0012	1.280	0.0015	1.770	0.0017
0.310	0.0007	0.800	0.0012	1.290	0.0015	1.780	0.0017
0.320	0.0007	0.810	0.0012	1.300	0.0015		
0.330	0.0007	0.820	0.0012	1.310	0.0015		
0.340	0.0007	0.830	0.0012	1.320	0.0015		
0.350	0.0008	0.840	0.0012	1.330	0.0015		
0.360	0.0008	0.850	0.0012	1.340	0.0015		
0.370	0.0008	0.860	0.0012	1.350	0.0015		
0.380	0.0008	0.870	0.0012	1.360	0.0015		
0.390	0.0008	0.880	0.0012	1.370	0.0015		
0.400	0.0008	0.890	0.0012	1.380	0.0015		
0.410	0.0008	0.900	0.0012	1.390	0.0015		
0.420	0.0008	0.910	0.0012	1.400	0.0015		
0.430	0.0008	0.920	0.0012	1.410	0.0015		
0.440	0.0009	0.930	0.0012	1.420	0.0015		
0.450	0.0009	0.940	0.0013	1.430	0.0016		
0.460	0.0009	0.950	0.0013	1.440	0.0016		
0.470	0.0009	0.960	0.0013	1.450	0.0016		
0.480	0.0009	0.970	0.0013	1.460	0.0016		

Rainwater Harvesting Tank Design No.05 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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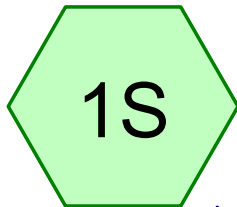
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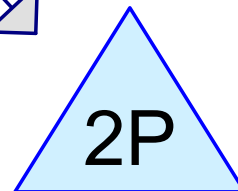
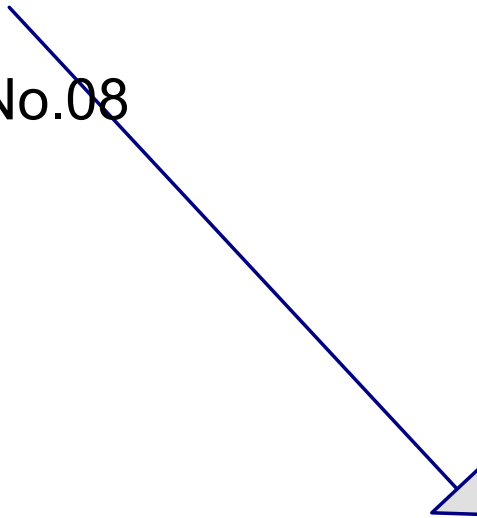
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Stage-Area-Storage for Pond 2P: Rainwater Harvesting Tank No.05

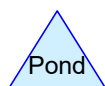
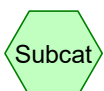
Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)
0.000	0.0	0.980	2.2
0.020	0.0	1.000	2.3
0.040	0.1	1.020	2.3
0.060	0.1	1.040	2.4
0.080	0.2	1.060	2.4
0.100	0.2	1.080	2.4
0.120	0.3	1.100	2.5
0.140	0.3	1.120	2.5
0.160	0.4	1.140	2.6
0.180	0.4	1.160	2.6
0.200	0.5	1.180	2.7
0.220	0.5	1.200	2.7
0.240	0.5	1.220	2.8
0.260	0.6	1.240	2.8
0.280	0.6	1.260	2.9
0.300	0.7	1.280	2.9
0.320	0.7	1.300	2.9
0.340	0.8	1.320	3.0
0.360	0.8	1.340	3.0
0.380	0.9	1.360	3.1
0.400	0.9	1.380	3.1
0.420	1.0	1.400	3.2
0.440	1.0	1.420	3.2
0.460	1.0	1.440	3.3
0.480	1.1	1.460	3.3
0.500	1.1	1.480	3.3
0.520	1.2	1.500	3.4
0.540	1.2	1.520	3.4
0.560	1.3	1.540	3.5
0.580	1.3	1.560	3.5
0.600	1.4	1.580	3.6
0.620	1.4	1.600	3.6
0.640	1.4	1.620	3.7
0.660	1.5	1.640	3.7
0.680	1.5	1.660	3.8
0.700	1.6	1.680	3.8
0.720	1.6	1.700	3.8
0.740	1.7	1.720	3.9
0.760	1.7	1.740	3.9
0.780	1.8	1.760	4.0
0.800	1.8	1.780	4.0
0.820	1.9		
0.840	1.9		
0.860	1.9		
0.880	2.0		
0.900	2.0		
0.920	2.1		
0.940	2.1		
0.960	2.2		



Roof Area No.08



Rainwater Harvesting
Tank No.06



Routing Diagram for Rainwater Harvesting Tank Design No.06

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Rainwater Harvesting Tank Design No.06

Rainfall Duration=5 min, Inten=240.3 mm/hr

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Summary for Subcatchment 1S: Roof Area No.08

Runoff = 0.0015 m³/s @ 0.08 hrs, Volume= 0.000 MI, Depth= 20 mm
 Routed to Pond 2P : Rainwater Harvesting Tank No.06

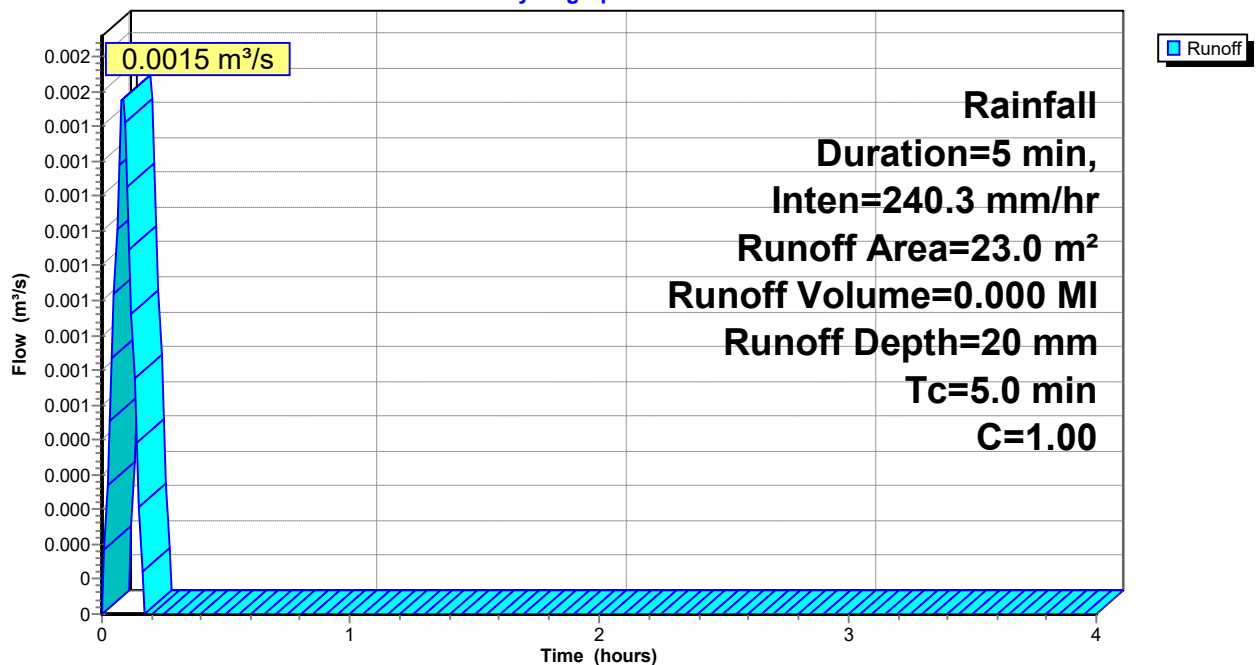
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Rainfall Duration=5 min, Inten=240.3 mm/hr

Area (m ²)	C	Description
23.0	1.00	
23.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m ³ /s)	Description
5.0					Direct Entry,

Subcatchment 1S: Roof Area No.08

Hydrograph



Rainwater Harvesting Tank Design No.06 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Subcatchment 1S: Roof Area No.08

Time (hours)	Runoff (m ³ /s)	Time (hours)	Runoff (m ³ /s)
0.00	0.0000	2.45	0.0000
0.05	0.0009	2.50	0.0000
0.10	0.0012	2.55	0.0000
0.15	0.0003	2.60	0.0000
0.20	0.0000	2.65	0.0000
0.25	0.0000	2.70	0.0000
0.30	0.0000	2.75	0.0000
0.35	0.0000	2.80	0.0000
0.40	0.0000	2.85	0.0000
0.45	0.0000	2.90	0.0000
0.50	0.0000	2.95	0.0000
0.55	0.0000	3.00	0.0000
0.60	0.0000	3.05	0.0000
0.65	0.0000	3.10	0.0000
0.70	0.0000	3.15	0.0000
0.75	0.0000	3.20	0.0000
0.80	0.0000	3.25	0.0000
0.85	0.0000	3.30	0.0000
0.90	0.0000	3.35	0.0000
0.95	0.0000	3.40	0.0000
1.00	0.0000	3.45	0.0000
1.05	0.0000	3.50	0.0000
1.10	0.0000	3.55	0.0000
1.15	0.0000	3.60	0.0000
1.20	0.0000	3.65	0.0000
1.25	0.0000	3.70	0.0000
1.30	0.0000	3.75	0.0000
1.35	0.0000	3.80	0.0000
1.40	0.0000	3.85	0.0000
1.45	0.0000	3.90	0.0000
1.50	0.0000	3.95	0.0000
1.55	0.0000	4.00	0.0000
1.60	0.0000		
1.65	0.0000		
1.70	0.0000		
1.75	0.0000		
1.80	0.0000		
1.85	0.0000		
1.90	0.0000		
1.95	0.0000		
2.00	0.0000		
2.05	0.0000		
2.10	0.0000		
2.15	0.0000		
2.20	0.0000		
2.25	0.0000		
2.30	0.0000		
2.35	0.0000		
2.40	0.0000		

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Summary for Pond 2P: Rainwater Harvesting Tank No.06

Inflow Area = 0.0023 ha, 100.00% Impervious, Inflow Depth = 20 mm
 Inflow = 0.0015 m³/s @ 0.08 hrs, Volume= 0.000 MI
 Outflow = 0.0006 m³/s @ 0.13 hrs, Volume= 0.000 MI, Atten= 57%, Lag= 3.0 min
 Primary = 0.0006 m³/s @ 0.13 hrs, Volume= 0.000 MI

Routing by Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
 Peak Elev= 0.253 m @ 0.13 hrs Surf.Area= 1.0 m² Storage= 0.2 m³

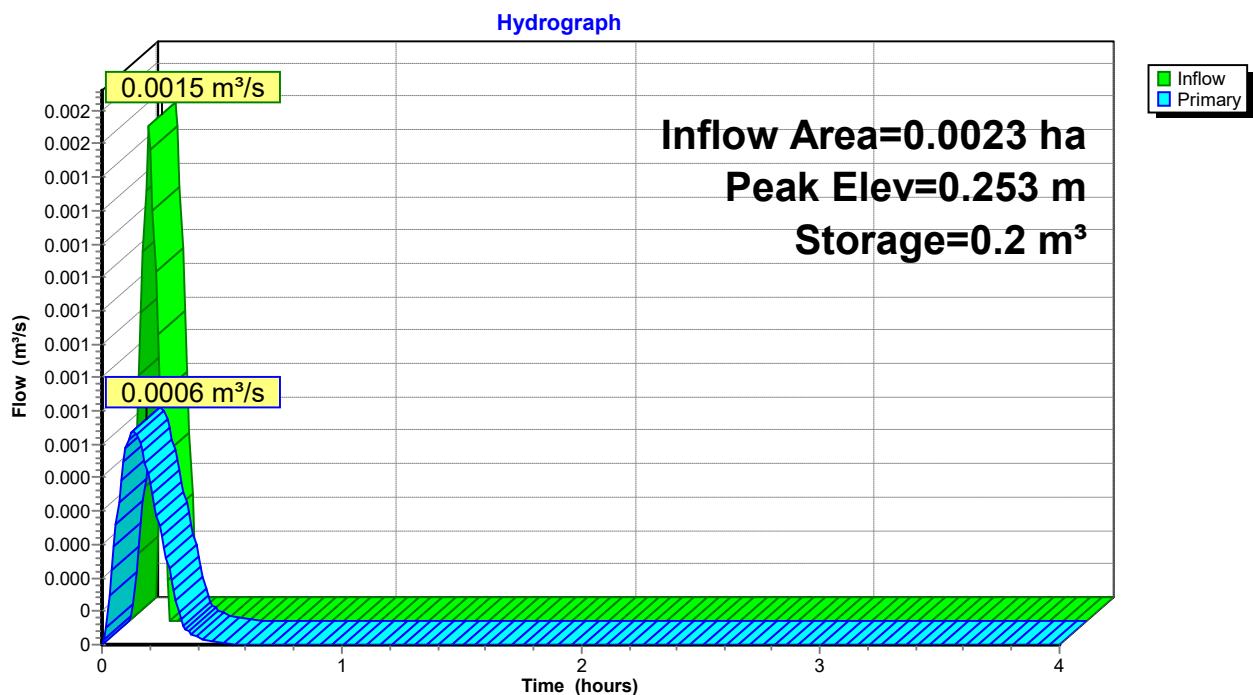
Plug-Flow detention time= 5.0 min calculated for 0.000 MI (100% of inflow)
 Center-of-Mass det. time= 5.0 min (10.0 - 5.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	1.3 m ³	1.11 mD x 1.30 mH Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	25 mm Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

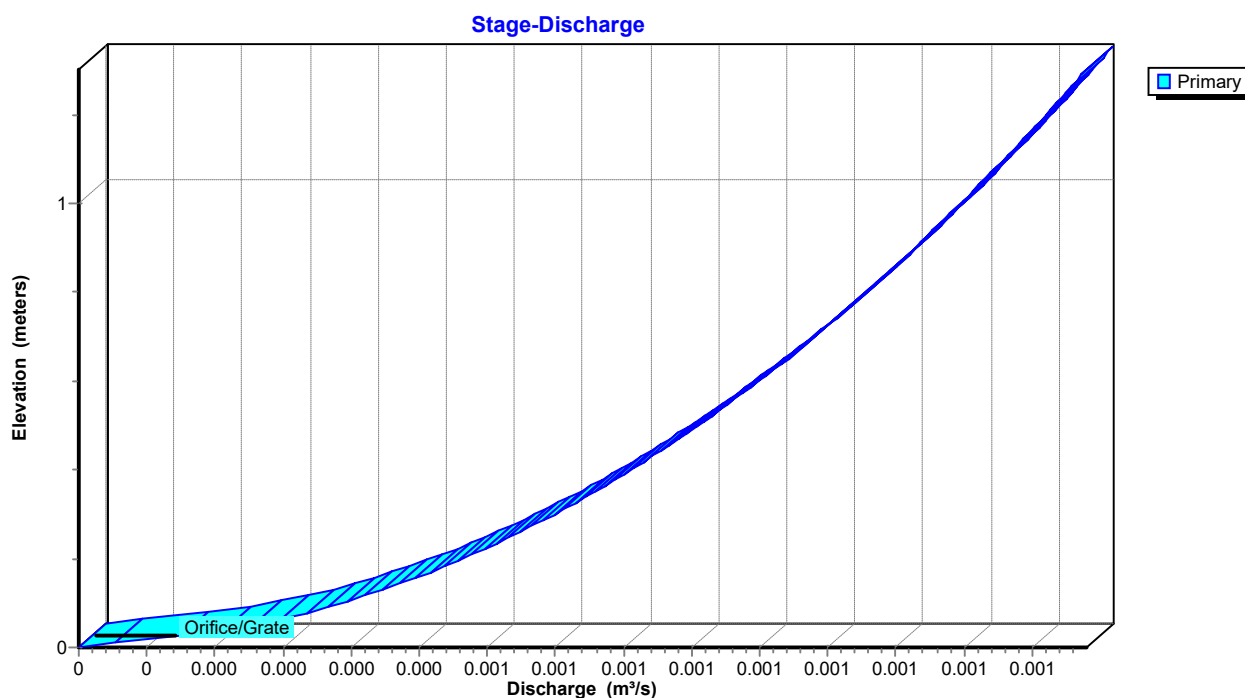
Primary OutFlow Max=0.0006 m³/s @ 0.13 hrs HW=0.252 m (Free Discharge)
 ←1=Orifice/Grate (Orifice Controls 0.0006 m³/s @ 1.30 m/s)

Pond 2P: Rainwater Harvesting Tank No.06

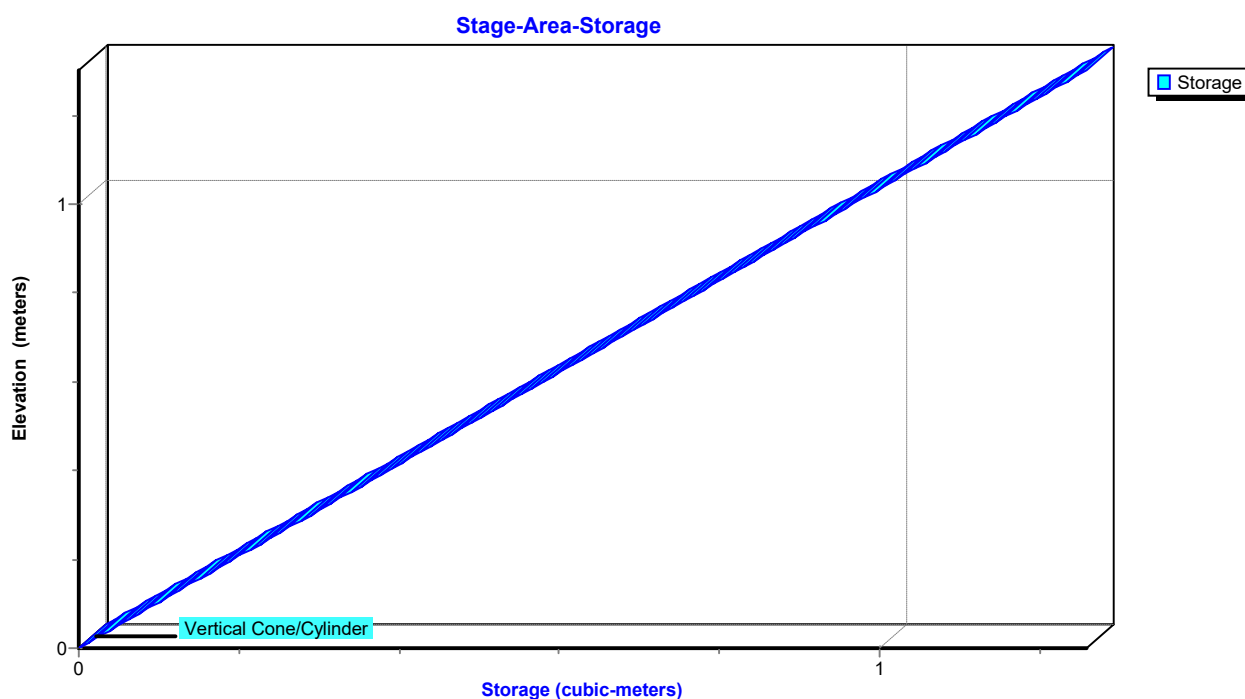


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Pond 2P: Rainwater Harvesting Tank No.06



Pond 2P: Rainwater Harvesting Tank No.06



Rainwater Harvesting Tank Design No.06 *Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Hydrograph for Pond 2P: Rainwater Harvesting Tank No.06

Time (hours)	Inflow (m ³ /s)	Storage (cubic-meters)	Elevation (meters)	Primary (m ³ /s)
0.00	0.0000	0.0	0.000	0.0000
0.10	0.0012	0.2	0.216	0.0006
0.20	0.0000	0.1	0.149	0.0005
0.30	0.0000	0.0	0.029	0.0002
0.40	0.0000	0.0	0.005	0.0000
0.50	0.0000	0.0	0.001	0.0000
0.60	0.0000	0.0	0.000	0.0000
0.70	0.0000	0.0	0.000	0.0000
0.80	0.0000	0.0	0.000	0.0000
0.90	0.0000	0.0	0.000	0.0000
1.00	0.0000	0.0	0.000	0.0000
1.10	0.0000	0.0	0.000	0.0000
1.20	0.0000	0.0	0.000	0.0000
1.30	0.0000	0.0	0.000	0.0000
1.40	0.0000	0.0	0.000	0.0000
1.50	0.0000	0.0	0.000	0.0000
1.60	0.0000	0.0	0.000	0.0000
1.70	0.0000	0.0	0.000	0.0000
1.80	0.0000	0.0	0.000	0.0000
1.90	0.0000	0.0	0.000	0.0000
2.00	0.0000	0.0	0.000	0.0000
2.10	0.0000	0.0	0.000	0.0000
2.20	0.0000	0.0	0.000	0.0000
2.30	0.0000	0.0	0.000	0.0000
2.40	0.0000	0.0	0.000	0.0000
2.50	0.0000	0.0	0.000	0.0000
2.60	0.0000	0.0	0.000	0.0000
2.70	0.0000	0.0	0.000	0.0000
2.80	0.0000	0.0	0.000	0.0000
2.90	0.0000	0.0	0.000	0.0000
3.00	0.0000	0.0	0.000	0.0000
3.10	0.0000	0.0	0.000	0.0000
3.20	0.0000	0.0	0.000	0.0000
3.30	0.0000	0.0	0.000	0.0000
3.40	0.0000	0.0	0.000	0.0000
3.50	0.0000	0.0	0.000	0.0000
3.60	0.0000	0.0	0.000	0.0000
3.70	0.0000	0.0	0.000	0.0000
3.80	0.0000	0.0	0.000	0.0000
3.90	0.0000	0.0	0.000	0.0000
4.00	0.0000	0.0	0.000	0.0000

Rainwater Harvesting Tank Design No.06*Rainfall Duration=5 min, Inten=240.3 mm/hr*

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Stage-Discharge for Pond 2P: Rainwater Harvesting Tank No.06

Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)	Elevation (meters)	Primary (m ³ /s)
0.000	0.0000	0.490	0.0009	0.980	0.0013
0.010	0.0000	0.500	0.0009	0.990	0.0013
0.020	0.0001	0.510	0.0009	1.000	0.0013
0.030	0.0002	0.520	0.0009	1.010	0.0013
0.040	0.0002	0.530	0.0009	1.020	0.0013
0.050	0.0003	0.540	0.0009	1.030	0.0013
0.060	0.0003	0.550	0.0010	1.040	0.0013
0.070	0.0003	0.560	0.0010	1.050	0.0013
0.080	0.0003	0.570	0.0010	1.060	0.0013
0.090	0.0004	0.580	0.0010	1.070	0.0013
0.100	0.0004	0.590	0.0010	1.080	0.0013
0.110	0.0004	0.600	0.0010	1.090	0.0014
0.120	0.0004	0.610	0.0010	1.100	0.0014
0.130	0.0004	0.620	0.0010	1.110	0.0014
0.140	0.0005	0.630	0.0010	1.120	0.0014
0.150	0.0005	0.640	0.0010	1.130	0.0014
0.160	0.0005	0.650	0.0010	1.140	0.0014
0.170	0.0005	0.660	0.0010	1.150	0.0014
0.180	0.0005	0.670	0.0011	1.160	0.0014
0.190	0.0005	0.680	0.0011	1.170	0.0014
0.200	0.0006	0.690	0.0011	1.180	0.0014
0.210	0.0006	0.700	0.0011	1.190	0.0014
0.220	0.0006	0.710	0.0011	1.200	0.0014
0.230	0.0006	0.720	0.0011	1.210	0.0014
0.240	0.0006	0.730	0.0011	1.220	0.0014
0.250	0.0006	0.740	0.0011	1.230	0.0014
0.260	0.0006	0.750	0.0011	1.240	0.0014
0.270	0.0007	0.760	0.0011	1.250	0.0015
0.280	0.0007	0.770	0.0011	1.260	0.0015
0.290	0.0007	0.780	0.0011	1.270	0.0015
0.300	0.0007	0.790	0.0012	1.280	0.0015
0.310	0.0007	0.800	0.0012	1.290	0.0015
0.320	0.0007	0.810	0.0012	1.300	0.0015
0.330	0.0007	0.820	0.0012		
0.340	0.0007	0.830	0.0012		
0.350	0.0008	0.840	0.0012		
0.360	0.0008	0.850	0.0012		
0.370	0.0008	0.860	0.0012		
0.380	0.0008	0.870	0.0012		
0.390	0.0008	0.880	0.0012		
0.400	0.0008	0.890	0.0012		
0.410	0.0008	0.900	0.0012		
0.420	0.0008	0.910	0.0012		
0.430	0.0008	0.920	0.0012		
0.440	0.0009	0.930	0.0012		
0.450	0.0009	0.940	0.0013		
0.460	0.0009	0.950	0.0013		
0.470	0.0009	0.960	0.0013		
0.480	0.0009	0.970	0.0013		

Rainwater Harvesting Tank Design No.06*Rainfall Duration=5 min, Inten=240.3 mm/hr*Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net

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Stage-Area-Storage for Pond 2P: Rainwater Harvesting Tank No.06

Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)	Elevation (meters)	Storage (cubic-meters)
0.000	0.0	0.490	0.5	0.980	0.9
0.010	0.0	0.500	0.5	0.990	1.0
0.020	0.0	0.510	0.5	1.000	1.0
0.030	0.0	0.520	0.5	1.010	1.0
0.040	0.0	0.530	0.5	1.020	1.0
0.050	0.0	0.540	0.5	1.030	1.0
0.060	0.1	0.550	0.5	1.040	1.0
0.070	0.1	0.560	0.5	1.050	1.0
0.080	0.1	0.570	0.6	1.060	1.0
0.090	0.1	0.580	0.6	1.070	1.0
0.100	0.1	0.590	0.6	1.080	1.0
0.110	0.1	0.600	0.6	1.090	1.1
0.120	0.1	0.610	0.6	1.100	1.1
0.130	0.1	0.620	0.6	1.110	1.1
0.140	0.1	0.630	0.6	1.120	1.1
0.150	0.1	0.640	0.6	1.130	1.1
0.160	0.2	0.650	0.6	1.140	1.1
0.170	0.2	0.660	0.6	1.150	1.1
0.180	0.2	0.670	0.6	1.160	1.1
0.190	0.2	0.680	0.7	1.170	1.1
0.200	0.2	0.690	0.7	1.180	1.1
0.210	0.2	0.700	0.7	1.190	1.2
0.220	0.2	0.710	0.7	1.200	1.2
0.230	0.2	0.720	0.7	1.210	1.2
0.240	0.2	0.730	0.7	1.220	1.2
0.250	0.2	0.740	0.7	1.230	1.2
0.260	0.3	0.750	0.7	1.240	1.2
0.270	0.3	0.760	0.7	1.250	1.2
0.280	0.3	0.770	0.7	1.260	1.2
0.290	0.3	0.780	0.8	1.270	1.2
0.300	0.3	0.790	0.8	1.280	1.2
0.310	0.3	0.800	0.8	1.290	1.2
0.320	0.3	0.810	0.8	1.300	1.3
0.330	0.3	0.820	0.8		
0.340	0.3	0.830	0.8		
0.350	0.3	0.840	0.8		
0.360	0.3	0.850	0.8		
0.370	0.4	0.860	0.8		
0.380	0.4	0.870	0.8		
0.390	0.4	0.880	0.9		
0.400	0.4	0.890	0.9		
0.410	0.4	0.900	0.9		
0.420	0.4	0.910	0.9		
0.430	0.4	0.920	0.9		
0.440	0.4	0.930	0.9		
0.450	0.4	0.940	0.9		
0.460	0.4	0.950	0.9		
0.470	0.5	0.960	0.9		
0.480	0.5	0.970	0.9		

ANNEXURE J: MAINTENANCE LETTER

ANNEXURE K: WRITTEN ACCEPTANCE LETTER

ANNEXURE L: APPOINTMENT LETTER

Project No: FP0247 – Proposed Rezoning
Application on Erf 439 Garsfontein

Date: 15 July 2026

APPOINTMENT AS ENGINEER:

Proposed Rezoning Application on Erf 439 Garsfontein, City of Tshwane

Services	Mark with an X
1. Services Report for Roads & Storm Water (Part 2) Engineering Services	X

Name of Entity to which the invoice should be issued.

MULTI PRINT PRINTERS

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Garsfontein.

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Patrick Vergne

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Mobile Number

082 440 6137

E-mail Address

patrick@multiprintdigital.co.za

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4720123175

Terms and Conditions Accepted

Date: 21/7/26

SIGNATURE OF SIGNATORY

