Memorandum

To: Jay Jarvis
From: Mark Meyer, P.E., Intuition and Logic Engineering, Inc.
Date: May 1, 2026
Subject: 305 N Sappington Stormwater (I&L PN: 2608)

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1. Introduction

Home addition and site modifications are proposed for the residence at 305 N Sappington Road. Intuition and Logic Engineering, Inc. (I&L) was retained to prepare stormwater drainage calculations and supporting exhibits to illustrate compliance with the following Glendale Architectural Review Board (ARB) Site Design Guidelines:

- 4D - Grading Design, #2
- 4E - Pervious and Impervious Surfaces Table
- 4F - Drainage Utility Drawing, #1
- 4G.1 - Stormwater Mitigation
- 4G.2 - Stormwater Mitigation Calculations for Group 1: Building Additions

2. Existing and Proposed Site Conditions

The 305 N Sappington Road existing site is 0.484 Acres total with 0.158 Acres impervious area and 0.326 Acres pervious areas. Impervious areas are classified as house, deck, driveway, garage, entry patio, cottage, and cottage path. Pervious areas make up the remaining parcel area.

The proposed development includes modifying structure footprints, removing the existing garage, adding a new garage, and reconfiguring the driveway. The proposed development increases the total impervious areas on the site by 0.002 Acres (90 sf). The proposed driveway modifications include a trench drain in front of the proposed garage entryway to collect sheet flow from the driveway and redirect to a dry well storage with a pervious bottom and a pump.

3. Stormwater Calculations

I&L followed the City of Glendale's requirements and used the Metropolitan St. Louis Sewer District Rational Method's required 15-year, 20-minute storm event to determine the existing and proposed condition stormwater runoff rates and differentials. The proposed site modifications increase runoff during the 15-year, 20-minute storm by 0.0158 cubic feet per second (cfs) which equates to a volume of 19 cubic feet, or 142 gallons. Runoff calculations are summarized in the tables below.

Description	Existing	Proposed	Difference
Pervious Area (Ac)	0.3265	0.3245	0.0020 (90sf)
15yr, 20min Rational PI Factor	1.74	1.74	
Pervious Flow Rate (cfs)	0.5666	0.5631	0.0035

Description	Existing	Proposed	Difference
Impervious Area (Ac)	0.1572	0.1593	0.0020 (90sf)
15yr, 20min Rational PI Factor (Weighted)	3.77	3.84	
Impervious Flow Rate (cfs)	0.5930	0.6123	0.0193
Flow Rate Change (cfs)	**1.1596**	**1.1754**	**0.0158**

*See Rational Q's Calculation for PI Factors

Differential Runoff Mitigation Calculations	
Description	**Rate**
15YR-20MIN Differential Runoff (cfs)	0.0158
20 MIN Differential Volume (CF)	19
20 MIN Differential Volume (Gal)	142

4. Glendale, MO ARB Guidelines Compliance

4D – Grading Design Criteria #2

- Criteria – Avoid overland discharge of stormwater onto neighbors' properties. Direct drainage from structures and impervious pavements to swales, area drains served by drain piping, curbed or swaled pavements discharging to streets, or stormwater detention areas to prevent concentrated roof downspout stormwater flow from discharging across neighboring properties.
- Description of Compliance – Existing drainage and proposed drainage is directed to the existing concrete channel at the northern edge of parcel. The concrete channel terminates into an existing enclosed system at the property line (see photo). The site drainage pattern does not change. There is no concentrated drainage planned. Downspouts overland flow to the existing concrete channel or to the proposed trench drain. See the Drainage Utility Exhibit.

Existing and proposed concrete drainage channel flowing into existing enclosed system

4E - Pervious and Impervious Surfaces Table

- Criteria – For Total Lot - Existing Impervious, Proposed Impervious, Change. For Front Yard Setback - Existing Impervious, Proposed Impervious, change
- Description of Compliance – Proposed improvements increase impervious surface area:

Impervious Lot Coverage Calculations			
	AREA (SF)	ACRES	PERCENTAGE
TOTAL LOT	21,071	0.484	
Existing Impervious Area	6849	0.159	32.5%
Proposed Impervious Area	6937	0.157	32.9%
Change (Increase)	88	0.002	0.4%

4F - Drainage Utility Drawing, #1

- Drainage Utility Drawing, showing grading contours, structure drainage downspouts, underground storm utility piping, over-land storm drainage patterns and flow, stormwater detention structures, municipal stormwater structures on or in immediate proximity to the site

and that are intended to accept stormwater flow from the proposed project, stormwater calculations, and the ARB's specified expression of water volumes, differential discharge, etc. as defined in Section 4G.

- Description of Compliance – See attached Drainage Utility Exhibit. No grading is proposed beyond the home and driveway improvements. Grading beyond the home and driveway improvements will be existing grades. Pipe size and slopes are to be determined based on final design.

4G.1 - Stormwater Mitigation

- Criteria – Infiltration pit, Infiltration Trench, Infiltration Basin, Bio-detention basin
- Description of Compliance – Proposed improvements will increase the total impervious surface area on the site and differential runoff storage will be required. A storage tank with a pervious bottom will be utilized to manage the increased runoff.

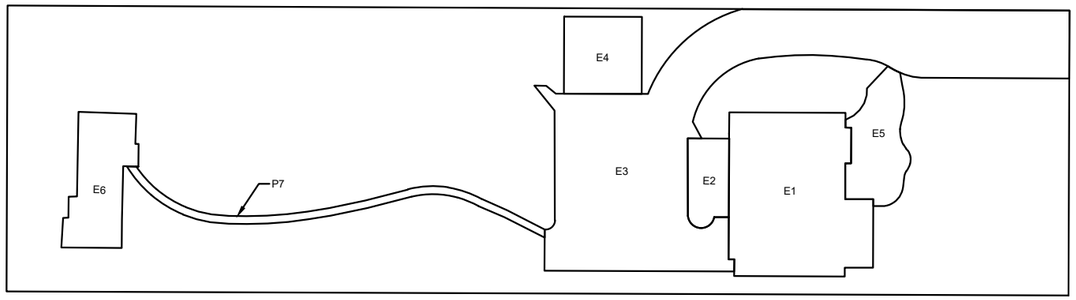
4G.2 - Stormwater Mitigation Calculations for Group 1: Building Additions

- Criteria – Any project where the existing residence is substantially remaining, and new building additions are to be constructed, that creates an increase in the stormwater differential as compared to the existing conditions of the site, shall provide stormwater mitigation that can hold and delay the runoff of the differential stormwater volume.
- Description of Compliance – Proposed improvements will increase the total impervious surface area on the site and differential runoff storage will be required. The increased runoff will be held in a storage tank with a pervious bottom. A float pump will be used to manage flow in the storage tank. The float will draw down no further than the depth required for differential storage. The pump will be sized as to not increase the runoff flowrate from the site. See the Drainage Utility Exhibit.

Attachment(s):

- Drainage Area Exhibit
- Drainage Utility Exhibit
- SCS Hydrograph for the Driveway Drain
- Rational Q's Calculation for Existing and Proposed

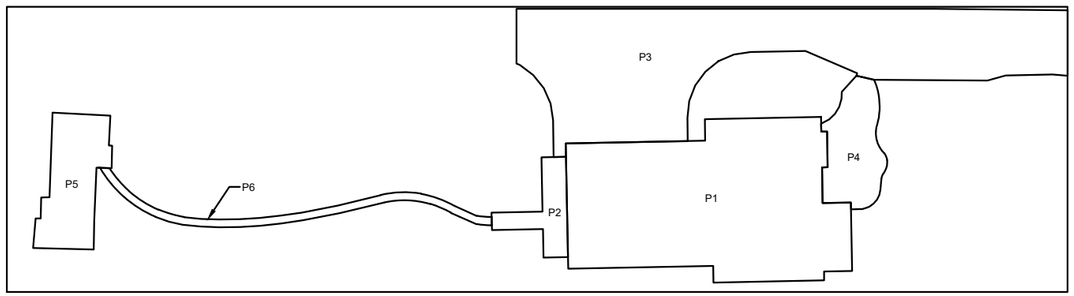
DRAINAGE AREA EXHIBIT



EXISTING IMPERVIOUS DRAINAGE AREAS

EXISTING IMPERVIOUS AREAS			
AREA		SF	% TOTAL IMP. AREA
HOUSE	E1	1467	21%
DECK	E2	241	4%
DRIVEWAY	E3	3519	51%
GARAGE	E4	416	6%
ENTRY PATIO	E5	447	7%
COTTAGE	E6	520	8%
COTTAGE PATH	E7	240	3%
TOTAL IMPERVIOUS		6849	100%

*EXISTING DECK IS IMPERVIOUS. CONCRETE UNDER DECK.

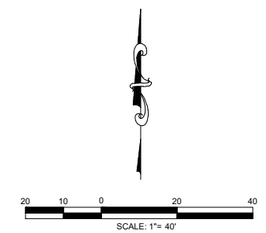


PROPOSED IMPERVIOUS DRAINAGE AREAS

PROPOSED IMPERVIOUS AREAS			
AREA		SF	% TOTAL IMP. AREA
HOUSE	P1	2685	39%
DECK	P2	233	0%
DRIVEWAY	P3	3066	44%
ENTRY PATIO	P4	440	6%
COTTAGE	P5	520	7%
COTTAGE PATH	P6	226	3%
TOTAL IMPERVIOUS		6937	100%

*PROPOSED DECK IS PERVIOUS. BARE EARTH UNDER DECK.

SUMMARY	
CHANGE IN TOTAL IMPERVIOUS AREA (SF)	90
CHANGE IN TOTAL IMPERVIOUS AREA (AC)	0.00207



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305 N SAPPINGTON STORMWATER GLENDALE, MO

Professional Engineer Seal
Mark Edward Meyer - Engineer
MO# E-2000150043

PRELIMINARY NOT FOR CONSTRUCTION

Expiration Date: Dec. 31, 2027

Rev	Date	Description
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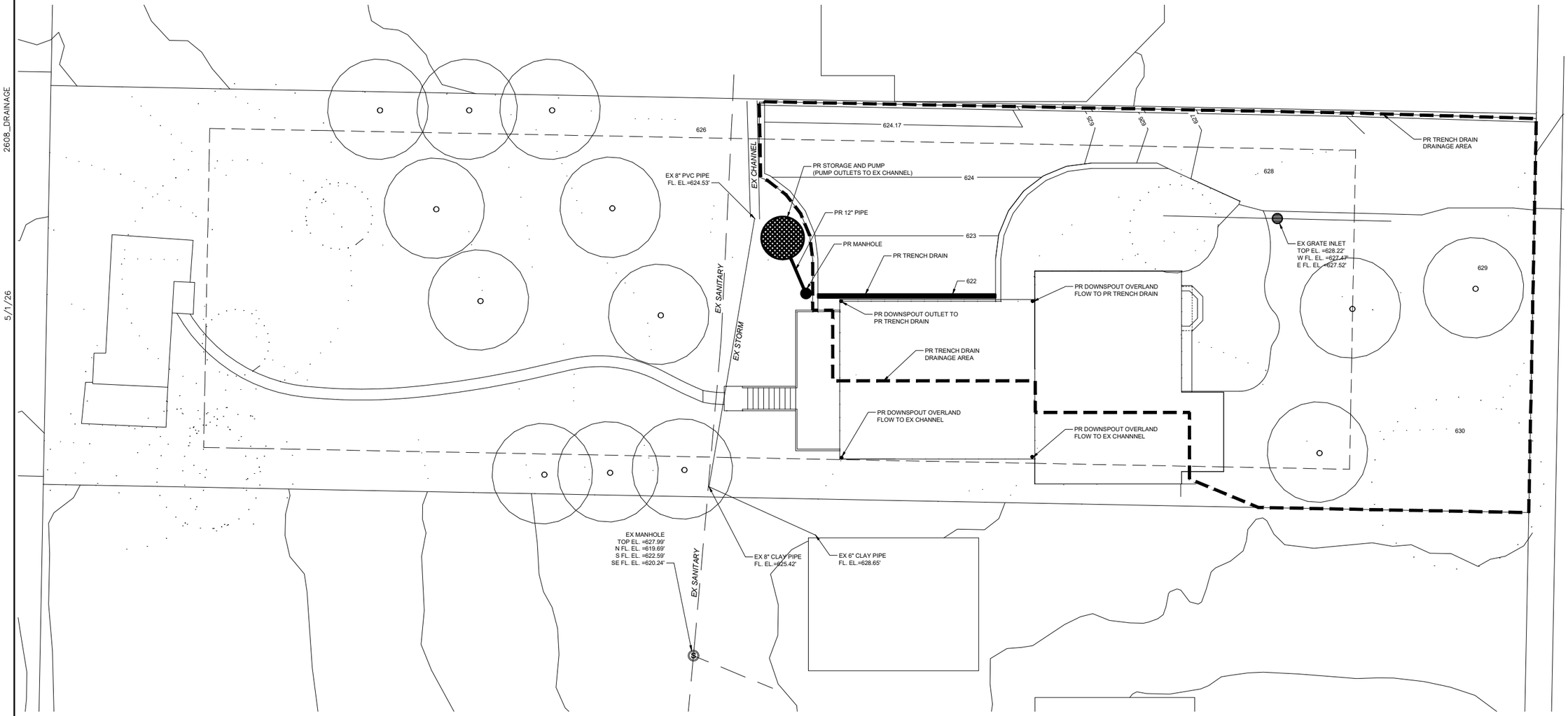
Date:
Drawn by: DGL
Checked by: MSA
Approved by: MEM

PROJECT NO. 2608

SHEET TITLE:
DRAINAGE AREAS EXHIBIT

SHEET NUMBER:
1 OF 1

DRAINAGE UTILITY EXHIBIT



Differential Runoff Mitigation Storage	
Differential runoff will be kept in the storage tank. The pump float will draw down no further than the depth for required differential storage. The depth for differential storage is calculated as follows:	
[required diff. storage (CF)] / [π*R^2] , where R is the inside radius of the storage tank. See the following example:	
Required Differential Storage (gal)	142
Required Differential Storage (CF)	19
Example:	
Tank Diameter (ft)	8
Tank Area (SF)	50.24
Depth for Required Differential Storage (ft)	0.38

Max Pump Flow Rate (gal/min)	
Maximum PR Flow (gal/min)	520.46
(-) PR Conditions Flow Not to Trench Drain (gal/min)	307.83
(=) Maximum PR Conditions Flow from Trench Drain (gal/min)	212.63

The maximum proposed flow rate from the site must be less than or equal to the existing maximum flow rate of 520.46 gal/min. The storage tank pump will be used to control the proposed flow rate. The maximum pump flow rate must be less than or equal to the Maximum PR Conditions Flow from the Trench Drain.

10 5 0 10 20
SCALE: 1"= 20'

INTUITION & LOGIC

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Approved by:	MEM

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DRAINAGE UTILITY EXHIBIT

SHEET NUMBER:
1 OF 1

2608_DRAINAGE
5/1/26

Path: P:\2608 - JAY JARVIS - Stormwater\Calculations\CAD
Plotted on: 5/1/26 @ 11:07:07 AM by DANIELLE.LAURIE

Hydrograph Report

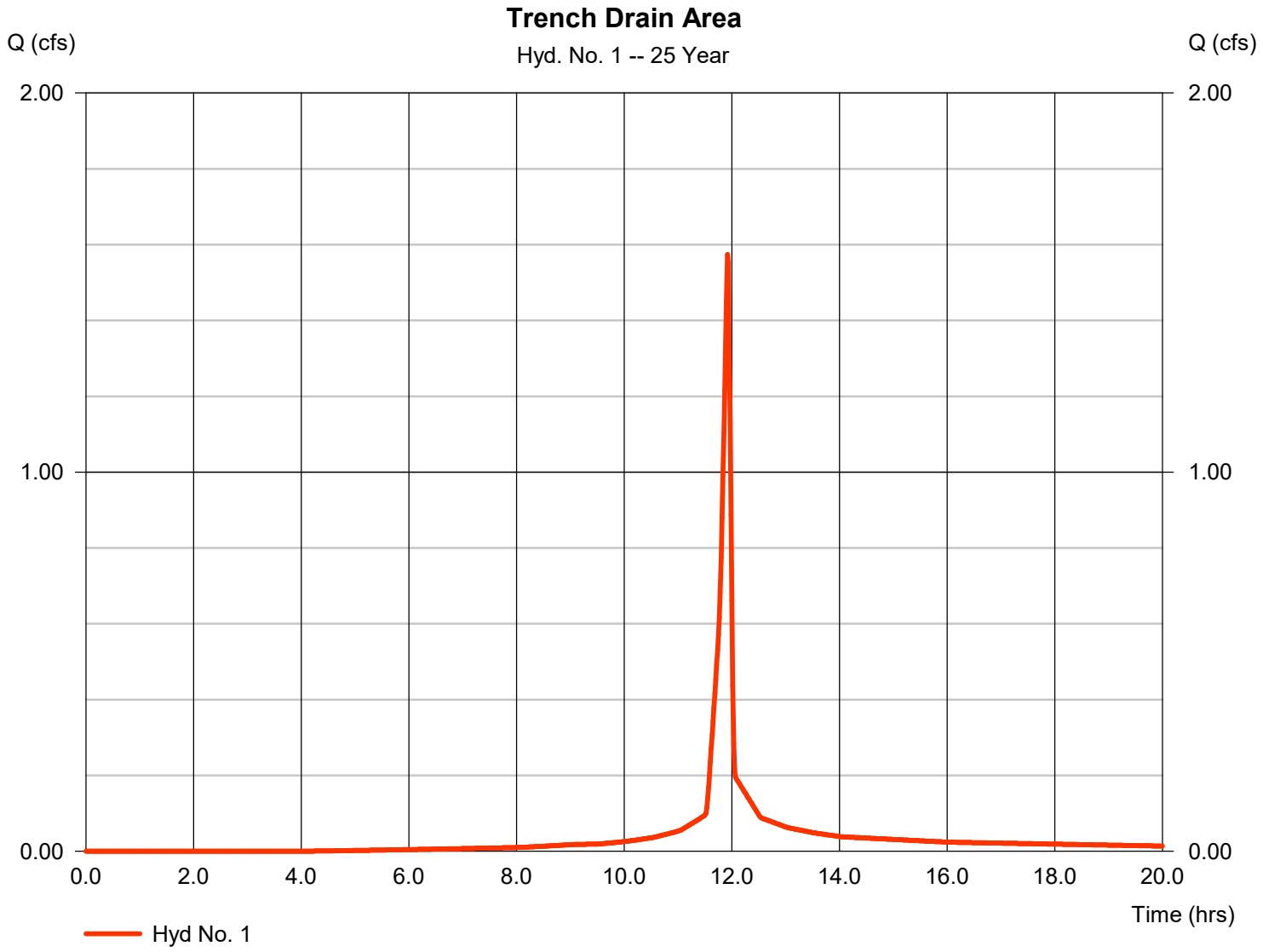
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2026 Friday, 05 / 1 / 2026

Hyd. No. 1

Trench Drain Area

Hydrograph type	= SCS Runoff	Peak discharge	= 1.574 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.92 hrs
Time interval	= 1 min	Hyd. volume	= 2,998 cuft
Drainage area	= 0.200 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 2.70 min
Total precip.	= 5.77 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.116 x 98) + (0.086 x 74)] / 0.200



Project Name: 2608 305 N Sappington Stormwater	Project Number:	2608	Date:		Date:		
Client Name: Jay Jarvis	Updated by:	DGL	Date:	5/1/2026	Date:		
Subject: MSD Q=PIA calculations	Checked By:	MSA	Date:	5/1/2026	Date:		

Inlet ID	Drainage Area sf	Drainage Area Acre	% Imp	$PI_{2yr-20min}$	Flow $Q_{2yr-20min}$ cfs	$PI_{15yr-20min}$	Flow $Q_{15yr-20min}$ cfs	$PI_{100yr-20min}$	Flow $Q_{100yr-20min}$
EX Impervious Pavement	4446.05	0.102	100.0	2.39	0.24	3.54	0.36	4.77	0.49
EX Impervious Roof	2402.99	0.055	100.0	2.39	0.13	4.20	0.23	4.77	0.26
EX Pervious	14221.58	0.326	7.0	1.17	0.38	1.74	0.57	2.34	0.76
PR Impervious Pavement	3731.78	0.086	100.0	2.39	0.20	3.54	0.30	4.77	0.41
PR Impervious Roof	3205.54	0.074	100.0	2.39	0.18	4.20	0.31	4.77	0.35
PR Pervious	14133.3	0.324	7.0	1.17	0.38	1.74	0.56	2.34	0.76
EX Impervious Summary	6849.04	0.157				3.77	0.59		
PR Impervious Summary	6937.32	0.159				3.84	0.61		
EX Summary	21070.62	0.484			0.76		1.16		1.51
PR Summary	21070.62	0.484			0.76		1.18		1.52