Stormwater Calcs - Elm Estates 203 SW 4th St
Using Rational Method

Pre-development

Calculated Tc values - Drainage Basin 1

$$Tc = \frac{0.83 * L^{.467} * n^{.467}}{S^{.5}}$$ minutes (Eqn 400-3)

L1 =	150	feet			
n1 =	0.2	Poor Grass (n values taken from Table 400-3 of City of Bryant Drainage Manual)			
S1 =	0.017	ft/ft	Z1=	400.300	ft
			Z2=	397.75	ft

$Tc_{calculated}$ 13.80 minutes

Tc = 13.80 minutes

Stormwater Calcs - Elm Estates 203 SW 4th St
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Stormwater Calcs - Elm Estates 203 SW 4th St
using Rational Method

Pre-development

Calculated C values - Drainage Basin

	Area	C_{100}	C_{50}	C_{25}	C_{10}	C_5	C_2
Roof & Driveway	0.07	0.97	0.92	0.88	0.83	0.8	0.75
Greenspace	0.77	0.41	0.37	0.34	0.3	0.28	0.25
Total Area =	**0.84**	**0.45**	**0.41**	**0.38**	**0.34**	**0.32**	**0.29**

(C values taken from Table 400-1 of City of Bryant Drainage Manual)
Concrete/Roof
Fair Condition-Flat, 0-2%

Stormwater Calcs - Elm Estates 203 SW 4th St
using Rational Method

Post-development

Calculated C values - Drainage Basin 1

	Area	C_{100}	C_{50}	C_{25}	C_{10}	C_5	C_2
Single Family House	0.84	0.7	0.65	0.6	0.5	0.4	0.3
Total Area =	**0.84**	**0.70**	**0.65**	**0.60**	**0.50**	**0.40**	**0.30**

(C values taken from Page-50 of City of Bryant Drainage Manual)

Stormwater Calcs - Elm Estates 203 SW 4th St
using Rational Method

Pre-development

Drainage Basin 1

Q_{100} =	2.92	CFS	Q_{50}=	2.42	CFS	Q_{25} =	2.01	CFS	Q_{10} =	1.57	CFS
c =	0.45		c =	0.41		c =	0.38		c =	0.34	
i=	7.70	in/hr	i=	7.00	in/hr	i=	6.30	in/hr	i=	5.50	in/hr
A=	0.84	acres	A=	0.84	acres	A=	0.84	acres	A=	0.84	acres
Total	2.92	CFS		2.42	CFS		2.01	CFS		1.57	CFS

Q_5 =	1.31	CFS	Q_2 =	1.01	CFS
c =	0.32		c =	0.29	
i=	4.90	in/hr	i=	4.20	in/hr
A=	0.84	acres	A=	0.84	acres
	1.31	CFS		1.01	CFS

Post-development

Drainage Basin 1A - New Site

Q_{100} =	4.53	CFS	Q_{50}=	3.82	CFS	Q_{25} =	3.18	CFS	Q_{10} =	2.31	CFS
c =	0.70		c =	0.65		c =	0.60		c =	0.50	
i=	7.70	in/hr	i=	7.00	in/hr	i=	6.30	in/hr	i=	5.50	in/hr
A=	0.84	acres	A=	0.84	acres	A=	0.84	acres	A=	0.84	acres

Q_5 =	1.65	CFS	Q_2 =	1.06	CFS
c =	0.40		c =	0.30	
i=	4.90	in/hr	i=	4.20	in/hr
A=	0.84	acres	A=	0.84	acres

Detention Volume

for Q100

Cundev=	0.45	
Iundev=	7.70	in/hr
Cdev=	0.70	
Idev=	7.70	in/hr
R=	1.90	
A=	0.84	acres
Tc=	14.00	minutes
	60	sec/min
Detention Volume=	1,339	cubic feet

R= (Cdev*Idev)-(Cundev*Iundev)
Detention Volume= R*A*Tc*60

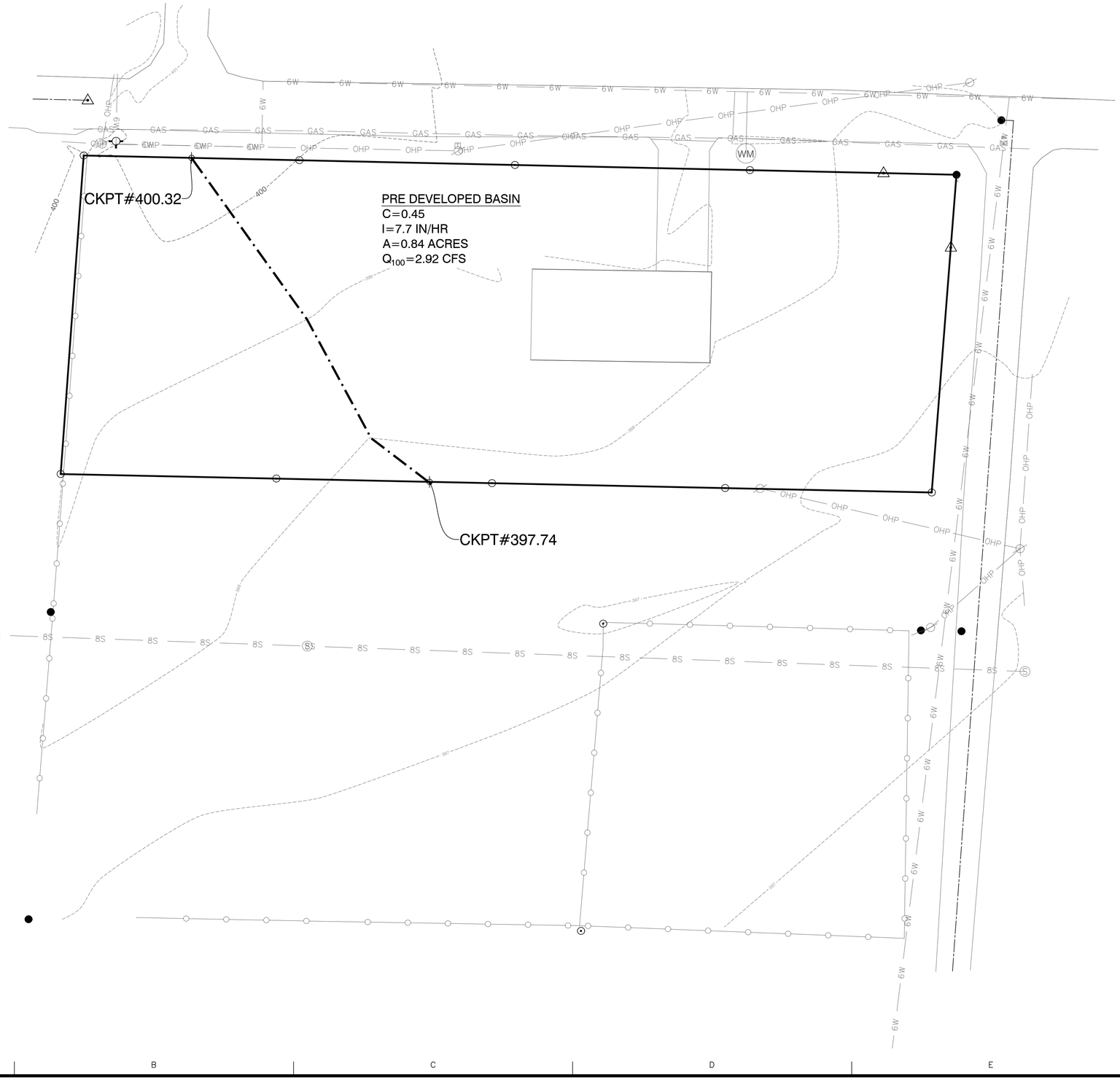
Stormwater Calcs - Elm Estates 203 SW 4th St
using Rational Method

In-Lieu-Fee Calculation

Detention= 1339 cubic feet

In-Lieu Detention ($10,000/ac-ft) Ratio = Vol (100-yr)/43,560 sq ft /ac

-Lieu-Fee = 0.030732 ac-ft
= **$307.32** **Note - $500 minimum**



BY	REVISION	DATE

GNE Designing our client's success
GarNat Engineering, LLC
P.O. Box 116
Benton, AR 72018
3825 Mt Carmel Rd
Bryant, AR 72022
garnatengineering@gmail.com
Ph (501) 408-4650

FOR THE USE & BENEFIT OF:
SALINE COUNTY CONTRACTING
AND RENTAL PROPERTIES, LLC
ELM ESTATES
CITY OF BRYANT
SALINE COUNTY, ARKANSAS

PRELIMINARY

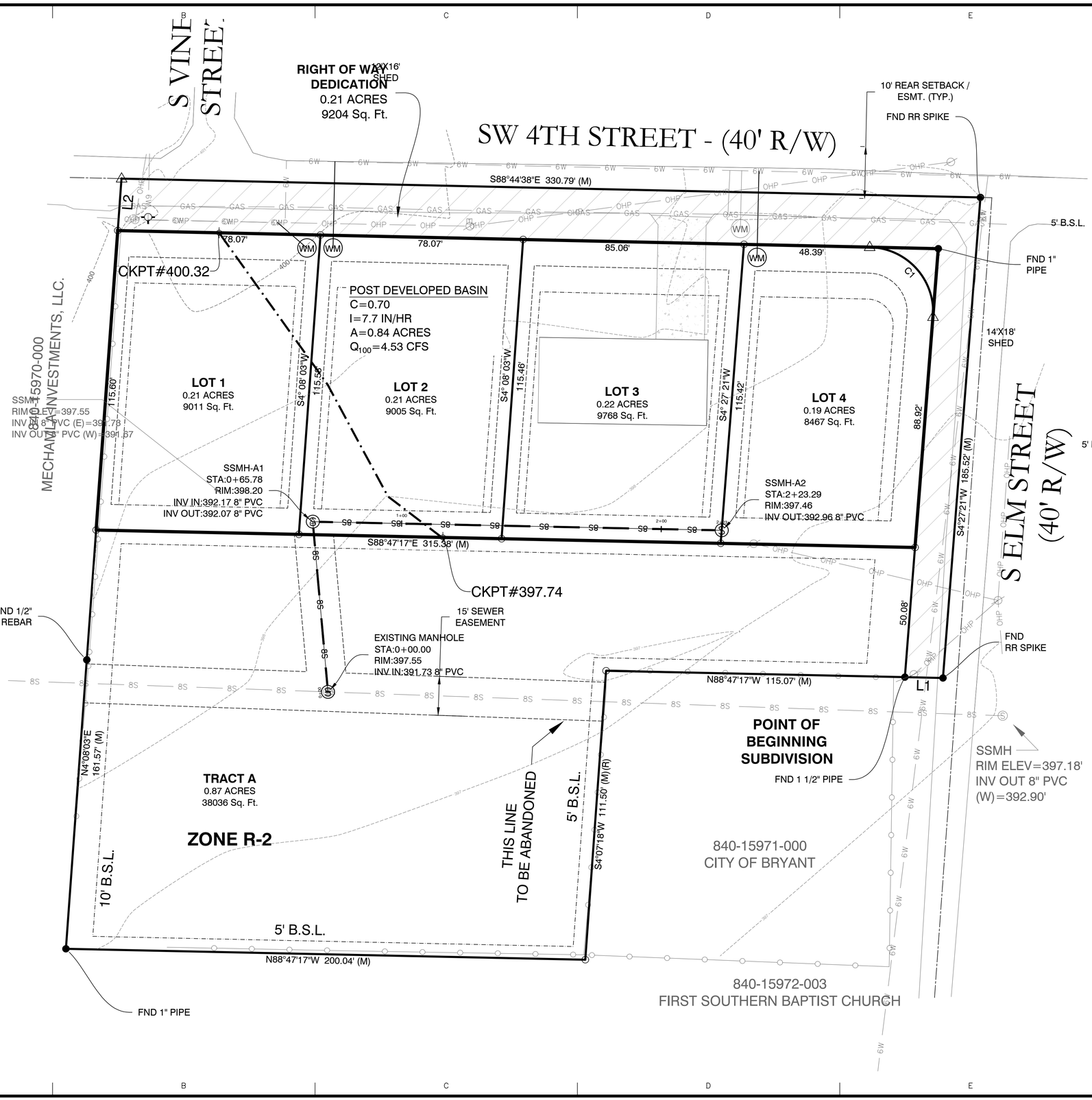
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PRE DEVELOPED BASIN

PROJECT NO: 24145

DATE: MAR 2025

SHEET NO: 1.0

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GarNat Engineering, LLC
P.O. Box 116 Benton, AR 72018
3825 Mt Carmel Rd Bryant, AR 72022
garnatengineering@gmail.com
Ph (501) 408-4650

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SALINE COUNTY CONTRACTING AND RENTAL PROPERTIES, LLC
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PRELIMINARY

CONTENTS:
POST DEVELOPED BASIN

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