# EVERETT M BROOKS COMPANY

PROJECT ADDRESS: Rumford Avenue Newton PROJECT NO.: 26736 SHEET: OF: CALCULATIONS BY: ES DATE: 9/13/23

## Watershed to Street

100 – Year Storm Event	<b>Existing Conditions</b>	Proposed Conditions	
Peak Volume	1.07 cfs	0.13 cfs	
Peak Flow	0.081 af	0.011 af	

25 – Year Storm Event	Existing Conditions	Proposed Conditions
Peak Volume	0.74 cfs	0.09 cfs
Peak Flow	0.054 af	0.008 af

10 – Year Storm Event	Existing Conditions	Proposed Conditions	
Peak Volume	0.58 cfs	0.08 cfs	
Peak Flow	0.042 af	0.006 af	

2 – Year Storm Event	Existing Conditions	Proposed Conditions
Peak Volume	0.33 cfs	0.05 cfs
Peak Flow	0.023 af	0.004 af

## Watershed to Rear

100 – Year Storm Event	Existing Conditions	<b>Proposed Conditions</b>
Peak Volume	0.47 cfs	0.15 cfs
Peak Flow	0.035 af	0.011 af

25 – Year Storm Event	Existing Conditions	Proposed Conditions	
Peak Volume	0.32 cfs	0.10 cfs	
Peak Flow	0.024 af	0.007 af	

10 – Year Storm Event	Existing Conditions	<b>Proposed Conditions</b>
Peak Volume	0.25 cfs	0.07 cfs
Peak Flow	0.019 af	0.005 af

2 – Year Storm Event	Existing Conditions	<b>Proposed Conditions</b>	CILTH OF MARCH
Peak Volume	0.14 cfs	0.03 cfs	MICHAELS EL
Peak Flow	0.010 af	0.002 af	KOSMO

# EVERETT M BROOKS COMPANY

PROJECT ADDRESS:	Rumford Avenue
	Newton
PROJECT NO.: 2673	6
SHEET:	OF:
CALCULATIONS BY: E	S DATE: 9/13/23

## **Phosphorus Load Calculation:**

**BMP Load = (IA x PLER)** BMP Load = Phosphorous load to the existing BMP IA= Impervious area PLER = Phosphorous rate

Land Use Category	Cover Type	P export rate (lb/acre/yr)*
Commercial (Com) and Industrial	Directly	1.78
(inu)	impervious	

\*Average annual phosphorous load (P Load) from Table 3-1 of EPA Stormwater Handbook.

Existing Impervious Area = 239 s.f. (0.0055 ac) Existing Load = 0.0055 ac X 1.78 lb/ac/yr = 0.0098 lbs/ year

Proposed Impervious Area = 6,294 s.f. (0.1445 ac) Proposed Load = 0.1445 ac X 1.78 lb/ac/yr = 0.2572 lbs/ year

BMP (Inflow to City Drainage Systems) =0.155 ac BMP Load = 0.155 ac X 1.78 lb/ac/yr = 0.2759 lbs/ year

Total Phosphorous Reduction = 0.2759 / 0.2572 = 1.073 X 100% = 107% (> 50% reduction)







<b>26736_Rumford Ave, Newton Pre-Post</b> Prepared by Everett M. Brooks Company, Inc. HydroCAD® 7.10 s/n 003546 © 2005 HydroCAD Software Solution	Type III 24-hr 2-YEAR Rainfall=3.26" Page 2 9/13/2023
Time span=0.00-30.00 hrs, dt=0.0 Runoff by SCS TR-20 metho Reach routing by Stor-Ind+Trans method - Po	15 hrs, 601 points d, UH=SCS nd routing by Stor-Ind method
Subcatchment 1S: Existing Conditions to Street	Runoff Area=0.130 ac Runoff Depth=2.14" Tc=5.0 min CN=89 Runoff=0.33 cfs 0.023 af
Subcatchment 3S: Remainder of Proposed Conditions to S	<b>tre</b> Runoff Area=0.015 ac Runoff Depth=3.03" Tc=5.0 min CN=98 Runoff=0.05 cfs 0.004 af
Subcatchment 5S: Existing Conditions to Rear	Runoff Area=0.057 ac Runoff Depth=2.14" Tc=5.0 min CN=89 Runoff=0.14 cfs 0.010 af
Subcatchment 7S: Proposed Condtitions to Rear	Runoff Area=0.020 ac Runoff Depth=1.45" Tc=5.0 min CN=80 Runoff=0.03 cfs 0.002 af
Subcatchment 9S: Proposed Watershed to City Drain Main	Runoff Area=0.155 ac Runoff Depth=2.60" Tc=5.0 min CN=94 Runoff=0.46 cfs 0.034 af
Reach 2R: Existing Watershed To Street	Inflow=0.33 cfs 0.023 af Outflow=0.33 cfs 0.023 af
Reach 4R: Proposed Watershed to Street	Inflow=0.05 cfs 0.004 af Outflow=0.05 cfs 0.004 af
Reach 6R: Existing Watershed to Rear	Inflow=0.14 cfs 0.010 af Outflow=0.14 cfs 0.010 af
Reach 8R: Proposed Watershed to Rear	Inflow=0.03 cfs 0.002 af Outflow=0.03 cfs 0.002 af
Reach 10R: Proposed Watershed to City Drain Main	Inflow=0.46 cfs 0.034 af Outflow=0.46 cfs 0.034 af

Total Runoff Area = 0.377 ac Runoff Volume = 0.073 af Average Runoff Depth = 2.33"

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#### Subcatchment 1S: Existing Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.023 af, Depth= 2.14"

Area (ac)	CN	Description		
0.128	89	Dirt roads, HSG	D	
0.002	98	Aphalt		
0.130	89	Weighted Average	ge	
Tc Leng (min) (fe	gth et)	Slope Velocity ( (ft/ft) (ft/sec)	Capacity (cfs)	Description
5.0 Direct Entry,				
Subcatchment 1S: Existing Conditions to Street				



#### Subcatchment 3S: Remainder of Proposed Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 3.03"

Area (ac) C	N Dese	cription					
0.015 98 Proposed Concrete Sidewalk							
Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs)							
5.0				Direct Entry,			
Subcatchment 3S: Remainder of Proposed Conditions to Street							
Hydrograph							



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#### Subcatchment 5S: Existing Conditions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 2.14"

.010 al, Deptil= 2.14



#### Subcatchment 7S: Proposed Condtitions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Depth= 1.45"

Area	(ac) CN	Des	cription		
0.	.020 80	) >759	% Grass c	over, Good	d, HSG D
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
		Su	bcatchm	nent 7S: F	Proposed Condtitions to Rear
				Hydro	ograph
0.00					Runoff
0.03	4			0.03 cfs	
0.032	2				Type III 24-III 2-I EAR
0.0	3				Rainfall=3.26"
0.02					Runoff Area=0.020 ac
0.024	4				Runoff Volume=0.002 af
( <b>20</b> .02) 0.02	2				Runoff Depth=1.45"
<b>0.01</b>	8				Tc=5.0 min
<b>L</b> 0.01					CN-90
0.012	2				<b>UN-00</b>
0.0	1				
0.008	8				
0.00	6				
0.004	2				
0.001					
	0 1 2 3	4 5 6	7 8 9 1	10 11 12 13 1 Tir	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 ime (hours)

#### Subcatchment 9S: Proposed Watershed to City Drain Main

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.46 cfs @ 12.07 hrs, Volume= 0.034 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs Type III 24-hr 2-YEAR Rainfall=3.26"

Area (ac)	CN	Description						
0.070	98	Proposed Roo	Proposed Roof Runoff					
0.052	98	Proposed Asp	Proposed Asphalt Driveway					
0.033	80	>75% Grass c	>75% Grass cover, Good, HSG D					
0.155	94	Weighted Ave	rage					
Tc Leng (min) (fe	gth : et)	Slope Velocity (ft/ft) (ft/sec)	Capacity (cfs)	Description				
5.0				Direct Entry,				

## Subcatchment 9S: Proposed Watershed to City Drain Main



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#### **Reach 2R: Existing Watershed To Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.130 ac, I	nflow Depth	= 2.14"	for 2-YEAR eve	ent	
Inflow	=	0.33 cfs @	12.07 hrs,	Volume=	0.023 af		
Outflow	=	0.33 cfs @	12.07 hrs,	Volume=	0.023 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## **Reach 2R: Existing Watershed To Street**

# Reach 4R: Proposed Watershed to Street

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.015 ac, I	nflow Depth	= 3.03"	for 2-YEAR ev	ent	
Inflow	=	0.05 cfs @	12.07 hrs,	Volume=	0.004 af		
Outflow	=	0.05 cfs @	12.07 hrs,	Volume=	0.004 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## **Reach 4R: Proposed Watershed to Street**

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## Reach 6R: Existing Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.057 ac, I	nflow Depth	= 2.14"	for 2-YEAR ev	ent	
Inflow	=	0.14 cfs @	12.07 hrs,	Volume=	0.010 af		
Outflow	=	0.14 cfs @	12.07 hrs,	Volume=	0.010 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## Reach 6R: Existing Watershed to Rear

## **Reach 8R: Proposed Watershed to Rear**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.020 ac, I	nflow Depth	= 1.45"	for 2-YEAR e	vent	
Inflow	=	0.03 cfs @	12.08 hrs,	Volume=	0.002 a	ſ	
Outflow	=	0.03 cfs @	12.08 hrs,	Volume=	0.002 a	f, Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## Reach 8R: Proposed Watershed to Rear

#### **Reach 10R: Proposed Watershed to City Drain Main**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.155 ac, Ir	nflow Depth	= 2.60"	for 2-YEAR e	event	
Inflow	=	0.46 cfs @	12.07 hrs,	Volume=	0.034 a	af	
Outflow	=	0.46 cfs @	12.07 hrs,	Volume=	0.034 a	af, Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



#### Reach 10R: Proposed Watershed to City Drain Main



26736_Rumford Ave, Newton Pre-Post Prepared by Everett M. Brooks Company, Inc. HydroCAD® 7.10 s/n 003546 © 2005 HydroCAD Software Solution	Type III 24-ł	hr 10-YEAR Rainfall=5.13" Page 2 9/13/2023
Time span=0.00-30.00 hrs, dt=0.0 Runoff by SCS TR-20 metho Reach routing by Stor-Ind+Trans method - Po	5 hrs, 601 points d, UH=SCS nd routing by Sto	s or-Ind method
Subcatchment 1S: Existing Conditions to Street	Runoff Area= Tc=5.0 min CN=	=0.130 ac Runoff Depth=3.90" =89 Runoff=0.58 cfs 0.042 af
Subcatchment 3S: Remainder of Proposed Conditions to Se	<b>tre</b> Runoff Area= Tc=5.0 min CN=	=0.015 ac Runoff Depth=4.89" =98 Runoff=0.08 cfs 0.006 af
Subcatchment 5S: Existing Conditions to Rear	Runoff Area= Tc=5.0 min CN=	=0.057 ac Runoff Depth=3.90" =89 Runoff=0.25 cfs 0.019 af
Subcatchment 7S: Proposed Condtitions to Rear	Runoff Area= Tc=5.0 min CN=	=0.020 ac Runoff Depth=3.01" =80 Runoff=0.07 cfs 0.005 af
Subcatchment 9S: Proposed Watershed to City Drain Main	Runoff Area= Tc=5.0 min CN=	=0.155 ac Runoff Depth=4.44" =94 Runoff=0.75 cfs 0.057 af
Reach 2R: Existing Watershed To Street		Inflow=0.58 cfs 0.042 af Outflow=0.58 cfs 0.042 af
Reach 4R: Proposed Watershed to Street		Inflow=0.08 cfs 0.006 af Outflow=0.08 cfs 0.006 af
Reach 6R: Existing Watershed to Rear		Inflow=0.25 cfs 0.019 af Outflow=0.25 cfs 0.019 af
Reach 8R: Proposed Watershed to Rear		Inflow=0.07 cfs 0.005 af Outflow=0.07 cfs 0.005 af
Reach 10R: Proposed Watershed to City Drain Main		Inflow=0.75 cfs 0.057 af Outflow=0.75 cfs 0.057 af

Total Runoff Area = 0.377 ac Runoff Volume = 0.129 af Average Runoff Depth = 4.11"

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#### Subcatchment 1S: Existing Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.58 cfs @ 12.07 hrs, Volume= 0.042 af, Depth= 3.90"



#### Subcatchment 3S: Remainder of Proposed Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 4.89"

Area (ac) CN	N Description							
0.015 98	0.015 98 Proposed Concrete Sidewalk							
Tc Length (min) (feet)	Slope Velocity Capacity (ft/ft) (ft/sec) (cfs)	Description						
5.0		Direct Entry,						
Su	bcatchment 3S: Remaind	er of Proposed Conditions to Street						
	Hydrog	graph						
0.08	0.08 cfs	Type III 24-hr 10-YEAR						



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#### Subcatchment 5S: Existing Conditions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.25 cfs @ 12.07 hrs, Volume= 0

0.019 af, Depth= 3.90"



#### Subcatchment 7S: Proposed Condtitions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.07 cfs @ 12.08 hrs, Volume= 0.005 af, Depth= 3.01"

ŀ	Area (ac)	CN	Desc	cription									
	0.020	80	>75%	% Grass co	over, Good	, HSG	D						
(r	Tc Lenç nin) (fe	gth et)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Desc	ription						
	5.0					Direc	t Entry	/,					
			Su	bcatchm	nent 7S: F	Propos	sed C	ondtiti	ions t	to Re	ar		
			•••		Hydro	ograph							
													Runoff
	0.075				0.07 cfs								
	0.07						I y	pe III	24-1	nr 1(	)-YE	AR	
	0.06								Ra	infal	l=5.′	13"	
	0.055						R	unof	f Are	ea=0	.020	ac	
	0.05						Run	off V	olur	ne=(	0.005	5 af	
cfs)	0.045							Run	off D	ont	n=3 (	<b>)1''</b>	
) MO	0.04				<mark>/</mark>			Num		Тот			
Ĕ	0.035									IC-	<b>5.0</b> N		
	0.03										CN=	=80	
	0.020												
	0.015												
	0.01					<u>&gt;</u>							
	0.005			m					mm	TTTT			
	0	2 3	4 5 6	7 8 9 1	0 11 12 13 1	14 15 16	17 18	19 20 21	22 23 2	24 25 20	5 27 28	29 30	
			- •		Tir	me (hours	s)						

#### Subcatchment 9S: Proposed Watershed to City Drain Main

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 0.057 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs Type III 24-hr 10-YEAR Rainfall=5.13"

Area (ac)	CN	Description						
0.070	98	Proposed Roof	Proposed Roof Runoff					
0.052	98	Proposed Asph	Proposed Asphalt Driveway					
0.033	80	>75% Grass co	>75% Grass cover, Good, HSG D					
0.155	94	Weighted Avera	age					
Tc Leng (min) (fee	th נ ∋t)	Slope Velocity (ft/ft) (ft/sec)	Capacity (cfs)	Description				
5.0		· · · · ·		Direct Entry,				

## Subcatchment 9S: Proposed Watershed to City Drain Main



## **Reach 2R: Existing Watershed To Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.130 ac, I	nflow Depth	= 3.90"	for	10-YEAR ev	rent	
Inflow	=	0.58 cfs @	12.07 hrs,	Volume=		0.042 af		
Outflow	=	0.58 cfs @	12.07 hrs,	Volume=		0.042 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



**Reach 2R: Existing Watershed To Street** 

# Reach 4R: Proposed Watershed to Street

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.015 ac, I	nflow Depth	= 4.89"	for	10-YEAR e	vent	
Inflow	=	0.08 cfs @	12.07 hrs,	Volume=		0.006 af		
Outflow	=	0.08 cfs @	12.07 hrs,	Volume=		0.006 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## **Reach 4R: Proposed Watershed to Street**

## **Reach 6R: Existing Watershed to Rear**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.057 ac, li	nflow Depth	= 3.90"	for '	10-YEAR ev	ent	
Inflow	=	0.25 cfs @	12.07 hrs,	Volume=		0.019 af		
Outflow	=	0.25 cfs @	12.07 hrs,	Volume=		0.019 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



**Reach 6R: Existing Watershed to Rear** 

# Reach 8R: Proposed Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.020 ac, Ir	nflow Depth	= 3.01"	for 10-	YEAR ev	ent	
Inflow	=	0.07 cfs @	12.08 hrs,	Volume=	(	0.005 af		
Outflow	=	0.07 cfs @	12.08 hrs,	Volume=	(	0.005 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## Reach 8R: Proposed Watershed to Rear

## Reach 10R: Proposed Watershed to City Drain Main

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.155 ac, li	nflow Depth	= 4.44"	for	10-YEAR ev	/ent	
Inflow	=	0.75 cfs @	12.07 hrs,	Volume=		0.057 af		
Outflow	=	0.75 cfs @	12.07 hrs,	Volume=		0.057 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## Reach 10R: Proposed Watershed to City Drain Main



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Time span=0.00-30.00 hrs, dt=0.0 Runoff by SCS TR-20 metho Reach routing by Stor-Ind+Trans method - Po	05 hrs, 601 points od, UH=SCS ond routing by Stor-Ind method
Subcatchment 1S: Existing Conditions to Street	Runoff Area=0.130 ac Runoff Depth=5.03" Tc=5.0 min CN=89 Runoff=0.74 cfs 0.054 af
Subcatchment 3S: Remainder of Proposed Conditions to S	<b>Stre</b> Runoff Area=0.015 ac Runoff Depth=6.06" Tc=5.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment 5S: Existing Conditions to Rear	Runoff Area=0.057 ac Runoff Depth=5.03" Tc=5.0 min CN=89 Runoff=0.32 cfs 0.024 af
Subcatchment 7S: Proposed Condtitions to Rear	Runoff Area=0.020 ac Runoff Depth=4.05" Tc=5.0 min CN=80 Runoff=0.10 cfs 0.007 af
Subcatchment 9S: Proposed Watershed to City Drain Main	Runoff Area=0.155 ac Runoff Depth=5.59" Tc=5.0 min CN=94 Runoff=0.94 cfs 0.072 af
Reach 2R: Existing Watershed To Street	Inflow=0.74 cfs 0.054 af Outflow=0.74 cfs 0.054 af
Reach 4R: Proposed Watershed to Street	Inflow=0.09 cfs 0.008 af Outflow=0.09 cfs 0.008 af
Reach 6R: Existing Watershed to Rear	Inflow=0.32 cfs 0.024 af Outflow=0.32 cfs 0.024 af
Reach 8R: Proposed Watershed to Rear	Inflow=0.10 cfs 0.007 af Outflow=0.10 cfs 0.007 af
Reach 10R: Proposed Watershed to City Drain Main	Inflow=0.94 cfs 0.072 af Outflow=0.94 cfs 0.072 af

Total Runoff Area = 0.377 ac Runoff Volume = 0.165 af Average Runoff Depth = 5.25"

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#### Subcatchment 1S: Existing Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.74 cfs @ 12.07 hrs, Volume= 0.054 af, Depth= 5.03"



#### Subcatchment 3S: Remainder of Proposed Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.09 cfs @ 12.07 hrs, Volume= 0.008 af, Depth= 6.06"

	Area (	ac)	CN	Desc	cription		
	0.0	015	98	Prop	osed Con	crete Sidew	<i>v</i> alk
(r	Tc nin)	Leng (fee	th et)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	5.0						Direct Entry,





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#### Subcatchment 5S: Existing Conditions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.32 cfs @ 12.07 hrs, Volume=

0.024 af, Depth= 5.03"



#### Subcatchment 7S: Proposed Condtitions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.10 cfs @ 12.07 hrs, Volume= 0.007 af, Depth= 4.05"

Area	(ac) CN	Des	cription									
0.	020 80	) >75°	% Grass c	over, Good	1, HSG D							
Tc	Length	Slope	Velocity	Capacity	Description							
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)								
5.0					Direct Entry,							
		Su	bcatchm	nent 7S: F	Proposed Condtitions to Rear							
Hydrograph												
0.105	ſ											
0.1	[/			0.10 cfs								
0.095	[/				Type III 24-hr 25-YEAR							
0.09												
0.005					Rainiali=0.30							
0.075					Runoff Area=0.020 ac							
0.07												
0.065	·/				Runoff Volume=0.007 af							
0.06 <b>(ئ</b>	[/				Runoff Denth=4.05"							
⊂0.055 ≥ 0.055												
6 0.05 E 0.045					Tc=5.0 min							
0.043					CN-80							
0.035												
0.03	/ <b></b>											
0.025	ľ/											
0.02	[/											
0.015	1/+											
0.01												
0.005		///////////////////////////////////////										
Ŭ	0 1 2 3	4 5 6	7 8 9 1	0 11 12 13 1	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30							
				Tin	me (hours)							

## Subcatchment 9S: Proposed Watershed to City Drain Main

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.94 cfs @ 12.07 hrs, Volume= 0.072 af, Depth= 5.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs Type III 24-hr 25-YEAR Rainfall=6.30"

Area (ac)	CN	Description	
0.070	98	Proposed Roof Runoff	
0.052	98	Proposed Asphalt Driveway	
0.033	80	>75% Grass cover, Good, HSG D	
0.155	94	Weighted Average	
Tc Leng (min) (fee	ith S et)	Glope Velocity Capacity Description (ft/ft) (ft/sec) (cfs)	
5.0		Direct Entry,	

## Subcatchment 9S: Proposed Watershed to City Drain Main



Type III 24-hr 25-YEAR Rainfall=6.30" Page 8 HydroCAD® 7.10 s/n 003546 © 2005 HydroCAD Software Solutions LLC 9/13/2023

## **Reach 2R: Existing Watershed To Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.130 ac, I	nflow Depth	= 5.03"	for 25-	YEAR ev	ent	
Inflow	=	0.74 cfs @	12.07 hrs,	Volume=	0	).054 af		
Outflow	=	0.74 cfs @	12.07 hrs,	Volume=	0	).054 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



#### **Reach 2R: Existing Watershed To Street**

## **Reach 4R: Proposed Watershed to Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.015 ac, li	nflow Depth	= 6.06"	for 25	-YEAR ev	ent	
Inflow	=	0.09 cfs @	12.07 hrs,	Volume=		0.008 af		
Outflow	=	0.09 cfs @	12.07 hrs,	Volume=		0.008 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## **Reach 4R: Proposed Watershed to Street**

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#### **Reach 6R: Existing Watershed to Rear**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.057 ac, I	nflow Depth	= 5.03"	for 25-YE	EAR ev	ent	
Inflow	=	0.32 cfs @	12.07 hrs,	Volume=	0.0	)24 af		
Outflow	=	0.32 cfs @	12.07 hrs,	Volume=	0.0	)24 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



Reach 6R: Existing Watershed to Rear

## Reach 8R: Proposed Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.020 ac, li	nflow Depth	= 4.05"	for 2	5-YEAR ev	ent	
Inflow	=	0.10 cfs @	12.07 hrs,	Volume=		0.007 af		
Outflow	=	0.10 cfs @	12.07 hrs,	Volume=		0.007 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## Reach 8R: Proposed Watershed to Rear

## Reach 10R: Proposed Watershed to City Drain Main

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.155 ac, li	nflow Depth	= 5.59"	for 25	-YEAR ev	ent	
Inflow	=	0.94 cfs @	12.07 hrs,	Volume=		0.072 af		
Outflow	=	0.94 cfs @	12.07 hrs,	Volume=		0.072 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## Reach 10R: Proposed Watershed to City Drain Main



26736_Rumford Ave, Newton Pre-Post Prepared by Everett M. Brooks Company, Inc.	Type III 24-hr 100-YEAR Rainfall=8.78" Page 2
HydroCAD® 7.10 s/n 003546 © 2005 HydroCAD Software Solution	ons LLC 9/13/2023
Time span=0.00-30.00 hrs, dt=0.0 Runoff by SCS TR-20 metho Reach routing by Stor-Ind+Trans method - Po	5 hrs, 601 points d, UH=SCS nd routing by Stor-Ind method
Subcatchment 1S: Existing Conditions to Street	Runoff Area=0.130 ac Runoff Depth=7.45" Tc=5.0 min CN=89 Runoff=1.07 cfs 0.081 af
Subcatchment 3S: Remainder of Proposed Conditions to S	<b>tre</b> Runoff Area=0.015 ac Runoff Depth=8.54" Tc=5.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment 5S: Existing Conditions to Rear	Runoff Area=0.057 ac Runoff Depth=7.45" Tc=5.0 min CN=89 Runoff=0.47 cfs 0.035 af
Subcatchment 7S: Proposed Condtitions to Rear	Runoff Area=0.020 ac Runoff Depth=6.36" Tc=5.0 min CN=80 Runoff=0.15 cfs 0.011 af
Subcatchment 9S: Proposed Watershed to City Drain Main	Runoff Area=0.155 ac Runoff Depth=8.06" Tc=5.0 min CN=94 Runoff=1.32 cfs 0.104 af
Reach 2R: Existing Watershed To Street	Inflow=1.07 cfs 0.081 af Outflow=1.07 cfs 0.081 af
Reach 4R: Proposed Watershed to Street	Inflow=0.13 cfs 0.011 af Outflow=0.13 cfs 0.011 af
Reach 6R: Existing Watershed to Rear	Inflow=0.47 cfs 0.035 af Outflow=0.47 cfs 0.035 af
Reach 8R: Proposed Watershed to Rear	Inflow=0.15 cfs 0.011 af Outflow=0.15 cfs 0.011 af
Reach 10R: Proposed Watershed to City Drain Main	Inflow=1.32 cfs 0.104 af Outflow=1.32 cfs 0.104 af

Total Runoff Area = 0.377 ac Runoff Volume = 0.242 af Average Runoff Depth = 7.69"

26736 Rumford Ave, Newton Pre-Post

 Type III 24-hr 100-YEAR Rainfall=8.78"

 Page 3

 \$ LLC
 9/13/2023

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#### Subcatchment 1S: Existing Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.07 cfs @ 12.07 hrs, Volume= 0.081 af, Depth= 7.45"



#### Subcatchment 3S: Remainder of Proposed Conditions to Street

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.011 af, Depth= 8.54"

Ar	ea (a	ac) C	N Des	cription									
	0.0	15 9	8 Pro	posed Con	crete Side	walk							
- (mi	Tc ∣ n)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Desc	ription						
5	.0					Direc	t Entr	у,					
		Su	hcatch	mont 3S	Romain	dor of	Pron	nead (	Condi	tione	o Stra	aat	
		Uu	bcatch		Hydro		ιοp	USEU V	Sonar			561	
						ograph							
(	).14 <sup>-</sup>				0.13 cfs								Runoff
(	).13 <sup>-</sup>						Tyr	be III d	24-hi	r 100	-YEA	R	1
(	).12 <sup>-</sup>								Ra	infall	=8.78	8"	1
(	).11 <del>-</del> /							Dunot	f Arc		015		1
	0.1						<u>г</u>			;a-v.			1
) ()	0.09				<b>r</b>		Rur	10TT V	olun	ne=u	.011	ат	1
) (Cf	0.08- 0.07							Run	off D	epth	=8.54	4"	1
Flov										Tc=5	5.0 m	in	1
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(	0.04 0.04												1
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#### Subcatchment 5S: Existing Conditions to Rear

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.47 cfs @ 12.07 hrs, Volume= 0

0.035 af, Depth= 7.45"



#### Subcatchment 7S: Proposed Condtitions to Rear

[49] Hint: Tc<2dt may require smaller dt

0.15 cfs @ 12.07 hrs, Volume= 0.011 af, Depth= 6.36" Runoff =

0.020 80 >75% Grass cover, Good, HSG D Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 5.0 Direct Entry, Subcatchment 7S: Proposed Conditions to Rear Hydrograph 0.16 0.16 0.14 0.12 0.11 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.15 0.11 0.14 0.14 0.14 0.15 0.15 0.01 0.13 0.14 0.01 0.0	Area	(ac) C	N Des	cription									
Tc       Length       Slope       Velocity       Capacity       Description         5.0       Direct Entry,         Subcatchment 7S: Proposed Condtitions to Rear         Hydrograph         0.16       0.15       0.14       0.15       0.14       0.10       YEAR       Rainfall=8.78"         0.12       0.14       0.14       0.14       Runoff Area=0.020 ac       Runoff Depth=6.36"       Tc=5.0 min         0.19       0.06       0.07       CN=80       CN=80       0.04       0.04       0.04       0.05       0.04       0.04       0.04       0.05       0.04 <t< td=""><td>0</td><td>.020 8</td><td>30 &gt;75</td><td>% Grass c</td><td>over, Good</td><td>, HSG</td><td>D</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	0	.020 8	30 >75	% Grass c	over, Good	, HSG	D						
5.0 Direct Entry, Subcatchment 7S: Proposed Conditions to Rear Hydrograph 10 10 10 10 10 10 10 10 10 10	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Desc	criptior	ו					
Subcatchment 7S: Proposed Conditions to Rear	5.0					Dire	ct Ent	ry,					
Hydrograph			Sı	ıbcatchn	nent 7S: F	Propo	sed (	Condti	tions	to Re	ear		
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0.14       13       Rainfall=8.78"         0.12       0.11       Runoff Area=0.020 ac         0.11       Runoff Volume=0.011 af         0.19       Runoff Depth=6.36"         0.08       CN=80         0.06       CN=80         0.05       0.04         0.03       0.02         0.01       0	0.15				0.15 cfs								
0.13       Rainfall=8.78"         0.12       Runoff Area=0.020 ac         0.11       Runoff Volume=0.011 af         0.1       Runoff Depth=6.36"         0.08       Tc=5.0 min         0.06       CN=80         0.05       0.04         0.03       0.02         0.01       0	0.14						IY	реш	24-r	1r 10	U-YI	EAR	
0.12       0.11       0.14       Runoff Area=0.020 ac         0.11       0.1       Runoff Volume=0.011 af         0.1       Runoff Depth=6.36"         0.07       Tc=5.0 min         0.06       CN=80         0.05       0.04         0.03       0.02         0.01       0.02         0.02       0.01	0.13								R	ainfa	<b>II=8</b>	.78"	
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## Subcatchment 9S: Proposed Watershed to City Drain Main

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.32 cfs @ 12.07 hrs, Volume= 0.104 af, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs Type III 24-hr 100-YEAR Rainfall=8.78"

Area (ac) Cl	N Description
0.070 9	3 Proposed Roof Runoff
0.052 9	3 Proposed Asphalt Driveway
0.033 8	>75% Grass cover, Good, HSG D
0.155 9	4 Weighted Average
Tc Length (min) (feet)	Slope Velocity Capacity Description (ft/ft) (ft/sec) (cfs)
5.0	Direct Entry,

## Subcatchment 9S: Proposed Watershed to City Drain Main



## **Reach 2R: Existing Watershed To Street**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.130 ac, I	nflow Depth	= 7.45"	for	100-YEAR e	vent	
Inflow	=	1.07 cfs @	12.07 hrs,	Volume=		0.081 af		
Outflow	=	1.07 cfs @	12.07 hrs,	Volume=		0.081 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



**Reach 2R: Existing Watershed To Street** 

# Reach 4R: Proposed Watershed to Street

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.015 ac, 1	nflow Depth	= 8.54"	for	100-YEAR e	vent	
Inflow	=	0.13 cfs @	12.07 hrs,	Volume=		0.011 af		
Outflow	=	0.13 cfs @	12.07 hrs,	Volume=		0.011 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## **Reach 4R: Proposed Watershed to Street**

## Reach 6R: Existing Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.057 ac, li	nflow Depth	= 7.45"	for	100-YEAR e	vent	
Inflow	=	0.47 cfs @	12.07 hrs,	Volume=		0.035 af		
Outflow	=	0.47 cfs @	12.07 hrs,	Volume=		0.035 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



Reach 6R: Existing Watershed to Rear

# Reach 8R: Proposed Watershed to Rear

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.020 ac, I	nflow Depth	= 6.36"	for	100-YEAR e	event	
Inflow	=	0.15 cfs @	12.07 hrs,	Volume=		0.011 af		
Outflow	=	0.15 cfs @	12.07 hrs,	Volume=		0.011 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



## **Reach 8R: Proposed Watershed to Rear**

## Reach 10R: Proposed Watershed to City Drain Main

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area	a =	0.155 ac, Ir	nflow Depth	= 8.06"	for	100-YEAR e	vent	
Inflow	=	1.32 cfs @	12.07 hrs,	Volume=		0.104 af		
Outflow	=	1.32 cfs @	12.07 hrs,	Volume=		0.104 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



