GB ENGINEERING, LLC
Engineering ▪ Surveying

144 Jewell Street ▪ Garfield, NJ 07026 Tel: 973-340-0948 ▪ Fax: 973-340-0015

DRAINAGE CALCULATIONS

FOR

517 Bergen Street
LOT 28 in BLOCK 155
TOWN OF HARRISON
HUDSON COUNTY
NEW JERSEY
2022/0322

Prepared for:

Selgrove Group, LLC

April 4, 2022

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Present Existing Site:

Area in Question consists of Existing Lot 28
Area = 2500 sf = 0.057 Acres
tc = 6 min.

2	year storm,	i = 5.2 "/hr;	Use Rational Method
10	year storm,	i = 6.7 "/hr;	"
100	year storm,	i = 9.1 "/hr;	"

EXISTING COEFFICIENT FROM PRESET SITE:

	Area(SF)	%	Ce	Partial Ce
Dwelling	803	32.1	0.95	0.305
Plat/Steps (Front)	52	2.1	0.95	0.020
Plat/Steps (Rear)	24	1.0	0.95	0.009
Bsmt Door	27	1.1	0.95	0.010
Conc. Feat.	345	13.8	0.95	0.131
Landscape	1249	50.0	0.3	0.150
	2,500	**100%**		**0.625**

RUNOFF FROM EXISTING SITE:

$Q_{e2} = CiA =$ 0.625 x 5.2 x 0.057 = 0.187 cfs 50% = 0.093 cfs

$V_{e2} =$ 0.093 x 1/2 x 18.00 x 60 = 50 allowable volume

$Q_{e10} = CiA =$ 0.625 x 6.7 x 0.057 = 0.240 cfs 75% = 0.180 cfs

$V_{e10} =$ 0.180 x 1/2 x 18.00 x 60 = 97 allowable volume

$Q_{e100} = CiA =$ 0.625 x 9.1 x 0.057 = 0.327 cfs 80% = 0.261 cfs

$V =$ 0.261 x 1/2 x 18.00 x 60 = 141 allowable volume

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Proposed Developed Site:

Area in Question consists of Proposed Lot 28
Area = 2500 sf = 0.057 Acres
tc = 6 min.

2	year storm,	i = 5.2 "/hr;	Use Rational Method
10	year storm,	i = 6.7 "/hr;	"
100	year storm,	i = 9.1 "/hr;	"

RUNOFF COEFFICIENT FROM PROPOSED SITE:

	Area(SF)	%	Ce	Partial Ce
Dwelling	1003	40.1	0.95	0.381
Front Plat/Steps	77	3.1	0.95	0.029
Driveway	310	12.4	0.95	0.118
Conc Features	218	8.7	0.95	0.083
AC Pad	18	0.7	0.95	0.007
Landscape	874	35.0	0.3	0.105
	2500	**100%**		**0.723**

RUNOFF FROM PROPOSED SITE:

Q_{p2} = 0.723 x 5.2 x 0.057 = 0.216 cfs

V_{p2} = 0.216 x 1/2 x 18.00 x 60 = 116 cf

Q_{p10} = 0.723 x 6.7 x 0.057 = 0.278 cfs

V_{p10} = 0.278 x 1/2 x 18.00 x 60 = 150 cf

Q_{p100} = 0.723 x 9.1 x 0.057 = 0.377 cfs

V_{p100} = 0.377 x 1/2 x 18.00 x 60 = 204 cf

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Storage Required for Proposed Increase in Runoff Volume: (as per Residential Site Improvement)

2 yr storm	116	cf	-	50	=	**66**	cf
10 yr storm	150	cf	-	97	=	53	cf
100 yr storm	204	cf	-	141	=	63	cf

Storage Required for Roof Runoff:

10 yr storm used 60 min. storm duration I = 2.0"/hr

Roof Area - 1003 sf.

Designated Area $1003 \times \frac{2.0}{12} \times 0.95 \times \frac{60}{60} = \mathbf{159}$ cf.

Note: 66 cf (req. for 2 yr storm) < 159 cf

Use 159 cf as design volume

SEEPAGE PIT STORAGE CALCULATIONS FOR ROOF RUNOFF

Pre-cast 7.5 ft inner diameter concrete seepage pit → 3 ft deep
(8 ft outer diameter)

Provide stone with filter fabric around pit → 2.0 ft thick

40% stone void ratio used.
* No base stone area considered as storage due to sedimentation.

Pit Volume: 3 ft deep 2.0 ft thick stone

V = (3.14 x 7.5 x 8 x 3 / 4) +

(3.14 x (144 - 64) x 0.4 x 3 / 4 = **207.9 CF**

208 CF PIT

Provided Storage for Dwelling 208 CF > 159 CF Required

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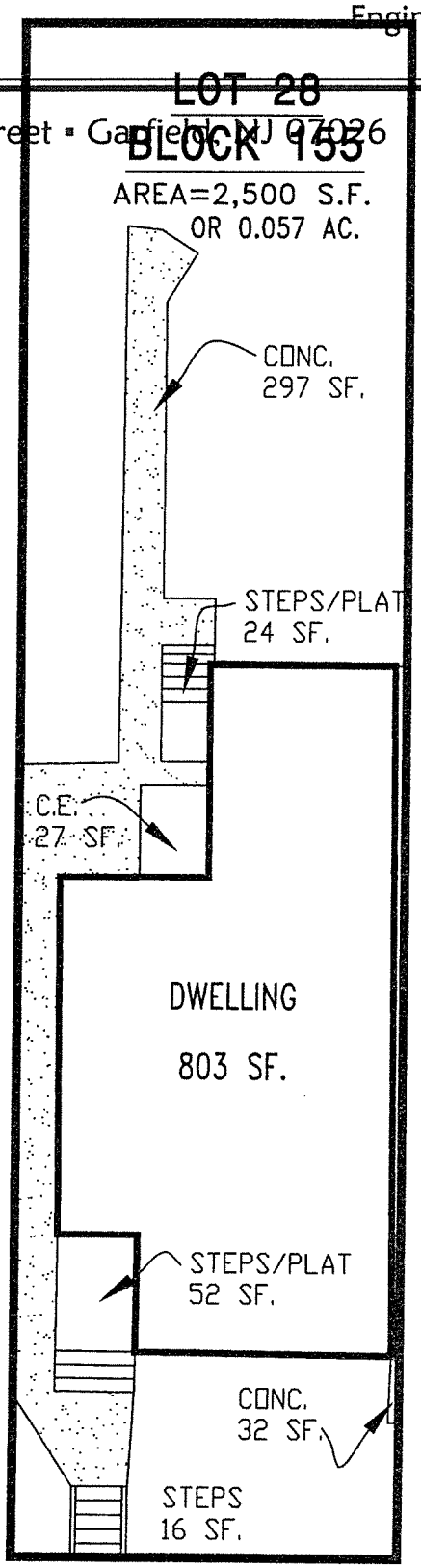
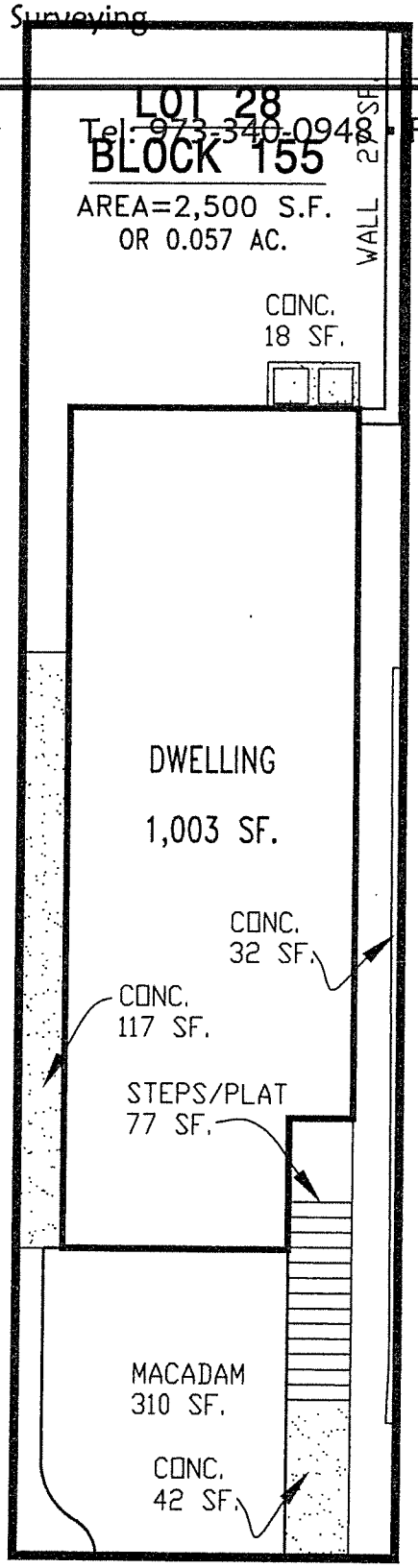


EXISTING



PROPOSED