

CALCULATIONS

for

Hidden Pines

Wilmington
North Carolina

August 28th, 2017



Prepared By:

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PN 2017-013

Final SW Calcs
10/10/2017
SWP 2017044
Ave

LOCATION		AREA		RUNOFF	RAIN	FLOW	PIPE DATA									
FROM	TO	SUB TOTAL (Acre)	TOTAL TOTAL (Acre)	COEFF. C	INT. I (in/hr)	Q=CIA (C.F.S. REQ'D)	TYPE	N	LENGTH (ft)	S %	SIZE (in)	VEL. (fps)	Q AVAIL. (cfs)	HI INV.	LOW INV.	ELEV. HEAD HEAD (ft)
15" FES #1	15" FES #2		0.53	0.37	7.23	1.42	RCP	0.012	35	1.43%	15	1.2	8.39	30.50	30.00	0.50

Energy Dissipator Sizing

Required Zone 1 for a 15"
3.75' x 5' x 12"

Minimum Provided Zone 1 15"
5' x 5' x 12"

Swale Calculations

3 :1 swales

$$R_H = [(3)(D) / 2(\text{sqrt}(9+1))]$$

$$= 0.47D$$

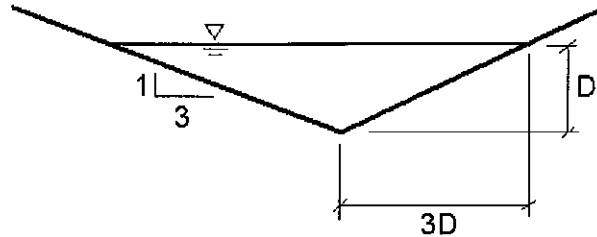
$$A = (3D)(D)$$

$$= 3D^2$$

$$Q = (1.49/n)(A)(R_H)^{2/3}(S)^{1/2}$$

$$Q = (1.49/n)(3D^2)(0.47d)^{2/3}(S)^{1/2}$$

$$D^{8/3} = [(Q)(n/1.49)] / [(3)(.47)^{2/3}(S)^{1/2}]$$



Swale No 1	
Drainage Area =	0.49 acres
Intensity "I" =	7.23 in/hr
Runoff "C" =	0.37
Q = CIA	
=	1.31 cfs
swale length =	116 ft.
difference in height =	3.0 ft.
Slope (S) =	0.0259
n =	0.03
D ^{8/3} =	0.09
D =	0.41 ft.
Vel. =	2.65 fps

Swale No 2	
Drainage Area =	0.12 acres
Intensity "I" =	7.23 in/hr
Runoff "C" =	0.37
Q = CIA	
=	0.32 cfs
swale length =	141 ft.
difference in height =	2.1 ft.
Slope (S) =	0.0147
n =	0.03
D ^{8/3} =	0.03
D =	0.27 ft.
Vel. =	1.51 fps

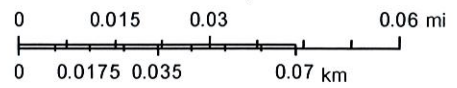
Swale No 3	
Drainage Area =	0.36 acres
Intensity "I" =	7.23 in/hr
Runoff "C" =	0.37
Q = CIA	
=	0.96 cfs
swale length =	46 ft.
difference in height =	0.6 ft.
Slope (S) =	0.0130
n =	0.03
D ^{8/3} =	0.09
D =	0.41 ft.
Vel. =	1.90 fps

OUTFALL



August 28, 2017

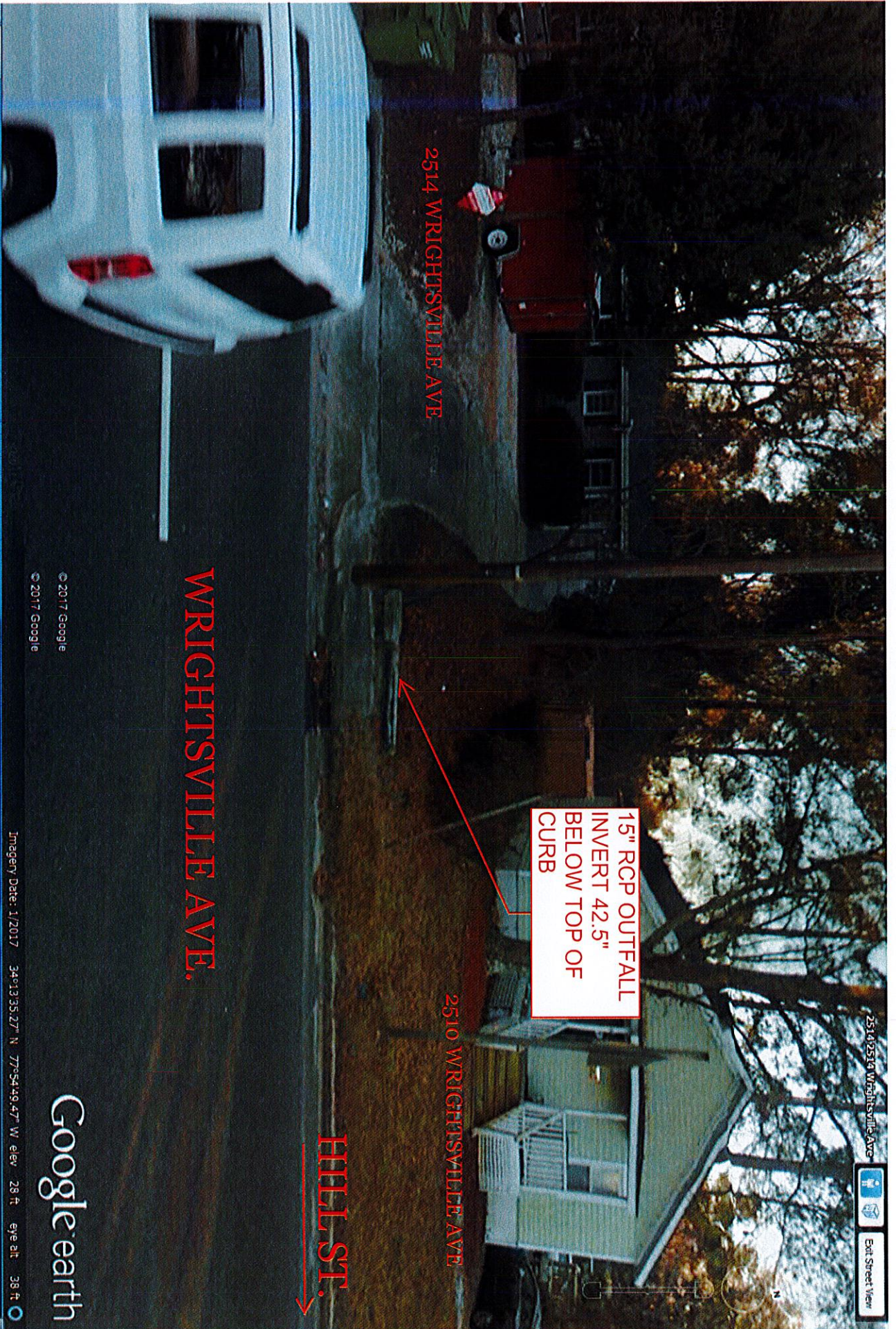
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- Addresses
- Schools
- ▲ Landmarks
- Parks
- Cemeteries
- City Limits
- Parcels



New Hanover County, NC



2514 WRIGHTSVILLE AVE

WRIGHTSVILLE AVE.

2510 WRIGHTSVILLE AVE

HILL ST. 

15" RCP OUTFALL
INVERT 42.5"
BELOW TOP OF
CURB

2514/2514 Wrightsville Ave

Eye Street View

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Imagery Date: 1/2017 34°13'35.27" N 77°54'49.47" W elev 28 ft eye alt 38 ft

Google earth

RECEIVED
AUG 29 2017
ENGINEERING