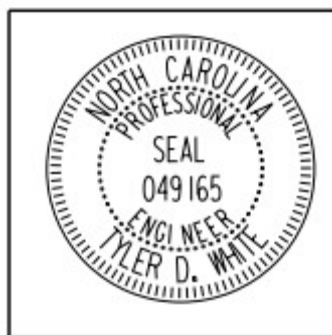


# Hydraulic Calculations

**FOR**

**Parker Ridge  
Offsite Improvements  
ROLESVILLE, NORTH CAROLINA**

**SUBMITTAL  
June 23, 2023**



**Kimley»»Horn**

300 Morris St., Suite 200  
Durham, NC 27701  
NC LICENSE # F-0102

## **Storm Water System Design**

The storm water systems are designed to meet North Carolina Department of Transportation (NCDOT) hydraulic design standards. The inlet spacing is based on limiting the spread at each inlet to 6' encroachment into the travel lane during 4 in/hr. The pipes were sized based on the 10-year event.

We have included the storm drain profile for this project and is attached separately.

CREATE DATE: 6/26/2023

### INLET COMPUTATION SHEET

REV. DATE: \_\_\_\_\_

I.D. NO.: \_\_\_\_\_

PROJ. NO.: 13829007

COUNTY: Wake

DESIGNED BY: JHV

DESCRIPTION: Parker Ridge

REVD BY: TDW

LOCATION							ROADWAY		RUNOFF							INLET				REMARKS
SYSTEM	STRUCTURE NUMBER	ALIGNMENT	STATION	OFFSET	DESCRIPTION	ELEVATION (ft)	GRADE (ft/ft)	CROSS SLOPE (ft/ft)	DRAINAGE AREA (acres) D.A.	RUNOFF COEFF. C	TIME OF CONC. (min) T <sub>C</sub>	RAINFALL INT. (in/hr) I	DISCHARGE FROM D.A. (cfs) Q <sub>D.A.</sub>	DISCHARGE CARRYOVR (cfs) Q <sub>C</sub>	TOTAL DISCHARGE Q <sub>T</sub> = Q <sub>D.A.</sub> + Q <sub>C</sub>	SPREAD (ft)	INTERCEPT (MAX) (cfs) Q <sub>I(max)</sub>	BYPASS (cfs) Q <sub>B</sub>	BYPASS TO INLET	
1	0104	L	13+80	17 Rt	CB-E	421.31	SAG	0.053	0.03	0.81	5.0	4.0	0.1	0.0	0.1	0.5	N/A	N/A		
1	0103	L	14+75	20 Rt	CB-E	421.18	SAG	0.051	0.15	0.79	5.0	4.0	0.5	0.0	0.5	1.3	N/A	N/A		
1	0107	L	13+82	17 Lt	CB-E	422.09	SAG	0.006	0.05	0.71	5.0	4.0	0.1	0.0	0.1	1.1	N/A	N/A		
1	0102	L	16+00	20 Rt	CB-G	422.06	0.006	0.032	0.09	0.79	2.0	4.0	0.3	0.0	0.3	2.4	0.3	0.0	103	
1	0108	L	13+82	26 Lt	OEP	421.77	0.000	0.330	1.20	0.32	5.0	4.2	1.6	0.0	1.6					
1	0109	L	14+50	19 Lt	CB-E	422.01	SAG	0.007	0.07	0.75	5.0	4.0	0.2	0.0	0.2	1.5	N/A	N/A		
1	0101	L	17+30	20 Rt	CB-G	423.30	0.007	0.021	0.08	0.80	5.0	4.0	0.3	0.0	0.3	2.8	0.3	0.0	102	
1	0110	L	15+00	20 Lt	CB-F	422.01	0.002	0.010	0.08	0.78	5.0	4.0	0.2	0.0	0.3	6.8	0.2	0.0	109	
1	0100	L	18+83	14 Rt	CB-G	425.05	0.015	0.043	0.02	0.80	2.0	4.0	0.0	0.0	0.0	0.9	0.0	0.0	101	
1	0111	L	15+00	29 Lt	OEP	421.69	0.002	0.330	1.68	0.30	5.0	3.6	1.8	0.0	1.8					
1	0112	L	16+42	20 Lt	CB-F	422.53	0.005	0.022	0.09	0.82	5.0	4.0	0.3	0.1	0.3	3.7	0.3	0.0	110	
1	0113	L	17+33	32 Lt	CB-F	422.95	0.009	0.026	0.45	0.40	5.0	4.0	0.7	0.0	0.7	4.4	0.7	0.1	112	
2	0105	L	13+18	14 Rt	CB-F	421.48	0.004	0.058	0.14	0.80	5.0	4.0	0.4	0.0	0.4	3.3	0.4	0.0	104	

CREATE DATE: 6/26/2023

### STORM DRAIN DESIGN COMPUTATIONS

REV. DATE: \_\_\_\_\_

I.D. NO.: \_\_\_\_\_

PROJ. NO.: 13829007

COUNTY: Wake

DESIGNED BY: JHV

DESCRIPTION: Parker Ridge

REVD BY: TDW

LOCATION				RUNOFF								PIPE DESIGN										REMARKS		
SYSTEM	LINK	STRUCTURE NUMBER		CUM. D.A. (acres)	SUM CA (C x A)	PIPE LENGTH (ft)	TIME OF CONCENTRATION (min)			INTENSITY (in/hr)	DISCHG. (cfs)	INLET ELEV. (ft)	OUTLET ELEV. (ft)	SLOPE (ft/ft)	MINIMUM REQ'D SLOPE (ft/ft)	DIA. (in)	MATERIAL	EXISTING / ALT	LESSER of INLET vs PIPE CAP. (cfs)	VEL. (ft/s)	UPSTREAM BOX DEPTH (ft)		HGL ELEV. (ft)	FREEBOARD
		FROM	TO				INLET	FLOW	DES															
1	104	0104	0106	4.39	1.92	46	5	10	10	5.9	11.3	421.31 418.11	0.00 417.87	0.005		24	C		17.3	5.9	3.20	419.69		
1	103	0103	0104	0.73	0.59	92	5	7	10	5.9	3.5	421.18 418.68	421.31 418.22	0.005		18	C		7.9	2.0	2.50	419.74		
1	107	0107	0104	3.62	1.30	29	5	9	10	5.9	7.6	422.09 418.63	421.31 418.47	0.005	0.005	18	C		8.1	5.0	3.46	420.16		
1	102	0102	0103	0.59	0.48	122	2	6	10	5.9	2.8	422.06 419.29	421.18 418.68	0.005		15	C		4.9	2.5	2.77	419.99		
1	108	0108	0107	1.20	0.39	9	5	5	10	5.9	2.3	421.77 421.77	422.09 419.09	0.266	0.004	15	S		9.0	9.8		422.64	X	
1	109	0109	0107	2.37	0.87	65	5	9	10	5.9	5.1	422.01 418.96	422.09 418.63	0.005		18	C		7.9	2.9	3.05	420.28		
1	101	0101	0102	0.50	0.41	127	5	5	10	5.9	2.4	423.30 420.30	422.06 419.29	0.008		15	C		6.2	4.7	3.00	420.95		
1	110	0110	0109	2.30	0.82	50	5	9	10	5.9	4.8	422.01 419.20	422.01 418.96	0.005		18	C		7.7	2.9	2.81	420.48		
1	100	0100	0101	0.41	0.34	150	2	2	10	5.9	2.0	425.05 422.05	423.30 420.30	0.011		15	C		7.5	5.2	3.00	422.83		
1	111	0111	0110	1.68	0.50	8	5	5	10	5.9	3.0	421.69 421.69	422.01 419.20	0.255	0.007	15	S		9.0	10.2		422.71	X	
1	112	0112	0110	0.54	0.25	141	5	7	10	5.9	1.5	422.53 419.90	422.01 419.20	0.005		15	C		4.9	1.2	2.63	420.53		
1	113	0113	0112	0.45	0.18	89	5	5	10	5.9	1.1	422.95 420.35	422.53 419.90	0.005		15	C		4.9	3.2	2.60	420.91		
2	105	0105	0115	0.14	0.11	23	5	5	10	5.9	0.7	421.48 418.78	0.00 418.01	0.031		18	C	E	13.0	5.1	2.70	419.18		

