STORM DRAINAGE NARRATIVE

THIS PROJECT CONSISTS OF THE CONSTRUCTION OF PUBLIC ROADWAYS AND SUPPORTING INFRASTRUCTURE (WATER, SEWER AND STORM DRAINAGE) TO SERVE 53 LOTS LOCATED WITHIN THE POWELL PLACE MIXED USE DEVELOPMENT.

RUNOFF WILL BE CAPTURED BY THE USE OF A STORM DRAINAGE SYSTEM CONSISTING OF CATCH BASINS AND DROP INLETS WHICH WILL DIRECT RUNOFF TO EXISTING BMP B. RUNOFF FROM UNDER US64 WILL BE BYPASSED AROUND THE SITE BY USE OF A SEPARATE STORM DRAINAGE SYSTEM (FES60 TO Y164).

EXISTING BMP B WILL BE A PERMANENT WET DETENTION POND WHICH WILL BE USED DURING INITIAL GRADING AND INFRASTRUCTURE CONSTRUCTION OPERATIONS AS A SEDIMENT BASIN. BMP B WILL BE REQUIRED TO BE CLEANED OUT, CONVERTED TO A WET DETENTION POND, AS-BUILTED AND A CERTIFICATION WILL BE COMPLETED, SUBMITTED FOR APPROVAL BY THE TOWN STORMWATER ADMINISTRATOR.

STORM DRAINAGE PIPE SCHEDULE

DS Inlet	US Inlet	DS Invert	US Invert	Pipe Size	Pipe Material	Pipe Length (ft)	Pipe Slope (%)	Post-development Discharge Q10 (cfs)	Ave Vel (ft/s)
FES10	JB11	469.50	470.23	48" Dia.	CLASS III	52.90	1.38	83.35	6.63
JB11	CB12	474.15	474.80	30" Dia.	CLASS III	39.31	1.65	29.69	6.21
CB12	CB13	475.00	475.67	30" Dia.	CLASS III	27.00	1.00	29.51	6.01
CB13	CB14	475.47	475.91	30" Dia.	CLASS III	66.70	0.66	29.32	6.03
CB14	CB15	476.11	476.19	30" Dia.	CLASS III	8.00	1.00	24.61	5.01
CB15	CB16	476.39	477.17	30" Dia.	CLASS III	124.54	0.63	23.91	4.63
CB16	CB17	478.91	484.44	24" Dia.	CLASS III	231.30	2.39	12.98	9.75
CB17	CB18	484.94	488.62	18" Dia.	CLASS III	176.71	2.08	8.19	8.67
CB18	CB19	488.82	489.36	18" Dia.	CLASS III	80.14	0.81	6.45	3.72
CB19	CB20	489.56	490.33	18" Dia.	CLASS III	120.23	0.64	5.97	4.99
CB20	CB21	490.58	491.04	15" Dia.	CLASS III	75.35	0.81	5.47	4.92
CB21	CB22	491.24	491.32	15" Dia.	CLASS III	8.00	1.00	4.55	3.71
CB22	CB23	491.52	491.79	15" Dia.	CLASS III	27.00	1.00	3.66	4.36
CB23	CB24	491.99	492.07	15" Dia.	CLASS III	8.00	1.00	1.83	1.81
CB14	CB26	477.07	477.34	18" Dia.	CLASS III	27.00	1.00	4.02	2.28
CB26	CB27	477.54	477.62	18" Dia.	CLASS III	8.00	1.00	2.02	1.14
CB16	CB30	477.67	477.85	24" Dia.	CLASS III	29.17	0.62	8.66	2.76
CB30	Y131	478.35	479.30	18" Dia.	CLASS III	151.23	0.63	6.97	3.33
Y131	Y132	479.50	480.85	18" Dia.	CLASS III	193.14	1.73	4.55	6.15
Y132	Y133	483.05	489.95	15" Dia.	CLASS III	156.06	4.42	2.37	7.96
CB17	CB25	485.19	485.47	15" Dia.	CLASS III	27.17	1.03	3.04	2.57
JB11	CB41	473.44	476.88	36" Dia.	CLASS III	75.89	4.53	54.42	13.77
CB41	CB42	477.06	485.59	36" Dia.	CLASS III	253.44	3.36	46.92	13.10
CB42	CB43	485.79	486.46	36" Dia.	CLASS III	48.81	1.39	46.01	6.18
CB43	JB44	486.62	487.01	36" Dia.	CLASS III	39.76	0.98	45.79	6.48
JB44	EXCB81	487.21	487.70	36" Dia.	CLASS III	49.00	1.00	46.01	6.54
CB41	CB50	478.84	479.12	18" Dia.	CLASS III	27.68	1.01	7.14	4.04
CB50	CB51	479.37	480.41	15" Dia.	CLASS III	29.91	3.48	4.11	2.56
CB51	CB52	480.61	481.95	15" Dia.	CLASS III	106.43	1.26	3.69	5.79
CB52	CB53	482.15	486.48	15" Dia.	CLASS III	159.68	2.71	2.04	6.37
CB50	CB54	479.37	481.23	15" Dia.	CLASS III	58.37	3.19	2.51	3.68
FES60	JB61	474.00	474.93	30" Dia.	CLASS III	137.34	0.68	27.54	6.01
JB61	JB62	475.13	475.59	30" Dia.	CLASS III	68.34	0.70	27.62	5.64
JB62	JB63	475.73	477.33	30" Dia.	CLASS III	219.90	0.70	26.67	5.73
JB63	Y164*	477.53	478.00	30" Dia.	CLASS III	69.76	0.67	29.21	5.95

STORM DRAINAGE INLET SCHEDULE

Inlet Name	Runoff Coeff	System Int (in/hr)	Drainage Area (ac)	Inlet Sys Q (cfs)	Rim Elev	Floor Elev	Box Depth (ft)
JB11	0.60	6.03	0.00	0.00	480.23	470.23	10.00
CB12	0.60	6.19	0.12	0.45	482.76	474.80	7.96
CB13	0.60	6.21	0.11	0.41	482.76	475.67	7.49
CB14	0.60	6.26	0.31	1.16	482.24	475.91	6.33
CB15	0.60	6.26	0.31	1.16	482.24	476.19	6.05
CB16	0.60	6.38	0.69	2.64	484.36	477.17	7.19
CB17	0.60	6.51	0.55	2.14	490.05	484.44	5.61
CB18	0.60	6.62	0.47	1.86	494.29	488.62	5.67
CB19	0.60	6.76	0.15	0.61	496.41	489.36	7.05
CB20	0.60	6.91	0.14	0.58	497.79	490.33	7.46
CB21	0.60	7.02	0.22	0.93	496.72	491.04	5.68
CB22	0.60	7.02	0.22	0.93	496.71	491.32	5.39
CB23	0.60	7.06	0.43	1.82	496.71	491.79	4.92
CB24	0.60	7.08	0.43	1.83	496.72	492.07	4.65
CB26	0.50	7.05	0.57	2.01	482.24	477.34	4.90
CB27	0.50	7.08	0.57	2.02	482.24	477.62	4.62
CB30	0.60	6.48	0.50	1.95	484.09	477.85	6.24
Y131	0.50	6.74	0.76	2.56	482.80	479.30	3.50
Y132	0.50	6.94	0.64	2.22	486.35	482.85	3.50
Y133	0.50	7.08	0.67	2.37	492.95	489.95	3.00
CB25	0.50	7.08	0.86	3.04	490.12	485.47	4.65
CB41	0.60	6.06	0.46	1.67	483.86	476.88	6.98
CB42	0.60	6.13	0.31	1.14	492.14	485.59	6.55
CB43	0.60	6.17	0.11	0.41	493.51	486.46	7.05
JB44	0.00	6.19	0.00	0.00	494.76	487.01	7.75
EXCB81	0.70	6.22	0.53	2.31	494.41	487.70	6.71
CB50	0.60	6.72	0.17	0.69	484.02	479.12	4.90
CB51	0.60	6.79	0.12	0.49	485.06	480.41	4.65
CB52	0.60	6.90	0.41	1.70	486.60	481.95	4.65
CB53	0.60	7.08	0.48	2.04	491.13	486.48	4.65
CB54	0.60	7.08	0.59	2.51	485.88	481.23	4.65
JB61	0.00	6.68	0.00	0.00	484.87	474.93	9.94
JB62	0.00	6.74	0.00	0.00	485.05	475.59	13.46
JB63	0.00	7.00	0.00	0.00	485.77	477.33	8.44
Y164	0.50	7.08	8.25	29.21	482.00	478.00	4.00

STORM DRAINAGE NOTES:
FES: FLARED END SECTION, CB: CATCH BASIN, Yl: YARD INLET, JB: JUNCTION BOX
DISCHARGE BASED ON 10-YR STORM EVENT UNLESS NOTED OTHERWISE.

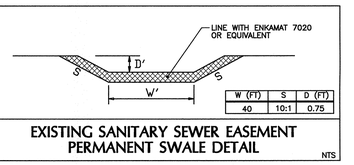
& DENOTES O-RING PIPE REQUIRED
* DENOTES 4' X 4' SLAB TOP (SEE DETAIL)

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF PITTSBORO AND NCDOT STANDARD SPECIFICATIONS AND DETAILS.
2. RIM ELEVATION GIVEN FOR CB IS TOP OF CURB, D IS TOP OF GRATE FOR GRATED INLET.
3. ALL PIPING SHALL BE CLASS III REINFORCED CONCRETE PIPE (RCP) UNLESS NOTED OTHERWISE.
4. ALL PUBLIC STORM DRAINAGE FRAMES, GRATES, & HOODS SHALL BE STAMPED w/ "DRAINS TO RIVER" IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARDS.

VELOCITY DISSIPATOR DESIGN

OUTLET #	PIPE DIA (INCHES)	DISCHARGE 10-YEAR (CFS)	LENGTH (L) (FT)	OUTLET WIDTH (FT)	D.STREAM WIDTH (FT)	RIP RAP THICKNESS (INCHES)	RIP RAP CLASS (NCDOT)
FES10	48	83.35	20	12.0	12.0	22	1
FES60	30	29.21	20	7.5	22.5	22	1

ALL DISSIPATORS SHALL HAVE FILTER FABRIC UNDERLINERS.



W (FT)	S	D (FT)
40	10:1	0.75

EXISTING SANITARY SEWER EASEMENT PERMANENT SWALE DETAIL
NTS

GENERAL NOTES:

1. BOUNDARY SURVEY BY WITHERS & RAVENEL. TOPOGRAPHICAL INFORMATION BASED FIELD SURVEY BY WITHERS & RAVENEL.
2. EROSION CONTROL PLAN APPROVAL WILL BE REQUIRED TO BE OBTAINED FROM CHATHAM COUNTY PRIOR TO CONSTRUCTION.
3. ALL LAND DISTURBING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH EROSION AND SEDIMENT CONTROL STANDARDS AND PRACTICES PRESCRIBED BY CHATHAM COUNTY. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO GRADING.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY SEDIMENTATION AND EROSION CONTROL DEVICES SHOWN ON THE APPROVED PLAN.
5. SLOPES SHALL BE NO STEEPER THAN 2:1 (H:V), PREFERABLY FLATTER, FOR VEGETATION.
6. THE CONTRACTOR SHALL FAITHFULLY MAINTAIN ALL SEDIMENTATION CONTROL DEVICES AND TAKE ANY PRECAUTIONARY MEASURES TO ENSURE THAT SILT DOES NOT ENTER ANY NATURAL STREAM CHANNEL LOCATED WITHIN THE SITE. DRAINAGE CHANNELS MUST BE CLEAN OF SEDIMENT AND STABILIZED BEFORE THE PROJECT IS RELEASED.
7. ALL STORM DRAINAGE PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED.
8. RECEIVING WATERCOURSES: UNNAMED TRIBUTARY OF HAW RIVER
9. RECEIVING WATERSHED: CAPE FEAR RIVER BASIN
10. NO PORTION OF THIS PROJECT IS LOCATED WITHIN FEMA FLOOD HAZARD AREA PER FEMA FIRM COMMUNITY-PANEL NUMBERS 3710974200J, CHATHAM COUNTY, DATED FEBRUARY 2, 2007.
11. ALL EXISTING VEGETATION THAT IS TO BE PRESERVED SHALL BE FENCED WITH A STURDY AND VISIBLE FENCE BEFORE EXCAVATION BEGINS. THE TREE PROTECTION FENCE SHOULD BE LOCATED AS FAR AS PRACTICABLE FROM THE TREES AND VEGETATION.
12. NO WETLANDS ARE PRESENT WITHIN THIS PHASE PER FIELD DETERMINATION BY WITHERS & RAVENEL AND VERIFIED BY USACOE ON 11/25/14.
13. VELOCITY DISSIPATORS SHALL BE INSTALLED AT THE END OF EACH FES AND SHALL HAVE A FILTER FABRIC UNDERLINER.
14. NPDES GROUND COVER REQUIREMENTS SHALL BE FOLLOWED IN ADDITION TO STANDARD NCDENR EROSION CONTROL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING A PERMANENT STAND OF VEGETATION ON ALL DISTURBED AREAS AND MEETING ALL NPDES FINAL STABILIZATION REQUIREMENTS.
15. THIS PROJECT SHALL BE SUBJECT TO MONITORING REQUIREMENTS IN ACCORDANCE WITH SECTION II.B(3) OF THE MOST RECENT NCDENR-DEMLR GENERAL PERMIT NCG 01000.

PRELIMINARY PLAN
NOT APPROVED FOR CONSTRUCTION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31982 JOHN C. IHNATKO JR. 3/24/15

0 25' 50' 100' 200'
SCALE: 1" = 50'

No.	Revision	Date	By
1	TOP 1st REVIEW COMMENTS	02/20/15	JCI
2	TOP 2nd REVIEW COMMENTS	03/24/15	JCI

Designer W&R	Scale SEE SHEET
Drawn By JCI	Date 12/19/14
Checked By JCI	Job No. 020503512

POWELL PLACE - PHASE 2E

TOWN OF PITTSBORO CHATHAM COUNTY NORTH CAROLINA

STORM DRAINAGE AND INFRASTRUCTURE GRADING PLAN

WITHERS & RAVENEL
ENGINEERS I PLANNERS I SURVEYORS
115 MacKenan Drive Cary, North Carolina 27511 tel: 919-469-3340 fax: 919-467-6008 www.withersravenel.com License No. C-0832

Sheet No. 3 of 7

K:\020\05-SSD\05D\1-20-Powell Place Ph 2\CAD\Civil\xrefs\Plan Mar 25, 2015, 10:49AM WITHERS & RAVENEL, INC