



Town of Perdido Beach Comprehensive Drainage Master Plan

TOWN OF PERDIDO BEACH PROJECT NO. 636502.AV
BALDWIN COUNTY, ALABAMA
May 2017

FUNDING FOR THIS PROJECT IS PROVIDED BY THE ALABAMA DEPARTMENT OF TRANSPORTATION AND NATURAL RESOURCES STATE LANDS DIVISION, COASTAL SECTION, IN PART BY A GRANT FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, OFFICE OF OCEAN AND HAVENAL RESOURCE MANAGEMENT, AWARD # 05N034190318

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Glossary

A (area) – drainage area in a watershed

C (runoff coefficient) – dimensionless value used to describe the function of the cover of the watershed or drainage area

I (rainfall intensity) – amount of rain expressed in inches per hour

GPS (global positioning system) – is a satellite-based system that can be used to locate positions anywhere on the earth.

L (length) – distant in feet from the most remote point in a watershed to the watershed outlet.

LIDAR (light detection and ranging) – surveying technology that measures distance by illuminating a target with a laser light.

Q (peak flow) – peak flow in cubic feet per second of a drainage area

S (average overland slope) – difference in elevation between two points

T_c (time of concentration) – time needed for water to flow from the most remote point in a watershed to the watershed outlet. It is a function of the topography, geology, and land use within the watershed.

Executive Summary

The Town of Perdido Beach is located between Palmetto Creek, Soldier Creek, and Perdido Bay, in the southeastern region of Baldwin County, Alabama. The town was incorporated in 2009 and presently has a population of approximately 631 permanent residents per the 2015 Census Estimate, as well as a large number of home owners and property owners who live elsewhere and claim Perdido Beach as their home away from home.

Town Council began in 2008 to preserve the town, the land, and all those who inhabit it. Since then, the Town of Perdido Beach has adopted a Master Plan in 2013 and has contracted Volkert, Inc. to develop a Comprehensive Drainage Master Plan for the Town of Perdido Beach as a part of this effort. Funding for this Comprehensive Drainage Master Plan was provided by the Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section, in part by a grant from the National Oceanic and Atmospheric Administration, and the Town of Perdido Beach.

The drainage study scope was to study the existing mapping to establish an understanding of the overall drainage patterns. With this information, a model of existing drainage flow patterns within their respective sub-basins was developed. Extensive field reviews were completed to compare what was shown in the model versus what was seen in the field. This information was used to analyze the existing drainage infrastructure. With the results from this analysis, critical areas were identified and recommendations made. LIDAR (light detection and ranging), in the form of 1-foot and 5-foot contours, was used to separate the Town of Perdido Beach into 18 major basins with a total of 556.1 acres of storm water runoff.

Project Information

Scope of Services:

The scope of this project was to develop an inventory of the existing drainage structures within the Town of Perdido Beach and to study the existing mapping to establish an understanding of the overall drainage patterns. With this information, a model of existing drainage flow patterns within their respective sub-basins was developed. Extensive field reviews were completed to make sure what was shown in the model represented what was seen in the field. This information was used to do a cursory analysis of the existing drainage infrastructure. With the results from this analysis, critical areas were identified and recommendations made to improve the flow of stormwater through the town. It should be noted that a detailed survey and design will need to be performed as the Town of Perdido Beach obtains funds to make the proposed improvements. LIDAR, in the form of 1-foot and 5-foot contours, was used to separate the Town of Perdido Beach into 18 major basins with a total of 556.1 acres of storm water runoff. Infrastructure information was gathered by GPSing existing conditions.

Design Criteria

For this study, all pipes were analyzed in the existing conditions. The results of this analysis determined what structures need maintenance and what structures need to be upgraded. All existing and proposed pipe culverts crossing a road were analyzed for the 50-year storm and then checked for the 100-year storm to make sure it was not overtopping the road. All existing pipes under driveways and all roadside ditches were analyzed for the 10-year storm. Recommended pipe sizes are shown as round reinforced concrete pipe, but equivalent pipe sizes can be used. The proposed ditch typical section is a 2-foot-deep, 4-foot bottom ditch with a 4:1 front slope and a 3:1 back slope. The proposed swale typical section is 2-foot-deep with 4:1 front and back slopes. Regrading and shaping of existing ditches must conform to these two typical sections to adequately convey the runoff. It is recommended that permission may need to be obtained from property owners for construction of proposed infrastructure. Any pipe proposed in the future is recommended to be a minimum 18" RCP for maintenance purposes. See typical section in appendix for details of the proposed ditch and swale.

Existing Conditions:

The majority of the existing pipes and ditches within the Town of Perdido Beach need immediate attention. Most of the pipes either lack the capacity to carry the runoff based on the 10-year or 50-year storm event or are damaged and/or filled with sediment. The ditches are also undersized and/or filled with sediment. A complete list of these pipes and ditches can be found in the corresponding basin overview section in the Appendix.

Data Collection

Listed below are items used to develop the Town of Perdido Beach Comprehensive Drainage Master Plan.

- Town of Perdido Beach Ordinance 2011-02 and Scope of Services provided by the Town of Perdido Beach defined the requirements of the drainage study. Immediate and future improvements were reviewed from onsite investigations taking into consideration of green/low impact methods.
- The town's Subdivision Regulations and Master Plan was taken into consideration when the drainage study was performed, specifically existing and future development that will impact the town's drainage systems.
- LIDAR, light detection and ranging in the form of Contour Mapping is a rapid, cost-effective source of high-accuracy, high-density elevation data for many traditional topographic mapping applications. This technology allows large area topographic surveys to be completed significantly faster and at a reduced cost compared to traditional methods by illuminating a target with a laser light. The LIDAR used to define the drainage basins and sub-basins within the town were 1-foot and 5-foot LIDAR contours.
- Town limits were provided to Volkert, Inc. by the Town of Perdido Beach to specify the drainage study area.
- GPS, Global Positioning System, surveying was used to set control points. The control points were then utilized to get the location and invert elevations of all the existing pipes. Elevation of some pipes could not be obtained due to the amount of sediment in the pipes. During the site inspections and surveying, culverts were visually inspected, noted for their size and material type, and photographed. Ditches were also noted for their approximate top width, bottom width, approximate slopes, and conditions.
- Site photos were taken of all the culverts within the town limits. These photos show the existing condition of the culverts. Some of the qualities taken into consideration were whether the culvert is in good shape, if there is damage, or if there is sedimentation build-up.

Data Analysis

The Rational Method was used to determine the peak runoff volumes. The ALHYDRO program was used to obtain the values for the intensity equation that was used to calculate the flow. The Rational Method estimates peak runoff using: intensity-duration-frequency (IDF) curves for a given location, a runoff coefficient based upon the characteristics of the basin, and the area of the basin expressed in acres.

The Rational Formula in US Customary units is:

$$Q = C i A$$

where

Q is design flow rate (cfs)

C is rational coefficient for drainage area

i is rainfall intensity (inches/hour)

A is drainage area (acres)

The Time of Concentration formula used was the Kirpich formula.

$$T_c = 0.0149 L^{0.77} S^{-0.385}$$

Where

T_c is time of concentration in minutes

L is length of overland flow in feet

S is average overland slope in ft/ft

A standard drainage coefficient “C” chart was used in the calculations for obtaining the basin and sub-basin flows. See chart below.

C VALUES	
PAVED	0.90
RESIDENTIAL	0.50
GRASS	0.35
WOODS	0.25

Existing and proposed culverts and ditches were designed using Bentley’s StormCad V8i(SS4). StormCad provides comprehensive modeling for the design and analysis of storm sewer systems using the peak flow method (Rational Method).

Results and Recommendations

Analysis results, basin maps, summaries, cost estimates, pictures, and available public involvement comments are located under each drainage basin overview section in the Appendix.

Immediate Improvements:

Immediate improvements are items that need prompt attention so the existing systems can be minimally functional. For the most part, these issues include sediment removal from pipes and ditches and some minimal ditch regrading. Within the drainage basins where these issues are identified, it is recommended that low impact designs be implemented and installed.

Future Improvements:

Future improvements are improvements to the existing systems so the systems can function at the appropriate storm event. These improvements include pipe upsizing, extensive ditch regrading, new pipe, new ditches, and/or new outfalls. Within the drainage basins where these issues are identified, it is recommended that low impact designs be implemented and installed. These improvements will be prioritized by basin.

Low Impact Development:

Low impact development (LID) is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial, and industrial settings. LID employs principles such as preserving and recreating natural landscape features and minimizing impervious surfaces to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. Practices that adhere to these LID principles include bioretention facilities, rain gardens, vegetated rooftops, rainwater harvesting (rain barrels and cisterns), and permeable pavements. A natural design is to have a sodded swale or ditch. A fully vegetated swale or ditch can be used allowing certain types of native vegetation to slow runoff, treat runoff, and provide an optic view of the system.

Basin Priority:

All basins were analyzed and prioritized. The priority chart lists a summary of the cost estimate for each basin. Cost did not factor into the prioritization of the basins. Basin prioritization was strictly on an as needed basis and where known drainage issues exist. Some of the items

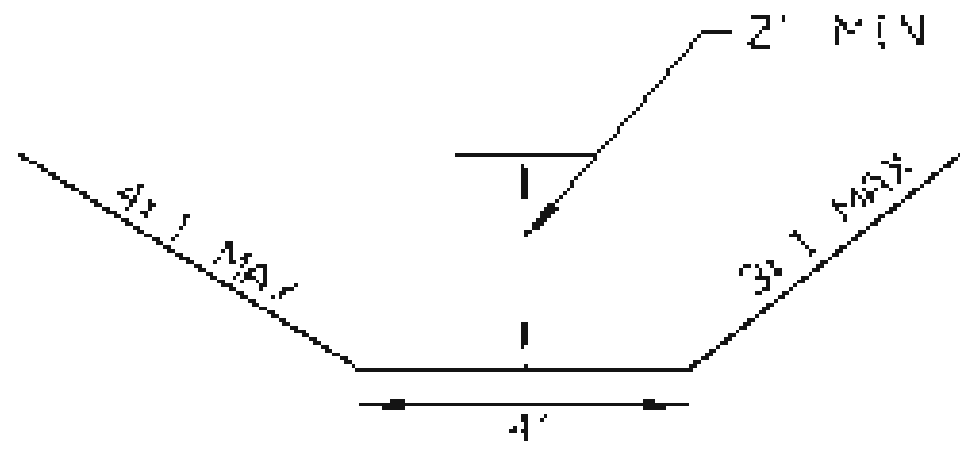
considered included undersized pipes, locations where pipes are needed, drainage conveyances, and new outfalls being required. Typically, the larger the basin, the higher the cost and the more drainage structures, the higher the cost. See the following basin priority chart.

BASIN PRIORITY CHART	
BASIN #	COST ESTIMATE
15	\$214,293.75
11	\$86,422.50
7	\$242,646.00
13	\$187,507.75
10	\$282,508.25
9	\$166,126.75
4	\$205,527.25
17	\$67,429.50
6	\$73,929.75
8	\$129,748.00
1	\$98,688.75
3	\$63,674.00
12	\$41,193.75
2	\$94,158.50
16	\$44,785.00
18	\$47,208.25
14	\$41,648.00
5	-----

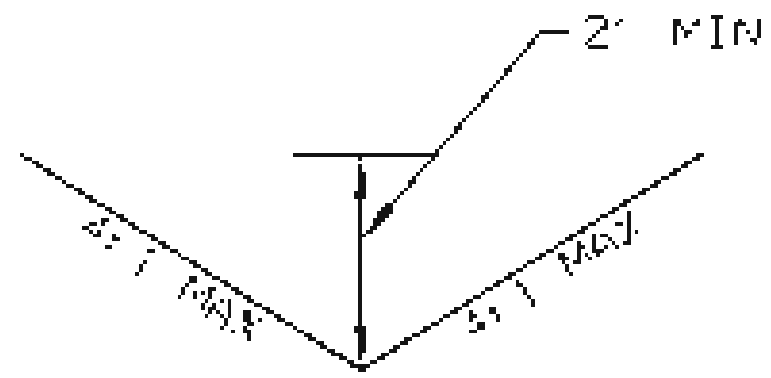
Cost Estimate:

The cost estimates are only a best guess of what the costs and fees for each basin were estimated to be based upon current information available. These fees are not all inclusive and unit costs could vary in the actual design phase of the project or projects. The cost estimates are based upon the improvements that became apparent during the cursory review performed for this study. Costs could vary once the more detailed survey and design are performed.

DITCH TYPICALS



STANDARD DITCH



STANDARD SWALE

TOWN OF PEACOCK DESIGN
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PEACOCK RES-07

VOLKERT
CONSULTING ENGINEERS

JTCU TYPICALS

PRIORITY CHART

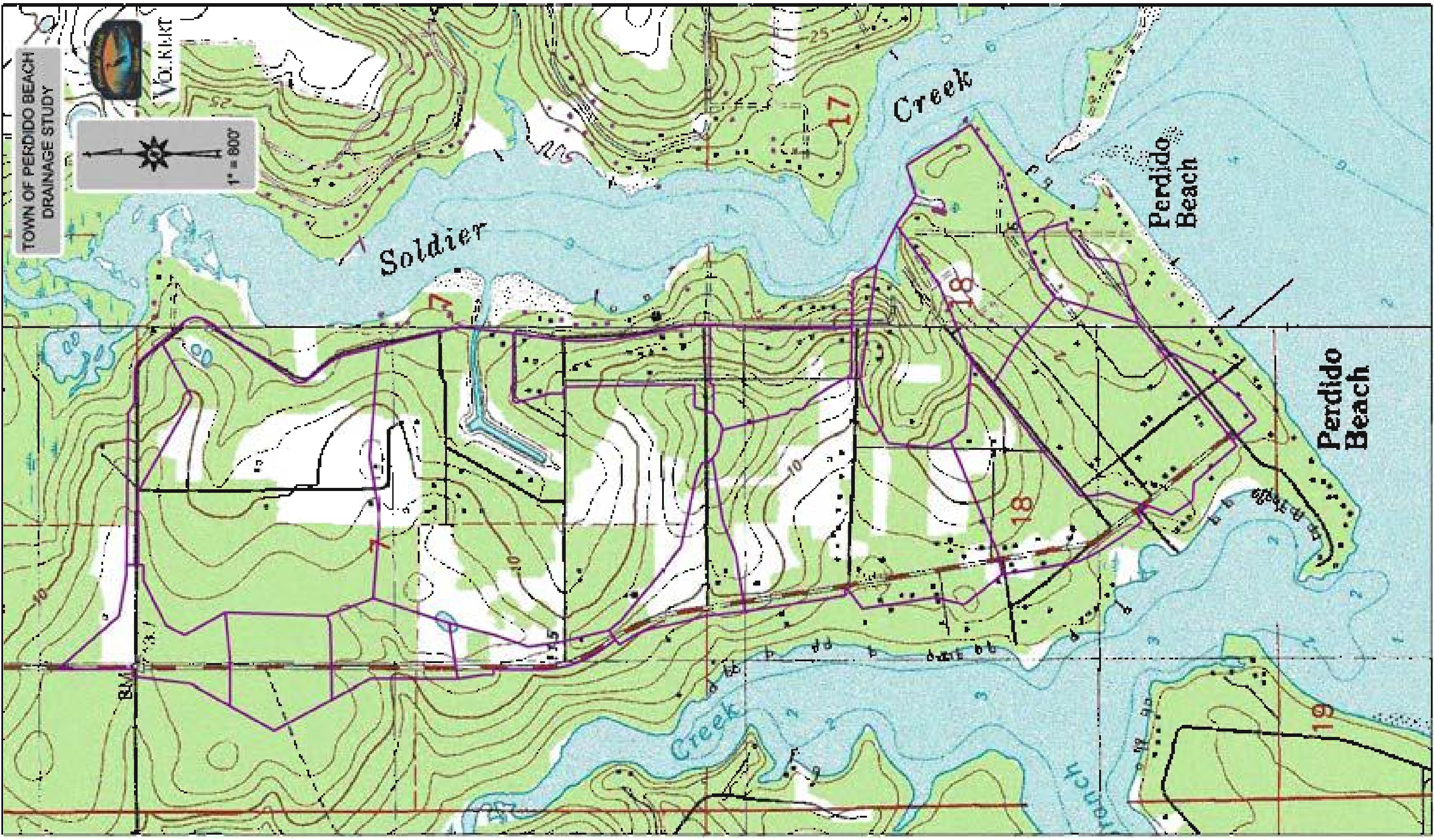
BASIN PRIORITY CHART

BASIN #	COST ESTIMATE
15	\$214,293.75
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12	\$41,193.75
2	\$94,158.50
16	\$44,785.00
18	\$47,208.25
14	\$41,648.00
5	-----

OVERALL DRAINAGE BASIN MAP

QUAD MAP

TOWN OF PERDIDO BEACH
DRAINAGE STUDY



Soldier

Creek

Perdido
Beach

Perdido
Beach

17

18

18

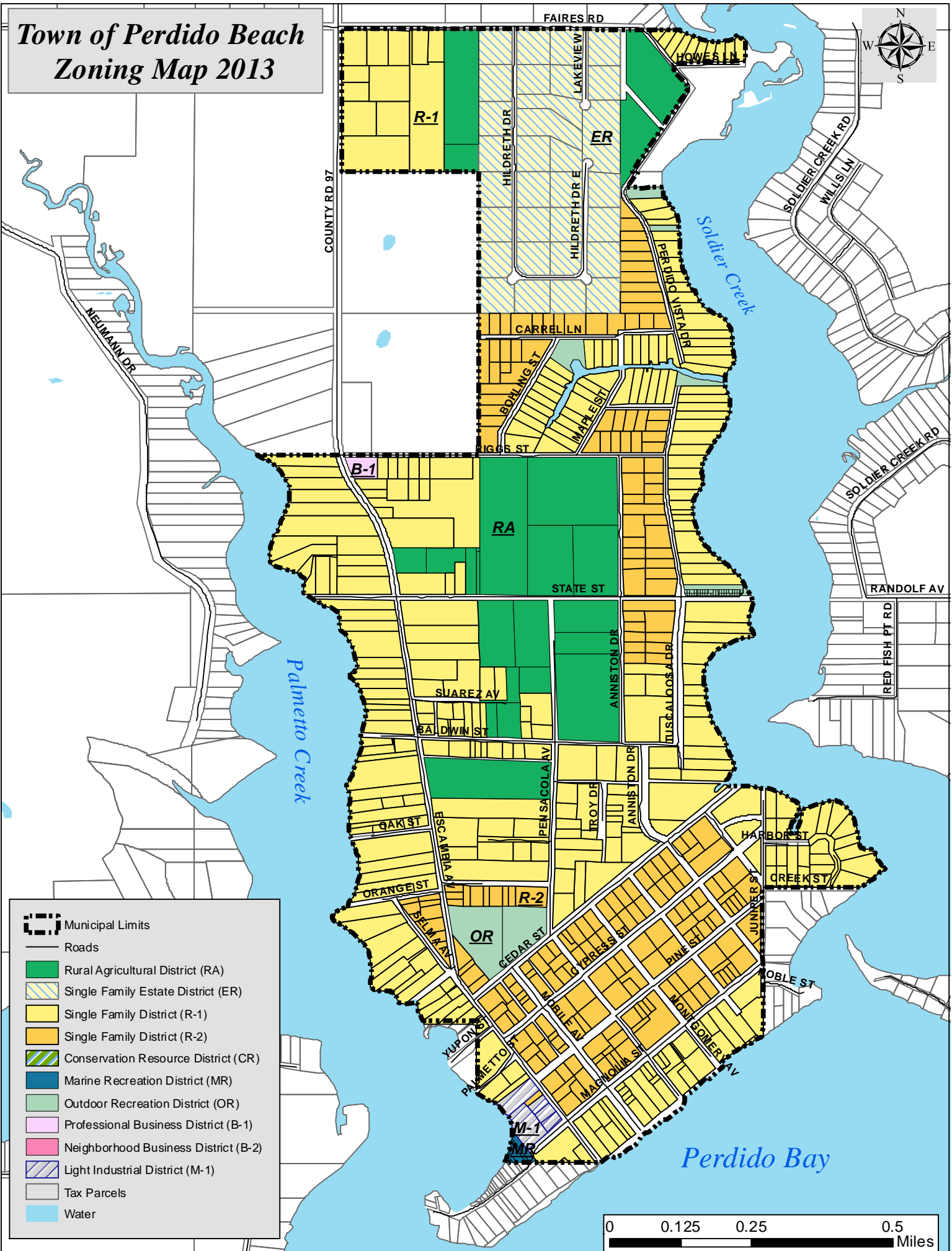
19

Creek

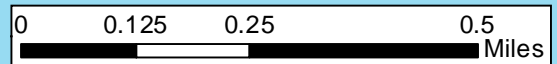
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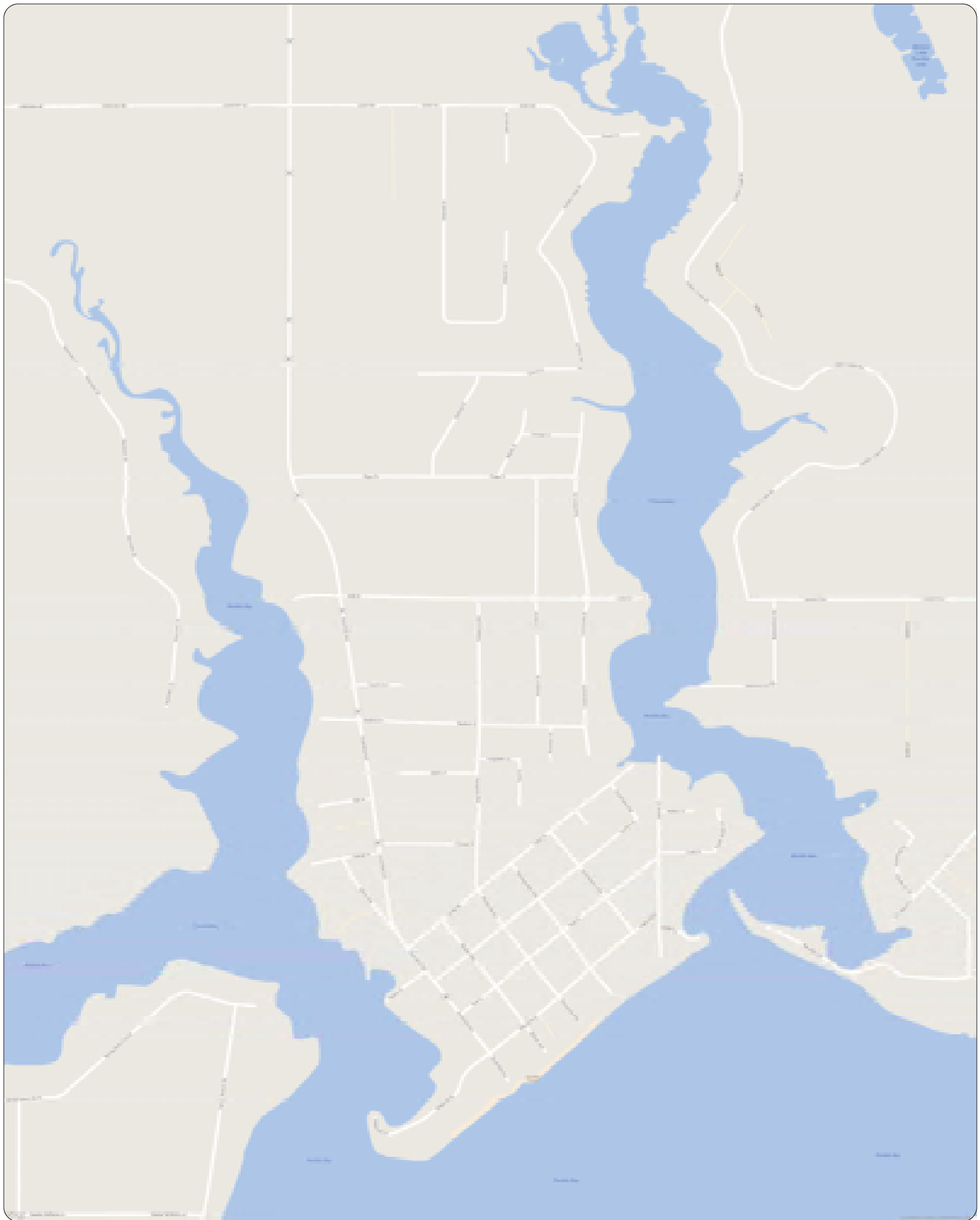
LOCATION MAP

Town of Perdido Beach Zoning Map 2013

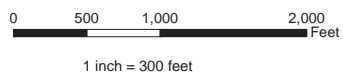


- Municipal Limits
- Roads
- Rural Agricultural District (RA)
- Single Family Estate District (ER)
- Single Family District (R-1)
- Single Family District (R-2)
- Conservation Resource District (CR)
- Marine Recreation District (MR)
- Outdoor Recreation District (OR)
- Professional Business District (B-1)
- Neighborhood Business District (B-2)
- Light Industrial District (M-1)
- Tax Parcels
- Water

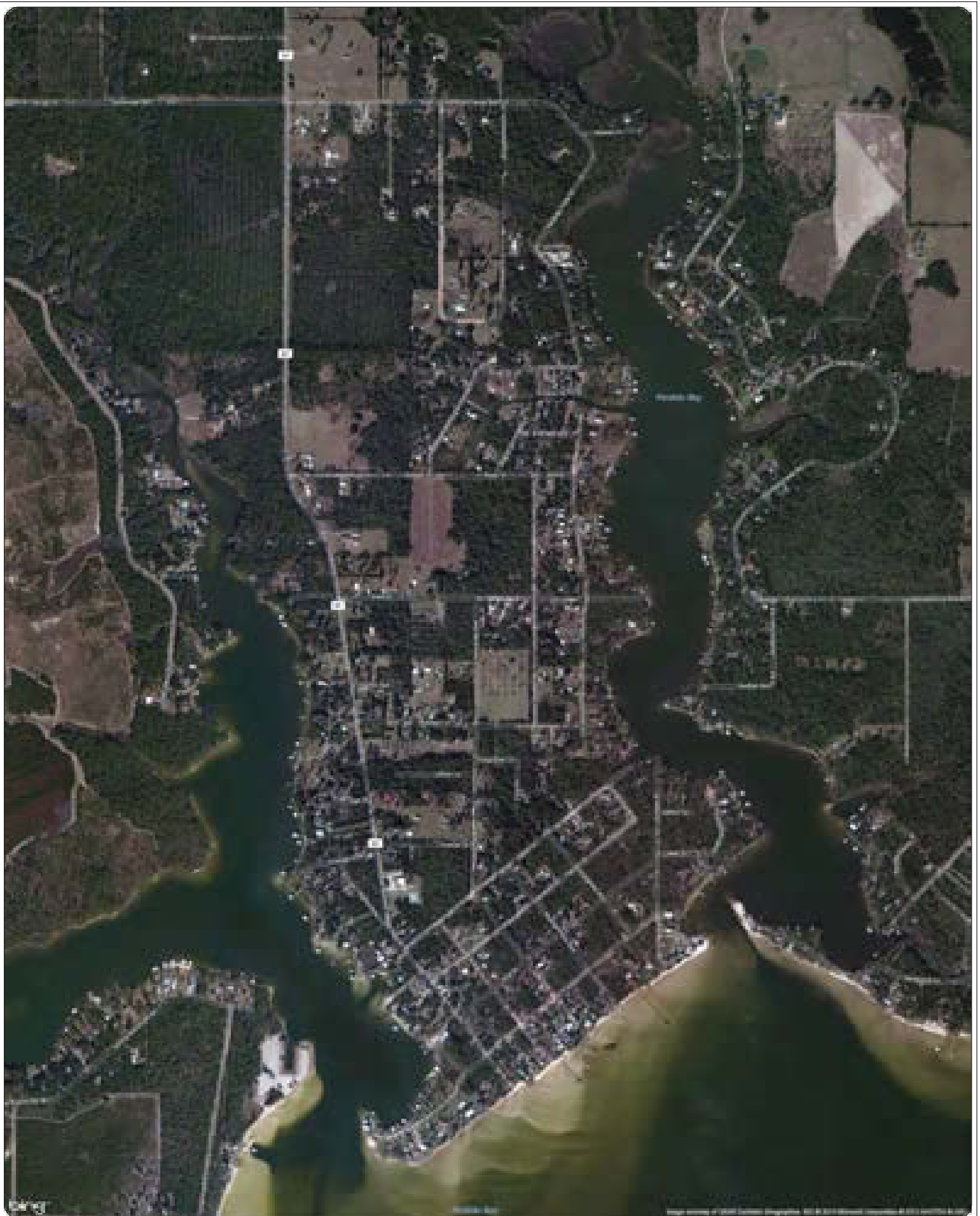




VOLKERT



PERDIDO BEACH



VOLKERT

0 500 1,000 2,000 Feet
1 inch = 600 feet



Note: This map is for presentation use only and not to be used for construction purposes.

PERDIDO BEACH

DRAINAGE AREAS

DRAINAGE AREAS

PROJECT NO.:

DESCRIPTION:

DATE:

INPUT C VALUES	
C PAVED	0.9
C GRASS	0.35
C WOOD	0.25
C OTHER	0.5

DRAINAGE AREA NUMBER	AREA PAVED (SF)	AREA PAVED (AC.)	AREA GRASSED (SF)	AREA GRASSED (AC.)	AREA WOODED (SF)	AREA WOODED (AC.)	OTHER AREA (SF)	OTHER AREA (AC.)	TOTAL AREA (AC.)	C
0		0.000		0.000						
1.01	1121	0.026	4486	0.103		0.000		0.000	0.129	0.46
1.02	773	0.018	3046	0.070		0.000		0.000	0.088	0.46
1.03	2742	0.063	11	0.000		0.000		0.000	0.063	0.90
1.04	673	0.015	2693	0.062		0.000		0.000	0.077	0.46
1.05	3955	0.091	15819	0.363		0.000		0.000	0.454	0.46
1.06	3460	0.079	34133	0.784		0.000		0.000	0.863	0.40
1.07	5012	0.115	257516	5.912		0.000		0.000	6.027	0.36
1.08	439	0.010	38284	0.879		0.000		0.000	0.889	0.36
1.09	2093	0.048	58554	1.344		0.000		0.000	1.392	0.37
1.10	10691	0.245	131738	3.024		0.000		0.000	3.270	0.39
1.11	17969	0.413	237721	5.457		0.000		0.000	5.870	0.39
2.01	7222	0.166	41493	0.953		0.000		0.000	1.118	0.43
2.02	2696	0.062	6657	0.153		0.000		0.000	0.215	0.51
2.03	4075	0.094	10062	0.231		0.000		0.000	0.325	0.51
2.04	5942	0.136	30268	0.695		0.000		0.000	0.831	0.44
2.05	1850	0.042	6788	0.156		0.000		0.000	0.198	0.47
2.06	6594	0.151	34574	0.794		0.000		0.000	0.945	0.44
2.07	61	0.001		0.000	63775	1.464		0.000	1.465	0.25
2.08		0.000		0.000	47290	1.086		0.000	1.086	0.25
2.09	277	0.006	5422	0.124		0.000		0.000	0.131	0.38
2.10	3444	0.079		0.000	180103	4.135		0.000	4.214	0.26
2.11	4585	0.105		0.000	78054	1.792		0.000	1.897	0.29
3.01	951	0.022	50596	1.162		0.000		0.000	1.183	0.36
3.02	1534	0.035	64702	1.485		0.000		0.000	1.521	0.36
3.03	4487	0.103	95475	2.192		0.000		0.000	2.295	0.37
3.04		0.000	188899	4.337		0.000		0.000	4.337	0.35
3.05	4293	0.099	74520	1.711		0.000		0.000	1.809	0.38
3.06	6949	0.160	228116	5.237		0.000		0.000	5.396	0.37
3.07	4319	0.099	171197	3.930		0.000		0.000	4.029	0.36
4.01		0.000		0.000	108356	2.488		0.000	2.488	0.25
4.02		0.000	9114	0.209	196097	4.502		0.000	4.711	0.25
4.03		0.000	209512	4.810	760135	17.450		0.000	22.260	0.27
4.04		0.000		0.000	333765	7.662		0.000	7.662	0.25
4.05		0.000		0.000		0.000		0.000	0.000	0.00
4.06		0.000		0.000		0.000		0.000	0.000	0.00
4.07		0.000	23908	0.549		0.000		0.000	0.549	0.35
4.08		0.000	134810	3.095		0.000		0.000	3.095	0.35
4.09	11114	0.255		0.000	358615	8.233		0.000	8.488	0.27
4.10	3183	0.073	549467	12.614	975960	22.405		0.000	35.092	0.29
4.11	4376	0.100		0.000	188042	4.317		0.000	4.417	0.26
4.12	4991	0.115		0.000	254722	5.848		0.000	5.962	0.26
4.13		0.000	30833	0.708		0.000		0.000	0.708	0.35
4.14		0.000	24885	0.571		0.000		0.000	0.571	0.35
5.01	6472	0.149		0.000	224892	5.163		0.000	5.311	0.27
5.02		0.000		0.000	193450	4.441		0.000	4.441	0.25
5.03	7496	0.172		0.000	202450	4.648		0.000	4.820	0.27
5.04	6469	0.149		0.000	74336	1.707		0.000	1.855	0.30
5.05	7518	0.173		0.000	47396	1.088		0.000	1.261	0.34
6.01	9785	0.225	130726	3.001	117634	2.701		0.000	5.926	0.33
6.02	5018	0.115	41278	0.948		0.000		0.000	1.063	0.41
6.03	2740	0.063	15751	0.362		0.000		0.000	0.424	0.43
6.04	6399	0.147	63162	1.450		0.000		0.000	1.597	0.40
6.05	4134	0.095	17668	0.406		0.000		0.000	0.501	0.45
7.01	5746	0.132	203684	4.676	152837	3.509	209249	4.804	13.120	0.38
7.02	5246	0.120	83921	1.927		0.000	136752	3.139	5.186	0.45
7.03	2991	0.069	1448	0.033	48820	1.121	46111	1.059	2.281	0.39
7.04	2961	0.068	830	0.019	68736	1.578		0.000	1.665	0.28
7.05	6236	0.143	20497	0.471	262034	6.015		0.000	6.629	0.27
7.06	10465	0.240		0.000		0.000	114168	2.621	2.861	0.53
7.07	4876	0.112	15030	0.345		0.000		0.000	0.457	0.48
7.08	10839	0.249		0.000	774772	17.786	64215	1.474	19.509	0.28
7.09	8220	0.189	30146	0.692		0.000		0.000	0.881	0.47
7.10	1309	0.030	12722	0.292	255624	5.868	21699	0.498	6.689	0.28
7.11	14238	0.327	410380	9.421	268134	6.156		0.000	15.903	0.32
7.12	616	0.014	1663	0.038		0.000		0.000	0.052	0.50
7.13	3341	0.077		0.000	24949	0.573		0.000	0.649	0.33
7.14	2137	0.049		0.000		0.000	78945	1.812	1.861	0.51
7.15	865	0.020		0.000	85157	1.955		0.000	1.975	0.26
7.16	5685	0.131	146240	3.357	368143	8.451		0.000	11.939	0.29
7.17	5985	0.137	189120	4.342	87288	2.004		0.000	6.483	0.33
7.18		0.000	326102	7.486	682262	15.663		0.000	23.149	0.28
7.19	761	0.017		0.000	127166	2.919		0.000	2.937	0.25
7.20	9039	0.208		0.000	366381	8.411		0.000	8.618	0.27
7.21	4121	0.095	8125	0.187	68357	1.569		0.000	1.850	0.29
7.22	4740	0.109	4740	0.109		0.000		0.000	0.218	0.63
7.23	5150	0.118	10332	0.237		0.000		0.000	0.355	0.53
7.24	5487	0.126	9870	0.227		0.000		0.000	0.353	0.55
7.25	3772	0.087	7079	0.163		0.000		0.000	0.249	0.54
8.01	1388	0.032	12241	0.281		0.000		0.000	0.313	0.41
8.02	846	0.019	5922	0.136		0.000		0.000	0.155	0.42
8.03	2949	0.068	36881	0.847		0.000		0.000	0.914	0.39
8.04	526	0.012	43255	0.993		0.000		0.000	1.005	0.36
8.05	2557	0.059	111248	2.554		0.000		0.000	2.613	0.36
8.06	2379	0.055	189668	4.354	17940	0.412		0.000	4.821	0.35

INTENSITY EQUATION COORDINATES FROM HYDRO RUN (GIVEN BY ALDOT)

YEAR	A	B	M
2	37.72	7.89	0.653
5	39.17	7.9	0.614
10	44.17	7.98	0.618
25	49.08	8.01	0.608
50	52.84	8.02	0.6
100	56.99	8.04	0.596

THIS CURVE IS FOR TOWN OF PERDIDO BEACH, AL

8.07	2158	0.050	2380	0.055		0.000		0.000	0.104	0.61
8.08	1045	0.024	1682	0.039		0.000		0.000	0.063	0.56
8.09	1958	0.045	4272	0.098		0.000		0.000	0.143	0.52
8.10	8708	0.200	20376	0.468		0.000		0.000	0.668	0.51
8.11	12930	0.297	33072	0.759		0.000		0.000	1.056	0.50
8.12	3787	0.087	71834	1.649	136918	3.143		0.000	4.879	0.30
8.13	1118	0.026		0.000	24129	0.554		0.000	0.580	0.28
8.14	2791	0.064		0.000	11187	0.257		0.000	0.321	0.38
8.15	5039	0.116		0.000	24185	0.555		0.000	0.671	0.36
8.16	2699	0.062		0.000	10893	0.250		0.000	0.312	0.38
8.17	2749	0.063	9210	0.211		0.000		0.000	0.275	0.48
8.18	1783	0.041	6580	0.151		0.000		0.000	0.192	0.47
9.01	1445	0.033	2655	0.061		0.000		0.000	0.094	0.54
9.02	1391	0.032	2636	0.061		0.000		0.000	0.092	0.54
9.03	774	0.018	1434	0.033		0.000		0.000	0.051	0.54
9.04	3023	0.069	4849	0.111		0.000		0.000	0.181	0.56
9.05	3153	0.072		0.000		0.000	62426	1.433	1.505	0.52
9.06	3227	0.074		0.000		0.000	60493	1.389	1.463	0.52
9.07	4944	0.113		0.000		0.000	98107	2.252	2.366	0.52
9.08	6257	0.144	11913	0.273		0.000		0.000	0.417	0.54
9.09	1768	0.041	3700	0.085		0.000		0.000	0.126	0.53
9.10	1724	0.040	3197	0.073		0.000		0.000	0.113	0.54
9.11	2008	0.046	3145	0.072		0.000		0.000	0.118	0.56
9.12		0.000	62111	1.426		0.000		0.000	1.426	0.35
9.13		0.000		0.000	25049	0.575		0.000	0.575	0.25
9.14	358	0.008	14976	0.344		0.000		0.000	0.352	0.36
9.15	3935	0.090		0.000		0.000	140557	3.227	3.317	0.51
9.16	515	0.012		0.000		0.000	19736	0.453	0.465	0.51
9.17	1184	0.027		0.000		0.000	44987	1.033	1.060	0.51
9.18	1165	0.027		0.000		0.000	40150	0.922	0.948	0.51
9.19	2930	0.067		0.000		0.000	99085	2.275	2.342	0.51
9.20	1252	0.029		0.000		0.000	42347	0.972	1.001	0.51
9.21	1485	0.034		0.000		0.000	48551	1.115	1.149	0.51
9.22	1025	0.024		0.000		0.000	33083	0.759	0.783	0.51
9.23	1097	0.025		0.000		0.000	35633	0.818	0.843	0.51
9.24	686	0.016		0.000		0.000	18575	0.426	0.442	0.51
9.25		0.000	17502	0.402		0.000		0.000	0.402	0.35
9.26		0.000	15686	0.360		0.000		0.000	0.360	0.35
10.01	4697	0.108		0.000	29483	0.677	108958	2.501	3.286	0.46
10.02	2469	0.057		0.000	14393	0.330	65400	1.501	1.888	0.47
10.03	474	0.011		0.000		0.000	17712	0.407	0.417	0.51
10.04		0.000		0.000		0.000	21978	0.505	0.505	0.50
10.05	1659	0.038		0.000		0.000	10259	0.236	0.274	0.56
10.06	1224	0.028		0.000		0.000	36041	0.827	0.855	0.51
10.07	992	0.023		0.000		0.000	29004	0.666	0.689	0.51
10.08	625	0.014	6178	0.142		0.000		0.000	0.156	0.40
10.09	7441	0.171	73963	1.698		0.000		0.000	1.869	0.40
10.10	1068	0.025	40694	0.934		0.000		0.000	0.959	0.36
10.11	1825	0.042	36078	0.828		0.000	11385	0.261	1.131	0.41
10.12	1795	0.041	35400	0.813		0.000	23052	0.529	1.383	0.42
10.13	2494	0.057	33122	0.760	7783	0.179	24089	0.553	1.549	0.41
10.14	2127	0.049	208822	4.794	176383	4.049	106983	2.456	11.348	0.35
10.15	556	0.013		0.000	226852	5.208	109593	2.516	7.736	0.33
10.16	976	0.022		0.000	307829	7.067	58405	1.341	8.430	0.29
10.17	2627	0.060		0.000		0.000	155157	3.562	3.622	0.51
10.18	1996	0.046		0.000		0.000	37020	0.850	0.896	0.52
10.19	2401	0.055		0.000		0.000	8045	0.185	0.240	0.59
10.20	10188	0.234		0.000		0.000	73895	1.696	1.930	0.55
10.21	481	0.011		0.000		0.000	40104	0.921	0.932	0.50
10.22	781	0.018		0.000		0.000	3663	0.084	0.102	0.57
10.23	418	0.010		0.000		0.000	922	0.021	0.031	0.62
10.24	507	0.012		0.000		0.000	735	0.017	0.029	0.66
10.25	2081	0.048		0.000		0.000	21648	0.497	0.545	0.54
10.26	602	0.014		0.000		0.000	1561	0.036	0.050	0.61
10.27	4091	0.094		0.000		0.000	8267	0.190	0.284	0.63
10.28	2050	0.047		0.000		0.000	2042	0.047	0.094	0.70
10.29	1458	0.033	99846	2.292	128006	2.939	123936	2.845	8.109	0.37
10.30	15527	0.356	67832	1.557	450418	10.340	517220	11.874	24.128	0.39
10.31	874	0.020	3282	0.075		0.000		0.000	0.095	0.47
10.32	1952	0.045	7292	0.167		0.000		0.000	0.212	0.47
10.33	1930	0.044	7204	0.165		0.000		0.000	0.210	0.47
10.34	1340	0.031	4997	0.115		0.000		0.000	0.145	0.47
10.35	266	0.006	991	0.023		0.000		0.000	0.029	0.47
10.36	2008	0.046	7484	0.172		0.000		0.000	0.218	0.47
10.37	1142	0.026	4255	0.098		0.000		0.000	0.124	0.47
10.38	1837	0.042	6839	0.157		0.000		0.000	0.199	0.47
10.39	560	0.013	1736	0.040		0.000		0.000	0.053	0.48
10.40	1150	0.026	14843	0.341		0.000		0.000	0.367	0.39
10.41	833	0.019	13012	0.299		0.000		0.000	0.318	0.38
10.42	14694	0.337		0.000	243086	5.580		0.000	5.918	0.29
11.01		0.000		0.000		0.000		0.000	0.000	0.00
11.02		0.000		0.000		0.000		0.000	0.000	0.00
11.03		0.000		0.000	189546	4.351		0.000	4.351	0.25
11.04		0.000	28711	0.659		0.000		0.000	0.659	0.35
11.05		0.000	113950	2.616		0.000		0.000	2.616	0.35
11.06		0.000	34300	0.787		0.000		0.000	0.787	0.35
11.07	4015	0.092	58943	1.353	71008	1.630		0.000	3.075	0.31
11.08	2345	0.054		0.000		0.000	107799	2.475	2.529	0.51
11.09	2449	0.056		0.000	51896	1.191	44205	1.015	2.262	0.38
11.10	2035	0.047		0.000	42815	0.983	38161	0.876	1.906	0.38
11.11	1303	0.030		0.000		0.000	50327	1.155	1.185	0.51
11.12	2764	0.063		0.000		0.000	109230	2.508	2.571	0.51
11.13	940	0.022		0.000		0.000	30231	0.694	0.716	0.51
12.01	5915	0.136	7930	0.182		0.000		0.000	0.318	0.58
12.02	5669	0.130	36192	0.831		0.000		0.000	0.961	0.42

13.01	7163	0.164	62100	1.426	174787	4.013	94699	2.174	7.777	0.35
13.02	1473	0.034	4746	0.109	36525	0.838	28564	0.656	1.637	0.37
13.03	1586	0.036	3980	0.091	41399	0.950	27026	0.620	1.699	0.36
13.04	1806	0.041	4279	0.098	56585	1.299	30753	0.706	2.145	0.35
13.05	11221	0.258	156213	3.586	154828	3.554		0.000	7.398	0.32
13.06		0.000	37350	0.857		0.000		0.000	0.857	0.35
13.07		0.000	43313	0.994		0.000		0.000	0.994	0.35
13.08	10229	0.235	10618	0.244	267711	6.146	20972	0.481	7.106	0.29
13.09	3951	0.091	25652	0.589		0.000		0.000	0.680	0.42
13.10	5638	0.129		0.000	81216	1.864		0.000	1.994	0.29
13.11	10959	0.252		0.000	61231	1.406		0.000	1.657	0.35
13.12	1695	0.039	7339	0.168		0.000		0.000	0.207	0.45
13.13	861	0.020	4342	0.100		0.000		0.000	0.119	0.44
13.14	3224	0.074		0.000	18174	0.417		0.000	0.491	0.35
14.01	6935	0.159	37509	0.861		0.000		0.000	1.020	0.44
14.02	6972	0.160	13477	0.309	35898	0.824		0.000	1.294	0.35
14.03	1958	0.045	18224	0.418		0.000		0.000	0.463	0.40
15.01	5032	0.116		0.000		0.000	62521	1.435	1.551	0.53
15.02		0.000		0.000	39941	0.917		0.000	0.917	0.25
15.03	7381	0.169		0.000	277681	6.375	92248	2.118	8.662	0.32
15.04	689	0.016		0.000		0.000	30995	0.712	0.727	0.51
15.05	6640	0.152		0.000		0.000	233206	5.354	5.506	0.51
15.06	11562	0.265		0.000	702146	16.119		0.000	16.384	0.26
15.07	3430	0.079		0.000	159903	3.671		0.000	3.750	0.26
15.08	3805	0.087		0.000	169066	3.881		0.000	3.969	0.26
15.09	5951	0.137		0.000	264660	6.076		0.000	6.212	0.26
15.10	1286	0.030		0.000	57097	1.311		0.000	1.340	0.26
15.11	10716	0.246		0.000		0.000	223401	5.129	5.375	0.52
15.12	1479	0.034		0.000		0.000	50488	1.159	1.193	0.51
15.13	7871	0.181		0.000		0.000	107729	2.473	2.654	0.53
15.14	3545	0.081	46006	1.056		0.000		0.000	1.138	0.39
15.15	1989	0.046	26972	0.619		0.000		0.000	0.665	0.39
15.16	925	0.021	5944	0.136		0.000		0.000	0.158	0.42
15.17	609	0.014	3751	0.086		0.000		0.000	0.100	0.43
15.18	300	0.007	1803	0.041		0.000		0.000	0.048	0.43
15.19	1017	0.023	5871	0.135		0.000		0.000	0.158	0.43
15.20	1201	0.028	6464	0.148		0.000		0.000	0.176	0.44
15.21	2275	0.052	10898	0.250		0.000		0.000	0.302	0.44
16.01	7104	0.163		0.000	92320	2.119	218610	5.019	7.301	0.44
16.02	948	0.022	39167	0.899		0.000		0.000	0.921	0.36
16.03	2913	0.067	9994	0.229		0.000		0.000	0.296	0.47
17.01	6887	0.158		0.000		0.000	82767	1.900	2.058	0.53
17.02	884	0.020		0.000		0.000	12955	0.297	0.318	0.53
17.03	901	0.021		0.000		0.000	23627	0.542	0.563	0.51
17.04	1274	0.029		0.000		0.000	32009	0.735	0.764	0.52
17.05	685	0.016		0.000		0.000	20387	0.468	0.484	0.51
17.06	1585	0.036		0.000		0.000	39690	0.911	0.948	0.52
18.01	8705	0.200		0.000	201191	4.619		0.000	4.819	0.28
18.02	1520	0.035		0.000	104464	2.398		0.000	2.433	0.26
18.03	416	0.010		0.000	24709	0.567		0.000	0.577	0.26
18.04	10467	0.240		0.000	75564	1.735		0.000	1.975	0.33

BASIN 1

Basin 1:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas on the east side and wooded areas on the west side of Escambia Avenue. This basin runs to the high point along the western portion of Faires Road for about 1000 feet and for about 900 feet down Escambia Avenue. This basin has approximately 19.38 contributing acres of stormwater.

Proposed Improvements: Pipes 1.1-1.4 have the capacity to handle the design flow. These pipes need minimal pipe cleaning and the existing swale running through these pipes needs minimal regrading to achieve positive flow. Pipe 1.5 is a 22"x13" RCP and does not have the capacity to handle the design flow. This pipe needs to be a DBL 24" RCP. Pipes 1.6 and 1.7 do not have the capacity to handle the design flow. These two pipes, along with the open sided inlet needs to be replaced with one 36" RCP crossing under Escambia Avenue. Pipe 1.8 is an 18" HDPE and does not have the capacity to handle the design flow. This pipe needs to be replaced with a DBL 24" RCP. Pipes 1.9-1.10 have the capacity to handle the design flow. These pipes need cleaning and the majority of the ditches that run parallel to Escambia Avenue on the east and west side will need minimal regrading to achieve positive flow. Upstream and downstream of Pipe 1.8, the ditch will need to be regraded to the standard 4' bottom ditch.



- EXIST DITCH
- EXIST SWALE
- PROP DITCH
- PROP SWALE

VOLKERT
 NOT ISSUED FOR CONSTRUCTION

TOWN OF HOPKINS CEMETERY
 COMPONENTS (PLAN AND
 MASTER PLAN)

TOWN OF HOPKINS, MISSISSIPPI

BASIN

PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
1.1	22" X13" RCP	0.54		PASS	PIPE OK
1.2	22" X13" RCP	0.84		PASS	PIPE OK
1.3	18" HDPE	2.86		PASS	PIPE OK
1.4	22" X13" RCP	3.08		PASS	PIPE OK
1.5	22" X13" RCP		12.37	FAIL	DBL 24" RCP
1.6	22" X13" RCP		15.67	FAIL	36" RCP
1.7	18" RCP		22.7	FAIL	-----
1.8	18" HDPE	15.19		FAIL	DBL 24" RCP
1.9	15" HDPE	4.45		PASS	PIPE OK
1.10	18" HDPE	2.79		PASS	PIPE OK

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

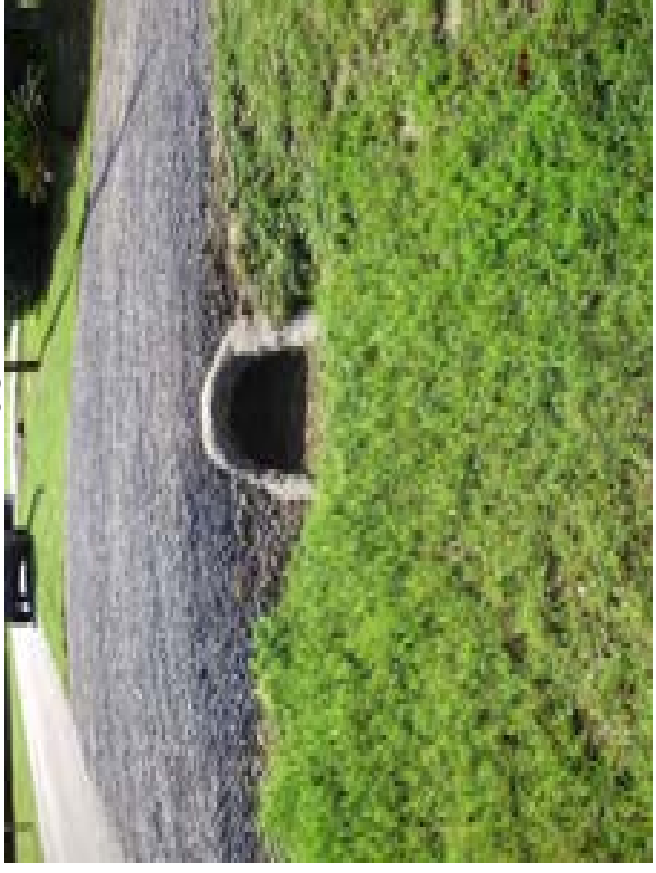
TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 1

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
147	206D-000	LF	REMOVING PIPE	\$8.00	\$1,176.00
1817	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$12,719.00
44	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$396.00
4	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$120.00
39	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$468.00
39	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$29.25
2	405A-000	GAL	TACK COAT	\$4.50	\$9.00
3	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$240.00
6	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$480.00
154	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$9,240.00
120	530A-004	LF	36" ROADWAY PIPE (CLASS 3 R.C.)	\$75.00	\$9,000.00
154	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$2,310.00
4667	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$21,001.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$1,000.00
1	1004-000	LS	SURVEY SERVICES	\$4,000.00	\$4,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$9,500.00	\$9,500.00
1	1007-000	LS	BID SERVICES	\$8,000.00	\$8,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$9,500.00	\$9,500.00
TOTAL					\$98,688.75

1.1 ds



1.2 ds



1.1 us



1.2 us



1.3 ds



1.4 ds



1.3 us



1.4 us



1.5 us



1.5 ds



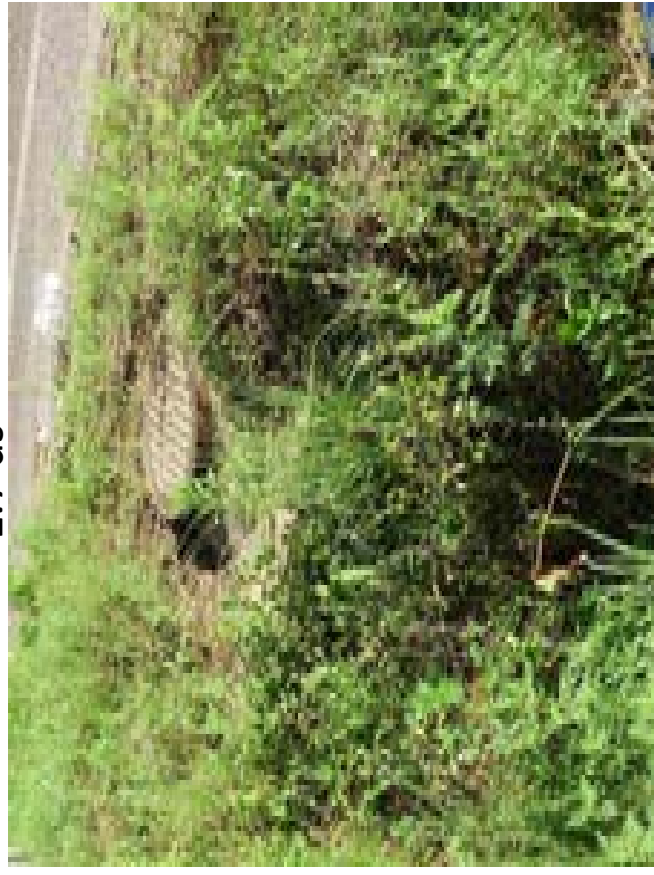
1.6 us



1.7 us



1.7 ds



1.8 us



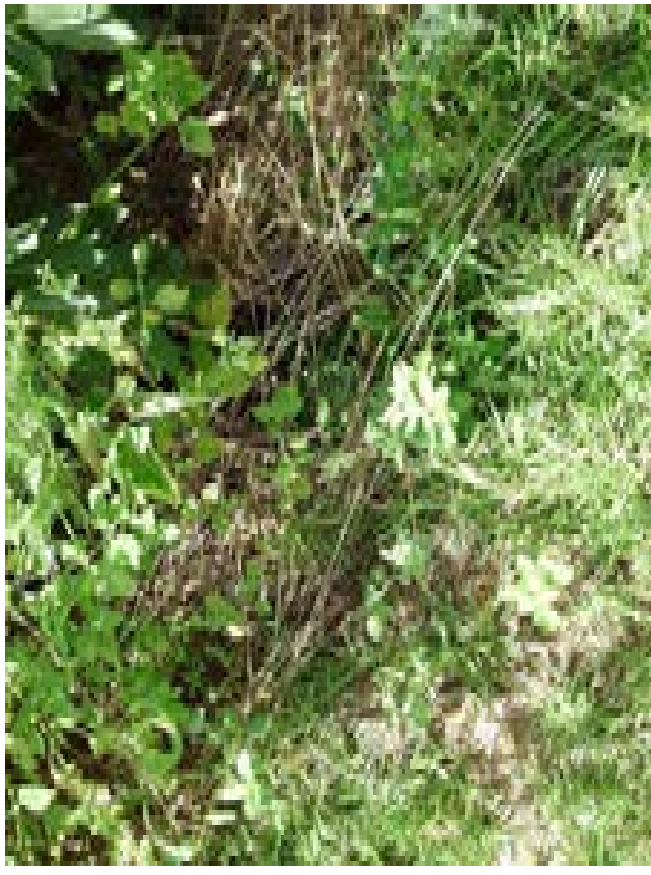
1.8 ds



1.9 us



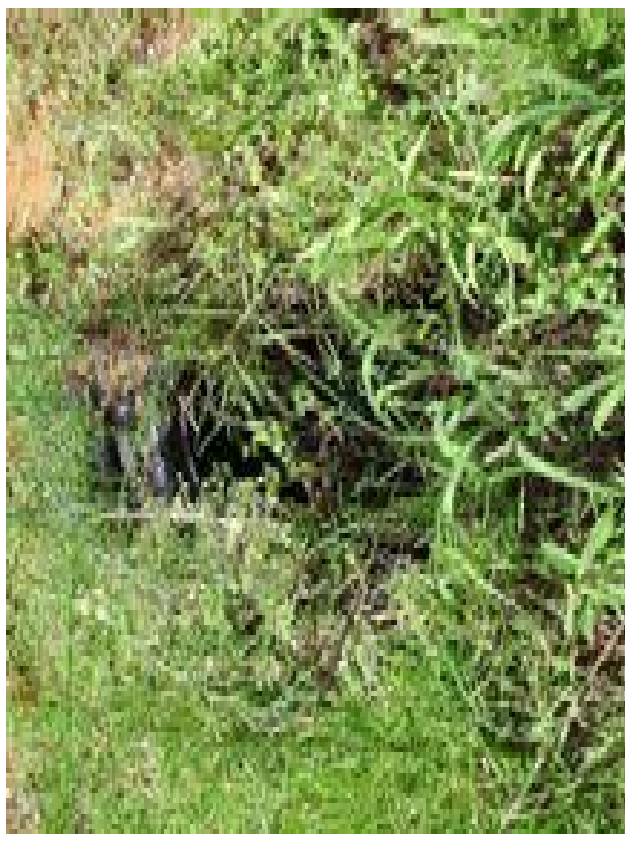
1.9 ds



1.10 us



1.10 ds

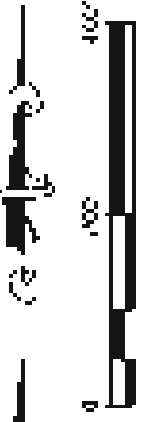
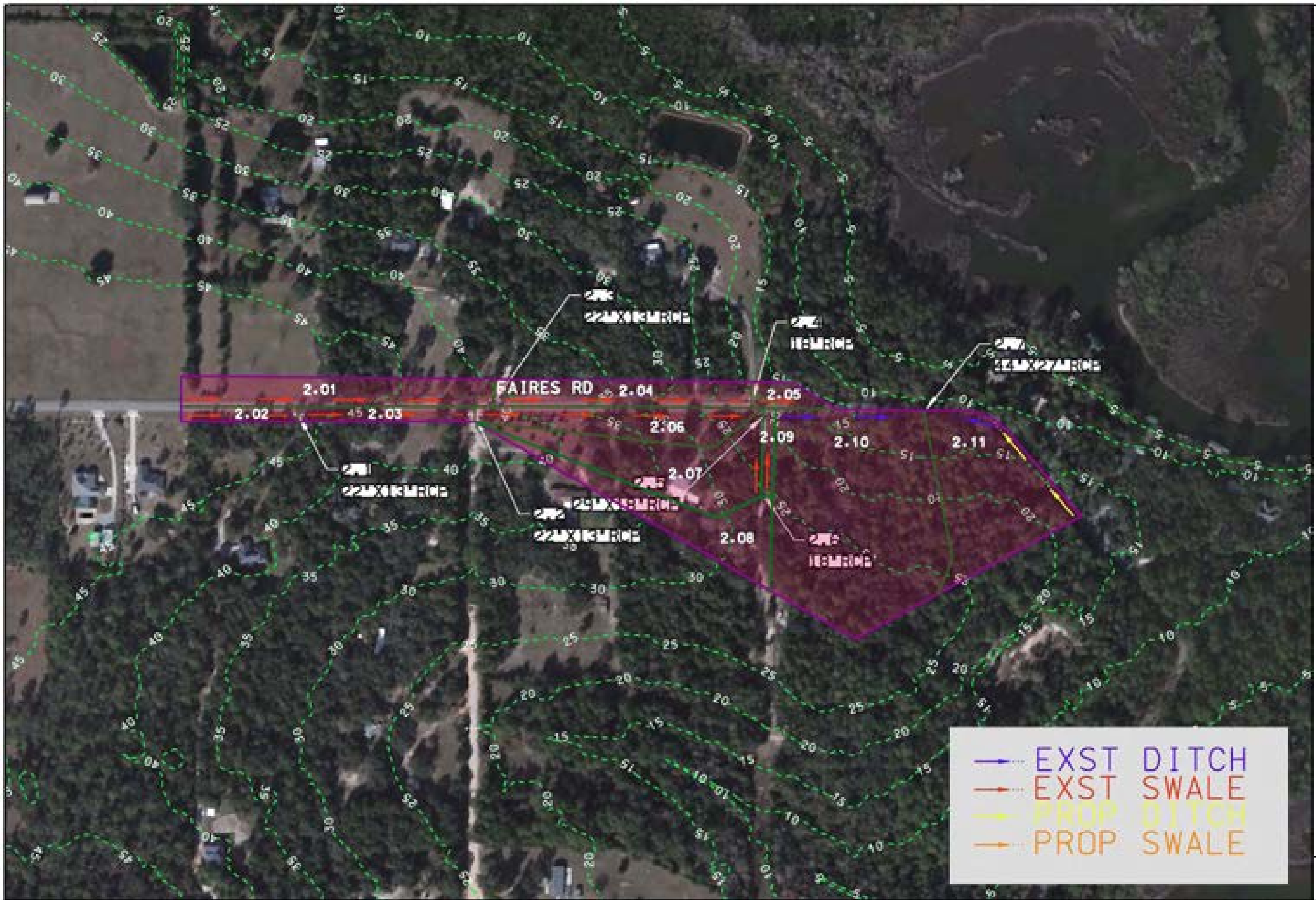


BASIN 2

Basin 2:

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas with a small section of grassed areas. This basin runs along Faires Road where Basin 1 ends to the high point around the curve at the northern most end of the basin which is approximately 450 feet past the culvert. This basin has approximately 12.43 contributing acres of stormwater.

Proposed Improvements: All seven pipes in this basin have the capacity to handle the design flow. Pipes 2.1-2.4 need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes. Pipes 2.5-2.7 appear to be in good condition. The swales on both sides of Faires Road to Lakeview Drive and the ditch on the south side of Faires Road from Lakeview Drive to the culvert appear to need minimal regrading. A ditch will need to be constructed from past the culvert and around the curve on Faires Road to the high point.



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF NORFOLK DESIGN
 COMPONENTS DRAWING
 WATER PLAN

TOWN OF NORFOLK DESIGN

BASIN 2

PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
2.1	22" X13" RCP	0.95		PASS	18" RCP
2.2	22" X13" RCP		2.68	PASS	18" RCP
2.3	22" X13" RCP	3.52		PASS	18" RCP
2.4	18" RCP	5.81		PASS	18" RCP
2.5	29" X18" RCP		8.87	PASS	PIPE OK
2.6	18" RCP	1.84		PASS	PIPE OK
2.7	44" X27" RCP		54.8	PASS	PIPE OK

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 2

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
119	206D-000	LF	REMOVING PIPE	\$8.00	\$952.00
2108	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$14,756.00
100	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$900.00
119	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$5,355.00
223	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$3,345.00
5989	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$26,950.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
4	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$4,000.00
1	1004-000	LS	SURVEY SERVICES	\$3,000.00	\$3,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$9,200.00	\$9,200.00
1	1007-000	LS	BID SERVICES	\$8,000.00	\$8,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$1,500.00	\$1,500.00
1	1009-000	LS	CEI SERVICES	\$9,200.00	\$9,200.00
TOTAL					\$94,158.50

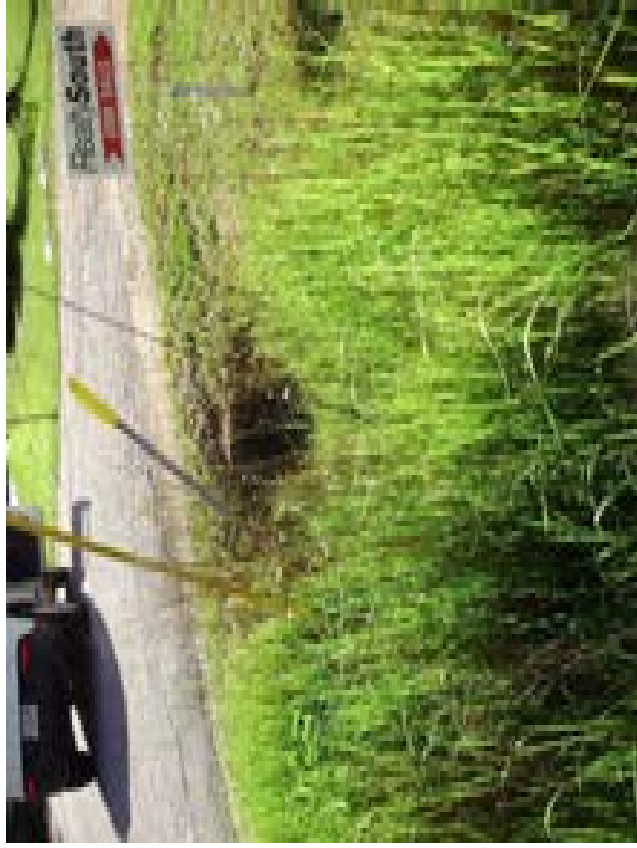
2.1 us



2.1 ds



2.2 us



2.2 ds



2.3 us



2.3 ds



2.4 us



2.4 ds



2.5 us



2.5 ds



2.6 us



2.6 ds



2.7 us



2.7 ds



BASIN 3

Basin 3:

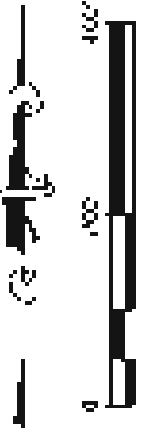
Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas on both sides of Escambia Avenue. This basin runs along Escambia Avenue where Basin 1 ends to the adjacent high point approximately 1000 feet away. This basin has approximately 20.57 contributing acres of stormwater.

Proposed Improvements: Pipes 3.1-3.2 have the capacity to handle the design flow. These pipes need minimal pipe cleaning and the existing ditch running through these pipes needs minimal, if any, regrading to achieve positive flow. Pipe 3.3 is a 29"x18" arch pipe and does not have the capacity to handle the design flow. This pipe needs to be replaced with a 30" RCP. The existing ditches running parallel to Escambia Avenue on the east and west sides will need minimal, if any, regrading to achieve positive flow.



TOWN OF HOPKINS DESIGN
COMPONENTS (PLAN AND
SECTION PLAN)

VOLKERT
NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
3.1	18" HDPE	2.29		PASS	PIPE OK
3.2	18" HDPE	4.02		PASS	PIPE OK
3.3	29" X18" RCP		25.18	FAIL	30" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 3

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
41	206D-000	LF	REMOVING PIPE	\$8.00	\$328.00
1558	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$10,906.00
39	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$351.00
4	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$120.00
40	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$480.00
40	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$30.00
2	405A-000	GAL	TACK COAT	\$4.50	\$9.00
3	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$240.00
6	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$480.00
50	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$3,250.00
52	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$780.00
3800	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$17,100.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1004-000	LS	SURVEY SERVICES	\$2,500.00	\$2,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$5,800.00	\$5,800.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$5,800.00	\$5,800.00
TOTAL					\$63,674.00

3.1 us



3.1 ds



3.2 us



3.2 ds



3.3 ds



3.3 us



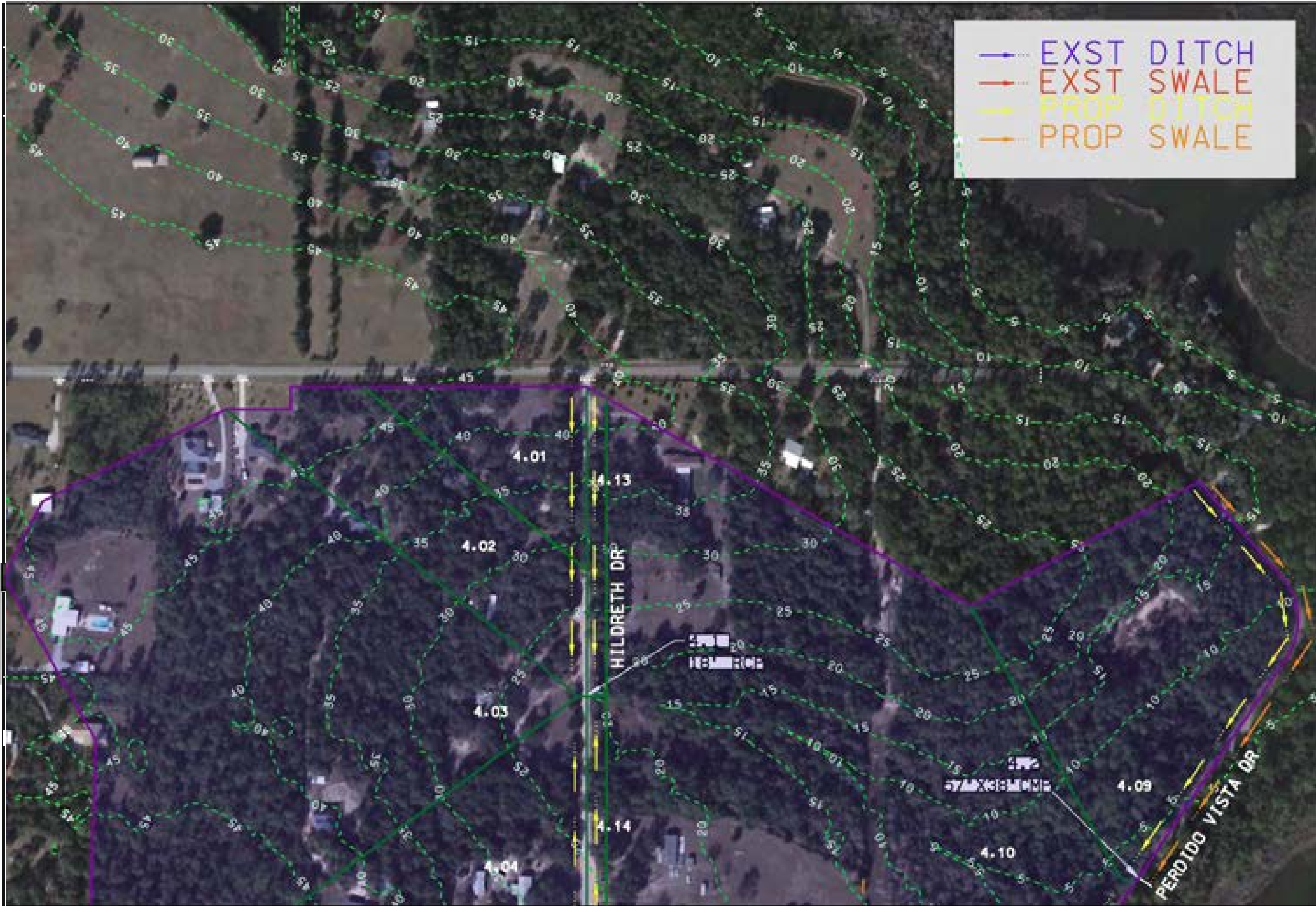
BASIN 4

Basin 4:

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas with a patch of grassed area between both sides of Hildreth Drive. This basin runs along the ridge east of Escambia Avenue where Basins 1, 3, and 5 end to the east to Soldier Creek. The northernmost portion of this basin reaches to the point where Basins 1 and 2 end and the southernmost portion of this basin reaches the point where Basin 7 ends on the north side of the portion of Hildreth Drive that runs parallel to Faires Road. This basin has approximately 115.09 contributing acres of stormwater.

Proposed Improvements: This is such a large area the improvements will be broken down by streets starting from the western end of the basin heading east. Pipe 4.1 does not have the capacity to handle the design flow. This existing 18" pipe will need to be upsized to a DBL 30" RCP. Standard ditches need to be graded on the east and west side of Hildreth Drive from Faires Road to the culvert and from the high point on the west side to the culvert. The high point is located where the tree is in the middle of the road. Approximately 285 feet down the road from the high point is another low point. Proposed pipe 4.3, a DBL 24" RCP, will need to be placed here to channel the fairly large overland flow into a proposed ditch from this point back to the pipe 4.1. At this junction, the water runs through a natural channel from pipe 4.1 to pipe 4.2 that crosses Perdido Vista Drive and continues on to Soldier Creek. A proposed swale will need to be constructed on the west side of the eastern leg of Hildreth Drive. This proposed swale will channel the overland flow from between the west and east sides of Hildreth Drive to the natural flow channel that drains from pipe 4.1 to pipe 4.2.

Pipe 4.2 does not have the capacity to handle the design flow. This existing 57"x38" pipe will need to be upsized to DBL 42" RCP. On Perdido Vista Drive, a proposed ditch needs to be constructed on the west side and a proposed swale needs to be constructed on the east side from where Basin 2 ends to pipe 4.2. On the south side of pipe 4.2, a proposed ditch will need to be constructed from approximately the curve back to pipe 4.2. During a field review, it was noted that the area to the west of the curve was very wet. A proposed ditch needs to be constructed on the west side of Perdido Vista Drive from the high point approximately 600 feet north of Carrel Lane to this low lying area. Proposed pipe 4.4, a 24" RCP, will need to be constructed to convey this water from the west side of the road to the east side of the road and into Soldier Creek. This piece of property is privately owned. For any work done on this property, a construction easement will need to be obtained and some site grading will need to be done to direct the water to flow to the ditch and into proposed pipe 4.4.



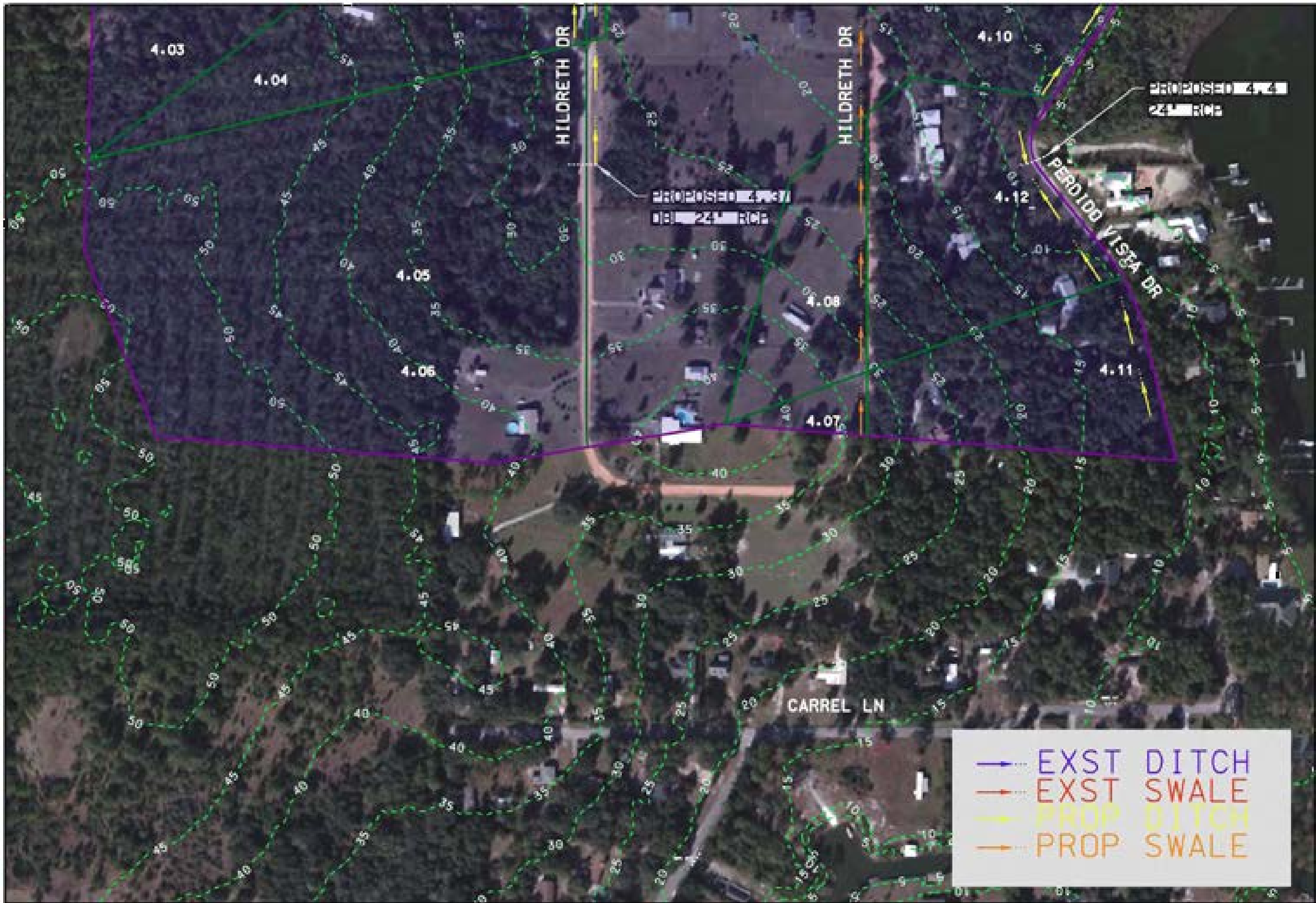
	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

TOWN OF PERDIDO BEACH
 COMPONENTS GRADING
 MASTER PLAN

TOWN OF PERDIDO BEACH

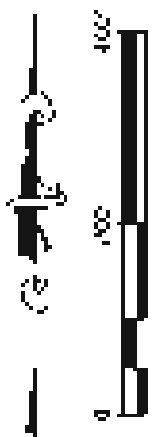


- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE

TOWN OF PERDIDO BEACH
 COMPONENTS DRAINAGE
 MASTER PLAN

BASED ON
 2011

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
4.1	18" RCP		63.61	FAIL	DBL 30" RCP
4.2	58"x36" CMP		155.03	FAIL	DBL 42" RCP
4.3			42.14		DBL 24" RCP
4.4			16.04		24" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 4

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
105	206D-000	LF	REMOVING PIPE	\$8.00	\$840.00
5122	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$35,854.00
80	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$720.00
7	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$210.00
57	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$684.00
57	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$42.75
3	405A-000	GAL	TACK COAT	\$4.50	\$13.50
5	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$400.00
9	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$720.00
60	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$2,700.00
272	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$16,320.00
70	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$4,550.00
140	530A-005	LF	42" ROADWAY PIPE (CLASS 3 R.C.)	\$90.00	\$12,600.00
12994	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$58,473.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1004-000	LS	SURVEY SERVICES	\$25,000.00	\$25,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$5,000.00	\$5,000.00
1	1006-000	LS	ENGINEERING SERVICES	\$13,900.00	\$13,900.00
1	1007-000	LS	BID SERVICES	\$10,000.00	\$10,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$3,000.00	\$3,000.00
1	1009-000	LS	CEI SERVICES	\$10,000.00	\$10,000.00
TOTAL					\$205,527.25

4.1 us



4.1 ds



4.2 us



4.2 ds



Summary Form
Public Involvement Meeting
Project: Town of Florida Beach Swampland Management Plan

Name _____
Address (Street, City, State, ZIP) _____

Telephone Number _____

E-mail Address _____

Public Meeting Attendance Location: Florida Department of Agriculture, March 18, 2014

Meeting in Person: Property Owner/Neighbor Public Official
 Other Other _____

General Comments

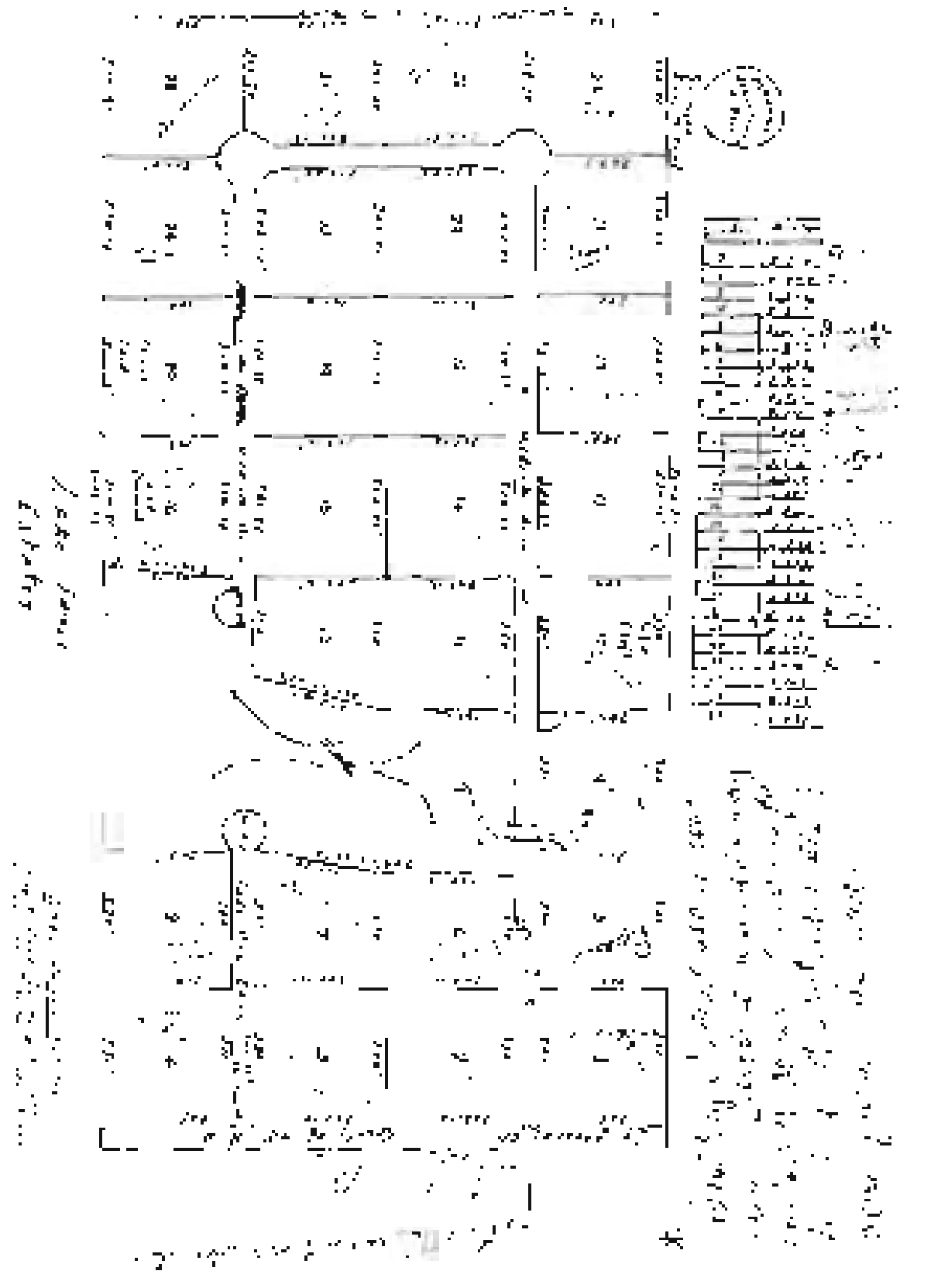
Other comments and suggestions regarding the project

Comments regarding the accessibility of the information distributed at each

Suggest ideas for ways to improve public input

Please return this form to the registration desk through the end of the meeting or mail to the following address by April 8, 2014.

Florida Department of Agriculture
1000 N. Gandy Blvd.
Tallahassee, FL 32304
Phone: 904-201-2000



Gate House
Elkhart

Gate House
Elkhart

Gate House
Elkhart

Comment Form
 Public Involvement Meeting
 Project: Town of Perdou Beach Stormwater Management Plan

Name: Harvey, Robert
 Address (Street, City, State, Zip): 11772 11th Street, Houston, TX 77036
 Telephone Number: 281-461-1212
 E-mail Address: harveyr@perdoubeach.com

Public Meeting Attendance Location: Fire Department, Saturday, March 14, 2014

Interest in Project: Property Owner/Tenant Public Official
 Local Business Owner Other Local Business Owner

General Comments:

Provide location and explain known drainage issues:
11772 11th Street - 1st floor parking, mostly covered
 concrete on the 2nd floor. Driveway drains to curb & into
 gutter, drains to the street.
 11772 11th Street - 2nd floor parking, mostly covered
 concrete on the 2nd floor. Driveway drains to curb & into
 gutter, drains to the street.

Comments regarding the development of a stormwater management plan:
Need to know more about the current way
 the plan is being developed & what the next steps are.

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight, or e-mail it to the following e-mail address or the following address by April 2, 2014:

Kermit Richardson, P.E., CPESC
 Volker Inc.
 P.O. Box 7434
 Mobile, AL 36670
 kermit.richardson@volker.com

BASIN 5

Basin 5:

Characteristics: This basin is made up of mainly wooded areas on both sides of Escambia Avenue. This basin runs along Escambia Avenue where Basin 3 ends to the adjacent high point approximately 1200 feet away. This basin has approximately 17.69 contributing acres of stormwater.

Proposed Improvements: Existing pipe 5.1 in this basin has the capacity to handle the design flow. Upon inspection, this pipe looks to be in good condition. The existing ditches have positive flow and capacity. A minimal maintenance issue would be to remove the small amount of sediment buildup at the outlet end of the pipe. Otherwise, no improvements to this basin are needed.

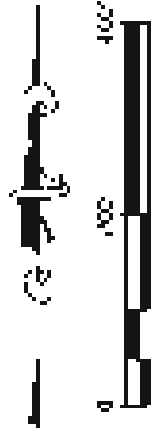


- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE

TOWN OF HOPKINS DESIGN
 COMPONENTS DRAWING
 MASTER PLAN

DATE: 5

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
5.1	18" RCP		27.79	PASS	PIPE OK

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

5.1 ds



5.1 us



BASIN 6

Basin 6:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas and a small wooded area section to the north. This basin runs along Escambia Avenue where Basin 5 ends to the adjacent high point approximately 550 feet past Riggs Street. This basin has approximately 9.51 contributing acres of stormwater.

Proposed Improvements: Pipe 6.1 has the capacity to handle the design flow. Upon inspection, this pipe is in good condition. For maintenance, this pipe will need to be replaced with an 18" RCP for minimum pipe size recommendation. The existing ditch that runs to this pipe needs minimal regrading. Pipe 6.2 is a 15" RCP and does not have the capacity to handle the design flow. This pipe needs to be replaced with an 18" RCP. The upstream ditch of pipe 6.2 is in good shape. The ditch running from pipe 6.2 to pipe 6.3 needs minimal regrading at pipe 6.3 for positive drainage. Pipes 6.3-6.5 do not have the capacity to handle the design flow. Originally pipes 6.3 and 6.4 collect water in the ditch and run under Riggs Street to a junction box under Riggs Street and outfalls through pipe 6.5. Since these three pipes are under sized, the system will be replaced. The proposed 18" RCP, replacement of pipe 6.3 and 6.4, pipe under Riggs Street will flow from south of Riggs Street to north of Riggs Street. From there the proposed 30" RCP, pipe 6.5, will cross Escambia Avenue from east to west. Reconfiguring the system this way will allow for easier maintenance to the system since the existing junction box doesn't have access now. The ditch south of Riggs Street is in good shape. Minimal work will need to be done at the new pipe crossing.

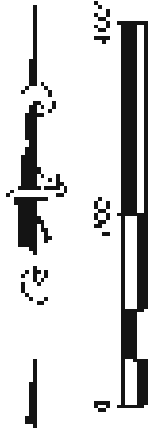


- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE

TOWN OF HOPKINS BASIN C
 COMPONENTS (RAINAGE
 MASTER PLAN)

Basin C

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
6.1	18"x11" RCP	1.79		PASS	18" RCP
6.2	15" RCP	9.78		FAIL	18" RCP
6.3	15" RCP		14.87	FAIL	18" RCP
6.4	15" RCP		7.69	FAIL	
6.5	15" RCP		19.96	FAIL	30" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

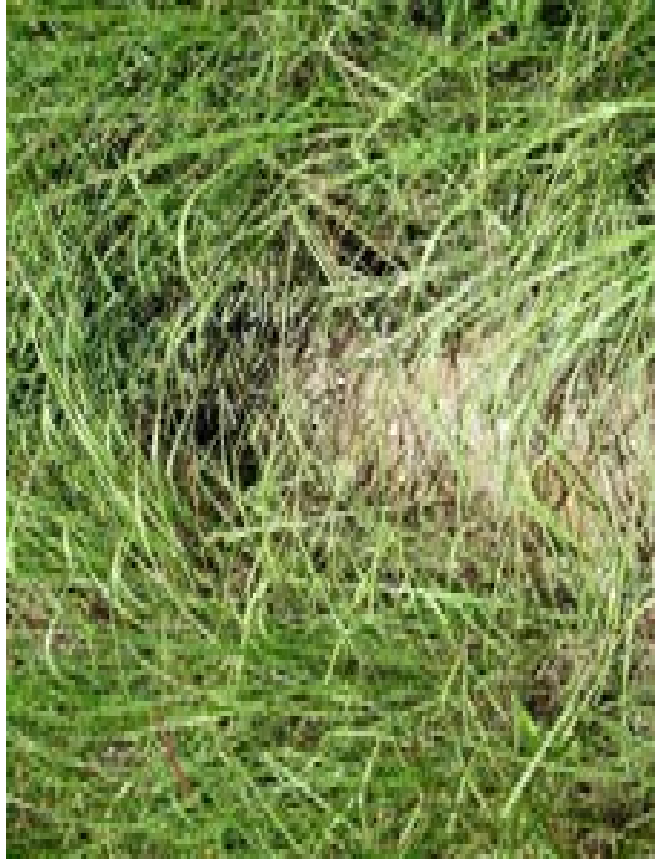
TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 6

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
135	206D-000	LF	REMOVING PIPE	\$8.00	\$1,080.00
1529	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$10,703.00
60	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$540.00
6	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$180.00
63	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$756.00
63	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$47.25
3	405A-000	GAL	TACK COAT	\$4.50	\$13.50
5	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$400.00
10	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$800.00
86	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$3,870.00
55	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$3,575.00
42	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$630.00
3730	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$16,785.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$1,000.00
1	1004-000	LS	SURVEY SERVICES	\$4,500.00	\$4,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$6,750.00	\$6,750.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$6,800.00	\$6,800.00
TOTAL					\$73,929.75

6.1 ds



6.2 ds



6.1 us



6.2 us



6.3 us



6.4 us



6.5 ds



BASIN 7

Basin 7:

Characteristics: This basin is made up of existing single family residential houses with grassed and wooded areas. This basin is a large area in the center of the town limits. It is bordered by basin 4-6 and 8-11. It spans an area from east of Escambia Avenue to south of Hildreth Drive to Perdido Vista Drive to north of Everage Lane to west of Anniston Drive and north of State Street. This basin has approximately 161.50 contributing acres of stormwater.

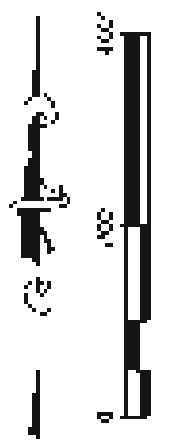
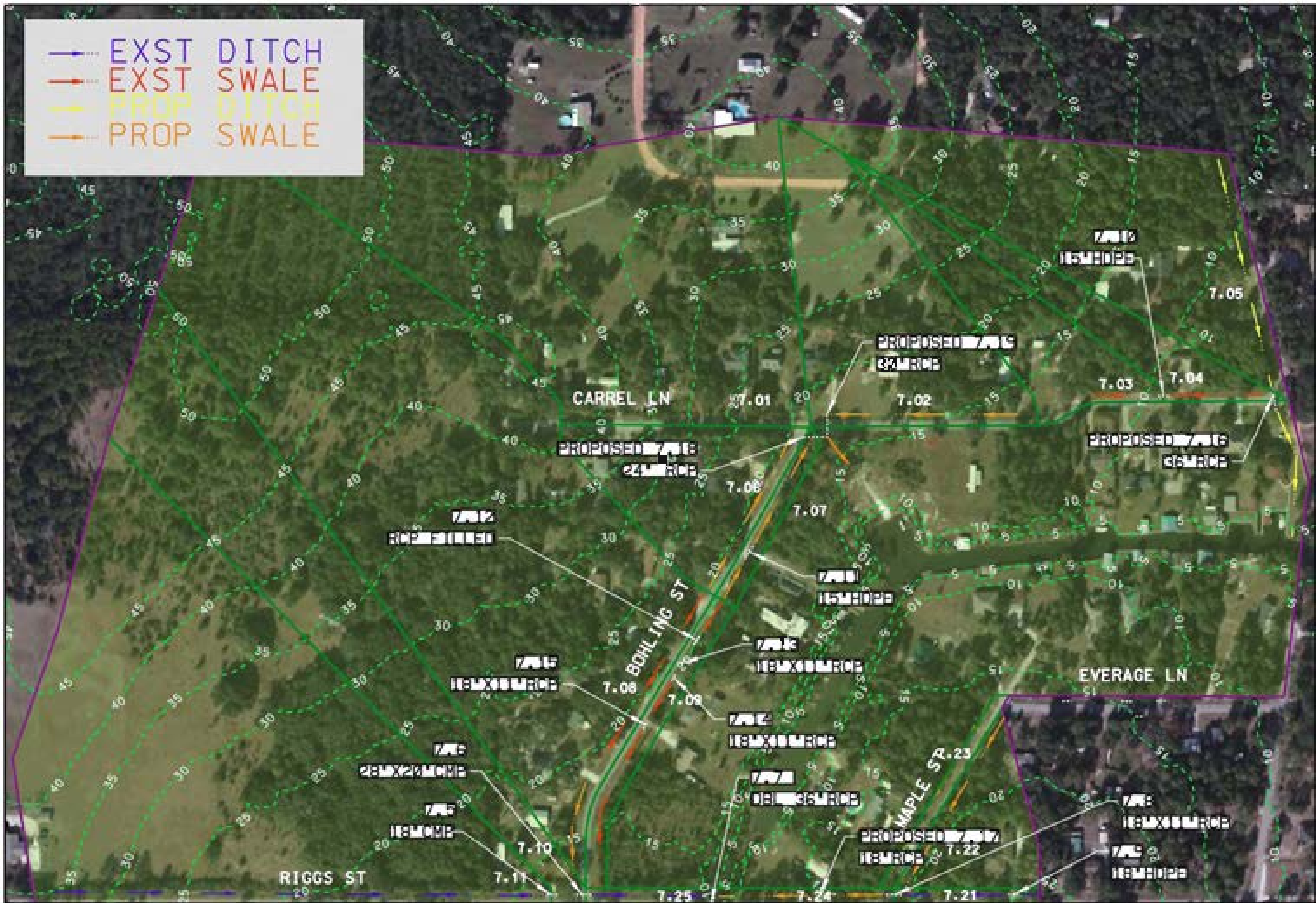
Proposed Improvements: This is such a large area the improvements will be broken down by streets starting from the northern end of the basin heading south. A proposed ditch needs to be constructed on the west side of Perdido Vista Drive from the high point approximately 600 feet north of Carrel Lane to Carrel Lane where proposed pipe 7.16, size 36" RCP, will be constructed under Carrel Lane into a proposed ditch that will outfall to the boating channel to the south. The far northern section of the basin drains toward Carrel Lane. Approximately 600 feet down Carrel Lane west of Perdido Vista Drive is a high point. Regrade the existing swale on the north side of Carrel Lane from the high point towards Perdido Vista Drive. This will drain to proposed pipe 7.16. Pipe 7.10 falls in this range and does not have the capacity to handle the design storm. This existing 15" pipe will need to be replaced with a 24" RCP. A proposed swale needs to be constructed on the other side of the high point on Carrel Lane to the intersection of Carrel Lane and Bohling Street. At the intersection proposed pipe 7.19, size 30" RCP, will be constructed from the north side of Carrel Lane to the south side of Carrel Lane. This pipe will convey the water from the home owners' yards to the boating channel to the south. Approximately 450 feet down Bohling Street from Carrel Lane is another high point. From this point the water will drain back to the intersection of Bohling Street and Carrel Lane. Proposed swales need to be constructed on both sides of Bohling Street to the proposed pipe 7.18. Pipe 7.11, that falls in this range, does not have the capacity to drain the design storm. This existing 15" pipe will need to be replaced with an 18" RCP. Proposed pipe 7.18, size 24" RCP, needs to be constructed to convey the water from the west side of Bohling Street to the east side of Bohling Street. This pipe will convey the water to the boating channel to the south. A construction easement will need to be acquired to construct a ditch/swale to convey the water from pipes 7.18 and 7.19 to the boating channel. From the high point on Bohling Street, proposed swales need to be constructed on the west and east side to channel the water to Riggs Street. Pipes 7.12-7.15, that fall within this range, do not have the capacity to handle the design flow. These existing 18"x11" pipes will need to be upsized to an 18" RCP. An immediate concern is to clean out the existing pipes and regrade the ditches to achieve positive flow.

Approximately 250 feet east of Escambia Avenue up Riggs Street is a high point. From this point east, the existing ditch on the north side of Riggs Street is in good shape. This ditch runs to pipe 7.5. Pipe 7.5 does not have the capacity to handle the design flow. The existing 18" pipe needs to be upsized to a 30" RCP. Just down from pipe 7.5 is pipe 7.6. This pipe runs under Bohling Street and does not have the capacity to handle the design flow coming down Riggs Street and Bohling Street. This existing 29"x18" pipe needs to be upgraded to a DBL 36". Regrade the

ditches in the area around pipes 7.5 and 7.6 to insure positive drainage. Some regrading from Bohling Street to the culvert crossing, pipe 7.7, will need to be done. Pipe 7.7 has the capacity to handle the design flow. The ditches on the south side of Riggs Street from the high point are in good shape between pipes 7.1-7.2. These pipes have the capacity to handle the design flow. Pipes 7.3-7.4 do not have the capacity to handle the design flow. The existing 15" pipes need to be upsized to an 18" RCP and DBL 18" RCP respectively. Regrade the existing ditch upstream and downstream of pipes 7.3 and 7.4 to pipe 7.7 to insure positive drainage. There is another high point at approximately Anniston Drive.

Grade a swale along the west side of Anniston Drive from State Street to Riggs Street. Minimal regrading, if any, needs to be done along the south side of Riggs Street from Anniston Drive to pipe 7.7. On the north side of Riggs Street, water drains down from high point on Maple Street to Riggs Street. Pipes 7.8 and 7.9 have the capacity to handle the design flow. Pipe 7.8 needs to be updated for minimum pipe size recommendation. Regrade the swale from Maple Street to pipe 7.7 for positive drainage and to eliminate flooding issues and add Pipe 7.17, proposed 18" RCP, under the driveway just west of Maple Street.

- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

TOWN OF HENNESSY BEACH
 COMPONENTS (PLAN) -
 MASTER PLAN

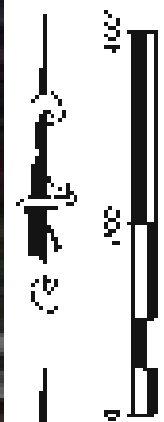


	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF NORFOLK BEACH
 COMPONENTS DRAWING
 MASTER PLAN

DATE: 11/1/2024

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
7.1	18" HDPE	0.24		PASS	PIPE OK
7.2	15" HDPE	1.99		PASS	PIPE OK
7.3	15" RCP	9.25		FAIL	18" RCP
7.4	15" RCP	12.54		FAIL	DBL 18" RCP
7.5	18" CMP	24.79		FAIL	30" RCP
7.6	29"x18" CMP		72.38	FAIL	DBL 36" RCP
7.7	DBL 36"		110.9	PASS	PIPE OK
7.8	18"x11" RCP		9.92	PASS	18" RCP
7.9	18" HDPE	0.73		PASS	PIPE OK
7.10	15" HDPE	17.91		FAIL	24" RCP
7.11	15" HDPE	1.65		FAIL	18" RCP
7.12	18"x11" RCP	2.78		FAIL	18" RCP
7.13	18"x11" RCP	2.71		FAIL	18" RCP
7.14	18"x11" RCP	2.69		FAIL	18" RCP
7.15	18"x11" RCP	2.65		FAIL	18" RCP
7.16			35.43		36" RCP
7.17		10.68			18" RCP
7.18			11.07		24" RCP
7.19			31.67		30" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 7

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
304	206D-000	LF	REMOVING PIPE	\$8.00	\$2,432.00
5990	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$41,930.00
169	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$1,521.00
16	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$480.00
144	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$1,728.00
144	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$108.00
7	405A-000	GAL	TACK COAT	\$4.50	\$31.50
12	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$960.00
23	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$1,840.00
258	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$11,610.00
80	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$4,800.00
74	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$4,810.00
124	530A-004	LF	36" ROADWAY PIPE (CLASS 3 R.C.)	\$75.00	\$9,300.00
165	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$2,475.00
16049	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$72,220.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
9	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$9,000.00
1	1004-000	LS	SURVEY SERVICES	\$25,000.00	\$25,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$3,500.00	\$3,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$17,900.00	\$17,900.00
1	1007-000	LS	BID SERVICES	\$12,000.00	\$12,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$4,500.00	\$4,500.00
1	1009-000	LS	CEI SERVICES	\$10,000.00	\$10,000.00
TOTAL					\$242,646.00

7.1 us



7.1 ds



7.2 us



7.2 ds



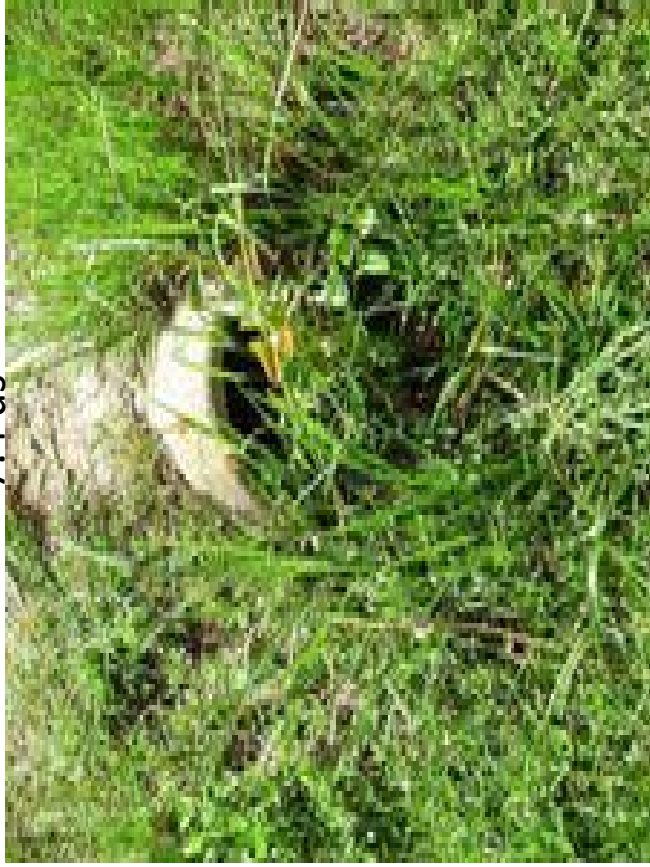
7.3 us



7.3 ds



7.4 us



7.4 ds



7.5 ds



7.6 ds



7.5 us



7.6 us



7.7 us 1



7.7 us 2



7.7 ds



7.8 us



7.8 ds



7.9 us



7.9 ds



7.10 us



7.10 ds



7.11 us



7.11 m



7.11 ds



7.12 us



7.12 ds



7.13 us



7.13 ds



7.14 us



7.14 ds



7.15 us



7.15 ds



Comments Form
Public Involvement Meeting
Project: Town of Perdoo Beach Stormwater Management Plan

Name: Paula E. Stewart
Address (Street, City, State, Zip): 3001 E. Lincoln St. ...
Telephone Number: 202 221 1100
E-mail Address: paule@stewart.com

Event Meeting Attendance Location: _____
Event Date: Saturday March 19, 2011
Participation in Project: Property Owner/Tenant Public Official
Local Business Owner Other

General Comments:
Love Perdoo Beach. The 100% (see above).

Provide location and explain known drainage issues:
100% of beach is 100% covered in sand. ...

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk (right) or by e-mail to the following email or mail to the following address by April 8, 2011:

Karen Richardson, P.E. CM 50
Water, Inc.
P.O. Box 7434
Mobile, AL 36670
karen.richardson@water.com



30665 Carrel Lane
Perdido Beach, AL 36530



30665 Carrel Lane
Perdido Beach, AL 36530

BASIN 8

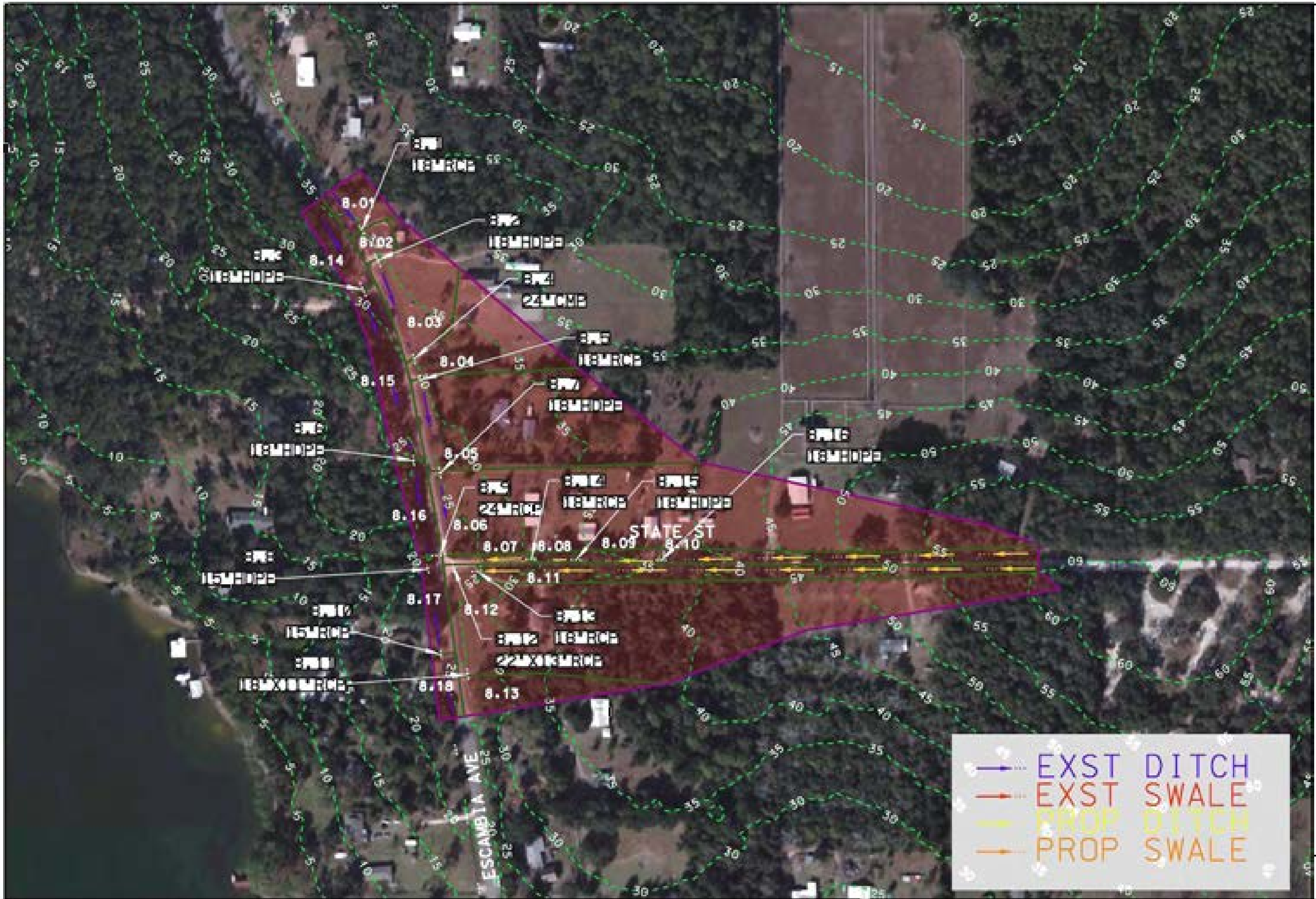
Basin 8:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas and a couple of small wooded area sections. This basin runs along Escambia Avenue where Basin 6 ends to the adjacent high point approximately 350 feet south of State Street to approximately 1350 feet east on State Street from Escambia Avenue. This basin has approximately 19.08 contributing acres of stormwater.

Proposed Improvements: Pipes 8.3 and 8.6 have the capacity to handle the design flow. These two pipes are located on the west side of Escambia Avenue. Upon field inspection, pipe 8.33 needs minimal pipe cleaning and the existing ditch running through this pipe needs minimal, if any, regrading to achieve positive flow. Pipe 8.6 also needs cleaning and the downstream ditch needs regrading for positive drainage to pipe 8.9, the outfall. Pipes 8.8 and 8.10 are also on this side of Escambia Avenue on the other side of the outfall. These pipes have the capacity to handle the design flow. Pipe 8.8 needs to be replaced with an 18" RCP due to minimum pipe size recommendation and pipe 8.10 needs cleaning and the ditches need extensive regrading to the outfall.

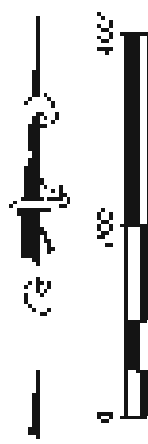
Pipes 8.1, 8.2, 8.4, 8.5, and 8.7 are located on the east side of Escambia Avenue. Pipes 8.1, 8.2, 8.4, and 8.5 have the capacity to handle the design flow. These pipes need cleaning and the ditch needs to be regraded to pipe 8.9, the outfall. Pipe 8.7 needs to be upgraded to a 24" RCP. Pipes 8.11 and 8.12 are also on this side of Escambia Avenue on the other side of the outfall. Pipe 8.11 has the capacity to handle the flow, but should be replaced with an 18" due to minimum pipe size recommendation. Pipe 8.12 does not have the capacity to handle the design flow. This pipe needs to be replaced with a 24" pipe which runs under State Street. The outfall pipe 8.9 does not have the capacity to handle the design flow. The existing 24" needs to be upgraded to a 36" RCP. A more extensive study will need to be done on the outfall, which outlets to the west of Escambia Avenue, in the design phase to see if any modifications will need to be made to the pipe or the outlet ditches.

Proposed ditches will need to be constructed on both sides of State Street from the high point towards Escambia Avenue. Pipes 8.13-8.16 have the capacity to handle the flow, but these pipes need cleaning and the existing ditches downstream need regrading for positive drainage.



TOWN OF ESCAMBA COUNTY
COMPREHENSIVE ZONING
MASTER PLAN

VOLKERT
NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
8.1	18" RCP	1.12		PASS	PIPE OK
8.2	18" HPDE	1.67		PASS	PIPE OK
8.3	18" HPDE	1.05		PASS	PIPE OK
8.4	24" CMP	4.51		PASS	PIPE OK
8.5	18" RCP	6.9		PASS	PIPE OK
8.6	18" HPDE	2.6		PASS	PIPE OK
8.7	18" RCP	13.7		FAIL	24" RCP
8.8	15" HPDE	1.78		PASS	18" RCP
8.9	24" RCP		45.04	FAIL	36" RCP
8.10	15" RCP	0.77		PASS	PIPE OK
8.11	18"x11" RCP	1.46		PASS	18" RCP
8.12	22"x14" RCP		15.65	FAIL	24" RCP
8.13	18" RCP	3.74		PASS	PIPE OK
8.14	18" RCP	3.35		PASS	PIPE OK
8.15	18" HPDE	3.13		PASS	PIPE OK
8.16	18" HPDE	2.64		PASS	PIPE OK

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 8

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
146	206D-000	LF	REMOVING PIPE	\$8.00	\$1,168.00
3977	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$27,839.00
49	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$441.00
5	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$150.00
44	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$528.00
44	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$33.00
2	405A-000	GAL	TACK COAT	\$4.50	\$9.00
4	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$320.00
7	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$560.00
50	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$2,250.00
58	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$3,480.00
38	530A-004	LF	36" ROADWAY PIPE (CLASS 3 R.C.)	\$75.00	\$2,850.00
298	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$4,470.00
9700	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$43,650.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
3	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$3,000.00
1	1004-000	LS	SURVEY SERVICES	\$4,500.00	\$4,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$9,500.00	\$9,500.00
1	1007-000	LS	BID SERVICES	\$8,000.00	\$8,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$7,500.00	\$7,500.00
TOTAL					\$129,748.00

8.1 ds



8.2 ds



8.1 us



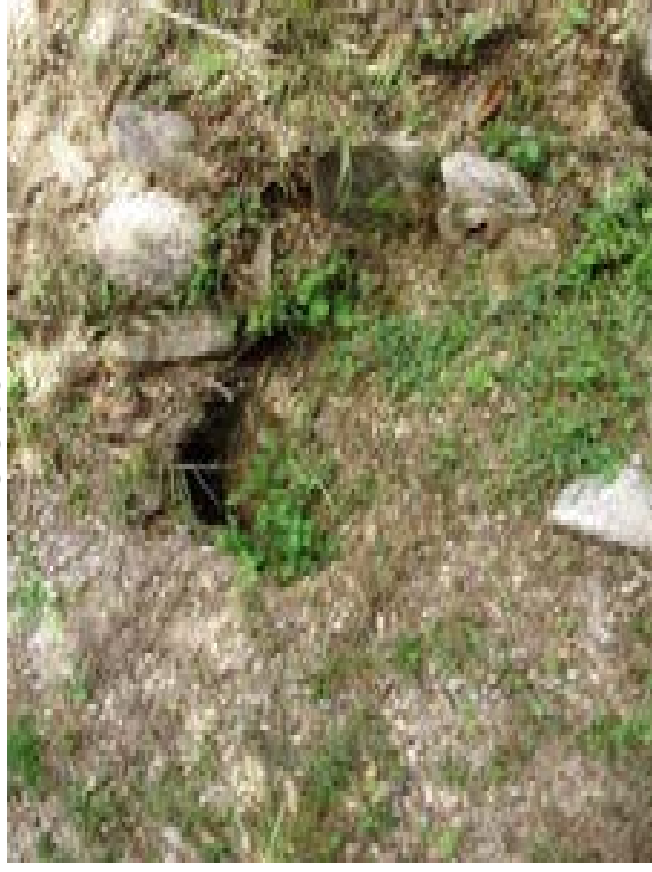
8.2 us



8.3 us



8.3 ds



8.4 us



8.4 ds



8.5 ds



8.6 ds



8.5 us



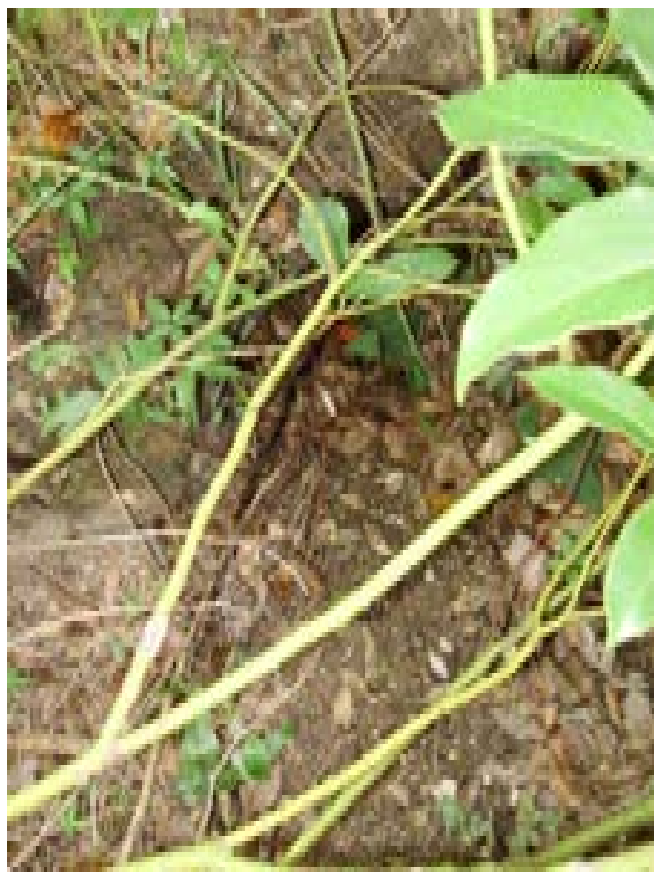
8.6 us



8.7 ds



8.8 us S



8.7 us



8.8 us N



8.9 us



8.9 ds



8.10 us



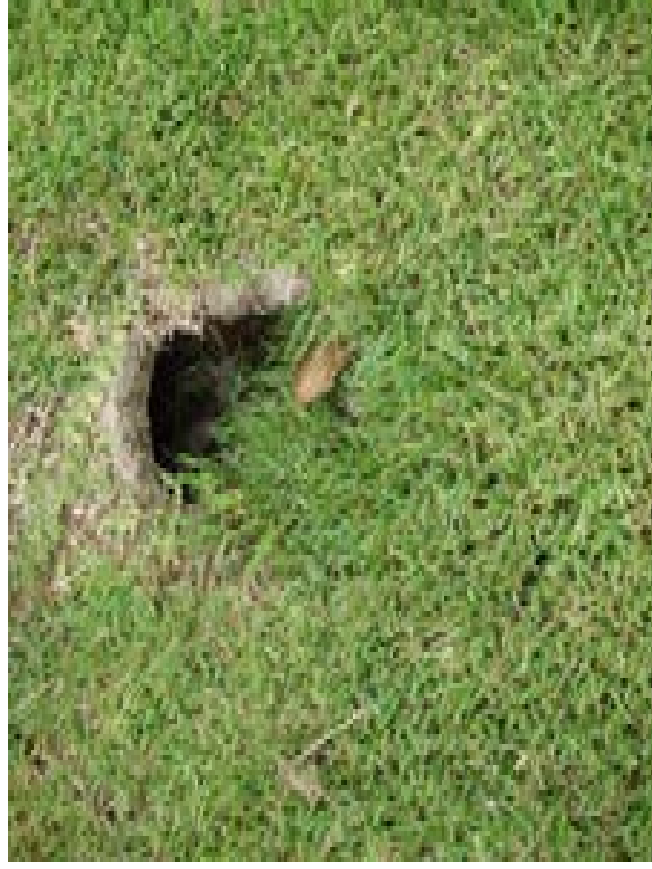
8.10 ds



8.11 us



8.11 ds



8.12 us N



8.12 us S



8.13 us



8.13 ds



8.14 us



8.14 ds



8.15 us



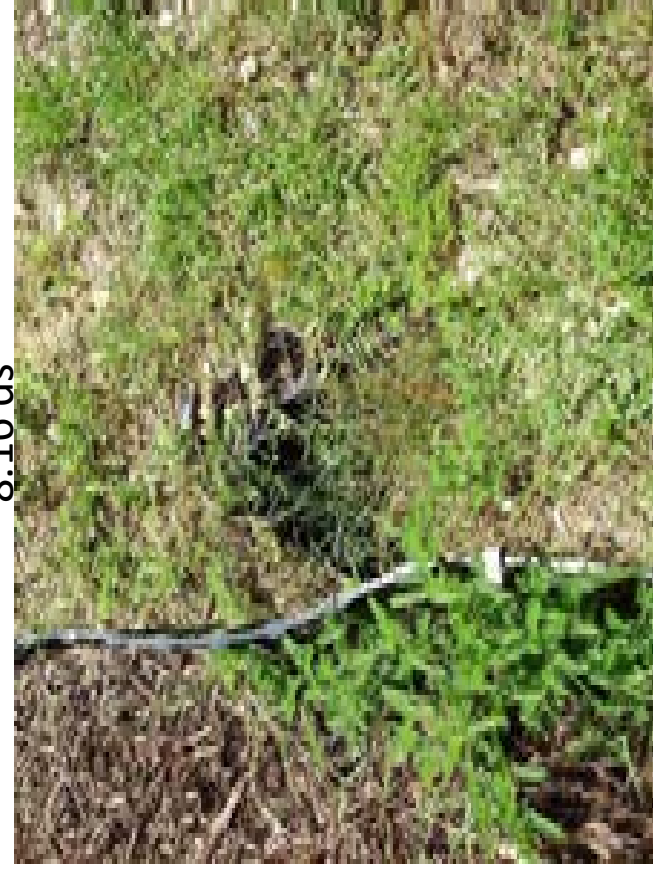
8.15 ds



8.16 us



8.16 ds



BASIN 9

Basin 9:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas and a wooded area section to the south. This basin is bordered by basin 7 and basin 11. It covers just north of Riggs Street to State Street to Tuscaloosa Drive. This basin has approximately 21.98 contributing acres of stormwater.

Proposed Improvements: Proposed swales need to be graded along the north and south side of Everage Lane. Pipes 9.1-9.4 fall within this range and have the capacity to handle the design flow. Pipes 9.2 and 9.4 will need to be replaced for minimum pipe size recommendation and all the pipes will need to be cleaned and the swale constructed for positive drainage which will flow north along the west side of Tuscaloosa Drive to the boating channel. A construction easement will need to be acquired to construct a swale to convey the water from proposed pipe 9.23 to the boating channel. A swale will also need to be constructed along the north side of Riggs Street from the high point to Tuscaloosa Drive and onto proposed pipe 9.23 that crosses under Everage Lane.

A proposed swale will need to be constructed along the east side of Anniston Street from State Street to Riggs Street and a swale constructed along the south side of Riggs Street to Tuscaloosa Drive. Pipes 9.5-9.6 fall in this range and have the capacity to handle the design flow. These pipes need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes.

The existing drainage pattern for this basin has all the water running north down a ditch on the west side of Tuscaloosa from State Street to Riggs Street where it ponds in the radius return until it overflows the roadway. The proposed drainage schematic recommends rerouting the water in a ditch to a new outfall approximately 400 feet south of Riggs Street along Tuscaloosa Drive. A drainage easement will need to be acquired to outfall the water into Soldier Creek. The proposed ditches will flow from Riggs Street to the new outfall. The existing ditch will be used from State Street to the new outfall. Pipes 9.7-9.15 do not have the capacity to handle the design flow in their current condition nor in the proposed drainage schematic. All these pipes will need to be upsized. Pipe 9.7 will be replaced with an 18" RCP. Pipes 9.8-9.9 will be replaced with a 24" RCP. Pipe 9.10 will be replaced with proposed pipes 9.20-9.22. A 30" RCP will run from each side of the existing pipe to a junction box in the middle and then into a 30" RCP that outfalls across the street.

There is a high point approximately 250 feet west of Anniston Drive on State Street. The existing drainage pattern has the water running down the middle of State Street and across Tuscaloosa Drive. The proposed drainage schematic has proposed swales running down State Street to Tuscaloosa Drive. The existing pipes, 9.16-9.17, under Anniston Drive have the capacity to handle the design flow. These pipes need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the

purpose of this drainage study, the assumption was to replace the pipes. The water running down the swales on State Street will drain to proposed pipe 9.18 that runs under State Street from the north to the south, then across Tuscaloosa Drive in proposed pipe 9.19, and finally down a proposed ditch on State Street to Soldier Creek. These two pipes are proposed size 18" RCP.



VOLKERT
NOT ISSUED FOR CONSTRUCTION

TOWN OF HOUSTON BEACH
COMPLEMENTARY GRADING
MASTER PLAN

TOWN OF HOUSTON BEACH

DATE: 12/1/24

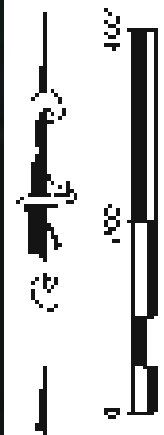


	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF HOOPER CEMETERY
 COMPONENTS GRADING
 MASTER PLAN

DATE: 11/14/14

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
9.1	15" CMP	0.42		PASS	PIPE OK
9.2	17"x13" CMP	0.79		PASS	18" RCP
9.3	15" CMP	0.98		PASS	PIPE OK
9.4	18"x11" RCP	5.45		PASS	18" RCP
9.5	15" CMP	3.42		PASS	18" RCP
9.6	21"x15" CMP	3.74		PASS	18" RCP
9.7	15" CMP	39.02		FAIL	18" RCP
9.8	18" HDPE	36.75		FAIL	24" RCP
9.9	18" RCP	34.55		FAIL	24" RCP
9.10	18" RCP	31.13		FAIL	SEE PIPES 20-22
9.11	15" HDPE	27.88		FAIL	DBL 24" RCP
9.12	15" CMP	20.71		FAIL	24" RCP
9.13	15" CMP	17.53		FAIL	24" RCP
9.14	15" CMP	13.94		FAIL	24" RCP
9.15	15" RCP	12.28		FAIL	24" RCP
9.16	22"x13" RCP		1.56	PASS	18" RCP
9.17	22"x13" RCP		1.52	PASS	18" RCP
9.18			2.77		18" RCP
9.19			5.49		18" RCP
9.20		30.9			30" RCP
9.21		13.05			30" RCP
9.22			50.02		30" RCP
9.23		19.83			24" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 9

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
481	206D-000	LF	REMOVING PIPE	\$8.00	\$3,848.00
3021	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$21,147.00
93	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$837.00
10	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$300.00
99	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$1,188.00
99	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$74.25
5	405A-000	GAL	TACK COAT	\$4.50	\$22.50
8	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$640.00
16	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$1,280.00
275	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$12,375.00
248	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$14,880.00
173	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$11,245.00
43	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$645.00
8310	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$37,395.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
15	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$15,000.00
1	1004-000	LS	SURVEY SERVICES	\$6,500.00	\$6,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$11,250.00	\$11,250.00
1	1007-000	LS	BID SERVICES	\$8,000.00	\$8,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$10,000.00	\$10,000.00
TOTAL					\$166,126.75

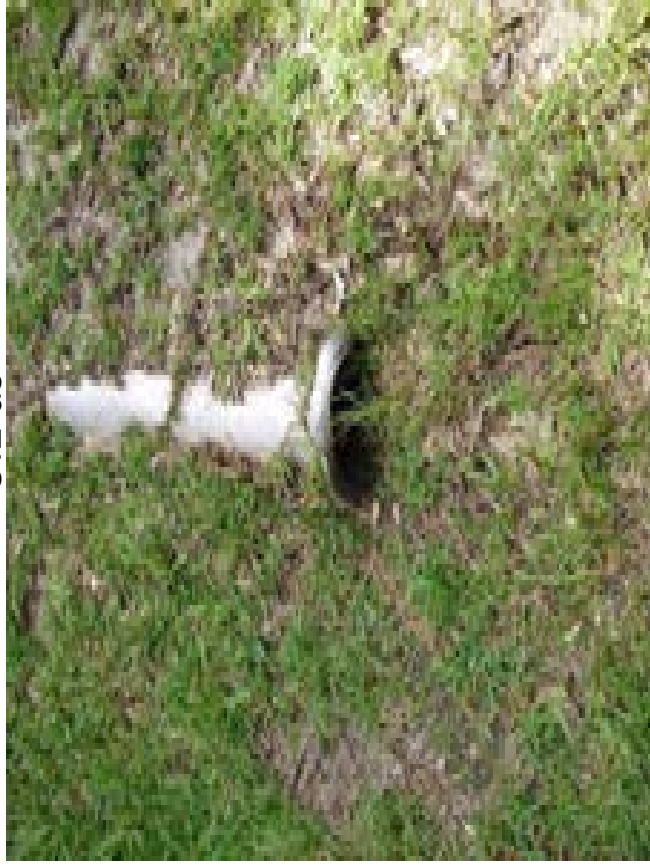
9.1 us



9.1 ds



9.2 us



9.2 ds



9.3 us



9.3 ds



9.4 us



9.4 ds



9.5 ds



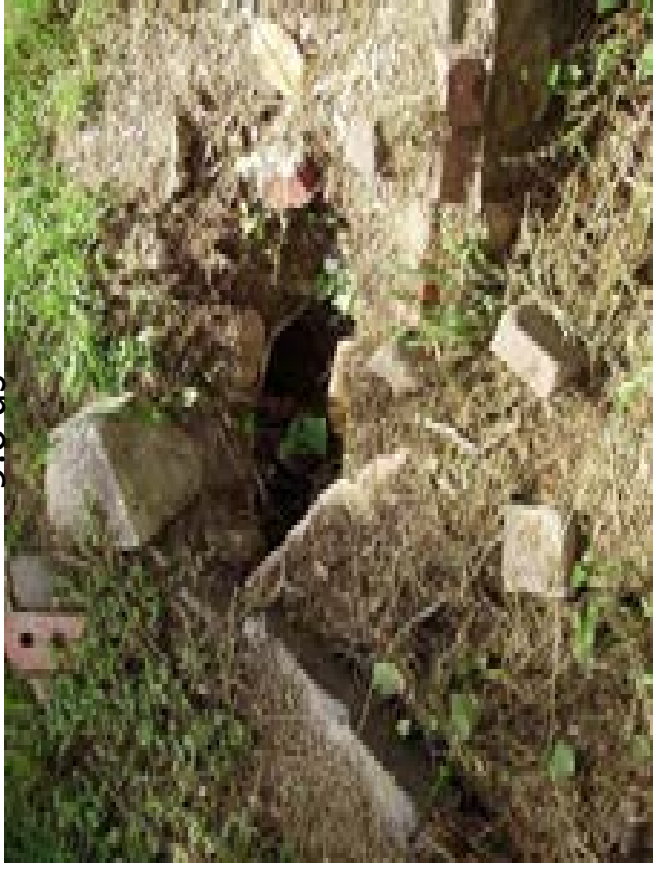
9.6 ds



9.5 us



9.6 us



9.7 us



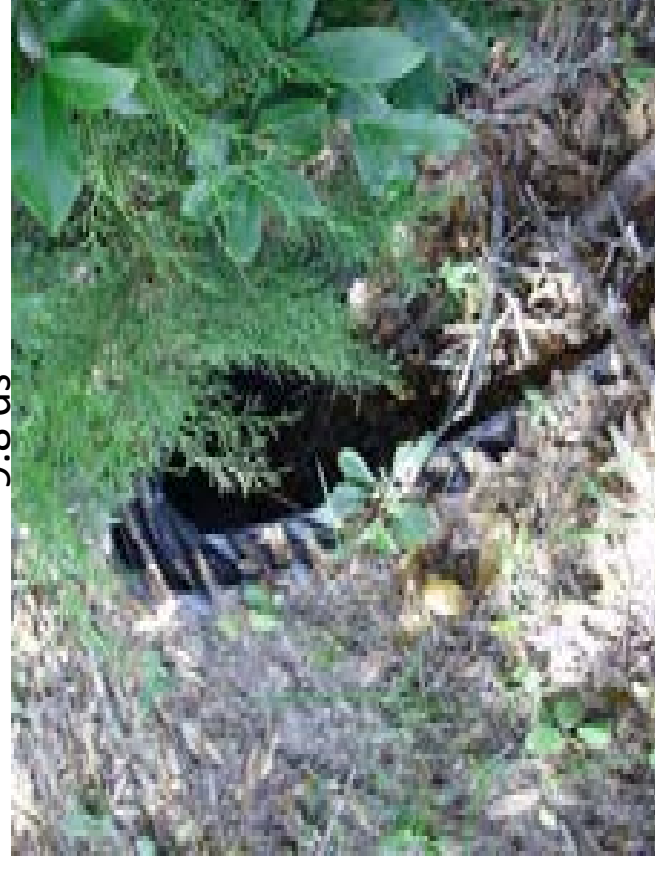
9.7 ds



9.8 us



9.8 ds



9.9 us



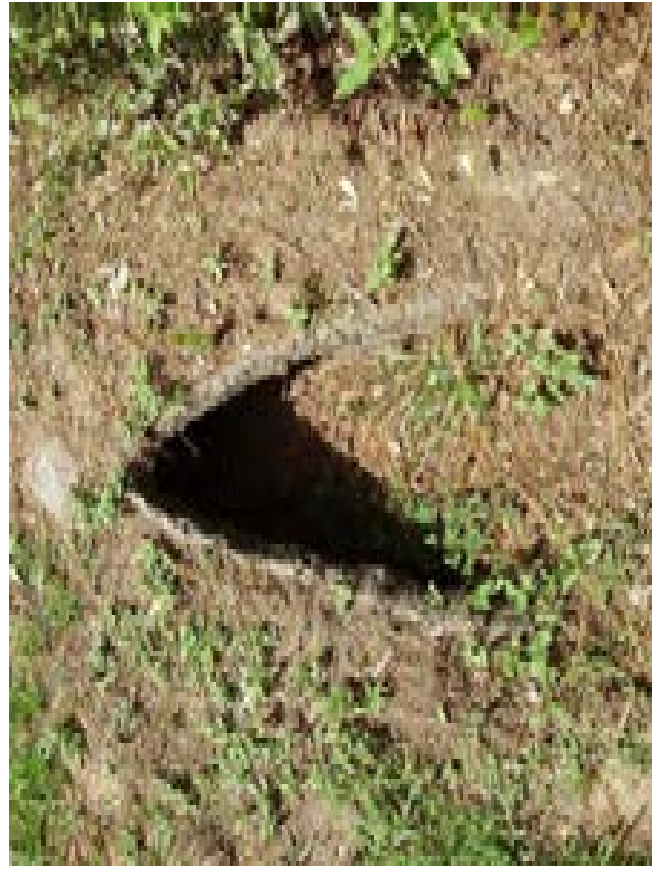
9.9 ds



9.10 us



9.10 ds



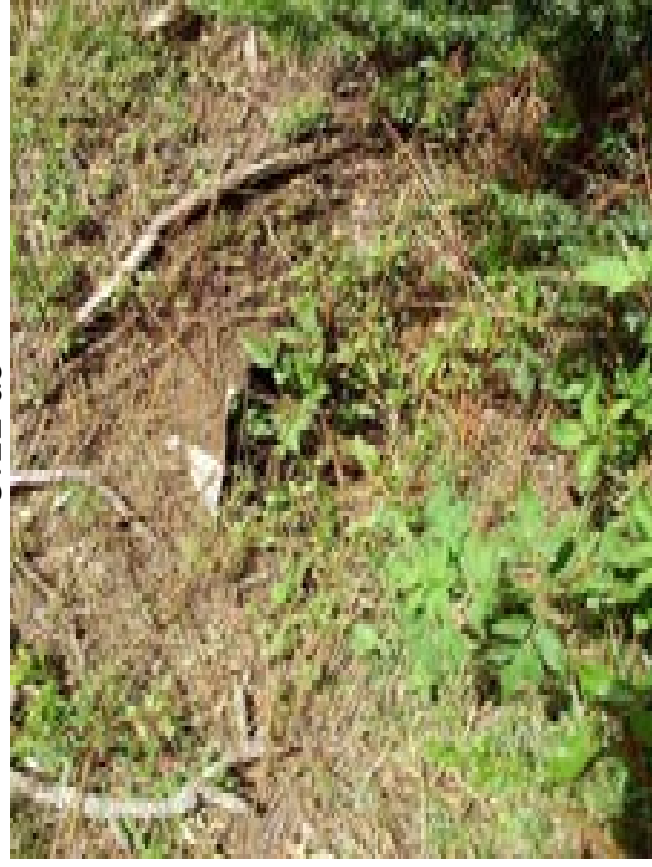
9.11 us



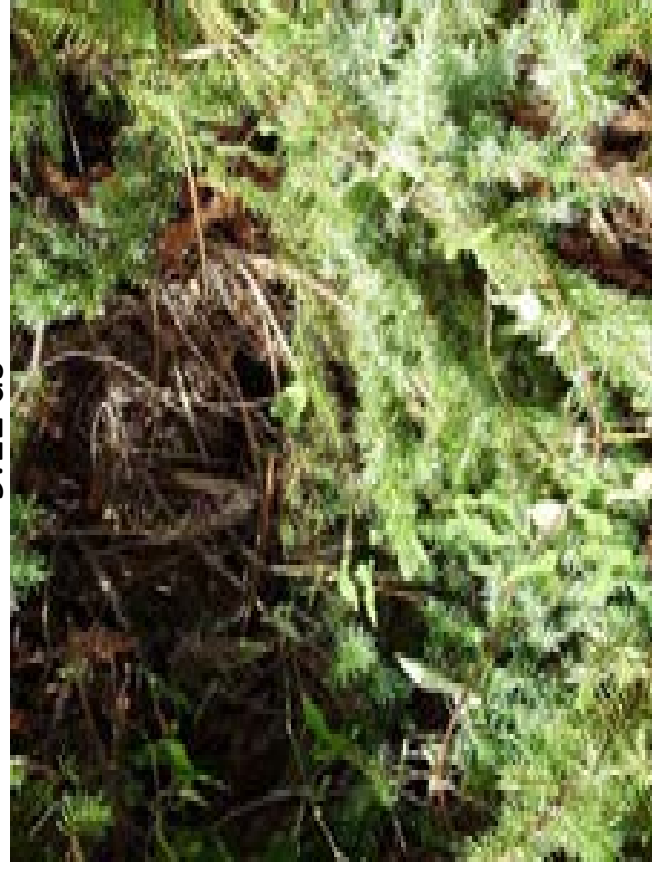
9.11 ds



9.12 us



9.12 ds



9.13 us



9.13 ds



9.14 us



9.14 ds



9.15 us



9.15 ds



9.16 us



9.16 ds



9.17 us



9.17 ds



BASIN 10

Basin 10:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is bordered by basins 7, 8, 11, 13, and 14 and covers south of State Street to west of Anniston Drive to approximately 1400 feet south of Baldwin Street to Pensacola Avenue. This basin has approximately 91.35 contributing acres of stormwater.

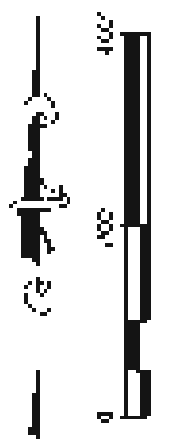
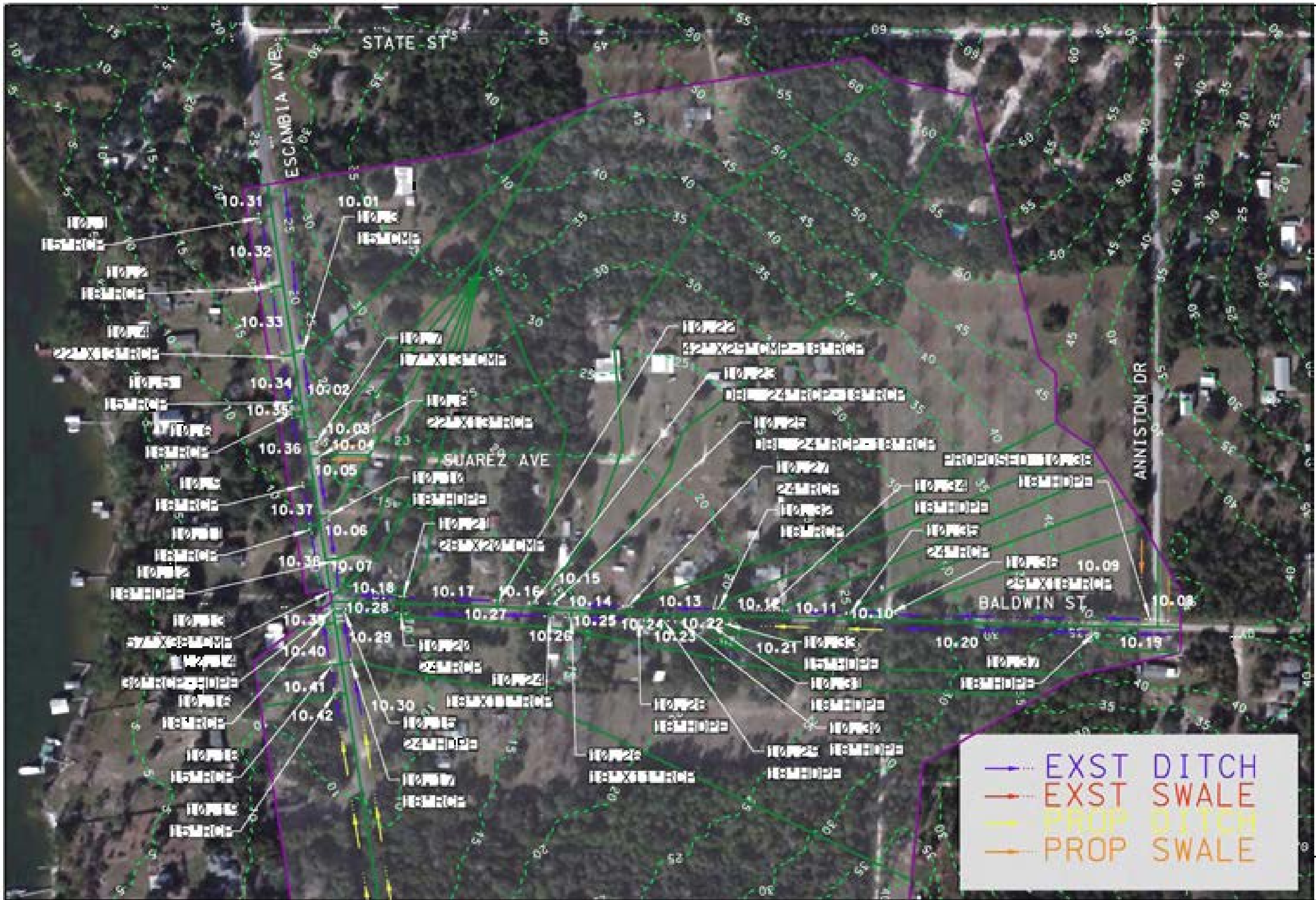
Proposed Improvements: This is such a large area the improvements will be broken down by streets starting from the western end of the basin heading east. The existing ditch on the west side of Escambia Avenue from the high point to the outfall at pipe 13 needs to either be regraded or reconstructed in various sections of the ditch. Pipes 10.1-10.2, 10.4-10.6, 10.9, and 10.11 fall within this range and have the capacity to handle the design flow. A proposed ditch needs to be constructed on the west side of Escambia Avenue from the high point approximately 1400 feet south of Baldwin Street to the outfall at pipe 10.14. Pipes 10.16, 10.18, and 10.19 fall within this range. Pipes 10.18-10.19 do not have the capacity to handle the design flow. These existing 15" pipes need to be replaced with an 18" RCP. Pipe 10.16 has the capacity to handle the design flow but needs to be cleaned and then inspected to determine the condition of the pipe. Upon inspection, the decision can be made to keep or replace the pipe. For the purpose of this drainage study, the assumption was to replace the pipe.

The existing ditch on the east side of Escambia Avenue from the high point to the outfall at pipe 10.13 needs to either be regraded or reconstructed in various sections of the ditch. Pipes 10.3, 10.7, 10.8, 10.10, and 10.12 fall within this range and do not have the capacity to handle the design flow. Pipes 10.3 and 10.7 need to be replaced with an 18" RCP and pipes 10.8, 10.10, and 10.12 need to be replaced with a 24" RCP. Suarez Avenue falls along this range also. A proposed swale will need to be constructed on both sides approximately 125-150 feet up Suarez Avenue from Escambia Avenue to channel the water along each side of Suarez Avenue and not down the middle of the road. A proposed ditch needs to be constructed on the east side of Escambia Avenue from the high point approximately 1400 feet south of Baldwin Street to the outfall at pipe 10.14. Pipe 10.17 falls within this range and does not have the capacity to handle the design flow. This pipe needs to be replaced with a 30" RCP.

From the high point at Anniston Drive on Baldwin Street, the existing ditch on the south side will need minimal regrading and maintenance to Pensacola Avenue. From Pensacola Avenue to approximately 350 feet west, a proposed ditch will need to be constructed. From this point, the existing ditch will need minimal regrading and maintenance to Escambia Avenue. Pipes 10.20, 10.24, 10.26, 10.28-10.31, 10.33, and 10.37 all fall within this range. Pipes 10.24, 10.26, and 10.33 do not have the capacity to handle the design flow. These pipes need to be replaced with an 18" RCP. Pipes 10.20, 10.28-10.31, and 10.37 have the capacity to handle the design flow and will require minimal cleaning. From the high point at Anniston Drive on Baldwin Street, the existing ditch on the north side will need minimal regrading and maintenance to Escambia Avenue. Pipes 10.21-10.23, 10.25, 10.27, 10.32, 10.34-10.36, and 10.38 all fall within this range. Pipe 10.38 is a proposed pipe that runs under Anniston Drive that conveys the flow from

proposed swales on Anniston Drive. Pipes 10.21-10.23, 10.25, and 10.32 do not have the capacity to handle the design flow. Pipes 10.21-10.22 need to be replaced with a DBL 30" RCP, pipes 10.23 and 10.25 need to be replaced with a DBL 24" RCP, and pipe 10.32 needs to be replaced with a 24" RCP. Pipes 10.27 and 10.34-10.36 have the capacity to handle the design flow and require minimal cleaning.

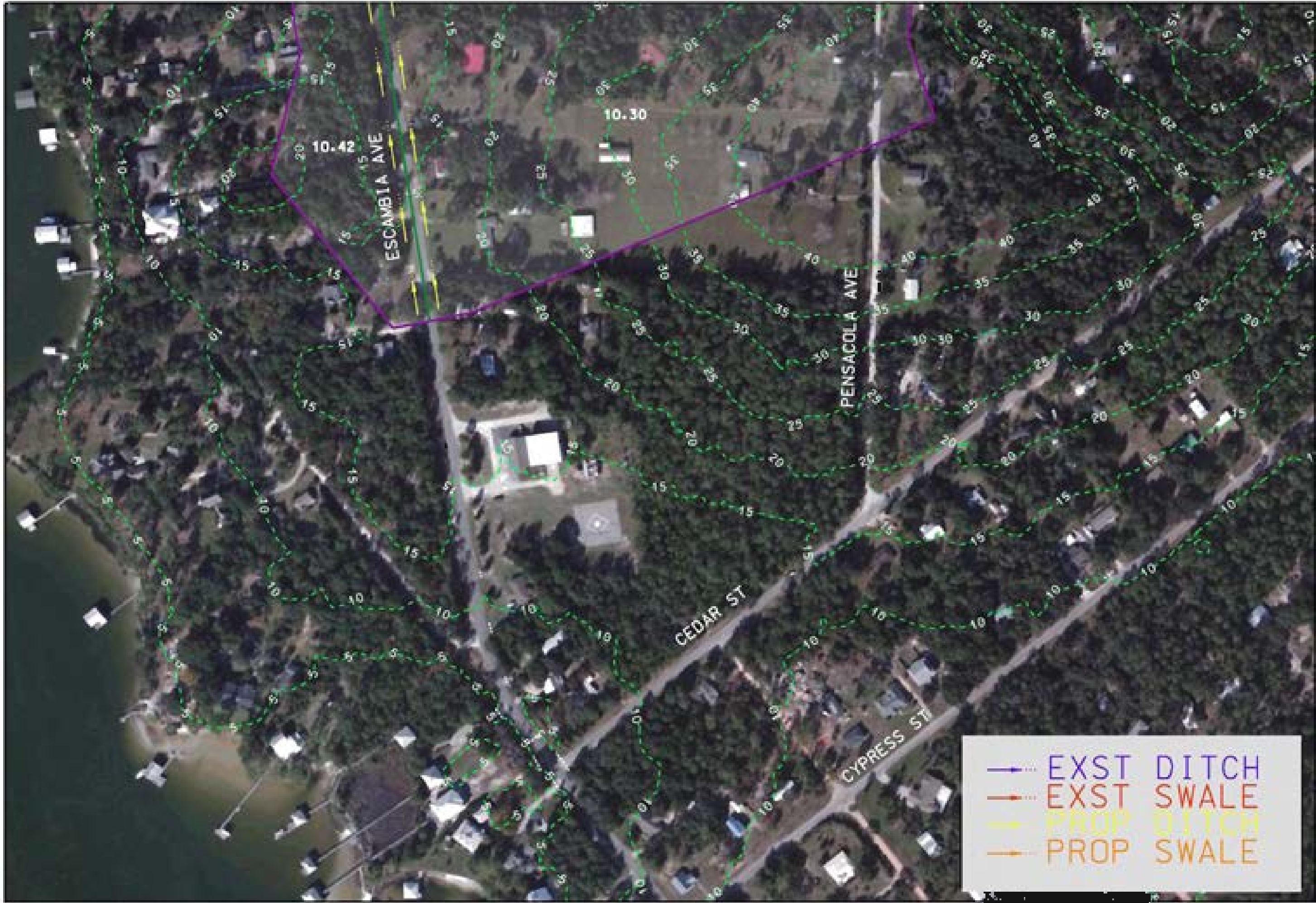
There are two crossings under Escambia Avenue at Baldwin Street. Pipe 10.13 is the northern most crossing and pipe 10.14 is the southernmost crossing. Neither pipe has the capacity to handle the design flow. Pipe 10.13 needs to be replaced with a DBL 36" RCP and pipe 10.14 and 10.15 need to be replaced with a 30" RCP. The proposed ditch coming from pipes 10.12, 10.17, 10.20, and 10.21 to the outfall pipes needs to be 2.5 feet deep to contain the design flow.



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

TOWN OF HUNTER CREEK
 COMPONENT C (PARTIAL)
 MASTER PLAN

TOWN OF HUNTER CREEK



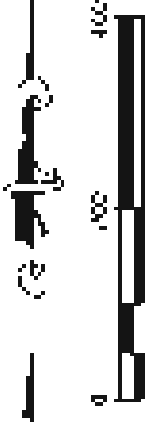
- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE

TOWN OF PENSACOLA BEACH
 COMPONENTS GRANT-02
 MASTER PLAN

DATE: 10/2011

VOLKERT

NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
10.1	15" RCP	0.39		PASS	PIPE OK
10.2	18" RCP	1.18		PASS	PIPE OK
10.3	15" CMP	9		FAIL	18" RCP
10.4	22"x14" RCP	1.88		PASS	PIPE OK
10.5	15" RCP	2.35		PASS	PIPE OK
10.6	18" RCP	2.45		PASS	PIPE OK
10.7	18"x11" CMP	14		FAIL	18" RCP
10.8	22"x13" RCP		21.27	FAIL	24" RCP
10.9	18" RCP	3.09		PASS	PIPE OK
10.10	18" HDPE	17.36		FAIL	24" RCP
10.11	18" RCP	3.45		PASS	PIPE OK
10.12	18" HDPE	19.64		FAIL	24" RCP
10.13	58"x36" CMP		124.31	FAIL	DBL 36" RCP
10.14	30" RCP/30" HDPE		78.98	FAIL	36" RCP
10.15	24" HDPE	51.54		FAIL	
10.16	18" RCP	9.57		PASS	18" RCP
10.17	18" RCP	39.48		FAIL	30" RCP
10.18	15" RCP	9.01		FAIL	18" RCP
10.19	15" RCP	8.48		FAIL	18" RCP
10.20	24" RCP	11.87		PASS	PIPE OK
10.21	29"x18" CMP	75.14		FAIL	DBL 30" RCP
10.22	42"x29" CMP/18" RCP	66.01		FAIL	DBL 30" RCP
10.23	DBL 18" RCP/24" RCP	52.57		FAIL	DBL 24" RCP
10.24	18"x11" RCP	13.38		FAIL	18" RCP
10.25	DBL 18" RCP/24" RCP	38.39		FAIL	DBL 24" RCP
10.26	18"x11" RCP	13.24		FAIL	18" RCP
10.27	24" RCP	16.89		PASS	PIPE OK
10.28	18" HDPE	12.79		PASS	PIPE OK
10.29	18" HDPE	12.7		PASS	PIPE OK
10.30	18" HDPE	12.6		PASS	PIPE OK
10.31	18" HDPE	12.27		PASS	PIPE OK
10.32	18" RCP	13.28		FAIL	24" RCP
10.33	15" HDPE	8.89		FAIL	18" RCP
10.34	18" HDPE	9.88		PASS	PIPE OK
10.35	24" RCP	7.19		PASS	PIPE OK
10.36	29"x18" RCP	5.08		PASS	PIPE OK
10.37	18" HDPE	1.21		PASS	PIPE OK
10.38		0.54			18" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 10

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
535	206D-000	LF	REMOVING PIPE	\$8.00	\$4,280.00
7348	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$51,436.00
80	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$720.00
7	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$210.00
65	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$780.00
65	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$48.75
3	405A-000	GAL	TACK COAT	\$4.50	\$13.50
5	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$400.00
11	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$880.00
306	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$13,770.00
176	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$10,560.00
107	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$6,955.00
129	530A-004	LF	36" ROADWAY PIPE (CLASS 3 R.C.)	\$75.00	\$9,675.00
532	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$7,980.00
18000	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$81,000.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
20	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$20,000.00
1	1004-000	LS	SURVEY SERVICES	\$20,000.00	\$20,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$3,500.00	\$3,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$21,300.00	\$21,300.00
1	1007-000	LS	BID SERVICES	\$12,000.00	\$12,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$10,000.00	\$10,000.00
TOTAL					\$282,508.25

10.1 us



10.1 ds



10.2 us



10.2 ds



10.3 us



10.3 ds



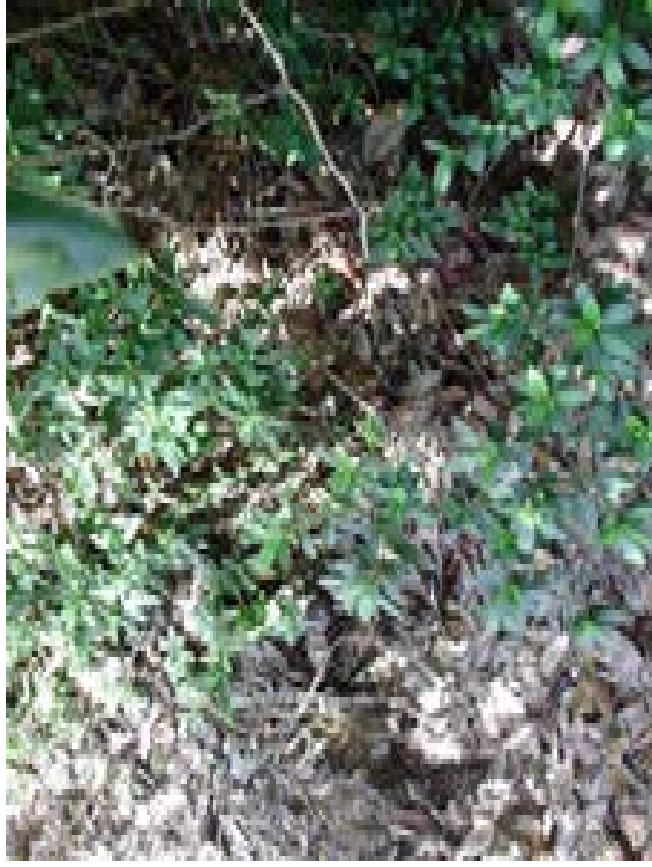
10.4 us



10.4 ds



10.5 us



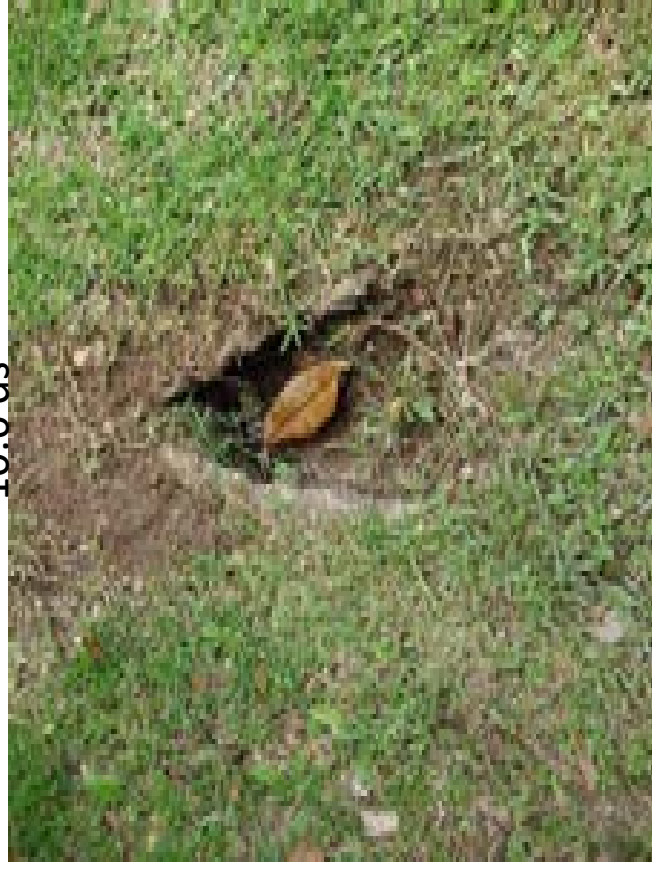
10.5 ds



10.6 us



10.6 ds



10.7 us



10.7 ds



10.8 us



10.8 ds



10.9 us



10.9 ds



10.10 us



10.10 ds



10.11 us



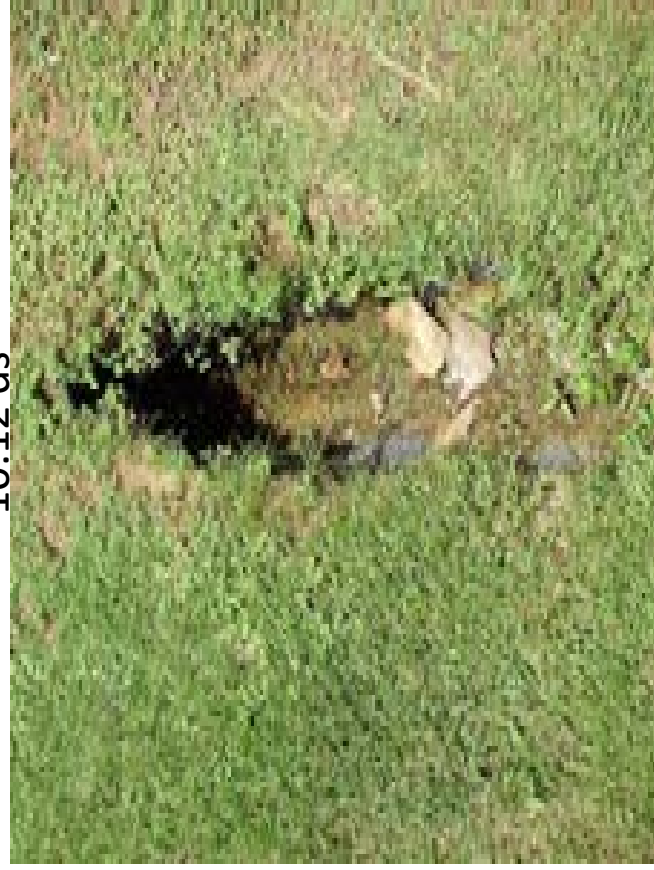
10.11 ds



10.12 us



10.12 ds



10.13 us



10.13 ds



10.14 us



10.14 ds



10.15 us



10.16 us



10.16 ds



10.17 us



10.17 ds



10.18 us



10.18 ds



10.19 us



10.19 ds



10.20 us



10.20 ds



10.21 us



10.21 ds



10.22 us



10.22 ds



10.23 us



10.23 ds



10.24 us



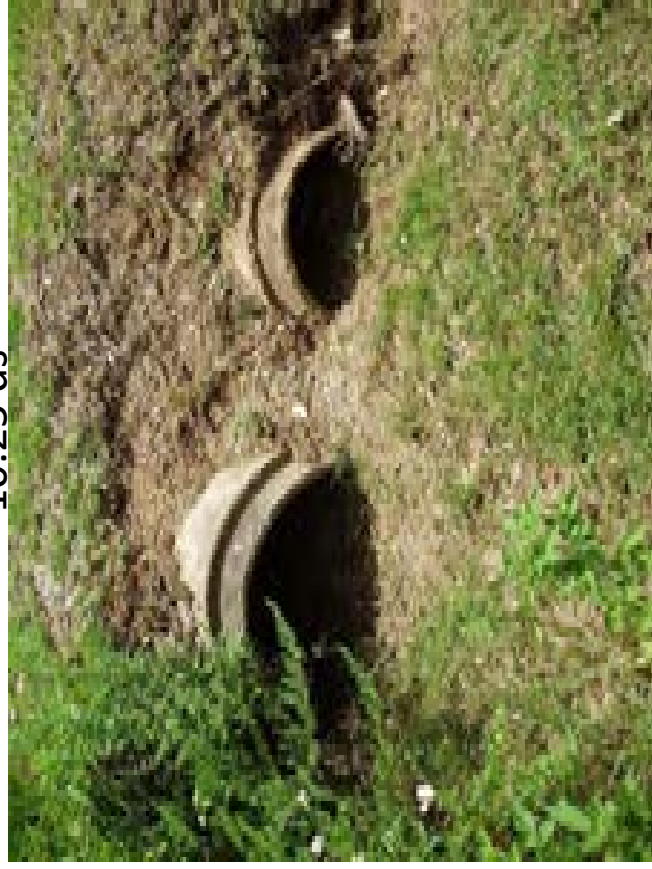
10.24 ds



10.25 us



10.25 ds



10.26 us



10.26 ds



10.27 us



10.27 ds



10.28 us



10.28 inlet



10.28 ds



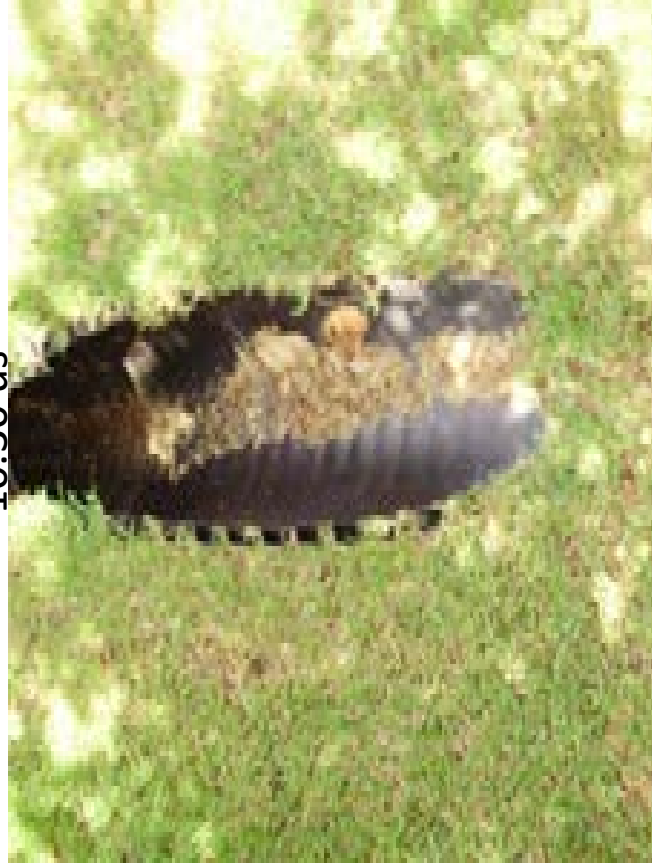
10.29 us



10.29 ds



10.30 us



10.30 ds



10.31 us



10.31 ds



10.32 us



10.32 ds



10.33 us



10.33 ds



10.34 us



10.34 ds



10.35 us



10.35 ds



10.36 us



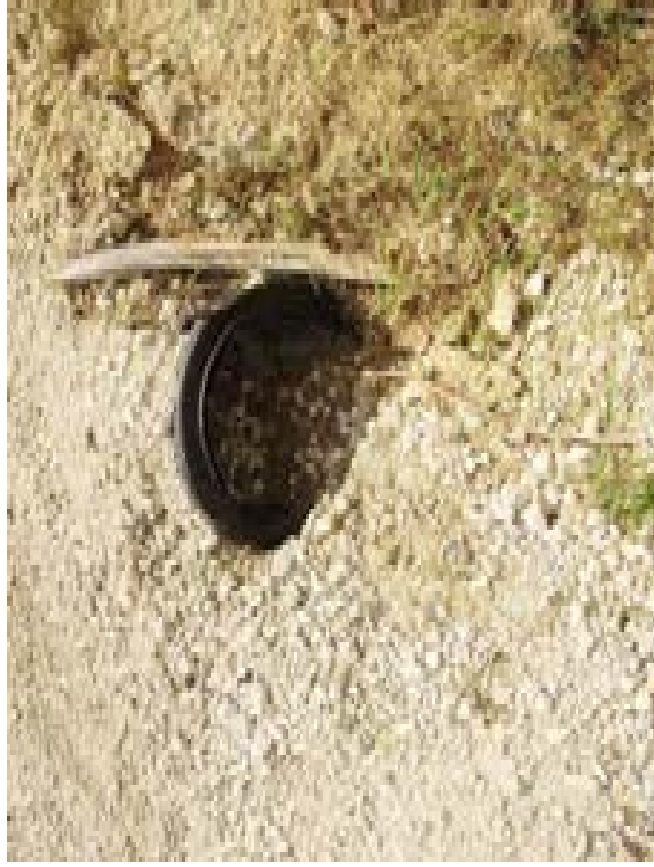
10.36 ds



10.37 us



10.37 ds



Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Steve Love

Address (Street, City, State, Zip): 8847 Escambia Ave, Perdido Beach 36530-6122

Telephone Number: 251-861-7903

E-mail Address:

stlove123@att.net

Public Meeting Attendance Location: Fire Department (Saturday, March 16, 2013) 9:00pm

Interest in Project: Property Owner

Public Official: Planning Coordinator

General Comments: Thanks for the presentations.
Topography maps would be helpful at next meeting.

Provide location and explain known drainage issues:
Wade Run off and under Escambia to Holly Street where
it runs into the creek please review for any drainage
issues.

Comments regarding the development of a stormwater management plan.
Please be as transparent as possible to prevent friction with some residents
and elected officials.

Suggestions for ways to improve public input: Have forms and
questionnaires either on your website or towns for people to fill
out. Some property owners live out of town and this would be a
good way for them to participate

Please return this form to the registration desk tonight, drop off at the town hall area, to the following email, or
mail to the following address by April 1, 2013.

Karman Richardson, P. L., CPLSC
Volken, Inc.
P. O. Box 7434
Mobile, AL 36670
karman.richardson@volkeninc.com

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Steve Love

Address (Street, City, State, Zip): 8865 Escambia Ave, Perdido Beach 32430-8172

Telephone Number: 251-961-1801

E-mail Address:
steve.love@perc.com

Public Meeting Attendance Location: Fire Department (Saturday, March 19, 2016) 2:00pm

Interested in Project: Property Owner and Public Utility Owner
Local Business Owner

Public Official: Planning Commission
Other: --

General Comments: Thanks for the presentations. Topography maps would be helpful at next meeting.

Provide location and explain known drainage issues: I live on North East corner of Escambia and Suarez. Water runs out of field behind my house down our driveway into Suarez. Each time we have a heavy rain it washes a trench across and down the south side of Suarez washing dirt and gravel into the street and neighbors yard.

Comments regarding the development of a stormwater management plan: Please be as transparent as possible to prevent friction with some residents and elected officials.

Suggestions for ways to improve public input: Have forms and questionnaires either on your website or towns for people to fill out. Some property owners live out of town and this would be a good way for them to participate.

Please return this form to the registration desk tonight, drop-off at the town hall, email to the following email, or mail to the following address by April 8, 2016.

Walter Richardson, P.L. (CPI) SC
Special Agent
P.O. Box 7434
Wade, AL 36576
w.richardson@perc.com

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: John J. Perdue
 Address (Street, City, State, Zip):
10100 Perdido Beach Blvd
 Telephone Number: 904-277-1234
 E-mail Address: perduejohn@perdue.com

Public Meeting Attendance Location: Perdue Departmental Building March 19, 2016
 Interest in Project: Property Owner/Tenant Other
Local Business Owner Other

General Comments:
Perdue Departmental Building is
located on the east side of my property. I am concerned
that the stormwater management plan will be a major issue.

Provide location and explain known or a huge issues:
located on the east side of my property
located on the east side of my property. I am concerned
that the stormwater management plan will be a major issue.

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk located outside of the Town Hall, email to the following email, or mail to the following address by April 6, 2016.

Kathleen Peterson, P.E. CAESB
 Wotter, Inc.
 P.O. Box 7404
 Mobile, AL 36613
 kathleen.peterson@wotter.com

Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530
Sheet 1 of 6

Town of Perdido Beach Comments and Concerns

August 1, 2013
DATE

Carl & Holly Hance Jr
YOUR NAME

30520 Baldwin St Perdido Beach, Al 36530
STREET# STREET TOWN STATE ZIP
YOUR ADDRESS

Holly_Hance@yahoo.com Alternate 251-424-1114
Holly.S.Hance.1022@statefarm.com Primary 850-882-6152
EMAIL ADDRESS PRIMARY AND ALTERNATE PHONE

30520 Baldwin St Perdido Beach Al 36530
STREET# STREET TOWN STATE ZIP
PHYSICAL ADDRESS OF PROPERTY CONCERN

ARE YOU THE OWNER YES/NO (Please Explain)

DESCRIBE YOUR CONCERNS Location: Pensacola Ave & Baldwin St. Poor Drainage Maintenance

There is a berm of dirt at the intersection of Pensacola Ave & Baldwin St blocking the drainage ditch causing the rain run off to flow down Baldwin St. and spill into our driveway. This is causing washouts and flooding in our yard. The drainage ditch is dry East of our property.

Holly Hance
SIGNATURE 8/1/13 FORM RECEIVED BY TOWN CLERK (DATE)

YOU MAY MAIL EMAIL OR FAX THE FILLED OUT FORM TO:
9212 CO RD 97-PERDIDO BEACH, AL 36530
OR FAX TO (251) 962-2206
OFFICE PHONE (251) 962-2200
CLERK@TOWNOFPERDIDOBACH.ORG

USE ADDITIONAL SHEETS IF NECESSARY

RECEIVED BY _____ PUBLIC WORKS DEPT _____ (DATE)



Carl & Holly Hance Jr
30520 Baldwin St
Perido Beach, Al 36530
Sheet 2 of 6

30520 Baldwin St



Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530
Sheet 3 of 6

30520 Baldwin St



Center of Rosarola Ave.



drainage ditch dry



drainage ditch dry

BASIN 11

Basin 11:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin runs from State Street where Basin 9 ends to west of Anniston Drive where Basin 10 ends to north of Baldwin Street where Basin 12 ends and on to the east to Soldier Creek. This basin has approximately 22.66 contributing acres of stormwater.

Proposed Improvements: This basin all drains to Pipe 11.5, the outfall. From the high point on each end of Anniston Drive, the water drains to the low spot or sag which is approximately 600 feet south of State Street. At the sag, the existing ditches do not have a cross drain to convey the water to the outfall. Proposed pipe 11.1, a 24" RCP, will need to be constructed under Anniston Drive to convey the water. From here, the water will drain down a proposed ditch to Pipe 11.5. A drainage easement will need to be acquired to construct the proposed ditch. Like Anniston Drive, the water drains from State Street and from Baldwin Street to the sag on Tuscaloosa Drive. Pipes 11.2, 11.3, 11.4, 11.6, 11.7, and 11.8 all drain to Pipe 11.5, the outfall. Pipes 11.2, 11.3, and 11.8 have the capacity to handle the design flow and pipes 11.4-11.7 do not have the capacity to handle the design flow. These pipes will need to be upsized. Pipes 11.2 and 11.3 need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipe. Pipes 11.4, 11.6, and 11.7 do not have the capacity to handle the design flow and will be upsized to a 24" RCP. Pipe 11.5 does not have the capacity to handle the design flow. It will need to be upsized to a DBL 30" RCP. There is an existing drainage easement from outfall pipe 11.5 to Soldier Creek. Using this easement, a drainage ditch needs to be constructed from the outfall to Soldier Creek for drainage purposes.

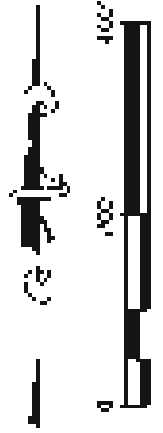


	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF HOUSTON BEACH
 COMPONENT GRADING
 MASTER PLAN

8/25/20

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
11.1					24" RCP
11.2	17"x13" CMP	3.07		PASS	18" RCP
11.3	18" HDPE	13.58		PASS	18" RCP
11.4	18" RCP	17.81		FAIL	24" RCP
11.5	28"x20" CMP		71.23	FAIL	DBL 30" RCP
11.6	15" HDPE	22.31		FAIL	24" RCP
11.7	15" CMP/18" CMP	16.66		FAIL	24" RCP
11.8	15" HDPE	7.27		PASS	PIPE OK

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 11

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
193	206D-000	LF	REMOVING PIPE	\$8.00	\$1,544.00
994	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$6,958.00
33	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$297.00
4	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$120.00
30	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$360.00
30	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$22.50
1	405A-000	GAL	TACK COAT	\$4.50	\$4.50
2	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$160.00
5	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$400.00
48	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$2,160.00
127	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$7,620.00
82	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$5,330.00
161	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$2,415.00
3007	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$13,531.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
6	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$6,000.00
1	1004-000	LS	SURVEY SERVICES	\$6,500.00	\$6,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$7,800.00	\$7,800.00
1	1007-000	LS	BID SERVICES	\$8,000.00	\$8,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$7,700.00	\$7,700.00
TOTAL					\$86,422.50

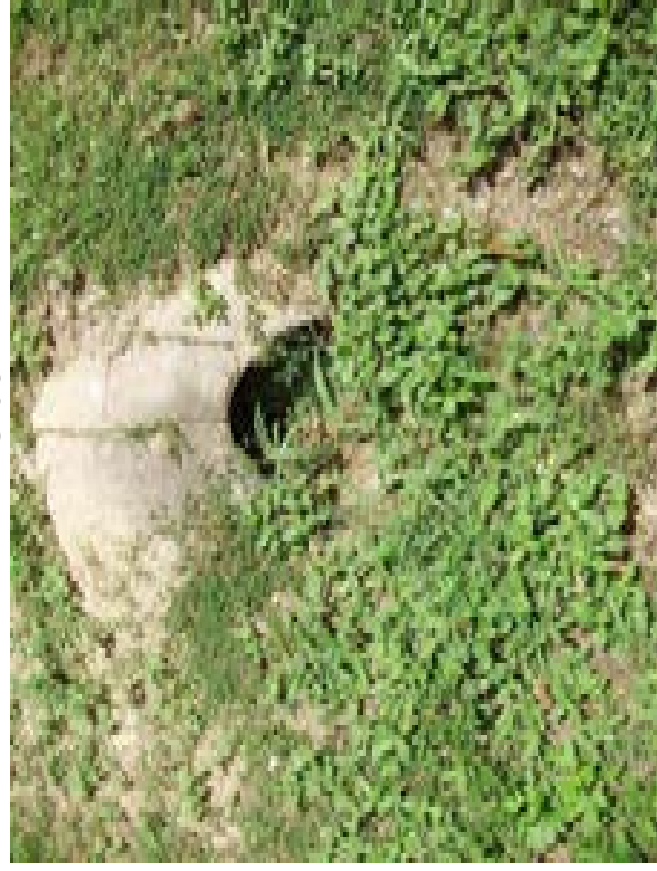
11.2 us



11.2 ds



11.3 us



11.3 ds



11.4 ds



11.5 ds



11.4 us



11.5 us



11.6 us



11.6 ds



11.7 us



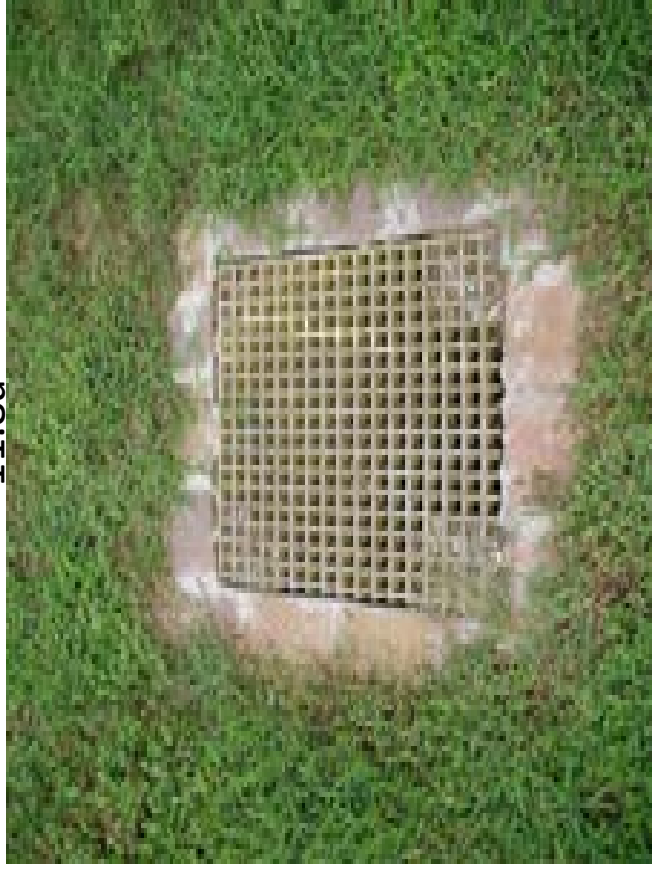
11.7 ds



11.8 us



11.8a



11.8b



11.8 ds



Comment Form
Public Involvement Meeting
Project: Town of Perdue Beach Stormwater Management Plan

Name: Ray Ellis
Address (Street City State Zip): 8704 Ashton Dr
Telephone Number: 251-202-1718
Email Address: _____

Public Meeting Attendance Location: 5-4 Department (Monday) March 16 2016

Interested in Project: Property Owner/Tenant: _____ Public Official: _____
Local Business Owner: _____ Other: _____

General Comments:

Provides location and explain known drainage issues:
Location Dr between 44th and 5th into St. water ponds in...
basement (water erosion susceptible flood impaction &
in heavy rains. Culvert or drainage ditch should be
installed for water to leave culvert as instructed.

Comments regarding the development of a stormwater management plan:
Stormwater plan should be developed & implemented to protect
property & environment. County should be notified, correct
problems they create. Also plan for planning to avoid construction.

Suggestions for ways to improve public input:

Please refer to the form in the registration book for the drop off at the meeting. The form is the following email or
mail to the following address by April 2, 2016

Laura Richardson P.E., CFESC
Udell, NC
P.O. Box 1414
Udell, N. 27080
laura_richardson@carrollco-nc.gov

Comments Form
Public Involvement Meeting
Project Town of Verdugo Beach Stormwater Management Plan

Name: Ed & Rosemary
Address (Street, City, State, Zip):
11117 Verdugo Beach Blvd, Verdugo Beach, CA 94705
Telephone Number: 916 251 2257
E-mail Address:

Public Meeting Attendance Location: Fire Department (Saturday, March 19, 2016)
Interested In Project: Property Owner/Manager Local Business Owner Public Official Other

General Comments:
There are two old water tunnels in between Baldwin St and State St. They are the lowest in height so the rain water runoff must pass through to go to Soldotna Creek. When the rains hit, the County needed an extra 2000 sq ft of paved area for the runoff. The County figured the easement and said that they would pay for the cost of the easement. However, the County is not paying for the easement. It is the responsibility of the property owner to pay for the easement. The County is not paying for the easement. The County is not paying for the easement. The County is not paying for the easement.

Provide feedback and explain how it will be used

State your municipality's property concerns. Explain how all has evolved a Council about the issue for the project. The project manager look at the property's data. The project manager look at the property's data.

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the Registrar Dept. through drop off at the specified time to the following email or mail to the following address by April 6, 2016

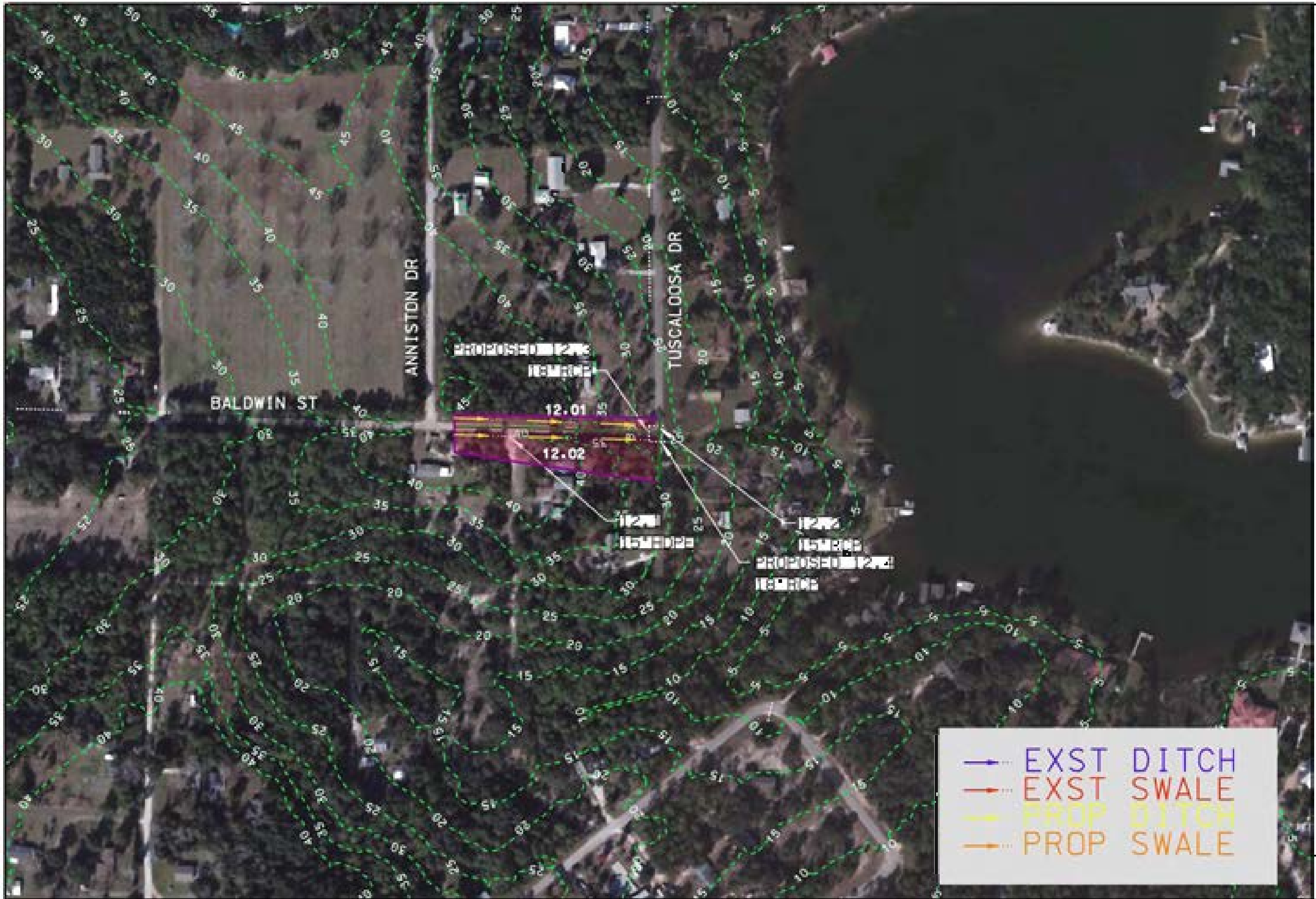
Kathryn Behrendson, P.E., CPESC
Verdugo
P.O. Box 3434
Verdugo, CA 94705
kathryn.behrendson@verdugobeach.com

BASIN 12

Basin 12:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin runs from Anniston Drive east to Tuscaloosa Drive down Baldwin Street. This basin has approximately 1.28 contributing acres of stormwater.

Proposed Improvements: Proposed swales will need to be constructed down both sides of Baldwin Street. Pipe 12.1 falls within this range. It has the capacity to handle the design storm and will need to be cleaned. The water running down the south side of Baldwin Street will be piped under Tuscaloosa Drive by proposed pipe 12.4, an 18" RCP and will run down an existing ditch to Soldier Creek. The water on north side of Baldwin Street will pipe under Baldwin St by proposed pipe 12.3, an 18" RCP. The water will then flow through proposed pipe 12.4 to the existing ditch to Soldier Creek



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

TOWN OF HOUSTON BEACH
 COMPONENTS GRANT-AGE
 MASTER PLAN

TOWN OF HOUSTON BEACH

BAY 10

PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
12.1	15" HDPE	3.33		PASS	PIPE OK
12.2	15" RCP		1.63	PASS	18" RCP
12.3			1.63		18" RCP
12.4			3.95		18" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 12

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
26	206D-000	LF	REMOVING PIPE	\$8.00	\$208.00
738	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$5,166.00
27	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$243.00
4	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$120.00
41	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$492.00
41	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$30.75
2	405A-000	GAL	TACK COAT	\$4.50	\$9.00
3	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$240.00
7	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$560.00
69	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$3,105.00
28	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$420.00
1800	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$8,100.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1004-000	LS	SURVEY SERVICES	\$2,000.00	\$2,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$1,500.00	\$1,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$3,500.00	\$3,500.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$1,500.00	\$1,500.00
1	1009-000	LS	CEI SERVICES	\$3,500.00	\$3,500.00
TOTAL					\$41,193.75

12.1 us



12.1 ds



12.2 us



12.2 ds



12.3 us



BASIN 13

Basin 13:

Characteristics: This basin is made up of existing single family residential houses and the Volunteer Fire Department with mainly grassed and wooded areas. This basin runs from approximately 1100 feet north of Cedar Street where Basin 10 ends to approximately 400 feet south of Cedar Street. There is a high point on Cedar Street approximately 2100 feet east of Escambia Avenue and a high point up Pensacola Avenue approximately 850 feet north of Cedar Street. This basin has approximately 34.76 contributing acres of stormwater.

Proposed Improvements: A proposed ditch needs to be constructed on the west side of Escambia Avenue from the high point to pipe 13.4. At this point, a proposed easement needs to be obtained to outlet the water in a proposed ditch to Palmetto Creek or a more extensive study will need to be done at the current location in the design phase to determine the capacity of the current natural retention pond to see if expanding the retention pond is the better alternative. The existing ditch from the other high point to the new proposed outfall needs regrading. Pipes 13.4, 13.6, and 13.7 fall within this range and do not have the capacity to handle the design flow. They will need to be replaced with a DBL 30" RCP, a 24" RCP, and an 18" RCP respectively. On the east side of Escambia Avenue just south of the Volunteer Fire Department, a proposed ditch needs to be constructed. Pipes 13.1-13.3 fall within this range and do not have the capacity to handle the design flow. These three pipes need to be replaced with a 24" RCP. This proposed ditch will run to pipe 13.5. This pipe will need to be relocated to the proposed outfall that outlets to Palmetto Creek. A proposed ditch needs to be constructed on the other side of pipe 13.5 from the high point on Escambia Avenue. Pipe 13.8 falls within this range. The existing pipe has the capacity to handle the design flow. Pipe 13.8 needs to be cleaned and then inspected to see the condition of the pipe. Upon inspection, the decision can be made to keep or replace the pipe. For the purpose of this drainage study, the assumption was to replace the pipe. Pipe 13.5 does not have the capacity to handle the design flow and will need to be replaced with a DBL 30" RCP.

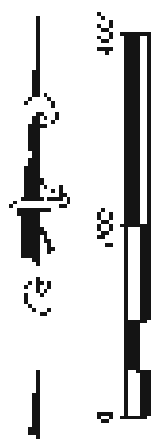
Proposed ditches will need to be constructed on both sides of Pensacola Avenue from the high point to Cedar Street. Proposed pipe 13.9 will need to be constructed under Pensacola Avenue to channel the water from one side of Pensacola Avenue to the other side. A proposed swale will need to be constructed on the north side of Cedar Street from the high point to Pensacola Avenue and then a proposed ditch will need to be constructed from Pensacola Avenue down Cedar Street to pipe 13.5, which crosses under Escambia Avenue. A proposed swale will also need to be constructed about 400 feet down Cedar Street on the south side.



	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF PENSACOLA
 COMPONENTS DRAWING
 WATER PLAN

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
13.1	15" RCP	14.62		FAIL	24" RCP
13.2	18"x11" RCP	17.69		FAIL	24" RCP
13.3	15" HDPE	20.71		FAIL	24" RCP
13.4	24" HDPE		71.66	FAIL	DBL 30 RCP
13.5	24" RCP	55.24		FAIL	DBL 30 RCP
13.6	18" CMP	1.84		FAIL	24" RCP
13.7	15" HDPE	1.45		FAIL	18" RCP
13.8	29"x18" RCP	5.55		PASS	24" RCP
13.9		17.94			24" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 13

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
232	206D-000	LF	REMOVING PIPE	\$8.00	\$1,856.00
4825	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$33,775.00
49	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$441.00
5	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$150.00
47	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$564.00
47	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$35.25
2	405A-000	GAL	TACK COAT	\$4.50	\$9.00
4	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$320.00
8	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$640.00
24	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$1,080.00
268	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$16,080.00
130	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$8,450.00
12135	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$54,607.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
7	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$7,000.00
1	1004-000	LS	SURVEY SERVICES	\$20,000.00	\$20,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$3,000.00	\$3,000.00
1	1006-000	LS	ENGINEERING SERVICES	\$12,500.00	\$12,500.00
1	1007-000	LS	BID SERVICES	\$10,000.00	\$10,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$2,500.00	\$2,500.00
1	1009-000	LS	CEI SERVICES	\$10,000.00	\$10,000.00
TOTAL					\$187,507.75

13.1 us



13.1 ds



13.2 us



13.2 ds



13.3 us



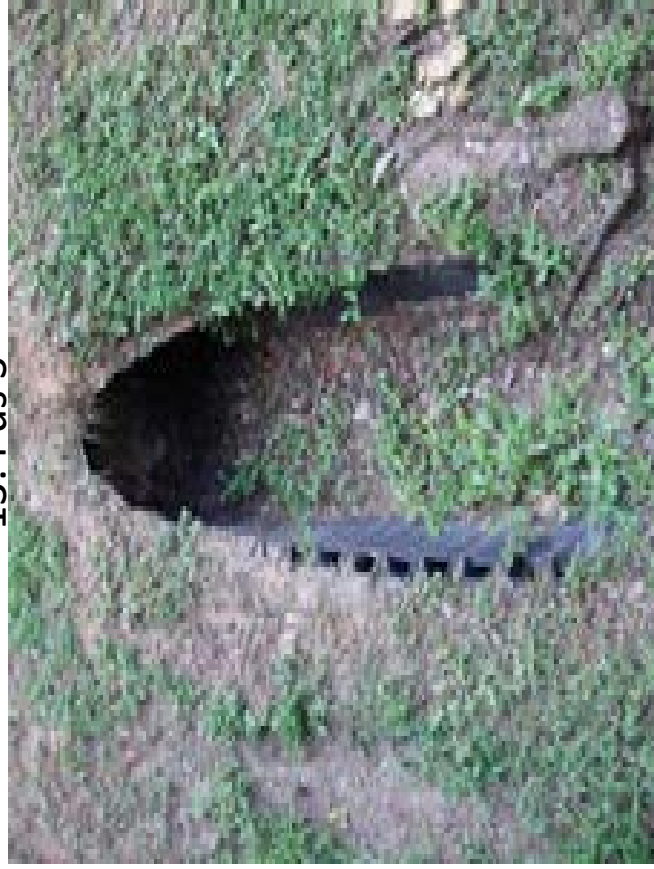
13.3 ds



13.4 us N



13.4 us S



13.5 us



13.5 ds



13.6 us



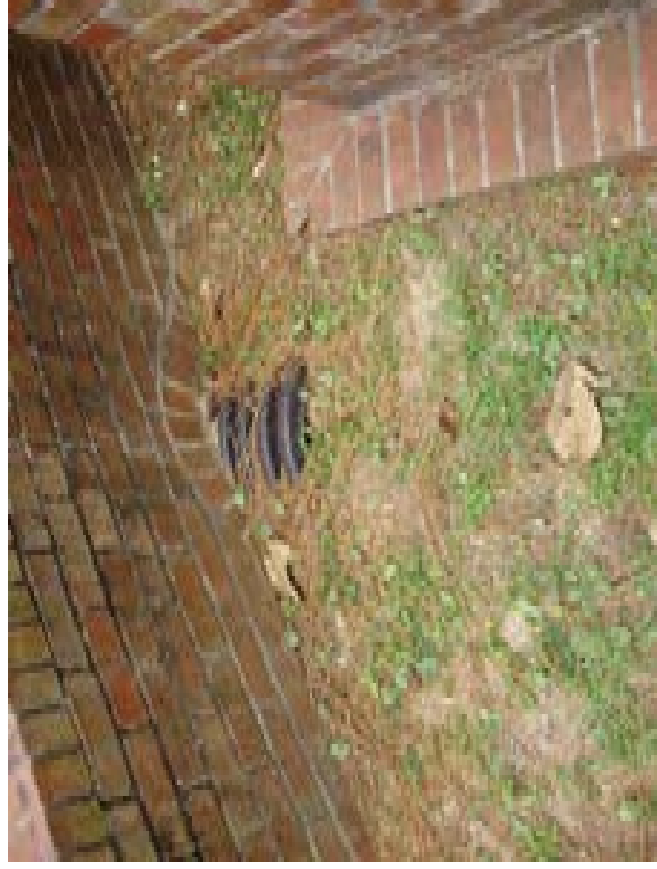
13.6 ds



13.7 us



13.7 ds



13.8 us



13.8 ds



Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Charles + Sharon Odell Mailing Address:
Address (Street, City, State, Zip): 8310 E. Columbia Avenue 30479 Spanish Lake
Perdido Beach, AL Spanish Fork, AL
Telephone Number: 251-458-7635
E-mail Address: Vanbuddy@att.net

Public Meeting Attendance Location: _____ Fire Department (City/Town, March 19, 2010): _____
Interest in Project: (Property Owner) Yes Local Business Owner _____ Public Office _____
_____ Other _____

General Comments:

Provide location and explain known drainage issues.

We are at the corner of Columbia Ave. and Cedar St. Water
flows down Cedar St. from a pipe at road level, down the
driveway, and under the house. Also when it rains
heavily, like the April 2010 flood, there is approximately
three feet of standing water in our front yard.

Comments regarding the development of a stormwater management plan

The City needs to have a comprehensive stormwater
drainage plan. This is:

Suggestions for ways to improve public input

Please return this form to the registration desk (bright disco ball) at the town hall, email to the following email or
mail to the following address by April 5, 2010

Karman Richardson, P.E., CPEST
Volert, Inc
P.O. Box 7434
Mobile, AL 36670
karman.richardson@volert.com

BASIN 14

Basin 14:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is bordered by 10, 12, 13, and 16. It covers just south of Baldwin Street to east of Pensacola Avenue to the northern tip of Cedar Street. This basin has approximately 25.97 contributing acres of stormwater.

Proposed Improvements: Pipe 14.1 has the capacity to handle the design flow. This pipe needs minimal pipe cleaning and the existing swale running on the south side through this pipe needs minimal regrading to achieve positive flow. A proposed swale needs to be constructed on the north side of Cedar Street to the outfall and on the west side of Tuscaloosa Avenue to the outfall.



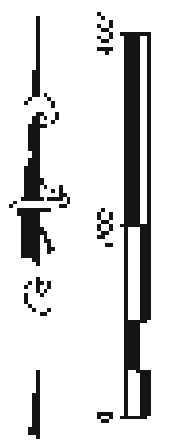
- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE

TOWN OF PENSACOLA BEACH
 COMPONENTS DRAWING
 MASTER PLAN

ISSUE 14

VOLKERT

NOT TO BE USED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
14.1	29"x18" RCP		6.52	PASS	PIPE OK

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 14

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
682	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$4,774.00
100	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$900.00
43	534E-001	LF	CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING)	\$15.00	\$645.00
2062	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$9,279.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1004-000	LS	SURVEY SERVICES	\$5,000.00	\$5,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$3,500.00	\$3,500.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$1,500.00	\$1,500.00
1	1009-000	LS	CEI SERVICES	\$3,050.00	\$3,050.00
TOTAL					\$41,648.00

14.1 US



14.1 ds



Comment Form
Public Involvement Meeting
Project: Town of Ferdin Beach Stormwater Management Plan

Name: Oliver Guilford - Beverly Currie
Address (Street, City, State, Zip): 7931 Tusculum Dr.
Ferdido Beach Fla 32630
Telephone Number: 251-921-3360
E-mail Address: oliverguilford@spbas.com

Public Meeting Attendance Location: Fire Department Thursday June 30 2016
Interested In Project: Property Owner/Tenant
 Local Business Owner Public Official Other

General Comments

Propose changes and explain known drainage issues

List off location, circle on map, between
cedar & forest

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight, drop off at the town hall, email to the following email, or
mail to the following address by July 15 2016

Kameron Richardson, P.E. ORES
Volant, Inc
P.O. Box 2434
Moberg, AL 36870
kameron.richardson@volant.com

BASIN 15

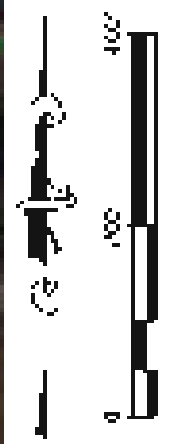
Basin 15:

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas and small patches of grassed areas. This basin is bordered by 13, 14, 16, 17, and 18. It covers south of Cedar Street to north of Magnolia Street. This basin has approximately 61.29 contributing acres of stormwater.

Proposed Improvements: This is such a large area the improvements will be broken down by streets. A proposed ditch needs to be constructed on the west side of Escambia from Cypress Street to Magnolia Street. Pipes 15.1, 15.2, 15.3, 15.5, 15.6, 15.7, and 15.9 fall in this range. All of these pipes can handle the design flow and all of these pipes need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes. A proposed ditch will need to be constructed on the east side of Escambia Avenue approximately 300 feet south of Cypress Street to Magnolia Street. Pipes 15.4, 15.8, and 15.14 fall in this range. Pipe 15.14 is completely filled with sediment and in the proposed drainage scheme, not needed. Pipes 15.4 and 15.8 do not have the capacity to handle the design flow. These pipes will need to be replaced with a 24" RCP and a 30" RCP respectively.

A proposed ditch needs to be constructed on the north side of Cypress Street from Escambia Avenue to Mobile Avenue. From the high point on Cypress Street approximately 1400 feet east of Mobile Avenue, a ditch needs to be constructed on the north side of Cypress Street to Mobile Avenue. Pipes 15.15-15.16 fall in this range. These pipes do not have the capacity to handle the design flow. They need to be replaced with 24" RCP. Proposed pipe 15.17 needs to be constructed from the east side of Mobile Avenue to the west side of Mobile Avenue and then proposed pipe 15.18 needs to be constructed from the outlet of pipe 15.17 across Cypress Street to the south. From the outlet of pipe 15.18, a 2.5 feet deep proposed ditch will need to be construct down the west side of Mobile Avenue to Magnolia Street.

A proposed ditch needs to be constructed from the high point on Magnolia Street to Escambia Avenue. Pipes 15.11-15.13 fall in this range. None of these pipes can handle the design flow and will need to be replaced. Pipe 15.13 needs to be a 24" RCP and pipes 11-12 need to be a 30" RCP. The proposed ditch from pipe 15.12 to Escambia Avenue needs to be 2.5 feet deep. Pipe 15.10, the outfall pipe, runs under Escambia Avenue and cannot handle the design flow. This pipe will need to be replaced with a DBL 36" RCP so the water can be conveyed down the exiting ditch to the receiving wetland area.



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

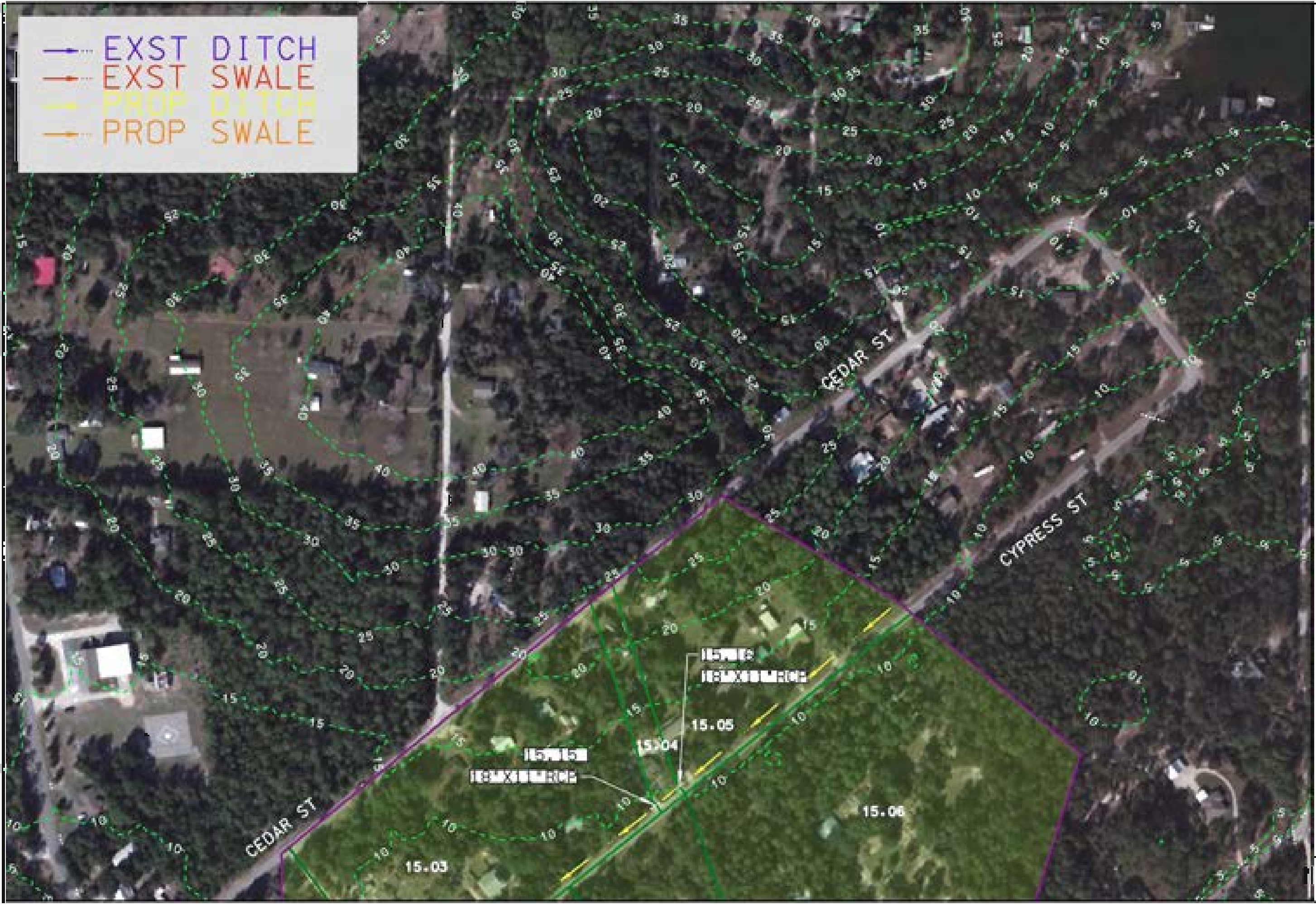
TOWN OF MOBILE BEACH
 COMPONENTS DRAINAGE
 MASTER PLAN

TOWN OF MOBILE BEACH

DATE: 08/20/15

	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

- EXST DITCH
- EXST SWALE
- PROP DITCH
- PROP SWALE



VOLKERT
 NOT ISSUED FOR CONSTRUCTION

TOWN OF HUNTER BEACH
 COMPONENTS GRANTING
 MASTER PLAN

TOWN OF HUNTER BEACH

PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
15.1	18"x11" CMP	3.4		PASS	18" RCP
15.2	15" RCP	5.21		PASS	18" RCP
15.3	15" RCP	5.13		PASS	18" RCP
15.4	15" RCP	16.9		FAIL	24" RCP
15.5	18" RCP	5.37		PASS	18" RCP
15.6	18" RCP	5.49		PASS	18" RCP
15.7	18" HDPE	5.82		PASS	18" RCP
15.8	15" RCP	20.26		FAIL	30" RCP
15.9	22"x13" RCP	6.17		PASS	18" RCP
15.10	18" RCP		88.77	FAIL	DBL 36" RCP
15.11	15" RCP		35.54	FAIL	30" RCP
15.12	18"x11" RCP	22.45		FAIL	30" RCP
15.13	15" RCP		24.6	FAIL	24" RCP
15.14	COMPLETELY FILLED			FAIL	-----
15.15	18"x11" RCP	16.52		FAIL	24" RCP
15.16	18"x11" RCP	14.65		FAIL	24" RCP
15.17			33.97		30" RCP
15.18			39.7		30" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

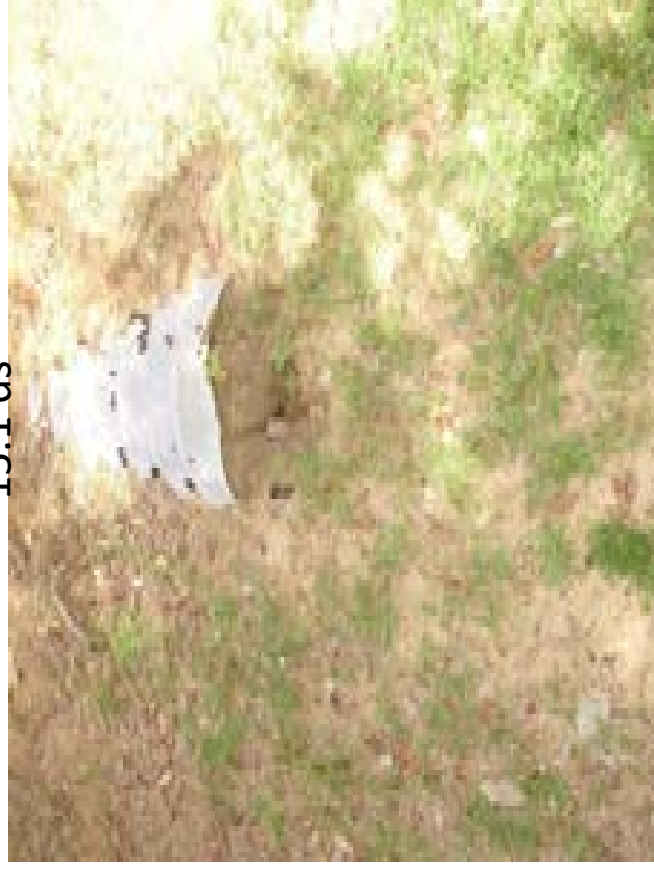
TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 15

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
473	206D-000	LF	REMOVING PIPE	\$8.00	\$3,784.00
4797	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$33,579.00
143	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$1,287.00
13	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$390.00
117	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$1,404.00
117	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$87.75
6	405A-000	GAL	TACK COAT	\$4.50	\$27.00
10	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$800.00
19	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$1,520.00
182	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$8,190.00
111	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$6,660.00
201	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$13,065.00
118	530A-004	LF	36" ROADWAY PIPE (CLASS 3 R.C.)	\$75.00	\$8,850.00
11700	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$52,650.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
14	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$14,000.00
1	1004-000	LS	SURVEY SERVICES	\$20,000.00	\$20,000.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$3,500.00	\$3,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$15,000.00	\$15,000.00
1	1007-000	LS	BID SERVICES	\$12,000.00	\$12,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$3,000.00	\$3,000.00
1	1009-000	LS	CEI SERVICES	\$10,000.00	\$10,000.00
TOTAL					\$214,293.75

15.1 us



15.1 ds



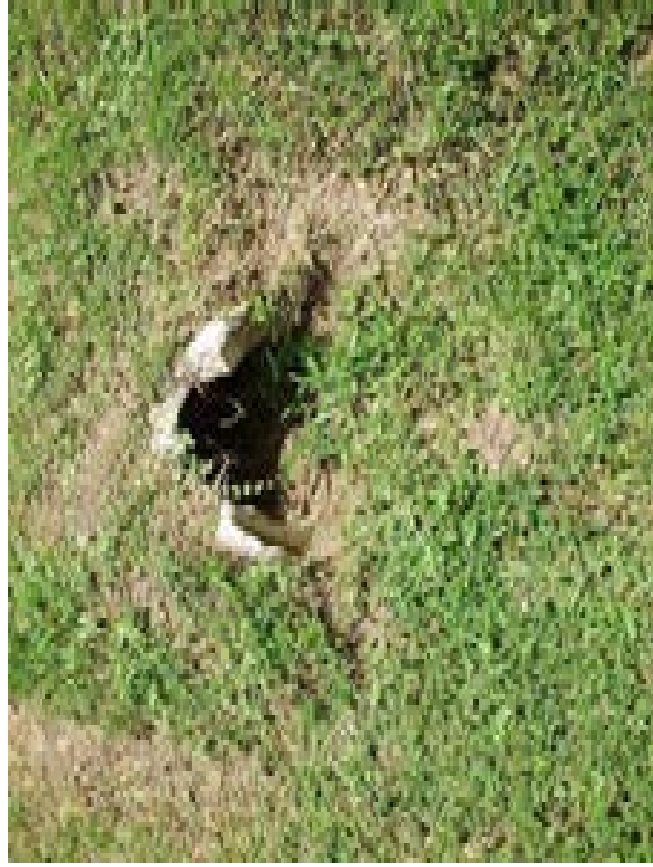
15.2 us



15.2 ds



15.3 us



15.3 ds



15.4 us



15.4 ds



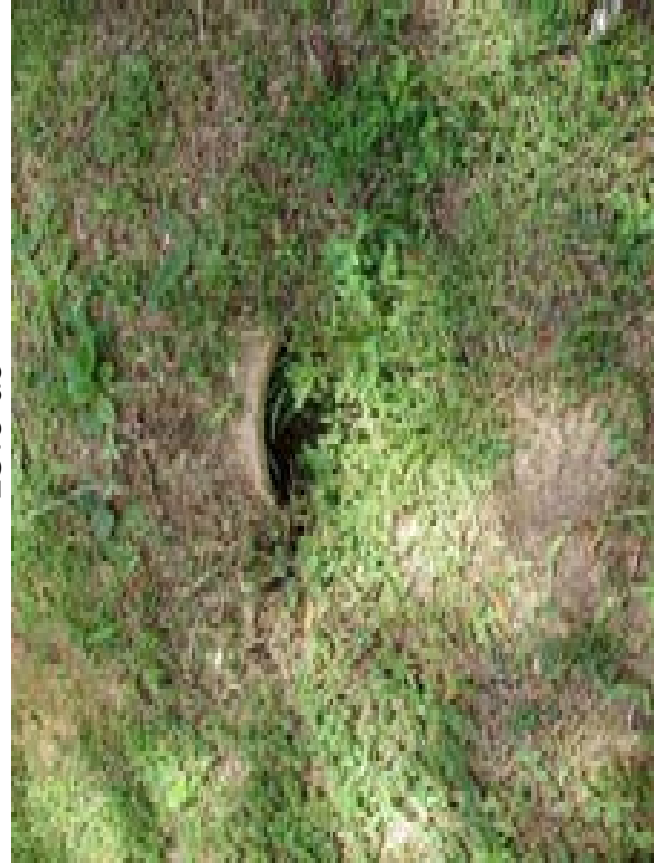
15.5 us



15.5 ds



15.6 us



15.6 ds



15.7 us



15.7 ds



15.8 us



15.8 ds



15.9 us



15.9 ds



15.10 us



15.10 ds



15.11 us



15.11 ds



15.12 us



15.12 ds



15.13 us



15.13 ds



15.14 us



15.14 ds



15.15 us



15.15 ds



15.16 us



15.16 ds



8306 Mobile Ave
Perdido Beach, Al 36530



8306 Mobile Ave
Perdido Beach, Al 36530



8306 Mobile Ave
Perdido Beach, Al 36530

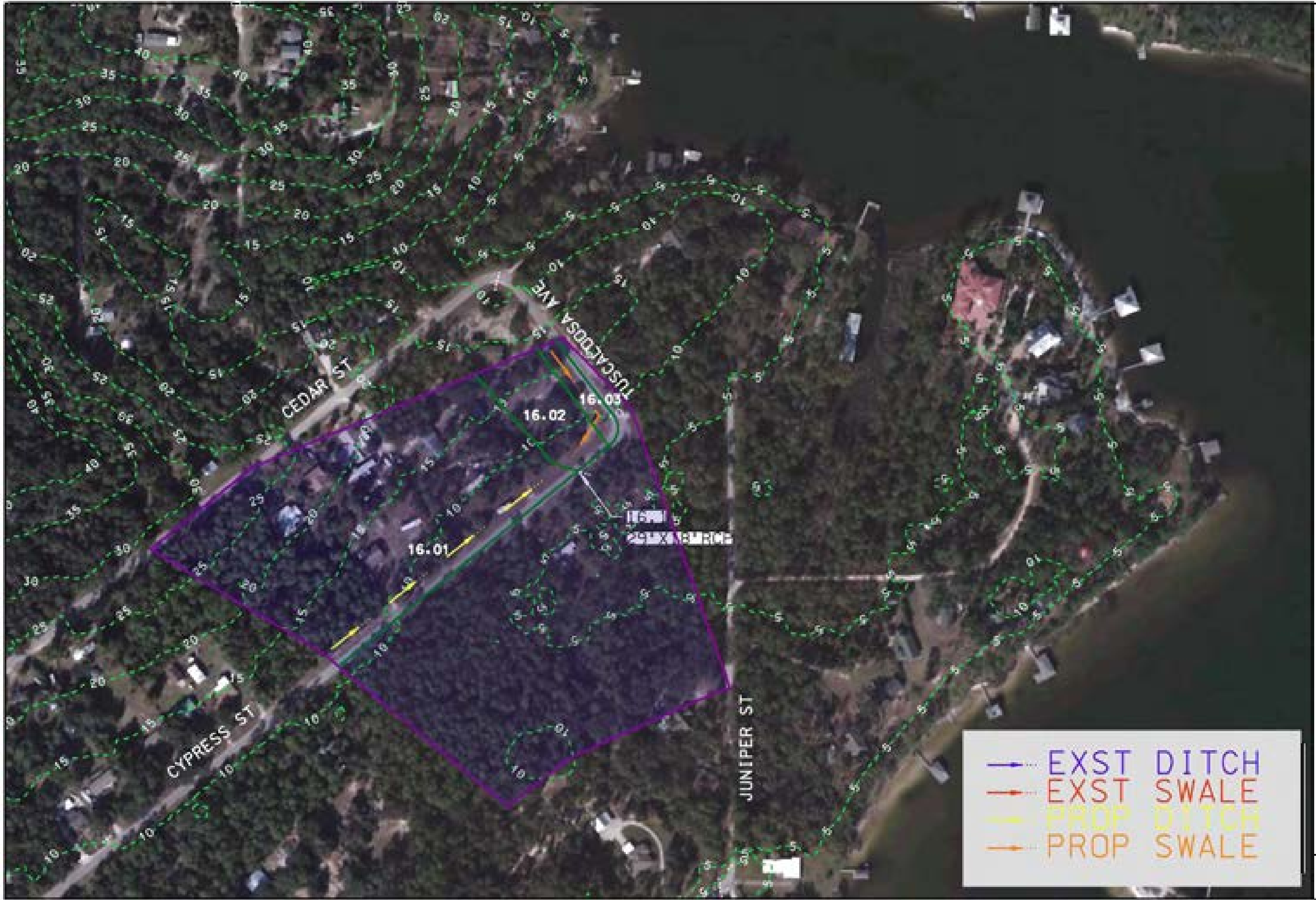


BASIN 16

Basin 16:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is bordered by 13, 14, 15, and 18. It covers just south of Cedar Street to the high point approximately 2000 feet east of Escambia Avenue to a high point approximately 500 feet south of Cypress Street. This basin has approximately 17.89 contributing acres of stormwater.

Proposed Improvements: Pipe 16.1 does not have the capacity to handle the design flow. This pipe needs to be replaced with a 30" RCP. A proposed ditch needs to be constructed on the north side of Cypress Street to the outfall while a proposed swale needs to be constructed on the west side of Tuscaloosa Avenue to the outfall.

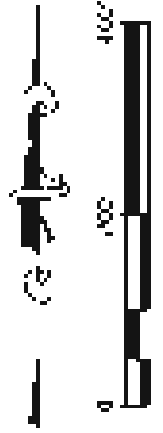


	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF HOUSTON BASIN
 COMPONENTS GRADING
 MASTER PLAN

BASIN 15

VOLKERT
 NOT ISSUED FOR CONSTRUCTION



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
16.1	29"x18" RCP		23.61	FAIL	30" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 16

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
60	206D-000	LF	REMOVING PIPE	\$8.00	\$480.00
719	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$5,033.00
24	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$216.00
3	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$90.00
24	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$288.00
24	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$18.00
1	405A-000	GAL	TACK COAT	\$4.50	\$4.50
2	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$160.00
4	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$320.00
60	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$3,900.00
1839	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$8,275.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1004-000	LS	SURVEY SERVICES	\$4,500.00	\$4,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$3,500.00	\$3,500.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$1,500.00	\$1,500.00
1	1009-000	LS	CEI SERVICES	\$3,500.00	\$3,500.00
TOTAL					\$44,785.00

16.1 us



16.1 ds



BASIN 17

Basin 17:

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is south of Magnolia Street to a high point approximately 1125 feet east of Escambia Avenue. This basin has approximately 5.13 contributing acres of stormwater.

Proposed Improvements: Pipe 17.1 is completely filled. A proposed swell will need to be constructed from approximately 300 feet east of Mobile Avenue. Proposed pipe 17.2 will need to be constructed to convey the water from the east side of Mobile Avenue to the west side of Mobile Avenue. A proposed ditch will need to be constructed from Mobile Avenue to Escambia Avenue. Pipes 17.2-17.5 in this range, will be 24" RCP constructed under the driveways with a proposed pipe 17.6, a 30" RCP, constructed under Escambia Avenue to convey the water into the existing ditch.



	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF PERDIDO BEACH
 COMPONENTS DRAWING
 MASTER PLAN

BASIN 17

VOLKERT
 NOT ISSUED FOR CONSTRUCTION

PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
17.1	COMPLETELY FILLED	18.7			24" RCP
17.2		9.92			18" RCP
17.3		11.18			24" RCP
17.4		13.4			24" RCP
17.5		16.25			24" RCP
17.6			27.07		30" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 17

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
40	206D-000	LF	REMOVING PIPE	\$8.00	\$320.00
861	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$6,027.00
16	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$144.00
2	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$60.00
16	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$192.00
16	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$12.00
1	405A-000	GAL	TACK COAT	\$4.50	\$4.50
1	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$80.00
3	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$240.00
40	530A-001	LF	18" ROADWAY PIPE (CLASS 3 R.C.)	\$45.00	\$1,800.00
160	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$9,600.00
60	530A-003	LF	30" ROADWAY PIPE (CLASS 3 R.C.)	\$65.00	\$3,900.00
2100	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$9,450.00
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
5	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$5,000.00
1	1004-000	LS	SURVEY SERVICES	\$4,500.00	\$4,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$5,800.00	\$5,800.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$1,500.00	\$1,500.00
1	1009-000	LS	CEI SERVICES	\$5,800.00	\$5,800.00
TOTAL					\$67,429.50

17.1 us



17.1 ds



Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Justin S. Galloway
Address (Street, City, State, Zip): 7000 Perdido Beach Blvd
Telephone Number: 850 361 1111
Email Address: Justin.S.Galloway@perdido-beach.com

Public Meeting Attendance Location: Perdido Beach Senior Center, March 19, 2016
Interested in Project: Property Owner/Owner Local Business/Other: Local Business Owner Public Office:

General Comments:

I would like to see the town register

Provide location and any air known drainage issues:

The drainage in the Perdido Beach area is very poor. There are many areas where the water does not drain properly. This is a major issue for the town and the residents. The town should consider installing more drainage pipes and catch basins to improve the drainage system.

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk (right) side of all the town hall meetings the following email or mail to the following address by April 5, 2016:

Kenneth Richardson, P.E., CPESC
Votken, Inc.
P.O. Box 1434
Mobile, AL 36610
kenneth.richardson@votken.com

BASIN 18

Basin 18:

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas and small patches of grassed areas. This basin is located from the high point on Magnolia Street to a high point approximately 450 feet north of Magnolia Street to Juniper Street with a small area south of Magnolia Street. This basin has approximately 11.02 contributing acres of stormwater.

Proposed Improvements: An existing swale on the north side of Magnolia Street will need minimal regrading to the outlet at pipe 18.3. Pipe 18.1 falls in this range and has the capacity to handle the design storm. An existing swale on the south side of Magnolia Street will need minimal regrading to pipe 18.2 where the water crosses under Magnolia Street to the north side swale. Pipe 18.2 has the capacity to handle the design flow. Pipes 18.1-18.2 need to be cleaned and then inspected to see the condition of the pipe. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes. The outfall pipe, pipe 18.3, does not have the capacity to handle the design flow. It will need to be replaced with a DBL 24" RCP to convey the water into the outfall channel and not overtopping the road. The outfall channel could potentially need some minimal regrading,

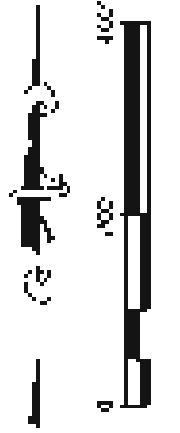


	EXST DITCH
	EXST SWALE
	PROP DITCH
	PROP SWALE

TOWN OF NORFOLK BEACH
 COMPONENTS DRAWING
 MASTER PLAN

DATE: 10/18

VOLKERT
 CONSULTING ENGINEERS



PIPE #	EX. PIPE SIZE	DISCHARGE (10 YR) (cfs)	DISCHARGE (50 YR) (cfs)	PASS/FAIL	DESIGN PIPE SIZE
18.1	18" RCP	5.98		PASS	18" RCP
18.2	22"x13" RCP		4.24	PASS	18" RCP
18.3	22"x13" RCP		15.69	FAIL	DBL 24" RCP

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
 COMPREHENSIVE DRAINAGE MASTER PLAN
 Volkert Project No. 636502.AV
 BASIN 18

QUANTITY	ITEM NO.	UNIT	ITEM	UNIT COST	TOTAL COST
95	206D-000	LF	REMOVING PIPE	\$8.00	\$760.00
253	210A-000	CY	UNCLASSIFIED EXCAVATION	\$7.00	\$1,771.00
31	210D-001	CY	BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT)	\$9.00	\$279.00
4	214B-001	CY	FOUNDATION BACKFILL, COMMERCIAL	\$30.00	\$120.00
37	301A-012	SY	CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS	\$12.00	\$444.00
37	401A-000	SY	BITUMINOUS TREATMENT A	\$0.75	\$27.75
2	405A-000	GAL	TACK COAT	\$4.50	\$9.00
3	429-A	TON	IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$240.00
6	429-B	TON	IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D	\$80.00	\$480.00
120	530A-002	LF	24" ROADWAY PIPE (CLASS 3 R.C.)	\$60.00	\$7,200.00
1995	654A-000	SY	SOLID SODDING (MATCH EXISTING)	\$4.50	\$8,977.50
1	1001-000	LS	TRAFFIC CONTROL	\$2,500.00	\$2,500.00
1	1002-000	LS	EROSION CONTROL	\$2,000.00	\$2,000.00
1	1003-000	EA	DRIVEWAY REPAIR	\$1,000.00	\$1,000.00
1	1004-000	LS	SURVEY SERVICES	\$3,500.00	\$3,500.00
1	1005-000	LS	ENVIRONMENTAL SERVICES	\$2,500.00	\$2,500.00
1	1006-000	LS	ENGINEERING SERVICES	\$4,000.00	\$4,000.00
1	1007-000	LS	BID SERVICES	\$6,000.00	\$6,000.00
1	1008-000	LS	GEOTECHNICAL SERVICES	\$1,500.00	\$1,500.00
1	1009-000	LS	CEI SERVICES	\$3,900.00	\$3,900.00
TOTAL					\$47,208.25

18.1 us



18.1 ds



18.2 us



18.2 ds



18.3 us



18.3 ds



Level 1 Wetland Assessment

Subsection Level One Wetland Assessment

**890 ± Acre Town of Perdido Beach
Perdido Beach, Alabama
Volkert Contract No. 636500.AE**

Prepared for

**Town of Perdido Beach
Mayor Patsy Parker
9212 County Road 87
Perdido Beach, AL 36530**

May 17, 2016

Prepared by

**VOLKERT, INC.
316 South McKenzie Street
Foley, Alabama 36525
(251) 968-7551**

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3.0 Windshield Survey.....	5
4.0 Conclusion.....	5

APPENDIX

APPENDIX A Figures

1.0 PURPOSE

The purpose of this subsection level one wetland assessment was to formulate the probability as to whether or not jurisdictional wetlands and waters of the United States (U.S.) occur, and to what extent they occur, on approximately 890 acres known as the Town of Perdido Beach, Alabama. The survey area is located in Township 8 South, Range 6 East, Sections 7 and 18 of the Orange Beach and Perdido Bay, Alabama USGS topographic quadrangle maps. As this determination is a subsection level one, no detailed delineation field work was performed; however, a windshield survey of the general project area was conducted. When a subsection level one determines the presence of wetlands or waters of the U.S., then field reconnaissance is necessary to delineate the actual wetland limits so they can be mapped and officially verified by the U.S. Army Corps of Engineers (COE).

2.0 METHODS

Several sources of information were gathered, such as the USGS 7.5 minute quadrangle maps of Orange Beach and Perdido Bay, Alabama, the National Wetland Inventory map, the Baldwin County wetlands assessment GIS data, the NRCS soil data information for Baldwin County, the NRCS 2015 aerial photo and the Baldwin County lidar contour data for the project site.

For each source researched for this level of determination a demarcation line was established. These sources have varying levels of accuracy and as such produced differing results. The level of probability for a wetland or a water of the U.S. to exist was highest where multiple sources overlap and less probable where only one source was represented.

Source 1: USGS 7.5 minute quadrangle map of Orange Beach and Perdido Bay, Alabama.

Appendix A, Data Source 1, showed that it is unlikely that there would be a perennial or intermittent stream or tributaries within the survey area. There are a few associated wetlands or mud flats mapped along the water's edge to the eastern and southern shores of the survey area. In the north west portion of the survey area there is a small lake identified and to the east of the lake it shows the man made canal that empties into Soldier Creek to the east. The quadrangle map also shows that there is a high ground ridge that runs generally down the middle of the survey site and storm water runoff generally flows west to Palmetto Creek, east to Soldier Creek, and south to Perdido Bay.

Source 2: National Wetland Inventory Map (NWI).

This wetland data was downloaded from the U.S. Fish and Wildlife's website, <http://www.fws.gov/wetlands/>. According to the NWI Map, Appendix A, Data Source 2, there are two broad wetland types identified within the property boundary. The most dominant wetland type found to be within the survey area is Estuarine and Marine Wetlands and the other is Freshwater Emergent Wetland. Estuarine and Marine Wetlands are usually tidally influenced and are typically found along the shore line of various types of brackish or saltwater waterbodies such as bays, sloughs and estuarine rivers. Freshwater Emergent Wetlands typically occur along the banks and shores of freshwater ponds, lakes, rivers and streams. Both of these wetland types are emergent in nature and do not have a developed canopy or midstory component.

Source 3: Baldwin County Wetlands Assessment GIS Data.

This wetland data layer was created by the Baldwin County Planning and Zoning Department using available aerial photography and available spatial data. According to the Baldwin County Wetlands Assessment data layer, Appendix A,

Data Source 3, the wetlands on the subject property are hydrogeomorphically characterized as one of three different types: riverine, fringe, or depressional. The Baldwin County Planning and Zoning's Baldwin County Wetland Conservation Plan web page, http://www.outdooralabama.com/sites/default/files/images/file/Weeks_Bay/Baldwin_wetlands.pdf classifies each wetland type as follows:

Riverine wetlands are found to occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are overbank flow from the channel or subsurface hydrologic connections between the stream channel and adjacent wetlands.

Fringe wetlands are located adjacent to a large body of water, most typically the Gulf of Mexico or a large bay system, and they receive frequent and regular two-way flow from astronomic tides or from wind-driven water level fluctuation. The dominant fringe wetlands in Baldwin County are salt marshes.

Depressional wetlands are wetlands located in a depression in the landscape, and they have a very small catchment area for surface runoff. Depressional wetlands in Baldwin County can include interdunal swales along Fort Morgan and Grady ponds located throughout the agricultural areas in the southern half of the county.

Source 4: NRCS soil data for Baldwin County

The soil survey information used in this analysis was downloaded from the NRCS Soil Data Mart and the soil interpretations were gathered from the ***Soil Survey of Baldwin County, Alabama (1964)***. There are six soil classes found within the subject property boundary limits that are identified as hydric, Appendix A, Data Source 4. They are Bibb and Mantachie soils, local alluvium (Bb), Coastal Beaches (Co), Grady soils (Gr), Plummer loamy sand, 0 to 5 percent slopes (PmB), Tidal marsh (Td) and Wet loamy alluvial land (Wm).

Source 5: NRCS 2015 aerial photo

Another good indicator of where wetlands may occur is a distinct change in vegetation density. Abrupt changes in color or canopy density can indicate the difference between upland and wetland plant communities. Also, depending on the canopy density, streams, lakes, and tidally influenced mud flats can also be easily identified on the aerial. The 2015 aerial photo clearly shows the large canal system in the northern half of the survey area with a connection to Soldier Creek. There are also several tidally influenced emergent fringe wetlands that show up on the aerial photography. Most of these wetlands are in the southwestern portion of the property along Palmetto Creek and along the northeast portion of the survey site along Soldier Creek, Appendix A, Data Source 5.

Source 6: Baldwin County Lidar Data

Lidar contour data is collected through the use of aircraft-mounted lasers that record elevation measurements. From this data, areas with gradual to no relief located at the bottoms of steep topography features can usually be identified as potential wetland areas and streams. Appendix A, Data Source 6, showed the Baldwin County lidar information for the subject property overlain on the USGS 7.5 minute quadrangle maps.

Cumulative Map Results: Appendix A, Cumulative Site Map, is a comprehensive map showing the correlation between the USGS 7.5 minute quadrangle maps of Orange Beach and Perdido Bay, Alabama, the National Wetland Inventory map, the Baldwin County wetlands assessment GIS data, the NRCS soil data information for Baldwin County, the NRCS 2015 aerial photo and the Baldwin County lidar contour data. The highest level of probability for wetlands and waters of the U.S. to exist is where these sources would overlap;

however, wetlands and waters may still exist in areas where only one source is represented. This map was used as a guide for the windshield survey verification.

3.0 WINDSHIELD SURVEY

A windshield survey of the property boundary was conducted on May 13, 2016. During the survey, some areas where data sources overlapped as depicted in the Cumulative Map were identified as jurisdictional wetlands or waters of the U.S. The extent of wetland boundaries or waters of the U.S. was not determined at this level of investigation.

4.0 CONCLUSION


As a result of this assessment, it has been determined that jurisdictional wetlands are present within the survey area. A jurisdictional determination should be performed and verified by the U.S. Army Corps of Engineers prior to conducting any land disturbing activities on the subject property.

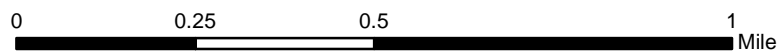
APPENDIX A
FIGURES

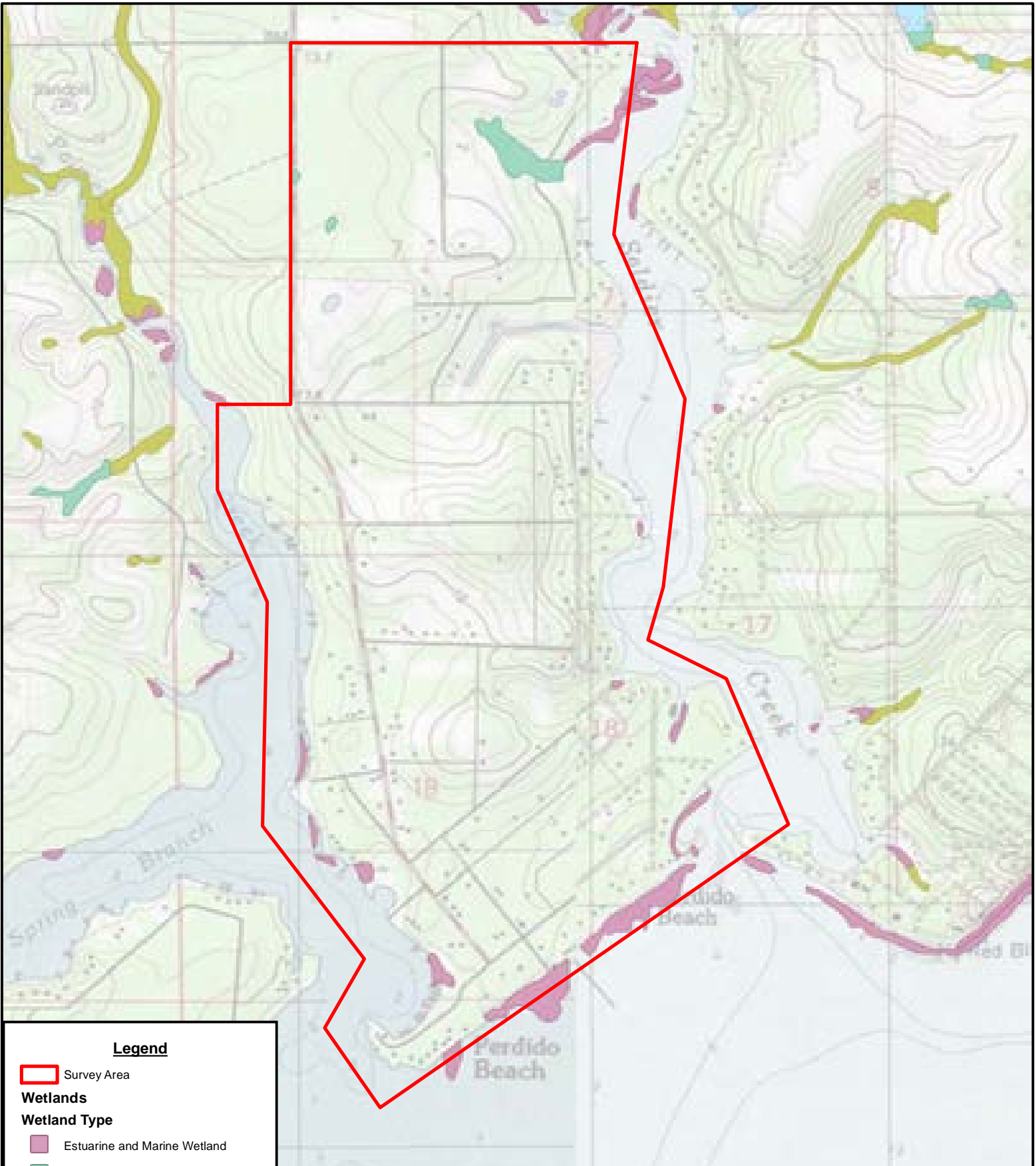


Data Source 1:
Orange Beach and Perdido Bay
USGS Topographic Quadrangle Maps


Legend

 Survey Area












Legend

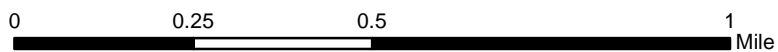
 Survey Area

Wetlands

Wetland Type

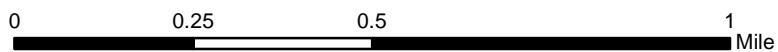
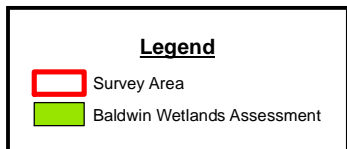
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond
-  Lake
-  Other
-  Riverine

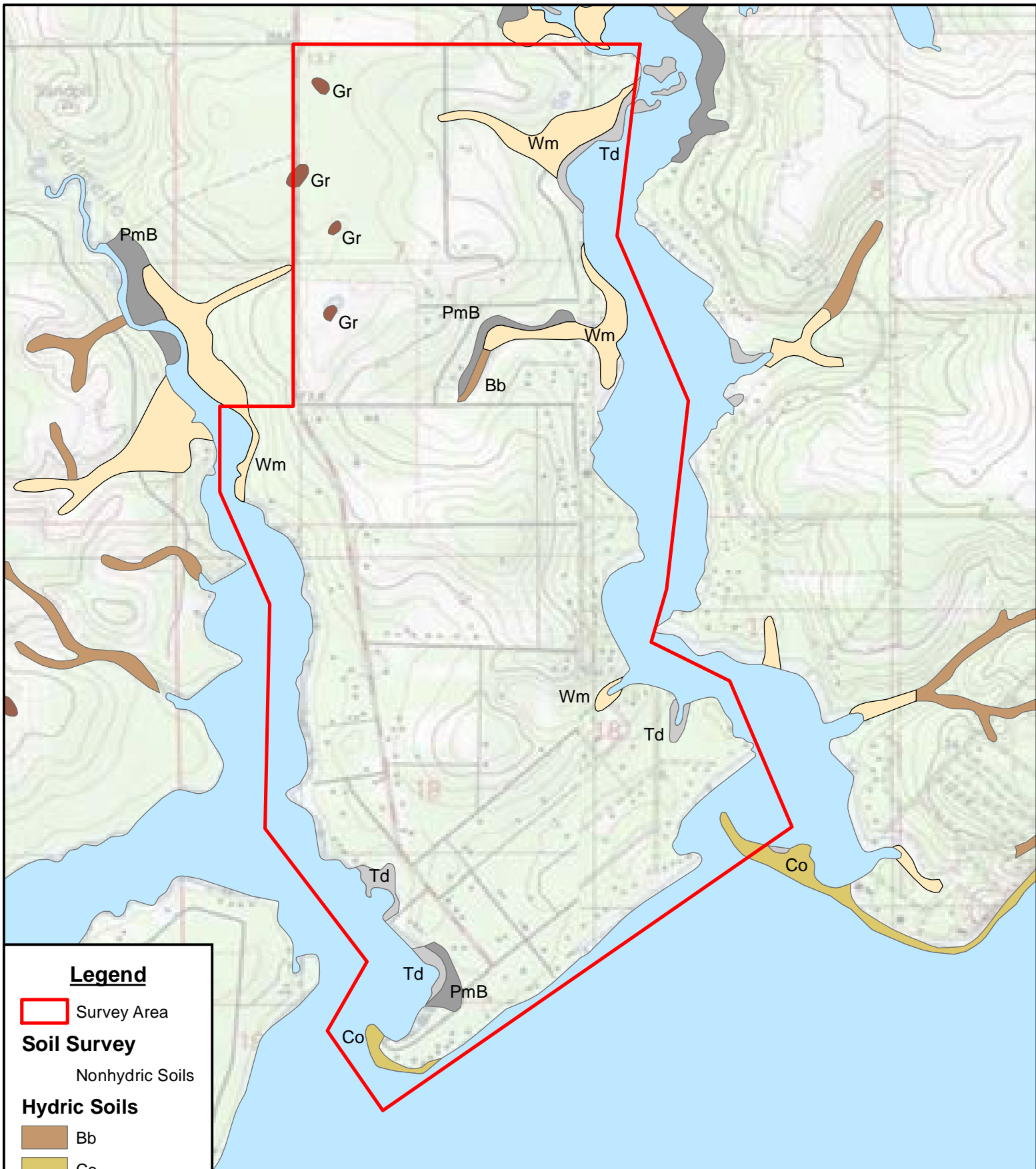
**Data Source 2:
National Wetland Inventory Map**






Data Source 3: Baldwin County Wetland Assessment






Legend

 Survey Area

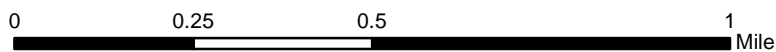
Soil Survey

Nonhydic Soils

Hydic Soils

-  Bb
-  Co
-  Gr
-  PmB
-  Td
-  Wm
-  Water


**Data Source 4:
Baldwin County Soil Survey**





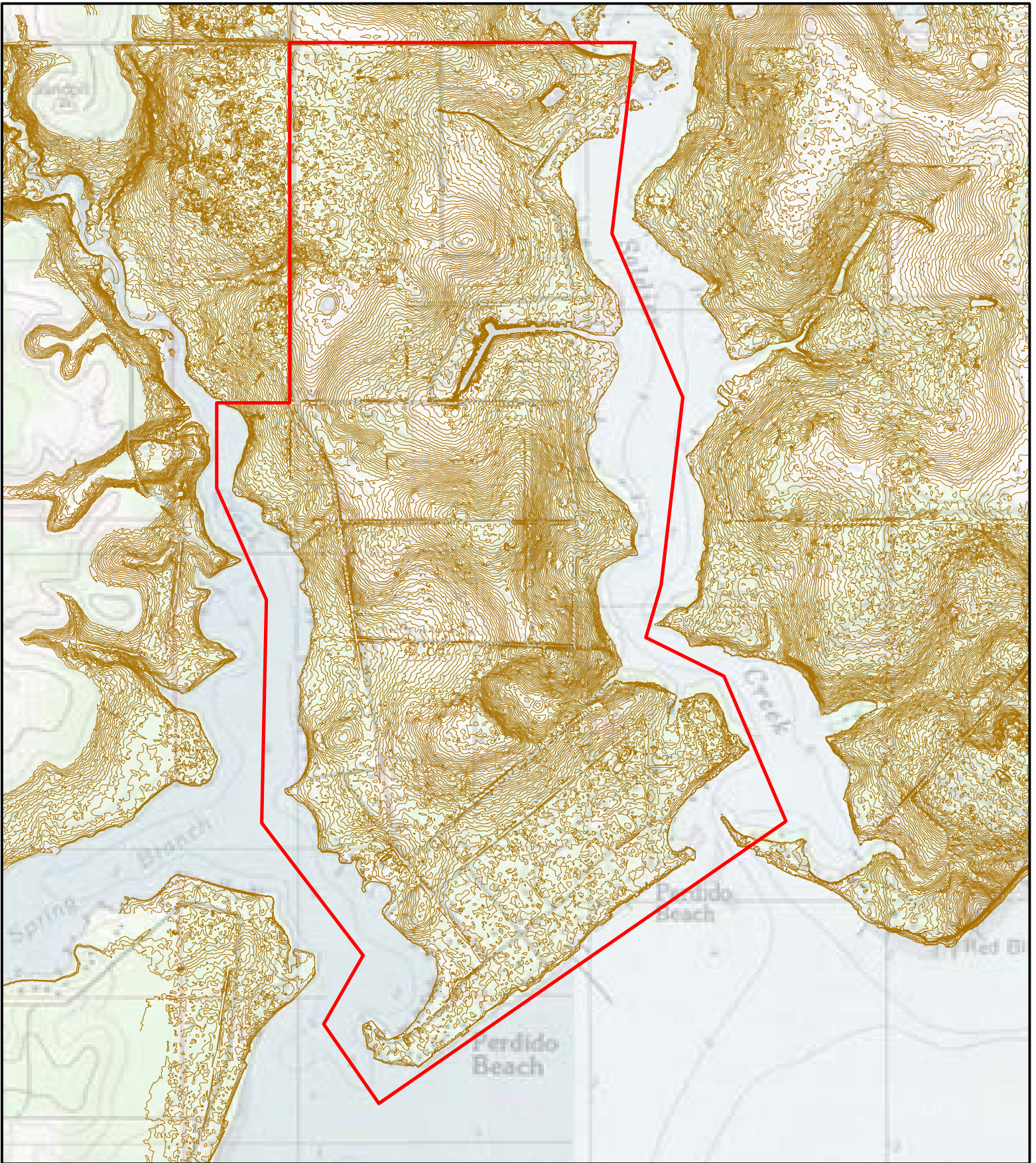
Data Source 5:
2015 NRCS Aerial

Legend



 Survey Area

0 0.25 0.5 1 Mile

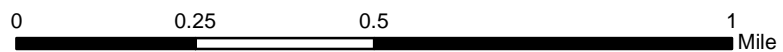




Legend

-  Survey Area
-  LIDAR Contours


**Data Source 6:
Baldwin County Lidar Contour Data**

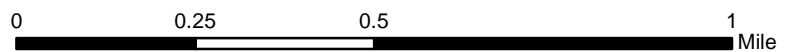


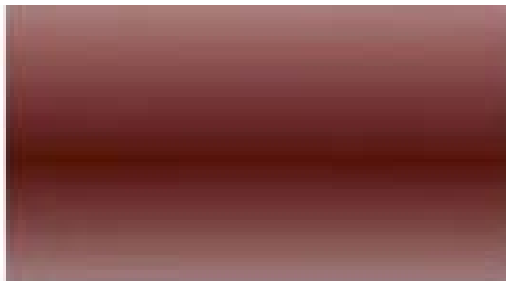


Cumulative Site Map

Legend

 Survey Area





www.ks.com



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