

PRINCIPALS

Lawrence L. Smith, Jr.
Wayne D. Chalifoux
Donaldson K. Barton, Jr.
Glenn J. Lusink
Jon S. Meadows
Mark D. Prochak
Mark E. Puckett

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18-0365.M19

Ms. Tammy Thomas-Wood
Public Works Support Services Manager
Finance & Contracts Administrations Section
Brevard Co. Public Works Department
2725 Judge Fran Jameson Way
Room A-204
Viera, Florida 32940-6605

**Subject: GIS, Surveying Services, Drainage Modeling and Master Planning for the District 4
Indialantic Region.**

Dear Ms. Thomas-Wood

DRMP, Inc. (DRMP) is pleased to provide Brevard County Public Works the following proposal for professional GIS, Surveying, Drainage Modeling and Master Planning services and support.

PROJECT UNDERSTANDING

The County requests comprehensive geospatial services to obtain pipe invert elevations at survey-grade accuracy for portions of the County-maintained stormwater systems. The task will focus on collecting new field survey data and integrating data into the County's existing GIS stormwater schema. Updated pipe invert and rim elevations determined by survey crews will be integrated into the existing GIS data maintained by the County. This task will focus on the drainage basins within the County's Stormwater District 4 Indialantic Region. This does not include structures owned/maintained by private entities or the FDOT. We estimate the total amount of stormwater structures to be approximately 100 total locations over approximately 140 acres. Stormwater structure inventory conducted by DRMP as part of the ***Stormwater Master Plan Indialantic Project*** (completed in 1991) will be utilized as a resource document to generally locate existing stormwater systems. Note that retrofits and additions to those existing systems are anticipated to have occurred in the 29 years since that study was conducted. Also note that no elevation data was collected in the 1991 data collection process.

We will provide survey-grade accuracy stormwater system information for modeling, planning, maintenance and permitting. DRMP proposes several tasks to ensure comprehensive field data collection effort and update specific stormwater GIS model feature classes and attribute fields. We will require additional verifications of known control points to ensure this collection effort is of the utmost accuracy.

The existing stormwater drainage information collected will be evaluated and modeled. Field reconnaissance will be conducted to confirm the existing modeling results. The stormwater will be validated, and the stormwater system will be analyzed for deficiencies. This model will be run for various stormwater events and durations. The stormwater systems will be analyzed, and improvement recommendations will be made during the stormwater master planning effort.

SCOPE

Task 1: Stormwater Survey Data Collection Effort

Horizontal/Vertical Reference Control

DRMP will create a temporary control network to establish accurate vertical and horizontal control for capturing the top elevations of approximate 100 storm sewer structures. Top Elevations will be determined by closed loop Level Runs between know Bench Marks throughout the project in

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NAVD88. Locations of control points will be provided as a GIS shapefile for future reference and any required calculations.

We have estimated from our review of the area that the survey team's field effort will locate up to 100 structures in the field and the GIS integration effort will include updating attribute fields in the related GIS feature classes for manholes/catch basins, storm sewer conveyances and outfalls. If the number of total structures exceeds 100, we may need to request additional funds to complete the project.

Stormwater System Invert and Dimensions Data Collection

DRMP will obtain the Top Elevation of each structure identified within the subject Area. Horizontal Control will be referenced to the State Plan Coordinate System, Florida East (901), North American Datum of 1983, 2011 Adjustment (NAD83/2011) established by RTK GPS observations. Elevations will be taken on the North Rim or an identifiable location to be consistent throughout the project limits. Elevations will be referenced to North American Vertical Datum of 1988 (NAVD88) based on existing Brevard County Vertical Control near the site. Each identified stormwater structure, pipe diameter and pipe (invert) elevations will be obtained. To obtain the invert elevations we will measure down from the north rim of the manhole or an identifiable location on the structure (where the Top Elevation was obtained) for consistency. The structure's measurements will be subtracted from the Top Elevation to determine each structures invert elevation. DRMP will obtain length, width and height for each structure as requested by the County. We estimate additional effort on this section based on rectifying previous stormwater data and newly identified structures. We will document any structures we are unable to obtain detailed information on with photographs and a description of the reason.

Canal Cross Sections and Culvert Survey

DRMP will perform four (4) cross sections at the canal located south of Sandpines Section Three Subdivision. The first cross section will be performed west of the existing culvert located on N Riverside Dr, the second cross section will be performed at the east side of the culvert, third cross section will be performed 1000 ft east of the center of the culvert and the last cross section will be performed 2000 feet east of the center of the culvert. DRMP will collect elevations for top of muck and bottom of canal. DRMP will provide survey data of said culvert as requested by the design engineer.

Task 1 Fee:

\$47,259.00

Task 2: Stormwater GIS Data Integration Effort

We estimate about 100 stormwater structures in the identified areas of the project. Our GIS team will integrate the collected pipe elevations as attributes for the structure locations as points and pipe segments as lines per the existing County's enterprise geodatabase schema requirements. Any additions to the database schema will be reviewed and approved by the County's Project Manager. Typically, our team will integrate the following attributes from survey collections:

- Pipe rim elevations
- Pipe invert elevations
- Horizontal stormwater structure locations
- Pipe Diameter
- Pipe length
- Manhole/Catch Basin Condition based on a standardized methodology.

Further investigations into pipe conditions and locations requiring additional remobilization efforts for utilizing Ground Penetrating Radar, Sub-Surface Utility Engineering (SUE) locates, or Closed-Circuit Television (CCTV) analysis of pipe runs are considered additional services beyond this scope (and can be provided if the County desires).

Task 2 Fee:

\$9,850



Task 3: Stormwater Model

Collect and Evaluate Existing Stormwater Data for Modeling

DRMP stormwater staff will collect, review and evaluate the relevant stormwater data that has been collected specifically for this study and may be available from other sources, including the following:

- County Stormwater Infrastructure Geodatabase – collected for this study
- LiDAR
- District or County Land Use GIS layer
- NRCS Soils GIS layer
- Basin delineations by others
- Flooding complaints
- SJRWMD ERP files
- FDOT and County infrastructure projects – as-built and proposed
- Indian River Lagoon sea level rise projections

Field Reconnaissance

DRMP stormwater staff will conduct limited field reconnaissance to confirm drainage patterns and the general conditions of existing drainage features as inventoried for this study.

Develop Stormwater Model

DRMP stormwater staff will develop an ICPR version 4 surface water model based on the stormwater infrastructure geodatabase, LiDAR and other available data. The model will include a detailed hydraulic network of the culverts, storm sewers, swales and ditches represented as nodes and links at adequate refinement to capture significant storage areas, and changes in pipe and channel sizes and shapes. Basin delineations, storage and weir/channel cross sections will be derived from a terrain model that will be built for this study based on available LiDAR. Basin delineations included in the 1991 Stormwater Master Plan will be used as reference in developing basins to be derived from LiDAR terrain. Hydrology will be developed following the TR-55 CN methodology and based on available land cover and soils GIS data that may be refined for this study. As the drainage systems under study are directly discharging into the Indian River Lagoon, special consideration will be given to tailwater conditions in the model. The team will develop a set tidal conditions to analyze sensitivity of the drainage systems to tidal cycles including low, ordinary high, storm surge and future sea level rise conditions.

Validate Stormwater Model

DRMP stormwater Staff will validate the model by simulating an actual, flood-inducing storm event through the model that has occurred within the past 15 years. Doppler rainfall data will be collected on the chosen flood event and a model simulation will be developed to compare the modeled peak stages with the witnessed flooding.

Analyze Stormwater System Deficiencies

Staff will utilize the surface water model to analyze deficiencies in the existing stormwater infrastructure. The following design storms will be simulated through the model:

- Mean annual
- 5-year, 24-hour
- 10-year, 24-hour
- 25-year, 24-hour
- 100-year, 24-hour

Staff will evaluate the performance of each stormwater feature and provide a level of service to each of the collection systems. Floodplains of the modeled peak stages will be developed for the doppler and 100-year storms in GIS to assist in identifying system deficiencies.



Task 3 Fee:

\$91,160

Task 4: Stormwater Master Plan

The systems analyses conducted in the previous task will be compared to present conditions of the structures and pipes to make improvement recommendations that may include a combination of pipe upsizing, pipe/structure replacement and/or pipe lining. Recommended improvements will be categorized, evaluated and ranked in order to develop a prioritized schedule of improvements. The improvements will be organized into projects with conceptual plan graphics, project costs and an implementation schedule with consideration of permitting, utility adjustments and roadway reconstruction. Note that up to ten (10) capital improvement projects were proposed in the 1991 Stormwater Management Plan for the current study area. The concepts of these projects will be considered for relevance to present conditions. Opportunities to incorporate water quality improvements will be considered with along with the recommended drainage performance improvements. The stormwater master plan will be documented in a final report.

Task 4 Fee:

\$88,682

COMPENSATION SUMMARY AND TERMS

The following table summarizes the fees and billing terms as proposed by DRMP for the Scope of Services as presented herein.

Task	Description	Terms	Amount
1	Stormwater Survey Data Collection	Lump-Sum	\$ 47,259.00
2	Stormwater GIS Data Integration	Lump-Sum	\$ 9,850
3	Stormwater Model	Lump-Sum	\$ 91,160
4	Stormwater Master Plan	Lump-Sum	\$ 88,682
	Total Estimated Amount	Lump-Sum	\$236,951.00

SCHEDULE

DRMP will commence work on this project upon receipt of notice to proceed from the County. The estimated completion time for field collection (reference control and invert data) is as follows:

The data survey field collection will take approximately one (1) month to complete.

GIS integration will occur concurrently with field collection. The final GIS files will be deliverable (1) month after the final field data is completed.

Stormwater modeling will occur after the GIS integration and will be submitted within four (4) months. The County will have one (1) month to review the draft model. The final model will be delivered two (2) months after the County's draft review. The County will have two weeks to review the final model for approval.

The stormwater master planning will begin after the County's approval of the stormwater model. The stormwater master planning will be an iterative process involving the County's input of future project priorities and funding. This effort is estimated to take approximately three (3) months to complete including one (1) month of County review time.



We appreciate the opportunity to provide this proposal to you. Should you have any questions regarding the contents of this proposal, or if we can be of further assistance in any way, please do not hesitate to contact us at your convenience.

This Scope of Services is hereby submitted by:

Sincerely,
DRMP, Inc.

A handwritten signature in blue ink, reading "Wayne D. Chalifoux", is written over a horizontal line.

Wayne D. Chalifoux, PE
Vice President

CC: Jeanette Scott
Susan Jackson
John Gilreath
Frank Lopez
John Burkett
Kyle Brown
Rasha Obaydi