BAY BEACH COMMUNITIES DRAINAGE ASSESSMENT

SCOPE OF SERVICES

The Consultant's responsibilities will be to conduct a comprehensive drainage study of each of the Bay Beach Communities to identify both major flooding events and more common "nuisance" flooding events. This will include an evaluation of drainage complaints to public agencies, any emergency flood response reports, review of drainage or flooding problems of concern identified by area residents and landowners at public workshops held by the Department of Natural Resources and Environmental Control (DNREC), mapping of the existing drainage infrastructure, and field reconnaissance and review of the existing detailed topographic LiDAR data.

1. **Obtain Public Input on Drainage/Flooding Issues**
   Review and analyze information provided by landowners and residents most familiar with the area's drainage and flooding issues during a workshop organized and facilitated by the DNREC. Previously documented drainage concerns should also be reviewed and considered as part of this item. Agencies to be contacted should at a minimum include:
   - Municipal Leaders if the community is incorporated
   - Kent or Sussex County Government
   - Local Conservation District
   - DNREC
   - DelDOT

2. **Review existing drainage network mapping and topography data.**
   This effort will collect, compile and map additional data to assist in the field reconnaissance and evaluation of the drainage problems identified through the drainage complaints and public input. Existing data includes detailed topographic LiDAR data. As it becomes available mobile LIDAR data will be provided by DNREC from the economic study of bay beach communities. All existing drainage infrastructure, including stormwater and sewage, should be collected and mapped. Tidal data may also need to be obtained from established gage stations and if necessary temporary gage stations may need to be installed and monitored.

3. **Inventory areas with routine drainage or flooding complaints**.
   Based on review of existing complaints, community identification of problem areas, and review of existing data, develop a comprehensive list of drainage or flooding problem areas and their locations. All locations should also be mapped in an Arc GIS compatible format.

4. **Rank/Prioritize Drainage Problems**
   Work with the project's steering committee to develop ranking criteria that incorporates factors such as public safety, economic (agricultural), technical, environmental, ecological, order of severity, frequency of flooding, and the potential impact of sea level rise.

5. **Conduct Field Reconnaissance**
   Based on the inventory of drainage problems, conduct site visits and collect field data that describes the nature of identified drainage and flooding problems and likely causative factors.

6. Develop recommendations for improvements.

Develop a set of recommendations for the potential improvement of drainage and flooding problems such as cleaning of ditches, redirection of surface flows, enlargement of wetland areas, resizing or removing drainage pipes, addition of tidegates, and other potential solutions applicable to various site specific drainage problems. Recommendations for improvements must include consideration for the increased inundation to be experienced with continuing sea level rise and a preliminary cost benefit analysis based on a conceptual cost estimate. DNREC sea level rise projections will be provided.

7. Develop conceptual designs of proposed improvements.

Design specific descriptions and/or conceptual designs of high priority drainage problems with cost estimates. For structural improvements, these should be detailed enough to provide information needed to begin preconstruction and engineering design work. A specific geographic location, extent of remedy, and calculations on the expected reduction of flood/stormwater volume, time of concentration of flows, and any long term maintenance requirements to ensure effectiveness shall be provided for all proposed improvements. Consideration for increased inundation from sea level rise must be included in development of conceptual designs.

8. Deliverables

A detailed drainage and flooding report that includes a description of the study area, the completed inventory of drainage problem areas with maps, the findings of the reviews and field reconnaissance of these areas, the prioritization of the drainage problems and its justification, the description of recommendations for improvements, and the more detailed conceptual designs for the highest priority problems. The report and maps will be delivered in digital format. A spread sheet of all identified drainage problems and attribute data and base map data layers will also be delivered in digital format.