



Wade Trim, Inc.

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June 18, 2019

City of Miami Beach Public Works
1700 Convention Center Drive
Miami Beach, FL 33139

Attention: Mr. Luis Soto, PE
Assistant City Engineer

Re: City of Miami Beach Architectural and Engineering Design Services for 1st Street
Amendment Request

In accordance with City of Miami Beach's (City) request, attached is our amendment request regarding hydraulic modeling, pump station alternative siting analysis, accommodation of larger sanitary sewer pipe and pump station, streetscape, and additional construction services.

We are glad to have resolved any issues and are looking forward to completing this to exceed your expectations.

Please do not hesitate in contacting us with any questions.

Very truly yours,

Wade Trim, Inc.

A blue ink signature of Jim Penkosky, consisting of a stylized 'J' and 'P' followed by a horizontal line.

Jim Penkosky, PE
Senior Project Manager

JP:HK:jjc

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Enclosure

cc: Roger Cooley, Wade Trim

Wade Trim, Inc.

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Holly Kremers, PE
Vice President

SCOPE OF SERVICES SUMMARY: AMENDMENT NO. 1
PROFESSIONAL SERVICES AGREEMENT BETWEEN THE CITY OF MIAMI BEACH (CITY)
& WADE TRIM, INC. (CONSULTANT) ARCHITECTURAL AND ENGINEERING DESIGN
SERVICES FOR 1ST STREET (ALTON ROAD TO WASHINGTON AVENUE)

June 18, 2019

The original scope for the 1st Street project included stormwater and streetscape improvements that were location and size-specific and tied to a \$12M construction project. The storm system improvements were defined in the 2017 First and Fifth Street Draft Drainage report by AECOM. Since the time of the original scope, significant changes to the 1st Street scope have been requested by the CITY in response to new stormwater criteria identified in the July 2018 AECOM report and implementation of ULI report recommendations.

Description	Original	Revised
Complete roadway reconstruction for 1st Street from Alton Road to Washington Avenue, which includes - o Elevating 1st Street to minimum 3.7' NAVD - o Utility removal and replacement (of existing water main) - o Storm sewer trunk line installation - o Landscape, lighting, and pedestrian safety improvements		
Storm sewer trunkline installation on Alton Road and Washington Avenue from 5th Street to South Pointe Drive	48" and 60"	60" and 96"
Submersible stormwater pump station located in the triangle park bordered by Jefferson, Alton, and 1st Street	60,000 gpm, CITY standard station design	120,000 gpm
Force main and outfall/dissipation structure located along the seawall south of Murano Grande	72"	72"

The increased size of the new recommended pipe and pump station will result in additional design considerations for the project. In addition, modeling tasks have been added to provide the CITY information that will be needed to communicate the expected level of service to the residents and business owners in the South Pointe drainage area after each phase of construction is complete.

This scope of services document provides a description of the additional work that has been identified based on this change.

Task 1 – Pump Station and Dissipater Site Alternatives Analysis

Prior to the new design efforts, CONSULTANT will provide for analysis of alternatives to have a consensus for final design elements. These elements are:

- Pump Station Site Alternatives Analysis for up to three station locations
- Outfall/Dissipater Structure Site Alternatives Analysis for up to three outfall locations

Concept layouts will be prepared for each and a summary of pros and cons along with budgetary level cost impacts for each alternative will be developed. Results will be presented to the CITY for discussion and selection of a recommended concept.

Task 2 – Force Main Design for Alternative Outfall Location

Task 1 will identify a final location for the pump station outfall. If this outfall location requires a force main route longer than 900 lf, the budget in Task 2 will be used to design the longer force main route up to an additional 1,100 lf.

Task 3 – Storm Sewer Redesign

In general, the proposed 48"-60" diameter storm sewers are increasing to a size of 60"-96" with an invert elevation not to exceed -8.0' NAVD to align with the AECOM drainage report. The CONSULTANT will revise the diameter of storm sewer pipes on the design drawings in accordance with the model results under this amendment. Changes shall be made to the horizontal and vertical alignment to manage utility conflicts and provide for the required capacity and hydraulic performance. Alton and Washington will be restored at the same configuration and elevation as the existing roadway.

Additional coordination will be needed with pipe vendors to confirm availability, scheduling, and pricing impacts. CONSULTANT will need to take this into account when sizing excavations and designing connections between pipes and prefabricated structures.

Utility relocations will be necessary to clear the path for the large collection system pipe after the preferred route and depth has been identified. These relocations (for water, sanitary or storm sewer) will be designed by CONSULTANT and shown on the utility drawings. Utility company coordination, review, and field visits will be needed to coordinate relocations of gas, cable, fiber optic or electric lines. Potholing (soft dig locates) may be needed to confirm locations of key utilities and structures. Any required potholing will be conducted by others.

The storm sewer has increased in size significantly, with a large portion of the alignment at an anticipated 84" diameter. The CONSULTANT will perform design of the storm sewer structures using FDOT index standards. Custom structural design of large cast-in-place storm structures is not included in the scope of service. Design drawings, details, and technical specifications will be provided for the junction chambers. Additional considerations will be needed to review access, working space and more elaborate excavation support measures.

Task 4 – Sanitary Sewer Design

CONSULTANT will provide for the design of improvements to the existing sanitary sewer system located within 1st Street between Alton and Washington. Improvements are anticipated to include replacement of the main line sewer within the existing ROW, while maintaining its current size, slope, and elevation. Drawing notations and technical specifications related to bypass pumping and sewer details will be provided. It is assumed that laterals can be reconnected and replaced in kind.

Task 5 – Geotech – Deeper Borings at Pump Station & Structures

The geotechnical investigations have yet to be performed but the scope was developed based on a simpler project with an assumed number of borings and depth of drilling. As the pipe will be larger and is expected to be deeper to avoid utility conflicts where feasible, additional geotechnical investigations will be required to support the design. The original scope assumed 10 borings at a total depth of 10-15 feet to support the sewer design. We are estimating that the revised scope will require 20 borings at a total depth of 15-20 feet.

As the facility pump station, wet well, diversion structure, water quality units, valve box, and dissipater will be significantly larger and deeper, additional geotechnical investigations will be required to support the new design. The original scope assumed 1 boring at a total depth of 40 feet to support the pump station design, the revised scope is based on 3 borings at a total depth of 40 feet. Our Geotechnical Subconsultant will advance the borings and provide a report of the findings and recommendations. Additional effort will be needed by the Geotechnical Engineer to address groundwater management and temporary excavation support measures in their report.

Task 6 – Additional Generator Design

Since the size of the pump station has doubled, the emergency standby power equipment will need to be increased to support the added load. The large generators desired by and used elsewhere in the City have a 60/40 mix of diesel and natural gas with a bladder tank for diesel storage.

CONSULTANT understands the need to standardize CITY owned and operated equipment. Therefore, the generator, fuel tank, fuel control system and instrumentation at the 19th Street Pump Station will be reviewed, and drawings and specifications modified to provide for a similar design. This design configuration is contingent on a sufficient natural gas line available near the pump station site and will require coordination with the gas utility to provide.

Task 7 – Larger Pump Station Design

The CONSULTANT will revise the pump station design reflecting the increase of the station from 60,000 gpm to 120,000 gpm and associated infrastructure due to the updated design storm requirements. This task includes hydraulic, electrical, process, instrumentation and controls, and landscape architecture design associated with the increase in the pump station capacity and larger site impact. Additional piping, fittings and valves will potentially be needed to address flow control, surge, and air release from the expanded facility. The dual wet well may also introduce levels of complexity with the pump operational schemes to address the standby pump and split flow operation. Additional civil/site and restoration design will be needed to address the greater impact footprint of the proposed facility and staging areas.

Pump stations that exceed 100,000 gpm have more stringent design requirements in accordance with the Hydraulic Institute (HI) Standards. HI Standards recommended a physical modeling study be conducted, which is recommended and described as an allowance under Task 16. CONSULTANT will work with the two city-approved pump manufacturers regarding inlet structure configuration and warranties to determine if physical pump station modeling is necessary. Vendor coordination and design approval will continue through the entire design phase. CONSULTANT will seek to confirm if pump vendor will provide warranty and guarantees for pump performance after installation.

The increased pump station capacity will change the design from a single wet well structure to a dual wet well structure. If a physical model is done, the wet well will be shaped with intention to meet HI Standards for a pump station of this size and the results of the physical model. If the City chooses not to perform a physical model, the wet well will be shaped in accordance with the pump manufacturer's recommendation, and the manufacturer will take responsibility for the wet well performance. This larger footprint will increase the level of structural analysis and design of foundation, walls, top slabs and access hatches. The change in pump station design from a single wet well structure to a dual wet well structure will require design of a custom bar

screen, flow splitter box structure and possible gates, stop logs, or other static provisions to allow each wet well to be isolated if necessary.

The increased pump station capacity will also require a larger force main and outfall dissipation structure. Similar to the storm sewer, additional considerations will be needed for establishing a horizontal and vertical alignment that provides for the proper hydraulics and thrust restraining while minimizing the needs for venting or flushing structures. Considerations for access to the pipe for maintenance will also be needed. It is assumed that the dissipater will be integrated into the existing shoreline and that tunneling into the open or special structures will not be needed. Easements that may be required will be the responsibility of the CITY.

Task 8 – Proposed Conditions Model Conversion and Report

The CONSULTANT will review the design model to confirm that the hydrologic and hydraulic representations are reasonable.

The Proposed Conditions Model will be converted from ICPR v3 to v4. Because ICPR v3 model elements are not geographically referenced within the model framework, each model element will be adjusted to provide a spatial representation of the system within ICPR v4. Adjustments identified in Task 3 below will be made to the model representation. Changes will be made to the proposed storm sewer, WQ units and pump station as needed to meet the 10-year level of service criteria. Model simulations will be conducted for the 1.5" water quality event and the 10-year design storm.

The findings from this analysis will be summarized in a technical memorandum. As with the original model, the model will not consider the effects of a high groundwater table and its impacts on the system.

Task 9 – Existing Conditions Model Development and Report

The CONSULTANT will generate an Existing Conditions model within ICPR v4 based on modifications to the ICPR v4 Proposed Conditions Model. The hydraulic network will be updated to reflect the South Pointe neighborhood drainage system as it exists today. This task may involve, as appropriate:

- Removing proposed pipes
- Downsizing proposed upsized pipes
- Altering elevations within the hydraulic network
- Moving inlet locations or removing inlets
- Altering drainage areas and storage assumptions
- Adjusting pump station representations
- Adding existing gravity outfalls and drainage wells

Interbasin transfer of flow will not be considered. Surface flooding depths will be approximated based on available topographical data and will not be calibrated to existing flood level data. Field correlation for this task is outlined in Task 10. It will be assumed that any groundwater well discharge will be at design or free flowing capacity. No flow monitoring or collection of new rain gage information will be conducted. The model will be run for the 10-year design storm to demonstrate the existing level of flooding and the existing level of service of the system will be identified.

The findings from this analysis will be summarized in a technical memorandum.

Task 10 – Historical Record Field Correlation

The CONSULTANT will collect available City records and data such as locations of roads and buildings with observed flooding, known high water marks, photographs, videos, and/or reports on historical flooding patterns during storms to correlate the models with observed conditions. Historical rainfall and tide information will be reviewed to assess the reasonableness of the existing model. The assumptions in the model will be modified to improve the correlation of the model with actual field conditions and observations provided in the research.

Task 11 – Interim Solution Model Development and Report

After the Proposed Conditions and Existing Conditions models are complete, the CONSULTANT will generate an Interim Conditions model. The hydraulic network will be updated to reflect the scenario when the storm sewer and pump station proposed as part of the 1st Street project are complete, but prior to construction of the planned 5th Street Pump Station and full upstream neighborhood storm sewer system improvements. The Interim Conditions model is not expected to show that the 1st Street project meets the 10-year level of service but meets a storm smaller than this.

Model simulations will be conducted for the 1.5" water quality event, the 10-year design storm and to determine the anticipated level of service of the Interim Conditions project.

The findings from this analysis will be summarized in a technical memorandum.

Task 12 – Survey and Elevation Impact/Level of Service Analysis

Elevation survey will be performed throughout the South Pointe drainage area to document the crown of road, sidewalk, and building finish floor elevations. Analysis of these elevations will be completed to determine what criteria should be used to determine the "pass/fail" evaluation point for the modeled basin inlets. Similar activity was successfully performed by CONSULTANT for previous projects.

Task 13 – Green Infrastructure Design

CITY has asked CONSULTANT to provide for green infrastructure design including design of bioswales and/or rain gardens in the 1st Street greenspace and surrounding the pump station. Design drawings, details, and technical specifications for the green infrastructure features will be provided.

Task 14 – Additional Streetscape Meetings, Support, and Renderings

In providing streetscape, CONSULTANT will provide for analysis of alternatives to have a consensus for final 1st Street Streetscape design elements. The Streetscape design element alternatives include:

- Number/width/direction of traffic and parking lanes
- Parking preservation
- Valet parking preservation
- Multi-use paths
- Surface treatments (e.g. concrete, pavers, stamped concrete)
- Traffic calming bumpouts
- Pedestrian-protective crosswalks

CONSULTANT will provide support for a single meeting and provide renderings as part of the CITY's effort to have a stakeholder consensus for the revised project under this task.

Task 15 – Additional Construction Services

The increased construction scope will result in additional construction duration of 6 months. Additional construction services are expected to include additional field visits, progress meetings, RFI and submittal response and change support.

Task 16 – Hydraulic and Engineering Allowance

The previous pump station size of 60,000 gpm has increased to 120,000 gpm. Due to the large size of the new stormwater pump station, HI Standards require that a physical modeling study be implemented to confirm the hydraulics of the wet well configuration are acceptable. Should the CITY choose to exercise this Allowance Item, the work will require a time frame of 12 to 16 weeks. This work includes coordination, model construction, testing and recommendations for improvements, preparation of a modeling report and several visits to the lab to review and discuss the work.

Due to the dynamic nature of this project, an engineering allowance is recommended to allow for additional design services should changes in the scope become necessary.

Assumptions

- CITY will provide CONSULTANT the current 10-year, 24-hour design model prepared by AECOM in ICPR Version 3, existing drainage system maps and data for development of the existing conditions model.
- Per the AECOM South Pointe Final Drainage Report dated July 2, 2018, the ultimate 10-year Level of Service described in the report will NOT be met until the 5th Street Pump Station and other system improvements are constructed in the future. The interim level of service for the neighborhood will be determined as a part of the modeling analysis.
- The ultimate Level of Service established for the South Pointe drainage area requires that a 10-year, 24-hour storm with 8.75 inches of rainfall be contained within the drainage system such that water does not exceed the crown of road elevation and that design water level design not enter the first-floor elevation of the adjacent buildings. It should be noted that there are two low-lying locations along 5th Street as identified in the AECOM memo which will have water on the road during the design storm until the roadway elevation is increased under a future project.
- It is assumed that the invert elevations, pipe sizes and road elevations in the model are accurate and do not require review or field survey. Additional field survey to understand the first floor elevations, curb, and existing road elevations along the storm sewer alignment for this project will be obtained under the Survey and Elevation Impact/Level of Service Analysis task for purposes of confirming the level of service.
- Water quality treatment will be sized for 1.5 inches over the City right-of-way in the South Pointe drainage area. Water quality units are sized to handle only public ROW, not residential areas per the AECOM memo. Permits for private properties needed to allow discharge into the proposed storm system are not included in this scope of service.
- The minimum top elevation of the pump station and associated structures will be 3.7' NAVD.
- No part of this project will be housed in a building.

- Pump Station dissipater discharge configuration into the waterway will remain along the seawall.
- Preparation of plats and obtaining any required easements are not included in this scope of work.
- Resubmittal of the 30% design documents will not be necessary as the 30% design has been approved. Final design will continue towards the 60% submittal in accordance with the original contract and this amendment's scope.
- Participation and support of value engineering activities are not included in this work.
- Meetings will include one public pre-construction meeting with resident and monthly design development progress meetings.

Project Schedule

The project will begin at the start of the 60% design milestone. The project schedule moving forward with this amendment is presented below. All tasks are relative to receipt of Contract Notice to Proceed on Amendment No. 1 from the City.

Schedule Task	Time Elapsed to Task Completion
Task 1 – Engineering Design	
Alternatives Analysis	4 weeks
City Decision	6 weeks
Survey	6 weeks
Geotechnical	16 weeks
Sewer System Modeling	20 weeks
60% Design Documents	26 weeks*
City Review	28 weeks*
90% Design Documents	32 weeks*
City Review	34 weeks*
100% Design Documents	36 weeks*
Permitting	40 weeks*
Bid Ready Documents	42 weeks*

*If physical modeling studies are required by the City, a minimum of 12 to 16 additional weeks will be needed to complete the design based on lab availability.

Task 2 – Bid Phase	6 weeks after City advertisement
Task 3 – Construction Services	
Shop Drawing review	8 weeks (after Contractor NTP)
Construction	18 months (after Contractor NTP)

Contract Reference

This Task Order shall be performed under the terms and conditions described within the Professional Architectural and Engineering Services Agreement dated June 16, 2017 between

the City of Miami Beach and Wade Trim, Inc. as amended in accordance with Schedule A-1 and herein.

Obligations of the City

1. The City shall provide Wade Trim in a timely manner all available record data and information related to the project as necessary for the performance of the services specified herein.
2. The City shall review all documents presented by Wade Trim; and render decisions pertaining thereto within reasonable time so as not to delay the services of Wade Trim.
3. City to provide all services necessary to acquire rights-of way at no cost to Wade Trim.

Additional Services Budget

Task No.	Description	Negotiated Fee
1	Pump Station and Outfall Site Alternatives Analysis	\$30,318
2	Force Main Design for Alternative Outfall Location	\$22,000
3	Storm Sewer Redesign	\$14,782
4	Sanitary Sewer Design	\$2,643
5	Geotech – Deeper Borings at Pump Station & Structures	\$18,505
6	Additional Generator Design	\$16,003
7	Larger Pump Station Design	\$20,000
8	Proposed Conditions Model Conversion and Report	\$55,304
9	Existing Conditions Model Development and Report	\$65,700
10	Model – Historical Record Field Correlation	\$11,150
11	Interim Solution Model Development and Report	\$20,256
12	Survey and Elevation Impact/Level of Service Analysis	\$56,969
13	Green Infrastructure Design	\$26,371
14	Additional Streetscape Meetings, Support, and Renderings	\$28,800
15	Additional Construction Services	\$110,000
16	Hydraulic and Engineering Allowance	\$120,000
TOTAL		\$618,801