VILLAGE OF LA GRANGE
Department of Public Works

BOARD REPORT

TO: Village President, Village Clerk, Board of Trustees, and Village Attorney

FROM: Robert J. Pilipiszyn, Village Manager
Ryan Gillingham, Director of Public Works

DATE: September 22, 2014

RE: **ENGINEERING SERVICES AGREEMENT– SOUTH OF 47TH STREET DRAINAGE BASIN HYDRAULIC MODELING**

This summer the Village experienced multiple high intensity rain events that exceeded the limited capacity of the Village's sewer system resulting in flooded basements, streets and rear yards. In the August 22 rain event approximately 4.24 inches of rain fell over the area. In this event water flowed overland and pooled in depressional areas in the neighborhood south of 47th Street resulting in water entering houses through window wells and other low openings. This event also caused flooding in other depressional areas such as Sunset and Elm and caused numerous combined sewer basement backups throughout the Village.

In response to these and other flooding events the Village has developed drainage studies for each of the three major drainage basins throughout the Village. Within these reports a number of initiatives were identified to address flooding, however implementation has been measured based on available resources. Identified projects from these reports such as the Maple Avenue Relief Sewer (MARS) have been constructed in phases on a pay as you go basis. As the frequency and intensity of rain events appears to be increasing, the Village Board has requested staff to pursue funding and engineering solutions that reduce flooding in an affordable and shorter time frame than currently planned.

A number of solutions have been identified to address the multiple types of flooding that are occurring during these rain events (i.e. overland flooding, combined sewer backups, seepage, rear yard flooding.) Staff recommends a tiered approach to the prioritization of flooding objectives given the Village's limited resources. In the first tier, staff recommends implementing solutions that will address overland flooding and water pooling in depressional areas. Staff recommends implementing these solutions first as residents that experience this type of flooding are generally unable to undertake individual private property solutions to address this type of flooding. In the second tier, staff recommends implementing solutions that will reduce the frequency of combined sewer backups. As the next tier, staff recommends carrying out solutions that reduce the incidences of rear yard flooding.

Staff recommends as the next step to address the first tier objective of reducing overland flooding, to update the hydraulic model of the area south of 47th Street to evaluate other alternatives that directly address overland flooding in the depressional areas. The result of this analysis will be to develop an implementation plan that is based on the affordability of the different options. This next step is a refinement of the previous drainage study prepared in 2011 that will provide further assessment of solutions based on updated objectives. The goals of this hydraulic analysis are the following:

1. Model various storm sewer and floodwall alternatives that seek to reduce the incidences of overland flooding.
2. Develop inundation maps detailing the expected performance of the alternatives based on various rainfall events.
3. Identify alternatives for storm water outfalls
4. Collect geotechnical information to determine expected subsurface conditions
5. Develop cost estimates for identified alternatives
6. Refine alternatives based on affordability of the different options
7. Present concepts, inundation maps, cost estimates and recommended alternatives to the Village Board for consideration

This analysis will provide the Village with a comparison of the expected performance of the different options against their cost of implementation. Preliminarily, the alternatives that will be considered include the installation of a relief sewer along 50th Street, a floodwall along Brainard Avenue, installation of inlet restrictors throughout the study area, and the installation of a storm sewer installed along Plainfield Avenue. Please note that the Village's hydraulic analysis will not model the proposed storm sewer on Plainfield Road as this is a project being led by MWRD. However the reduction of rain water entering the Village from this proposed storm sewer will be included in the model so its impact on flooding in the Village can be determined.

Attached for your consideration and review is a task order agreement with Baxter & Woodman to complete the above hydraulic analysis of the various alternatives in the amount of $32,000. The geotechnical investigation is a separate sub-consultant expense and is estimated to be $15,000. Baxter & Woodman anticipates completion of this hydraulic model and assessment in November. Staff recommends approval of an agreement with Baxter & Woodman for this work based on their experience, familiarity with the project and past performance with the Village. If approved, task orders with Baxter & Woodman will be executed for this work in accordance with their task order contract. These documents are attached for your consideration.

As this engineering analysis is an unbudgeted expenditure, staff recommends using General Fund reserves. The use of General Fund reserves is recommended because it is the only funding source readily available for this purpose and it is only a one-time expenditure. If you concur a budget amendment will be required at the end of the current fiscal year to recognize the additional expenditure within the General Fund.

While the area south of 47th Street has been designated for additional hydraulic modeling, there are other depressional areas within the Village that also experience overland flooding. Specifically, the intersection of Sunset Avenue and Elm Avenue has been identified as an area that experiences this type of flooding in heavy rain events. The Maple Avenue Relief Sewer has been designated as the solution to address the frequency of flooding in this area so additional engineering analysis for this area is not required at this time.

In summary, we recommend approval of the task order contracts with Baxter & Woodman in the amount of $47,000 for engineering services for the development of a hydraulic analysis of various alternatives to reduce the incidences of flooding in the area south of 47th Street.

VILLAGE OF LA GRANGE, ILLINOIS
SOUTH BASIN MODELING

TASK ORDER NO. 71

In accordance with Section 1.2 of the Master Contract executed May 13, 2013 between the Village of La Grange (the "Village") and Baxter & Woodman, Inc. (the "Consultant"), the Parties agree to the following Task Order Number 71:

1. Contracted Services:

Baxter & Woodman, Inc. shall provide the Village with engineering services to evaluate flood reduction alternatives in the South Basin region of La Grange.

The following scope of services is anticipated:

A. DATA COLLECTION AND REVIEW – Obtain Cook County topographic mapping through the Cook County GIS Department, or the Village Consultant, GIS Consortium. Review Village record drawings for Brainard Avenue between 49th Street and 52nd Street, if available.

B. LIMITED SURVEY – Survey up to eighteen (18) lowest-openings elevations of homes within critical flooding areas. The homes will be selected with input from Village staff. Perform limited topographic and storm sewer survey as needed to evaluate and confirm existing drainage patterns and infrastructure, supplementing available data. This task includes three (3) full days of field work performed by a two-person survey crew.

C. EXISTING CONDITIONS MODELING – Recreate the existing conditions hydrologic and hydraulic SWMM modeling of the drainage area tributary to the Hanson Quarry in the South Basin region of the Village of La Grange. Review and utilize the SWMM model input and supporting documentation included in the May 10, 2011 *South Basin Drainage Investigation* report prepared by Heuer and Associates (Heuer). Run the model for the 5-, 10-, and 100-year critical duration rainfall events and compare results to Heuer report results.

D. FLOOD REDUCTION ALTERNATIVES ANALYSES – Evaluate five (5) alternatives to reduce flooding at six (6) critical depressional areas identified throughout the South Basin region. Alternatives will include construction of a flood wall along Brainard Avenue, installation of a relief storm sewer along 50th Street discharging to the Hanson Quarry, installation of inlet restrictors throughout the study area, upsizing the existing storm sewer along Plainfield Road, and one combination of those improvements. Each alternative will be evaluated for the 5-, 10-, and 100-year critical duration rainfall events. This task does not include design or analysis of a new pumping system to increase the outflow capacity from the Hanson Quarry.

E. MEET WITH STAFF – Attend two (2) meetings with Village staff to discuss preliminary findings, refine alternatives, receive further direction, and obtain feedback on recommendations.

F. GEOTECHNICAL ENGINEERING SUB-CONSULTANT SERVICES – Arrange for a geotechnical sub-consultant to make soil borings, collect and analyze soil samples, and determine bedrock elevations. **Sub-consultant and laboratory services are estimated to cost $15,000, which is not included in the not-to-exceed amount.**

G. COST ESTIMATES – Prepare a preliminary opinion of probable cost for design and construction of each alternative evaluated.

H. SUMMARY MEMORANDUM – Prepare a brief summary memorandum describing the analyses performed, alternatives considered, conclusions, and recommendations. Prepare associated exhibits, including concept plans for each alternative and inundation maps for the recommended alternative. Inundation mapping will be prepared for the 5-, 10-, and 100-year critical duration rainfall events in the six (6) identified depressional areas.

I. PRESENTATION OF RESULTS – Present results of the analyses performed, conclusions, and recommendations at a Village Board meeting.

All terms and conditions of the master task order contract executed May 13, 2013, with the Village of La Grange shall apply.

2. **Project Schedule** (attach schedule if appropriate):

   All services shall be completed prior to November 23, 2014.

3. **Project Completion Date:**

   All services shall be completed prior to November 23, 2014.

4. **Project Specific Pricing** (if applicable):

   Our engineering fee for the stated scope of services shall be compensated on a cost plus fixed fee basis in an amount not to exceed $32,000.

5. **Additional Changes to the Master Contract** (if applicable):

   N/A **[signature page follows]**

VILLAGE	CONSULTANT
Signature	Signature
Ryan Gillingham	John V. Ambrose
Director of Public Works	Name (Printed or Typed)
September 24, 2014	September 16, 2014
Date	Date

If greater than $2,000, the Village Manager's signature is required.

Signature

Village Manager

Date

If greater than $10,000, the Village Board must approve the Task Order in advance and the Village President's signature is required.

Signature

Thomas E. Livingston
Village President

September 22, 2014
Date

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VILLAGE OF LA GRANGE, ILLINOIS
South Basin Modeling

EXHIBIT A
PRELIMINARY ENGINEERING

Route: 50th Street and Brainard Avenue
Local Agency: Village of La Grange
(Municipality/Township/County)

Section:
Project:
Job No.: 140853.30

*Firm's approved rates on file with IDOT's Bureau of Accounting and Auditing:

Overhead Rate (OH)	147%
Complexity Factor (R)	0
Calendar Days	20

Method of Compensation:

Cost Plus Fixed Fee 1	X	14.5%[DL + R(DL) + OH(DL) + IHDC]
Cost Plus Fixed Fee 2	□	14.5%[DL + R(DL) + 1.4(DL) + IHDC]
Cost Plus Fixed Fee 3	□	14.5%[(2.8 + R)DL] + IHDC
Direct Labor Multiple	□	
Specific Rate	□	
Lump Sum	□	

Cost Estimate of Consultant's Services in Dollars

Element of Work	Employee Classification	Man-Hours	Payroll Rate	Payroll Costs (DL)	Overhead*	Services by Others	In-House Direct Costs (IHDC)	Profit	Total
DATA COLLECTION	Engineer III	4	$ 37.92	$ 152.00	$ 223.00			$ 54.00	$ 429
	GIS Tech II	9	$ 32.11	$ 289.00	$ 425.00			$ 104.00	$ 818
LIMITED SURVEY	Survey Tech IV	30	$ 40.34	$ 1,210.00	$ 1,779.00		$ 157.92	$ 456.00	$ 3,603
	Survey Tech II	30	$ 32.11	$ 963.00	$ 1,416.00			$ 345.00	$ 2,724
	GIS Tech II	4	$ 32.11	$ 128.00	$ 188.00			$ 46.00	$ 362
EXISTING CONDITIONS MODELING	Engineer III	15	$ 37.92	$ 569.00	$ 836.00			$ 204.00	$ 1,609
	Engineer I	28	$ 24.95	$ 699.00	$ 1,028.00			$ 250.00	$ 1,977
FLOOD REDUCTION ALTERNATIVES ANALYSES	Sr Engineer III	12	$ 54.14	$ 650.00	$ 956.00			$ 233.00	$ 1,839
	Engineer III	24	$ 37.92	$ 910.00	$ 1,338.00			$ 326.00	$ 2,574
	Engineer I	37	$ 24.95	$ 923.00	$ 1,357.00			$ 331.00	$ 2,611
MEET WITH STAFF	Sr Engineer III	12	$ 54.14	$ 650.00	$ 956.00		$ 106.00	$ 248.00	$ 1,960
	Engineer III	12	$ 37.92	$ 455.00	$ 669.00			$ 163.00	$ 1,287
GEOTECHNICAL SUB-CONSULTANT SERVICES	Sr Engineer III	6	$ 54.14	$ 325.00	$ 478.00			$ 116.00	$ 919
				$ -	$ -				
COST ESTIMATES	Sr Engineer III	2	$ 54.14	$ 108.00	$ 159.00			$ 39.00	$ 306
	Engineer III	1	$ 37.92	$ 38.00	$ 56.00			$ 14.00	$ 108
SUMMARY MEMORANDUM	Sr Engineer III	5	$ 54.14	$ 271.00	$ 398.00			$ 97.00	$ 766
	Engineer III	16	$ 37.92	$ 607.00	$ 892.00			$ 217.00	$ 1,716
	Engineer I	5	$ 24.95	$ 125.00	$ 184.00			$ 45.00	$ 354
	GIS Tech II	28	$ 32.11	$ 899.00	$ 1,322.00			$ 322.00	$ 2,543
	Clerical I	4	$ 25.40	$ 102.00	$ 150.00			$ 37.00	$ 289
PRESENTATION OF RESULTS	Sr Engineer III	12	$ 54.14	$ 650.00	$ 956.00		$ 53.00	$ 240.00	$ 1,899
	Engineer III	12	$ 37.92	$ 455.00	$ 669.00			$ 163.00	$ 1,287
TOTALS		308		$ 11,178	$ 16,435	$ -	$ 317	$ 4,050	$ 31,980

In-House Direct Costs:
VEHICLE EXPENSES - TRAVEL MILES @ $0.56/MILE = $316
UPS SHIPPING EXPENSES - 0 SHIPMENTS @ $40/SHIPMENT $0