CITY OF NOVI CITY COUNCIL
JULY 10, 2023

SUBJECT: Approval to award engineering services to Spalding DeDecker to evaluate the City's existing surveying benchmarks in the amount of $27,500.

SUBMITTING DEPARTMENT: Department of Public Works, Engineering Division

EXPENDITURE REQUIRED	**$ 13,750 General Fund** **$ 13,750 Water & Sewer Fund** **$ 27,500 Total**
AMOUNT BUDGETED	**$ 26,900 General Fund** **$ 26,900 Water & Sewer Fund** **$ 58,800 Total**
APPROPRIATION REQUIRED	**$ 0**
LINE ITEM NUMBER	**101-441.10-816.059** **592-536.00-816.059**

BACKGROUND INFORMATION:

Novi has a vertical land survey benchmark system that was established in the late 1980s and includes approximately 400 benchmarks set along main roadways, generally following the section lines. Benchmarks can be any fixed object such as a point marked on a manhole rim, hydrant arrows, and utility pole bench ties. The benchmark system is important in site development and construction projects as it provides vertical reference data critical to establishing building floor elevations, utility invert elevations, and floodplain elevations. Over time some of the benchmarks may be moved or damaged due to utility pole, hydrant or manhole adjustments, removals or relocations. The City benchmark system was last evaluated and updated in 2009.

City engineering consultant, Spalding DeDecker, prepared a proposal for updating the City's benchmarks, which includes two phases:

- Phase 1 – confirm status of existing benchmarks, $27,500 lump sum fee

- Phase 2 – replace/reset damaged or missing benchmarks, fee to be determined depending on the amount of replacement benchmarks needed

The attached design engineering services proposal outlines the detailed scope of services. Work would being upon approval with completion expected within a year.

RECOMMENDED ACTION: Approval to award engineering services to Spalding DeDecker to evaluate the City's existing surveying benchmarks in the amount of $27,500.

June 22, 2023

Ms. Rebecca Runkel
Project Engineer
City of Novi
Department of Public Works
26300 Lee BeGole Drive
Novi, MI 48375

Re: City of Novi Benchmark Update
Job No.: PR18-423

Dear Ms. Runkel:

Spalding DeDecker is pleased to once again have this opportunity to provide professional surveying services to the City of Novi.

SCOPE OF SERVICES

We understand that the City-wide benchmark system was established around 2009, and consists of roughly 411 benchmarks set along the main roadway generally following the section lines. Benchmarks set consist of a variety of different objects, including points marked on manholes rims, arrows on hydrants, bench ties set in utility poles, and other features. These have generally remained in place, but you are noticing some issues where utility poles have been replaced or hydrants or manholes have been adjusted.

In order to be as efficient as possible, we understand that you would like us to approach the work in two separate phases. In the first phase, we would revisit each of the points to identify which ones remain and which ones require replacement. In the second phase, we would establish new benchmarks as replacements. More details on each phase are outlined below.

Phase 1: Confirm Status of Existing Benchmarks

We will physically visit each of the benchmarks that were previously established. We will recover the benchmark based on the existing description, remark it as needed, obtain a picture of it, and make a note confirming the date of the visit and whether the mark was found in good condition or not. We will set up a GIS layer internally and use Arc GIS Collector App to document these checks, and output the results to a table when it is completed. This will allow the City of Novi to update their GIS, if desired, with the notes we provide. We will also give Novi access to the online information so they can view the images that are linked to our field visits if desired.

During this step, we will also measure the points using GPS RTK methods as long as the point is suitable for GPS occupation. This will confirm the position horizontally and roughly confirm the elevation with an accuracy of 0.05' to 0.15' in general. This will help us and the City to detect points that may have been moved horizontally or adjusted in elevation such as hydrants or manholes, even though the description of the benchmark still matches the point. We will produce a comparison report showing the difference between our measurements and the published northing, easting, and elevation for each point.

Phase 2: Status of Existing Benchmarks

Our scope of services includes the following:

1. Work with the City to define which specific missing benchmarks they want us to replace, or which areas we should concentrate on if multiple benchmarks have been obliterated along a particular road, for instance.
2. For the missing to be replaced or added, assign a new number and set a replacement benchmark in that same general vicinity, and document this in a format consistent with the prior information sheet, which includes a photo, description, and location.
3. Perform new level loops through the new benchmarks, which will include:
    a. Begin the loop at an existing benchmark, run the loop through a second existing benchmark to confirm their elevations, continue through the new points established, and close into at least one or two other existing benchmarks.
    b. Use a Leica LS15 or DNA03 or equivalent digital bar-code reading level and standard survey staffs.
    c. Adjust electronic data utilizing a least-squares program (Microsurvey Star*Net) in order to check for errors and compute estimated point precision/accuracy.
    d. Prepare a comparison report in tabular format showing the prior published elevations, the current measured elevations, and the differences.
    e. Provide data sheets for the new benchmarks established.

The overall scope for Phase 2 is dependent on how many benchmarks are identified in Phase 1 that need to be replaced, and where they are located in relation to one another. If we had to redo all of the bench loops, the total length of the bench loops would be approximately 80 miles. This includes seven north-south corridors that are six miles long and seven east-west runs that are six miles long each. This yields a total length of 84 miles, but some stretches would not be run due where current benchmarks are not present due to unimproved rights of ways in a particular stretch or other physical features such as lakes. However, we would anticipate that we only need to re-run certain segments of each line, which would reduce the total length that actually needs to be performed. We won't be able to accurately estimate the length of loops required until we see where the replacement benchmarks fall and how many are needed.

FEE

We will perform the work for the following fees:

Phase 1 (Confirm existing benchmarks):	$27,500 Lump Sum
Phase 2 (Established replacement marks)	To be determined

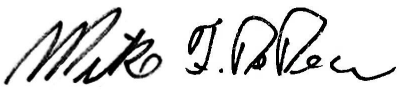
SCHEDULE

We are able to begin phase 1 upon authorization and will work with you to define an acceptable schedule including progress and delivery milestones. We understand that the overall project (phase 1) will need to be completed in the current fiscal year, which runs from July 1, 2023 through June 30, 2024. This will allow us to schedule the work after the construction season if needed.

Thank you for considering us for this project. If the above terms are acceptable, please contact us to enter into a formal written agreement in the form of a purchase order or other form of authorization to proceed. We would be glad to review the details of this proposal with you, and please let me know if you have any questions.

Sincerely,

SPALDING DEDECKER



Mike F. DeDecker, PS
Senior Project Manager
Vice President

cc: Taylor Reynolds, PE
Jeremy Schrot, PE
George M. Platz, PS