



April 25, 2025

Dominick Itzi
Sewer Operations Manager
Office of Infrastructure and Operations
Municipality of Princeton
400 Witherspoon Street
Princeton, NJ 08540

Re: Extra Work Order for our Existing Contract – Maintenance Hole Documentation in Flood Hazard Areas, Municipality of Princeton, NJ
JMT No. 24-01085-001

Dear Mr. Itzi:

The proposal Johnson, Mirmiran & Thompson (JMT) submitted in June of 2024 included a scope of work to collect data on 400 maintenance holes located within the new Federal Emergency Management Agency (FEMA) 100-year floodplain. Originally, the Municipality had determined that 356 maintenance holes were located within the old FEMA layer. At the time of the proposal submission, prior to investigating the exact number, we estimated that there may be 400 maintenance holes within the new layer. We found that the new FEMA layer produced by the NJ Climate Change Resource Center at Rutgers, in consultation with the New Jersey Department of Environmental Protection (NJDEP), includes 538 maintenance holes. We informed the Municipality of the increase in the number of maintenance holes and the plan was to work efficiently to complete as many maintenance holes as possible within the proposed fee. We were able to visit over 400 maintenance holes but could only collect data on about 80 percent of them due to issues with locating them and opening the covers. We have shared this list with the Municipality so crews can go out and attempt to locate and open these maintenance holes.

We have reviewed our progress to date and the remaining work. We are pleased to submit our fee proposal to complete the additional 138 maintenance holes, the approximately 80 maintenance holes that were not able to be completed and have to be revisited, and the work to turn the GIS map over to the Municipality after all the data collection has been performed.

Maintenance Hole Data Collection

JMT is proposing to continue with the approach from the data collection phase. This includes having our survey crew collect the GPS locations and rim elevations, and our wastewater staff perform the rest of the data collection. We realized at the beginning of the project that our survey crew can be much more efficient using their GPS equipment, with our wastewater staff following with the inspection and documentation of the maintenance hole details. This worked well to maintain a good pace, and we plan to continue with this approach.

- Our proposal for the survey crew and wastewater staff to complete the maintenance holes that have not been visited assumes that these can be completed at a similar pace. This assumes that the remaining maintenance holes can be easily located and are accessible, including if located on private property, and there are no major satellite issues with the survey equipment. We prioritized the maintenance holes located in wooded areas by visiting these during the winter months when there was little to no foliage. The majority of the remaining maintenance holes are located in open areas or roadways where satellite reception should not be an issue.
- For the maintenance holes that were not found the first time and have to be revisited, we assume that Princeton's crew will join our staff to show us the locations. We do not want our staff to have to revisit any maintenance holes a third time.
- Our wastewater staff will have one (1) member performing data collection and will require the presence of Princeton's crew to open the maintenance holes. We will notify Princeton of any maintenance holes that cannot be located or

opened. We assume the help of Princeton's crew for any minor traffic control or flagging operations for the maintenance holes located in roadways. The standard traffic control measures that Princeton's crews implement for routine maintenance hole inspections in roadways should be adequate. As such, we do not anticipate that any major traffic control measures will be required.

- As we approach the end of the data collection phase and must revisit the maintenance holes that could not be completed when first visited, the pace may be slower since travel time will be required to move from one area to another. On average, we were not able to complete documentation of one (1) in every five (5) maintenance holes visited. We attempted to locate and open these missing maintenance holes, but did not want to take too much time to look for, uncover, or open any since that would reduce efficiency. We figured the best approach was to move on in the interest of maintaining a good pace and revisit these later after Princeton's crews had a chance to go back to these first.
- The maintenance holes we will need to revisit are spread out in various areas of the system. We have been able to maintain a good pace by walking the pipeline and collecting data one maintenance hole after another. However, these will not be able to be completed in this way and will require driving, which will be a slower operation. Our proposal reflects the longer time to complete these maintenance holes.

GIS Map Deliverables

JMT used shapefiles provided by Princeton to create a GIS map in JMT's ArcGIS online account for data collection of the original 538 maintenance holes. Originally, we intended to collect the data in a handwritten log and input the data later into a JMT created GIS map. We would then turn over a shapefile to Princeton that included all the data collected. This approach would require Princeton to perform some integration of the data into the existing GIS map.

We realized that collecting the data this way would increase the amount of time spent per maintenance hole and would require us to input the data into the GIS map later. We asked JMT's Technology Group to help make our data collection more efficient. Since we were not sure what level of editor permission we could be granted, our Technology Group created a form in Field Maps that could be used by both our surveyors and wastewater staff to collect the data on iPads. Maintenance hole attributes that were not in Princeton's existing GIS map but were asked to be collected were added, such as cover diameter, opening diameter, and frame depth. As per the meeting between Princeton and JMT on April 14, 2025, Princeton will provide JMT owner level credentials to their ArcGIS Online to directly edit the map and import the collected data. The updates will be to the original 538 maintenance holes as well as some that were found during the course of the data collection.

JMT will update Princeton's GIS dataset using a combination of field survey data collected by JMT augmented with as-built documentation that was provided by the Municipality. JMT will perform the following:

- Adjust the x and y coordinates of the maintenance holes to match the GPS location collected by our surveyors.
- Associate all field data collected by appending attribute fields to the existing structure feature class attribute table. Maintenance hole attributes will include the rim elevation, upstream and downstream invert elevations, frame and cover dimensions, cover type, maintenance hole material, maintenance hole type, pipe size, and pipe material.
- Generate new point features within the maintenance hole feature class representing the maintenance holes that were discovered during the data collection that were not previously mapped. All the attributes listed in the second bullet point will be added to the attribute table for each added structure. We will discuss these maintenance holes with the Municipality and the identification numbers for these and the ones that do not currently have identification numbers will follow the naming convention provided by the Municipality.
- Remove maintenance holes from the sanitary sewer feature class that were found during the data collection to be stormwater and not sanitary.
- Snap the connecting sanitary sewer pipes to the repositioned and/or new maintenance hole point features to maintain proper network connectivity and system topology.

Compensation

JMT will provide the above services based on the described approach, for the upset fee limits as follows:

Total Estimated Budget:**\$34,352.64**

The cost breakdown for staff is also included for your review. The contract will be a not-to-exceed amount, but with the ability to amend it if more hours are required, however we don't intend to seek additional funding unless something drastically changes with this process.

As discussed in the meeting with Princeton on 3/25/24, reviewing the collected data, analyzing the maintenance holes' existing conditions, and determining the course of action for each maintenance hole (i.e. replacement, raising the cone or barrel, replacing the type of cover) will be performed under a future contract. This effort is not included in this proposal.

We have enjoyed working with the Municipality of Princeton on this project and look forward to continuing our services. We trust that you will find the attached fee proposal to be responsive to your request. If you have any questions or need further information, please do not hesitate to contact me at 609-512-3418 (office), 609-313-1528 (cell) or dmadden@jmt.com or PJ Wiegartner 609-791-7949, pwiegartner@jmt.com

Very truly yours,

JOHNSON, MIRMIRAN & THOMPSON, INC.



Daniel A. Madden, PE | Vice President
DAM/PW
Enclosures

EXTRA WORK ORDER FEE PROPOSAL
FIELD DATA COLLECTION FOR REMAINING MAINTENANCE HOLES

Maintenance Holes in Flood Hazard Areas
Municipality of Princeton, NJ

Title	Total Hours	Hourly Rate	Total
Project Manager	8	\$263.41	\$2,107.28
Project Engineer	84	\$139.16	\$11,689.44
Design Engineer/GIS	80	\$123.54	\$9,883.20
Survey Project Manager	8	\$270.51	\$2,164.08
CADD Technician	8	\$143.42	\$1,147.36
Survey Technician	72	\$102.24	\$7,361.28
TOTAL HOURS	260	-	-
Total Labor			\$34,352.64
Mileage/Misc. Expenses			\$0.00
TOTAL			\$34,352.64

