

ORTHO & PLANIMETRIC UPDATE

REQUEST FROM ENGINEERING DEPARTMENT

STAFF REPORT

November 29, 2023

PURPOSE: To expend funds from the Tax Map Updating Fees account for the purposes of updating Hudson’s Ortho (aerial imagery) and Planimetric data in the year 2024. The last Ortho update was performed in Spring of 2022, which was also partially funded by this account. Planimetrics consist of GIS shapefiles of structures, roads and other features. Both are critical tools for town staff in performing their duties in the Assessing, Engineering, Planning and Zoning Departments.

ATTACHMENTS:

- A. Letter from Town Engineer to Town Planner & Planning Board, dated November 15, 2023.
- B. Scope of Services from Quantum Spatial, dated November 15, 2023.

COMMENTS:

The last Ortho update was performed in Spring of 2022, as well as the Planimetrics, which was also partially funded by this account. Planimetrics consist of GIS shapefiles of structures, roads and other features. Both are critical tools for town staff in performing their duties in the Assessing, Engineering, Planning and Zoning Departments.

As in the past, this is proposed to be partially funded by the Tax Map Updating Fee, a fee collected in Site Plan and Subdivision Applications. The current balance of this account is \$12,076.50. The remaining cost is to be funded by the Engineering Department.

DRAFT MOTIONS

APPROVE funding of the project with tax map updating fees:

I move to recommend to the Board of Selectmen the release of \$12,076.50 from the Tax Map Updating Fee Account, 01-0000-1312-000-505, for the 2024 Ortho & Planimetric Update project in accordance with the request made by Elvis Dhima, Town Engineer.

Motion by: _____ Second: _____ Carried/Failed: _____



TOWN OF HUDSON

Engineering Department



12 School Street • Hudson, New Hampshire 03051 • Tel: 603-886-6008 • Fax: 603-816-1291

RECEIVED

NOV 15 2023

TOWN OF HUDSON
PLANNING DEPARTMENT

TO: Brian Groth, Town Planner
Planning Board

FROM: Elvis Dhima, P.E., Town Engineer

DATE: November 15, 2023

RE: Request for Approval of Funds from Planning Board Tax Map Update

Town of Hudson currently has 3 inch resolution from Spring of 2022 and 2022 planimetric. This was partially funded (50%) by Planning Board's Tax Map Update Account 1312-505, which currently holds \$12,076.50.

We have been notified of a state flyover from our consultant for 3 inch resolution and would like to take advantage to this opportunity to complete this in Spring of 2024. We have received a quote for the amount of \$34,000 for the flyover and planimetric update.

Engineering, Zoning and Assessing Department is asking the Planning Board to approve and recommend the expenditure to the Board of Selectmen.

Motion:

To approve and recommend 2024 aerial imagery flyover using Account #: 1312-000-505, for the amount of \$12,076.50.

November 15th, 2023

Town of Hudson
Attn: Elvis Dhima – Town Engineer
12 School Street
Hudson, NH 03051

Project Proposal – 2024 3in Ortho and Planimetric update

Dear Mr. Dhima:

NV5 Geospatial is pleased to respond to your request for proposal regarding the above referenced project. This proposal describes our understanding of the scope of work and services your project requires.

Summary of Work

For this project, we will acquire aerial imagery from a large format high precision mapping camera mounted in a fixed-wing plane. Imagery will be captured at a 7.5cm or 3in resolution.

From these collections, we will produce the following:

- 3in 4bnad digital orthophotos
- Planimetric mapping update to 2021 data standards

Project Area

The entire Town plus the additional planned area (blue polygon), totaling ~48mi² will be captured.



Survey Control

Based on previous capture years, 2020 and 2022, no additional control is planned for this project.

Aerial Imagery and Photogrammetric Mapping

In 2020 and 2022 NV5 Geospatial did acquire 3in 4 band imagery. The new imagery will be collected with a large format digital camera in 4 bands (R, G, B, NIR) at 7.5cm (3") ground sample distance (GSD) with 60% along-track overlap, and $\geq 30\%$ sidelap. Flight parameters will be adjusted to collect imagery with a native pixel size (ground sample distance) of 7.5 cm.



Survey equipment placed by NV5I crew.

Orthorectification will be accomplished using known coordinates of photo-identifiable features within the study areas. Direct georeferencing typically results in accuracies of < 3 pixels when compared to ground targets. Individual ortho-rectified TIFFs will be mosaicked ensuring that any remaining radiometric differences between images are corrected. All four bands will be rectified, mosaicked and edited concurrently as one process. Mosaic lines will be non-apparent by carefully blending and editing seam location. The resulting data product is geo-rectified 8-bit, 7.5 cm (3") resolution imagery of the study area provided as tiled, color-balanced ortho-mosaic. Orthophotos will be collected during peak sun angles for the day, under clear conditions with minimal cloud cover.

Photogrammetric Mapping Update

Feature updates to collect similar to that of the 2022 project:

- Roads
- Buildings
- Driveways
- Parking
- Sidewalks
- Manholes
- Catch basins
- Hydrants
- Structure features captured from the 2024 planimetric data will compare to the 2022 structure layer and will be a stand alone layer provided to the town.

Please note that sidewalks and driveways will be converted to polygons if they are not already



Figure: Town current features with update areas to collect

Schedule

NV5 anticipates the aerial acquisition will be performed in Spring 2024 (March – May). Based on anticipated workload, full delivery will be done within 3-4 months from date of collection.

Deliverables

Data will be delivered in UTM Zone 10, meters horizontal datum: NAD83 (2011), and vertical datum: NAVD88 (Geoid12B), unless otherwise specified before final contracting.

Imagery

Orthophotos

- Orthophoto tiles, 7.5 cm (3") GSD/resolution or better, *GeoTIFF format***Vectors**
- Survey Boundaries, *shapefile format*
- Orthophoto Index, *shapefile format*

Planimetrics

- **Geodatabase**

Cost and Payment Terms

Compensation for the services above are broken down below. A detailed breakdown of hours and rates are included in the Fee Estimate document:

Town of Hudson, NH Ortho and Planimetric update.			
Option	AOI	Services	Total
Hudson, NH	48mi2	3in 4band Orthos	\$23,500
Hudson, NH	32.5mi2	Planimetric Update	\$10,500
		GRAND TOTAL	\$34,000.00

For contracting purposes please use NV5 Geospatial as our company name. We no longer operate under Quantum Spatial.

NV5 Geospatial Representative

Brian Tolley will be the assigned Project Manager and Marlin Zook will be the production manager and will represent us during the performance of the services to be provided under this agreement. They have the authority to transmit and receive instructions and make decisions with respect to the services and is authorized to commit the necessary resources towards completing the services described herein.

Authorization

If you would like to authorize NV5 Geospatial to proceed with the services described above and you agree with the fee schedule and payment terms, and the attached Standard Terms and Conditions which are part of this agreement, please return a signed original to NV5 Geospatial. We look forward to working with you and your staff to complete this project in a timely and cost-effective manner. Should you have any questions, please call me at 703-919-8038 or email me at the address shown below.

NV5 Geospatial.



Drew Meren
 Sr. Account Manager – East Coast
Drew.meren@nv5.com

Signature Summary

PDS Contract: Hudson Ortho and Planimetric Updtae

NV5 Project Number: AR043710

Proposal Date: November 15th 2023

Proposed To: Town of Hudson

12 School St.

Hudson, NH 03051

Submitted By: Drew Meren – Sr. Account Manager East Coast

Agreement: This constitutes the entire agreement between the Town and NV5 Geospatial, as it relates to this project and that Notice to Proceed is given.

Town of Hudson

NV5 Geospatial

Authorized Signature:



Printed Name:

Drew Meren

Title:

Sr. Account Manager

Date:

November 15th 2023

Trial Balance
Agency for Brooke Dubowik
Town of Hudson, NH
July 2023, GL Year 2024 - October 2023, GL Year 2024

Account Number	Beginning Balance	Total Debits	Total Credits	Ending Balance
General Fund				
01-0000-1312-000-505	-11,441.50	0.00	635.00	-12,076.50
01-0000-1350-000-000	-1,746.73	6.17	42.84	-1,783.40
01-0000-1350-000-188	-1,250.00	2,313.03	1,100.00	-36.97
	<ENC>	2,313.03	2,313.03	0.00
01-0000-1350-000-303	-101.69	0.00	0.00	-101.69
01-0000-1350-000-304	-162.22	154.02	0.00	-8.20
	<ENC>	154.02	154.02	0.00
01-0000-1350-000-369	-70.00	0.00	0.00	-70.00
01-0000-1350-000-511	-6.17	6.17	0.00	0.00
01-0000-1350-000-512	-1,704.41	0.00	0.00	-1,704.41
01-0000-1350-000-529	-3,387.18	3,097.42	0.00	-289.76
	<ENC>	3,097.42	3,097.42	0.00
01-0000-1350-000-532	-1,925.66	0.00	0.00	-1,925.66
01-0000-1350-000-544	-166.10	0.00	0.00	-166.10
01-0000-1350-000-547	-328.04	0.00	975.00	-1,303.04
	<ENC>	1,274.01	0.00	1,274.01
01-0000-1350-000-550	0.00	2,308.06	8,165.00	-5,856.94
01-0000-1350-000-551	0.00	3,237.90	2,308.06	929.84
	<ENC>	2,695.14	3,600.00	-904.86
	<ENC>	3,519.87	2,695.14	824.73
01-0000-1350-000-852	-543.75	0.00	0.00	-543.75
01-0000-1350-000-856	-2,516.82	0.00	0.00	-2,516.82
01-0000-1350-000-871	-10.00	10.00	0.00	0.00
01-0000-1350-000-886	-210.00	0.00	0.00	-210.00
01-0000-1350-000-893	-258.16	0.00	0.00	-258.16