Town of Goffstown, New Hampshire

Request for Proposals

Town-Wide Photogrammetric Mapping Project

March 6, 2012

1. General Introduction

The Town of Goffstown, New Hampshire is seeking proposals from qualified firms for the development of a town-wide photographic land base map. Funding of this project is subject to passage of the Town budget at the March 13th Town meeting. Major tasks involved with this project include color aerial photography, ground control, planimetric mapping, topographic mapping, and digital orthophotography. Provided in the remainder of this RFP are detailed specifications related to the project. Sealed proposals will be received until 2pm Wednesday March 21, 2012 at which time proposals will be opened and publicly read. The Town reserves the right to reject and/or waive any proposals if deemed in the best interest of the Town.

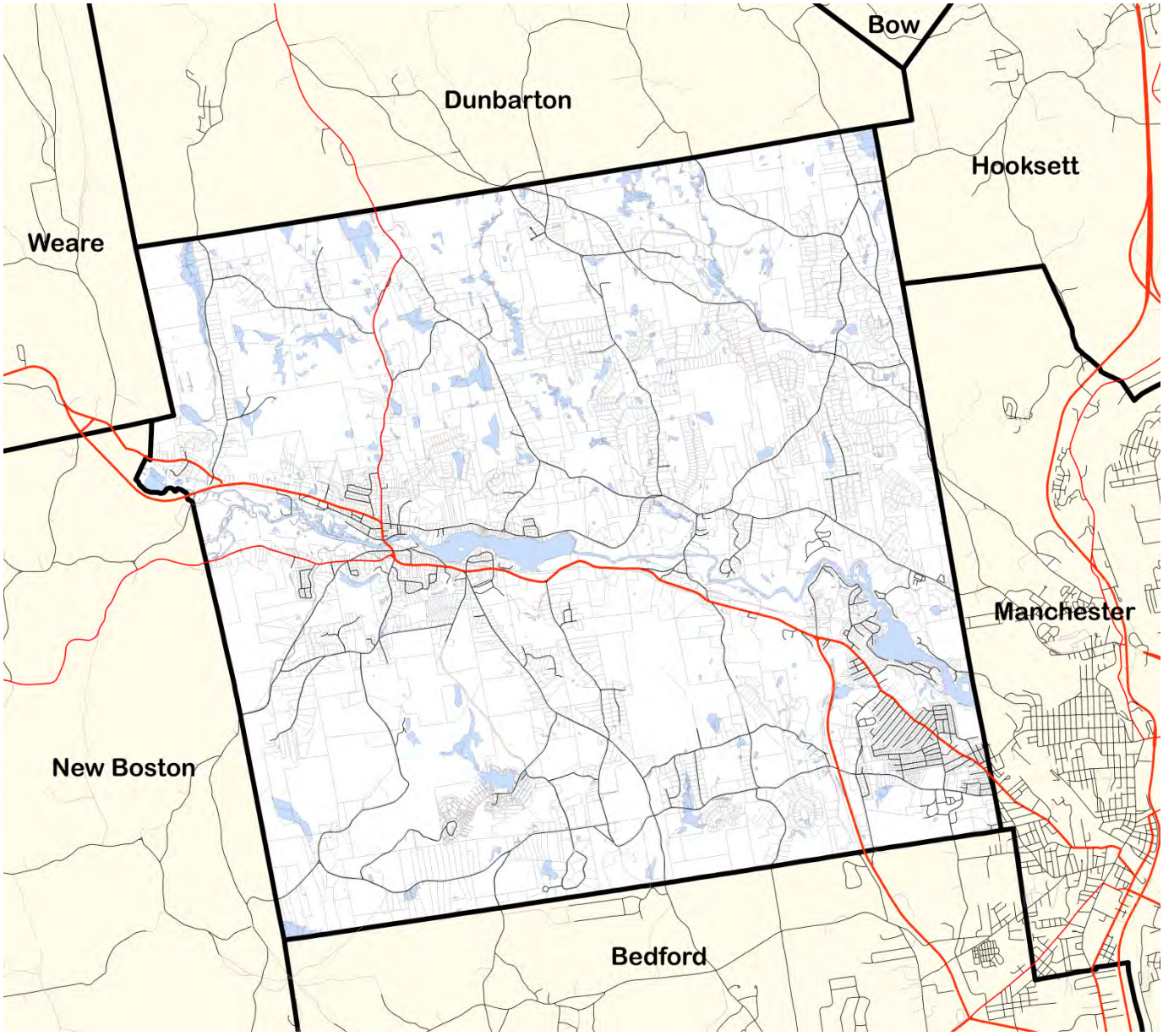
All deliverable products of this work will be the property of the Town of Goffstown. The Town of Goffstown will have the right to sell or freely distribute the products in accordance with state and federal law.

2. Project Area

The project area includes the entire Town of Goffstown, New Hampshire, 500-feet beyond town borders. Facts about Goffstown include:

- Approximate Total Area in Square Miles: 37
- Approximate Population: 18,000

  Number of Parcels 6705


Bow
Dunbarton
Hooksett
Weare
Manchester
New Boston
Bedford

3. General Scope of Work

In general, the scope of work for this project will consist of developing planimetric mapping, topographic mapping, and digital orthophotography that meets 1”=100’ scale ASPRS mapping standards, for the entire project area. The anticipated scope items for this project include:

- Color aerial imagery acquisition at a suitable resolution to support development of planimetric mapping that meets 1”=100’ scale ASPRS standards and production of 4” orthophotography.
- Ground Control and Aerotriangulation
- Planimetric Mapping
- Topographic Mapping (2-foot contours)
- Digital Orthophotography (3 or 4-inch pixel resolution)

Final planimetric and topographic mapping files will be delivered in AutoCAD and ESRI Geodatabase format. Digital Orthophotography will be delivered in TIFF and SID file format.

Alternate proposals are acceptable if they can provide the same or better results without negatively impacting project cost.

These services, as detailed herein, shall be conducted in a manner which meets or exceeds the minimum performance criteria identified in Section 4, below.

4. Minimum Performance Criteria

The work shall conform to the following minimum performance criteria:

1. All mapping shall meet ASPRS and National Map Accuracy standards for 1"=100' mapping.
2. Photogrammetric project work will be accomplished under the direct supervision of a photogrammetrist certified by the American Society of Photogrammetry and Remote Sensing (ASPRS). The photogrammetrist shall make maximum utilization of his/her professional experience to select the technique or methods conducive to superior results.
3. Survey work shall conform to the Procedural and Technical Standards for the practice of land surveying in New Hampshire. Ground survey control for the project will be accomplished under the direct supervision of a Professional Land Surveyor registered to practice in the State of New Hampshire.
4. Horizontal datum shall be the New Hampshire State Plane Coordinate System NAD83 (feet). Vertical datum shall be National American Vertical Datum of 1988 (NAVD).
5. Contractor must propose and adhere to an aggressive project schedule.

5. Detailed Specifications

Outlined in this section are detailed specifications related to the project.

5.1. Digital Aerial Imagery Acquisition

Digital aerial imagery shall be acquired for the project area. The contractor shall develop a flight plan that abides by applicable standards of the American Society for Photogrammetry and Remote Sensing (ASPRS). This flight plan, including proposed control points, shall be includes in the proposal.

Unacceptable coverage resulting from deviation from the approved flight plan shall be corrected at the contractor's expense. The photography must meet prescribed specifications of ASPRS for scale, overlap, crab, tilt, and other standard requirements necessary to support the development of mapping that meets 1"=100' scale ASPRS accuracy standards. These specifications must be stated in the contractor's proposal.

The flight shall occur during the Spring of 2012 under optimal conditions of high sun angle (greater than 45 degrees), no snow, no cloud cover, and full defoliation.

Upon completion of the aerial photography mission, the photography shall be inspected for cloud shadow, density and clarity. The photographs will then be checked for sidelap, endlap and crab. A QC summary report shall be provided to the Town.

Deliverable Products

a. Aerial Camera A copy of the current camera calibration report.

b. Flight Plan/Boundaries The flight plan and boundaries, including control layout, shall be provided with the proposal on a single sheet plotted to scale.

c. Digital Products: One set of digital imagery files on a portable hard drive.

d. Photo QC summary report A quality control report produced during review of the film (if applicable).

5.2. Ground Control and FAAT

The contractor shall be responsible for establishing and surveying both horizontal and vertical control required to develop mapping that meets Class 1 ASPRS standards for 1"=100' scale mapping. If adequate, Airborne GPS can be used on this project. The contractor shall state the number of ground control points that will be acquired in the proposal.

The Contractor shall provide the Town with a ground control report, control diagrams, and other applicable deliverables as outlined in *Deliverable Products.*

Deliverable Products

a. Ground Control and Aerotriangulation Report
b. FAAT Solution Tables
c. 8 ½" X 11" sketches of all control points.

5.3. Planimetric Mapping

A planimetric land base, for the entire Project Area, will be developed and compiled digitally using stereo-photogrammetric methods. All mapping shall comply with National Map Accuracy and ASPRS standards for 1”=100’ scale mapping.

Data developed as part of this process will be integrated with the Town’s GIS system. Therefore, procedures to ensure that planimetric data is topologically structured, edge-matched, and include proper line styles must be followed.

In general, the features to be captured are outlined below. A detailed list of data layers and associated layer design is provided in Table 2.

Table 1
Features to be Captured as Part of the Aerial Mapping Project

Building Features Buildings, Out Buildings, Mobile Homes, Swimming Pools, Foundations, Decks and Porches, Building Fire Walls
Hydrographic Features Rivers, Streams, Ponds and Lakes, Wetlands, Ditches, Culverts, Dams
Transportation Features Roads, Road Centerlines, Street Names, Bridges, Trails, Railroads, Sidewalks, Guardrails, Parking Areas, Driveways
Boundary Features Cemeteries, Town Border, Stone and Retaining Walls, Fences
Vegetation Features Tree/Vegetation Lines, Hedge Rows, Street Trees
Recreation Features Parks and Playgrounds, Recreation Areas, Field Outlines, Golf Courses
Utility Features Utility box, Street Lights, Utility Poles, Towers, Signs, Signals
Miscellaneous Features Smoke Stacks Silos, Storage Tanks, Monument Locations

The Contractor will be required to follow a topologically-structured layering/database design that will allow the Town to easily integrate this data with GIS. Buildings, ponds, wetlands, driveways, two-sided rivers and streams, pools, and paved parking shall be automated to allow polygon creation. These and all other polygons that do not close to themselves, shall contain a label in the visual center of the polygon.

All line and polygon features must be continuous, unexploded, unformatted, polylines and contain X, Y, and Z coordinates at each vertex.

A single x,y,z coordinate pair shall be placed at the visual center of all point features.

All tiles must be edge-matched visually and by coordinate reference with adjacent tiles. The connectivity of line, area, and polygon data must be mathematically exact. No "overshoots", "undershoots," or "offsets" are permitted. Lines and graphic entities that intersect must digitally integrate exactly.

The Contractor shall use a 1”=100’ scale tiling system that will be provided by the Town. The Town will provide a copy of the tiling system to the selected contractor.

Features to be captured, associated layer names, and topology standards are as outlined in Table 2.

The Contractor shall complete a pilot project consisting of two maps. The Contractor shall then meet with the Town to review the pilot project. The Contractor shall also provide monthly progress reports noting what has been accomplished during the reporting period.

Deliverable Products

a. Pilot project consisting of two map sheets.

b. Digital Data Files - All maps and databases shall be prepared in formats suitable for running in AutoCAD Release 2008 (.DWG) format. Data to be captured, and associated layer design, is detailed in Table 2.

c. Check Plots - 1" = 200" scale paper plots of all planimetric and topographic features identified, with a 20" x 30" neat area shall be provided for QC purposes. The Town will use these to provide comments and corrections to mapping contractor. The mapping contractor will be responsible for the development of a title block.

d. Monthly progress reports.

5.4. 2-Foot Contours

Two-foot contours and spot elevations shall be developed for the Project Area. All topographic data must meet ASPRS accuracy standards for 1”=100’ scale mapping.

Contours shall be continuous and shall conform to the database design outlined in Table 3. Where contours intersect with buildings, the contour line shall continue through the building. The section of contour that resides inside the building shall be “cut out” and placed on a separate layer as described in Table 3.

If this option is selected, contours shall be depicted on all planimetric check plots.

Deliverable Products

a. Pilot project consisting of two map sheets.

b. Digital Data Files - All maps and databases shall be prepared in formats suitable for running in AutoCAD Release 2008 (.DWG) format. Data to be captured, and associated layer design, is detailed in Table 3.

5.5. Digital Orthophotography

Color digital orthophotography shall be developed for the project area. Digital orthophotography must meet ASPRS mapping accuracy requirements for 1”=100’ scale mapping and must be configured in the same tile units as planimetric mapping. The Contractor shall abide by applicable standards for developing digital orthophotography, reducing shadows and building lean, and correction of errors.

Digital orthophotography will be generated with at least a 4-inch foot pixel resolution and delivered to the Town in georeferenced TIFF and SID file formats. Tile layout shall match planimetric tile layout as specified above.

Proposer shall state the proposed scanning resolution for each orthophoto option in the proposal.

Deliverable Products

a. Pilot project consisting of two map sheets.

b. Digital Data Files – 4-inch pixel resolution orthophotos delivered in TIFF and SID file format.

5.6. Geodatabase Formatting

The Town may consider the delivery of planimetric mapping data in Geodatabase formatted based on a geodatabase design agreed to by the Town and the selected contractor. Buildings, ponds, wetlands, driveways, two-sided rivers and streams, pools, and paved parking shall be automated as polygons. All other layers shall be automated as points, lines, and annotation as applicable.

The exact Geodatabase design of ESRI-based deliverables will be agreed to by the Town and the selected Contractor. However, it will be similar to the AutoCAD-based layer design provided on Tables 2 and 3.

6. Format of Proposals

The Town is seeking proposals for this effort. The proposals shall be no longer than 20 pages and include the following:

a. Introduction

   i. Introduction to the firm and statement of Firm's financial status.

   ii. Agreement to incorporate both this RFP and the proposal into an Agreement to be negotiated in good faith**.**

   iii. Statement that the firm will commence with aerial photography upon notice-to-proceed.

   iv. Statement of any proposed subcontractors.

b. Scope of Services

   i. Concise Scope of Work

   ii. Statement detailing any exceptions to the RFP.

   iii. Statement of aerial imagery acquisition process including type of camera, anticipated number of exposures, photo scale/resolution, flight altitude, number of bands, forward and sidelap percentage, maximum crab and tilt, minimum sun angle, and pixel resolution.

   iv. Include map of proposed flight plan labeled with proposed ground control points.

   v. Statement of ground control and FAAT process and standards including number of anticipated ABGPS and ground control points.

   vi. Statement of acceptance (or exceptions) of planimetric and topographic mapping specifications provided.

vii. Statement of digital orthophotography deliverables including pixel resolution and scanning resolution.

viii. Statement of accuracy standards that will be adhered to.

ix. Statement of where work will be completed.

x. Statement on Geodatabase formatting.

xi. Statement of proposed schedule for all phases.

c. Related Experience

i. Brief descriptions of and references for four similar projects.

ii. Qualifications Statement

d. Staffing Plan

i. Brief description of staffing plan including project manager, key staff, and sub contractors.

e. Alternatives

i. Descriptions of alternatives.

f. Price Proposal

i. Price proposal for 100-scale mapping using provided price forms.

Costs provided shall be valid for a period of six months from proposal opening and are subject to Town funding approval.

7. Contact Information and Proposal Submittal

Questions and proposals shall be directed to:

Neil Funcke
IT Director
Town of Goffstown
16 Main Street
Goffstown, New Hampshire 03045
603-497-8990 x 101

Proposals shall be submitted to:

Selectmen's Office
Town of Goffstown
Goffstown Town Hall
16 Main Street
Goffstown, New Hampshire 03045

No pre-proposal meeting will be held. All Proposers are encouraged to call with questions.

All proposals in response to this RFP must be received in a sealed envelope and clearly marked "**GOFFSTOWN AERIAL MAPPING PROPOSAL"** by 2 PM on Wednesday March 21st, 2012 to be eligible for consideration.

The Town requests that a TWO copies of the proposal be submitted.

If it becomes necessary to revise any part of the RFP, an addendum will be posted on our website.

The Town of Goffstown assumes no responsibility or liability for costs incurred by Proposers in responding to this RFP or in responding to any further request for interviews, additional data, etc.

The proposal shall be signed by an official authorized to bind the offer and shall contain a statement to the effect that the proposal is a firm offer for a ninety (90) day period from opening.

The Town reserves the right to reject any or all proposals, to waive any non-material irregularities or information in any RFP, and to accept or reject any item or combination of items.

The completion of this project is subject to funding approval at Town Meeting to be held on March 13, 2012.

8. Selection Criteria

The contract will be awarded to the responsive contractor submitting the most advantageous proposal to the Town of Goffstown. The following minimum criteria shall be used in the evaluation.

- Reputation of Firm
- Cost and Schedule
- Experience on Similar Projects
- Personnel
- Optional and Variants Proposed
- Apparent Financial Status

9. Schedule

Project schedule is estimated to be as follows:

1.	Proposals Available	March 6th, 2012
2.	Proposals Due	March 21th, 2012
3.	Approximate Notice to Proceed	March 27th, 2012

10. Alternative Approaches

Any alternative approaches or pricing options can be described in an "Alternative Approach" section of the proposal and/or can be itemized in the cost form.

Table 2
Goffstown Planimetric Layer Specification

Building Features

Description	Layer	Topology	Comments
Buildings-General	BLDG_GEN	Polygon	All residential, commercial, industrial, and institutional buildings
Out Buildings	BLDG_OUT	Polygon	Out buildings such as sheds, detached garages, carports, etc.
Mobile Homes	BLDG_MH	Polygon	All visible mobile homes
Above Ground Pools	BLDG_POOL_AG	Polygon	All visible above ground swimming pools
In-Ground Pools	BLDG_POOL_IG	Polygon	All visible in-ground swimming pools
Foundations	BLDG_FDTN	Polygon	All visible foundations and ruins.
Building Fire Walls	BLDG_WALL	Line	All discernible fire walls, common walls, and roof breaks
Decks and Porches	BLDG_DECK BLDG_DECK_PT	Polygon Point	All visible decks with label point in visual center

Hydrographic Features

Description	Layer	Topology	Comments
Rivers	WAT_RIVER	Line/ Polygon	Collect all rivers.
Streams and Brooks	WAT_STREAM	Line/ Polygon	As visible. Use double lines of width greater than 10'.
Intermittent Streams	WAT_STREAM_INT	Line	Visible intermittent streams.
River/Stream Text	WAT_RIV_TXT	Annotation	Include river and stream names as text.
Ponds and Lakes	WAT_POND WAT_POND_PT	Polygon Point	Closed, permanent bodies of water. Label point in visual center of each water body.
Pond/Lake Annotation	WAT_POND_TXT	Annotation	Include lake and pond names as text.
Wetlands	WAT_WETLANDS WAT_WETLNDS_PT	Polygon Point	Delineate areas of moist soils where patchy vegetation, marshes, swamps, and other small pools of standing water are characteristic. Layer consists of polyline and wetland symbols. Label point in visual center.
Ditches	DITCH	Line	All visible drainage ditches.
Culvert	CULVERT	Line	All visible culverts.
Dams	WAT_DAM	Line	Visible dams, including beaver dams.

Transportation Features

Description	Layer	Topology	Comments
Paved Street Pavement Edge	RD_EDGE	Line Polygon	All edges of street pavement including alley ways. Pavement edges must be continuous and should not break at driveways, parking lots or other features.
Unpaved Street Edge	RD_EDGE_UNPAV	Line Polygon	All unpaved street edges. Edges must be continuous and should not break at driveways, parking lots, etc.
Street Annotation	RD_TEXT	Annotation	Include road names as text placed in the center of the traveled way.
Bridge	RD_BRIDGE RD_BRIDGE_PT	Polygon Point	Show limits of bridge structures. Label point in visual center of all bridges.
Paved Street Centerline	RD_CL_PAVED	Line	Compile visual center of paved streets. Psuedonodes must be placed at all intersections.
Unpaved Street Centerline	RD_CL_UNPAVED	Line	Compile visual center of unpaved streets. Psuedonodes must be placed at all intersections.
Trails and Paths	TRAIL	Line	Identify all visible pedestrian and bicycle trails.
Sidewalks	RD_SDWLK	Line	Front and back of sidewalk. If front of sidewalk is coincident with curb or road feature, road features take precedence.
Walkways	RD_WALKWY	Line	Walkways including from a road to a house or a driveway to a house.
Guardrails	RD_GUARD	Line	All visible guard rails.
Paved Parking Areas	PARKING_PV PARKING_PV_PT	Polygon Point	Identify all areas that have more than five parking spaces. All of these features must be labeled with “PK” the visual center of the lot.
UnPaved Parking Areas	PARKING_UPVD PARKING_UPVD_PT	Polygon Point	Identify all areas that have more than five parking spaces. All of these features must be labeled with “PK” the visual center of the lot.
Paved Driveways	DRIVEWAY DRIVEWY_PT	Polygon Point	Identify all public and private paved driveways. All to contain a label at the visual center of the driveway.
Unpaved Driveways	DRIVEWAY_UPV DRIVEWAY_UPV_PT	Polygon Point	Identify all public and private unpaved driveways. All to contain a label at the visual center of the driveway.
Railroads	RAILROAD	Line	Railroad Lines

Boundary Features

Description	Layer	Topology	Comments
Cemetery	CEMETERY	Polygon	Indicate approximate boundaries of cemeteries.
Cemetery Text	CEMETERY_TXT	Annotation	Include cemetery names as text. Any cemetery with no name shall contain the label ”CEM” in the visual center.
Town Border	BOUNDARY	Polygon	Town borders.
Town Border Text	BOUNDARY_TXT	Annotation	Town Names as annotation.
Stone Wall	WALL_SW WALL_SW_LN	Line	Identify all visible stone walls which appear to define property boundaries. A copy of this layer without the stone wall line type is to be copied to the LN layer.
Retaining Walls	WALL_RET	Line	Identify all visible retaining walls.
Fence	FENCE	Line	Identify all visible wooden, chain link, and other fences.

Vegetation Features

Description	Layer	Topology	Comments
Tree Lines/Veg Areas	VEG_AREA VEG_AREA_PT	Polygon Point	Identify all tree lines and vegetation areas. All must be labeled in the visual center.
Cultivated Fields	VEG_FIELD VEG_FIELD_PT	Polygon Point	Identify all discernible cultivated fields. All must contain label in visual center.
Hedge Rows	VEG_HEDGE VEG_HEDGE_LN	Line	Identify all visible hedge rows that appear to define property boundaries. A copy with no vegetation line type should be copied to the LN layer.
Point Trees	VEG_TREE	Point	Identify all street and landmark trees.

Recreation Features

Description	Layer	Topology	Comments
Parks and Playgrounds	PARKS	Polygon	Show approximate boundaries of park areas.
Park and Playground Text	PARK_TXT	Annotation	Include park and playground names as text in the visual center. Any park without a name must be labeled as "PARK".
Recreation Areas	PARK_REC_AREA PARK_REC_TXT	Polygon	Show outlines of all baseball and football fields, playgrounds, tennis courts, tracks, and other play areas.
Golf Courses	PARK_GOLF	Polygon	Show approximate boundaries of golf courses, greens, and fairways.

Utilities

Description	Layer	Topology	Comments
Street Lights	UTIL_ST_LIGHT	Point	Locate all visible public and private street lights.
Utility Poles	UTIL_POLE	Point	Locate all visible utility poles.
Transmission Poles	ELEC_TRAN_POLE	Point	Locate all cross country transmission poles.
Transmission Lines	ELEC_TRAN_LINE	Line	Locate all cross-country power lines.
Power Substations	ELEC_SUBSTA	Polygon	Locate all power substations.
Tower	UTIL_TOWER	Point	All communications towers (radio, cell, etc.) and large satellite dishes.
Tank	TANK	Polygon	Locate all water tanks, propane, and other tanks.
Sign	UTIL_SIGN	Point	Identify all visible street signs.

Miscellaneous Features

Description	Layer	Topology	Comments
Smoke Stack Silos	MISC_SMOKE	Point	Locate all Smoke Stacks.
Storage Tanks	MISC_TANKS	Polygon	All Visible Storage Tanks
Monument Locations	MISC_MONUMENTS	Point	Locate all Monuments

Table 3
Goffstown Photogrammetric Database
Topographic Specification

Topographic Data

Description	Layer	Topology	Comments
Index Contours	TOPO_IDX_CON	Line	Indicate all index contours.
Index Contour Cut Outs	TOPO_IDX_CUT	Line	Indicate all contour cut outs (contours that run through buildings)
Intermediate Contours	TOPO_INT_CON	Line	Indicate all intermediate contours
Intermediate Contour Cut Outs	TOPO_INT_CUT	Line	Indicate all contour cut outs (contours that run through buildings)
Approximate Intermediate Contours	TOPO_INT_APP	Line	Indicate all approximate intermediate contours
Approximate Index Contours	TOPO_IDX_APP	Line	Indicate all approximate index contours
Index label	TOPO_IDX_LAB	Annotation	Label for index contours
Spot Elevation Markers	TOPO_SOPT_ELEV	Point	Spot Elevations
Spot Elevation Labels	TOPO_SPOT_LAB	Text	Spot Elevation Labels.

Town of Goffstown, New Hampshire
Town-Wide Photogrammetric Mapping Project
Price Proposal - 100-Scale

Prices include services as specified in RFP.
Task numbers are coordinated with RFP scope items.

Photogrammetric Mapping Price Proposal

5.1 Flight and Aerial Photography	$_____
5.2 Ground Control and FAAT	$_____
5.3 Planimetric Mapping	$_____
5.4 Topographic Mapping	$_____
5.5 Digital Orthophotography	$_____
5.6 Geodatabase Formatting	**$_____**

Project Total Cost: **$_____**

Comments:

Name of Firm: _____

Authorized Signature: _____

Printed Name: _____

Date: _____

General Specifications for Each Task (Use 1 Extra Page if Necessary)