

**PROPOSED INTERSECTION IMPROVEMENTS  
SOUTH MAIN STREET AT DEPOT STREET  
MILFORD, MASSACHUSETTS**

**SURVEY SCOPE OF SERVICES  
November 2, 2021**

The SURVEYOR shall provide surveying services to the ENGINEER, in conformance with the following:

1. The survey limits are as shown in Figure 1 as attached herewith.
2. Horizontal control shall be based on the Massachusetts State Plane Coordinate System (MCS), Mainland Zone, referenced to the North American Datum Of 1983 (NAD83).
3. Establish coordinated and closed traverse for all streets within the project limits, by means of an on-the-ground instrument survey of existing monumentation. The traverse will be looped to existing traverse(s) and/or monumentation where possible. The final balanced traverse shall be shown on the plans as well as a description of the traverse points. When performing work on a state or county layout, or when a state or county baseline exists, the baseline shall be reestablished and shown on the plan. All baselines of record shall be shown on the final plans with ties (bearing and distance) to all existing monumentation. A description of the monument and the point on the monument used as the control point for the tie (i.e., drill hole, back center, etc.) shall be labeled on the plan. Baseline stationing, bearings, distances and curve data shall be shown on the baseline.
4. Establish the existing right-of-way (ROW) for all streets within the project limits. The ROW shall be established from State/County/Town record plans, existing monumentation located during the survey and any necessary deed research of abutting properties. Label all existing ROW with bearing, distance and curve data, date, type of layout (State/County/Town), layout number and denote public or private way. Copies of all backup materials used in the establishment of all ROW (i.e. plans, deeds, etc.), shall be provided to MDM Transportation Consultants, Inc.
5. Monuments used in the re-establishment of the ROW shall be labeled on the plans as "HELD" along with description of the monument and the point on the monument held (i.e., drill holes, back center, etc.). A tie course between monuments held shall be shown on the plans and labeled with a bearing and distance. Any monument not used to re-establish the ROW shall be labeled "FND" along with a description of the monument.
6. Establish the location of existing town boundary lines separating abutting municipalities within the project limits. Town lines (not ROW lines) shall be established from existing monumentation, plans and/or other record information. Label on the plan the name(s) of the respective municipalities.
7. Establish the location of existing property lines separating abutting properties within the project limits. Property lines (not ROW lines) may be established from plans and/or other record information. Label on the plan the owner of record for each abutting property and the book and page of the deed reference; these may be obtained from the assessor's office.
8. Establish any and all utility (water, sewer, electric, etc.) and/or usage easements within the project limits. Label all easements with bearings, distances, curve data and type of easement, along with book and page of the deed reference. Copies of all backup materials used in the establishment of all easements (i.e. plans, deeds, etc.), shall be provided to MDM Transportation Consultants, Inc.

9. Locate all existing subsurface utilities (water, sewer, drain, gas, telephone, cable TV, etc.) from field investigation and from plans available at the Town, utility companies or other sources as required. Indicate on the plan the size of water, sewer, drainage and gas utility lines as well as the size of any underground utility vaults. Rim grades of all utility structures shall be established and shown on the survey plans. Include invert elevations for both drainage and sewer systems.
  
10. Establish existing topography for the project limits **based on the North American Vertical Datum of 1988 (NAVD88)**. Provide spot elevations of existing topographic features. Benchmarks shall be established at a minimum of every 500 feet throughout the project limits and shall be shown on the survey plan. A minimum of two (2) benchmarks shall be provided for projects less than 500 feet in length. Benchmarks shall be PK nails or railroad spikes in existing utility poles.
  
11. Locate and plot existing surface features. All surface features shall be located by means of an on-the-ground instrument survey. Surface features shall include, but not be limited to:
  - Traverse with control points
  - sidewalks and walkways (denote material)
  - curbing/berms (denote type)
  - driveway openings (denote material)
  - utility poles, guy wires and light poles (denote pole number)
  - utility structures (drain, sewer, electrical, telephone, etc.)
  - ROW/monumentation (label as per #5 above)
  - edge of pavement
  - edge of wooded areas
  - walls (denote material, type and height)
  - bridge abutments, wing walls, parapet walls and support columns, etc.
  - fences (denote material, type and height)
  - all building fronts within 75 feet of the edge of roadway
  - house numbers and/or business names
  - trees six inches (6") or greater in diameter and located within wooded areas (denote species and trunk diameter in inches)
  - trees two inches (2") or greater in diameter and located within open areas including yards, fields and landscaped areas (denote species and trunk diameter in inches)
  - brush/shrubs/planting beds
  - hydrants, water gates and gas gates
  - traffic signal equipment, mast arms, span wire, signal heads, control cabinets, pull boxes
  - signs (denote the sign text and/or description)
  - edges/banks of resource areas including streams, brooks, ponds, etc. within 100 feet of the ROW (denote flow direction as applicable)
  - drainage swales, ditches, etc. within 100 feet of the ROW (denote flow direction)
  - wetland resource area flagging within 100 feet of the ROW
  - guard rail
  - railroad tracks
  - culverts
  - mailboxes
  - pavement markings (denote size, type and color)
  
12. Spot grades shall also be provided at all low points, at all building entrances and at any abrupt changes in elevation, as determined by the surveyor.

13. Provide centerline “profile” grades for all walkways from back of sidewalk to building face. At all driveways provide driveway edge line and center line grades for a distance of 35 feet beyond the edge of the roadway, unless otherwise noted on Figure 1.
14. Provide Autodesk Civil 3D (2018 Version) generated contours at a one (1’) foot contour interval in accordance with the following:

**Creation of a Surface**

An accurate surface shall be created and edited to provide accurate Civil 3D-generated contours. The surface shall be created using all survey points and necessary breaklines. Breaklines shall be created at the crown line of the roadway, edge of roadway, top of curb, bottom of curb, buildings, top or bottom of slopes, streams, driveway edge lines or any other area where there is a break in terrain.

**Editing of the Surface**

Contours shall be edited by editing the surface and recreating the contours; manually editing the contours by any other method will not be acceptable.

15. In no instance shall Right of Way lines or baselines be trimmed to allow placement of text. Trimming of other lines is permitted but should be avoided whenever possible.

**Items to be provided to MDM Transportation Consultants, Inc.:**

1. One 1"=20' scale Mylar roll plan showing all existing topographic features, right-of-way, baselines, monumentation and base line ties, stamped by a registered professional land surveyor, registered in the Commonwealth of Massachusetts. Cut sheets or multiple roll plans are acceptable provided each sheet is stamped by a professional land surveyor, registered in the Commonwealth of Massachusetts. The surveyor shall provide a draft version of this plan to MDM Transportation Consultants, Inc. for review and comment.
2. A Civil 3D (2018 Version) drawing file prepared in accordance with the above.
3. All TIN files, point files, alignment files, breakline files and any other Civil 3D generated files.
4. Copies of the following:
  - All backup materials used in the establishment of all ROW and easements (i.e. plans, deeds, etc.)
  - All backup materials used to establish the property lines and owners of record
  - All record plans used to locate underground utilities as well as contact information (names, addresses, phone numbers, etc.) for each utility



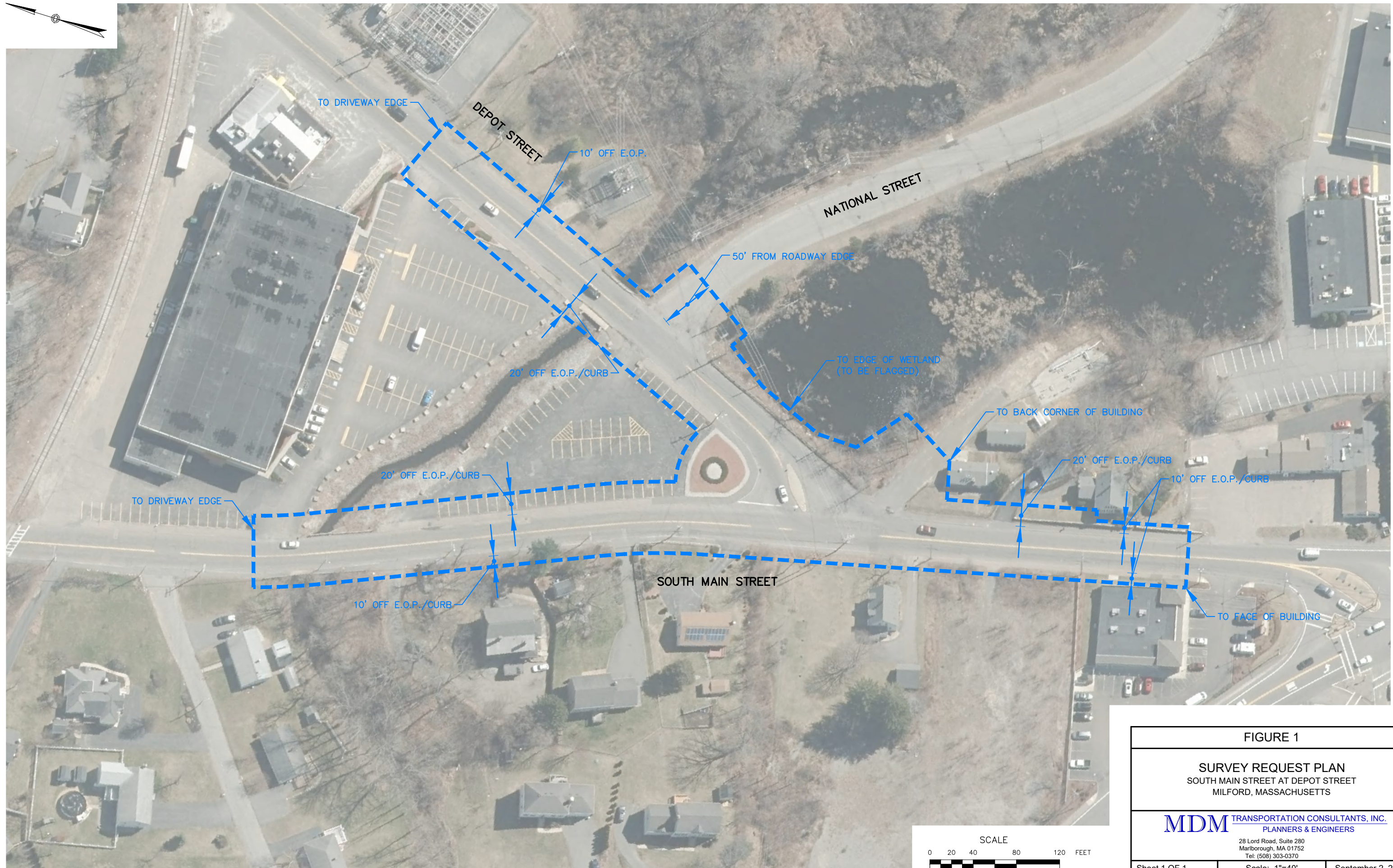
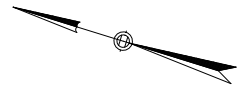


FIGURE 1

**SURVEY REQUEST PLAN**  
 SOUTH MAIN STREET AT DEPOT STREET  
 MILFORD, MASSACHUSETTS

**MDM** TRANSPORTATION CONSULTANTS, INC.  
 PLANNERS & ENGINEERS

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Sheet 1 OF 1	Scale: 1"=40'	September 2, 2021
Project No. Milford (Amazon)	File Name: Survey Request Plan.dwg	