

Work Type Definition and Submittal Requirements

6.10 Ground Penetrating Radar (GPR) Survey

Work Type Definition

Pages 1-2 details the work type definition. In order to become *pre-qualified* for this work type, please see the “Work Type Submittal Requirements” on page 3-4.

I. Description

Investigations using Ground Penetrating Radar (GPR) to identify the material layer profile and thicknesses as requested by the Engineer (or Project Manager) and establish the characteristics of the subsurface materials when requested. Examples of "characteristics" may include pavement types, layers, and distresses (delamination, stripping, cracking, etc). Note: GIS Locations of the GPR data will also be required via GPS data collection.

II. Standards and Specifications

Standards and specifications required for a project under this work type may include the following:

A. All tasks will be performed in accordance with current ASTM, AASHTO, and MnDOT standards and specifications or approved by MnDOT engineers. All MnDOT GIS data must be supplied in:

- UTM coordinates;
- NAD 83;
- GRS 80;
- Horizontal units = meters; and
- Vertical Units (if used) = feet

GIS data may be in either **ARC/INFO** coverages or **ArcView** shapefiles. **No other formats will be accepted.** Coverages may be transmitted in **ARC/INFO** interchange (*.e00) file format. Horizontal positions must be within "sub-meter" accuracy, unless otherwise specified.

III. Provided By MnDOT

Information to be supplied by MnDOT for a project may include the following:

- A. A written description of the purpose (and desired depth) of the GPR investigation.
- B. Project Limits: Trunk Highway Number (TH#), beginning and ending Reference Points, description of which lanes, shoulders, and / or miscellaneous areas to investigate.
- C. Available plans showing estimated pavement layer thickness (or other areas of interest as specified per project), alignments and reference posts.
- D. Available information (plans) showing pavement layer material properties.
- E. American Society for Testing and Materials (ASTM), American Association of State Highway & Transportation Officials (AASHTO), and MnDOT Standard Specifications.

IV. Provided by Consultant

Deliverables to be supplied by the consultant for a project may include the following:

- A. Spreadsheet(s) containing the subsurface information specified with GPS and MnDOT log point system coordinate information at the beginning and end of the project, at intervals as specified, and at every change in layer thickness more than 1 inch.

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- B. Graphical Radar images with descriptions (i.e., noting anomalies, etc.) representing typical material layer configurations, and where significant subsurface anomalies are visible in the radar data
- C. Material identification and layer thickness determined from the in-situ testing must also be included in the spreadsheet(s) at the corresponding location(s). Location information to be submitted in MnDOT specified format.
- D. All GPR data collection files, including calibration files, delivered on a formatted, labeled CD.
- E. Written notes and progress reports generated during the testing.
- F. GPS Location Data, corresponding to GPR findings and images.
- G. A spreadsheet showing the pavement layer thickness at intervals as specified by MnDOT.
- H. GPR images or CADD drawings showing typical layer profiles and materials found.
- I. GIS data
- J. A copy of the subsurface material information.
- K. Weekly progress reports, including daily schedules.

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Work Type Submittal Requirements

A consultant firm becomes pre-qualified based on the qualifications of the personnel that are employed by the firm and by meeting the demonstrated requirements.

Key Personnel Requirements	
Minimum Number of Staff:	<ul style="list-style-type: none"> • At least two individuals with the proper qualifying experience
Professional Certification/Licensure:	<ul style="list-style-type: none"> • None required
Work Type Submittal Requirements*	
<p>I. Resume and Relevant Project Experience Form (Form PQ1)</p> <p align="center"><i>Submit in Word format</i></p>	<p>A. Complete Parts 1, 1A, 2 and 3 of Form PQ1</p> <p><u>Part 1:</u> Fill out general information and names of personnel</p> <p><u>Part 1A:</u> Experience of qualified personnel must meet the following:</p> <ol style="list-style-type: none"> 1. Qualified supervisor in charge of field investigations must have a minimum of two years experience in the GPR data collection activities required. 2. At least one qualified employee must have minimum two years experience in GPR data analysis and be able demonstrate her/his knowledge on basic GPR principles. 3. The Author of the technical reports must also have a minimum of two years of experience interpreting field investigation data and composing technical reports. 4. Experience of the qualified staff must be demonstrated by reference to 2 completed projects within the last two years. <p><u>Part 2:</u> Project Examples listed must correlate to those described below in “Project Example Requirements.”</p> <p><u>Part 3:</u> Provide equipment list meeting the following requirements:</p> <ol style="list-style-type: none"> 1. GPR and GPS equipment must have a high-speed data acquisition system, which allows data collection at a normal highway speed (minimum 45 mile per hour). 2. GPR equipment must be able to provide continuous pavement layer profiles. 3. GPS receivers must have a minimum of "sub-meter" accuracy. Applicant must document how accurate the Horizontal positions are for their equipment as listed. 4. Equipment and software utilized to provide information such as pavement thickness within 10 percent accuracy.

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II. Project Example Requirements <i>Submit in PDF format</i>	A. One example of a technical investigation / final report must be submitted representing the Qualified Staff
<p style="text-align: center;">*Work Type Submittal Instructions:</p> <p>Create a CD or flash drive that includes the following individual files or folders in this order:</p> <ul style="list-style-type: none">I. Resume and Relevant Project Experience Form (Form PQ1)II. Project Example Requirements (this should be a folder that includes individual files clearly named according to Part 2 of the PQ1) <p style="text-align: center;">Each file should be saved in the format identified above. Submit 5 copies of the CD or flash drive.</p>	