TECHNICAL SERVICE PROVIDER (TSP) REFERENCES DOCUMENTATION AND PERFORMANCE REQUIREMENTS

This document shall be followed as reference guidance, documentation and performance requirements for TSP assistance on Natural Resources Conservation Service (NRCS) engineering projects. This document should not be considered as all inclusive. In addition to the following materials and documentation requirements for the TSP shall follow the Montana Supplement to the Engineering Field Handbook, Chapter 51, Engineering Planning and Design Guides. Chapter 51 outlines the documentation requirements for planning, preliminary design, surveys, engineering drawings, and final design.

I. REFERENCE MATERIALS

The NRCS Engineer or NRCS representative will discuss the appropriate reference materials, required to complete the engineering project.

A. National Engineering Manual (NEM)

B. National Engineering Handbooks

C. Design Notes (DN)

D. Engineering Field Handbooks

E. Geology Notes (GN)

F. Other Notes

G. Soil Mechanics Notes (SMN)

H. Technical Releases (TR)

The NRCS reference materials can be found at:
http://www.mt.nrcs.usda.gov/technical/eng/documents.html and/or
http://www.info.usda.gov/CED

I. Field Office Technical Guide (FOTG)

The NRCS practice standards are available via the eFOTG web site: http://www.nrcs.usda.gov/technical/efotg. Click on Montana on the United States map under the Access eFOTG banner and go to Section IV. As listed above practice

code is in parenthesis followed by the title. The practice documentation requirements may be found in NRCS, 450 – General Manual, Part 407.10, Supporting Data and the Montana Supplement to the Engineering Field Handbook, Chapter 51.

J. Planning Procedures Handbook

K. Stream Corridor Restoration (NRCS)

L. The Practical Streambank Bioengineering Guide (NRCS)

M. National Operation and Maintenance Manual

II. PERFORMANCE SCHEDULE

A performance schedule for the various phases of the work as described in each contract shall be submitted by the Technical Service Provider and approved by NRCS for each project. The performance schedule will detail the Technical Service Provider's operations for all phases of work. The Technical Service Provider shall schedule each project on MT-ENG-1, Montana Application Task Schedule Worksheet, or similar document. The MT-ENG-1 Worksheet shall be updated quarterly.

If a project is to be federally contracted, a MT-ADS-1, Check List for Federal Construction Contracts shall be used as a check list of the steps required to contract a project. Other contracting methods should follow a checklist similar as the MT-ADS-1 to make sure that all steps have been completed, prior to contracting.

The Technical Service Provider should consider that there can be considerable time gaps between the Phases of Work. Some time gaps can be caused by, but not limited to funding, permits, and landowner decisions. The Technical Service Provider shall consider time gaps in the performance schedules.

III. QUALITY OF WORK

A. All work shall be performed in a professional manner in accordance with the minimum criteria of the Natural Resources Conservation Service engineering standards, manuals and references, along with the information in the NRCS (FOTG).

B. Text material of reports, design memorandums and computation sheets shall be prepared on standard letter-sized sheets. Drawings and plates for reports and memoranda shall have a binding edge of eleven (11) inches in length.

C. All notes, computations, drawings, sketches, and other data shall be complete, recorded neatly, checked and initialed (as a peer review) as checked by persons as equally qualified as those performing the original computations, and organized in a manner that will allow reproduction of copies and incorporation in reports with a minimum of editing and revision.

Design drawings, diagrams, graphs, sketches or other pictorial representations shall be physically incorporated into the design file whenever the size and scale is appropriate. Design drawings that must be drawn on larger-sized sheets and cannot be folded to computation sheet size shall be cited at the appropriate place in the computations by a notation that fully identifies the drawing and its file location. Information necessary in a design file is outlined in NEM, Section 511.11, Design Folders.

The input and output files of computer programs used in design shall be provided electronically as well as in hard copy format. The files shall be fully documented and presented to the designated NRCS Employee.

D. Field Surveys

The criteria, methods and procedures contained in the NEM, Section 540, Field Surveys and Technical Release 62 shall be used. All survey notes shall be kept in accordance with industry standards and shall contain only notes and records that pertain to this project. Field books shall be labeled and indexed as described on Pages 1-1 and 1-2 of Technical Release 62. The notebooks shall be furnished to the designated NRCS Employee for the design records file following the termination of the project.

All field surveys to establish the horizontal and vertical control which will be used for design and construction control shall be at appropriate levels of accuracy commensurate with the design requirements.

IV. SUBSURFACE INVESTIGATIONS

A. Investigation Requirements:

1. The Technical Service Provider shall determine the soil and rock profiles to sufficient depths and in the detail required to obtain data adequate to design the facilities. The investigation shall conform to the requirements for geologic investigations contained in NEM, Section 531.

2. Soil sampling methods shall conform to the requirements of NRCS, Soil Mechanics Note 8, and the applicable Standard Methods of the American Society for Testing and Materials (ASTM). Soils shall be identified and classified by means of the Unified Soil Classification System as prescribed in ASTM, Designations D2487 and D2488.

B. Foundation Investigations:

1. Sufficient borings or test pits, will be made to accurately delineate and describe foundation materials and conditions to a sufficient depth where materials and/or conditions will have no adverse effect on the stability and performance of the facilities from the standpoint of strength, consolidation, stability, seepage, or erosion.

2. Undisturbed samples of representative and critical materials encountered in the foundation will be collected and tested, if required. Undisturbed samples taken by Shelby tube or piston sampler will be at least three (3) inches in diameter. All undisturbed samples shall be handled, preserved, packed and transported in a manner that will prevent changes in moisture content (except for the removal of free water, or to prevent liquefaction), or physical condition between the time they are collected from the foundation and delivered to the testing facility.

3. Samples representing each significant kind of borrow material available for use shall be collected for laboratory testing. Samples shall not be a composite for testing.

4. Materials to be excavated shall be fully described and classified as to methods required for excavation. Materials encountered at final design grades in excavated channels and ponds shall be tested to be stable for the hydraulic and slope conditions required by the final design layout.

C. Recording of Investigation Results

1. A log of each test hole and/or pit shall be recorded. Abbreviations used in recording and plotting logs shall be those shown in Soil Mechanics Note Number 6.

   All other abbreviations used will be clearly explained in an appropriate list. Plan, profile, and cross-sectional views shall be plotted to delineate location of the holes and subsurface conditions. The format and content shall be adequate for the purpose of the facility.

D. Borings and Test Pits

1. Wash borings, probes, fishtail bits, roller bits, flight augers, helical augers, unverified geophysical soundings and other similar borings shall be considered adequate only for determining rough bedrock profiles. Auger borings (except large-diameter bucket augers) or small-diameter split spoon borings, with or without supplemental geophysical soundings, shall be considered adequate only for determining bedrock profiles or rough soil profiles. Large diameter (12" or more) bucket-auger borings may be considered adequate for this purpose in very coarse or very mixed materials.

2. Test pits and/or trenches may be used to determine detailed profiles. When used, pits and trenches shall be of adequate dimensions and configuration to permit safe access by personnel for the purpose of logging and collecting soil samples.

E. Safety

1. The geological investigation shall conform to the safety requirements applicable as contained in the OSHA regulations.

2. Borings, test pits, and other excavation, if needed, shall be so excavated, braced, supported, or cased as to safeguard the work and the workmen. The Technical Service Provider shall furnish, place, and subsequently remove such supporting installations as needed.

3. When drill holes, test pits, or other excavations are left open at the end of a day's work or for observation after completion of work, the Technical Service Provider shall provide temporary plugs, covers, fences, barricades, lights, markers, or other measures consistent with the hazard involved, to prevent injury to humans or livestock, and to protect other installations.

V. GEOLOGIC REPORT

A. The Technical Service Provider shall prepare a report covering all on-site geologic investigations. The report shall be in accordance with Geology Note Number 3.

B. In addition to the information required by Geology Note Number 3, the Geologic Report shall include:

1. Site Geology Map in accordance with NEM, Section 531.14.

2. All on-site investigation data and information including information on all borrow areas investigated including those which have been classified as being unsuitable.

3. Narrative discussion including interpretations, conclusions and recommendations for design of geologic conditions pertinent to laboratory testing, design, construction, and performance of the works.

4. Recorded logs of investigations.

5. Drawings showing the location of all test holes and pits.

6. Plotted profiles and cross sections as necessary to show subsurface conditions, locations, and elevations of samples, penetration test locations and results, and ground water elevations and date of measurement.

VI. SOIL MECHANICS REPORT

A. The soil mechanics report shall include:

1. Results of field and laboratory tests.

2. Interpretations and analysis of tests.

3. Conclusions and decisions based on the soil mechanics testing results which affect the design of the project.

4. Preparation of a soil mechanics report as outlined NEH, Part 633, Soil Engineering.

VII. UTILITIES

Utilities affected by the proposed project shall be identified and listed for the landowner, contractor and Contracting Officer (CO). The list shall specify what needs to be done with the utility (modification, relocation, abandonment, extensions, tie-ins, etc.). It is the Technical Service Provider's responsibility to inform the NRCS, landowner and contractor of known utilities that can/will be affected. This should be documented on the drawings and in writing to the landowner and utility company. The Technical Service Provider shall make necessary follow up with landowners and utility companies to make sure modifications, relocations, etc., are performed, prior to construction. Drawings and specifications should

say that it is the final responsibility of the contractor to make the necessary utility contacts and arrangements. The "Call Before You Dig" phone number is 1-800-424-5555.

VIII. PLANNING

Planning shall follow the NRCS Planning Procedures Handbook. All planning and alternatives developed shall be documented. Additional guidance on planning is found on pages 51-7 to 51-8 of the Montana Supplement to the Engineering Field Handbook.

IX. PRELIMINARY DESIGN DOCUMENTATION

A. The preliminary design is not to be just a "conceptual" plan. The preliminary design documentation shall include:

1. Two (2) sets of drawings and sketches sufficient to define essential elements of the design.

2. Two (2) sets of the design folder including, but not limited to bid schedule, specifications, cost estimate, design report, computations, and design notes and inspection plan. Fully documented input and output files of computer programs used in design shall be provided in hard copy and electronic format.

3. Two (2) copies of the preliminary Operation and Maintenance (O&M) Plan.

4. Preliminary Cost Estimate.

   Preliminary cost estimates shall be prepared. The Technical Service Provider shall prepare a cost estimate based on reasonable construction unit prices for the various types of construction work as a basis for estimating construction costs. Many times the TSP should also provide a cost estimate based on contracted items along with using the current NRCS Cost Share List. The rationale for establishing those prices shall be made a part of the design folder.

X. FINAL DESIGN DOCUMENTATION

A. The final design documentation shall include:

1. Final Construction Specifications.

The Technical Service Provider shall complete the construction and material specifications in conformance with the requirements of NRCS, NEM, Section 542.

Final construction specifications shall be prepared on 8-1/2" x 11" paper. Supplemental specifications not already included in NEH, Part 642, Specifications, shall follow the format of NEH, Part 642, Specifications, and shall be numbered consecutively. As appropriate, the Engineering Specifications in the Montana Supplement to the Engineering Field Handbook, Chapter 50 may be used.

Reference specifications in NEH, Part 642, and Montana Supplement to the Engineering Field Handbook, Chapter 50, Construction Specifications, shall be used verbatim, where applicable. New specifications shall be written in the same format.

2. Final Construction Drawings.

   a. Final construction drawings shall be on 11" X 17" sheets. A minimum of four (4) sets of drawings and specifications shall be prepared.

   b. Construction drawings shall be drafted in accordance with NEM, Section 541. Where practical, drawings shall be prepared using computer-aided drafting methods in accordance with Technical Release (TR) 73. Electronic files for drawings shall be furnished to the designated NRCS Employee. The format of files shall be AutoCAD 2002 compatible or DXF. Each sheet of the drawings shall be a separate electronic file.

   c. Construction drawings shall include locations of test holes drilled and sampled on a plan view, as well as test hole logs showing the field classification of the soil in appropriate depth increments.

   d. Construction drawings shall contain all details required to facilitate the construction of the works including, but not limited to, dimension drawings, rock placement, final fill and excavation slopes, reinforcing steel schedules, construction and structural details, fencing and vegetative details, pay limits, construction limits, borrow areas, disposal areas, staging areas, and construction access routes.

   e. Drawings shall be prepared in accordance with NEM, Section 541 and the Montana Supplement to the Engineering Field Handbook, Chapter 51.

3. Design Folder.

   A design folder for the design shall be prepared in accordance with the NEM, Section 511.11(a) with the addition of the cost estimate. This folder shall contain all data pertinent to the design.

4. Design Report.

   The design report shall include information as outlined in the NEM, Section 511.11 (b) as appropriate.

5. Bid Schedule.

   The bid schedule shall consist of a list of construction bid items prepared in accordance with the format contained in the NRCS, NEH, Part 642, Specifications. Bid schedule items shall be consistent with the bid items listed in the Items of Work and Construction Details section in the construction specifications. The Technical Service Provider shall develop Items of Work and Construction Details for each Specification used.

6. Final Cost Estimate.

   The engineer's final cost estimate of construction costs shall be prepared in detail and itemized in the same format as in the bid schedule. The engineer's estimate shall remain confidential and is not for public release.

XI. OPERATION AND MAINTENANCE

The Technical Service Provider shall prepare an Operation and Maintenance (O&M) document for the installed facilities. The O&M document shall address all major components of the constructed improvements. It will cover items that require regular monitoring and will identify occurrences where inspection of the works should be accomplished in response to unusual or severe events. The eFOTG web site listed above contains base O&M documents for each practice standard. Additional guidance for O&M can be found in the Montana Supplement to the Engineering Field Handbook, Chapter 52.

The O&M document will act as a source of reference for future use by the landowner or personnel who may be unfamiliar with specific design requirements or construction problems encountered at this site. Therefore, the O&M document shall include information such as sketches, descriptions, location plans, instructions, maintenance schedules, checklist and recommended inspection forms to facilitate its use. Guidance for the O&M Plan is found in the National Operation and Maintenance Manual.

XII. CONTRACT ADMINISTRATION

A. If the project is to be constructed using formal contracting methods, the preparation and the administration of Construction Contracts shall be prepared by a trained Contract Specialist that is familiar with all NRCS, Local Awarded and Federal Awarded Contracting Methods.

XIII. SERVICES DURING CONSTRUCTION

The Technical Service Provider shall furnish material and labor required to perform the construction services as required for each project.

XIV. CHANGES AND MODIFICATIONS TO CONSTRUCTION DRAWINGS, CONSTRUCTION AND MATERIAL SPECIFICATIONS DURING CONSTRUCTION

A. Modifications required for design, drawings, and specifications during construction.

1. Basic design changes shall be made by the Technical Service Provider. Basic design changes shall not be implemented until concurrence by NRCS.

2. Minor deviations and corrections will generally be made by the Technical Service Provider. Review and approval of minor deviations and corrections will be obtained from NRCS as quickly as practical, but construction shall not be delayed to await approval unless there is a reason to doubt that the change will be approved.

3. The Technical Service Provider shall provide interpretations of the plans and specifications.

4. The Technical Service Provider shall review and approve shop drawings, diagrams, illustrations, catalogs, data, samples, etc., submitted by the Construction Contractor.

XV. CONSTRUCTION INSPECTION AND QUALITY CONTROL

This work shall consist of developing, implementing and maintaining a construction quality control system to ensure that the specified quality and quantities are achieved for all the materials and the work performed. The Technical Service Provider's shall provide quality assurance during construction. A quality assurance and inspection plan shall be developed and followed by the Technical Service Provider. Content for an inspection plan is found in the NEM, MT512.32(a), Inspection Procedures. Documentation of construction tests, materials, quantities, material certification, by the contractor sub-contracted by the

Technical Service Provider shall be documented according to NEH, Section 19, Construction Inspection. The Technical Service Provider shall perform final checkout of the quantities. The final quantities and three (3) sets of "As-Built" drawings shall be submitted to the designated NRCS Employee.

XVI. CONSULTATION AND ADVICE DURING CONSTRUCTION

A. The Technical Service Provider shall provide consultation, on-site observation and advice on geologic, soil mechanics, or structural problems that may arise during construction of the structures designed. Consultation, observation, and construction inspection shall be provided at times determined in the inspection plan and shall include, but is not limited to, the following:

1. If cultural material such as bones, fire hearths, flakes/points/scrapers, human skeletal remains or foundations are discovered, then;

a. The construction contractor shall cease working in the area until the resource is evaluated and clearance to proceed is given by the designated NRCS Employee.

b. The construction contractor shall notify the Technical Service Provider who in turn will notify the designated NRCS Employee and the NRCS Archaeologist.

c. NRCS will document the resource and make recommendations regarding the discovered resource.

d. The NRCS Archaeologist will prepare a report for consultation and final decision.

e. The NRCS Archaeologist shall notify the designated NRCS Employee that the construction can proceed or actions to be taken.