

## PART 512 - CONSTRUCTION

### SUBPART A - INTRODUCTION

#### 512.00 General.

Installation of conservation practices and project structures in accordance with approved drawings and specifications are essential if the practice is to serve its intended purpose and expected service life with normal operation and maintenance. NRCS has standardized construction practices and procedures to ensure that engineering conservation practices and project structures are installed according to design. These procedures provide uniformity in NRCS activities and result in common understanding between all parties involved with the design and installation of an engineering practice. Quality assurance activities are an important part of NRCS standard construction practices.

#### 512.01 Scope.

This policy applies to all conservation engineering practices, structures, and systems in all NRCS programs for Engineering Job Approval Classes I through VIII as defined in NEM Part 501. Quality assurance activities may vary in accordance with complexity and hazard class of the structure(s).

#### 512.02 Definitions.

(a) Owner. For contracting purposes, the owner is defined as the party responsible for contracting for construction. The owner pays the contractor and accepts the completed works of improvement. The owner may be NRCS (Federal Government contract), a local contracting organization (project sponsor), or a private individual or group.

(b) Engineer. The engineer is responsible for project installation. The engineer is the project representative for the owner and is assigned technical and contract administration duties as outlined in the quality assurance plan (QAP) and appointment letter issued by the contracting officer. The engineer may be an NRCS employee, an architectural and engineering (A&E) firm employee that is providing professional

PART 512 - CONSTRUCTION

services under a contract with NRCS, or an employee of the local contracting organization or partnership agency.

(c) Government Representative. The Government Representative (GR) is a NRCS employee who has the responsibility to protect the Government's interest and maintain close working relations with the Contracting Local Organization (CLO) for all works of improvement. The GR is an engineer if NRCS has quality assurance responsibility for a construction contract. This appointment is not normally provided for contracts handled by private individuals or informal groups. The NRCS administrative officer will appoint a GR by letter for all construction contracts that are administered by others and utilize Federal funds.

(d) Contracting Officer's Technical Representative. The contracting officer's technical representative (COTR) is an engineer if procurement activity is engineering and/or construction contract related with the primary duties to ensure that the Government's interests are protected. For construction contracts administered by NRCS utilizing the administrative requirements of the Federal Acquisition Regulations (FAR), an NRCS engineer has quality assurance responsibility for installation of the works of improvement. The NRCS contracting officer will appoint, by letter, a COTR for A&E Contracts, professional services contracts, and construction contracts administered by NRCS.

(e) Construction Inspector. Duties of the construction inspector frequently involve quality assurance testing, engineering surveys, the daily documentation of project activities, coordination with the contractor's quality control personnel, and maintaining the As-Built drawings. The NRCS contracting officer will appoint, in writing, construction inspectors with the qualifications outlined in the quality assurance plan.

(f) Contractor. The contractor is the individual or firm that installs the works of improvement. The contract or agreement with the owner may be formal as in project installations, or informal as with an individual landowner or operator in the installation of an engineering conservation practice. Provisions are available for the project sponsor(s) to

PART 512 - CONSTRUCTION

function as a contractor under agreements that may include division of work, performance of work, or force account.

512.03 Value Engineering.

(a) Value engineering is a formal technique by which contractors may:

(1) Voluntarily suggest alternatives to the design that may be more economical or less costly to install and from which both the owner and contractor would benefit.

(2) Be required to identify and submit to the Government methods for performing work more economically. The FAR, Part 48, Value Engineering, provides the terms and conditions for Value Engineering Change Proposal (VECP). Consideration of any VECP must include the comparison of future costs of operation and maintenance and other costs that may be affected as a result of the change.

(b) Each state will establish internal guidelines for processing VECP's and procedures for funding the contractor's share of the collateral savings.

(c) Changes for conservation engineering practices proposed by the contractor should be handled similar to a VECP. When the change is technically acceptable (meets NRCS standards and specifications), the decision to accept the change remains with the landowner/operator. NRCS will provide adequate review of the proposal and provide the decisionmaker with the necessary information to support the acceptance or rejection of the proposal. Any proposed change to an engineering structure must be approved by a person with the appropriate job approval authority.

PART 512 - CONSTRUCTION

(NOTE: Sections 512.04 through 512.09 are reserved.)

PART 512 - CONSTRUCTION

SUBPART B - PRECONSTRUCTION ACTIVITIES

512.10 Selection of the contractor.

The submitted bid or proposal, which must comply with the instructions outlined in the solicitation package, must be complete in order to determine contractor responsibility. The contractor is responsible for understanding and being familiar with the procurement requirements, project location, material requirements, construction requirements, special provisions, construction site access, restrictions and limitations, local rules and regulations, and be familiar with the type of work.

512.11 Site showing.

(a) Where formal contracts or agreements are utilized to install conservation engineering practices or project elements, the following procedures shall be followed:

(1) Potential bidders will be shown the project site so that they may inspect the area, determine the scope of the work, and receive answers to questions that may occur. Stakes and/or flagging shall be used to identify the major items of work and their relationship to other elements of the proposed project.

(2) The engineer and contracting officer, or their authorized representative(s), are to show the site to interested contractors and identify physical elements on or near the site that will contribute to the submission of a responsible bid. The following items shall be identified and discussed, as appropriate: access roads, right-of-way and construction limits provided by the owner, clearing limits, location of known utilities, proposed structure(s) location, existing structures to be removed, proposed borrow and waste areas, location of geologic test holes/pits, the contractor's responsibility for pollution control, construction safety, and other important features.

(3) The person conducting the site showing is not to express an opinion as to the difficulty or the ease of performing work elements. A site showing is intended to introduce potential bidders to the procurement contract documents and to provide responses to questions concerning those documents that may arise.

PART 512 - CONSTRUCTION

It is critical that all responses to questions that may affect a contractor's evaluation and potential bid proposal be shared with all solicitation package holders. This may require a written follow-up or an amendment to the solicitation as required by the Agriculture Acquisition Regulations (AGAR) 452.237-71.

(4) The site showing activities will be documented and shall include a list of attendees, outline of the site showing presentation, questions raised together with the responses, and any item or occurrence that could enter into a contractor's evaluation of the extent of work being solicited by the procurement activity. All attendees shall provide their name, company, mailing address, telephone number, and FAX number on a sign-in register. The job diary, or other permanent record for the project, shall be utilized to record basic information and to reference the site showing minutes.

(b) Where individual landowners/operators hire a contractor, site showings for engineering conservation practices may be less formal than following the guidelines listed in items (1) through (4) above. The landowner/operator may request that an NRCS employee be present to assist with the site showing. A job diary, assistance notes (SCS-CPA-6), or other permanent record shall be utilized to document construction activities. A job diary shall be used for job approval Class V - VIII engineering practices.

512.12 Evaluation of bidder(s).

Prior to awarding a construction contract, an evaluation of equipment and credentials must be conducted and responsibility of the bidder evaluated. Responsibility is defined as having the capacity, credit, integrity, tenacity, and perseverance to perform the job as specified. If a landowner/operator is installing a conservation practice, he/she will make the responsibility determination and negotiate the contract. NRCS may provide technical assistance (TA) to the landowner/operator in evaluation of bidders.

(a) Determining the lowest responsible bidder. Government agencies must award contracts to the lowest responsible bidder. Project sponsors having contract administration duties have

## PART 512 - CONSTRUCTION

similar responsibilities. Individual landowners have similar interests to ensure quality and timely installation of their works of improvement at a reasonable cost. The potential for timely installation shall be determined by reviewing the contractor's present workload and commitments. Responsibility can usually be determined by interviewing owners and individuals who have a first-hand knowledge of the contractor's past performance, reviewing the contractor's plant and equipment, and by performing a credit check and reviewing the contractor's financial statement. A critical element in determining responsibility is the history of performance and authority of the contractor's project superintendent. Proposed subcontractors, especially those having a unique specialty, shall be evaluated to the same extent as the prime contractor. All information collected to determine responsibility is to remain confidential with only those involved with awarding the contract having a need to know.

(b) Documentation. Information collected to determine if a potential contractor is responsible will be documented by the contracting officer to support the award of a contract.

### 512.13 Preconstruction conference.

(a) For Federal contracts under the Federal Acquisition Regulations, this meeting is titled the Post Award Conference. It is usually the first meeting between the owner and contractor following the issuance of the contract. The conference will be used to develop a positive working relationship and generate a discussion that centers on the procedures the contractor plans to implement to meet the terms and conditions of the contract. Individuals representing the contractor and subcontractor(s), the owner (sponsors), major suppliers, and others who will be working together in the execution of the contract should be present. The authorities and responsibilities of these individuals shall be jointly understood. A detailed review of the drawings, construction and material specifications, and contract provisions shall be a priority of this meeting. The contractor's construction schedule will be reviewed and any questions resolved prior to final approval by the contracting officer. Status of all land rights, permits, easements, and related items should be reviewed and any restrictions or limitations that could affect

PART 512 - CONSTRUCTION

performance by the contractor needs to be reviewed. Other items that shall be discussed will include: contractor's safety plan, emergency response plan, health and safety meetings schedule, schedule for partnering meetings, sanitary facilities, communication system, construction office space and equipment provided to the owner by the contractor, project layout and staking, public health and safety, utilities in the area including those that will provide service during construction, source of construction materials, contractor's quality control plan, removal of water and dewatering plan(s), weather clauses and time extensions, holidays that will be honored during the performance time provided, and any other item that could have an impact on the contractor's performance.

(b) The preconstruction conference minutes are to be recorded. Minutes are to be reviewed, finalized, and shared with all participants. Any questions and answers and any interpretations of contract documents provided at the preconstruction conference will be included in the minutes. Any questions that could not be answered by the contract documents, (where interpretation is provided), will be addressed and included in the minutes. A contract modification may be necessary to provide clarity or to provide a summary of a response that could affect the extent of the work or final cost of the contract. All basic information of the conference will be recorded in the Job Diary or other permanent record.

(c) Reviewing the extent of the work required of the contractor for the installation of engineering conservation practices to be installed for an individual landowner/operator is equally important. Documentation, to the extent listed previously, may not be required unless it is requested by one of the parties associated with the installation to support decisions made and provide necessary clarity. The use of the job diary, SCS-CPA-6, or other permanent record and/or sharing in writing of agreed-to action items will usually suffice to document installation activities and associated items. The owner shall be involved in any decision that could affect the practice installation and/or final cost. Owner/operator involvement is particularly important for any changes requested by a contractor in which installation is being accomplished without a formal contract.

PART 512 - CONSTRUCTION

512.14 Partnering.

(a) Partnering is an attitude that leads to resolution of issues, at the lowest possible level of the parties to the contract, with the greatest amount of material benefits possible. It is a way of doing business with a contractor, cooperator, or other customer(s) that recognizes that they have common goals which can be achieved through cooperation and open communications. The philosophy of partnering is strongly encouraged in the daily activities of providing technical assistance. A primary benefit of partnering is the reduction of the threat of resolving issues through the legal process which is costly to all parties involved.

(b) The partnership for construction contracts may be established through a facilitated process, normally consisting of organized workshops that bring the participants together. The costs to conduct a partnering workshop shall be shared among all the participants to the contract. The participants shall represent all levels of each organization involved with the construction contract. A Partnering Charter or similar agreement should be developed and shared with all participants.

(c) When issues are not resolved to the satisfaction of those directly involved at one level, the issue is elevated to the next management level for resolution.

(d) Federal agencies, together with construction industry organizations, provide guidelines to the partnering process. Procedures to implement partnering vary significantly. Implementation of the partnering concept will vary with each contract. All individuals associated with a potential partnering arrangement need to be flexible.

PART 512 - CONSTRUCTION

(NOTE: Sections 512.15 through 512.19 are reserved.)

## PART 512 - CONSTRUCTION

### SUBPART C - EVALUATION OF CONSTRUCTION MATERIALS

#### 512.20 General.

(a) Quality requirements for construction materials are contained in the National Handbook of Conservation Practices (NHCP) and the National Engineering Handbook (NEH). Many of these specifications and standards refer to standards and specifications used in industry and include: American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), USA Standards Institute, American Concrete Institute (ACI), Federal Supply Service (FSS), product standards published by the National Bureau of Standards (NBS), and others. These referenced standards and specifications set forth requirements for material performance, material testing, quality control, and quality assurance.

(b) To ensure that construction materials meet job requirements, an evaluation of material quality in relation to applicable industry standards and/or specifications must be made. The nature, time, and place of this evaluation depends on the type of material, the specifications, the kind of construction, and other factors that could affect the public's health and safety.

#### 512.21 Evaluation procedures.

(a) Material quality will be evaluated by at least one of the following procedures:

(1) Laboratory testing by NRCS, by a consulting firm, or commercial laboratory under contract with NRCS; laboratory under contract with a sponsor or owner, or by another Government agency. (Example: concrete compressive strength testing)

(2) Testing by a consulting firm or commercial laboratory employed by the manufacturer under approved conditions and independent arrangements. (Example: structural steel)

(3) Certification in writing by the manufacturer that the material complies with the applicable specifications. Test

PART 512 - CONSTRUCTION

results showing compliance may be required and attached to the certification. (Example: steel reinforcement)

(4) Markings on material that identify the manufacturer and indicate compliance with the appropriate specification(s). Laboratory tests and current test reports are to be provided on request. (Example: plastic pipe)

(5) Examination and/or testing at the job site. (Example: drainfill)

(6) Prequalification of materials. (Example: water control valves)

(b) Used materials are acceptable if they are suitable for the proposed work, the expected service life is equal to or greater than the projected overall structure or system's designed service life, they are structurally adequate, and environmentally acceptable. State conservation engineers are to establish guidelines for accepting and incorporating used materials in systems for which NRCS provides technical or financial assistance. The owner must pay special attention to used items during operation and maintenance activities.

(c) New products that have not been used previously for conservation practice application must be evaluated and approved for use before being specified. Trial use of new products must be under the approval of the state conservation engineer and shall be supported by industry or applicable standards, specifications, evaluation data and/or reports.

(d) State conservation engineers are to designate materials that require certification and/or testing based on the quantity of the items used, the life of the item in relation to the life of structures in which it is used, the cost of the types of structures in which it is used, the difficulty of replacement, and the consequences of failure of the structures in which it is used. Acceptance of a material on the basis of the certification is permissible only if the material meets all of the following requirements:

PART 512 - CONSTRUCTION

(1) Its conformance to the specification requirements cannot be verified on site by visual inspection. (Example: Rock for riprap, the material durability)

(2) It is a commercially available or manufactured item or product, the quality of which is customarily controlled by the manufacturer within specified limits. (Example: Metal slide gates)

(3) Its quality is specified by reference to standards and/or specifications normally used in the construction industry such as ASTM, AWWA, ACI, etc. Such materials include: portland cement, air-entraining agents, set retarders and plasticizers, sealing compounds for joints, steel reinforcement, curing compounds, preformed expansion joint filler, and waterstops for concrete structures; asphaltic cements; concrete, corrugated steel, aluminum, ductile iron, steel, copper, and plastic pipe and fittings; rubber gaskets; preservative treatments for wood products; structural metals; steel piles; geotextiles; etc.

512.22 Waivers of material certifications.

(a) NRCS contracts require certification for all materials incorporated in the works of improvement unless specifically waived.

(b) Certification may be waived under the following conditions:

(1) The material is tested by NRCS.

(2) The material serves a minor role of a project that has no potential detrimental public health and safety impacts.

(i) Quantities are considered to be small in relation to the total structure;

(ii) The material is a commercially available, manufactured, or fabricated item and conformance with specifications can be reasonably determined by field examination; and,

## PART 512 - CONSTRUCTION

(iii) The item's location within or on the structure or system allows for easy maintenance and/or replacement.

### 512.23 Prequalification of materials.

(a) Prequalification is the evaluation and determination of materials that may be used without further certifications. Prequalification eliminates the need for requesting and furnishing individual certifications and test results for each project or contract.

(1) Prequalification is an acceptable procedure to support quality installation of materials used in NRCS construction when items are manufactured under close quality control and consistently meet the applicable specifications. Several items frequently identified for use in NRCS construction include: cement; reinforcement steel; structural metals; concrete, metal, and plastic pipe; fittings and gaskets for pipe; waterstop, preformed expansion joint filler, sealing compound, air-entrainment agents, curing compound, set retarding, and water reducing agents for concrete; metal coatings; wood preservatives; water control gates and valves; pipeline protection valves; geotextiles and geomembranes; etc. Materials must be clearly marked by the manufacturer as to the size, grade, ASTM Standard, manufacturer, and other essential characteristics that further identifies the product and/or material. Quality assurance support for material quality can be provided by photographic documentation showing the manufacturer's label on the product or item.

(2) Local natural materials for which prequalification is a suitable procedure include aggregate for drainfill or concrete, and rock for riprap or rockfill. Prequalification of material is to support quality and should not be construed as a waiver from testing to provide support to document material gradation. For small projects and those in which adequate time is not available to complete a test, the use of prequalified materials is a viable alternative to insure material quality.

(b) Prequalified materials may be used in NRCS construction by referring to the certification and/or test data file. When a prequalified item or product is used, its use must be recorded on

PART 512 - CONSTRUCTION

the As-Built drawings, recorded in the job diary, or documented by other suitable methods as determined by the state conservation engineer.

(c) States have authority to prepare and maintain a list of materials approved for prequalification when the quantity of materials being used economically justifies its preparation.

(1) Each state conservation engineer is responsible for evaluation and prequalification of materials manufactured in their state and sharing the data with adjacent state conservation engineers.

(i) The state conservation engineer is to initiate the prequalification procedure. Methods that may be considered are: request written certification and supporting test results from the manufacturer; conduct material testing of the item or product; obtain material certification data from other Government agencies or organizations.

(ii) Each state conservation engineer is to evaluate certification and test data when received to determine if the material or product meets the applicable specification. The state conservation engineer will determine if additional inspection and testing is necessary.

(iii) When the state conservation engineer has determined that the product and/or material meets the requirements for prequalification, it is included on the state list for prequalified materials. The list shall include the name of the product, the manufacturer, the applicable specifications, and any other identifying information, as appropriate.

(2) The coordination and sharing of prequalified material lists between states shall be as determined by the appropriate state conservation engineers. It is strongly encouraged that prequalified lists be shared so time to develop proper support to prequalify a product or material will be minimized.

(d) Many factors affect the quality and acceptability of manufactured products. Prequalified products and/or materials may need to be reviewed occasionally to ensure minimum quality requirements are current. The frequency of this review will be

PART 512 - CONSTRUCTION

determined by the state conservation engineer who initially approved the material for entry on the list of prequalified materials.

(NOTE: Sections 512.24 through 512.29 are reserved.)

PART 512 - CONSTRUCTION

SUBPART D - QUALITY ASSURANCE ACTIVITIES

512.30 General.

(a) For formal construction contracts, the general and special provisions of the contract and the quality assurance plan (QAP) outline construction inspection requirements. The construction specifications outline the duties and responsibilities of the contractor's quality control program.

(b) Quality assurance activities may vary in accordance with complexity and hazard class of the structure(s). Quality Assurance Plans (QAP) will be prepared and utilized in accordance with Natural Resources Conservation Service Acquisition Regulations (NRCSAR) and the National Contracts, Grants, and Cooperative Agreements Manual (NCGCAM). QAP will outline the technical and administrative expertise required, identify the individuals with that expertise, outline the frequency and timing of technical assistance, estimate the contract completion date, and be co-approved by all responsible supervisors, state conservation engineer, and contracting officer.

(c) All manure (animal waste) management structures having moderate or high environmental risk must have a quality assurance (construction inspection) plan prepared and implemented in accordance with Sections 512.30(e) (1) and 512.32. To determine environmental risk, the current NRCS Form SCS-CPA-52 "Environmental Effects For Conservation Plans and Areawide Conservation Plans" shall be completed. If the evaluation of the Conservation Management System (CMS) on SCS-CPA-52 results in the number of adverse effects exceeding the beneficial effects or if any of the special environmental concerns are adverse or positive, a QAP will be developed and implemented.

(d) National Engineering Handbook (NEH) includes procedures for inspection of construction activities.

(e) The performance of quality assurance duties in an efficient and economical manner requires:

(1) Providing the proper number of qualified personnel with the knowledge, skills, and abilities (KSAs) necessary to conduct timely and effective technical assistance as outlined in

PART 512 - CONSTRUCTION

the Quality Assurance Plan (QAP) for the project. Preparation and content of the QAP is outlined in the National Contracts, Grants, and Cooperative Agreement Manual (NCGCAM) and in Natural Resources Conservation Service Acquisition Regulations (NRCSAR) 4I-46.70-6.

(2) Continuous coordination with the quality control representative of the contractor to insure NRCS quality assurance activities are effective.

(3) Minimizing interference with the contractor's production activities.

512.31 Definitions.

(a) Quality control - Activities performed by the contractor to document that the work installed meets the minimum requirements of the contract. This is a bid item for most contracts involving project type work and requirements are specified in NEH-20, Construction Specification 94, Contractor Quality Control. On less formalized construction activities, the contractor's quality control (QC) responsibilities shall be outlined in the construction specifications or contract, where applicable.

(b) Quality assurance - Activities performed by the owner including: observing construction methods and procedures, reviewing quality control testing activities of the contractor, conducting material testing to evaluate contractor's quality control system, and other measures to ensure compliance with the contract provisions. The duties and responsibilities for this activity are outlined in the quality assurance plan for the specific project being installed.

(c) Quality Assurance Plan - This plan is a major tool in defining NRCS quality assurance duties. The plan includes the following quality, quantity, and timeliness requirements: General Description of the Work, Items of Work Requiring Inspection, Timing of Inspections, Skills Needed by Inspectors, Number of Staff Hours, Equipment and Facilities Needed, Names and Qualifications of Personnel, and Supervisors Statement of

## PART 512 - CONSTRUCTION

Availability (includes state conservationist, state conservation engineer and contracting officer for Engineering Job Approval Class V - VIII Projects). Policy for QAP content is located in NRCSAR 4I-46.70-6.

### 512.32 Quality assurance procedures.

(a) Quality assurance requires a uniform degree of implementation. It is to be applied equally to all projects that are similar. The extent of quality assurance testing by NRCS and/or its agents may vary depending on the contractor's quality control performance. All staff members assigned to construction contracts shall have the minimum KSAs outlined in the quality assurance plan.

(b) To ensure that engineering conservation practices with Engineering Job Approval Class I - IV are provided the minimum technical assistance needed for proper installation, the responsible line officer and the responsible technical staff person will determine the adequacy and availability of the technical resources required. This determination will be evaluated and established prior to practice layout. The line officer shall assign a staff member this responsibility and provide adequate time to insure quality installation.

(c) Quality assurance duties assigned for Engineering Job Class V - VIII will be outlined in the quality assurance plan for the project and be signed by the state conservation engineer, the contracting officer, and state conservationist. Quality Assurance Plans will be prepared by an individual that has an understanding of the project design and has knowledge of individuals with the quality assurance technical skills and are available for appointment for the project. Under no circumstances will certification stating that work has been accomplished in compliance with the drawings, specifications, and other contract provisions occur without a physical review and documentation of the work performed.

(1) Continuous inspection is required for any construction activity the quality of which cannot be verified by intermittent observations. Continuous inspection is also

## PART 512 - CONSTRUCTION

required for work that cannot be readily removed and replaced if it fails to meet the requirements of the contract. Construction activities related to this type of situation may include: foundation, core trench, and structure excavation; placing and compacting earthfill, drainfill, and rock riprap; pipe installation; driving piles; mixing and placing concrete, concrete form removal, dental concrete grout, and pneumatically applied mortar; repairing concrete; correcting over excavations; fertilizing and seeding disturbed areas; contractor quality control testing; etc.

(2) Intermittent or periodic inspections may be adequate for certain phases of project activities depending on the complexity of the installation and the potential impacts upon the health and welfare of the public. Intermittent observation and its documentation may apply to the following types of construction activities: dewatering and removal of water; clearing, and clearing and grubbing; vegetation stripping; structure removal; excavations when the resulting finished grade will remain exposed; forming and placing of reinforcing steel for concrete structures; applying pigmented concrete curing compound; fabrication of project elements; installation of items that can be observed following project completion; painting; sodding and mulching; installing fences; and, other similar activities.

### 512.33 Inspection of materials.

Materials used in construction must be inspected before they are installed as part of the completed works of improvement. This requirement also includes material that is prequalified. Documentation of the material certification is to be accomplished by listing the associated information in the project job diary or recording data on the As-Built drawings.

(a) Quality assurance (formal construction inspection) at the factory and/or place of fabrication may be required for special items or specialty products. NRCS procurement procedures usually do not warrant having inspectors at factories, locations of fabrication, or other sources of supply. The extent of quality assurance required will be determined by the State Conservation Engineer and shall be compatible with the contractor's quality control responsibilities.

PART 512 - CONSTRUCTION

(b) Quality assurance at or near the project site is normally required for all materials and work for which compliance with specification requirements must be verified by examination and/or testing. Quality assurance may include:

(1) Field verification of the material certification will be made including the size, dimensions, and other measurements required by the drawings and approved shop drawings. Information provided with the item needs to be verified and documented which may include reference to ASTM, ACI, AWWA, and/or other standards and specifications.

(2) Sampling and testing of materials that are provided by local suppliers.

(c) Some materials must be inspected at the work site. They shall be listed in the quality assurance plan for the project and may include:

(1) Earth fill materials, rock riprap, drainfill, filter materials, and bedding materials, aggregates for concrete, and other similar items.

(2) Materials manufactured and delivered to the site which could include: concrete, mortar, asphalt concrete, concrete for roller compacted concrete structures, and other similar type materials.

PART 512 - CONSTRUCTION

(NOTE: Sections 512.34 through 512.39 are reserved.)

PART 512 - CONSTRUCTION

SUBPART E - EQUIPMENT, RECORDS, AND COORDINATION

512.40 Engineering equipment.

(a) Engineering equipment must be available for assigned project and field staff to provide necessary quality assurance duties in accordance with the quality assurance plan. Each state conservation engineer shall develop a list that outlines the minimum equipment that will be permanently assigned to each field or technical service office. This list will be utilized to develop and maintain a statewide inventory of engineering equipment. Procedures shall be established to ensure that all engineering equipment is periodically inspected for accuracy and serviceability (See PART 544, EQUIPMENT).

(b) Specialty equipment will be assigned to qualified individuals that have the necessary skills and approvals to operate and maintain the equipment. This requirement applies to but is not limited to nuclear gauges that are used to determine soil moisture for irrigation associated technical assistance and soil moisture/density of earth fills normally used for project contracts. Qualifications to become a responsible user of nuclear gauges are as required by the Nuclear Regulatory Commission under an agreement with the U. S. Department of Agriculture, Agriculture Research Service.

512.41 Records.

(a) Job Diary. Where formal contracts or agreements are utilized to install conservation engineering practices or project elements and for all Engineering Job Class V - VIII practices, a job diary shall be maintained to document the daily activities of the project. The state conservation engineer (SCE), contracting officer (CO), government representative (GR), or contracting officer's technical representative (COTR), individually or jointly, will determine which quality assurance (QA) personnel will maintain a job diary to record the progress and other elements of the project. It may be beneficial on projects where construction activity is occurring at more than one location to have more than one diary to ensure important information is recorded. The job diary serves as a source of factual data

PART 512 - CONSTRUCTION

related to the contractor's performance in both quantity and quality. The National Contracts, Grants, and Cooperative Agreement Manual (NCGAM) section 120-517 provides guidance on proper use of the job diary for project type work. On less formalized construction activities, the level of detail to be recorded in the job diary shall be commensurate with the complexity of the work and potential impacts upon public health and safety.

(b) Construction contracts that include Construction Specification 94, Contractor Quality Control, will include specific testing and documentation and other requirements for the contractor. Coordination of the quality control and quality assurance activities will minimize duplication of effort to support compliance with contract requirements.

(c) Construction documentation will include the following:

(1) All quality control and quality assurance testing.

(2) A record keeping system that identifies the status of construction activities that meet and those that fail to meet the minimum contract requirements. The use of NRCS Job Diary provides the tools to record and document these daily activities.

(3) Photographic documentation of significant construction activities which may include: site conditions that may affect contractor performance, deficiencies, safety and health conditions, water quality protection system and its effectiveness, etc. Each picture and/or slide will be properly identified with the following minimum data: project name, subject of the picture, contractor, contract number, date, and photographer's name. Where necessary to provide a reference to scale, an item of known size shall be included in the photograph. An index of all photographic documentation will be kept current.

(4) Video recording provides additional methods to document construction activities. Complete audio description should be included on the video to assist in communicating the intended message. The initial part of the recordings shall include the project name, contract number, subject being recorded, date, and the camera operator and others assisting with the video recording.

PART 512 - CONSTRUCTION

(5) The Quality Assurance Plan that outlines the quality assurance duties and construction documentation needed.

(6) Documentation required by procurement, safety, health, personnel, financial regulations, local laws and regulations, permitting requirements, etc.

(d) For Engineering Job Class I - IV conservation practices, the state conservation engineer is required to outline the extent of testing and record keeping required to support quality installation. The use of SCS-CPA-6 (Conservation Planning and Implementation Notes) is a viable option.

512.42 Coordination between disciplines.

(a) The design report contains technical information from several specialists: design engineer, geologist, soils engineer, landscape architect, and others who may recommend specific tests or examinations during construction. An individual with the appropriate level of approval must be responsible to ensure that items of the design report are addressed and that all recommended testing and examinations are properly completed as outlined in the QAP.

(b) The engineer and/or technician responsible for on-site quality assurance must detect variations from the design. The project design report shall be reviewed and understood by QC and QA personnel, and be available at the construction site. When differences exist, quality assurance personnel or other persons shall not alter or make design related changes in the work under the contract without review and concurrence of an individual with appropriate job approval authority. The appropriate discipline(s) necessary to review potential variations shall be contacted as early as possible to minimize delays for the contractor.

PART 512 - CONSTRUCTION

(NOTE: Sections 512.43 through 512.49 are reserved.)

PART 512 - CONSTRUCTION

SUBPART F - AS-BUILT DRAWINGS

512.50 General.

As-Built drawings are developed to document the final installation features of the structure and the final physical condition of the site. These drawings are important in providing critical information for those physical features of the structure that are not visible following completion of the project installation. The As-Built drawings are reviewed as needed to: evaluate the design; determine proper operation and maintenance items; provide support for any legal matters; provide support to evaluate problems if the structure fails to perform as designed; and facilitate efficient maintenance or modification.

512.51 Applicability.

(a) As-Built drawings must be prepared for all major (Class V - VIII) structural works of improvement and for all inventory size dams. As-Built documentation of changes during construction is also required, when: local organization provides the quality assurance duties; quality assurance activities are accomplished by a professional services contract; etc. As-Built drawings must also be prepared for structures:

(1) Built under formal contract by NRCS or a cooperating local sponsor;

(2) When another agency of Government requires the filing of As-Built plans (Example - statewide utility notification system for buried pipes);

(3) When the final installed plans are required to properly locate structural features and perform operation and maintenance; (Example - Pipeline system where the As-Built shows the final location of valves, drains and pipe sizes.); or

(4) When future plans could include additions and/or adaptations to the present structure (Example - Plans include the extension of the pipeline system).

PART 512 - CONSTRUCTION

(b) As-Built drawings for structures in the Engineering Job Class I - IV will be prepared as determined by the State Conservation Engineer.

512.52 Documentation.

(a) Recording changes.

(1) All changes during construction must be recorded on the drawings to indicate As-Built conditions. The state conservation engineer shall outline procedures for supplementing the design report to include analysis and supporting data. If a structure is altered at any time following initial completion, the As-Built plans must be retrieved and revised to indicate the alterations. After the drawings have been revised to include the additions and modifications, updated As-Built plans will be re-distributed in the same manner as the original As-Built plans.

(2) A complete set of full-size construction drawings must be maintained at the work site to make timely updates as the work progresses. Changes shall be recorded on these drawings in a manner that As-Built information is obvious. The noted changes must be neat and legible and of quality equal to the original drawings because the drawings may be camera copied and reduced in size. If changes are extensive, they may be re-drafted on new standard drawing sheets with adequate detail and cross referenced to define the changes that were incorporated. The original corrected drawings and any new drawings must be included as the revised As-Built drawings for the completed works of improvement. As-Built CAD drawings should clearly show both the original design and As-Built information using varying line weight, color, shading, hatching, dimensioning, notes, and separate layers as needed.

(3) Determination of when a change is significant, and when it should be recorded, depends on its effect on the functioning of the structure, whether it is visible and/or accessible after construction is complete, and if any planned future changes involve adaptation to the present structure that was affected by the change. All significant changes shall be described in writing by concise notes or by updating the

PART 512 - CONSTRUCTION

drawings. Notes describing the changes will be recorded on all sheets of the drawings where changes occurred.

(4) Structural and/or dimensional changes made in a conduit, drainage system, cutoff trench, foundation preparation, embankment zoning, geotextile material, dental concrete, outlet pipes, or any structural element that will not be visible following completion of the works of improvement must be illustrated in detail to provide complete, legible, and a true and final record of the As-Built conditions.

(5) Changes during construction that could affect the storage volume of a reservoir or structure are to be recorded as an As-Built condition. These changes could include: more or less borrow material being removed from the reservoir basin, deposition of waste material within the basin, and a significant change in a structure (like a roadway) within the storage area.

(b) Geology.

(1) Because pre-construction borrow and foundation investigations rely on a sampling and evaluation process to establish the geologic conditions at the proposed structure(s) site, excavations during construction may expose conditions not previously observed and reported. Actual conditions encountered shall be appropriately documented, with particular emphasis on those that vary significantly from information presented in the design reports. Significant variations may require a reevaluation by the original designer.

(2) All significant differences in the geologic information identified during construction shall be reported to the approving engineer on the As-Built drawings and geologic maps and sections to supplement the geologic report of the project and/or structure. Significant differences include structural or stratigraphy discontinuities in the geologic materials (any type of soil or rock) at the site, location of solution cavities and voids, ground water conditions, and any other geologic related condition that can adversely affect the engineering performance of the structure.

PART 512 - CONSTRUCTION

(c) Labeling. Each sheet of the As-Built drawings must be clearly identified as "AS-BUILT." The title sheet of the drawings shall list the contractor, contract number, construction completion date, name(s) of construction inspectors and final amount of the contract. The title sheet will also contain the GR or COTR name and signature to certify that all work under the contract was installed in accordance with the As-Built drawings and specifications, and that the As-Built drawings are a true and correct record.

(d) Checking. Following construction, the As-Built plans must be checked by the individual certifying completion in accordance with the contract provisions. The certifying official shall initial each sheet of the drawings together with signing the title sheet. The As-Built drawings must be submitted to the NRCS office that has the technical responsibility for the project work and be available for future reference.

(e) Reproduction. Each state office (including the Pacific Basin Area and Caribbean Basin Area) is responsible for the size reduction and reproduction of the As-Built drawings for project type work. Final size of the reproduced As-Built plans should be 11 to 12 inches by 15 to 18 inches. A reproducible copy will be properly filed at the state office and be available for developing additional copies in the future. Copies of the As-Built drawings shall have the following distribution:

(1) A negative or print copy for extended Federal Archives and Records Center (FARC) storage. (See GM Title 120, Section 408.63) For those projects where the National Archives has designated the records as PERMANENT, a negative copy must be provided.

(2) Each sponsor or owner of the project that requests a copy. The sponsor that has operation and maintenance responsibility shall receive and retain a copy for reference. Operation and maintenance information, including shop drawings for equipment that was installed for the project and/or practice, shall be included with the As-Built drawings for the sponsors/owner/operator.

(3) A copy shall remain on file at the local USDA Field Office.

PART 512 - CONSTRUCTION

(4) A copy of the As-Built construction drawings and specifications shall be provided to the sponsors f o r project work. This includes updated As-Built drawings for projects where additional work was performed. A copy of As-Built drawings prepared for conservation engineering practices, when required under Section NEM Part 512.51, shall be provided to the landowner/operator following completion and acceptance of the work.

(5) CADD generated drawings with As-Built updates may be used to reproduce drawings for sponsors/owners. The CADD electronic file shall be clearly identified and made a part of the file documentation.

(6) State and/or local regulatory authorities which issue permits, or as required by regulations.

512.53 Disposition.

For the disposition of As-Built files for structures installed as part of a total project, see General Manual Title 120, Section 408.63 under File Code 210-12-11.

PART 512 – CONSTRUCTION

(Note: Sections 512.54 through 512.59 are reserved)