

Part 512 - Construction

Subpart A - General Information

KS512.3 Value Engineering

F. Sectional Fills

- (1) In [National Engineering Handbook Part 642, Specifications for Construction Contracts, Chapter 2](#), Construction Specification 23, Sections 4(d) and 4(e) indicate that the fill for a dam shall be placed in horizontal layers from abutment to abutment, except for the case where sectional fills are allowed to facilitate construction or passage of streamflow.
- (2) When sectional fills are allowed, opportunities for differential settlement can be increased. Hydraulic fracturing of the earthfill embankment can result if the differential settlement is great enough. This can lead to internal erosion of the dam and potential failure over time. On sites with good foundation soils with the embankment constructed of compacted clay materials, different sectional fills with up to 30 feet of elevation difference can be constructed on low hazard dams without concern.
- (3) Prior to approval to allow the contractor to build sectional fills greater than 30 feet or sectional fills on significant or high hazard structures, the design engineer (or soil mechanics engineer) shall perform an analysis of the site to determine if the proposed sectional plan is acceptable. This analysis is site-specific and will be dependent upon the proposed fill slope between the sections, the foundation soils, and the settlement potential within the fill to be placed. In all cases where sectional fills are allowed, the minimum criteria for bonding surfaces preparation and bonding surfaces slope shall be as outlined in Construction Specification 23, Section 4(e).

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Subpart C - Evaluation of Construction Materials

KS512.21 Evaluation Procedures

A. Material quality will . . .

(1) Shop drawings

(i) Definition: The term “shop drawings” includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by a contractor to explain in detail specific portions of the work required by the plans. It is furnished to provide details of fabrications and/or installation or to indicate the specific commercially fabricated item to be furnished to meet the requirements of the plans. Shop drawings for some items are indicated as being required by the drawings or specifications. Work requiring shop drawings shall not be installed until the shop drawings have been properly approved.

(ii) When shop drawings are furnished, the contractor must coordinate all such drawings and review them for accuracy, completeness, and compliance with contract requirements and indicate his approval thereon as evidence of such coordination and review. If shop drawings show variations from the contract requirements, the contractor must indicate such variations at the time of submission. Approval of the shop drawings does not relieve the contractor of responsibility for any errors or omission in such drawings nor from responsibility for complying with the requirements of the plans.

(iii) Shop drawings should be reviewed by the designer (i.e., the person who designed the item for which the shop drawings are being submitted).

(iv) Shop drawings shall be approved by the incumbent in the same position as that which approved the plans.

(v) When construction is performed under federal or local contracts, the following will occur:

(a) The state conservation engineer (SCE) or someone acting for the SCE will approve shop drawings for plans approved by the SCE, except that a project engineer may approve shop drawings for any item that meets all of the following requirements:

- Item is not buried
- Item is not permanently below the water surface
- Item is not embedded in concrete
- Item is not part of a facility designed by a consulting engineer

(b) Representative items for which shop drawings may be reviewed and approved by a project engineer are fence gates, trash racks, and guard rails; reinforced concrete pipe and precast riser details; and forming plans. Representative items for which shop drawings must be reviewed by the designer and approved by the SCE include water control gate details, manhole and cover details, and details of items designed or specified by a consulting engineer.

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Subpart C - Evaluation of Construction Materials

KS512.21 Evaluation Procedures (continued)

(c) The project engineer shall review the shop drawings submitted by the contractor to see if they appear to meet the contract requirements. If they do not appear to meet the contract requirements, the shop drawings shall be returned to the contractor (through the contracting officer in federally assisted contracts) with an explanation of why they will not be reviewed further.

(d) If the shop drawings appear to meet the contract requirements and the project engineer has approval authority as indicated above, the project engineer shall do the following:

- Review the shop drawings
- Make appropriate comments or corrections as necessary
- Approve the drawings, if appropriate, subject to any necessary corrections
- Return the marked shop drawings to the contractor (through the contracting officer [CO] in federally assisted contracts)
- Send a marked copy to the SCE as reference for those plans approved by the SCE

(e) If the shop drawings appear to meet the contract requirements and the project engineer does not have approval authority as indicated above, the project engineer shall send the drawings with any comments to the SCE. The SCE will do the following:

- Have the shop drawings reviewed and approved, if appropriate, with comments and corrections as necessary
- Return one marked copy to the project engineer
- Retain one marked copy for reference

(f) If a consultant is involved, the SCE will submit two copies to the consultant for review and comment. The consultant shall return a marked copy with recommendations. A duplicate copy will be retained in the engineering design file.

(g) The marked copy that has been returned to the project engineer becomes the official Natural Resources Conservation Service (NRCS) copy and shall be filed in the project engineer contract file.

(h) The project engineer shall indicate NRCS approval on a copy, along with corrections and comments as necessary, and return it to the contractor (through the CO on federally assisted contracts). Additional marked copies shall be made and distributed as necessary.

(2) Materials must be examined on the job site (regardless of how they are evaluated initially) since material may become defective because of improper storage, handling, or other causes.

B. The NRCS individual with appropriate job approval as authorized by [Form KS-CPA-1, Kansas Practice Approval Certification](#), will determine if used construction materials may be

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Subpart C - Evaluation of Construction Materials

KS512.21 Evaluation Procedures (continued)

incorporated in conservation practices. The materials must be inspected prior to installation and are acceptable if they meet at least one of the following conditions:

- They are allowed and meet the material requirements in the [Kansas Field Office Technical Guide \(FOTG\)](#)
- They are listed in the [Kansas Prequalified Materials List](#) found in Section IV of the Kansas FOTG.
- They are in the following list:
 - Used pipe for fence posts and appurtenances
 - Used steel pipe for principal spillways and underground outlets, provided the pipe is free of obvious defects and meets the minimum wall thickness requirements
 - Used gated pipe (in good condition) to serve as a flow distribution device for a waste treatment strip or similar wastewater management practice

Materials that do not meet the criteria above may be specifically approved by the SCE on a site-by-site basis. The request for consideration and acceptance of these materials shall be made in writing using [Form KS-TCH-1, Variance Request](#), prior to installation of the materials.

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KS512.23 Prequalification of Materials

E. The names of products and their supplier or manufacturer that have been precertified with the Natural Resources Conservation Service (NRCS) State Office are listed in the [Kansas Prequalified Materials List](#), and, as appropriate, will be added to the general provisions of formal contracts. If the quality of a precertified product is uncertain, additional tests and verification for the specific product in question are to be obtained to verify compliance with requirements. The list of prequalified materials shall be reviewed at least once every 3 years for completeness and reliability.

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Subpart D - Quality Assurance Activities

KS512.32 Quality Assurance (QA) Procedures

C. Natural Resources Conservation Service (NRCS) personnel shall not inspect or approve the installation of electrical pumps and other electrical machinery and wiring services to them. The electrical wiring shall be installed in accordance with national, state, and local electric codes and shall meet local permit and electric utility requirements.

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Subpart E - Equipment, Records, and Coordination

KS512.40 Engineering Equipment

B. Specialty equipment may . . .

(1) The following construction safety items have been issued to each individual that has responsibility for quality assurance testing on Engineering Class VI-VIII structures:

- (i) One reflective vest
- (ii) One position-marking, pole-mounted flag
- (iii) One magnetic-mount strobe light

(2) These items shall be utilized by all personnel responsible for taking quality assurance tests while on an earthfill surface and in the presence of parked or operating construction equipment.

(3) The vest shall be worn and properly fastened. The marking flagpole shall be pushed into the earthfill being tested within 3 feet of the test location to a depth that will prevent it from falling over for the duration of the testing. The strobe light shall be turned on and then placed on the exterior top of the cab of the inspection vehicle anytime the vehicle is driven or parked on the earthfill surface for the duration of the testing procedure.

(4) Additional use of this equipment is encouraged whenever extra visibility is needed to provide a safer working environment for Natural Resources Conservation Service (NRCS) employees and equipment.

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Subpart E - Equipment, Records, and Coordination

KS512.41 Records

D. Form NRCS-ENG-310, Job Diary, shall be used to document daily activities on all Federal construction contracts to install conservation engineering practices or project elements. It will also be used on all local contracts for installation of project elements including force accounts, division of work, and performance of work or when required by the quality assurance plan.

(1) Special effort should be taken to maintain high quality job diaries. The state and area engineering staffs will review diaries and offer comments during construction reviews.

(2) Instructions for completing the job diary are shown in the National Contracts, Grants, and Cooperative Agreements Manual, Part 517.12.

E. Upon completion of the final inspection of an inventory-size dam, all items shall be completed as outlined in page 5 of the [Kansas Supplement to Chapter 4 of National Engineering Handbook, Section 19 \(NEH-19\), Construction Inspection](#).

F. Construction records for Engineering Job Classes I through V (not included above) shall be kept on Form NRCS-ENG-29, Loose Leaf Field Sheet, or Conservation Assistance Notes (Form NRCS-CPA-6). Construction records for ponds shall be kept on [Form KS-ENG-15, Earth Dam Inspection Report](#), and for waste storage structures on [Form KS-ENG-16, Waste Management System Inspection Report](#). Typical records shall include field survey, stakeout and checkout notes, material measurements, documentation pipe markings, reinforcing steel markings, and material delivery invoices (tickets). The specific records necessary for each job will be designated by the individual approving the design.

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Subpart E - Equipment, Records, and Coordination

KS512.42 Coordination Between Disciplines

D. The inspector or engineer for all project contracts and all inventory-size dams shall have a copy of the design and investigation report(s) available for reference during construction.

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Subpart F – As-Builts

KS512.52 Documentation

A. Recording Changes

(1) As-built plans will be prepared by the individual responsible for quality assurance during construction of the works of improvement. A red or black ink pen shall be used for recording changes. A red pencil should not be used. All numerical and note changes shall have the original crossed out with a single line and the as-built value written adjacent and “boxed.” Example: elev. ~~23.6~~ 24.5

(2) Geology.—If new major deposits are found (in auxiliary spillway, outlet channels, borrow areas, etc.), they should also be noted as well as major differences in elevation of soft alluvium in foundation excavations. Additional geologic information shall be recorded, especially on structures where only a minimum amount of geologic investigation was done. The responsibility to see that all major geologic changes are recorded on the as-built is the person(s) in charge of construction, such as the engineer, inspector, engineering technician, etc.

C. Checking.—The completed as-built plans for project dams shall be sent to the state office within 90 days after completion has been certified. The completed as-built plans for other structures will be sent to the office that approved the design. Project dams include those constructed or modified using Federal Funds including Public Law 83-566 and Public Law 107-472 (Rehabilitation).

D. Reproduction.

(1) Initially 4 prints of the as-built plans for project dams shall be produced by the state office. One copy each shall be distributed to the following:

- (i) State office
- (ii) Field office
- (iii) Local sponsoring organization
- (iv) Kansas Division of Water Resources

(2) An electronic copy of the plan will be maintained at the state office to be available for use with national dam safety programs. Copies will be made available to other Natural Resources Conservation Service (NRCS) offices, state agencies, or local sponsors as requested.

(3) Two prints and an electronic copy of the as-built plans for all other projects shall be reproduced by the office approving the design. The electronic copy shall be maintained at the approving office, and one printed copy shall be distributed to each of the following:

- (i) Field office
- (ii) Local sponsor

E. Operation and maintenance . . .

(1) Photographs shall be taken of all newly completed dams that require as-built plans be prepared. The photographs are to be taken immediately after construction is completed and shall be carefully selected to show key components of the dam.

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Subpart F – As-Builts

KS512.52 Documentation (continued)

- (2) The photographs should show the as-built appearance of such features as the following:
 - (i) The stilling basin and adjacent portion of the outlet channel
 - (ii) Foundation drain, filter drain, or other drain outlet
 - (iii) Critical embankment (abutment gutters)
 - (iv) Principal spillway inlet and trash racks
 - (v) Inlet, outlet, and floor of the auxiliary spillway
 - (vi) Diversions, waterways, and other appropriate components of the dam
- (3) Two sets of photographs shall be made and labeled indicating the features being shown. One set shall be distributed to each of the following:
 - (i) The supervisory district conservationist or district conservationist who has been assigned the responsibility for the applicable watershed—these photographs shall be placed in the case file folder in the field office that has been established for the site in accordance with [General Manual Title 120, Section KS408.23\(c\)\(2\)](#).
 - (ii) Local sponsor (watershed district or individual)
- (4) The photographs may also be distributed to the same individuals in electronic format with information regarding the features shown.

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KS512.53 Disposition

The original as-built plans for non-project structures shall be filed in the field office until final disposition.