

March 19, 2004

NATIONAL ENGINEERING MANUAL  
210V (Second Edition)  
Amendment FL-33

SUBJECT: ENG - NATIONAL ENGINEERING MANUAL, FLORIDA AMENDMENTS

Purpose. To supplement the National Engineering Manual (NEM).

Effective Date. This amendment is effective when received.

The Florida NEM amendment changes all references from “Assistant State Conservationist for Field Operations” (ASTC/FO) to “Area Conservationist (AC).” In addition, a few minor editorial changes were made.

Amendment FL-33 supercedes all previous Florida Amendments.

Filing Instructions. The attached amendments are to be filed in the NEM.

Delete Pages

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FL501-12(1) - FL501-12(10) (1/01)  
FL501-12(11) - FL501-12(19) (2/04)  
FL503-2(1) – FL503-2(2) (1/01)  
FL503-13(1) – FL503-13(2) (1/01)  
FL505-12(1) – FL505-12(4) (1/01)  
FL506-6(1) – FL506-6(6) (1/02)  
FL512-16(1) - FL512-16(2) (1/01)  
FL512-22(1) – FL512-22(2) (1/01)  
FL512-26(1) - FL512-26(2) (1/01)  
FL520-12(1) - FL520-12(2) (1/01)  
FL530-7(1) – FL530-7(2) (1/01)  
FL540-3(1) – FL540-3(2) (1/01)  
FL542-6(1) – FL542-6(20) (10/02)  
FL540-3(1) – FL540-3(2) (1/01)  
FL544-1(1) – FL544-1(2) (1/01)

Insert Pages

NEM Notice Florida Amendment FL-33

FL501-12(1) - FL501-12(20) (3/04)

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FL503-2(1) - FL503-2(2) (3/04)  
FL503-13(1) – FL503-13(2) (3/04)  
FL505-12(1) – FL505-12(4) (3/04)  
FL506-6(1) – FL506-6(6) (3/04)  
FL512-16(1) - FL512-16(2) (3/04)  
FL512-22(1) – FL512-22(2) (3/04)  
FL512-26(1) - FL512-26(2) (3/04)  
FL520-12(1) - FL520-12(2) (3/04)  
FL530-7(1) - FL530-7(2) (3/04)  
FL540-3(1) – FL540-3(2) (3/04)  
FL542-6(1) – FL542-6(20) (3/04)  
FL540-3(1) – FL540-3(2) (3/04)  
FL544-1(1) – FL544-1(2) (3/04)

----- MORE -----

The NEM is now available online at the web site  
<http://www.info.usda.gov/CED/ftp/CED/NEM.html>

Florida amendments to the NEM are available online at the web site  
<http://www.fl.nrcs.usda.gov/technical/techres.html>

Questions regarding the attached amendment should be directed to the SCE.

Jesse T. Wilson  
State Conservation Engineer

Enclosure

DIST: A, F, ENG

PART 501 - AUTHORIZATIONS  
SUBPART A - REVIEW AND APPROVAL

FL501.01(b)(3)(ii)

FL501.01 Scope.

FL501.01(b)(3)(i) Non-NRCS employees who are not Federal employees and are not licensed to practice engineering in Florida and who are specifically assigned to carry out NRCS work under the direct supervision and control of a NRCS employee(s) may be assigned engineering job approval authority (see FL501.01(3)(v)).

(ii) Assigning engineering job approval authority to a district employee by NRCS does not provide any liability protection for the district nor does it provide any protection to the individual district employee. The federal government cannot provide legal protection for a district employee based solely on the fact that the employee was operating under a job approval authority established by NRCS. However, if a tort claim is brought against a district employee, arising out of district work, the fact that the employee was following NRCS conservation practice standards and had engineering job approval from NRCS for the level of work that was performed, may be helpful in the defense of the suit since NRCS is the acknowledged leader in the field of conservation engineering.

In that regard, it is appropriate to consider the application of the Federal Tort Claims Act, as amended, 28 U.S.C. 2671 et seq., to district employees. This Act provides that the exclusive remedy for person injured by federal employees, acting within the scope of their employment, is an action against the federal government. It effectively immunizes federal employees from tort liability.

Under certain circumstances, the protection of the Act can be extended to district employees when they are carrying out NRCS work. The definition of “Employee of the Government” for purposes of the Torts Claims Act, includes “... persons acting on behalf of a federal agency in an official capacity, temporarily or permanently in the service of the United States, whether with or without compensation.” Since district employees often assist as “loaned employees” in carrying out NRCS programs, they may be considered federal employees for purposes of the Torts Claims Act. Whether a person is considered a federal employee for this purpose is a question of fact to be determined in each case. However, at a minimum, the district employee must be specifically assigned to NRCS to carry out NRCS work under the direct supervision and control of employees of the Service. If he or she is determined to be a federal employee for the purposes of the Act, he or she will be protected by the Act and may be provided representation by the federal government.

It has been determined that in those cases where a district agrees to provide a product or service to NRCS and the district uses its employee under its supervision and control to furnish the agreed to service or product that employee will not be considered a federal employee for purposes of the Tort Claims Act. Again, the status of the employee must be determined on a case by case basis. The determination that a person is acting as an NRCS employee is not made by the NRCS state office, but by the office of General Council (OGC) on a case-by-case basis when a tort claim has been filed or other action.

FL501.01(b)(3)(iii)

(iii) Non-NRCS employees who are not Federal employees and are not licensed to practice engineering in Florida must adhere to Chapter 471 Florida Statute (F.S.) regarding the practice of engineering. Following are excerpts from Chapter 471 F.S. that are applicable to District employees.

*No person other than a duly registered engineer shall practice engineering or use the name or title of "registered engineer" or any other title, designation, words, letters, abbreviations, or device tending to indicate that such person holds an active registration as an engineer in this state.*

*The following persons are not required to register under the provisions of 471.001-471.037 F.S. as a registered engineer:*

*Any person practicing engineering for the improvement of, or otherwise affecting, property legally owned by her or him, unless such practice involves a public utility or the public health, safety, or welfare or the safety or health of employees. This paragraph shall not be construed as authorizing the practice of engineering through an agent or employee who is not duly registered under the provisions of F.S. 471.001-471.037.*

*A person acting as a public officer employed by any state, county, municipal, or other governmental unit of this state when working on any project the total estimated cost of which is \$10,000 or less.*

*Persons who are employees of any state, county, municipal, or other governmental unit of this state and who are the subordinates of a person in responsible charge registered under 471.001-471.037 F.S., to the extent that the supervision meets standards adopted by rule of the board.*

(iv) Due to liability issues and Florida laws regarding the practice of engineering, the delegating engineer shall confer with the SCE prior to delegating engineering job approval to non-NRCS employees.

(v) Before engineering job approval can be delegated to non-NRCS employees, a memorandum of understanding (MOU) or other written agreement between the employee's employer and NRCS will be required. The MOU or other written agreement must specifically state the employee is assigned to NRCS to carry out NRCS work under the direct supervision and control of the employee(s) of NRCS. A copy of the MOU shall be attached to the engineering job approval authority form. Exhibit FL1 – Sample Memorandum of Understanding may be used to delegate engineering job approval to non-NRCS employees.

SUBPART A - REVIEW AND APPROVAL

FL501.01(b)(3)(v) Exhibit FL1 - Sample Memorandum of Understanding (Page 1 of 2)

Memorandum of Understanding  
Between the

\_\_\_\_\_ (AGENCY)

And the

United States Department of Agriculture  
Natural Resources Conservation Service

This Memorandum of Understanding establishes the foundation for an enduring cooperative working relationship between the \_\_\_\_\_ (AGENCY) and the USDA Natural Resources Conservation Service (NRCS).

Whereas the \_\_\_\_\_ (AGENCY) and the NRCS have the common objective of helping bring about the wise conservation of land, water and related resources, they have determined it mutually beneficial to enter into this cooperative working relationship on this \_\_\_\_\_ day of \_\_\_\_\_.

A. What the \_\_\_\_\_ (AGENCY) will do.

1. Assign \_\_\_\_\_ (PERSON), to the NRCS under the direct technical control and supervision of the NRCS District Conservationist for the purpose of carrying out NRCS work upon request.

B. What the NRCS will do:

1. Provide engineering job approval authority to \_\_\_\_\_ (PERSON) for carrying out NRCS work while under the direct technical control and supervision of the NRCS District Conservationist.
2. Provide services of qualified personnel and logistical support necessary to carry out such work.
3. NRCS services will be provided in accordance with national NRCS standards and specifications as defined in the Field Office Technical Guide and other related technical standards used by NRCS.
4. Request the assignment of \_\_\_\_\_ (PERSON) for the purpose of carrying out NRCS work.
5. Provide direct technical supervision and control of \_\_\_\_\_ (PERSON) while carrying out NRCS work.

C. It is further understood:

1. Either party may arrange or provide as much agreed such additional services, equipment, facilities, materials, and arrangements that may be required to achieve the common objectives.
2. The relationship described herein is that of cooperating agencies, except that while carrying out NRCS work, \_\_\_\_\_ (PERSON), shall be considered a person acting on behalf of a federal agency for the purposes of the Federal Tort Claims Act, as amended, 28 U.S.C. 2671 et seq.
3. Any working relationship between \_\_\_\_\_ (AGENCY) and the NRCS will be that of cooperating parties to achieve a common objective and not one of procurement of services.
4. This MOU shall become effective when signed by both parties and shall continue for the term of employment of \_\_\_\_\_ (PERSON).

FL501-12(3)

Part 501 - AUTHORIZATIONS

FL501.01(b)(3)(v) Exhibit FL1 - Sample Memorandum of Understanding (Page 2 of 2)

5. This MOU may be terminated by either party giving five (5) days written notice to the other party.
6. This MOU will automatically terminate in the event \_\_\_\_\_ (PERSON) is no longer employed by the \_\_\_\_\_ (AGENCY).
7. All programs with support from this MOU shall be in compliance with the non-discrimination provisions contained in the Titles VI and VII of the Civil Rights Act of 1964, as amended; the Civil Rights Restoration Act of 1989 (Public Law 100-259); and other non-discrimination statutes; namely, section 504 of the Rehabilitation Act of 1973, title IX of the Education Amendment of 1972, and the Age Discrimination Act of 1975. They will also be in accordance with the regulations of the Secretary of Agriculture (7 CFR-15, Subparts A and B), which provide that no person in the United States shall on the grounds of race, color, national origin, age, sex, religion, marital status, or handicapped be excluded from participation in, be denied benefits of, or be otherwise subjected to discrimination under any program or activity receiving federal financial and/or technical assistance from the Department of Agriculture or any agency thereof.

This Memorandum of Understanding was approved by the \_\_\_\_\_ (AGENCY) on \_\_\_\_\_.

\_\_\_\_\_  
(AGENCY)

USDA-NRCS

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

Title: \_\_\_\_\_

Title: State Conservationist

FL501.03 Compliance of engineering work with laws and regulations.

(c) Procedures for signing and sealing engineering plans.

(1) For works designed by NRCS and non-NRCS employees working as partners with NRCS.

(i) When specifically required by state law, engineering plans prepared by a NRCS employee or a non-NRCS employee working as a partner (i.e., district employees) shall be sealed by a registered professional NRCS engineer with appropriate engineering job approval authority.

(ii) Engineering plans sealed by the engineer must be personally prepared by the engineer or prepared under the engineer's responsible supervision, direction, and control and within the engineer's job approval authority. See Chapter 471, Florida Statutes.

(iii) It is the responsibility of the NRCS or non-NRCS employee preparing the design to determine if the engineering plans require sealing. When sealing is required, the person designing the works of improvement must be a Florida registered professional engineer or arrange for the sealing of the plans by the supervising engineer. If neither the person performing the design or supervising engineer is licensed in Florida and/or does not have the appropriate engineering job approval authority, arrangements for sealing the engineering documents must be coordinated with the State Conservation Engineer (SCE) prior to beginning the design.

(2) The SCE and NRCS engineers registered as a Professional Engineer in Florida are authorized to seal engineering jobs within their delegated engineering job approval authority for plans required to be sent to regulatory agencies for review, approval or the granting of permits. NRCS personnel shall not act as agents for cooperators in securing permits.

(3) If a cooperating local organization for which NRCS is providing technical assistance is required by law to have plans for public works prepared under direct supervision of a registered professional engineer, the SCE or other NRCS engineers registered as a Professional Engineer in Florida are authorized to seal engineering jobs within their delegated engineering job approval authority.

## PART 501 - AUTHORIZATIONS

FL501.04(b)

FL501.04 Engineering job approval authority.

(b) State engineering job approval authority (Classes I-V).

(2) The procedure for approval of engineering work in Florida shall be as follows:

(i) Inventory and evaluation (I&E), design, and construction of engineering practices must be approved by a person with appropriate engineering job approval authority before alternatives are presented, design is finalized, and construction (installation) is started. Engineering designs and installation are to provide for all aspects of technical quality as stated in NEM 501.02.

(ii) Engineering job review and approval shall be provided by the person closest to the job with technical responsibility for that location. Where personnel with appropriate engineering job approval authority are not available in the field office, the engineer assigned to provide assistance to the field office shall review and approve the job. If higher engineering job approval authority is needed, the job shall be submitted to the Area Engineer (AE) for review and approval.

(iii) Jobs above the AE's engineering job approval authority shall have the SCE's concurrence during the I&E (planning) stage prior to commitment of NRCS resources.

(iv) Any NRCS employee or non-NRCS employee operating under the supervision of an NRCS employee may survey, design, and prepare the engineering plans for jobs requiring approval at any level of engineering job classification. However, final approval of the plans must be made in accordance with delegated engineering job approval authority. Before committing resources, employees shall consult with the person who will review and approve the engineering plan.

(v) All design calculations and plans must be checked prior to construction and initialed by the person checking the plans. The person checking the plans is responsible for determining that all calculations, dimensions, lines, notes, drawing details, and specifications are correct.

(vi) The employee approving the engineering design shall check the designs, drawings, and specifications and be satisfied that (1) adequate field investigations have been made; (2) the plans conform to NRCS standards and policy; (3) the layout is suitable; and (4) installations, if made in accordance with the plans and specifications, will function properly. Each sheet of the engineering plans shall be signed and dated by the person approving the plans.

(vii) Approval of engineering work within the limits of the engineering job approval authority places the full responsibility on the individual for planning, design, and construction of the practice. Any engineering practice may involve complexities, such as geology or hydrology, with which the employee may be unfamiliar. Employees shall request assistance when complexities are encountered which exceed their expertise.

(viii) All works of improvement prepared by NRCS for formal contracting shall be reviewed and approved by the SCE.

(3) Each employee responsible for any phase of engineering work shall be delegated engineering job approval authority. Non-NRCS employees may be delegated engineering job approval authority as stated in NEM FL501.01(b)(3). The engineering job approval authority applies to engineering inventory and evaluations, designs, and construction. Individual engineering job approval authority shall be delegated according to the employee's training, experience, and demonstrated competence. Engineers responsible for delegating engineering job approval authority should have reviewed one or more recent designs of each practice prepared (within the last 3 years) by the employee being considered. Major factors of the practice to be considered in determining the employee's engineering job approval authority are: (1) applicability; (2) accuracy; (3) completeness, including notekeeping and record keeping; (4) technical adequacy; and (5) construction applicability.

(i) The Engineering Job Approval Authority, FL-ENG-39 (see FL501.09, Exhibit FL2), establishes job type (practice), controlling factors, units, and job approval size (job class) for Florida. The engineering job approval authorities apply to all engineering work in all NRCS programs.

(ii) Form FL-ENG-39 shall be prepared by the responsible engineer for each employee who performs engineering work in the state. The employee's administrative supervisor shall concur in the engineering job approval authority and issue a copy to the employee.

(iii) Only those practices for which job approval is being given to an individual need to be listed on form FL-ENG-39. Maximum engineering job approval limits for I&E, design, and construction will be entered in the spaces provided. All spaces will contain an entry. Use an "0" when no engineering job approval authority is assigned.

(iv) Copies of the individual's engineering job approval chart shall be maintained by the employee, the employee's administrative supervisor, and by the engineer delegating the individual's engineering job approval authority.

(4) Professional engineers registered in Florida and working under NRCS technical supervision will be delegated engineering job approval authority according to the employee's training, experience, and demonstrated competence.

(5) Delegating engineering job approval authority.

(i) Engineering job approval authority for field personnel (except engineers in grades GS-11 and above) shall be delegated based on a technical determination by the AE and concurred in by the employee's supervisor. Maximum engineering job approval limits cannot be higher than the recommending engineer's engineering job approval authority. The engineering job approval authority of an individual transferred to a different administrative area shall be canceled and a new engineering job approval authority shall be delegated based on the technical determination of the AE and concurred in by the employee's new administrative supervisor.

Part 501 - AUTHORIZATIONS

FL503.04(b)(ii)

(ii) Engineering job approval authority for all engineers in grades GS-11 and above shall be delegated based on a technical determination by the SCE and concurred in by the employee's administrative supervisor.

(iii) The responsible engineer shall review the employee's engineering job approval authority at the frequency of not less than that stated in NEM 501.04(b)(5). The review shall include a spot check of the employee's engineering work.

(iv) If a review of an employee's engineering work reveals a need to revise (increase or decrease) an employee's engineering job approval authority, the reasons shall be documented in writing to the employee and the employee's administrative supervisor. The responsible engineer shall send a revised delegated engineering job approval authority to the employee's administrative supervisor. The employee's administrative supervisor shall concur in and reissue in writing to the employee the revised engineering job approval authority.

(c) State Conservation Engineer's engineering job approval (classes VI through VIII).

(3) Engineering design assistance, review, and processing for engineering Job Class VI through VIII will be coordinated by the SCE. The SCE will obtain the required expertise needed from the NRCS Regional Design Technical Team (RDTT), National Design, Construction and Soil Mechanics Center (NDCSMC), or other states as appropriate.

The SCE is responsible for:

(i) Securing assistance and coordinating activities with NRCS specialists outside of Florida.

(ii) Providing and coordinating data needed by technical specialists assigned to provide technical assistance to Florida.

(iii) Approving the final engineering plans and specifications.

(iv) Installation.

## FL501.05 Engineering job review

## (a)(3) Design reviews.

(i) Job Classes I through V. Design reviews will be performed as needed for engineering job Classes I through V. Non-routine jobs and complex jobs (regardless of engineering job class) shall receive a design review by others prior to final approval by the designer. Routine jobs that are within the delegated approval authority of the designer do not necessarily require a design review. Where needed to assure technical quality, the employee approving the job is responsible for obtaining design reviews.

(ii) The AE will be the reviewer for designs approved by NRCS employees, volunteers and others in their assigned area. The SCE or someone acting for the SCE will be the reviewer for jobs Class I through V approved by the AE.

(b)(1) Post reviews.

(i) The AE will be responsible for conducting post reviews (spot checks) of Class I through V engineering jobs in their administrative area in conformance with General Manual 450-Part 407. The Area Conservationist (AC) shall provide copies of engineering spot check reports to the SCE.

(ii) The SCE or his/her representative will conduct an annual post review of representative Classes I through V engineering jobs that were approved by the AE and other engineers grade GS-11 and above. The AE and engineers grade GS-11 and above shall submit to the SCE a list of all practices approved during the previous fiscal year by December 31. The list shall include the practice name and code number, extent of practice (feet, acres, etc.), engineering job class, location (county), and landowner name

(iii) The number and type of jobs reviewed will be determined by the SCE. Post reviews will include a variety of job types. All similar jobs will receive a post review a minimum of once in three years. The SCE will submit a copy of the post review report to the State Conservationist and the AC.

PART 501 - AUTHORIZATIONS

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PART 501 – AUTHORIZATIONS  
SUBPART A - REVIEW AND APPROVAL

FL501.09 Exhibit FL2 - Engineering job approval authority.

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Natural resources Conservation Service

FL-ENG-39  
Page 1

**ENGINEERING JOB APPROVAL AUTHORITY <sup>1/</sup>**

Name: \_\_\_\_\_ Title: \_\_\_\_\_ Grade: \_\_\_\_\_

Delegated by: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
*(Responsible Engineer)*

Concurred By: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
*(Line Officer)*

This form will be reviewed with the employee annually and revised as needed. If no significant changes are made, the following table will be used to document that the review has been made by the appropriate engineering personnel.

<u>Reviewed by</u>	<u>Title</u>	<u>Comments</u>	<u>Date:</u>

**DEFINITIONS OF MAXIMUM APPROVAL LIMITS COLUMN**

Inventory and Evaluation (I&E) - Onsite review of an exploratory nature and preparation of sound engineering alternative solutions of sufficient intensity for the land owner to make treatment decisions. I&Es may require assistance from engineers with higher engineering job approval authority for large or complex jobs.

Design - Designing and checking all aspects of supporting data, drawings, and specifications to ensure that the planned practice will meet the purpose for which it is installed. Also includes determining and setting any specific requirements for the site conditions.

Construction – Includes survey construction layout, inspections of construction materials, and construction inspection including performing required tests to determine that the job meets the requirements of the plans and specifications.

Standard designs noted under practice name are those engineering drawings and design criteria that have been approved and distributed or otherwise approved by the State Conservation Engineer. Standard designs are developed to function satisfactorily based on a set of design parameters. The person responsible for design and approval shall verify that the standard design is adaptable to the site and the design limitations are not exceeded.

<sup>1/</sup> Approval of engineering work within the limits of the engineering job approval authority places the full responsibility on the individual for planning, design, and construction of the practice. Any engineering practice may involve complexities, such as geology or hydrology, with which the employee may be unfamiliar. Employees shall request assistance when complexities are encountered which exceed their expertise. The employee approving the engineering design shall check the designs, drawings, and specifications and be satisfied that (1) adequate field investigations have been made; (2) the plans conform to NRCS standards and policy; (3) the layout is suitable; and (4) installations, if constructed in accordance with the plans and specifications, will function properly. Each sheet of the engineering plans shall be signed and dated by the person approving the plans. See National Engineering Manual for additional information on engineering job approval authority.

PART 501 – AUTHORIZATIONS

FL501.09 Exhibit FL2 - Engineering job approval authority.

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Page 2

Name: \_\_\_\_\_ Title: \_\_\_\_\_ Grade: \_\_\_\_\_

Prac. Code	Practice Name	Controlling Factors	Units	Job Class					Max. Approval Limits			
				I	II	III	IV	V	I&E	Design	Constr.	
--	Any Practice	Hazard Potential as defined in 503 NEM	---	Low	Low	Low	Low	Low.				
--	Any Practice	Alters the visual resources of beaches and shorelines on oceans	---	None	None	None	None	None				
560	Access Road	Surface Treatment	kind	Un-surfaced	Gravel	Gravel	Asphalt	All				
		Length	feet	2,000	5,000	10,000	20,000	All				
		Grade	%	3	5	8	10	All				
		Culvert										
		Pipe, I.D.	feet	2	3	4	5	6				
		Fill Height Over Top of Pipe	feet	3	5	8	12	All				
		Other Water Control Structures	2/	2/	2/	2/	2/	2/	2/	2/	2/	
702	Agrichemical Handling Facility	Tank Storage Volume for Chemicals	gal	None	None	500	1,000	5,000				
703	Agrichemical Mixing Station - Portable	Area	sq. ft.	None	None	All	All	All				
316	Animal Mortality Facility <u>Normal Mortality</u>	Composters	Capacity	cu. ft.	1,000	2,000	All	All	All			
		Freezers	Capacity	cu. ft.	None	None	All	All	All			
		Incinerator	Capacity	lbs.	None	None	All	All	All			
		Disposal Pit	Capacity	cu. ft.	None	None	All	All	All			
		<u>Catastrophic Mortality Events</u>										
		Burial Pit	Capacity	cu. ft.	None	None	All	All	All			
		Composting	Capacity	cu. ft.	None	None	All	All	All			
365	Anaerobic Digester – Ambient Temperature	No.	each	None	None	None	All	All				
366	Anaerobic Digester – Controlled Temperature	No.	each	None	None	None	All	All				

SUBPART A - REVIEW AND APPROVAL

FL501.09 Exhibit FL2 - Engineering job approval authority.

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575	Animal Trails and Walkways	Area	acres	0.5	2	5	10	All			
450	Anionic Polyacrylamide (PAM) Erosion Control	Area	acres	1	20	40	80	All			
397	Aquaculture Ponds	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Surface Area	acres	1	2	5	10	All			
310	Bedding	Area	acres	10	40	160	320	All			
584	Channel Stabilization	Design Capacity	cfs	10	100	300	400	500			
		Design Velocity	fps	2	2.5	3	5	10			
326	Clearing & Snagging	Length of Reach	feet	500	1,500	2,500	All	All			
360	Closure of Waste Impoundments	Surface Area	acres	0.5	1.0	3.0	10	All			
317	Composting Facility (Std. Design)	Design Capacity	cu. ft.	1,000	2,000	3,000	5,000	All			
656	Constructed Wetland	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Area	acres	0.5	1	5	20	All			
402	Dam	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Storage	ac-ft	1	10	50	100	All			
348	Dam, Diversion	Stream Flow (25 yr. freq.)	cfs	100	500	1,000	1,500	2,000			
		Flow Diverted	cfs	10	50	100	150	200			
		Height of Drop	feet	2	3	5	7	8			
356	Dike	Water Height	feet	1	2	3	5	12			
		Hazard	class	III	III	III	II & III	II & III			
362	Diversion	Drainage Area	acres	5	20	40	100	All			
554	Drainage, Water Management	Area	acres	40	80	160	640	All			
432	Dry Hydrant	Capacity	gpm	500	1,000	2,000	All	All			
393	Filter Strip	Surface Area	acres	0.5	1	5	All	All			
398	Fish Raceway or Tank	Length	feet	500	1,000	2,000	3,000	All			
		Capacity	cfs	1	3	5	10	All			

PART 501 – AUTHORIZATIONS

FL501.09 Exhibit FL2 - Engineering job approval authority.

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410	Grade Stabilization Structure		2/	2/	2/	2/	2/	2/	2/	2/	2/	2/	
412	Grassed Waterway	Design Capacity		cfs	25	50	100	250	All				
561	Heavy Use Area Protection	Area Treated		acres	0.25	0.5	1.0	All	All				
		Surface Treatment		kind	Grass, mulch, etc.	Gravel	Limerock	All	All				
320	Irrigation Canal or Lateral	Design Capacity		cfs	10	25	100	300	500				
388	Irrigation Field Ditch	Design Capacity		cfs	1	5	10	25	All				
464	Irrigation Land Leveling	Design Area		acres	40	80	160	640	All				
552	Irrigation Regulating Reservoir (Std. Design)		2/	2/	2/	2/	2/	2/	2/	2/	2/	2/	
		Storage			ac-ft	5	10	20	40	All			
436	Irrigation Storage Reservoir		2/	2/	2/	2/	2/	2/	2/	2/	2/	2/	
		Storage Capacity			ac-ft	5	10	20	40	All			
441	Irrigation System, Microirrigation	System Area		acres	10	40	80	160	All				
		Slope			%	0.5	2	5	All	All			
442	Irrigation System, Sprinkler	System Area		acres	10	40	80	160	All				
		Slope			%	2	5	10	All	All			
443	Irrigation System, Surface and Subsurface												
		<u>All surface systems</u>	System Area		acres	20	40	80	160	All			
		<u>Subsurface systems</u>											
		Crown Flood	System Area		acres	20	80	160	320	All			
		Flow Through	System Area		acres	20	80	160	320	All			
		Fully Enclosed	System Area		acres	20	40	80	320	All			
		Open Channels	System Area		acres	20	80	160	320	All			
		Underground Conduits	System Area		acres	10	20	80	160	All			
		Ebb and Flow	System Area		acres	5	10	20	40	All			
447	Irrigation System, Tailwater Recovery	Pump-back Capacity		gpm	500	1,000	2,500	5,000	All				
		Area Served			acres	20	80	160	320	All			

SUBPART A - REVIEW AND APPROVAL

FL501.09 Exhibit FL2 - Engineering job approval authority.

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543	Land Reconstruction, Abandoned Mined Land	Area	acres	0.5	10	40	160	All			
428	Irrigation Water Conveyance, Ditch & Canal Lining	Design Capacity	cfs	2	5	50	100	200			
430	Irrigation Water Conveyance, Pipeline	Pipeline Capacity ≥ 50 psi	gpm	300	600	1,200	2,000	3,500			
		Pipeline Capacity ≤ 50 psi	gpm	300	600	1,200	2,000	5,000			
449	Irrigation Water Management	Area Served	acres	10	40	80	320	All			
460	Land Clearing	Area Cleared	acres	5	10	40	All	All			
455	Land Reclamation, Toxic Discharge Control	Flow	cfs	None	None	None	None	None			
466	Land Smoothing	Area Smoothed	acres	40	80	160	320	All			
468	Lined Waterway or Outlet	Design Capacity	cfs	10	50	100	300	All			
779	Livestock Cooling Pond	Water Surface Area	acres	0.25	0.50	1.0	All	All			
717	Livestock Shade Structure	Structure Size, Area	sq. ft.	300	500	All	All	All			
634	Manure Transfer		2/	2/	2/	2/	2/	2/	2/	2/	2/
482	Mole Drain	Length	feet	660	1,320	All	All	All			
353	Monitoring Well	No.	each	None	None	None	All	All			
500	Obstruction Removal	Hazard to Public During Removal									
		None	acres	0.5	1	3	All	All			
		Moderate to High	acres	None	None	None	None	None			
582	Open Channel	Design Capacity (Subcritical Flow Only)	cfs	50	100	300	500	1,000			
		Design Velocity	fps	2.0	2.0	3.0	5	10			
516	Pipeline	Operating Pressure	psi.	60	80	125	200	300			
		Inside Diameter	in.	2	3	4	6	8			
378	Pond Embankment Excavated		2/	2/	2/	2/	2/	2/	2/	2/	2/
		Water Surface Area	acres	0.25	0.50	1.0	All	All			

PART 501 – AUTHORIZATIONS

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521	Pond Sealing or Lining	Area Lined	acres	0.25	0.5	2	5	All			
462	Precision Land Forming	Design Area	acres	40	160	320	640	All			
533	Pumping Plant	<u>Axial Flow Pump</u>									
		Design Capacity	gpm	1,000	2,500	10,000	30,000	50,000			
		Static Head	feet	10	10	10	12	15			
		<u>Mixed Flow Pump</u>									
		Designed Capacity	gpm	1,000	5,000	10,000	30,000	50,000			
		Head	feet	10	10	15	30	40			
		<u>Centrifugal Pump</u>									
		Design Capacity	gpm	300	500	2,000	2,500	3,500			
		Static Head	feet	75	150	300	350	350			
		<u>Turbine Pump</u>									
		Design Capacity	gpm	300	500	1,500	2,500	3,500			
		Static Head	feet	75	150	300	350	500			
566	Recreation Land Grading & Shaping	Area Graded	acres	4	10	40	160	All			
568	Recreation Trail and Walkway	Length	feet	1,000	5,000	10,000	All	All			
		Surface Treatment	kind	No Treat.	Wood Chips	Gravel	All	All			
558	Roof Runoff Structure	Roof Area	sq. ft.	2,000	10,000	All	All	All			
557	Row Arrangement	Area of Field	acres	40	160	320	640	All			
570	Runoff Management System		<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Area of System	acres	1	5	20	100	All			
350	Sediment Basin		<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
572	Spoil Spreading	Area Receiving Spoil	acres	0.25	0.50	3.0	All	All			
574	Spring Development	Spring Flow	gpm	10	50	300	450	All			
787	Stormwater Wet Detention/Chemical Treatment System	Storage	ac-ft	10	20	40	160	All			

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580	Streambank and Shoreline Protection	Beaches and Shorelines, Revetments, Bulkheads, and Groins									
		Water Height Above Shoreline	feet	None	None	None	None	3			
		Bankfull Capacity	cfs	None	None	200	500	5,000			
		Bankfull Velocity	fps	None	None	3	5	10			
587	Structure for Water Control	2'	2'	2'	2'	2'	2'	2'	2'	2'	
		Design Capacity	cfs	10	50	100	300	All			
606	Subsurface Drain	Design Area	acres	10	40	160	640	All			
		Diameter	in.	4	8	12	24	All			
607	Surface Drainage, Field Ditch	Drainage Area	acres	2	5	10	All	All			
608	Surface Drainage, Main or Lateral	Design Capacity	cfs	10	50	100	300	1,000			
		Design Velocity	fps	1.5	2.0	3.0	5	10			
600	Terrace	Area of System	acres	25	50	100	All	All			
620	Underground Outlet	Pipe Diameter	in.	6	8	10	18	All			
367	Waste Facility Cover	Area of Cover	acres	None	None	None	All	All			
313	Waste Storage Facility (Std. Design)	<u>Structure</u>									
		<u>Wall Height</u>									
		Above Ground	feet	0	3	6	10	16			
		Below Ground	feet	0	3	5	8	8			
		<u>Tank Span</u>									
		Above Ground	feet	0	0	0	All	All			
		Below Ground	feet	0	0	0	14	16			
		<u>Storage Capacity</u>	cu. ft. (thous)	0	0	0	1,000	2,000			
		<u>Impoundment</u>									
		Storage Volume	ac. ft.	5	10	40	100	All			
Effective Height of Dam	feet	5	10	15	25	35					

PART 501 – AUTHORIZATIONS

FL501.09 Exhibit FL2 - Engineering job approval authority.

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359	Waste Treatment Lagoon	Aerobic-Surface Area	acres	0.25	0.50	1.0	8	25			
		Anaerobic Volume	cu. ft. (thous)	50	100	500	1,000	2,000			
		Effective Height of Dam	feet	5	5	15	25	35			
635	Wastewater Treatment Strip	Area	acres	1	2	5	10	All			
633	Waste Utilization	Area	acres	20	40	160	All	All			
638	Water and Sediment Control Basin	Drainage Area	acres	5	10	20	All	All			
		Fill Height	feet	5	10	12	15	All			
614	Watering Facility	Capacity	gal.	100	200	1,000	All	All			
642	Water Well	Diameter	in.	4	6	8	16	All			
351	Well Decommissioning	Diameter	in.	4	6	8	All	All			
755	Well Plugging	Diameter	in.	4	6	8	10	All			
658	Wetland Creation	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Area	acres	0.25	0.50	5	20	All			
659	Wetland Enhancement	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Area	acres	10	20	40	All	All			
657	Wetland Restoration	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
		Area	acres	10	20	40	All	All			
648	Wildlife Watering Facility	Surface Area	acres	0.25	0.50	1	All	All			
		Capacity of Fabricated Structure	gal	100	200	1000	All	All			

SUBPART A - REVIEW AND APPROVAL

FL501.09 Exhibit FL2 - Engineering job approval authority.

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--- <sup>2/</sup> Dams and Structures	Hazard Class	---	low	low	low	low	low	low	low	low
	Drainage Area	sq. mi.	0.25	0.50	1.0	5.0	20.0			
	<sup>3/</sup> Effective Height	feet	10	15	25	30	35			
	Embankment over active fault	---	None	None	None	None	None			
	<u>Open Channel Spillways</u>									
	slope > 0.5%	acres	40	80	640	960	12,800			
	slope < 0.5%	sq. mi.	0.25	1	5	10	20			
	<u>Principal Spillway</u>									
	<u>Prefabricated Conduit (Single)</u>									
	<u>Corrugated Metal</u>									
	Inside Diameter	in.	12	24	36	42	48			
	<sup>4/</sup> Total Head	feet	10	15	25	30	All			
	<u>Concrete</u>									
	Inside Diameter	in.	None	12	24	36	48			
	<sup>4/</sup> Total Head	feet	None	10	20	30	All			
	<u>HDPE</u>									
	Inside Diameter	in.	12	24	36	42	48			
	<sup>4/</sup> Total Head	feet	3	5	10	15	All			
	<u>Plastic (PVC)</u>									
	Inside Diameter	in.	8	12	15	18	48			
	<sup>4/</sup> Total Head	feet	5	10	15	20	All			
	Storage x Height	ac-ft <sup>2</sup>	500	1,000	2,000	3,000	3,000			
	<u>Straight Drop Spillways (Std. Design)</u>									
	Net Drop	feet	None	4	6	8	8			
	Weir Capacity	cfs	None	100	300	400	500			
	<u>Box Inlet Drop Spillways Open or to Conduit</u>									
	Net Drop	feet	None	3	4	5	6			
	Weir Capacity	cfs	None	100	300	400	500			
	<u>Chutes (Std. Design)</u>									
	Net Drop	feet	None	4	8	10	12			
	Weir Capacity	cfs	None	50	200	250	300			

<sup>2/</sup> Dams & Structures - All with relatively impervious cutoff, simple foundation needs, and standard or proven designs not exceeding the limits of effective height and total head set forth above in the above table.

<sup>3/</sup> Effective height of dam is the difference in elevation in feet between the lowest open channel auxiliary spillway crest and the lowest point in the original profile along the centerline of the dam. If there is no open channel auxiliary spillway, the top of the dam becomes the upper limit.

<sup>4/</sup> Total head is measured from crest of auxiliary spillway to elevation at the top of pipe outlet.

PART 501 – AUTHORIZATIONS

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PART 503 - SAFETY  
SUBPART A - ENGINEERING ACTIVITIES AFFECTING UTILITIES

FL503.02(d)

FL503.02 General considerations.

(a) It is the Natural Resources Conservation Service (NRCS) policy in Florida to take the necessary steps to protect public and private utilities, equipment operators, and other personnel during investigation or construction activities involving NRCS. It will be the responsibility of the NRCS employee mentioned in FL503.02(c) to carry out all the procedures and action items mentioned in paragraphs NEM 503.02 through 503.06. The responsible NRCS employee is to utilize others, as needed, for assistance in locating, identifying and ensuring that the proper officials of the utility companies involved are notified.

(b) Location of utilities will be determined by a thorough field review; discussions with the landowner, operator, or sponsoring organization; and/or contact with the utility companies.

(c) Known utilities shall be shown on the construction plans. The following note is to be placed on all engineering plans or drawings where utilities are involved.

<p><b>IMPORTANT:</b> Utility owners must be notified of the date and time construction is scheduled to approach the utility (pipelines, telephone lines, electric lines, etc.) construction shall not commence until all utility companies have been notified and have their utilities located on the ground</p>
--

This note will serve as a reminder to the responsible NRCS employee to advise the owner or contractor of his/her responsibility.

(d) The District Conservationist is the responsible NRCS employee for carrying out this policy for all non-formal contract jobs installed with NRCS assistance within his/her field office. The State Project Engineer is the responsible NRCS employee for implementing this policy for formal contracts between NRCS and/or local sponsors and a contractor.

PART 503 - SAFETY

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PART 503 - SAFETY

SUBPART D – DAM SAFETY

FL503.56(b)

FL503.55 NRCS/State Relationships.

The State Conservation Engineer (SCE) is responsible for coordinating NRCS activities concerning dam safety and adherence to state laws. The SCE shall establish needed working arrangements with the State of Florida in promoting a strong State dam-safety program. Florida's dam safety law is contained in Water Resources, Chapter 373, Florida Statutes (F.S.). Rules and regulations for the administration of Chapter 373, F. S. have been delegated to the five water management districts and are contained in Chapter 40 (A, B, C, D, and E)-4 Florida Administrative Code (F.A.C.). The law contains requirements for a permit to construct, alter or remove a dam.

FL503.56 Responsibility for dams.

(a) NRCS in Florida provides technical and/or financial assistance on dams, dikes, and other water control structures under various programs. Sudden failure of many of these may seriously endanger life and property. Adequate design, construction, and proper operation and maintenance can significantly reduce the likelihood of such failures. NRCS technical assistance in the design and construction of dams shall ensure that all applicable state laws and regulations and NRCS standards are met and that the dam does not pose an unsafe condition to downstream landowners.

(b) For dams planned, designed, and constructed under the conservation operations program, the District Conservationist (DC) in consultation with the Area Conservationist and Area Engineer, is responsible for determining if proper design and construction inspection assistance can be provided to fulfill NRCS commitments in accordance with NRCS policy and state law, rules and regulations. If NRCS cannot provide the necessary technical assistance in a timely manner, the DC shall inform the landowner of his/her need to arrange for the services of a private engineer before proceeding with the project. Before NRCS provides technical assistance for the design of dams, the DC is to inform the landowner in writing of his/her responsibilities to comply with all applicable laws, regulations and permit conditions in constructing and operating the dam. When the design and plans are complete, the landowner is responsible for obtaining required permits to construct the dam. The DC should provide assistance as needed in securing the permit, but shall not act as an agent for the landowner under any circumstances.

PART 503 - SAFETY

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PART 505 - NON-NRCS ENGINEERING SERVICES  
SUBPART B - USE OF NON-NRCS ENGINEERING SERVICES

FL505.10(a)(2)(iii)

FL505.10 Non-project activities

(a) Non-NRCS Engineering Services

(2) (i) It is NRCS policy in Florida to encourage the use of non-NRCS engineering services in planning and applying soil and water conservation measures, regardless of size, for individuals or groups who wish to use these services and where NRCS standards and specifications will be followed.

(ii) Non-NRCS engineering services should be used for jobs that exceed the engineering job approval authority of the Area Engineer (AE). Where requests for technical services are beyond the normal capabilities, staff time, and/or resources available at the field offices, the Area Conservationist (AC) may set the limits of NRCS assistance to an engineering job class below that of the AE's engineering job approval authority. This will allow NRCS to work on jobs within available resources and to further encourage the use of non-NRCS engineering services. Requests for engineering assistance exceeding the AE's engineering job approval authority are to be submitted to the State Conservationist (STC) by the AC for approval prior to committing resources beyond a preliminary investigation.

(iii) Non-NRCS engineering services shall be used for jobs that exceed the engineering job approval authority of the state conservation engineer (Class VI and greater), unless specifically authorized by the STC. Unless additional assistance is authorized, NRCS assistance on these jobs shall be limited to conservation planning assistance, preliminary investigations, furnishing criteria and consultative assistance. Requests for NRCS assistance on these complex jobs will be in writing from the AC to the STC. The STC will evaluate the request and decide the extent of assistance that NRCS can provide and so inform the AC. The request shall include, but not be limited to, the following information:

- Location of the proposed job.
- General description of the proposal and brief discussion of its complexities.
- Purpose of the proposed work.
- Landowner or operator, group, or organization requesting assistance.
- Estimated cost of the job.
- Availability of non-Service engineers.
- Engineering assistance needed that cannot be provided at the area level such as geology, structural design, etc.
- Assurance that interested landowner(s) or operator(s) will install the facility in accordance with the plans and specifications. (Note: landowner(s) or operator(s) will be required to pay for necessary soil mechanics laboratory tests.)
- Area staff recommendation on what assistance NRCS should provide.

FL505-12(1)

Part 505 - NON-NRCS ENGINEERING SERVICES

FL505.10(b)

(b) Technical Services.

(1) Utilizing technical services.

(i) Qualified contractors and other qualified individuals should be encouraged to design, layout, and provide construction check out of conservation practices. To facilitate this, field offices should determine the training needs of local contractors and provide training where applicable. Training may include such items as how to perform design surveys, how to use NRCS standards and specifications, how to perform construction layout surveys from bench marks and reference stakes or lines, how to prepare engineering designs, and how to perform construction checks.

(ii) The cooperator and the person providing technical services shall be informed and understand that they are responsible for the accuracy of the survey and supporting data. The survey, design, and supporting data need not be the format used by NRCS but must be legible and understandable. The NRCS acceptance of a design is based on the assumption that the survey and supporting data are accurate.

(iii) To ensure conformance to NRCS standards and specifications, jobs designed by someone providing technical services shall be reviewed and approved by NRCS personnel having the appropriate engineering job approval authority prior to installation. If the NRCS employee responsible is satisfied that the design will meet standards and specifications, a statement such as: "This design, as presented, will meet NRCS minimum standards and specifications." shall be placed on the design and signed by the NRCS employee.

(iv) The landowner and designer will be informed, preferably in writing, that the NRCS must be notified at least three days prior to the start of installation. Failure to inform the NRCS and not provide the NRCS an opportunity to inspect construction may result in the NRCS not being able to certify the practice as meeting standards and specifications.

(v) The certification of practices accomplished by non-NRCS personnel within the field office service area is the responsibility of the District Conservationist (DC). The DC may accept the final checkout, and quantity documentation provided by individuals providing technical services as supporting data for certifying performance of a practice. The individual is to furnish signed statements, sketches, design data and notes giving appropriate information and measurements to show that standards and specifications have been met and design quantities have been installed. The supporting data does not have to be in the format used by NRCS, but must be legible and understandable. This information must be on file before certifying the practice.

(vi) Utilizing technical services of non-NRCS employees does not relieve the DC of the responsibility for determining needs and practicability for cost share programs.

FL505-12(2)

(210-V-NEM, Amend. FL-33, March 2004)

## SUBPART B - USE OF NON-NRCS ENGINEERING SERVICES

### FL505.10(b)(1)(viii)

(vii) Where persons supplying technical services are utilized in providing construction documentation, a complete construction check (spot check) will be made on at least one (1) job but not less than ten (10) percent of the jobs designed and/or installed by each individual during the year. Spot checks will be conducted by a NRCS engineer. The spot check notes will be recorded and filed in the field office. If it was determined that the individual performed unacceptable work, additional jobs will be checked and the AC will determine if a misunderstanding exists and if the individual can be depended upon to perform to the quality expected. If the individual produces poor quality plans, designs, or checking of completed installations, then all the individual's documentation will not be utilized in certifying practices.

(viii) Laws and regulations - Those who provide technical services need to be aware of state laws and regulations contained in Chapter 471, Florida Statutes (F.S.) and Chapter 61G15, Florida Administrative Code (F.A.C.). The practice of engineering must be performed under the responsible charge of or by a registered professional engineer. Persons who are not registered professional engineers or who do not have a registered engineer to seal the specifications, construction drawings, reports, and other engineering documents must be careful not to be in violation of state law. Compliance with state law is the individual's responsibility and NRCS acceptance of an individual's work does not suggest or imply compliance with state engineering registration requirements.

PART 505 - NON-NRCS ENGINEERING SERVICES

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## PART 506 - TECHNICAL MATERIALS

FL506.05(d)(2)

FL506.05 Distribution of engineering technical materials within NRCS.

(a) The State Conservation Engineer (SCE) is responsible for procuring all engineering technical materials needed in the state. The SCE will distribute all new engineering technical materials, as well as subsequent revisions. Requests for additional copies of technical materials shall be made in writing to the SCE.

(b) All engineering technical materials will be filed in loose leaf, three ring binders or in accordance with appropriate instructions. As revisions or new materials are received, they are to be immediately filed in the proper binder. When revised reference specifications are received, the older copy is to be discarded after all contracts which incorporate the older specification are completed.

(c) A complete set of engineering technical materials will be maintained at the Administrative Area office. It will be the responsibility of the Area Conservationist (AC) to maintain the engineering technical references. The required technical materials required at the Administrative Area office are listed in FL506.05(g) and FL506.05(h)

(d) As a minimum, the engineering technical materials listed in 501.05(d)(1) - 501.05(d)(2) shall be required at each field office. The AC and Area Engineer shall determine any additional engineering technical reference materials required at each field office. The required engineering reference materials for each office shall be based on the engineering practices applied and needs of the office. The AC will provide the field office with a list of required engineering technical materials and copies of the engineering technical materials. It is the responsibility of the District Conservationist (DC) to maintain all engineering technical references assigned to their office.

(1) NRCS National Engineering Technical References:

- (i) National Engineering Manual
- (ii) Part 650, Engineering Field Handbook
- (iii) Part 652, National Irrigation Guide and Florida amendments
- (iv) TR-55 Urban Hydrology for Small Watersheds and Florida amendments
- (v) TR-62, Engineering Layout Notes, Staking and Calculations

(2) Florida Engineering Technical References

- (i) Part 650, Engineering Field Handbook, Florida Supplements
- (ii) Florida Irrigation Guide
- (iii) Florida Drainage Guide
- (iv) Florida Standards for Engineering Computations
- (v) Florida Engineering Technical Notes

## PART 506 - TECHNICAL MATERIALS

### FL506.05(e)

(e) Engineering technical references for field engineers will be assigned directly to the engineer. It shall be each engineer's responsibility to keep his/her technical references up-to-date. Engineers relocated within the state shall take all technical references assigned to them to their new location. Engineers transferred out of state shall return all technical references assigned to them to the SCE.

(f) Engineers assigned to the state office, area offices, or project offices will not have a complete set of technical references assigned to them individually. They will have access to the complete engineering technical references assigned to the state office or area office.

(g) The following shall be considered as the complete engineering technical references for all engineers.

- (1) National Engineering Manual
- (2) Bulletins and Instructions received from the National or State Office
- (3) Florida Irrigation Guide
- (4) Irrigation Training Toolbox
- (5) Florida Drainage Guide
- (6) Florida Engineering Technical Notes
- (7) NRCS National Engineering Handbooks:
  - (i) NEH-3, Sedimentation
  - (ii) NEH-5, Hydraulics, including Supplements A and B
  - (iii) NEH-6, Structural Design
  - (iv) NEH-8, Engineering Geology
  - (v) NEH-11, Drop Spillways
  - (vi) NEH-14, Chute Spillways
  - (vii) NEH-18, Ground Water
  - (viii) NEH-19, Construction Inspection
  - (ix) Part 623, Irrigation (formerly NEH-15)
  - (x) Part 624, Drainage (formerly NEH-16)
  - (xi) Part 628, Dams, Chapters 50, 51, 52
  - (xii) Part 630, Hydrology (formerly NEH-4)
  - (xiii) Part 633, Soil Engineering, Chapter 26
  - (xiv) Part 637, Environmental Engineering
  - (xv) Part 642, Specifications for Construction Contracts (formerly NEH-20)
  - (xvi) Part 650, Engineering Field Handbook
  - (xvii) Part 650, Engineering Field Handbook, Florida Supplements
  - (xviii) Part 651, Agricultural Waste Management Field Handbook and Florida Amendments
  - (xix) Part 652, Irrigation Guide
  - (xx) Part 653, Stream Corridor Restoration: Principles, Processes, and Practices

## PART 506 - TECHNICAL MATERIALS

FL506.05(h)(2)(viii)

- (xxi) Part 637, Environmental Engineering National Handbook, Chapter 2, Composting

(7) Miscellaneous Engineering Technical References as follows:

- (i) National Map Symbol Handbook
- (ii) Florida Standards for Engineering Computations
- (iii) Applicable National Technical Releases
- (iv) Applicable design notes, specifications notes, soil mechanics notes and technical notes from the National Office.

(h) The following technical references will be distributed to engineers and Administrative Area Offices as needed and shall be maintained as part of that office location or engineer's file.

(1) Reference Specifications

(i) Those standard specifications of other agencies, associations, institutes, or societies that are referenced in NRCS National Engineering Handbook (NEH) 19, Construction Inspection; NEH Part 642, Specifications for Construction Contracts; and the FOTG Section IV, conservation practice standards. See NEM 542.40 for list of reference specifications.

(ii) Florida Department of Transportation, Standard Specifications for Road and Bridge Construction.

(iii) Florida Department of Transportation, Roadway and Traffic Design Standards Specifications for Road and Bridge Construction.

(2) Reference books:

- (i) Handbook of Hydraulics by King and Brater
- (ii) Occupational Safety and Health Administration (OSHA), Parts 1910 and 1926 Construction Industry Standards and Interpretations.
- (iii) Surveying, by Davis and Foote.
- (iv) Earth Manual, Bureau of Reclamation
- (v) Concrete Manual, U.S. Department of Interior, Eleventh Edition
- (vi) Structures and Environment Handbook, Midwest Plan Service, Eleventh Edition, 1987
- (vii) Post-Frame Building Handbook Materials, Design Considerations, Construction Procedures, Northeast Regional Agricultural Engineering Service, Revised 1997
- (viii) Water Measurement Manual, U.S. Department of the Interior, Bureau of Reclamation, Third Edition, 1997.

## PART 506 - TECHNICAL MATERIALS

FL506.05(i))

(i) Consultants, contractors or other individuals desiring copies of reference specifications and NRCS manuals may obtain them from the issuing agencies in the list below.

(1) NRCS Publications can be purchased from:

National Technical Information Service  
U.S. Department of Commerce  
Springfield, VA 22161  
(703) 605-6500  
[www.ntis.gov/](http://www.ntis.gov/)

(2) Federal specifications, standards, and interim specifications (and the index thereof) may be purchased from:

Superintendent of Documents  
Government Printing Office  
Washington, D.C. 20401  
(202) 512-1530  
[www.access.gpo.gov/su\\_docs/sale/prf/prf.html](http://www.access.gpo.gov/su_docs/sale/prf/prf.html)

(3) Specifications and test methods of the American Society for Testing and Materials (ASTM) may be purchased from:

American Society for Testing and Materials  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959  
(610) 832-9585  
[www.astm.org](http://www.astm.org)

(4) Commercial standards and product standards may be purchased from:

Commodity Standards Division  
NIST, Office of Weights and Measures  
820 W. Diamond, Room 223  
Gaithersburg, MD 20878  
(301) 975-4004  
[www.nist.gov/owm](http://www.nist.gov/owm)

and

Superintendent of Documents, GPO  
Washington, D.C. 20401  
(202) 512-1530  
[www.access.gpo.gov/su\\_docs/sale/prf/prf.html](http://www.access.gpo.gov/su_docs/sale/prf/prf.html)

PART 506 - TECHNICAL MATERIALS

FL506.05(8)

(5) Manuals of the Bureau of Reclamation, U.S. Department of the Interior, may be purchased from:

U.S. Government Printing Office  
Superintendent of Documents  
Washington, D.C. 20402  
(202) 512-1800 or (888) 293-6498  
[www.access.gpo.gov/su\\_docs/sale.html](http://www.access.gpo.gov/su_docs/sale.html)

or

National Technical Information Service  
Port Royal Road  
Springfield, VA 22161  
(800) 553-6847  
[www.ntis.gov/](http://www.ntis.gov/)

(6) Standards of the American Water Works Association (AWWA) may be purchased from:

American Water Works Association  
AWWA Bookstore  
6666 W. Quincy Avenue  
Denver, CO 80235  
(800) 926-7337 or (303) 795-2114  
[www.awwa.org/orders.htm](http://www.awwa.org/orders.htm)

(7) Standards of the American Concrete Institute (ACI) may be purchased from:

American Concrete Institute  
Member/Customer Services Department  
P.O. Box 9094  
Farmington Hills, Michigan 48333  
(248) 848-3800  
[www.aci-int.org/bookstore/bo-custser.htm](http://www.aci-int.org/bookstore/bo-custser.htm)

(8) Specifications of the American Institute of Steel Construction (AISC) may be purchased from:

American Institute of Steel Construction  
Dept. 77-5245  
Chicago, IL 60678-5245  
(800) 644-2400  
[www.aiscweb.com/publications/](http://www.aiscweb.com/publications/)

## PART 506 - TECHNICAL MATERIALS

### FL506.05(i)(9)

- (9) Publications of the American Welding Society (AWS) may be purchased from:

American Welding Society  
550 N.W. LeJeune Road  
Miami, FL 33126  
(800) 334-9353 or (305) 443-9353  
[www.aws.org/cgi-bin/shop](http://www.aws.org/cgi-bin/shop)

- (10) Standards of the American National Standards Institute, Inc. (ANSI) (USA or AN Standards), may be purchased from:

American National Standards Institute, Inc.  
11 West 42<sup>nd</sup> Street  
New York, NY 10036  
(212) 642-4900  
[www.ansi.org/](http://www.ansi.org/)

- (11) Military Specifications may be purchased from:

Commanding Officer  
Naval Supply Depot  
5801 Tabor Avenue  
Philadelphia, PA 19120  
Attn: Code CDS.  
(215) 697-2667  
[www.dodssp.daps.mil/dodssp.htm](http://www.dodssp.daps.mil/dodssp.htm)

### FL506.06 Distribution of engineering technical materials outside of NRCS

(a) Outside requests for engineering technical materials are to be handled by the office receiving the request. Generally, requests are to be referred to the appropriate issuing office as listed in NEM FL506.05(h).

(b) Copies of Florida engineering directives, amendments, conservation practice standards, etc., may be provided directly to units of government, individuals with whom NRCS has established a professional relationship, individuals who may be involved with NRCS programs and contracts, or others. When a field office cannot provide copies locally, these requests should be forwarded to the SCE.

(c) Requests for NRCS technical materials out of publication or not available for sale normally require reproduction which is can be time consuming. When a field office cannot make copies locally, these requests should be screened and a real need determined before the request is forwarded to the SCE.

PART 512 - CONSTRUCTION  
SUBPART C - EVALUATION OF CONSTRUCTION MATERIALS

FL512.21(b)

FL512.21 Evaluation Procedures.

(b) Where used materials are allowed in conservation practices, the material shall be examined to determine if it meets or exceeds the minimum material quality, design life and performance criteria as specified in the appropriate Field Office Technical Guide (FOTG) practice standard. Before using used materials, the quality, performance and the design life of the used material must be documented in writing as meeting or exceeding the requirements as specified in the FOTG. The determination shall be by a person with appropriate engineering job approval authority. Where cost share of used materials is allowed, the cost share rate shall be based on the average annual cost of the materials annualized over its life. See NEM FL543.00 for additional policy on the use of used materials.

PART 512 - CONSTRUCTION

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PART 512 - CONSTRUCTION  
SUBPART D – QUALITY ASSURANCE ACTIVITIES

FL512.32(d)(2)(iii)

FL512.30 General

(c)(3) The Area Conservationist (AC) shall ensure that the area and field office personnel are aware of vegetative resource considerations incorporated in each construction project and notify the State Resource Conservationist (SRC) when significant changes or potential problems or opportunities for improvements develop.

FL512.32 Quality assurance procedures.

(d) It is the policy of the NRCS in Florida, regardless of program, to provide the degree of quality assurance required to ensure acceptable results in each element of construction work by providing continuous or periodic construction inspection as outlined in 512.32 of this part.

(1) Non-Contract Work. The person responsible for the design of the job will be responsible for determining the degree of inspection and the elements to be inspected within their engineering job approval authority. The Area Engineer (AE) in consultation with the AC will determine the degree of inspection required for all engineering job classes above the approval authority of the field office employee. The SCE will review and approve the quality assurance plan for all engineering job classes above the engineering job approval authority of the AE and for all engineering job classes V-VIII.

(2) Formal Contracts.

(i) The designer will identify in the project design report those job elements and employee qualifications necessary for proper inspection of job elements. Inspector assignments will be based on the qualifications identified in the design report for the job. Normally, one inspector will be assigned to a construction contract. Other inspectors may be detailed to assist as needed on a temporary basis.

(ii) It is important that inspectors be on the job only during the time when actually needed and overtime should be held to a minimum commensurate with job inspection requirements. Overtime must be approved by the State Conservationist prior to use. It will be the responsibility of the Contracting Officer's Technical Representative to keep in close touch with daily construction operations on each contract and provide guidance to the inspector or inspectors assigned to the job. If an emergency arises during the day which changes the situation, it will be the responsibility of the inspector to determine if continuous or periodic inspection is required and act accordingly. The rationale for making the change should be recorded in the inspector's daily report.

(iii) A quality assurance plan (QAP) is required for all formal contracts. Elements to be included in the QAP are listed in 512.41(c). QAPs will be included in the design report and/or design folder for each formal contract. The designer of the project is responsible for preparing the QAP and shall ensure concurrence from the SCE. A copy of the QAP will be forwarded to the AC and the Contracting Officer.

FL512-22(1)

PART 512 - CONSTRUCTION

FL512.34

FL512.34 Pre-final and final inspections.

(a) The following procedure will apply for all construction performed by formal contract:

(1) A pre-final inspection will be held when the contractor has substantially completed the work under the terms of the contract. The purpose of the pre-final inspection is to determine if the technical provisions of the contract are in compliance and identify any items of work remaining to be completed. NRCS personnel involved in a pre-final inspection would normally include the contracting officer's technical representative (COTR), construction inspector (CI), and District Conservationist (DC). The COTR will notify the contracting officer (CO) and all other personnel involved, in as many days in advance as possible, prior to the date desired to hold a pre-final inspection. After consulting with those to be involved, the COTR will establish the final date and time of the pre-final inspection and make appropriate notifications. The COTR will document the results of the pre-final inspection on Form SCS-AS-805 "Checklist Prior to Final Inspection". Copies will be furnished to the CO and SCE. The COTR will inform the contractor and the CO on the results of the inspection.

(2) A final inspection will be held when the contractor has completed the work under the terms of the contract. The final inspection is for the purpose of determining if the contractor has fulfilled his/her contractual obligation and can be relieved of the project. Personnel involved in a final inspection normally includes the CO, COTR, SCE, CI, DC, AC, and the sponsors. The COTR will notify the CO, COTR, SCE, CI, DC, AC, and the sponsors, in as many days in advance as possible, of the desired date to hold the final inspection. In some instances, it may be determined before or at the pre-final inspection. Results of the final inspection shall be recorded by the COTR on Form SCS-AS-45. If the SCE is not available for the final inspection, the COTR shall sign the final inspection form as acting SCE. Copies of the final inspection shall be furnished to the CO, SCE, ASTC (Administration). At an appropriate time during the final inspection, the DC shall review the operation and maintenance plan with the sponsors.

(3) All construction documentation including job diaries, engineering field books, quantity computations, photographs, and as-built drawings shall be forwarded to the SCE within 60 days of completion of the job.

FL512-22(2)

PART 512 - CONSTRUCTION  
SUBPART E - EQUIPMENT, RECORDS AND COORDINATION

FL512.40(a)

FL512.40 Engineering equipment.

(a) Minimum engineering equipment needs. Each Field Office, Area Office, and Project Office shall have the necessary equipment to ensure quality assurance on installation of conservation practices. Equipment needs will vary greatly between field offices due to workloads and type of practices installed. The Area Conservationist with the assistance of the Area Engineer (AE) shall develop a list of equipment needs for each field office in their administrative areas. The AE will develop the minimum equipment needed for the Area Office. Equipment needs for Project Offices shall be determined by the Project Engineer or Project Manager assigned to supervise the office.

The following is intended to provide a minimum list of equipment from which to add or delete for each Field Office, Area Office or Project Office.

Minimum Equipment Needs for Field Offices

- Surveying instrument preferably self leveling or laser. (Self leveling instruments should have a graduated vernier).
- Surveying rod
- Clinometer
- Engineering chain or tape (100 feet or 200 feet)
- Chaining pins
- Hand level
- Measuring wheel
- Measuring tape – 12 and/or 25 feet
- Calculator
- Stop watch
- Graduated cylinder
- Pressure gage – 0 to 60 psi and 0 to 100 psi
- Pitot tube

Minimum Equipment Needs for Area Offices and Project Offices

- Total station surveying instrument
- Surveying instrument preferably self leveling or laser. (Self leveling instruments should have a graduated vernier).
- Surveying rod
- Range pole
- Clinometer
- Engineering chain or tape ( 100 feet or 200 feet)
- Chaining pins
- Hand level
- Measuring wheel
- Measuring tape – 12 and/or 25 feet
- Calculator
- Slump cone
- Concrete thermometer
- Caliper
- Sand cone for taking soil density tests
- Stop watch
- Graduated cylinder
- Pressure gage – 0 to 60 psi and 0 to 100 psi
- Pitot tube

FL512-26(1)

## PART 512 - CONSTRUCTION

### FL512.40(b)

(b) Each office is responsible to determine when additional equipment is needed to ensure quality assurance of conservation practices installed within their area of responsibility and to request the equipment in a timely manner through appropriate channels.

(c) Equipment shall be checked in accordance with NEM FL544.05

### FL512.41 Construction documentation.

(d) For engineering job Class I - IV conservation practices, the minimum documentation to support quality installation shall be as outlined in Florida Supplement to Engineering Field Handbook, Part 650, Chapter 1. Additional documentation to support quality installation may be necessary based on the complexity of the conservation practice and shall be included in a quality assurance plan. The person with appropriate engineering job approval authority shall identify any additional items needing testing or documentation and specify additional requirements in the construction specifications.

### FL512.42 Coordination between disciplines.

(c) Construction contract modifications. For contract modifications requiring the immediate attention and technical concurrence of the state conservation engineer (SCE), the responsible project engineer shall inform the SCE regarding the nature of the needed change and the estimated cost. Upon technical concurrence of the change, the project engineer will inform the contracting officer (CO) of the details on the proposed modification and furnish detailed information required to prepare the modification. The CO will obtain funding approval from the appropriate program manager before proceeding with the modification. The CO will advise the project engineer whether or not to proceed with the modification. Modified work shall not proceed before the CO approves the modification. Modifications not requiring immediate attention will be prepared by the Project Engineer (PE) and forwarded through normal channels to the CO.

Contract modifications involving major changes to the construction plan drawings or require additional construction plan drawings, shall be reviewed and approved (signed plans) by the SCE. The plans must be approved by the SCE before the modification is processed.

SUBCHAPTER C - APPLICATIONS  
PART 520 – SOIL AND WATER RESOURCE DEVELOPMENT  
SUBPART C – DAMS

FL520.22(4)

FL520.22 Design Criteria

The following procedures shall be followed for the design, construction, repair or alteration of dams subject to Florida laws.

(1) Once NRCS undertakes the design of a dam or impoundment, the district conservationist (DC) shall inform the landowner that any changes to the plans and specifications must be approved by NRCS. If for any reason the design is changed or construction proceeds without NRCS's approval and appropriate corrections are not made, the DC shall immediately notify the landowner in writing of the deviations and state that NRCS is terminating all assistance on the project. A copy of this letter shall be sent to the Area Conservationist (AC), Area Engineer (AE), and State Conservation Engineer (SCE).

(2) When final designs are completed, the NRCS will provide sufficient copies of the plans and specifications to the cooperator for submission to the appropriate state or local agency for permitting. The plans and specifications shall adequately describe the works of improvement and shall include the hazard classification of the dam in accordance with NEM 520.21(e); designated access to the dam; location with respect to highways, roads and streams. The plans shall also include an appropriate description of downstream land use and potential damage that may result from a sudden dam failure; the results of a geologic investigation; cross-sections; profiles; logs of borings; location of borrow areas; drawings of principal and emergency spillways; and other additional details to clearly indicate the extent of the work to be performed. An operation and maintenance plan shall be included as a part of the final design.

(3) It is essential that NRCS provide adequate inspection during construction in order to certify that the dam was constructed in accordance with the plans and specifications (see NEM FL512.32(d)). Before final designs are prepared, the DC will determine if NRCS can provide adequate construction inspection by someone with appropriate engineering job approval authority. If NRCS can provide adequate construction inspection, further NRCS technical assistance may be committed. If NRCS cannot provide adequate construction inspection, the DC shall notify the landowner of his/her need for private engineering assistance to complete the project. NRCS shall not provide technical assistance on the layout and/or construction of a dam until the cooperator has obtained all required permits.

(4) Landowners and contractors are to be strongly encouraged to construct the dam in accordance with NRCS plans and specifications. If at any time the plans and specifications are not adhered to, the DC shall notify the landowner verbally to immediately take corrective action. If the deficiencies are not corrected in a timely manner, the DC shall notify the landowner in writing (with a copy of the AC, AE, and SCE) stating the deficiencies and that no further NRCS assistance will be provided until the deficiencies are corrected. The DC shall also notify the appropriate permitting agency. When specifications are not met and the dam has the potential to cause significant off site damages in the event of partial or complete failure, the NRCS shall immediately send a written notification to the landowner. The notification shall state the known deficiencies and the need for immediate correction.

FL520-12(1)

## SUBPART C – DAMS

FL520.22(5)

(5) During the installation of the dam, construction checks shall be taken and recorded in the survey field notes. Construction checks shall be of such frequency and amount that it can be determined if installation is in conformance with NRCS plans and specifications. As a minimum, the following items shall be checked during construction and properly recorded in the engineering field book.

- (i) Foundation preparation and cutoff trench
- (ii) Principal spillway installation including type of pipe and coating, pipe size and gauge, pipe invert elevations, etc.
- (iii) Antiseep collar or drainage diaphragm
- (iv) Foundation drain installation, if required.
- (v) Sufficient checks of earthfill placement and compaction to ensure adherence to plans and specifications.
- (vi) Emergency spillway width, side slopes, control section, inlet and outlet grades.
- (vii) Assurance that adequate vegetation will be established.

(6) Construction technical assistance provided to the landowner in the form of verbal instructions shall be documented in writing and filed in the engineering file.

(7) Any design changes made during construction must be approved by a NRCS employee with appropriate engineering job approval authority and the appropriate permitting agency (if required by state law) before changes are made.

(8) When the dam is completed, the responsible NRCS employee with appropriate engineering job approval will prepare and sign a construction certification and "as-built" plans. If required by state law, the DC will furnish copies of the certification of construction and "as-built" plans to the appropriate permitting agency within 30 days after completion of the dam.

(9) Construction check notes, design data, a copy of the "as-built" plans and specifications shall be retained in the field office as a permanent record as long as the dam remains in place.

PART 530 - HYDROLOGY  
SUBPART B - HYDROLOGIC PROCEDURES AND CRITERIA

FL530.11

FL530.11 Hydrologic procedures.

Urban Hydrology for Small Watersheds (Technical Release No. 55) including Florida supplements or Engineering Field Handbook (EFH), Chapter 2, shall be the method used for hydrologic analysis for onfarm conservation practices.

FL530.11 Hydrologic criteria.

In using Urban Hydrology for Small Watersheds with Florida supplements or EFH Chapter 2, the Type III rainfall distribution may be used for the entire state of Florida. The DelMarVa (DMV) unit hydrograph may be used in areas with average watershed slopes of 0.5 percent or less without benches or terraces.

PART 530 - HYDROLOGY

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## PART 540 - FIELD SURVEYS

FL540.03(c)

FL540.03 Format.

(a) Notekeeping - The format and minimum requirements for engineering notekeeping for conservation engineering practices will comply with Engineering Field Handbook (EFH), Part 650, Florida Supplement. Technical Release No. 62 will be used for practices not listed and procedures contained in NEH-Florida Supplement should be used as a guideline for similar and comparable practices. All project works of improvement will comply with procedures outlined in Technical Release 62 and National Engineering Handbook Section 19, Construction Inspection.

(1) All field survey notes will be specific as the WHERE, WHAT, WHEN, AND HOW MUCH was designed, laid out, checked, and by WHOM. Site locations of completed practices shall be recorded. Supporting engineering notes shall be adequately referenced by field number, sketches, descriptions, etc., so that practice location may be determined by a person unfamiliar with the site.

(2) All loose leaf field survey notes for a given conservation practice shall be stapled together or placed in a envelope clearly marked to prevent separation of survey notes. Each sheet must be clearly identified and the sheets numbered as needed so if they become separated they can be properly refiled.

(3) To simplify and expedite notekeeping, maximum use will be made of standard Florida engineering forms as listed in EFH, Florida Supplement, Chapter 5.

(4) All engineering surveys will be tied back (closed) to the original bench mark. Loose leaf field survey notes will be attached (stapled) to the design and layout notes. A bench mark is required for all engineering surveys and shall be adequately described.

(b) Where non-NRCS engineering services are retained by land users for non-project activities and they provide designs for approval by the NRCS, their survey data may be accepted. The person (contractor, consultant, engineer, etc.) is to be informed and understand the he/she is responsible for the accuracy of the survey data. The NRCS design approval is based on the assumption that the survey data is accurate and does not require their survey notes to be furnished unless the person approving the design needs the notes.

(c) Planimetering Procedure - The planimetering procedure outlined in Chapter 1 Engineering Surveys, EFH, Florida Supplement, will be followed when planimetering an area to determine the extent of an engineering practice. Areas planimetered shall have sufficient dimensions measured in the field to plot the area accurately and show all principal dimensions.

PART 540 - FIELD SURVEYS

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PART 542 – SPECIFICATIONS

SUBPART C – EXHIBIT

FL542.40(a) ASTM Specifications

This lists the number, current issue date and title of all NRCS maintained American Society for Testing and Materials (ASTM) Standards.

It is recommended that the ASTM web site be checked to determine if the standards listed herein are the current edition.

<b>"A" SERIES</b>		<b>Applicable CS or MS</b>
A 6/A 6M-01	General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling	MS 511, 581 APP
A 27-95 (2000) Re-approved	Steel Castings, Carbon, for General Application	MS 572, 573
A 29/A 29M-99e1	General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold Finished	581 APP
A 36/a 36M-00a	Standard specification for Carbon Structural Steel	MS 511, 571, 572, 573, 581,
A 47/A 47M-99	Standard Specification for Ferritic Malleable Iron Castings	CS 83
A 48-00	Gray Iron Castings	MS 571, 572,573
A 53/A 53M-01	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	MS 554, 591
A 82-01	Steel Wire, Plain, for Concrete Reinforcement	MS 539 APP
A 90/A 90M-01	Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings	MS 581, CS 82 APP
A 108-99	Steel Bars, Carbon, Cold Finished, Standard Quality	MS 571, 572, 573
A 116-00	Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric	MS 591
A 121-99	Zinc-Coated (Galvanized) Steel Barb Wire	MS 591, C S91
A 123/A 123M-00	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	MS 582 APP
A 126-95 (2001) Re-approved	Gray Iron Castings for Valves, Flanges, and Pipe Fittings	MS 571
A 134-96	Pipe, Steel, Electric-Fusion (Arc)-Welded (Size NPS 16 and Over)	MS 554
A 135-01	Electric-Resistance-Welded Steel Pipe	MS 554
A 139-00	Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)	MS 554

MS 571 OR CS 31 - Indicates the Material or Construction Specification that lists the ASTM

MS 551 OR CS 83 APP - Indicates not listed in Material or Construction Specs but is applicable to specification

**BOLD TYPE** - Indicates that Project Construction activities should have this ASTM

PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"A" SERIES continued</b>		<b>Applicable CS or MS</b>
A 148/A 148M-01	Steel Castings, High Strength, for Structural Purposes	MS 572, 573
<b>A 153/A 153M-01</b>	<b>Zinc Coating (Hot-Dip) on Iron and Steel Hardware</b>	MS 581
A 167-99	Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip	MS 571, 572, 573
A 184/A 184M-01	Fabricated Deformed Steel Bar Mats for Concrete Reinforcement	MS 539
<b>A 185-01</b>	<b>Steel Welded Wire, Fabric, Plain for Concrete Reinforcement</b>	MS 539, CS 64
A 242/A 242M-00a	High-Strength Low-Alloy Structural Steel	MS 581
A 276-00a	Standard Specification for Stainless Steel Bars and Shapes	MS 571, 572, 573
A 283/A 283M-00	Low and Intermediate Tensile Strength Carbon Steel Plates	MS 581
A 307-00	Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength	MS 581, CS 83
A 325-00	Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength	MS 581
<b>A 328/A 328M-00</b>	<b>Steel Sheet Piling</b>	<b>MS 511</b>
A 385-00	Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)	MS 581 APP
A 390-95 (2001) Re-approved	Standard Specification for Zinc-Coated (Galvanized) Steel Poultry Fence Fabric (Hexagonal and Straight Line)	MS 591
<b>A 392-96</b>	<b>Zinc-Coated Steel Chain-Link Fence Fabric</b>	<b>MS 591, CS 91</b>
A 436-84 (1997) e <sup>1</sup>	Austenitic Gray Iron Castings	MS 571, 572
A 449-00	Quenched and Tempered Steel Bolts and Studs	
A 494/A 494M-00	Castings, Nickel and Nickel Alloy	MS 571
A 496-97a e <sup>1</sup>	Steel Wire, Deformed, For Concrete Reinforcement	
A 497-99 e <sup>1</sup>	Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement	MS 539
A 501-01	Hot-Formed Welded and Seamless Carbon Steel Structural Tubing	
A 563-00	Carbon and Alloy Steel Nuts	

*MS 571 OR CS 31* - Indicates the Material or Construction Specification that lists the ASTM

*MS 551 OR CS 83 APP* - Indicates not listed in Material or Construction Specs but is applicable to specification

**BOLD TYPE** - Indicates that Project Construction activities should have this ASTM

## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

## ASTM Specifications (continued)

<b>"A" SERIES continued</b>		<b>Applicable CS or MS</b>
A 568/A 568M-00b	General Requirements for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled	
A 572/A 572M-00a	High-Strength Low-Alloy Columbium-Vanadium Structural Steel	MS 511
A 575-96	Steel Bars, Carbon, Merchant Quality, M-Grades	MS 571, 581
A 582/A 582M-95b (2000) Re-approved	Free-Machining Stainless Steel Bars	MS 571
A 584-97	Aluminum-Coated Steel Woven Wire Fence Fabric	MS 591
A 588/A 588M-00a	Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi [345 MPa] Minimum Yield [100 mm] Thick	MS 581
A 589-96	Seamless And Welded Carbon Steel Water-Well Pipe	
A 615/A 615M-01	Deformed and Plain Billet Steel Bars for Concrete Reinforcement	MS 539
A 641/A 641M-98	Zinc-Coated (Galvanized) Carbon Steel Wire	MS 591, CS 64
A 648-95e1 (2000) Re-approved	Steel Wire, Hard-Drawn for Prestressing Concrete Pipe	
<b>A 653/A 653M-00</b>	<b>Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process</b>	<b>MS 538, 571, 581</b>
A 690/A 690M-00a	High-Strength Low-Alloy Steel H-Piles and Sheet Piling for Use in Marine Environments	MS 511
A 702-89 (2000) Re-approved	Standard Specification for Steel Fence Posts and Assemblies, Hot Wrought	MS 591
A 711-92(1996)e1	Standard Specification for Steel Forging Stock	CS 83
A 742/A 742M-98	Steel Sheet, Metallic-Coated And Polymer A Precoated for Corrugated Steel Pipe	MS 551 APP
<b>A 760/A 760M-01</b>	<b>Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains</b>	MS 551
A 761/A 761M-98	Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches	MS 551
<b>A 762/A 762M-00</b>	<b>Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains</b>	MS 551

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*MS 551 OR CS 83 APP* - - Indicates not listed in Material or Construction Specs but is applicable to specification

**BOLD TYPE** - Indicates that Project Construction activities should have this ASTM

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"A" SERIES continued</b>		<b>Applicable CS or MS</b>
A 775/A 775M-01	Epoxy-Coated Reinforcing Steel Bars	MS 539
A 780-01	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings	MS 551 APP
A 796/A 796M-00	Standard Practice for Structural Design of Corrugated Steel Pipe, Pipe-Arches, and Arches for Storm and Sanitary Sewers and Other Buried Applications	MS 551 APP
A 798/A 798M-01	Standard Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications	MS 551 APP
A 849-00	Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe	MS 551
A 854/A 854M-98	Standard Specification for Metallic-Coated Steel Smooth High-Tensile Fence and Trellis Wire	MS 591
A 857/A 857M-00a	Steel Sheet Piling, Cold Formed, Light Gage	MS 511 APP
A 858/A 858M-00	Standard Specification for Heat-Treated Carbon Steel Fittings for Low-Temperature and Corrosive Service	MS 554
A 865-97	Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints	MS 554
A 875/A 875M-01	Steel Sheet, Zinc-5% Aluminum Alloy-Coated by the Hot-Dip Process	MS 551
A 885/A 885M-96	Steel Sheet, Zinc and Aramid Fiber Composite Coated for Corrugated Steel Sewer, Culvert, and Underdrain Pipe	MS 551
A 924/A 924M-99	Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process	MS 573
A 929/A 929M-01	Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe	MS 551
A 996/A 996M-01	Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement ( <i>Replaces A 616 and A 617</i> )	MS 539 APP
A 1008-01	Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability ( <i>Replaces A 611</i> )	MS 581 APP
A 1011-01	Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability ( <i>Replaces A 569 and A 570</i> )	MS 581 APP

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>“B” SERIES</b>		<b>Applicable CS or MS</b>
B 6-00	Standard Specification for Zinc	MS 582 APP
B 21-96	Naval Brass Rod, Bar, and Shapes	MS 571
B 98/B 98M-98	Copper-Silicon Alloy Rod, Bar, and Shapes	MS 571
B 103/B 103M-98e1	Phosphor Bronze Plate, Sheet, Strip, and Rolled Bar	MS 571
B 127-98 (2001) Re-approved	Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip	MS 571
B 138-96	Manganese Bronze Rod, Bar and Shapes	MS 571
B 139-95	Phosphor Bronze Rod, Bar, and Shapes	MS 571
B 152/B 152M-00	Copper Sheet, Strip, Plate, and Rolled Bar	MS 538
B 164-98	Nickel-Copper Alloy Rod, Bar and Wire	MS 571, 572
B 209-01	Aluminum and Aluminum-Alloy Sheet and Plate	MS 581
B 210-00	Aluminum and Aluminum-Alloy Drawn Seamless Tubes	MS 581
B 211-00	Aluminum and Aluminum-Alloy Bar, Rod, and Wire	MS 581
B 221-00	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes	MS 581
B 241/B2 41M-00	Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube	
B 308/B 308M-00	Aluminum-Alloy 6061-T6 Standard Structural Profiles	MS 581
B 316/B 316M-00	Aluminum and Aluminum-Alloy Rivet and Cold-Heading Wire and Rods	MS 581
B 418-95a (2000) e <sup>1</sup>	Cast and Wrought Galvanic Zinc Anodes	
B 429-00	Aluminum-Alloy Extruded Structural Pipe and Tube	MS 581
B 584-00	Copper Alloy Sand Castings for General Applications	MS 571, 572 573
B 633-85 (1998)	Electrodeposited Coatings of Zinc on Iron and Steel	MS 581
B 744/B 744M-99	Aluminum Alloy Sheet For Corrugated Aluminum Pipe	MS 552 APP
<b>B 745/B 745M-97</b>	<b>Corrugated Aluminum Pipe for Sewers and Drains</b>	<b>MS 552</b>
B 746/B 746M-95 (2000) (Re-approved)	Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches	MS 552

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"B" SERIES continued</b>		<b>Applicable CS or MS</b>
B 766-86(1998)	Electrodeposited Coatings of Cadmium	MS 581
B 790/B 790M-00	Standard Practice for Structural Design of Corrugated Aluminum Pipe, Pipe-Arches, and Arches for Culverts, Storm Sewers, and Other Buried Conduits	MS 552
<b>"C" SERIES</b>		<b>Applicable CS or MS</b>
C 4-00	Clay Drain Tile and Perforated Clay Drain Tile	MS 544
C 12-00	Standard Practice for Installing Vitrified Clay Pipe Lines	
C 14-99	Concrete Sewer, Storm Drain, and Culvert Pipe	MS 542
C 14M-99	Concrete Sewer, Storm Drain, and Culvert Pipe [Metric]	MS 542 APP
C 29/C 29M-97	Standard Test Method for Bulk density ('Unit Weight') and Voids in Aggregate	MS 521, 522, 523 APP
<b>C 31/C 31M-00</b>	<b>Standard Practice for Making and Curing Concrete Test Specimens in the Field</b>	CS 31, 32
<b>C 33-01</b>	<b>Standard Specification for Concrete Aggregates</b>	MS 522
<b>C 39/C 39M-01</b>	<b>Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens</b>	CS 31
C 40-99	Standard Test Method for Organic Impurities in Fine Aggregates for Concrete	MS 522 APP
<b>C 42/C 42M-99</b>	<b>Standard Test Methods for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete</b>	CS 31
C 70-94 (2001) (Re-approved)	Test Method for Surface Moisture in Fine Aggregate	MS 522 APP
<b>C 76-00</b>	<b>Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe</b>	MS 542
C 76M-00	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe [Metric]	MS 542
C 78-02	Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)	MS 542 APP
<b>C 88-99a</b>	<b>Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate</b>	<b>MS 523</b>
<b>C 94/C 94M-00 e<sup>1</sup></b>	<b>Ready-Mixed Concrete</b>	CS 29
C 110-00a	Standard Test Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone	MS 593

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>"C" SERIES continued</b>		<b>Applicable CS or MS</b>
<b>C 117-95</b>	<b>Standard Test Method For Material Finer Than 75-um (No. 200) Sieve In Mineral Aggregates by Washing</b>	<b>MS 521</b>
C 118-99	Concrete Pipe for Irrigation or Drainage	MS 543
C 123-98	Standard Test Method for Light-Weight Pieces in Aggregate	MS 522 APP
<b>C 125-00a e<sup>1</sup></b>	<b>Standard Terminology Relating to Concrete and Concrete Aggregates</b>	CS 31, MS 522 APP
C 127-88 (2001) Re-approved	Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate	MS 523
C 128-97	Standard Test Method for Specific Gravity and Absorption of Fine Aggregates	MS 523 APP
<b>C 136-01</b>	<b>Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates</b>	MS 521
<b>C 138-01</b>	<b>Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete</b>	CS 31
C 142-97	Standard Test Method for Clay Lumps and Friable Particles In Aggregates	MS 522 APP
<b>C 143/C 143M-00</b>	<b>Standard Test Method for Slump of Hydraulic Cement Concrete</b>	CS 31
<b>C 150-00</b>	<b>Portland Cement</b>	MS 531
C 171-97a	Sheet Materials for Curing Concrete	
<b>C 172-99</b>	<b>Standard Practice For Sampling Freshly Mixed Concrete</b>	<b>CS 31, 62</b>
<b>C 173-01</b>	<b>Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method</b>	<b>CS 31</b>
C 192/C 192M-00	Making and Curing Concrete Test Specimens in the Laboratory	
C 207-91 (1997)	Standard Specification for Hydrated Lime for Masonry Purposes	
C 227-97a	Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)	

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"C" SERIES continued</b>		<b>Applicable CS or MS</b>
<b>C 231-97 e<sup>1</sup></b>	<b>Test Method for Air Content of Freshly Mixed Concrete by The Pressure Method</b>	<b>CS 31</b>
C 233-00	Standard Test Method for Air-Entraining Admixtures for Concrete	
<b>C 260-00</b>	<b>Air-Entraining Admixtures for Concrete</b>	MS 533
C 289-94	Standard Test Method for Potential Reactivity of Aggregates (Chemical Method)	MS 522
C 295-98	Standard Guide for Petrographic Examination of Aggregates for Concrete	
C 301-98	Standard Test Methods for Testing Vitrified Clay Pipe	
<b>C 309-98a</b>	<b>Liquid Membrane-Forming Compounds for Curing Concrete</b>	MS 534
<b>C 361-99</b>	<b>Reinforced Concrete Low-Head Pressure Pipe</b>	<b>MS 541</b>
C 361M-99	Reinforced Concrete Low-Head Pressure Pipe [Metric]	MS 541
C 412-99	Concrete Drain Tile	MS 543
C 425-00	Compression Joints for Vitrified Clay Pipe and Fittings	MS 544, CS 43
C 443-98	Joints For Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets	MS 542
C 444-95	Standard Specification for Perforated Concrete Pipe	MS 543
C 470/C 470M-98	Molds For Forming Concrete Test Cylinders Vertically	
C 478-97	Precast Reinforced Concrete Manhole Sections	
<b>C 494/C 494M-99a</b>	<b>Chemical Admixtures for Concrete</b>	MS 533
C 497-98	Standard Test Methods for Concrete Pipe Manhole Sections or Tile	MS 541
C 498-95	Perforated Clay Drain Tile	MS 544
<b>C 505-99a</b>	<b>Nonreinforced Concrete Irrigation Pipe With Rubber Gasket Joints</b>	MS 543
C 506-00	Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe	MS 542
C 507-00	Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe	MS 542
C 566-97	Standard Test Method for Total Moisture Content of Aggregate By Drying	
C 595-00a e <sup>1</sup>	Blended Hydraulic Cements	MS 532

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>"C" SERIES continued</b>		<b>Applicable CS or MS</b>
<b>C618-01</b>	<b>Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete</b>	<b>MS 532</b>
C 655-00	Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe	MS 542
C 655M-00	Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe [Metric]	MS 542 APP
C 666-97	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing	
C 684-99	Standard Test Method for Making, Accelerated Curing, and Testing Concrete Compression Test Specimens	
C 685/C 685M-00a	Concrete Made By Volumetric Batching and Continuous Mixing	CS 31,32
C 700-00	Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated	MS 544
<b>C 702-98</b>	<b>Standard Practice For Reducing Field Samples of Aggregate to Testing Size</b>	MS 522 APP
C 717-01a	Standard Terminology of Building Seals and Sealants	
C 823-00	Standard Practice for Examination and Sampling of Hardened Concrete in Constructions	
C 828-98	Standard Test Method for Low-Pressure Air Test of Vitrified Clay Pipelines (3 to 18-in.)	
C 877-00	External Sealing Bands for Noncircular Concrete Sewer, Storm Drain, and Culvert Pipe	MS 536
C 882-99	Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete by Slant Shear	CS 35
C 913-98	Precast Concrete Water and Wastewater Structures	
<b>C 920-01</b>	<b>Elastomeric Joint Sealant</b>	MS 536
C 924-89e <sup>1</sup> (1997)	Standard Practice For Testing Concrete Pipe Sewer Lines by Low-pressure Air Test Method	MS 536, CS 41
C 977-00	Quicklime and Hydrated Lime for Soil Stabilization	MS 573
C 989-99	Standard Specification for Ground Granulated Blast-Furnace Use in Concrete and Mortars)	MS 532

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"C" SERIES continued</b>		<b>Applicable CS or MS</b>
<b>C 990-01a</b>	<b>Standard Specification for Joints for Concrete Pipe, Manholes ,and Precast Box Sections Using Preformed Flexible Joint Sealants)</b>	MS 536
<b>C 1017/C 1017M-98</b>	<b>Chemical Admixture for Use in Producing Flowing Concrete</b>	MS 533
C 1040-93(2000)	Density of Unhardened and Hardened Concrete in Place by Nuclear Methods	
<b>C 1064/C 1064M-99</b>	<b>Test Method for Temperature of Freshly Mixed Portland Cement Concrete</b>	<b>CS 31</b>
C 1077-00	Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation	CS 31 APP
C 1103-94 (2000)	Standard Practice for Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines	CS 41, 42
<b>C 1116-00</b>	<b>Fiber-Reinforced Concrete and Shotcrete</b>	
C 1140-98	Preparing and Testing Specimens from Shotcrete Test panels	CS 33
C 1141-01	Admixtures for Shotcrete	
<b>C 1193-00</b>	<b>Standard Guide for Use of Joint Sealants</b>	
<b>C 1262-98e1</b>	<b>Evaluating the Freeze-Thaw Durability of Manufactured Concrete Masonry Blocks and Related Concrete Units</b>	
C1330-96	Cylindrical Sealant Backing for use with Cold Liquid Applied Sealants	CS 3, 41, 42 APP
C 1433-00a	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers ( <i>Replaces C 789 and C850</i> )	MS 542
C 1433M-00a	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers [Metric] ( <i>Replaces C 789 and C850</i> )	MS 542
C 1435-99	Molding Roller Compacted Concrete in Cylinder Molds Using A Vibrating Hammer	
<b>"D" SERIES</b>		<b>Applicable CS or MS</b>
D 4-86 (1998)	Standard Test Method of Bitumen Content	MS 583
D 25-99	Round Timber Piles	MS 512
<b>D 75-97</b>	<b>Standard Practice For Sampling Aggregates</b>	MS 521, 522 APP

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(210-V-NEM, Amend. FL-33, March 2004)

## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 79-86 (1999)	Zinc Oxide Primer	CS 51
D 98-98	Calcium Chloride	
D 235-99	Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)	CS 84
D 244-00	Standard Test Methods for Emulsified Asphalts	
D 245-00e <sup>1</sup>	Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber	MS 584
D 360-89 (1996)e <sup>1</sup>	Shellac Varnish	CS 84
D 412-98a	Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension	MS 537
D 420-98	Guide for Site Characteristics for Engineering, Design and Construction Purposes	
D 520-00	Zinc Dust Pigment	CS 51
D 545-99	Standard Methods of Testing Preformed Expansion Joint Fillers for Construction (Nonextruding and Resilient Types)	
D 558-96	Standard Test Method for Moisture-Density Relations of Soil-Cement Mixtures	CS 29
D 559-96	Standard Test Method for Wetting and Drying Compacted Soil-Cement Mixture	CS 29
D 560-96	Methods for Freezing and Thawing Compacted Soil-Cement Mixture	CS 29
D 638-00	Standard Test Method for Tensile Properties of Plastics	CS 64
D 653-97 (2000) Re-approved	Standard Terminology Relating To Soil, Rock and Contained Fluids	
<b>D 698-00a</b>	<b>Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))</b>	CS 23,24,28
D 746-98	Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact	MS 537, CS 64
D 751-00	Standard Test Methods for Coated Fabrics	

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 792-00	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement	CS 64
D 882-00	Standard Test Method for Tensile Properties of Thin Plastic Sheeting	
D 883-00	Standard Terminology Relating to Plastics	
D 977-98	Emulsified Asphalt	
<b>D 994-98</b>	<b>Preformed Expansion Joint Filler For Concrete (Bituminous Type)</b>	MS 535
D 1004-94a	Test Method for Initial Tear Resistance of Plastic Film and Sheeting	
D 1186-93	Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base	MS 583
D 1190-97	Concrete Joint Sealer, Hot-Poured Elastic Type	MS 536
D 1241-00	Materials for Soil-Aggregate Subbase, Base, and Surface Courses	
D 1242-95a	Standard Test Method for Resistance of Plastic material to Abrasion)	CS 64
D 1452-80 (2000)	Standard Practice Methods for Soil Investigation and Sampling by Auger Borings	
D 1527-99	Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80	MS 583
<b>D 1556-00</b>	<b>Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method</b>	CS 23
D 1557-00	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> (2,700 kN-m/m <sup>3</sup> ))	CS 23
D 1558-99	Standard Test Method for Moisture Content Penetration Resistance Relationships of Fine-Grained Soils	
D 1586-99	Standard Method for Penetration Test and Split-Barrel Sampling of Soils	
D 1587-00	Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes	

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 1593-99	Nonrigid Vinyl Chloride Plastic Sheeting	
<b>D 1751-99</b>	<b>Preformed Expansion Joint Fillers For Concrete Paving and Structural Construction</b>	MS 535
<b>D 1752-84 (1996)e<sup>1</sup></b>	<b>Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction</b>	MS 535
<b>D 1760-01</b>	<b>Pressure Treatment of Timber Products</b>	MS 585
D 1784-99a	Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated (Vinyl Chloride)(CPVC) Compounds	
<b>D 1785-99</b>	<b>Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120</b>	MS 547
D 2103-97	Polyethylene Film and Sheeting	
<b>D 2104-99e<sup>1</sup></b>	<b>Polyethylene (PE) Plastic Pipe, Schedule 40</b>	MS 547
D 2122-98	Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings	
D 2152-95	Standard Test Method for Degree of Fusion of Extruded Poly (Vinyl Chloride)(PVC) Pipe and Molded Fittings by Acetone Immersion	
<b>D 2167-94</b>	<b>Standard Test Method for Density and Unit Weight of Soil In Place by the Rubber Balloon Method</b>	CS 23
<b>D 2216-98</b>	<b>Standard Test Method for Laboratory Determination Of Water (Moisture) Content of Soil and Rock</b>	CS 23
D 2235-93a	Solvent Cement for Acrylonitrile-Butadiene- Styrene (ABS) Plastic Pipe and Fittings	CS 45
D 2239-99	Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter	MS 547
D 2240-00	Standard Test Method for Rubber Property-Durometer Hardness	MS 537
D 2241-00	Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)	MS 547
D 2282-99	Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR)	MS 547

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 2290-00	Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method	
<b>D 2321-00</b>	<b>Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications</b>	
D 2397-98	Cationic Emulsified Asphalt	
D 2412-96a	Standard Test Method for External Loading Properties of Plastic Pipe by Parallel-Plate Loading	
D 2415-98	Standard Test Method for Ash in Coal Tars and Pitch	MS 583
D 2444-99	Standard Test Method for Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)	
<b>D 2447-99</b>	<b>Polyethylene (PE) Plastic Pipe, Schedules 40 and 80 Based on Outside Diameter</b>	MS 547
D 2464-99	Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings Schedule 80	MS 547 APP
<b>D 2466-99</b>	<b>Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40</b>	MS 547
D 2467-99	Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	MS 547 APP
D 2468-96a	Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe Fittings, Schedule 40	MS 547 APP
<b>D 2487-00</b>	<b>Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)</b>	
<b>D 2488-00</b>	<b>Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)</b>	
D 2564-96a	Threaded Poly (Vinyl Chloride) (PVC) Plastic Piping Systems Schedule 80	MS 547 APP
D 2573-01	Standard Method for Field Vane Shear Test in Cohesive Soil	
D 2609-00	Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe	
D2657-97	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings	MS 547
D 2661-02	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings	MS 547

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 2665-00	Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	MS 547
D 2672-96a	Joints For IPS PVC Pipe Using Solvent Cement	MS 547
D 2680-01	Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping	MS 547
D 2683-98	Socket-Type Polyethylene Fittings For Outside Diameter-Controlled Polyethylene Pipe and Tubing	
D 2729-96a	Poly (Vinyl Chloride)(PVC) Sewer Pipe and Fittings	MS 547 APP
D 2737-99	Polyethylene (PE) Plastic Tubing	MS 547 APP
D 2751-96a	Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings	MS 547
D 2774-01	Underground Installation of Thermoplastic Pressure Pipe	
D 2852-95	Styrene-Rubber (SR) Plastic Drain Pipe and Fittings	MS 547 APP
D 2855-96	Standard Practice For Making Solvent-Cemented Joints With Poly (Vinyl Chloride) (PVC) Pipe and Fittings	C 45
<b>D 2922-01</b>	<b>Standard Test Methods For Density Of Soil And Soil-Aggregate In Place By Nuclear Methods (Shallow Depth)</b>	CS 23
<b>D 2937-00</b>	<b>Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method</b>	CS 23
D 2949-00	3.25-in. Outside Diameter Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	MS 547 APP
<b>D 3017-01</b>	<b>Standard Test Method for Moisture Content Of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)</b>	CS 23
D 3034-00	Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings	MS 547 APP
D 3035-95	Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter	MS 547

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 3122-95	Solvent Cements For Styrene-Rubber (SR) Plastic Pipe and Fittings	
D 3138-95	Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly Vinyl Chloride) (PVC) Non-Pressure Piping Components	MS 547 APP
D 3139-98	Joints For Plastic Pressure Pipes Using Flexible Elastomeric Seals	MS 547 APP
D 3212-96a	Joints for Drain and Sewer Plastic Pipe, Using Elastomeric Seals	MS 547 APP
D 3261-97	Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	
D 3350-00	Polyethylene Plastics Pipe and Fittings Materials	MS 547
D 3441-98	Standard Test Method for Deep, Quasi-static, Cone and Friction-Cone Penetration Tests of Soil	
D 3517-96	"Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-Resin) Pressure Pipe	
<b>D 3665-99</b>	<b>Standard Practice For Random Sampling of Construction Materials</b>	
D 3740-01	Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction	
D 3754-96	"Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-resin) Sewer and Industrial Pressure Pipe	
D 3963/D 3963M-01	Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars	
D 4083-89 (2001)	Standard Practice for Description of Frozen Soils (Visual-Manual Procedure)	
D 4146-96	Standard Test for Formability of Zinc Rich Primer/Chromate Complex Coatings on Steel	CS 51
D 4161-96	"Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals	
D 4220-95 (2000)	Standard Practice for Preserving and Transporting Soil Samples	
D 4253-00	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table	

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
D 4254-00	Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density	CS 24, 25
<b>D 4318-00</b>	<b>Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils</b>	
D 4355-99	Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)	MS 592
D 4491-99a	Standard Test methods for Water Permeability of Geotextiles Geotextiles by Permittivity	MS 592
D 4545-86 (1999)	Standard Practice for Determining the Integrity of Factory Seams Used in Joining Manufactured Flexible Sheet Geomembranes	MS 592
D 4549-00	Polystyrene and Rubber-Modified Polystyrene Molding and Extrusion Materials (PS)	MS 546
D 4581-86 (2001)	Standard Guide for Measurement of Morphologic Studies of Water Bodies	
D 4632-91 (1996)	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles	<b>MS 592</b>
<b>D 4643-00</b>	<b>Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method</b>	CS 23
D 4647-93	Standard Test Method for Identification and Classification of Dispersive Clay Soils by the Pinhole Test	
D 4751-99a	Standard Test Method for Determining Apparent Opening Size of a Geotextile	MS 592
D 4833-00	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products	MS 592
D 4873-01	Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples	MS 592 APP
D 4884-96	Standard Test Method for Seam Strength of Sewn Geotextiles	
D 4914-99	Standard Test Methods for Density of Soil and Rock in Place by the Sand Replacement Method in a Test Pit	

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"D" SERIES continued</b>		<b>Applicable CS or MS</b>
<b>D 4944-98</b>	<b>Standard Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Gas Pressure Tester Method (Speedy Moisture Meter)</b>	CS 23
<b>D 4959-00</b>	<b>Standard Test Method for Determination of Water (Moisture) Content of Soil By Direct Heating</b>	CS 23
<b>D 4992-94e<sup>1</sup></b>	<b>Standard Practice for Evaluation of Rock to be used for Erosion Control</b>	MS 523
D 5030-89 (1994)e <sup>1</sup>	Standard Test Method for Density of Soil and Rock in Place by the Water Replacement in a Test Pit	
D 5079-90 (1996)	Standard Practice for Preserving and Transporting Rock Core Samples	MS 523 APP
D 5121-90 (1995)	Standard Practice for Preparation of Rock Slabs for Durability Testing	MS 523
<b>D 5240-92 (1997)</b>	<b>Standard Test Method for Testing Rock Slabs to Evaluate Soundness of Riprap by Use of Sodium Sulfate or Magnesium Sulfate</b>	MS 523
D 5249-95 (2000)	Backer Material for Use with Cold and Hot-Applied Joint Sealants in Portland Cement and Asphalt Joints	CS 31, and MS 536 APP
D 5299-99	Standard Guide for Decommissioning of Ground Water Wells Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities	
<b>D 5519-94</b>	<b>Standard Test Method for Particle Size Analysis of Natural and Man-Made Riprap materials</b>	CS 61
D 5890-95	Standard Test Method for Swell Index of Clay Mineral of Geosynthetic Clay Liners	
<b>D 6092-97e<sup>1</sup></b>	<b>Standard Practice of Specifying Standard Sizes of Stone For Erosion Control</b>	CS 61
<b>"E" SERIES</b>		<b>Applicable CS or MS</b>
E 11-95	Wire-cloth Sieves for Testing Purposes	S 521, 522 APP
E 96-00	Standard Test Method for Water Vapor Transmission of Materials	
E 1547-99	Standard Terminology Relating to Industrial Chemicals	

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## PART 542 – SPECIFICATIONS

## SUBPART C – EXHIBIT

FL542.40(a)

## ASTM Specifications (continued)

<b>BOOKLETS</b>		
IEEE/ASTM SI 10-1997	Standard Practice for use of the International Metric System <i>This replaces E 380-93, Standard Practice for use of the International 71 Metric System</i>	
<b>“F” SERIES</b>		<b>Applicable CS or MS</b>
F 405-97	Corrugated Polyethylene (PE) Tubing and Fittings	MS 548
F 412-01	Standard Terminology Relating to Plastic Piping Systems	
F 449-97	Standard Practice For Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control	
F 477-99	Elastomeric Seals (Gaskets) for Joining Plastic Pipe	MS 547
F 480-00	Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80	
F 593-98	Stainless Steel Bolts, Hex Cap Screws, and Studs	
F 594-98	Stainless Steel Bolts	
F 626-96a	Standard Specification for Fence Fittings	
F 628-00	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core	
F 656-96a	Primers for Use in Solvent Cement Joints Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	
F 667-97	Specifications For 8, 10, 12, and 15-In. Corrugated Polyethylene Tubing and Fittings	MS 548
F 668-99a	Poly (Vinyl Chloride) PVC-Coated steel Chain Link Fence	CS 91
F 679-01	Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings	MS 547
F 690-86 (1994)	Practice For Underground Installation of Thermoplastic Pressure Piping Irrigation Systems	
F 714-00	Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter	MS 547
F 758-95 (2000) (Re-approved)	Smooth-Wall Poly (Vinyl Chloride) (PVC) Underdrain Systems for Highway, Airport, And Similar Drainage	MS 547

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PART 542 – SPECIFICATIONS

FL542.40(a) ASTM Specifications (continued)

<b>"F" SERIES continued</b>		<b>Applicable CS or MS</b>
F 771-99	Polyethylene (PE) Thermoplastic High-Pressure Irrigation Pipeline Systems	
F 789-95a	Type PS-46 Poly (Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings	MS 547
F 794-99	Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based On Controlled Inside Diameter	MS 547
F 810-99	Smooth-wall Polyethylene (PE) Pipe for use in Drainage and Waste Disposal Absorption Fields	
F 894-98a	Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe	MS 548
F 900-94 (2000)	Industrial and Commercial Swing Gates	CS 91
F 949-01	Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings	<b>MS 547</b>
F 1043-00	Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework	<b>CS 91</b>
F 1083-97	Pipe, steel, Hot-dipped Zinc-Coated (Galvanized) Welded, for Fence Structures	CS 91
<b>"G" SERIES</b>		<b>Applicable CS or MS</b>
G 152-00a	Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials ( <i>Replaced G 23 in 2000</i> )	
G 153-00a	Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials ( <i>Replaced G 23 in 2000</i> )	

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## PART 543 - MATERIALS

FL543.00(b)(6)

FL543.00 General.

(a) New materials shall be used in all work installed unless plans and specifications specifically provide for the use of used materials in accordance with (b) below.

(b) Used materials may be authorized under the following conditions:

(1) Where the Field Office Technical Guide (FOTG) contains standards and specifications for the use of used materials. Exceptions are allowed for minor appurtenances which will not adversely affect the practice and are readily accessible and easily replaced.

(2) Where specific criteria for using used materials is not contained in the FOTG practice standard, a case by case determination will be made to determine if used materials meet or exceed NRCS minimum requirements. The determination shall be made by a person with appropriate engineering job approval authority. The determination must document the adequacy of the used material in meeting the minimum quality criteria of the practice. The basis for this determination shall be attached to the plans and specifications.

(3) Cost share of used materials in NRCS cost share programs must be approved in writing by the Program Manager. Where non-NRCS agencies are involved in the cost share of conservation practices, approval of the agency shall be obtained in writing prior to using used materials.

(4) Cost share of used materials shall be based on a fair and equitable price. Fair and equitable prices of used materials shall be approved in writing by the cost sharing agency.

(5) Used materials shall not be specified or allowed without the landowner's complete understanding and total agreement. The landowner's decision to use used materials shall be documented in the case file.

(6) NEM FL512.21 contains additional policy on the use of used materials.

PART 543 - MATERIALS

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## PART 544 - EQUIPMENT

FL544.05(d)(2)

### FL544.05 State procedures

The following instructions are to be followed for the care, checking, and transportation of engineering equipment. This includes levels, transits, hand levels, total stations, chains, tapes, etc.

(a) Engineering instruments are precise, delicate pieces of equipment. All personnel using these instruments will be responsible for their care, adjustment and proper operating condition. Area Engineers (AE) will periodically inspect all engineering equipment to determine that the equipment is being checked, properly cared for, and is in proper operating condition. The AE will prepare a report to the Area Conservationist (AC) when equipment is not being checked as required or is being improperly handled and transported. The AC will arrange for training where field office personnel are not familiar with the field adjustment procedures for instruments used by them.

(b) The recommendations contained in Chapter 1, Engineering Field Handbook, and Chapter 2, Section 19, National Engineering Handbook, shall be followed in caring for engineering equipment. All personnel using engineering equipment shall become familiar with these references.

(c) Frequent checking of surveying instruments is essential for high quality work. Personnel responsible for each field office and project office will:

(1) Install permanent survey checking station close to their headquarters.

(2) Check all surveying instruments being used as necessary to ensure that they are in proper adjustment. Adequate frequency of checking may vary from every day to once each 90 days. All engineering instruments being used will be checked at least once each 90 days. Surveying instruments used on engineering jobs requiring precise measurements may need to be checked every day. Instruments must be checked anytime they receive rough treatment, such as being dropped or jarred during transportation.

(3) Establish a record of when the survey instrument was checked. This will be accomplished by thumbtacking or taping a record card in the instrument box lid. Dates the instrument was checked, amount the instrument was out of adjustment, and name of person making the check should be shown on this card.

(d) Instruments are normally transported to the job in automotive vehicles. Instruments will be transported in carrying cases. The carrying case will be transported in one of the following ways:

(1) On the floor board of pickup trucks or in the trunk of passenger vehicles. The instrument will be secured by straps or other fasteners to protect from overturning or bouncing.

(2) In a stationary box mounted in the bed of the pickup truck. Effective padding must be provided such as a foam rubber cushion on which to place the instrument case. The instrument case must be secured to prevent overturning or bouncing.

FL544-1(1)

PART 544 - EQUIPMENT

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