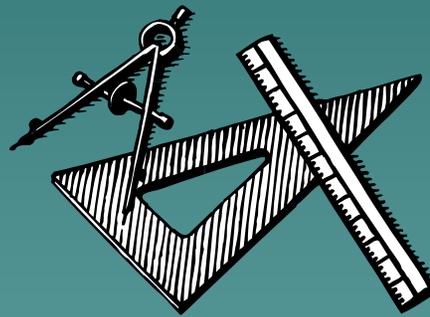


Introduction to Engineering Job Approval Authority



Mathew Lyons, PE

State Conservation Engineer

2008 ICE Training

Presentation Overview

- ◆ Historical Perspective
- ◆ Need for an Approval System
- ◆ Engineering Job Approval Policy
- ◆ Practical Application of Engineering Job Approval Authority

Historical Perspective



Historical Perspective

- ◆ SCS established on April 27, 1935
- ◆ Engineering assistance included:
 - Design and plans for CCC and WPA flood control projects
 - Installation of mechanical practices (waterways, gully control structures, farm ponds, etc.)

Historical Perspective (continued)

- ◆ SCS grew from 6,622 employees in 1935 to 14,431 in 1949
- ◆ Growth of personnel and workload prompted a need for a **standard** approach to installing soil and water conservation practices

Historical Perspective (continued)

Significant dates in Standard Development

- ◆ July 1949 – Established the Engineering Standards Unit which began to prepare standards for conservation practices
- ◆ February 1951 – Secretary of Agriculture issues order to develop a field technical guide
- ◆ November 1953 – SCS Regional Offices abolished and State Offices created. State Conservation Engineer (SCE) established and charged with adherence to standards

Historical Perspective (continued)

Informal Approval

- Before 1968, an “informal” system of engineering approval existed and varied from state to state

Historical Perspective (continued)

Formal Approval

- ◆ February 1969
 - SCS established the Engineering Job Approval Authority System
- ◆ SCS assigned engineering job approval authority to the SCE

Historical Perspective (continued)

Point to Remember

- ◆ The Engineering Job Approval Authority System *IS NOT* a new concept

Need for an Approval System



Need for an Approval System

Question

Why do we need an Engineering Job Approval Authority System for the Conservation Partnership?

Need for an Approval System (continued)

- ◆ Quality Control/Quality Assurance
- ◆ Maintain accountability required by state certification of PEs
- Engineering Job Approval Authority is the only process we have for determining and documenting employee technical capability

Need for an Approval System (continued)

◆ Quality Control/Quality Assurance

- ❖ Provide competent, functional engineering in planning, design and construction of conservation practices
- ❖ Maintain credibility and public trust

Need for an Approval System (continued)

Maintain accountability required
by state certification of PEs

- ❖ By law, engineering design and construction must be performed under an engineer licensed by the Commonwealth of Virginia (SCE)

Need for an Approval System (continued)

The Engineering Job Approval Authority system is in place to ensure conservation practices are:

- Planned properly
- Designed to accepted criteria
- Constructed to meet design life and safety requirements

Need for an Approval System (continued)

The Engineering Job Approval Authority system is in place to ensure engineering work is:

- Safe – minimize threat to life and property
- Durable – built to last the “design life”
- Efficient – efficient use of materials to minimize costs of construction

Need for an Approval System (continued)



Need for an Approval System (continued)

Challenge "Finding a Balance"

Limited Number
of Engineers



Engineering Quality

Need for an Approval System (continued)

Solution

- ◆ Basic engineering design and construction principles are taught to NRCS and SWCD field personnel
- ◆ Individuals
 - Gain *experience*
 - Demonstrate *competence*
- Engineering job approval authority is granted accordingly

Need for an Approval System (continued)

The Engineering Job Approval Authority system

- ✓ Identifies
- ✓ Documents
- ✓ Authorizes

qualified employees that can plan, design and construct quality engineering practices

Engineering Job Approval Policy



Engineering Job Approval Policy

- ◆ NRCS policy on Engineering Job Approval Authority is covered in
 - General Manual
 - National Engineering Manual

Engineering Job Approval Policy (continued)

General Manual, Section 210, Part 402

- ◆ NRCS engineering must comply with Virginia's professional engineering regulations
- ◆ NRCS engineering work must be under the supervision and authority of a Virginia registered professional engineer
- ◆ References National Engineering Manual (NEM) Section 210, Part 501

Engineering Job Approval Policy (continued)

General Manual, Section 210, Part 402

- ◆ Federal employee liability issues
 - Operating within the scope of your employment

Engineering Job Approval Policy (continued)

Important

- ◆ Delegation of Engineering Job Approval Authority to a SWCD employee does not imply that *federal* liability protection is provided
 - State employee
 - Standard of reasonable care
 - Operating within scope of employment
 - Following accepted standards
 - Operating within delegated authority

Engineering Job Approval Policy (continued)

NRCS and SWCD employees are operating within the scope of their employment when they:

- ◆ Do not approve designs beyond their approval level
- ◆ Do not check out practices beyond their approval level
- ◆ Design and build by NRCS technical standards
- ◆ **Work within their limitations!!**

Engineering Job Approval Policy (continued)

NEM Section 210, Part 501

- ◆ Requires the State Conservation Engineer to be a state registered professional engineer
- ◆ Delegates engineering job approval authority for all engineering jobs to State Conservation Engineer
- ◆ Requires State Conservation Engineer to define engineering job classes for engineering practices

Engineering Job Approval Policy (continued)

NEM Section 210, Part 501 (continued)

- ◆ Each NRCS and non-NRCS employee (SWCD) must be evaluated and assigned an appropriate engineering job approval authority based on experience and demonstrated competence
- ◆ Practices applicable to the employee's location are to be considered in assigning authority level
- ◆ Employee engineering job approval authority is to be reviewed on an annual basis by a designated conservation engineer

Engineering Job Approval Policy (continued)

NEM Section 210, Part 501 (continued)

- ◆ Requires post review of installed engineering practices and references General Manual Section 450, Part 407, "Spot Checks"
- ◆ Requires "quality" installed practices that function as planned, exhibit sound engineering principles, perform safely, are cost effective, and comply with industry established standards and criteria

Engineering Job Approval Policy (continued)

- ❖ Employees that do not have the appropriate engineering job approval authority for a given practice can perform
 - Planning functions
 - Design functions
 - Construction functions
- ❖ But Someone with the appropriate level of engineering job approval authority *must* sign off (take responsibility) for the work

Engineering Job Approval Policy (continued)

Question

How do I get engineering job approval authority?

Engineering Job Approval Policy (continued)

Answer

- ◆ Experience
- ◆ Demonstrated competence
 - Refer to NEM 501 VA Amendment

The only way to gain approval authority is to practice and apply what you learn!

Engineering Job Approval Policy (continued)

If you are not sure about engineering job approval policy.....

Ask!



Practical Application of Engineering Job Approval Authority



Practical Application

- ◆ If you (NRCS or SWCD) design or install engineering practices, Engineering Job Approval Authority is not optional!
 - SWCD/NRCS MOU – SWCD will operate under NRCS standards

Practical Application (continued)

Point to Remember

- ◆ **All** engineering assistance that is provided by NRCS/SWCD staff will be done in accordance with NRCS standards

Practical Application (continued)

NRCS and SWCD employees are allowed to perform engineering work because:

- ◆ NRCS has an approval authority system for delegating permission to do engineering work
- ◆ NRCS has a framework of technical standards that are followed in doing engineering work
- ◆ The State Conservation Engineer is a Virginia licensed professional engineer (P.E.)

Practical Application (continued)

- ◆ Every employee that designs or installs engineering practices must have an Engineering Job Approval Authority Sheet
 - I&E
 - Design
 - Construction

Practical Application (continued)

Inventory and Evaluation (I&E)

On-site observations of an exploratory nature for planning and preparation of sound alternative solutions of sufficient intensity for the cooperator to make treatment decisions (Planning)

Practical Application (continued)

Design

Designing and checking all aspects of the supporting data, drawings and specifications to ensure that the planned practice will meet the purpose for which it is installed, also includes setting any specific inspection requirements

- Approval signature is required

Practical Application (continued)

Construction

Surveys, layout, staking, inspection of materials and work, and making tests to determine that the job meets specifications and practice certification

- Approval signature is required

Practical Application (continued)

Engineering Job Approval Authority Delegation

State Conservation Engineer, PE



Area Engineer



DC, CET, SCT, SWCD

VIRGINIA ENGINEERING JOB APPROVAL AUTHORITY

NAME _____ TITLE _____ GRADE _____ LOCATION _____

DELEGATED BY _____ TITLE _____ DATE _____ STATE Virginia
(Responsible Engineer)

CONCURRED _____ TITLE _____ DATE _____
(Line Supervisor/SWCD Chairperson for SWCD employee)

REVIEWED AND CONCURRED _____ DATE _____
(NRCS District Conservationist if SWCD employee)

NOTES

1. Authority is issued based on the individual's training, experience and demonstrated competence.
2. Employees shall not approve designs or certify construction for practices that exceed their maximum approval limit.
3. The Responsible Engineer may recommend approval authority only up to the approval authority held by that engineer.
4. The controlling factor that results in the highest classification determines the Job Class. For example, a waste storage facility (pond) with a storage capacity of 100,000 ft³ (Class II) and a fill height of 15 ft. (Class III) would be a Job Class III.
5. Engineering approval applies to new construction only. Refer to NEM 501.20-501.24 for repair and rehabilitation.
6. Engineering practices not listed or more complex than those listed shall be sent with documentation to the state office for review and approval by the State Conservation Engineer.
7. All jobs to be constructed under formal contract must be approved by the State Conservation Engineer.
8. The State Conservation Engineer must approve all jobs requiring the signing and sealing of construction plans by a licensed professional engineer.
9. Job Class I-V for all practices is limited to low hazard potential as defined in NEM 503.

DEFINITIONS OF MAXIMUM APPROVAL LIMITS

Inventory and Evaluation (I&E) - On-site observations of an exploratory nature for planning and preparation of sound alternative solutions of sufficient intensity for the cooperator to make treatment decisions. May require assistance from higher levels for large or complex jobs. (See NEM 501 and 510.)

Design - Designing and checking all aspects of the supporting data, drawings and specifications to ensure that the planned practice will meet the purpose for which it is installed. Also includes setting any specific inspection requirements. Approval signature is required. (See NEM 501 and 511.)

Construction (Const.) - Surveys, layout, staking, inspection of materials and work, and making tests to determine that the job meets specifications. Approval signature is required. Jobs where inspection staffing plans are issued are not included on this chart. (See NEM 501 and 512.)

ANNUAL REVIEW

The 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 indicate that the review has been made by the appropriate engineering personnel.

| Reviewed By | Title | Comments | Date |
|-------------|-------|----------|------|
| | | | |
| | | | |
| | | | |

Unit Abbreviations

- A.U. - Animal Units, equivalent to 1,000 pounds live weight
- Veg. - Vegetated
- Mech. - Mechanical or structural
- Land Appl. - Land Application
- Grav. - Gravity
- Sed. - Sediment

Practical Application (continued)

Why do the Area Engineer and Supervisor both sign the form?

- Technical approval delegated *only* by SCE through the Area Engineer
- Supervisor concurs – *Does the supervisor want this individual representing the agency in this capacity?*

Approval limits

VA 501.09 Exhibit VA2

FORM
VA-ENG-3
05/03
Sheet 2 of 6

VIRGINIA ENGINEERING JOB APPROVAL AUTHORITY

| Code | Practice Name | Controlling Factors | Units | Job Class | | | | | Maximum Approval Limits | | |
|------|------------------------------|---------------------------------|---------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------|--------|--------|
| | | | | I | II | III | IV | V | I&E | Design | Const. |
| 560 | Access Road | Culvert Inside Diameter | in. | 18 | 24 | 36 | 48 | All | | | |
| | | Maximum Grade | % | 8 | 10 | 15 | 20 | All | | | |
| | | Length | ft. | 2,000 | 5,000 | 10,000 | 20,000 | All | | | |
| | | Surface | type | Soil | Gravel | Asphalt | Concrete | All | | | |
| 702 | Agrichemical Mixing Facility | Tank Storage Volume | gallons | - | 500 | 1,000 | 2,000 | All | | | |
| 575 | Animal Trails and Walkways | With Culverts (See Access Road) | | | | | | | | | |
| 578 | Stream Crossing | Without Culverts | | All ^{3/} | | | |
| 326 | Clearing and Snagging | Section Length | ft. | 1,000 | 2,500 | 5,000 | 15,000 | All | | | |

Maximum value within class

Practical Application (continued)

Authority Evaluation

- ◆ Employees are evaluated on an annual basis by the Area Engineer
 - Usually done at Spot Check
 - Changes in Job Approval Authority are typically made at that time

Practical Application (continued)

Spot Checks

- ◆ Engineers conduct “spot checks” on five percent of the installed engineering practices
- ◆ Spot Checks provide
 - Quality Control
 - Evaluation of employee performance

Practical Application (continued)

- ◆ An employee's Engineering Job Approval Authority level may be increased if:
 - Employee has received additional training/experience
 - Employee has demonstrated competence (field application)
 - Employee becomes an engineer

Practical Application (continued)

- ◆ An employee's Engineering Job Approval Authority level may be reduced if:
 - I&E, Design or Construction deficiencies
 - Spot Checks consistently identify deficiencies
 - General policy or standards require a change
- ❖ **Result** - Employee may no longer plan, design or install certain practice(s)
(potential negative impact on performance)

Summary

- ◆ Engineering Job Approval Authority is essential for:
 - Quality Control/Quality Assurance
 - Maintaining accountability required by state certification of PEs

Summary

- ◆ Quality Control/Quality Assurance
 - Provide competent, functional engineering in planning, design and construction of conservation practices
 - Maintain credibility and public trust

Summary

- ◆ Maintain accountability required by state certification of PEs
 - By law, engineering design and construction must be performed under an engineer licensed by the Commonwealth of Virginia

Summary

- ◆ Engineering Job Approval Authority is **not**:
 - an employee “entitlement”
 - a certification
 - a mark of seniority

Summary

- ◆ Engineering Job Approval Authority is:
 - Quality Control / Quality Assurance
 - a benchmark of an individual's technical abilities
 - essential to deliver technical assistance (a tool to do your job)

Summary

- ◆ Engineering Job Approval Authority must be earned - *not* a privilege
- ◆ Know what limits your Engineering Job Approval Authority places on you

Summary

- ◆ Doing work without EJAA
 - May be a violation of state law
 - Outside the scope of your employment
- ◆ Doing work outside the scope of EJAA is subject to NRCS disciplinary action
- ◆ Both cases put yourself at liability - not NRCS

Summary

- ◆ **“Know what you don’t know”**
- ◆ Know the standards
- ◆ Certify only those practices meeting the standards
- ◆ Only approve things you feel comfortable with
- ◆ **ASK** for help from your Area Engineer or others when unsure



Don't get too excited.....



It all works out in the end!

Questions?

The image features a solid teal background. In the bottom right corner, there is a dark teal silhouette of a mountain range with jagged peaks. The word "Questions?" is centered in the upper half of the image in a large, white, sans-serif font with a subtle drop shadow.