

NSPS - ACSM Survey Technician Certification Program

National Society of Professional Surveyors (NSPS)
American Congress on Surveying and Mapping (ACSM)



The Certified Survey Technician Program

Presentation Outline



PART 1

- Program Facts
- Goals of the CST Program
- Value of the Certification
- Program Organization Chart
 - Required Knowledge Areas : Level I through Level IV

■ PART 2

- Examination Format/Rules: Level I Through Level IV
- Testing Locations and Dates
- Application Fee
- Examination Fee
- Annual Renewal Fee
- Some Uses of the Program
- Legal Aspects
- Surveying Technician Organization
- Future Plans of the CST Board
- For More Information

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■ Program Facts

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 - Required Knowledge Areas
 - Level I
 - Level II
 - Level III
 - Level IV

Presentation Outline (ctd.)



- Examination Format/Rules

- Level I Exam
- Level II Exam
- Level III Exam
- Level IV Exam

- Testing Locations and Dates

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Program Facts

**Administered by a Certification Board that
was created by ACSM and NSPS in 1986
(testing started in Fall 1988)**



Program Facts (ctd.)

After Program was developed, first Pre-test given in April 1988 (Level I).

Level III Pre-test administered in December 1989

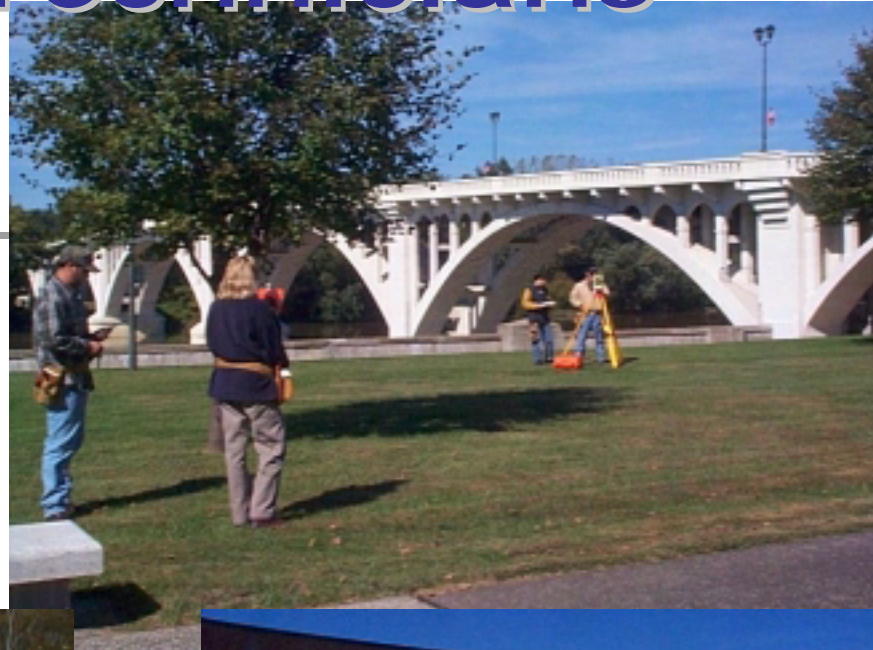


Program Facts (ctd.)

- 1989 - 1999 : 990 Certified, 456 Active Nationwide
- 1995 - 1999 :
 - Request for Information: ≈ 1300 / Yr.
 - Tested : ≈ 300 / Yr.
 - Certified : ≈ 170 / Yr.

Certified Technicians

Setting a
Straight
Course to the
Future





Program Facts (ctd.)

- Certification is by Examination and Experience (job competency).
- **Four levels** of Certification throughout the United States
 - Level I is an entry level
 - Levels II, III and IV have minimum field and office requirements.



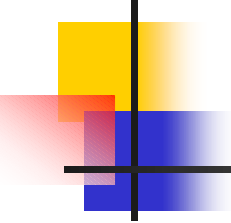
Program Facts (ctd.)

- Two main tracks.
 - Field
 - Office
- The program uses **“work elements”** to define testing parameters.



Goals of the Certification Program

- Recognize the important contribution that technicians provide to the surveying and mapping profession.
- Provide credentials to technicians.



Goals of the Certification Program (ctd.)

- Identify those technicians who have achieved specific technical competencies.
- Provide a career ladder for technicians.

Goals of the Certification Program (ctd.)

- Provide employers with a way to evaluate applicants and an opportunity to promote the quality of their technical staff.





Certification Value

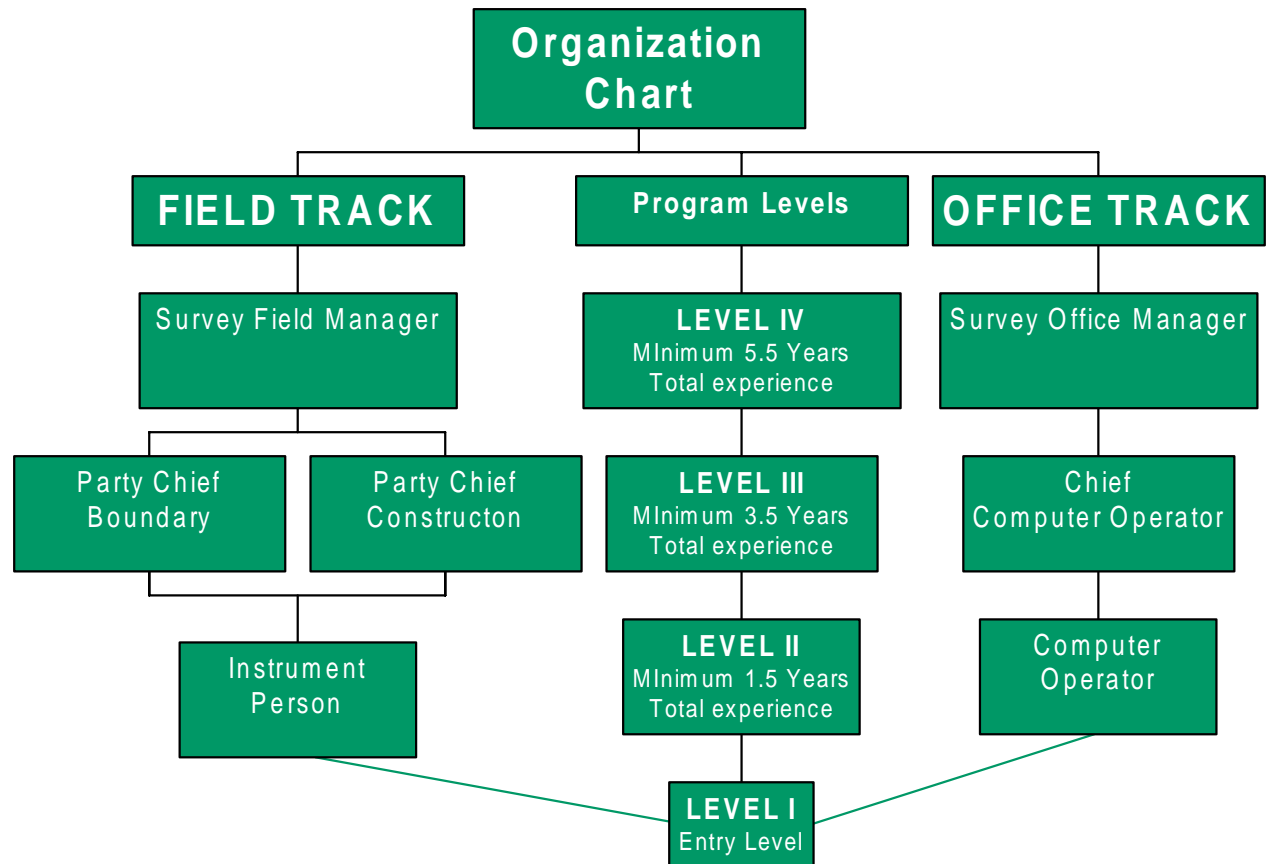
- **Official recognition** that a person has demonstrated that they are competent to perform surveying tasks at a specified technical level.
- It provides the individual with a **sense of achievement.**
- Provides employers with a method of determining **job assignments and advancement.**

Certified Technicians At Work



Program Organization Chart

Survey Technician Certification





Level I Technicians Required Knowledge Areas

Basic First Aid and Safety

**Basic Field Operations and Types of
Surveys**

**Familiarity with Field Equipment and
Use**

Level I Technicians

Additional Skills Required

Computational Ability

Survey Notekeeping

Drafting/CAD

Map Reading





Level II Technicians Required Knowledge Areas

- Demonstrate a more detailed knowledge of

The principles of the profession

Survey computations

Types of surveys and field operations

Comprehensive field note taking

Plan reading and preparation



Level II Technicians Required Knowledge Areas (ctd.)

The Field Track Technician should possess detailed working knowledge and application of standard field equipment.

The Office Track Technician should possess detailed working knowledge and application of related hardware and software.

Level III Technicians Required Knowledge Areas (ctd.)

- Demonstrate a thorough knowledge of

The principles of the profession

CST Level III

Various technical standards

Survey computations

Types of surveys

Field Operations



Level III Technicians

Required Knowledge Areas (ctd.)



- Demonstrate a thorough knowledge of

- Field note taking

- Plan reading, interpretation and preparation

- Standard field equipment

- Standard field and office procedures

- Supervisory skills



Level IV Technicians Required Knowledge Areas

- Performs the tasks and functions of an **Office Manager/ Field Manager** and has in depth knowledge of:

Plans and specifications

Clear and concise communications

Client contract

Evaluating and selecting field and office equipment

Good management practices



Level IV Technicians

Required Knowledge Areas (ctd.)

- Performs the tasks and functions of an **Office Manager/ Field Manager** and has in depth knowledge of:

Good organizational abilities

Research and problem solving

Permitting processes, codes and regulations

Project Management:

estimating, scheduling, staffing, delegating, coordinating,
budgeting and cost control

Personnel training

Understanding company structure



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Presentation Outline (ctd.)



■ Examination Format/Rules

- Level I Exam
- Level II Exam
- Level III Exam
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- Testing Locations and Dates
- Application Fee
- Examination Fee
- Annual Renewal Fee



Exam Formats/Rules

- All exams open book tests.
- Bound books. No loose leaf notes.
- Level I, II, III are multiple choice exams.
- Level IV is take home, open book, essay exam, similar to a college level term paper.



Exam Formats/Rules (ctd.)

- No computers, laptops or keyboard style hand-held computers are allowed at the exams centers.
- Data collectors with HP-48 style calculators with survey cards are allowed.



A General Note About the Examinations

- The exam is a challenging timed test. You must be prepared to move purposefully through four to seven hours of testing
- Study, review, and practice in the Work Element areas is important to prepare you for the questions and to be successful
- These tests require a significant amount of computations

Level I Exam



- Entry level exam
- No minimum experience required
- The Level I exam has 200 questions
- Four hours allowed for the completion of the exam

Level I Exam

LEVEL I EXAMINATION MATRIX

Number of Questions Per Work Element

Work Element

1) Types of Surveys		10
2) Field Equipment & Instruments	41	
3) Survey Computations		50
4) Control Points		6
5) Field Operations		21
6) Field Notes		5
7) Plan & Map Reading		17
8) First Aid and Safety		20
9) Drafting/CAD		17
10) Electronic Instruments	8	
11) Survey History		5
TOTAL QUESTIONS		200



Level I Exam (ctd.)

- Exam questions are taken from these work elements: (# of questions)
 - Types of surveys. (10)
 - Field equipment & instruments. (41)
 - Survey computations. (50)
 - Horizontal and vertical control points. (6)
 - Field operations. (21)
 - Field notes. (5)
 - Plan reading. (17)
 - First aid and safety (20)
 - Drafting/Cad. (17)
 - Electronic instruments. (8)
 - Surveying history. (5)



Level II Exam

- 3000 hours, or 1.5 years of surveying experience required.
(up to 750 hours can be education = 1 year full-time with a minimum of 12 credit hours per term)
(1 CEU = 10 classroom hours = 0.5 credit hours)
- 180 questions - multiple choice
- Six hours allowed for the completion of the exam.
- **Field Track** Examination
- **Office Track** Examination

Level II Exam

LEVEL II EXAMINATION MATRIX

Number of Questions Per Work Element

For a second, **specialty exam**

<u>Work Element</u>	<u>Field</u>	<u>Office</u>	<u>Field</u>	<u>Office</u>
1) Types of Surveys	10	10		
2) Field Equipment & Instruments	35	15	30	
3) Survey Computations	40	55		30
4) Control Points	10	10		
5) Field Operations	35	10	30	
6) Field Notes	10	10		
7) Plan Reading & Preparation	15	45		30
8) First Aid and Safety	15	15		
9) Principles of the Profession	<u>10</u>	<u>10</u>		
Total Questions	180	180	60	60

Level II Exam (ctd.)

- Exam questions are taken from these work elements:
(# of questions) (F= **Field Track**, O= **Office Track**)
 - Types of surveys. (F=10; O=10)
 - Field equipment & instruments. (F=35; O=15)
 - Survey computations. (F=40; O=55)
 - Horizontal and vertical control points. (F=10; O=10)
 - Field operations. (F=35; O=10)
 - Field notes. (F=10; O=10)
 - Plan reading and preparation. (F=15; O=45)
 - First aid and safety. (F=15; O=15)
 - Principles of the Profession. (F=10; O=10)

Level III Exam

- 7000 hours, or 3.5 years total of surveying experience required.
 - **Field Track:** 3000 hours (1.5 years) Level II experience plus 4000 hours (2.0 years) as a party chief required.
 - **Office Track:** 3000 hours (1.5 years) Level II experience plus 4000 hours (2.0 years) as a chief computer operator required.
- (Up to 1750 hours can be **education** = 2.33 years, full-time with a minimum of 12 credit hours per term)
- (1 CEU = 10 classroom hours = 0.5 credit hours)
- The Level III exam has 150 questions.
- Six hours allowed for the completion of the exam.

Level III Exam

SURVEY TECHNICIAN CERTIFICATION PROGRAM LEVEL III EXAMINATION MATRIX

Number of Questions per Examination

<u>Work Element</u>	<u>Field</u>		<u>Office</u>
	<u>Boundary</u>	<u>Construction</u>	<u>Computer</u>
1) Types of Surveys	7	7	7
2) Field Equipment and Instruments	34	34	11
3) Survey Computations	21	21	21
4) Control Points	8	8	8
5) Field Operations	22 Bound. 8 Const.	8 Bound. 22 Const.	8
6) Field Notes	7	7	7
7) Plan Reading and Preparation	8	8	30
8) First Aid and Safety	11	11	11
9) Principles of the Profession	7	7	7
10) Office Operations	7		7
11) Supervisory Skills	<u>10</u>	<u>10</u>	<u>10</u>
TOTAL QUESTIONS	150	150	150

Level III Exam (ctd.)

Exam questions are taken from these work elements:

(F= **Field Track**, O= **Office Track**)

- Types of surveys. (F=7; O=7)
- Field equipment & instruments. (F=34; O=11)
- Survey computations. (F=21; O=21)
- Horizontal and vertical control points. (F=8; O=8)
- Field operations. (Field Track Boundary = 22 Boundary & 8 Construction; Field Track Construction = 8 Boundary & 22 Construction; O=8)
- Field notes. (F=7; O=7)
- Plan reading and preparation. (F=8; O=30)
- First aid and safety. (F=11; O=11)
- Principles of the Profession. (F=7, O=7)
- Office operations. (F=7, O=30)
- Supervisory skills. (F=10, O=10)

CST LEVEL III



Level IV Exam



- **Must hold a Level III certification** to take the Level IV exam
- 11,000 hours, or 5.5 years total of surveying experience required.
 - **Field Track:** 7000 hours (3.5 years) Level II & III experience plus 4000 hours (2.0 years) as a party chief required.
 - **Office Track:** 7000 hours (3.5 years) Level II & III experience plus 4000 hours (2.0 years) as a chief computer operator required.

(Up to 2750 hours can be education = 3.66 years, full-time with a minimum of 12 credit hours per term)

Level IV Exam (ctd.)

- A take home/open book, essay style exam
- Exam questions are taken from these work elements:
 - Types of surveys.
 - Field equipment & instruments.
 - Survey computations.
 - Horizontal and vertical control points.
 - Field operations.
 - Field notes.
 - Plan reading and preparation.
 - First aid and safety.
 - Principles of the Profession.
 - Office operations.
 - Supervisory skills.

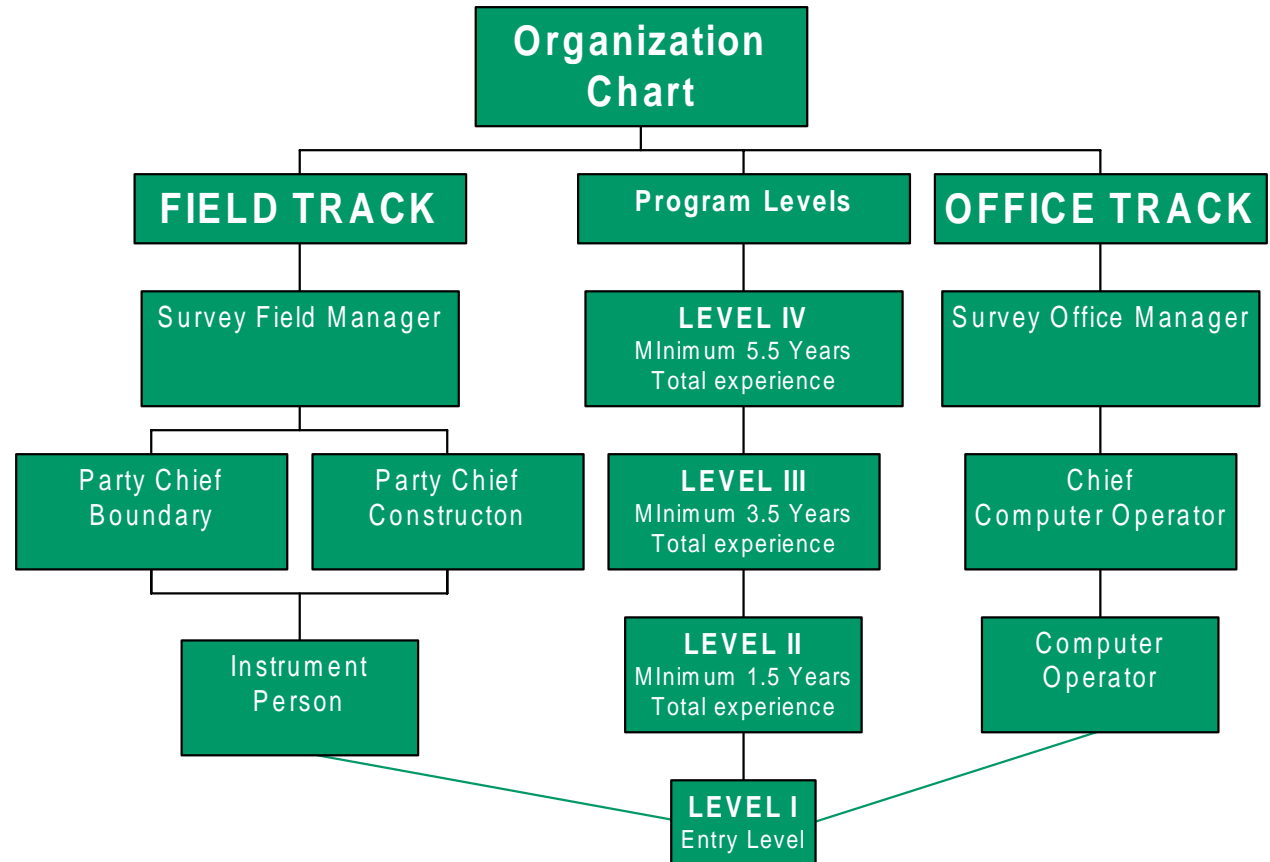
Level IV Exam (ctd.)



- Two or more questions
- Two months to complete and return
- “Report” form, typed, complete with supporting documentation
- Affidavit that the exam was completed by examinee

Program Organization Chart

Survey Technician Certification





Testing Locations/Dates

- Currently tests are offered at 180 NICET exam centers across the United States.
- Tests are given four times a year in quarterly cycles.
- It is also possible for college programs and professional organizations to arrange for special testing centers for groups.

See ACSM web site at
<http://www.acsm.net>
for testing schedule.



Application Fees

All Levels

Application Fee:

Student Member	None
■ *Member	\$30.00
■ Non-Member	\$50.00

- * A member is an NSPS dues paying individual or an employee of an ACSM sustaining member.



Examination Fees

<u>All Levels</u>	<u>Examination Fee</u>
■ Student Member	\$110.00
■ *Member	\$120.00
■ Non-Member	\$150.00

For Specialty Exams

Level II and III second specialty exam fee additional \$50.00

* A member is an NSPS dues paying individual or an employee of an ACSM sustaining member.



Examination Results

- Graded in Four Cycles

<u>Cycle</u>	<u>Test Results</u>
■ Cycle 1	mid-May
■ Cycle 2	mid-August
■ Cycle 3	mid-October
■ Cycle 4	mid-February



Examination Results

- Normal passing score 70%
- After failure three times, proof of appropriate continuing education required prior to fourth attempt
- Or, can step down one level



Annual Renewal Fees

Annual Certification Renewal Fee \$30.00

Required for advancement in the Program

After three years of non-renewal, will have to re-test to become certified again.

Seals and Stamps



- No official seal or stamp for the CST Program
- No legal standing
- Appropriate recognition:
 - Signature
 - CST level
 - CST certificate number
- Ex. Susan S. Smith, CST Computer II (0588-1234)
- Any improper use will result in revocation of certification and inability to continue in the CST Program

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- **Legal Aspects**
- **Surveying Technician Organization**
- **Future Plans of the CST Board**
- **For More Information**



Some Uses of the Program

- Recognized by the U.S. Department of Labor as a part of the **National Apprenticeship Program**.
- Validation Exam by educational programs just prior to students graduation.
- Developing a relationship with **DANTES** (Defense Activity for Non-Traditional Educational Support)
 - Allows members of the military to prepare for civilian certifications prior to leaving the service.



Some Users of the Program

- **Public Entities:**
 - Virginia State Board of Registration - LSIT exam
 - Washington Metro Area Transit Authority, Washington, DC
 - City of Orlando, FL
 - City of Virginia Beach, VA
 - AZDOT, Phoenix, AZ
 - Florida Surveying And Mapping Society, Tallahassee, FL
 - Michigan Society of Professional Surveyors Survey Technician Council, Lansing, MI
 - Texas Society of Professional Surveyors
 - Department of Public Works, Las Vegas, NV



Some Users of the Program

- Private Entities:
 - Cherry Land Surveying, Nashville, TN
 - E & A Consulting, Omaha, NE
 - Miller Legg & Assoc., Pembroke Pines, FL
 - Tri-State Engineering, Joplin, MO
 - Clark Construction Company, Bethesda, MD
 - Vincennes University, Vincennes, IN



Some Uses of the Program

- As a hiring requirement.
- As a promotional tool within the firm or agency.
- As a marketing tool.
- As a career ladder for technicians.



Legal Aspects

- Certification does not license individuals to practice surveying. Professional surveying licensing is regulated by individual state boards of registration. This certification program is sponsored by NSPS-ACSM and should not be confused with any other certification program.

Surveying Technician Organization



- Survey technicians seeking technical development through publications and educational opportunities may want to consider joining NSPS, a member organization of ACSM. Educational programs, publications, and other member services are provided by ACSM. Membership in NSPS-ACSM is not required for certification.

Certified Survey Technicians





Some Future Plans of the CST Board

- Develop a strategy to promote participation in the program
- Encourage the hiring of CST's
- Offer group discounts for testing ten or more
- Develop and distribute a multimedia promotion tool



For more information

- **ACSM/NSPS**
 - . **6 Montgomery Village Avenue**
 - . **Suite #403**
 - . **Gaithersburg, MD 20879**
- **Or see ACSM web site at**
 - . **<http://www.acsm.net>**



Questions for Audience

- How many persons on a typical field crew?
- What titles do you use for field and office technicians?
- What tasks do you associate with those titled positions?

Certified Survey Technicians



NSPS - ACSM

**Survey Technician
Certification Program**



GET CERTIFIED