NSPS CERTIFIED SURVEY TECHNICIAN

PROGRAM BOOK
AND
EXAM PREPARATION INFORMATION

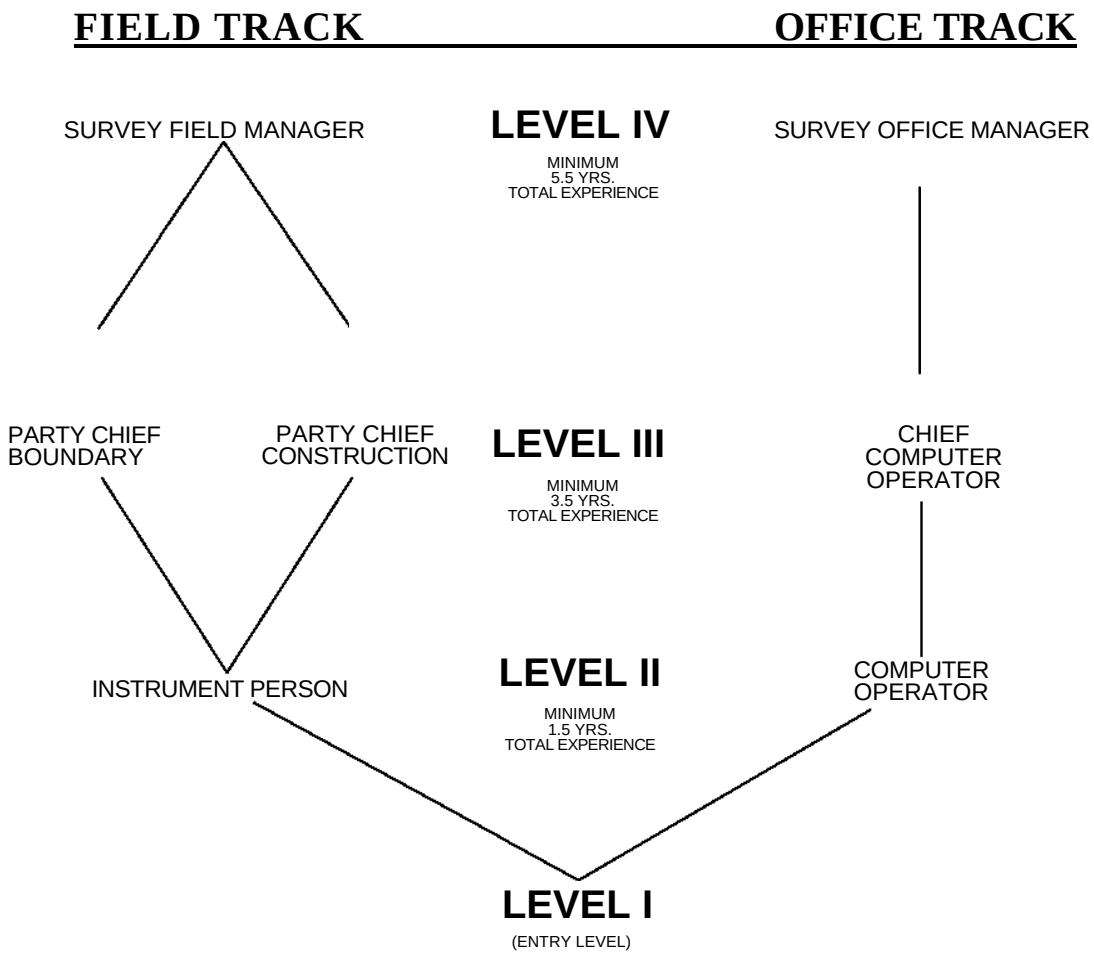
NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS
5119 Pegasus Court, Suite Q
Frederick, MD 21704
Phone: 240-439-4615 * Fax: 240-439-4952
cstinformation@nsps.us.com * www.nsps.us.com

October 2013

NSPS

CERTIFIED SURVEY TECHNICIAN PROGRAM

ORGANIZATION CHART



CERTIFICATION MAY BE SOUGHT IN EITHER THE FIELD TRACK
OR THE OFFICE TRACK OR IN BOTH TRACKS.

Detailed knowledge, skills & ability requirements are described under each position description and further defined under each respective work element section.

www.nsps.us.com

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NSPS

CERTIFED SURVEY TECHNICIAN PROGRAM

SUMMARY OF PROGRAM

The National Society of Professional Surveyors (NSPS) sponsors a comprehensive national certification program for survey technicians. The program is recognized by the U.S. Department of Labor as part of the National Apprenticeship Program. The Certified Survey Technician Board (CSTB), which administers this program, recognizes the importance of technicians to the surveying and mapping profession.

As the Certified Survey Technician Program Organization Chart shows, the program has four levels of certification (I through IV) and two main tracks (Field and Office). Certification is by examination and experience. The certification program was initiated in 1986 and testing at Level I began in 1988. The fact sheet on the next page provides additional background information on the program.

The goals of the Survey Technician Certification Program are:

- Recognize the important contribution that technicians provide to the surveying and mapping profession.
- Provide credentials to technicians.
- Identify those who have achieved specific technical competencies.
- Provide a career ladder for technicians.
- Provide firms who support and utilize certified technicians a way to evaluate applicants and an opportunity to promote the fact that their technical staff is certified.
- Provide additional use as an assessment tool.

REQUESTS FOR CERTIFICATION INFORMATION

All requests for certification information must be directed to NSPS in writing. In this manner better records of requests and payments can be kept.

CST Testing is currently offered within the 50 United States of America and the District of Columbia. The exam is available for military use as long as it is offered on a military base and proctor qualifications are met.

Note: The NSPS Certified Survey Technician Program is looking for ideas, suggestions and questions.

Program information can be obtained from the NSPS web site at www.nsps.us.com or by email: cstinformation@nsps.us.com

Please Send to:

NSPS – CST
5119 Pegasus Court, Suite Q
Frederick, MD 21704

CERTIFICATION VALUE

Certification as a survey technician is official recognition by NSPS that a person has demonstrated that he or she is minimally competent to perform surveying tasks at a specified technical level. Certification provides the individual with a sense of achievement, since it reflects advancement in the field of surveying. Certification also provides employers with a method of determining job assignments and advancement since certification is an indication of one's ability to perform specific job tasks.

USE AN ASSESESMENT TOOL

The CST exam can be used as an excellent outcomes assessment tool for courses, programs and schools. The CST program can be used to satisfy accreditation requirements. Private industry can also use the CST program to as an assessment tool for promotions, human resource evaluation and career advancement and recognition.

LEGAL ASPECTS

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

SURVEY TECHNICIAN ORGANIZATIONS

Survey technicians seeking technical development through publications and educational opportunities may want to consider joining NSPS. Educational programs, publications and other member services are provided by NSPS. Membership in NSPS is not required for certification. Those interested in membership can obtain information by visiting www.nsps.us.com.

SURVEY TECHNICIAN CERTIFICATION PROGRAM FACT SHEET

What:

- A four-level certification program for surveying technicians throughout the United States

Why:

- To provide recognition to the survey technicians in public and private practice.
- To provide objectives for improvement and advancement for field and office survey technicians.
- To give employers a way of judging the qualifications of potential employees.

How: All Levels:

1. Individual

Non-Member	$200.00	($150.00 + $50.00 Application Fee)
Member*	$150.00	($120.00 + $30.00 Application Fee)
2. Student and Military	$110.00	No application Fee

3. GROUP DISCOUNT of 10 or more at same site, same time, same proctor

Non-Member	$150.00	Application Fee Waived
Member*	$120.00	Application Fee Waived

4. Company/Agency MOU Quantity of 100 over a five year period

First 100	$150.00	($120.00 + $30.00 Application Fee)
After first 100	$120.00	($100.00 + $20.00 Application Fee)

5. Additional Fee for Paper Exams – Level I, II, and III (Effective April 2012)
Each paper exam is subject to a $10.00 Shipping and Handling fee.

All Re-Exams during first 12 months after failing the exam will have application fee waived.

*** For the purposes of this program and fees, only a "member" is defined as a NSPS current member or an employee of a NSPS current member.**

- **NOTICE: All application and testing fees are non-refundable.**
- Open book exams.
- Certificate suitable for framing.
- Annual renewal of certification: $35.00
    - Reinstatement fee: $10.00
- Available Online and Paper. (Both formats must be Proctored)

Level I through III:

- Quarterly testing nationwide.
- Examinations from four to six hours in length.
- Multiple choice questions.
- If failed, no reapplication necessary (within 1 year period), just examination fee for retesting.

Level IV:

- Offered Cycle I–Applications are due on or before December 15th.
- Offered Cycle III-Applications are due on or before June 15th.
- "Take Home" exam format.
- Two months to complete.
- Essay/Report form.
- Must hold active Level III certification.

The information contained in this booklet is general in nature. Specific information relating to testing fees, policies, and procedures will be included in the confirmation package, which is mailed upon acceptance of the application.

TESTING POLICIES

The normal passing score for the survey technician examination will be 70%, however the Board shall have the right to modify the cut-off score for any exam based upon the exam analysis furnished by the testing agent. The Board will periodically review test results and adjust the passing score if necessary.

In the event that it becomes necessary to postpone the examination date, the examination can be rescheduled for the next test date at the same location. The first postponement will be made at no cost, however, subsequent postponements are subject to additional fees. A postponement request will be accepted until the date specified. Non-payment of exam fees will result in exam cancellation. A cancellation due to nonpayment will require payment in full prior to rescheduling the examination.

In order to advance within the program, your certification must be kept active.

NSPS ADA POLICY EFFECTIVE APRIL 2013. The view visit www.nsps.us.com

NEW PENCIL POLICY EFFECTIVE JANUARY 1, 2011 - Only NSPS-CST issued pencils with erasers can be used to complete an exam. Using a non-issued writing instrument or eraser to complete any portion of the exam is grounds for dismissal from the exam and/or invalidation of the exam results.

NEW CALCULATOR POLICY EFFECTIVE August 1, 2012 - Programmable and non-programmable calculators are permitted during CST exam testing if they are: silent, without external power or without communication links such as Bluetooth, infrared and wireless technology. In addition, allowed calculators shall not have external memory cards, modules, USB flash drives or ports for such devices.

The use of any device having a QWERTY keyboard / keypad during the exam is strictly prohibited. The following devices are also prohibited, whether or not they have a QWERTY keyboard / keypad function: Palmtop, Laptop, Tablet, Handheld or Desktop computers, Personal readers, Data Banks, Data Collectors, and Personal Data Assistants (PDA). Also, cell phones, cameras, scanners, video recorders or any other copying devices are prohibited. Calculators with other style alphanumeric keyboard / keypads are acceptable.

Notwithstanding the above, the NSPS CST Board or its designees have the right to prohibit the use of any device which, in the opinion of the Board, poses a threat to exam security.

The HP41 and HP48 are not allowed because they contain a communication link (infrared port) and an external memory card port which does not meet the requirements for use on CST exams as established by NSPS CST Board.

If applicant fails an examination, the application will be retained for one year after the test date. Applicants who re-test at the same level within that year will be assessed only the exam fee. If more than one year has passed or if applicant changes level, the applicant must update the application information and pay the application and exam fees. If an applicant fails the same examination in three consecutive attempts, formal and documentable proof of continuing education relating to the work elements failed is required before a fourth attempt will be scheduled. Or, whenever possible, applicants can step down a level.

Challenges of examination questions must be made on the day of examination on form(s) provided. The Board reserves the right to be the final judge of all challenges pertaining to examination scoring. **Any examination returned with missing pages will result in a failing grade.**

While Level IV requires a broad foundation of knowledge, the Survey Technician Certification Board feels that questions can be focused quite narrowly in only one or two areas. To ensure the overall quality and consistency of the Technician Certification Program and to be certain that technicians are qualified in all of the specific work elements, examinees for Level IV must first have successfully passed one of the Level III Exams (Party Chief Boundary, Party Chief Construction, Chief Computer Operator).

TESTING RESULTS

TESTS ARE GRADED ONCE PER CYCLE. YOU CAN EXPECT TEST RESULTS TO BE MAILED TO YOU ABOUT SIX WEEKS AFTER THE END OF THE CYCLE.

CYCLE 1 RESULTS—MID MAY
CYCLE 2 RESULTS—MID AUGUST
CYCLE 3 RESULTS—MID OCTOBER
CYCLE 4 RESULTS—MID FEBRUARY

REVIEW COURSE/INFORMATION FOR SURVEY TECHNICIAN EXAMINATION

Be prepared: These tests require a significant amount of computations.

Past test results have shown that many examinees with extensive experience and, in some cases, even formal surveying education did not pass an examination. The CST Exam sequence is a challenging, timed test. It is an open book examination and that may tend to give examinees a false sense of security. You must be prepared to move purposefully through 4 to 6 hours of testing. Study, review, and practice in the Work Element areas are important to prepare you for the questions.

If you are planning to study for one of the exams, you might start listing all of the different topics listed in each of the Work Elements (See Examination Matrices attached.) This will give you a topical study guide and show you how much weight is placed on each Work Element area.

Level I= 200 questions	(4 hours to complete)
Level II = 180 questions	(6 hours to complete)
Level III = 150 questions	(6 hours to complete)

Review Course

Review courses have been offered at the state professional society annual meeting. You can contact the Education Coordinator at headquarters and they can direct you to courses that are currently available or could be established.

A SAMPLE PRESENTATION OUTLINE

What is it all about and who is it for?

- A brief history of the program.
- Purpose of the program.
- Combination of job competency and testing.
- Levels I, II, III, and IV.
- Field/Office Route.
- Test dates, Location, and Cost.
- U.S. Department of Labor Registration.
- License/Registration versus Technician Certification.
- Seals and Stamps.
- Sample Test (A voluntary short sample test will be available to take, so bring your calculators.)

Any of this information can be duplicated, used as overheads, etc.

Sample tests are available for free download at www.nspsmo.org

LEVEL I

SURVEY TECHNICIAN CERTIFICATION

POSITION DESCRIPTION, WORK ELEMENTS AND TYPICAL QUESTIONS

This is an open book exam.

POSITION DESCRIPTION

Level I Technicians are required to demonstrate knowledge of basic first aid skills and safety requirements. The individual in this position possesses a basic knowledge of field operations and types of surveys as well as familiarity with field equipment and procedures used in these functions. Additional skills required include computational ability, survey note taking, drafting/CAD and map reading. Work Elements further describe the requirements related to this position.

WORK ELEMENTS

Test problems will be taken from the following work elements:

1) *Types of Surveys* (10)
Knowledge of the different types of surveying and the basic differences between them.

2) *Field Equipment & Instruments* (41)
Knowledge of the care, cleaning and use of surveying tools and equipment, including field radios. Understand the names, purpose and parts, setup, transport and the need for calibration of various surveying field instruments. Some historical knowledge is required.

3) *Survey Computations* (50)
Knowledge of mathematics and measurements relating to surveying (including linear, angular, elevations and unit systems conversion).

4) *Control Points: Horizontal & Vertical* (6)
Knowledge of types of survey control points and their differences.

5) *Field Operations* (21)
Knowledge of the field duties of a Survey Technician. Such duty areas may include line clearing, establishing points, taping, leveling and compass reading.

6) *Field Notes* (5)
Knowledge of the basic types of surveying field notes.

7) *Plan Reading* (17)
Knowledge of the types of surveying maps and the ability to obtain basic information from these maps.

8) *First Aid & Safety* (20)
Basic knowledge of treatment practices for a variety of medical emergencies. Knowledge of traffic control and safety procedures for surveying and construction operations, including Occupational Safety and Health Administration (OSHA) standards.

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9) *Drafting/CAD* (17)
Knowledge of basic drafting and CAD skills, tools and procedures.

10) *Electronic Instruments* (8)
Knowledge of the handling, setup and care of electronic instruments and their accessories.

11) *Surveying History* (5)
Knowledge of the historical development of survey procedures and practices.

LEVEL II QUALIFICATIONS

FIELD: 1.5 years of surveying experience OFFICE: 1.5 years of surveying experience

OR 65 transcripted semester hours, or quarterly equivalent, of which 18 semester hours are surveying/engineering related plus six months of full time work experience, consisting of at least 40 hours of survey related work per week.

LEVEL II

SURVEY TECHNICIAN CERTIFICATION

POSITION DESCRIPTION, WORK ELEMENTS AND TYPICAL QUESTIONS

This is an open book exam.

POSITION DESCRIPTION

In addition to the Level I requirements, **Level II Technicians** are required to demonstrate more detailed knowledge of survey computations, types of surveys and field operations. The individual in this position is familiar with comprehensive field note taking, plan reading and preparation. The field track technician possesses a detailed working knowledge and application of standard field equipment. The office track technician possesses a detailed working knowledge and application of related computer hardware and software. The technician has a basic knowledge of the principles of the profession. Work Elements further describes the requirements related to this position.

WORK ELEMENTS

Test problems will be taken from the following work elements:

1) *Types of Surveys* (F=10; O=10)
Knowledge of the principles of performing basic surveys: leveling, traversing, triangulation, trilateration, public land surveys, metes and bounds surveys, construction surveys, photo control surveys, and GPS surveys.

2) *Field Equipment & Instruments* (F=35; O=15)
Knowledge of the care, cleaning, and use of a variety of surveying tools and equipment, including field radios. Knowledge of the operation, checking, and basic field adjustments on transits, theodolites, total stations, robotic total stations, data collectors, levels, compass, tribrachs, tripods, and GPS equipment. This would include repeating observations. Some historical knowledge is required.

3) *Survey Computations* (F=40; O=5 5)
Knowledge of trigonometry, geometry, algebra, coordinate geometry, and basic surveying computations. A familiarity with hand-held calculators and micro-computers is important. With either a hand-held calculator or micro-computer software, be able to enter field data and produce positional information (i.e. leveling, traversing, stadia, topographic mapping and construction stakeout). Demonstrate lot, area, and intersection (bearing-bearing, distance-distance, bearing-distance) computations. Knowledge of the reduction and checking of field notes for determination of positions and elevations. Have an elementary comprehension of computer operating systems and GIS.

4) *Control Points: Horizontal & Vertical* (F=10; O=10)
Know how to interpret control point records and data sheets, as well as locate points in the field.

5) *Field Operations* (F=35; O=10)
Under the supervision of a party chief, be able to coordinate field work for a variety of standard types of surveys. Know how to observe the Sun and Polaris for True North determination. Know basic sources of measurement errors. Know principles of staking and stake markings. Know procedures for GPS surveys.

6) *Field Notes* (F=10; O=10)
Know how to keep neat and orderly field notes for standard surveying operations: leveling, traversing, topographic mapping, layout, as-built surveys, boundary surveys, profile and cross-section surveys.

7) *Plan Reading & Preparation* (F=1 5; O=45)
Knowledge and understanding of the basic plan reading and preparation (i.e. site plans, boundary plans, highway plans, profile and cross sections, horizontal and vertical curves, pipeline plans, foundation plans, and developing existing and finished contours). A basic knowledge of the terminology and principles of drafting, including computer-aided drafting (CAD).

8) *First Aid & Safety* (F=15; O=15)
Basic knowledge of treatment practices for a variety of medical emergencies. Knowledge of traffic control and safety procedures for a variety of surveying and construction operations, including Occupational Safety and Health Administration (OSHA) standards.

9) *Principles of the Profession* (F=10; O=10)
Knowledge of surveying ethics and technical standards. Show responsibility in the profession (i.e. attire, honesty, respect for personal property), awareness of related professional association.

TOTAL NUMBER OF QUESTIONS = 180, TIME = SIX HOURS

LEVEL III QUALIFICATIONS

Field or Office Route:
3.5 years of progressive surveying experience or 65 transcripted semester hours, or quarterly equivalent, of which 18 semester hours are surveying/engineering related plus 2.5 years of full time work experience, consisting of at least 40 hours of survey related work per week.

LEVEL III

SURVEY TECHNICIAN CERTIFICATION

POSITION DESCRIPTION, WORK ELEMENTS AND TYPICAL QUESTIONS

This is an open book exam.

POSITION DESCRIPTION

In addition to the Levels I and II requirements, **Level III Technicians** are required to demonstrate a thorough knowledge of survey computations, types of surveys and field operations. The individual in this position is well versed with field note reduction and in depth plan interpretation and preparation. The Level III technician possesses supervisory skills and a detailed working knowledge of standard field and office procedures. The technician had knowledge of the principles of the profession and various technical standards. Work Elements further describe the requirements related to this position.

Test problems will be taken from the following work elements:

1) *Types of Survey s*(F=7, 0=7)
Know the principles and methods used in performing a variety of surveys such as: photo control surveys, state plane coordinate surveys, public land surveys, metes and bounds survey, GPS surveys, construction surveys, and as-built surveys.

2) *Field Equipment & Instruments* (F=34, 0=11)
Extensive knowledge of proper field procedures, knowledge of the care, cleaning and use of a variety of surveying tools and equipment, including field radios. Know how to operate, check, and perform basic field adjustments on rods, compass, transits, levels, tribrachs, theodolites, total stations, robotic total stations, data collectors, tripods, and GPS equipment. Some historical knowledge is required.

3) *Survey Computations* (F=21, 0=21)
Have extensive knowledge of trigonometry, geometry, and algebra as related to traverse, inverse and intersection computations. Be capable of performing horizontal and vertical traverse adjustments, area and quantity computations, and horizontal and vertical curve computations.

4) *Control Points: Horizontal & Vertical* (F=8, 0=8)
Know when to use, how to obtain, how to interpret control point records and data sheets, as well as locate points in the field.

5) *Field Operations* (F=30, 0=8)
Have a knowledge of a wide variety of surveying field operation methods including but not limited to; traversing; triangulation; trilateration; observation of the Sun and Polaris for True North determination; repeating observations and precision measurements using steel tapes and theodolites; construction layout methods and procedures. Know procedures for GPS surveys.

6) *Field Notes* (F=7, 0=7)
Know how to create, reduce, and check orderly field notes for standard surveying operations such as but not limited to: leveling, traversing, topographic mapping, construction layout, as-built surveys, boundary surveys, profile and cross section surveys.

7) *Plan Reading & Preparation* (F=8, 0=30)
Have a knowledge and understanding of plan reading and preparation (i.e. site plans, boundary plans, highway plans, profiles and cross sections, horizontal and vertical curves, pipeline plans, foundation plans, and developing existing and finish contours).

8) *First Aid & Safety* (F=11, 0=11)
Basic knowledge of treatment practices for a variety of medical emergencies. Have a general knowledge of traffic control and safety procedures for surveying and construction operations including Occupational Safety and Health Administration (OSHA) standards.

9) *Principles of the Profession* (F=7, 0=7)
Have a knowledge of ethics and the various technical standards of groups such as ALTA, NGS, NSPS, ACSM, BLM, and ACSE. Show responsibility in the profession (i.e. attire, honesty, respect for personal property) and awareness of related professional associations.

10) *Office Operations* (F=7, 0=30)
Using hand calculations or micro-computer software, be able to enter field data and produce positional information (i.e. leveling, traversing, as-built surveys, topographic mapping). Have a knowledge and familiarity with general applications of computer aided drafting (CAD). Have knowledge of microcomputer operating system and hardware peripherals.

11) *Supervisory Skills* (F=10, 0=10)
Have a basic knowledge and familiarity with: client contacts, dealing with the public and governmental agencies, field crew management, scheduling, equipment and supplies management. Have a knowledge of general company policies as they relate to field and office operations, office work flow procedures, and field and office problem solving techniques. Also have a knowledge of proper record keeping, time keeping, and job charges. Be able to coordinate and supervise field work, staking and stake marking for a variety of standard types for survey. Have a general familiarity with local and state land use regulations as they relate to lot site development.

TOTAL NUMER OF QUESTIONS= 150, TIME = SIX HOURS

LEVEL IV QUALIFICATIONS

Survey Field Manager or Survey Office Manager:
A certified Level III Technician and a total of 5.5 years of surveying experience of which 2 years must be in a supervisory capacity.

For the Level IV examination a 2 year or 4 year degree in surveying will be treated as 2 or 4 years experience respectively.

PHILOSOPHY AND OBJECTIVES OF LEVEL IV

The Board recognizes that in many Surveying and Mapping firms the principal/professional performs the tasks and functions of a chief of parties/office manager. However, in many other firms those tasks are performed by technicians. The purpose of this exam is to test and certify those individuals.

The testing for this level differs significantly in format and content from the other three levels. **Before you open the sealed envelope, realize that the thoroughness required by the Board will result in reports of 10 to 30 pages in length on which you will have expended in excess of 30 hours of research and writing.**

The test is in a "take home/open book" format and will consist of two or more essay questions which will be sent to the individual. The examinee will be given two months to complete the examination and return it to the Certification Board.

A passing grade on each question is required.

The responses must be typed in report form with copies of complete supporting documentation and have an affidavit that the exam was completed by the examinee. A passing grade must be obtained on all questions submitted.

The reports must conform to the American Modern Language Association.

Failure to return the Level IV examination materials (whether or not the examination is completed) will make you ineligible for any future level IV testing. If the exam envelope is return opened, it will be accepted as a completed exam and accordingly.

Among the knowledge, tasks and skills subject to evaluation by this test will be:

- Budgeting and project cost control
- Clear and concise communications
- Client contact
- Codes and regulations
- Delegating and coordinating
- Evaluating and selecting equipment and supplies
- Good management practices
- Good organizational ability
- Independent investigating/Researching - Problem solving
- Permitting processes
- Project estimating
- Scheduling
- Staffing
- Thorough understanding of plans and specifications
- Training
- Understanding company structure

In summary, this individual is someone who has the level of judgment to research, evaluate, document, and manage a variety of situations while maintaining quality and minimizing costs.

LEVEL IV
SURVEY TECHNICIAN CERTIFICATION
POSITION DESCRIPTION AND WORK ELEMENTS

POSITION DESCRIPTION

In addition to the Level I, II and III requirements, Level IV technicians are required to demonstrate a more comprehensive knowledge of surveys and field operations. This shall include but is not limited to independent judgment, communication and supervisory abilities. The individual in this position is well versed in the day to day operational functions of a field and/or office survey organization. The Level IV technician possesses advanced technical and supervisory skills. Work elements listed below further describe the requirements related to this position.

Essay questions may include the following work elements:

1) *Types of Surveys*:
Know the principles of performing basic surveys such as leveling, traversing, public land surveys, metes and bounds surveys, topographic surveys, construction surveys, horizontal control surveys, State Plane Coordinate surveys and as-built surveys. In addition, be familiar with requirements of global positioning (GPS) and geographic/land information systems (GLIS). Have a general knowledge of hydrographic, mining and photogrammetric surveying.

2) *Field Equipment & Instruments*:
Be familiar with proper procedures for the care, cleaning and use of a variety of surveying tools and equipment, including field radios. Have ability to inventory, evaluate, specify, and purchase field equipment. Be able to determine proper equipping of personnel. Know how to operate, check, and perform basic field adjustments on theodolites, total stations, data collectors, levels, compass, tribrachs, and tripods. This would include repeating observations and steel taping. Have ability to inventory, evaluate, specify, and purchase field instruments. Some historical knowledge is required.

3) *Survey Computations*:
Perform mathematical checks of trigonometry, geometry, algebra, coordinate geometry, and basic surveying computations. Having a working knowledge of hand-held calculators is important. Also be able to perform traverse and level loop computations including closure, precision determination and adjustment computations. Be familiar with taping corrections, basic principles of measurement, EDM baseline comparison computations, error propagation, and astronomic azimuth determination. Perform and/or check lot, area, and intersection (bearing-bearing, distance-distance, bearing-distance) computations. Have a familiarity with land use regulations as they relate to lot and site development.

4) *Control Points: Horizontal & Vertical*:
Know when to use, how to obtain, and how to interpret control point records and data sheets.

5) *Field Operations*:
Be able to coordinate and supervise field work for a variety of standard types of surveys. Also have a knowledge of proper record keeping, timekeeping, and job expenses.

6) *Field Notes*:
Know how to keep, reduce, and check (for completeness and accuracy) neat and orderly field notes for standard surveying operations: leveling, traversing, topographic mapping, layout, as-built surveys, boundary surveys, profile and cross section surveys.

7) *Plan Reading & Preparation*:
Have a knowledge and understanding of plan reading and preparation. Also have a knowledge of and familiarization with general applications of computer aided drafting (CAD). Be able to coordinate design elements obtained from professionals and format into final drawings.

8) *First Aid & Safety*:
Have a basic knowledge of treatment practices for a variety of medical emergencies. Have a general knowledge of traffic control and safety procedures for a variety of surveying and construction operations.

9) *Principles of the Profession*:
Have a knowledge of ethics and technical standards and organizations such as ALTA, NGS, NSPS/ACSM, BLM, ASCE. Show responsibility in the profession (i.e. attire, honesty, respect for personal property)

10) *Office Operations:*
Using hand calculations or micro-computer software, be able to enter or check field data and the resulting positional information. Have a knowledge of microcomputer operating systems and peripheral computer equipment. Be able to inventory, evaluate, and specify computer software peripheral equipment and supplies.

11) *Supervisory Skills*:
Have a comprehensive knowledge of and familiarity with: client contacts, dealing with the public and governmental agencies, field crew management, scheduling, equipment and supplies management. Have knowledge of on-site office operation, office work flow procedures, and field and office problem solving techniques. Also, be able to evaluate personnel performance, and perform basic budgeting and cost control techniques. Have ability to train personnel in all aspects of field and/or office surveying practices.

LEVEL IV
CERTIFIED SURVEY TECHNICIAN EXAMINATION
GUIDELINES FOR PREPARATION/EVALUATION

1. The applicant will have two months to prepare and submit the answers.

2. Follow all directions and restate the problem in your answer.

3. All material submitted should be clearly marked with the identification number provided by the NSPS Certified Survey Technician Board (CSTB).

4. Submit three copies of each completed answer along with the signed examination statement. Each copy shall be separately bound in an expandable report folder with a clear cover.

5. Answers to test questions must be thoroughly researched and documented. Answers should be well organized, complete, clear, and concise. The written (narrative) portion of the answers shall be formatted using the Modern Language Association Style Guidelines (MLA). References and proper citation must be made using the MLA Guidelines In-Text Citations Systems with Works Cited Page (Bibliography). For your convenience, please find enclosed a Modern Language Association (MLA) Style Guidelines Overview Sheet. For more information visit www.modernlanguageassociation.com. A passing grade in each test question is required.

6. Presentation of answers will be in report form with copies of complete supporting documentation. This documentation (tables, graphs, drawings, calculations and regulations, etc.) shall be included either in the test or as appendices. The presentation of the answers must be professionally formatted such that a technically competent individual can understand and follow your reasoning.

7. Your technical report for each submitted answer shall include a cover sheet, table of contents, introduction, body (narrative), conclusion, bibliography (Works Cited Page), and appendix.

8. Examinees are responsible for obtaining reference materials. The ability to obtain pertinent available data will be considered as part of the examination.

9. Proper spelling, correct grammatical usage, neatness, and the overall logical approach to the problem will be considered in grading.

10. The examination is open book and any available materials may be used.

11. Before you open the sealed test envelope, realize that the thoroughness required by the Board will result in 2 reports each including 10 to 30 pages in length on which you will have expended in excess of 40 hours of research and writing.

12. All examination material that you receive other than the cover letter and guidelines must be returned with completed exam. **NO COPIES ARE TO BE MADE OF ANY OF THIS MATERIAL. Failure to return this material (whether or not you have completed the examination) will make you ineligible for any future Level IV testing. If the examination envelope is returned opened, it will be accepted as a completed examination.**

13. Verification of answers will be by methods deemed sufficient by the CSTB. This may include independent contact with surveyors and/or local officials in your area.

NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS
LEVEL IV
Certification Survey Technician Examination
Grading Checklist

Candidates Name_____ _____

Reviewer and Date

		Initial
1. Signed Exam Statement	2 pts.	_____
2. Re-Stated Problem	3 pts.	_____
3. Thoroughly Researched and Documented	15 pts.	_____
4. Followed Directions/Well Organized	15 pts.	_____
5. Content/Complete/Clear/Concise	25 pts.	_____
6. Logical Approach	5 pts.	_____
7. Report Organized From Table of Content	5 pts.	_____
8. Spelling, Grammar/Neatness	5 pts.	_____
9. Supporting Documentation	5 pts.	_____
10. References and Specific Citations (P#'s, Source)	10 pts.	_____
11. Professional Appearance	10 pts.	_____

Initial that you acknowledge accomplishing the items and submit with final exam packet.

SEALS AND STAMPS

There is no official seal or stamp that can be applied to drawings, specifications, or other documents prepared by a certified survey technician. Use of an individually designed seal or stamp that refers to the NSPS certification number is unauthorized because the NSPS certification has no legal standing by itself. Use of "custom-designed" seals and stamps will discredit NSPS and decrease the value of issued certificates for everyone.

In those cases where it is appropriate to call attention to work having been done by an NSPS certified survey technician, it is suggested that you write CST (Certified Survey Technician) after your name, followed by your level of certification and your certification number; i.e., John J. Jones, CST I (0588-1234) or Susan S. Smith, CST Computer II (0588-1234).

The use of the CST logo is permitted on business cards. However, if this logo is to be used on stationery, the following support statement shall accompany it: We support and encourage NSPS certification. It is not acceptable to print the NSPS certified mark on letterhead stationery without the support statement because it then looks like the company is NSPS certified.

If NSPS receives notice of the conviction of any CST for improper use of the designation of certified surveying technician, the CST certification shall be revoked and the individual shall not be allowed to continue in the program.

BIBLIOGRAPHY/REFERENCES

FUNDAMENTAL SURVEYING TEXTS

Elementary Surveying, Wolf and Ghilani
Surveying, Moffit/Bossler
Surveying Solved Problems, Van Sickle

OTHER SURVEYING TEXTS

Surveying: Theory and Practice, Anderson and Mikhail
Land Survey Review Manual, Buckner
Surveyor Reference Manual, Harbin
GPS for Land Surveyors, Van Sickle
Land Surveying Computation, Buckner
Introduction to Geodesy: The History and Concepts of Modern Geodesy, Smith
Land Surveyor's Formulas with Applications, Keen
Getting started with Geographic Information Systems, Clarke

BOUNDARY

Brown's Boundary Control and Legal Principles, Robillard and Wilson
Evidence and Procedure for Boundary Location, Robillard and Wilson
The Real Elements of Boundaries and Adjacent Properties, Skelton
Land Survey Descriptions, Wattles
A Guide to Understanding Land Surveys, Estopinal

PUBLIC LAND

Manual of Instruction (BLM)
Restoration of Lost and Obliterated Corners and Subdivision Corners 1883-1974
Land Survey Systems, McEntyre

NATIONAL SURVEY STANDARDS

Minimum Standard Detail Requirements for and Classifications of ALTA/ACSM Land Title Surveys,
Standards & Specifications for Geodetic Control Networks, Federal Geodetic Control Committee,
http://www.ngs.noaa.gov/FGCS/tech_pub/1984-stds-specs-geodetic-control-networks.pdf
Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques, Federal Geodetic Control Committee,
http://docs.lib.noaa.gov/noaa_documents/NOS/NGS/Geom_Geod_Accu_Standards.pdf
Minimum Standards for Surveys (Individual States)

DRAFTING AND COMPUTERS

Surveying Drafting, Wattles
Latest AutoCad or CADD Text

CONSTRUCTION

Measuring Practice on the Building Site, Vanderberg
Manual on Construction Layout, NSPS/ACSM
Surveying with Construction Applications, Kavanaugh
Construction Surveying and Layout, Crawford

ROUTE SURVEYING

Route Location and Design, Meyer and Gibson

FIRST AID AND SAFETY

First Aid & Safety Handbook, American Red Cross
OSHA Title 29, Chapter XVII, Part 1926, Occupational Safety and Health Standards for the Construction Industry with Amendments (latest version)

DICTIONARIES

American College Dictionary, Random House (or any other college dictionary)
Glossary of the Mapping Sciences, 1994, ASCE, ACSM and ASPRS
Definitions of Surveying and Associated Terms, ACSM

NOTE:

You should review the work elements for which you will be testing. If there are areas in which you feel you need additional study, you should be able to find one or two possible books from this list to assist you. Many of these books or others like them are quite often available at public libraries or may be borrowed from acquaintances in the field.

This is an open book test. These and other materials can be brought into the testing facility

At a minimum examinee should bring:

1) A Fundamental Surveying Text (with unit conversion charts)

2) A First Aid & Safety Manuel

3) A Surveying and Mapping Dictionary