General Definition of California Professional Land Surveying Practices:

The practice of land surveying in the State of California consists of determining, establishing, reporting and mapping the positions, contours and/or geospatial configuration of points, physical features, property interests, boundary and/or property lines by applying the principles of surveying, mathematics, measurement and law to meet the distinctive requirements of the State of California to protect the health, safety and welfare of the public.

I. Project Management (13%)

Project Management includes assessing needs of clients, gathering and analyzing data from public and private sources to define project scope of services, negotiating and preparing the final contract, supervising resources necessary to meet contractual obligations, and exercising independent control and direction of land surveying work.

Job Tasks

01 Communicate survey practice to the public and potential clients

02 Negotiate and secure a written contract with client

03 Offer land surveying services

04 Procure land surveying services

05 Direct personnel for office and field survey tasks

06 Coordinate projects with third parties (e.g., agencies, consultants)

07 Identify project standards (e.g., mapping, accuracy requirements, client needs, methodology, quality assurance)

08 Develop project standards (e.g., mapping, accuracy requirements, client needs, methodology, quality assurance)

09 Prepare proposals (e.g., scope, schedule, budget)

10 Preserve monuments in accordance with State law

11 Manage a land surveying business, organization or department

12 Establish and maintain GPS real-time network

13 Make survey records available to the public

14 Maintain an index for survey records available to the public

15 Utilize the Subdivision Map Act

16 Utilize the Professional Land Surveyors Act

17 Assess project needs (e.g., legal requirements, client needs, local ordinance requirements)

Knowledge Areas

Knowledge of:

K01 Professional Land Surveyors' (PLS) Act

K02 Subdivision Map Act (SMA)

K03 impact of local ordinances

K04 project requirements

I. Project Management (Continued)

K05 laws and ordinances pertaining to setting of monuments (e.g., PLS Act § 8771-8772, SMA § 66495-66498, local ordinances)

K06 right of entry laws, rules and regulations

K07 capabilities and limitations of current technologies (e.g., GPS, laser scanning, levels, total stations)

K08 interpretation of elements in construction plans and specifications pertaining to staking

K09 elements required for an aerial flight plan (e.g., photogrammetric, LiDAR)

K10 procedures for preparation for aerial mapping and contouring

K11 procedures for preparation for terrestrial mapping and contouring (e.g., total station, GPS, LiDAR)

K12 National Standard for Spatial Data Accuracy (NSSDA)

K13 when records of survey are required

K14 when corner records are required

K15 when parcel maps are required

K16 when final maps are required

K17 when tentative maps are required

K18 map waivers (e.g., SMA § 66428)

K19 exceptions to SMA (e.g., § 66412)

K20 state and local agency processing requirements for maps and related documents (e.g., submittal, review, filing)

K21 methods to identify mapping requirements and criteria

K22 project location, objectives and constraints

K23 appropriate types of data required

K24 contractual agreements (e.g., cost estimates, scope of services, limitations)

K25 appropriate communication methods (e.g., verbal and written)

K26 project constraints and objectives (e.g., location, physical, regulatory, environmental, legal, political)

II. Research, Pre and Post Field Analysis (25%)

Research, Pre and Post Field Analysis includes determining, evaluating, analyzing, reducing and adjusting field collection data in accordance with accepted standards of practice and in compliance with all applicable statutes, rules and regulations and to meet accuracy standards for design of improvements.

Job Tasks

18 Ensure use of proper control datums and epochs (e.g., plane coordinates, NAVD88 / NGVD29, epoch 1991.35 / 2007.00)

19 Analyze project data (e.g., recorded maps, deeds, control data, title data, land planning requirements)

20 Identify conflicts within the drawing set

21 Conduct project research

22 Prepare construction staking layout and drawings

23 Perform surveying calculations (e.g., boundary, construction staking, control, topographic)

24 Analyze field evidence together with recorded and unrecorded documentation to determine boundaries, easements, and possible encroachments

25 Identify conflicts between project drawings and existing field conditions (e.g., construction plans, condo plans)

26 Determine accuracies of maps and measured survey data

27 Evaluate relevance and spatial relationships of maps and measured survey data

28 Identify boundary conflicts

29 Compile and provide geographic information system (GIS) data

Knowledge Areas

Knowledge of:

K08 interpretation of elements in construction plans and specifications pertaining to staking.

K09 elements required for an aerial flight plan (e.g., photogrammetric, LiDAR)

K10 procedures for preparation for aerial mapping and contouring

K11 procedures for preparation for terrestrial mapping and contouring (e.g., total station, GPS, LiDAR)

K13 when records of survey are required

K14 when corner records are required

K27 public lands survey system

K28 sequential conveyances (e.g., senior, junior rights)

K29 simultaneous conveyances

II. Research, Pre and Post Field Analysis (Continued)

K30 water boundaries

K31 hierarchy of evidence (e.g., CCP 2077)

K32 relationship of land grants between private, state and federal (e.g., Rancho)

K33 effects of unwritten rights on boundaries

K34 boundary resolution

K35 evaluation of field evidence

K36 methods of establishing boundaries

K37 types and components of title documents (e.g., title report, chain of title, lot and block report)

K38 types of conveyances and their effects of ownership on property (e.g., fee vs. easement, grant deed, quitclaim deed)

K39 effect of riparian and littoral rights on boundaries

K40 effect of cloud on title

K41 methods for calculating and adjusting boundary surveys

K42 error analysis

K43 monument recovery and re-establishment procedures

K44 effect of ground movement on boundaries (e.g., earthquakes, subsidence, slides)

K45 procedures, standards and requirements for ALTA/ACSM surveys

K46 easements, rights-of-way and other encumbrances

K47 effects of leases

K48 methods and procedures for retracement and re-establishment of railroads rights-of-way

K49 criteria for acceptance or rejection of monuments

K50 tidal cycles and datums

K51 physical evidence that may indicate unwritten rights (e.g., adverse possession, prescriptive rights)

K52 controlling elements of legal descriptions

K53 types of legal descriptions (e.g., strip, metes and bounds, lot and block, aliquot)

K54 exceptions and reservations of legal descriptions

K55 horizontal and vertical control

K56 projections, datums and epoch dates

K57 transformation between epoch dates

K58 transformation between datums and projections

II. Research, Pre and Post Field Analysis (Continued)

K59 geoid, ellipsoid and orthometric heights

K60 conversion between grid and ground distances

K61 error sources (e.g., multipath, data input, instrument calibration)

K62 calculating and analyzing errors

K63 California Coordinate Systems

K64 real-time-networks (e.g., processes, redundancy, accessibility, accuracy)

K65 methods and procedures to produce control networks within accuracy standards (e.g. Public Resources Code, NGS Standards, FGCS Standards)

K66 procedures for analysis, reduction, and adjustment of raw data to obtain coordinate values

K67 requirements for aerial survey data collection

K68 methods to obtain bearings or azimuths related to geodetic, magnetic, grid or astronomic north

K69 survey calculations (e.g., horizontal and vertical alignments, volumes, grade)

K70 mathematics (e.g., algebra, trigonometry, geometry)

K71 accuracy required for construction staking

K72 field notes and staking reports

K73 basis of control values and their relation to maps and construction plans (e.g., basis of bearing, benchmark)

K74 methods to produce digital terrain models

K75 sources of research data (e.g., public, quasi-public, private)

K76 GIS metadata

K77 methods for identifying and resolving errors in research data (e.g., map or deed misclosure)

K78 source, type and accuracy of digital data (e.g., metadata, GIS)

K79 researching relevant case law (e.g., boundary issues, liability)

III. Field Work (20%)

Field work includes the process of performing field observations by collecting field data in accordance with accepted standards of practice and in compliance with all applicable status, rules and regulations.

Job Tasks

30 Perform topographic surveys

31 Perform control surveys

32 Perform boundary surveys

33 Perform as-built surveys

34 Perform PLSS surveys

35 Perform monitoring surveys

36 Perform cadastral surveys

37 Recognize and locate field features relevant to the survey (e.g., boundary evidence, topographic features)

38 Perform construction staking

39 Set, replace or remove monuments

40 Verify character and position of given horizontal and vertical control points

41 Perform hydrographic survey (e.g., bathymetric, tidal datum, riparian boundary)

42 Communicate with clients and contractors while in the field

43 Communicate with the general public while in the field

Knowledge Areas

Knowledge of:

K06 right of entry laws, rules and regulations

K07 capabilities and limitations of current technologies (e.g., GPS, laser scanning, levels, total stations)

K08 interpretation of elements in construction plans and specifications pertaining to staking

K25 appropriate communication methods (e.g., verbal and written)

K27 public lands survey system

K43 monument recovery and re-establishment procedures

K45 procedures, standards and requirements for ALTA/ACSM surveys

K48 methods and procedures for retracement and re-establishment of railroads rights-of-way.

III. Field Work (Continued)

K51 physical evidence that may indicate unwritten rights (e.g., adverse possession, prescriptive rights)

K55 horizontal and vertical control

K61 error sources (e.g., multipath, data input, instrument calibration)

K63 California Coordinate Systems

K64 real-time-networks (e.g., processes, redundancy, accessibility, accuracy)

K65 methods and procedures to produce control networks within accuracy standards (e.g. Public Resources Code, NGS Standards, FGCS Standards)

K68 methods to obtain bearings or azimuths related to geodetic, magnetic, grid or astronomic north

K69 survey calculations (e.g., horizontal and vertical alignments, volumes, grade)

K70 mathematics (e.g., algebra, trigonometry, geometry)

K71 accuracy required for construction staking

K72 field notes and staking reports

K73 basis of control values and their relation to maps and construction plans (e.g., basis of bearing, benchmark)

K80 types, uses, capabilities of survey equipment

K81 parol evidence (e.g., use, methods to document, and effects of)

K82 procedures to recover and perpetuate control monuments

K83 methods and requirements for collecting field positions and attributes

K84 methods and requirements for performing as-built surveys

K85 field procedures for photogrammetric control layout

K86 field survey methods, procedures and standards

K87 field practices and procedures for construction staking.

K88 methods to maintain and calibrate equipment

IV. Mapping and Document Preparation (28%)

Mapping includes meeting specified accuracy standards and collecting, analyzing, interpreting developing, reducing , and adjusting data (e.g., Control, Geodetic, Topographic, Photogrammetric, California Coordinate System, horizontal and vertical datums) for the purpose of preparing graphic and/or mathematic representations of existing physical features, terrain, monuments, and geospatial positions. Document Preparation includes preparing necessary documents, legal descriptions, maps and exhibits based on clients' needs and contractual obligations and providing documentation of surveys based on all applicable statutes, rules and regulations.

Job Tasks

44 Perform FEMA flood certification

45 Prepare legal descriptions (e.g., easements, lot line adjustments, other interests in real property)

46 Ensure survey documents comply with State law, local ordinance and the appropriate standard of care prior to execution

47 Prepare ALTA/ACSM surveys

48 Create digital terrain model (DTM)

49 Create topographic map from various sources (e.g., photogrammetric, field survey, LiDAR, GIS)

50 Create control maps or reports

51 Create boundary maps

52 Create exhibit maps (e.g., court, easement, aerial)

53 Prepare maps, plats, exhibits and documents for filing and/or recordation (e.g., records of survey, corner records, lot line adjustment, subdivision map, condo documents)

54 Prepare staking reports (e.g., cut-sheets, plots)

55 Compile and provide geographic information system (GIS) data

56 Establish and maintain a geographic information system (GIS) land cadastre

57 Provide geodetic control (e.g., GIS, preliminary, design)

58 Provide mapping services (e.g., GIS, topographic, hydrographic, photogrammetric)

Knowledge Areas

Knowledge of:

K01 Professional Land Surveyors' (PLS) Act

K03 impact of local ordinances

K12 National Standard for Spatial Data Accuracy (NSSDA)

K21 methods to identify mapping requirements and criteria

IV. Mapping and Document Preparation (Continued)

K27 public lands survey system

K45 procedures, standards and requirements for ALTA/ACSM surveys

K53 types of legal descriptions (e.g., strip, metes and bounds, lot and block, aliquot)

K54 exceptions and reservations of legal descriptions

K56 projections, datums and epoch dates

K63 California Coordinate Systems

K65 methods and procedures to produce control networks within accuracy standards (e.g. Public Resources Code, NGS Standards, FGCS Standards)

K72 field notes and staking reports

K74 methods to produce digital terrain models

K76 GIS metadata

K81 parol evidence (e.g., use, methods to document, and effects of)

K89 Code of Regulations (Board Rules)

K90 Streets and Highway Code (survey relevant sections)

K91 signing and sealing requirements

K92 preparation of legal descriptions

K93 components of a legal description (e.g., preamble, body)

K94 elements of topographic maps (e.g., contours, features, symbols, legend, metadata)

K95 elements of corner records (legal content required)

K96 elements of records of survey (legal content required)

K97 methods and procedures for preparing corner records and records of survey

K98 elements of parcel maps (legal content required)

K99 elements of final maps (legal content required)

K100 elements of tentative maps (legal content required)

K101 requirements for signatures (e.g., trustee, owner, beneficiaries)

K102 graphical methods to represent land boundaries and related information

K103 depicting physical evidence that may indicate unwritten rights

K104 GIS software

K105 methods of disclosing and depicting encroachments

K106 reports, documents and exhibits creation

K107 evidence documentation

V. Consultation and Legal (14%)

Consultation and legal pertains to professional consultation expertise provided to the public as the practice of land surveying relates to legal and contractual obligations.

Job Tasks

59 Administer an oath for boundary evidence

60 Communicate accuracies of maps or survey data

61 Represent clients (e.g., depositions, public hearings)

62 Provide expert witness testimony

63 Provide professional surveying consultation

64 Provide litigation support (e.g., land boundary matters, datums, engineering projects)

65 Provide land planning services (e.g., prepare tentative maps)

66 Provide references for Land Surveyor candidates

67 Provide recommendations in accordance with the Subdivision Map Act and Professional Land Surveyors Act

Knowledge Areas

Knowledge of:

K01 Professional Land Surveyors' (PLS) Act

K02 Subdivision Map Act (SMA)

K03 impact of local ordinances

K20 state and local agency processing requirements for maps and related documents (e.g., submittal, review, filing)

K25 appropriate communication methods (e.g., verbal and written)

K33 effects of unwritten rights on boundaries

K39 effect of riparian and littoral rights on boundaries

K40 effect of cloud on title

K44 effect of ground movement on boundaries (e.g., earthquakes, subsidence, slides)

K47 effects of leases

K51 physical evidence that may indicate unwritten rights (e.g., adverse possession, prescriptive rights).

K79 researching relevant case law (e.g., boundary issues, liability)

K89 Code of Regulations (Board Rules)

K90 Streets and Highway Code (survey relevant sections)

K105 methods of disclosing and depicting encroachments

K107 evidence documentation.

V. Consultation and Legal (Continued)

K108 Public Resources Code (survey relevant sections)
K109 Civil Code (survey relevant sections)
K110 Code of Civil Procedure (survey relevant sections)
K111 Penal Code (survey relevant sections)
K112 Government Code (survey relevant sections)
K113 Health and Safety Code (survey relevant sections)
K114 Public Contract Code (survey relevant sections)
K115 Evidence Code (survey relevant sections)
K116 court decorum
K117 public meeting procedures

NCEES
advancing licensure for engineers and surveyors

PRINCIPLES AND PRACTICE OF SURVEYING Exam Specifications

Effective beginning with the April 2013 Examinations

- April 2013 is the first administration of a **closed-book** PS exam. NCEES will supply reference material. The 6-hour exam contains 67 multiple-choice questions in the 4-hour morning session and 33 multiple-choice questions in the 2-hour afternoon session. Examinee works all questions.
- The exam uses the US Customary System (USCS) of units.
- The exam is developed with questions that will require a variety of approaches and methodologies, including design, analysis, and application.
- The knowledge areas specified as examples of kinds of knowledge are not exclusive or exhaustive categories.

		Approximate Percentage of Examination
I.	**Standards and Specifications**	**12%**
	A. Federal statutes, laws, rules and regulations	
	B. State/local statutes, laws, rules and regulations	
	C. Monumentation laws and ordinances	
	D. U.S. Public Land Survey System	
	E. American Land Title Association/American Congress on Surveying and Mapping (ALTA/ACSM) surveys	
	F. Geodetic control network accuracy standards	
	G. Federal Geographic Data Committee (FGDC) standards (digital mapping)	
	H. U.S. National Map Accuracy Standards (analog mapping)	
	I. Federal Emergency Management Agency (FEMA)	
II.	**Legal Principles**	**26%**
	A. Common/case law boundary principles	
	B. Sequential and simultaneous conveyances	
	C. U.S. Public Land Survey System	
	D. Controlling elements in legal descriptions	
	E. Riparian and littoral rights	
	F. Property title issues (e.g., encumbrances, interpretation, deficiencies)	
	G. Sovereign land rights (e.g., navigable waters, eminent domain)	
	H. Prescriptive rights/adverse possession	
	I. Easement rights	
	J. Parol evidence	
III.	**Professional Survey Practices**	**26%**
	A. Public/private record sources	
	B. Project planning (e.g., photogrammetric, geodetic, boundary)	
	C. Control datums	
	D. Encumbrances (e.g., easements, rights of way, mineral rights, subsurface rights)	
	E. Control network accuracy standards	
	F. Supervision of and responsibility for field procedures	
	1. Instrument operations and usage	
	2. Monumentation (e.g., identification, classification, perpetuation)	

3. Vegetation identification (e.g., wetlands, bearing/corner trees, first line of vegetation, aquatic and upland species)
4. Survey control (e.g., boundary, topographic, photogrammetric)
5. GPS operations
6. Construction surveying

G. Supervision of and responsibility for the application of surveying principles and computations
1. Mapping methods and/or projections
2. Graphical terrain representations
3. Geoid, ellipsoid, and orthometric heights
4. State plane or other coordinate systems
5. GPS data reduction and analysis
6. Control network calculations, analysis, and adjustments
7. Bearings/azimuths
8. Area/volume calculations
9. Horizontal and vertical alignment calculations
10. Construction surveying calculations (e.g., plan interpretation)
11. Data preparation for importation into geographical information systems (GIS)

H. Grading and site preparation
I. Survey maps/plats
J. Survey report
K. Descriptions

IV. Business/Professional Practices 20%

A. Project planning (e.g., parameters, costs, budgeting)
B. Contracts
C. Risk management (e.g., liability, safety procedures, insurance)
D. Ethics
E. Communications (oral, written, graphical)
F. Quality assurance procedures
G. Activities, background, and skills of related professions (e.g., engineers, lawyers, architects, planners)

V. Types of Surveys 16%

A. American Land Title Association/American Congress on Surveying and Mapping (ALTA/ACSM) surveys
B. Control and geodetic surveys
C. Construction surveys (e.g., construction calculations and staking)
D. Hydrographic surveys (e.g., elevations of submerged surfaces)
E. Boundary surveys
F. Route and right-of-way surveys
G. Topographic surveys (e.g., scanning, photogrammetry, LiDAR, field)
H. Condominium surveys
I. Subdivision surveys
J. Record drawing (as-built) surveys

BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS
2535 Capitol Oaks Drive, Suite 300, Sacramento, California, 95833-2944
Telephone: (916) 263-2222 – Toll Free: 1-866-780-5370
Facsimile: (916) 263-2246
www.pels.ca.gov & www.geology.ca.gov

June 2012

Candidate ID Number: [redacted] **Candidate Name:** [redacted]

The following table identifies the important content areas and the quality of your performance from the April 2012 examination: Proficient, Marginal or Deficient. Please use the table below and the listing of test plan areas on the California Professional Land Surveyor Examination section of the Board's web site to identify areas needing improvement in your performance on future administrations of the **California Professional Land Surveyor Examination**.

TEST PLAN AREA	PERCENT OF TEST	YOUR PERFOMANCE
PROJECT MANAGEMENT	13%	Deficient
RESEARCH, PRE AND POST FIELD ANALYSIS	25%	Deficient
FIELD WORK	20%	Deficient
MAPPING AND DOCUMENT PREPARATION	28%	Marginal
CONSULTATION AND LEGAL	14%	Proficient

For additional information on the examination and the test plan, please refer to the California Professional Land Surveyor Examination section of the Board's web site at http://www.pels.ca.gov/applicants/refs.shtml.

BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS
2535 Capitol Oaks Drive, Suite 300, Sacramento, California, 95833-2944
Telephone: (916) 263-2222 – Toll Free: 1-866-780-5370
Facsimile: (916) 263-2246
www.pels.ca.gov & www.geology.ca.gov

June 2012

Candidate ID Number: [redacted] **Candidate Name:** [redacted]

The following table identifies the important content areas and the quality of your performance from the April 2012 examination: Proficient, Marginal or Deficient. Please use the table below and the listing of test plan areas on the California Professional Land Surveyor Examination section of the Board's web site to identify areas needing improvement in your performance on future administrations of the **California Professional Land Surveyor Examination**.

TEST PLAN AREA	PERCENT OF TEST	YOUR PERFOMANCE
PROJECT MANAGEMENT	13%	Proficient
RESEARCH, PRE AND POST FIELD ANALYSIS	25%	Deficient
FIELD WORK	20%	Deficient
MAPPING AND DOCUMENT PREPARATION	28%	Deficient
CONSULTATION AND LEGAL	14%	Proficient

For additional information on the examination and the test plan, please refer to the California Professional Land Surveyor Examination section of the Board's web site at http://www.pels.ca.gov/applicants/refs.shtml.

BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS
2535 Capitol Oaks Drive, Suite 300, Sacramento, California, 95833-2944
Telephone: (916) 263-2222 – Toll Free: 1-866-780-5370
Facsimile: (916) 263-2246
www.pels.ca.gov & www.geology.ca.gov

June 2012

Candidate ID Number: [redacted] **Candidate Name:** [redacted]

The following table identifies the important content areas and the quality of your performance from the April 2012 examination: Proficient, Marginal or Deficient. Please use the table below and the listing of test plan areas on the California Professional Land Surveyor Examination section of the Board's web site to identify areas needing improvement in your performance on future administrations of the **California Professional Land Surveyor Examination**.

TEST PLAN AREA	PERCENT OF TEST	YOUR PERFOMANCE
PROJECT MANAGEMENT	13%	Deficient
RESEARCH, PRE AND POST FIELD ANALYSIS	25%	Deficient
FIELD WORK	20%	Proficient
MAPPING AND DOCUMENT PREPARATION	28%	Deficient
CONSULTATION AND LEGAL	14%	Deficient

For additional information on the examination and the test plan, please refer to the California Professional Land Surveyor Examination section of the Board's web site at http://www.pels.ca.gov/applicants/refs.shtml.

NCEES
advancing licensure for engineers and surveyors

FUNDAMENTALS OF SURVEYING (FS)
CBT EXAM SPECIFICATIONS

Effective Beginning with the January 2014 Examinations

- The FS exam is a computer-based test (CBT). It is closed book with an electronic reference.
- Examinees have 6 hours to complete the FS exam, which contains 110 multiple-choice questions. The 6-hour time also includes a tutorial, a break, and a brief survey at the conclusion.
- The FS exam uses the US Customary System (USCS) of units.

Knowledge	Number of Questions
1. Mathematics	**13–20**
A. Algebra, trigonometry, and basic geometry	
B. Spherical trigonometry	
C. Linear algebra and matrix theory	
D. Analytic geometry and calculus	
2. Basic Sciences	**5–8**
A. Geology	
B. Dendrology	
C. Cartography	
D. Environmental sciences	
3. Spatial Data Acquisition and Reduction	**6–9**
A. Vertical measurement	
B. Distance measurement	
C. Angle measurement	
D. Unit conversions	
E. Redundancy	
F. Knowledge and utilization of instruments and methods	
G. Understanding of historical methods and instruments	
4. Survey Computations and Computer Applications	**19–29**
A. Coordinate geometry	
B. Traverse closure and adjustment	
C. Area	
D. Volume	
E. Horizontal curves	
F. Vertical curves	
G. Spirals	
H. Spreadsheets	
5. Statistics and Adjustments	**6–9**
A. Mean, median, mode	
B. Variance, standard deviation	
C. Error analysis	
D. Least squares adjustment	
E. Measurement and positional tolerance	
F. Relative, network, and positional accuracy	

6. Geodesy **5–8**

A. Basic theory
B. Satellite positioning
C. Gravity
D. Coordinate systems
E. Datums
F. Map projections

7. Boundary and Cadastral Survey Law **13–20**

A. Controlling elements
B. Gathering and identifying evidence
C. Records research
D. Legal descriptions
E. Case law
F. Riparian rights
G. Public land survey system
H. Metes and bounds
I. Simultaneously created parcels
J. Easements and encumbrances

8. Photogrammetry and Remote Sensing **4–6**

A. Interpretation and analysis
B. Project and flight planning
C. Quality control
D. Ground control
E. LiDAR

9. Survey Processes and Methods **11–17**

A. Land development—principles, standards, and regulations
B. Boundary location
C. Mapping, cartography, and topography
D. Construction
E. Riparian surveys
F. Route surveying
G. Control surveys

10. Geographic Information Systems (GIS) **5–8**

A. Feature collection and integration
B. Database concepts and design
C. Accuracy and use
D. Metadata

11. Graphical Communication and Mapping **6–9**

A. Plans and specifications
B. Contours and slopes
C. Scales
D. Planimetric features and symbols
E. Land forms
F. Digital terrain modeling and digital elevation modeling
G. Survey maps, plats, drawings, and reports

12. Professional Communication **4–6**

A. Oral
B. Written
C. Alternate forms of communication
D. Documentation and recordkeeping

13. Business Concepts **3–5**

A. Contracts
B. Liability and risk management
C. Financial practices
D. Leadership and management principles
E. Personnel management principles
F. Project planning and design
G. Ethics
H. Safety

What you Need to Know About The 2014 Land Surveyor Exams

Presented by

Ric Moore, PLS – Executive Officer

Raymond Mathe, PLS – Exams Manager

Board for Professional Engineers, Land Surveyors and Geologists (BPELSG)

February 13, 2014

San Diego Chapter CLSA

PS/PLS Exam Overview

- FS Test Plan
- FS Exam – New Process
- PS/PLS Test Plans
- PS / PLS Exam Tips
- 2005-2013 Results
- PLS Diagnostic (Examples)
- CBT Tutorial
- Questions

NCEES FS Test Specifications

Effective beginning January 2014

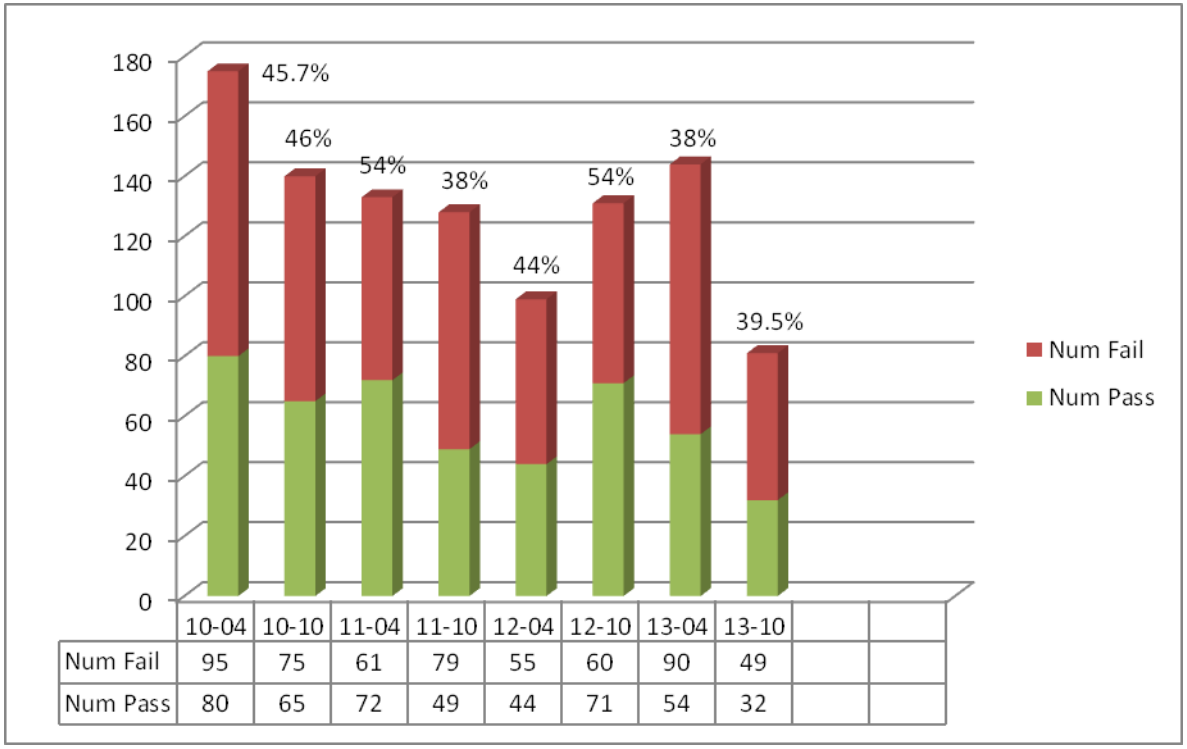
- Mathematics – 13-20 items
- Basic Sciences – 5-8 items
- Spatial Data Acquisition / Reduction – 6-9 items
- Survey Computations / Computer Applications – 19-29 items
- Statistics and Adjustments – 6-9 items
- Geodesy – 5-8 items
- Boundary and Cadastral Survey Law – 13-20 items
- Photogrammetry and Remote Sensing – 4-6 items
- Survey Processes and Methods – 11-17 items
- GIS – 5-8 items
- Graphical Communication and Mapping – 6-9 items
- Professional Communication – 4-6 items
- Business Concepts – 3-5 items

http://cdn2.ncees.co/wp-content/uploads/2013/10/FS-January-2014_with-ranges.pdf

NCEES FS Exam – New Process

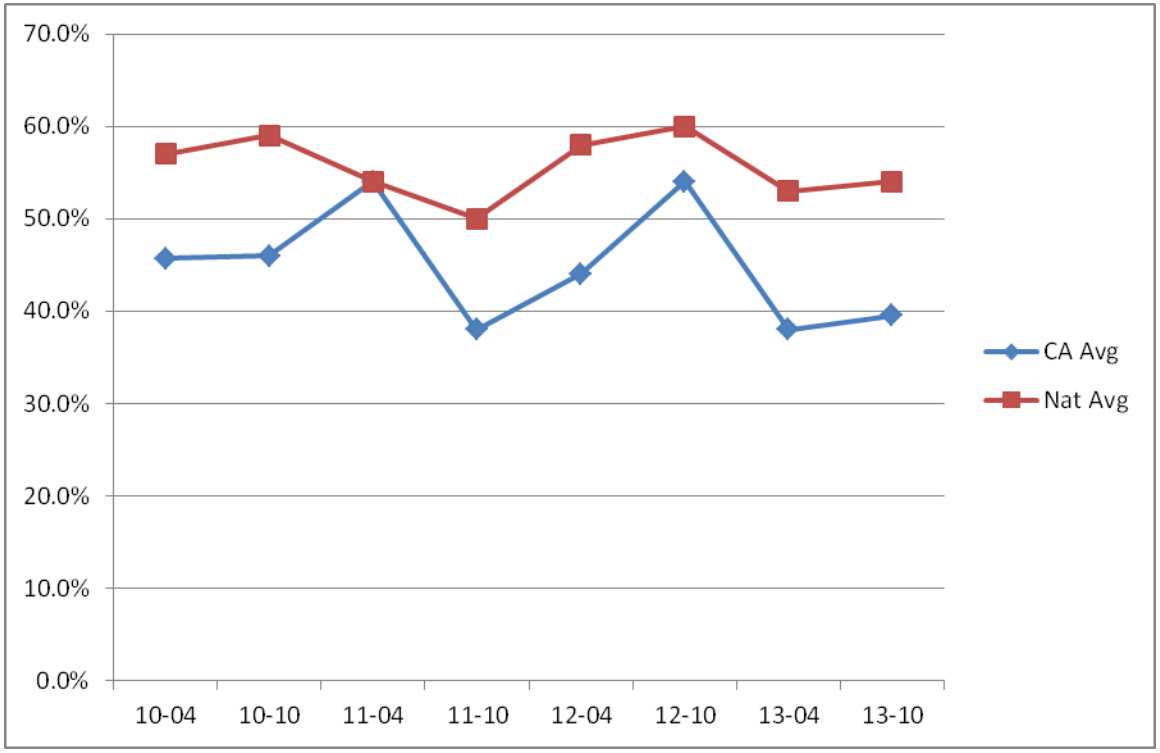
- FS Exam is now Computer Based (CBT)
  - Pearson Vue CBT Centers
  - Offered 4 windows a year
    - (Jan-Feb; Apr-May; Jul-Aug; Oct-Nov)
    - Sit ONCE per window and MAX 3 times annually
  - Do not apply for LSIT with BPELSG until after passing FS exam
- Register at http://ncees.org/exams/state-pages/california-exam-registration/

Recent FS Results for California



	10-04	10-10	11-04	11-10	12-04	12-10	13-04	13-10
Num Fail	95	75	61	79	55	60	90	49
Num Pass	80	65	72	49	44	71	54	32

FS Exam – California vs. USA



NCEES PS Test Specifications

Effective beginning with April 2013 National PS Exam

- Standards and Specifications – 12%
- Legal Principles – 26%
- Professional Survey Practices – 26%
- Business / Professional Practices – 20%
- Types of Surveys – 16%

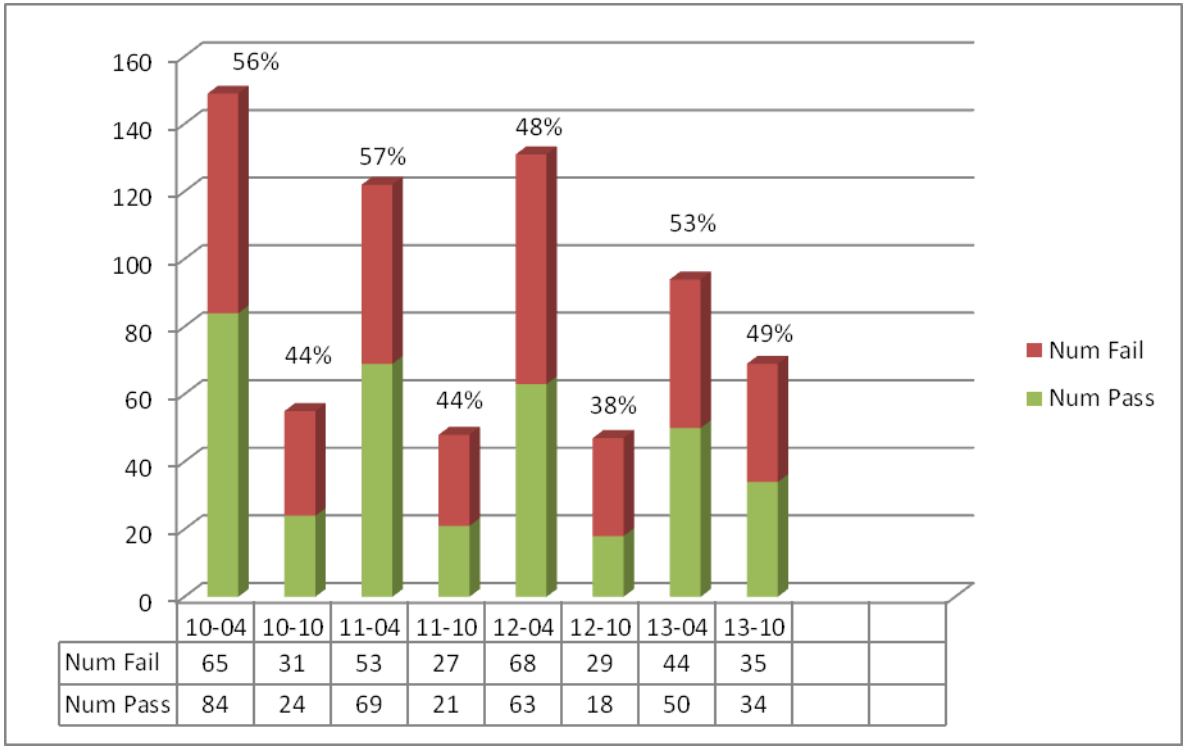
http://www.ncees.org/Documents/Public/Exam%20specifications/PS%20Apr%202013.pdf

NCEES PS Exam Tips

- PS Exam is now Closed Book
  - Paper based (PBT)
  - Wrist watches are OK
- **DO NOT** bring:
  - CELL PHONES
  - Food, drinks, calculator watch , other electronic devices…

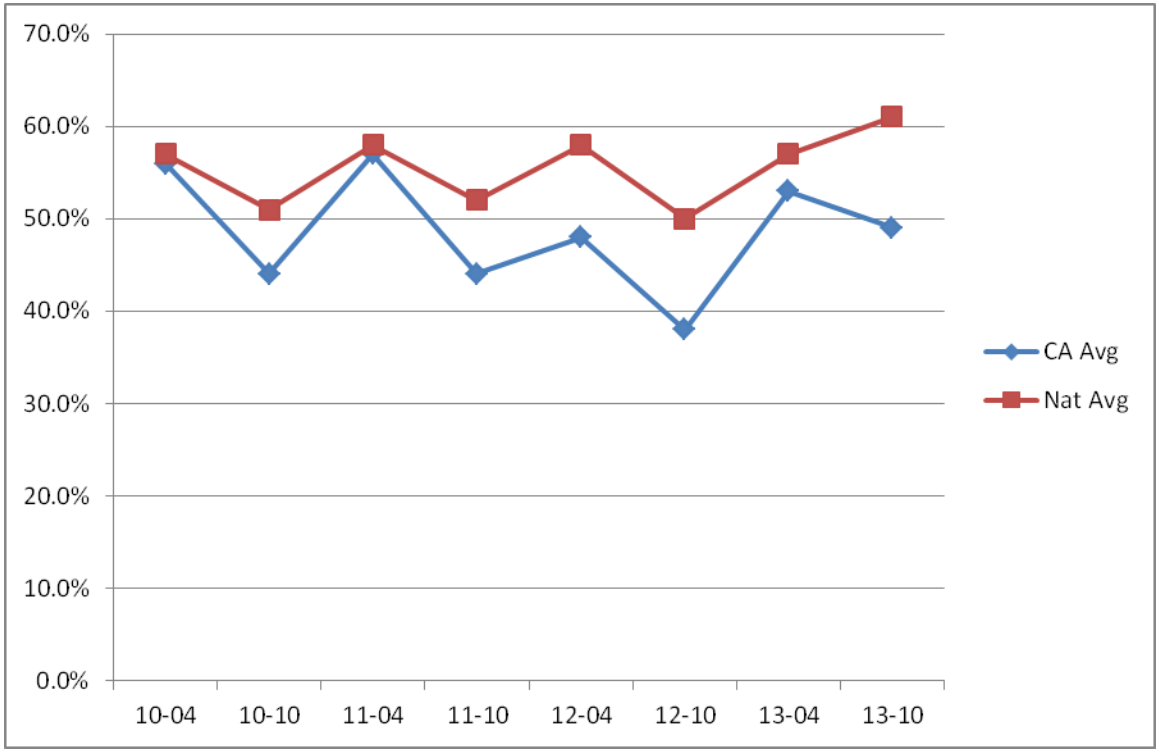
http://www.youtube.com/watch?v=KXECgt0JsRE

Recent PS Results for California



	10-04	10-10	11-04	11-10	12-04	12-10	13-04	13-10		
Num Fail	65	31	53	27	68	29	44	35		
Num Pass	84	24	69	21	63	18	50	34		

PS Exam – California vs. USA



State PLS Test Plan

Based on a 2011 Occupational Analysis of practicing California Land Surveyors

- Project Management – 13%
- Research Pre and Post Field Analysis – 25%
- Field Work – 20%
- Mapping and Document Preparation – 28%
- Consultation and Legal – 14%

http://www.bpelsg.ca.gov/applicants/ls_test_plan.pdf

State CBT Exam Tips

- Bring:
  - Valid Government Issued Identification
  - Candidate Information Bulletin (CIB)
  - Reference Materials
  - Calculators
- Limit the Materials
  - Books
  - Calculators
  - Scales, protractors, etc.

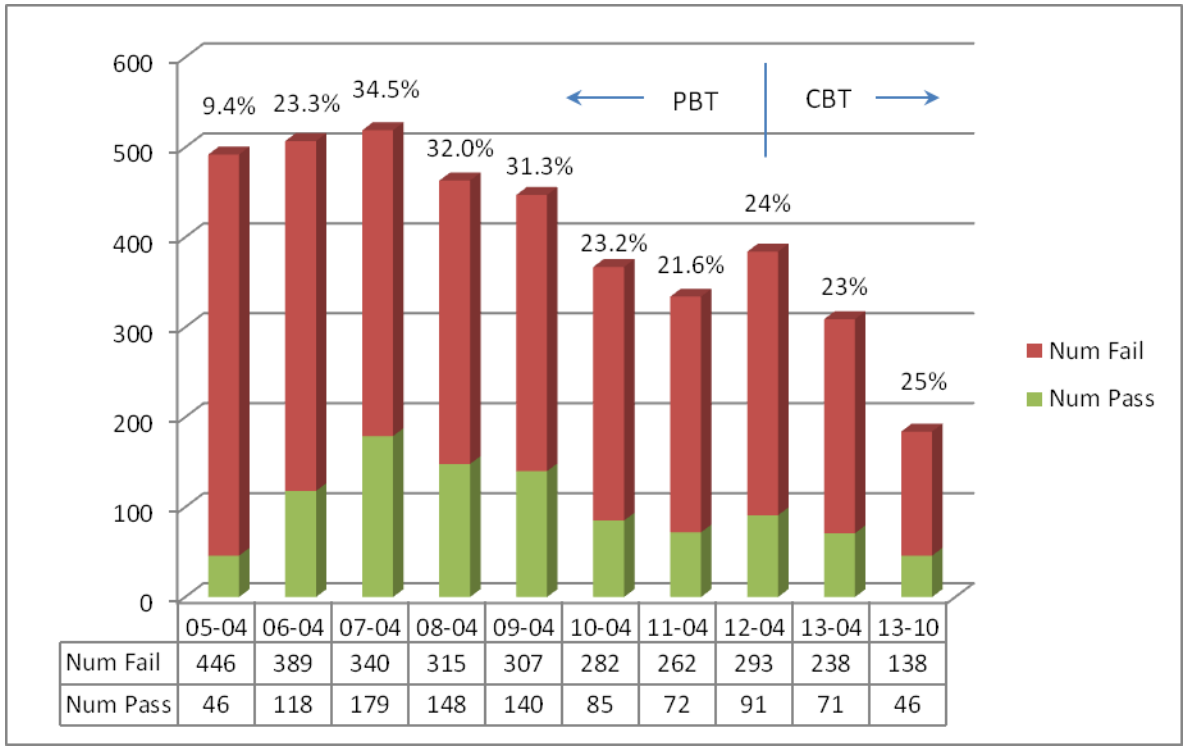
State CBT Exam Tips

- Other Items You Might Bring:
  - Batteries, extra glasses, other loose items
    - Put in personal locker or leave in car
    - Your exam time will NOT be stopped to retrieve from locker or car!
- **DO NOT** bring:
  - Watch, clock, gloves, electronic devices

CBT – State Exam

- 250 Prometric CBT Centers
- North America

Recent PLS Results for California



	05-04	06-04	07-04	08-04	09-04	10-04	11-04	12-04	13-04	13-10
Num Fail	446	389	340	315	307	282	262	293	238	138
Num Pass	46	118	179	148	140	85	72	91	71	46

Results released December 18 (50 days after admin)

(Goal is 30-45 Days)

How to Understand PLS Diagnostic

- Proficient, Marginal, Deficient
- Cut Score Averaged Over Test Entire Plan
- Marginal in all Test Plan areas
  - Passing +/- a couple of points
  - Some Test Plan areas may have a Marginal Range of 3 points
- Example Diagnostic Reports Match Experience

Land Surveyor:

Raymond Mathe (916) 263-2271
Raymond.mathe@dca.ca.gov

Executive Officer:

Ric Moore (916) 263-2230 Ric.moore@dca.ca.gov

Enforcement:

Nancy Eissler (916) 263-2241 Nancy.eissler@dca.ca.gov

Monument Conservation (Sec. 8771):

Larry Kereszt (916) 263-2240 Larry.kereszt@dca.ca.gov

PLS Board Member:

Patrick Tami

Welcome to the tutorial

This tutorial provides a series of screens that orient you to the computer testing environment. This will give you an opportunity to try each feature before using it in questions that will be scored. You will be instructed on how to use the mouse and the different parts of the screen.

You may use the tutorial for 10 minutes. Notice the "Time Remaining" box in the upper right corner of this screen. A similar display will appear during the actual exam. In the upper left corner is a box that shows where you are in the series of questions (or in this case, screens of the tutorial). Other screen features are described later in the tutorial.

Click on the 'Next' button to continue.

Using the mouse

The mouse pointer moves when you move the mouse around on a surface. Although it can assume different shapes, the arrow shown at left is common. To point with the mouse, move the pointer until it rests on the desired object. To click something, point to it and then press and quickly release the left mouse button.

Practice:

1. Rest your hand lightly on the mouse and move it. Note how the pointer moves as your hand does.
2. Point to the correct answer (A) on the sample question below and click. You can click anywhere in the answer. Notice that the open circle next to the answer you chose is now filled in.

Sample Question

- ○ A. Correct answer
- ○ B. Incorrect answer

Click on the 'Next' button to continue.

Navigating through the exam

You can use the mouse to move through the exam one question at a time. Buttons appear at the bottom of the screen.

To move backwards
Click the **Previous** button.

To move forwards
Click the **Next** button.

Click on the 'Next' button to continue.

Marking questions for later review

Your score is determined by the number of questions you answer correctly. Therefore it is to your advantage to answer every question. If you are unsure of your answer, you can mark the question to review if time permits.

To mark a question

Click the **Mark** button.

To unmark a question

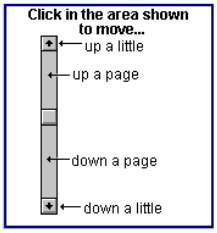
Click the **Marked** button. This button will only appear if you have marked the question.

Unmark each question when you are satisfied with your answer choice. If you forget to unmark the question, it's OKAY. The scoring process does not differentiate between marked and unmarked questions.

You can also leave a question unanswered (incomplete). Marked and Incomplete questions will be highlighted in a Review Questions screen before you exit the exam, and you will have the opportunity to go back to those if you have time remaining.

Click on the 'Next' button to continue.

Using the scroll function



A scroll bar appears when a question doesn't fit on a single screen. Scroll bars may be horizontal or vertical.
To scroll through the screen contents, click the scroll arrow that points in the appropriate direction to move a short distance. To move up or down one screen at a time, click within the scroll bar above or below the scroll box.

Click on the 'Next' button to continue.

Reviewing items

Questions	Marked	Incomplete	Complete
Question 1			Yes
Question 2			Yes
Question 3		Yes	
Question 4	Yes	Yes	
Question 5	Yes		Yes

At the end of each portion, you will see a scrollable listing of all the question numbers. This list displays each question number and indicates if the question has been marked for review, completed or skipped. You will not be able to return to these items once you leave this portion of the exam, so please answer all questions prior to exiting the review.

To review questions

Click on the **Review All** button. You will be moved to the first question. Clicking on the **Next** button will cause you to move to the next question. You can also double-click on the question number in the list to move to a particular question.

REVIEW ALL

To review marked questions

Click on the **Review Marked** button. You will be moved to the first marked question. Clicking on the **Next** button will cause you to move to the next marked question.

REVIEW MARKED

To review incomplete questions

Click on the **Review Incomplete** button. You will be moved to the first incomplete question. Clicking on the **Next** button will cause you to move to the next incomplete question.

REVIEW INCOMPLETE

Click on the 'Next' button to continue.

Survey Comments

At the conclusion of the examination, you will be presented with a brief survey and an opportunity to comment on any examination question. Please note you will not be able to return to the exam once you entered the survey portion, so you should note any examination comments you would like to share on the scratch paper provided.

Click on the 'Next' button to continue.

End of tutorial

This concludes the tutorial. If you have time remaining, you can repeat the tutorial by clicking on the **Previous** button to back up one screen at a time.

Good luck with the examination.

Click the 'End' button.