

APPENDIX G

TRAINING REQUIREMENTS

(This Appendix to be incorporated into the Contract)

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A. General

The Contractor will develop course curricula, create training materials, conduct training, and provide support for the software. Seventy-three (73) Key Support Users and approximately 4,000 users statewide must be trained. The course curricula and all training material; including, manuals, user tutorials with sample data sets, and quick reference guides must be developed by the Contractor and must incorporate Caltrans policies, standards, and workflow processes. All training material shall become the property of Caltrans and may be modified or supplemented by Caltrans at any time.

1. Contractor Responsibilities:

- a. A Final Training Plan must be completed and approved by the Caltrans Contract Manager within 45 calendar days after contract award. The Final Training Plan must include an outline of the development of the curriculum course content, and a proposed training schedule.
- b. A Final Training Schedule must be completed and approved by the Caltrans Contract Manager within one month of completion of the training for the 73 key users.
- c. The following courses must be developed by the Contractor:
 - Survey Data Processing and DTM
 - Survey COGO and Map Production
 - Introduction to Roadway Design
 - Intermediate Roadway Design
 - Basic Structure Design
 - Basic Hydraulic Design

Course content, training logistics including locations and capacity, and approximate users to be trained are provided later in this Appendix. All training will be conducted at designated Caltrans training facilities.

- d. The Contractor must provide draft training material for all courses within four months after the contract is executed to provide Caltrans the opportunity to comment before work is complete and to ensure that the material follows Caltrans methods, policies and standards.
- e. The course curricula and training materials must be completed and approved by the Caltrans Contract Manager within eight months contract execution.
- f. Upon approval of the course curricula and training materials, the Contractor will train 73 Key Support users at a Caltrans training facility in Sacramento.

- Once the Key Support users are trained, a four year training cycle will begin to train 4,000 (approximate) users statewide.
- g. The Contractor must have the resources available to provide the required services within the allotted timeframe. Due to the volume of classes required, it is expected that training may be required concurrently in multiple locations, starting the first year of statewide implementation and beginning with the Survey and Roadway design courses. There must be a minimum of 3 to 6 months between the Introduction to Roadway and the Intermediate Roadway Design courses, in order for students to become familiar with the content of the first course before taking the second course.
 - h. Training manuals, handouts, data sets, video demonstrations, guides, and any other media developed for the training courses must be provided to the OoCEGS three weeks prior to the actual training date in order for the Caltrans Reproduction department to produce and ship course materials.
 - i. All training manuals, handouts, guides and any other printed media, must be provided in both .pdf and .doc electronic format. In addition, two hard copies of each training manual must be provided to Caltrans.
 - j. The Contractor shall provide available on-line training, video demonstrations, and knowledgebase resources to Caltrans as learning tools to address frequently asked questions. Video demonstrations will be placed on Caltrans servers for the use of all Caltrans employees.
 - k. Training materials must be updated, as needed, within three weeks of any software upgrades or updates, at no cost to the State, for the duration of the maintenance agreement.
 - l. Prior to commencement of training, the Contractor must provide resumes for all trainers. Each trainer is required to have:
 - Knowledge and expertise with the software and the curricula. A minimum of one year of training experience is required.
 - Training experience with other agencies and/or private entities utilizing their respective policies, standards, needs and workflow process. A minimum of one year of training experience will be required with at least five training classes taught.
2. Review and Approval Procedures:
- a. Caltrans shall have the right during any phase of the Contractor's work, or as requested by the Contractor, to monitor and review the progress and/or processes of the Contractor.

- b. All training manuals, handouts, data sets, videos demonstrations and guides produced by the Contractor shall be subject to the acceptance and approval of Caltrans before the training sessions can begin.
- c. At the end of each training class each student will be asked to complete an instructor evaluation form for the Contractor's instructor. If the more than half of the class students give a below average rating to the Contractor's instructor on more than two occasions, Caltrans reserves the right to reject any future training by that particular instructor(s).

B. Course Content

Caltrans has identified six training courses that must be developed by the Contractor. Each course must be created using U.S. Survey feet and include the topics/content described below. It is the Bidder's responsibility to identify additional course content that is deemed necessary for staff to effectively and efficiently use the roadway design software.

1. Survey Data Processing and DTM

a. General Software Use:

- Create project and file structure
- Configure files and setup
- Customize interfaces
- Review differences in data types: survey data, surface data, geometry data
- Review Survey Control and feature coding methods

b. Topographic Data (using survey equipment supplied by Caltrans):

- Assign codes and descriptive information
- Collect data in a cross section mode
- Collect data in a template mode, if possible
- Collect multiple lines of data at the same time
- Perform a small traverse through intermediate control

c. Working With Multiple Survey Data Sets:

- Import raw survey data from Trimble Survey Controller, applying codes per Caltrans standards.
- Process data
- Display data
- Resolve errors

d. Working With Multiple Photogrammetric Data Sets:

- Import photo data from 3D DGN files, applying codes per Caltrans CADD Users Manual.
- Display data
- Resolve errors

e. Creating a DTM With Combined Survey & Photogrammetric Data:

- Merge survey and photo data
- Display the DTM
- Create & review cross sections
- Create & review contours
- Create & review drive through
- Resolve errors
- Edit DTM
- Prepare for delivery to design
- Work with georeferenced images

f. COGO:

- Create horizontal alignment
- Create profile

g. Creating Reports:

- Traverse report
- Point listing of codes used in project, i.e. legend
- Export roadway definitions & control to Trimble Survey controller
- Stakeout report
- Station & offset
- XML Style sheets

h. Preparing Deliverables for Design:

- Create a 3D DGN topo map per Caltrans CADD Users Manual
- Package DTM
- Package survey data for use by design

2. Survey COGO and Map Production

a. General Software Use:

- Create project and file structure
- Configuration of files and setup
- Customize interfaces

- Review differences in data types: survey data, surface data, geometry data
 - Review feature coding methods
- b. Working with Survey Control and R/W Data:
- Import raw survey data from Trimble Survey Controller.
 - Process data
 - Display data
- c. COGO:
- Convert between Metric & U.S. Survey feet
 - Work with ground and grid coordinates
 - Create horizontal alignments
 - Perform traverse adjustments, i.e. compass rule
 - Calculate landnet, parcels & R/W with a variety of methods to include:
 - Store by bearing & distance
 - Store by angle & distance
 - Station & offset
 - Parallel offset
 - Intersection
 - Divide a closed boundary by a specified area
 - Edit geometry
 - Subdivide parcels
- d. Preparing Map:
- Annotate & label geometry on base map per Caltrans CADD Users Manual and Plans Preparation Manual.
 - Edit geometry and update annotation
 - Create geometry tables
 - Create multiple sheet drawing
 - Work with georeferenced images
- e. Reports & Export:
- Deed descriptions
 - Traverse report
 - Point listing of codes used in project, i.e. legend
 - Export geometry & control to Trimble Survey controller
 - Stakeout report
 - Station & offset
 - XML Style sheets

3. Introduction to Roadway Design

- a. Overview of the Roadway Design Software
- b. Introduction to the Roadway Design Software
- c. Project Setup
- d. Existing Digital Terrain Model
- e. Geometry, COGO
- f. Horizontal Alignment
- g. Original Ground Profiles
- h. Original Ground Cross Sections
- i. Vertical Alignments
- j. Superelevation
- k. Roadway Design
- l. Templates
- m. Digital Design Model Surface
- n. Cross Sections and Annotation
- o. Special features and Tools
- p. Earthwork Volumes
- q. Reports
 - Slope stakes, earthwork, volumes
 - Survey file deliverables

4. Intermediate Roadway Design

- a. Intermediate Roadway Design
- b. Intermediate Template Design
 - Creating/building templates
 - Transitions
 - Template Controls

- c. Intermediate Superelevation Design
 - d. Design with Multiple Roadways
 - e. Advanced Earthwork and Design Volumes
 - f. Edit Design
 - g. Site Design
 - h. Digital Design Model
 - i. Special Reports
 - Slope stakes, earthwork, volumes, quantities
 - Survey file deliverables.
5. Basic Structure Design
- a. Bridge Layout
 - Locate Pts
 - Station Offset
 - Angle and distance
 - Intersection
 - Superelevation
 - Creation and Modification
 - Cross Section
 - Creation and Modification relative to Model surface
 - Advance Planning
 - Import aerial images for prelim layout.
 - b. COGO Tools
 - Geometry/Alignment generation/Modification
 - Generation of reports (chain description)
 - Generation of design chains (EOD, Pave Notch, etc)
 - Generation of breaklines for modification of surfaces
 - c. Modeling
 - Basic 3D usage

- View Perspective
 - Rotate View
 - Solids -
 - Blending
 - Filletting
 - Modification
 - Generation of Deck Contours from model
- d. Drafting Aspects
 - Plotting and Manipulation on border sheets
 - Annotation tools
- e. DTM
 - Building design DTM triangles
 - Calculating Surface volumes for earthwork cut/fill
- f. Data Export
 - For use with existing analysis software
 - Xml
- 6. Basic Hydraulic Design
 - a. Hydrology:
 - Watershed Delineation
 - DTM Surface and Topography
 - Imported DEM Data, Aerial Photos, and Images
 - Interface With ArcGIS (Import/Export)
 - Analysis
 - Time of Concentration
 - Rational Method
 - SCS Method
 - b. Cross Drainage:
 - Inlet Control Culvert

- Headwater Depth
 - Capacity
 - Outlet Velocity
- Outlet Control Culvert
 - Tailwater Depth
 - Critical Depth
 - Barrel Velocity
 - Hydraulic Radius
 - Total Head Loss
 - Capacity
- c. Open Channels:
 - Cross-Sectional Shapes
 - Trapezoidal
 - Triangular
 - Irregular
 - Analysis
 - Normal Depth
 - Critical Depth
 - Capacity
 - Alignments
 - Horizontal
 - Vertical
 - Earthwork
- d. Roadway Drainage:
 - Inlet-Spread Analysis
 - On-Site Hydrology
 - Shoulder/Gutter Flow Depth
 - Spread Width
 - Inlet Interception (On-Grade/Sag) and Layout
 - Bypass Flow
 - Storm Drains
 - Pipe Sizing

- Pipe Layout (Main/Lateral)
- Head Losses (Major/Minor)
- Hydraulic Grade Line
- Energy Grade Line
- System Modeling

e. Detention Basins

- Inflow Hydrograph
- Pond Routing
- Stage-Storage Relationship
- Outflow Hydrograph

C. Training Logistics

1. Training room locations and capacity limits

Caltrans district and headquarters training room locations and capacity limits are shown in the chart below. Training classes will vary in size according to the District training room capacities listed. When the training room capacity exceeds 12, two instructors will be required for each class held at that location.

Training Room Locations and Capacity Limits

District	Location	Training Room Capacity
1	1656 Union Street Eureka, CA	10
2	1657 Riverside Avenue CADD Training Room Redding, CA	10
3	703 B Street Marysville, CA	17
4	111 Grand Avenue 10th Floor, Room 436 Oakland, CA	20

Training Room Locations and Capacity Limits

District	Location	Training Room Capacity
5	66 Madonna Road Shop 5 San Luis Obispo, CA	10
6	2015 East Shields Avenue CADD Training Room Fresno, CA	12
7	100 South Main Street 8th Fl, Rm 8.038 Los Angeles, CA	12
8	464 West 4th Street San Bernardino, CA	16
9	500 South Main Street CADD Training Room Bishop, CA	7
10	1976 East Charter Way CADD Training Room Stockton, CA	16
11	4050 Taylor St. RM 1-139 San Diego, CA	12
12	3337 Michelson Drive, Suite 380 C1152 Bld 3347 Irvine, CA	19
HQ-FM3	1727 30th Street, 3rd Floor Sacramento, CA	16

Training Room Locations and Capacity Limits

District	Location	Training Room Capacity
HQ-eLearn*	1616 29th Street, 1st Floor Sacramento, CA	18

- HQ-eLearn is available as an alternative to HQ-FM3. Classes are not expected to run concurrently in both HQ facilities. Either training facility may be utilized for training at HQ.

2. Number of Key Support Users to be trained

The training courses that the 73 Key Support Users will be attending and the number of students are listed below. All Key Support Users will be trained at Headquarters in Sacramento, California

Training Course	Number of Key Support Users
Survey Data Processing and DTM	13
Survey COGO and Map Production	13
Introduction to Roadway Design and Intermediate Roadway Design (47 Key Support Users will attend each course)	47