

APPENDIX D

BIDDER'S FORMS FOR BUSINESS AND TECHNICAL REQUIREMENTS

Table of Contents

Form VI-1: Draft Project Management Requirements Response Form	1
Form VI-2: Mandatory and Desirable System Administration Requirements Response Form	3
Form VI-3: Mandatory Functional Requirements Response Form	15
Form VI-4: Desirable Functional Requirements Response Form	77
Form VI-5: Other Technical Requirements Response Form.....	101

Form VI-1: Draft Project Management Requirements Response Form

The Bidder shall indicate whether the requirement is included in their Draft Project Management Plan (Yes/No). The Draft Project Management Plan must be included in Bidder Proposal Volume 1.

Requirement Number	Requirement	Included? (YES/NO)
Project Schedule		
P1	Project schedule reflects expected timeframes	
P2	Includes full list of project tasks	
P3	Includes start/end dates with durations	
P4	Includes milestones (as appropriate)	
P5	Dependencies are accurate	
P6	Includes resource assignments	
P7	Schedule management plan includes schedule monitoring and update procedures	
Proposed project organization, including roles and responsibilities		
P8	Project organization chart is included	
P9	Roles and responsibilities are well defined	
P10	Project organization chart conforms to resource assignment in project schedule	
Risk/issue management plan		
P11	Issue resolution procedures are well defined	
P12	Includes list of planned risk and issue resolution activities, including responsibilities	
P13	Includes risk/issue identification and tracking process	

Form VI-1 – Draft Project Management Requirements Response Form (continued)

Requirement Number	Requirement	Included? (YES/NO)
P14	Risk mitigation procedures are defined	
P15	Issue escalation procedures are defined	
Communication Plan		
P16	Communications are well defined	
P17	Includes list of planned communication activities, including responsibilities and audience	
Change Management Plan		
P18	Change management procedures are well defined	
P19	Includes list of planned change management activities, including responsibilities	
Quality Plan		
P20	Requirements tracking procedures are defined	
P21	Documents conformance to Caltrans hardware/ software standards. Refer to Section IV.E	
P22	Documents understanding of Caltrans security standards. Refer to Section IV.C.	

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form

The System Administration Requirements are broken into eight parts, each with a set of mandatory and desirable requirements.

The eight parts are:

- Part 1. Hardware Requirements;
- Part 2. Software Requirements;
- Part 3. Installation;
- Part 4. Configuration;
- Part 5. Usage Rights;
- Part 6. Uninstalls;
- Part 7. Patching/Updates; and
- Part 8. User Security.

The Bidder shall provide the proposed solution and supporting literature or documentation reference for both mandatory and desirable system administration requirements.

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Part 1. Hardware Requirements				
Mandatory:				
S1	<p>The software must have system requirements equal to or less than Caltrans system hardware specifications as listed below:</p> <p>HP xw4600 or equivalent:</p> <p>Intel Core 2 Duo E6550 (2.33 GHz) Dual-Core CPU</p> <p>4 GB RAM</p> <p>80 GB Hard Drive (Partitioned 40GB C: Drive, 40GB D: Drive)</p> <p>Nvidia Quadro NVS290 256 MB Video Card</p> <p>10/100/1000 Broadcom NetXtreme Gigabit Network Interface</p> <p>RealTek Sound Card</p>			

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Desirable:				
S2	The minimum amount of RAM (published by vendor) required to run the software is less than or equal to 512 megabytes.			
S3	The minimum amount of RAM (published by vendor) required to run the software is less than or equal to 1 gigabyte.			
S4	The recommended amount of Hard Disk space (published by vendor) needed to install the software is less than 1 gigabyte.			
S5	The minimum CPU (published by vendor) required to run the software is less than or equal to a Pentium 4 2.0GHz processor.			

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Part 2. Software Requirements				
Mandatory:				
The software must run on workstations with the following software installed:				
S6	Windows XP Professional SP3 and Vista SP1 (32 bit Versions)			
	Microsoft Office Professional 2003			
	MicroStation V8i			
	CAiCE Visual Transportation 10 SP6			
	Internet Explorer 7			
	Novell Client 4.91 SP4			
	ZenWorks Client 7.0.1.4			
	McAfee Enterprise Viruscan 8.5.0.781			
	Hummingbird NFS Maestro Ver. 10			
	InterPlot Client 8.5.2.89			
	ArcGIS 9.3 (Continued on next page)			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
S6 (cont'd)	AutoTURN 6.0			
	SignCAD 8.18			
	Lotus Notes 6.5.4			
The software must operate with the following network environments as listed below:				
S7	Novell Directory Services			
S8	NFS by Mapped Drive			
S9	Windows Active Directory (CIFS/SMB)			
Desirable:				
S10	The software is compatible/supported with Microsoft Windows XP Professional, Vista, and the latest Microsoft operating system available.			
S11	The software is compatible/supported with import/export to Microsoft Office Professional 2000.			
S12	The software is compatible/supported with import/export to Microsoft Office Professional 2003.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
S13	The software is compatible/supported with PDF export.			
S14	The software is compatible/supported with Internet Explorer 6.0 import/export.			
S15	The software is compatible/supported with Internet Explorer 7.0 import/export.			
S16	The software supports multiple users on the same computer, each with customizable settings, on Windows XP Professional.			
S17	The software supports multiple users on the same computer, each with customizable settings, on Windows Vista Business.			

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Part 3. Installation				
Mandatory:				
S18	The installer must be able to be installed from a network server on a local area network (LAN).			
S19	The installer must be made available in DVD-ROM or CD media.			
Desirable:				
S20	The installer is available as a Microsoft Installer (MSI) format.			
S21	The installer is installable from a network server by mapped drive and by UNC.			
S22	The installer is capable of installing silently (no prompts).			
S23	Multiple versions of the software can be installed, co-exist, and function on the same computer.			

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
S24	Components can be installed/added without full re-install.			
Part 4. Configuration				
Mandatory:				
S25	Configuration settings or files can be modified. (Bidder must provide sample.)			
Desirable:				
S26	The configuration settings can be packaged into a single file.			
S27	The configuration settings can be text file configurable.			
S28	The configuration function has built-in error checking.			
S29	Multiple users can configure custom settings.			
S30	Multiple users can configure custom settings without using Windows Profiles.			

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Part 5. Usage Rights				
Mandatory:				
S31	<p>The software</p> <ul style="list-style-type: none"> • Must not require the use of a hardware lock to operate; and • Must be capable of allowing any user, on any machine, at any time, to use the software, up to the allocated number of users for that year (i.e. based on usage and not the number of installations.) 			
Desirable:				
S32	Usage is fully open. (i.e. Program can be installed and used without the use of the original CD/DVD, a unique key, etc.)			
S33	Usage is controlled via a pool at the local area network server.			
S34	Usage can be granted for use without network operation.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Part 6. Uninstalls				
Mandatory:				
S35	The software must have a utility to uninstall.			
Desirable:				
S36	Patches/Updates can be discretely uninstalled.			
S37	Uninstall uses standard Windows uninstall.			
S38	Components can be uninstalled without uninstalling entire software.			
S39	Uninstall is capable of silent uninstall (no prompts).			
Part 7. Patches/Updates				
Mandatory:				
S40	Contractor must have a means of providing patches/updates to the software through their own website.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Desirable:				
S41	Patches/Updates are modular and do not require complete re-install of product.			
S42	Patches are configurable (i.e. allows user-defined settings such as installation path, reboot options, etc.)			
S43	Patches are capable of silent install (no prompts).			
S44	Patches can be managed centrally.			
S45	Patches can be performed on-demand by ordinary user.			
S46	Summary of installed patches can be given on demand.			
S47	Patches auto-detect pre-requisites.			
S48	Reports can be gathered for machines that do not have certain patches.			
S49	Users can be notified of new patches.			
S50	Users can be notified of missing patches.			

Form VI-2: Mandatory and Desirable System Administration Requirements Response Form (continued)

Requirement Number	Requirement	Meets Requirement? (Yes/No)	Proposed Solution Description	Supporting Literature or Documentation Reference
Part 8. User Security				
Mandatory:				
S51	The software shall be able to operate using an ordinary, non-administrator level account within the Windows Active Directory and Novell Directory Services environment.			
Desirable:				
S52	Users can secure their projects within the software to keep other users from modifying their projects.			
S53	If the software has integrated security, Administrators have ability to access the projects of users that have secured their projects using the software’s integrated security.			

Form VI-3: Mandatory Functional Requirements Response Form

The Bidder shall provide the proposed solution description and supporting literature or documentation reference for Mandatory Functional Requirements.

Caltrans design standards and methods are defined in the Caltrans Highway Design Manual. Drafting standards are defined in the CADD Manual and the Plans Preparation Manual. Survey standards and methods are defined in the Surveys Manual. Links to all manuals are included in the Bidder's Library.

References to "intelligent" objects or elements mean the software is storing information about that object or element that governs its behavior and/ or its association to other elements (e.g. an Element with a particular feature code will display with pre-defined attributes.)

Supporting Literature or Documentation Reference may include, but is not limited to:

- Software Manuals
- Screen shots
- Statement of affirmation
- Samples

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
GENERAL SPECIFICATIONS				
GENERAL SPECIFICATIONS: General				
M1	The software shall provide all reports as user-defined and writable in ASCII text, XML, or Word file formats.			
M2	The software shall create design elements from simple graphic elements.			
M3	The software shall provide for viewing and importing files from, and exporting files to, the Department’s drafting software, MicroStation.			
M4	The software shall either operate in a CAD drafting software or the software shall create graphical elements within its own environment; however, graphical elements created by the software within its own environment must allow the user to translate them into MicroStation graphical elements.			
M5	The software shall be capable of manipulating and utilizing intelligent CADD elements during the design process.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M6	The software shall support both U.S. Customary and Metric units and provide for conversion from one to the other.			
M7	The software shall provide accuracy features satisfying the following: <ul style="list-style-type: none"> • Double-precision accuracy for all calculations; • User-defined unit accuracies for all output reports; • Station values using the 10+00.00 format; and • Option to input stations, length, and coordinates up to double precision. 			
M8	The software shall accommodate any elevation above or below Mean Sea Level or zero.			
M9	The software shall allow the user to define CADD symbology (e.g. color, weight, line style, level, cell, etc.) per feature or style of all elements.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M10	The software shall allow enhancements and/or modifications to software to accommodate automation of repetitive tasks (e.g. Batch command routines, LISP, etc.)			
M11	The software shall provide integration with commercially available programming languages (e.g. VBA, C++, VB.NET).			
M12	The software shall utilize and manipulate coordinate values in the millions.			
M13	The software shall import survey and photogrammetric data from DGN files and the following legacy data formats- TSS, SRV, and KCM.			
M14	The software shall support N-E-Z, Latitude / Longitude, and X-Y-Z input formats.			
GENERAL SPECIFICATIONS: User Interface				
M15	The software shall allow viewing of reports without leaving the program.			
M16	The software shall support 2D / 3D DGN and DWG input.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
DTM SURFACES				
DTM SURFACES: General Specifications				
M17	The software shall provide intelligent triangulation with user-defined settings.			
M18	The software shall provide the ability to cut areas with a boundary string, creating points at cut boundaries and breaklines.			
M19	The software shall allow the original DTM to be saved as backup prior to editing.			
M20	The software shall be able to measure or determine the vertical distance between two surfaces (e.g. between bridge and road).			
M21	The software shall provide user-definable curve smoothing and spline density for breaklines representing curvilinear elements.			
M22	The triangulation method provided by the software shall not allow triangles to cross breaklines.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
DTM SURFACES: Input				
M23	The software shall import points including the following filterable attributes: <ul style="list-style-type: none"> • Point Number; • Northing; • Easting; • Elevation; • Description; • Feature Code; • Comments; • Curve vs Linear; • DTM point; • Non-DTM point; and • Line ID. 			
M24	The software shall import breaklines including the following filterable attributes: <ul style="list-style-type: none"> • Description; • Feature Code; and • Comments. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M25	The software shall develop and generate surfaces from the following input sources: <ul style="list-style-type: none"> • ASCII data files (preserving point numbers, descriptions, feature codes, etc.); • Graphics files (3D); • ASCII/Digital elevation models (DEM); and • Design Cross-Sections. 			
M26	The software shall differentiate between Curve and Linear attributes of survey data, providing the automatic generation of curvilinear or splined lines when the curve attribute is assigned.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
DTM SURFACES: Contours				
M27	The software shall create contour maps, including: <ul style="list-style-type: none"> • Index contours; • Intermediate contours; • Quick contours; • Smoothed contours; • 3D polylines / line strings; • User-defined CADD related attributes; • User-defined contour intervals; and • Void areas. 			
M28	The software shall provide labeling capabilities for automatic generation of aligned contour labels to create user-defined finished contour maps.			
DTM SURFACES: Cross Sections				
M29	The software shall provide flexibility to extract freehand / user-defined cross sections.			
M30	The software shall support the display and plotting of multiple cross sections.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M31	<p>The software shall allow labels to be applied to cross sections at any user-defined location. Label types must include:</p> <ul style="list-style-type: none"> • Original Ground (OG); • Design Features; • Elevations; • Point Descriptions; and (EP, CL, ETW, etc.) • Slopes 			
M32	<p>The software shall provide Slope Stake reporting from cross section data on any surface (finish, subgrade, etc.). Slope stake reports must:</p> <ul style="list-style-type: none"> • Include user-defined headers; and • Utilize user-defined labels. 			
M33	<p>The software shall interactively measure or determine offset, elevation, and slope on cross section.</p>			
M34	<p>The software shall provide user-defined vertical exaggeration in free-hand / user-defined cross sections.</p>			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
DTM SURFACES: Modifications				
M35	The software shall provide the ability to edit DTM parameters for breaklines, points, and triangles. This includes the ability to add, delete, and move points; and add or drape breaklines.			
DTM SURFACES: Reports/Output				
M36	The software shall develop 3D graphic files from the DTM / Design model.			
M37	The software shall provide DTM export in the following formats: <ul style="list-style-type: none"> • ASCII file; • LandXML file; • Output to Trimble survey data collector; and • Cross Section file. 			
M38	The software shall be able to generate volumes from multiple surfaces.			
M39	The software shall develop rectangular grids and create graphics for 3D perspective presentation.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M40	The software shall assign user-defined CADD symbology (e.g. color, weight, line style, level, cell, etc.) per code, feature, or style.			
M41	The software shall provide Original Ground and Finish Grade DTM’s.			
COGO				
COGO: Input				
M42	The software shall allow both interactive and graphic input.			
M43	The software shall provide user-definable input formats for the import of points and lines. The following formats must be allowed: <ul style="list-style-type: none"> • Comma delimited; • Tab delimited; and • Space delimited. 			
M44	The software shall support import of COGO files in LandXML format.			
M45	The software shall include the ability to reference geometric elements.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M46	The software shall convert graphical elements to COGO elements (e.g. lines, strings, curves, etc.)			
M47	The software shall provide flexible input formats in dialog boxes (e.g. quadrant and azimuths).			
COGO: Points				
M48	<p>The software shall compute, store, and display points as follows:</p> <ul style="list-style-type: none"> • At a user-defined location (precision or graphical input); • At the endpoints, or key points of an element or an optional offset element; • At the intersection of any two selected geometric elements including lines, arcs, chains, graphical shapes, or two points defining a line. If elements do not cross, projects elements for intersection; <p><i>(continued on next page)</i></p>			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M48 (cont'd)	<ul style="list-style-type: none"> • At a point at a defined distance and offset from another point on an element; • At a point projected perpendicular from an element from a selected location; • At a point a given distance and bearing (or azimuth) from a defined location or geometry point; • At a point a defined distance and angle from two other points; • At a point a given station and offset from a given horizontal alignment; • At a point along a tangent to an arc a given distance; • At two points tangent to two specified arcs; • At points of tangency, point of compound, or reversing arcs; and • At a point x-y-z from a selected or defined point. 			
M49	The software shall execute point commands on stored lines, arcs, and chains.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
COGO: Lines				
M50	<p>The software shall construct a line as follows:</p> <ul style="list-style-type: none"> • Between two defined points; • Perpendicular to an element through a defined point; • At an angle, deflection angle, or skew to an element through a defined point; • At a user-defined bearing (or azimuth) and distance through a point; • Tangent line from a specified point on an arc a given distance or to a approximate endpoint; • Through a horizontal alignment station at a specified bearing, azimuth, or skew angle; • Based upon a "least squares" fit through a series of points. Reports residual values and allows user to determine point list based on residuals; <p><i>(continued on next page)</i></p>			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M50 (cont'd)	<ul style="list-style-type: none"> • By division or proportion along a line; • Tangent to two arcs; and • Parallel to any other line at a user-defined distance. 			
COGO: Arcs/Circles				
M51	<p>The software shall construct an arc as follows:</p> <ul style="list-style-type: none"> • From a center point, radius, and two points indicating the endpoints of the arc; • By division or proportion along an arc / curve; • Based upon a "least squares" fit through a series of points. Reports residual values and allows user to determine point list based on residuals; • From a radius and the end points; • Tangent to two specified lines; • Tangent to a line through a point on the line; <p><i>(continued on next page)</i></p>			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M51 (cont'd)	<ul style="list-style-type: none"> • A circle with a specified center and radius, degree of curvature, or point on the circle; • With radius, one end point, and delta angle; • Constructs arc with radius, one end point, and arc length; • Compound and reversing curves; • Allows major arc curves to be divided into a series of minor arcs; • Has flexibility to have delta angle between 0-360 degrees; and • Fillet & chamfer curves. 			
COGO: Spirals				
M52	<p>The software shall construct spirals as follows:</p> <ul style="list-style-type: none"> • By sweep angle; • By length; • By endpoints; • Including spiral-curve-spiral capability; • By minimum / maximum radius, beginning and end points; and • By chord or arc definition. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M53	The software shall construct offset points to an existing spiral.			
COGO: Chains/Shapes				
M54	The software shall build a string/ shape from existing geometric elements including points, lines, arcs, and other chains.			
M55	The software shall construct a string parallel to an existing string.			
M56	The software shall construct a string with varying offsets from an existing string.			
M57	The software shall provide a routine to construct a best-fit alignment from survey data.			
M58	The software shall provide user-definable rules when building chains (e.g. all curves will be tangent or allow non-tangent curves).			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
COGO: Manipulation/Modifications				
M59	<p>The software shall edit geometric elements in the following manners, including:</p> <ul style="list-style-type: none"> • Revising and deleting geometric element(s) individually or in groups; • Lengthening or shortening an existing line/ arc/ string by distance or by graphically defining end point; • Rotating, translating, scaling, or renumbering groups of points or point files, curves, lines, and chains; • Retrieving and displaying geometry elements based on user-defined queries; • Associating attributes to geometry elements; and • Retrieving or defining an elevation on a geometric point from a surface or user-defined input. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
COGO: Computational				
M60	The software shall calculate bearing and distance between two defined points or from a single point to a group of selected points, including options for slope distance, vertical difference, and cumulative distance.			
M61	The software shall calculate the major or minor angle between three points.			
M62	The software shall calculate the angle between two lines.			
M63	The software shall calculate the station and offset of a given point relative to a given horizontal alignment.			
M64	The software shall calculate the area of a defined shape.			
M65	The software shall be able to subdivide a shape based on user-defined parameters and/or a predetermined area.			
M66	The software shall calculate the minimum distance between any two lines, arcs, or graphical elements.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M67	The software shall compute, store, and display a line or arc parallel to an existing line or arc.			
M68	The software shall create individual geometry elements from all or part of a given horizontal alignment.			
M69	The software shall create parallel elements at a user-defined distance apart.			
M70	The software shall calculate the perpendicular offset from a point to: <ul style="list-style-type: none"> • An object; • Line; and • Two points defining a line. 			
COGO: Traverse				
M71	The software shall provide open and closed traverse capability.			
M72	The software shall provide calculation of unknowns with the capability of solving two unknowns.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M73	The software shall provide traverse adjustment including compass, transit, Crandall, scale and rotate, and least squares.			
M74	The software shall allow for the selection of stored points and curves, input from file, and/or manual entry of traverse data including bearings and distances, ability to traverse through tangent and non-tangent curves, and points of cusp.			
M75	The software shall save traverse input and allow for edits and reprocessing.			
M76	The software shall graphically preview the traverse before stored.			
M77	The software shall rotate bearings, apply a scale factor, and convert distances between U.S. Survey feet and meters.			
COGO: User Defined Annotations				
M78	The software shall identify and label geometric elements.			
M79	The software shall provide the option of incrementally numbering elements as they are stored with the alternate option of overwriting an existing element.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M80	The software shall provide automated element labeling with on / off switch to control feature.			
M81	The software shall automate element labeling per user-defined parameters depending on the length of the element (i.e., bearing and distance on top, bearing on top and distance on bottom, creates data table).			
M82	The software shall provide user-definable annotation format including number of decimal places.			
M83	The software shall provide automatic generation and placement of element annotation including: <ul style="list-style-type: none"> • Bearings; • Distances; • Coordinates; • Elevation; • Station / offset; and • Curve data to a range of data or singular data. 			
M84	The software shall provide intelligent element annotation.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M85	The software shall provide coordinate annotation of a user-specified point.			
COGO: Reports/Output				
M86	The software shall provide a user-definable traverse report including: <ul style="list-style-type: none"> • Distance; • Bearing; • Arc length; • Latitudes and Departures; • Coordinates; • Radius; • Closing course error; and • Precision of closure. 			
M87	The software shall provide a report on user selected geometry elements.			
M88	The software shall provide a station and offset report for a user-defined set of points relative to a given alignment.			
M89	The software shall include geometry feature data on COGO reports and output files.			
M90	The software shall provide a report of feature data quantities.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M91	The software shall provide a report / summary listing of all features used in the project.			
HORIZONTAL ALIGNMENT				
HORIZONTAL ALIGNMENT: General				
M92	The software shall be able to generate a horizontal alignment from geometry elements.			
M93	The software shall allow input of horizontal alignments interactively, graphically, or by a combination thereof.			
M94	The software shall provide a station equation scheme for horizontal alignments, including gaps and overlaps (without any station addition for overlaps).			
M95	The software shall provide stationing up to 1000000+00.			
M96	The software shall accommodate any size curve radius or delta.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M97	The software shall provide flexible roadway naming conventions (e.g. k1, RampA).			
M98	The software shall allow for increasing and decreasing stationing.			
M99	The software shall provide diagnostic capabilities to check and highlight non-tangent curves.			
HORIZONTAL ALIGNMENT: Construct Horizontal Alignment				
M100	The software shall be able to construct horizontal alignments by points of intersection (PI's) for deltas less than 180 degrees using: <ul style="list-style-type: none"> • Alignment designation; • Beginning station; • PI coordinates; • Curve radii; and • Option of spiral length. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M101	The software shall be able to construct horizontal alignments by curve data using: <ul style="list-style-type: none"> • Alignment designations; • Beginning station; • Curve radii, delta (up to 360 degrees) and direction; • BC and EC (PC, PT) stations; and • Chord length. 			
M102	The software shall be able to construct horizontal alignments by chains using: <ul style="list-style-type: none"> • Alignment designations; • Beginning station; and • Stored chains including arcs up to 360 degrees. 			
HORIZONTAL ALIGNMENT: Horizontal Alignment Annotations				
M103	The software shall provide automatic annotation of Horizontal Alignment elements.			
M104	The software shall allow user-definable annotation of Horizontal Alignment.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
HORIZONTAL ALIGNMENT: Modify Horizontal Alignment				
M105	The software shall allow user to copy, edit, delete, insert, move, and revise Horizontal Alignment data.			
HORIZONTAL ALIGNMENT: Reports/Output				
M106	Horizontal Alignment reports shall be capable of providing the following user-defined items; including: <ul style="list-style-type: none"> • Curve radii; • Curve length; • Deflections or deltas; • Degree of curvature; • Total string alignment length; • Tangent lengths; • PI coordinates; • EC, BC (PC, PT) coordinates and corresponding stations; • Bearings (tangents, curve direction back, curve direction ahead, etc.); and • Point names. 			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M107	When Horizontal Alignment reports include spiral curves, the report shall include the following additional information: <ul style="list-style-type: none"> • Radius in; • Radius out; • Spiral angle; and • Spiral length. 			
M108	The software shall export Horizontal Alignment(s) to LandXML & Trimble formats.			
VERTICAL ALIGNMENT				
VERTICAL ALIGNMENT: General				
M109	The software shall allow input of Vertical Alignments interactively, graphically, or by a combination thereof.			
M110	The software shall import Vertical Alignment data from other sources (e.g. LandXML).			
M111	The software shall provide flexible roadway naming conventions (e.g. k1, RampA).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M112	The software shall provide a design specification checker configurable to Caltrans standards listed in Appendix F.			
VERTICAL ALIGNMENT: Construct Vertical Alignment				
M113	The software shall be able to construct and draw Vertical Alignment reference lines (grids).			
M114	The software shall be able to construct Vertical Alignments by VPIs.			
M115	The software shall provide for user-defined Vertical Alignment point placement by: <ul style="list-style-type: none"> • Station and elevation; • Station and grade from existing point; • Elevation and grade from existing point; and • Placing at grade line intersections. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M116	The software shall provide capability to construct Vertical Alignment tangents by: <ul style="list-style-type: none"> • Distance and grade from existing Vertical Alignment point; and • Placing the tangent between any two existing Vertical Alignment points or VPIs. 			
M117	The software shall construct Vertical Alignments using parabolic curves.			
M118	The software shall be able to construct vertical curves through points using various combinations including: <ul style="list-style-type: none"> • Station departing grade, VC length, and VPI; • Both grades, VC length, and VPI station; • Both grades, VC length, and VPI elevation; and • Both grades and VC length from station of either start or end of VC. 			
M119	The software shall be able to construct Vertical Alignments using surface data.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M120	The software shall be able to display and/or store profiles of any surface using the following selection methods: <ul style="list-style-type: none"> • Two-points; • Along or offset from any geometry or survey string; and • Along any user-defined line string. 			
M121	The software shall be able to construct Vertical Alignments with offset and elevation differences from the surface data.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
VERTICAL ALIGNMENT: User-Defined Vertical Alignment Annotations				
M122	The software shall provide and display Vertical Alignments with automatic annotation including: <ul style="list-style-type: none"> • Stationing scheme including BVC’s, EVC’s, etc.; • Sags and crest identification (station, elevation, etc.); • VPI stationing and elevations; • Vertical curve lengths; • User-defined line codes representing OG and design; • User-defined scale along vertical and horizontal axes; • Station equations; and • Grades. 			
M123	The software shall label Vertical Alignments at any user-defined location.			
M124	The software shall be able to display multiple offset design profiles of any user-defined roadway strings (e.g. CL, ETW, EP, gutters, curbing, bridge soffits) along with tabular elevations of each string at station increments, transit points, and other specified stations.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
VERTICAL ALIGNMENT: Modify Vertical Alignment				
M125	The software shall allow user to copy, edit, delete, insert, move, and revise Vertical Alignment data.			
M126	The software shall be able to copy Vertical Alignments with identical design characteristics.			
M127	The software shall be able to modify vertical elements by constraining selected parameters (e.g. station, elevation, grade back, grade ahead).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
VERTICAL ALIGNMENT: Reports/Output				
M128	Vertical alignment reports and output shall provide the following: <ul style="list-style-type: none"> • Point descriptions; • Stationing at user-defined intervals and limits; • Elevations; • Grades; • Curve lengths; • Sags / crest stations and elevations; • K values; • Stopping sight distances; • Design speeds; and • Original Ground profile. 			
M129	The software shall export Vertical Alignment(s) to LandXML & Trimble formats.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SUPERELEVATION				
SUPERELEVATION: General				
M130	The software shall automatically define a Superelevation per user-defined parameters.			
M131	The software shall allow for interactive input of Superelevation data.			
M132	The software shall develop Superelevation transitions by station.			
M133	The software shall be capable of defining a Superelevation in a non-crowned roadway section.			
M134	The software shall provide user-defined rollover capabilities.			
M135	The software shall provide axis of rotation along any user-defined reference line.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SUPERELEVATION: Superelevation Plots				
M136	The software shall provide Superelevation diagrams for standard, compound, and reversing curves automatically from Superelevation design parameters (e.g. Superelevation rates, runoff length, axis of rotation, etc.).			
M137	The software shall provide user-defined Superelevation diagram annotation including: <ul style="list-style-type: none"> • ETW's and ES's, Lt and Rt; • Points of non-linear transition (e.g. taper); • Stationing scheme, including station equations; • Superelevation rates; and • Axis of rotation. 			
M138	The software shall provide user-defined line styles, etc., differentiating between existing and proposed Superelevation.			
M139	The software shall provide a user-defined super rate grid to allow for vertical exaggeration.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M140	The software shall provide a user-defined station grid.			
M141	The software shall save settings for each alignment independently.			
M142	The software shall plot Superelevation and Vertical Alignment on one Reference / Station Line.			
ROADWAY DEFINITION				
ROADWAY DEFINITION: General Cross-Section Requirements				
M143	The software shall provide for the facilitation of earthwork analysis and pavement structure quantity calculation.			
M144	The software shall provide for multiple substrata representation (e.g. a subsurface of different materials such as limestone, bay mud, etc.)			
M145	The software shall model the proposed condition and create design surfaces including: <ul style="list-style-type: none"> • Multiple layers of varying depths; and • Stepped subgrades. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M146	The software shall be able to design roadway cross sections using multiple roadway alignments.			
M147	The software shall provide flexibility to extract freehand/ user-defined design cross-sections from a design model (e.g. even, odd, and skewed).			
M148	The software shall calculate areas of any generated cross section.			
M149	The software shall allow viewing of cross-section window and planimetric window concurrently. Each view must be capable of displaying user-defined strings (e.g. ETW, EP, etc.)			
M150	The software shall be capable of generating cross sections at user-defined stations at any point in the design process both perpendicular and at a skew.			
ROADWAY DEFINITION: Defining Roadway Segments				
M151	The software shall allow interactive and graphic input.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M152	The software shall provide a library to model roadway segments (e.g. lanes, shoulders, curbing, dikes, gutters, retaining walls, barriers, sound walls, etc.).			
M153	The software shall define sections by segments and/ or strings.			
M154	The software shall apply segments by station or station ranges.			
M155	The software shall allow users to add to or edit the segment library.			
M156	The software shall define segments or strings by projected CL using offset, slope, superelevation, profile, ridge points, etc.			
M157	The software shall assign feature codes from user-defined feature table to points and/ or strings.			
M158	The software shall be capable of defining roadway sections where existing ground data is provided on only one side of roadway.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M159	The software shall be capable of using existing terrain strings in the proposed roadway design.			
M160	The software shall provide segment transitions.			
M161	The software shall interactively add, revise, insert, and delete segment points, segments, and strings.			
ROADWAY DEFINITIONS: Slope Selection/Ditch Design				
M162	The software shall allow interactive and graphic input.			
M163	The software shall allow any combination of variable and fixed slopes.			
M164	The software shall allow slope transitions between stations or a user-defined roadway section.			
M165	The software shall allow user-defined benching patterns.			
M166	The software shall allow slope rounding.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M167	The software shall allow user-defined minimum / maximum catch point capability (defined from any roadway or reference line string).			
M168	The software shall model chokers with the use of flat slope criteria.			
M169	The software shall provide user-defined ditch segments.			
ROADWAY DEFINITION: Median Design				
M170	The software shall be able to define any median segment in a variety of sequences.			
M171	The software shall be able to define median patterns using user-defined strings, ridge points, etc.			
M172	The software shall provide user-defined median segments.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
ROADWAY DEFINITION: Roadway Rehabilitation Design				
M173	The software shall provide for rehabilitation design on different types of roadways (e.g. divided and undivided highways, multilane highways, expressways, conventional).			
M174	The software shall be capable of adding new roadway segments utilizing a user-defined Superelevation (e.g. a roadway widening during rehabilitation).			
M175	The software shall provide for overlays across entire roadway matching existing slopes or defined Superelevation.			
M176	The software shall provide for milling, grinding, and AC leveling with user-defined tolerances.			
M177	The software shall provide for overlay after grinding and/or AC leveling with user-defined tolerances.			
M178	The software shall add lanes, shoulders, and/or overlays concurrently.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M179	The software shall be able to match new segment's slope to existing adjacent segment's slope.			
M180	The software shall be able to create overlays or widenings with a new user-defined crown location.			
M181	The software shall add lanes and/or shoulders based on a rehabilitated surface.			
M182	The software shall support widening to the right and left of roadway sections concurrently using independent logic (e.g. divided highways).			
M183	The software shall provide for retaining walls, barriers, and other roadway features.			
ROADWAY DEFINITION: Earthwork Quantity Parameters				
M184	The software shall incorporate separate expansion/ shrinkage factors for excavation and fill.			
M185	The software shall provide for earthwork gaps (e.g. bridge begin and end stations).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M186	The software shall provide for substrata selection for user-defined stations or locations.			
M187	The software shall define material type for design pavement structure layers.			
ROADWAY DEFINITION: Earthwork Quantities Analysis				
M188	The software shall calculate earthwork volumes by the following: <ul style="list-style-type: none"> • Prismatic method; and • Average end area method. 			
M189	The software shall allow for the quantity calculation and representation of multiple layers.			
M190	The software shall segregate quantity take-offs based on user-defined parameters (e.g. ramps).			
M191	The software shall correct earthwork volumes for curvature when using average end area method.			
M192	The software shall compute DTM-to-datum elevation volumes (e.g. volumes for ponds and lakes, borrow pits).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
ROADWAY DEFINITION: Roadway Cross Section Output (Quantities, Plots, Reports)				
M193	The software shall provide roadway cross section reports based on user-defined parameters.			
M194	The software shall provide user-definable report formats for roadway cross-section reports (e.g. Word, XML, PDF, Excel).			
M195	The software shall provide user-definable slope stake reports including: <ul style="list-style-type: none"> • Station, offset, and elevation; • Labeling; • Header; • Cross slopes; • Cut and fill; • Catch point; and • Right-of-Way. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
ROADWAY DEFINITION: Cross Section Plots				
M196	The software shall provide user-defined cross section plots including the following: <ul style="list-style-type: none"> • OG; • Finish and subgrade elevations at defined cross section points; • User-defined point descriptors (e.g. EP, ETW, HP, CP, etc.); • User-defined line styles and colors • Segments slopes; and • Offset distances from user-defined elements (e.g. R/W, utilities, tree). 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M197	The software shall provide user-defined labels and sheet layout including: <ul style="list-style-type: none"> • Scale; • Grids; • Sheet size and orientation; • Margins; • Spacing between cross sections; • Single column or multiple columns of cross sections; • Page numbers including beginning page number; • Border cell selection; • Project description; and • Time and date of plot. 			
M198	The software shall load/ save user-defined settings file for each cross-section independently.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SITE MODELING/DESIGN				
SITE MODELING/DESIGN: General				
M199	The software shall provide for import of data from various sources, including: <ul style="list-style-type: none"> • ASCII; • Land XML; • ASCII DEM; and • Shapefiles. 			
M200	The software shall be capable of creating 3D surface models (e.g. building pad, retention ponds, berms, dikes and levees, landfills, stockpiles, borrow pits, general landscaping, interchanges and overpasses).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M201	The software shall store/ edit 3D surface models using the following parameters: <ul style="list-style-type: none"> • Defining and positioning 3D shapes; • Defining catch slope (e.g. catch slope interval, fixed elevations, and using design profile); and • Defining catch slope rate (e.g. slope to DTM, fixed elevation, transitional slope rate, and design profile). 			
M202	The software shall be capable of creating 3D surface models with user-defined contours.			
SITE MODELING/DESIGN: Modifications				
M203	The software shall be capable of merging surface models and extracting and deleting portions of surface models.			
M204	The software shall be capable of moving design pad horizontally and vertically, and to rotate design pads.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SITE MODELING/DESIGN: Reports/Output				
M205	The software shall generate reports based on user-defined parameters, including: <ul style="list-style-type: none"> • Coordinates; • Elevation; • Description; and • Point name. 			
M206	The software shall provide user-definable report formats (e.g. Word, XML, PDF, Excel).			
M207	The software shall generate Earthwork Reports using prismatic and average end area methods.			
M208	The software shall generate user-definable Stake Out Reports (e.g. radial).			
M209	The software shall generate a report of selected points (e.g. coordinates, description, elevations, point name, etc.)			
M210	The software shall generate 3D Traverse Reports of selected closed traverses and strings.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
VISUALIZATION TOOLS				
M211	The software shall be capable of generating 3D surface models with: <ul style="list-style-type: none"> • Dynamic rotation; • 3D perspective views; and • User-set camera view (height of eye and target). 			
M212	The software shall be capable of viewing/ draping geo-referenced raster images (e.g. TIF/TFW, JPG/JGW, SID, and other geo-referenced images).			
M213	The software shall provide user-defined vertical exaggeration in 3D views.			

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
AUTOMATED PLAN/MAP PRODUCTION				
M214	The software shall be capable of creating plan sheets using the following user-definable parameters: <ul style="list-style-type: none"> • Sheet sizes; • Sheet settings; • Sheet masks; • Percent overlap; • Match lines; • Scale and scale bars; and • Geo-referencing 			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES				
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Hydraulics/Hydrology				
M215	The software shall provide an integrated hydraulic and hydrologic design module.			
M216	The software shall provide storm drain design and development per FHWA HEC No. 22.			
M217	The software shall determine on-site design flows using the following methods: <ul style="list-style-type: none"> • Rational method; and • SCS method. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M218	The software shall perform culvert sizing and analysis per FHWA HDS No. 5.			
M219	The software shall generate and plot energy and hydraulic grade lines from developed piping systems, including multiple branches.			
M220	The software shall model roadway drainage systems including design flows, bypass flows, gutter spreads, outlet and inlet locations, etc. per FHWA HEC No. 22.			
M221	The software shall create and display drainage flow-paths, high points, low points, and slope arrows from DTM surface.			
M222	The software shall be capable of working with “broken-back” cross sections.			
M223	The software shall provide pond analysis, including the following capabilities: <ul style="list-style-type: none"> • Stage/Storage/Discharge plot generation; • Pond Routing; and • Inflow/Outflow Hydrograph generation. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M224	The software shall perform open channel analysis.			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Bridges				
M225	The software shall have the capability to model a 3D bridge deck surface dependant upon user input of horizontal and vertical alignment data, superelevation data, and lateral offset distance to left and right edges of bridge deck.			
M226	The software shall have the capability to report the bridge deck surface geometry by: <ul style="list-style-type: none"> • Northing, easting, and elevation; • Station, offset, and elevation; and • Graphically in the form of plan view deck elevation contours. 			
M227	The software shall have the capability to report vertical clearances between the modeled bridge soffit and the modeled surface below.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (General)				
M228	The software shall use and display grid and/ or ground distances.			
M229	The software shall provide U.S. Survey Foot/ Metric conversion capability.			
M230	The software shall automatically update graphics when changes are made to the database.			
M231	The software shall retain original field labels of points, lines, and descriptors.			
M232	The software shall provide automatic overwrite protection for points, while allowing user to overwrite when necessary. Includes option to re-number or increment new number.			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (Input)				
M233	The software shall provide for a user-definable ASCII file format for point and string input.			
M234	The software shall provide for Coordinate, Latitude/ Longitude, DMS, and DD input.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M235	The software shall import raw & processed data directly from survey data collection systems including but not limited to Tripod Data Systems and Trimble.			
M236	The software shall import the following raw data formats including: <ul style="list-style-type: none"> • RAW; • RW5; • DC; and • StarNet DAT files. 			
M237	The software shall import geometry, cross-section, and surface data with LandXML and legacy CAiCE formats such as, KCM and SRV files. See Bidder’s Library.			
M238	The software shall differentiate survey data including: <ul style="list-style-type: none"> • Conventional survey points; • Photogrammetry data; • GPS survey points; • Conventional and GPS control points; • Laser scanned data; and • User-defined data (e.g. Bridge sites). 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M239	The software shall resolve conflicting data and automatically provide the ability for the user to identify potential conflicts.			
M240	The software shall import points and maintain the following attributes: <ul style="list-style-type: none"> • Point Number; • Northing and Easting; • Elevation; • Description; • Feature Code; • Comments; • Ground vs Planimetric; and • Curve vs. Linear attribute. 			
M241	The software shall import chains with the attributes: <ul style="list-style-type: none"> • Description; • Feature code; • Comments; and • Ground vs. Planimetric. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (Data Reduction)				
M242	The software shall allow coordinate and datum transformation of user-specified elements between CCS zones within the same datum adjustment. Refer to the Surveys Manual.			
M243	<p>The software shall provide 2D/ 3D least squares analysis capabilities, including:</p> <ul style="list-style-type: none"> • Weights user specified control and observation; • Provides error propagation capabilities, including residuals of the observations, with results in a report and graphic display; • Analyzes observation data; • Analyzes 2D/ 3D data entered manually as coordinates and/ or as bearings/ distances (e.g. LandNet adjustments); • Solves for up to two unknown items within a network adjustment; and • Includes the precision of measurement in the least squares adjustment results. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M244	The software shall use observation equations in the least squares adjustment.			
M245	The software shall provide least squares network adjustment of conventional survey data.			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (Data Validation and Editing)				
M246	The software shall extract and sort terrain data by user-definable criteria including: <ul style="list-style-type: none"> • Northing and easting; • Terrain features; • Topographic feature/ single point objects; • Elevation; • Description; and • Points within a chain. 			
M247	The software shall identify and resolve crossing breaklines within a user-defined tolerance, indicating vertical difference. Allow the user to determine the method of correction (automated and/or manual corrections).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M248	The software shall be capable of modifying string configuration, attributes, and individual points associated with a string (e.g. transpose a selection of points).			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (Output)				
M249	The software shall provide user-definable ASCII file format for point and string output.			
M250	The software shall provide for Coordinate and Latitude/ Longitude output.			
M251	The software shall provide 2D/ 3D DGN and DWG output.			
M252	The software shall export geometry, cross-section, and surface data directly to survey data collection systems including but not limited to Tripod Data Systems and Trimble.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M253	The software shall export the following geometry, cross-section, and surface data formats, including: <ul style="list-style-type: none"> • DC; • LandXML; • RD5; • TP5; and • File formats suitable for Machine Guidance systems. 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-3: Mandatory Functional Requirements Response Form (continued)

Requirement Number	Mandatory Functional Requirements	Meets Requirement (YES/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
M254	<p>The software shall provide user-definable report formats (e.g. ASCII, Word, XML, PDF) including:</p> <ul style="list-style-type: none"> • Station and offset listings; • String-line notes; • Radial stakeout reports; • Point data reports including: <ul style="list-style-type: none"> ○ X, Y, Z coordinates and/ or Latitude/Longitude of adjusted and original survey data, ○ point numbers, ○ features, ○ descriptions, and grid/ground information; • Horizontal alignment data reports; • Vertical alignment data reports; • Area reports; and • A user-defined legend per the data in the project (e.g. for codes, features). 			

Form VI-4: Desirable Functional Requirements Response Form (continued)***Form VI-4: Desirable Functional Requirements Response Form***

Bidders are not required to offer these desirable features in order to be compliant with this RFP. However, Bidders must indicate if the functionality is included in their proposed COTS software by entering "Yes" or "No" as indicated on the form for each desirable functional requirement. Where Bidders indicate the functionality is included in their software, a narrative response is also required, as described above.

Caltrans design standards and methods, are defined in the Caltrans Highway Design Manual. Drafting standards are defined in the CADD Users Manual and the Plans Preparation Manual. Survey standards and methods are defined in the Surveys Manual. Links to all manuals are included in the Bidder's Library.

Supporting Literature or Documentation Reference may include, but is not limited to:

- Software Manuals
- Screen shots
- Statement of affirmation
- Samples

References to "intelligent" objects or elements mean the software is storing information about that object or element that governs its behavior and/ or its association to other elements (e.g. an Element with a particular feature code will display with pre-defined attributes.)

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
GENERAL SPECIFICATIONS				
GENERAL SPECIFICATIONS: General				
D1	The software should provide design and drafting features in MicroStation.			
D2	The software is capable of running in MicroStation and in other drafting software.			
D3	If the software doesn’t work within MicroStation, the software should use multiple tables during translation process (e.g. symbol, color, layer/level, line style tables, etc.)			
GENERAL SPECIFICATIONS: Documentation				
D4	The solution includes online tutorials and online training.			
GENERAL SPECIFICATIONS: File Structure/Management				
D5	The software provides user tools to manage files (not computer managed only).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D6	The software generates a project history / log file.			
D7	The software allows multiple users to access the same project files simultaneously, with security features to prevent users from overwriting changes made by others.			
GENERAL SPECIFICATIONS: User Interface				
D8	The software provides a consistent look of menus, dialog boxes, messages, and functions (i.e. same fonts, colors, and formatting.)			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D9	The software provides menu-driven commands with characteristics as follows:			
	a. Has three or less submenus in a stream for all menu-driven commands;			
	b. Provides a grouping of commands based on transportation design process (e.g. Pull Down Menu has groups for Horizontal Alignments, Vertical Alignments, Superelevation, etc. and all commands needed to design and display that item are under that menu); and/or			
	c. Has user-defined toolbars and menus transferable between users / projects.			
D10	The software provides the ability to repeat the last command without invoking the menu structure.			
D11	The software displays object attributes with cursor.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D12	The software provides the ability to recall the data entry from the last use of that command.			
D13	The software provides at least two “Undo” actions for design commands. (e.g. Undo modified and deleted data by selection set or working session.)			
DTM SURFACES				
DTM SURFACES: General Specifications				
D14	The software provides a dynamic interface with the DTM engine.			
D15	The software is capable of working with large data sets (e.g. laser-scanned data with a large number of points).			
D16	The software is able to lock DTM from manipulation / modification.			
D17	The software creates DTM extents for GIS purposes.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
DTM SURFACES: Input				
D18	The software develops and generates surfaces from a LandXML file format.			
DTM SURFACES: Contours				
D19	The software dynamically links contour modifications to DTM surface.			
DTM SURFACES: Cross Sections				
D20	The software automatically updates cross sections based on changes to the DTM.			
D21	Cross sections identify void areas.			
D22	The software extracts cross section data directly from 3D digital contour maps or Digital Elevation Models (DEM's) without the use of a surface (TIN) model.			
D23	The software resolves crossing sections (e.g. at curb returns and bridge cones).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
DTM SURFACES: Modifications				
D24	The software provides dynamic interactive manipulation of multiple surfaces.			
D25	The software allows user-defined boundaries and void areas.			
D26	The software provides for point filtering (i.e. thinning).			
D27	The software is able to process a portion of the DTM in user-defined areas.			
DTM SURFACES: Reports/Output				
D28	The software provides DTM export in LandXML format.			
D29	The software is compatible with Machine Guided Grading.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
COGO				
COGO: Spirals				
D30	The software constructs a spiral based upon a "least squares" fit through a series of points. Should report residual values and allows user to determine point list based on residuals.			
COGO: Manipulation/Modifications				
D31	The software provides dynamic modification capabilities for single or complex geometry elements (e.g. modifying a circular curve in a horizontal alignment would also affect tangents to that curve), with an option to let user save changes as a new element rather than automatically updating the existing element.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
COGO: Traverse				
D32	The software graphically previews traverse before it is stored.			
COGO: User-Defined Annotations				
D33	The software provides user-definable tabular element annotation including tables for areas with descriptions and dynamically updates tables when geometry changes.			
D34	The software provides radial or tangent bearing annotation at a given point on a curve.			
COGO: Reports/Output				
D35	The software provides a report with the ability to list or display user-defined elements, for example: <ul style="list-style-type: none"> • Duplicate points; and • Points not in a string. 			
D36	The software provides command listing that can be used to edit and re-run a series of commands.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
HORIZONTAL ALIGNMENT				
HORIZONTAL ALIGNMENT: Construct Horizontal Alignment				
D37	Horizontal Alignment reports are capable of providing point descriptors.			
VERTICAL ALIGNMENT				
VERTICAL ALIGNMENT: Construct Vertical Alignment				
D38	The software is capable of displaying vertical curves superimposed over Horizontal Alignment curves (visualization tool for improved HA and VA design continuity).			
D39	The software is capable of constructing a vertical alignment by a best-fit method.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
VERTICAL ALIGNMENT: User-Defined Vertical Alignment Annotations				
D40	The software provides and displays profiles with automatic annotation including K-value.			
VERTICAL ALIGNMENT: Modify Vertical Alignment				
D41	When any interactive modification is made, all affected features and elements of the alignment, including stationing, are automatically updated and saved in the design file / model with on/off switch.			
VERTICAL ALIGNMENT: Reports/Output				
D42	Vertical alignment reports and output provide:			
	a. Slope differences;			
	b. Passing sight distance; and/or			
	c. Decision sight distance.			
D43	The software computes minimum vertical distance between any two vertical alignments or line strings at overlapping points.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SUPERELEVATION				
SUPERELEVATION: General				
D44	The software provides Superelevation transition curves.			
D45	The software imports Excel spreadsheets with Superelevation data.			
SUPERELEVATION: Modifications				
D46	The software allows user to copy, edit, delete, insert, move, and revise previously defined Superelevations.			
D47	The software is able to graphically modify previously defined Superelevations.			
D48	When any modification to Superelevation is made, the affected elements of the design (e.g. cross sections or design model) are automatically updated; including automatic Superelevation plot update with on/off switch.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SUPERELEVATION: Superelevation Plots				
D49	The software provides user-defined Superelevation diagram annotation including:			
	a. Superelevation runoff lengths			
	b. Point of intersection for coincidental rates			
D50	The software provides Horizontal Alignment Curve annotation (e.g. BC, EC, etc.) on Reference Line.			
ROADWAY DESIGN: General				
D51	The software provides a configurable design specification checker (including horizontal and vertical alignments as well as Superelevation.)			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
ROADWAY DEFINITION				
ROADWAY DEFINITION: General Cross Section Requirements				
D52	The software displays longitudinal features in cross-section view including: <ul style="list-style-type: none"> • Edge drains; and • Utilities (gas lines, pipes, etc.) 			
ROADWAY DEFINITION: Defining Roadway Segments				
D53	The software allows a minimum of 10,000 segments, strings of segments, and strings.			
D54	The software allows the user to graphically review design sections and strings in cross section window and planimetric window before storing to database.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
ROADWAY DEFINITION: Slope Selection / Ditch Design				
D55	The software allows a minimum of 100 slope segments / strings per: <ul style="list-style-type: none"> • Station; • Range of stations; or • Section of roadway. 			
D56	The software allows slope input by both ratio and percents.			
ROADWAY DEFINITION: Earthwork Quantity Parameters				
D57	The software generates mass-haul diagrams, including the option of forced balance.			
ROADWAY DEFINITION: Roadway Cross Section Output (Quantities, Plots, and Reports)				
D58	The software provides a station and offset report of grinding areas and intersection with Original Ground (OG) surface.			
ROADWAY DEFINITION: Cross Section Plots				
D59	The software is able to plot partial cross sections.			

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
SITE MODELING/DESIGN				
SITE MODELING DESIGN: General				
D60	The software allows data input graphically and / or interactively in a dynamic environment.			
VISUALIZATION TOOLS				
D61	The software provides 3D animation capabilities (e.g. drive-thru).			
D62	The software is able to manipulate and edit in a 3D view.			
D63	The software provides photo-realistic rendering capabilities, including the modeling of manmade features (e.g. buildings, vehicles, utility objects, etc.) and natural features (e.g. trees, shrubs, pedestrians, etc.).			
D64	The software provides line of sight measurements, distance and bearings between any two defined locations.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D65	The software produces 3D views that are color coded by elevation or slope intensity and allows the user to modify shading settings.			
D66	The software is able to view GIS data as a background.			
AUTOMATED PLAN/MAP PRODUCTION				
D67	The software has the ability to automate the composition and placement of plan view labels onto plans.			
MISCELLANEOUS CRITERIA				
D68	The software has user-defined save options (e.g. auto-save every 5 minutes vs. only when user activates a save command.)			
D69	The software provides quantity takeoff and cost estimating capabilities.			
D70	The software provides a scientific calculator (able to do RPN, convert from DMS to Radians, etc.).			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D71	The software is able to link multiple images to any object.			
D72	The software allows multiple input methods (e.g. quadrants, azimuths, bearings, mathematical operations, deflection, etc.)			

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES				
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Hydraulics/Hydrology				
D73	The software can create annotated drainage profiles with the following parameters:			
	a. Pipe type;			
	b. Pipe size;			
	c. Inlet type;			
	d. Flowline elevations, including entrance and exit invert elevations;			
	e. Grades;			
	f. Normal and critical depth lines where applicable;			
	g. User-defined text size, font style and justification;			
	h. Original ground/finish grade;			
	i. Hydraulic Grade Line (HGL) and Energy Grade Line (EGL) for storm drains; and/or			
j. Station and offsets.				

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Landscape Design				
D74	The software is able to provide user-defined plant labeling.			
D75	The software provides automatic take-offs for quantities.			
D76	The software provides a customizable item database.			
D77	The software provides piping analysis (pressure loss, sizing, etc.).			
D78	The software is able to display plant growth with 3D rendering capabilities applying time and plant species parameters.			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Right of Way Engineering				
D79	The software generates user-defined metes and bounds / legal descriptions from complex horizontal alignments including alignments with spirals and curves (chord or arc definition).			
D80	The software provides user-defined tables for parcel area management.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D81	The software is able to access a parcel database through a user-defined index (e.g. Oracle, Access, SQL).			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Bridges				
D82	The software is able to report superstructure and substructure concrete, structural excavation, and structural backfill pay item quantities.			
D83	The software is able to create and export a 3D model of bridge superstructure and substructure to a 3D MicroStation file.			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (General)				
D84	The software provides the ability to restrict modifications to specific files (e.g. DTM, survey, design, etc.) to specified users.			
D85	The software allows the user to assign different Epoch dates to the coordinate systems.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (Data Reduction)				
D86	The software has the ability to do least squares network adjustment of survey data from mixed collection methods (GPS, conventional, etc.)			
FUNCTIONAL/SPECIALIST UNIT CAPABILITIES: Surveys (Data Validation and Editing)				
D87	The software is able to combine terrain breaklines by user-definable criteria (e.g. same terrain features that fall within a user-defined horizontal and vertical tolerance in order to remove spaces or gaps between lines).			
D88	The software is able to identify all points that fall next to other points within a user-defined horizontal and vertical tolerance.			
D89	The software is able to accurately divide large DTM surfaces along existing triangulation lines.			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
GEOGRAPHIC INFORMATION SYSTEMS				
D90	The software is able to directly link, to one of the following GIS databases: <ul style="list-style-type: none"> • ArcSDE; • Geodatabases; or • Spatial Data Option (SDO) for 2D and 3D data including: <ul style="list-style-type: none"> • Lines and curves (e.g. Alignments, right of way lines); • Polygons (e.g. parcels, ESA's, soil types); and • Points (e.g. cells). 			

Appendix D – Bidder’s Forms for Business and Technical Requirements

Form VI-4: Desirable Functional Requirements and Response Form (continued)

Requirement Number	Desirable Functional Requirements	Meets Requirement? (Yes/NO)	Proposed Solution Description	Supporting Literature or Documentation Reference
D91	<p>The software is able to facilitate through another module, to one of the following GIS databases:</p> <ul style="list-style-type: none"> • ArcSDE; • Geodatabases; or • Spatial Data Option(SDO) <p>for 2D and 3D data including:</p> <ul style="list-style-type: none"> • Lines and curves (e.g. Alignments, right of way lines); • Polygons (e.g. parcels, ESA's, soil types); and • Points (e.g. cells). 			

Form VI-5: Other Technical Requirements Response Form

Requirement #	Name of Requirement	Meets Requirement? (Yes/No)	Response Section/Page #
T1	Bidder affirms that a System Administration Manual will be provided to the Caltrans Contract Manager prior to commencement of acceptance testing.		N/A
T2	Bidder affirms that the proposed software meets, or will be configured to meet, all software Configuration Requirements, as listed in Appendix F.		N/A
T3	A DRAFT Training Plan is included. The plan includes an outline of the development of the curriculum, course content, and a proposed class schedule.		