

Section # Page #	Description
Entire Document	Updated font to Arial
Preface Page i	Deleted signature and acknowledgments
Section 1 Page 1	Remove items found elsewhere in Geotechnical Manual such as Exceptions and Quality Assurance
Section 1.3 Page 1	Modify 1st sentence of 2nd paragraph to read:
	An LOTB is typically associated with a structure, is part of the Project Plans, and has an accompanying Test Boring Layout sheet that presents location information of the test borings in a plan view.
Figure 2-3 Page 6	Item 4 is amended to read: Borehole Location and Elevation: Location: Physical location of the boring relative to a fixed object(s) must be measured and recorded such as light fixture, drainage inlet, begin or end bridge (required) Station and offset (if available) Northing and Easting, local coordinate reference system (required for LOTB and/or BR)
	 Elevation, vertical datum, benchmark location and description Method(s) used for horizontal (e.g., steel tape, measuring wheel, range finder) and vertical (level survey, hand level) measurement
Figure 2-3 Page 6	Item 6 is amended to include: • Bearing and degrees of inclination from horizontal (for horizontal borings only)
Figure 2-3 Page 6	Item 8, Hole Completion, 2 nd bullet is amended to read: • Sealing Method (e.g., grout, dry bentonite chips)
Figure 2-3 Page 6	Add new: • Part 9, "Instrumentation Installed"
Entire Document	Ensured ASTM tests were properly formatted "ASTM D1587"



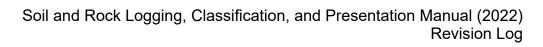
Section # Page #	Description
Section 2.5.1 Page 7	Last complete soil descriptive sequence changed for clarity
Page 9	Add new:
	Section 2.5.1.3, "Description of Isolated Interbeds/layer"
	For small, isolated layers or interbeds, it is acceptable to call out the isolated layer without having to create a new layer as long as the following conditions are met: (1) the isolated layer must be 2 feet thick or less, and (2) the isolated layer must be described completely per Sec. 2.5.1, and (3) predominant soil description above and below the isolated layer are the same.
	Poorly Graded SAND (SP); dense; brown; moist; fine sand.
	6-inch thick interbed of Fat Clay (CH); very stiff; black; moist; PP=3 tsf.
Section	Amend description to:
2.5.1.3 Page 9	Poorly graded SAND (SP); dense; brown; moist; fine sand.
	6" thick interbed of fat CLAY (CH); very stiff; black; moist; PP=3.0 tsf
Page 9	Change 2.5.1.3 Description of Fills to 2.5.1.4
Section 2.5.2	The 2 nd paragraph is amended to read:
Page 10	The ASTM procedure for identifying and describing fine-grained and coarse-grained soil is only applicable to material passing the 3-inch sieve. The percentage(s) of cobbles and/or boulders (if encountered) must be reported per Section 2.5.17 and the group name must be modified accordingly.
Section 2.5.2	The text is modified as follows:
Page 10	The group name for a soil with a borderline symbol must be the group name for the first symbol. except for: - CL/CH lean to fat CLAY - ML/CL CLAYEY SILT, and - CL/ML SILTY CLAY"
1	



Section # Page #	Description			
Sec. 2.5.2 Page 10	Dual Symbol is r	modified as follows:		
· ·	A dual symbol is	two symbols separate	d by a hyphen, e.g., GP-	GM, SW-SC, GW
	1	•	oil has about 10% fines.	,
Figure 2-13 Page 16	The figure is ame	ended to read:		
J	Percent or Prop	portion of Soil, Pp		
	Description	Criteria		
	Trace	Particles are pres		
	Few	5 - 10%		
	Little	15 - 25%		
	Some	30 - 45%		
	Mostly	50 - 100%	,	
Page 16	Particle Size, Ps			
	Description	Sieve Size	Approximate Particle Size (in)	
	Boulder	Greater than 12 in.	12 < Ps	
	Cobble	3 - 12 in.	3 < Ps ≤ 12	
	Coarse Gravel	3/4 - 3 in.	3/4 < Ps ≤ 3	
	Fine Gravel	No. 4 - 3/4 in.	1/5 < Ps ≤ 3/4	
	Coarse Sand	No. 10 - No. 4	1/16 < Ps ≤ 1/5	
	Medium Sand	No. 40 - No. 10	1/64 < Ps ≤ 1/16	
	Fine Sand	No. 200 - No. 40	1/300 < Ps ≤ 1/64	
	Fines	Passing No. 200	Ps ≤ 1/300	
0 0 5 47	A - - -			
Sec 2.5.17 Page 19	Added:			
J	-	•	s or boulders, "with cobbl	es" or "with
	boulders" shall be	e added to the group r	name.	



Section # Page #	Description		
Sec. 2.5.19 Page 20	"Additional Comments", add bullet:		
	 No SPT recovery very from elev. XX to elev. XX 		
F: 0.00			
Figure 2-23 Page 21	Item 4 is amended to read Bedding Thickness		
Figure 2-23 Page 21	Item 11, "Relative Strength of Intact Rock", is amended to read:		
	11 Relative Strength of Intact Rock 3.3		
Section 2.6.1.2 Page 22	Added section for isolated interbeds of rock		
Section 2.6.1.4 Page 22	Add the following to the end of the section: If subsequent changes only occur in the soil properties, these changes can be shown independently in parentheses. SEDIMENTARY ROCK (SANDSTONE); medium grained; gray; intensely weathered; soft; unfractured (Well-graded SAND (SW); medium dense; moist; medium sand; weak cementation) (dense) (medium dense)		
Figure 2-24 Page 25	Amended the table to include Ash fall and Ash flow under Tuff		
Figure 2-25 Page 26	Amended Categorization to include Chemical Rocks and breakout subsets into Evaporites and Precipitates		
Figure 2-38 Page 33	Amended figure by deleting Partially Healed and redefined Moderately Healed		
Section 2.7.1 Page 34	Updated year on Hole ID		

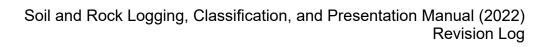




Section # Page #	Description				
Figure 2-42 and 2-43 Page 35	Updated "EA" to "	EA/PID" to add Pro	ject ID		
Figure 2-44 Page 36-37	Add new row:				
	Test Method(s)	Test Name	Material Required	Typical Sample Size/Type	TL-101 Required
	ASTM D6467	Drained Residual Shear Strength	1 lb.	1 Tube	No
	 Delete "AS Replace "A Replace "A Add ASTM Add ASTM Add ASTM 	ASTM D5333" with STM D427" ASTM D2938" with ASTM D4767" with 1 D1140 No. 200 W 1 D6913 Grain Size 1 D7928 Hydromete PA 9081 with AAS	"ASTM D701 "ASTM D726 /ash Distribution	2 Method C"	r Unit Weight
Figure 3-2 Page 44	Amended heading	g to include "Sand/0	Gravel" to ma	tch Figure 2-6	
Section 3.2.3 Page 48	Reworded second based on lab testi	l paragraph for clar ng.	ity, added ex	ample of consis	stency descriptor
Section 3.2.4 Page 48	Section reworded	for clarity			
Section 4.3.1 Page 51	laboratory test same field des one or more re samples were	d field test results as symbol or field test scriptions should be epresentative samp field identified to careported "little silt"	et result. Desc e corrected bables. For exal ontain "some	criptors within a ased on the labo mple, if three co silt", and a repr	layer with the oratory test(s) of onsecutive resentative



Section # Page #	Description
Section 4.3.1 Page 51	Deleted the 10 th bullet.
Section 4.4 Page 52	Reworded for clarity.
Figure 4-2 Page 54	Revised descriptions for clarity
Figure 4-3 Page 55	Change location information to Northing and Easting Changed descriptors to match Figure 4-2
Figure 4-4 Page 56	Revised figure to match descriptors
Section 5.1 Page 58	Modify 1st sentence to read: An LOTB is typically associated with a structure, is part of the Project Plans, and has an accompanying Test Boring Layout sheet that presents location information of the test borings in a plan view.
Figure 5-1 Page 59-60	Replace Figure 5-1 with: • Figure 5-1A, Test Boring Layout • Figure 5-1B, Log of Test Borings





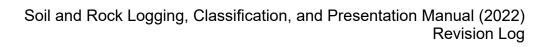
Section # Page #	Description
Section	Entire section replaced with:
5.2.1 Page 61	5.2.1 - Contents and Characteristics of the LOTB and Test Boring Layout Sheets
	The Log of Test Borings (LOTB) and Test Boring Layout (Layout) sheets are part of the project plans and presented on separate plan sheets, and they:
	Present the boring logs on an elevation scale.
	Present a plan view showing the location of each boring relative to an alignment and/or existing or planned facility or structure.
	 Present the type(s) of drilling method(s) used to perform the investigation, the type(s) of sampling performed, and how the sampler was advanced.
	Present the location and description, both graphical and written, of the types of soil and rock encountered within the borehole.
	Present the types of field and laboratory testing performed.
	Present field and laboratory test data.
	 Are optimized for printing on full-size plan sheets (24" x 36") and typically reproduced on 11" x 17" sized paper.
	Allow presentation of more than one boring log per plan sheet.
	Are accompanied by LOTB legend sheets.



Section # Page #	Description
Section 5.2.2	Entire section replaced with:
Page 61	5.2.2 - Notes on the LOTB and Layout Sheets
	Each LOTB and Layout sheet must contain a note section for presentation of relevant factual data and one of the following two notes:
	If the procedures of this manual were followed without exception, then the following note must be placed on the LOTB sheet: "This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (Date)"
	If the procedures of this manual were followed without exception, then the following note must be placed on the Test Boring Layout sheet:
	"This Test Boring Layout sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (Date)"
	If an exception to the procedures of this manual has been approved and implemented, then the notes must be modified to read:
	"This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (Date) except as noted below"
	and
	"This Test Boring Layout sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (Date) except as noted below"
	Optional notes may include:
	 Changes in drilling equipment Site observations Other drilling observations Depth and length of no recovery No SPT recovery from elevation XX to elevation XX
	Do not repeat the procedures or requirements set forth in this manual in the notes section. Notes specific to a borehole should be presented on the LOTB sheet. Only notes that are generalized for the project and/or alignment are presented on the Layout sheet.

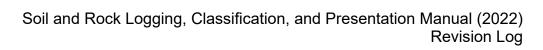


Section # Page #	Description
Section 5.2.3	Entire section replaced with:
Page 62	5.2.3 - LOTB and Layout Sheet Formatting
	Plan sheets must be prepared in accordance with this manual and the Caltrans Plans Preparation Manual. The plan sheet border must present the following:
Section	Replace item "a" with:
5.2.3.1 Page 62	 a) The State of California Registered Civil Engineer, Geotechnical Engineer, Structure Engineer (for Layout only), Certified Engineering Geologist, or Professional Geologist seal with the signature, date, license number, and registration certificate expiration date of the Geoprofessional in responsible charge of the LOTB sheet;
Section	Replace items "c" and "d" with:
5.2.3.2 Page 62	 c) "DRAWN BY": The name of the Engineering Graphics Unit person who prepared the LOTB and draft Layout sheet.
	d) "CHECKED BY": The name of the person who performed the quality control check of the LOTB and Layout sheet





Section # Page #	Description
Section	Entire section replaced with:
5.2.3.3	5.2.3.3 - Plan View – Layout
Page 63	 a) The first project plan sheet(s) for test borings is used entirely for the Layout and consists of a Plan View and a Borehole Location Table.
	b) Multiple Layout sheets must be numbered with reference to the stationing of the control line (i.e., showing the first sheet with the lowest stationing and the last sheet with the highest stationing).
	c) "BENCH MARK" provide a note stating "Bench Marks shown on the Log of Test Borings sheets are for Design purposes only. For complete list of survey monuments for this project, see Survey Control information provided in the ROADWAY PLANS."
	c) Show the scale directly below the Plan View label.
	d) Show a North arrow.
	e) Lines or control lines shown in the Plan View must be consistent with those shown on the General Plan sheet.
	f) Show stationing and names for control lines. Stationing must increase from left to right. Show a minimum of two stations on all lines.
	g) Show control line intersection stationing and bearings.
	h) Show names and directions of nearest cities.
	i) Show names and directions of stream flows when applicable.
	j) Show Table listing Hole Identification, Alignment Name, and Station and Offset
	 k) Plot boring locations with symbols as shown in the legend to identify drilling methods (e.g., auger hole, rotary hole, cone penetration). The Hole Identification must be presented with each symbol.
	 For horizontal borings include "(HORIZONTAL BORING)" below the Hole Identification and indicate the bearing to scale extending from the hole symbol (Figure 5-2).





Section # Page #	Description		
Section 5.2.3.4	Entire section replaced with:		
Page 63-64	5.2.3.4 - Profile View – LOTB		
	 a) Show the name, northing and easting, description, and elevation of the benchmark used for determining the top of boring elevations under the heading "BENCHMARK". Identify the vertical datum (National Geodetic Vertical Datum, U.S. Geological Survey, U.S. Coast & Geodetic Survey, District, etc.) used to determine the benchmark elevations. 		
	b) Show the elevations and grid lines on both the left and right margins. Numerical values must be in multiples of 10 (e.g., 20, 10, 0, -10, -20). For horizontal borings, indicate length (feet) instead of elevation (Figure 5-3)		
	c) Show the Hole Identification, top of hole elevation, Northing and Easting at the top of each boring log. For horizontal borings, include "(HORIZONTAL BORING)" adjacent to the Hole Identification (Figure 5-3)		
	d) Show types and diameters of drill tools.		
	e) Show the completion date of boring (m/d/y) at the bottom of each boring log.		
	f) Show "Terminated at EL. XX" to indicate the bottom of boring elevation.		
	g) Show the SPT hammer energy ratio, "Hammer Energy Ratio (ER _i) = XX%," at the bottom of each boring.		
	 h) Provide groundwater information for each boring. If groundwater was measured, show the date(s) and elevation(s) of groundwater measurement(s) along the boring log. 		
	i) If groundwater was not encountered state, "Groundwater was not encountered in boring(s) ####" at the bottom of the boring log. If groundwater was encountered but not measured state, "Groundwater was encountered in boring(s) ####, but elevation was not measured" at the bottom of the boring log. If groundwater was not measured state, "Groundwater was not measured" at the bottom of the boring log		
	 j) Show results from field penetration tests at relevant elevations along the boring log (see Appendix A.8). 		
Section 5.2.3.4 cont'd	k) Show types of field and laboratory tests with symbols as indicated in the legend, at relevant elevations along the right side of the boring log.		
	Show the Profile scales (horizontal and vertical) under the heading "PROFILE".		
	m) Show RQD and/or recovery		
	n) For horizontal borings, include "Inclination ##° down from horizontal" at the bottom of the boring log (Figure 5-3)		



Section # Page #	Description
Section 5.2.4.3 Page 64	Replace item "b" with: b) The State of California Registered Civil Engineer, Geotechnical Engineer, Structure Engineer (for Layout sheet only), Certified Engineering Geologist, or Professional Geologist seal with the signature, date, license number, and registration certificate expiration date of the Geoprofessional in responsible charge of the LOTB sheet
Figure 5-2 Page 65	Add figure "Horizontal Boring Plan View"
Figure 5-3 Page 66	Add figure "Horizontal Boring Profile View"
Figure 5-5 Page 67	 Add: Groundwater symbol to CPT boring Next to the diamond "symbol", add Hole Type "RC" and Description "Rotary core with continuously-sampled, self-casing wire-line Changed Hole I.D. to Hole Identification Clarified SPT N-value test methods Changed Size of Sampler to Inner Diameter of Sampler
Figure 5-6 Page 68	Under Field and Laboratory Testing: Deleted tests that were not relevant to the descriptive sequence. Eliminated test methods.
Figures 5-8, 5-9, 5-11, 5- 12 Pages 71- 72	Figures updated to match Standard Plan sheet revisions
Section 5.2.5 Page 71	Amended "Four general hole type formats" to "Five general hole type formats"
Figure 5-16 Page 74-75	Updated Boring Record by revising title block and adding column for Sample Size
Figure 5-17 Page 76	Updated CPT title block



Section # Page #	Description
Figures 5- 18, 5-19, and 5-20 Pages 78- 80	Updated Boring Record Legend to reflect updates to the Manual
References Page 81	Amended references
Section A 8 Page 84	Amended Standard Penetration Test description to match ASTM D1586 and provide clarity in reporting blows.
Section A.10 Page 86	"Mechanical breaks must be fitted together and counted as one piece."