STRUCTURE PRELIMINARY GEOTECHNICAL REPORT
PLEASANT GROVE CREEK BRIDGE (WIDEN)
BRIDGE NUMBERS 19-0136L/R
Placer County, California
EA 03-1F1700; 03-PLA-65; PM R8.8

Prepared by:

BLACKBURN CONSULTING
2491 Boatman Avenue
West Sacramento, California
(916) 375-8706

November 2015

Prepared for:

Mark Thomas & Company, Inc.
7300 Folsom Blvd., Suite 203
Sacramento, CA 95826

West Sacramento Office:
2491 Boatman Ave. ▪ West Sacramento, CA 95691
(916) 375-8706 ▪ Fax (916) 375-8709

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411
Modesto Office: (209) 522-6273

File No. 2602.1
November 25, 2015

Mr. Matt Brogan, PE
Mark Thomas & Company, Inc.
7300 Folsom Blvd., Suite 203
Sacramento, CA 95826

Subject: **Structure Preliminary Geotechnical Report**
Pleasant Grove Creek Bridge (Widen), Bridge Numbers 19-0136L/R
Placer County, California
EA 03-1F1700; 03-PLA-65; PM R8.8

Dear Mr. Brogan,

Blackburn Consulting (BCI) prepared this Structure Preliminary Geotechnical Report for the proposed widening of Pleasant Grove Creek Bridge (Right and Left structures) on State Route 65 in Placer County, California. BCI prepared this report in accordance with our January 16, 2014 Subcontract Agreement (SA-13143) between BCI and Mark Thomas & Company, Inc.

Thank you for the opportunity to be part of your design team. Please call us if you have questions or require additional information.

Sincerely;

BLACKBURN CONSULTING

Reviewed by:

David J. Morrell, P.E., G.E.
Senior Project Manager

Patrick Fischer, P.E., C.E.G.
Principal

Copies: 6 to Addressee

STRUCTURE PRELIMINARY GEOTECHNICAL REPORT

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FIGURES

APPENDIX A

1 INTRODUCTION

1.1 Purpose

Mark Thomas & Company, Inc. (MTCo) retained Blackburn Consulting (BCI) to prepare this Structure Preliminary Geotechnical Report (SPGR) for the proposed widening of Pleasant Grove Creek Bridge (Right and Left structures), which is part of the overall State Route 65 (SR 65) Capacity and Operational Improvements Project located in Placer County, California. This report provides preliminary geotechnical/geologic information for advance planning purposes. Additional geotechnical studies are required for design level recommendations.

BCI prepared this SPGR for MTCo for advance planning purposes only. Do not use or rely upon this report for other locations or for final project design.

1.2 Scope of Services

To prepare this report, BCI:

- Discussed the project with the project team
- Reviewed a preliminary advance planning study plan prepared by CH2M Hill.
- Reviewed published maps and literature related to site soil, rock, and geologic conditions
- Reviewed published geotechnical data and as-built information for the existing Pleasant Grove Creek Bridge (right and left structures)
- Conducted a preliminary geologic site reconnaissance to confirm reported conditions

1.3 Site Location and Description

Pleasant Grove Creek Bridge is located on SR 65 in Placer County, California, about 0.7 miles north of the Blue Oaks Boulevard Overcrossing and 0.8 miles south of the Sunset Boulevard Overcrossing. Figure 1 presents a site vicinity map.

In the project area, SR 65 is a 4-lane divided highway with a wide unpaved median. The Pleasant Grove Creek Bridge (Left) structure was built in 1971 and consists of a 2-lane, 5-span cast-in-place reinforced concrete slab bridge supported on 16-inch Cast-In-Drilled-Hole (CIDH) piles at the abutments and bent pile extensions. The bridge is 42 feet wide and 128 feet long. The Pleasant Grove Creek Bridge (Right) structure was built in 2001 and consists of a 2-lane, 5-span cast-in-place reinforced concrete slab bridge supported on 15-inch precast, prestressed concrete piles (octagonal) at the abutments and pier pile extensions. Abutment front slopes for both bridges are covered with rock slope protection.

Within the project limits, Pleasant Grove Creek flows southwest on a shallow gradient. The creek channel contains a moderate to heavy growth of brush and marsh vegetation between and directly upstream/downstream of the existing bridges.

2 PROJECT DESCRIPTION

The right and left bridges are proposed to be widened on the outside by about 11½ to 12½ feet to accommodate new auxiliary lanes for the SR 65 Capacity and Operational Improvements Project. The widening bridges will be similar to the existing bridges, and consist of 5-span, reinforced concrete slab structures supported on piles at the abutments and pile extensions at the bents/piers.

3 EXCEPTIONS TO POLICY

No exceptions to Caltrans departmental policy are included for this SPGR.

4 FIELD INVESTIGATION AND TESTING PROGRAM

4.1 Subsurface Investigation and Laboratory Testing

New subsurface investigation and laboratory testing was not completed for this SPGR. We used subsurface data obtained for the existing structures to evaluate site conditions within the project area. See Appendix A for copies of the Logs of Test Borings (LOTB's) used in our review. Appendix A also includes copies of the laboratory test results from the April 30, 1998 Foundation Report for Pleasant Grove Creek Bridge at SR 65 (Bridge No. 19-136R), prepared by Anderson Consulting Group.

4.2 Site Review and Geologic Mapping

BCI completed a site reconnaissance to observe the site and confirm published geologic conditions. We include a discussion of area geology in Section 6.1.

5 EXISTING BRIDGE DOCUMENT REVIEW

The project team provided the following documents related to the existing bridges for our review:

- As-Built Plans, Pleasant Grove Creek Bridge (Left), Caltrans, Completed 11/09/1971, Sheets 1-5, including Log of Test Borings
- As-Built Plans, Pleasant Grove Creek Bridge (Right), Mark Thomas & Company, Inc., Completed 5/01/2001, Sheets 1-10, including Log of Test Borings
- Foundation Report (unsigned), Pleasant Grove Creek Bridge (Right), Anderson Consulting Group, 4/30/1998
- Hydrology Report, Pleasant Grove Creek Bridge at State Route 65 (Bridge No. 19-136R), Mark Thomas & Company, Inc., 12/05/1997
- Bridge Inspection Report, Pleasant Grove Creek Bridge (Bridge No. 19-136L), Caltrans, Inspection Date 10/17/2013

- Bridge Inspection Report, Pleasant Grove Creek Bridge (Bridge No. 19-136R), Caltrans, Inspection Date 1/15/2014

Appendix A contains copies of the above As-Built Logs of Test Borings (LOTB's) sheets as well as the laboratory test results from the Foundation Report.

6 SITE GEOLOGY AND SUBSURFACE CONDITIONS

6.1 General Project Area Geology

The project area lies on the eastern margin of the Great Valley Geomorphic Province (Sacramento Valley portion). The Great Valley is bordered by the Cascade and Klamath Ranges to the north, the Coast Ranges to the west, and the Sierra Nevada to the east. The valley was formed by tilting of the Sierran Block with the western side dropping to form the valley and the eastern side uplifted to form the Sierra Nevada. The western slope of the Sierra Nevada is underlain by intrusive, volcanic, and metamorphic rock. Valley deposits are characterized by a thick sequence of alluvial, lacustrine, and marine sediments. The thickness of the sediments varies from a thin veneer at the valley margin, to thousands of feet in the central portion. In the project area, granitic rock and volcanic deposits occur along the valley margin.

Based on review of published geologic mapping[1], our site review, and available subsurface information, the project area is underlain by the Quaternary age Turlock Lake Formation. The Turlock Lake Formation is typically composed of semi-consolidated, alluvial deposits that consist of stiff to hard clays and silts and medium dense to dense sands and gravels. These sediments are alluvial deposits derived from granitic rock of the Sierra Nevada and deposited over 450,000 years ago.

The As-Built Log of Test Borings for the Pleasant Grove Creek Bridge (Right) indicate that Mehrten Formation conglomerate is present beneath the Turlock Lake Formation at a depth of about 35 feet below the creek channel bottom. The conglomerate consists primarily of cobbles in a well-cemented matrix of andesitic sand and silt, and often contains interbedded layers of sandstone, siltstone, and lenses of mudflow breccia. Bedding of sediments and flows within the Mehrten Formation typically dip gently (2 to 4 degrees) to the west/southwest. These volcanic materials were deposited during Miocene time (5 to 20 million years ago).

Figure 2 presents a regional geologic map showing the site location and geologic units.

[1] Mulder, J., 2007, Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley, California Department of Water Resources, modified digital reproduction of the Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California, by Edward J. Helley and David S. Harwood (USGS Publication MF-1790, 1985).

6.2 Subsurface Soil and Rock

We describe the anticipated subsurface soil and rock conditions at the site based on our site reconnaissance, review of the As-Built Log of Test Borings for the existing structures and review of the April 30, 1998 Foundation Report for the right structure.

Existing bridge approach fills extend up to a maximum height of about 7 feet above surrounding grades at the abutment locations. Several feet of recent alluvium (soft sandy clay and loose sand) exist within the channel bed. Beneath the approach fill and alluvium, the borings generally encountered interlayered, hard silts and clays, and dense to very dense (occasionally medium dense) silty sand, clayey sand and poorly graded sand extending to a depth of about 35 feet (Elev. 69.5 ft, NGVD 29 datum) below the existing channel bottom. These soils were variably cemented and are underlain by Mehrten Formation conglomerate (strongly cemented, soft rock) to the maximum depths explored.

Appendix A contains copies of the As-Built Logs of Test Borings (LOTB's) sheets.

6.3 Groundwater and Surface Water

The As-Built Log of Test Borings for the right structure indicate that groundwater was encountered at a depth of about 17 feet (Elev. 87.0-88.0 ft) below the existing channel bottom in November, 1997. We reviewed groundwater level data made available by the California Department of Water Resources (Historical Data Map Interface website). The closest well data (about 1,700 feet northeast of the project) indicates that the regional groundwater table fluctuated between approximate elevations 53.0-60.0 ft. between 1997 to 2008 (last measurement). The higher groundwater levels observed in the borings for the right structure likely resulted from infiltration of the creek surface water into the underlying soil units.

Based our review of historical satellite imagery (Google Earth™), it appears that surface water is present within the creek channel throughout the year, with higher flows occurring during the rainy season. There was 1-2 feet of relatively stagnant water beneath the bridges during our November 16, 2015 site visit.

7 PRELIMINARY GEOLOGIC HAZARDS AND SEISMIC DATA

7.1 Seismic Data and Geologic Hazards

7.1.1 *Ground Motion*

BCI used Caltrans ARS Online (Version 2.3.06) to develop a preliminary Acceleration Response Spectrum (ARS) Spectra Curve for preliminary design of the new bridge structures.

We summarize the data in Table 1. Figure 4 shows a graphical display of the preliminary ARS Response Spectra Curve.

TABLE 1 – PRELIMINARY GROUND MOTION STUDY RESULTS	
Peak Ground Acceleration (PGA)	0.23g
V_{S30} (Small Strain Shear Wave Velocity)[1]	1,200 feet per second (365 m/s)
Near Fault Factor	Yes
Basin Amplification Factor	NA
Controlling Deterministic Scenario	Minimum Deterministic: ➢ Style: Vertical strike-slip ➢ Maximum Magnitude (Mmax): 6.5 ➢ Site to fault distance (R_{RUP}): 7.5 mi
Nearest Late Quaternary Fault	Foothills Fault System – Deadman Fault ➢ Fault ID Number: 422 ➢ Style: Normal ➢ Dip: 50 degrees, West ➢ Maximum Magnitude (Mmax): 6.2 ➢ Site-to-Fault Distance (R_{RUP})[2]: 9.8 miles/15.8 km
RECOMMENDED PRELIMINARY DESIGN RESPONSE SPECTRUM	Envelope that consists of the minimum deterministic spectrum and the probabilistic spectrum (probability of exceedance equal to 5% in 50 years, a 975-year return period). ➢ ARS Response Spectra - See Figure 4 ➢ PGA = 0.23g (based on minimum deterministic spectrum) ➢ Mmax = 6.5

1) Preliminary V_{S30} value based on the lower limit of shear wave velocity for Soil Profile Type C (very dense soil and soft rock)
2) R_{RUP} is defined as the closest distance to the fault rupture plane (as defined in Caltrans' "Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations," Appendix B, November 2012)

The information provided in Table 1 and the Preliminary Design Response Spectra will need to be updated for final design.

7.1.2 *Liquefaction*

Liquefaction can occur when saturated, loose to medium dense, granular soils (generally within 50 feet of the surface), or specifically defined cohesive soils, are subjected to ground shaking. According to our document and site review, non-liquefiable soils (medium dense to very dense granular soils, very stiff to hard, cohesive soils, and/or soft rock) are present at relatively shallow depths at planned structure locations. We consider the potential for detrimental liquefaction to be low at planned structure locations throughout the project.

7.1.3 *Fault Rupture*

Faulting is not mapped through the site, and the site does not lie within or adjacent to a Fault Rupture Hazard Zone (Bryant and Hart, 2007). Based on the Caltrans ARS Online (V2.3.06) , the closest seismic source is a portion of the Foothills Fault System (Deadman Fault) located approximately 9.8 miles (15.8 km) to the east. We consider the potential for fault rupture within the project area to be very low. Figure 3 shows the general fault locations in the region.

7.1.4 *Seismic Settlement*

During a seismic event, ground shaking can cause densification of granular soil above the water table that can result in settlement of the ground surface. Based on our review, medium dense to very dense/hard soils and/or rock is present at relatively shallow depths throughout the project area and probable ground motions are relatively low (Peak Ground Acceleration of 0.23g). We consider the potential for detrimental seismic settlement within the project area to be low for native soil/rock and engineered fill, provided engineered fills are constructed in accordance with Caltrans guidelines.

7.1.5 *Seismic Slope Instability*

Based on the geologic conditions and past performance, we consider the potential for seismic slope instability in the form of landslides and mudslides within the project area to be very low. Similarly, we consider the potential for seismic instability of engineered cut or fill slopes constructed at typical allowable gradients of 2H:1V or flatter to be low.

8 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

8.1 Structure Foundations

The Pleasant Grove Creek Bridge (Left) structure was built in 1971 and is supported on 16-inch Cast-In-Drilled-Hole (CIDH) piles at the abutments and bent pile extensions. The piles were Class 45 (45 ton) with a specified tip elevation of 85.0 ft.

The Pleasant Grove Creek Bridge (Right) structure was built in 2001 and is supported on driven 15-inch precast, prestressed concrete piles (octagonal) at the abutments and pier pile extensions. The abutment piles were Class 45 and had average pile tip elevations of 90-91 feet based on the as-built plans. The pier pile extensions were Class 70 and had average pile tip elevations of about 79 feet. Although not indicated on the as-built plans, it is likely that undersize drilling to assist driving was necessary since it was recommended in the foundation report.

The subsurface conditions encountered in the existing borings indicate that the site is conducive for either driven or cast-in-drilled-hole (CIDH) piles. Since CIDH piles would likely require installation using the “wet” method (temporary casing, slurry drilling, gamma gamma inspection and minimum 24-inch diameter piles) due to high groundwater and surface water intrusion, we favor the use of driven piles over CIDH piles. Driven concrete or closed-end steel pipe piles

would likely require undersize drilling to assist driving through very dense/hard soil conditions in order to reach specified tip elevations. Open-ended pipe piles and/or steel HP piles could likely be driven to specified tip elevations without drilling to assist pile driving, although heavier sections than Class 90 piles may be necessary to avoid damage to the piles during driving (i.e. Class 140 PP14x0.438 pipe piles or HP10x57 piles). We anticipate that specified tip elevations for Class 90/140 piles will range from about 75.0 feet to 85.0 feet.

8.2 Cuts and Fills

Most cuts and cut slopes are expected to occur within engineered fill placed for existing improvements, and within alluvial sediments that consist of medium dense to very dense, silty to clayey sands and hard silts and clays. We expect that cut slopes will be stable at slopes of 2H:1V or flatter within native soils and engineered fills.

We did not identify areas of potentially soft/compressible soils within the existing subsurface information or during our site reconnaissance for those areas that are likely to have significant, engineered fills constructed. We anticipate that settlement of engineered fill established on appropriately prepared subgrade will be minimal and occur primarily during fill placement. Settlement waiting periods are not expected. We expect engineered fill slopes constructed of local materials will be stable at gradients of 2H:1V or flatter. A slope gradient of 1.5H:1V can be used in front of abutments. Rock slope protection should be used to protect abutment slopes from scour and erosion.

8.3 Erosion

Embankment slopes and areas disrupted by grading are susceptible to erosion from surface runoff. Cut and fill slopes will require erosion control, such as vegetation, and control of surface runoff.

8.4 Scour

We did not observe evidence of significant scour at the abutments during our November 16, 2015 site visit, but we could not examine the bents/piers for scour since the cloudy water limited visibility.

Bridge inspection reports referenced in Section 5 did not disclose any scour issues at the bridges. The previous Hydrology Report for the right structure indicated an expected pier scour of 3.7 feet.

9 PRELIMINARY SOIL CORROSION EVALUATION

The April 30, 1998 Foundation Report for the right structure included two sulfate/chloride corrosion tests conducted on soil samples obtained from Boring B97-8, with all results less than 50 ppm. Based on available subsurface/corrosion test data, and our local experience, the soil and

rock within the project area is generally expected to be non-corrosive to structural elements (as defined by Caltrans, 2012, Corrosion Guidelines, Version 2.0).

10 CONSTRUCTION CONSIDERATIONS

Excavation and Dewatering: Excavations within soil can be achieved using typical heavy-duty construction equipment. Excavations that extend below the creek bed or surface water level will require dewatering using sump pumps and/or diking/diversion of the creek. To reduce dewatering construction impacts and associated costs, we strongly recommend scheduling foundation construction during the dry season (July through October).

Pile Installation: Refer to Section 8.1 for a discussion of construction considerations related to pile installation at the site.

11 SUBSURFACE EXPLORATION AND LABORATORY TESTING

Additional subsurface exploration and laboratory testing will be required to provide the design level foundation report for widening the bridges. Specifically, we recommend the following:

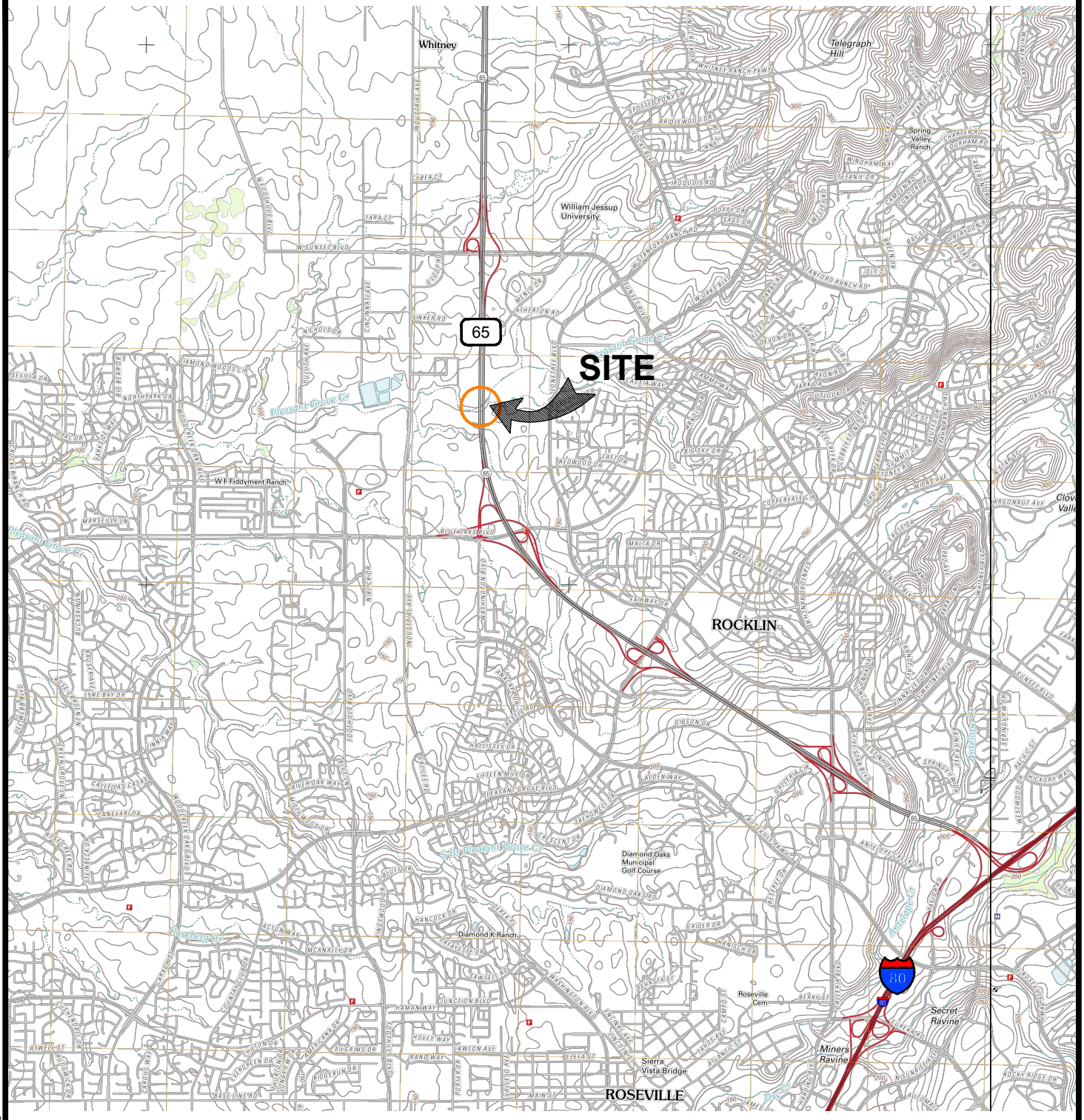
- Drill, log and sample a minimum of one boring at each proposed bridge abutment for to depths of 50 to 60 feet
- Record groundwater depths during drilling
- Complete laboratory tests that include moisture content, density, unconfined compressive strength, direct shear, maximum density (proctor), R-value, and soil corrosivity

12 LIMITATIONS

This SPGR is based on site review and existing structure document review noted in Section 5, and is not intended for final design. Additional study, including subsurface exploration, laboratory testing, and analyses are required for final design. BCI performed these services in accordance with generally accepted geotechnical engineering principles and practices currently used in this area. We do not warranty our services.

STRUCTURE PRELIMINARY GEOTECHNICAL REPORT
PLEASANT GROVE CREEK BRIDGE (WIDEN)
BRIDGE NUMBERS 19-0136L/R
Placer County, California
EA 03-1F1700; 03-PLA-65; PM R8.8

FIGURES



SOURCE: USGS Roseville and Rocklin Quadrangles, 7.5 Minute Series topographic, 1:24000, dated 2012.

SCALE: 1"=4,000'

blackburn consulting

2491 Boatman Avenue
West Sacramento, CA 95691
Phone: (916) 375-8706
Fax: (916) 375-8709
www.blackburnconsulting.com

VICINITY MAP

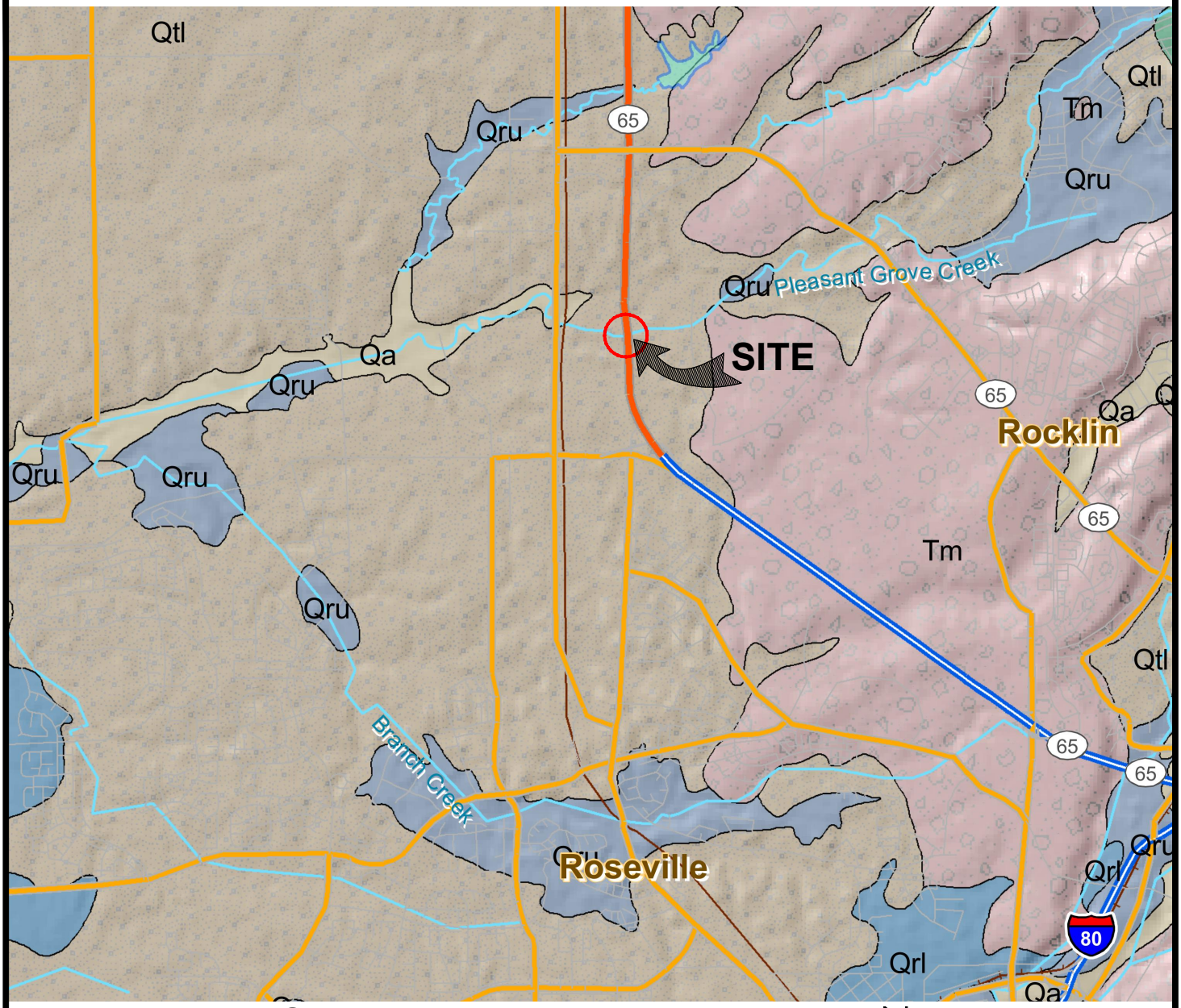
Pleasant Grove Creek Bridge (Widen)
Bridge No's 19-0136 L/R
Placer County, California

File No. 2602.1

November 2015

Figure 1

11/23/2015 2602.1 Fig1 Pleasant Grove Creek (Widen).dwg



LEGEND

- Qa — Quaternary Alluvium
- Qru — Riverbank Formation (upper member)
- Qtl — Turlock Lake Formation
- Tm — Mehrten Formation

N

SCALE: 1"=4,000'

SOURCE: Mulder, J., 2007, Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley, California Department of Water Resources, modified digital reproduction of the Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California, by Edward J. Helley and David S. Harwood (USGS Publication MF-1790, 1985).

blackburn consulting

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West Sacramento, CA 95691
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Fax: (916) 375-8709
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GEOLOGIC MAP

Pleasant Grove Creek Bridge (Widen)
Bridge No's 19-0136 L/R
Placer County, California

File No. 2602.1

November 2015

Figure 2

SOURCE: Caltrans ARS Online (V2.3.06)

N

Not to Scale

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West Sacramento, CA 95691
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Fax: (916) 375-8709
www.blackburnconsulting.com

REGIONAL FAULT MAP

Pleasant Grove Creek Bridge (Widen)
Bridge No's 19-0136 L/R
Placer County, California

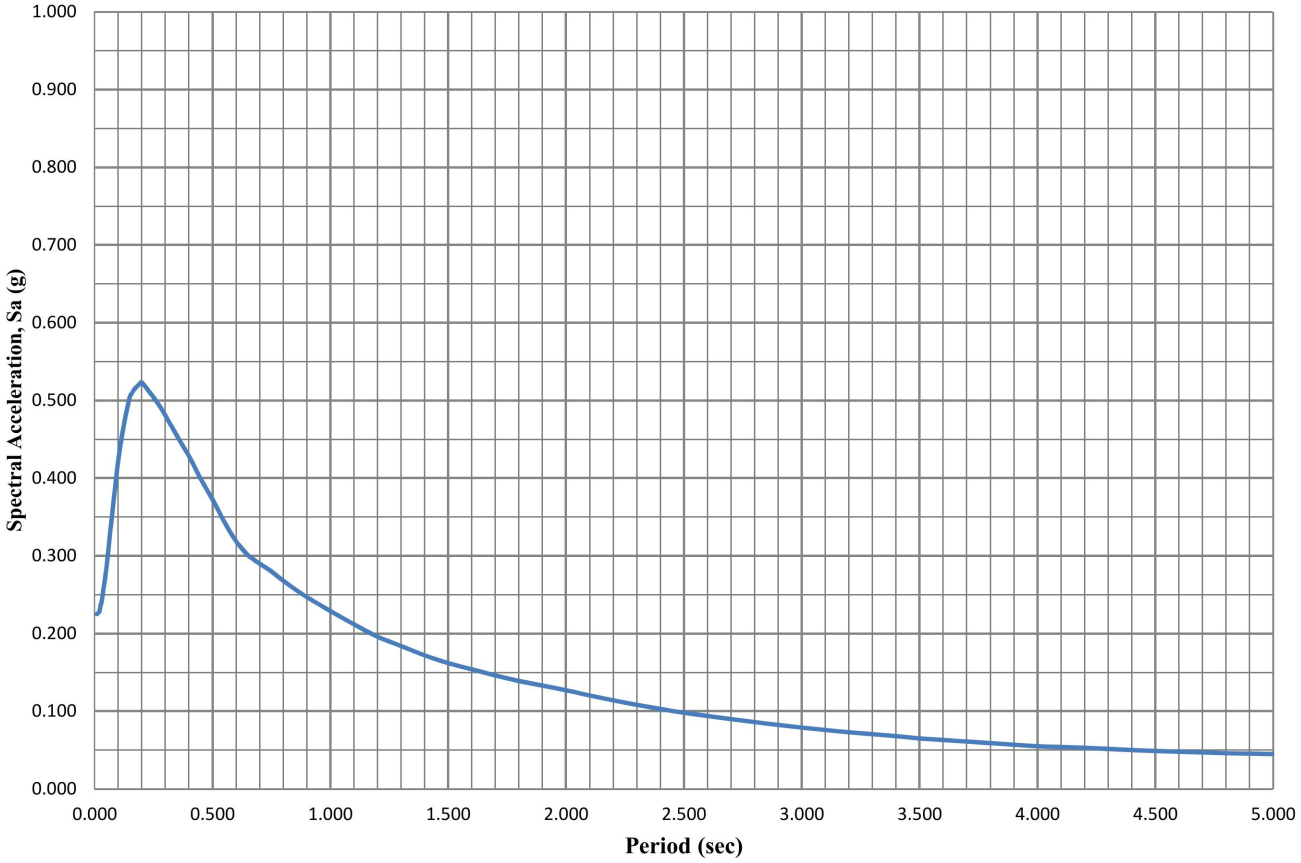
File No. 2602.1

November 2015

Figure 3

11/24/2015 2602.1 Fig3 Pleasant Grove Creek (Widen).dwg

Preliminary ARS Curve (5% Damping) - ARS Online (V2.3.06)
Pleasant Grove Creek Bridge at State Route 65



blackburn consulting

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West Sacramento, CA 95691
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Fax: (916) 375-8709
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PRELIMINARY ARS RESPONSE SPECTRUM

Pleasant Grove Creek Bridge (Widen)
Bridge No's 19-0136 L/R
Placer County, California

File No. 2602.1

November 2015

Figure 4

STRUCTURE PRELIMINARY GEOTECHNICAL REPORT
PLEASANT GROVE CREEK BRIDGE (WIDEN)
BRIDGE NUMBERS 19-0136L/R
Placer County, California
EA 03-1F1700; 03-PLA-65; PM R8.8

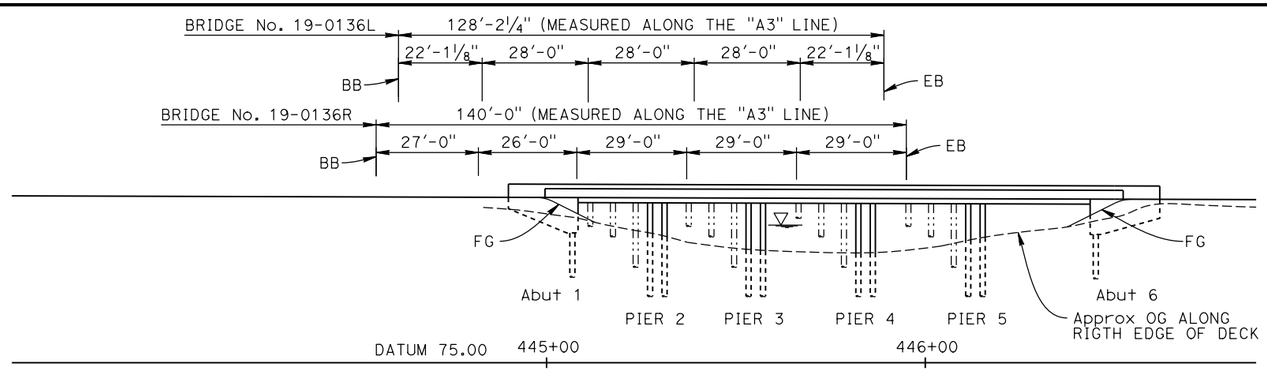
APPENDIX A

Preliminary Advance Planning Study Plan (Bridge No. 19-0136L/R)

As Built Logs of Test Borings (Bridge No. 19-0136L/R)

Laboratory Test Results

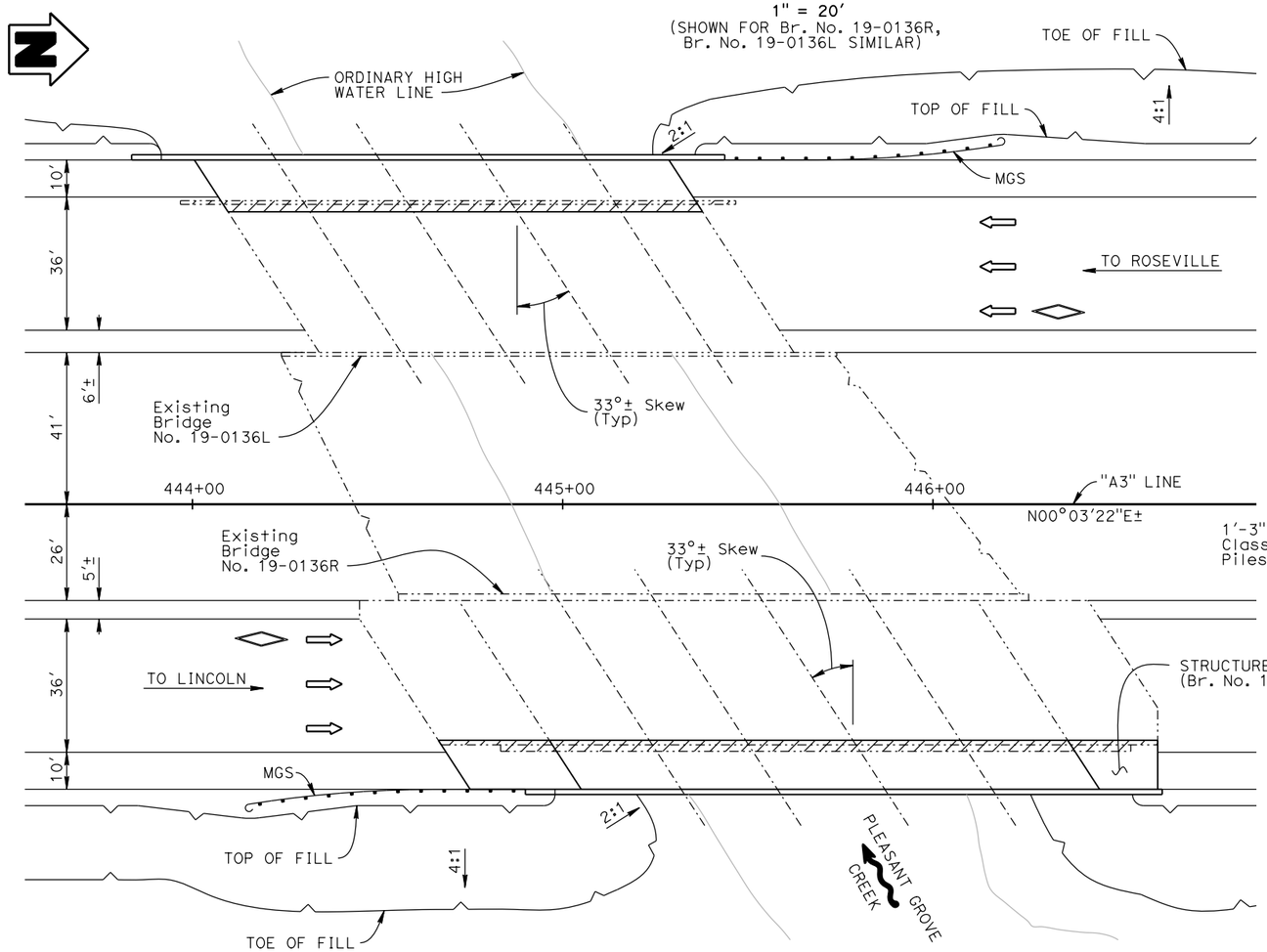
PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



ELEVATION

1" = 20'

(SHOWN FOR Br. No. 19-0136R, Br. No. 19-0136L SIMILAR)



PLAN

1" = 20'

LEGEND

- Indicates Existing Structure
- Indicates New Construction
- Indicates Bridge Removal (Portion)
- Indicates Ordinary High Water

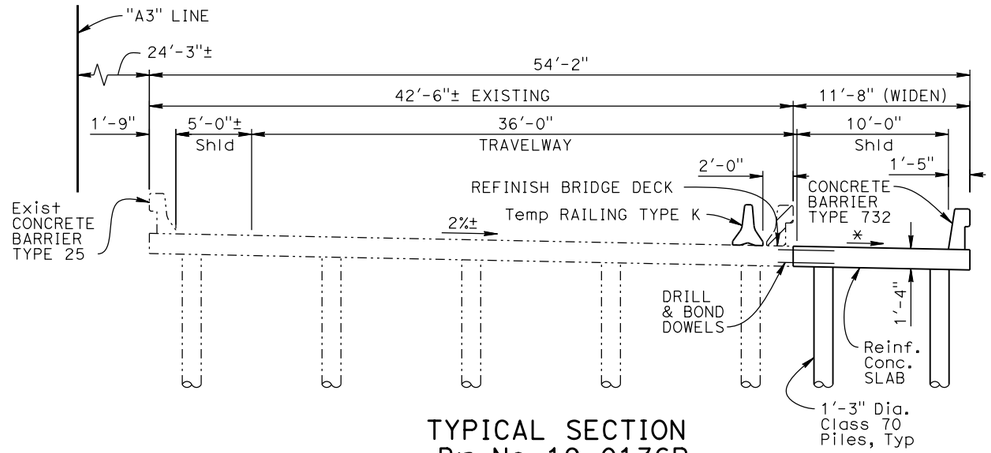
Vehicular Traffic

1. ___ New alignment. No traffic at the site.
2. ___ Traffic will be detoured away from the site.
3. X Traffic will be carried on the structure. Stage construction will not be required.
4. ___ Traffic will pass under the structure on _____

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
03	Pla	65	

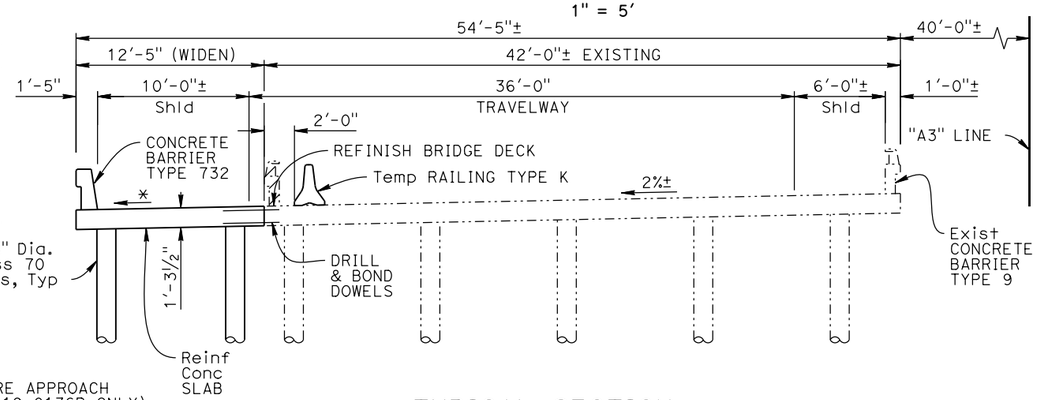
PCTPA
299 NEVADA ST.
AUBURN, CA 95603

CH2M HILL
2485 NATOMAS PARK DR. STE 600
SACRAMENTO, CA 95833



TYPICAL SECTION Br No 19-0136R

1" = 5'



TYPICAL SECTION Br No 19-0136L

1" = 5'

* Match existing grade and cross slope.

DATE OF ESTIMATE		10-16-15
BRIDGE REMOVAL	=	$6,700
STRUCTURE DEPTH	=	1'-3½"(Lt), 1'-4"(Rt)
LENGTH	=	128.19'±(Lt), 140'±(Rt)
WIDTH	=	12'-5"(Lt), 11'-8"(Rt)
AREA	=	3,225 SQFT
COST/ □FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$200
TOTAL COST	=	$651,700

PRELIMINARY

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGNED BY	JENNIFER ELWOOD	DATE	10/16/15
DRAWN BY	ED MAECHLER	DATE	10/16/15
CHECKED BY	MARK BRADY	DATE	10/16/15
APPROVED	X	DATE	X

MARK BRADY
PROJECT ENGINEER

PLANNING STUDY

PLEASANT GROVE CREEK BRIDGE (WIDEN)

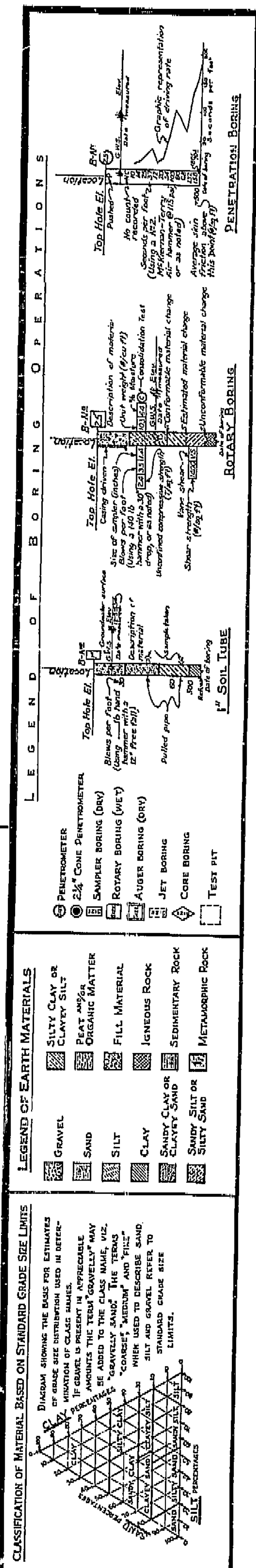
BRIDGE NO. 19-0136L/R | UNIT: 03

SCALE: AS SHOWN | PROJECT NUMBER & PHASE: X

USERNAME => emaechle DATE PLOTTED => 13-OCT-2015 TIME PLOTTED => 17:13

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Pla	65, 256	5.4/13.5, 5.1/6.0	48	55

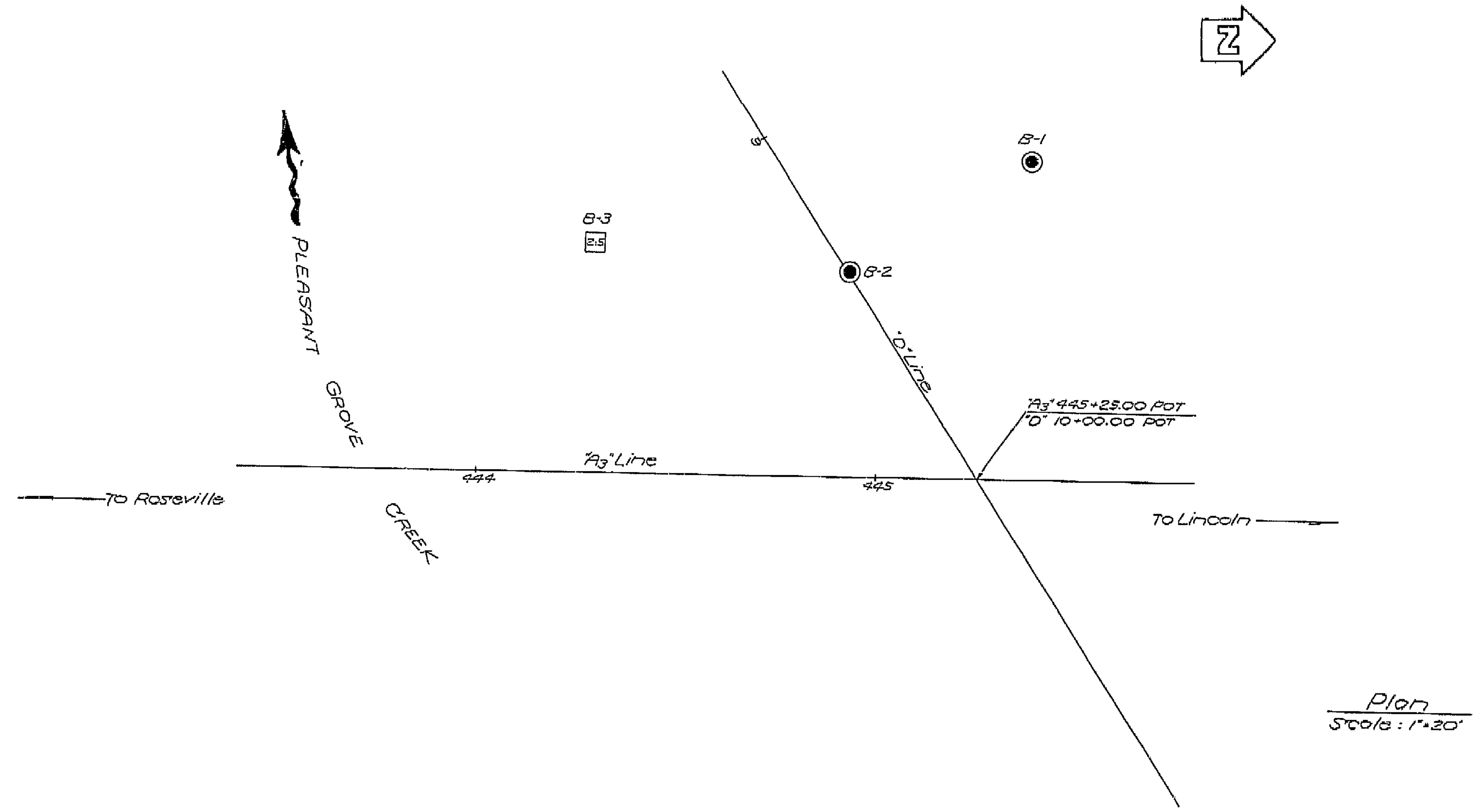
A. P. Bezzone
DESIGN SECTION SUPERVISOR — REGISTERED CIVIL ENGINEER NO. 11144
DATE APPROVED May 11, 1970



NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

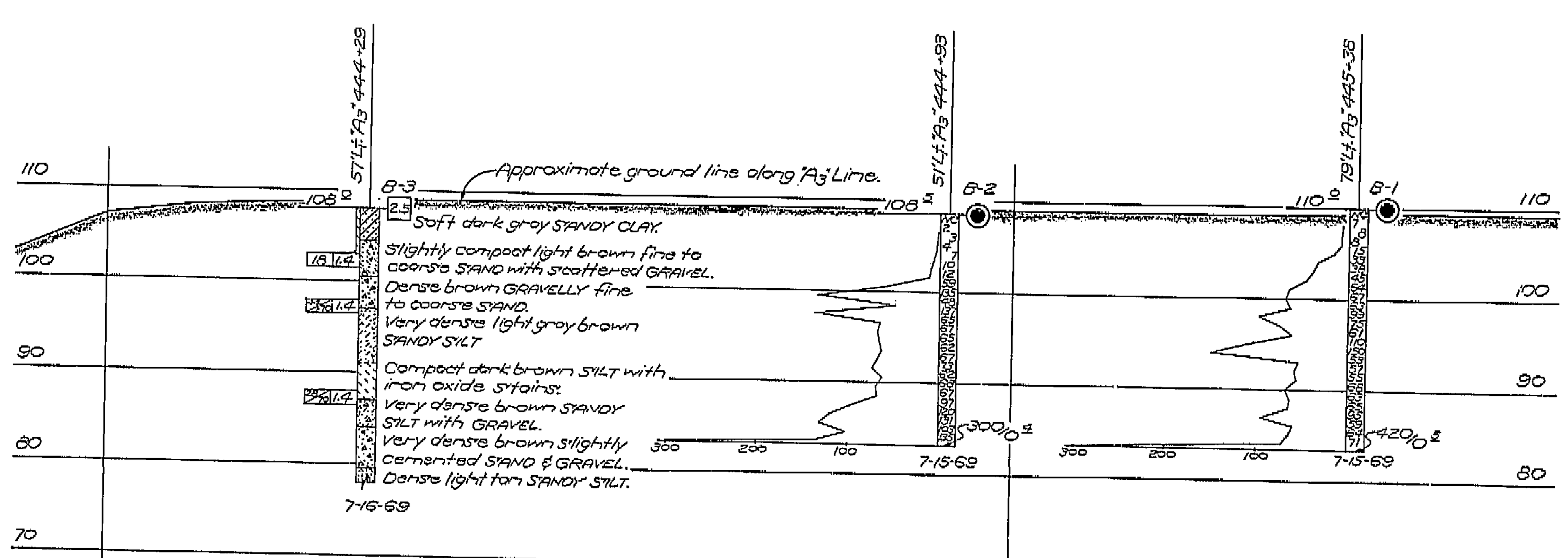
48



Plan
Scale: 1"=20'

AS BUILT PLANS
Contract No. 03-078934
Date Completed 11-9-71
Document No. 30002012

REG 03-078933



NO GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT. GEOLOGY SECTION
DATE July, 1969

Profile
Scale: 1"=10'

STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

PLEASANT GROVE CREEK

LOG OF TEST BORINGS

BRIDGE NO.	POST MILE	DRAWING NO.	SHEET	OF
19-136	8.0		5	5

WO 078931
CU 03203
PR19136-2

Disregard prints bearing earlier revision dates

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.
DATE 7/11/72 SIGNATURE TITLE Sr. EMO

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
3	PLA	65	R8.3 / T13.0	208	216

Tom Blackburn 4-28-98
GEOTECHNICAL PROFESSIONAL

REGISTERED PROFESSIONAL ENGINEER
THOMAS W. BLACKBURN
NO. 2311
EXP. 6/30/00
GEOTECHNICAL
STATE OF CALIFORNIA

2-22-99
PLANS APPROVAL DATE

CITY OF LINCOLN
1390 FIRST STREET
LINCOLN, CA 95646

ANDERSON CONSULTING GROUP
631 COMMERCE DRIVE
ROSEVILLE, CA 95678

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

BENCHMARK

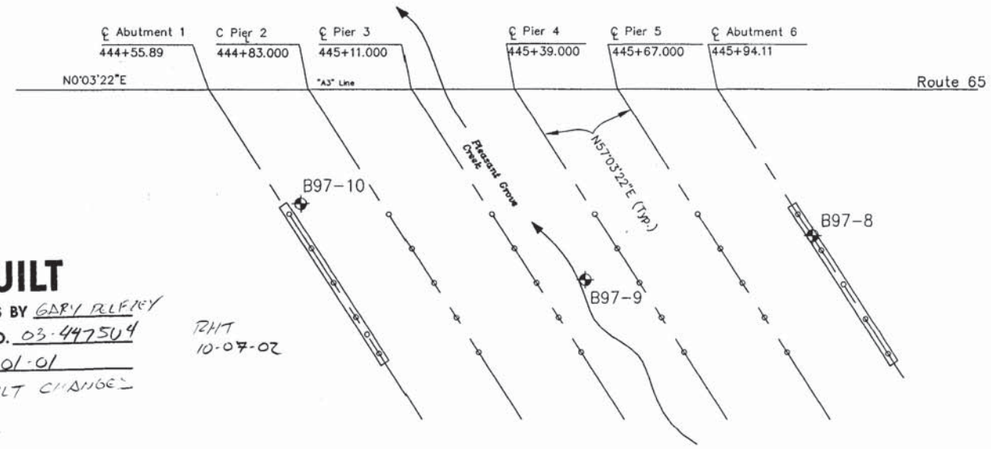
Horizontal coordinates and stations are CCS83, Zone 2, in U.S. survey feet based on NAD 83 (Epoch 1991.35) datum. Vertical elevations are in feet on the NGVD 29 datum. (To convert elevations to the NAVD 88 datum, add 0.710m).

CalTrans 19-131 T-Bar — "A3" Station 455+57.60 Lt 82.43'
N 2,056,989.311'
E 6,760,987.903'
Elev. 117.865'

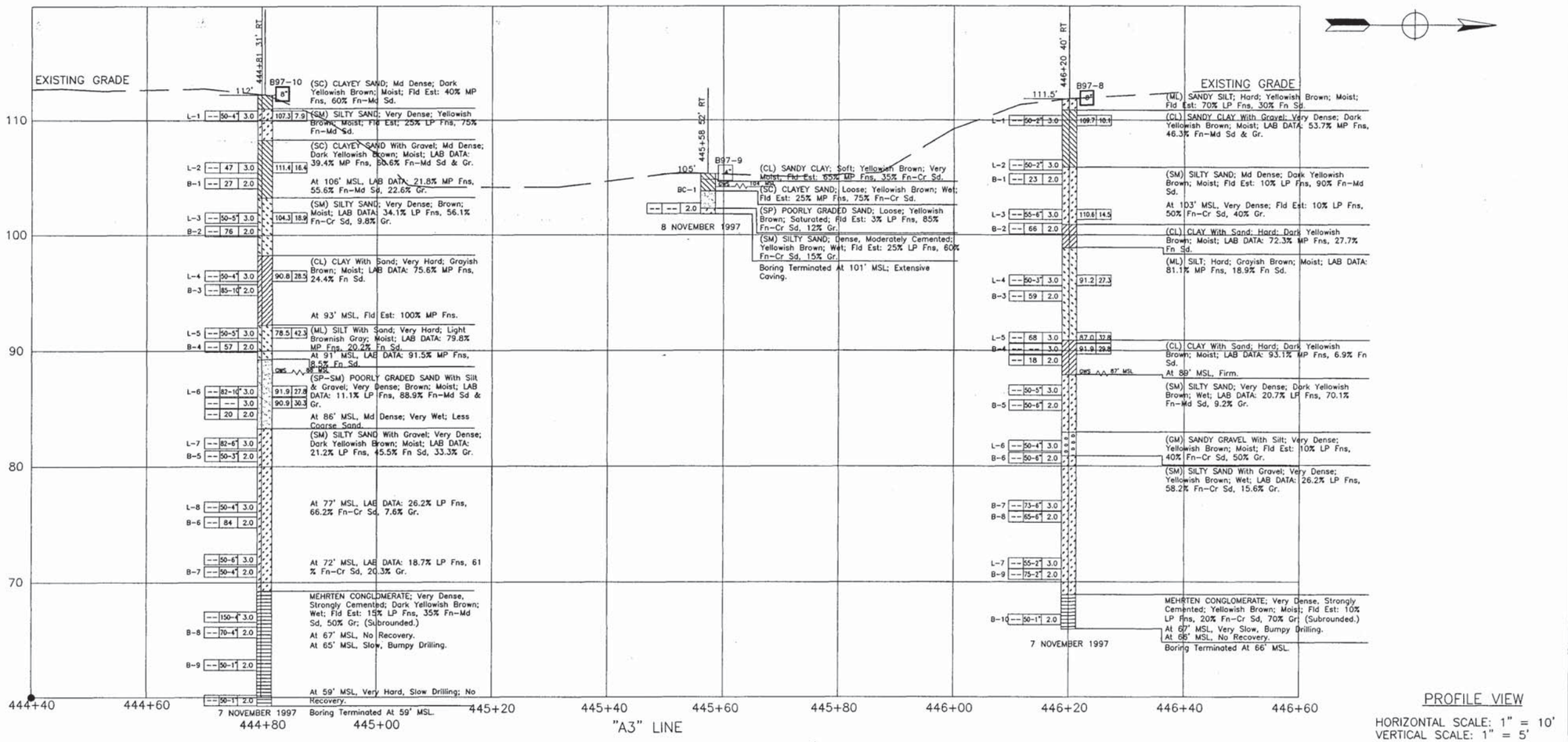
CalTrans 19-130 T-Bar — "A3" Station 434+49.37 Lt 82.50
N 2,054,881.189'
E 6,760,985.772'
Elev. 114.37'

AS BUILT
CORRECTIONS BY GARY RUFFEY
CONTRACT NO. 03-447504
DATE 05-01-01
NO ASBUILT CHANGES

RHT 10-07-02



PLAN VIEW
SCALE: 1" = 20'

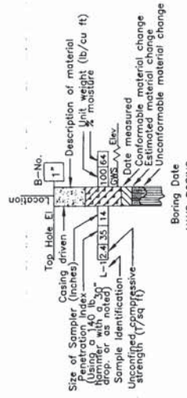


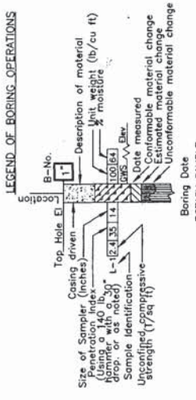
PROFILE VIEW
HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'

LEGEND OF BORING OPERATIONS

BORING LOCATION
HAND BORING
ROTARY SAMPLE BORING (DRY)
AUGER BORING (DRY)

NOTES:
3.0" DIAMETER SAMPLER CONSISTED OF A SPLIT-SPOON SAMPLER EQUIPPED WITH 2.5" O.D. AND 2.375" I.D. BRASS LINERS.
2.0" DIAMETER SAMPLER CONSISTED OF A STANDARD PENETRATION TEST SAMPLER WITHOUT LINERS; EXCEPT B97-9 WHICH WAS A HAND SAMPLER.
SAMPLERS WERE DRIVEN INTO THE GROUND WITH THE FORCE OF A 140 POUND AUTOMATIC TRIP HAMMER FALLING 30", EXCEPT FOR THE HAND SAMPLER.





LEGEND OF EARTH MATERIALS

GRAVEL · SAND · SILT · CLAY · SANDY CLAY or CLAYEY SAND · SANDY SILT or SILTY SAND · SILTY CLAY · CLAYEY SILT · FILL MATERIAL · IGNEOUS ROCK · SEDIMENTARY ROCK · METAMORPHIC ROCK

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

Penetration Resistance (Blows / Ft)	Granular	Cohesive
0-4	Very loose	Very soft
5-9	Loose	Soft
10-19	Slightly compact	Firm
20-34	Compact	Very stiff
35-69	Dense	Hard
>70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon visual inspection and is not to be construed to imply laboratory analysis.

DESIGN OVERSIGHT	Joel E. Ewaldson 6-10-98 SIGN OFF DATE	DRAWN BY	LOREE HAMMER
		CHECKED BY	ROBERT B. LOKTEFF

ROBERT B. LOKTEFF
FIELD INVESTIGATOR
DATE JANUARY 1998

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ROBERT B. LOKTEFF
PROJECT ENGINEER

BRIDGE NO. 19-136R
POST MILE R 8.7

PLEASANT GROVE CREEK BRIDGE
LOG OF TEST BORINGS

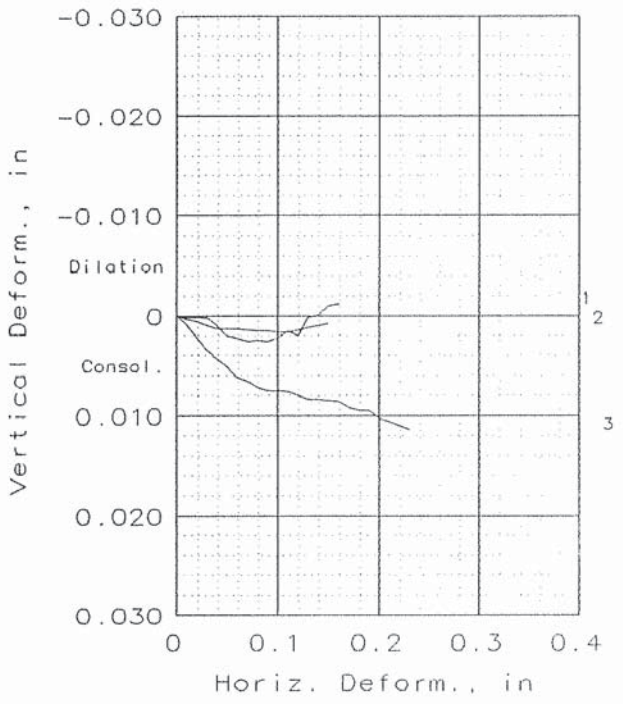
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

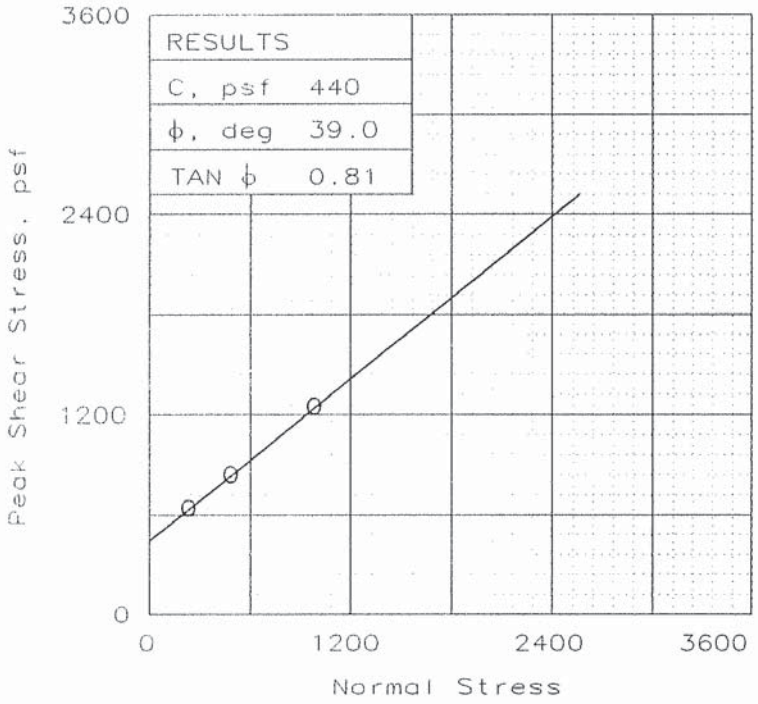
CU 03198
EA 4475U1

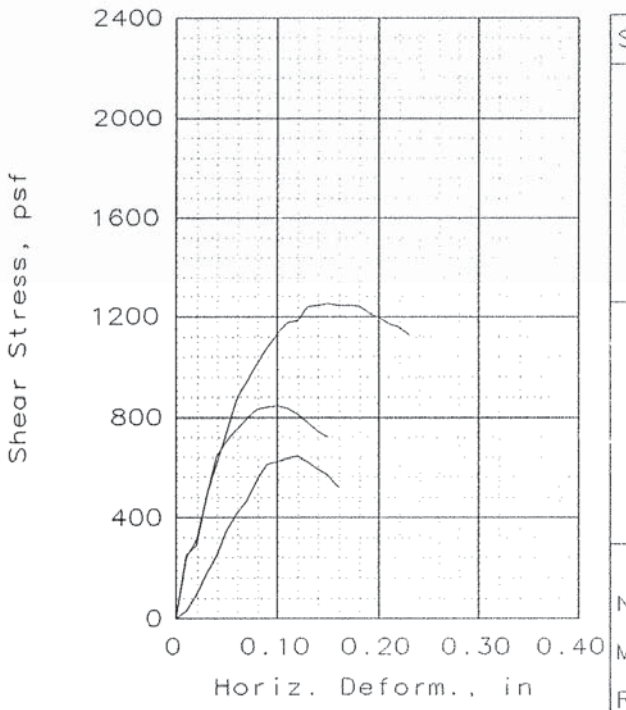
REVISION DATES (PRELIMINARY STAGE ONLY) 4/28/98

SHEET 10 OF 10

D:\AGI\41493\Sheet03b.dwg







SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	9.7	10.9	9.6
	DRY DENSITY, pcf	110.5	110.0	108.5
	SATURATION, %	51.9	57.5	48.5
	VOID RATIO	0.497	0.504	0.524
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	17.9	17.6	17.9
	DRY DENSITY, pcf	109.6	111.3	110.6
	SATURATION, %	93.1	95.8	95.7
	VOID RATIO	0.509	0.486	0.496
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.01	0.99	0.98
NORMAL STRESS, psf		250	500	1000
MAXIMUM SHEAR, psf		644	845	1251
RESIDUAL SHEAR, psf				
Strain rate, %/min		0.194	0.193	0.164

SAMPLE DATA

SAMPLE TYPE: In situ

DESCRIPTION: Very dark grayish brown sandy lean clay (CL)

LL= 30 PL= 17 PI= 13.0

SPECIFIC GRAVITY= 2.65

REMARKS:

FIG. NO. A-1

CLIENT:

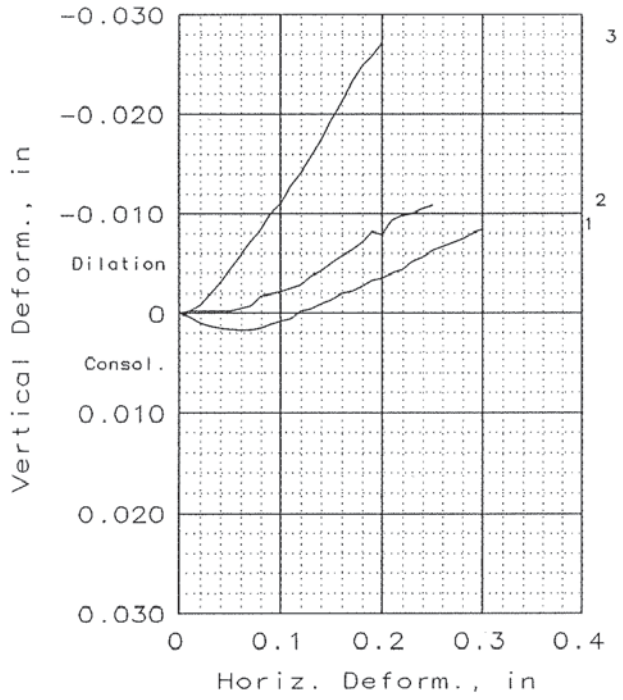
PROJECT: Route 65 Materials Report

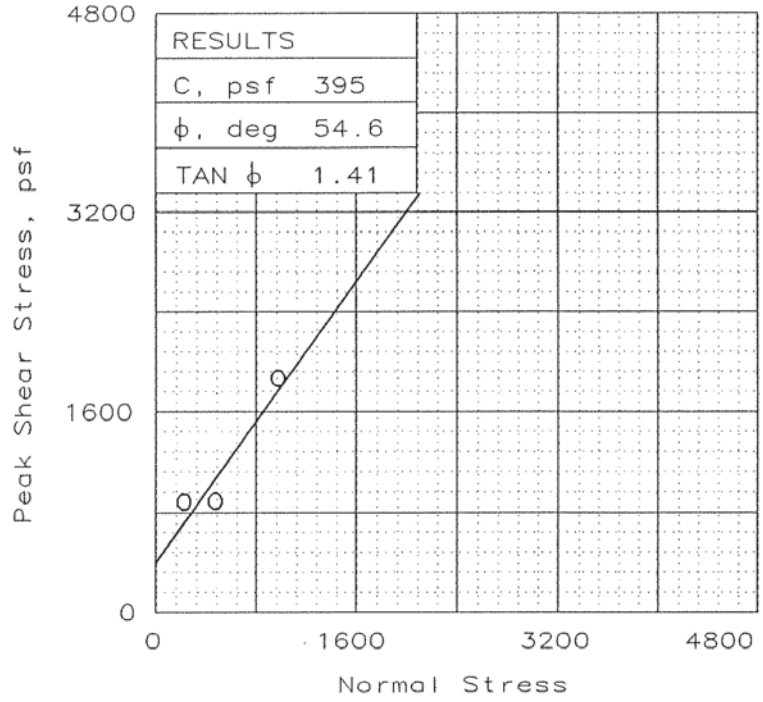
SAMPLE LOCATION: B97-8; L1

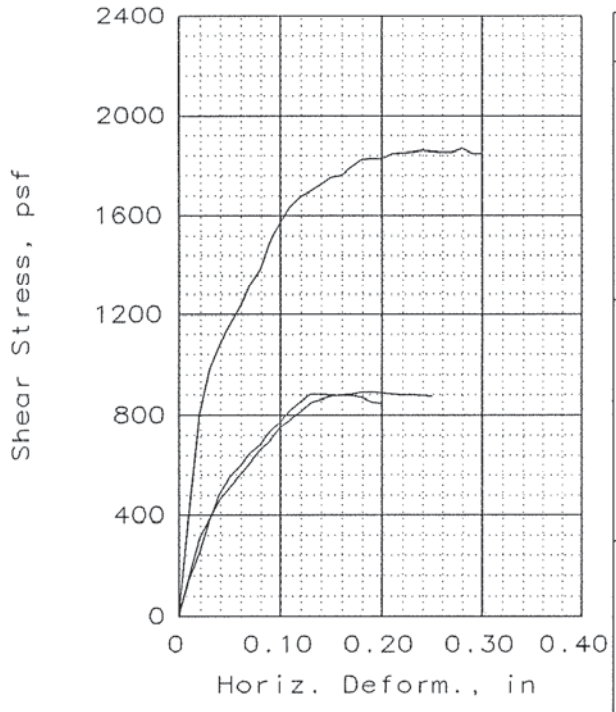
PROJ. NO.: 4143.3 DATE: 12-3-97

DIRECT SHEAR TEST REPORT

ANDERSON CONSULTING GROUP







SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	16.8	15.8	16.7
	DRY DENSITY, pcf	112.2	110.4	111.5
	SATURATION, %	93.8	84.1	91.3
	VOID RATIO	0.474	0.498	0.483
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	18.8	19.2	19.6
	DRY DENSITY, pcf	112.9	110.2	110.3
	SATURATION, %	106.9	101.3	103.9
	VOID RATIO	0.465	0.501	0.500
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	0.99	1.00	1.01
NORMAL STRESS, psf		1000	500	250
MAXIMUM SHEAR, psf		1869	891	884
RESIDUAL SHEAR, psf				
Strain rate, %/min		0.191	0.177	0.191

SAMPLE DATA

SAMPLE TYPE: In situ

DESCRIPTION: Dark brown clayey sand (SC)

LL= 37 PL= 19 PI= 18.0

SPECIFIC GRAVITY= 2.65

REMARKS:

FIG. NO. A-2

CLIENT:

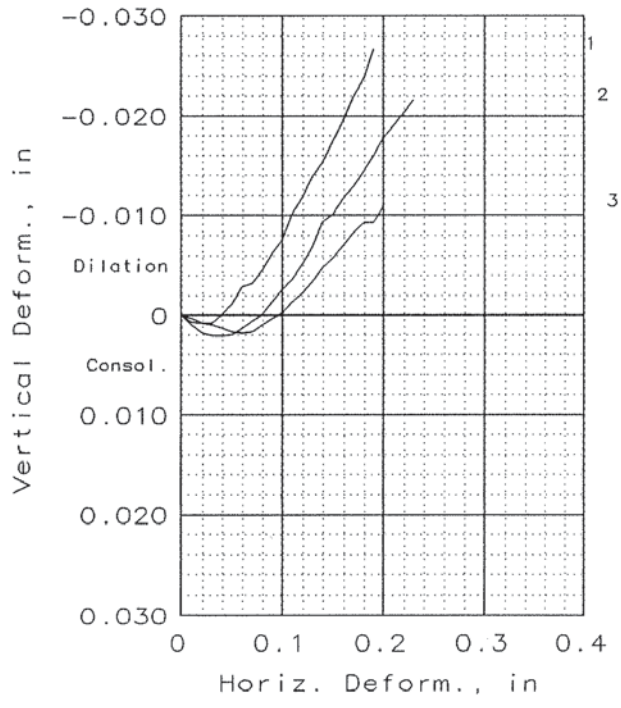
PROJECT: Route 65 / Pleasant Grove Creek Bridge

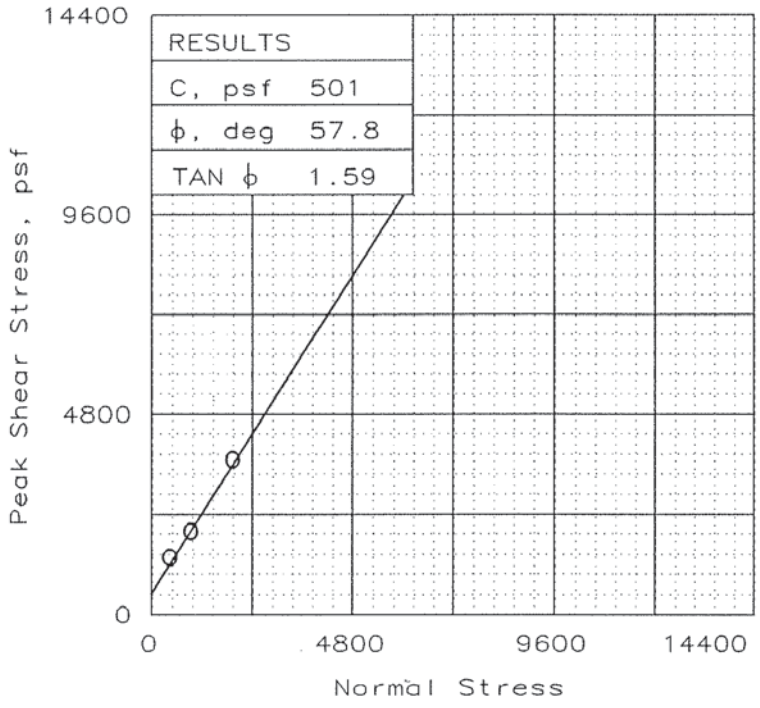
SAMPLE LOCATION: B97-10; L2

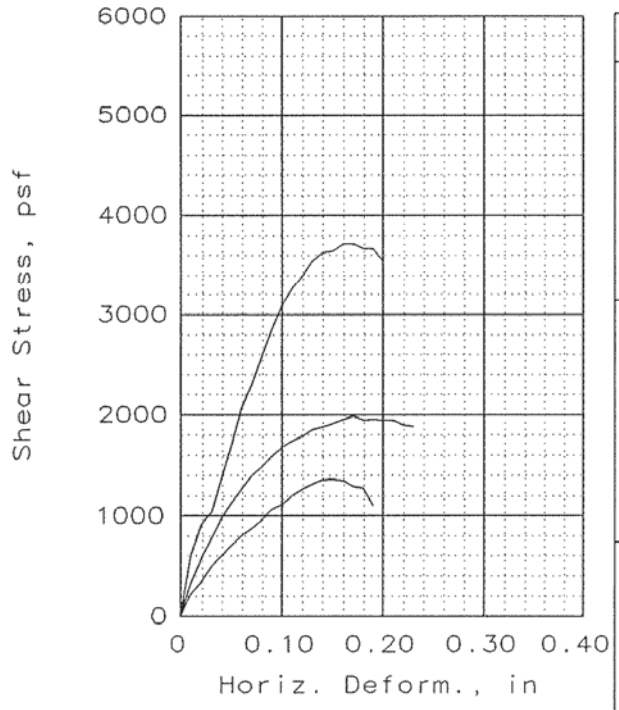
PROJ. NO.: 4143.3 DATE: 12-10-97

DIRECT SHEAR TEST REPORT

ANDERSON CONSULTING GROUP







SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	17.7	19.4	19.5
	DRY DENSITY, pcf	104.9	104.9	103.0
	SATURATION, %	81.3	89.2	85.4
	VOID RATIO	0.577	0.577	0.606
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	21.2	21.5	22.1
	DRY DENSITY, pcf	105.9	106.1	105.1
	SATURATION, %	100.0	101.6	102.2
	VOID RATIO	0.563	0.560	0.574
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	0.99	0.99	0.98
NORMAL STRESS, psf		500	1000	2000
MAXIMUM SHEAR, psf		1365	1986	3715
RESIDUAL SHEAR, psf				
Strain rate, %/min		0.160	0.170	0.156

SAMPLE DATA

SAMPLE TYPE: In situ

DESCRIPTION: Yellowish red clayey sand with gravel (SC)

LL= PL= PI=

SPECIFIC GRAVITY= 2.65

REMARKS:

CLIENT:

PROJECT: Route 65 / Pleasant Grove Creek Bridge

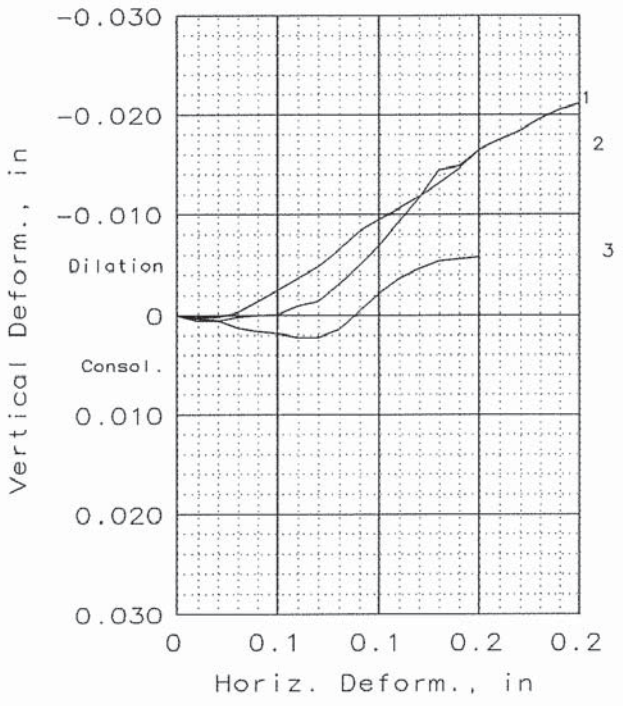
SAMPLE LOCATION: B97-10; L3

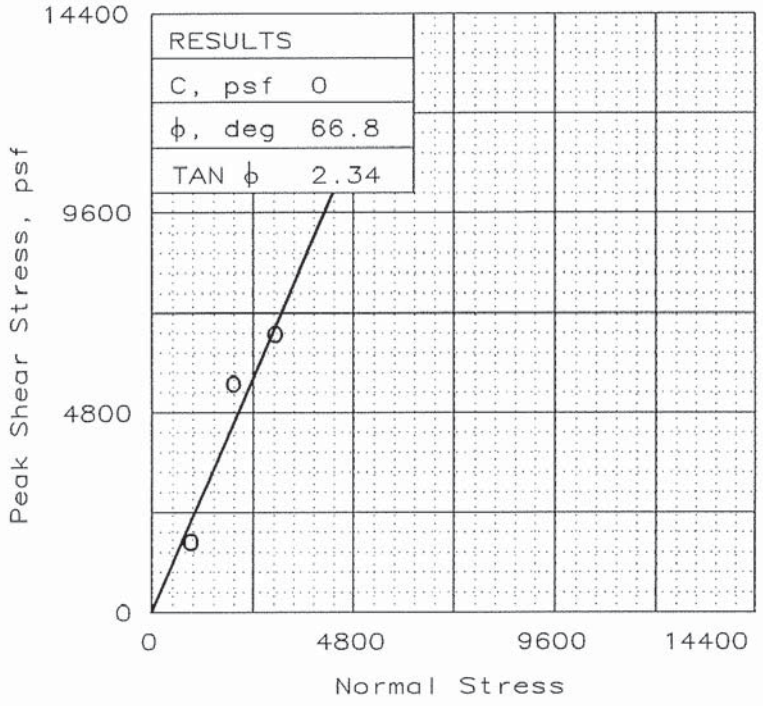
PROJ. NO.: 4143.3 DATE: 12-12-97

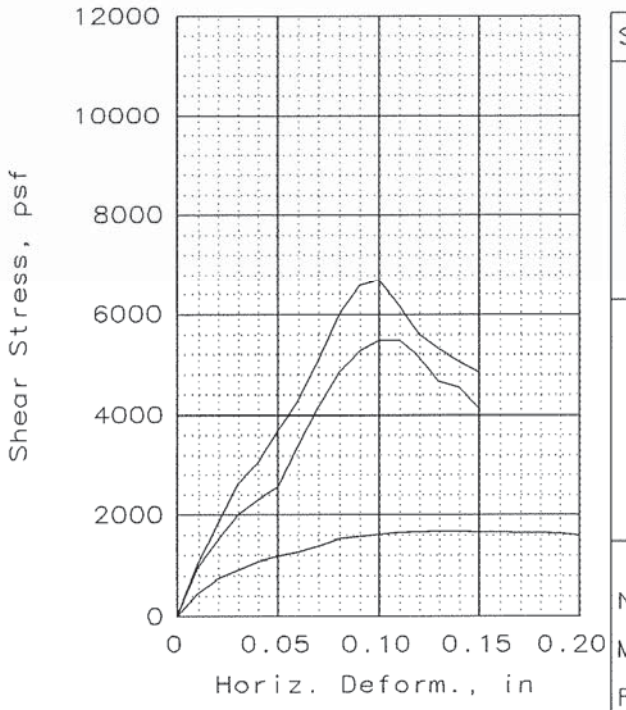
DIRECT SHEAR TEST REPORT

ANDERSON CONSULTING GROUP

FIG. NO. A-3







SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	29.7	26.0	26.3
	DRY DENSITY, pcf	85.8	93.3	94.5
	SATURATION, %	84.7	89.1	92.9
	VOID RATIO	0.928	0.773	0.751
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	34.5	30.2	28.4
	DRY DENSITY, pcf	86.6	94.4	96.5
	SATURATION, %	100.3	106.6	105.3
	VOID RATIO	0.911	0.752	0.714
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	0.99	0.99	0.98
NORMAL STRESS, psf		1000	2000	3000
MAXIMUM SHEAR, psf		1680	5493	6689
RESIDUAL SHEAR, psf				
Strain rate, %/min		0.160	0.144	0.137

SAMPLE DATA

SAMPLE TYPE: In situ

DESCRIPTION: Brown silt with sand

LL= 46 PL= 30 PI= 16.0

SPECIFIC GRAVITY= 2.65

REMARKS:

CLIENT:

PROJECT: Route 65 / Pleasant Grove Creek Bridge

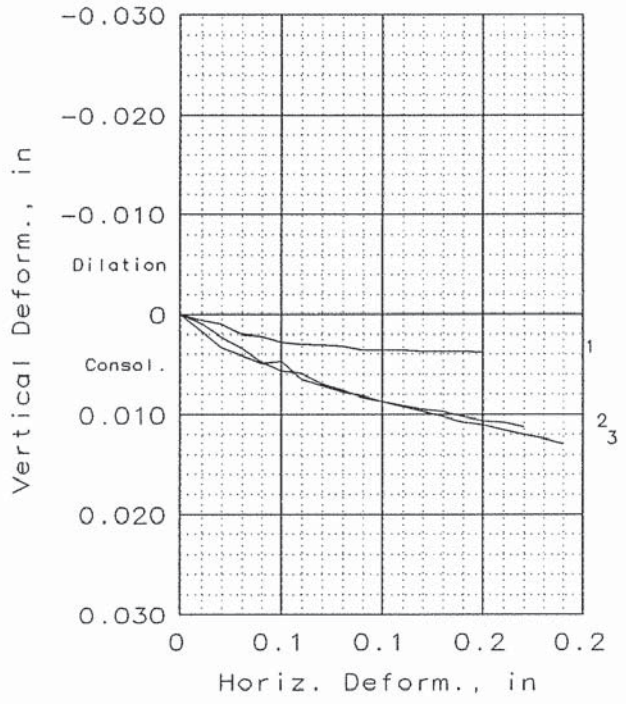
SAMPLE LOCATION: B97-8; L4

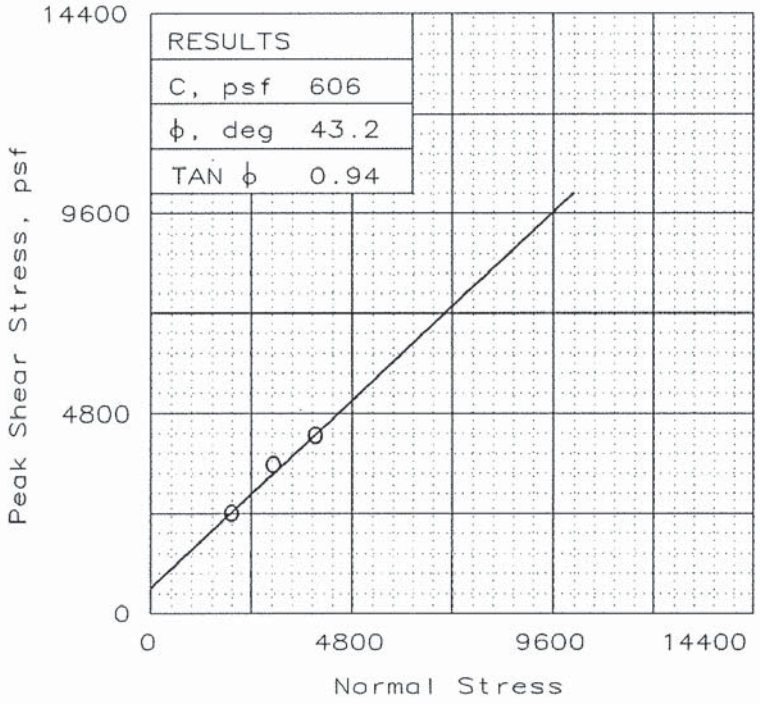
PROJ. NO.: 4143.3 DATE: 12-5-97

DIRECT SHEAR TEST REPORT

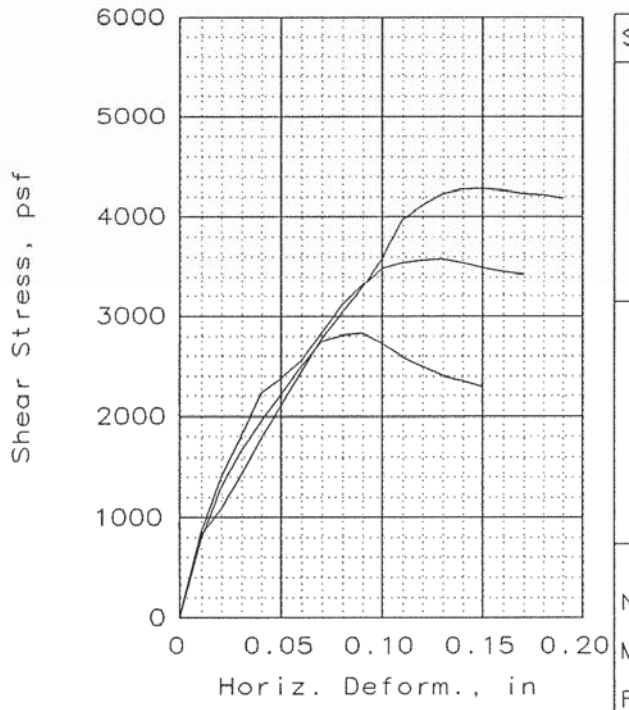
ANDERSON CONSULTING GROUP

FIG. NO. A-4





RESULTS	
C, psf	606
ϕ, deg	43.2
TAN ϕ	0.94



SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	42.6	42.1	42.1
	DRY DENSITY, pcf	78.1	78.9	78.4
	SATURATION, %	101.0	101.6	100.6
	VOID RATIO	1.119	1.098	1.109
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	42.5	41.3	41.6
	DRY DENSITY, pcf	79.2	80.7	81.2
	SATURATION, %	103.5	104.2	106.1
	VOID RATIO	1.089	1.051	1.038
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	0.99	0.98	0.97
NORMAL STRESS, psf		2000	3000	4000
MAXIMUM SHEAR, psf		2405	3582	4284
RESIDUAL SHEAR, psf				
Strain rate, %/min		0.164	0.151	0.144

SAMPLE DATA

SAMPLE TYPE: In situ

DESCRIPTION: Light brownish silt with sand (ML)

LL= 44 PL= 39 PI= 5.0

SPECIFIC GRAVITY= 2.65

REMARKS:

CLIENT:

PROJECT: Route 65 / Pleasant Grove Creek Bridge

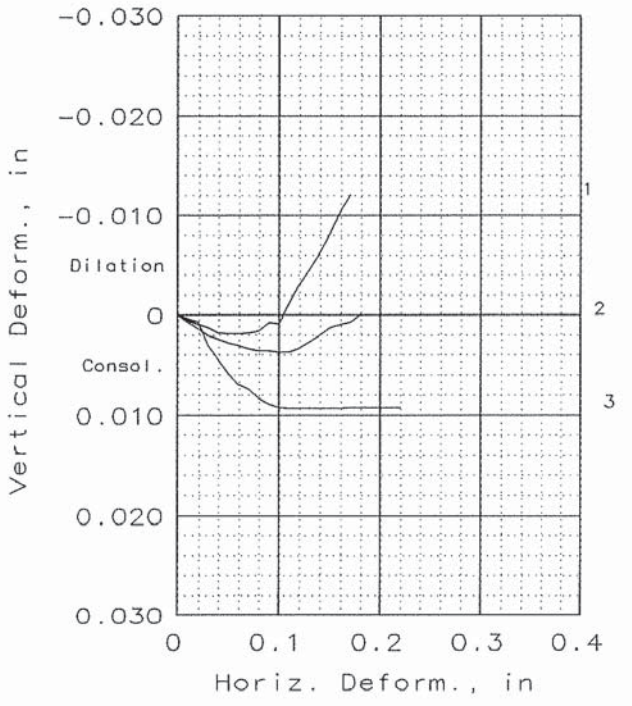
SAMPLE LOCATION: B97-10; L5

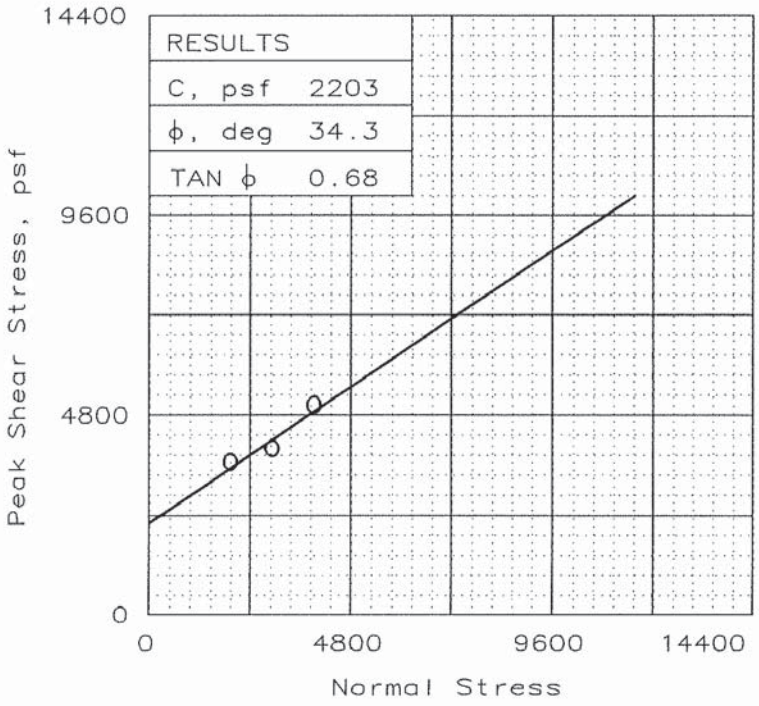
PROJ. NO.: 4143.3 DATE: 12-12-97

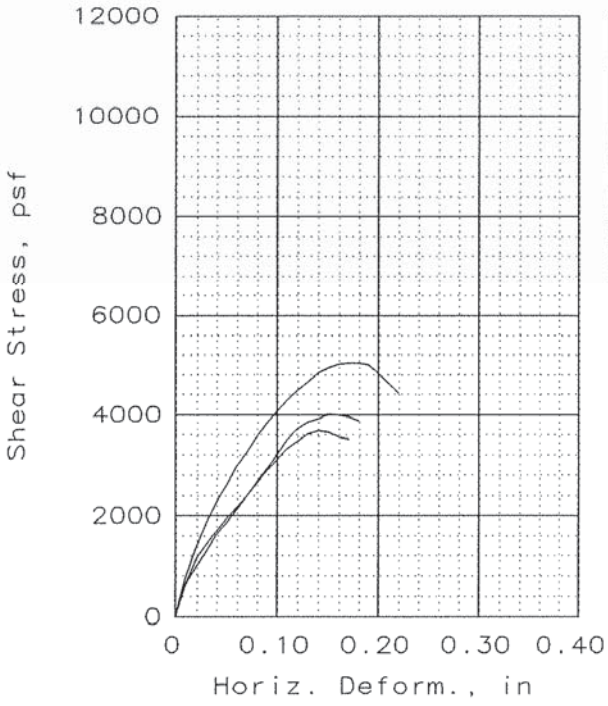
DIRECT SHEAR TEST REPORT

ANDERSON CONSULTING GROUP

FIG. NO. A-5







SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	27.3	30.5	33.0
	DRY DENSITY, pcf	92.4	91.7	88.6
	SATURATION, %	91.8	100.4	100.8
	VOID RATIO	0.790	0.805	0.868
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	30.3	29.2	29.8
	DRY DENSITY, pcf	94.6	94.6	92.1
	SATURATION, %	107.4	103.3	99.1
	VOID RATIO	0.748	0.749	0.797
	DIAMETER, in	2.38	2.38	2.38
	HEIGHT, in	0.98	0.97	0.96
NORMAL STRESS, psf		2000	3000	4000
MAXIMUM SHEAR, psf		3686	4005	5048
RESIDUAL SHEAR, psf				
Strain rate, %/min		0.161	0.161	0.164

SAMPLE DATA

SAMPLE TYPE: In situ

DESCRIPTION: Dark yellowish brown silty sand with gravel

LL= PL= PI=

SPECIFIC GRAVITY= 2.65

REMARKS:

FIG. NO. A-6

CLIENT:

PROJECT: Route / 65 Pleasant Grove Creek Bridge

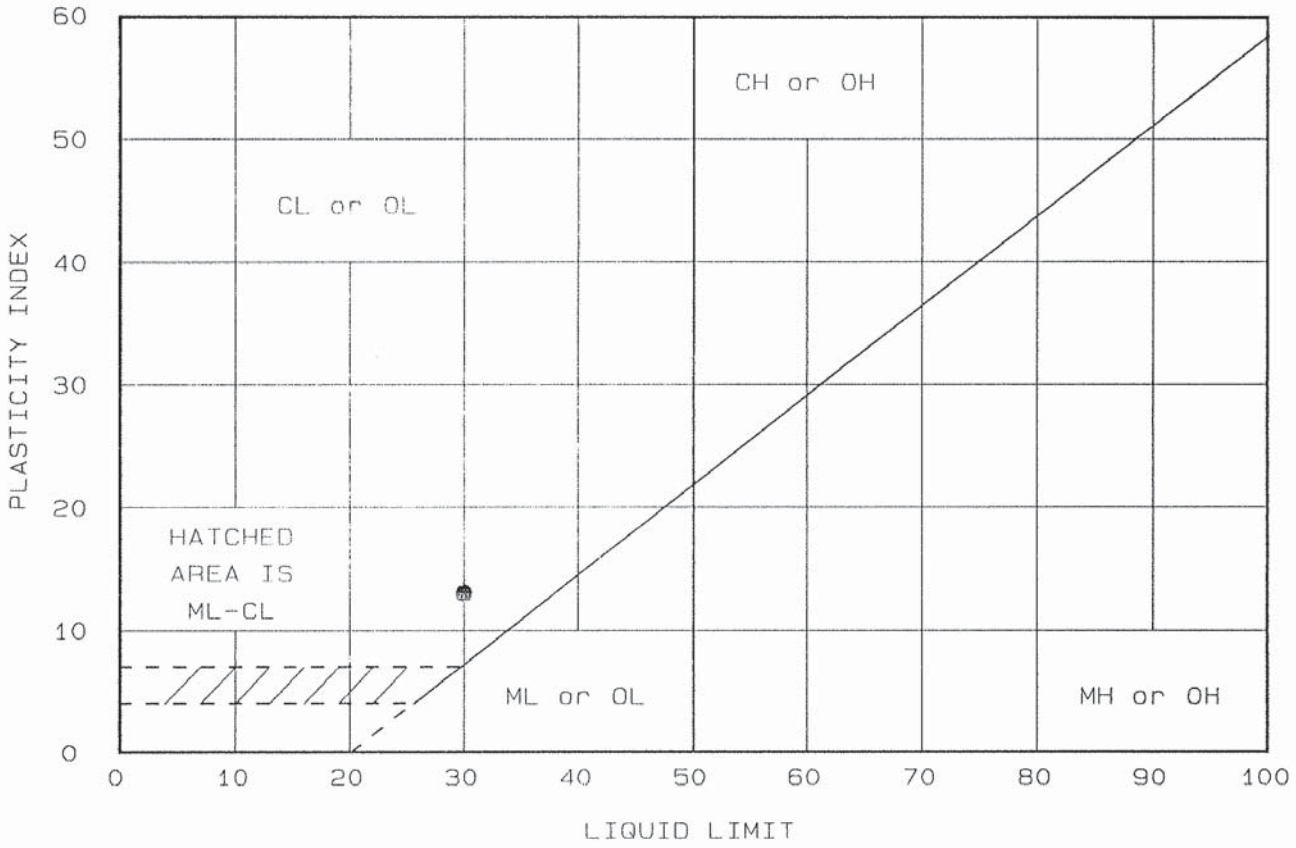
SAMPLE LOCATION: B97-10; L6

PROJ. NO.: 4143.3 DATE: 12-22-97

DIRECT SHEAR TEST REPORT

ANDERSON CONSULTING GROUP

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-8; L1; Very dark grayish brown sandy lean clay	30	17	13	53.7	CL, Sandy lean clay

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-8; L1

Date: 12-9-97

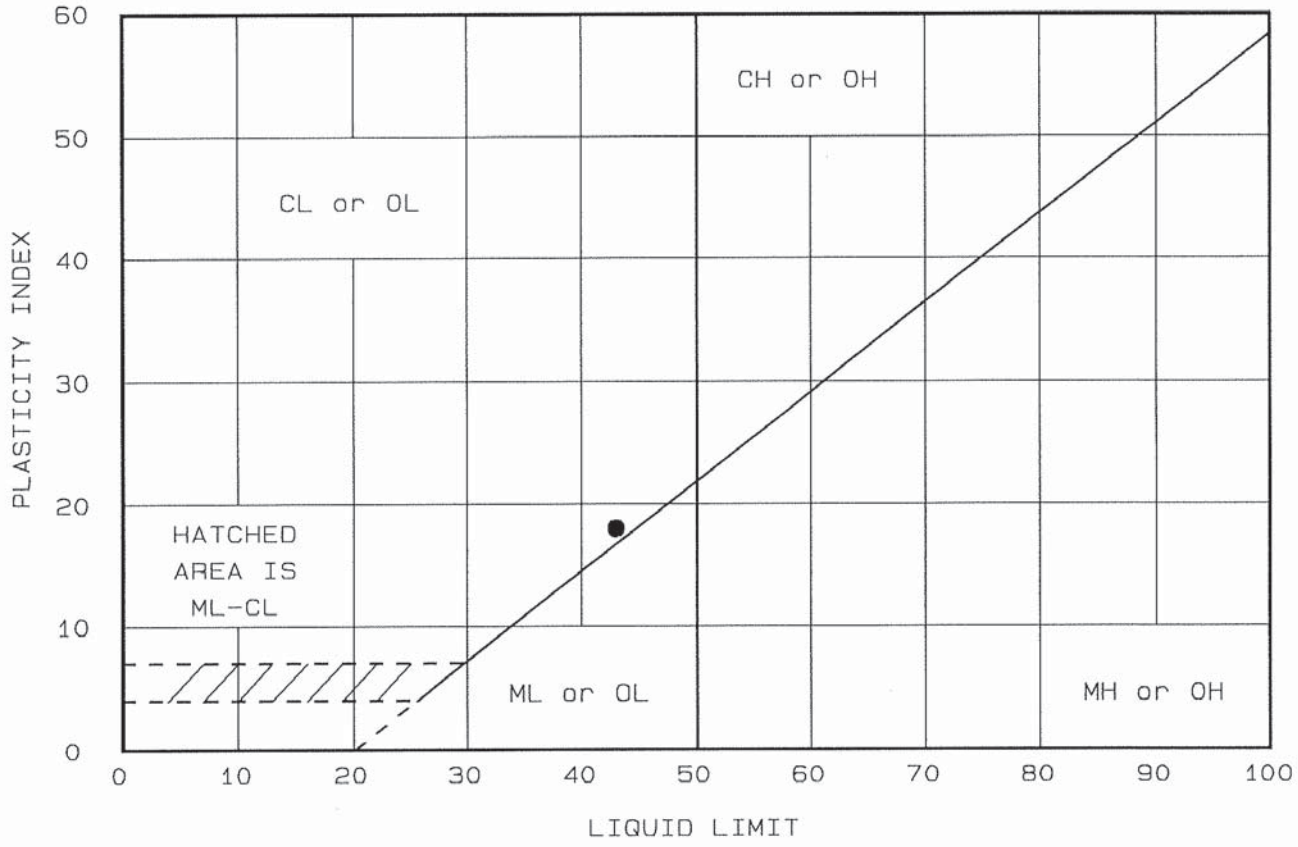
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-7

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-8; B-2; Brown lean clay with sand	43	25	18	72.3	CL, Lean clay with sand

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-8; B-2

Date: 12-29-97

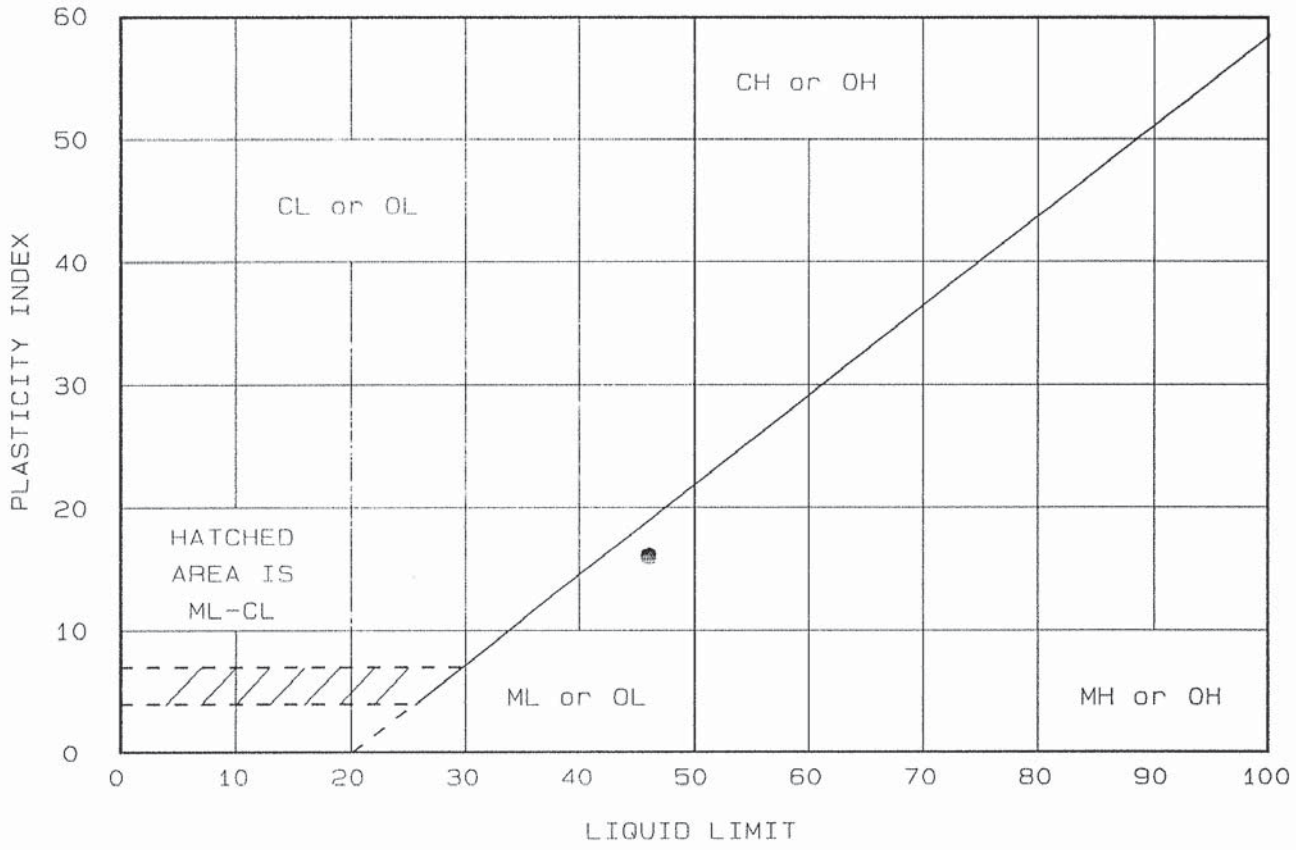
LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Remarks:

Fig. No A-8

LIQUID AND PLASTIC LIMITS TEST REPORT



Location + Description	LL	PL	PI	-200	ASTM D 2487-85
● B97-8; L4; Brown silt with sand	46	30	16	81.1	ML, Silt with sand

Project No.: 4143.2
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-8; L4

Date: 12-9-97

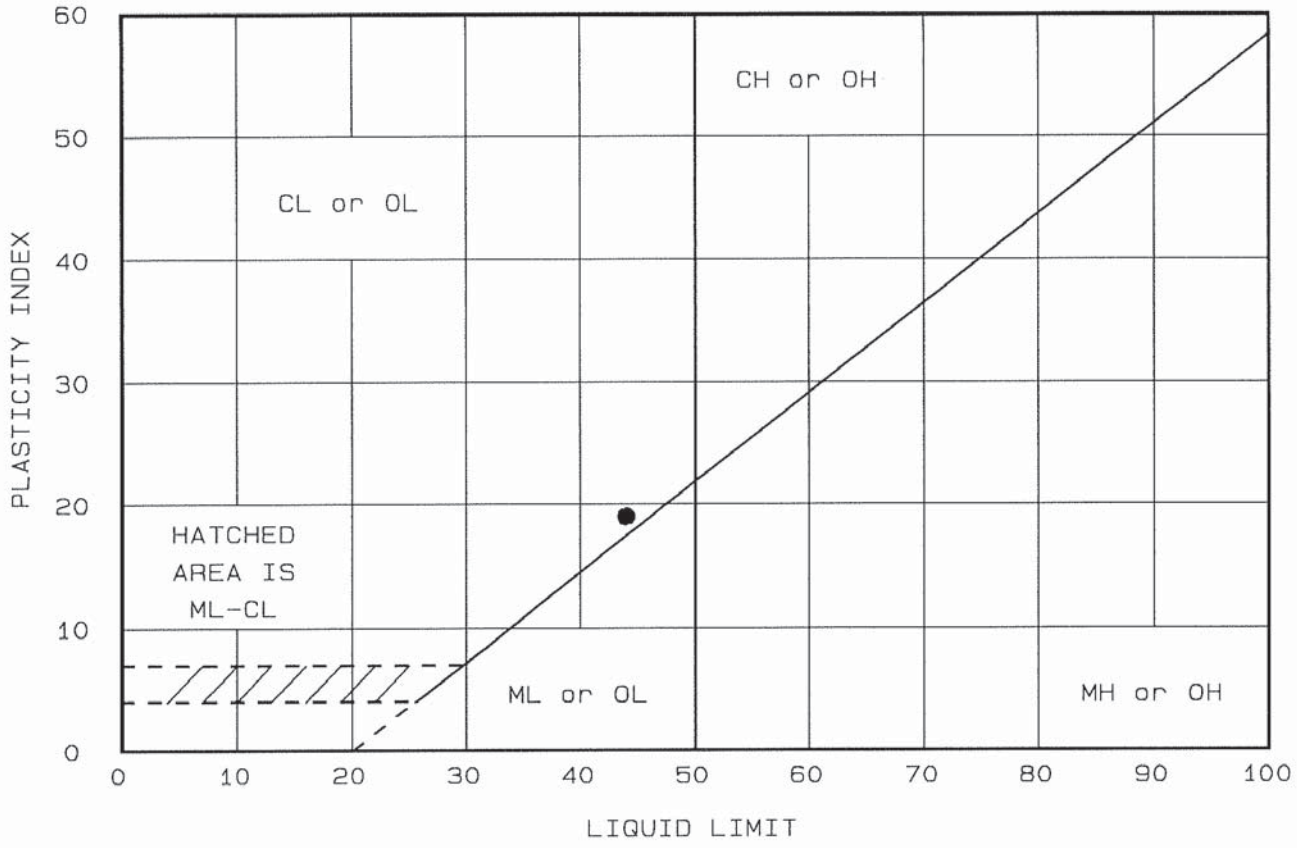
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-9

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-8; B-4 Strong brown lean clay	44	25	19	93.1	CL, Lean clay

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B-97-8; B-4

Date: 1-2-98

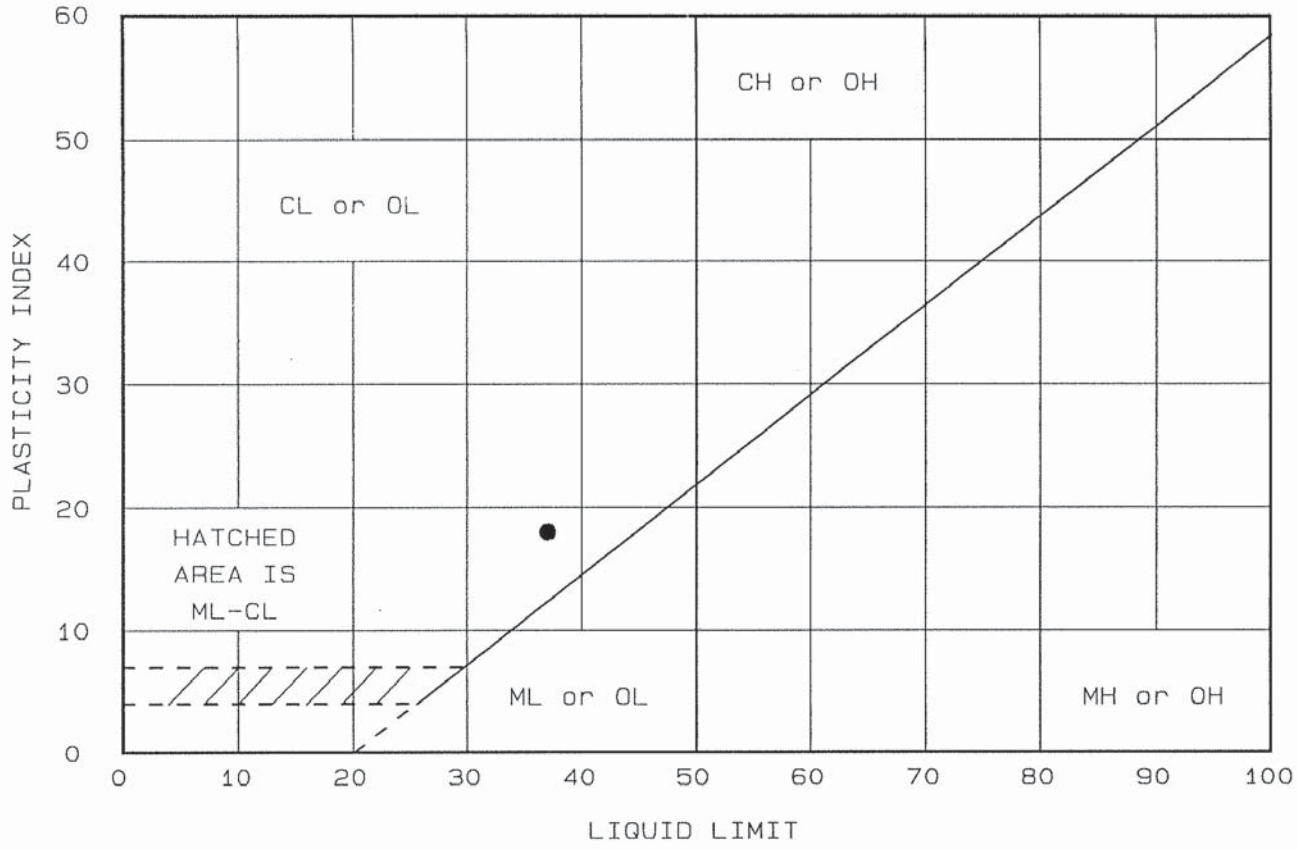
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-10

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-10; L2; Dark brown clayey sand (SC)	37	19	18	39.4	SC, Clayey sand

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-10; L2

Date: 12-15-97

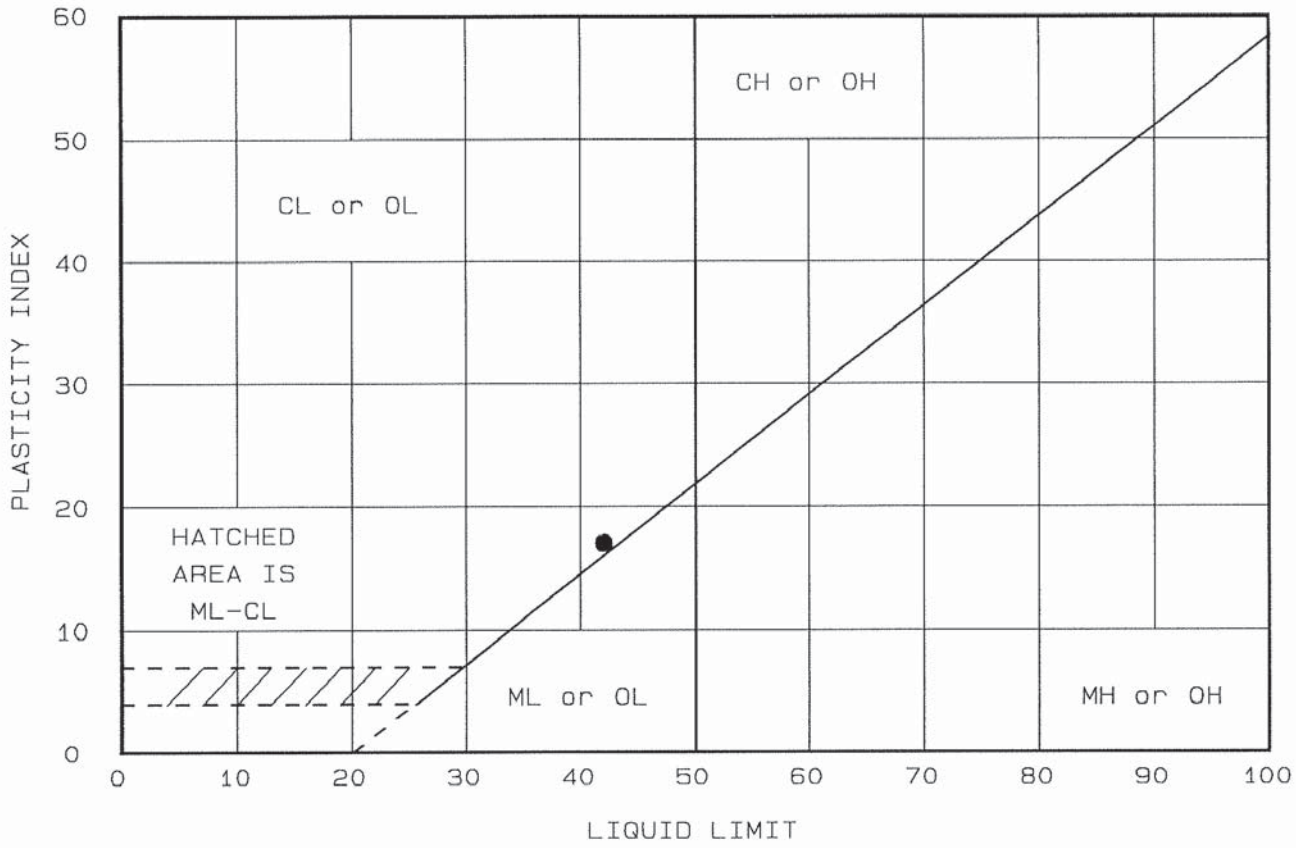
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-11

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-10; B-3; Grayish brown lean clay with sand	42	25	17	75.6	CL, Lean clay with sand

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-10; B-3

Date: 12-29-97

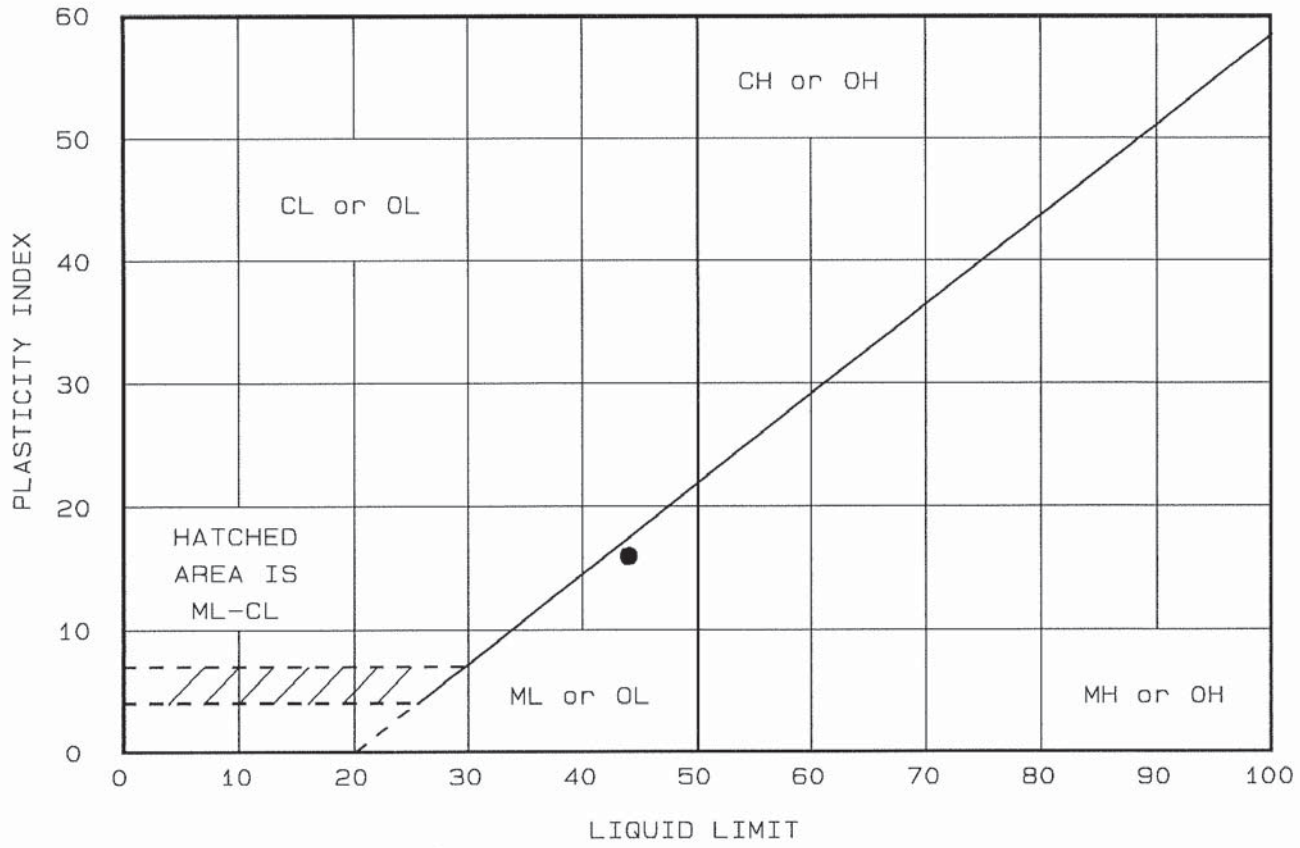
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-12

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-10; B-4 Yellowish brown silt	44	28	16	91.5	ML, Silt

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-10; B-4

Date: 1-2-98

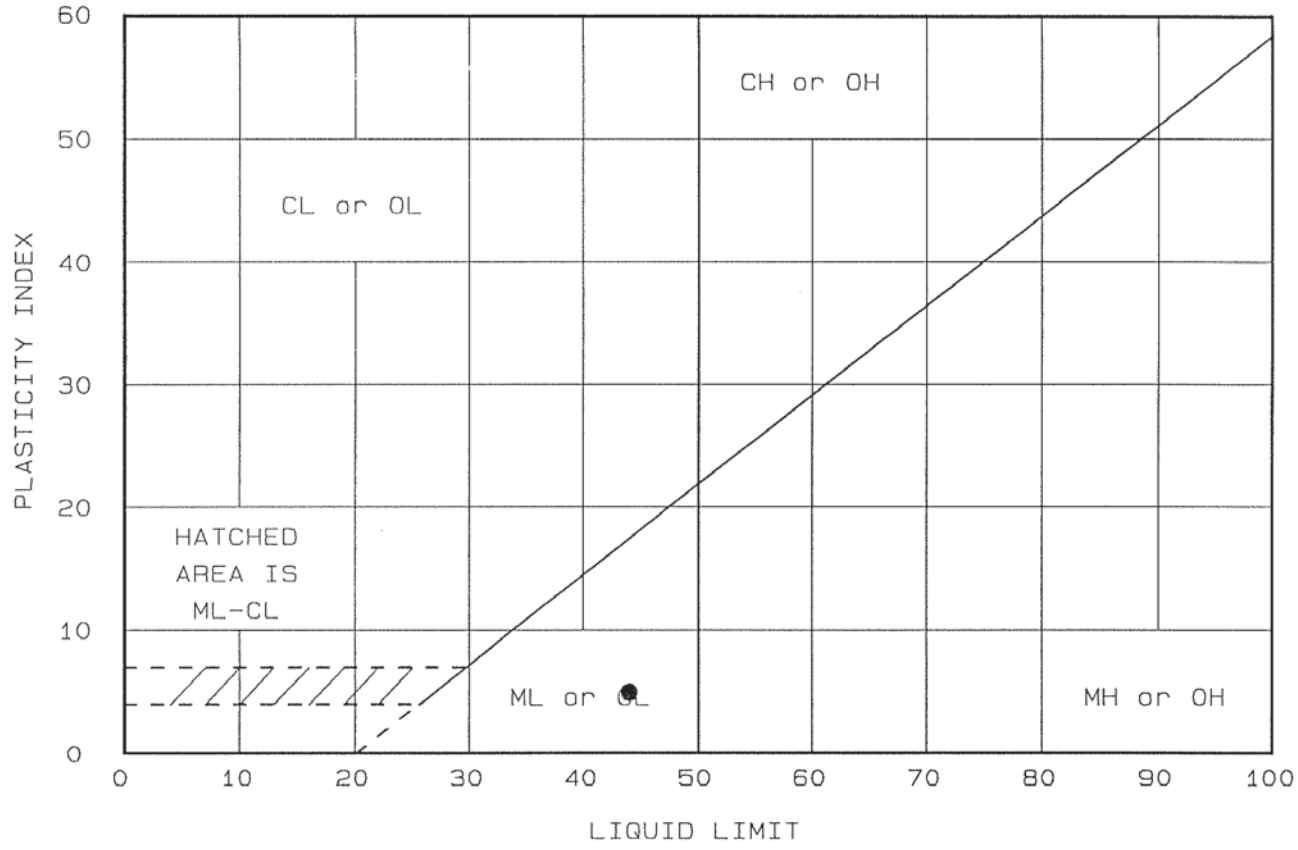
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-13

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-10; L5; Light brownish gray silt with sand	44	39	5	79.8	ML, Silt with sand

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-10; L5

Date: 12-15-97

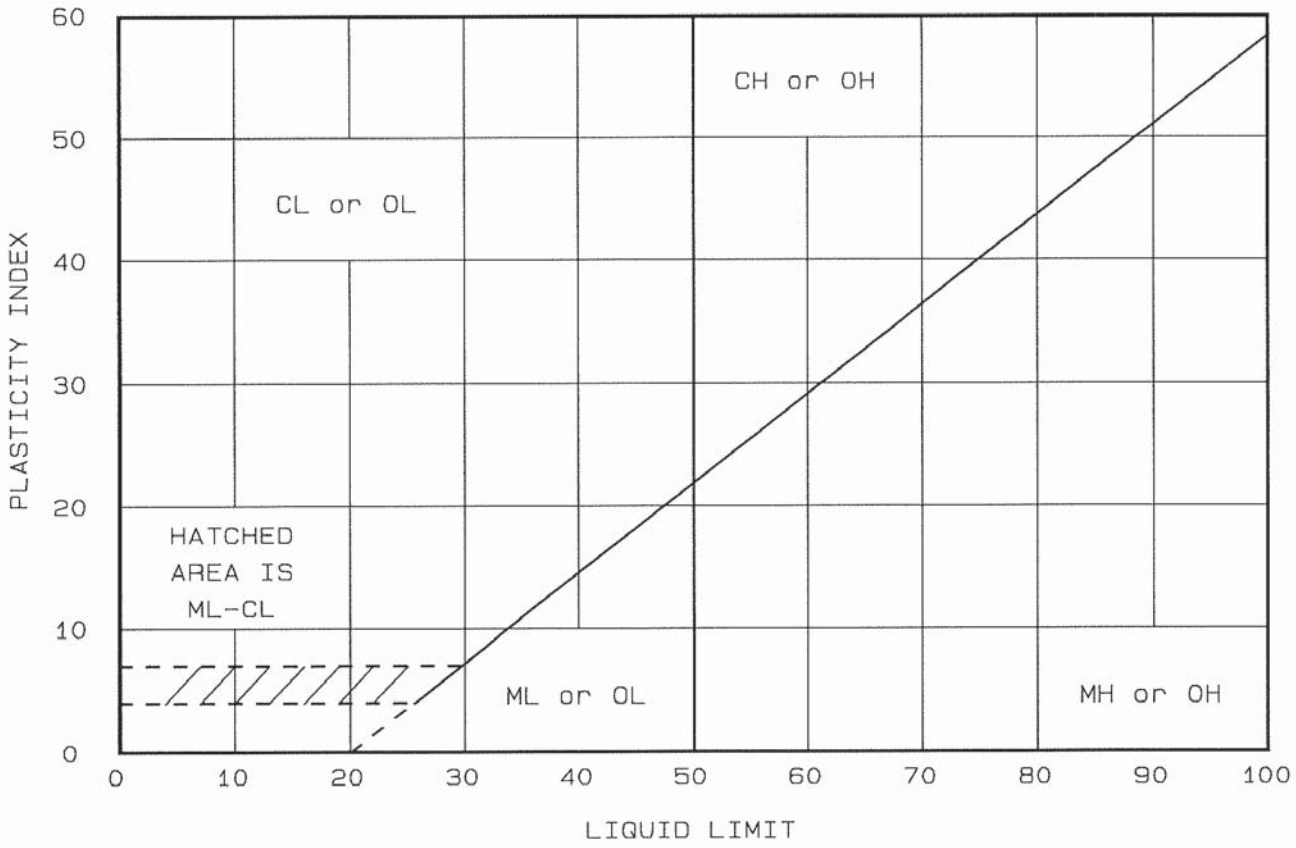
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-14

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
●	B97-10; L6 Dark yellowish brown sand with silt & gravel	NV	NP	None	11.1	SP-SM, Poorly graded sand with silt and gravel

NV - Non-Viscous NP - Non-Plastic

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge

Client:
Location: B97-10; L6

Date: 1-2-98

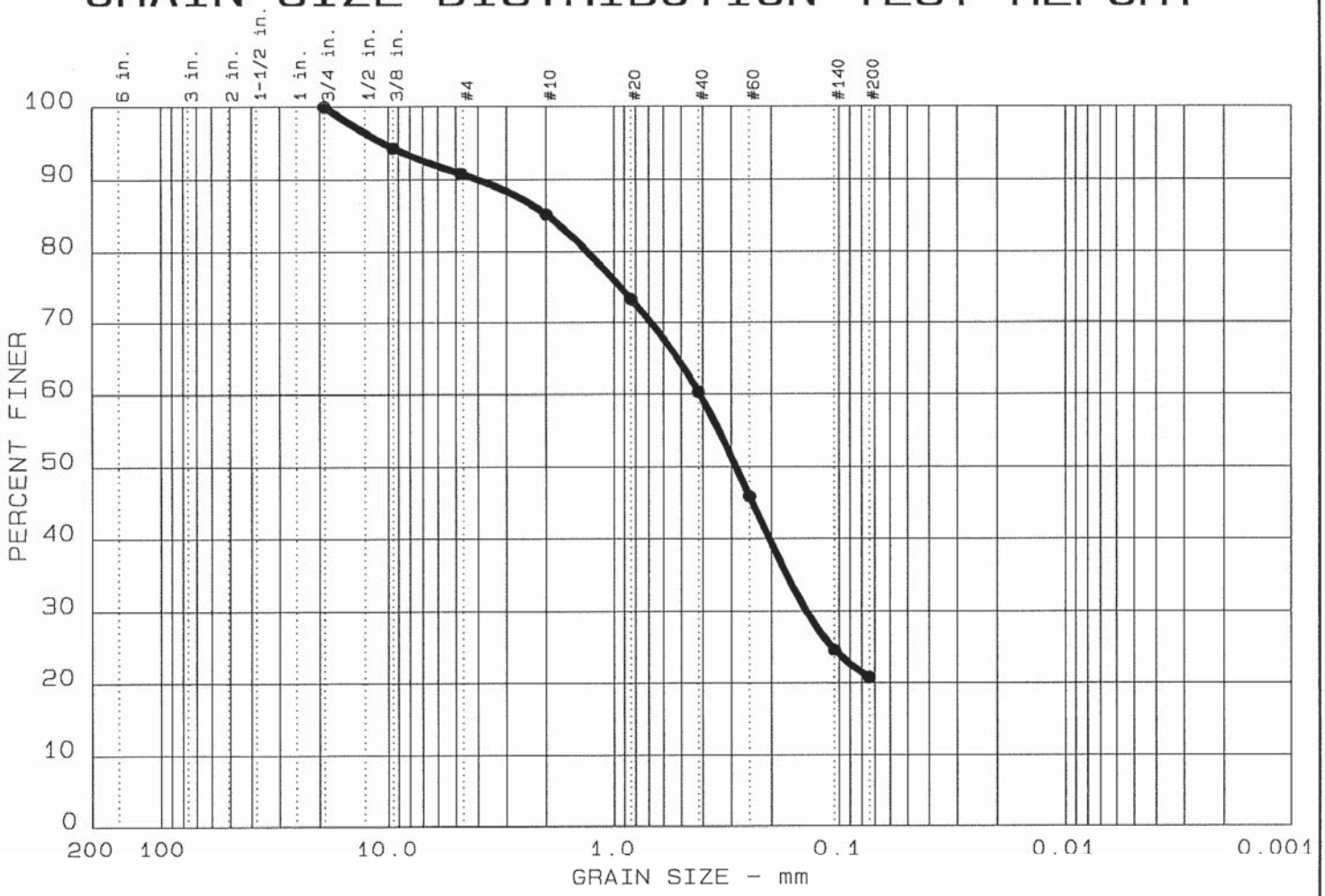
Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT

ANDERSON CONSULTING GROUP

Fig. No. A-15

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	7	0.0	9.2	70.1	20.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			1.95	0.41	0.29	0.139				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown silty sand	SM	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-8; B-5

Date: 1-2-98

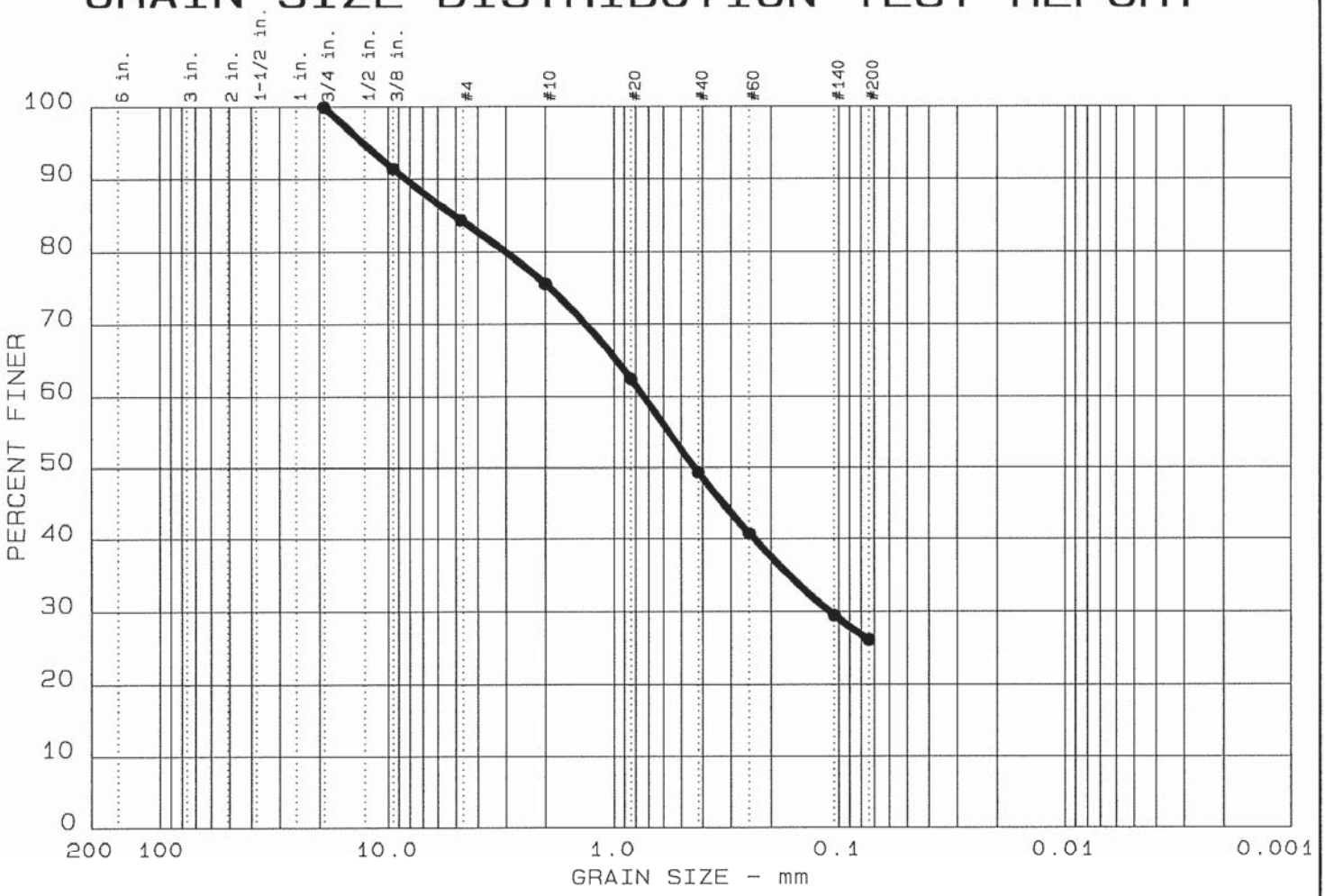
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-16

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	15.6	58.2	26.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			5.07	0.73	0.43	0.110				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown silty sand with gravel	SM	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-8; B-7 & B-8 combined

Date: 1-2-98

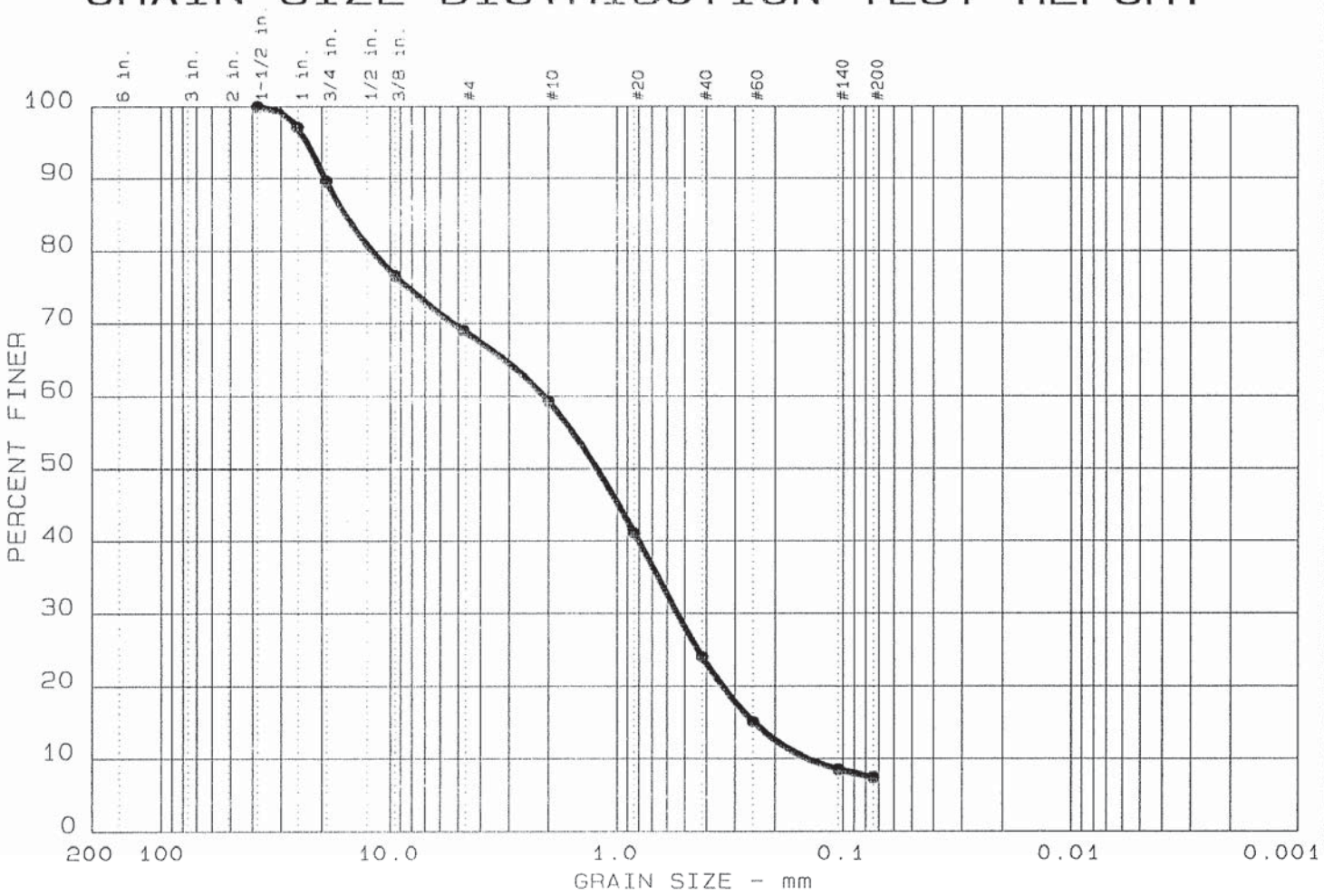
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-17

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	4	0.0	31.0	61.6	7.4	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			15.67	2.09	1.22	0.537	0.2483	0.1445	0.95	14.5

MATERIAL DESCRIPTION	USCS	AASHTO
● Drk yellowish brown sand with clay and gravel	SP-SC	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-9; BC-10-3

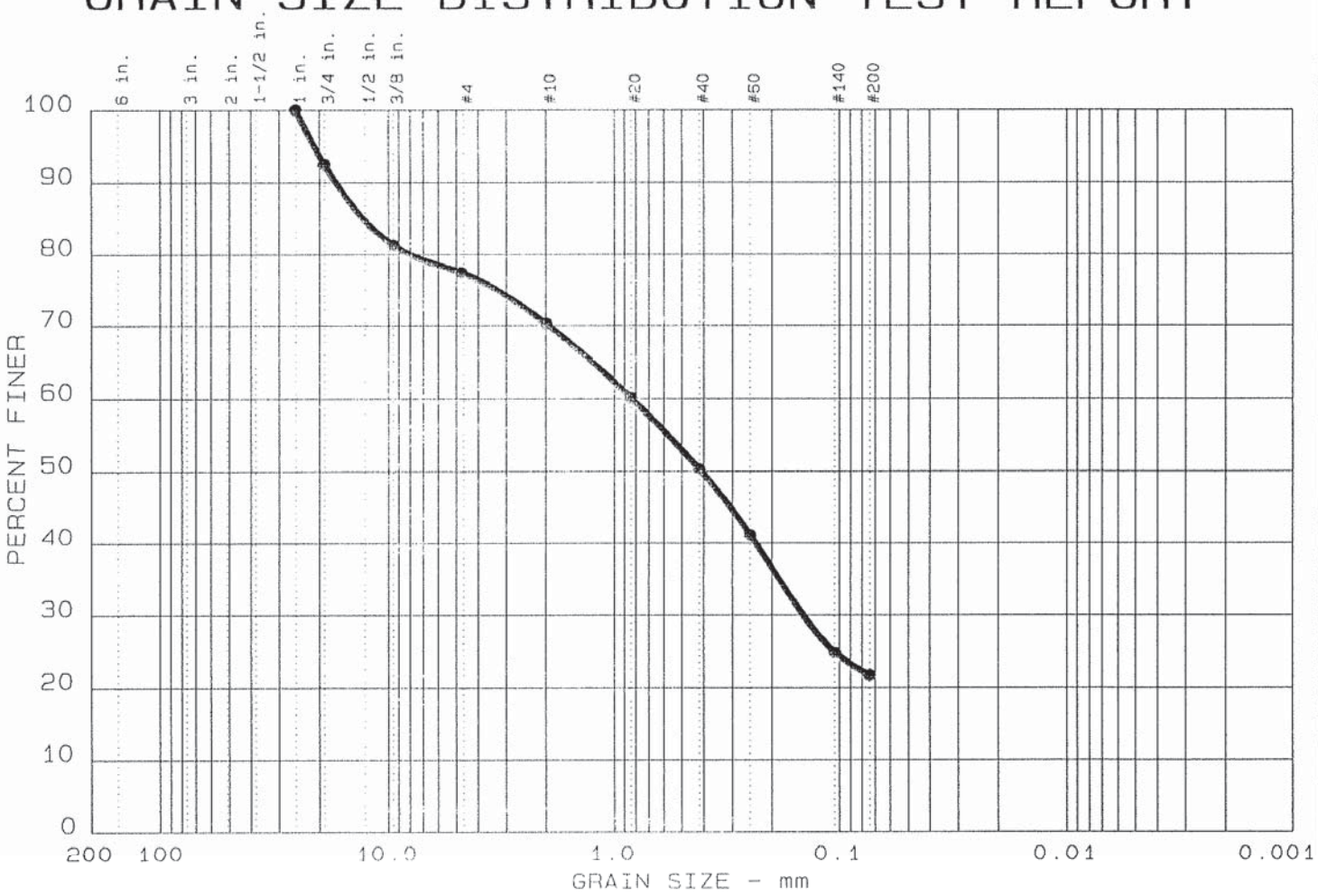
Date: 12-3-97

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT
ANDERSON CONSULTING GROUP

Figure No. A-18

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	22.6	55.6	21.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
●			12.88	0.83	0.41	0.145				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark brown clayey sand with gravel	SC	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-10; B-1

Date: 12-3-97

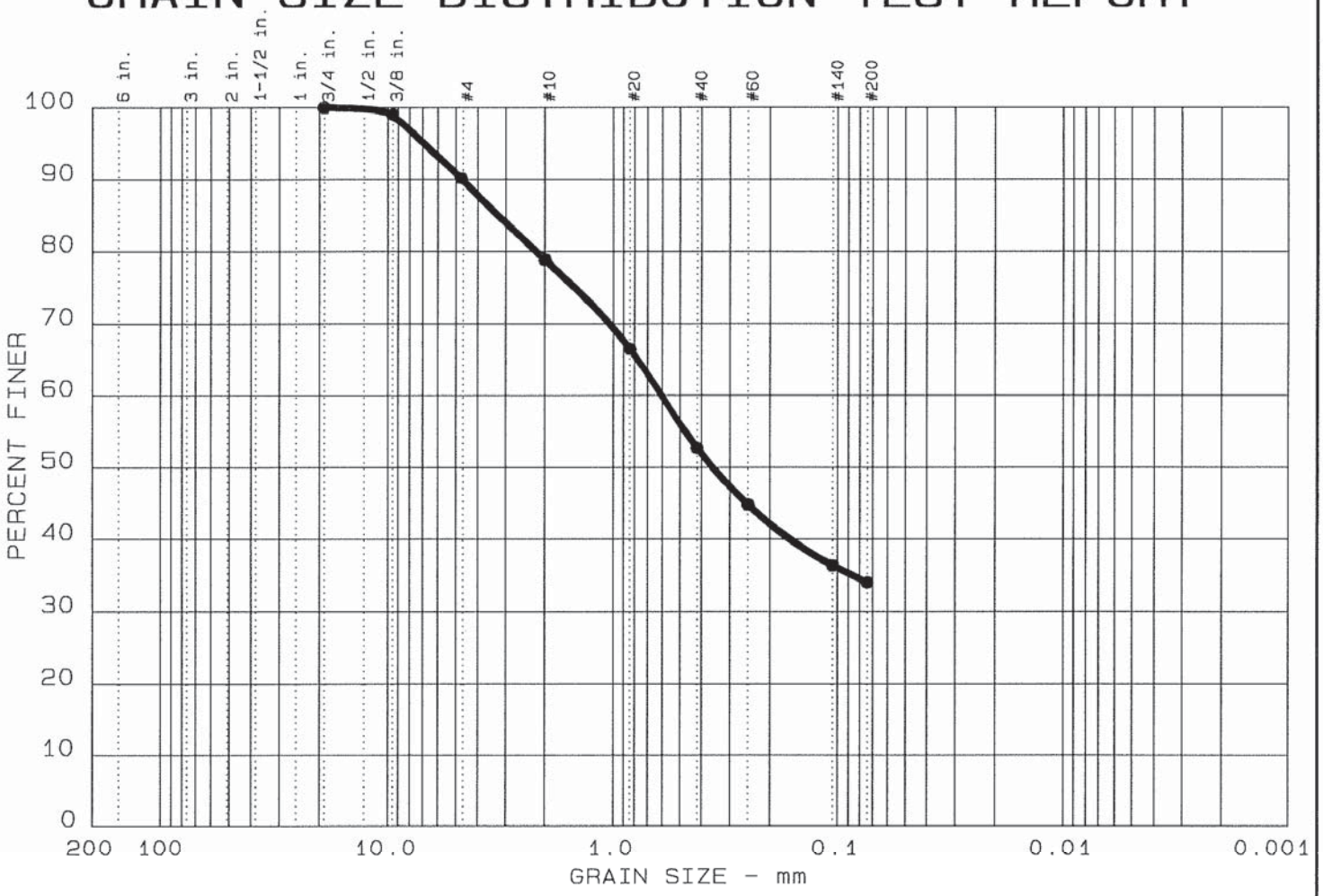
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-19

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	9.8	56.1	34.1	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			3.24	0.60	0.36					

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowish brown silty sand	SM	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-10; B-2

Date: 1-2-98

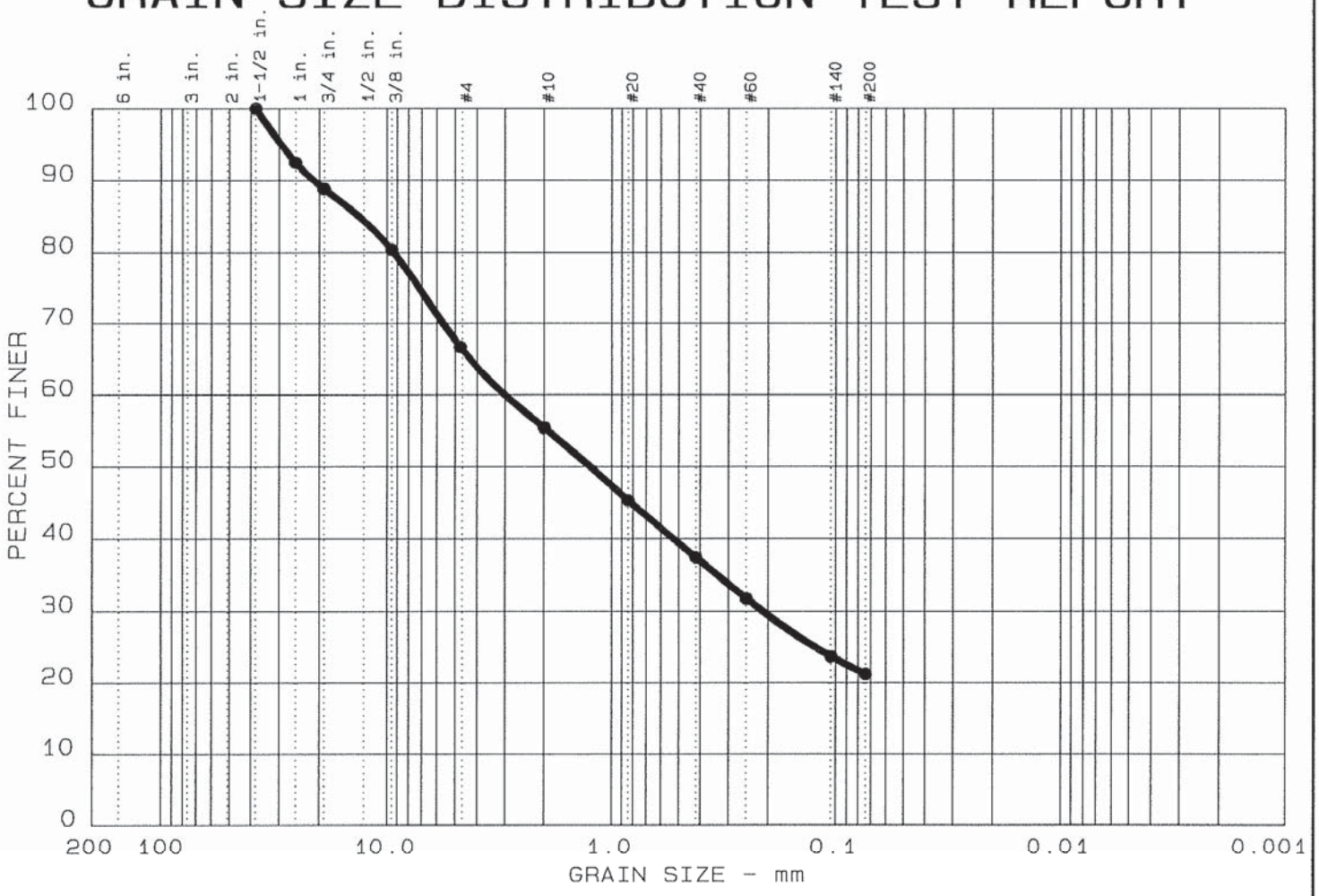
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-20

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	5	0.0	33.3	45.5	21.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			13.34	2.99	1.24	0.209				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowish brown silty sand with gravel	SM	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-10; B-5

Date: 12-26-97

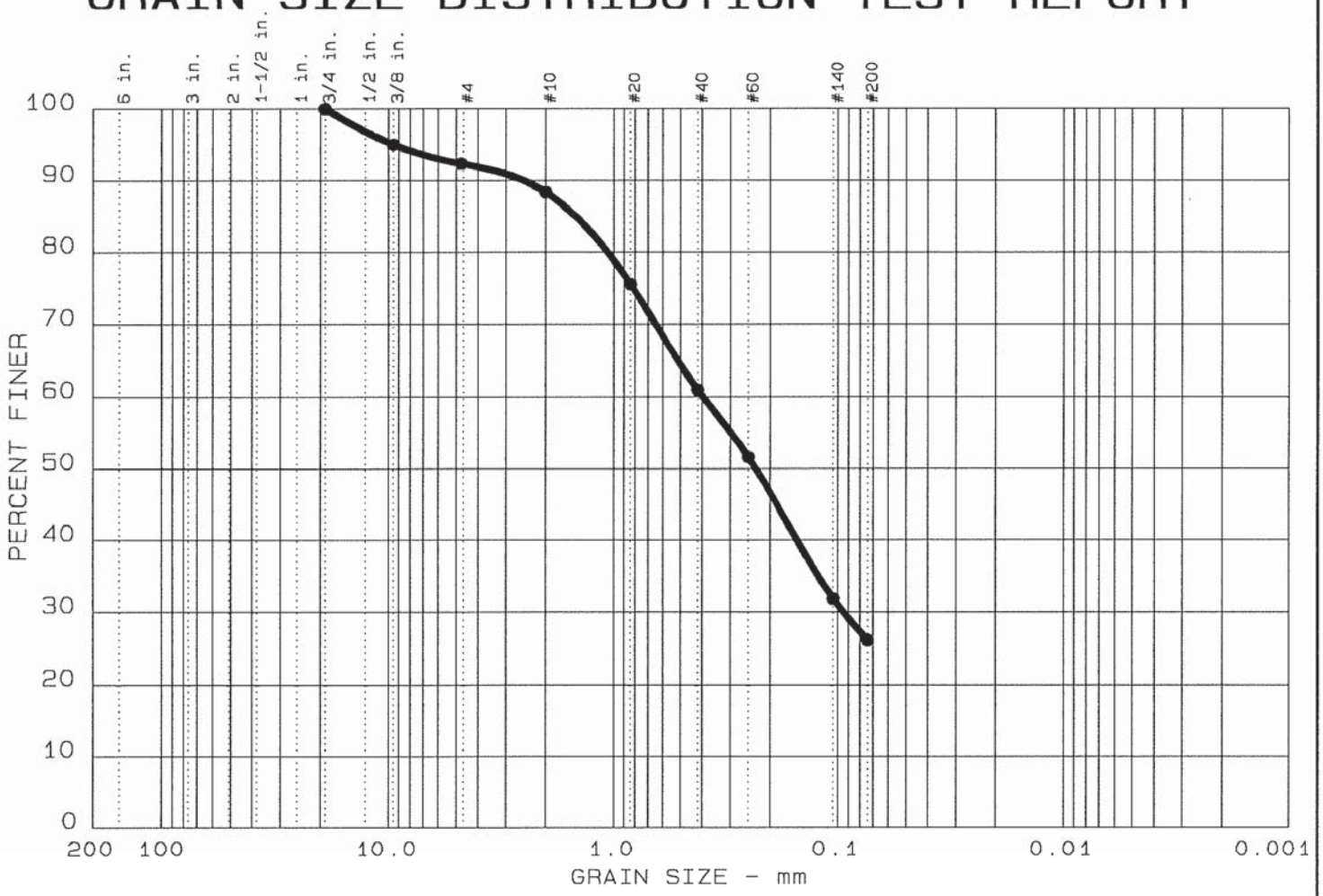
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-21

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	7.6	66.2	26.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			1.46	0.40	0.23	0.094				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowish brown silty sand	SM	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-10; B-6

Date: 1-2-98

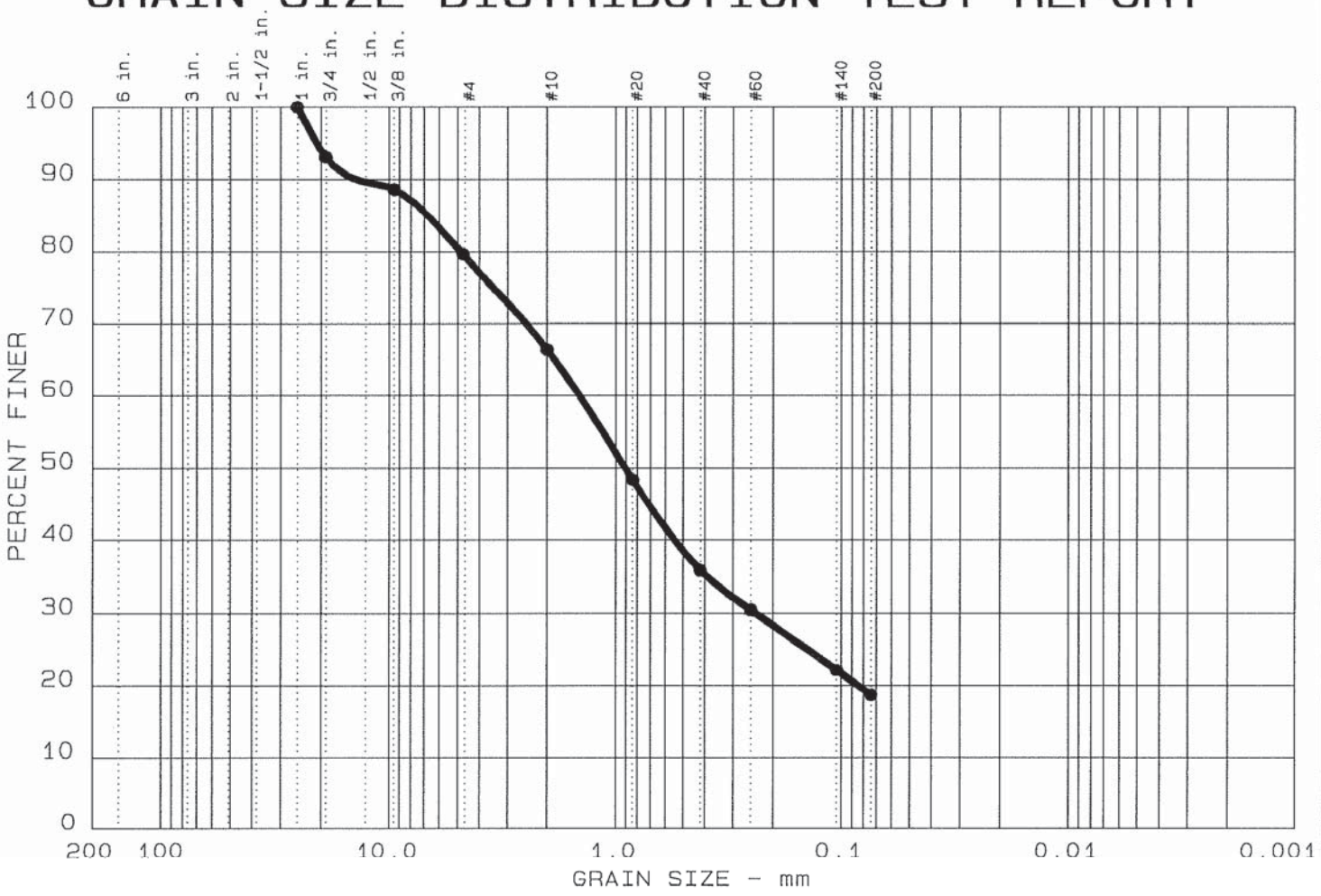
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-22

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	6	0.0	20.3	61.0	18.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
●			6.76	1.43	0.90	0.237				

MATERIAL DESCRIPTION	USCS	AASHTO
● Dark yellowish brown silty sand with gravel	SM	

Project No.: 4143.3
Project: Route 65 / Pleasant Grove Creek Bridge
● Location: B97-10; B-7

Date: 12-26-97

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

ANDERSON CONSULTING GROUP

Figure No. A-23

Sunland Analytical Lab, Inc.

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 01/09/98
Date Submitted 01/06/98

To: Craig Newport
Anderson Consulting Group
631 Commerce Dr.
Roseville, CA 95678

From: Gene Oliphant, Ph.D.
General Manager

The following is the report of analysis requested on SUN Order 18592.
Your purchase order number is .
Thank you for your business.

SUN #	Sample Describ	Sample #	Chloride as ppm Cl /Dry Wt.	Sulfate as ppm SO4 /Dry Wt.
41178	4143.3/B97-8;L-2		29.6	36.3
41179	4143.3/B97-8;B-3		14.8	12.1

Methods: Sulfate-Cal Trans #417, Chloride-Cal Trans #422