Ann M. Stillman
Director

County Government Center
555 County Center, 5th Floor
Redwood City, CA 94063
650-363-4100 T
650-361-8220 F
www.smcgov.org

February 17, 2023

COUNTY OF SAN MATEO

SAN CARLOS AIRPORT RUNWAY 12-30 & CONNECTOR TAXIWAY REHABILITATION PROJECT

COUNTY PROJECT NO. ASL03
PROJECT FILE NO. E5077

ADDENDUM NO. 2

TO ALL PLAN HOLDERS:

The following **Addendum No. 2** to the above referenced project, dated January 27, 2023, shall be included in the project plans and specifications.

1. Notes 18 to 20 have been deleted on Plan Sheet GI002. Sheet GI002 shall be replaced in the Project Plans:

   Replace plan sheet GI002 with plan sheet GI002 (rev2).

2. A contractors secondary staging area has been added and shown on Plan Sheet GC102. Sheet GC102 shall be replaced in the Project Plans:

   Replace plan sheet GC102 with plan sheet GC102 (rev2).

3. Detail B2 on Plan Sheet CP501 has been revised. Sheet CP501 shall be replaced in the Project Plans:

   Replace plan sheet CP501 with plan sheet CP501 (rev2).

4. The DBE and Good Faith Efforts documentation submittal date has been changed. Pages 4, and 45 to 51 of the PR (Proposal) Section shall be replaced in the Project Specifications:

   Replace pages 4, and 45 to 51 of the PR Section with pages 4 (rev2), and 45 (rev2) to 51 (rev2).

5. The DBE and Good Faith Efforts documentation submittal date has been changed. Pages 6 to 8, 23 and 24 of the SP (Special Provision) Section shall be replaced in the Project Specifications:

   Replace pages 6 to 8, 23 and 24 of the SP Section with pages 6 (rev2) to 8 (rev2), 23 (rev2), and 24 (rev2).

6. Report for Geotechnical Engineering Investigation dated 12/20/2021 by BAGG Engineers has been included with this Addendum for informational purposes:

   Geotechnical Engineering Investigation (93 sheets total) dated 12/20/2021 is provided for informational purposes only.

Please sign and return the attached "Receipt of Addendum No. 2" form. The "Receipt of Addendum No. 2" form MUST be received in this office no later than 2:00 PM, Wednesday, March 1, 2023 or the bid will NOT be considered. The Receipt of Addendum can be emailed to Krzysztof Lisaj attention email at klisaj@smcgov.org, with carbon copy to wng@smcgov.org and azhang@smcgov.org.

All plan holders should check the project webpage for the latest updates on Request for Information. The project webpage address is: https://www.smcgov.org/publicworks/san-carlos-airport-runway-rehab-project

If you have any questions or require additional information, please contact Alex Zhang, Wency Ng, or Krzysztof Lisaj of our office at (650) 363-4100. They can also be reached by e-mail at:

azhang@smcgov.org
wng@smcgov.org
klisaj@smcgov.org

Very truly yours,

Ann M. Stillman
Director of Public Works

AMS:KL:WN:AZ
F:\Users\design\C3D\E5077000_San Carlos Airport Runway\Bidding\Addendum\Addendum No. 2\Addendum No.2.docx

Encl.- "Receipt of Addendum No. 2" Form
Revised Plan Sheet GI002 (rev2)
Revised Plan Sheet GC102 (rev2)
Revised Plan Sheet CP501 (rev2)
Revised Pages 4 (rev2) and 45 (rev2) to 51 (rev2) of the PR Section
Revised Pages 6 (rev2) to 8 (rev2), 23 (rev2), and 24 (rev2) of the SP Section
Geotechnical Engineering Investigation (93 sheets) dated 12/20/2021

cc: Gretchen Kelly, Acting Deputy Director of Public Works, Administration
Michael Byrne, Acting Airport Manager
Krzysztof Lisaj, Principal Civil Engineer, Engineering and Construction
Wency Ng, Senior Civil Engineer, Project Development and Design
Alex Zhang, Associate Civil Engineer, Project Development and Design

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Director

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February 17, 2023

COUNTY OF SAN MATEO

SAN CARLOS AIRPORT RUNWAY 12-30 & CONNECTOR TAXIWAY REHABILITATION PROJECT

COUNTY PROJECT NO. ASL03
PROJECT FILE NO. E5077

RECEIPT OF ADDENDUM NO. 2

I, _____, an authorized representative for _____, have received **Addendum No. 2** for the San Carlos Airport Runway 12-30 & Connector Taxiway Rehabilitation Project from an authorized representative of the County of San Mateo, which is to be included in the Specifications for the above referenced project.

This form must be signed and received in the offices of the County of San Mateo, Department of Public Works ***no later than*** **2:00 P.M., Wednesday, March 1, 2023.**

"Contractor"

_____
(Print)

_____
(Signature)

_____
(Date)

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR'S ATTENTION IS DIRECTED TO SECTION 70-08, ATTACHMENT A - CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) OF THE GENERAL PROVISIONS.
2. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON RECORD DRAWINGS AND/OR CAD FILES FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THOSE UTILIZING THE INFORMATION ON THESE DRAWINGS ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY PURPOSE.
3. EXISTING UTILITIES WERE TAKEN FROM PLANS OF RECORD. THEY HAVE BEEN SHOWN TO THE EXTENT KNOWN AND ARE OFFERED IN GOOD FAITH SOLELY FOR INFORMATIONAL PURPOSES. THEY MAY NOT REFLECT ACTUAL LOCATIONS AND MAY NOT BE INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
4. THE ACTUAL LOCATION AND ELEVATION OF ALL UTILITIES SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
5. IN THE EVENT OF DAMAGE TO EXISTING UTILITIES OR CABLES, THE ENGINEER AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
6. THE CONTRACTOR SHALL REPAIR ALL DAMAGE TO UTILITIES OR CABLES, AS DIRECTED BY THE ENGINEER, IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.
7. ALL AREAS DISTURBED AS A RESULT OF THE CONTRACTOR'S STAGING AND CONSTRUCTION OPERATIONS SHALL BE RESTORED EQUAL TO OR BETTER THAN ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
8. DURING THE WORK OF THIS CONTRACT, THE CONTRACTOR SHALL FURNISH, ERECT AND MAINTAIN WHATEVER TEMPORARY LIGHTING MAY BE NECESSARY TO KEEP THE TAXIWAY IN OPERATING CONDITION WHEN OPEN FOR AIRCRAFT.
9. ALL DIRT, DUST, STONES AND LOOSE DEBRIS SHALL BE CONTINUOUSLY REMOVED FROM ALL PAVED SURFACES DURING THIS CONTRACT.
10. THE CONTRACTOR SHALL RECONSTRUCT AND MAINTAIN EXISTING ACCESS ROADS AS REQUIRED FOR ACCESS TO THE WORK AREAS.
11. PROPOSED ACCESS ROADS SHALL BE REMOVED UPON COMPLETION OF WORK AND THE AREA RESTORED TO ORIGINAL CONDITION.
12. ALL OF THE CONTRACTOR'S OPERATIONS SHALL REMAIN ON AIRPORT PROPERTY AT ALL TIMES. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR BE ALLOWED ON ADJACENT PROPERTY.
13. THIS CONTRACT DOES NOT ALLOW FOR PRICE INCREASES DUE TO ESCALATION IN COST OF UNIT BID ITEMS. THE CONTRACTOR SHALL TAKE THIS INTO CONSIDERATION WHEN PREPARING UNIT PRICES FOR BID.
14. THE COST OF ALL FAILING TESTS PERFORMED BY THE OWNER OR ON THE OWNER'S BEHALF SHALL BE BORNE BY THE CONTRACTOR.

GRADING AND EXCAVATION NOTES

15. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL STRIP AND STOCKPILE ALL MATERIAL SUITABLE FOR TOPSOILING.
16. SELECTIVE GRADING SHALL BE REQUIRED AS DIRECTED BY THE ENGINEER.
17. QUALITY ASSURANCE TESTS WILL BE MADE BY AND AT THE EXPENSE OF THE OWNER, UNLESS OTHERWISE NOTED. THE COST OF ALL FAILING TESTS SHALL BE BORNE BY THE CONTRACTOR.

2

~~18. THE QUANTITY OF UNCLASSIFIED EXCAVATION, ITEM P-152, INCLUDES 21,580 CY OF UNDERCUT EXCAVATION WHICH WILL BE USED ONLY WHEN DIRECTED BY THE ENGINEER.~~

~~19. THE QUANTITY OF CRUSHED STONE BASE COURSE, ITEM P-209, INCLUDES 36,930 SY FOR REPLACEMENT OF UNDERCUT EXCAVATION WHICH WILL BE USED ONLY WHEN DIRECTED BY THE ENGINEER.~~

~~20. THE QUANTITY OF SEPARATION FABRIC, ITEM P-154/P-208/P-209, INCLUDES 13,870 (8" THICK) SY AND 23,060 (11" THICK) SY FOR PLACEMENT IN UNDERCUT AREAS WHICH WILL BE USED ONLY WHEN DIRECTED BY THE ENGINEER.~~

21. THE EXACT LOCATIONS AND DIMENSIONS OF PAVEMENT TO BE RECONSTRUCTED SHALL BE DETERMINED BY THE ENGINEER DURING CONSTRUCTION.
22. ALL SPOIL SHALL BE DISPOSED OF OFF-SITE AT THE CONTRACTORS EXPENSE.
23. THE LIMIT FOR TOPSOILING, SEEDING, AND MULCHING ARE THE LIMITS OF GRADING SHOWN ON THE GRADING PLANS. ALL AREAS OUTSIDE OF THE GRADING LIMITS WHICH ARE DISTURBED SHALL BE RESTORED BY THE CONTRACTOR AT HIS EXPENSE.
24. THE COMBINATION OF SILT/CLAY SOILS AND HIGH NATURAL MOISTURE CONTENTS CREATE THE POTENTIAL FOR LOSS OF STRENGTH UNDER REPETITIVE LOADINGS OR VIBRATION. THE CONTRACTOR SHOULD TAKE THESE FACTORS INTO CONSIDERATION WHEN SELECTING EQUIPMENT, METHODS AND MEANS FOR CONSTRUCTION OF THIS PROJECT, AS WELL AS HAULING EQUIPMENT THAT WILL OPERATE IN THE AREA THROUGHOUT CONSTRUCTION. ANY DAMAGE TO THE SUBGRADE CONDITION AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO EQUAL OR BETTER THAN ORIGINAL CONDITION, AS DIRECTED BY THE ENGINEER AND ALL AT THE CONTRACTOR'S EXPENSE.
25. TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL WORK PERFORMED FOR PROTECTION OF CONSTRUCTION AREAS OUTSIDE THE CONSTRUCTION LIMITS, SUCH AS BORROW AREAS AND WASTE AREAS, HAUL ROADS, EQUIPMENT AND MATERIAL STORAGE SITES, AND TEMPORARY PLANT SITES, WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT SHALL BE CONSIDERED AS A SUBSIDIARY OBLIGATION OF THE CONTRACTOR.
26. ALL SOIL EROSION AND SEDIMENT CONTROL DEVICES AND MATERIALS SHALL BE IN PLACE PRIOR TO BEGINNING EARTHWORK OPERATIONS AND SHALL BE MAINTAINED UNTIL THE NEW SLOPES ARE STABILIZED WITH SEEDING AND/OR SLOPE PROTECTION.

SURVEY NOTES

27. FOR TYPICAL SECTIONS, THE CONTOUR INTERVAL EQUALS 1 FOOT. FOR TRANSITIONAL AREAS TO KEYWAYS, THE CONTOUR INTERVAL EQUALS 0.1 FOOT.
28. ALL ELEVATIONS REFER TO NAVD 88 VERTICAL DATUM. COORDINATES REFER NAD 83 HORIZONTAL DATUM.
29. THE TOPOGRAPHIC FEATURES SHOWN HEREON WERE COMPILED FROM FIELD SURVEY PERFORMED BY R.E.Y ENGINEERS, INC. DATED JANUARY 28 , 2019 AND OCTOBER 17, 2022.

PAVING NOTES

30. ALL AREAS TO BE OVERLAID SHALL BE PREPARED IN ACCORDANCE WITH ITEM P-101, "PREPARATION/REMOVAL OF EXISTING PAVEMENTS".
31. THE CONTRACTOR'S ATTENTION IS DIRECTED TO ITEM P-101 "PREPARATION/REMOVAL OF EXISTING PAVEMENTS" AS IT RELATES TO FILLING JOINTS AND CRACKS IN EXISTING PAVEMENT. A MIXTURE OF EMULSIFIED ASPHALT AND SAND IS REQUIRED TO FILL JOINTS AND CRACKS IN EXISTING PAVEMENT. ITEM P-605,"JOINT SEALING FILLER" WILL NOT BE ALLOWED.
32. EMULSIFIED ASPHALT TACK COAT, ITEM P-603, SHALL BE APPLIED PRIOR TO PLACING EACH LIFT OF PAVEMENT, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
33. TRANSVERSE PAVING JOINTS IN ONE LAYER SHALL LINE UP WITH TRANSVERSE JOINTS IN THE PREVIOUS LAYERS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
34. TRANSVERSE PAVING JOINTS IN ADJACENT LANES SHALL LINE UP WITH EACH OTHER EXTENDING ACROSS THE FULL WIDTH OF PAVEMENT.
35. IN CASES OTHER THAN CENTERLINE JOINTS, LONGITUDINAL PAVING JOINTS IN ONE LAYER SHALL BE OFFSET FROM THAT IN THE PREVIOUS LAYER BY AT LEAST ONE FOOT. THE JOINT AT THE CENTERLINE OF THE PAVEMENT SHALL LINE UP WITH PREVIOUS LAYER CENTERLINE JOINTS.
36. PROPOSED BITUMINOUS SURFACE COURSE TO BE INSTALLED IN PAVEMENT RECONSTRUCTION AREAS, SHALL BE SUBJECTED TO THE SAME MATERIAL ACCEPTANCE CRITERIA AS THE ASPHALT LEVELING COURSE.
37. COLD JOINTS SHALL BE SAWCUT BACK A MINIMUM OF 6 INCHES TO EXPOSE A CLEAN, SOUND, UNIFORM VERTICAL SURFACE FOR THE FULL DEPTH OF THE LIFT. THE SAWCUT SHALL NOT BE PERFORMED UNTIL THE PAVEMENT HAS REACHED AMBIENT TEMPERATURE.
38. DELAMINATED PAVEMENT SHALL BE REMOVED BY COLD MILLING. THE LIMITS OF DELAMINATED PAVEMENT SHALL BE SAW CUT. THE LOCATION OF THE LIMITS OF DELAMINATED PAVEMENT WILL BE DETERMINED BY THE ENGINEER.

ELECTRICAL AND SIGNAGE NOTES

39. ALL ELECTRICAL WORK SHALL CONFORM TO APPLICABLE LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
40. THE ELECTRICAL CHARACTERISTICS OF PROPOSED EQUIPMENT SHALL BE VERIFIED TO BE COMPATIBLE WITH EXISTING EQUIPMENT MANUFACTURER PRIOR TO INSTALLATION.
41. ABANDONED CABLES MAY EXIST IN THE VICINITY OF THE PROPOSED WORK. IF ENCOUNTERED, CONTRACTOR SHALL VERIFY THAT THEY ARE ABANDONED PRIOR TO REMOVAL. IF THEY ARE NOT ABANDONED, CABLES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
42. ITEMS OF SPECIFIC MANUFACTURE SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS AND/OR MANUFACTURER'S REPRESENTATIVE DIRECTIONS.
43. ALL GROUND CONNECTIONS SHALL BE MADE USING EXOTHERMIC CONNECTIONS.
44. GROUND RODS SHALL BE INSTALLED AT 500-FT INTERVALS ALONG COUNTERPOISE WIRE.
45. ALL CABLE CONNECTIONS SHALL BE MADE AT LIGHT UNITS OR AT ENDS OF DUCT BANKS UNLESS DIRECTED OTHERWISE.
46. THE OWNER RESERVES THE RIGHT TO SALVAGE LIGHTING EQUIPMENT. THE EQUIPMENT TO BE SALVAGED IS IDENTIFIED IN THE SPECIFICATION. SALVAGED EQUIPMENT SHALL BE STOCKPILED AT A LOCATION DESIGNATED BY THE OWNER IN PROPER WORKING CONDITION. ALL OTHER LIGHTING EQUIPMENT SHALL BE SPOILED OFF AIRPORT PROPERTY AT A PROPER DISPOSAL SITE SELECTED BY THE CONTRACTOR.
47. PROVIDE WATERTIGHT TERMINATION FOR ALL BURIED CONDUIT ENDS.
48. ALL RUNWAY AND TAXIWAY EDGE LIGHTS SHALL BE LOCATED 10 FEET OFF THE DEFINED PAVEMENT EDGE UNLESS OTHERWISE NOTED OR DIRECTED. THE CONTRACTOR SHALL ALIGN ALL LIGHTS ON TANGENT SECTIONS SUCH THAT THEY FORM A STRAIGHT LINE.
49. WHEN DETERMINING THE NUMBER OF CHARACTERS IN A GUIDANCE SIGN LEGEND THE CHARACTERS 1 , . (DOT) , - (DASH) WILL BE CONSIDERED ONE HALF CHARACTER. PAYMENT WILL BE FOR THE SUM OF ALL CHARACTERS ON THE LONGEST FACE ROUNDED UP TO THE WHOLE NUMBER. CHARACTERS ON THE OPPOSITE SIDE OF THE SIGN WILL NOT BE COUNTED.
50. WHEN DETERMINING THE NUMBER OF CHARACTERS IN A GUIDANCE SIGN LEGEND THE SYMBOL ON THE OPPOSITE SIDE OF A RUNWAY HOLDING POSITION SIGN WHICH REPRESENTS THE RUNWAY SAFETY AREA OR THE ILS CRITICAL AREA WILL BE CONSIDERED 4 CHARACTERS.

MARKING NOTES

51. FOR CLARITY PURPOSES, EXISTING RUNWAY MARKINGS TO BE REMOVED ARE NOT SHOWN.
52. REMOVAL OF EXISTING MARKINGS SHALL BE IN ACCORDANCE WITH ITEM P-620.

A1 GENERAL NOTES
SCALE: NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER ANN MADER STILLMAN C 47882 EXPIRES 12/31/23 CIVIL STATE OF CALIFORNIA

APPROVED:

DATE: 1/27/2023

ANN MADER STILLMAN,
DIRECTOR OF PUBLIC WORKS
R. C. E. # 47882 / EXPIRES 12-31-2023

C&S Engineers, Inc.
7801 Folsom Boulevard, Suite 210
Sacramento, California 95826
Phone: 916-364-1470
www.cscos.com

C&S COMPANIES

APPROVED DATE: 02-01-2023

TEDDY D. RAMIL
C&S ENGINEERS, INC.
R.C.E. # C063590 EXPIRES 09-30-2024

REGISTERED PROFESSIONAL ENGINEER TEDDY D. RAMIL No. C 063590 Exp. 09/30/2024 CIVIL STATE OF CALIFORNIA

COUNTY OF SAN MATEO PUBLIC WORKS

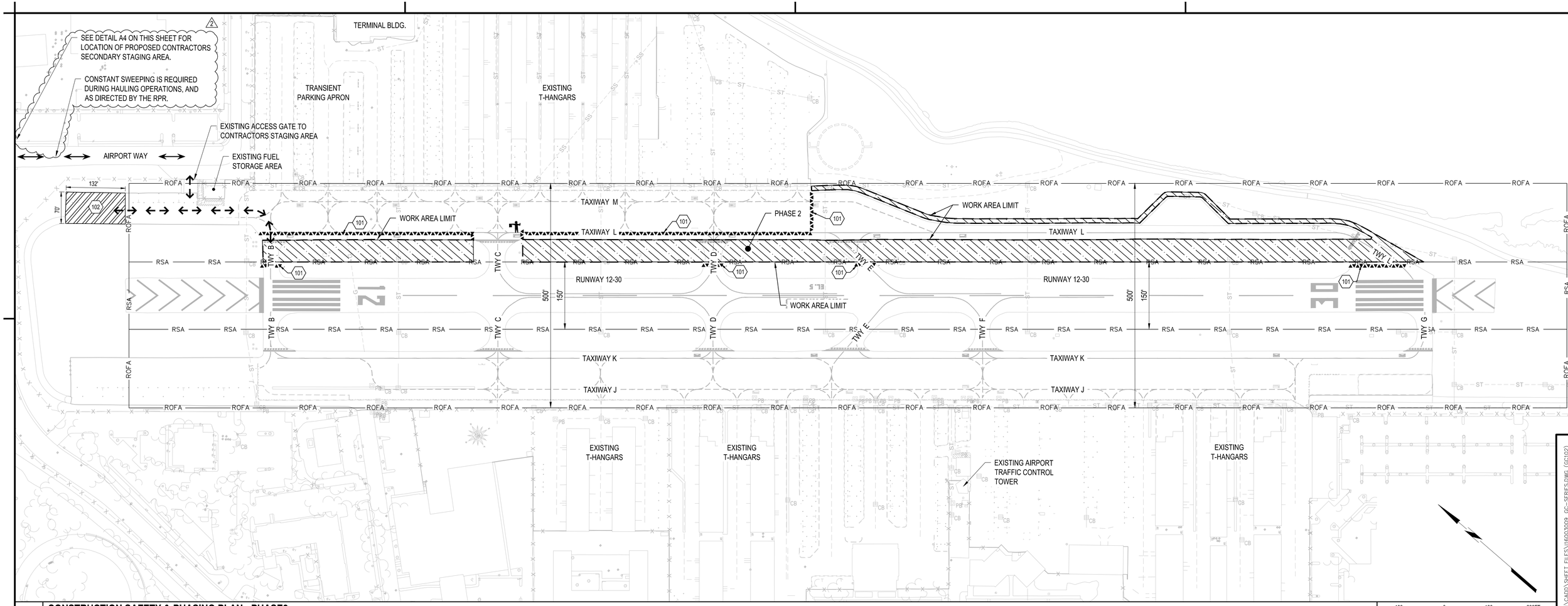
		DESIGNED BY: E.A. (C&S)	GENERAL NOTES
		CHECKED BY: D.M. (C&S)	RUNWAY 12-30 AND CONNECTOR TAXIWAYS REHABILITATION
		DRAWN BY: E.A. (C&S)	
2	2/15/2023	ANN MADER STILLMAN, DIRECTOR OF PUBLIC WORKS	555 COUNTY CENTER, 5th FLOOR
REVISION	DATE	SAN MATEO COUNTY	REDWOOD CITY, CALIFORNIA 94063

SCALE: NOT TO SCALE
DATE: JANUARY 2023
FILE NO.: 1:5077

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

GI002 (REV 2)
SHEET 2 OF 53

FILENAME: F:\PROJECT\V16 - SAN MATEO COUNTY\V16.003.009 - SQL RWY - TXY CONNECTOR REHAB\DESIGN\CADD\SHEET FILES\V16003009_GI-SERIES.DWG (GI002)



B1 CONSTRUCTION SAFETY & PHASING PLAN - PHASE2

SCALE: 1" = 100'

KEYED NOTES:

101. BARRICADE LOCATION (TYP.). SEE DETAIL A4/GC101.

102. CONTRACTORS STAGING AREA.

103. CONTRACTORS SECONDARY STAGING AREA (2)

LEGEND:

- WORK AREA HAUL ROUTE
- WORK AREA LIMIT
- LOW PROFILE BARRICADES
- WORK AREA
- CONTRACTOR STAGING AREA
- CONTRACTOR'S ACCESS ROUTE
- FLAGGER

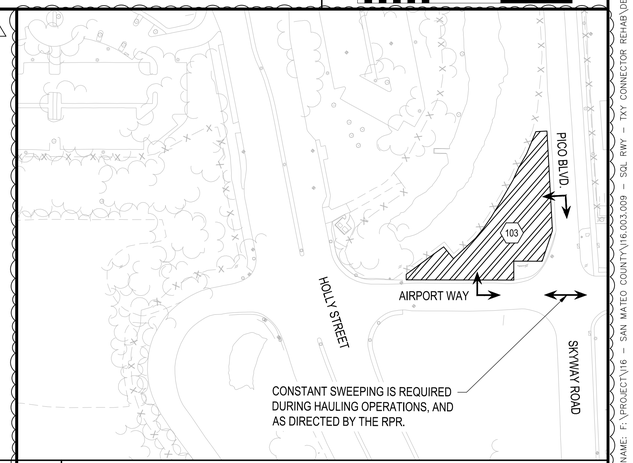
A1 LEGEND AND KEYED NOTES

SCALE: NOT TO SCALE

1. ALL PERSONAL VEHICLES SHALL BE PARKED IN THE STAGING AREA.
2. THE STAGING AREA IS NOT FENCED OR SECURED. FENCING & SECURITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION SAFETY PLAN IN SECTION 70 OF THE CONTRACT DOCUMENTS.
4. AIRPORT CTAF FREQUENCY = 119.0 MHz
5. MAXIMUM EQUIPMENT HEIGHT = 25 FEET
6. CONSTRUCTION OF PHASE 2 MUST BE COMPLETED IN 15 CALENDAR DAYS FOLLOWING THE COMPLETION OF WORK IN PHASE 1.
7. CONTRACTOR SHALL PROVIDE AT MINIMUM A THREE WEEK NOTICE BEFORE ANY RUNWAY CLOSURE WORK COMMENCES.
8. CONSTRUCTION OF PHASE 2 TO OCCUR DURING NIGHT CLOSURE OF TAXIWAY L, TAXIWAY M BETWEEN CONNECTOR TAXIWAY E AND THE CONVERGENCE POINT WITH TAXIWAY L, AND CONNECTOR TAXIWAY B, D, E & L AT THE EASTERLY LIMIT OF THE RUNWAY SAFETY AREA. WORKING HOURS SHALL BE FROM 6PM-6AM. WORK WITHIN PHASE 2 INCLUDES: MOBILIZATION & SETUP, PAVEMENT DEMOLITION, OVER-EXCAVATION, ELECTRICAL , LOCALIZE STORM DRAIN IMPROVEMENTS, PAVING, STRIPING AND CLEAN UP.
9. CONSTRUCTION VEHICLES SHALL YIELD TO TAXIING AIRCRAFT AT ALL TIMES IN ALL AREAS OF THE AIRPORT. TAXIING AIRCRAFT SHALL ALWAYS HAVE THE RIGHT OF WAY.
10. CONSTRUCTION VEHICLES MUST BE MARKED WITH AMBER BEACONS (DAY /NIGHT) OR ORANGE AND WHITE FLAGS DURING DAYLIGHT HOURS.
11. CONTRACTOR SHALL ELIMINATE FOREIGN OBJECT DEBRIS PER THE CONSTRUCTION SAFETY PLAN PRIOR TO RE-OPENING WORK AREAS TO AIR TRAFFIC.
12. CONTRACTOR SHALL NOTIFY THE AIRPORT IF AIRPORT ACCESS GATE IS TO BE LEFT OPEN DURING CONTRACTOR'S OPERATION. CONTRACTOR SHALL PROVIDE QUALIFIED PERSONNEL APPROVED BY THE AIRPORT TO ENSURE ONLY AUTHORIZED VEHICLES USE THE ACCESS GATE.
13. CONTRACTOR SHALL PROVIDE FLAGGING PERSONNEL AS REQUIRED IF AIRPORT ACCESS GATE IS TO BE LEFT OPEN DURING HAULING OPERATIONS.
14. ALL ROADS USED TO ACCESS SITE SHALL BE MAINTAINED. AT THE COMPLETION OF ALL CONSTRUCTION ACTIVITY, ROADS SHALL BE OPENED AT SAME OR BETTER CONDITION (TYP.).
15. AT NO TIME SHALL CONTRACTOR PERSONNEL OR EQUIPMENT BE WITHIN 150' OF AN ACTIVE RUNWAY CENTERLINE OR AN ACTIVE TAXIWAY(S) WITHOUT APPROVAL FROM AIRPORT.
16. ALL CONSTRUCTION DEBRIS INCLUDING DIRT TRACKING OUTSIDE THE STAGING AREA(S) SHALL BE CLEANED UP IMMEDIATELY.
17. CONTRACTOR TO PERFORM A FOD INSPECTION BEFORE THE END OF EACH NIGHT SHIFT AND PRIOR TO OPENING THE TAXIWAYS TO AIRCRAFT TRAFFIC.
18. CONTRACTOR TO USE LIGHTED RUNWAY CLOSURE MARKERS AND LOW PROFILE BARRICADES PROVIDED BY THE CONTRACTOR.
19. FAA EQUIPMENT AND INFRASTRUCTURE ARE WITHIN THE PROJECT AREA. ALL SHUTDOWNS MUST BE COORDINATED WITH FAA. FAA REQUIRE A MINIMUM OF TWO WEEK NOTIFICATION. CONTRACTOR SHALL INCLUDE THE FAA COORDINATION IN THE SCHEDULE AND ALLOW AMPLE TIME FOR FAA TO COMPLETE ANY PLANNED SHUTDOWN.

A2 GENERAL CSPP NOTES

SCALE: NOT TO SCALE



A4 CONTRACTORS SECONDARY STAGING AREA LOCATION

SCALE: 1" = 100'

FILENAME: F:\PROJECT\V16 – SAN MATEO COUNTY\V16.003.009 – SQL RWY – TXY CONNECTOR REHAB\DESIGN\CADD\SHEET FILES\V16003009_GC-SERIES.DWG (GC102)

APPROVED:

DATE: 1/27/2023

ANN MADER STILLMAN,
DIRECTOR OF PUBLIC WORKS
R. C. E. # 47882 / EXPIRES 12-31-2023

REGISTERED PROFESSIONAL ENGINEER ANN MADER STILLMAN C 47882 EXPIRES 12/31/23 CIVIL STATE OF CALIFORNIA

C&S Engineers, Inc.
7801 Folsom Boulevard, Suite 210
Sacramento, California 95826
Phone: 916-364-1470
www.cscos.com

C&S COMPANIES

APPROVED DATE: 01-27-2023

TEDDY D. RAMIL
C&S ENGINEERS, INC.
R.C.E. # C063590 EXPIRES 09-30-2024

REGISTERED PROFESSIONAL ENGINEER TEDDY D. RAMIL No. C 063590 Exp. 09/30/2024 CIVIL STATE OF CALIFORNIA

COUNTY OF SAN MATEO PUBLIC WORKS

		DESIGNED BY: E.A. (C&S)	CONSTRUCTION SAFETY & PHASING PLAN - PHASE2
		CHECKED BY: D.M. (C&S)	RUNWAY 12-30 AND CONNECTOR TAXIWAYS REHABILITATION
		DRAWN BY: E.A. (C&S)	
(2)	2/15/2023	ANN MADER STILLMAN, DIRECTOR OF PUBLIC WORKS	555 COUNTY CENTER, 5th FLOOR
REVISION	DATE	SAN MATEO COUNTY	REDWOOD CITY, CALIFORNIA 94063

SCALE: 1" = 100'
DATE: JANUARY 2023
FILE NO.: 1:5077

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

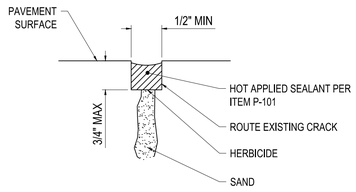
GC102 (REV 2)
SHEET 6 OF 53

C1 NOT USED
SCALE: NOT TO SCALE

C2 NOT USED
SCALE: NOT TO SCALE

C3 NOT USED
SCALE: NOT TO SCALE

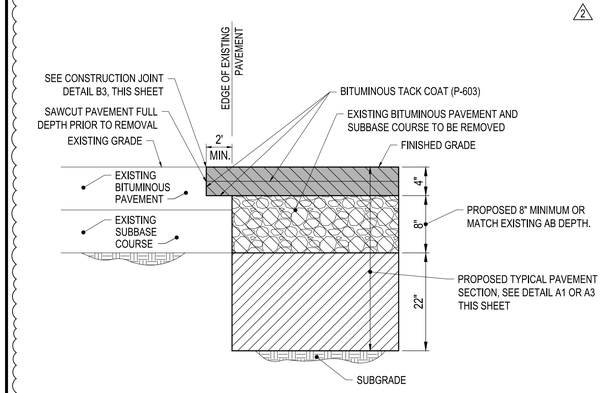
C4 NOT USED
SCALE: NOT TO SCALE



NOTES:

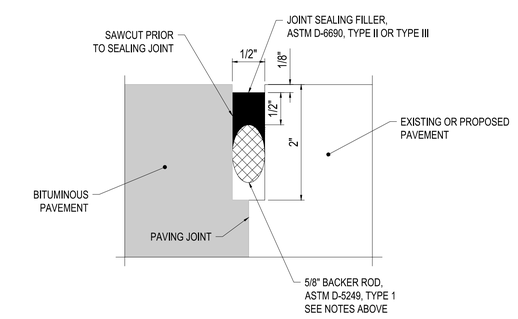
1. CRACKS 1" AND LESS SHALL BE ROUTED TO REMOVE AT LEAST 1/8" FROM EACH SIDE OF THE CRACK TO SOUND PAVEMENT.
2. CRACKS SHALL NOT BE OVERBANDED.

B1 CRACK SEAL DETAIL - 1/4" TO 1"
SCALE: NOT TO SCALE



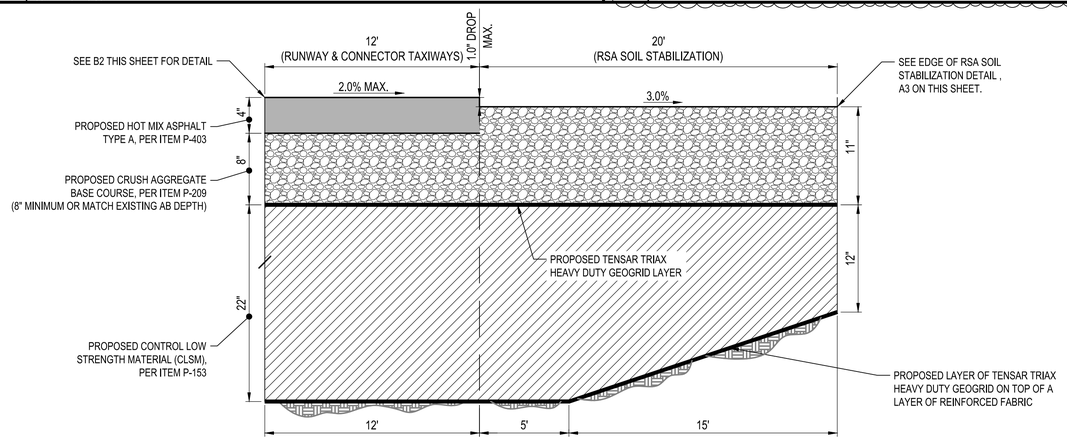
B2 NEW ASPHALT TO EXISTING ASPHALT KEYING DETAIL
SCALE: NOT TO SCALE

NOTE:
JOINT CONSTRUCTION IS CONSIDERED INCIDENTAL TO THIS CONTRACT AND NO DIRECT PAYMENT SHALL BE MADE.

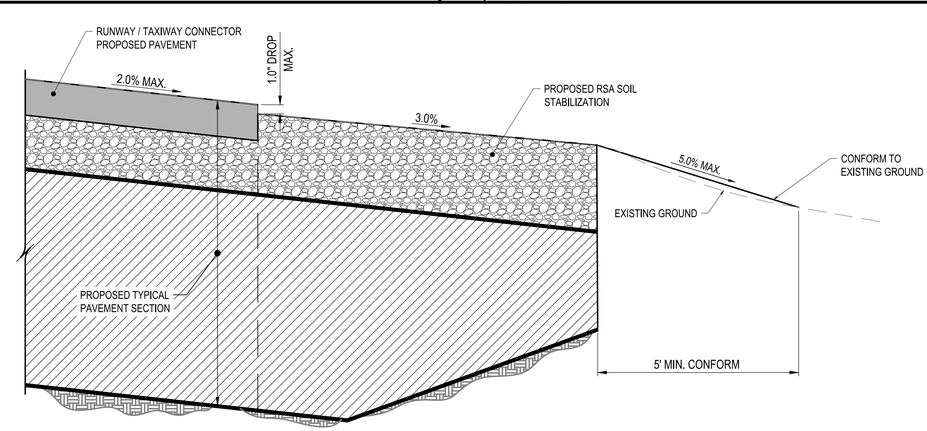


B3 CONSTRUCTION JOINT
SCALE: NOT TO SCALE

B4 NOT USED
SCALE: NOT TO SCALE



A1 TYPICAL PAVEMENT SECTION DETAIL
SCALE: NOT TO SCALE



A3 EDGE OF RSA SOIL STABILIZATION DETAIL
SCALE: NOT TO SCALE

FILENAME: F:\PROJECTV16 - SAN MATEO COUNTY\16.003.009 - SQL RWY - TXY CONNECTOR REHAB\DESIGN\CADD\SHEET FILES\16003009_CP-DETAILS.DWG (CP501)

REGISTERED PROFESSIONAL ENGINEER ANN MADER STILLMAN C 47882 EXPIRES 12/31/23 CIVIL STATE OF CALIFORNIA

APPROVED:

DATE: 1/27/2023

ANN MADER STILLMAN,
DIRECTOR OF PUBLIC WORKS
R. C. E. # 47882 / EXPIRES 12-31-2023

C&S Engineers, Inc.
7801 Folsom Boulevard, Suite 210
Sacramento, California 95826
Phone: 916-364-1470
www.cscos.com

C&S COMPANIES

APPROVED DATE: 01-27-2023

TEDDY D. RAMIL
C&S ENGINEERS, INC.
R.C.E. # C063590 EXPIRES 09-30-2024

REGISTERED PROFESSIONAL ENGINEER TEDDY D. RAMIL No. C 063590 Exp. 09/30/2024 CIVIL STATE OF CALIFORNIA

COUNTY OF SAN MATEO PUBLIC WORKS

		DESIGNED BY: E.A.(C&S)	CONSTRUCTION PAVING DETAILS
		CHECKED BY: D.M.(C&S)	RUNWAY 12-30 AND CONNECTOR TAXIWAYS REHABILITATION
		DRAWN BY: E.A.(C&S)	
2	2/15/2023	ANN MADER STILLMAN, DIRECTOR OF PUBLIC WORKS	555 COUNTY CENTER, 5th FLOOR
REVISION	DATE	SAN MATEO COUNTY	REDWOOD CITY, CALIFORNIA 94063

SCALE: 1" = 30'
DATE: JANUARY 2023
FILE NO.: 1/5077

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

CP501 (REV 2)
SHEET 21 OF 53

PROPOSAL TO THE COUNTY OF SAN MATEO

SAN CARLOS AIRPORT
RUNWAY 12-30 & CONNECTOR TAXIWAYS REHABILITATION PROJECT

COUNTY PROJECT NO. ASL03
PROJECT FILE NO. E5077

FEDERAL AVIATION ADMINISTRATION (FAA)
AIP PROJECT

NOTICE TO CONTRACTORS:
THE FOLLOWING FORMS MUST BE COMPLETED IN FULL BY AN OFFICIAL OF THE COMPANY AND SUBMITTED WITHIN FIVE (5) CALENDAR DAYS FROM BID OPENING~~WITH THE BID~~:

1. **Contractor's DBE Plan**
2. **DBE Letter of Intent Form**
3. **DBE Good Faith Efforts Documentation**

FAILURE TO COMPLETE AND SUBMIT THE REQUIRED FORMS SHALL BE CONSIDERED AS REASON FOR DISQUALIFICATION FROM BIDDING.

BIDDERS CANNOT BE WITHDRAW THEIR BIDS FOR A PERIOD OF 120 DAYS AFTER BID OPENING.

Item No.	Section No.	Estimated Quantity	Unit of Measure	Item Description	Item Price (In Figures)	Total (In Figures)
1	P-101	13,600	LF	Filling of Cracks 1/4" to 1" Wide	$	$
2	P-101	56,130	SF	Removal of Rubber	$	$
3	P-101	2,880	SY	Micro-Mill Existing Pavement Bump (0.2" Depth)	$	$
4	P-101	11,100	SY	Remove Existing Asphalt Concrete Structural Section (34" Depth)	$	$
4A	P-101	2	EA	Removal of Structure	$	$
5	P-152	21,580	CY	Unclassified Excavation	$	$
6	P-153	12,170	CY	Control Low Strength Material (CLSM) - Rwy/Taxiway Edge (22" Thick)	$	$
7	P-153	7,570	CY	Control Low Strength Material (CLSM) - RSA Soil Stabilization (Variable Thickness)	$	$
8	P-209	13,870	SY	Crushed Aggregate Base Course - Rwy/Taxiway Edge (8" Thick)	$	$

Continued on next page

BIDDER'S LIST COLLECTION FORM
(Bidder's Information)

The sponsor is required by CFR Title 49, Subtitle A, Part 26, Subpart A, Section 26.11 to collect the following information from the bidder. As such, it is the responsibility of the bidder to complete the following information as a condition of submitting a proposal for this project. The sponsor will consider incomplete information to be an irregular proposal.

Airport Name: _____ County Project No_____

Project Name: _____

Bidder's Information

Firm Name	Firm Street Address, City, State, Zip Code, Phone No.	DBE/Non DBE Status	Age of Firm	Annual Gross Receipts
	_____ _____ _____ _____ _____	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M

(This form must be completed and submitted as part of~~with~~ the Proposal.)

BIDDER'S LIST COLLECTION FORM
(Subcontractor's Information)

The sponsor is required by CFR Title 49, Subtitle A, Part 26, Subpart A, Section 26.11 to collect the following information from each subcontractor submitting a quote, bid or proposal to the bidder. As such, it is the responsibility of the bidder to complete the following information as a condition of submitting a proposal for this project. The sponsor will consider incomplete information to be an irregular proposal.

Please note that the information requested below must be filled out for each quote received by the bidder, regardless of DBE status. For example, if the bidder requests quotes from three contractors for electrical work, the information requested below must filled out for the three subcontractors. **It is important to note that providing the information does not commit the bidder to using any one of the three subcontractors in the work.**

Airport Name: ____ County Project No.______________

Project Name: ____

Subcontractor's Information

Firm Name	Firm Street Address, City, State, Zip Code, Phone No.	DBE/Non DBE Status	Age of Firm	Annual Gross Receipts
	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M
	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M
	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M

Firm Name	Firm Street Address, City, State, Zip Code, Phone No.	DBE/Non DBE Status	Age of Firm	Annual Gross Receipts
	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M
	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M
	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M
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	____________________ ____________________ ____________________ ____________________ ____________________	☐ DBE ☐ Non-DBE	☐ Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-10 years ☐ More than 10 yrs.	☐ Less than $500K ☐ $500K - $1M ☐ $1-$2M ☐ $2-$5M ☐ More than $5M

(Copy this form and submit with your original proposal if more space is needed.)

(This form must be completed and submitted as part of ~~with~~ the Proposal.)

SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) CERTIFICATION

Project Location: _____

Project Name: _____

Contractor's Official Name: _____

Contact Person: _____ Telephone: _____

Street Address: _____

City:_____State:_____Zip: _____

Certification Statement:

I certify that I have read the Construction Safety and Phasing Plan (CSPP) included in the Contract Documents and if awarded this Contract, I will abide by its requirements as written.

I certify that I have read the Safety Plan Compliance Document (SPCD) included in the Contract Documents and if awarded this Contract, I will abide by its requirements as written;

I certify that I will provide the information required in the SPCD prior to the start of construction work, if awarded this Contract, and that I will provide any additional information requested by the Owner.

_____ _____

Printed Name of Signer Signature

_____ _____

Title Date

DISADVANTAGED BUSINESS ENTERPRISE (DBE) STATEMENT

The requirements of 49 CFR Part 26, Regulations of the U.S. Department of Transportation, apply to this contract. It is the policy of the Sponsor to practice nondiscrimination based on race, color, sex, or national origin in the award or performance of this contract.

DISADVANTAGED BUSINESS ENTERPRISE:

The requirements of 49 CFR Part 26, Regulations of the U.S. Department of Transportation, apply to this contract. It is the policy of the Sponsor to practice nondiscrimination based on race, color, sex, or national origin in the award or performance of this contract. All firms qualifying under this solicitation are encouraged to submit proposals. Award of this contract will be conditioned upon satisfying the DBE requirements of this contract. These requirements apply to all bidders, including those who qualify as a DBE. A DBE contract goal of 10 percent has been established for this contract. The bidder shall make good faith efforts, as defined in Appendix A, 49 CFR Part 26, to meet the contract goal for DBE participation in the performance of this contract. Excerpts from 49 CFR Part 26 are included in Section 70-21.13.

As a matter of responsibility, within five (5) days after the opening of bids, all Bidders or Offerors shall submit the "Contractor's DBE Plan", and "DBE Letter of Intent Forms" from each of the DBE firms the Bidder or Offeror intends to use ~~with the bid/proposal~~. If the contract goal is not met, Bidder or Offeror shall include documentation of good faith efforts with its DBE Plan ~~with the bid/proposal~~.

The Contractor's DBE Plan Form and DBE Letter Of Intent Form are located in Special Provisions. The website for the Unified Certification Program directory in the state of California is: https://dot.ca.gov/hq/bep/find_certified.

CERTIFICATION OF BIDDER/OFFEROR: The undersigned Bidder or Offeror will satisfy the DBE requirements of these specifications in the following manner (please check the appropriate space):

_____ The Bidder or Offeror is committed to meeting or exceeding the DBE utilization goal stated above on this contract.

_____ The Bidder or Offeror, is unable to meet the DBE utilization goal stated above. However, we are committed to a minimum of 10% DBE utilization on this contract, and will include documentation demonstrating good faith efforts.

SMALL BUSINESS PARTICIPATION:

This Contract does not have a Small Business Element (SBE) set-aside.

IRS Number: _____

_____

Signature and Title

(This form must be completed and submitted as part of ~~with~~ the Proposal.)

CONTRACTOR'S DBE PLAN

(Submit this form and attach a DBE Letter of Intent Form for each DBE subcontractor, supplier or manufacturer.)

Airport Name: _____

Project Name: _____

County Project No: _____

Total Awarded Contract Amount: $_____

Name of Bidder's Firm: _____

Street Address: _____

City:_____ State:_____ Zip: _____

Printed name of signer:_____

Printed title of signer:_____

DBE UTILIZATION SUMMARY

	DBE Contract Amount	DBE Value	Contract %
DBE Prime Contractor	$_____ x 1.00 =	$_____	_____%
DBE Subcontractors	$_____ x 1.00 =	$_____	_____%
DBE Suppliers *	$_____ x 0.60 =	$_____	_____%
DBE Brokers **	$_____ x 1.00 =	$_____	_____%
DBE Manufacturers	$_____ x 1.00 =	$_____	_____%
Total Proposed DBE Participation ***		$_____	_____%
Established DBE Goal		$_____	_____%

* Applicable only to regular dealers.

** Applicable only to the amount of fees or commissions charged for assistance in the procurement of material and supplies, or fees and transportation charges for delivery of material and supplies.

*** If the total proposed DBE participation is less than the established DBE goal, bidder must provide written documentation of the good faith efforts as required by 49 CFR Part 26.

Affirmation:

The undersigned hereby assures that the information included herein is true and correct, and that the DBE firm(s) listed on the attached DBE Letter of Intent Forms have agreed to perform a commercially useful function in the work items noted for each firm. The undersigned further understands that no changes to this plan may be made without prior approval from the Civil Rights Staff of the Federal Aviation Administration.

By:_____

(Signature of Bidder's representative) (Title)

(This form must be completed and submitted as part of ~~with~~ the Proposal.)

DBE LETTER OF INTENT FORM

(Submit one form for each DBE subcontractor, supplier or manufacturer.)

Project Name/Location: _____

County Project No: _____

Name of Bidder's Firm: _____

Street Address: _____

City: _____ State: _____ Zip: _____

Name of DBE firm: _____

Street Address: _____

City: _____ State: _____ Zip: _____

Contact Person: _____ Telephone: _____

Certifying Agency: _____ Expiration Date: _____

(DBE firm shall submit evidence, such as a photocopy, of their certification status)

Classification: ☐ Prime Contractor ☐ Subcontractor ☐ Broker
☐ Manufacturer ☐ Supplier

Disadvantaged Group (check one):

Black American ☐ Male ☐ Female ☐	Hispanic American ☐ Male ☐ Female ☐	Native American ☐ Male ☐ Female ☐	Subcont. Asian American ☐ Male ☐ Female ☐
Asian Pacific American ☐ Male ☐ Female ☐	Non-Minority ☐ Male ☐ Female ☐	Other (not of any group listed here) ☐ Male ☐ Female ☐	

SUMMARY OF WORK ITEMS

Work Item(s)	Description of Work Item	NAICS	Estimated Quantity	Total Value

The bidder is committed to utilizing the above-named DBE firm for the work described above. The estimated dollar value of this work is $ _____.

Affirmation:

The above-named DBE firm affirms that it will perform the portion of the contract for the estimated dollar value as stated above.

By: _____
(Signature of DBE firm's representative) (Title)

By: _____
(Signature of Bidders representative) (Title)

If the bidder does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void.

(This form must be completed and submitted as part of ~~with~~ the Proposal.)

To ensure there is equal participation of the DBE groups specified in 49 CFR 26.5, the County specifies a goal for DBEs.

Contractor shall make work available to DBEs and select work parts consistent with available DBE subcontractors and suppliers.

Contractor shall meet the DBE goal or demonstrate that he/she made adequate good faith efforts to meet this goal. The DBE goal, as shown on the Notice to Contractors, is ten percent (10%).

It is Contractor's responsibility to verify that the DBE firm is certified as a DBE at date of bid opening. For a list of DBEs certified by the California Unified Certification Program, go to:

https://dot.ca.gov/programs/civil-rights/dbe-search

and choose the "Access the DBE Query Form" link.

All DBE participation will count toward the California Department of Transportation's federally mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs counts towards the goal in the following manner:

1. One hundred percent (100%) counts if the materials or supplies are obtained from a DBE manufacturer.
2. Sixty percent (60%) counts if the materials or supplies are obtained from a DBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies count if obtained from a DBE that is neither a manufacturer nor regular dealer. 49 CFR 26.55(e)(1)(i) and 49 CFR 26.55 (e)(2)(ii), respectively, defines "manufacturer" and "regular dealer."

Contractor receives credit towards the goal if he/she employs a DBE trucking company that performs a commercially useful function as defined in 49 CFR 26.55(d)(1) through (4) and (6).

DBE Commitment Submittal

The Contractor is advised of the following:

a. Contractor shall submit DBE information on the "Contractor's DBE Plan" form included in the Proposal section of this document. Said form shall be submitted, by each bidder, within

five (5) calendar days from bid openingwith the Proposal.

b. **Written confirmation from each DBE stating that it is participating in the contract shall be submitted. Include confirmation with the DBE Letter of Intent Form. A copy of a DBE's quote will serve as written confirmation that the DBE is participating in the contract.**

c. **If Contractor does not submit the DBE Letter of Intent Form and written confirmation from each DBE within five (5) calendar days from bid openingwith their bid, the County will find said Contractor's bid to be non-responsive and it will be disqualified.**

Good Faith Efforts Submittal

Regardless of whether or not the Contractor has met the DBE goal, the Contractor shall complete and submit the "Disadvantaged Business Enterprise Statement" form with the bid showing that an adequate good faith effort was made to meet the goal. Only good faith efforts directed towards obtaining participation by DBEs will be considered. **Good faith efforts documentation must be submitted within five (5) calendar days from bid openingwith the Proposal.**

Regardless if Contractor's DBE Plan shows that the DBE goal has or has not been met, Contractor is still required to submit good faith efforts documentation to protect eligibility for award of the contract in the event the County finds that the DBE goal has not been met.

Contractor's good faith efforts documentation must include the following information and supporting documents, as necessary:

1. Items of work Contractor has made available to DBE firms. Contractor shall identify those items of work he/she might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, Contractor shall show the dollar value and percentage of the total contract. It is the Contractor's responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.
2. Names of certified DBEs and dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs

were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. Contractor is reminded to solicit certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.

3. Name of selected firm and its status as a DBE for each item of work made available. Include name, address, and telephone number of each DBE that provided a quote and their price quote. If the firm selected for the item is not a DBE, provide the reasons for the selection.
4. Name and date of each publication in which Contractor requested DBE participation for the project. Attach copies of the published advertisements.
5. Names of agencies and dates on which they were contacted to provide assistance in contacting, recruiting, and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.
6. List of efforts made to provide interested DBEs with adequate information about the plans, specifications, and requirements of the contract to assist them in responding to a solicitation. If Contractor has provided information, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Contractor shall provide copies of supporting documents, as appropriate.
7. List of efforts made to assist interested DBEs in obtaining bonding, lines of credit, insurance, necessary equipment, supplies, and materials, excluding supplies and equipment that the DBE subcontractor purchases or leases from the prime Contractor or its affiliate. If such assistance is provided by Contractor, identify the name of the DBE assisted, nature of the assistance offered, and date. Contractor shall provide copies of supporting documents, as appropriate.
8. Any additional data to support demonstration of good faith efforts. The County may consider DBE commitments of the 2nd and 3rd responsible bidders when determining whether the low bidder made adequate good faith efforts to meet the DBE goal.

END OF SECTION

immediately notify the County in writing of the DBE's decertification date. If a business becomes a certified DBE before completing its work, the business must notify the Contractor and the County in writing of the certification date and submit the notifications to the County. On work completion, Contractor shall complete a Subcontractor's Prompt Payment Certification. Contractor shall submit the form to the County within 30 days of contract acceptance.

Upon work completion (i.e. completion of the contract bid items), a summary of these records shall be prepared on the Monthly Payment Report, and certified correct by the Contractor or Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. The amount of $10,000 will be withheld by the County from payment to the Contractor until a satisfactory form is submitted by the Contractor. The County will release the $10,000 withheld upon submission of a satisfactorily completed form by the Contractor.

7-0.18. DBE Certification Status

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, "Disadvantaged Business Enterprises (DBE) Certification Status Change" Form CEM-2403(F) indicating the DBEs' existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

7-0.19.Performance of Disadvantaged Business Enterprises

DBEs must perform work or supply materials as listed in the Contractor's DBE Plan and DBE Letter of Intent Forms to be submitted within five (5) calendar days from bid opening~~with Contractor's bid~~ and as specified under Section 2-1.02, "Disadvantaged Business Enterprise (DBE)," of these Special Provisions. The Contractor SHALL NOT terminate or substitute a DBE listed for convenience and perform the work with his/her own forces or obtain materials from other

sources without prior written authorization from the County.

The County authorizes a request to use other forces or sources of materials if the Contractor shows any of the following justifications:

1. Listed DBE fails or refuses to execute a written contract based on plans and specifications for the project.
2. Contractor stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet the Contractor's bond requirements.
3. Work requires a contractor’s license and listed DBE does not have a valid license under Contractors License Law.
4. Listed DBE fails or refuses to perform the work or furnish the listed materials.
5. Listed DBE's work is unsatisfactory and not in compliance with the contract.
6. Listed DBE is ineligible to work on the project because of suspension or debarment.
7. Listed DBE becomes bankrupt or insolvent.
8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
11. County determines other documented good cause.

Contractor shall notify the original DBE of its intent to use other forces or material sources and provide the reasons. Contractor shall provide the DBE with 5 days to respond to its notice and advise the Contractor and the County of the reasons why the use of other forces or sources of materials should not occur. The Contractor's request to use other forces or material sources must include:

1. One or more of the reasons listed in the preceding paragraph
2. Notices from the Contractor to the DBE regarding the request
3. Notices from the DBEs to the Contractor regarding the request

If a listed DBE is terminated, or substituted Contractor must make good faith efforts to find another DBE to substitute for the original DBE. The substitute

DRAFT REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

Prepared for:

C&S Engineers, Inc.

BAGG ENGINEERS

December 20, 2021
BAGG Job No. CSCOM-21-01

C&S Engineers, Inc.
8950 Cal Center Drive, Suite 102
Sacramento, CA 95826

Attention: David Moreno

DRAFT REPORT
Geotechnical Engineering Investigation
Runway & Taxiway Pavement Edge Repair
San Carlos Airport
620 Airport Way
San Carlos, California

Dear Mr. Moreno:

Transmitted herewith is our geotechnical engineering investigation report for the proposed construction to repair to the edges of the runway and taxiway pavement at San Carlos Airport in San Carlos, California. This investigation carried out a field exploration program consisting of thirty-one (31) borings in our report dated April 5, 2019 and an additional ten (10) borings drilled on September 10, 2021 to represent the entire length of the runway edges at the San Carlos Airport. Laboratory testing was also completed as discussed in the following sections of this report. The report presents a discussion of the existing subsurface conditions and conclusions and recommendations to implement the proposed pavement reconstruction at San Carlos Airport.

Thank you for the opportunity to be of service on this project. Please do not hesitate to contact us should you have any questions or comments.

Very truly yours,

BAGG Engineers

Alan O'Driscoll
Vice President

Jason Van Zwol
Geotechnical Engineer

DRAFT REPORT
GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

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BAGG ENGINEERS

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GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering investigation performed to address the proposed construction to repair the edges of the runway and taxiway pavement at San Carlos Airport. The scope of services for this investigation was developed following a review of the Federal Aviation Administration's Advisory Circular[1] on Airport Pavement Design and Evaluation dated November 10, 2016. The attached Plate 1, Vicinity Map, shows the general location of the subject airport and Plate 2, Site Plan, depicts the existing airport features as well as the approximate location of the exploratory borings drilled at the site as part of this study. This study was conducted in accordance with the scope of services outlined in our Proposal No. 21-484R, dated August 30, 2021.

Our services consisted of a review of the geologic maps and reports pertinent to the site area, marking of the forty one (41) borings and a survey of the existing utilities to avoid conflict with the borings, then advancing the borings to approximately 5½ to 15 feet with a truck-mounted drilling rig using continuous flight and/or hollow stem augers, and collection of bulk and relatively undisturbed samples for laboratory testing, including California Bearing Ratio (CBR), Atterberg Limits tests, classification, and moisture-density measurements, evaluation of the laboratory test data to explore trends/patterns in the engineering property of the site materials in order to develop recommendations for stabilizing the subgrade, and the preparation of this report.

[1] "Circular Advisory, Airport Pavement Design and Evaluation," AC No, 150.5320-6F, dated November 10, 2016, prepared by U.S. Department of Transportation Federal Aviation Administration.

2.0 SITE AND PROJECT DESCRIPTION

The subject site consists of a relatively flat, irregular shaped parcel, located northwest of Skyway Road on the southwest bank of Steinberger Slough. It is situated within a relatively low-lying area immediately east of the intersection of US Route 101 and Redwood Shores Parkway in San Carlos, California. The site is bordered by Steinberger Slough to the east, Skyway Road to the south and west, and developed properties to the north. The site is at an approximate elevation of 5 feet above the mean sea level. Levees, approximately 7 feet in height, exist along the eastern perimeter of the site. A topographic survey of the airport is not available.

The site currently serves as an operating civil airfield consisting of an approximately 2,600-foot long runway, taxiways, aprons, administration facilities, driveways, ground passenger vehicle parking, and numerous hangars. A majority of the subject airport is covered with asphaltic concrete pavement that is in currently in fair condition.

Our recent site visits to the San Carlos Airport have revealed that the existing runway and taxiway edges are cracking in mostly parallel lines, adjacent to the edges of the pavement. Over time, the edge cracking has visibly worsened, with the cracks having widened and moving inward towards the center of the runway, and the cracks now extending southward along both edges of the runway and taxiways, thus necessitating the secondary investigation and update of the original report to include the most recent boring information and preferred pavement repair recommendations. The current state of pavement "edge repair" along the runways and taxiways consists of existing asphaltic concrete pavement that has been crack sealed and seal coated. It appears that the ongoing California drought has exasperated the cracking, as the highly expansive underlying bay mud soil has increasingly dried out, thus causing the shrinkage cracks in the pavement to increase in number, migrate towards the center of the runway and taxiways and continue to increase in size, up to 2 inches in width.

The proposed project will therefore replace and/or remediate the outer thirteen feet of the pavement on both sides of the entire, approximately 2,600-foot-long existing runway and Taxiways B, C, D, E and K. We also understand that the airport management is considering the use of somewhat heavier aircraft on the airfield, so for this reason, some of our borings were drilled towards the center of the runway to investigate

the pavement section thickness and support capacity of the interior (main part) of the runway as well. Recommendation to strengthen the main part of the runway are contained in this report as well.

In addition, we understand that the proposed scope of work will include the removal and replacement of a section of pavement within the transient parking area, which is currently in poor condition. Reportedly, this area, at one time, was an aircraft fueling station that was patch paved when the station's structure was removed and the patch paving is exhibiting distress. The pavement in this area, is U-shaped, measuring approximately 140 feet by 100 feet in plan-view and the pavement exhibits distress due to "alligator" cracking and differential movements which appears to be patched several times in successive attempts to repair the area. Nearby soil borings have been used as the basis for our recommendation to repair the pavement in this area.

3.0 BACKGROUND

BAGG Engineers has conducted a number of wide ranging geotechnical and material testing services at the San Carlos Airport since 2007, including: Geotechnical Investigation, Geotechnical Consultation, Field Observation and Testing and Special Inspections. Projects include the "T" Shade, Aircraft Hangars on both the east and west sides of the airfield with pavement reconstruction in and around these structures. We also provided the noted services for the removal and relocation of the Fuel Storage Tanks to the east side parking area, reconstruction of the Fuel Tank and Airport Terminal Parking Pavement Areas, Enlargement of the Storm Water Pumping Station and the Raising of the Perimeter Levee.

The previous investigation work entailed drilling soil borings ranging from a depth of approximately 5 to 20 feet deep, with a truck-mounted drilling rig using small diameter continuous flight augers. Samples of the subsurface materials were collected and tested in order to provide information regarding the subsurface conditions with respect to the design to reconstruct the noted structures and pavement areas. Laboratory testing was conducted as part of our previous geotechnical investigations and the laboratory tests consisted of modified proctor (ASTM D-1557), California Bearing Ratio (ASTM D-1883), Atterberg Limits (ASTM D4318), unconfined compression tests on remolded soil cement cores (ASTM D-1633), Gradation tests (ASTM D-1140), in situ moisture, and density measurements on samples of the subsurface soils encountered. Geotechnical reports, consultation and construction monitoring were also provided by BAGG

Engineers during construction of these structures and associated reconstruction of the surrounding pavement areas at the San Carlos Airport.

Due to the presence of soft soils with a high plasticity (Bay Mud) at shallow depths (1½ to 3½ feet below the ground surface) beneath a majority of the site, we recommend that the existing asphaltic concrete and aggregate base should be pulverized in place and the upper 18 inches of the existing pavement, fill, and/or native bay mud should be stabilized by Soil- Cement Mixing by adding a minimum of 5% cement by weight. In some areas where super saturated bay mud is encountered, it is anticipated that up to 25% cement may be required to chemically dry the soil to the point where it can be placed and compacted to support equipment, wheel loads and to be able to place and compact baserock and Hot Mix Asphaltic Concrete as per FAA specifications. The general soil-cement mixing process consists of initially spreading 5% cement by weight, over the pulverized existing pavement then using a pavement type grinder/ mixer to mix the cement in to the grade, 18 inches deep. Depending on the moisture content of the soil, additional water can be added to reach near optimum moisture content if the soil is dry or additional cement can be added to chemically dry, wet soil, back to near optimum moisture content. Once proper moisture content is achieved the soil can usually be compacted to 90 % relative compaction. At this point and the cement treated soil needs to be left to cure for a minimum of 72 hours and sometimes, many days longer until the soil is stable enough to support construction equipment and their wheel loads. In areas where the initial soil-cement mixing fails to stabilize the subgrade, the soil-cement mixing process should be repeated, at the direction of the geotechnical engineer until stabilization is achieved. Due to the presence of soft, compressible bay mud, it is recommended that lightweight, low ground pressure equipment be used to prevent disturbance, damage and the sinking of construction equipment in to the bay mud, before, during and after soil-cement mixing, until the treated soil is deemed stable enough to proceed with placement of baserock and new pavement. Evaluation of stability is typically carried out by proof rolling the treated grade with a rubber tire vehicle such as a loaded Water Truck or Dump Truck.

Based on the findings of our previous and recent investigation work, the existing asphaltic concrete thickness in the runway and taxiway areas ranged from approximately 5 to 9½ inches. Groundwater was encountered and/or measured in the borings drilled for our investigation at depths ranging from 2 to 14 feet below the existing ground surface at the time of drilling, with groundwater levels, over time, expected to stabilize near the existing ground surface, as seen at various other locations at the airport.

Plates 56 and 57, Site Photographs, show the current condition of the runway/taxiway as well as the transient parking lot pavement.

4.0 APPROACH

According to Table 2-1 in the Federal Aviation Administration's Advisory Circular on Airport Pavement Design and Evaluation, referenced earlier, the typical subsurface boring spacing is 200 feet, and the required boring depth for the design of the runways and taxiway pavement is 10 feet.

To develop geotechnical recommendations for the proposed pavement replacement and/or rehabilitation along the edges of the runway, the exploration was carried out within the relatively sound pavement areas, within the failing pavement zones, and within adjacent unpaved infield areas. Comparison of the soil conditions in these areas aided in identifying the causes of the pavement failure.

To evaluate the existing pavement thickness and the consistency and distribution of the subsurface soils in the vicinity of the proposed improvements, the site was explored by advancing a total of forty-one (41) borings with a truck-mounted drilling rig equipped with continuous flight and/or hollow stem augers, at the locations depicted on the attached site plan. The borings were terminated at depths ranging from approximately 5½ to 15 feet below the existing ground surface in the underlying native bay mud. Disturbed bulk and relatively undisturbed ring samples of the subsurface materials were obtained at 1- to 3½-foot-intervals as necessary for visual classification and laboratory testing. A laboratory testing program was then designed and conducted on the samples collected from the borings to evaluate the consistency and strength parameters of the subsurface materials.

To avoid interference with the airport operations, the site exploration for the northern two- thirds of the runway and taxiway was carried out on two consecutive evenings and our most recent investigation for the south one- third of the runway and taxiway areas was carried out with two drill rigs during a daytime, runway closure for a pre-planned airport event.

5.0 PURPOSE AND SCOPE OF SERVICES

The purpose of our services was to review the existing geotechnical information available for the site and to conduct a geotechnical investigation to measure the existing pavement thickness and to collect soil samples for laboratory testing with respect to the proposed pavement design. On this basis, our report addresses the following:

- Specific soil conditions discovered by our borings, such as expansive, loose, saturated, or soft and compressible surface and subsurface soils that will impact pavement design and/or mitigation measures and impose restrictions on the project, including the thickness and consistency of the existing fill soils, and depth to groundwater as encountered,
- Description of existing pavement section thicknesses and support conditions within the failed perimeter areas, as well as along interior/central areas of the runway, based on AC cores and CBR test results,
- Criteria for site grading, placement of fills and backfills, and trench backfill requirements, including the suitability of the excavated soils from the site for use as fill and backfill material,
- Criteria for pavement replacement within the outer 12 feet of the existing runway and connector taxiways as well as preparation of the upper soils to receive the new improvements, as necessary, and alternative remediation measures that may be appropriate,
- General recommendations for maintaining or improving drainage, and an assessment of its role in the pavement failures.

Based on our understanding of the proposed project, the scope of this investigation consisted of the following specific tasks:

1. Researched and reviewed pertinent geotechnical and geological maps and reports relevant to the site and vicinity.
2. Visited the site, marked the boring locations at least 72 hours in advance of the planned explorations, and notified Underground Service Alert to mark the known utilities entering to and/or within the site. Retained the services of an independent utility locating firm to clear each boring location with respect to underground utilities.
3. Drilled, logged, and sampled a total of 41 borings to depths ranging from approximately 5½ to 15 feet with a truck-mounted drilling rig using continuous flight augers and/or hollow stem augers. The subsurface exploration was performed under the direction of one of our engineers/geologists who also obtained disturbed bulk and relatively undisturbed ring

samples from the borings at 1- to 3½-foot-intervals for visual classification and laboratory testing. The borings were backfilled with cement grout and/or clean sand. Soil cuttings were removed from the site.

4. Performed a geotechnical laboratory testing program on the collected soil samples to evaluate the engineering characteristics of the subsurface materials. Tests included California Bearing Ratio tests, Atterberg Limits tests, classification, and moisture-density measurements, as judged appropriate.

5. Using the information from the borings and laboratory tests, performed engineering analyses to develop conclusions, opinions, and recommendations oriented towards the above-noted purpose of the investigation.

6. Prepared this report summarizing our findings and recommendations, and including a vicinity map, a site plan, a regional geologic map, boring logs, and laboratory test results.

6.0 FIELD EXPLORATION AND LABORATORY TESTING

Subsurface conditions at the site were explored by drilling a total of forty-one (41) borings designated as B-1 through B-31 and B-1N through B-10N on the attached Plate 2, Site Plan. The exploration was carried out from January 21 through 23, 2019 and on September 10th 2021. Borings B-1 through B-31 were advanced with a truck-mounted drilling rig using 6-inch-diameter continuous flight augers while Borings B-1N through B-10N were drilled with a truck-mounted drilling rig equipped with 8-inch-diameter hollow stem augers. The top 2½ feet of Boring B-1 was excavated by a hand auger to avoid conflict with any existing underground utilities and no utility conflicts were encountered in any of the other boring locations.

Boring advancement was directed technically by our engineer and geologist who maintained a continuous log of the subsurface conditions encountered in each borehole. Disturbed bulk and relatively undisturbed ring samples of the site materials were obtained for visual examination and laboratory testing at depths indicated on the borings logs.

The subsurface materials were visually classified in the field; the classifications were then checked by visual examination of samples in the laboratory. In addition to sample classification, the boring logs contain interpretation of where stratum changes or gradational changes occur between samples. The boring logs depict BAGG's interpretations of subsurface conditions only at the locations indicated on Plate 2, Site Plan,

and only on the dates noted on the logs. The boring logs are intended for use only in conjunction with this report, and only for the purpose outlined by this report.

The laboratory testing program for this project consisted of saturated direct shear, Atterberg Limits, gradation, wash over #200 sieve, and moisture-density tests which were carried out at BAGG Engineers' laboratory. The CBR test samples were transported to Cooper Testing Laboratory (CTL) in Mountain View and Inspection Services Incorporated (ISI) testing laboratory in Berkeley.

The graphical representation of the materials encountered in the borings, and the results of laboratory tests performed by BAGG Engineers, as well as explanatory/illustrative data are attached at the end of this report, as follows:

- Plate 5, Unified Soil Classification System; illustrates the general features of the soil classification system used on the boring logs.
- Plate 6, Soil Terminology; lists and describes the soil engineering terms used on the boring logs.
- Plate 7, Boring Log Notes; describes general and specific conditions that apply to the boring logs.
- Plate 8, Key to Symbols; describe various symbols used on the boring logs.
- Plates 9 through 49, Boring Logs; describe the subsurface materials encountered, show the depths and blow counts for the samples, and summarize results of the strength tests, Atterberg Limits tests, gradation/wash over #200 sieve tests, and moisture-density data.
- Plates 50 and 51, Gradation Test Data; presents the results of sieve analyses performed on four samples obtained from the fill materials blanketing the site as well as the underling bay mud.
- Plates 52 through 54, Plasticity Data; presents the results of Atterberg Limits tests performed on selected samples of the subsurface materials.
- Plate 55, Direct Shear Test Plots; presents the results and plots of the direct shear tests carried out under saturated conditions at varying surcharge pressures.

The results of the CBR and compaction tests by CTL and/or ISI Testing Lab are included in Appendices A through C, as follows:

- Plates A-1 through A-4, California Bearing Ratio (ASTM D 1883), present the results of 4 CBR tests for composite samples (B-1/B-2, B-3/B-4, B-11/B-12, B-13/B-14) obtained from the borings and carried out by CTL.

- Plates B-1 through B-16, California Bearing Ratio (ASTM D-1883), present the results of 16 CBR tests performed by ISI on composite bulk samples obtained from the borings, as follows: B-5/B-6, B-7/B-8, B-9/B-10, B-15/B-16, B-17/B-18, B-19/B-20, B-21/B-22, B-23/B-24, B-25/B-26, B-27/B-31, and 6 composite samples obtained from Borings B-1N through B-10N.

- Plates C-1 through C-6, Compaction Test Report, present the results of 6 laboratory compaction tests performed by ISI on composite bulk samples obtained from Borings B-1N through B-10N.

Strength tests carried out in BAGG Engineers' laboratory consisted of saturated direct shear tests at artificially increased moisture contents and under various surcharge pressures, the results of which are summarized on the boring logs. The moisture content and dry density of selected undisturbed samples were measured to aid in correlating their engineering properties. Additionally, Atterberg Limits and gradation tests/wash over #200 sieve tests were carried out as shown on the boring logs and the plates described above. CBR tests were subcontracted to CTL and ISI, as previously noted. ISI also carried out six laboratory compaction curves. The results of the laboratory tests carried out by others are attached as Appendices A through C.

The following table presents the types and number of various laboratory tests performed as a part of this investigation on samples of the fill and native bay mud soils.

Table 1
Laboratory Testing Program

Test Designation	No. of Tests Performed
Saturated Direct Shear	13
Gradation	7
Wash over #200 Sieve	3
Atterberg Limits	16
Moisture-Density	64
CBR-CTL	4
CBR – ISI	16
Compaction Curve – ISI	6

7.0 GEOLOGY AND SEISMICITY

7.1 Area Geology

A review of the "Geology of the Onshore Part of San Mateo County, California: Derived From the Digital Database Open-File 98-137" compiled by E.E. Brabb, R.W. Graymer, and D.L. Jones, 1998, indicates the surficial geology of the general site area consists of "Artificial fill (Historic)," described as:

> **af**- "Artificial fill (Historic): Loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations. Thickness is variable and may exceed 30 m in places. Some is compacted and quite firm, but fill made before 1965 is nearly everywhere not compacted and consists simply of dumped materials."

The artificial fill materials in the vicinity of the site were placed above a geologic unit described as "Bay mud (Holocene)," described as:

> **Qhbm**- "Bay mud (Holocene): Water-saturated estuarine mud, predominantly gray, green and blue clay and silty clay underlying marshlands and tidal mud flats of San Francisco Bay, Pescadero, and Pacifica. The upper surface is covered with cordgrass (*Spartina* sp.) and pickleweed (*Salicornia* sp.). The mud also contains a few lenses of well-sorted, fine sand and silt, a few shelly layers (oysters), and peat. The mud interfingers with and grades into fine-grained deposits at the distal edge of Holocene fans, and was deposited during the post-Wisconsin rise in sea-level, about 12 ka to present (Imbrie and others, 1984). Mud varies in thickness from zero, at landward edge, to as much as 40 m near north County line."

According to a map depicting the "Thickness of Younger Bay Mud" compiled by James E Kahle and Harold B. Goldman, California Division of Mines and Geology, 1966, the thickness of the bay mud in the vicinity of the project site ranges from approximately 0 to 20 feet.

Plate 3, Area Geologic Map, shows the mapped geologic setting of the site and vicinity.

7.2 Seismicity & Geo-Hazards

The faults in the site area generally extend eastward from off the Pacific Coast through the San Francisco Bay area to the western side of the Great Valley. The San Francisco Bay region has one of the highest rates of seismic moment release per square mile of any urban area in the United States. It is emerging from the stress shadow of the 1906 San Francisco Earthquake and future large earthquakes are considered a certainty. The Working Group on California Earthquake Probabilities (2014) has estimated that the

probability for a major earthquake (Mw 6.7 or greater) within 30 years in the Greater Northern California region to be 95 percent with a 72 percent probability in the San Francisco Bay region.

The subject site is not situated within the limits of the Alquist-Priolo Earthquake Fault Zones (AP Zone) established by the CGS around active faults, where detailed evaluation and characterization of fault activity and potential for causing ground surface rupture are required.

The three major northwest-trending earthquake faults that are a part of the San Andreas fault system extending through the Bay Area include the San Andreas fault, the Hayward fault, and the Calaveras fault (see table below). The San Andreas fault, located about 7.2 km southwest, is considered to be the principal seismic hazard in this area because of its activity rate and proximity to the site. The estimated probability for a major earthquake (M_W 6.7 or greater) within 30 years on the San Andreas fault is approximately 33 percent. The Working Group on California Earthquake Probabilities also estimates that the San Andreas may be capable of generating an earthquake as large as magnitude 8.0.

The distances to the major active faults from the project site and the estimated probability of a $M_W \geq 6.7$ within 30 years for each fault are listed in the following table:

Table 2
Significant Earthquake Scenarios

Fault	Approximate Distance from Site (kilometers)[1]	Location with Respect to Site	Probability of $M_W \geq 6.7$ within 30 Years[2]
San Andreas	7.2	SW	33%
Hayward - Rogers Creek	22.5	E-NE	32%
Calaveras	33.6	E-NE	25%
San Gregorio	19.8	SW	5%

[1]USGS Fault files - Google Earth
[2]Working Group on California Earthquake Probabilities, 2014.

The attached Plate 4, Regional Fault Map, shows the major active fault locations with respect to the subject site.

Seismic Hazard Zone Maps for Redwood Point and San Mateo Quadrangles released by California Geological Survey (CGS), both dated January 11, 2018, depict the general site area is in a “liquefaction hazard zone,”

defined as "areas where historical occurrence of liquefaction, or local geologic, geotechnical and groundwater conditions indicate a potential for permanent ground displacement such that mitigation as defined in the Public Resources Code Section 2693(c) would be required." Note that the scope of this study does not include an assessment of the potential of the site materials for seismically-induced liquefaction which requires much deeper borings.

8.0 SITE CONDITIONS

8.1 Surface Conditions

The borings were advanced on the paved and unpaved areas as shown on the attached Plate 2, Site Plan. The surficial condition in the borings are tabulated below, which outlines the pavement thicknesses where present, as well the type and thickness of the underlying fill soils. Within the existing pavement areas, the average Asphaltic Concrete (AC) and Aggregate Baserock (AB), and fill thicknesses are 6.5", 6.4", and 12.7", respectively. Further, there is no discernable difference in the pavement thickness between the center and edges of the runway.

Table 3
Existing Pavement and Fill Soils

Boring No.	Asphaltic Concrete Thickness (AC), in.	Aggregate Base Thickness (AB), in.	Fill
Samples below are from 2019 investigation			
B-1	5	12	≈ 1' Lean Clay
B-2	6	10	≈1' Clayey Sand (SC)
B-3	7	6	≈1½' Clayey Sand (SC)
B-4	6½	5	≈1½' Clayey Sand (SC)
B-5	-	-	≈2½' Silty Sand with Gravel (SM)
B-6	6	6	≈1' Silty Sand with Gravel (SM)
B-7	-	-	2"-3" Topsoil over AB and Silty Sand with Gravel (SM); total thickness: ≈20"
B-8	7	5	≈1' Silty Sand (SM)
B-9	7	6	≈15" Silty Sand (SM)
B-10	7	6	≈1½' Silty Sand (SM)
B-11	6	12*	≈3" Clayey Sand (SC)
B-12	6	6	≈6" Silty Sand with Gravel (SM) & ≈8" Clayey Sand with Gravel (SC)
B-13	6½	5	≈8" Clayey Sand (SC)

Table 3
Existing Pavement and Fill Soils

Boring No.	Asphaltic Concrete Thickness (AC), in.	Aggregate Base Thickness (AB), in.	Fill
B-14	8	6	≈13" Silty & Clayey Sand (SC-SM)
B-15	-	-	≈6" Granular Topsoil over 6" AB and 6" Clayey Sand (SC)
B-16	7	5	≈12" Clayey Sand (SC)
B-17	-	-	≈6" Granular Topsoil over 6" AB and 6" Clayey Sandy (SC)
B-18	6	6	≈8" Clayey Sand (SC)
B-19	7	7	≈10" Clayey Sand (SC)
B-20	6	6	≈1' Clayey Sand (SC)
B-21	-	-	≈2' of Clayey Sand (SC), including a few inches of Topsoil
B-22	-	-	A few inches of topsoil over AB over 14" of Clayey Sand (SC) – total thickness: ≈2'
B-23	9½	5	≈10" Clayey Sand (SC)
B-24	7	5	≈7" Clayey Sand (SC)
B-25	8	8	≈5" Clayey Sand (SC)
B-26	-	-	3"-4" Topsoil over 6" AB over 10" Clayey Sand – total thickness: ≈20"
B-27	7	4	≈14" Clayey Sand (SC)
B-28	-	-	A few inches of Topsoil over AB to 10" plus 16" of Clayey Sand with Gravel (SC); total thickness - ≈26"
B-29	7	5	≈20" Clayey Sand with Gravel (SC)
B-30	6	6	≈9" Clayey Sand (SC)
B-31	8½	0	≈13" Clayey Sand
Samples below are from 2021 investigation			
B-1N	5	8	≈1' Well-Graded Sand with Clay and Gravel (SW-SC)
B-2N	5½	6	≈1' Well-Graded Sand with Clay and Gravel (SW-SC)
B-3N	6½	6	≈1¼' Clayey Sand with Gravel (SC)
B-4N	6	6	≈¾' Sandy Lean Clay (CL)
B-5N	5	0	≈3' Well-Graded Sand with Clay and Gravel (SW-SC)
B-6N	6¾	6	≈1¼' Clayey Sand with Gravel (SC)
B-7N	6	6	≈1¼' Sandy Fat Clay (CH)
B-8N	5¾	6	≈1¼' Sandy Lean Clay (CL)
B-9N	5¾	6	≈¾' Clayey Sand with Gravel (SC)
B-10N	6½	6	≈½' Clayey Sand with Gravel (SC)

*Well-graded gravel fill (does not resemble Class II AB).

8.2 Fill Soils

Fill soil types and thicknesses are tabulated above, which mainly consist of silty and clayey sands with varying gravel content, except for Borings B-1, B-4N, B-7N, and B-8N where the fill consisted of soft to stiff clays. Consistency of the granular fill soils in the area investigated was loose to medium dense. As shown above, the fill horizon is relatively thin, ranging from several inches to less than 3 feet in thickness. Also, at the time of our 2019 site exploration, the fill soils were found to be very moist to saturated, but were mostly moist or dry to moist at the boring locations of our 2021 investigation.

8.3 Young Bay Deposits (Bay Mud)

Native soils consisting of Young Bay Deposits (bay mud) underlie the pavement and/or fill in the runway and shoulder areas explored. The borings drilled for this investigation only extended to a maximum depth of 15 feet below the existing ground surface, and not to the bottom of the subject layer. However, records we have reviewed indicate the bay mud thickness is up to 20 feet in the San Carlos Airport area.

As encountered, bay mud is typically blue-gray to dark gray and olive-gray clay in color, and only brownish where it contains organics and peat, has a very high plasticity, it is saturated in most areas, and its consistency ranges from very soft to medium stiff. The bay mud is highly susceptible to consolidation under the pressures imposed by fill and structural loads.

The laboratory moisture density data indicates the upper bay mud dry densities were in the range of 42 to 84 pcf, and between 102 and 107 pcf at about 9 to 10 feet below the existing ground surface where it was frequently found to contain some sand. The moisture content of the bay mud ranged from 37.9% to 101.8%, and from 20.4% to 24.7% where the bay mud was sandy. Where the bay mud was organic-rich and/or contained peat, its dry density was as low as 25 pcf and its moisture content was as high as 200.4%.

The Atterberg limits tests carried out on samples of the bay mud yielded Liquid Limits in the range of 51 to 108, and the Plasticity Index of the same material ranged from 41 to 72, signifying the highly plastic nature of the bay mud.

For more information regarding the subsurface materials, we refer you to Plates 9 through 49, Borings Logs. Plate 55, Direct Shear Test Results presents plots of the direct shear testing carried out on samples of the fill and native bay mud soils, as well as the strength parameter for the samples tested.

8.4 Groundwater

Groundwater was encountered in 21 of the 31 borings advanced in 2019 and in 3 of the 10 borings advanced as part of our 2021 investigation, as tabulated in Table 4. Where possible, the groundwater level measurements were made at the time they were encountered in the boring, as well immediately before the borings were backfilled with grout/sand. The depths shown are measured from the runway pavement or unpaved shoulder surfaces. Where groundwater was not present in the boring, the highly cohesive bay mud soils had likely sealed off the side wall of the boring.

Because the elevation of the runway surface is only slightly above the mean sea level, as expected, groundwater is present at very shallow depths beneath the site as tabulated below. Note that groundwater levels were not allowed to stabilize in the borings and they were backfilled immediately after the last soil sample was collected. In all other airport locations both to the west and east sides of the runway, groundwater elevations are at or near the existing pavement surface.

Table 4
Groundwater (GW) Level Data

Boring No.	Boring Depth, ft	Initial GW Depth, ft	Final GW Depth, ft	Boring No.	Boring Depth, ft	Initial GW Depth, ft	Final GW Depth, ft
2019 Investigation							
B-1	10	10	9.8	**B-17**	10	5	2
B-2	10	-	-	**B-18**	10	-	10
B-3	10	-	-	**B-19**	10	-	-
B-4	15	-	10	**B-20**	10	-	5
B-5	15	5	2.2	**B-21**	10	-	10
B-6	10	-	-	**B-22**	10	-	2
B-7	10	5	2.5	**B-23**	10	5	2.3
B-8	10	-	-	**B-24**	10	8	10
B-9	10	-	-	**B-25**	10	-	10
B-10	15	5	8	**B-26**	10	5	2.5
B-11	10	-	-	**B-27**	10	-	9.8
B-12	10	9.5	-	**B-28**	10	5	2
B-13	10	8	2.2	**B-29**	10	-	-
B-14	10	-	-	**B-30**	10	-	10
B-15	10	-	2	**B-31**	10	-	-
B-16	10	8	-				

Boring No.	Boring Depth, ft	Initial GW Depth, ft	Final GW Depth, ft	Boring No.	Boring Depth, ft	Initial GW Depth, ft	Final GW Depth, ft
2021 investigation							
B-1N	5.5	-	-	**B-6N**	15	-	6
B-2N	5.5	-	-	**B-7N**	5.5	-	-
B-3N	5.5	-	-	**B-8N**	6.5	-	-
B-4N	5.5	-	-	**B-9N**	5.5	-	-
B-5N	14.5	14	2	**B-10N**	5.5	-	-

In the table above, where no groundwater level has been provided either initially or at the termination of drilling, or both, the boring sidewall was likely sealed off by the bay mud soils, thus blocking the flow of groundwater into the borehole. Furthermore, tidal influences also play a role on the groundwater levels due to the airport proximity to the San Francisco Bay.

9.0 CBR TESTING PROGRAM AND RESULTS

The bulk samples for CBR tests were collected from the depth interval of 2.5 to 10 feet in each boring advanced in 2019, and from approximately 2.5 feet to 5.5 feet in eight of the borings and 3.5 feet to 14.5 feet in two of the borings advanced in 2021. A total of 14 CBR tests were carried out by CTL and ISI for the initial investigation and 6 CBR tests by ISI for the second phase of the investigation. To expedite completion of the initial tests, the two outside laboratories were retained to carry out the CBR tests, as it would have been beyond the capability of any one laboratory to complete the CBR testing in a timely manner.

CBR tests were carried out on the bulk samples combined from every two borings advanced in 2019, and on the mixture of bay muds from all 10 borings advanced in 2021, as presented in Table 5 below. Testing was done after the composite samples were compacted to 85%, 90%, 95%, and/or near 100% while at the optimum moisture content or a moisture content of 2% over optimum, which required that a maximum density curve be prepared for each composite sample. The table also presents the relative density values for each composite sample, as well as the averages and standard deviation for the maximum dry density and optimum moisture content, density at test, relative density, and CBR.

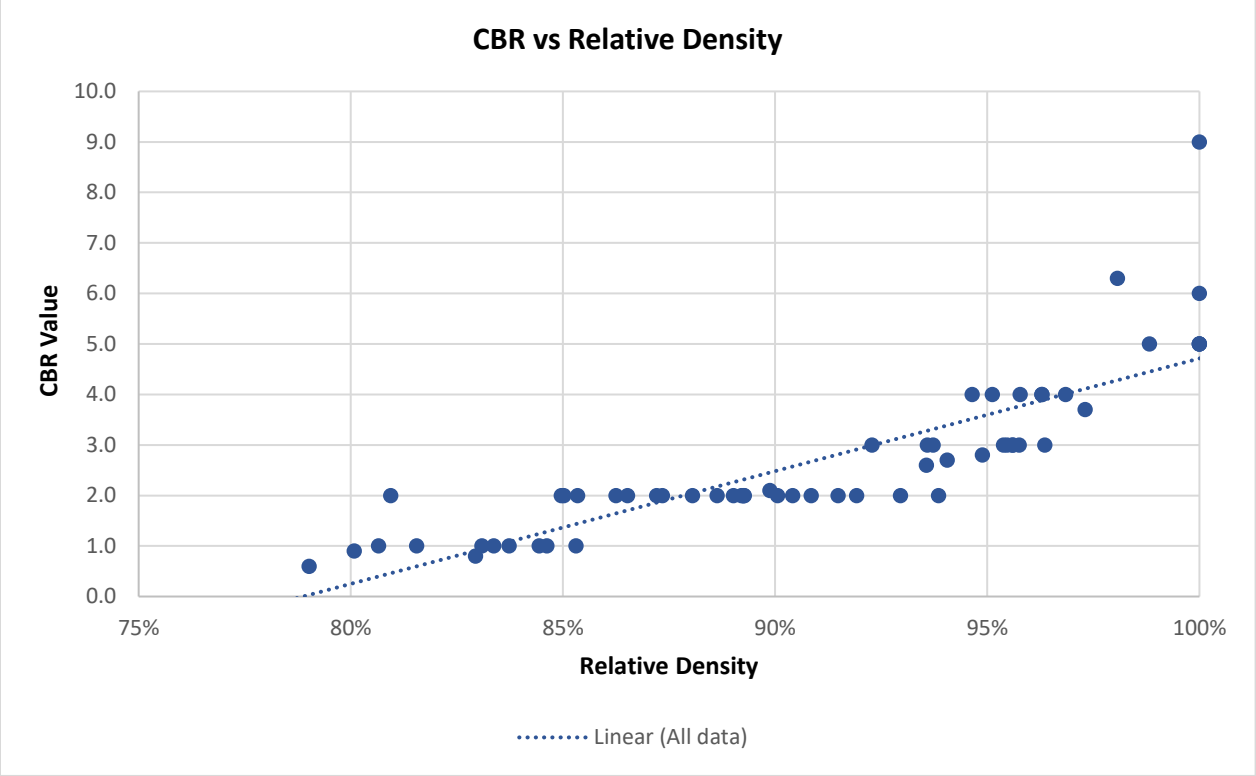
Table 5

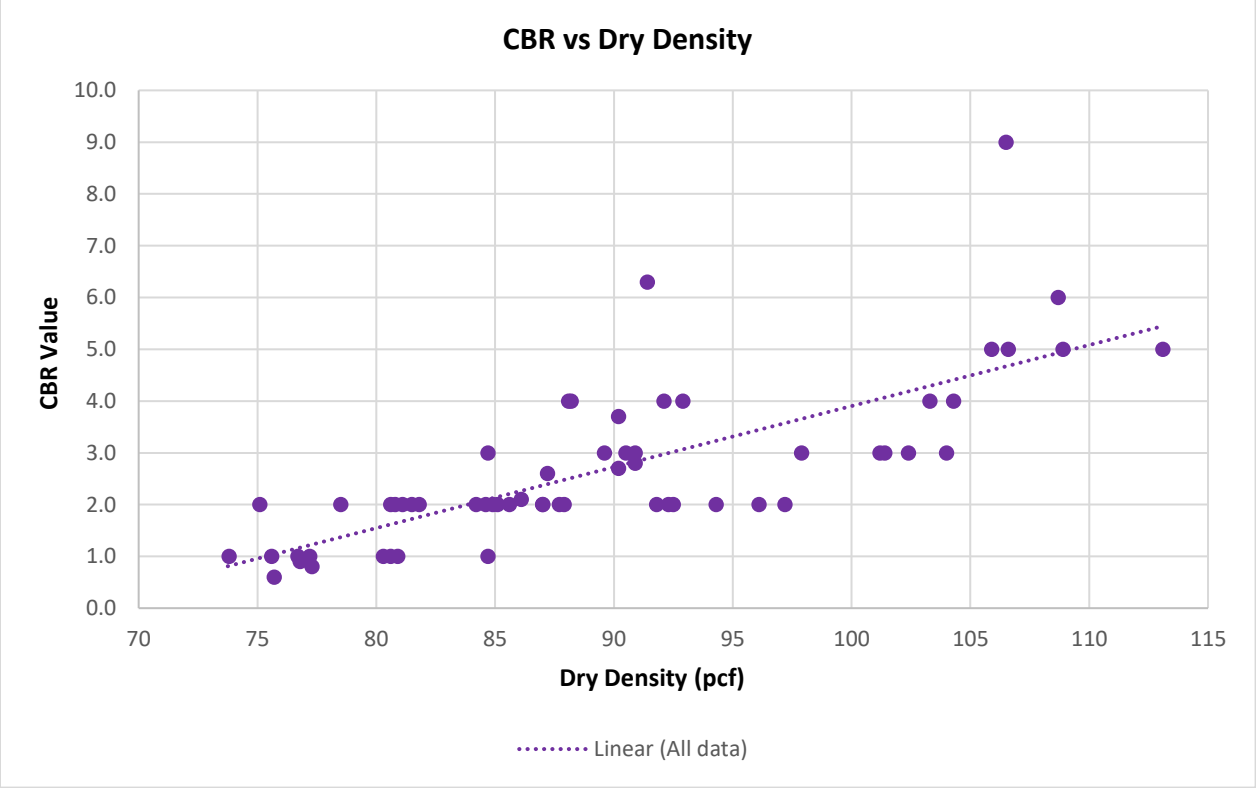
Laboratory CBR Test Results Summary

Sample	γ_{Max} [1]	w%	Density (pcf)	Relative Density	CBR	Density (pcf)	Relative Density	CBR	Density (pcf)	Relative Density	CBR	Density (pcf)	Relative Density	CBR
2019 Investigation: 85%, 90%, & 95% Relative Compaction at 2% Over Optimum Moisture Content														
	ASTM D1557		No. 1			No. 2			No. 3			-		
B1-B2	95.9	24.1	76.8	80.1%	0.9	85.6	89.3%	2	90.2	94.1%	2.7	N/A		
B3-B4	93.2	25.7	77.3	82.9%	0.8	87.2	93.6%	2.6	91.4	98.1%	6.3			
B5-B6	101.6	16.3	84.7	83.4%	1	92.3	90.8%	2	97.9	96.4%	3			
B7-B8	90.5	22.5	77.2	85.3%	1	81.5	90.1%	2	84.7	93.6%	3			
B9-B10	95.1	19.7	80.3	84.4%	1	84.9	89.3%	2	92.1	96.8%	4			
B11-B12	95.8	22.7	75.7	79.0%	0.6	86.1	89.9%	2.1	90.9	94.9%	2.8			
B13-B14	92.7	26.1	75.6	81.6%	1	87	93.9%	2	90.2	97.3%	3.7			
B15-B16	91.5	21.8	73.8	80.7%	1	81.1	88.6%	2	88.1	96.3%	4			
B17-B18	91.6	21.6	76.7	83.7%	1	84.2	91.9%	2	88.2	96.3%	4			
B19-B20	95.6	18.7	80.9	84.6%	1	85.1	89.0%	2	89.6	93.7%	3			
B21-B22	94.8	19.3	80.6	85.0%	2	84.6	89.2%	2	90.5	95.5%	3			
B23-B24	88	17.5	75.1	85.3%	2	78.5	89.2%	2	81.8	93.0%	2			
B25-B26	97	18.9	80.6	83.1%	1	87.7	90.4%	2	92.9	95.8%	4			
B27-B31	95.1	19.2	80.8	85.0%	2	87	91.5%	2	90.9	95.6%	3			
2021 Investigation: 90%, 95%, & 100% Relative Compaction at Optimum Moisture Content														
	ASTM D1557		-			No. 1			No. 2			No. 3		
Composite B-1N through B-10N	107.1	16.7	N/A			94.3	88.0%	2	102.4	95.6%	3	106.6	99.5%	5
	108.6	16.4				87.9	80.9%	2	103.3	95.1%	4	108.7	100.1%	6
	110.2	16.6				96.1	87.2%	2	104.3	94.6%	4	108.9	98.8%	5
	112.7	15.5				97.2	86.2%	2	104	92.3%	3	113.1	100.4%	5
	106.1	19.3				91.8	86.5%	2	101.2	95.4%	3	106.5	100.4%	9
	105.9	17.6				92.5	87.3%	2	101.4	95.8%	3	105.9	100.0%	5
Average	98.5	19.8	78.3	83.2%	1.2	87.6	89.1%	2.0	93.8	95.3%	3.4	108.3	99.9%	5.8
Standard Deviation	7.37	3.17	3.04	2.1%	0.47	5.01	2.8%	0.13	6.80	1.4%	0.89	2.66	0.6%	1.60

[1] Denotes maximum dry density (γ_{Max}, pcf) at optimum moisture content (w%).

The following charts present plots of CBR variations with relative density (degree of compaction), and CBR values versus dry density.


CBR vs Relative Density
CBR Value
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
75%
80%
85%
90%
95%
100%
Relative Density
Linear (All data)


CBR vs Dry Density
CBR Value
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
70
75
80
85
90
95
100
105
110
115
Dry Density (pcf)
Linear (All data)

The CBR results generally indicate the poor load carrying capacity of the subgrade material, which mainly consists of the native bay mud soils with minor fill mixed. As noted earlier in this report and on the boring logs, the fill thickness is in the range of about 1 to 3 feet, approximately a third of which consists of aggregate base. As such, the existing fill thickness is severely limited in its ability to provide a suitable bridging layer over the soft and compressible bay mud for the support of aircraft wheel loads.

Also as shown above, the CBR value is a little over 1 at 85% relative compaction, approximately 2 at 90% relative compaction, slightly less than 3.5 at 95% relative compaction, and increases to somewhere a little less than 6 at near 100% relative compaction. However, compaction of the subgrade, which mostly consisting of bay mud with a thin fill cover, to 95% or greater relative compaction is not practical and will not likely be achievable in the field. Therefore, for all practical purposes, a CBR value of 2, corresponding to a degree of compaction of 90%, should be used for pavement design involving a complete or partial reconstruction, and/or overlay.

10.0 DISCUSSION AND RECOMMENDATIONS

10.1 General

Based on our review of the published geologic and geotechnical documents, research, and subsurface exploration conducted on the existing runway and Taxiways K and L of the San Carlos Airport, as well as the results obtained from our laboratory testing program, it is our opinion that the proposed improvement of the subject pavement is geotechnically feasible, provided the results of this investigation and our recommendations for subgrade stabilization are taken into account.

The most significant constraint on the proposed project is the inadequacy of the existing fill soil to provide adequate support to the runway/taxiway pavement section. Consequently, any repair of the cracking along and parallel to the pavement edges will require stabilizing of the subgrade in the zone of cracking. As revealed by the CBR tests carried out for this investigation, the load-bearing capacity of the subgrade soil is very poor, which is typical of most areas that have been reclaimed from the waters of the San Francisco Bay.

Because of the poor subgrade CBR values and the thinness of the existing fill, stabilization of the subgrade underlying the cracked pavement edge must be carried out by one of two options:

1) The Soil- cement mixing process consisting of pulverizing the existing pavement, basercok and mixing it with existing fill and/ or Bay Mud then by treating the mixture with at least 5% cement by weight. This process, in some areas will locally require a higher percentage of cement depending on the bay mud consistency and possibly retreatment with additional cement as needed to obtain subgrade stabilization. The cement content recommended above is based on previous soil stabilization work at San Carlos Airport, and our local experience with cement treatment of the surface soils in the San Mateo County on many projects over the last 33 years, as well as, numerous trial R-value testing we have carried out in the past with the addition of varying amounts of cement.

2) The alternate and preferred method to stabilize the edges for the runway and taxi areas is a soil removal and cement slurry replacement method. This method entails the grinding and removal of the existing pavement and baserock along both edges of the runway and taxiways, where the pavement is heavily cracked due to pavement failure, currently as wide as 12 feet into the runway. Once the existing pavement and baserock is ground and removed, it can salvaged for re-use off site. At that point, excavation of weak, underlying soil consisting of combination of residual baserock, fill soil and/ or Bay Mud will be excavated with a smooth edge grading bucket to a prescribed depth of 3.0 feet below finished pavement. At this point, Mirafi 700 soil strength fabric, or approved equivalent will placed over the smooth excavated Bay Mud surface. If more saturated and softer Bay Mud soils exist, it will be at the discretion of the geotechnical engineer to increase the depth of excavation as necessary to further remove, weaker subgrade soil areas. Once the soil strength fabric is placed on the smoothly excavated subgrade, the soil strength fabric will be placed in such a manner to minimize wrinkles as much as practical. Overlap of fabric edges shall be no less than 5 feet wide, despite fabric supplier recommendations which may be less than 5 feet, so that fabric overlap and strength is not lost by pulling when concrete slurry is placed and spread over the fabric. The fabric overlap should also be maintained and held together with the use of galvanized nails. The concrete slurry shall consist of a sand-cement mixture (no flyash) capable of achieving a 28 day strength between 300 and 500 psi, the approximate strength (or slightly higher) of compacted baserock and/ or cement treated soil. A slurry strength less than 300 psi may not be strong enough, while as strength greater than 500 psi runs the risk of increased block cracking. The mix should be designed and proven with trial batch testing (ahead of construction) to demonstrate that the noted range can be achieved within 7 days and not exceed the maximum strength in 28 days. The Cement Slurry mixture should also have unit weight comparable to Bay Mud, on the order of 90 to 110

lbs./cu ft. so as not to float or to cause settlement of the reconstructed pavement edges. As per FAA requirements and calculation, when the slurry is cured to the 300- 500 psi strength requirement (to be confirmed by laboratory compression strength testing of field samples) baserock and pavement should then be placed and compacted as per FAA specification.

Along the edge of the repair, the pavement surface should be transition tapered with a pavement grinder. This transition grind will allow the use of a GlasGrid[2] paving fabric to be placed over the cold joint between the edge of the existing pavement, and the base layer of the new paving to reduce the chance of linear cracking between the edge repair and existing pavement. The overlap of the GlasGrid onto the transition grind of the existing pavement should be a minimum of 3 feet wide. Furthermore, the use of additional layers of GlasGrid may be recommended, where needed, in between the AC overlay lays, should more than one layer become necessary. At the option of the client, a minimum of 5-inch-thick aggregate base layer may be placed as bond breaker over the treated soil or slurry to prevent reflective and block cracking in addition and/ or instead of using GlasGrid paving fabric within the layers of the asphaltic concrete (AC)

For the "U" Shaped, distressed pavement in the transient parking area, exhibiting widespread cracking and distress, that area should also be reconstructed as per Option #1 or Option #2.

There are localized zones at the site where the Bay Mud is extremely soft and will provide little support to construction equipment. In areas where this condition exists, it may be necessary to increase the cement content and depth of mixing during treatment for Option #1 or the depth of the Cement Slurry for Option #2.

Cracking of the pavement edges is partially due to the poor drainage on the flat site. Because of flat grades and the difficulty to provide positive drainage, away from the edges of the pavement, rainwater runoff has adversely affected the pavement subgrade. In winter months, the lack of drainage allows rainwater to saturate the soil, near the edges of the pavement which causes the highly expansive soil to swell and lift the edges of the pavement. In the summer, the thin cover of fill soil does little to prevent the expansive soil

[2] The GlasGrid ® Pavement Reinforcement System is composed of fiberglass stands coated with an elastomeric polymer and formed into a grid structure. Each strand has a high tensile strength and high modulus of elasticity; this is particularly important as asphalt concrete typically cracks at low strains. When the GlasGrid is sandwiched between the leveling course and the surface course in an asphalt overlay, it becomes the hidden strength in the road, turning vertical crack stresses horizontally to effectively dissipate them (GlasGrid 8501/8511 Spec).

from drying out and shrinking back down and cracking the edges of the pavement. This repeated shrinking and swelling can cause most any (AC) pavement section to crack along its edges if not properly designed. So wherever possible, improving the drainage to remove stormwater away from the edges of pavement will help reduce edge cracking. That stated, stabilizing the outer edges of the pavement, as generally described above, will greatly help alleviate these concerns.

10.2 Procedure for Rehabilitation of the Distressed Runway/Taxiway Pavement

We recommend the following steps to stabilize/rehabilitate the cracked pavement on the edge of the runway:

10.2.1 Soil-Cement Mixing Option

- Mark a strip at least 12-foot-wide line along the two edges of the runway pavement;
- Saw cut and wedge-grind the pavement along these lines; either strip the pavement in these zones entirely to expose the aggregate base, or pulverize in place and thoroughly mix the material in the upper 24 inches with Portland cement;
- Treat the upper 24 inches of the pavement edges processed as described above with a minimum of 5% by weight of cement; where the bay mud is excessively soft, a higher percentage of cement will likely be required and/or the treatment depth may be greater;
- Preferably extend the zone of soil mixing and stabilization to the runway shoulders currently exposing aggregate base as it would prevent the moisture from migrating to beneath the runway edge and saturating/softening the subgrade which is the likely cause of cracking;
- Replace the (AC) pavement along the edges of the Runway and Taxiway areas to match the existing pavement thickness;
- If the use of GlasGrid is not desired, a 5-inch-thick aggregate base layer may be placed over the treated soil to help minimize reflective or block cracking of the pavement.

10.2.2 Slurry Backfill Option

- Mark a 12-foot-wide strip along the two edges of the runway pavement;
- Saw cut and wedge-grind the pavement either along the entire length of the pavement or selectively where pavement cracking and distress is evident.

- Remove the AC pavement;
- Remove the top 36 inches of the exposed base material and subgrade soils;
- Backfill the excavation with cement slurry to the bottom of the baserock layer (see below relative to the quality of the Cement Slurry)
- Place and compact the FAA required baserock section over the cured Cement Slurry
- Place fresh hot mix (AC) pavement to match the existing section with Gas Grid paving fabric overlapped between layers of paving overlapped onto the wedge grind of the existing pavement surface to reduce joint cracking.
- If the use of GlasGrid is not desired, a 5-inch-thick minimum thickness of aggregate base may be placed over the treated soil to help minimize reflective or block cracking of the pavement.
- The preferred method to repair edge cracking is to use Cement Slurry with 300 – 500 psi unconfined compression strength and a unit weight between 90 and 110 lbs. per cu.ft.

10.2.3 Complete Reconstruction of Runway/Taxiway Pavement

If a complete reconstruction of the runway/taxiway pavement is desired, it should consist of pulverizing the entire pavement in place, thorough mixing of the AC cuttings with the AB and other fill below, and by treating the mixture with at least 5% by weight of cement, a minimum of 18 inches deep. To prevent reflective cracking, we recommend a minimum of 5 inches of aggregate base should be placed over the treated surface and immediately beneath the new paving. To build up the desired strength for heavier aircraft, multiple layers of Hot Mix Asphaltic Concrete could be placed in 2-inch lift thicknesses, with layers of Glass Grid paving fabric sandwiched in between the layers of HMA, until the desired pavement strength is achieved.

Alternatively, another option to strengthen the runway for heavier aircraft, with far less airport downtime, would be to repair the edge cracking by the preferred method (Option #2) of cement-slurry replacement of soft soil. Once the edges were repaired, then the entire runway could be overlayed with HMA in 2-inch lifts with Glass Grid paving fabric sandwiched in between the layers of HMA until the desired strength is achieved. The method also helps raise the elevation of the runway higher above the groundwater table and to somewhat help counteract sea level rise over time if multiple layers are placed periodically over future years. Raising the runway with layers of HMA also helps increase drainage potential as the runway surface becomes higher, relative to the surrounding

infield drainage. To carry out this method of runway strengthening, the runway would undergo a light surface grinding to roughen the surface for bonding of successive layers of Glass Grid and HMA until the desired strength and runway elevation is accomplished.

Overlays thicker than 3 inches must be placed in two lifts and a layer of GlasGrid should be placed between the two overlay layers as well to prevent cracking and to prolong the life of the pavement.

10.3 Transient Parking Area Pavement

Because of the poor condition of the pavement in this area, we recommend removing the existing pavement, base material, and subgrade soils in a manner that will allow the placement of 36 inches of cement slurry topped with FAA required baserock and a minimum of 4 inches of hot mix asphaltic concrete pavement. If desired, a minimum 5-inch-thick aggregate base layer may be placed between the slurry and AC to help minimize reflective and block cracking; for which, the excavation must be somewhat deepened. If a layer of baserock is desired the slurry thickness could be reduced to a total minimum Cement Slurry depth of 24" underlain with the Mirafi 700 soil strength fabric as this is the minimum bridging layer required to obtain support of the replacement pavement section of the soft, underlying bay mud.

10.4 Pavement Subgrade Improvement

The improvement and/or reconstruction of the pavement in the outer edges of runway/taxiway pavement where it exhibits distress, will be difficult because of the presence of little fill over soft and compressible bay mud, and the presence of shallow groundwater. Placement of pavement over the soft bay mud is challenging because this material is only marginally capable of supporting lightweight, low ground pressure equipment or excavation equipment working on the existing pavement rather than attempting to operate on the unstable Bay Mud. Likewise, compaction of base and subbase material upon Bay Mud cannot be readily achieved because of its unstable nature.

If Option #1, using soil-cement mixing is chosen to repair the edges of the runway/taxiways our experience in stabilizing the subgrade at the subject site indicates cement is a better stabilizing agent than lime. Cement is a one step process with a relatively short cure time of 2 to 4 hours. The cement tends to dry out the soft and wet soils and has a lesser susceptibility to adverse impact from the shallow groundwater. Cement is

typically mixed with the bay mud with about 5% to 10% by weight until the desired setup is achieved usually in a relatively short time, whereas lime treatment requires a two-step, overnight cure and a remixing process with a substantial amount of set up time. In a shallow groundwater environment where saturation of the subgrade, after the initial mixing, may occur, the soil-lime mixture often becomes saturated and fails to achieve stabilization and would likely require additional lime to stabilize the saturated and unstable subgrade the day after the initial mixing.

If Option #2, the cement slurry soil replacement is selected, it should consist of a minimum 2-sack Portland Cement mix with no flyash or other additives which may inhibit timely curing of the cement-slurry mix. Based on our experience, depending on its actual constituents, such a mix will typically have a compressive strength in the range of 300 to 500 psi, which is the ideal strength range for the subject purpose. During construction, BAGG Engineers will review the mix design and perform compression strength tests to determine the suitability of the mix proposed by the General Contractor. Cement Slurry testing is also recommended as a quality control measure during construction to confirm that the material meets the required design standard, throughout the course of the project.

As used in this report, the term “compact” and its derivatives mean that all on-site native soils should be compacted to a minimum of 90 percent of the maximum dry density at a moisture content of about 2% over optimum, as determined by the latest ASTM Test Method D1557, and the aggregate base should be compacted to at least 95% or FAA Specification of the maximum dry density in layers not exceeding 6 to 8 inches in thickness.

Imported fill soils, if required, must consist of predominantly granular materials or materials similar to the existing near-surface fill soils, or Class II aggregate base. As a guide to acceptance, the material should have a Plasticity Index less than 12, a minimum R-value near 50, a maximum particle size of 2 inches, and must be approved by the Geotechnical Engineer before importing to the site.

It must be the Contractor’s responsibility to select lightweight, low ground pressure equipment and procedures that will accomplish the grading as described above. The Contractor must also organize his work in such a manner that one of our field representatives can observe and test the grading operations, including clearing, excavation, compaction of subgrade soil, fill, backfill, cement- slurry, baserock and Hot Mix Asphaltic Concrete.

10.5 Pavement Design

Based on the CBR test results discussed earlier, for all practical purposes, the design CBR value for the subgrade soils containing mostly bay mud with minor amounts of granular fill and aggregate base should be taken as 2.0 corresponding to a degree of compaction of 90%. These values for the CBR and degree of compaction of the subgrade are recommended for pavement design involving a complete reconstruction or an overlay.

10.6 Drainage

Site drainage should be considered an integral part of the proposed construction. Drainage swales and storm drain catch basins should be incorporated into the grading plan, and the grades should be designed to provide sufficient slope away from the existing runways/taxiways toward appropriate discharge points. Drainage from the paved areas should be directed by a positive slope away from the pavement crown to the sides and drainage swales may be constructed beyond the shoulder areas to drain by gravity to approved outfalls. Any area where surface run-off becomes concentrated should be provided with a catch basin which discharges the collected runoff in a manner that will not cause erosion.

Surface and subsurface drainage facilities and catchment areas should be checked frequently and cleaned or maintained throughout the project life, as necessary.

Treatment of the outer edges of the pavement, and if possible, the shoulder areas, with cement, will provide an effective relatively impervious barrier to the runoff and subsurface moisture flowing toward the runway and taxiways.

10.7 Plan Review

It is recommended that the Geotechnical Engineer (BAGG Engineers) be retained to review the final runway/taxiway pavement improvement plans. This review is to assess general suitability of the earthwork recommendations contained in the report, to verify the appropriate implementation of our recommendations into the project plans and specifications.

10.8 Observation and Testing

It is recommended that the Geotechnical Engineer (BAGG Engineers) be retained to provide observation and testing services during site grading, excavation, subgrade stabilization, backfilling, pavement reconstruction, and testing of lightweight slurry testing for minimum and maximum strength range. This is intended to monitor that the work in the field is performed as recommended and in accordance with the approved plans and specifications, as well as confirm that subsurface conditions encountered during construction are similar to those anticipated during the design phase. Unanticipated subsurface conditions may warrant revised recommendations. For this reason, BAGG cannot accept responsibility for the recommendations in this report if we are not given the opportunity to observe and test the construction activities in the field.

11.0 CLOSURE

This report has been prepared in accordance with generally accepted engineering practices for the strict use of C&S Engineers, San Carlos Airport, and other professionals associated with the specific project described in this report. The recommendations presented in this report are based on our understanding of the proposed construction as described herein, and upon the subsurface conditions encountered in the exploratory borings advanced by BAGG Engineers for this project.

The conclusions and recommendations contained in this report are based on subsurface conditions revealed by widely-spaced borings, and a review of available geotechnical and geologic literature pertaining to the project site. It is not uncommon for unanticipated conditions to be encountered during site grading and it is not possible for all such variations to be found by a field exploration program appropriate for this type of project. The recommendations contained in this report are therefore contingent upon the review of the final pavement improvement plans by this office, and upon geotechnical observation and testing by BAGG of all pertinent aspects of site grading, excavation, subgrade stabilization, pavement reconstruction, and drainage installation.

Subsurface conditions and standards of practice change with time. Therefore, we should be consulted to update this report if the construction does not commence within 18 months from the date this report is submitted. Additionally, the recommendations of this report are only valid for the proposed project as

described herein. If the proposed project is modified, our recommendations should be reviewed and approved or modified by this office in writing.

The following references and plates are attached and complete this report:

Plate 1	Vicinity Map
Plate 2	Site Plan
Plate 3	Area Geologic Map
Plate 4	Regional Fault Map
Plate 5	Unified Soil Classification System
Plate 6	Soil Terminology
Plate 7	Boring Log Notes
Plate 8	Key to Symbols
Plates 9 through 49	Boring Logs
Plates 50 and 51	Gradation Test Data
Plates 52 and 54	Plasticity Data
Plates 55	Direct Shear Test Plots
Plates 56 and 57	Site Photographs

Appendix A CBR Tests by Cooper Testing Labs (CTL)

Plates A-1 through A-4 California Bearing Ratio (ASTM D-1883)

Appendix B CBR Tests by Inspection Services, Inc. (ISI)

Plates B-1 through B-16 California Bearing Ratio (ASTM D-1883)

Appendix C Laboratory Compaction Tests by Inspection Services, Inc. (ISI)

Plates C-1 through C-6 Compaction Test Report (ASTM D-1557)

ASFE document titled “Important Information about This Geotechnical Engineering Report”

12.0 REFERENCES

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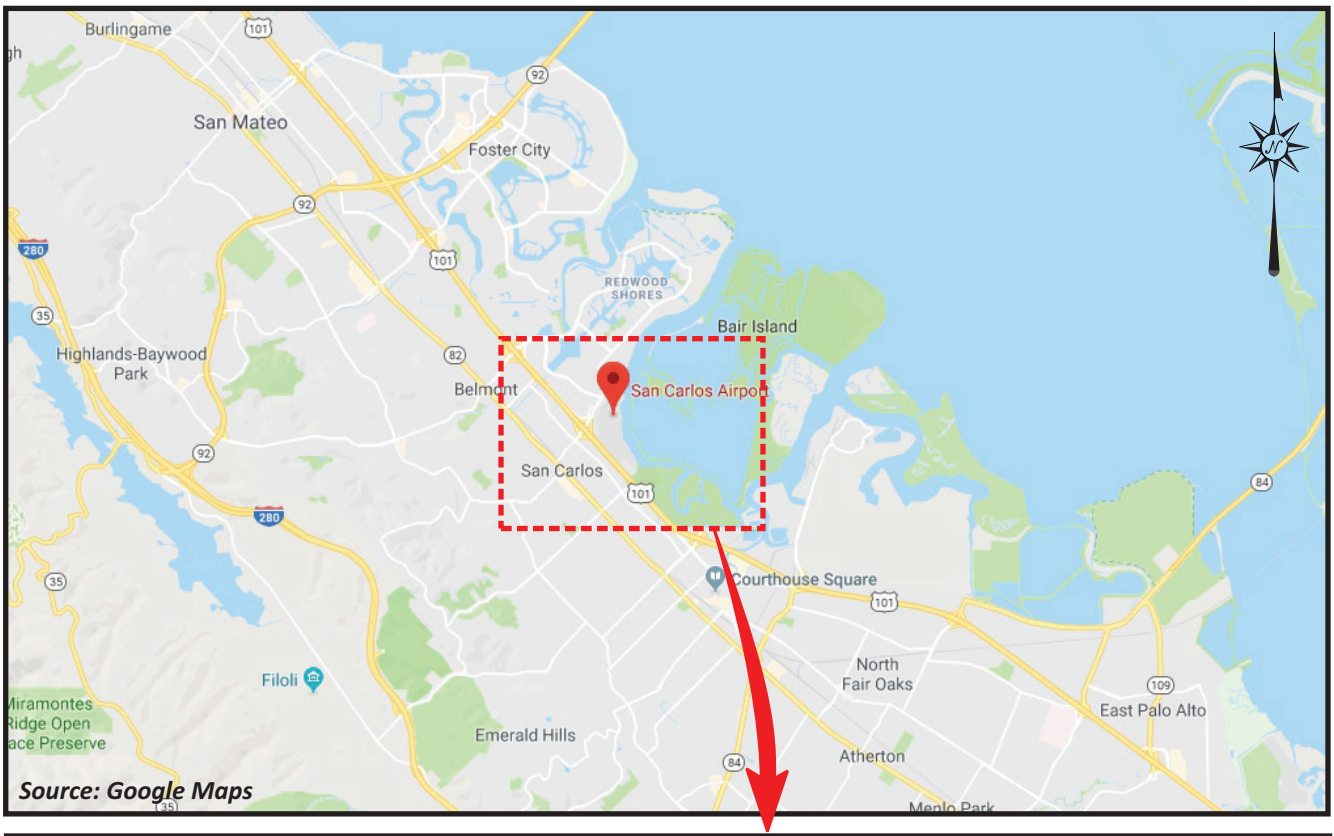


GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

VICINITY MAP

DATE	JOB NO.	PLATE
December 2021	CSCOM-21-01	1

BAGG ENGINEERS

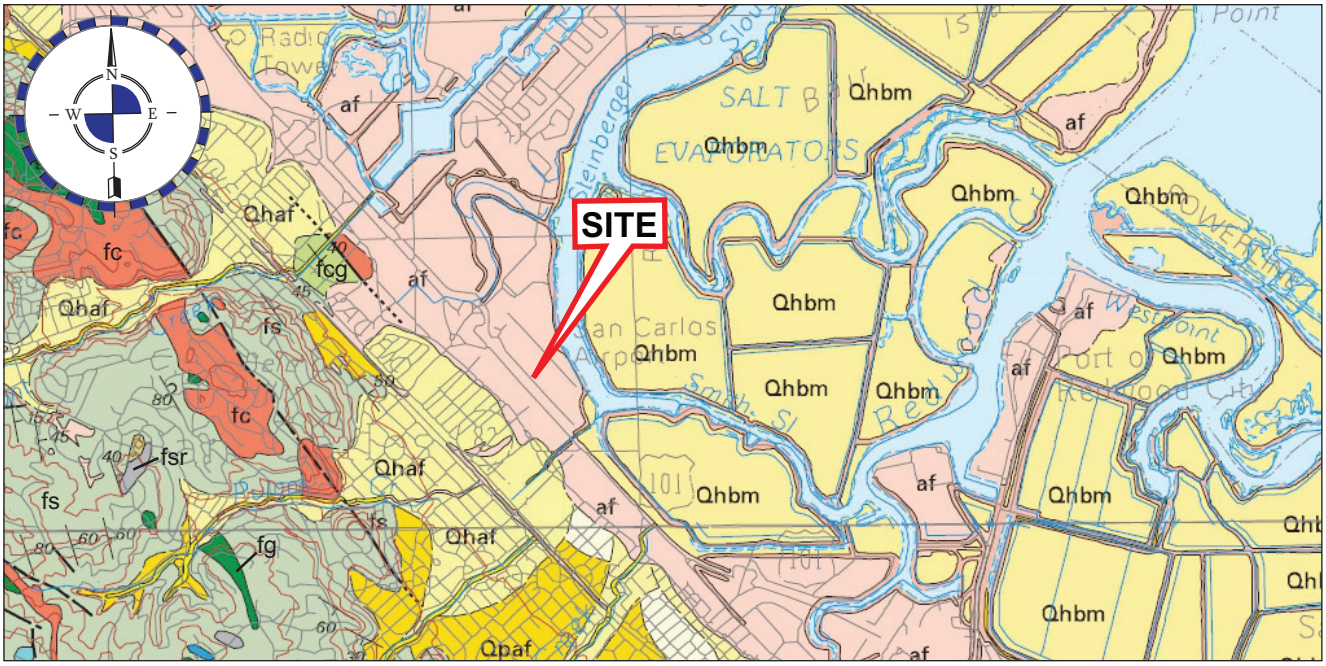
Base: "Limits of Geotech Borings, Exhibit" San Carlos Airport, by C&S Companies, unsigned and undated.

GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

BvGG ENGINEERS

SITE PLAN

JOB NO:	SCALE:	DATE:	PLATE
CSCOM-21-01	1" = 200'	December 2021	2



LEGEND

af	**Artificial Fill (Historic) –** Loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations.
Qhaf	**Alluvial Fan and Fluvial Deposits (Holocene) –** Brown or tan, medium dense to dense, gravely sand or sandy gravel that generally grades upward to sandy or silty clay.
Qhbm	**Bay Mud (Holocene) –** Water-saturated estuarine mud, predominantly gray, green and blue clay and silty clay underlying marshlands and tidal mud flats of San Francisco Bay, Pescadero, and Pacifica.
Qhb	**Basin Deposits (Holocene) –** Very fine silty clay to clay deposits occupying flat-floored basins at the distal edge of alluvial fans adjacent to the bay mud (Qhbm).
Qpaf	**Alluvial Fan and Fluvial Deposits (Pleistocene) –** Brown dense gravely and clayey sand or clayey gravel that fines upward to sandy clay.
fc	**Chert –** White, green, red, and orange chert, in places interbedded with reddish-brown shale.
fcg	**Conglomerate –** Greenish-gray to buff colored conglomerate, composed of well-rounded pebbles and cobbles in a graywacke matrix, cropping out as layers and lenses in graywacke (fs).
fg	**Greenstone –** Dark-green to red altered basaltic rocks.
fs	**Sandstone –** Greenish-gray to buff, fine to coarse-grained sandstone (graywacke), with interbedded siltstone and shale.
fsr	**Sheared Rock (melange) –** Predominantly graywacke, siltstone, and shale, substantial portions of which have been sheared, but includes hard blocks of all other Franciscan rock types.

Reference: *"Geology of the Onshore Part of San Mateo County, California*: Derived from the Digital Database Open-File 98-137" by Brabb et al., 1998.

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RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
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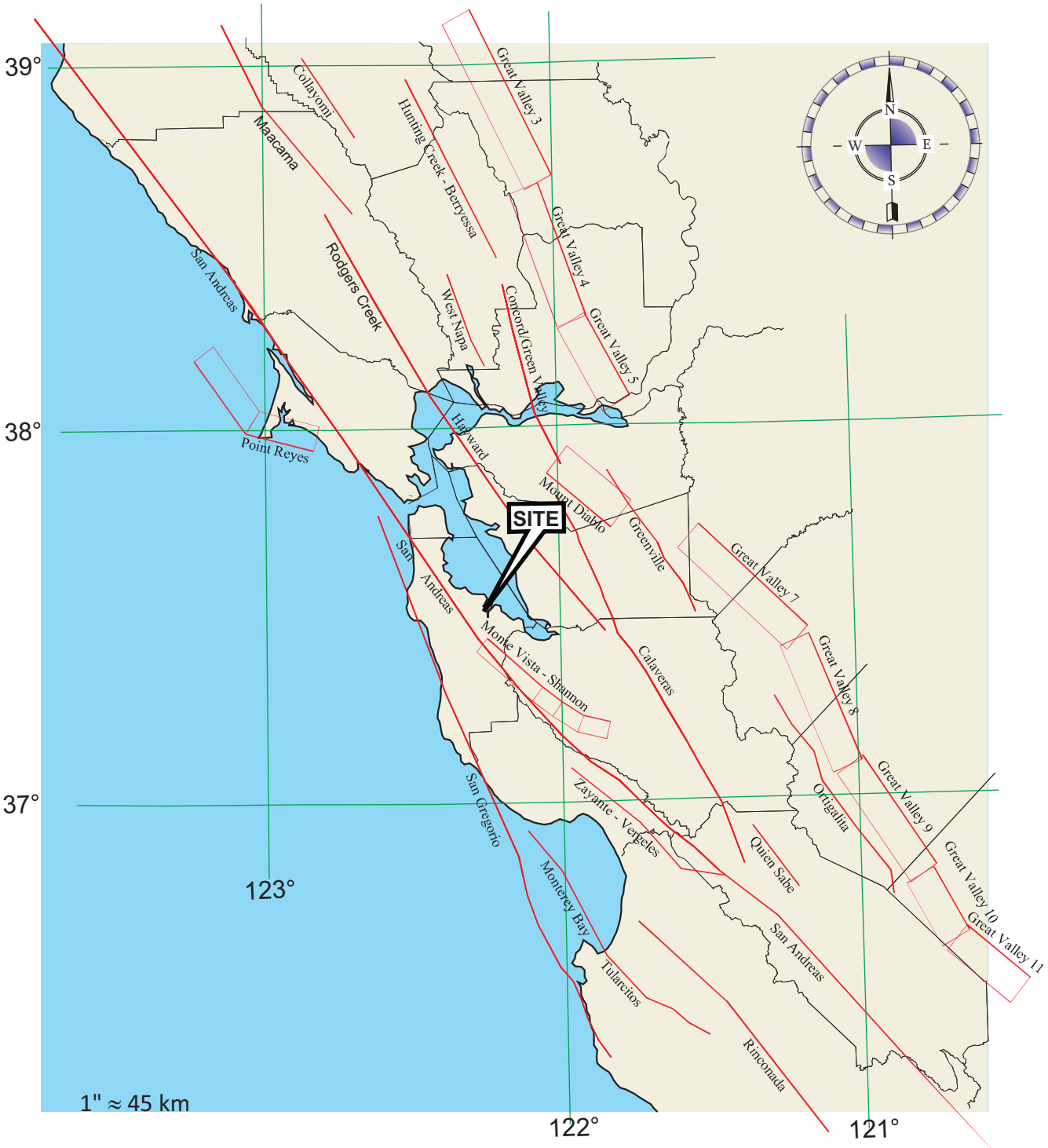
AREA GEOLOGIC MAP

DATE:	JOB NUMBER:	PLATE:
December 2021	CSCOM-21-01	3

BvGG ENGINEERS



Reference: California Geological Survey Fault Model, 2002

GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

REGIONAL FAULT MAP

DATE:	JOB NUMBER:	PLATE
December 2021	CSCOM-21-01	4

BAGG ENGINEERS

COARSE-GRAINED SOILS

LESS THAN 50% FINES*

GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	MAJOR DIVISIONS
GW	Well graded gravel Well graded gravel with sand	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	Poorly graded gravel Poorly graded gravel with sand	
GM	Silty gravel Silty gravel with sand	
GC	Clayey gravel Clayey gravel with sand	
SW	Well graded sand Well graded sand with gravel	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	Poorly graded sand Poorly graded sand with gravel	
SM	Silty sand Silty sand with gravel	
SC	Clayey sand Clayey sand with gravel	

NOTE: Coarse-grained soils receive dual symbols if:
(1) their fines are CL-ML (e.g. SC-SM or GC-GM) or
(2) they contain 5-12% fines (e.g. SW-SM, GP-GC, etc.)

FINE-GRAINED SOILS

MORE THAN 50% FINES*

GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	MAJOR DIVISIONS
CL	Lean clay Sandy lean clay with gravel	SILTS AND CLAYS liquid limit less than 50
ML	Silt Sandy silt with gravel	
OL	Organic clay Sandy organic clay with gravel	
CH	Fat clay Sandy fat clay with gravel	SILTS AND CLAYS liquid limit more than 50
MH	Elastic silt Sandy elastic silt with gravel	
OH	Organic clay Sandy organic clay with gravel	
PT	Peat Highly organic silt	HIGHLY ORGANIC SOIL

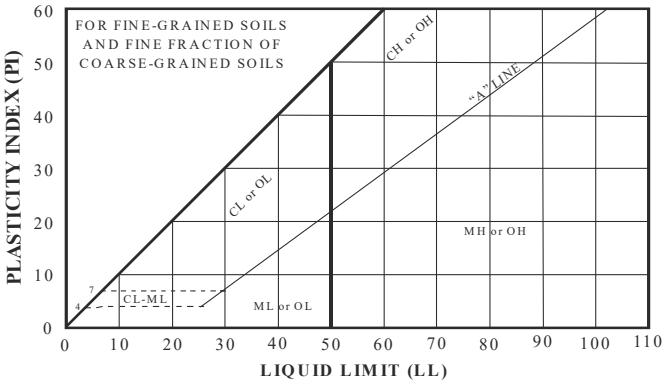
NOTE: Fine-grained soils receive dual symbols if their limits in the hatched zone on the Plasticity Chart(L-M)

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	ABOVE 12 in.
COBBLES	3 in. to 12 in.
GRAVEL	No. 4 to 3 in.
Coarse	¾ in to 3 in.
Fine	No. 4 to ¾ in.
SAND	No. 200 to No.4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
*FINES:	BELOW No. 200

NOTE: Classification is based on the portion of a sample that passes the 3-inch sieve.

PLASTICITY CHART



Reference: ASTM D 2487-06, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

GENERAL NOTES: The tables list 30 out of a possible 110 Group Names, all of which are assigned to unique proportions of constituent soils. Flow charts in ASTM D 2487-06 aid assignment of the Group Names. Some general rules for fine grained soils are: less than 15% sand or gravel is not mentioned; 15% to 25% sand or gravel is termed "with sand" or "with gravel", and 30% to 49% sand or gravel is termed "sandy" or "gravelly". Some general rules for coarse-grained soils are: uniformly-graded or gap-graded soils are "Poorly" graded (SP or GP); 15% or more sand or gravel is termed "with sand" or "with gravel", 15% to 25% clay and silt is termed clayey and silty and any cobbles or boulders are termed "with cobbles" or "with boulders".

UNIFIED SOIL CLASSIFICATION SYSTEM

BVGG ENGINEERS

SOIL TYPES (Ref 1)

Boulders: particles of rock that will not pass a 12-inch screen.
Cobbles: particles of rock that will pass a 12-inch screen, but not a 3-inch sieve.
Gravel: particles of rock that will pass a 3-inch sieve, but not a #4 sieve.
Sand: particles of rock that will pass a #4 sieve, but not a #200 sieve.
Silt: soil that will pass a #200 sieve, that is non-plastic or very slightly plastic, and that exhibits little or no strength when dry.
Clay: soil that will pass a #200 sieve, that can be made to exhibit plasticity (putty-like properties) within a range of water contents, and that exhibits considerable strength when dry.

MOISTURE AND DENSITY

Moisture Condition: an observational term; dry, moist, wet, or saturated.
Moisture Content: the weight of water in a sample divided by the weight of dry soil in the soil sample, expressed as a percentage.
Dry Density: the pounds of dry soil in a cubic foot of soil.

DESCRIPTORS OF CONSISTENCY (Ref 3)

Liquid Limit: the water content at which a soil that will pass a #40 sieve is on the boundary between exhibiting liquid and plastic characteristics. The consistency feels like soft butter.
Plastic Limit: the water content at which a soil that will pass a #40 sieve is on the boundary between exhibiting plastic and semi-solid characteristics. The consistency feels like stiff putty.
Plasticity Index: the difference between the liquid limit and the plastic limit, i.e. the range in water contents over which the soil is in a plastic state.

MEASURES OF CONSISTENCY OF COHESIVE SOILS (CLAYS) (Ref's 2 & 3)

Very Soft	N=0-1*	C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000 psf	Dented slightly by a pencil point

***N**=blows per foot in the Standard Penetration Test. In cohesive soils, with the 3-inch-diameter ring sampler, 140-pound weight, divide the blow count by 1.2 to get N (Ref 4).

MEASURES OF RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND SILTS) (Ref's 2 & 3)

Very Loose	N=0-4**	RD=0-30	Easily push a ½-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a ½-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a ½-inch reinforcing rod
Dense	N=31-50	RD=70-90	Drive a ½-inch reinforcing rod 1 foot
Very Dense	N>50	RD=90-100	Drive a ½-inch reinforcing rod a few inches

****N**=Blows per foot in the Standard Penetration Test. In granular soils, with the 3-inch-diameter ring sampler, 140-pound weight, divide the blow count by 2 to get N (Ref 4).

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Ref 1: ASTM Designation: D 2487-06, **Standard Classification of Soils for Engineering Purposes** (Unified Soil Classification System).

Ref 2: Terzaghi, Karl, and Peck, Ralph B., **Soil Mechanics in Engineering Practice,** John Wiley & Sons, New York, 2nd Ed., 1967, pp. 30, 341, and 347.

Ref 3: Sowers, George F., **Introductory Soil Mechanics and Foundations: Geotechnical Engineering,** Macmillan Publishing Company, New York, 4th Ed., 1979, pp. 80, 81, and 312.

Ref 4: Lowe, John III, and Zaccheo, Phillip F., **Subsurface Explorations and Sampling,** Chapter 1 in "Foundation Engineering Handbook," Hsai-Yang Fang, Editor, Van Nostrand Reinhold Company, New York, 2nd Ed, 1991, p. 39.

SOIL TERMINOLOGY

GENERAL NOTES FOR BORING LOGS:

The boring logs are intended for use only in conjunction with the text, and for only the purposes the text outlines for our services. The Plate "Soil Terminology" defines common terms used on the boring logs.

The plate "Unified Soil Classification System," illustrates the method used to classify the soils. The soils were visually classified in the field; the classifications were modified by visual examination of samples in the laboratory, supported, where indicated on the logs, by tests of liquid limit, plasticity index, and/or gradation. In addition to the interpretations for sample classification, there are interpretations of where stratum changes occur between samples, where gradational changes substantively occur, and where minor changes within a stratum are significant enough to log.

There may be variations in subsurface conditions between borings. Soil characteristics change with variations in moisture content, with exchange of ions, with loosening and densifying, and for other reasons. Groundwater levels change with seasons, with pumping, from leaks, and for other reasons. Thus boring logs depict interpretations of subsurface conditions only at the locations indicated, and only on the date(s) noted.

SPECIAL FIELD NOTES FOR THIS REPORT:

1. The borings for this investigation were advanced on January 21 through January 23, 2019 and September 10th, 2021 with a truck-mounted drilling rig using 6-inch diameter continuous flight augers and/or 8-inch diameter hollow stem augers. Immediately after the last soil sample was retrieved, the borings were backfilled with neat cement grout and/or clean sand and the top was patched with sac-crete or capped with soil.

2. The boring locations were approximately located by pacing from known points on the site, as shown on Plate 2, Site Plan.

3. The soils' Group Names [e.g. LEAN CLAY] and Group Symbols [e.g. (CL)] were determined or estimated per ASTM D 2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System, see Plate 5). Other engineering terms used on the boring logs are defined on Plate 6, Soil Terminology.

4. Groundwater was encountered on the dates and at the depths indicated on the boring logs.

5. The undisturbed soil samples were obtained using the sampler types noted on the boring logs and described on Plate 8, Key to Symbols.

6. The "Blow Count" Column on the boring logs indicates the number of blows required to drive the Modified California samplers below the bottom of the boring, with the blow counts given for each 6 inches of sampler penetration.

7. The tabulated strength values on the boring logs are peak strength values.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Concrete
	Aggregate Base
	Lean Clay
	High plasticity (fat) clay
	Clayey sand
	Silty sand with gravel
	Topsoil
	Silty sand
	Clayey sand with gravel
	Silty & clayey sand
	High plasticity (fat) clay with sand
	High plasticity organic clay
	High plasticity (fat) clay with organics

Symbol	Description
Misc. Symbols	
	Water first encountered during drilling
	Water level at completion of boring
Soil Samplers	
	Modified California Sampler: 24" long, 2.375" ID by 3" OD, split-barrel sampler driven w/ 140-pound hammer falling 30 inches (ASTM D3550)
Line Types	
_____	Denotes a sudden, or well identified strata change
- - - - - - -	Denotes a gradual, or poorly identified strata change
Laboratory Data	
DSX	Direct shear test performed after the sample was submerged in water until volume changes ceased (ASTM D3080).
PI	Plasticity Index established per ASTM D4318 Test Method.
LL	Liquid Limit established per ASTM D4318 Test Method.
%Gravel	Percent of soil particles coarser than a No. 4 sieve and finer than a 3" sieve (ASTM C117)
%Sand	Percent of soil particles coarser than a No. 200 sieve and finer than a No. 4 sieve (ASTM C117)
%Fines	Percent of soil particles finer than a No. 200 sieve (ASTM C117)
bgs	Below the ground surface
AC	Asphaltic Concrete
AB	Aggregate Base

BORING LOG

Boring No. B-1

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			5" AC over 12" AB	Hand auger to 2½ feet for utility clearance
								CL	LEAN CLAY: brown, stiff, moist	Fill
				57.0	61	3	5 5 6	CH	FAT CLAY: light blue-gray with dark blue-gray mottling, stiff, moist, trace organics	Native Bay Mud
						6	2 3 2		... blue-gray, soft, moist to wet	LL=98, PI=67
						9	1 2 2		... very soft, moist to wet	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was encountered at approximately 10 feet bgs when drilling and was measured at approximately 9'-10" bgs upon completion of the boring. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-2

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 10" AB	
							3 4 7	SC	CLAYEY SAND: gray-brown, gray, and red brown, medium dense, moist to wet, trace to few gravel	Fill
						3		CH	FAT CLAY: olive-gray with trace blue-gray, stiff, moist, trace organics	Native Bay Mud
							2 2 2		... blue-gray, soft, moist to wet	
				102.2	44	6				
						9	0 1 1		... very soft, moist to wet	
									The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						12				
						15				
						18				

BORING LOG

Boring No. B-3

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 6" AB	
							4 5 6	SC	CLAYEY SAND: brown to gray-brown, medium dense, dry to moist, well-graded sand, trace to few gravel	Fill
						3		CH	FAT CLAY: blue-gray with red-brown mottling, medium stiff, moist, trace organics	Native Bay Mud
				86.4	50		1 2 2		... blue-gray, very soft, moist to wet	
						6				
						9	0 1 2		... very soft, moist to wet	
									The boring was terminated at approximately 10 feet bgs. Groundwater was measured at approximately 2½ feet bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						12				
						15				
						18				

BORING LOG

Boring No. B-4

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6½" AC over 5" AB	
							5 5 5	SC	CLAYEY SAND: brown, medium dense, dry to moist, well-graded sand, trace gravel	Fill
DSX DSX	400 1500	58.5 55.5	630 1260	55.4 55.0	61 61	3		CH	FAT CLAY: light blue-gray with dark blue-gray mottling, medium stiff, moist to wet, contains trace peat lenses and organics	Native Bay Mud
						6	1 2 2		... blue-gray, very soft, moist to wet, trace shell fragments	
				97.4	46	9	0 1 1		...blue-gray, very soft, moist to wet	
						12			... medium stiff	
						15			The boring was terminated at approximately 15 feet bgs. Groundwater was measured at approximately 10 feet bgs.	Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.
						18				

BORING LOG

Boring No. B-5

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0	3	SM	SILTY SAND with GRAVEL: brown to gray-brown, well-graded sand, few gravel	Fill
									... more clayey	
				76.0	-	3	3 4	CH	FAT CLAY: gray with dark blue-gray and red-brown mottling, medium stiff, moist, trace organics	Native Bay Mud LL=84, PI=54
							0 1		... blue-gray, very soft, moist to wet	
				89.0	39	6	2			
						9	1 1 1		... wet	
						12		SC CH	CLAYEY SAND: olive-gray, fine to medium sand, trace coarse sand and gravel	
									FAT CLAY: blue-gray, medium stiff, moist to wet	
						15			The boring was terminated at approximately 15 feet bgs. Groundwater was encountered at approximately 5 feet bgs and measured at approximately 2 feet bgs upon completion of the boring.	Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.
						18				

BORING LOG

Boring No. B-6

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6"AC over 6" AB	
								SM	SILTY SAND with GRAVEL: olive-brown, medium dense, dry to moist, well-graded sand, trace to few gravel	Fill
							4 4 4	CH	FAT CLAY: blue-gray with dark blue-gray mottling, medium stiff, moist, trace organics	Native Bay Mud
						3				
							1 3 2		... blue-gray, very soft, moist to wet	
						6				
				95.8	45	9	1 1 1		... very soft, moist to wet	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-7

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			2" to 3" topsoil overlying olive-green Class II AB and orange-brown silty sand with gravel, trace cobbles	Fill
								CH	FAT CLAY: light blue-gray to gray with red-brown oxidation staining, medium stiff, moist, trace organics	Native Bay Mud
						3	4 4 5			
						6	1 1 2		... blue-gray, very soft, moist to wet	
				103.0	37	9	0 0 0		... wet	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was encountered at approximately 5 feet bgs and measured at approximately 2½ feet bgs upon completion of the boring. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						15				
						18				

BORING LOG

Boring No. B-8

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 5" AB	
								SM	SILTY SAND: olive-gray, medium dense to dense, dry to moist, well-graded sand	Fill
							3 3 4	CH	FAT CLAY: blue-gray to light olive-gray with trace dark blue-gray mottling and trace red-brown oxidation, soft to medium stiff, moist, trace organics between 2' to 3'	Native Bay Mud
DSX	500	80.5	430	78.7	52	3				
DSX	1000	77.4	570	76.9	53					
DSX	2000	70.1	920	72.0	56		1 1 2		... blue-gray, very soft, moist to wet	
						6				
							0 1 1		... wet	
						9				
									The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						12				
						15				
						18				

BORING LOG

Boring No. B-9

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 6" AB	
								SM	SILTY SAND: olive-gray, medium dense to dense, dry to moist, well-graded sand	Fill
				65.4	54	3	5 7 7	CH	FAT CLAY: light blue-gray with dark blue-gray mottling, stiff, moist, trace thin peat layers/ lenses, trace organics	Native Bay Mud
						6	1 1 1		... blue-gray, very soft, moist to wet	
						9	0 1 2			
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-10

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/21/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 6" AB	
							4 5 6	SM	SILTY SAND: brown to olive-brown, medium dense, moist to wet, well-graded sand	Fill
DSX DSX	350 1800	56.1 52.5	460 1000	52.7 51.6	64 63	3		CH	FAT CLAY: mottled light blue-gray and dark blue-gray, soft to medium stiff, moist, trace organics	Native Bay Mud
						6	0 1 1		... blue-gray, very soft, moist to wet, trace organics	
				101.8	37	9	1 1 2		... blue-gray, very soft, wet	
						12			... medium stiff ... contains thin beds of yellow-brown sandy clay	
						15			The boring was terminated at approximately 15 feet bgs. Groundwater was encountered at approximately 5 feet bgs when drilling and was measured at approximately 8 feet bgs upon completion of the boring.	Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.
						18				

BORING LOG

Boring No. B-11

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 12" AB (AB consists of well-graded gravel)	Fill
								SC CH	CLAYEY SAND: brown to slightly orange-brown, medium dense, moist, well-graded sand, few gravel	Native Bay Mud
						3	6 7 8		FAT CLAY: light blue-gray with trace dark blue-gray mottling, stiff, moist	
				100.6	42	6	1 1 1		... blue-gray, very soft, moist to wet	
						9	1 1 1		... moist to wet	
									The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						12				
						15				
						18				

BORING LOG

Boring No. B-12

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 6" olive-gray AB	
								SM SC	6" blue-gray Silty Sand with Gravel	Fill
							12 9 10	CH	CLAYEY SAND with GRAVEL: gray, medium dense, dry to moist, well-graded sand, trace to few gravel	LL=39, PI=21 Native Bay Mud
						3			FAT CLAY: blue-gray and dark blue-gray, stiff, moist ... at approx. 4': contains roots and rootlets ... blue-gray, very soft, moist to wet	
						6	1 1 2			
									... wet	
				100.0	45	9	1 1 1			
									The boring was terminated at approximately 10 feet bgs. Groundwater was encountered at approximately 9½ feet bgs when drilling but was not observed in the borehole at conclusion of the boring. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						12				
						15				
						18				

BORING LOG

Boring No. B-13

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6½" AC over 5" AB	
								SC	CLAYEY SAND: brown to dark yellow-brown, medium dense, dry to moist, well-graded sand	Fill
								CH	FAT CLAY: dark blue-gray to light blue gray and olive-gray with dark gray mottling, stiff, moist, trace organics	Native Bay Mud
							4 8 8			
						3				
									... blue-gray, soft, moist to wet	
				104.2	43		0 2 2			
						6				
									... blue-gray and olive-brown with trace brown organics	
							1 1 1		... very soft, moist to wet, trace organics	
						9			... dark blue-gray at approx. 9¼'	
									The boring was terminated at approximately 10 feet bgs.	
						12			Groundwater was encountered at approximately 8 feet bgs and measured at approximately 2 feet bgs upon completion of the boring.	
						15			Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						18				

BORING LOG

Boring No. B-14

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			8" AC over 6" AB	
				10.1	-		6 6 6	SC-SM	SILTY and CLAYEY SAND: olive-gray silty sand and orange-brown clayey sand, medium dense, dry to moist, well-graded sand	Fill
						3		CH	FAT CLAY: mottled light blue-gray and dark blue-gray, medium stiff, moist	Native Bay Mud
							1 2 2		... blue-gray, very soft to soft, moist to wet	
						6				
				200.4	25	9	1 3 4		... olive-gray with trace blue-gray and brown, soft to medium stiff, moist, contains organics and very thin peat layers	
									The boring was terminated at approximately 10 feet bgs.	
						12			Groundwater was not encountered.	
									Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-15

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" Granular topsoil over 6" AB and 6" orange-brown Clayey Sand	Fill
								CH	FAT CLAY: dark-gray, medium stiff, moist	Native Bay Mud
						3	4 4 6			
				96.5	45	6	2 2 2		... blue-gray, soft, moist, trace organics	LL=105, PI=72
						9	1 3 6		... soft to medium stiff, moist to wet	
									The boring was terminated at approximately 10 feet bgs. Groundwater was measured at approximately 2 feet bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						12				
						15				
						18				

BORING LOG

Boring No. B-16

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 5" AB	
								SC	CLAYEY SAND: orange-brown, medium dense, moist, well-graded sand, few gravel	Fill
				53.5	64	3	1, 7, 8	CH	FAT CLAY: mottled light blue-gray and dark blue-gray, stiff, moist, trace organics	Native Bay Mud
						6	1, 1, 2		... light blue-gray, very soft, moist to wet	
						9	1, 2, 3		... medium blue-gray, soft, wet	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was encountered at approximately 8 feet bgs when drilling but was not observed in the borehole at conclusion of the boring. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-17

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" Granular topsoil over 6" AB and 6" orange-brown Clayey Sand	Fill
										Native Bay Mud
								CH	FAT CLAY: light gray with trace orange brown oxidation staining, medium stiff, moist	
DSX	400	53.9	570	52.5	68	3	4 5 5			
DSX	1700	57.7	750	56.3	65					
									... medium blue-gray, soft, moist to wet	
						6	1 2 3			
						9	1 3 8		... medium blue-gray, stiff, moist to wet, trace fine to medium sand	%Gravel=1 %Sand=27 %Fines=72
									The boring was terminated at approximately 10 feet bgs.	
						12			Groundwater was encountered at approximately 5 feet bgs and measured at approximately 2 feet bgs upon completion of the boring.	
						15			Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						18				

BORING LOG

Boring No. B-18

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 6" AB	
								SC	CLAYEY SAND: orange-brown, medium dense, moist, well-graded sand, few gravel	Fill
								CH	FAT CLAY: mottled gray and dark blue-gray, stiff, moist, trace organics	Native Bay Mud
						3	4 6 7			
									... light blue-gray, soft, moist to wet, trace organics	
						6	1 2 2			
				23.4	102	9	0 2 3		... medium blue-gray, trace fine to medium sand	
									The boring was terminated at approximately 10 feet bgs.	
						12			Trace groundwater was encountered at approximately 10 feet bgs.	
									Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-19

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 7" AB	
								SC	CLAYEY SAND: orange-brown, medium dense, moist, well-graded sand, few gravel	Fill
							2 3 3	CH	FAT CLAY: light blue-gray, soft to medium stiff, moist	Native Bay Mud LL=95, PI=58
						3				
							1 1 2		... light blue-gray, very soft, moist to wet	
						6				
									... light blue-gray with trace orange-brown oxidation and brown organics, soft, moist to wet, trace thin peat layers	
						9	1 2 2		... medium blue-gray, soft, moist to wet, trace fine sand, scarce medium sand	
									The boring was terminated at approximately 10 feet bgs.	
						12			Groundwater was not encountered.	
									Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-20

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 6" AB	
								SC	CLAYEY SAND: orange-brown, medium dense, moist, well-graded sand, few gravel	Fill
								CH	FAT CLAY: blue-gray with trace orange-brown oxidation, soft, moist to wet, trace organics	Native Bay Mud
DSX	320	90.0	290	89.6	48	3	2 2 3			
DSX	1300	89.6	380	89.8	47	6	2 2 2			
						9	2 3 6		... medium gray, medium stiff, moist to wet, few fine sand, trace medium sand	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was encountered and measured at approximately 5 feet bgs. Steady flow into borehole was observed between 3 to 4 feet. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-21

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/22/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		SC	CLAYEY SAND: orange-brown, medium dense, moist, well-graded sand, few gravel	Fill
						3	2 4 5	CH	FAT CLAY: olive-gray to gray-brown and blue-gray with trace orange-brown oxidation staining, medium stiff, moist, trace organics	Native Bay Mud
						6	1 3 3		... light blue-gray, soft, moist to wet	
						9	0 1 2		... medium blue-gray, very soft, wet	LL=51, PI=33
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was measured at approximately 10 feet bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						15				
						18				

BORING LOG

Boring No. B-22

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0		SC	CLAYEY SAND: orange-brown, medium dense, moist, well-graded sand, few gravel	Fill
				60.4	61	3	3 4 4	CH	FAT CLAY: olive-gray and blue-gray with orange-brown, medium stiff, moist, trace organics	Native Bay Mud
						6	2 3 3			
						9	1 3 7		... blue-gray, soft, moist to wet ... blue-gray, medium stiff to stiff, moist, trace to few fine sand, trace sand- to fine gravel-size carbonate nodules	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was measured at approximately 2 feet bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						15				
						18				

BORING LOG

Boring No. B-23

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			9½" AC over 5" AB	
								SC	CLAYEY SAND: orange-brown, medium dense to dense, well-graded sand, few gravel	Fill
							3 4 4	CH	FAT CLAY: blue-gray and olive-brown with trace orange-brown oxidation, medium stiff, moist, trace organics	Native Bay Mud
						3				
				87.5	48		1 1 1		... blue-gray, very soft, moist to wet, trace organics	
						6				
						9	1 3 5		... soft, wet	
								CH	FAT CLAY with SAND: dark blue-gray, medium stiff, wet, fine sand, trace medium sand	
						12			The boring was terminated at approximately 10 feet bgs.	
									Groundwater was encountered at approximately 5 feet bgs when drilling and was measured at approximately 2'-3" bgs upon completion of the boring.	
						15			Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						18				

BORING LOG

Boring No. B-24

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 5" AB	
								SC	CLAYEY SAND: orange-brown, medium dense to dense, well-graded sand, few gravel	Fill
								CH		Native Bay Mud
DSX	350	52.1	460	49.3	68		2 4 4		FAT CLAY: olive-gray with dark blue-gray mottling, soft to medium stiff, trace organics	
DSX	1500	47.4	1030	45.7	71	3				
							1 1 1		... blue-gray, very soft, moist to wet, trace organic debris	
						6				
							4 7 10	CH	FAT CLAY with SAND: dark blue-gray, stiff, moist, fine sand, trace medium sand	%Gravel=1 %Sand=25 %Fines=74
				20.4	107	9				
									The boring was terminated at approximately 10 feet bgs.	
						12			Groundwater was encountered at approximately 8 feet bgs when drilling and was measured at approximately 10' bgs upon completion of the boring.	
						15			Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						18				

BORING LOG

Boring No. B-25

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			8" AC over 8" AB	
							2 3 5	SC CH	CLAYEY SAND: orange-brown, medium dense to dense, well-graded sand, few gravel	Fill Native Bay Mud
						3			FAT CLAY: olive-gray to olive-brown with trace dark blue-gray mottling, medium stiff, moist, trace organics	
							0 1 1		... blue-gray, very soft, moist to wet, trace organic debris	
						6				
							2 5 8			
				20.8	103	9		CH	FAT CLAY with SAND: dark blue-gray, stiff, moist, fine sand, trace medium sand	
									The boring was terminated at approximately 10 feet bgs.	
						12			Groundwater was measured at approximately 10' bgs.	
									Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-26

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			3" to 4" Topsoil over 6" Class II AB over 10" orange-brown Clayey Sand	Fill
				62.8	57	3	4 5 6	OH	ORGANIC-RICH FAT CLAY: brown, medium stiff, moist	Native Bay Mud LL=83, PI=47
						6	0 1 2	CH	FAT CLAY: blue-gray, very soft, wet	
						9	3 5 12		... dark blue-gray, stiff, moist, few fine sand, trace medium sand	%Sand=22 %Fines=78
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was encountered at approximately 5 feet bgs when drilling and was measured at approximately 2½ feet bgs upon completion of the boring. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						15				
						18				

BORING LOG

Boring No. B-27

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 4" AB	
								SC	CLAYEY SAND: orange-brown, medium dense to dense, well-graded sand, few gravel	Fill
				54.3	49	3	5 8 9	CH	FAT CLAY: olive-gray with blue-gray mottling, stiff, moist, trace organics	Native Bay Mud
						6	1 1 2		... very soft	
						9	1 2 2		... blue-gray with trace orange-brown, soft, moist to wet, trace organics and very thin peat layers	
								CH	FAT CLAY with SAND: dark blue-gray, soft, moist to wet, contains fine sand and trace medium sand	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was measured at approximately 9'-9" bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and patched with sac-crete.	
						15				
						18				

BORING LOG

Boring No. B-28

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
				54.5	58	0	4 5 7	SC	CLAYEY SAND with GRAVEL: brown and yellow-brown, medium dense, moist, well-graded sand, few gravel	Fill LL=29, PI=12
						3		OH	ORGANIC-RICH FAT CLAY: brown with light gray-brown, stiff, moist	Native Bay Mud
						6	1 1 1	CH	FAT CLAY: blue-gray, very soft, wet	
						9	1 4 7		... dark blue-gray, medium stiff to stiff, wet, few fine sand, trace medium sand	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was encountered at approximately 5 feet bgs when drilling and was measured at approximately 2 feet bgs upon completion of the boring. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						15				
						18				

BORING LOG

Boring No. B-29

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			7" AC over 5" AB	
							4 3 4	SC	CLAYEY SAND with GRAVEL: gray-brown over dark olive-gray, medium dense, moist, well-graded sand	Fill %Gravel=23 %Sand=59 %Fines=18
				70.0	44	3		OH	ORGANIC-RICH FAT CALY: gray-brown to olive-gray with trace dark gray, soft to medium stiff, moist	Native Bay Mud
								CH	FAT CLAY: olive-gray with trace brown to orange-brown, soft, moist, trace organic debris	
						6	1 2 3			
						9	1 2 7	CH	FAT CLAY with SAND: dark blue-gray, medium stiff to stiff, moist to wet, fine sand, trace medium sand	
									The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						12				
						15				
						18				

BORING LOG

Boring No. B-30

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 4 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 6" AB	
								SC	CLAYEY SAND: orange-brown, medium dense to dense, well-graded sand, few gravel	Fill
							3 4 5	CH	FAT CLAY with ORGANICS: olive-brown with trace blue-gray mottling, soft, moist, few organic debris	Native Bay Mud
				100.6	42	3				LL=108, PI=68
								CH	FAT CLAY: blue-gray, very soft, moist to wet, trace organic debris	
				101.8	43	6	1 1 1			
						9	1 4 8		... blue-gray with trace brown to orange-brown, medium stiff, moist to wet, trace organics	
									The boring was terminated at approximately 10 feet bgs. Trace groundwater was encountered at approximately 10 feet bgs. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						12				
						15				
						18				

BORING LOG

Boring No. B-31

JOB NAME: San Carlos Airport Runway Pavement Repair
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Hew Drilling Company, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 6" Dia. Continuous Flight Augers

JOB NO.: CSCOM-19-01
DATE DRILLED: 01/23/2019
ELEVATION: ± 5 feet
LOGGED BY: EW

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			8½" AC	
								SC	CLAYEY SAND: orange-brown, medium dense to dense, well-graded sand, few gravel	Fill
				57.7	54		4 4 5	CH	FAT CLAY: mottled olive-gray and dark blue-gray, medium stiff, moist, trace organics	Native Bay Mud
						3				
							1 1 2		... blue-gray, very soft, moist to wet	
						6				
							2 4 6		... soft, moist to wet	
				24.7	74	9		CH	FAT CLAY with SAND: dark blue-gray, medium stiff to stiff, moist, fine sand, trace medium sand	
						12			The boring was terminated at approximately 10 feet bgs. Groundwater was not encountered. Immediately after the last sample was retrieved, the borehole was backfilled with neat cement grout and capped with soil.	
						15				
						18				

BORING LOG

Boring No. B-1N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: JL

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0	17 12 5		5" AC over 8" AB	
				75.5	53	3	2 3 5	SW-SC CH	WELL-GRADED SAND with CLAY and GRAVEL: brown, medium dense, moist, well-graded sand, little to some fine gravel	Fill %Gravel=28 %Sand=61 %Fines=11 Native Bay Mud
				86.4	50		2 1 2		FAT CLAY: dark blue-gray, medium stiff, moist ... soft	LL=91, PI=57
						6			The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

BORING LOG

Boring No. B-2N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: JL

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0	12		5½" AC over 6" AB	
				10.5	117		17	SW-SC	WELL-GRADED SAND with CLAY and GRAVEL: brown, medium dense, moist, well-graded sand, little to some fine gravel	Fill %Fines=11
							16	CH		Native Bay Mud
						3	4			
							5			
							7		FAT CLAY: mottled blue-gray and dark gray, medium stiff, moist, trace organic	
				88.7	47		2		... soft	
							2			
							4			
						6			The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

BORING LOG

Boring No. B-3N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: JL

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0	9		6½" AC over 6" AB	
							6	SC	CLAYEY SAND with GRAVEL: brown, loose to medium dense, moist, well-graded sand, little fine gravel	Fill LL=33, PI=13
							4			
							2	CH	FAT CLAY: blue-gray, soft, moist ... very soft	Native Bay Mud
				85.5	50	3	2			
							2			
							1			
							1			
							1			
						6			The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

BORING LOG

Boring No. B-4N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: JL

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 6" AB	
				10.2	108		2 4	CL	SANDY LEAN CLAY: brown, soft, moist, well-graded sand, trace fine gravel	Fill %Gravel=1 %Sand=39 %Fines=60
				87.7	49	3	3 1 1 2	CH	FAT CLAY: dark gray to dark blue-gray, very soft, moist	Native Bay Mud
							1 1 2			
						6			The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

BORING LOG

Boring No. B-5N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: JL

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			5" AC	
				11.1	117		50/5"	SW-SC	WELL-GRADED SAND with CLAY and GRAVEL: brown, very dense, moist, well-graded sand, little to some fine gravel, few coarse gravel	Fill Positive Pheno. Reaction
							50/5"			
							50/5"			
				10.5			75			%Fines=5
				13.1	97	3	44		... geogrid at about 1.5'	
							14	CH	FAT CLAY: dark blue-gray, soft, moist	Native Bay Mud LL=89, PI=54
				86.3	49		5			
							2			
							2			
						6			... very soft	
						9				
						12				
								SC	CLAYEY SAND: brown, moist, fine sand	
						15			The boring was terminated at approximately 14½ feet bgs. Groundwater was encountered at approximately 14 feet bgs and was measured at about 2 feet bgs upon completion of the boring.	following completion of the boring, the borehole was backfilled with clean sand.
						18				

BORING LOG

Boring No. B-6N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 4 feet
LOGGED BY: SB

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			$6\frac{3}{4}$" AC over 6"AB	
				44.5	72		3 4 5	SC	CLAYEY SAND with GRAVEL: brown, loose, dry to moist, well-graded sand, little fine gravel, trace coarse gravel	Fill %Gravel=26 %Sand=45 %Fines=29
				89.4	49	3	3 2 3	CH	FAT CLAY: blue-gray, soft, moist, mottled, with peat	Native Bay Mud LL=90, PI=57
				37.9	84		3 2 3		... no peat	
						9				
						12				
						15			The boring was terminated at approximately 15 feet bgs. Groundwater was measured at 6 feet bgs.	Following completion of the boring, the borehole was backfilled with cement grout.
						18				

BORING LOG

Boring No. B-7N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: SB

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6" AC over 6" AB	
				42.3	78		11 5 5	CH	SANDY FAT CLAY: brown, medium stiff, moist, few fine to medium gravel	Fill LL=60, PI=33
				91.0	48	3	2 3 2	CH	FAT CLAY: blue-gray, soft, moist, mottled, with peat ... no peat	Native Bay Mud
						6	2 1 2		The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

BORING LOG

Boring No. B-8N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: SB

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			5¾" AC over 6"AB	
							2 3 2	CL	SANDY LEAN CLAY: brown, soft, moist, trace fine to medium gravel	Fill
				88.9	49	3		CH	FAT CLAY: blue-gray, mottled with dark red-brown, soft, moist, peat lenses	Native Bay Mud %Fines=98
							2 2 2			
				101.4	44		2 2 3		... no mottling & no peat	
						6			The boring was terminated at approximately 6½ feet bgs. Groundwater was not encountered in the boring. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

BORING LOG

Boring No. B-9N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: SB

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			$5\frac{3}{4}$" AC over 6"AB	
							5	SC	CLAYEY SAND with GRAVEL: brown, dry, medium dense	Fill
							6			
				55.9	60		11	OH		Native Bay Mud
							3	CH	ORGANIC-RICH FAT CLAY: gray-brown to blue-gray, stiff, moist, with rootlets	
						3	2			
				101.4	44		3			LL=88, PI=56
							2		FAT CLAY: blue-gray, soft, moist, trace rootlets	
							2		... no rootlets	
							2			
						6			The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered in the boring. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				

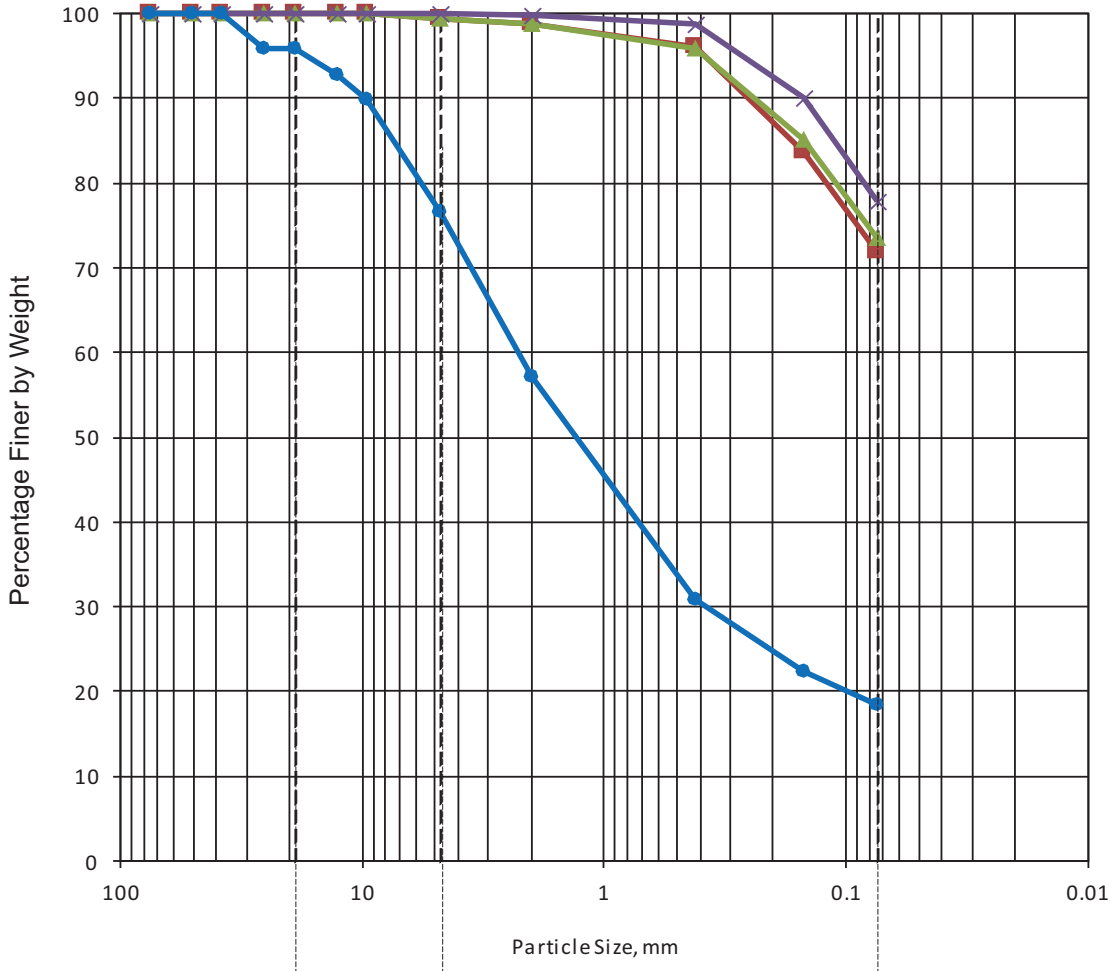
BORING LOG

Boring No. B-10N

JOB NAME: Runway & Taxiway Pavement Edge Repair, San Carlos Airport
CLIENT: C&S Engineers, Inc.
LOCATION: 620 Airport Way, San Carlos, California
DRILLER: Exploration Geoservices, Inc.
DRILL METHOD: Truck-Mounted Drilling Rig - 8" Dia. Hollow Stem Augers

JOB NO.: CSCOM-21-01
DATE DRILLED: 9/10/21
ELEVATION: ± 5 feet
LOGGED BY: SB

Type of Strength Test	Test Surcharge Pressure, psf	Test Water Content, %	Shear Strength, psf	In-Situ Water Content, %	In-Situ Dry Unit Weight, pcf	Depth, ft.	Soil Symbols, Samplers and Blow Counts	USCS	Description	Remarks
						0			6½" AC over 6" AB	
							5	SC	CLAYEY SAND with GRAVEL: brown, medium dense, dry	Fill
				54.9	83		8	OH		Native Bay Mud LL=81, PI=41
							7			
							4	CH	ORGANIC-RICH FAT CLAY: blue-gray, medium stiff, moist, trace gravel	
						3	3			
							4			
				79.7	53		2		FAT CLAY: blue-gray to gray, medium stiff, moist, trace fine grained sand lenses	
							3			
							2			
						6			The boring was terminated at approximately 5½ feet bgs. Groundwater was not encountered in the boring. Following completion of the boring, the borehole was backfilled with clean sand.	
						9				
						12				
						15				
						18				



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

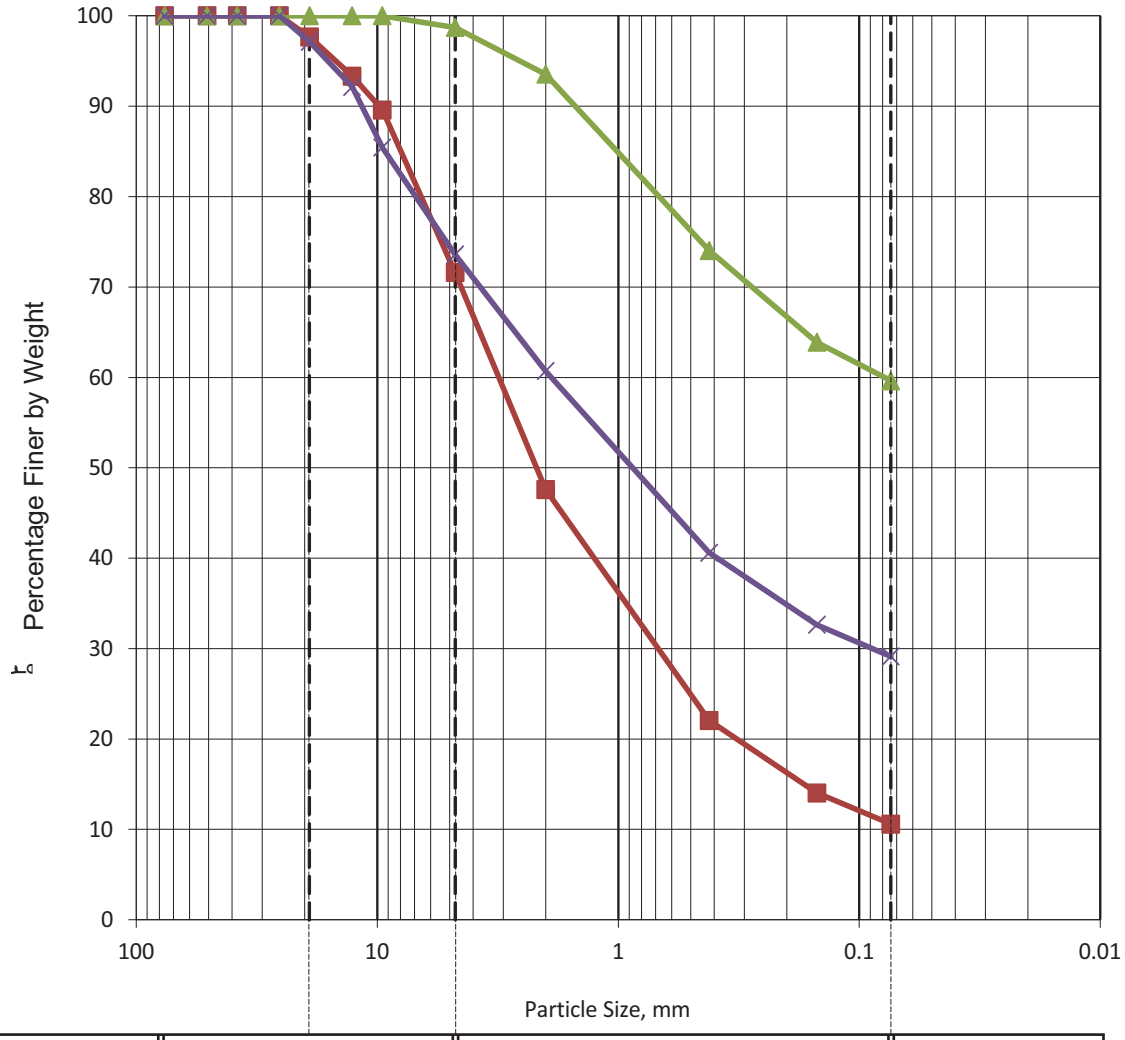
LEGEND				
BORING NUMBER	B-17	B-24	B-26	B-29
DEPTH (FEET)	9	9	9	2
SOIL DESCRIPTION	Fat Clay (CH)	Fat Clay (CH)	Fat Clay (CH)	Clayey Sand (SC)

GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

GRADATION TEST DATA

DATE:	JOB NUMBER:	PLATE:
December 2021	CSCOM-21-01	50

BAGG ENGINEERS



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

LEGEND				
BORING NUMBER	B-1N	B-4N	B-6N	
DEPTH (FEET)	1	1.5	1	
SOIL DESCRIPTION	Well-Graded Sand w/ Clay and Gravel (SW-SC)	Sandy Lean Clay (CL)	Clayey Sand w/ Gravel (SC)	

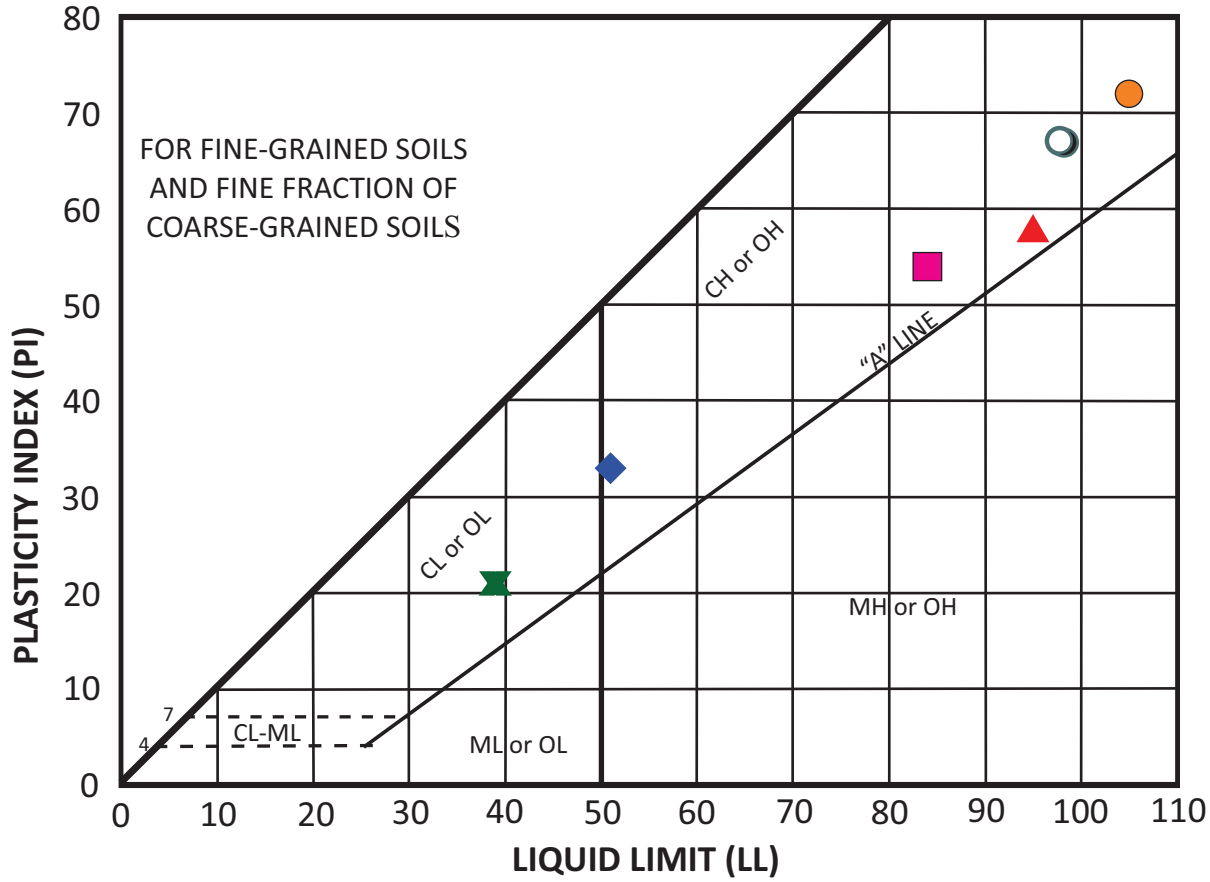
GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

GRADATION TEST DATA

DATE:	JOB NUMBER:	PLATE:
December 2021	CSCOM-21-01	51

BAGG ENGINEERS

PLASTICITY CHART



SYMBOL	SAMPLE SOURCE	DEPTH (FEET)	NATURAL WATER CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL DESCRIPTION
○	Boring B-1	6	--	98	31	67	Blue-Gray Fat Clay (CH)
■	Boring B-5	3	76.0	84	30	54	Gray Fat Clay (CH)
⧓	Boring B-12	2	--	39	18	21	Gray Clayey Sand (SC)
●	Boring B-15	5½	96.4	105	33	72	Blue-Gray Fat Clay (CH)
▲	Boring B-19	2½	--	95	37	58	Light Blue-Gray Fat Clay (CH)
◆	Boring B-21	9½	--	51	18	33	Blue-Gray Fat Clay (CH)

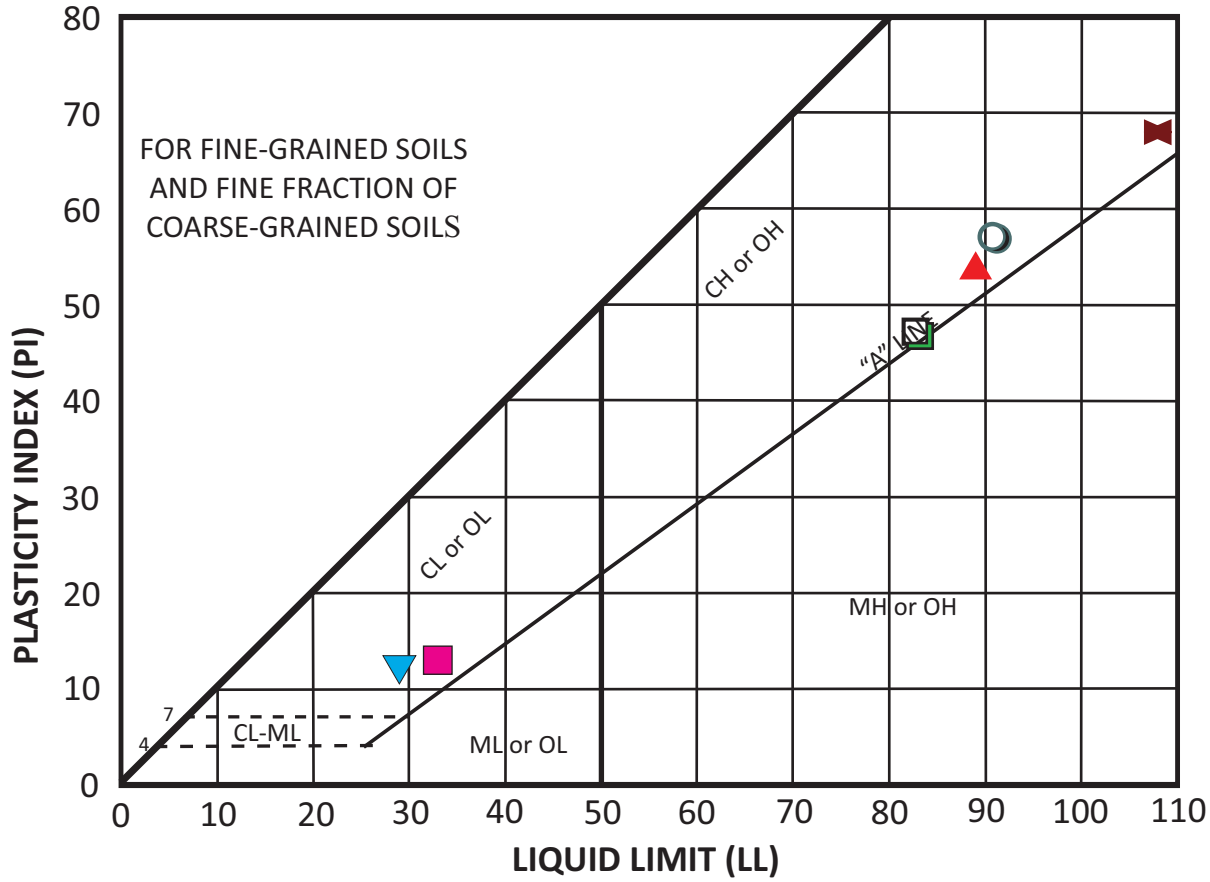
GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

PLASTICITY DATA

DATE:	JOB NUMBER:	PLATE
December 2021	CSCOM-21-01	52

BAGG ENGINEERS

PLASTICITY CHART



SYMBOL	SAMPLE SOURCE	DEPTH (FEET)	NATURAL WATER CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL DESCRIPTION
▣	Boring B-26	2¼	62.8	83	36	47	Brown Organic-Rich Fat Clay (OH)
▼	Boring B-28	2	--	29	17	12	Brown Clayey Sand (SC)
⧓	Boring B-30	3	100.6	108	40	68	Olive-Brown Fat Clay (CH)
○	Boring B-1N	4	86.4	91	34	57	Dark Blue-Gray Fat Clay (CH)
■	Boring B-3N	1	–	33	20	13	Brown Clayey Sand w/ Gravel (SC)
▲	Boring B-5N	4	86.3	89	35	54	Dark Blue-Gray Fat Clay (CH)

GEOTECHNICAL ENGINEERING INVESTIGATION
RUNWAY & TAXIWAY PAVEMENT EDGE REPAIR
SAN CARLOS AIRPORT
620 AIRPORT WAY
SAN CARLOS, CALIFORNIA

PLASTICITY DATA

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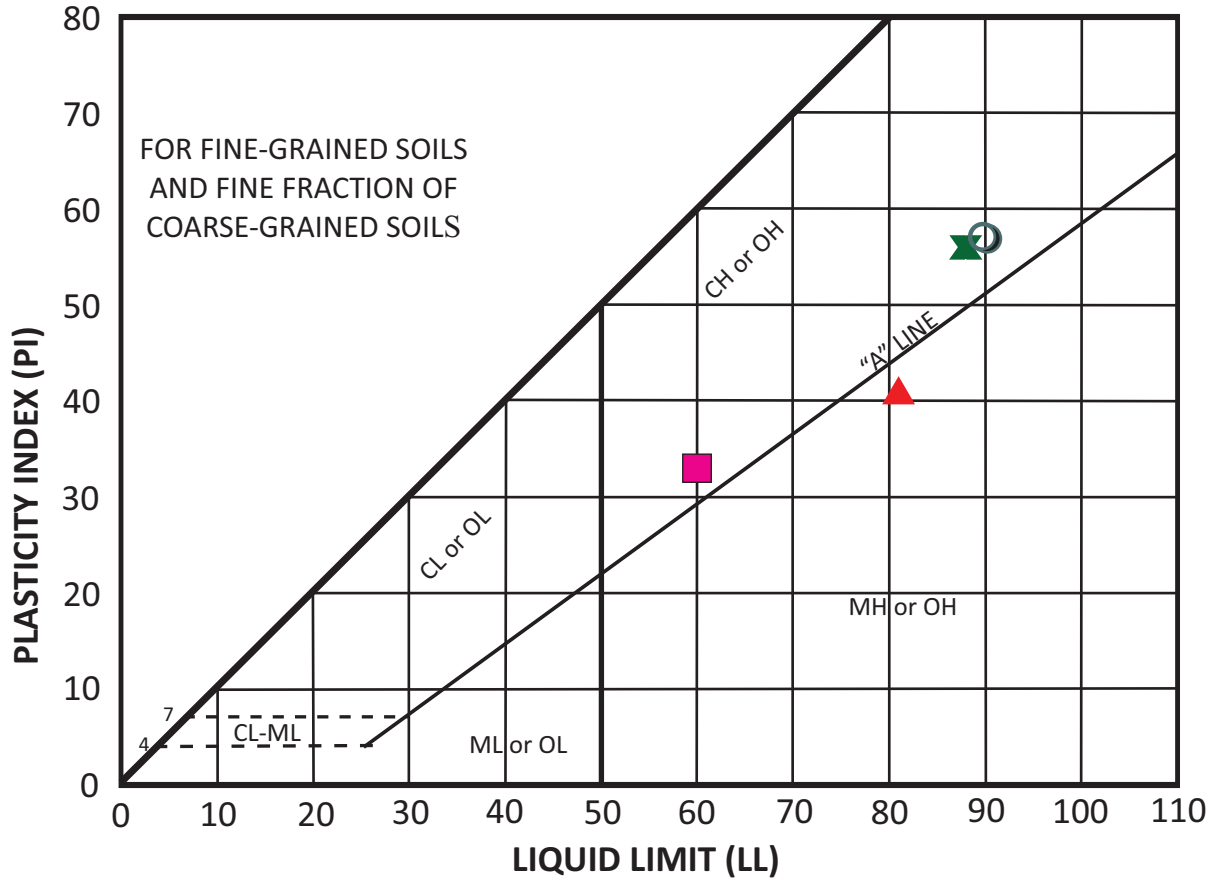
BAGG ENGINEERS

PLASTICITY CHART



SYMBOL	SAMPLE SOURCE	DEPTH (FEET)	NATURAL WATER CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL DESCRIPTION
○	Boring B-6N	2.5	89.4	90	33	57	Blue-Gray Fat Clay (CH)
■	Boring B-7N	1	42.3	60	27	33	Brown Sandy Fat Clay (CH)
⧓	Boring B-9N	3.5	101.4	88	32	56	Blue-Gray Fat Clay (CH)
▲	Boring B-10N	2	54.9	81	40	41	Blue-Gray Organic-Rich Fat Clay (OH)

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PLASTICITY DATA

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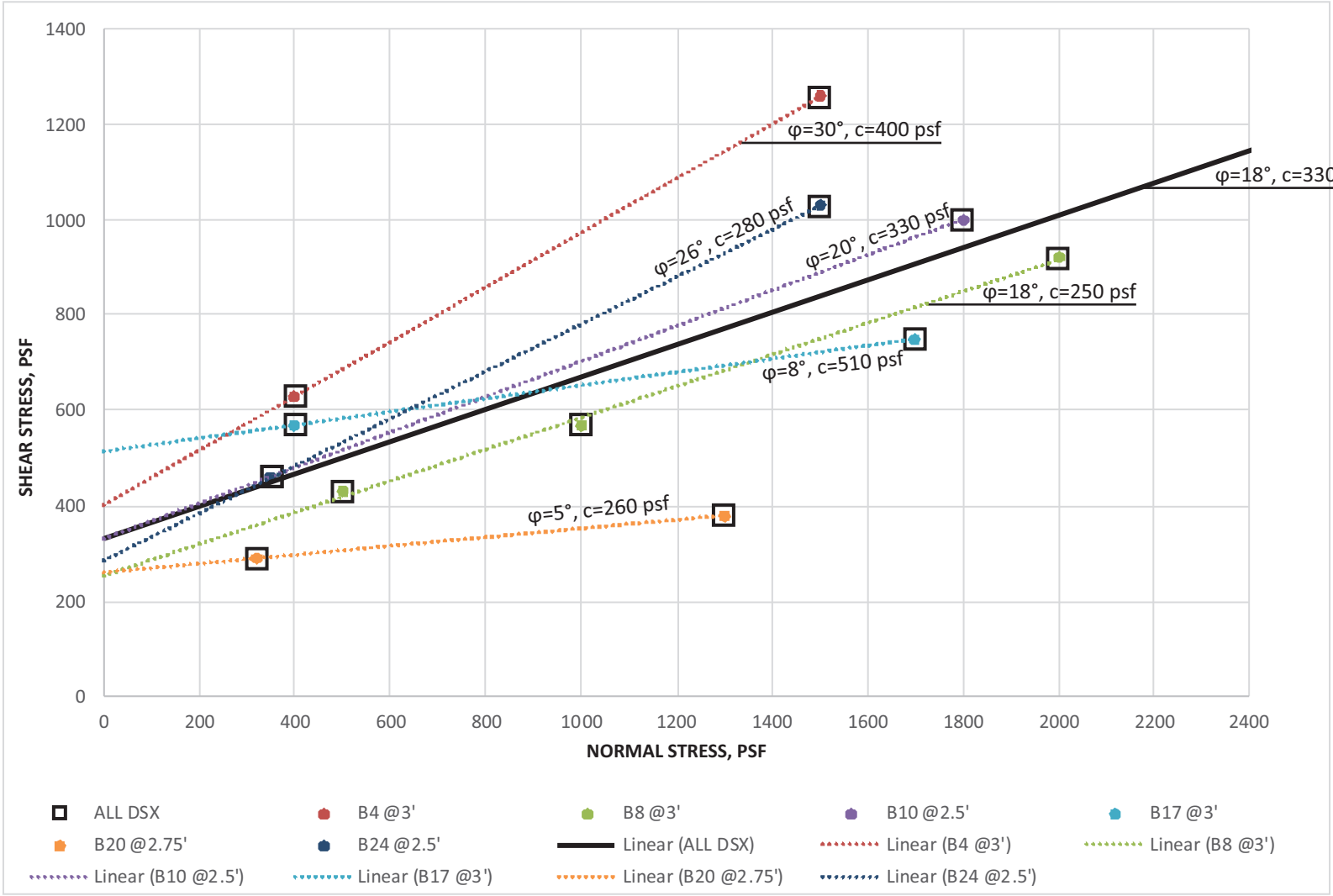
BAGG ENGINEERS



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BAGG ENGINEERS

DIRECT SHEAR TEST PLOTS

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SITE PHOTOGRAPHS

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Transient Parking Area

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SITE PHOTOGRAPHS

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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