ADDENDUM NO. 1

4/8/2024

PROJECT:	Pavement Maintenance at Various Sites	**OWNER:**	Clovis Unified School District
ENGINEER:	Blair, Church & Flynn Attention: Jenn Felix Tanairy Barrera	**BID NO:** **BCF PROJECT NO.**	2984 222-0431

It will be the responsibility of the General Contractor to submit the information contained in this addendum to all its subcontractors and suppliers. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification. The following additions, deletions, and revisions to the Drawings and Project Manual are hereby made and do become a part of these Contract Documents.

TABLE OF CONTENTS

ADDITIONAL PROJECT INFORMATION

Warranties
Revisions to Clovis East High School Site Plan
Geotechnical Reports
Engineer's Estimate

ATTACHMENTS

Sheet CE-30(AD1)
Geotechnical Reports for the following sites

Alta Sierra
Bud Rank
Clark
Clovis East
Cole
David E Cook Way
Fancher Creek
Liberty
Nelson
Sierra Vista

ADDITIONAL PROJECT INFORMATION

Warranties

Clovis Unified School District requires a minimum 1-year warranty on workmanship and materials.

Revisions to Clovis East High School Site Plan

Replace sheet CE-30, with the attached sheet CE-30 (AD1). Additional information has been added to clarify the dimensions for the playcourt striping. All changes have been clouded and delta'd

Geotechnical Reports

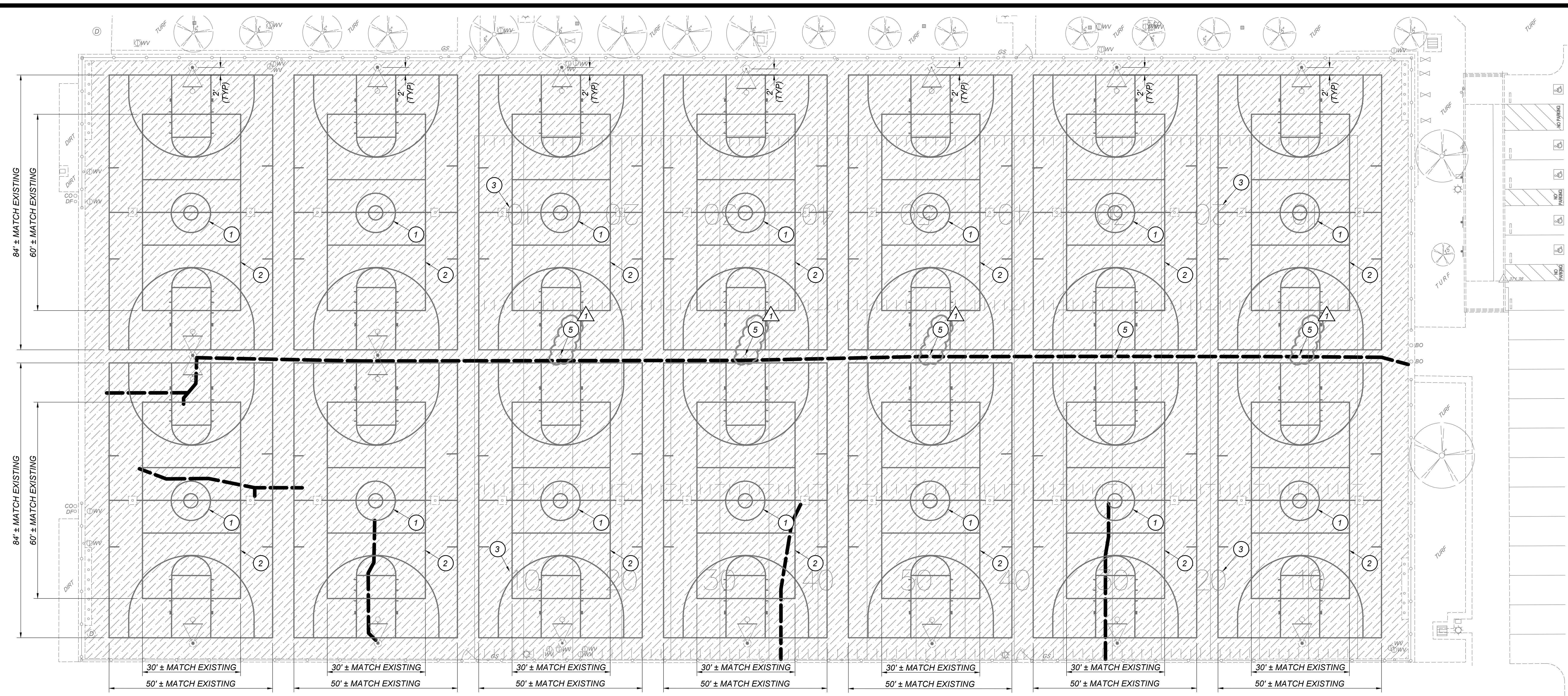
Clovis Unified School District has obtained geotechnical reports for all of the sites that require pavement replacement. The reports are attached to this addendum.

Engineer's Estimate

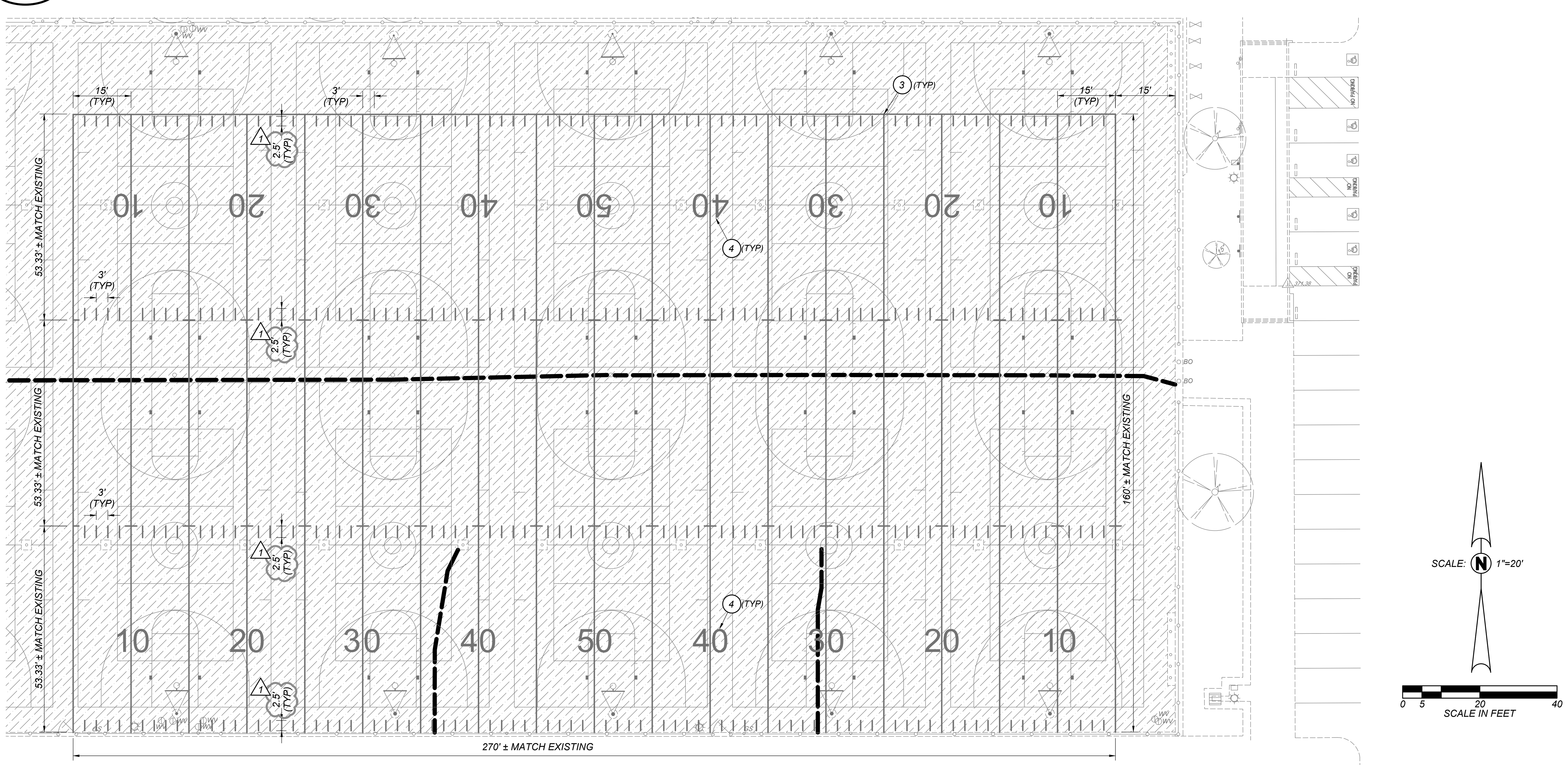
The Engineer's estimate for this project is $2,130,400.

Blair, Church & Flynn Consulting Engineers
451 Clovis Avenue, Suite 200
Clovis, CA 93612
(559) 326-1400 FAX (559) 326-1500

FOR DSA USE ONLY



A / CE-30 PLAYCOURT ENLARGED SITE PLAN



B / CE-30 FOOTBALL STRIPING PLAN

CONSTRUCTION LEGEND:

A / CEX-10	DETAIL DESIGNATION DETAIL REFERENCE SHEET LOCATION
[A/CEX-10]	[DETAIL DESIGNATION / SHEET LOCATION]
(shaded box)	LIMITS OF ASPHALTIC CONCRETE PAVEMENT STRUCTURAL SECTION REMOVAL AND REPLACEMENT PER [A/CEX-10]
(hatched box)	CRACKFILL PER [E/CEX-10] AND APPLY SEAL COAT PER THE PROJECT SPECIFICATIONS
(dashed line)	REPAIR CRACK PER [G/CEX-10]
1	PAINT BASKETBALL COURT TO MATCH EXISTING. CENTER COURT ON EXISTING POSTS. SEE [H/CEX-10] FOR TYPICAL COURT ELEMENTS AND LAYOUT
2	PAINT VOLLEYBALL COURT TO MATCH EXISTING. CENTER COURT ON EXISTING POST. SEE [I/CEX-10] FOR TYPICAL COURT ELEMENTS AND LAYOUT
3	PAINT 4" WIDE WHITE LINES TO MATCH EXISTING FOOTBALL FIELD STRIPING. SEE [B/CE-30] FOR FIELD ELEMENTS AND LAYOUT
4	PAINT 6' HIGH NUMBERS WITH A 1' WIDE LINE TO MATCH EXISTING
5	REMOVE CAP AND CUT DOWN EXISTING POST TO A MINIMUM OF 2', FILL WITH CLASS II AGGREGATE BASE, RECOMPACT AND PAVE FLUSH WITH EXISTING PAVEMENT

TYPICAL SITE PLAN NOTES:

1. THE DESIGN INTENT IS TO MATCH ALL EXISTING PLAYCOURT STRIPING DIMENSIONS AND LOCATIONS. DIMENSIONS HAVE BEEN PROVIDED ON THIS SITE PLAN TO LAY OUT PLAYCOURT STRIPING. IF THERE IS A DISCREPANCY BETWEEN THE SITE PLAN AND FIELD CONDITIONS, NOTIFY THE ENGINEER
2. ALL CRACKS SHALL BE THOROUGHLY CLEANED AND APPROVED BY THE PROJECT INSPECTOR PRIOR TO CRACK PATCHING.
3. EXISTING CRACKFILL THAT HAS SUNKEN MORE THAN 1/2" BELOW THE ADJACENT PAVEMENT SURFACE SHALL BE THOROUGHLY CLEANED PRIOR TO CRACK PATCHING AND SEAL COAT APPLICATION.
4. PRIOR TO PROCEEDING WITH SEAL COAT APPLICATION, CONTRACTOR SHALL OBTAIN PROJECT INSPECTOR'S APPROVAL OF THE CRACK FILL WORK.
5. PRIOR TO PROCEEDING WITH PAVEMENT STRIPING, CONTRACTOR SHALL OBTAIN PROJECT INSPECTOR'S APPROVAL OF THE SEAL COAT WORK.

Blair, Church & Flynn
CONSULTING ENGINEERS

REGISTERED PROFESSIONAL ENGINEER
ZACHARY D. HOSSFELDT
No. 87218
CIVIL
STATE OF CALIFORNIA
2/12/24
Date Signed:

CONSULTANT
Blair, Church & Flynn
Consulting Engineers
451 Clovis Avenue,
Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

REF. & REV.
1 AD01 4/08/24

CLOVIS UNIFIED SCHOOL DISTRICT
2024 PAVEMENT REHABILITATION
VARIOUS SITES
CLOVIS EAST HIGH SCHOOL
SITE PLAN

CONST. DOCUMENTS
DR. BY: GP
CH. BY: ZH
DATE: 2/12/24
SCALE AS NOTED

CE-30

Drawing: \\bcffs05\Project\223-0359\Site\productiondrawings\Clovis East HS\Production Drawings\223359_Clovis East_s01.dwg, Site Plan - BCF.ctb
Plot by: jfelix Apr 08, 2024 - 12:25pm

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January 31, 2024 RMA Project No. 07-230985-0

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Alta Sierra Intermediate School Pavement Maintenance
380 West Teague Avenue
Clovis, California 93619

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Alta Sierra Intermediate School playcourts in Clovis, California. The project site consists of the southwest corner of the existing Alta Sierra Intermediate School campus, located approximately 0.14 miles south of the intersection of West Teague and North Peach Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8573° north latitude and 119.7193° west longitude. At the time of our field exploration on January 4, 2023, the existing playcourt area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 370 feet at the project site. The layout of the playcourts is illustrated on Figure 2.

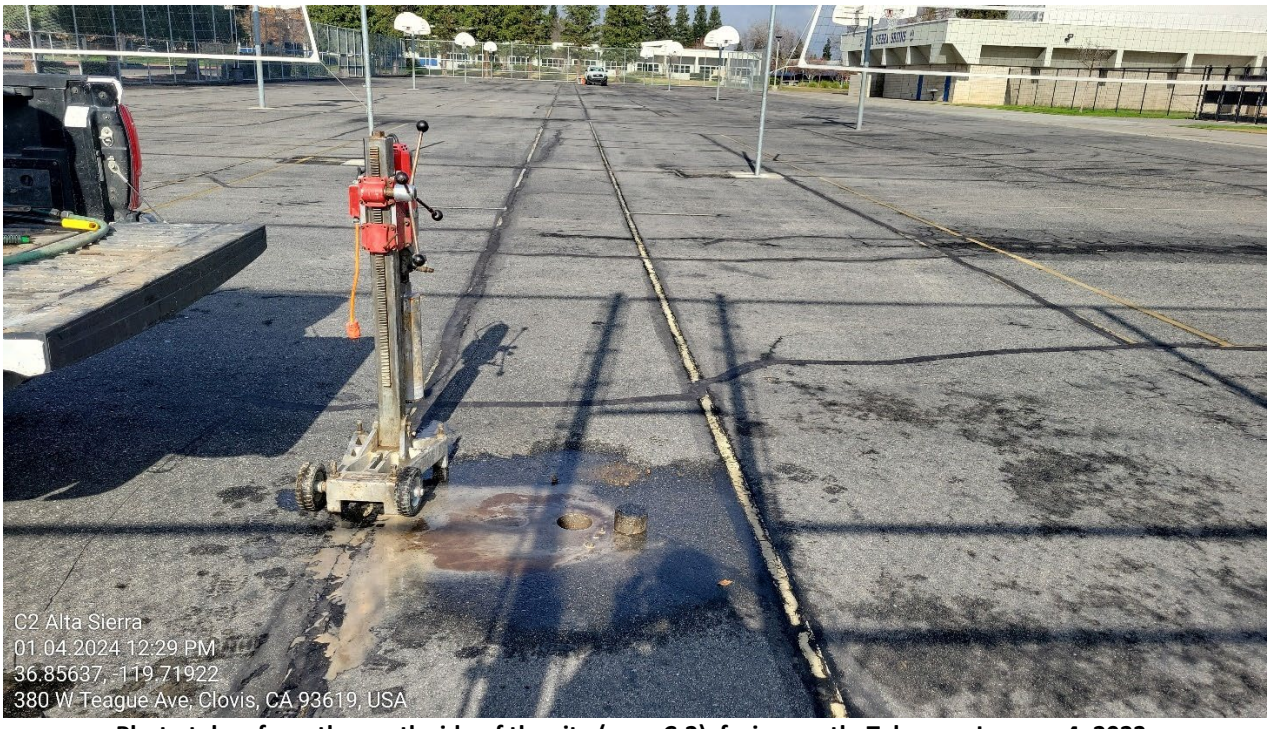

Photo taken from the south side of the site (near C-2), facing north. Taken on January 4, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at two locations (C-1 & C-2) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 6 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	2.25	4.25
C-2	2.25	2.75

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine-grained sandy silt with minor clay. The subgrade was dry for fine grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 0.67’	125.0	10.4
C-2 @ 0.5’	120.1	7.9

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 0.5' – 3'	272.0	124.9	54

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 15 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 9.0" Class 2 AB
5.5	3.0" AC over 9.5" Class 2 AB
6.0	3.0" AC over 11.5" Class 2 AB
7.0	4.0" AC over 13.0" Class 2 AB
8.0	4.5" AC over 15.5" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

RMA GeoScience
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CLOSING REMARKS

The information contained in this report was provided in accordance with generally accepted engineering principles and practices. No other warranty, either express or implied, is made. This report has been prepared for Clovis Unified School District and the Project Design Team to be used for the design and construction of the subject parking lot. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart

Megan J. Stewart, GIT
Staff Geologist

Josue Montes

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
GEOTECHNICAL
STATE OF CALIFORNIA

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
Mr. Zachary Hockett, Blair, Church & Flynn (pdf to *zhockett@bcf-engr.com*)
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*

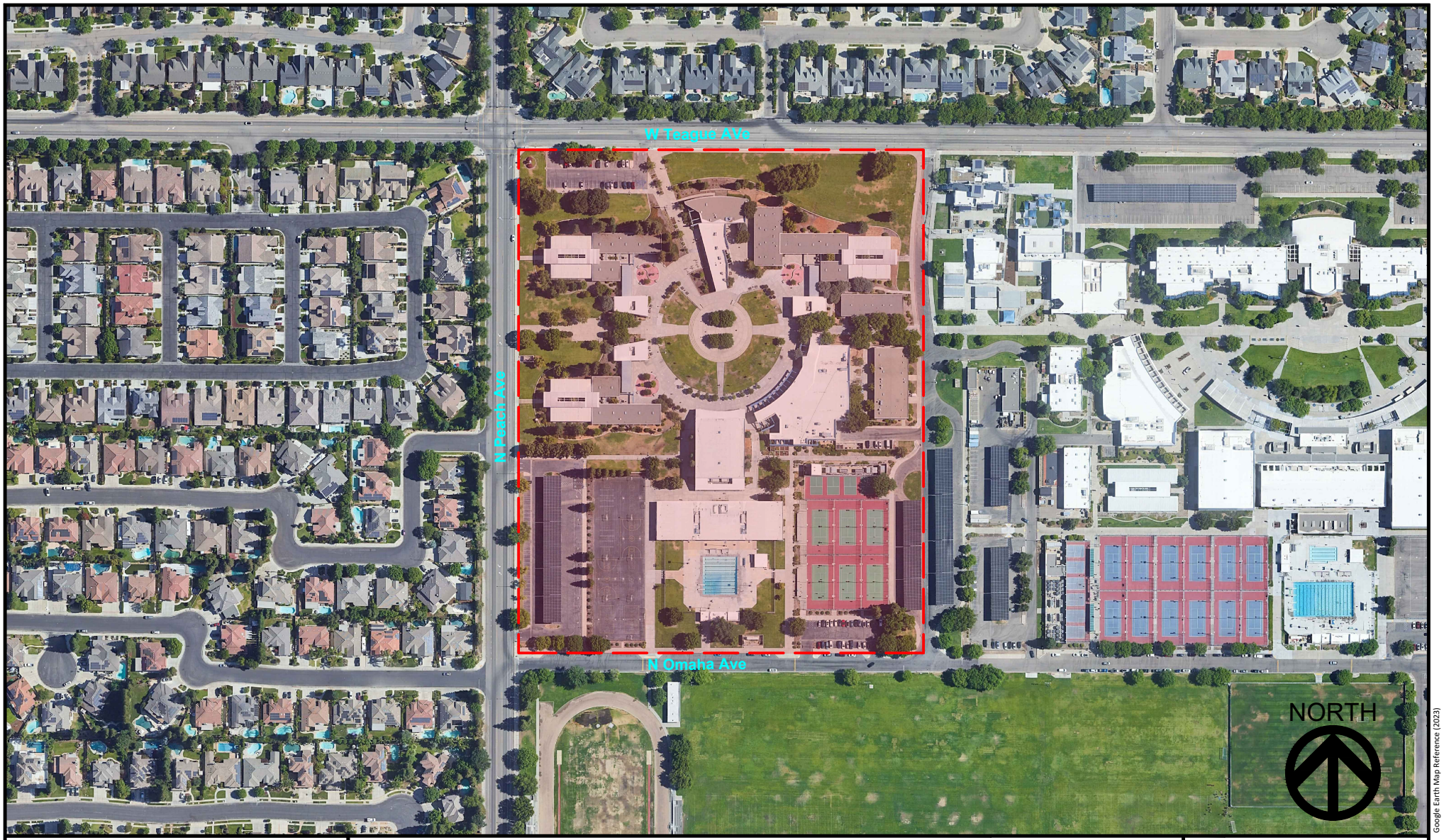

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FIGURE 1
SITE VICINITY MAP
ALTA SIERRA INTERMEDIATE SCHOOL - PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 300'

0 150' 300' 600'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-0
Project Location:	380 West Teague Ave Clovis, CA 93619
Date: January 2024	**Sheet:** 1/2

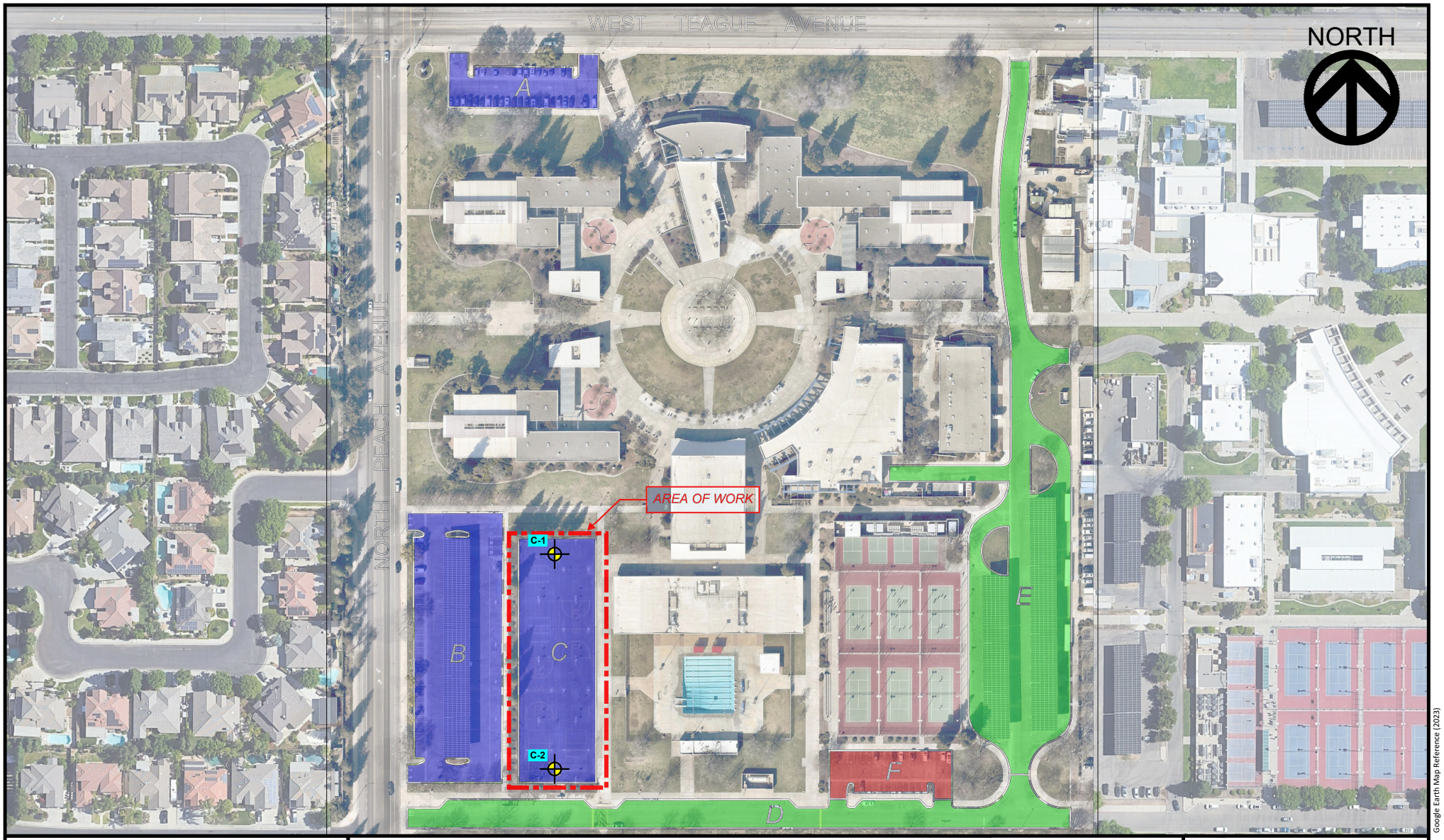

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FIGURE 2
CORING LOCATION MAP
ALTA SIERRA INTERMEDIATE SCHOOL - PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Core Location

Approximate Scale 1'' = 200'

0 100' 200' 400'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-0
Project Location:	380 West Teague Ave Clovis, CA 93619
Date:	January 2024
Sheet:	2/2

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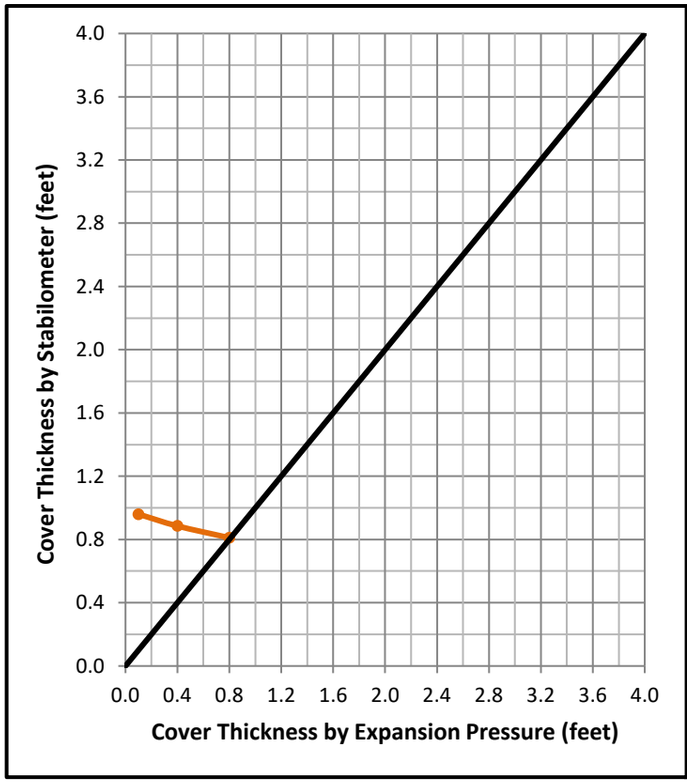
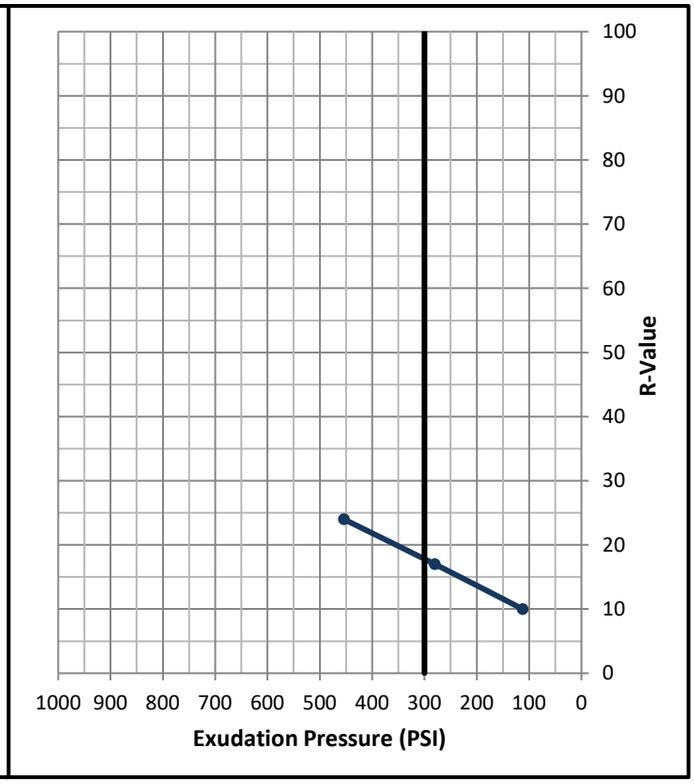
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-0/02		
Project Name:	Alta Sierra Intermediate School Pavement	Lab ID:	24-015079
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/4/2024
Tested By:	Jason M.	Date Tested:	1/10/2024
Sample Location:	Composite: C-1 & C-2 @ 0.5ft - 3ft		
Description:	Sandy SILT minor Clay, fine grained, brown		

"R" Value at 300psi Exudation Pressure:	18
"R" Value by Expansion Pressure:	25





Specimen:	1	2	3
Exudation Pressure Load (lbs):	1411	3518	5703
Exudation Pressure (psi):	112	280	454
Expansion * (0.0001 in):	3	12	24
Expansion Pressure (psf):	13	52	104
Stabilometer Value at 2000 lbs:	141	130	117
Displacement:	4.01	3.38	3.41
Resistance "R" Value:	8	15	21
"R" Value Corrected for Height:	10	17	24
Percent Moisture at Test:	11.9	10.5	9.2
Dry Density at Test (pcf):	126.1	127.9	129.3

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January 31, 2024 RMA Project No. 07-230985-1

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Bud Rank Elementary School Pavement Maintenance
3650 North Powers Avenue
Clovis, California 93619

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Bud Rank Elementary School playcourts in Clovis, California. The project site consists of the northwest corner of the existing Bud Rank Elementary School campus, located approximately 0.28 miles east of the intersection of De Wolf and Powers Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8622° north latitude and 119.6429° west longitude. At the time of our field exploration on January 4, 2023, the existing playcourt area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 416 feet at the project site. The layout of the playcourts is illustrated on Figure 2.

Photo taken from the southeast corner of the site (near C-2), facing north. Taken on January 4, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at two locations (C-1 & C-2) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 8 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	3.25	4.75
C-2	3.25	4.75

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium grained sandy silt with clay. The subgrade was moist for fine grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 0.67’	13.1	111.6
C-2 @ 0.67’	15.9	120.4

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 0.67' – 3'	266.3	107.4	60

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 15 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 9.0" Class 2 AB
5.5	3.0" AC over 9.5" Class 2 AB
6.0	3.0" AC over 11.5" Class 2 AB
7.0	4.0" AC over 13.0" Class 2 AB
8.0	4.5" AC over 15.5" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

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CLOSING REMARKS

The information contained in this report was provided in accordance with generally accepted engineering principles and practices. No other warranty, either express or implied, is made. This report has been prepared for Clovis Unified School District and the Project Design Team to be used for the design and construction of the subject parking lot. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
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STATE OF CALIFORNIA

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

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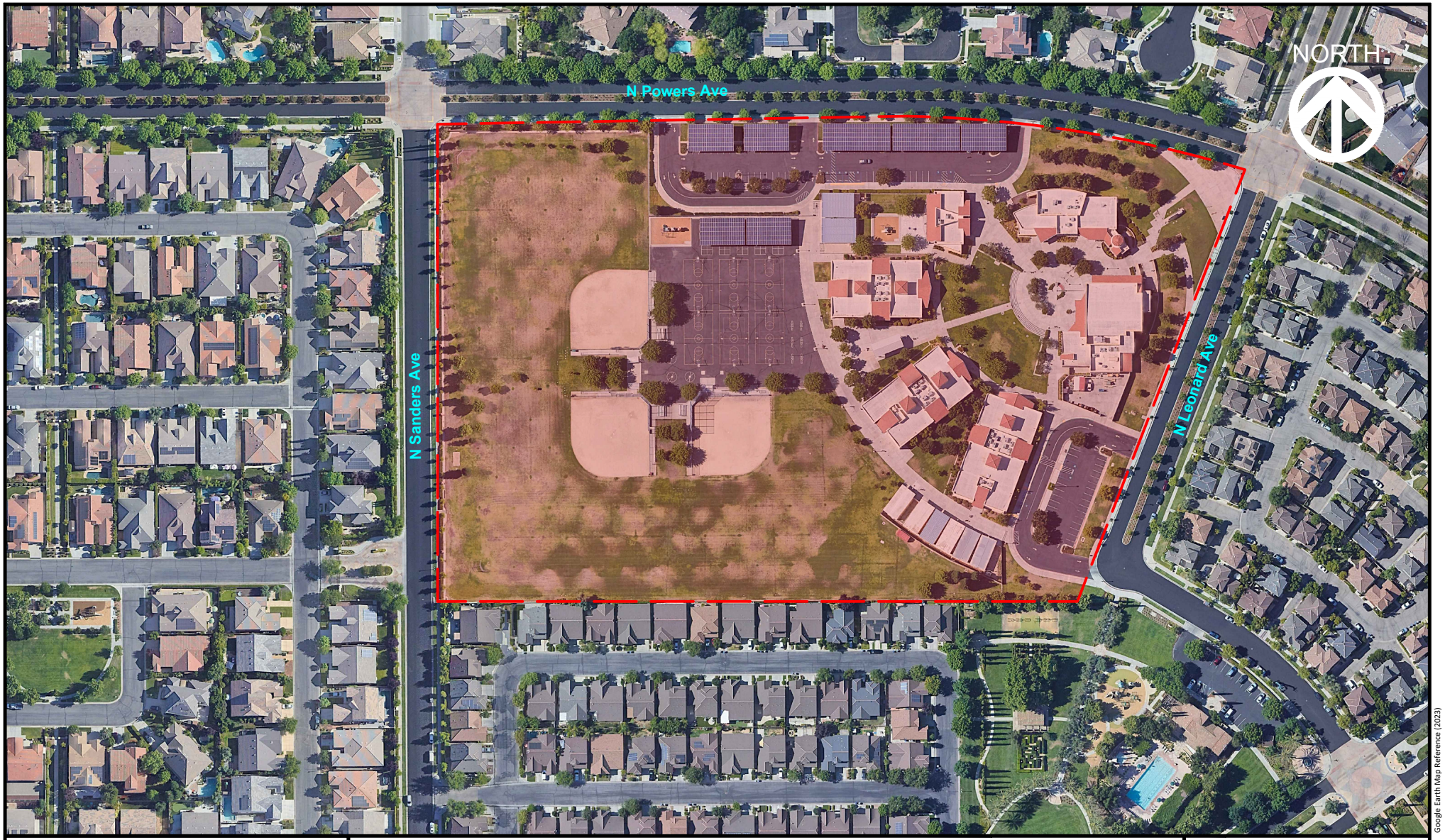
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*



Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
BUD RANK ELEMENTARY SCHOOL - PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 200'

0 100' 200' 400'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-1
Project Location:	3650 North Poweres Avenue Clovis, CA 93619
Date:	January 2024
Sheet:	1/2

RMA GeoScience
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FIGURE 2
CORING LOCATION MAP
BUD RANK ELEMENTARY SCHOOL - PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Core Location

Approximate Scale 1'' = 125'

0 62.5' 125' 250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-1
Project Location:	3650 North Powers Avenue Clovis, CA 93619
Date:	January 2024
Sheet:	2/2

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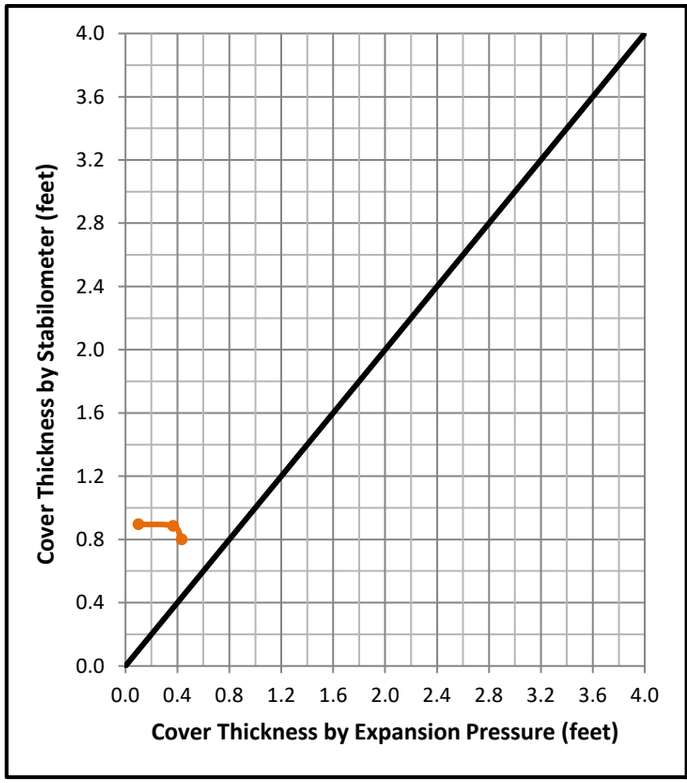
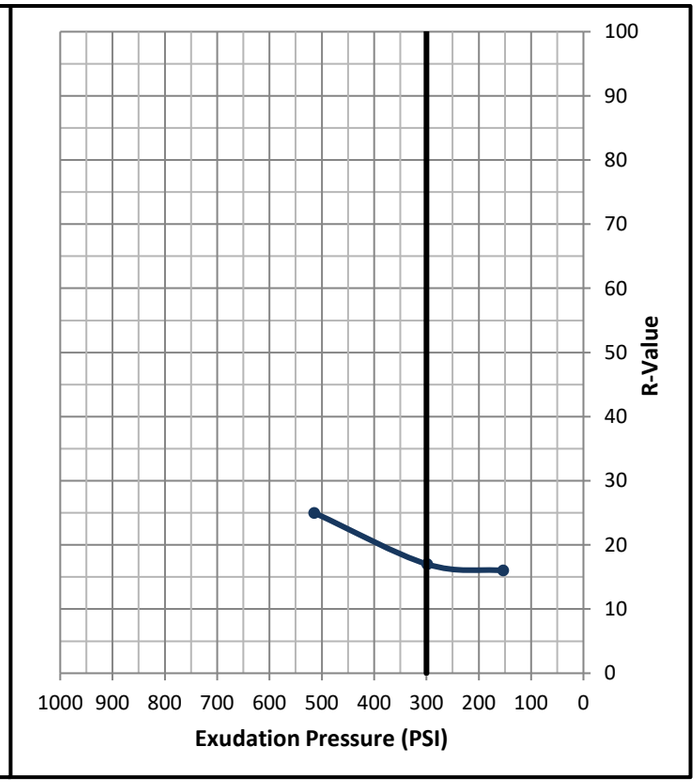
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-1/02		
Project Name:	Bud Rank Elementary School Pavement	Lab ID:	24-015052
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/4/2024
Tested By:	Jason M.	Date Tested:	1/10/2024
Sample Location:	Composite: C-1 & C-2 @ 0.67ft - 3ft		
Description:	Sandy SILTY with Clay, fine to medium grained, brown		

"R" Value at 300psi Exudation Pressure:	17
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	1927	3752	6461
Exudation Pressure (psi):	153	299	514
Expansion * (0.0001 in):	3	11	13
Expansion Pressure (psf):	13	48	56
Stabilometer Value at 2000 lbs:	124	120	106
Displacement:	4.33	4.57	4.29
Resistance "R" Value:	14	15	23
"R" Value Corrected for Height:	16	17	25
Percent Moisture at Test:	12.4	11.9	11.4
Dry Density at Test (pcf):	126.5	127.8	126.7

RMA GeoScience
Every Project Matters | www.rmacompanies.com

January 31, 2024 RMA Project No. 07-230985-2

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Clark Intermediate School Pavement Maintenance
902 5th Street
Clovis, California 93612

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Clark Intermediate School playcourts in Clovis, California. The project site consists of the southern side of the existing Clark Intermediate School campus, located approximately 0.17 miles east of the intersection of Clovis Avenue and 5th Street (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8228° north latitude and 119.6966° west longitude. At the time of our field exploration on January 5, 2023, the existing playcourt area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 363 feet at the project site. The layout of the playcourts is illustrated on Figure 2.

Photo taken from the southwest corner side of the site (near C-1), facing north. Taken on January 5, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at two locations (C-1 & C-2) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 12 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	2.0	9.5
C-2	2.0	9.0

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium grained silty sand. The subgrade was dry to moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 1.0’	124.4	6.8
C-2 @ 1.0’	122.1	2.1

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 1' – 3'	285.2	241.4	15

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 50 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 3.0" Class 2 AB
5.5	3.0" AC over 3.0" Class 2 AB
6.0	3.0" AC over 4.0" Class 2 AB
7.0	4.0" AC over 4.5" Class 2 AB
8.0	4.5" AC over 6.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

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CLOSING REMARKS

The information contained in this report was provided in accordance with generally accepted engineering principles and practices. No other warranty, either express or implied, is made. This report has been prepared for Clovis Unified School District and the Project Design Team to be used for the design and construction of the subject parking lot. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

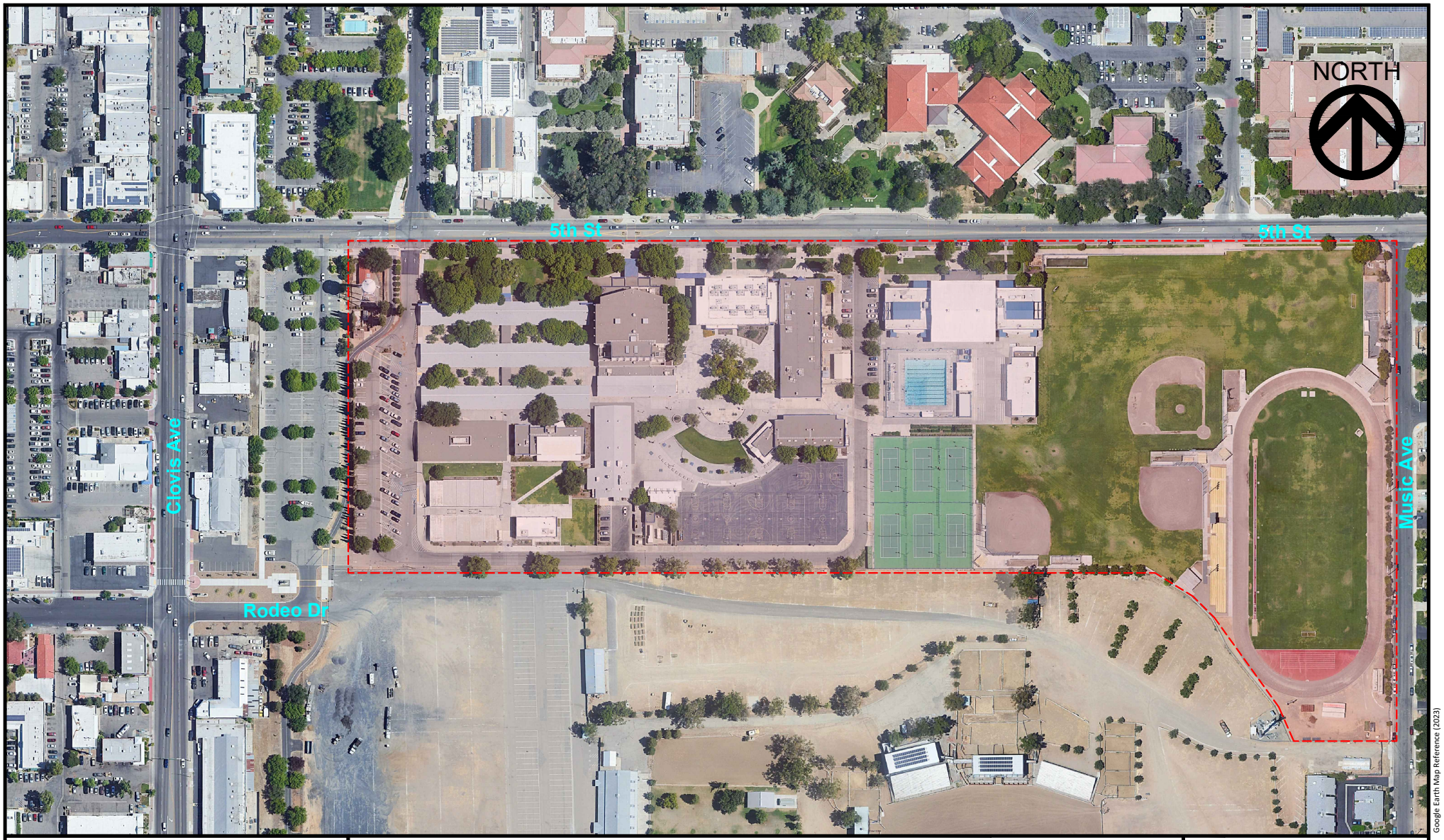
Megan J. Stewart, GIT
Staff Geologist

Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
Mr. Zachary Hockett, Blair, Church & Flynn (pdf to *zhockett@bcf-engr.com*)
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*



Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
CLARK INTERMEDIATE SCHOOL PAVEMENT MAINTENANCE

Approximate Limits of the Pavement Maintenance

Approximate Scale 1'' = 250'

0 125' 250' 500'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-2
Project Location:	902 5th Street Clovis, CA 93612
Date:	January 2024
Sheet:	1/2

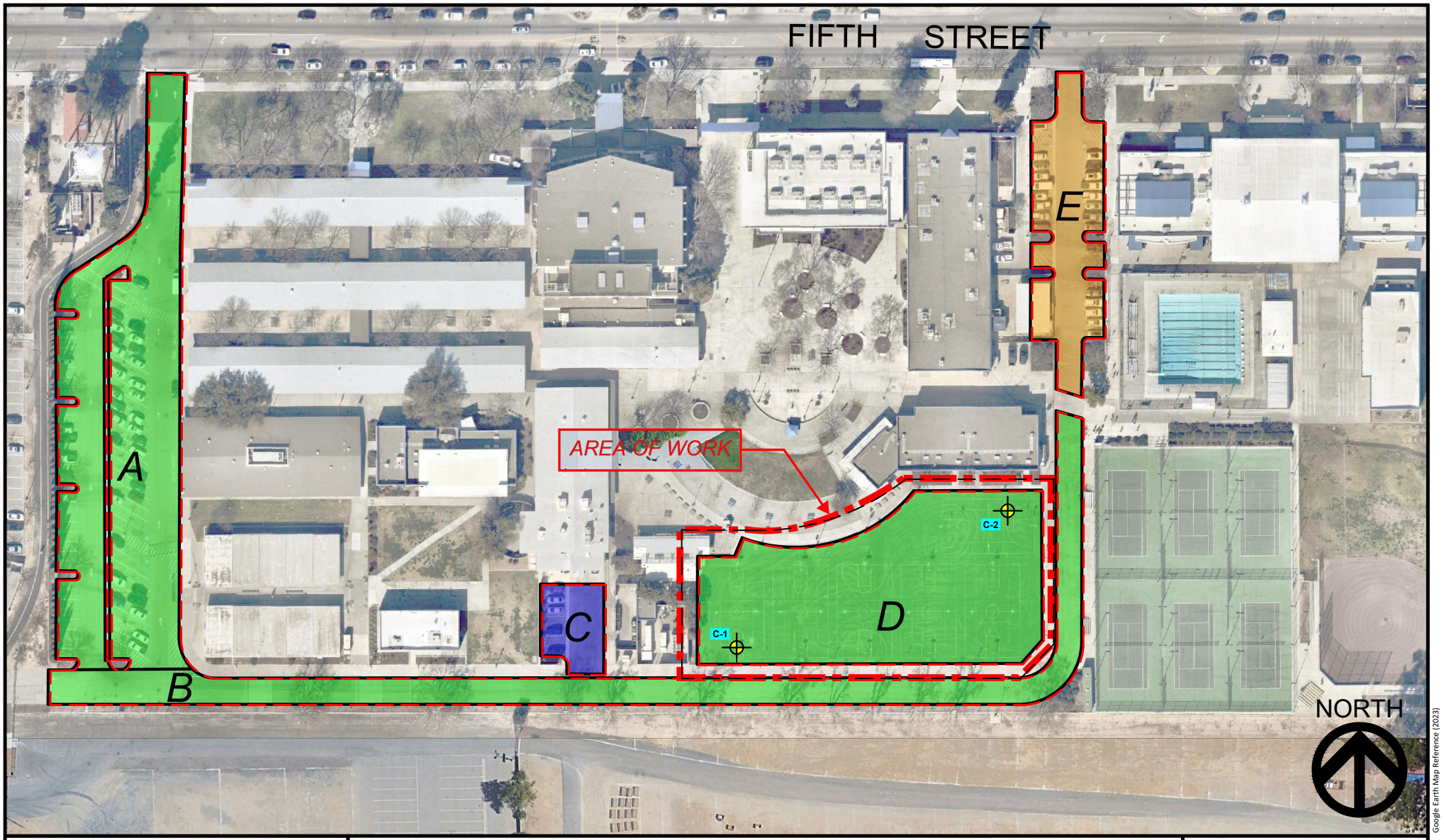

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FIGURE 2
CORING LOCATION MAP
CLARK INTERMEDIATE SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 125'

0 62.5' 125' 250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-2
Project Location:	902 5th Street Clovis, CA 93612
Date:	January 2024
Sheet:	2/2

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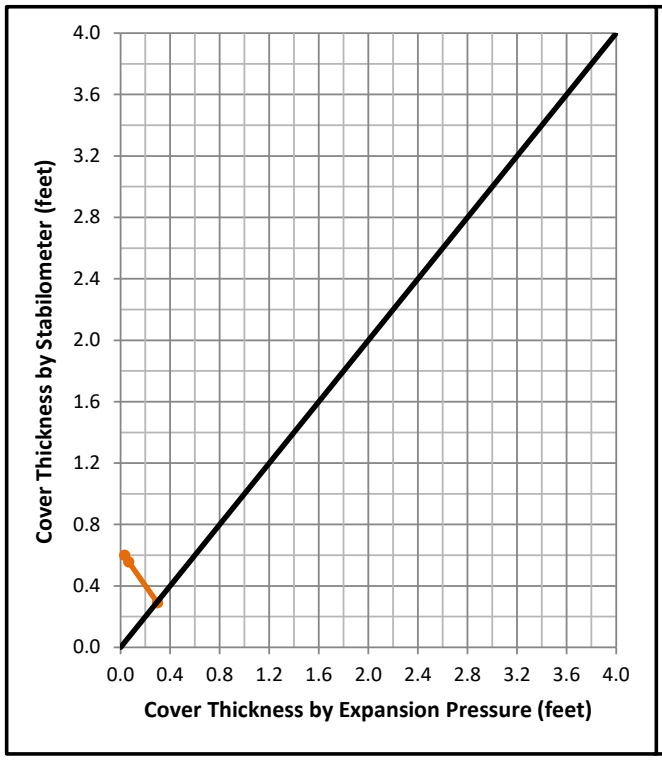
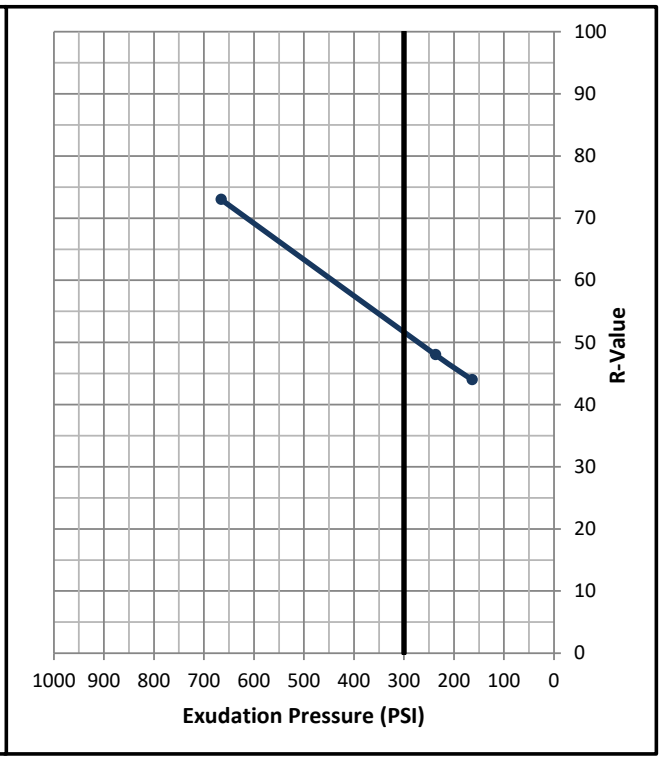
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-2/02		
Project Name:	Clark Intermediate School Pavement	Lab ID:	24-015092
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/5/2024
Tested By:	Jason M.	Date Tested:	1/15/2024
Sample Location:	Composite: C-1 & C-2 @ 1ft - 3ft		
Description:	Silty SAND, fine to medium grained, brown		

"R" Value at 300psi Exudation Pressure:	52
"R" Value by Expansion Pressure:	72





Specimen:	1	2	3
Exudation Pressure Load (lbs):	2058	2974	8361
Exudation Pressure (psi):	164	237	666
Expansion * (0.0001 in):	1	2	9
Expansion Pressure (psf):	4	9	39
Stabilometer Value at 2000 lbs:	69	64	34
Displacement:	4.26	4.19	3.31
Resistance "R" Value:	44	47	74
"R" Value Corrected for Height:	44	48	73
Percent Moisture at Test:	11.2	9.9	8.6
Dry Density at Test (pcf):	128.2	130.1	130.9

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January 31, 2024 RMA Project No. 07-230985-3

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Clovis East High School Pavement Maintenance
2940 Leonard Avenue
Clovis, California 93619

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Clovis East High School playcourts in Clovis, California. The project site consists of the southeast corner of the existing Clovis East High School campus, located approximately 0.25 miles north of the intersection of Ashlan and Leonard Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.7978° north latitude and 119.6394° west longitude. At the time of our field exploration on January 5, 2023, the existing playcourt area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 374 feet at the project site. The layout of the playcourts is illustrated on Figure 2.

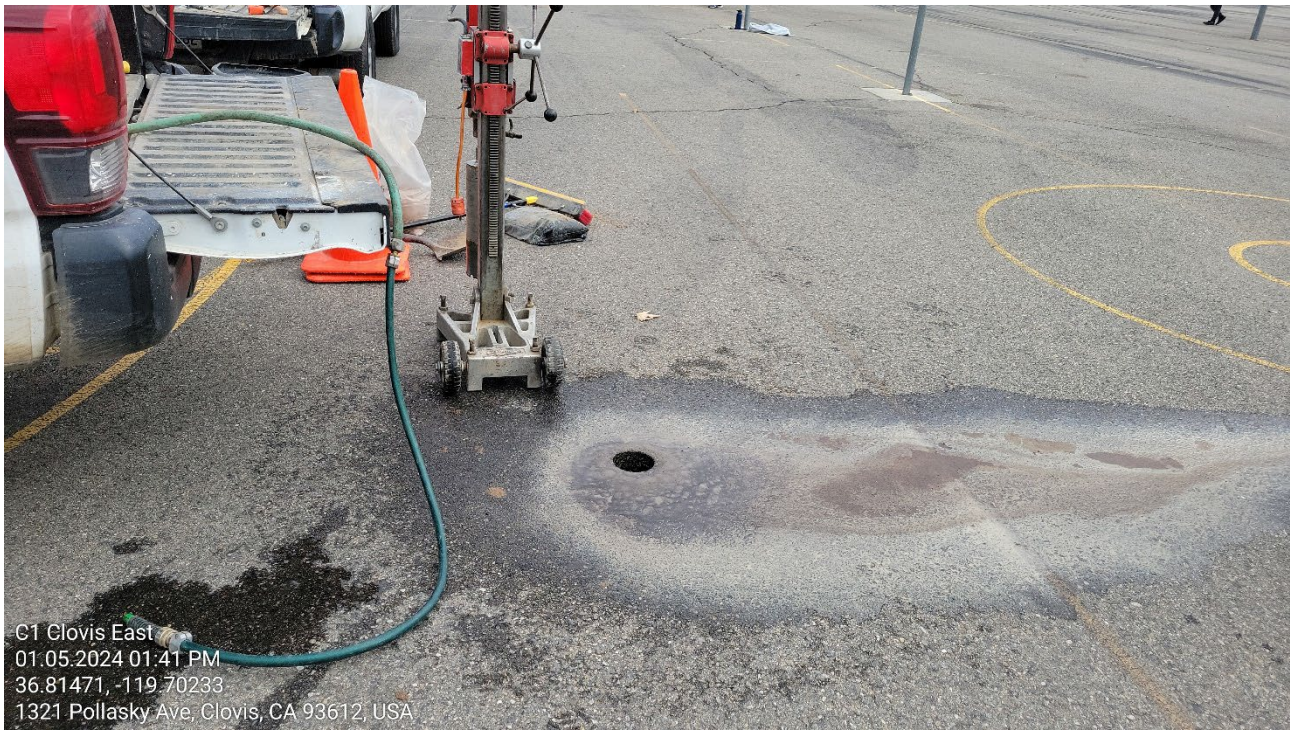

Photo taken from the northwest of the site (near C-1), facing east. Taken on January 5, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at two locations (C-1 & C-2) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 8 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	4.0	3.0
C-2	4.0	4.0

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium grained clayey sand. The subgrade was very moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 0.67’	119.7	12.9
C-2 @ 0.67’	123.2	12.2

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 0.67' – 3'	268.4	142.4	47

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 10 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 10.0" Class 2 AB
5.5	3.0" AC over 10.5" Class 2 AB
6.0	3.0" AC over 12.5" Class 2 AB
7.0	4.0" AC over 14.0" Class 2 AB
8.0	4.5" AC over 17.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

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CLOSING REMARKS

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Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

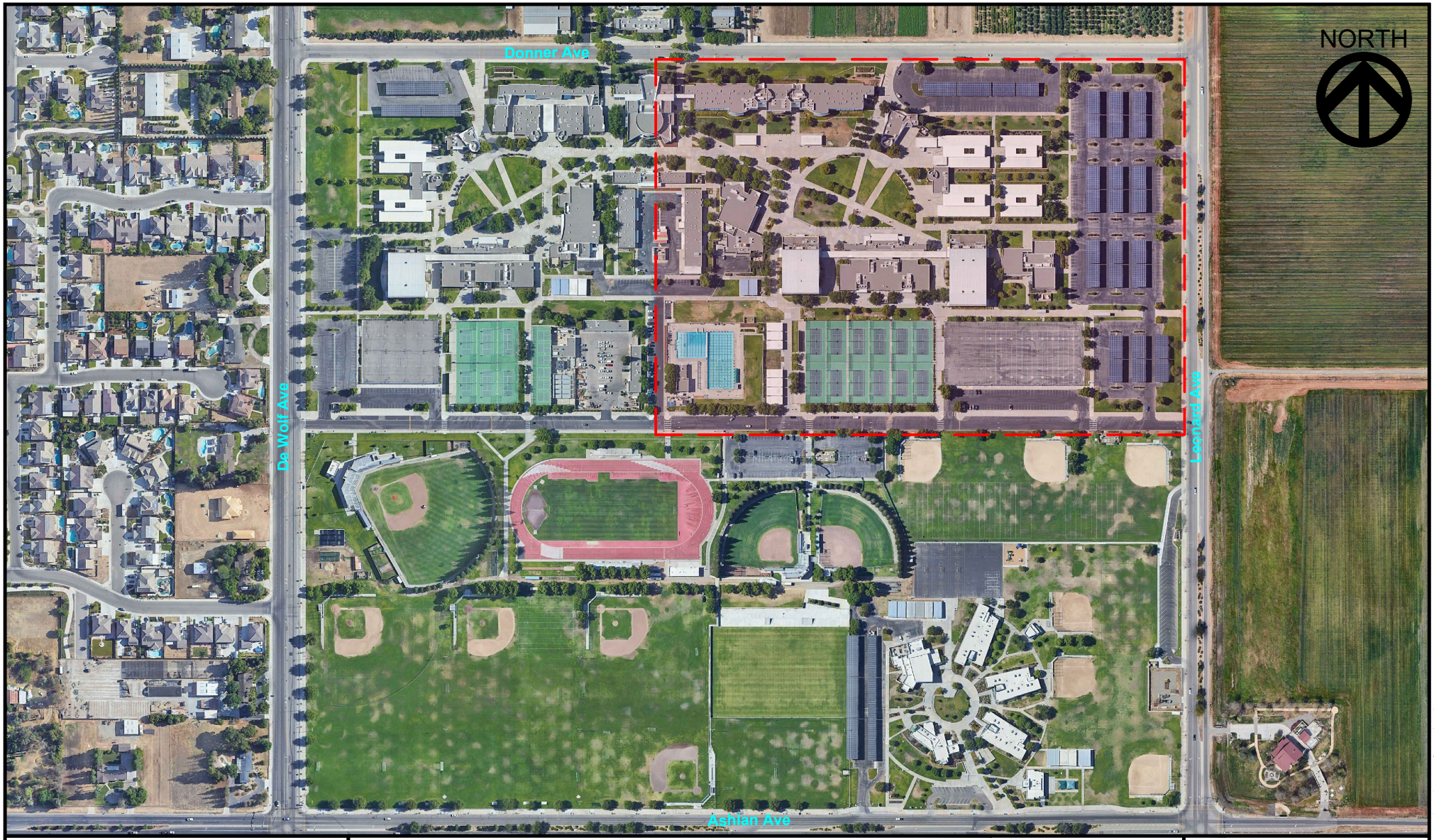
Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
GEOTECHNICAL
STATE OF CALIFORNIA

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
Mr. Zachary Hockett, Blair, Church & Flynn (pdf to *zhockett@bcf-engr.com*)
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*



Google Earth Map Reference (2023)

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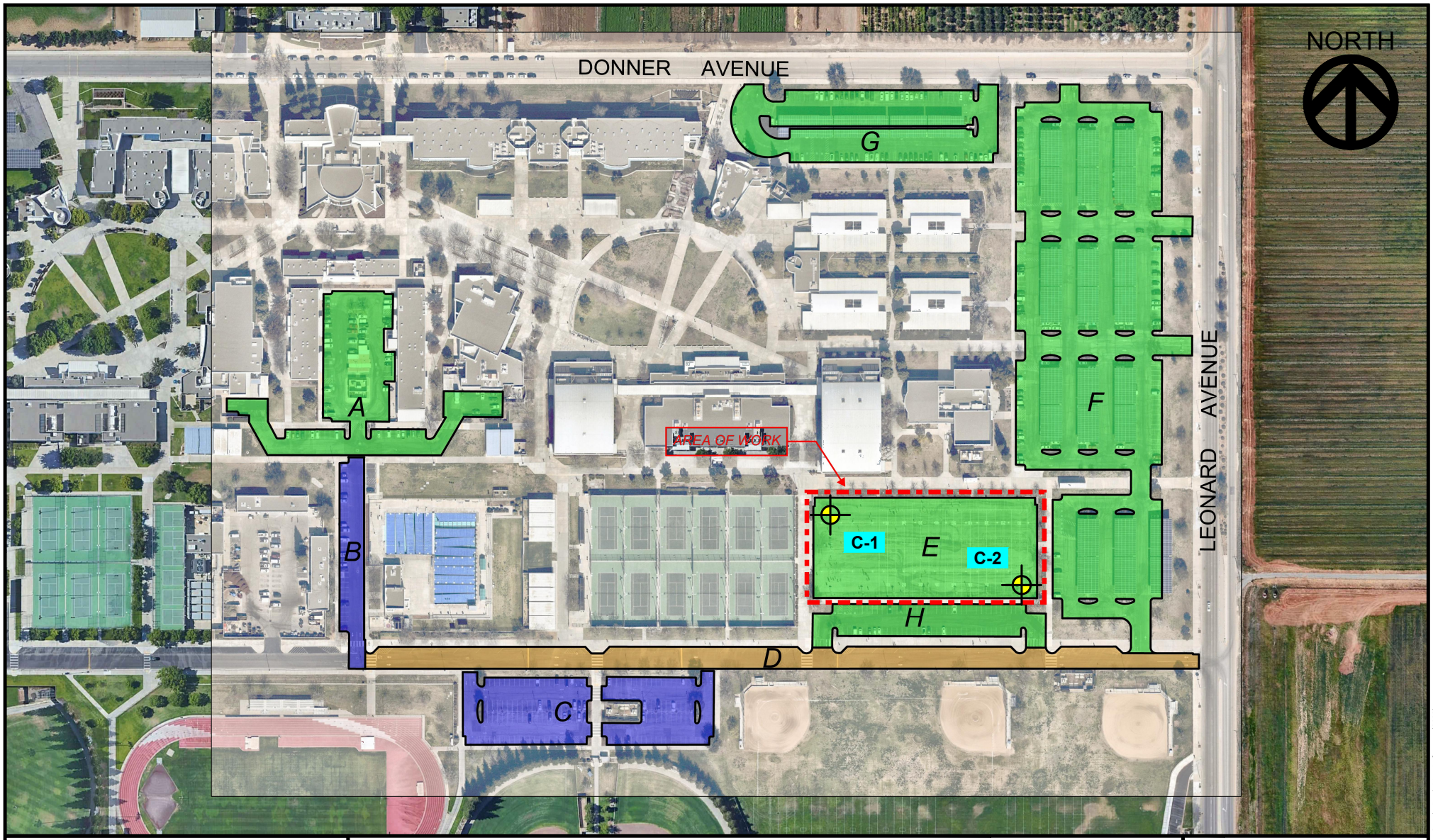
FIGURE 1
SITE VICINITY MAP
CLOVIS EAST HIGH SCHOOL PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 400'

0 200' 400' 800'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-3
Project Location:	2940 Leanoard Avenue Clovis, CA 93619
Date:	January 2024
Sheet:	1/2



Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
CLOVIS EAST HIGH SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 250'

0 125' 250' 500'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-3
Project Location:	2940 Leanoard Avenue Clovis, CA 93619
Date:	January 2024
Sheet:	2/2

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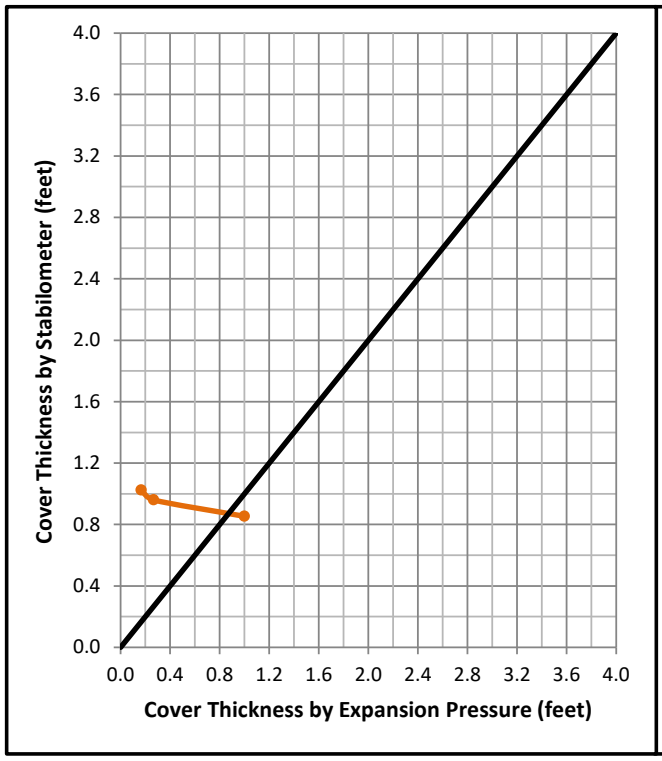
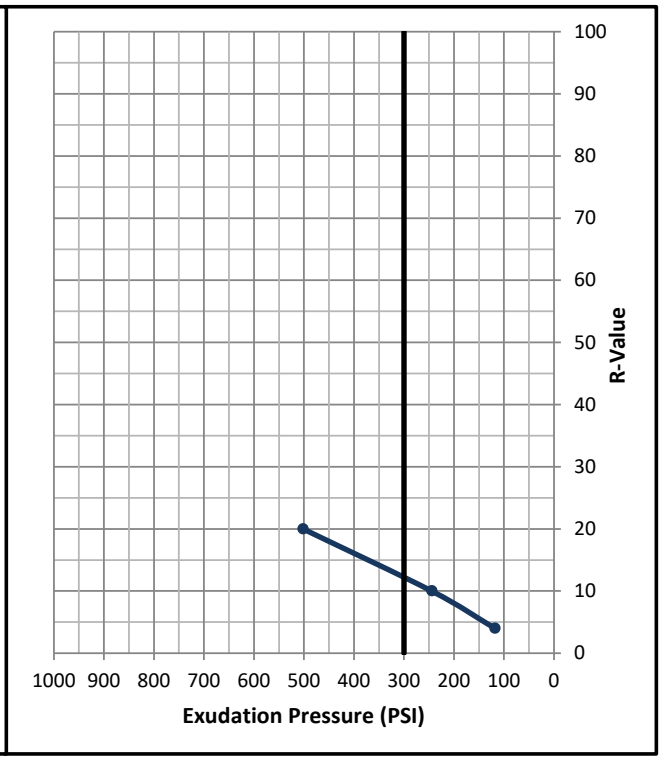
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-3/02		
Project Name:	Clovis East High School Pavement	Lab ID:	24-015100
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/5/2024
Tested By:	Jason M.	Date Tested:	1/15/2024
Sample Location:	Composite: C-1 & C-2 @ 0.67ft - 3ft		
Description:	Clayey SAND, fine to medium grained, dark brown		

"R" Value at 300psi Exudation Pressure:	12
"R" Value by Expansion Pressure:	16





Specimen:	1	2	3
Exudation Pressure Load (lbs):	1483	3072	6305
Exudation Pressure (psi):	118	245	502
Expansion * (0.0001 in):	5	8	30
Expansion Pressure (psf):	22	35	130
Stabilometer Value at 2000 lbs:	151	139	120
Displacement:	4.07	3.82	3.48
Resistance "R" Value:	4	9	19
"R" Value Corrected for Height:	4	10	20
Percent Moisture at Test:	14.7	13.3	11.9
Dry Density at Test (pcf):	122.7	127.1	128.6

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January 31, 2024 RMA Project No. 07-230985-4

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Cole Elementary School Pavement Maintenance
615 West Stewart Avenue
Clovis, California 93612

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Cole Elementary School playcourts in Clovis, California. The project site consists of the northeast corner of the existing Cole Elementary School campus, located approximately 0.2 miles north-northeast of the intersection of West Bullard and Helm Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8265° north latitude and 119.7222° west longitude. At the time of our field exploration on January 5, 2023, the existing playcourt area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 354 feet at the project site. The layout of the playcourts is illustrated on Figure 2.

Photo taken from the northwest of the site (near C-1), facing north. Taken on January 5, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at two locations (C-1 & C-2) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 12 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	2.75	7.75
C-2	2.25	8.75

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium grained silty sand with clay. The subgrade was moist to very moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 1.0’	119.7	14.4
C-2 @ 1.0’	111.1	11.1

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 1' – 3'	268.6	176.3	34

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 20 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 8.0" Class 2 AB
5.5	3.0" AC over 9.0" Class 2 AB
6.0	3.0" AC over 10.5" Class 2 AB
7.0	4.0" AC over 12.0" Class 2 AB
8.0	4.5" AC over 14.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

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CLOSING REMARKS

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Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
GEOTECHNICAL
STATE OF CALIFORNIA

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

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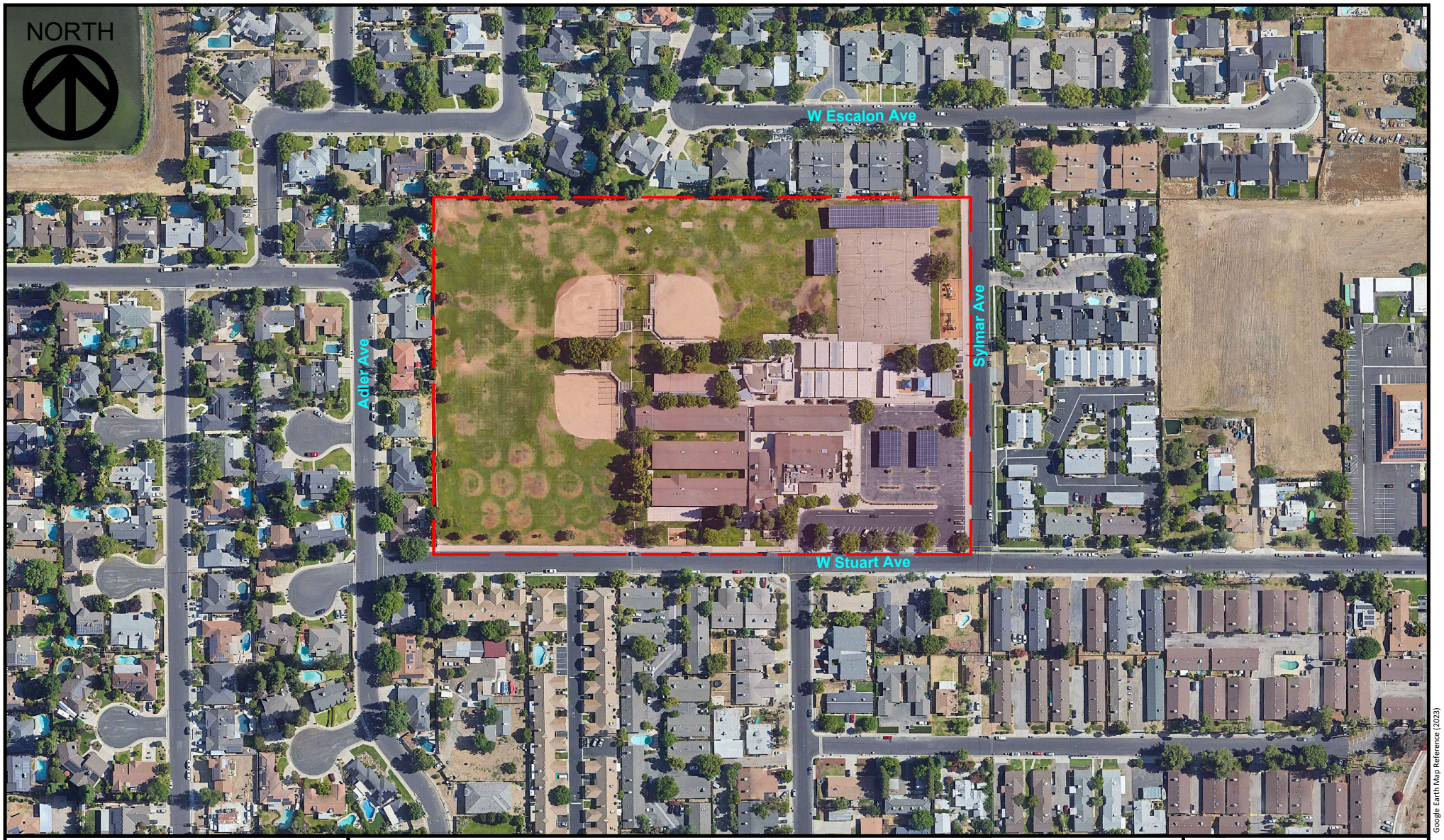
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*



Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
COLE ELEMENTARY SCHOOL PAVEMENT MAINTAINENCE

Approximate Limits of the Pavement Maintenance

Approximate Scale 1'' = 250'

0 125' 250' 500'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-4
Project Location:	615 West Stewart Avenue Clovis, CA 93612
Date:	January 2024
Sheet:	1/2

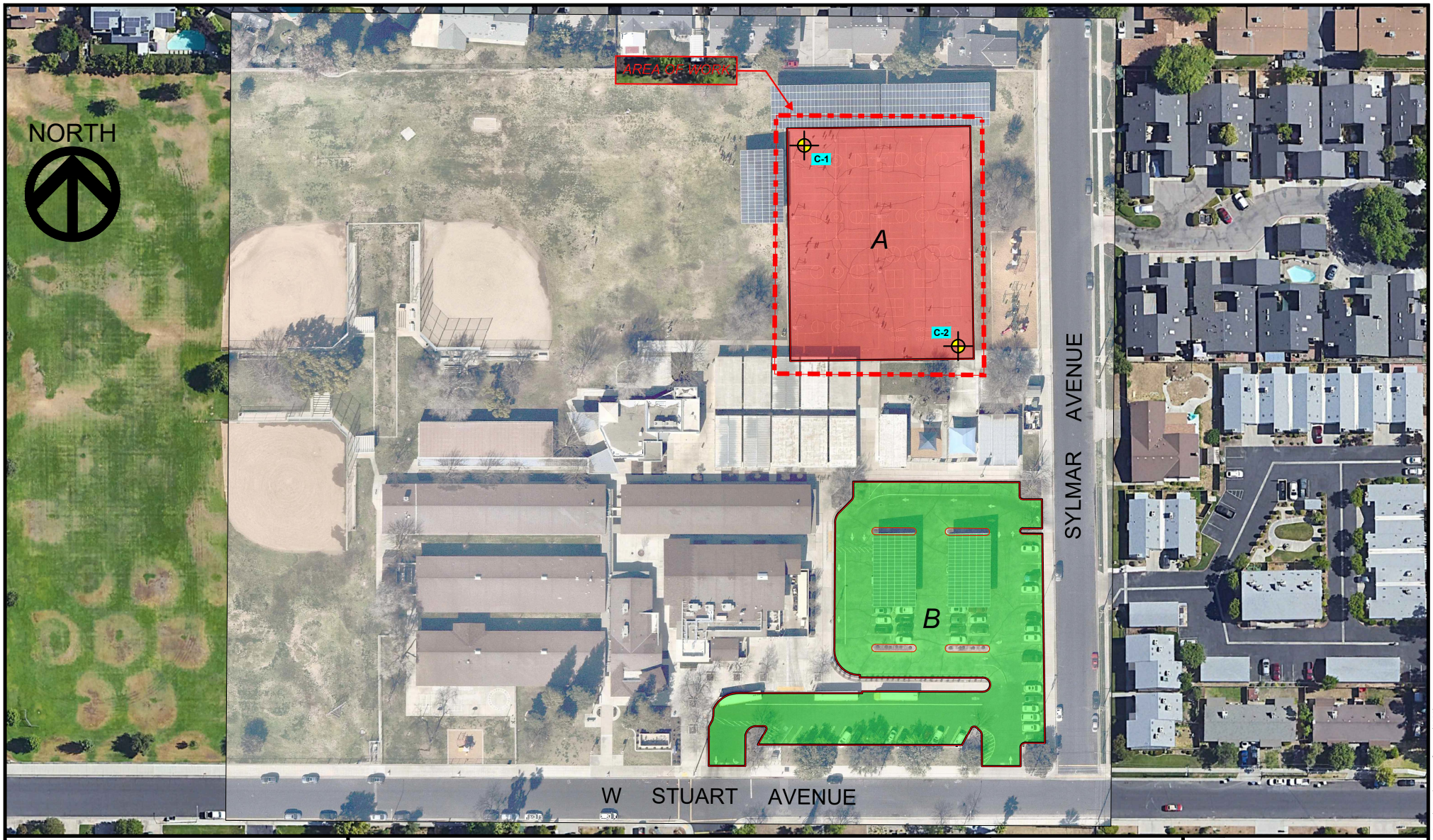

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FIGURE 2
CORING LOCATION MAP
COLE ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 125'

0 62.5' 125' 250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-4
Project Location:	615 West Stewart Avenue Clovis, CA 93612
Date:	January 2024
Sheet:	2/2

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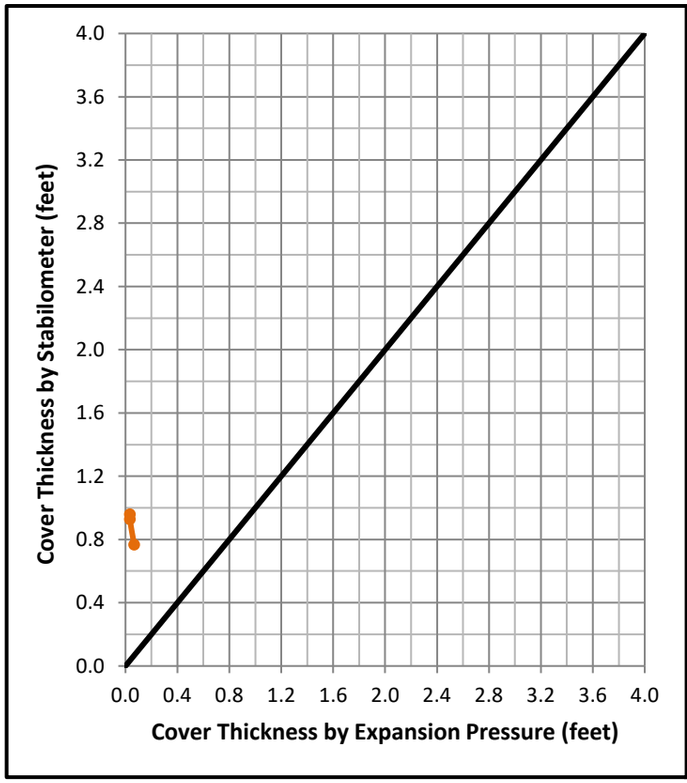
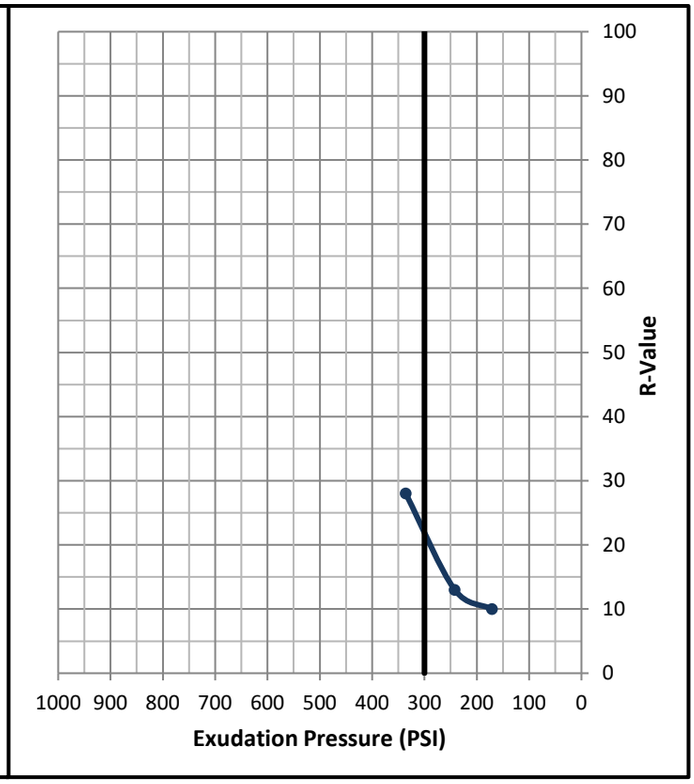
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-4/02		
Project Name:	Cole Elementary School Pavement	Lab ID:	24-015089
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/5/2024
Tested By:	Jason M.	Date Tested:	1/15/2024
Sample Location:	Composite: C-1 & C-2 @ 1ft - 3ft		
Description:	Silty SAND with Clay, fine to medium grained, dark brown		

"R" Value at 300psi Exudation Pressure:	22
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	2147	3041	4217
Exudation Pressure (psi):	171	242	336
Expansion * (0.0001 in):	1	1	2
Expansion Pressure (psf):	4	4	9
Stabilometer Value at 2000 lbs:	136	127	100
Displacement:	4.22	4.07	4.02
Resistance "R" Value:	9	14	27
"R" Value Corrected for Height:	10	13	28
Percent Moisture at Test:	15.4	14.4	13.5
Dry Density at Test (pcf):	122.8	126.2	125.0

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January 31, 2024 RMA Project No. 07-230985-9

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
David E Cook Way Pavement Maintenance
1465 David E Cook Way
Clovis, California 93611

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to David E Cook Way near the CUSD District Office in Clovis, California. The project site consists of David E Cook Way, located immediately southeast of the intersection of East Herndon and North Sunnyside Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8353° north latitude and 119.6890° west longitude. At the time of our field exploration on January 4, 2023, the existing roadway was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 376 feet at the project site. The layout of the roadway is illustrated on Figure 2.

Photo taken near the middle of the site (near C-1), facing east. Taken on January 4, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at one location (C-1) and hand-augering to a depth of approximately 48 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 12 and 48 inches.
- The core hole was backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	3.0	7.0

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium grained silty sand. The subgrade was moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 1.0’	126.7	8.3

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
C-1 @ 1' – 4'	280.1	220.4	21

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 45 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤ 5.0	2.5" AC over 4.0" Class 2 AB
5.5	3.0" AC over 4.0" Class 2 AB
6.0	3.0" AC over 5.0" Class 2 AB
7.0	4.0" AC over 5.5" Class 2 AB
8.0	4.5" AC over 7.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

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CLOSING REMARKS

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Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

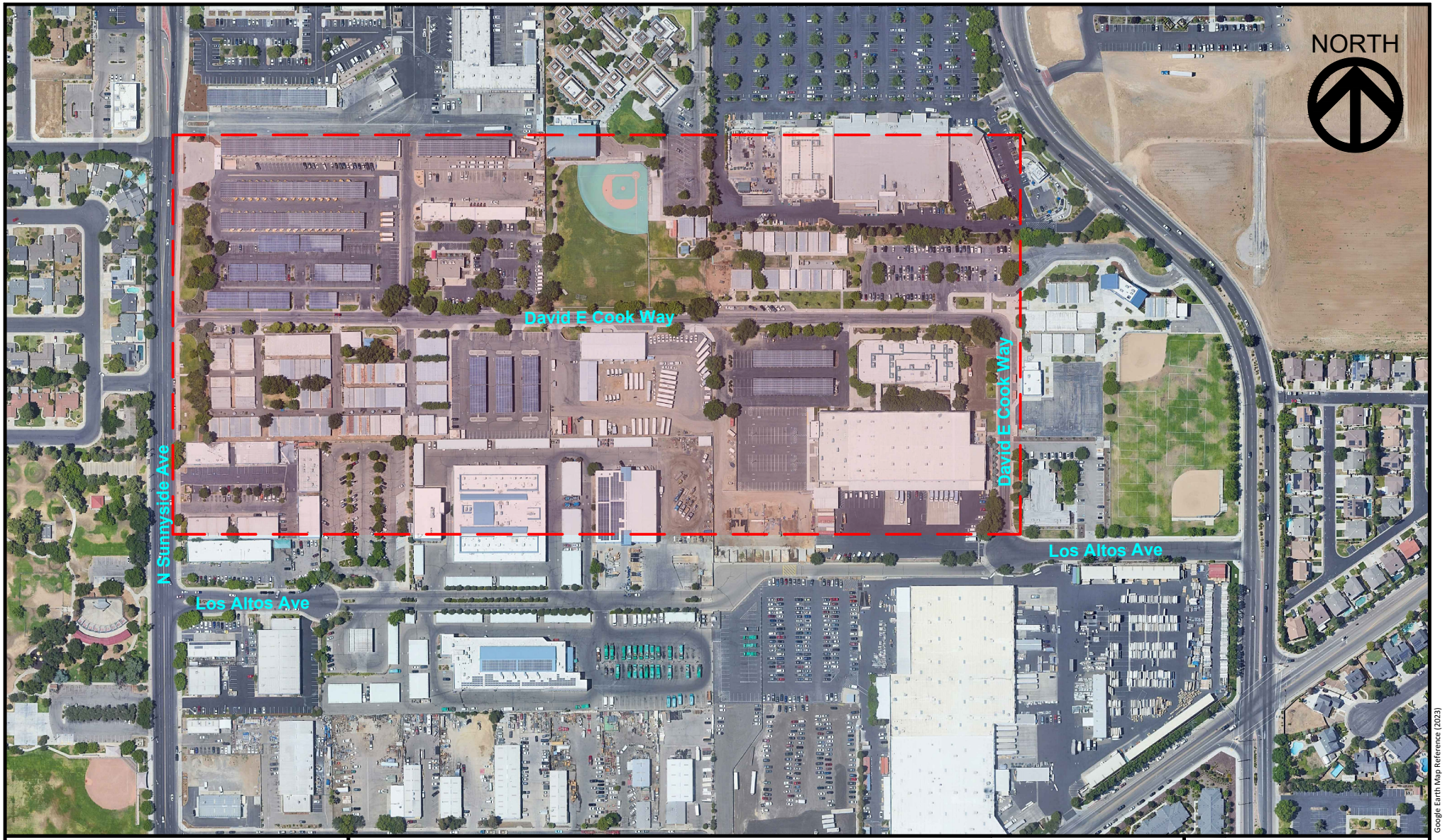
Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
GEOTECHNICAL
STATE OF CALIFORNIA

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
Mr. Zachary Hockett, Blair, Church & Flynn (pdf to *zhockett@bcf-engr.com*)
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*



Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
DAVID E COOK WAY PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 625'

0 312.5' 625' 1250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-9
Project Location:	1465 David E Cook Way Clovis, CA 93611
Date:	January 2024
Sheet:	1/2

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FIGURE 2
CORING LOCATION MAP
DAVID E COOK WAY PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 225'

0 112.5' 225 450'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-9
Project Location:	1465 David E Cook Way Clovis, CA 93611
Date:	January 2024
Sheet:	2/2

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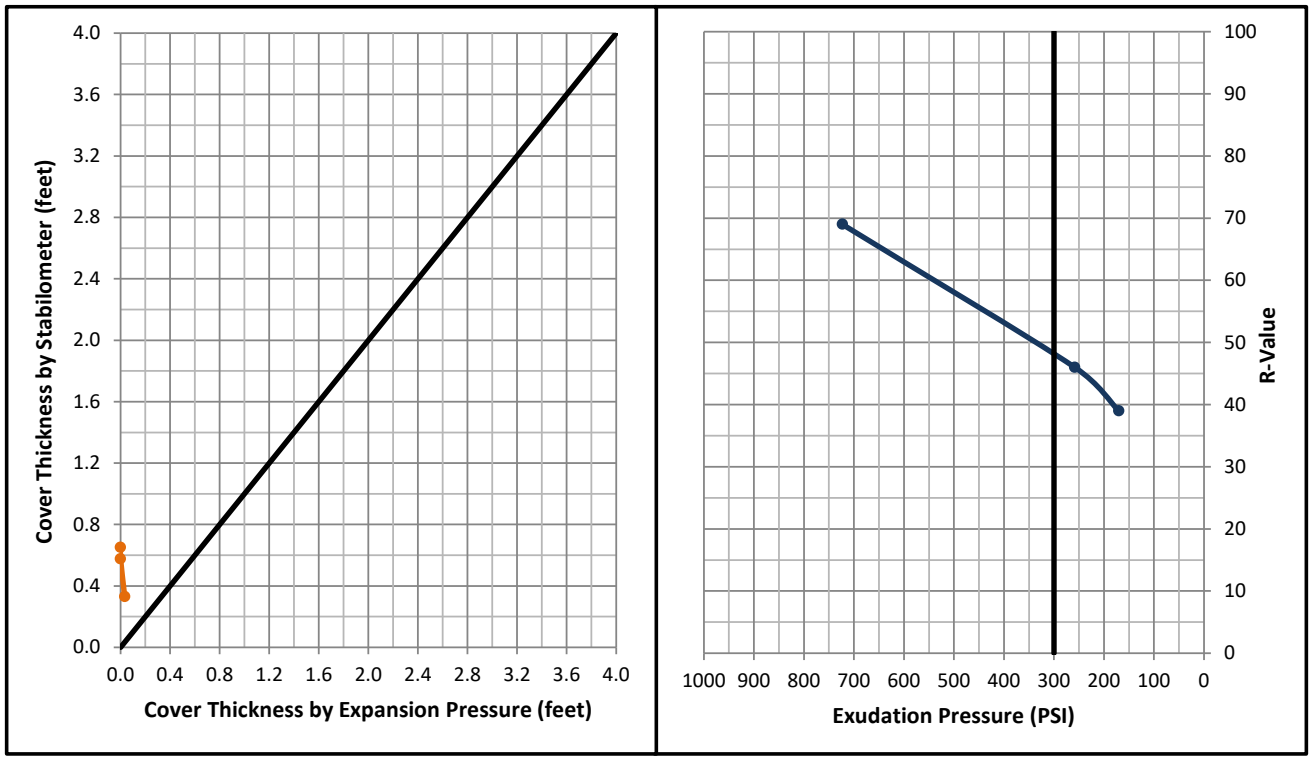
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-9/02		
Project Name:	David E Cook Way Pavement	Lab ID:	24-015084
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/4/2024
Tested By:	Jason M.	Date Tested:	1/8/2024
Sample Location:	C-1 @ 1ft - 4ft		
Description:	Silty SAND, fine to medium grained, brown		

"R" Value at 300psi Exudation Pressure:	48
"R" Value by Expansion Pressure:	N/A



Specimen:	1	2	3
Exudation Pressure Load (lbs):	2145	3247	9084
Exudation Pressure (psi):	171	259	723
Expansion * (0.0001 in):	0	0	1
Expansion Pressure (psf):	0	0	4
Stabilometer Value at 2000 lbs:	78	71	43
Displacement:	4.37	3.86	3.08
Resistance "R" Value:	38	45	69
"R" Value Corrected for Height:	39	46	69
Percent Moisture at Test:	12.2	10.9	9.6
Dry Density at Test (pcf):	125.8	126.0	126.4

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January 31, 2024 RMA Project No. 07-230985-5

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Fancher Creek Elementary School Pavement Maintenance
5948 East Tulare Avenue
Fresno, California 93727

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Fancher Creek Elementary School parking lot in Fresno, California. The project site consists of the northeast corner of the existing Fancher Creek Elementary School campus, located immediately southwest of the intersection of North Fowler and East Tulare Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.7433° north latitude and 119.6828° west longitude. At the time of our field exploration on January 5, 2023, the existing parking lot area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 334 feet at the project site. The layout of the parking lot is illustrated on Figure 2.

Photo taken near the middle of the site (near C-1), facing north. Taken on January 5, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at one location (C-1) and hand-augering to a depth of approximately 48 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 6 and 48 inches.
- The core hole was backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	2.0	3.0

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium grained clayey sand. The subgrade was moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 0.5’	121.6	7.0

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
C-1 @ 0.5' – 4'	281.2	202.4	28

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 20 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 8.0" Class 2 AB
5.5	3.0" AC over 9.0" Class 2 AB
6.0	3.0" AC over 10.5" Class 2 AB
7.0	4.0" AC over 12.0" Class 2 AB
8.0	4.5" AC over 14.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

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CLOSING REMARKS

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Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
GEOTECHNICAL
STATE OF CALIFORNIA

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
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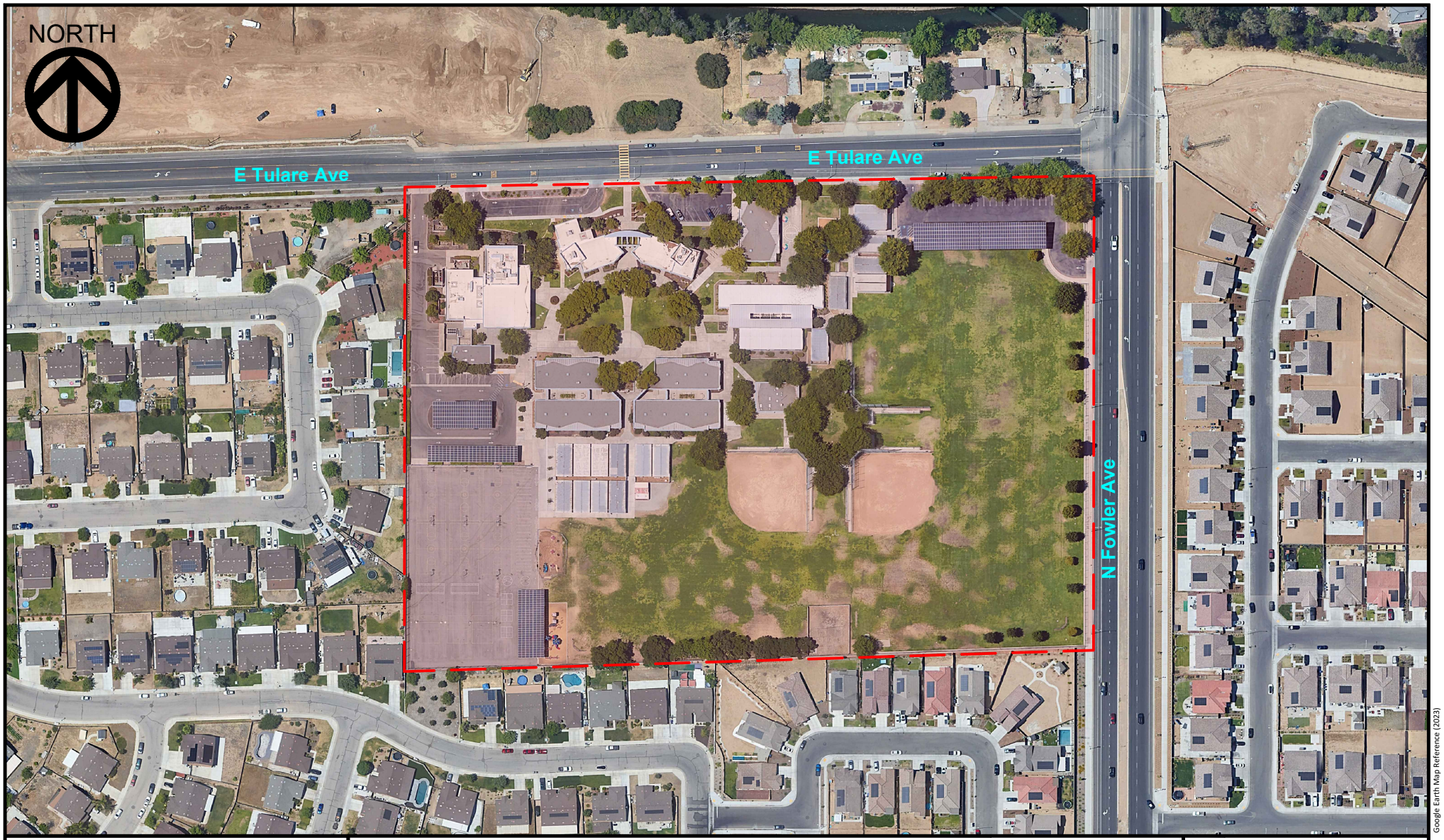

Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
FANCHER CREEK ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 200'

0 100' 200' 400'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-5
Project Location:	5948 East Tulare Avenue Fresno, CA 93727
Date:	January 2024
Sheet:	1/2

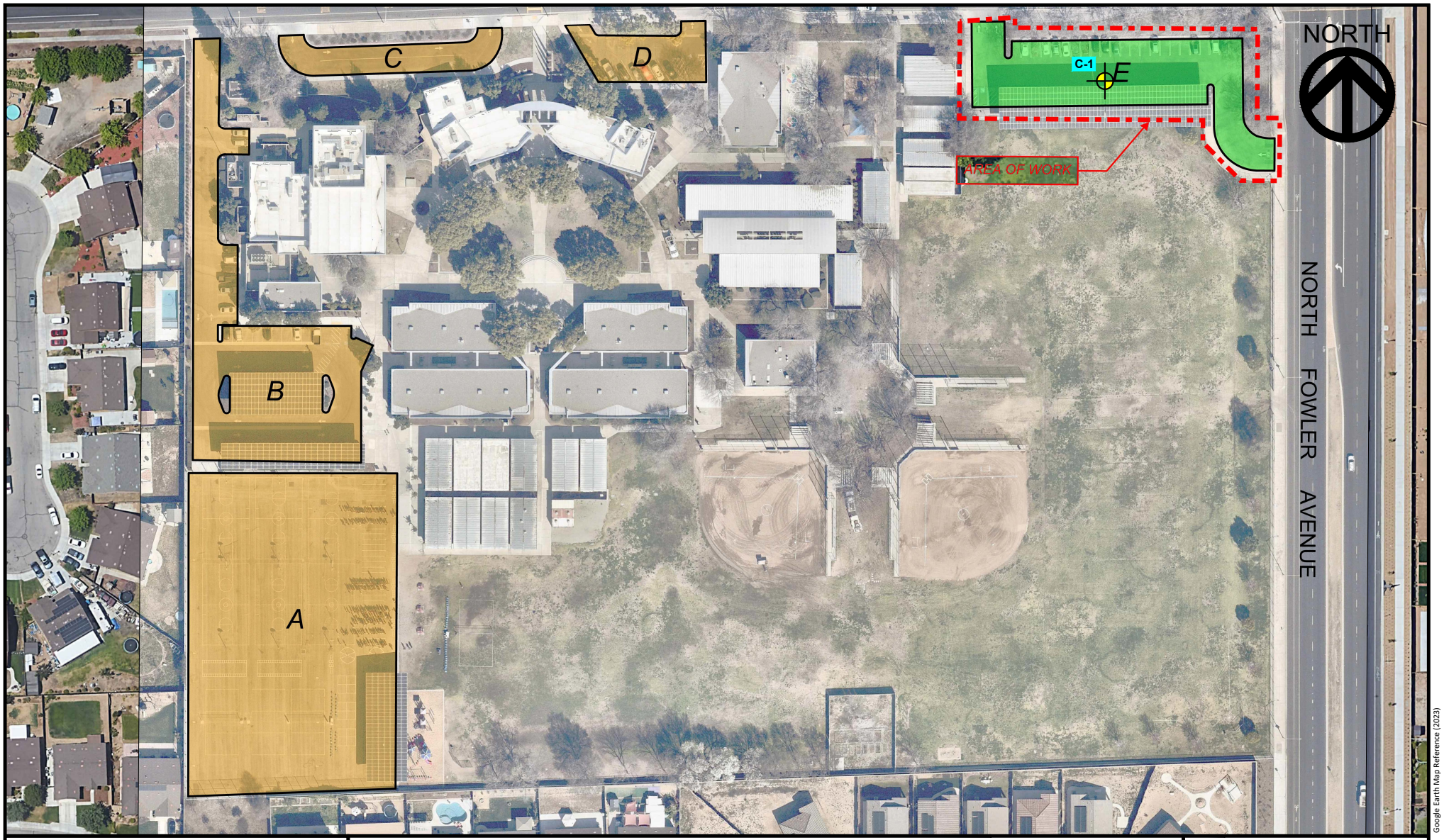

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FIGURE 2
CORING LOCATION MAP
FANCHER CREEK ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 125'

0 62.5' 125' 250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-5
Project Location:	5948 East Tulare Avenue Fresno, CA 93727
Date:	January 2024
Sheet:	1/2

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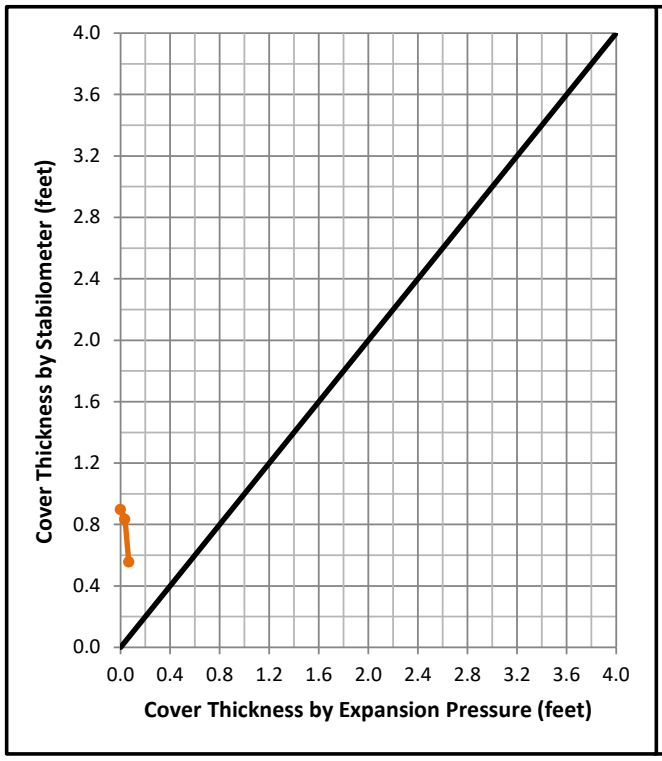
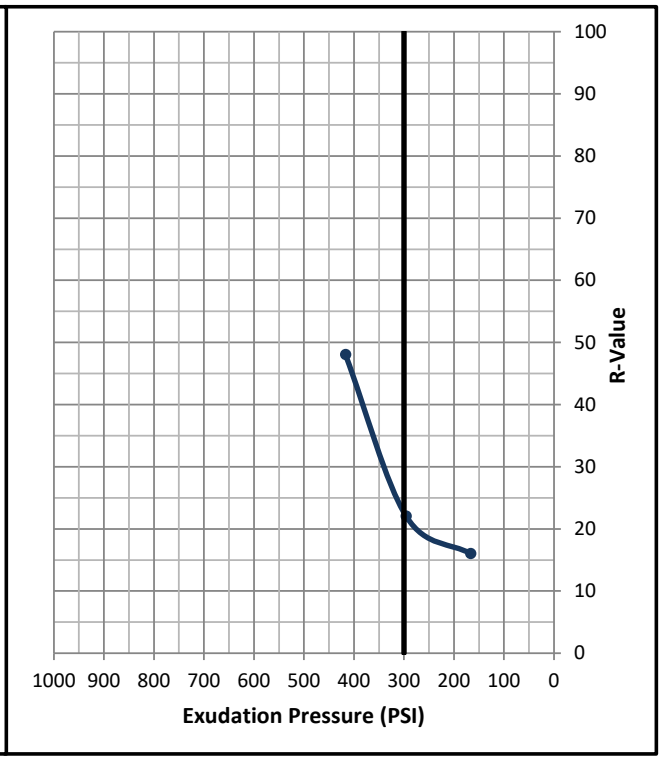
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-5/02		
Project Name:	Fancher Creek Elementary School Pavement	Lab ID:	24-015102
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/5/2024
Tested By:	Jason M.	Date Tested:	1/16/2024
Sample Location:	C-1 @ 0.5ft - 4ft		
Description:	Clayey SAND, fine to medium grained, brown		

"R" Value at 300psi Exudation Pressure:	22
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	2091	3710	5236
Exudation Pressure (psi):	166	295	417
Expansion * (0.0001 in):	0	1	2
Expansion Pressure (psf):	0	4	9
Stabilometer Value at 2000 lbs:	122	109	68
Displacement:	4.27	4.29	3.76
Resistance "R" Value:	15	21	47
"R" Value Corrected for Height:	16	22	48
Percent Moisture at Test:	11.9	10.8	9.8
Dry Density at Test (pcf):	129.2	132.7	132.3

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January 31, 2024 RMA Project No. 07-230985-6

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Liberty Elementary School Pavement Maintenance
1250 East Liberty Hill Road
Fresno, California 93720

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Liberty Elementary School playcourts in Fresno, California. The project site consists of the southeast corner of the existing Liberty Elementary School campus, located approximately 0.1 miles east of the intersection of East Perrin Avenue and East Liberty Hill Road (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8744° north latitude and 119.7595° west longitude. At the time of our field exploration on January 4, 2023, the existing playcourt area was cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 375 feet at the project site. The layout of the playcourts is illustrated on Figure 2.

Photo taken from the northwest of the site (near C-1), facing south. Taken on January 4, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at two locations (C-1 & C-2) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 9 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- An R-Value test was performed on a composite sample of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	5	4.5
C-2	4.5	4

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to coarse grained clayey sand. The subgrade was moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 1.0’	129.7	9.5
C-2 @ 1.0’	124.3	8.2

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 0.75' – 3'	281.2	162.9	42

A Resistance Value (R-Value) test was performed on a representative sample of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value test that was performed are provided in the attached laboratory report, Figure 3.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 10 is recommended for design purposes and has been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 10.0" Class 2 AB
5.5	3.0" AC over 10.5" Class 2 AB
6.0	3.0" AC over 12.5" Class 2 AB
7.0	4.0" AC over 14.0" Class 2 AB
8.0	4.5" AC over 17.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

RMA GeoScience
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Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
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Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
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Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*

Google Earth Map Reference (2023)

FIGURE 1
SITE VICINITY MAP
LIBERTY ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 250'

0 125' 250' 500'

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Staff Geologist:	Megan Stewart
Project Number:	07-230985-6
Project Location:	1250 East Liberty Hill Road Fresno, CA 93720
Date:	January 2024
Sheet:	1/2

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FIGURE 2
CORING LOCATION MAP
LIBERTY ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 150'

0 75' 150' 300'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-6
Project Location:	1250 East Liberty Hill Road Fresno, CA 93720
Date:	January 2024
Sheet:	2/2

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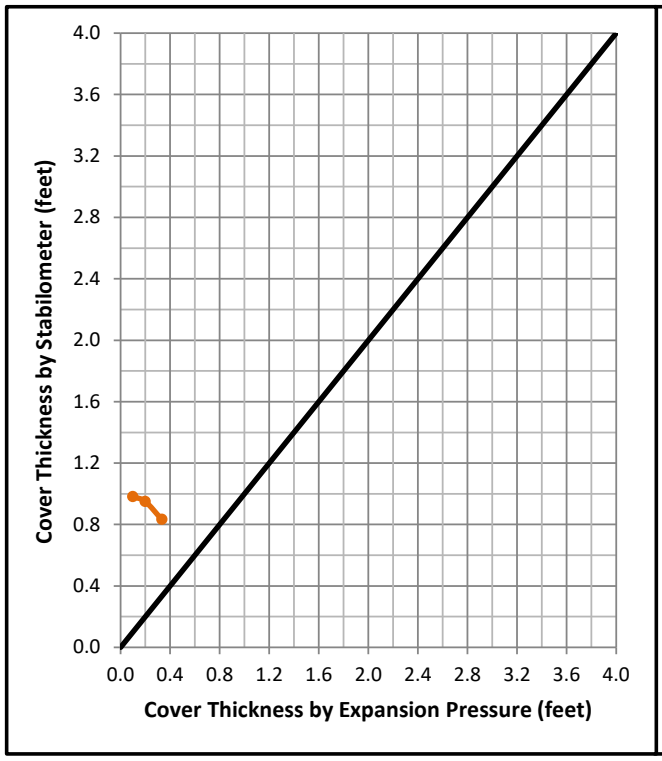
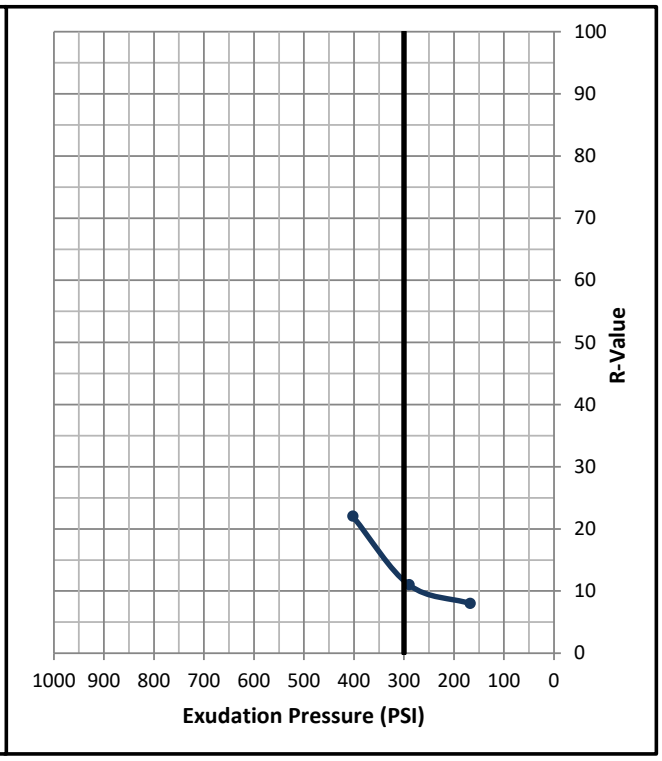
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-6/02		
Project Name:	Liberty ES Pavement Maintenance	Lab ID:	24-015076
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/4/2024
Tested By:	Jason M.	Date Tested:	1/11/2024
Sample Location:	Composite: C-1 & C-2 @ 0.75ft - 3ft		
Description:	Clayey SAND, fine to coarse grained, dark red brown		

"R" Value at 300psi Exudation Pressure:	12
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	2106	3643	5053
Exudation Pressure (psi):	168	290	402
Expansion * (0.0001 in):	3	6	10
Expansion Pressure (psf):	13	26	43
Stabilometer Value at 2000 lbs:	145	139	119
Displacement:	3.72	3.56	3.14
Resistance "R" Value:	7	10	22
"R" Value Corrected for Height:	8	11	22
Percent Moisture at Test:	10.6	9.7	8.9
Dry Density at Test (pcf):	130.4	131.5	130.2

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January 31, 2024 RMA Project No. 07-230985-7

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Nelson Elementary School Pavement Maintenance
1336 West Spruce Avenue
Fresno, California 93650

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Nelson Elementary School playcourts, fire lane, and bus loop in Fresno, California. The project site consists of the eastern half of the existing Nelson Elementary School campus, located approximately 0.28 miles north of the intersection of West Herndon and North Fruit Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8422° north latitude and 119.8163° west longitude. At the time of our field exploration on January 4, 2023, the existing playcourts, fire lane, and bus loop areas were cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 339 to 341 feet at the project site. The layout of the paved areas are illustrated on Figure 2.

Photo taken from the north side of the site (near C-1), facing north. Taken on January 4, 2023.

Photo taken from the west side of the site (near C-3), facing east. Taken on January 4, 2023.

Photo taken from the southwest corner the site (near C-4), facing north. Taken on January 4, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at four locations (C-1 through C-4) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 8 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- Two R-Value tests were performed on composite samples of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	4	3.5
C-2	4	3.5
C-3	3.5	5.5
C-4	4.5	3

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium sandy clay/sandy silt with clay. The subgrade was moist for fine grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 0.67’	126.7	12.2
C-2 @ 0.67’	113.6	14.4
C-3 @ 0.75’	121.5	11.9
C-4 @ 0.67’	No Recovery	

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 0.67' – 3'	265.0	119.3	55
Composite: C-3 & C-4 @ 0.67' – 2.25'	262.8	107.9	59

Two Resistance Value (R-Value) tests were performed on representative samples of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value tests that were performed are provided in the attached laboratory reports, Figures 3 and 4.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 15 is recommended for design purposes in the playcourt area and a subgrade R-Value of 10 is recommended for the design purposes in the fire lane and bus loop areas. These values have been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Playcourt Area (RV = 10)

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 9.0" Class 2 AB
5.5	3.0" AC over 9.5" Class 2 AB
6.0	3.0" AC over 11.5" Class 2 AB
7.0	4.0" AC over 13.0" Class 2 AB
8.0	4.5" AC over 15.5" Class 2 AB

Fire Lane and Bus Loop (RV = 15)

Design TI	Recommended Minimum Pavement Section
≤5.0	2.5" AC over 10.0" Class 2 AB
5.5	3.0" AC over 10.5" Class 2 AB
6.0	3.0" AC over 12.5" Class 2 AB
7.0	4.0" AC over 14.0" Class 2 AB
8.0	4.5" AC over 17.0" Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture

conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

CLOSING REMARKS

The information contained in this report was provided in accordance with generally accepted engineering principles and practices. No other warranty, either express or implied, is made. This report has been prepared for Clovis Unified School District and the Project Design Team to be used for the design and construction of the subject parking lot. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

RMA GeoScience
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Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

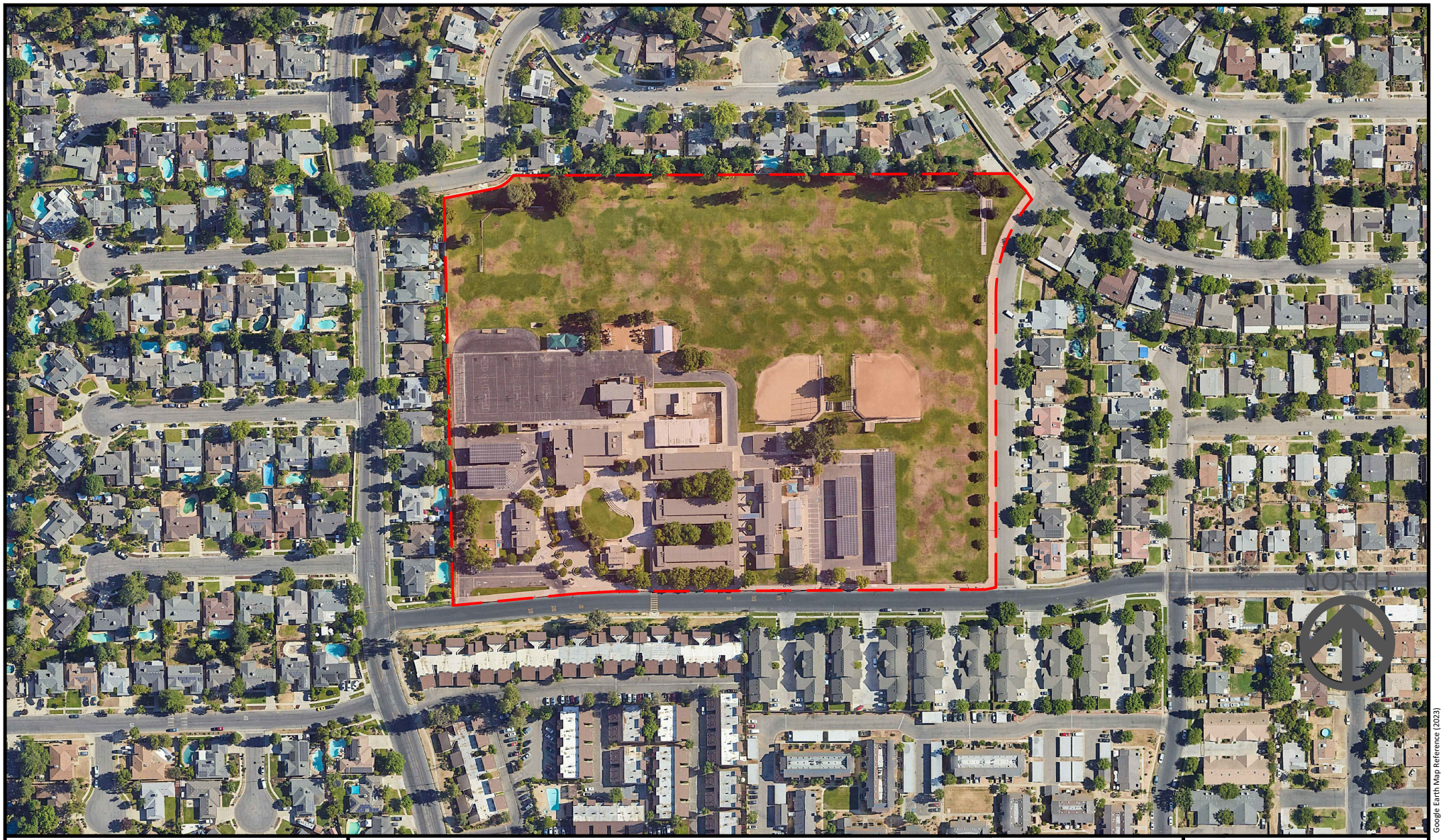
Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
No. GE2904
Exp. 12-31-24
GEOTECHNICAL
STATE OF CALIFORNIA

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result
Figure 4 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
Mr. Zachary Hockett, Blair, Church & Flynn (pdf to *zhockett@bcf-engr.com*)
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*



Google Earth Map Reference (2023)

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FIGURE 1
SITE VICINITY MAP
NELSON ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Limits of the Subject Property

Approximate Scale 1'' = 250'

0 125' 250' 500'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-7
Project Location:	1336 West Spruce Avenue Fresno, CA 93650
Date:	January 2024
Sheet:	1/2

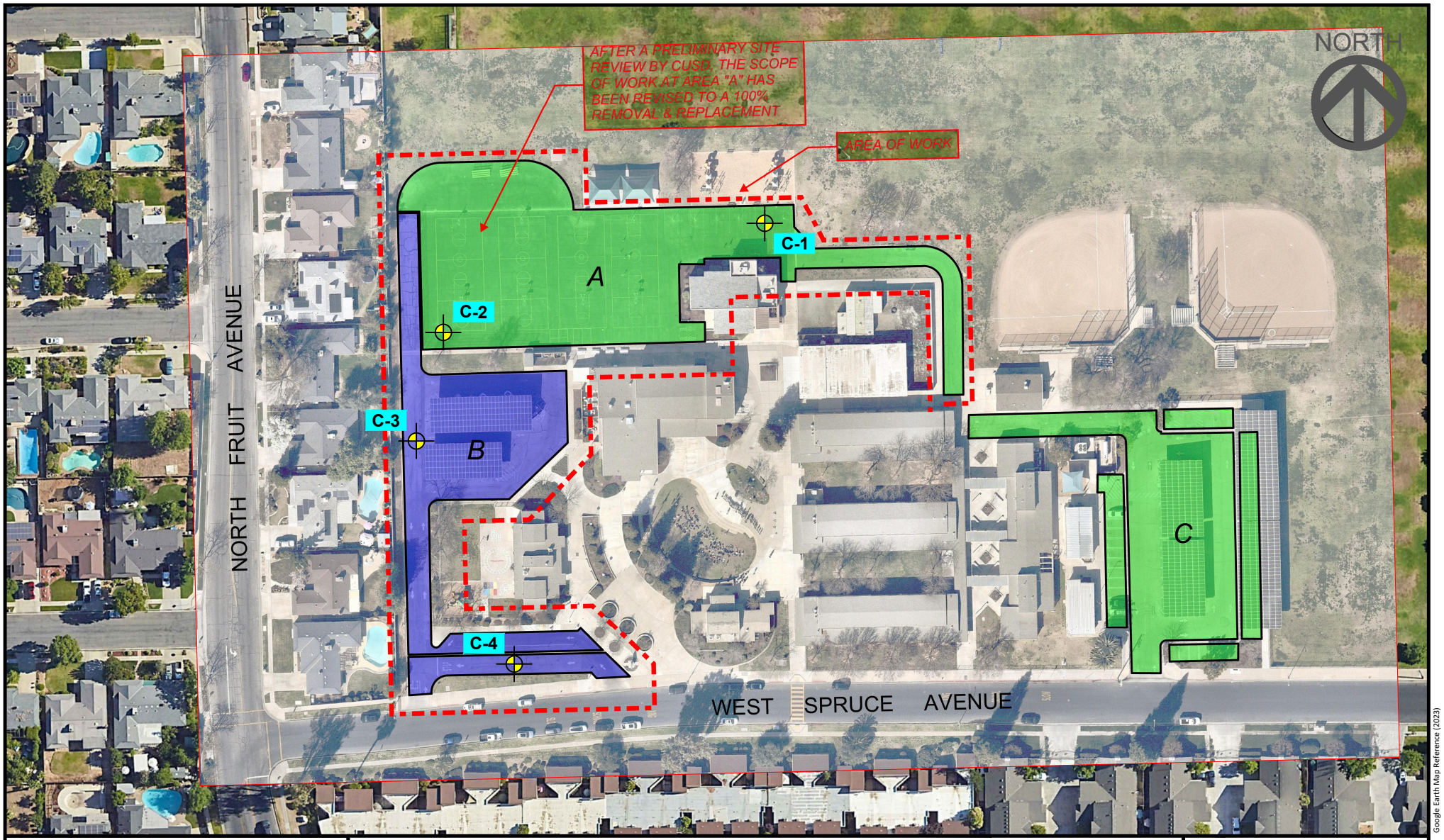

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FIGURE 2
CORING LOCATION MAP
NELSON ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 125'

0 62.5' 125' 250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-7
Project Location:	1336 West Spruce Avenue Fresno, CA 93650
Date:	January 2024
Sheet:	2/2

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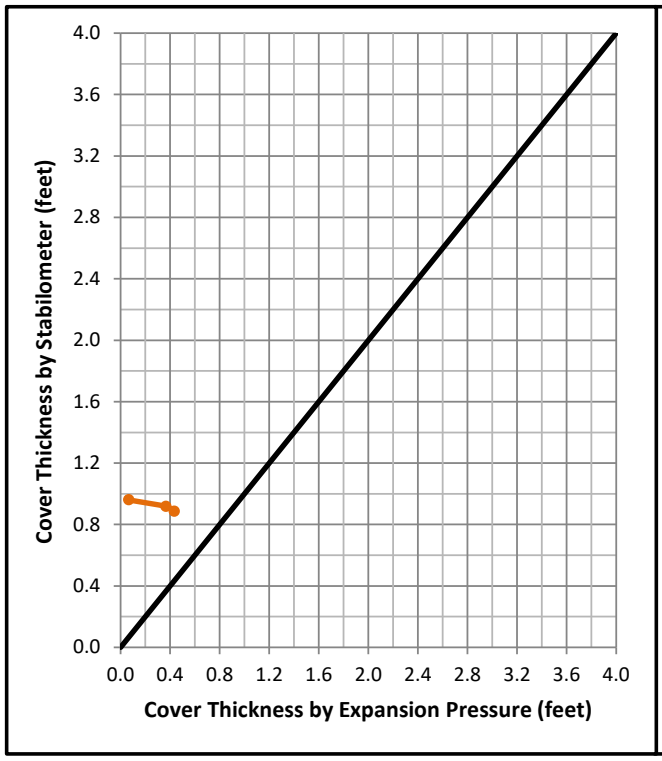
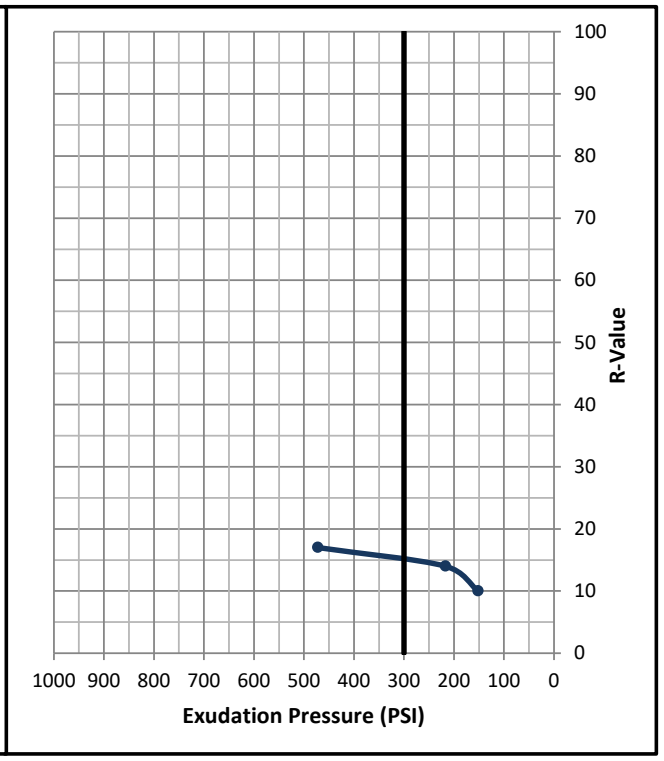
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-7/02		
Project Name:	Nelson Elementary School Pavement	Lab ID:	24-015071
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/4/2024
Tested By:	Jason M.	Date Tested:	1/8/2024
Sample Location:	Composite: C-1 & C-2 @ 0.67ft - 3ft		
Description:	Sandy CLAY/Sandy SILT with Clay, fine to medium grained, brown		

"R" Value at 300psi Exudation Pressure:	15
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	1909	2730	5936
Exudation Pressure (psi):	152	217	473
Expansion * (0.0001 in):	2	11	13
Expansion Pressure (psf):	9	48	56
Stabilometer Value at 2000 lbs:	140	132	125
Displacement:	4.09	3.97	3.61
Resistance "R" Value:	8	12	16
"R" Value Corrected for Height:	10	14	17
Percent Moisture at Test:	14.4	13.0	11.7
Dry Density at Test (pcf):	119.4	124.7	128.0

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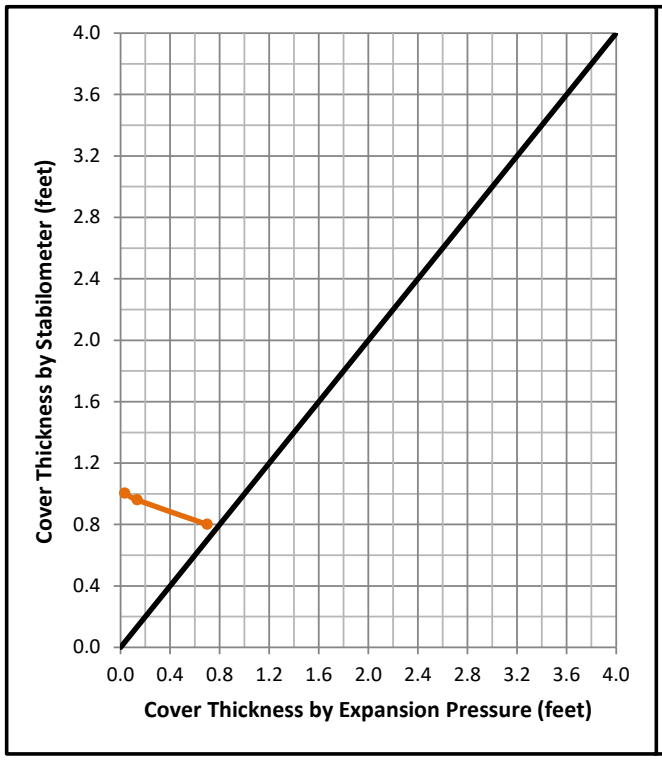
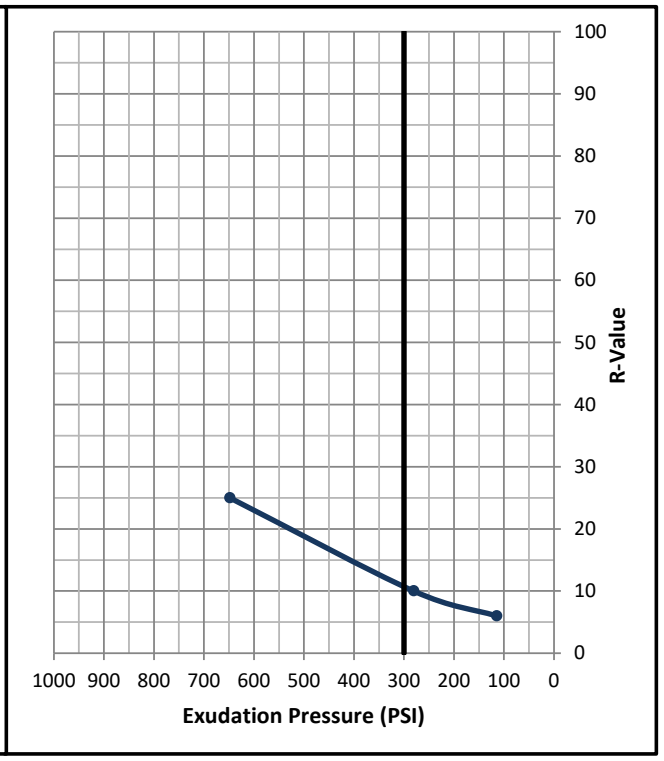
Figure 4
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-7/02		
Project Name:	Nelson Elementary School Pavement	Lab ID:	24-015072
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/4/2024
Tested By:	Jason M.	Date Tested:	1/10/2024
Sample Location:	Composite: C-3 & C-4 @ 0.75ft - 2.25ft		
Description:	Sandy CLAY/Sandy SILT with Clay, fine to medium grained, red brown		

"R" Value at 300psi Exudation Pressure:	11
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	1441	3525	8143
Exudation Pressure (psi):	115	281	648
Expansion * (0.0001 in):	1	4	21
Expansion Pressure (psf):	4	17	91
Stabilometer Value at 2000 lbs:	149	140	107
Displacement:	4.39	4.26	4.18
Resistance "R" Value:	4	8	23
"R" Value Corrected for Height:	6	10	25
Percent Moisture at Test:	13.6	12.2	10.9
Dry Density at Test (pcf):	126.3	126.9	127.9

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January 31, 2024 RMA Project No. 07-230985-8

Mr. Adam Belmont
Clovis Unified School District
1470 Herndon Avenue
Clovis, CA 93611

Subject: Materials Report for Pavement Section Recommendations
Sierra Vista Elementary School Pavement Maintenance
510 Barstow Avenue
Clovis, California 93612

Dear Mr. Belmont:

As requested, we have performed sampling, laboratory testing, and engineering for the planned improvements to the Sierra Vista Elementary School playcourts and parking lot in Clovis, California. The project site consists of the two areas within of the existing Sierra Vista Elementary School campus, located immediately southwest of the intersection of Barstow and Pollasky Avenues (see Figure 1, Site Vicinity Map). The geographic position of the project site is 36.8148° north latitude and 119.7038° west longitude. At the time of our field exploration on January 5, 2023, the existing playcourt and parking lot areas were cracked and worn (see photo below). Based on Google Earth data, the ground surface elevation is approximately 356 to 357 feet at the project site. The layout of the paved areas are illustrated on Figure 2.

Photo taken from the middle of the site (near C-2), facing south. Taken on January 5, 2023.

Photo taken from the east side of the site (near C-3), facing south. Taken on January 5, 2023.

SCOPE OF SERVICES

The scope of work performed for this project included the following tasks:

- Coring the existing pavement at four locations (C-1 through C-3) and hand-augering to a depth of approximately 36 inches, with approximate locations as indicated on the attached Figure 2, Coring Location Map. The coring was performed using a 4-inch core barrel, which extended through the asphalt concrete (AC) into the underlying aggregate base (AB) layer. Hand tools were used to dig through the AB layer and into the subgrade. Subgrade samples were obtained from the coring location between a depth of approximately 12 and 36 inches.
- The core holes were backfilled with soil and AB and then patched with asphalt cold mix.
- In-place moisture and density tests and classification tests were performed on samples of the onsite soils.
- Two R-Value tests were performed on composite samples of the near surface soils that was considered representative of the subgrade to evaluate the stability characteristics of the soil in accordance with ASTM D2844.
- Performing geotechnical engineering and providing recommendations for earthwork and pavement sections for the new parking lot and preparing this engineering report.

FINDINGS

A summary of the data that was obtained from the field exploration that were done for this project is provided in the following table.

Core Number	Encountered Pavement Section	
	AC (inches)	AB (inches)
C-1	1.5	9.5
C-2	2.25	7.5
C-3	2.5	7.5

LABORATORY TESTING

The soils encountered at the coring location consisted primarily of fine to medium silty sand with minor to varying amounts of clay. The subgrade was moist to very moist for coarse grained soils. No unusually loose or wet subgrade was noted within the depths explored.

TABLE 1: MOISTURE AND DENSITY TEST RESULTS

Sample Location	In-Place Dry Density (pcf)	Moisture (%)
C-1 @ 1.0'	123.0	8.8
C-2 @ 1.0'	114.4	9.0
C-3 @ 1.0'	120.0	13.9

TABLE 2: PERCENT PASSING #200 SIEVE TEST RESULTS

Sample Location	Dry Weight Before Wash (grams)	Dry Weight After Wash (grams)	Percent Passing #200 Sieve
Composite: C-1 & C-2 @ 1' – 3'	283.4	240.6	15
Composite: C-3 & C-4 @ 1' – 4'	277.6	201.0	28

Two Resistance Value (R-Value) tests were performed on representative samples of the subgrade obtained from planned paved areas using test methods outlined in ASTM D2844. Details of the R-Value tests that were performed are provided in the attached laboratory reports, Figures 3 and 4.

RECOMMENDATIONS FOR NEW PAVEMENT SECTIONS

Based on the laboratory testing that has been performed for this project, a subgrade R-Value of 15 is recommended for design purposes. These values have been used to develop the pavement sections given below. The asphalt concrete (AC) structural section recommendations given herein were developed using the procedures outlined in Chapter 630 of the California Highway Design Manual. The design procedure is based on the principle that the pavement structural section must be of adequate thickness to distribute the load from the design TI to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-Value). Recommended minimum structural sections are given below:

Design TI	Recommended Minimum Pavement Section
≤ 5.0	2.5” AC over 3.0” Class 2 AB
5.5	3.0” AC over 3.0” Class 2 AB
6.0	3.0” AC over 4.0” Class 2 AB
7.0	4.0” AC over 4.5” Class 2 AB
8.0	4.5” AC over 6.0” Class 2 AB

Prior to paving, the subgrade should be prepared with at least the upper 12 inches of subgrade soils compacted to a minimum of 95% relative compaction. All aggregate base (AB) courses should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% relative compaction. The AC mix design(s) and installation requirements should be specified by the Project Civil Engineer.

A representative from RMA GeoScience should perform observations and testing during construction in order to verify that the site preparation, compaction of subgrade, thickness of the base layer, and placement of Class 2 Aggregate Base is done in accordance with recommendations provided in this report and the project specifications.

The AC mix should comply with the Caltrans Standard Specifications. Details of the AC mix design and installation requirements should be specified by the Project Civil Engineer.

CLOSING REMARKS

The information contained in this report was provided in accordance with generally accepted engineering principles and practices. No other warranty, either express or implied, is made. This report has been prepared for Clovis Unified School District and the Project Design Team to be used for the design and construction of the subject parking lot. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

Thank you for the opportunity to be of service to you on this project. If you should have any questions regarding the information provided in this report, please contact the undersigned at (559) 708-8865.

Respectfully submitted,
RMA GeoScience

Megan J. Stewart, GIT
Staff Geologist

Gabriel J. Valov, GIT
Staff Geologist

Josue Montes, P.E., G.E.
Principal Geotechnical Engineer

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Coring Location Map
Figure 3 – R-Value Test Result
Figure 4 – R-Value Test Result

Distribution: Addressee (1 Original and a pdf to *adambelmont@clovisusd.k12.ca.us*)
Ms. Jennifer Felix, Blair, Church & Flynn (2 Originals and a pdf to *jfelix@bcf-engr.com*)
Mr. Zachary Hockett, Blair, Church & Flynn (pdf to *zhockett@bcf-engr.com*)
Ms. Tanairy Barrera, Blair, Church & Flynn (pdf to *tbarrera@bcf-engr.com)*

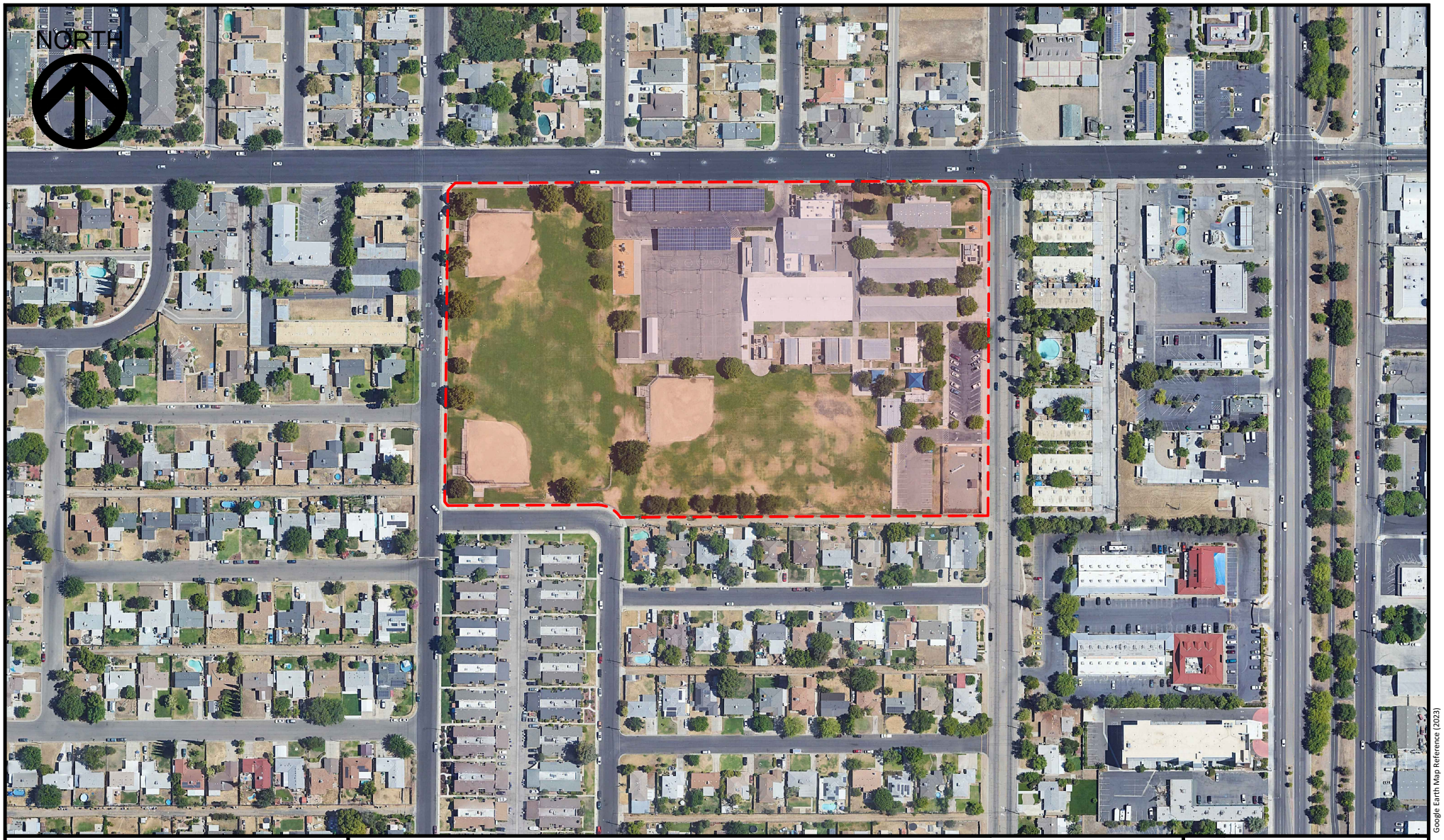

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FIGURE 1
SITE VICINITY MAP
SIERRA VISTA ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Staff Geologist:	Megan Stewart
Project Number:	07-230985-8
Project Location:	510 Barstow Avenue Clovis, CA 93612
Date:	January 2024
Sheet:	1/2

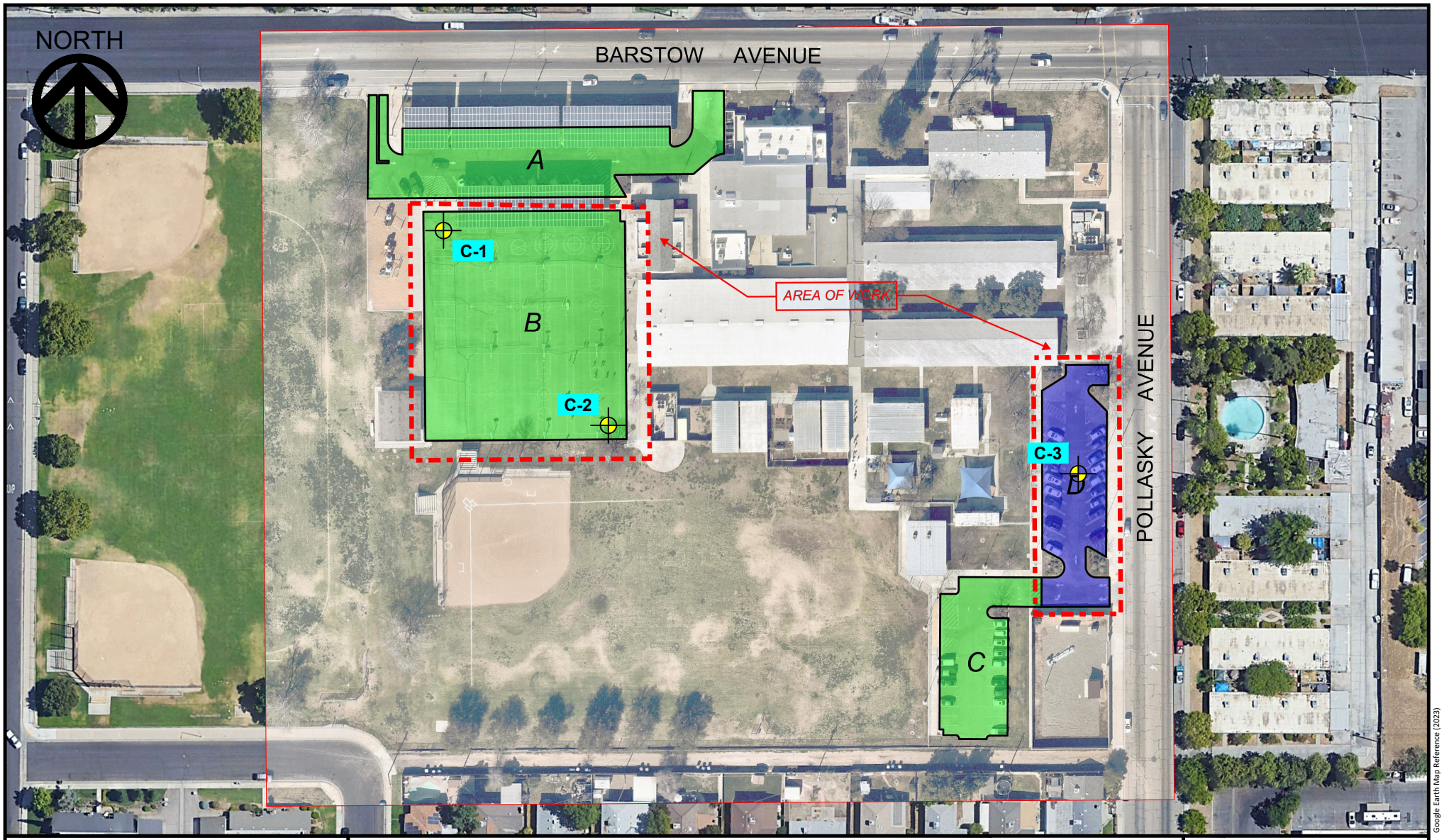

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FIGURE 2
CORING LOCATION MAP
SIERRA VISTA ELEMENTARY SCHOOL PAVEMENT MAINTENANCE

Approximate Coring Location

Approximate Scale 1'' = 125'

0 62.5' 125' 250'

Staff Geologist:	Megan Stewart
Project Number:	07-230985-8
Project Location:	510 Bartsow Avenue Clovis, CA 93612
Date:	January 2024
Sheet:	2/2

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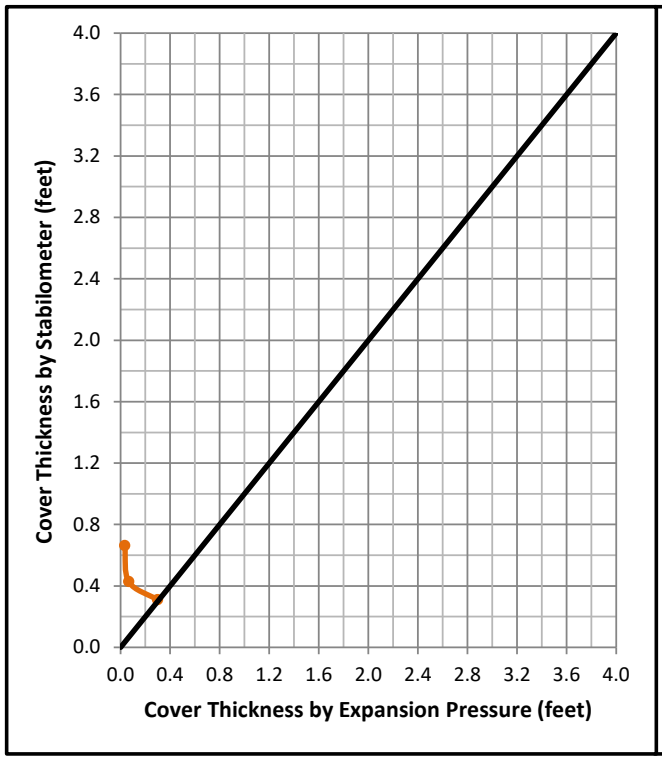
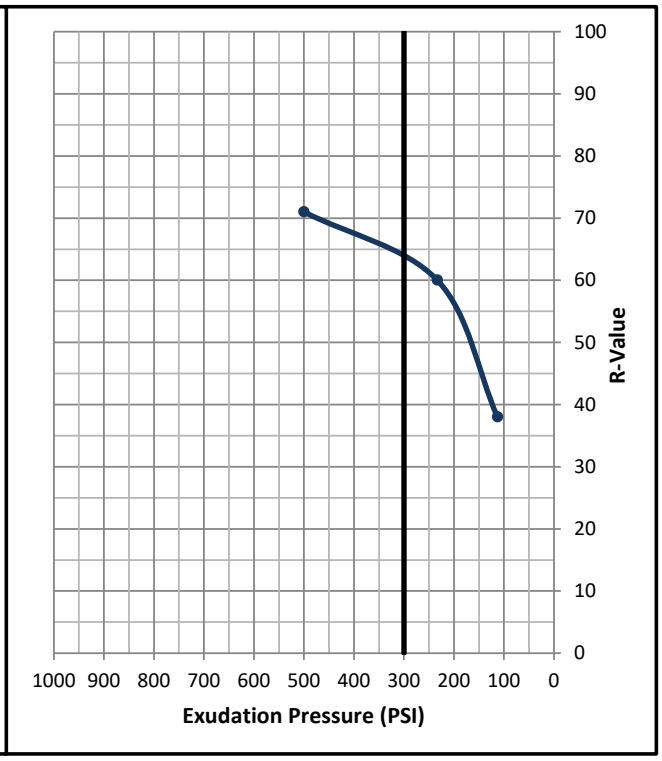
Figure 3
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-8/02		
Project Name:	Sierra Vista Elementary School Pavement	Lab ID:	24-015096
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/5/2024
Tested By:	Jason M.	Date Tested:	1/16/2024
Sample Location:	Composite: C-1 & C-2 @ 1ft - 3ft		
Description:	Silty SAND, fine to medium grained, dark brown		

"R" Value at 300psi Exudation Pressure:	64
"R" Value by Expansion Pressure:	N/A





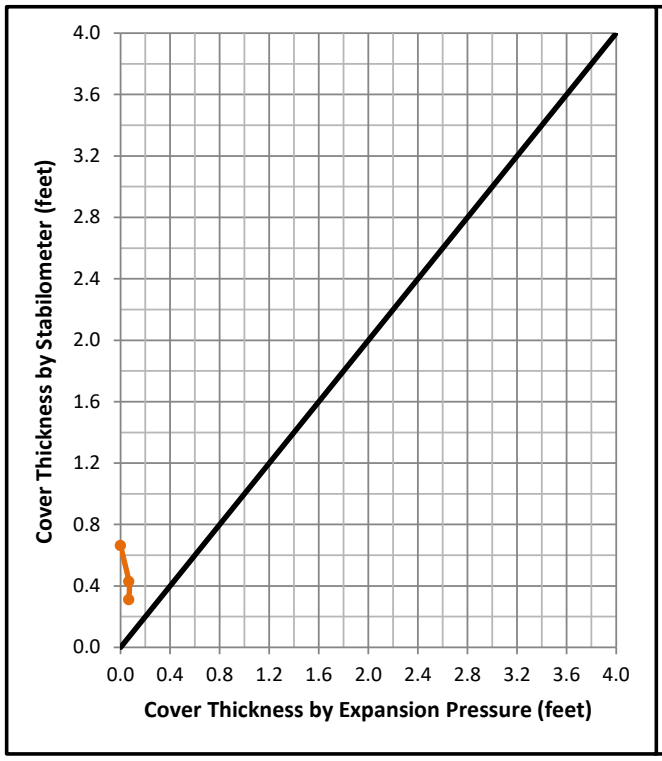
Specimen:	1	2	3
Exudation Pressure Load (lbs):	1421	2929	6279
Exudation Pressure (psi):	113	233	500
Expansion * (0.0001 in):	1	2	9
Expansion Pressure (psf):	4	9	39
Stabilometer Value at 2000 lbs:	77	53	42
Displacement:	4.87	3.67	3.19
Resistance "R" Value:	36	58	69
"R" Value Corrected for Height:	38	60	71
Percent Moisture at Test:	12.0	10.8	9.7
Dry Density at Test (pcf):	117.2	127.3	128.5

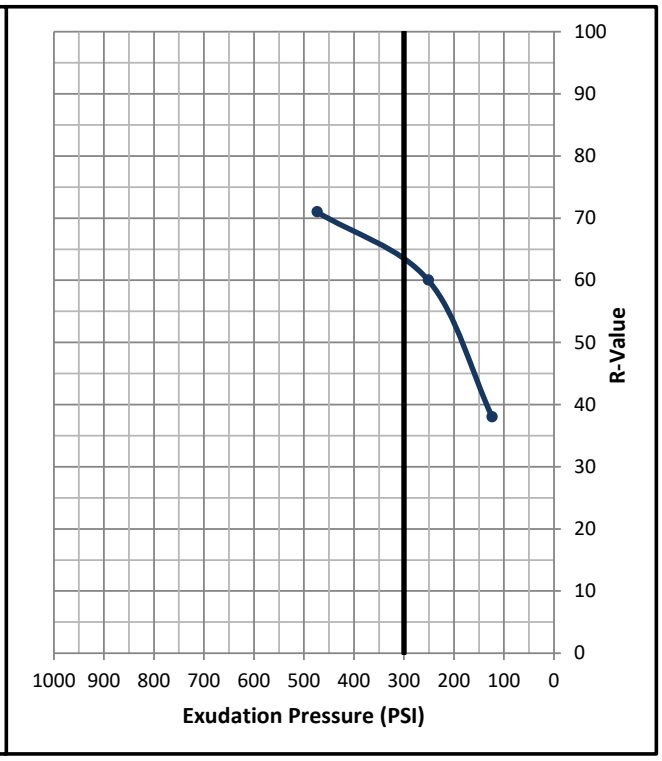
RMA GeoScience
Every Project Matters | www.rmacompanies.com

Figure 4
Laboratory Test Form | ASTM D2844
Resistance "R-Value" and Expansion Pressure of Compacted Soil

Project Number:	07-230985-8/02		
Project Name:	Sierra Vista Elementary School Pavement	Lab ID:	24-015097
Sampled By:	Rogelio C./Gabe V.	Date Sampled:	1/5/2024
Tested By:	Jason M.	Date Tested:	1/17/2024
Sample Location:	C-3 @ 1ft - 3ft		
Description:	Silty SAND minor Clay, fine to medium grained, dark brown		

"R" Value at 300psi Exudation Pressure:	63
"R" Value by Expansion Pressure:	N/A





Specimen:	1	2	3
Exudation Pressure Load (lbs):	1553	3158	5951
Exudation Pressure (psi):	124	251	474
Expansion * (0.0001 in):	0	2	2
Expansion Pressure (psf):	0	9	9
Stabilometer Value at 2000 lbs:	123	100	49
Displacement:	4.37	4.09	3.28
Resistance "R" Value:	15	27	63
"R" Value Corrected for Height:	38	60	71
Percent Moisture at Test:	12.3	11.0	9.6
Dry Density at Test (pcf):	125.2	126.7	127.3