GEOTECHNICAL INVESTIGATION OF SLAB MOISTURE INTRUSION

BRIDGEPORT ELEMENTARY SCHOOL (SAUGUS UNION SCHOOL DISTRICT)

23670 Newhall Ranch Road
Santa Clarita, California

July 19, 2017
FN 05725-01

Corporate Office:
22725 Old Canal Rd.
Yorba Linda, CA 92887

2640 Financial Court
Suite A
San Diego, CA 92117

3100 Fite Circle
Suite 103
Sacramento, CA 95827

5600 Spring Mtn. Rd.
Suite 201
Las Vegas, NV 89146

American Geotechnical Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

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American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

July 19, 2017 File No. 05725-01

Ms. Lynn Beekman
FAGEN FRIEDMAN & FULFROST LLP
1525 Faraday Avenue, Suite 300
San Diego, California 92008

Project: **GEOTECHNICAL INVESTIGATION OF SLAB MOISTURE INTRUSION**
BRIDGEPORT ELEMENTARY SCHOOL (SAUGUS UNION SCHOOL DISTRICT)
23670 Newhall Ranch Road
Santa Clarita, California 91355-1640

Dear Ms. Beekman:

As requested, American Geotechnical has performed a geotechnical investigation of the suspected slab moisture intrusion concerns at the Bridgeport Elementary School in Santa Clarita, California. This report presents our investigation findings. The investigation included the following scope of work.

- Review of documents pertaining to the site construction and reported moisture intrusion that were provided to us. Documents reviewed are listed in **Appendix A**.
- Visual review of the site conditions within the building interiors and the exterior school grounds. Photographs of observed conditions are presented in **Appendix B.**
- Moisture dome (vapor emission) testing of the interior concrete slabs in three school rooms at 11 locations utilizing the moisture dome test method. The approximate locations of the moisture dome tests and photographs are presented in **Appendix C**.
- Exploratory coring through the concrete slab-on-grade and sampling of the underlying soil in each of the three rooms that were tested for slab vapor emission rates. The approximate core locations are shown on the moisture dome test location maps in **Appendix C**. Field logs and photographs of the exploratory cores are presented in **Appendix D**.
- Two exploratory hand-auger borings with soil sampling and installation of two shallow groundwater monitoring wells (piezometers), and groundwater depth measurements were taken in the piezometers. The approximate locations of the hand-auger borings/piezometers are shown on **Figure 1**. Field logs and photographs of the exploratory hand-augers for the piezometer installations are presented in **Appendix D**.

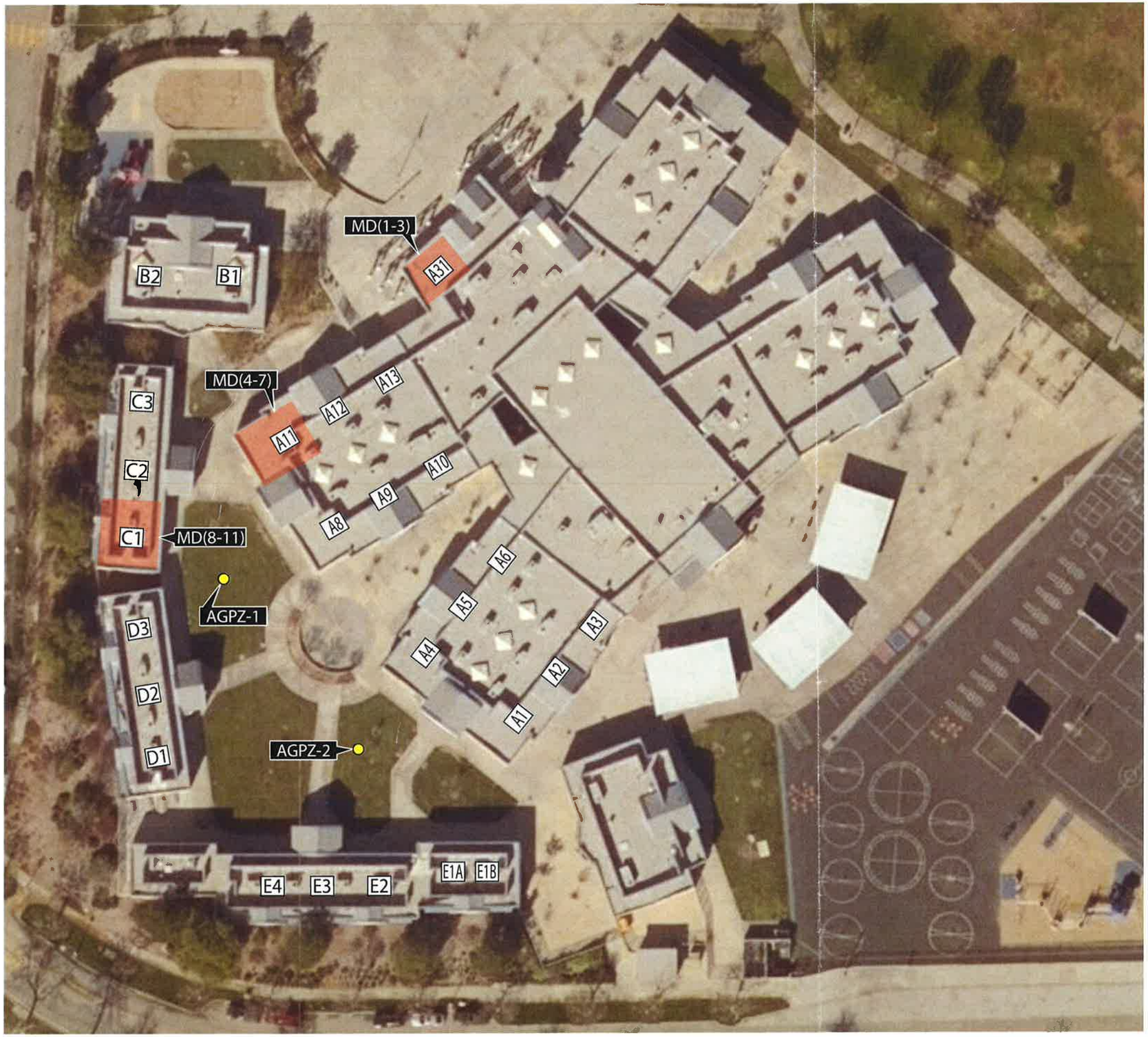
- Laboratory testing of soil samples collected from the exploratory corings and hand-auger borings. Soil testing included intact moisture content and density, and soil classification. Laboratory measurements of the slab cores were also performed. The laboratory test results are presented in **Appendix E**.

- Engineering and geologic analysis of the data acquired from the investigation.

- Preparation of this written report summarizing our findings.

1.0 SITE DESCRIPTION AND REPORTED DISTRESS

The Bridgeport Elementary School is located at 23670 Newhall Ranch Road in the City of Santa Clarita, California. The school has a central cluster of connected buildings surrounded by several detached classroom buildings to the west and southwest, and a common area concrete courtyard and asphalt sports courts to the east and southeast (see **Figure 1**). There are four lawn planter areas located between the central building cluster and detached classrooms on the west side. The sod areas are relatively flat and level, and are surrounded by concrete flatwork. The sod areas have restricted drainage directed towards surface area drains located approximately in the middle of each lawn area. The school was constructed in two phases and we were provided the Phase 1 construction plans to review. The school was built more than 10 years ago but sometime after 2001, which is the date of the Phase 1 structural plans that we reviewed. The school buildings are supported on conventional concrete slab-on-grade foundations. According to the foundation plans prepared by Thompson & La Brue Structural Engineers, the interior slab-on-grade foundations were specified to be 4-inches thick and reinforced with No. 4 steel bars placed at least 1-inch below the slab surface and spaced 18-inches apart in both directions. The slabs were also to be underlain by a 6-mil Visqueen vapor barrier overlain and underlain with 2 inches of sand (4-inch total thickness). The concrete specifications called for 2500 psi concrete for slabs and 3000 psi concrete for footings.



Legend

E4	Room number
MD-11	Rooms with moisture dome testing and slab corings
AGPZ-2	Approximate location of piezometer

North

0 25 50ft.

Approx. Scale

American Geotechnical, Inc.

F.N. 5725.01

Test Location Plan

Bridgeport Elementary School

Santa Clarita, Ca

Figure 1

The Phase 1 construction plans specify that the floor finishes for the central school building and the detached kindergarten classroom were to consist of carpet, linoleum tile, ceramic tile, quarry tile, and sealed concrete. According to the plans, both of the rooms that we tested in the central school building, (rooms 11 & 31), were initially finished with carpet. Reportedly, at some point the flooring in some of the classrooms began to emit an offensive odor. Some of the original flooring was then replaced with carpet that was glued to the slab with a mastic adhesive in an attempt to seal the slab, but then the mastic adhesive apparently failed. The flooring was then replaced again with rubber-backed carpet tiles that were spot-glued in place. However, reportedly some of the classrooms continued to be affected by an offensive odor possibly caused by moisture intrusion and/or carpet tile backing glue degrading in the presence of moisture. It is our understanding that Exponent, Inc. conducted an indoor air quality investigation and conducted emissions testing on carpet tile samples at Bridgeport Elementary. Our further understanding is that Exponent, Inc. issued two reports that outlines the findings from the investigations (See References in **Appendix A**). In May of 2017, American Geotechnical was asked to perform an investigation of the suspected moisture intrusion problem and provide recommendations for improvement.

2.0 SITE OBSERVATIONS

We observed the conditions of the interior flooring of the school rooms affected by suspected moisture intrusion and the adjacent exterior school grounds. Some of the square carpet tiles were removed to expose the underlying slab. At several locations we observed visible condensation on the rubber backing of the underside of the carpet tiles. Condensate staining was also observed on the concrete slab surface beneath the carpet, and remnants of the old mastic adhesive from the previous carpeting were also seen at many locations.

The courtyard located between the central school building complex and the detached classrooms located to the west contains concrete flatwork surrounding four lawn areas. The lawn areas have one or more surface drains located approximately in the center of each lawn area to capture runoff. At the time of our initial site visit it had been raining a day or two before our arrival. The court yard walkway areas between lawn areas had standing water present. Apparently this is a recurring problem after rain events. The surface drainage in the court yard appears to be inadequate to accommodate runoff during periods of heavy rainfall.

3.0 CONCERTE MOISTURE DOME (VAPOR EMISSION) TESTING

The concrete slab foundation was tested for moisture vapor emission in three school rooms, which included the teacher staff room A31, and the classrooms A11 and C1 (see **Figure 1** for classroom locations). The moisture dome test method was utilized to measure the moisture vapor emission rate of the slab surface in general conformance with ASTM Standard F-1869. A total of 11 tests were performed. However, one of the moisture domes was disturbed during the test period, which invalidated the test results at that location. The remaining 10 tests yielded moisture vapor emission rates ranging from 4.2 to 8.5 lbs per 1,000 square feet of floor area per day. The average moisture vapor emission rate for all 10 tests was 6.34 lbs per 1,000 square feet per day. The test results are presented in **Table 1**. The measured vapor emission rates are higher than the maximum allowable value of 3-5 lbs per 1,000 square feet per day specified by most flooring manufacturers.

4.0 CONCRETE SLAB CORINGS

The concrete slab-on-grade foundation was cored at one location within each of the three school rooms tested for vapor emission rates. A concrete coring subcontractor was hired to core through the slab with a 6-inch diamond bit coring machine. American Geotechnical supervised the coring and then logged and sampled the slab and the underlying soil conditions. Intact and bulk soil samples were collected from each core hole to a maximum depth of 31 inches below the slab surface. Field measurements of the slab thickness at the core locations ranged from a minimum of about 4.125 inches to a maximum of about 5.25 inches, which is more than the 4-inch thickness specified on the structural plans that we reviewed. We found the slabs to be reinforced with ½ -inch steel rebar set within the middle or lower third of the slab thickness and spaced at about 11 to 18-inches apart in both directions. The slabs were underlain with a moisture barrier consisting of an upper layer of sand placed on top of a yellow plastic sheet overlying another sand layer. The upper layer of sand was approximately 2-inches thick and the lower sand layer was generally only about 1-inch thick. The yellow plastic vapor barrier sheet appeared to be a Stegowrap product. The soil underlying the slab generally consisted of silty Sand with some cobbles and variable amounts of minor clay, and was relatively dense and moderately moist. Field logs of the cores are presented in **Appendix D**.

5.0 HAND-AUGER BORINGS/PIEZOMETERS

Two hand auger borings were advanced through the lawn areas within the court yard located west of the central building complex (see **Figure 1** for approximate locations) and piezometer pipes (groundwater monitoring wells) were installed in the boreholes. The piezometers consisted of 1.5-inch diameter slotted pipe backfilled with a permeable sand pack and capped with an impermeable bentonite surface seal. Soil samples were collected and the conditions were logged as the hand-augers were advanced. The first hand-auger was advanced to a depth of just over 10 feet. Cobbles were encountered in the second hand-auger that prevented its advancement beyond a five foot depth. The soil conditions encountered in the hand-augers were generally similar to those encountered beneath the slab cores. Field logs of the exploratory hand-augers for the piezometer installations are presented in **Appendix D**.

Seepage and perched groundwater was encountered at about 7-feet depth in the first hand-auger boring (AGPZ-1), but no seepage or groundwater or seepage was encountered during advancement of the second hand-auger (AGPZ-2). A groundwater depth reading was taken from AGPZ-1 after installation and the depth of the groundwater was approximately 7.6 feet inside the pipe. The piezometer was then bailed to lower the water level inside the pipe so that it could recharge to a stabilized depth before any additional readings were taken. Both piezometers were read again the following day and the groundwater depth had risen to about 6.52 feet inside the AGPZ-1, but no groundwater was found in AGPZ-2. The groundwater inside AGPZ-1 was bailed again to lower the water inside the pipe to a depth of 9.22 feet before leaving the site. A third reading of both piezometers was taken three days later and at that time the groundwater depth in AGPZ-1 was 8.3 feet. Groundwater was also found in AGPZ-2 at a depth of 3.75 feet during the third reading. The groundwater measured in AGPZ-2 was likely from irrigation water that seeped into the piezometer from the surface. The piezometers were read again on July 10, 2017. The depth of the groundwater in AGPZ-1 was 6.60 feet and AGPZ-2 was dry.

6.0 LABORATORY TESTING

Intact and bulk soil samples collected from the exploratory core holes and hand-auger borings were transported to our office for laboratory testing. Tests performed included field moisture content and density, and soil classification. Laboratory measurements of the slab cores were also performed.

The soil samples collected from the hand-auger borings classified as silty to clayey Sand. The moisture contents of the samples collected from the fill material beneath the slabs ranged from 7.7 to 10.5 percent, with an average of 9.5 percent. The degree of saturation of these samples ranged from 56 to 75 percent, with an average of 70 percent. The moisture contents of the samples collected from the hand-auger borings ranged from 7.9 to 13.7 percent, with an average of 11.0 percent. The degree of saturation for the auger soil samples ranged from 47 to 92 percent, with an average of 71 percent. The moisture contents and degrees of saturation were slightly higher on average for the auger soil samples than the core soil samples likely due to irrigation water percolating into the landscape areas. The average thickness of the three slab cores as determined by laboratory measurements was 4.8 inches, and the plastic vapor barrier was measured to be 15 mils thick. Summaries of the laboratory test results are presented in **Appendix E**.

7.0 CONCLUSIONS

The results of the moisture vapor emission testing performed on the three school rooms indicate that the slabs are being affected by elevated rates of moisture vapor transmission through the slab surface. The excessive moisture vapor appears to be primarily caused by moisture from the sub-slab soil being transmitted through the slabs due to relatively permeable concrete (2500 psi) and normal pressure differentials. The low compressive strength (2500 psi) of the concrete selected in the specification created a condition conducive to higher levels of moisture vapor emissions.

The area has experienced drought conditions for several years with very little measurable rainfall. On the other hand, irrigation levels to sustain sod areas within the courtyards and playing fields at the school are quite substantial and occur on a more regular basis over time. The irrigation water accumulates over time, which creates “moist” soil conditions. Groundwater is not considered to be a factor contributing to the excessive moisture vapor emissions.

The moisture vapor that is being transmitted through the concrete slab is being trapped beneath the relatively impermeable rubber-backed carpet flooring, causing it to condense and stain the slab surface and carpet, and apparently creating an offensive odor at many locations. Exponent's report found that the odors were likely caused by moisture under the carpets and the degradation of carpet tile backing or glue.

Slab moisture vapor emission is driven by vapor pressure differentials between the interior conditions of an enclosed building and the exterior conditions within and beneath the concrete slab. The dryer, lower atmospheric pressure conditions within enclosed air conditioned buildings causes moisture in the form of moisture vapor to migrate through the concrete slab from the more humid conditions that occur within and beneath the slab. Vapor transmission will continue to occur indefinitely as long as a vapor pressure differential exists between the interior and exterior conditions of a building. Vapor emission rates higher than 3.0 lbs per 1000 square feet over a 24 hour period can adversely affect many floor coverings. A vapor retarder such as the plastic sheeting found underlying the concrete slabs of the school rooms can reduce the amount of moisture vapor transmitted from the soil, but it is not completely effective in controlling vapor emissions.

8.0 RECOMMENDATIONS

To reduce the rate of vapor emission being transmitted through the concrete slabs we recommend that the slab surfaces be treated with a high quality topical sealant. The treatment should include removal of the interior floor coverings and preparation of the slab surface by bead-blasting to remove all deleterious materials and abrade the concrete surface to ensure a good bond is formed with the sealant. All existing slab cracks or joints should also be sealed with pressure-injected epoxy or a low viscosity gravity fill epoxy before the topical slab sealant is applied.

The slab surface should be cleaned and prepared, and the slab sealant should be applied in strict accordance with the manufacturer's specifications and procedures by an experienced, licensed, and qualified contractor. Also, after treatment the slab sealant is typically covered with a protective coating to prevent it from being damaged and compromised prior to the installation of new floor coverings. It is our understanding that Ralph Godfrey of R. Godfrey Consulting has developed the specifications for slab sealant and is also currently in the process of meeting with floor sealant contractors in an effort to complete the project by the end of summer. If additional information is needed to aid in carrying out the remedial process, our office can be contacted.

In addition to the slab sealant remediation process, the exterior landscape areas surrounding the buildings should have positive drainage directed away from the foundations to prevent percolation of water into the subgrade. Any areas where ponding occurs next to buildings should be improved to provide positive drainage away from the foundations. This could require the installation of additional surface drain inlets in hardscape and landscape areas wherever the existing drainage is inadequate to prevent runoff form ponding at the surface. Subsurface drains are not considered necessary based on water levels observed through our monitoring and investigation. Irrigation of landscape areas should be checked and maintained to ensure that only enough water is being applied to sustain the landscape vegetation to prevent overwatering and percolation of excess irrigation water into the subgrade. As discussed at the site, consideration should be given to convert landscape areas to drought-tolerant, low-water landscaping.

9.0 LIMITATIONS

Conclusions and recommendations presented herein are based on evaluations of technical information gathered, experience and professional judgment. Other consultants could arrive at different opinions and conclusions. Subsurface conditions can often vary across a given site; therefore conditions may differ at locations not tested. American Geotechnical did not design or construct any portion of the site and therefore we cannot provide any guarantee of its future performance. If additional information concerning the site becomes available it should be forwarded to our office for review so that we can revise our opinions and recommendations if needed. The contents of this report are presented for the sole benefit of the client and should not be used by any other parties without the client's permission.

Typically, "minimum" recommendations have been presented. Although some risk will always remain, lower risk of future problems would usually result if more restrictive criteria were adopted. Final decisions on matters presented are the responsibility of the client and/or the governing agencies. No warranties in any respect are made as to the performance of the project.

We appreciate the opportunity to be of service. If you should have any questions or concerns, please do not hesitate to contact this office.

Sincerely,

AMERICAN GEOTECHNICAL, INC.

Edred T. Marsh
Principal Engineer
G.E. 2387

Kevin R. Rogers
Chief Geologist
C.E.G. 2425

KR/ETM: am

Distribution: Ms. Lynn Beekman – (1) *Via Email*

Bridgeport Elementary
File No. 05725-01

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Table 1 - Vapor Emissions Test Results

Moisture Dome No.	Room	Test Start Date	Test Start Time	Initial Temp. (F)	Initial Humidity (%)	Conc. Surface Moisture Encounter %	Initial Weight (gm)	Test End Date	Test End Time	Weight After (gm)	Final Temp. (F)	Final Humidity (%)	Weight Absorbed (gm)	Elapsed Time (hr)	Vapor Emission Volume in lbs. / 1000 sq. ft. in 24 hours
MD-1	A31	06/04/17	8:30	73.0	57.0	4.0, 4.5, 4.5, 4.3	33.6	06/07/17	6:00	37.5	68.5	53.0	**3.9**	69.50	**6.6**
MD-2	A31	06/04/17	8:37	73.0	56.0	4.0, 4.1, 4.0, 4.2	32.4	06/07/17	6:01	35.8	69.0	53.0	**3.4**	69.40	**5.8**
MD-3	A31	06/04/17	8:40	73.0	55.0	3.9, 3.8, 3.1, 3.1	33.5	06/07/17	6:03	-	69.9	52.0	**0.0**	69.38	**N/A**
MD-4	A11	06/04/17	8:48	74.0	54.0	4.5, 4.2, 4.6, 4.4	34.3	06/07/17	6:10	38.4	71.0	50.0	**4.1**	69.37	**7.0**
MD-5	A11	06/04/17	8:53	74.0	55.0	4.2, 4.3, 4.2, 4.6	32.8	06/07/17	6:15	37.2	71.4	49.0	**4.4**	69.37	**7.5**
MD-6	A11	06/04/17	8:59	74.0	56.0	4.2, 4.2, 3.5, 4.1	32.9	06/07/17	6:19	37.9	71.2	49.0	**5.0**	69.33	**8.5**
MD-7	A11	06/04/17	9:03	74.0	56.0	4.2, 4.2, 3.8, 4.0	33.7	06/07/17	6:24	37.5	71.2	50.0	**3.8**	69.35	**6.4**
MD-8	C1	06/04/17	9:10	73.0	51.0	3.9, 4.0, 3.8, 3.9	33.8	06/07/17	6:29	36.6	71.4	50.0	**2.8**	69.32	**4.8**
MD-9	C1	06/04/17	9:16	73.0	56.0	4.5, 4.8, 4.3, 3.4	33.1	06/07/17	6:33	36.6	71.7	48.0	**3.5**	69.28	**5.9**
MD-10	C1	06/04/17	9:20	73.0	58.0	3.3, 3.0, 3.6, 3.5	33.4	06/07/17	6:36	35.9	71.5	48.0	**2.5**	69.27	**4.2**
MD-11	C1	06/04/17	9:25	73.0	61.0	4.3, 4.5, 4.3, 4.5	30.1	06/07/17	6:41	34.0	71.5	48.0	**3.9**	69.27	**6.7**

Average	**6.34**
Standard Deviation	**2.24**
Avg. + 1 Std. Dev.	**8.58**
Avg. + 1.282 Std. Dev.	**9.21**

APPENDIX A – DOCUMENTS REVIEWED

"Bridgeport Elementary School - Phase 1" Architectural plans prepared by PSWC Group Architects/Planners, dated 12-1-99.

"Bridgeport Elementary School - Phase 1" Structural plans prepared by Thompson & La Brie Structural Engineers, dated 01-10-2001.

"Indoor Air Quality Investigation, Bridgeport Elementary School, 23670 Newhall Ranch Road, Valencia, California, Exponent Project No. 1703766.00," prepared by Exponent, Inc., dated May 23, 2017

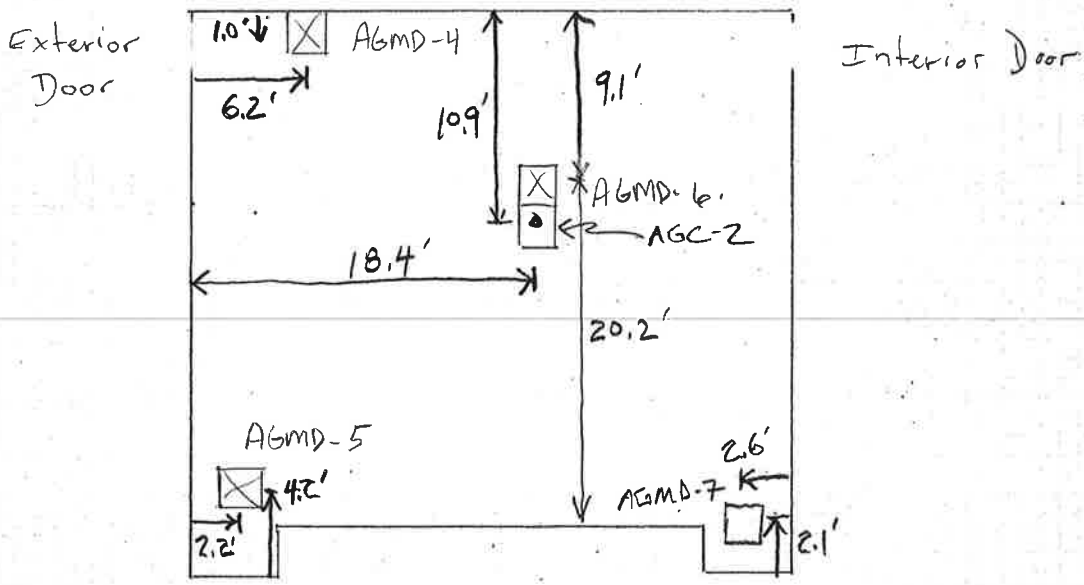
"Volatile Organic Compound (VOC) Emissions from Select Installed Carpet Tiles, Bridgeport Elementary School, 23670 Newhall Ranch Road, Valencia, California, Exponent Project No. 1703766.00," prepared by Exponent, Inc., dated May 30, 2017

APPENDIX B – SITE PHOTOGRAPHS

FILE NO: 05725.01 PROJECT: Bridgeport Elementary School

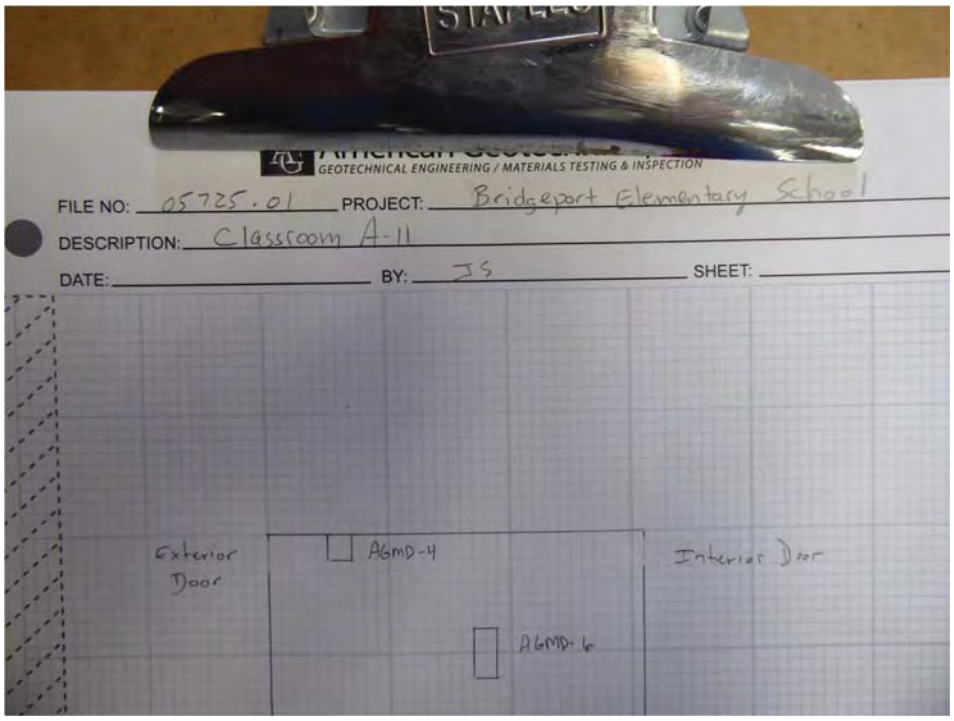
DESCRIPTION: Classroom A-11 AGMD 4-6

DATE: 6/2/17 BY: JS SHEET:



Photos (JS)

1) Plaque
2) Classroom #
3)-5) AGMD-4 OV before prep
6)-8) AGMD-5 OV before prep
9)-11) AGMD-6 OV before prep



Mositure Dome Prep, A11 - JS 6-3-17 (1)

Mositure Dome Prep, A11 - JS 6-3-17 (2)

Mositure Dome Prep, A11 - JS 6-3-17 (3)

Mositure Dome Prep, A11 - JS 6-3-17 (4)

Mositure Dome Prep, A11 - JS 6-3-17 (5)

Mositure Dome Prep, A11 - JS 6-3-17 (6)

Mositure Dome Prep, A11 - JS 6-3-17 (7)

Mositure Dome Prep, A11 - JS 6-3-17 (8)

Mositure Dome Prep, A11 - JS 6-3-17 (9)

Mositure Dome Prep, A11 - JS 6-3-17 (10)

Mositure Dome Prep, A11 - JS 6-3-17 (11)

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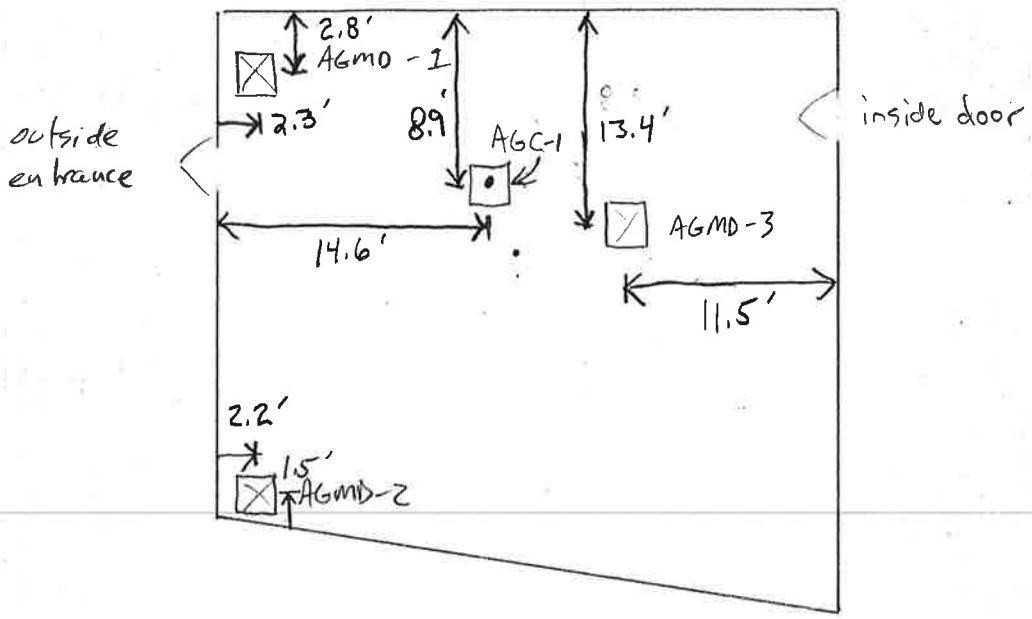
FILE NO: 05725-01 PROJECT: Bridgeport Elementary School

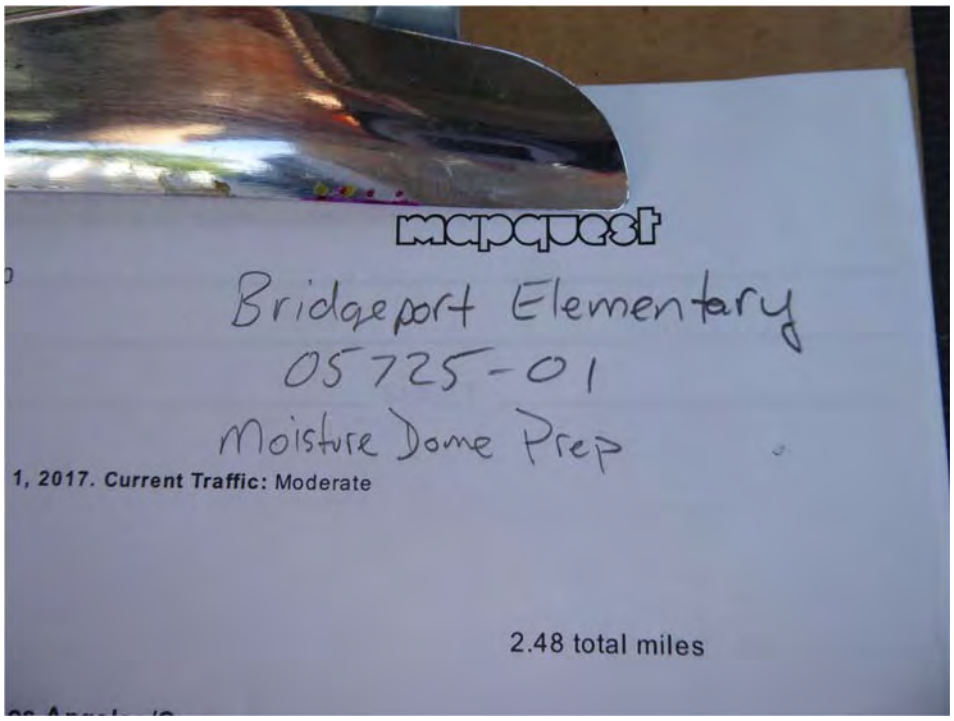
DESCRIPTION: Teacher's Lounge AGMD 1-3

DATE: 6/2/13 BY: SHEET:



Photos (JS)

1) Plaque
2) Outside ov
3) Outside door
4) Outside ov
5) - 9) AGMD-1 ov before prep
10) - 12) AGMD-2 ov before prep
13) - 15) AGMD-3 ov before prep
16) - 17) 1/16" slab ck, exposed after prep



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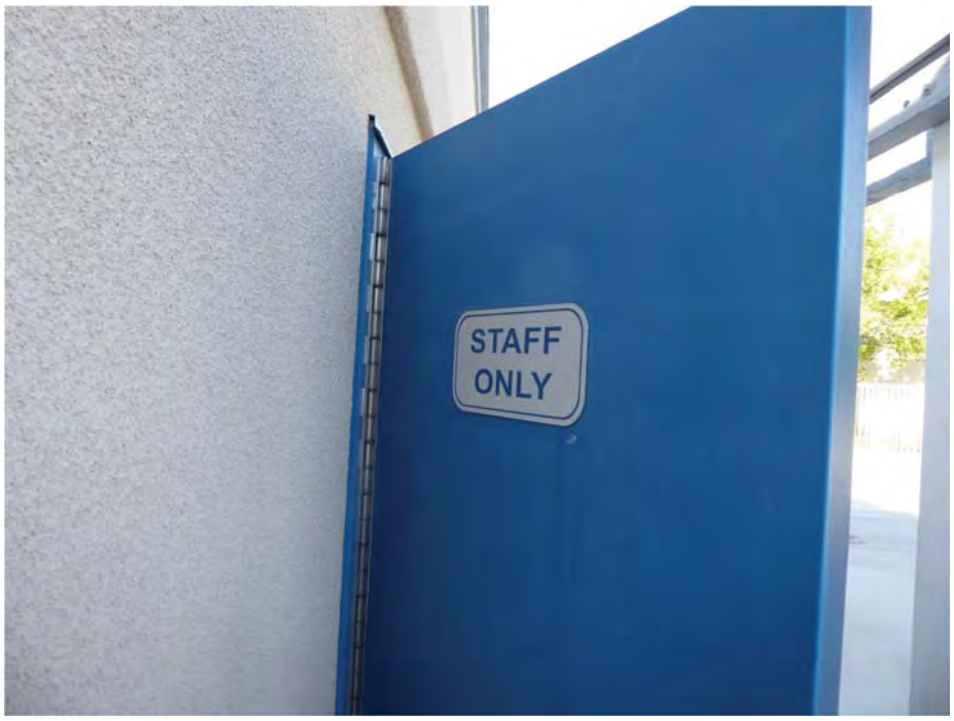
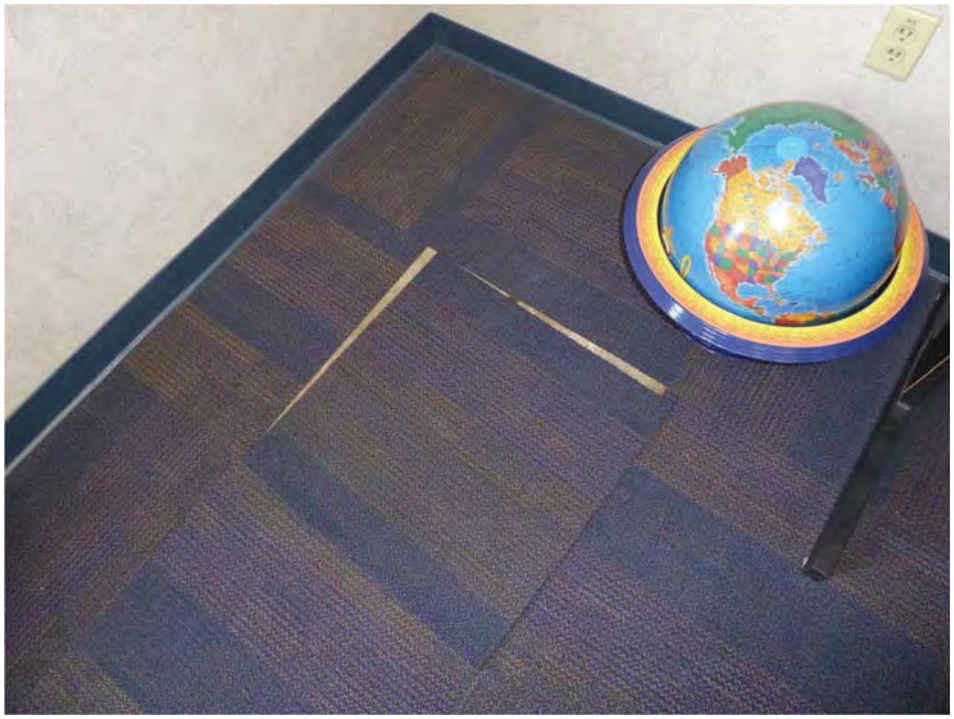
Mositure Dome Prep, A31 - JS 6-3-17 (2)



Mositure Dome Prep, A31 - JS 6-3-17 (3)

Mositure Dome Prep, A31 - JS 6-3-17 (4)

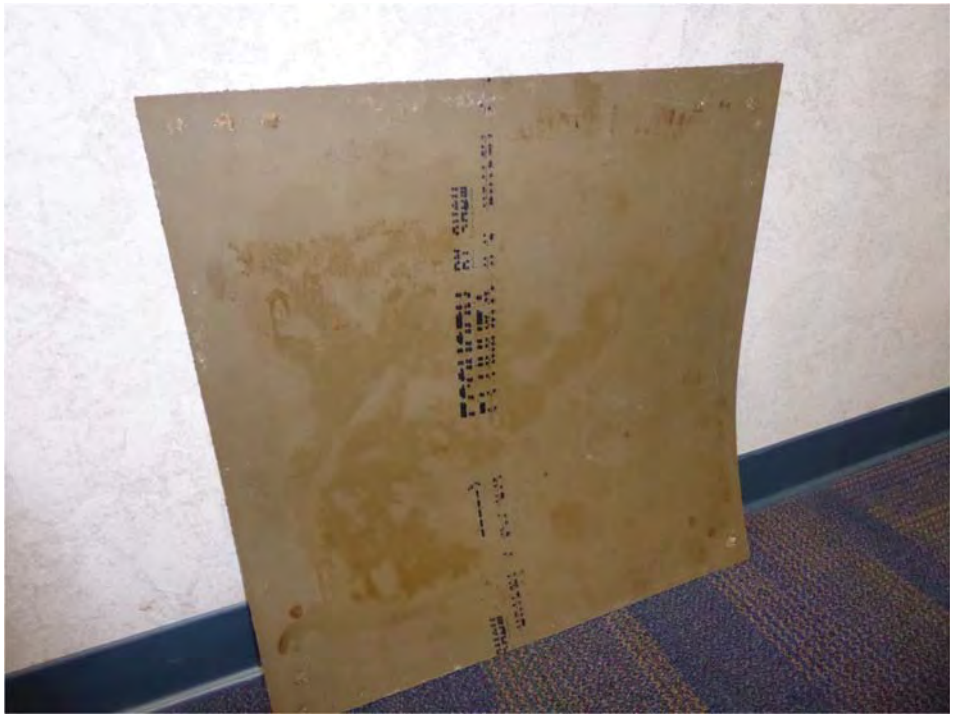
Mositure Dome Prep, A31 - JS 6-3-17 (5)



Mositure Dome Prep, A31 - JS 6-3-17 (6)

Mositure Dome Prep, A31 - JS 6-3-17 (7)

Mositure Dome Prep, A31 - JS 6-3-17 (8)

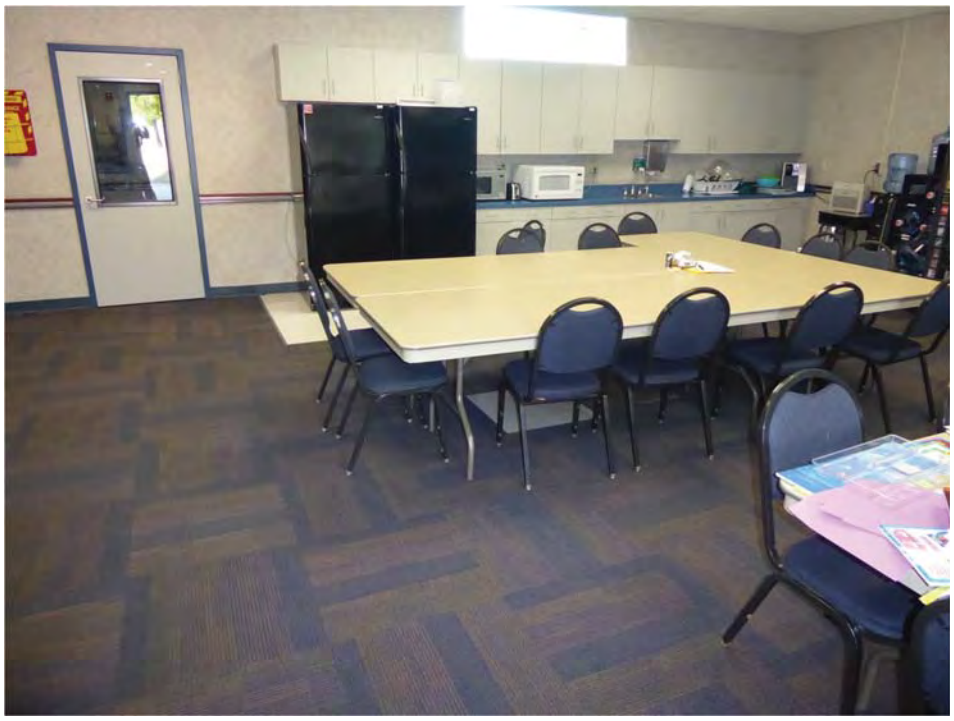


Mositure Dome Prep, A31 - JS 6-3-17 (9)

Mositure Dome Prep, A31 - JS 6-3-17 (10)

Mositure Dome Prep, A31 - JS 6-3-17 (11)

Mositure Dome Prep, A31 - JS 6-3-17 (12)

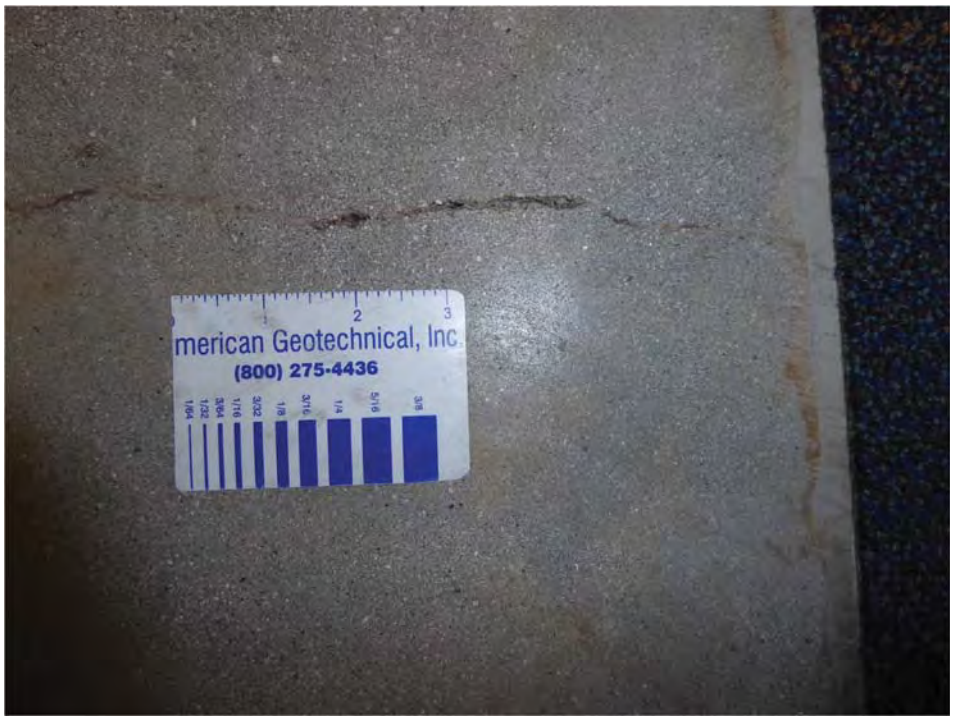


Mositure Dome Prep, A31 - JS 6-3-17 (13)

Mositure Dome Prep, A31 - JS 6-3-17 (14)

Mositure Dome Prep, A31 - JS 6-3-17 (15)

Mositure Dome Prep, A31 - JS 6-3-17 (16)

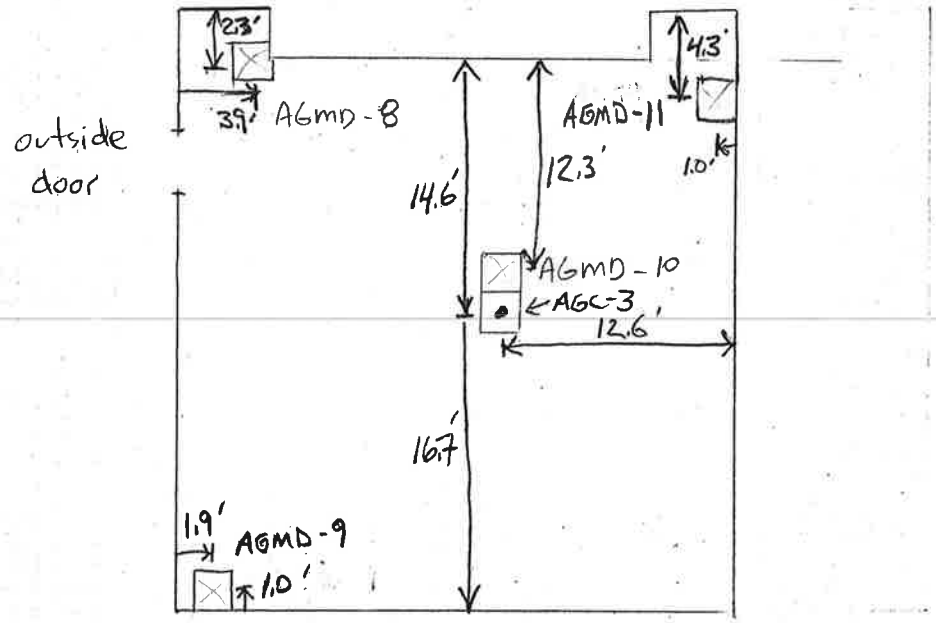


Mositure Dome Prep, A31 - JS 6-3-17 (17)

FILE NO: 05725.01 PROJECT: Bridgeport Elementary School

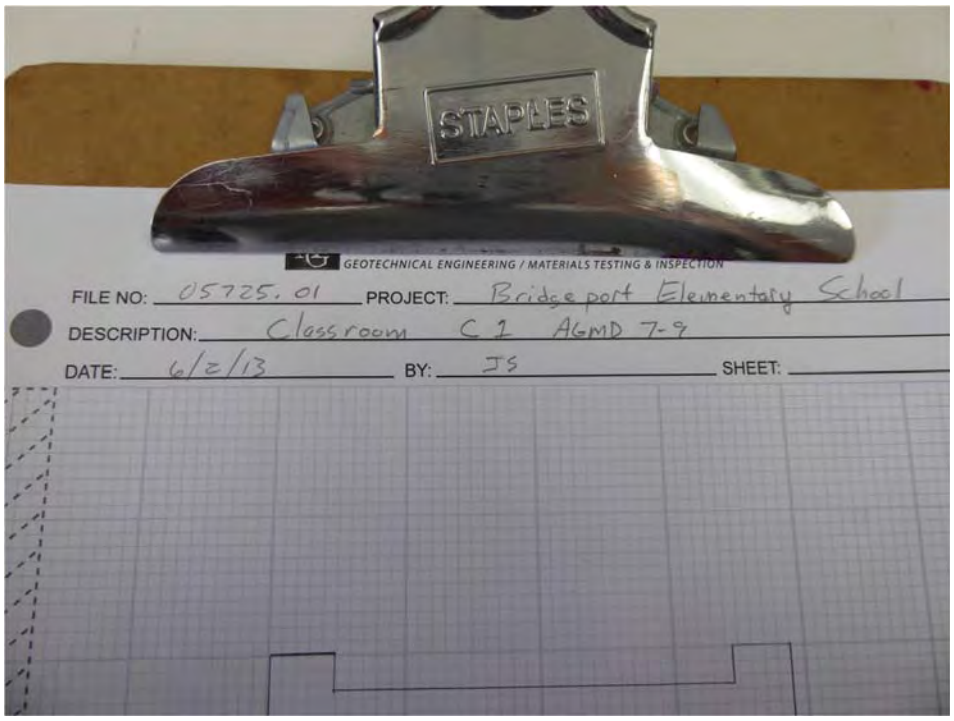
DESCRIPTION: Classroom C1 AGMD 7-9

DATE: 6/2/13 BY: JS SHEET:



Photos (JS)

1) Plaque
2) C1 door plaque
3) AGMD-7 ov before prep
4) " " " " "
5) " " " " "
6)-8) AGMD-8 ov before prep



Mositure Dome Prep, C1 - JS 6-3-17 (1)

Mositure Dome Prep, C1 - JS 6-3-17 (2)

Mositure Dome Prep, C1 - JS 6-3-17 (3)

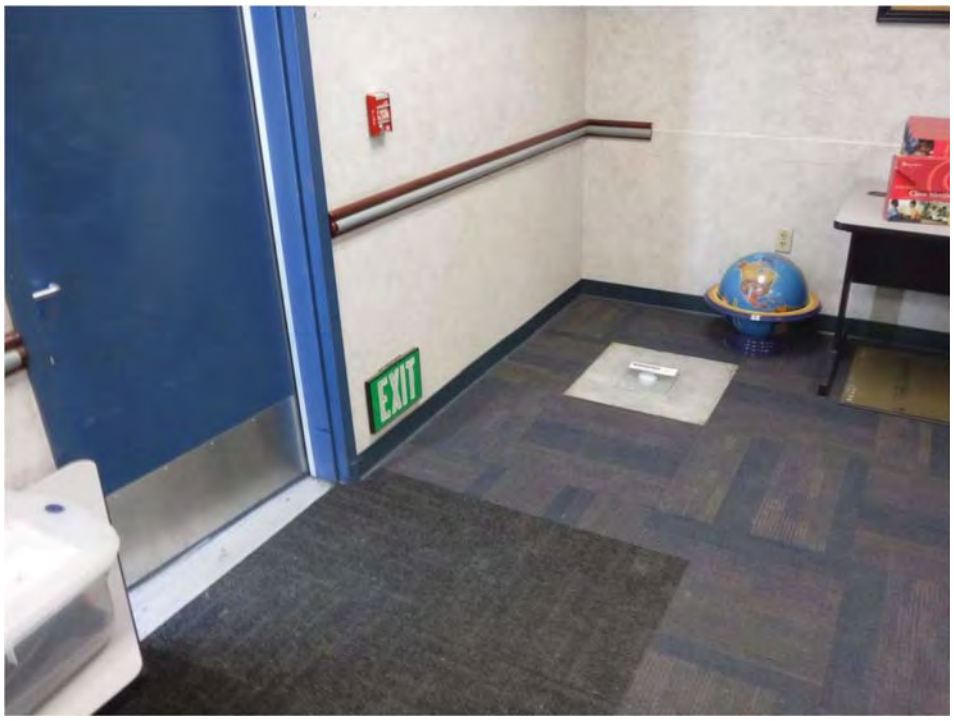
Mositure Dome Prep, C1 - JS 6-3-17 (4)

Mositure Dome Prep, C1 - JS 6-3-17 (5)

Mositure Dome Prep, C1 - JS 6-3-17 (6)

Mositure Dome Prep, C1 - JS 6-3-17 (7)

Mositure Dome Prep, C1 - JS 6-3-17 (8)



Moisture Domes - KR 6-4-17 (1)

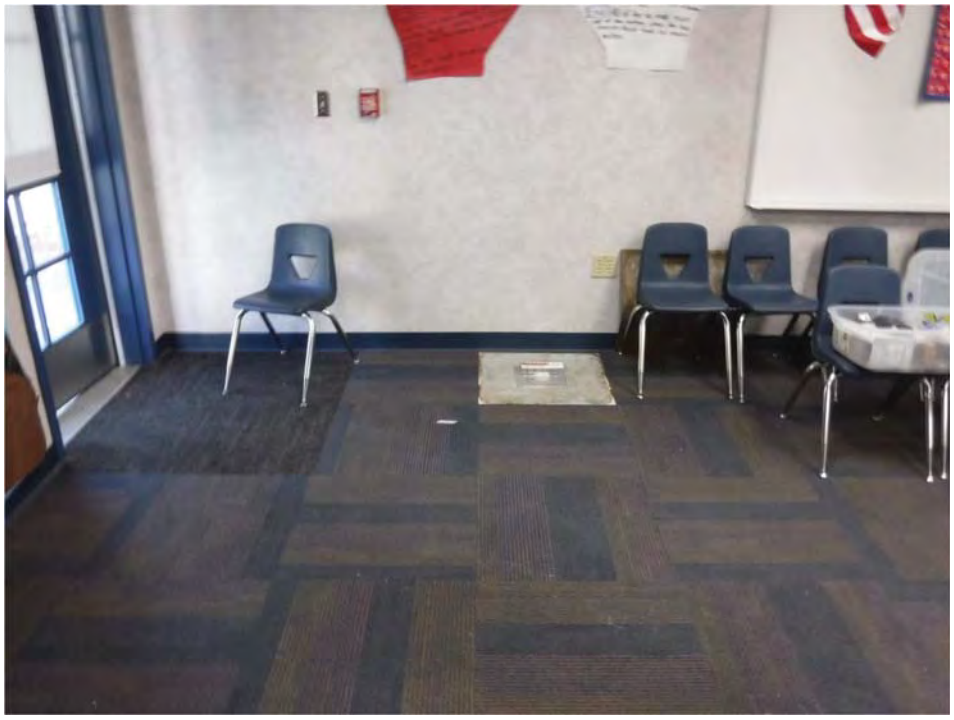
Moisture Domes - KR 6-4-17 (2)

Moisture Domes - KR 6-4-17 (3)

Moisture Domes - KR 6-4-17 (4)

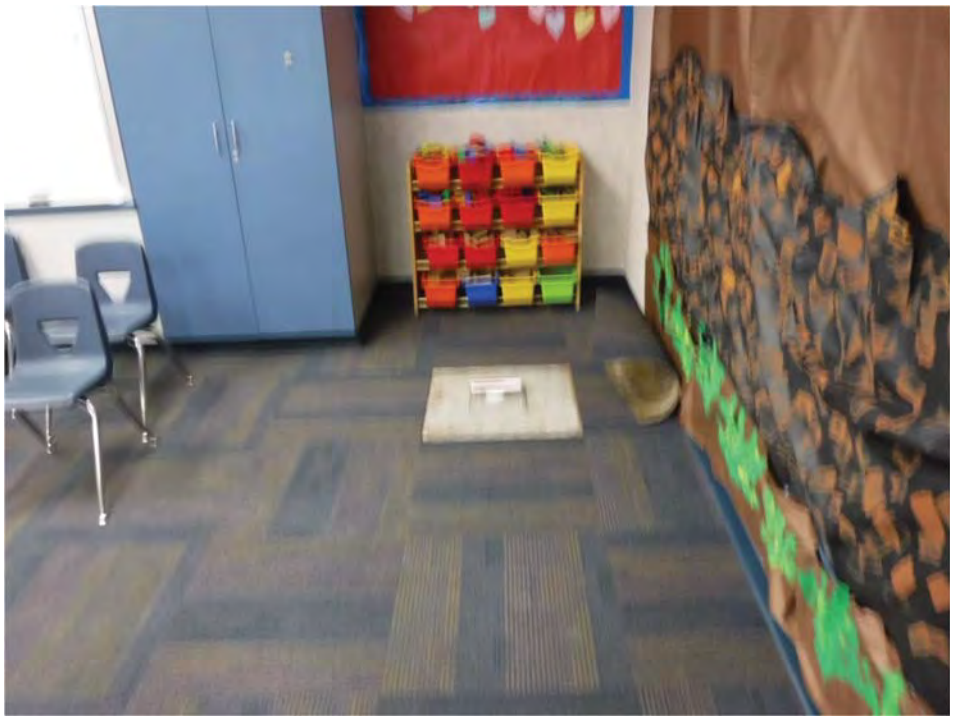
Moisture Domes - KR 6-4-17 (5)

Moisture Domes - KR 6-4-17 (6)



Moisture Domes - KR 6-4-17 (7)

Moisture Domes - KR 6-4-17 (8)



Moisture Domes - KR 6-4-17 (9)

Moisture Domes - KR 6-4-17 (10)

Moisture Domes - KR 6-4-17 (11)

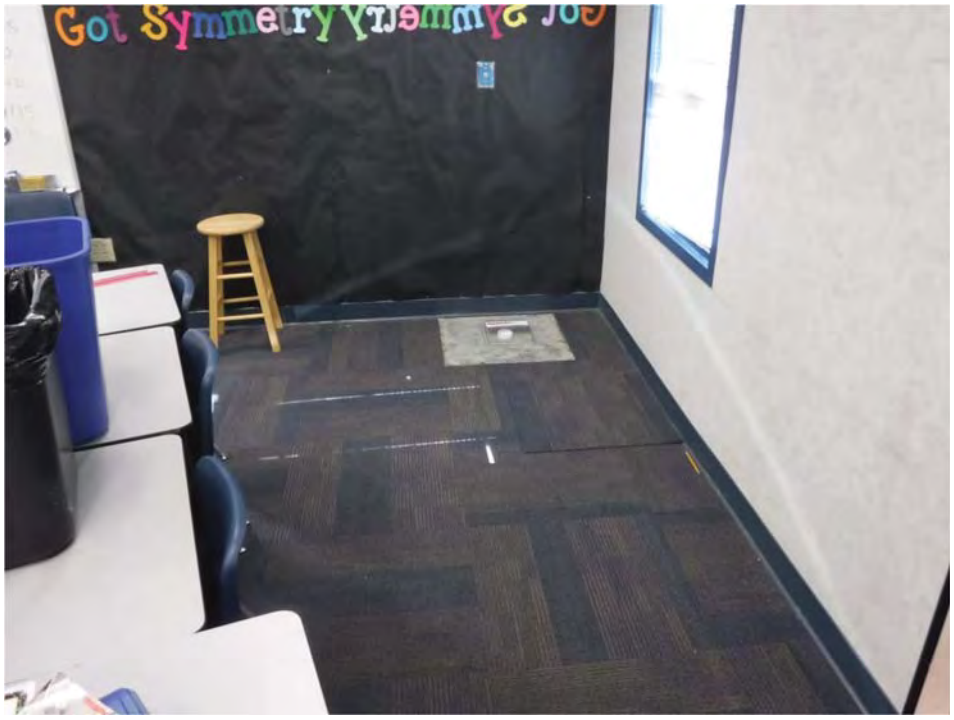
Moisture Domes - KR 6-4-17 (12)

Moisture Domes - KR 6-4-17 (13)

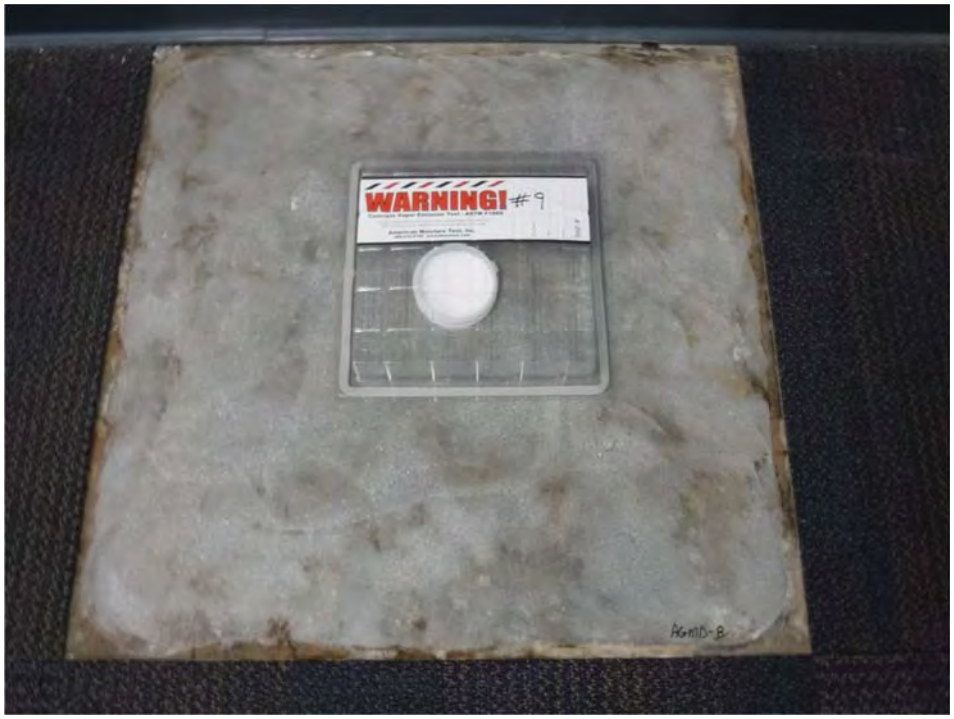
Moisture Domes - KR 6-4-17 (14)

Moisture Domes - KR 6-4-17 (15)

Moisture Domes - KR 6-4-17 (16)



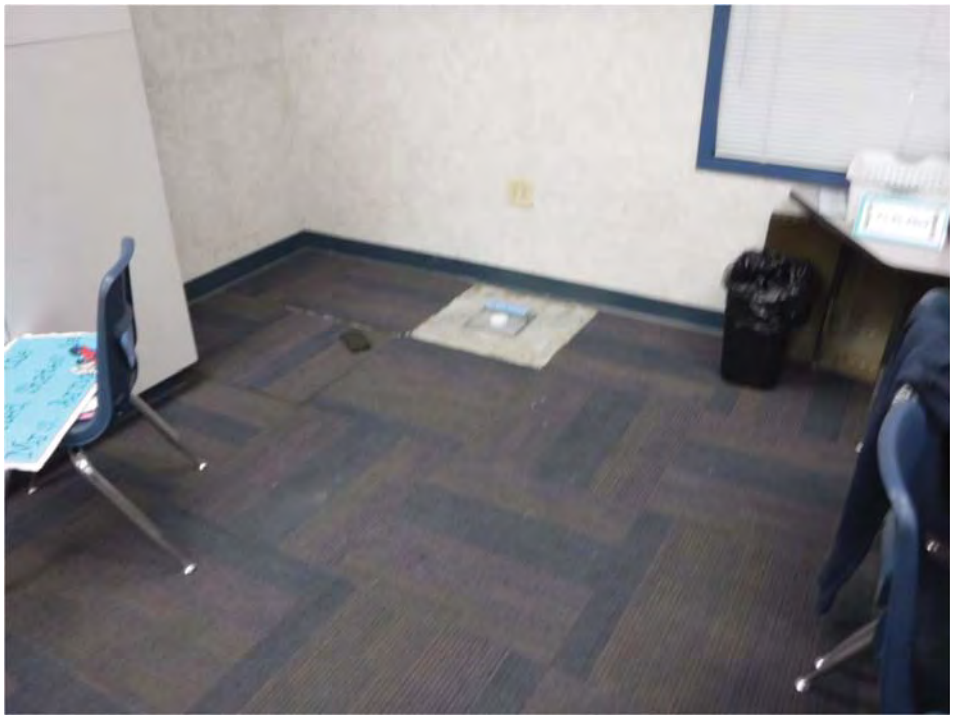
Moisture Domes - KR 6-4-17 (17)



Moisture Domes - KR 6-4-17 (18)

Moisture Domes - KR 6-4-17 (19)

Moisture Domes - KR 6-4-17 (20)



Moisture Domes - KR 6-4-17 (21)

Moisture Domes - KR 6-4-17 (22)

APPENDIX B – SITE PHOTOGRAPHS

Site Review - ETM 5-16-17 (1)

Site Review - ETM 5-16-17 (2)

Site Review - ETM 5-16-17 (3)

Site Review - ETM 5-16-17 (4)

Site Review - ETM 5-16-17 (5)

Site Review - ETM 5-16-17 (6)

Site Review - ETM 5-16-17 (7)

Site Review - ETM 5-16-17 (8)

Site Review - ETM 5-16-17 (9)

Site Review - ETM 5-16-17 (10)

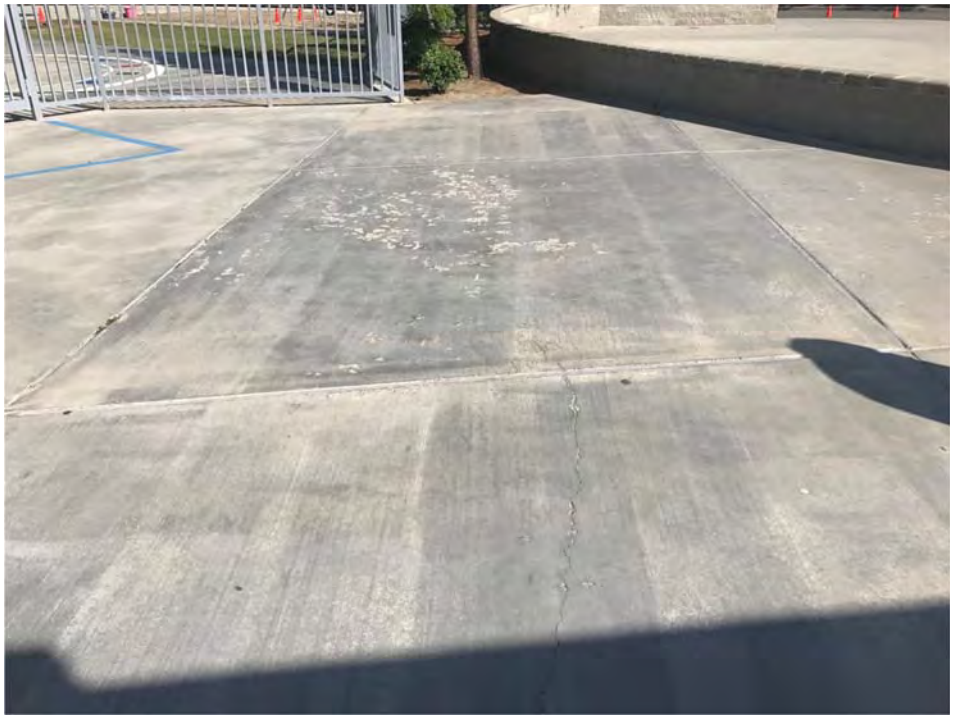
Site Review - ETM 5-16-17 (11)

Site Review - ETM 5-16-17 (12)

Site Review - ETM 5-16-17 (13)

Site Review - ETM 5-16-17 (14)

Site Review - ETM 5-16-17 (15)



Site Review - ETM 5-16-17 (16)

Site Review - ETM 5-16-17 (17)

Site Review - ETM 5-16-17 (18)

Site Review - ETM 5-16-17 (19)

Site Review - ETM 5-16-17 (20)

Site Review - ETM 5-16-17 (21)

Site Review - ETM 5-16-17 (22)

APPENDIX C – VAPOR EMISSION TEST & CORE LOCATION MAPS & PHOTOGRAPHS

APPENDIX D – SUBSURFACE LOGS & PHOTOGRAPHS

APPENDIX D – SUBSURFACE LOGS & PHOTOGRAPHS

Coring No. AGC-1 File No. 05725-01

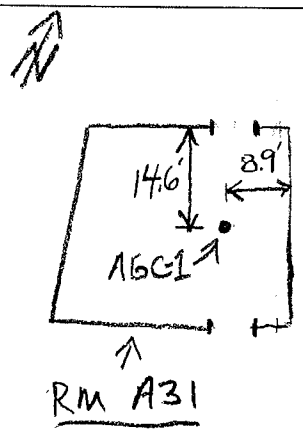
Project Name: Bridgeport Elementary School Sheet:

Location: Room A31 (staff meeting room) Start Date: June 3, 2017

Total Depth: 30 1/4 Rig Type: 6" Core Mach. Est. Surface Elevation:

Depth in Feet	Sample Type	Sample Depth	Field Description By: KA
0.0			Surface Conditions:
			Subsurface Conditions: FORMATION: Classification, color, moisture, tightness, etc.
			0-4 1/2 Conc. Core 6" dia. x 4 3/8 Min 5 1/4" Max thick #4 rebar w/in bottom third of slab space 18" apart E-W & 11" to 14" apart N-S,
			4 1/2 - 7 1/4" SAND BLANKET silty SAND w/f. gravel/v. coarse sand tan, moist (from coring mach.) med. dense
			7 1/4 Yellow plastic sheet vapor barrier, heavy duty, possibly STEGO WRAP product
			7 1/4 - 8 1/4 SAND BLANKET same as above vapor barrier sheet
			8 1/4 - 30 1/4" Fill, silty SAND w/variable CLAY & some gravel, dk brown to med brown, moist, dense to v. dense

Photos

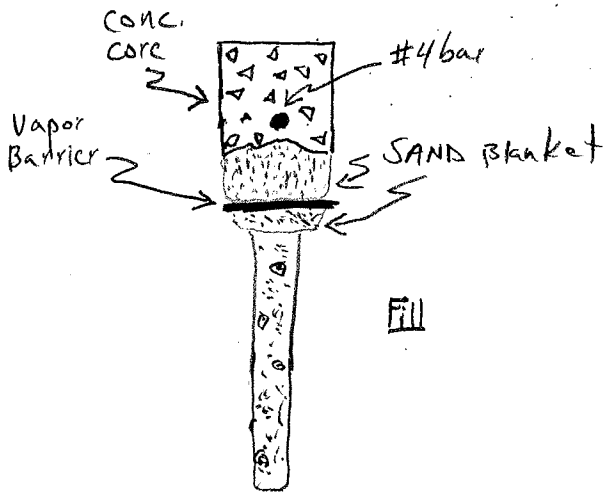


Samples

Tubes @ 8 1/4 - 20"
↓ 20 - 30 1/4"

MB @ 4 1/2 - 8 1/4"
MB @ 8 1/4 - 20"

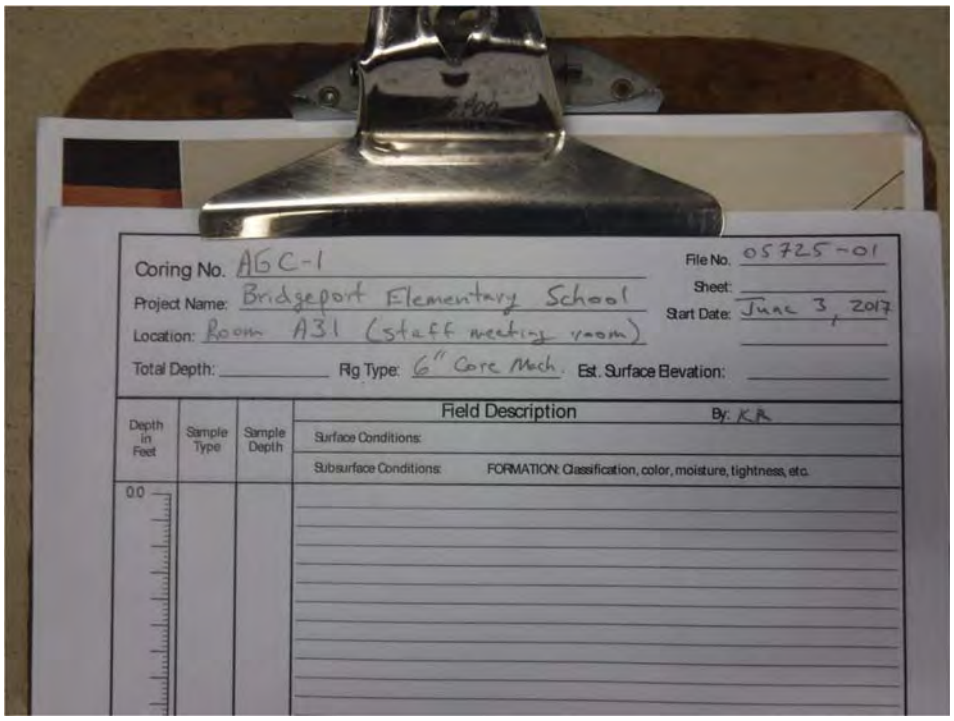
Profile



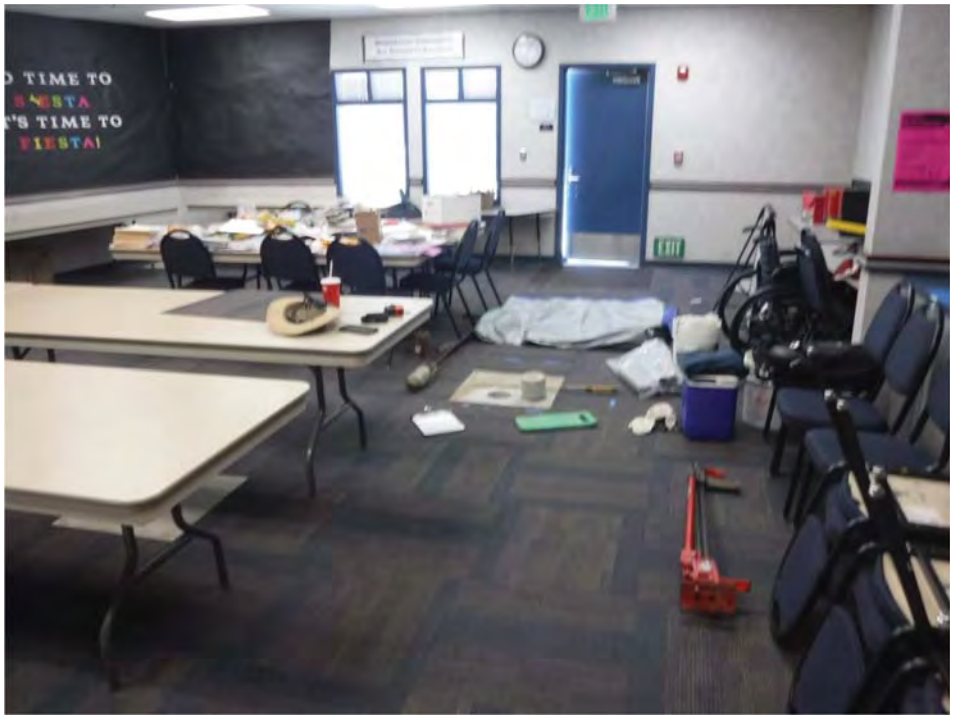
American Geotechnical

Explanation: Shelby, Ring Sampler, Large Bag, Medium Bag

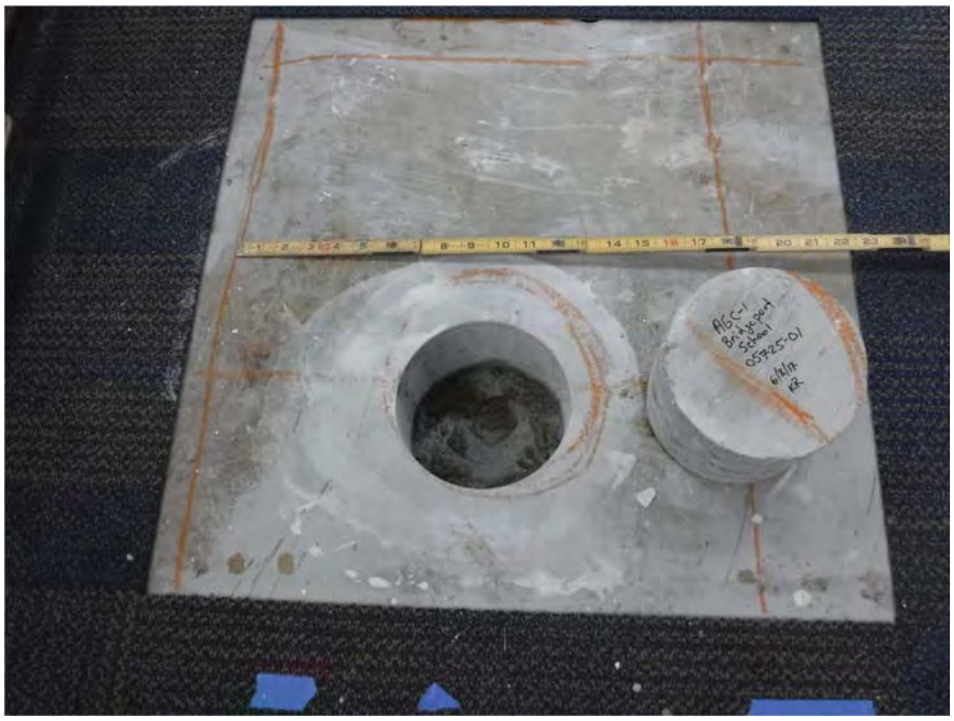
AGC-1



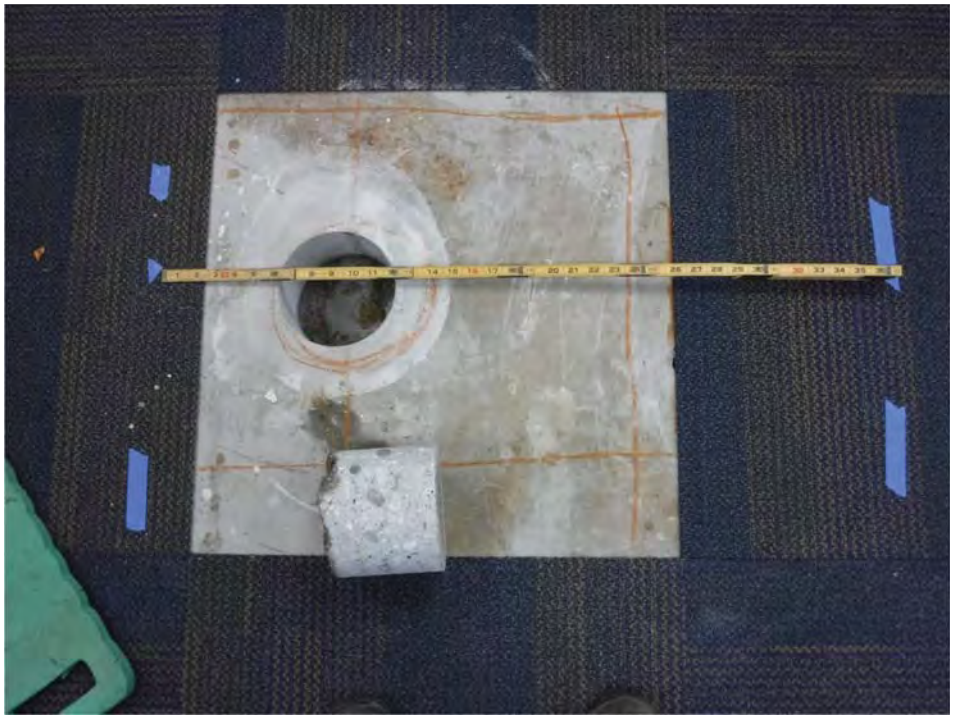
Room A31, AGC-1 - KR 06-03-17 (1)



Room A31, AGC-1 - KR 06-03-17 (2)



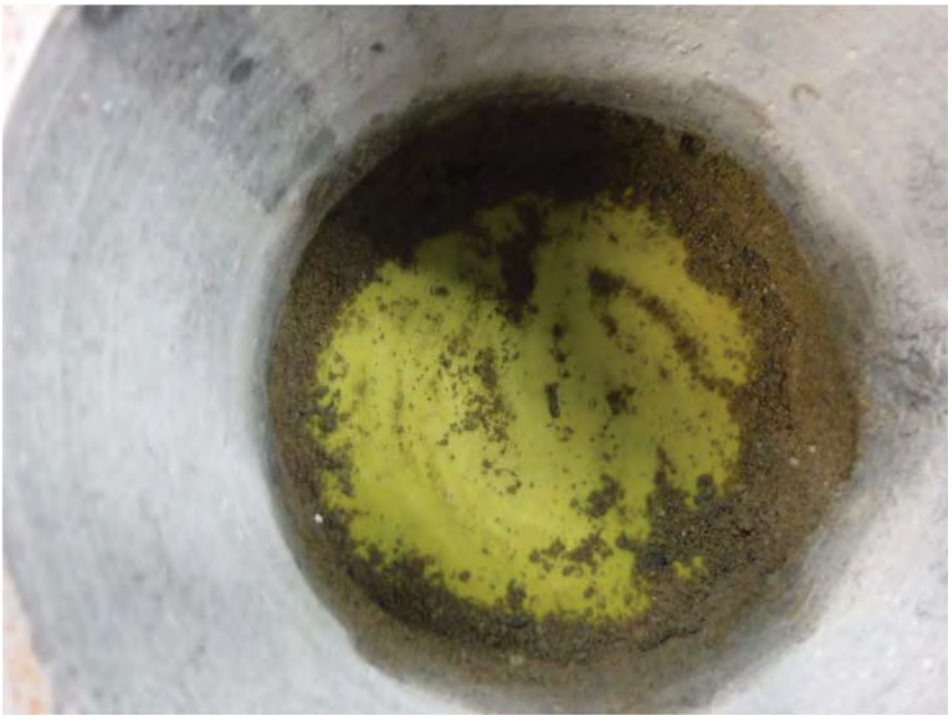
Room A31, AGC-1 - KR 06-03-17 (3)



Room A31, AGC-1 - KR 06-03-17 (4)

Room A31, AGC-1 - KR 06-03-17 (5)

Room A31, AGC-1 - KR 06-03-17 (6)



Room A31, AGC-1 - KR 06-03-17 (7)

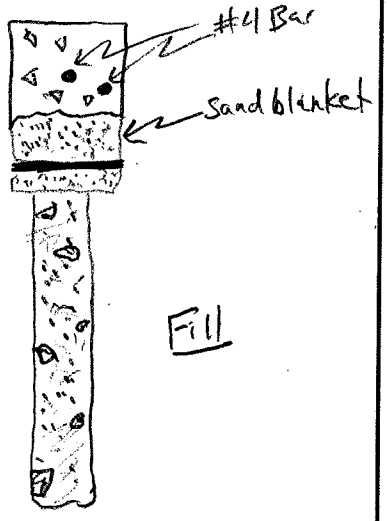
Coring No. AGC-2 File No. 05725-01

Project Name: Bridgeport Elementary School Sheet:

Location: Room A11 (classroom) Start Date: June 3, 2017

Total Depth: 31" Rig Type: 6" Core Mach Est. Surface Elevation:

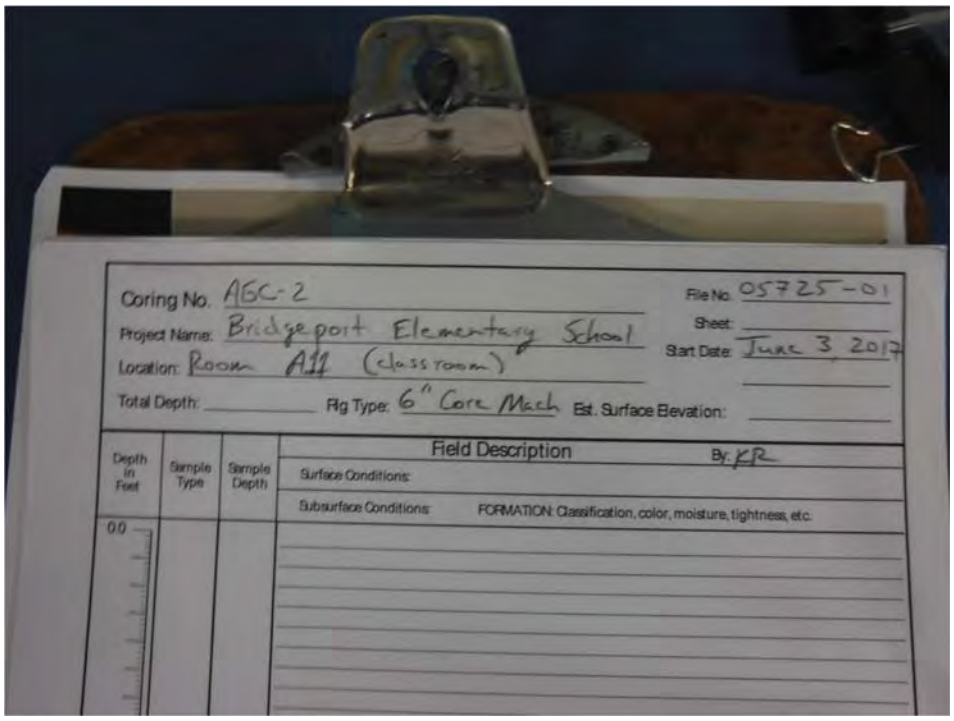
Depth in Feet	Sample Type	Sample Depth	Field Description By: KR
			Surface Conditions:
			Subsurface Conditions: FORMATION: Classification, color, moisture, tightness, etc.
0.0			0-4¾" Conc Core 6" diam x 4⅝ Min 5" Max thick #4 rebar w/in middle third of slab @ spaced ≈18" apart in N-S direction and 11" to 18" apart in E-W direction
			4¾-7" SAND BLANKET silty SAND w/ some f. gravel/u. coarse SAND tan, moist (from coring mach.) Med dense
			@7" Yellow plastic sheet Vapor barrier, heavy duty possibly Stego Wrap product
			7"-8½" SAND BLANKET same material as above Vapor barrier
			8½-31" Fill silty SAND w/ variable amounts of clay and some gravel, moist, dense to v. dense

Photos	Samples	Profile
	Tubes @ 8½-16" 21-31" MBe 4¾-8½" 8½-21"	

American Geotechnical

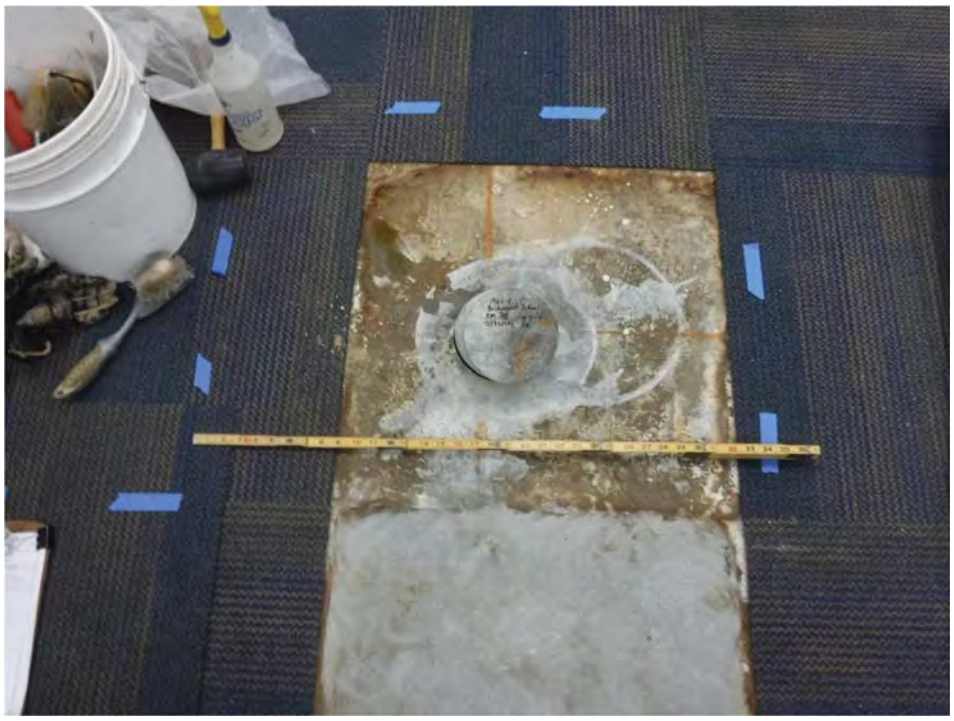
Explanation: Shelby, Ring Sampler, Large Bag, Medium Bag

AGC-2



Room A11, AGC-2 KR 06-03-17 (1)


Room A11, AGC-2 KR 06-03-17 (2)



Room A11, AGC-2 KR 06-03-17 (3)

Room A11, AGC-2 KR 06-03-17 (4)

Room A11, AGC-2 KR 06-03-17 (5)

Room A11, AGC-2 KR 06-03-17 (6)

Room A11, AGC-2 KR 06-03-17 (7)

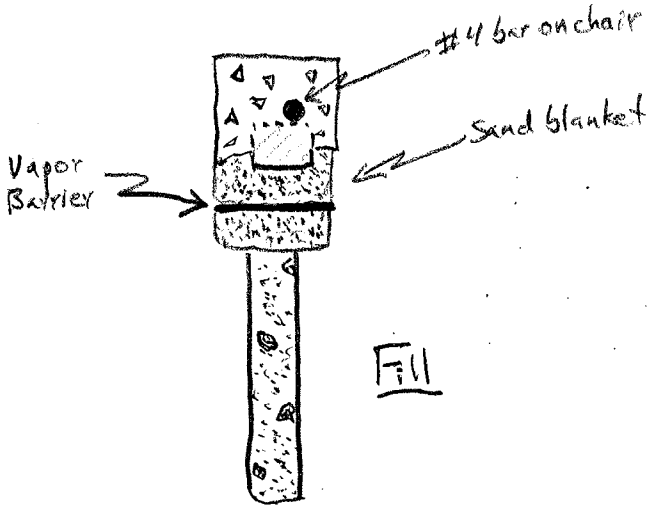
Coring No. AGC-3 File No. 05725-01

Project Name: Bridgeport Elementary School Sheet:

Location: Room C1 (classroom) Start Date: June 3, 2017

Total Depth: 28" Rig Type: 6" Core Mach. Est. Surface Elevation:

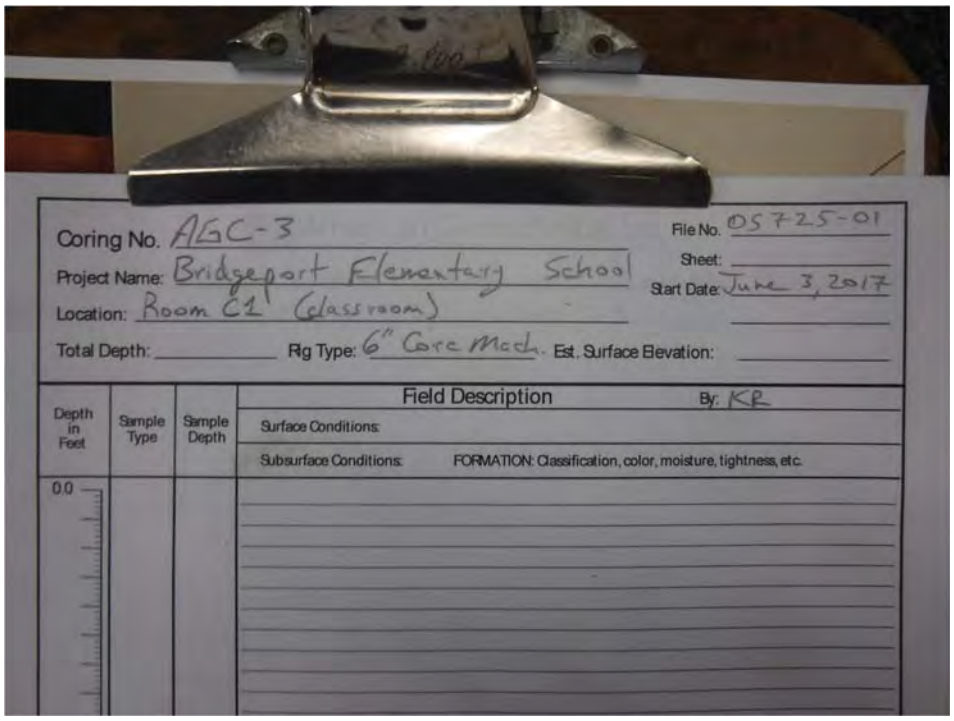
Depth in Feet	Sample Type	Sample Depth	Field Description By: KR
0.0			Surface Conditions:
			Subsurface Conditions: FORMATION: Classification, color, moisture, tightness, etc.
			0-5" Conc. Core 6" diam. x 4 1/8" Min 5" Max thick #4 rebar in middle third of slab set on rebar chair, @ spaced ≈ 18" apart in E-W direction & N-S direction ≈1/32" slab crack through rebar location
			5-6 3/4" SAND BLANKET silty SAND w/some f. gravel/v.coarse sand med. brwn, moist (from coring machine), med. dense
			@6 3/4 Heavy duty yellow plastic Moist. barrier sheet, possibly Stego wrap product
			6 3/4" ≈ 8" SAND BLANKET same material as above vapor barrier w/ ≈ 1/32" dia f. root underneath vapor barrier
			8-28" Fill silty SAND w/variable amounts of clay & some gravel med to dk brwn, sl. moist to moist, dense-v. dense

Photos	Samples	Profile
	MB @ 5-8" 8-20 1/4" Tubes @ 8-16" 20 1/4-28"	

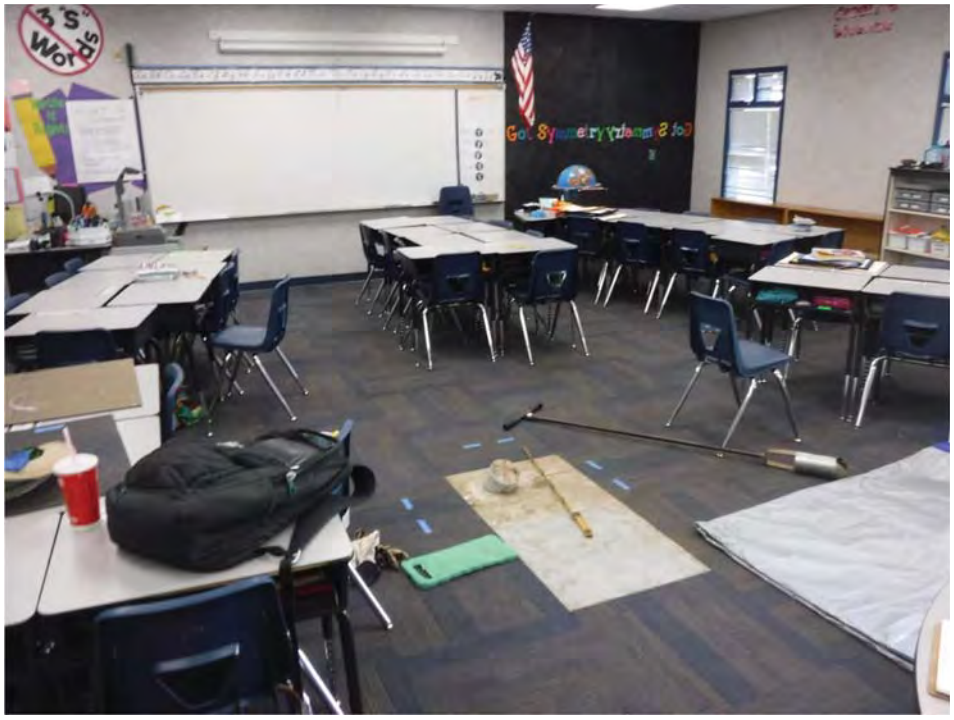
American Geotechnical

Explanation: Shelby, Ring Sampler, Large Bag, Medium Bag

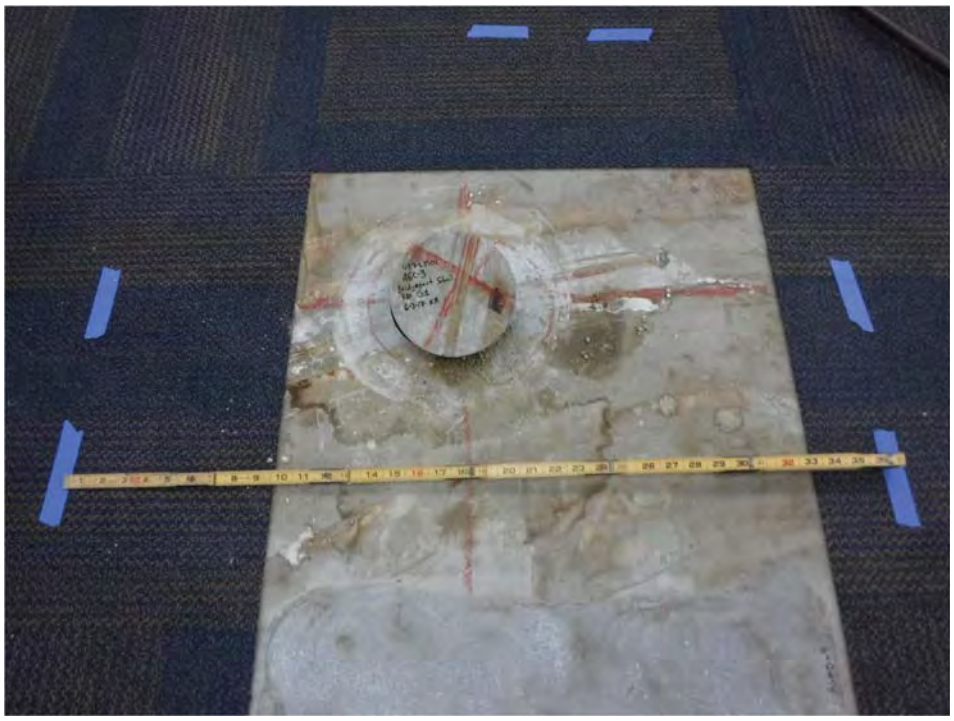
AGC-3



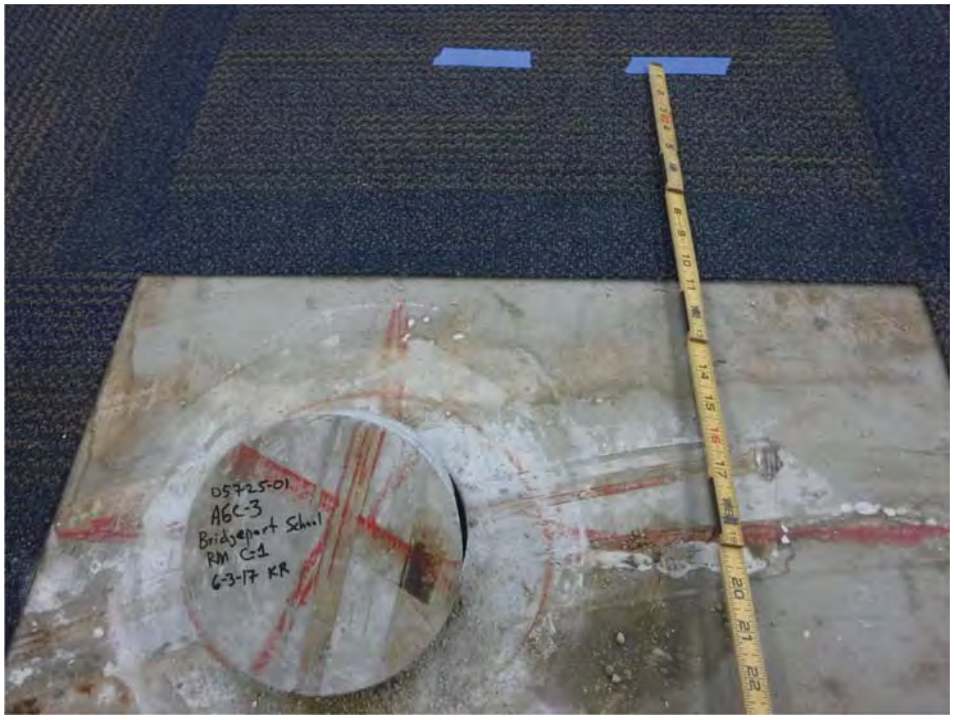
Room C1, AGC-3 - KR 6-3-17 (1)



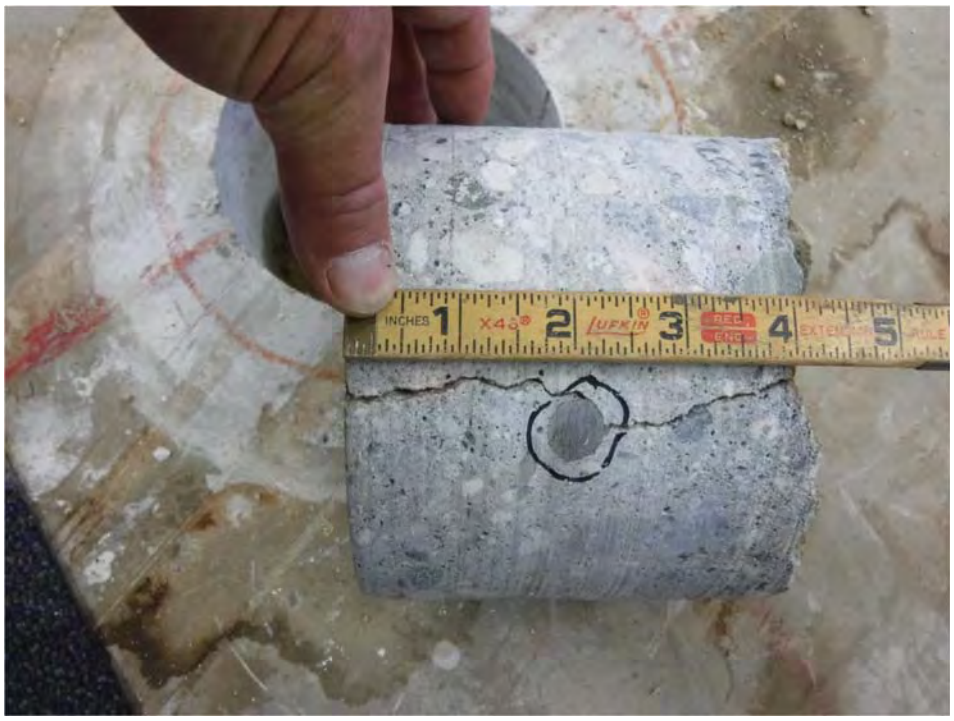
Room C1, AGC-3 - KR 6-3-17 (2)



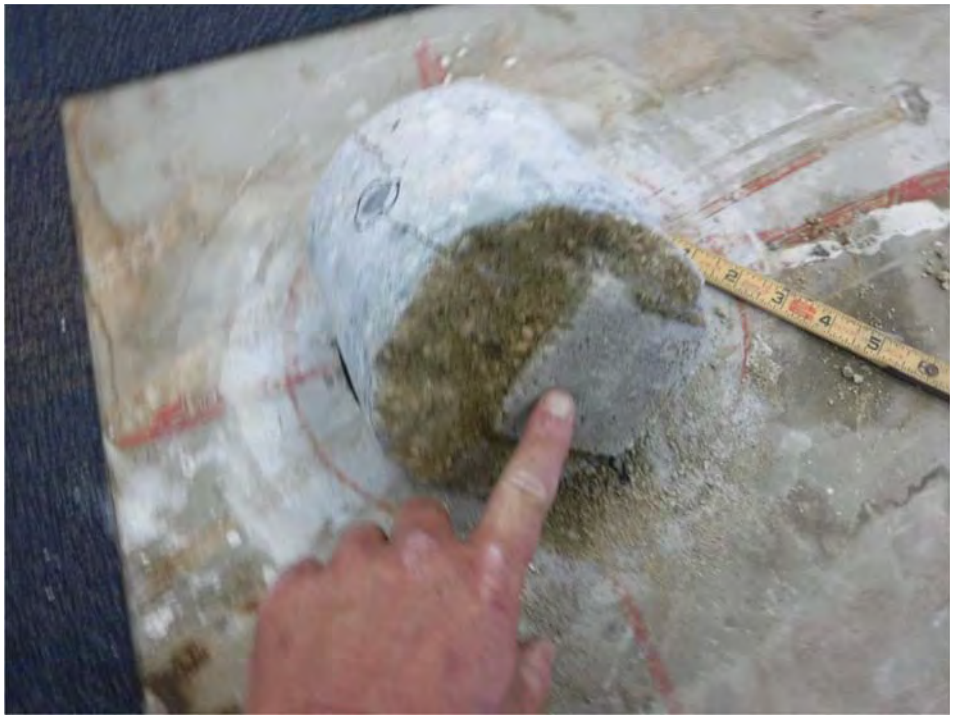
Room C1, AGC-3 - KR 6-3-17 (3)



Room C1, AGC-3 - KR 6-3-17 (4)



Room C1, AGC-3 - KR 6-3-17 (5)

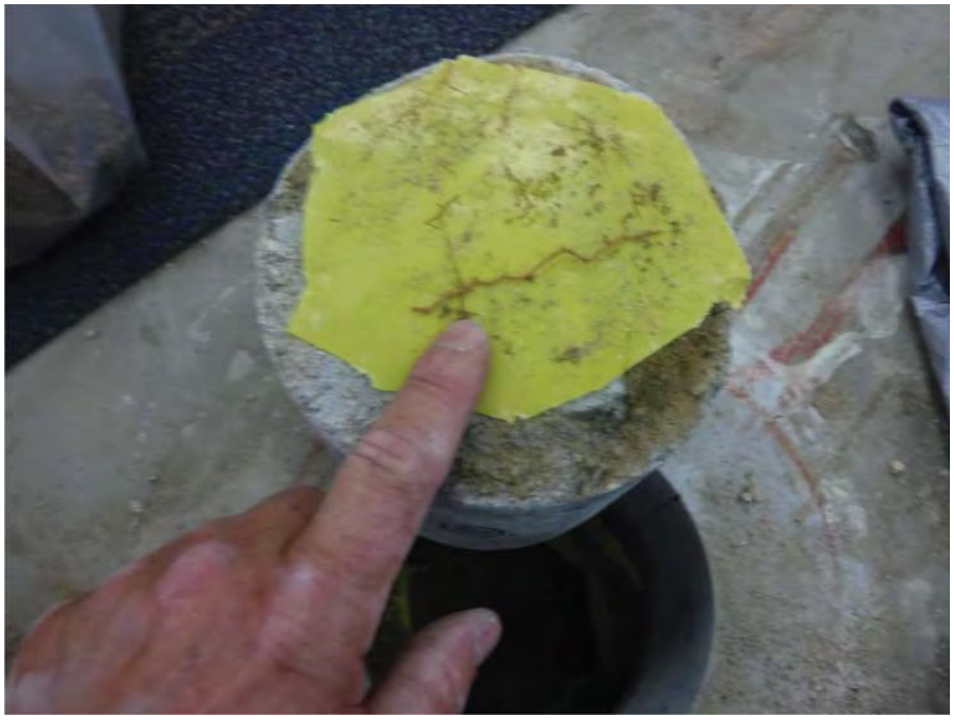


Room C1, AGC-3 - KR 6-3-17 (6)

Room C1, AGC-3 - KR 6-3-17 (7)

Room C1, AGC-3 - KR 6-3-17 (8)

Room C1, AGC-3 - KR 6-3-17 (9)



Room C1, AGC-3 - KR 6-3-17 (10)

American Geotechnical, Inc.

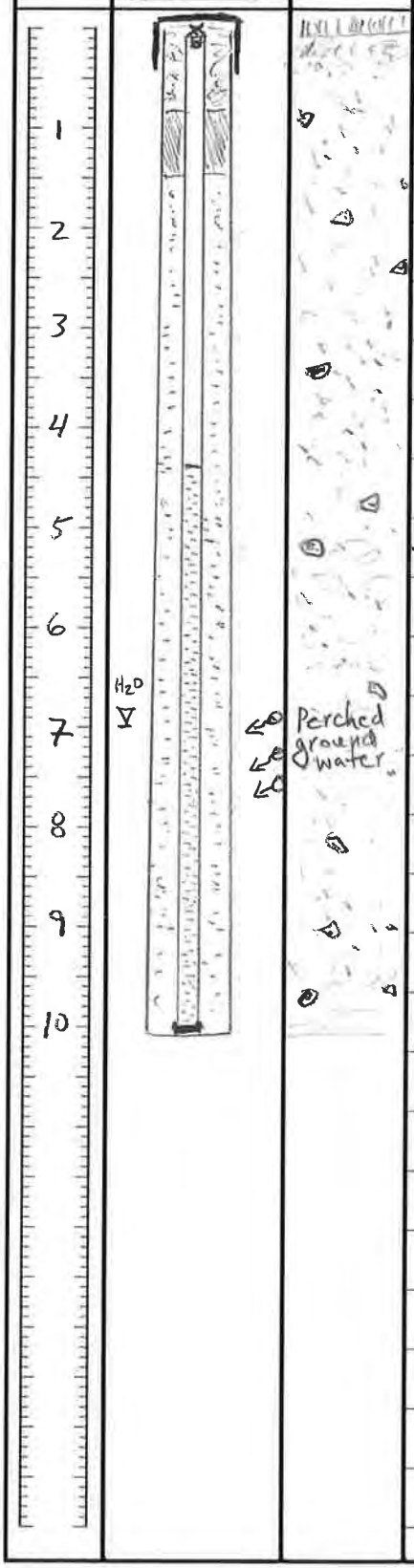
Project Name: Bridgeport Elementary School File No. 05725-01

Location: Sod area (see site map)

Sheet: 1 of 1 Date: 6/3/17 By: KR & JP

Boring No: AGHA-1 Total Depth: 10.1' Rig Type: Hand Auger ≈ 4" diam.

Depth in Feet



0-0.5' Sod & Topsoil, sandy LOAM, moist, soft, abundant roots & organics, dk brown

0.5-6.5' Fill silty SAND w/ some gravel & cobbles, sl. moist, med. dense, slightly clayey at 5 to 6.5'

6.5-10.1' silty SAND w/some clay and gravel, moist, med dense,

* perched groundwater encountered at about 7', then becomes dryer (No groundwater) again with depth

Piezometer installed inside auger hole with:
screen interval from 4.4' to 10.1'
solid/Non-screened interval from 0 to 4.4'
Sand pack from 1.5' to 10.1'
Bentonite seal from 10" to 18"
Soil from 0 to 10"
water tight cap & plastic irrigation cover
H_2O @ 7.6' depth after installation
then piezometer was bailed

Samples:

T @ 0.5-1.5' T@ 7.5-8.0' ABC 0.5-5.0'
2.5-3.5' 5.0-6.0'
6.5-7.0' 8.0-10.1'

AGHA -1 - JP 6-3-17 (1)

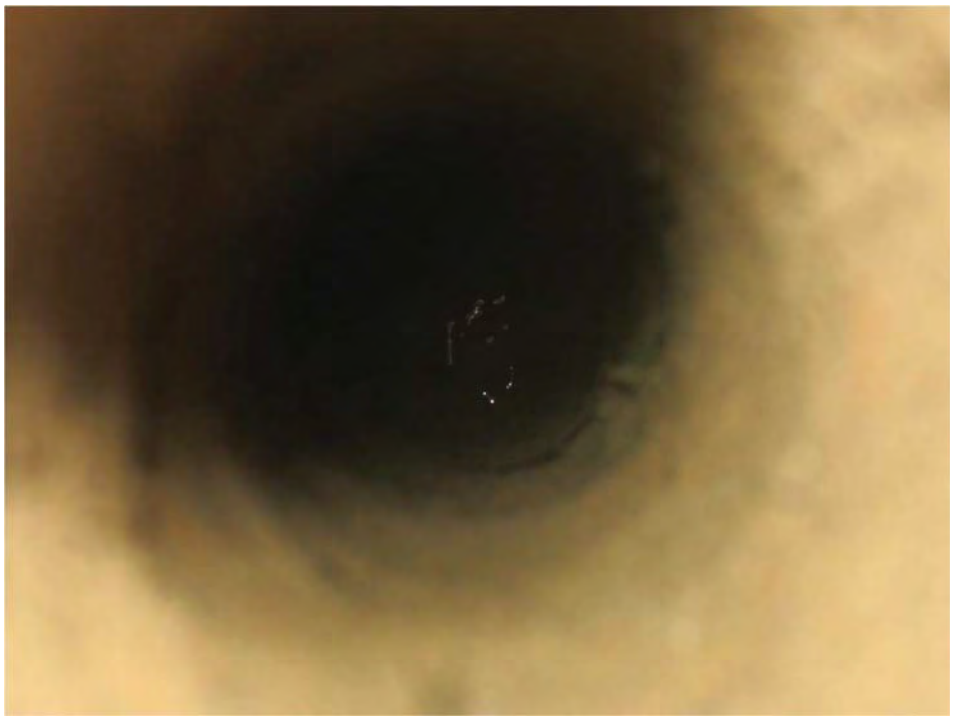
AGHA -1 - JP 6-3-17 (2)

AGHA -1 - JP 6-3-17 (3)

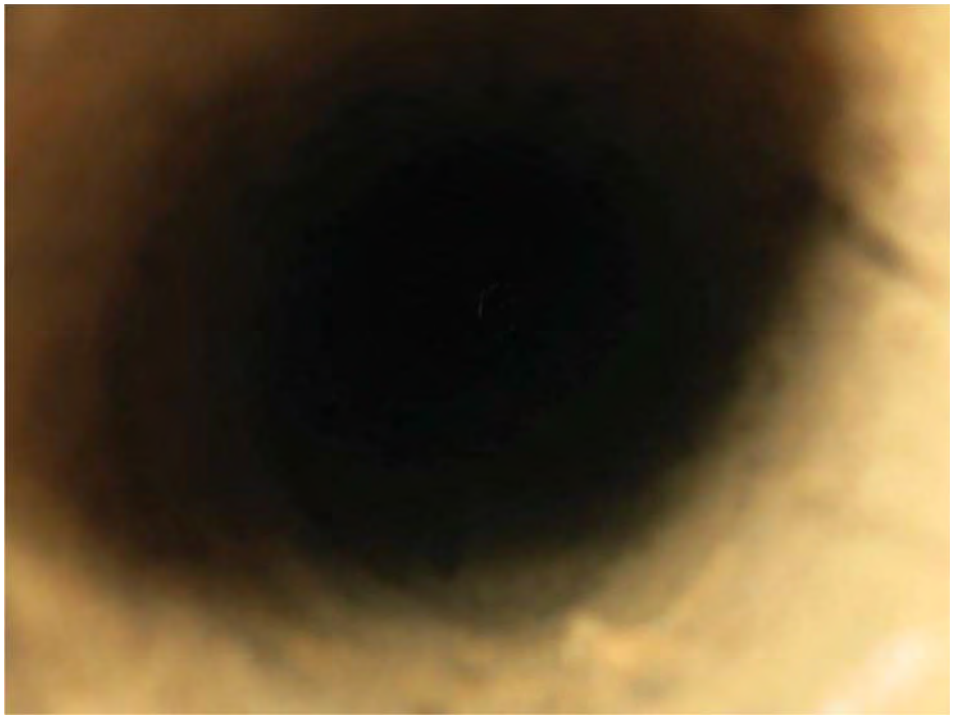
AGHA -1 - JP 6-3-17 (4)

AGHA -1 - JP 6-3-17 (5)

AGHA -1 - JP 6-3-17 (6)



AGHA -1 - JP 6-3-17 (7)



AGHA -1 - JP 6-3-17 (8)

AGHA -1 - JP 6-3-17 (9)

AGHA -1 - JP 6-3-17 (10)

AGHA -1 - JP 6-3-17 (11)

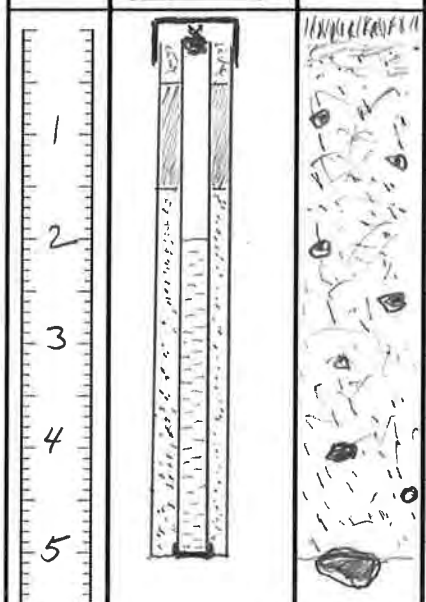
American Geotechnical, Inc.

Project Name: Bridgeport Elementary School File No. 05725-01

Location: Sod area (see site map)

Sheet: 1 of 1 Date: 6/3/17 By: JP & JS

Boring No: AGHA-2 Total Depth: _____ Rig Type: Hand Auger ≈ 4" diam.



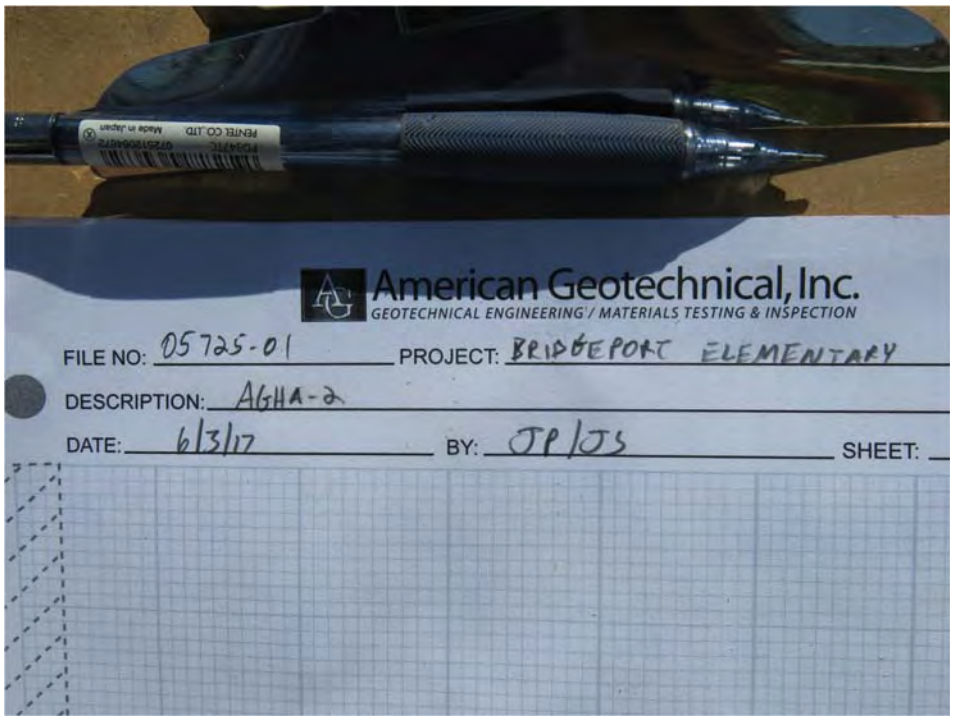
0 - 0.5' Topsoil + Sod sandy LOAM, dk brwn, moist, soft

0.5 - 5.0' Fill silty SAND w/ some clay & gravel yellow-brown, med. dense, slightly moist, occasional sub-round cobbles to ≥ 3.0" diam. trace organics, refusal on large cobble at 5.0'. No groundwater encountered

Piezometer installed inside auger hole with:
- screen interval from 2.0' - 5.0'
- solid / Non-screened interval from 0 - 2.0'
- sand pack from 1.5' - 5.0'
- Bentonite seal from 0.5 - 1.5'
- Soil from 0 - 0.5'

Samples:

T @ 0.5 - 1.5' LB @ 0.5 - 5.5'
2.0 - 2.4'
4.0 - 4.5'
5.0 - 5.5'



AGHA-2 JP 6-3-17 (1)

AGHA-2 JP 6-3-17 (2)

AGHA-2 JP 6-3-17 (3)

AGHA-2 JP 6-3-17 (4)

AGHA-2 JP 6-3-17 (5)

AGHA-2 JP 6-3-17 (6)

AGHA-2 JP 6-3-17 (7)

APPENDIX E – LABORATORY TEST RESULTS

APPENDIX E – LABORATORY TEST RESULTS

American Geotechnical, Inc.

GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

MOISTURE CONTENT / DRY DENSITY

Project Name: Bridgeport Elementary
File No: 05725-01
Date Sampled: 6/3/2017

ASTM D-2216

Lab Manager: RH
Tested by: SA
Date tested: 6/5/2017

Location	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA
Excavation	AGHA-1	AGHA-1	AGHA-1	AGHA-1	AGHA-1	AGHA-1	AGHA-2	AGHA-2	AGHA-2	AGHA-2
Depth	0.5'-1.5'	2.5'-3.5'	4.5'-5'	6.5'-7'	7.5'-8'	9.1'-9.6'	0.5'-1.5'	2'-2.4'	4'-4.5'	5'-5.5'
Soil Description	Grayish Olive Tan-Clayey Sand w. Gravel	Grayish Tan Brown-Clayey Sand w. Gravel	Grayish Orange Brown-Clayey Sand w. Gravel	Olive Red Brown-Clayey Sand w. Gravel	Grayish Olive-Clayey Sand w. Gravel	Orangish Gray Brown-Silty /Clayey Sand w. Gravel	Grayish Olive Brown-Clayey Sand w. Gravel	Reddish/Gray Olive-Clayey Sand w. Gravel	Reddish Brown-Clayey Sand w. Gravel	Reddish Brown-Clayey Sand w. Gravel
No. of Rings (# or in.)	6	3	4	6	5	6	6	2	4	5
Ring Size (in.)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Ring Weight (g)	143	143	143	143	143	143	143	143	143	143
RingWt.+WetSoil (g)	1923	949.3	1224.5	1877	1554.5	1895.7	1917.0	631.1	1217.3	1509.8
Total Ring Wt. (g)	858.0	429.0	572.0	858.0	715.0	858.0	858.0	286.0	572.0	715.0
Wet Soil (g)	1065.0	520.3	652.5	1019.0	839.5	1037.7	1059.0	345.1	645.3	794.8
Volume (cf)	0.01704	0.00852	0.01136	0.01704	0.01420	0.01704	0.01704	0.00568	0.01136	0.01420
Wet Density	137.75	134.60	126.60	131.80	130.30	134.22	136.98	133.91	125.20	123.37
Cup No.	9A	VO	C	10	A	511	AS	N1	CK	14
Cup+Wet Soil (g)	612.1	367.1	813.6	723.3	645.0	524.1	863.6	501.8	385.9	612.3
Cup+Dry Soil (g)	562.9	347.6	757.7	667.5	596.8	482.3	782.2	470.8	370.4	575.6
Moisture Loss (g)	49.20	19.50	55.90	55.80	48.20	41.80	81.40	31.00	15.50	36.70
Cup (g)	163.9	176.9	170.2	167.4	171.4	176.4	177.4	171.4	173.3	169.7
Dry Soil (g)	399.00	170.70	587.50	500.10	425.40	305.90	604.80	299.40	197.10	405.90
Moist. Content (%)	**12.33**	**11.42**	**9.51**	**11.16**	**11.33**	**13.66**	**13.46**	**10.35**	**7.86**	**9.04**
Dry Density (pcf)	**122.63**	**120.80**	**115.60**	**118.57**	**117.04**	**118.09**	**120.73**	**121.35**	**116.07**	**113.14**
Degree of Sat. (%)	**89**	**78**	**56**	**72**	**70**	**86**	**92**	**72**	**47**	**50**

Location	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA
Excavation	AGCI-1	AGCI-1	AGCI-1	AGCI-1	AGCI-2	AGCI-2	AGCI-2	AGCI-2	AGCI-3	AGCI-3
Depth	8 1/2"-20"	20"-30 1/4"	4 1/2"-8 1/4"	8 1/4"-20"	8 1/2"-16"	21"-31"	4 3/4"-8 1/2"	8 1/2"-21"	8"-16"	20 1/4"-28"
Soil Description	Olive Brown-Silty Sand	Olive Brown-Clayey Sand w.t Gravel	Olive Brown-Silty Sand	Med Brown-Silty Sand	Olive Brown-Clayey Sand w. Gravel	Olive Brown-Clayey Sand w. Gravel	Olive Brown-Silty Sand	Med Brown-Silty Sand w. Gravel	Olive Brown-Clayey Sand w. Gravel	Tanish Olive Clayey Sand w. Gravel
No. of Rings (# or in.)	6	6			5	6			6	5
Ring Size (in.)	2.5	2.5			2.5	2.5			2.5	2.5
Ring Weight (g)	143	143			143	143			143	143
RingWt.+WetSoil (g)	1915.4	1901.8			1579.4	1875.1			1881.9	1611.7
Total Ring Wt. (g)	858.0	858.0			715.0	858.0			858.0	715.0
Wet Soil (g)	1057.4	1043.8			864.4	1017.1			1023.9	896.7
Volume (cf)	0.01704	0.01704			0.01420	0.01704			0.01704	0.01420
Wet Density	136.77	135.01			134.17	131.56			132.44	139.18
Cup No.	1	4	SH	VO	6	SH	AS	HV	200	12
Cup+Wet Soil (g)	1018.3	927.6	588.1	502.5	444.2	971.4	583.9	461.1	459.9	613.9
Cup+Dry Soil (g)	942.7	857.9	566.9	472.8	419.3	896.0	561.3	435.1	438.8	577.9
Moisture Loss (g)	**75.60**	**69.70**	**21.20**	**29.70**	**24.90**	**75.40**	**22.60**	**26.00**	**21.10**	**36.00**
Cup (g)	170.0	164.4	178.2	176.9	166.7	178.2	177.3	178.0	164.9	165.9
Dry Soil (g)	772.70	693.50	388.70	295.90	252.60	717.80	384.00	257.10	273.90	412.00
Moist. Content (%)	**9.78**	**10.05**	**5.45**	**10.04**	**9.86**	**10.50**	**5.89**	**10.11**	**7.70**	**8.74**
Dry Density (pcf)	**124.58**	**122.68**			**122.13**	**119.05**			**122.97**	**128.00**
Degree of Sat. (%)	**75**	**73**	**#VALUE!**	**#VALUE!**	**70**	**68**	**#VALUE!**	**#VALUE!**	**56**	**75**

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GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

MOISTURE CONTENT / DRY DENSITY

Project Name: Bridgeport Elementary
File No: 05725-01
Date Sampled: 6/3/2017

ASTM D-2216

Lab Manager: RH
Tested by: SA
Date tested: 6/5/2017

Location	23670 Newhall Ranch RD,Santa Clarita,CA	23670 Newhall Ranch RD,Santa Clarita,CA								
Excavation	AGCI-3	AGCI-3								
Depth	5"-8"	8"-20 1/4"								
Soil Description	Olive Brown-Silty Sand	Med Brown-Silty Sand w. Gravel								
No. of Rings (# or in.)										
Ring Size (in.)										
Ring Weight (g)										
RingWt.+WetSoil (g)										
Total Ring Wt. (g)										
Wet Soil (g)										
Volume (cf)										
Wet Density										
Cup No.	200	N								
Cup+Wet Soil (g)	444.6	567.2								
Cup+Dry Soil (g)	431.3	535.6								
Moisture Loss (g)	13.30	31.60								
Cup (g)	164.9	169.4								
Dry Soil (g)	266.40	366.20								
Moist. Content (%)	**4.99**	**8.63**								
Dry Density (pcf)										
Degree of Sat. (%)	**#VALUE!**	**#VALUE!**								

Location										
Excavation										
Depth										
Soil Description										
No. of Rings (# or in.)										
Ring Size (in.)										
Ring Weight (g)										
RingWt.+WetSoil (g)										
Total Ring Wt. (g)										
Wet Soil (g)										
Volume (cf)										
Wet Density										
Cup No.										
Cup+Wet Soil (g)										
Cup+Dry Soil (g)										
Moisture Loss (g)										
Cup (g)										
Dry Soil (g)										
Moist. Content (%)										
Dry Density (pcf)										
Degree of Sat. (%)										

Assumes S.G. of 2.7

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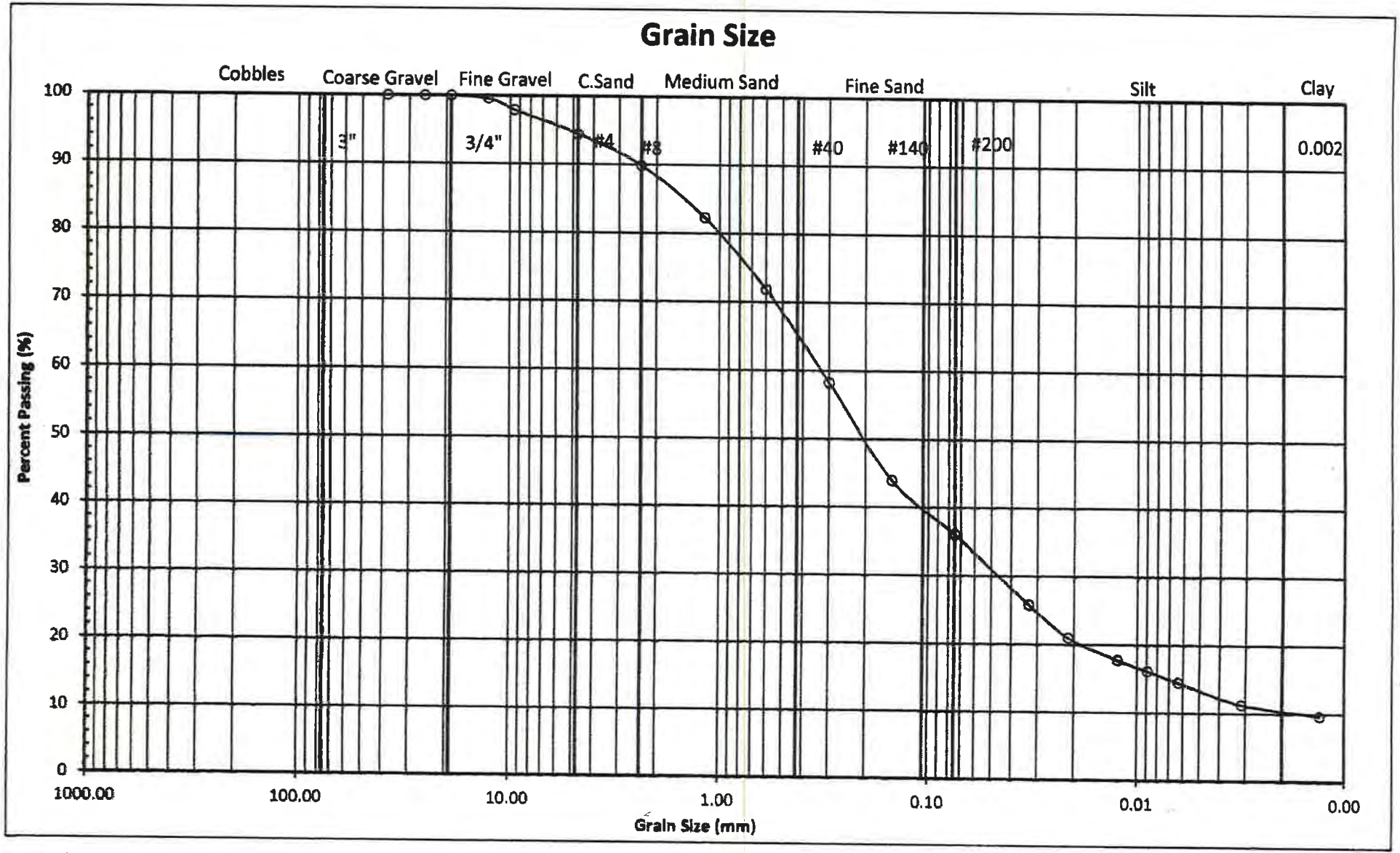
Grain Size



Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017
Excavation: AGHA-1
Depth: 0.5'-5'
By: RH

% Gravel =	5.6
% Sand =	58.4
% Silt =	25.7
% Clay =	10.3
Sum =	100.0

LL= NP PL= NP PI= NP

%>#200 = 64.0
%<#200 = 36.0
Soil Classification: Silty Clayey Sand

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American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

PARTICLE SIZE ANALYSIS

ASTM D422 (Over #4)

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-1
Depth: 0.5'-5'
By: RH

Total Weight of Sample	699.6	g
Dry Weight After Moisture Corr.	674.1	g

Sieve Size	Wet Retained (g)	Accumulated Wet Retained (g)	% Retained	Retained Accumulated %	Passing %
					100.00
3 "					
2 1/2 "					
2 "					
1 1/2 "	0.0	0.0	0.0	0.0	**100.0**
1 "	0.0	0.0	0.0	0.0	**100.0**
3/4 "	0.0	0.0	0.0	0.0	**100.0**
1/2 "	3.3	3.3	0.5	0.5	**99.5**
3/8 "	10.9	14.2	1.6	2.1	**97.9**
# 4	23.7	37.9	3.5	5.6	**94.4**
# 8					
# 16					
# 30					
# 40					
# 50					
# 60					
# 100					
# 140					
# 200					
PAN	636.2	674.1	94.4	100.0	**0.0**

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American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

PARTICLE SIZE ANALYSIS FOR HYDROMETER

ASTM D-422 (Under #4)

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-1
Depth: 0.5'-5'
By: RH

Moisture Correction

Wet Weight + Tare	827.1	g
Dry Weight + Tare	803	g
Moisture Weight	24.1	g
Tare	166.8	g
Dry Soil Weight	636.2	g
Moisture Content	3.8	%
% passing #4 sieve	94	g

Percent Passing #200: 36.00

Sieve Size	Retained (g)	Accumulated Retained (g)	Retained %	Accumulated %	Passing %	Corrected Passing %
3 "						
2 1/2 "						
2 "						
1 1/2 "						
1 "						
3/4 "						
3/8 "						
1/2 "						
# 4					100.00	
# 8	30.6	30.6	4.81	4.81	95.19	89.84
# 16	51.4	82	8.08	12.89	87.11	82.21
# 30	69.9	151.9	10.99	23.88	76.12	71.84
# 40						
# 50	91.5	243.4	14.38	38.26	61.74	58.27
# 60						
# 100	96.7	340.1	15.20	53.46	46.54	43.93
# 140						
# 200	53.4	393.5	8.39	61.85	38.15	36.00
PAN	242.7	636.2	38.15	100.00	0.00	0.00

American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

HYDROMETER TEST

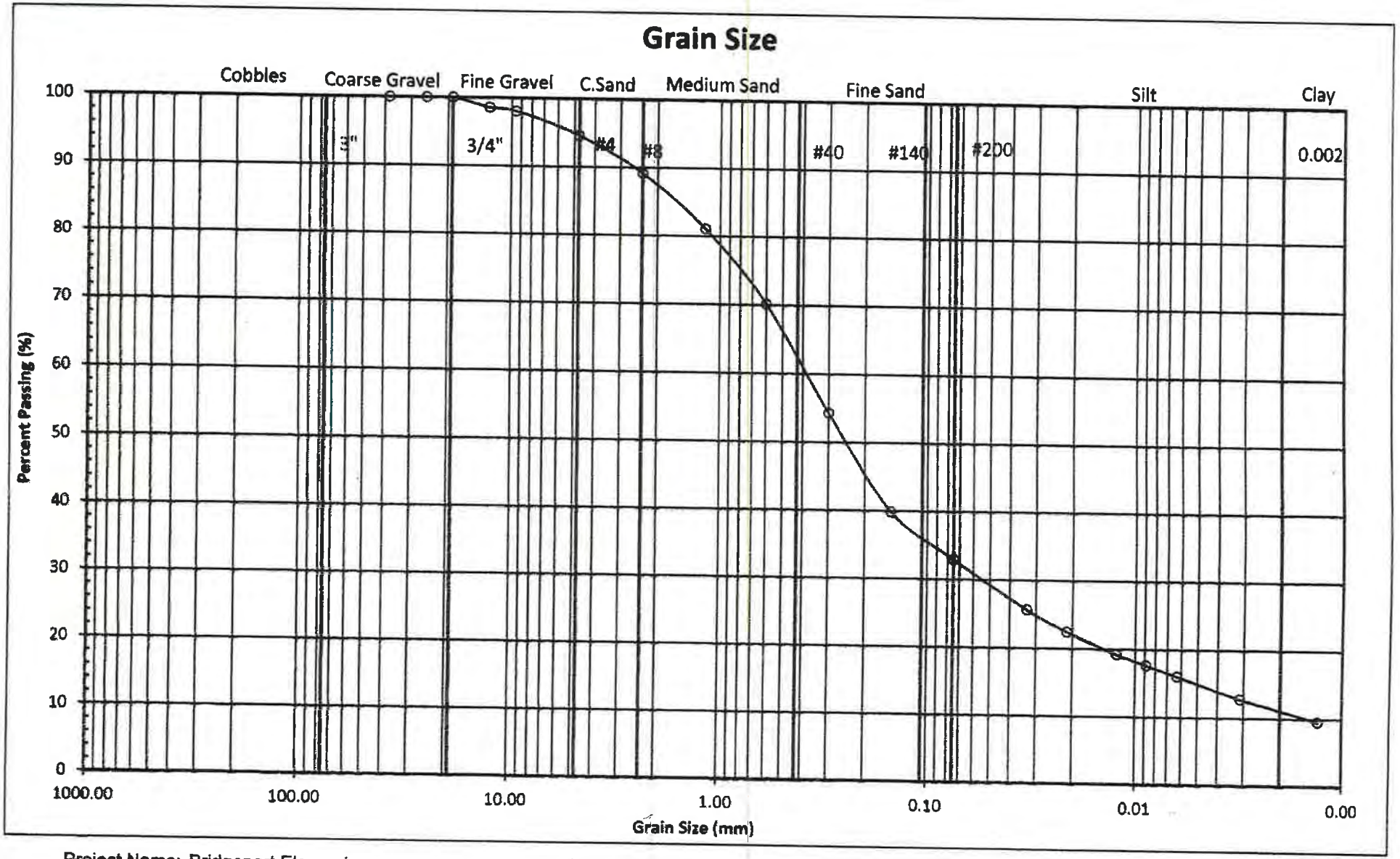
ASTM D-422

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-1
Depth: 0.5'-5'
By: RH

Date	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/15/2017
Time	11:30	11:33	11:43	11:58	12:28	3:38	11:28
Elapsed Time (min)	2	5	15	30	60	250	1440
Hydrometer 152 H Reading							
A	21	18	16	15	14	12	11
B	5	5	5	5	5	5	5
A-B	16	13	11	10	9	7	6
D (Table 1)	0.99	0.99	0.99	0.99	0.99	0.99	0.99
E - Soil In Solution*100	27.37	22.24	18.82	17.11	15.40	11.98	10.27
Corrected Grading	25.83	20.99	17.76	16.15	14.53	11.30	9.69
F % Passing # 4 Sieve	94.38	94.38	94.38	94.38	94.38	94.38	94.38
Temp C	22	22	22	22	22	22	22
G =Eff. Depth (Table 2)	12.9	13.3	13.7	13.8	14	14.3	14.5
Table 3	0.01312	0.01312	0.01312	0.01312	0.01312	0.01312	0.01312
Diameter of Particle (mm)	0.0333	0.0214	0.0125	0.0089	0.0063	0.0031	0.0013
Soil Moisture							
L= Wt. wet soil + tare (g)	100.13	100.13	100.13	100.13	100.13	100.13	100.13
M= Wt. dry soil + tare (g)	97.59	97.59	97.59	97.59	97.59	97.59	97.59
N= Wt. of tare (g)	31.49	31.49	31.49	31.49	31.49	31.49	31.49
O= Wt. of moisture loss (g)	2.54	2.54	2.54	2.54	2.54	2.54	2.54
P= Wt of dry soil (g)	66.1	66.1	66.1	66.1	66.1	66.1	66.1
Q= Moisture Content %	3.84	3.84	3.84	3.84	3.84	3.84	3.84
Soil Weight							
R= Specific Gravity	2.7	2.7	2.7	2.7	2.7	2.7	2.7
S= Wet Soil (g)	60.09	60.09	60.09	60.09	60.09	60.09	60.09
T= Dry Soil (g)	57.87	57.87	57.87	57.87	57.87	57.87	57.87

Grain Size



Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017
Excavation: AGHA-1
Depth: 5'-8'
By: RH

% Gravel =	5.4
% Sand =	61.6
% Silt =	22.1
% Clay =	10.8
Sum =	100.0

LL= NP PL= NP PI= NP

%>#200 = 67.0
%<#200 = 33.0

Soil Classification: Silty Clayey Sand

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American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

PARTICLE SIZE ANALYSIS

ASTM D422 (Over #4)

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-1
Depth: 5'-8'
By: RH

Total Weight of Sample	764.1	g
Dry Weight After Moisture Corr.	742.8	g

Sieve Size	Wet Retained (g)	Accumulated Wet Retained (g)	% Retained	Retained Accumulated %	Passing %
					100.00
3 "					
2 1/2 "					
2 "					
1 1/2 "	0.0	0.0	0.0	0.0	**100.0**
1 "	0.0	0.0	0.0	0.0	**100.0**
3/4 "	0.0	0.0	0.0	0.0	**100.0**
1/2 "	10.8	10.8	1.5	1.5	**98.5**
3/8 "	3.6	14.4	0.5	1.9	**98.1**
# 4	25.9	40.3	3.5	5.4	**94.6**
# 8					
# 16					
# 30					
# 40					
# 50					
# 60					
# 100					
# 140					
# 200					
PAN	702.5	742.8	94.6	100.0	**0.0**

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American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

PARTICLE SIZE ANALYSIS FOR HYDROMETER

ASTM D-422 (Under #4)

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-1
Depth: 5'-8'
By: RH

Moisture Correction

Wet Weight + Tare	898.5	g
Dry Weight + Tare	878.4	g
Moisture Weight	20.1	g
Tare	175.9	g
Dry Soil Weight	702.5	g
Moisture Content	2.9	%
% passing #4 sieve	95	g

Percent Passing #200: 32.97

Sieve Size	Retained (g)	Accumulated Retained (g)	Retained %	Accumulated %	Passing %	Corrected Passing %
3 "						
2 1/2 "						
2 "						
1 1/2 "						
1 "						
3/4 "						
3/8 "						
1/2 "						
# 4					100.00	
# 8	40.1	40.1	5.71	5.71	94.29	89.18
# 16	60.2	100.3	8.57	14.28	85.72	81.07
# 30	81.1	181.4	11.54	25.82	74.18	70.15
# 40						
# 50	117.7	299.1	16.75	42.58	57.42	54.31
# 60						
# 100	107.1	406.2	15.25	57.82	42.18	39.89
# 140						
# 200	51.4	457.6	7.32	65.14	34.86	32.97
PAN	244.9	702.5	34.86	100.00	0.00	0.00

American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

HYDROMETER TEST

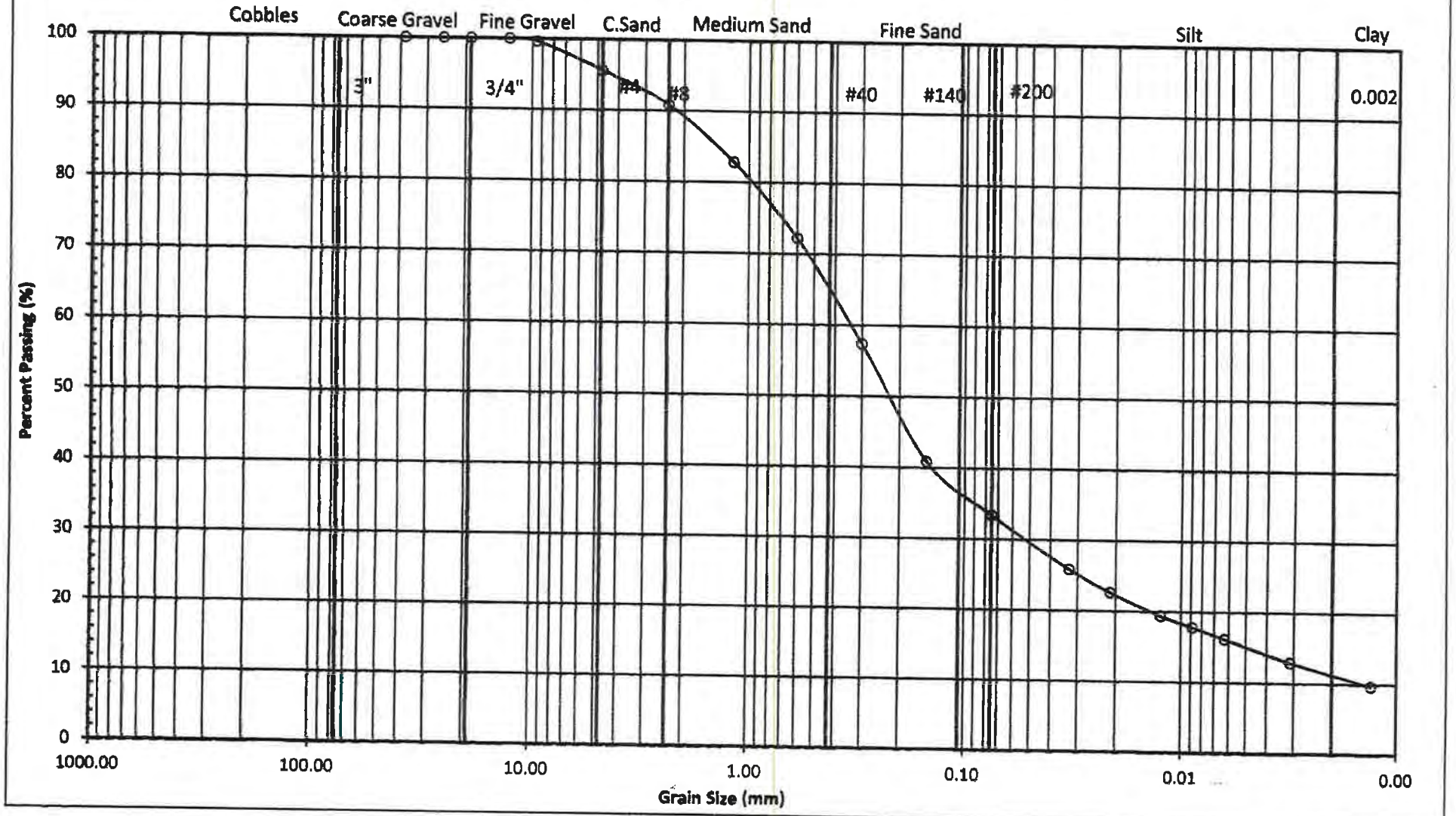
ASTM D-422

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-1
Depth: 5'-8'
By: RH

Date	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/15/2017
Time	11:18	11:21	11:31	11:46	12:16	3:26	11:16
Elapsed Time (min)	2	5	15	30	60	250	1440
Hydrometer 152 H Reading							
A	21	19	17	16	15	13	11
B	5	5	5	5	5	5	5
A-B	16	14	12	11	10	8	6
D (Table 1)	0.99	0.99	0.99	0.99	0.99	0.99	0.99
E - Soil In Solution*100	27.16	23.77	20.37	18.67	16.98	13.58	10.19
Corrected Grading	25.69	22.48	19.27	17.66	16.05	12.84	9.63
F % Passing # 4 Sieve	94.57	94.57	94.57	94.57	94.57	94.57	94.57
Temp C	22	22	22	22	22	22	22
G =Eff. Depth (Table 2)	12.9	13.2	13.3	13.7	13.8	14.2	14.5
Table 3	0.01312	0.01312	0.01312	0.01312	0.01312	0.01312	0.01312
Diameter of Particle (mm)	0.0333	0.0213	0.0124	0.0089	0.0063	0.0031	0.0013
Soil Moisture							
L= Wt. wet soil + tare (g)	100.53	100.53	100.53	100.53	100.53	100.53	100.53
M= Wt. dry soil + tare (g)	98.56	98.56	98.56	98.56	98.56	98.56	98.56
N= Wt. of tare (g)	31.38	31.38	31.38	31.38	31.38	31.38	31.38
O= Wt. of moisture loss (g)	1.97	1.97	1.97	1.97	1.97	1.97	1.97
P= Wt of dry soil (g)	67.18	67.18	67.18	67.18	67.18	67.18	67.18
Q= Moisture Content %	2.93	2.93	2.93	2.93	2.93	2.93	2.93
Soil Weight							
R= Specific Gravity	2.7	2.7	2.7	2.7	2.7	2.7	2.7
S= Wet Soil (g)	60.03	60.03	60.03	60.03	60.03	60.03	60.03
T= Dry Soil (g)	58.32	58.32	58.32	58.32	58.32	58.32	58.32

Grain Size



Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017
Excavation: AGHA-2
Depth: 0.5'-5.5'
By: RH

% Gravel =	4.4
% Sand =	62.2
% Silt =	22.4
% Clay =	10.9
Sum =	100.0

LL= NP PL= NP PI= NP

%>#200 = 66.6
%<#200 = 33.4
Soil Classification: Silty Clayey Sand

American Geotechnical, Inc.
GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

22725 Old Canal Road, Yorba Linda, CA 92887 - (714) 685-3900 - FAX (714) 685-3909
2640 Financial Court, Suite A, San Diego, CA 92117 - (858) 450-4040 - FAX (858) 457-0814
3100 Fite Circle, Suite 103, Sacramento, CA 95827 - (916) 368-2088 - FAX (916) 368-2188
5600 Spring Mountain Road, Suite 201, Las Vegas, NV 89146 - (702) 562-5046 - FAX (702) 562-2457

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PARTICLE SIZE ANALYSIS FOR HYDROMETER

ASTM D-422 (Under #4)

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-2
Depth: 0.5'-5.5'
By: RH

Moisture Correction

Wet Weight + Tare	949.6	g
Dry Weight + Tare	928.5	g
Moisture Weight	21.1	g
Tare	160.7	g
Dry Soil Weight	767.8	g
Moisture Content	2.7	%
% passing #4 sieve	96	g

Percent Passing #200: 33.36

Sieve Size	Retained (g)	Accumulated Retained (g)	Retained %	Accumulated %	Passing %	Corrected Passing %
3 "						
2 1/2 "						
2 "						
1 1/2 "						
1 "						
3/4 "						
3/8 "						
1/2 "						
# 4					100.00	
# 8	37.9	37.9	4.94	4.94	95.06	90.85
# 16	64.6	102.5	8.41	13.35	86.65	82.81
# 30	85.2	187.7	11.10	24.45	75.55	72.21
# 40						
# 50	118.9	306.6	15.49	39.93	60.07	57.41
# 60						
# 100	132.8	439.4	17.30	57.23	42.77	40.88
# 140						
# 200	60.4	499.8	7.87	65.10	34.90	33.36
PAN	268.0	767.8	34.90	100.00	0.00	0.00

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PARTICLE SIZE ANALYSIS

ASTM D422 (Over #4)

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-2
Depth: 0.5'-5.5'
By: RH

Total Weight of Sample	825.5	g
Dry Weight After Moisture Corr.	803.4	g

Sieve Size	Wet Retained (g)	Accumulated Wet Retained (g)	% Retained	Retained Accumulated %	Passing % 100.00
3 "					
2 1/2 "					
2 "					
1 1/2 "	0.0	0.0	0.0	0.0	**100.0**
1 "	0.0	0.0	0.0	0.0	**100.0**
3/4 "	0.0	0.0	0.0	0.0	**100.0**
1/2 "	0.0	0.0	0.0	0.0	**100.0**
3/8 "	2.9	2.9	0.4	0.4	**99.6**
# 4	32.7	35.6	4.1	4.4	**95.6**
# 8					
# 16					
# 30					
# 40					
# 50					
# 60					
# 100					
# 140					
# 200					
PAN	767.8	803.4	95.6	100.0	**0.0**

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GEOTECHNICAL ENGINEERING / MATERIALS TESTING & INSPECTION

HYDROMETER TEST

ASTM D-422

Project Name: Bridgeport Elementary
Location: 23670 Newhall Ranch Rd. Santa Clarita,CA
File No: 05725-01
Date: 6/15/2017

Excavation: AGHA-2
Depth: 0.5'-5.5'
By: RH

Date	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/14/2017	6/15/2017
Time	11:06	11:09	11:19	11:34	12:04	3:14	11:04
Elapsed Time (min)	2	5	15	30	60	250	1440
Hydrometer 152 H Reading							
A	21	19	17	16	15	13	11
B	5	5	5	5	5	5	5
A-B	16	14	12	11	10	8	6
D (Table 1)	0.99	0.99	0.99	0.99	0.99	0.99	0.99
E - Soil In Solution*100	27.12	23.73	20.34	18.64	16.95	13.56	10.17
Corrected Grading	25.92	22.68	19.44	17.82	16.20	12.96	9.72
F % Passing # 4 Sieve	95.57	95.57	95.57	95.57	95.57	95.57	95.57
Temp C	22	22	22	22	22	22	22
G =Eff. Depth (Table 2)	12.9	13.2	13.5	13.7	13.8	14.2	14.5
Table 3	0.01312	0.01312	0.01312	0.01312	0.01312	0.01312	0.01312
Diameter of Particle (mm)	0.0333	0.0213	0.0124	0.0089	0.0063	0.0031	0.0013
Soil Moisture							
L= Wt. wet soil + tare (g)	100.7	100.7	100.7	100.7	100.7	100.7	100.7
M= Wt. dry soil + tare (g)	98.83	98.83	98.83	98.83	98.83	98.83	98.83
N= Wt. of tare (g)	31.37	31.37	31.37	31.37	31.37	31.37	31.37
O= Wt. of moisture loss (g)	1.87	1.87	1.87	1.87	1.87	1.87	1.87
P= Wt of dry soil (g)	67.46	67.46	67.46	67.46	67.46	67.46	67.46
Q= Moisture Content %	2.77	2.77	2.77	2.77	2.77	2.77	2.77
Soil Weight							
R= Specific Gravity	2.7	2.7	2.7	2.7	2.7	2.7	2.7
S= Wet Soil (g)	60.03	60.03	60.03	60.03	60.03	60.03	60.03
T= Dry Soil (g)	58.41	58.41	58.41	58.41	58.41	58.41	58.41

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CORE MEASUREMENTS

ASTM C174-87

F.N. 05725-01 PROJECT BRIDGEPORT ELEM SCH

ADDRESS 23670 Newhall Ranch Road, Santa Clarita, CA

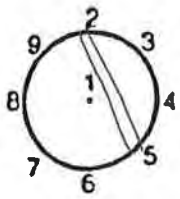
AG C-1 DATE CORED 6/3/2017 AG REP ICR

LOCATION: ☐GARAGE ☐LIVING ROOM ☐DINING ROOM ☐FOOTING ☐FAMILY ROOM ☒OTHER

DATE MEASURED 6/6/2017 BY SA

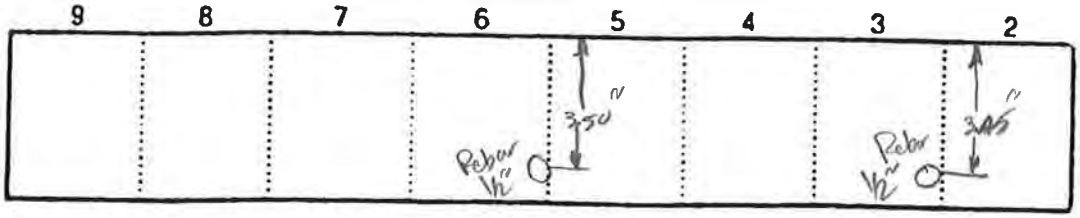
MEASUREMENT LOCATION	MEASUREMENT INCREMENTS	LENGTH (INCHES)
1	CORE CENTER	4.69
2	0°	4.90
3	45°	4.96
4	90°	4.83
5	135°	4.77
6	180°	5.07
7	225°	5.27
8	270°	5.06
9	315°	4.96
AVERAGE LENGTH (INCHES)		4.9

* CORE MEASUREMENTS WERE TAKEN AT 45 DEGREE INCREMENTS #2 ON CORE'S SMOOTHER INDICATES STARTING POINT (0 DEGREES) ROTATION WAS ACCOMPLISHED IN A CLOCKWISE DIRECTION WITH REFERENCE TO THE SMOOTHER END



CORE DIAMETER 5.7 INCHES

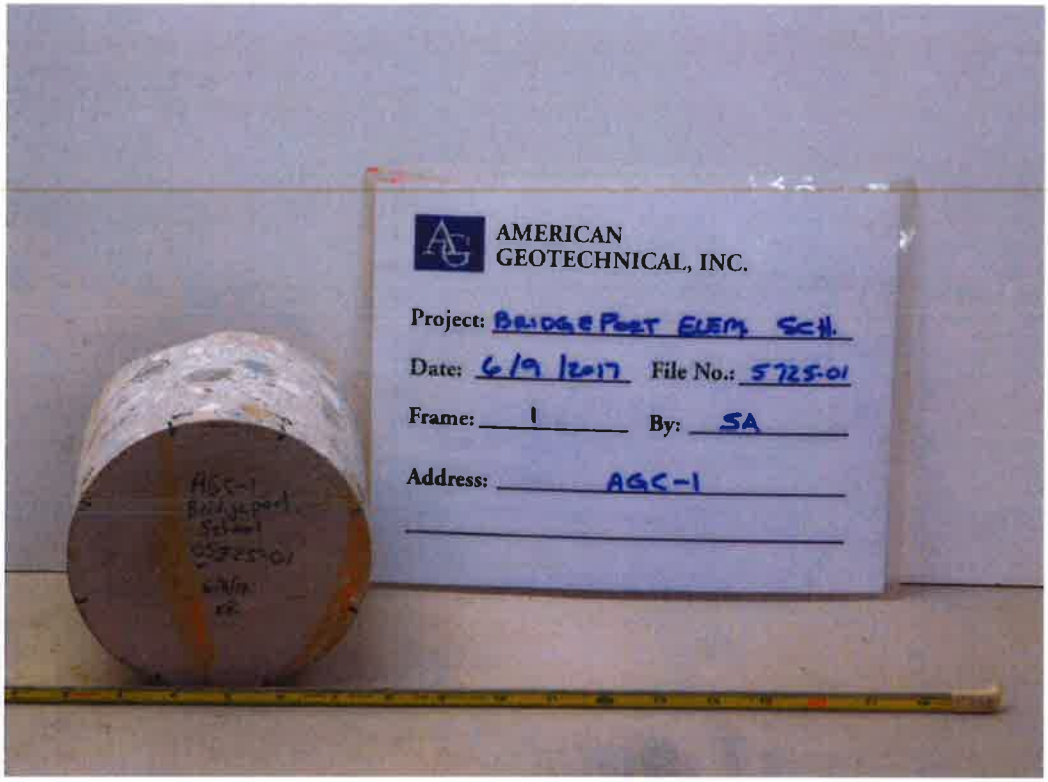
● REINFORCEMENT LOCATION



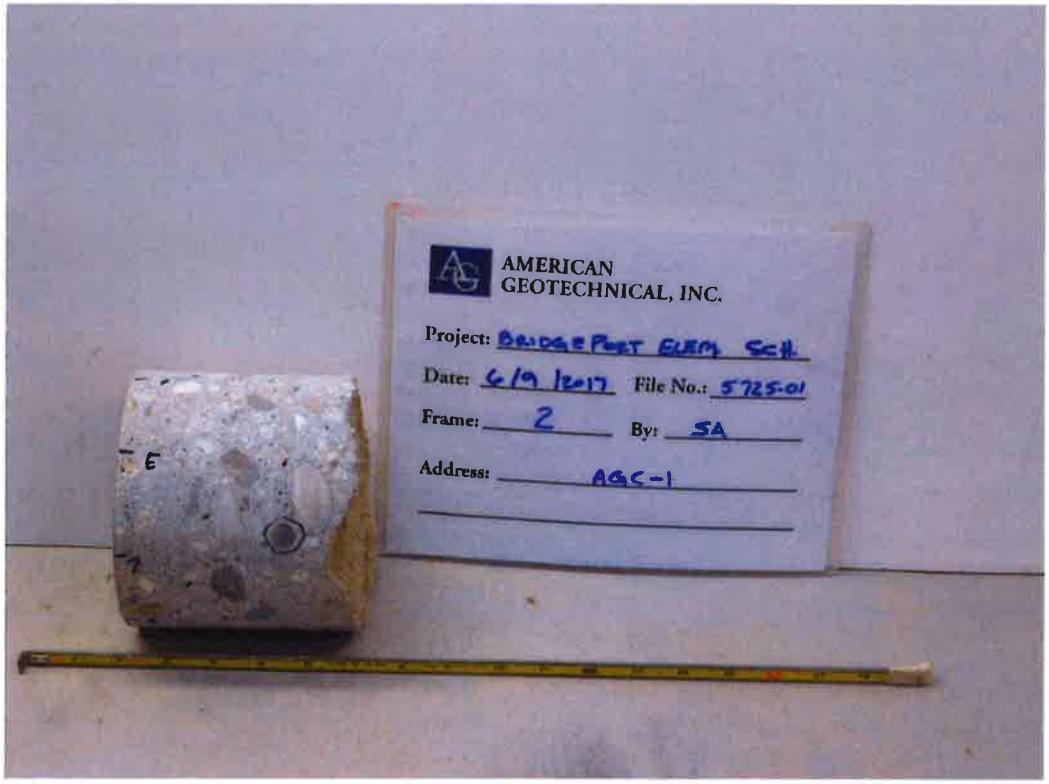
REINFORCEMENT: ☐WIRE MESH ☒REBAR ☐OTHER _____ ☒SIZE ½" ☐NO REINF.

LARGEST ROCK FRAGMENT 1.22 INCHES AIR BUBBLES (YES) NO

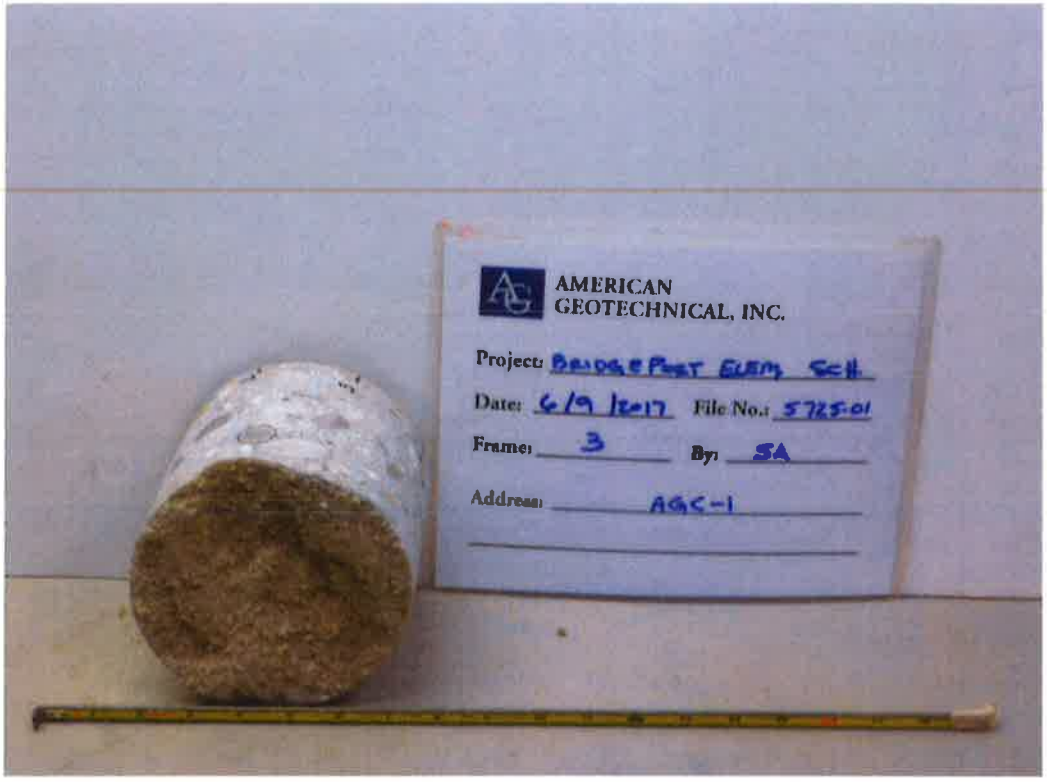
COMMENTS AIR POCKETS / MEMBRANE HAND CUT YELLOW (STE190?) 15 ML



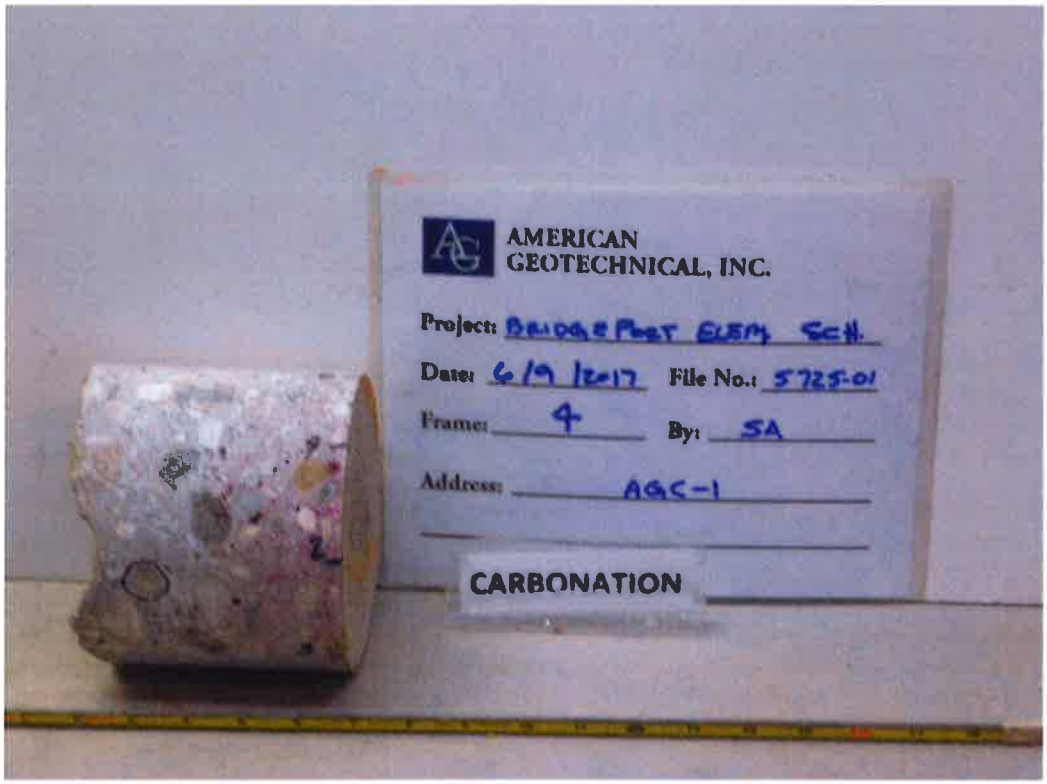
23670 Newhall Ranch Road- SA 6-9-17 (1)



23670 Newhall Ranch Road- SA 6-9-17 (2)



23670 Newhall Ranch Road- SA 6-9-17 (3)



23670 Newhall Ranch Road- SA 6-9-17 (4)

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CORE MEASUREMENTS

ASTM C174-87

F.N. 05725-01 PROJECT BRIDEPORT ELEM. SCH.

ADDRESS 23670 Newhall Ranch Road, Santa Clarita, CA

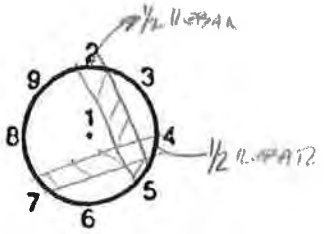
AG C-2 DATE CORED 6/3/2017. AG REP KR

LOCATION: ☐GARAGE ☐LIVING ROOM ☐DINING ROOM ☐FOOTING ☐FAMILY ROOM ☑OTHER _____

DATE MEASURED 6/6/2017 BY ST

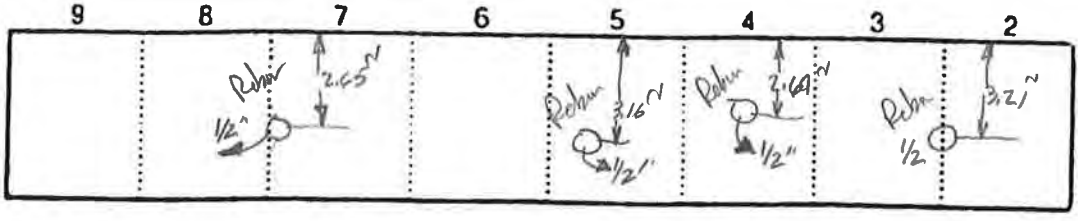
MEASUREMENT LOCATION	MEASUREMENT INCREMENTS	LENGTH (INCHES)
1	CORE CENTER	4.81
2	0°	4.82
3	45°	4.72
4	90°	4.78
5	135°	4.92
6	180°	4.98
7	225°	4.75
8	270°	4.85
9	315°	4.74
AVERAGE LENGTH (INCHES)		4.8

* CORE MEASUREMENTS WERE TAKEN AT 45 DEGREE INCREMENTS #2 ON CORE'S SMOOTHER INDICATES STARTING POINT (0 DEGREES) ROTATION WAS ACCOMPLISHED IN A CLOCKWISE DIRECTION WITH REFERENCE TO THE SMOOTHER END



CORE DIAMETER 5.07 INCHES

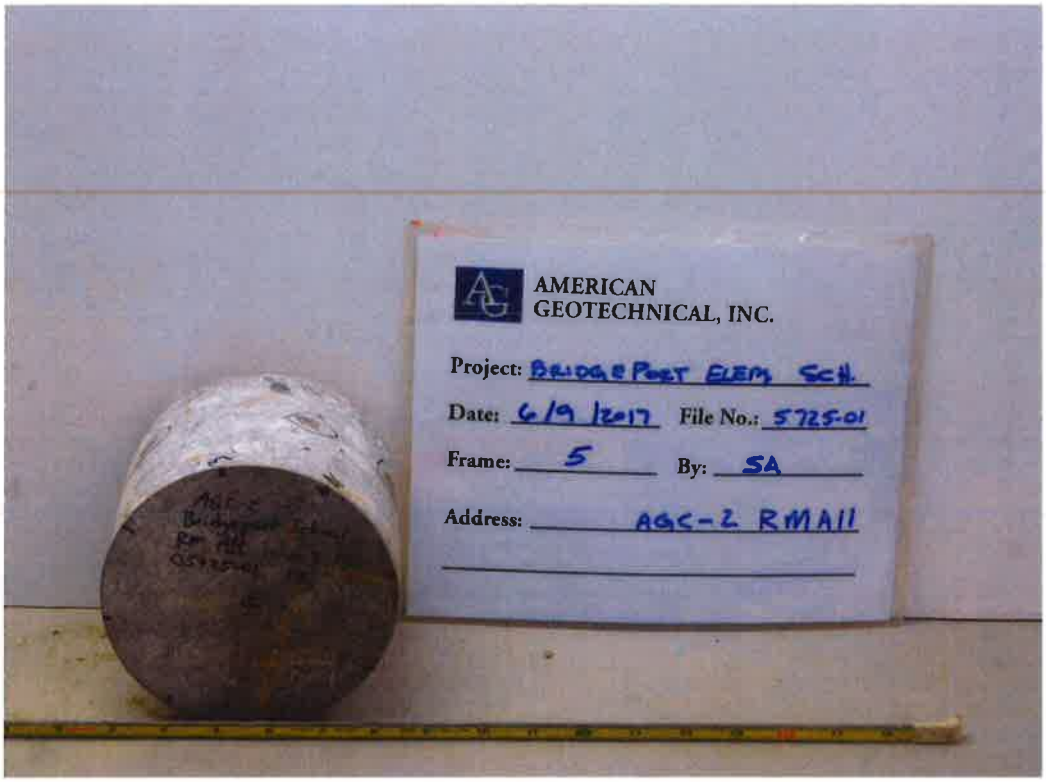
● REINFORCEMENT LOCATION



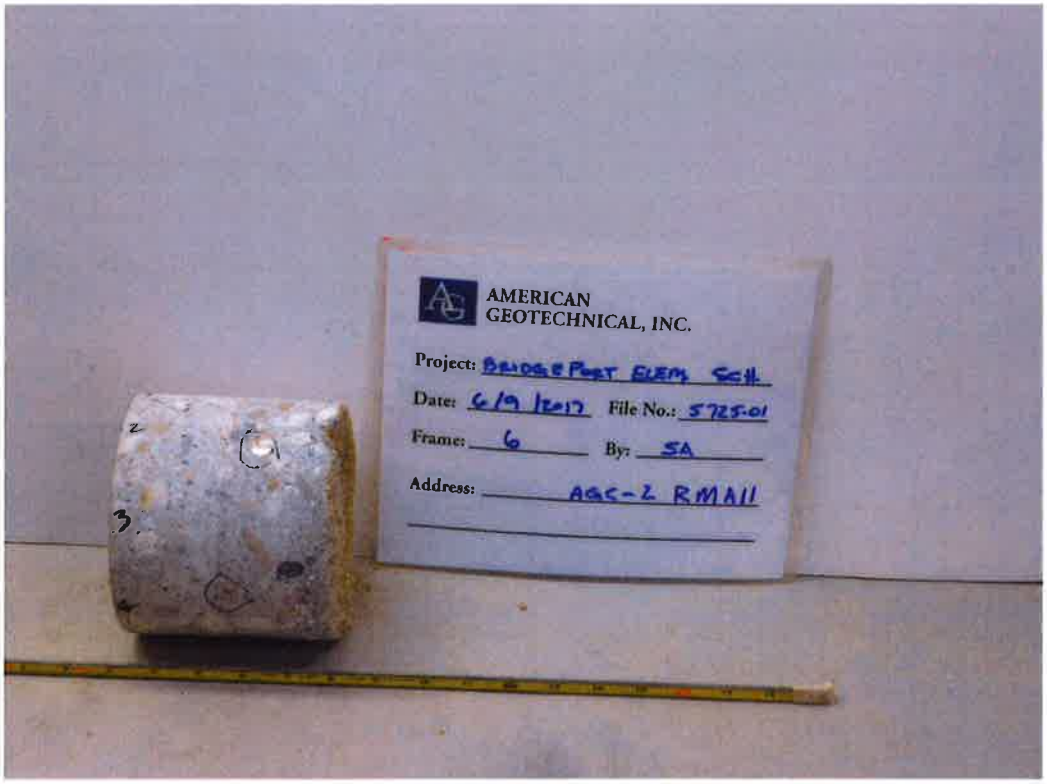
REINFORCEMENT: ☐WIRE MESH ☒REBAR ☐OTHER _____ ☒SIZE 1/2" ☐NO REINF.

LARGEST ROCK FRAGMENT 1.26 INCHES AIR BUBBLES (YES) NO

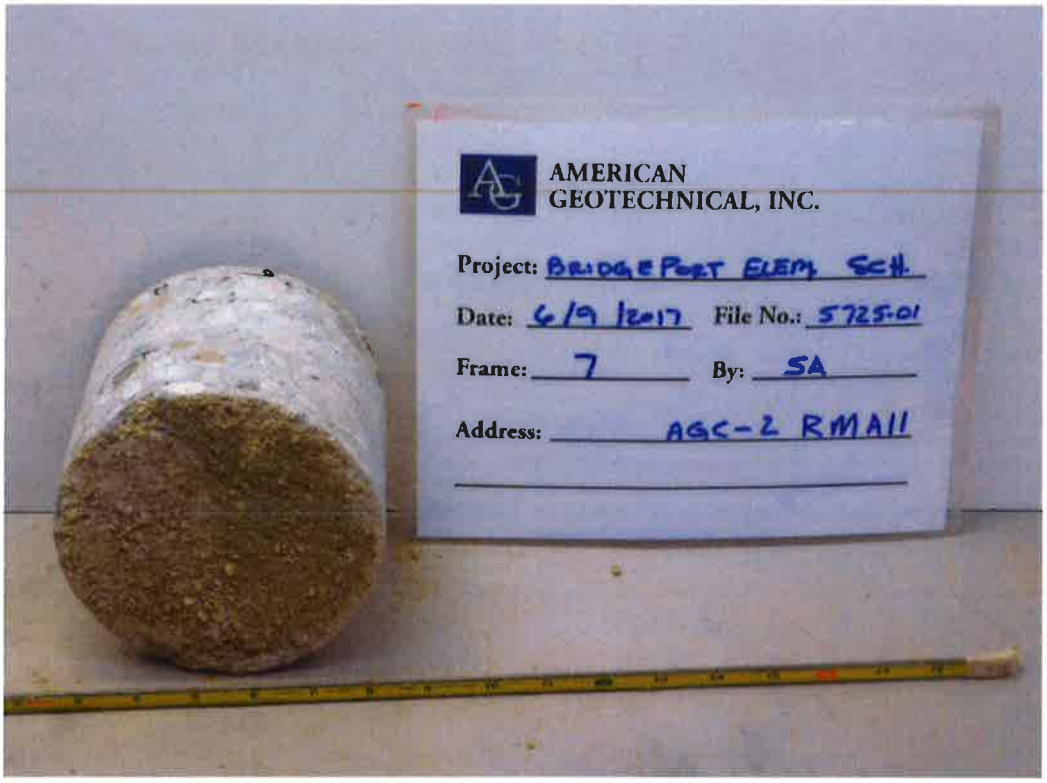
COMMENTS MEMBRANE - (STEMO? YELLOW 15 MIL)



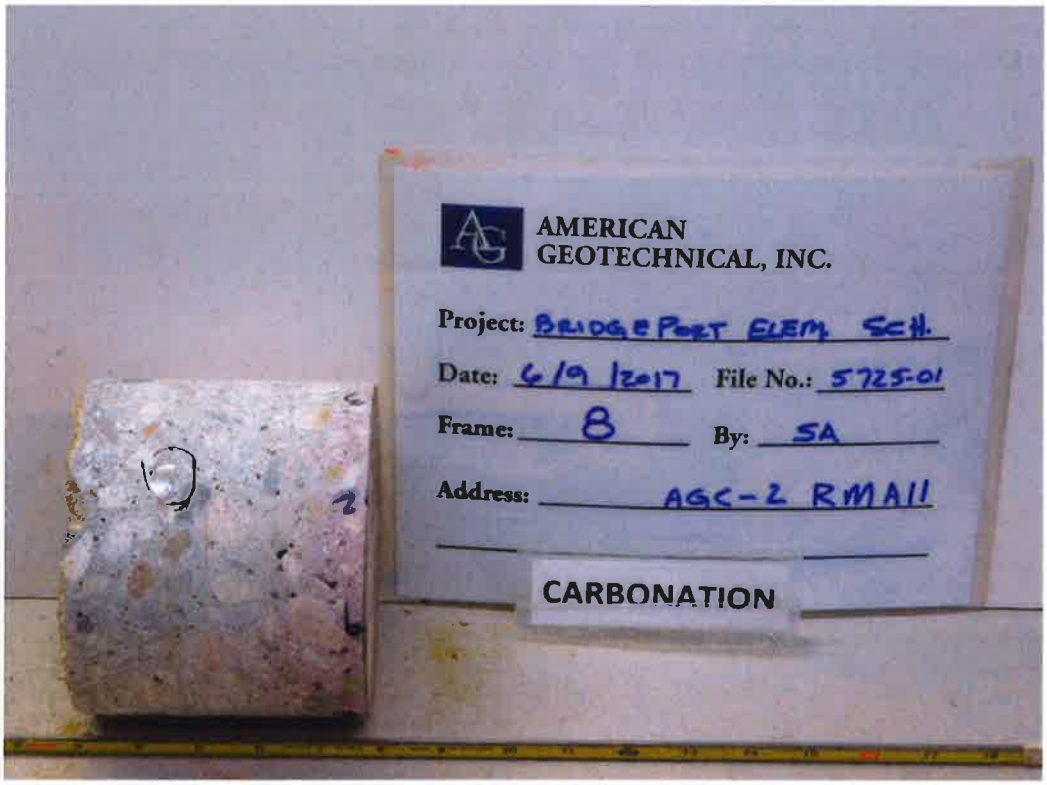
23670 Newhall Ranch Road- SA 6-9-17 (5)



23670 Newhall Ranch Road- SA 6-9-17 (6)



23670 Newhall Ranch Road- SA 6-9-17 (7)



23670 Newhall Ranch Road- SA 6-9-17 (8)

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CORE MEASUREMENTS

ASTM C174-87

F.N. 05725-01 PROJECT BRIDGEPORT ELEM. SCH.

ADDRESS (RM C-1)

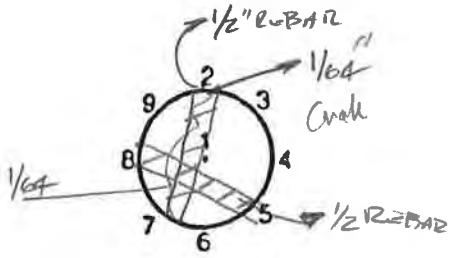
AG C-3 DATE CORED 6/3/2017 AG REP KR

LOCATION: ☐GARAGE ☐LIVING ROOM ☐DINING ROOM ☐FOOTING ☐FAMILY ROOM ☒OTHER

DATE MEASURED 6/6/1 BY SA

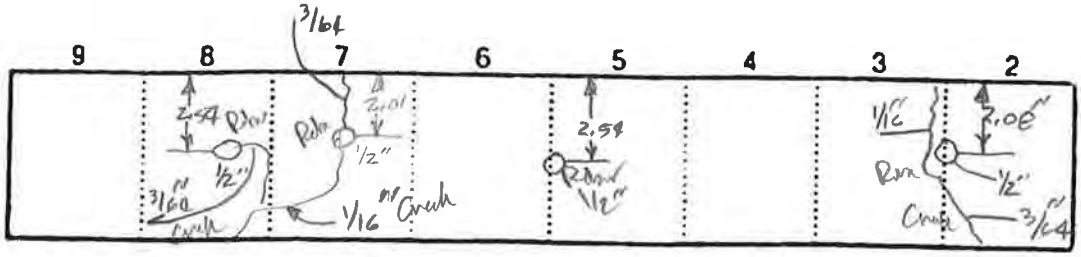
MEASUREMENT LOCATION	MEASUREMENT INCREMENTS	LENGTH (INCHES)
1	CORE CENTER	4.94
2	0°	4.04
3	45°	4.63
4	90°	4.61
5	135°	4.54
6	180°	4.67
7	225°	4.86
8	270°	4.85
9	315°	4.31
AVERAGE LENGTH (INCHES)		4.6

* CORE MEASUREMENTS WERE TAKEN AT 45 DEGREE INCREMENTS #2 ON CORE'S SMOOTHER INDICATES STARTING POINT (0 DEGREES) ROTATION WAS ACCOMPLISHED IN A CLOCKWISE DIRECTION WITH REFERENCE TO THE SMOOTHER END



CORE DIAMETER 5.7 INCHES

● REINFORCEMENT LOCATION

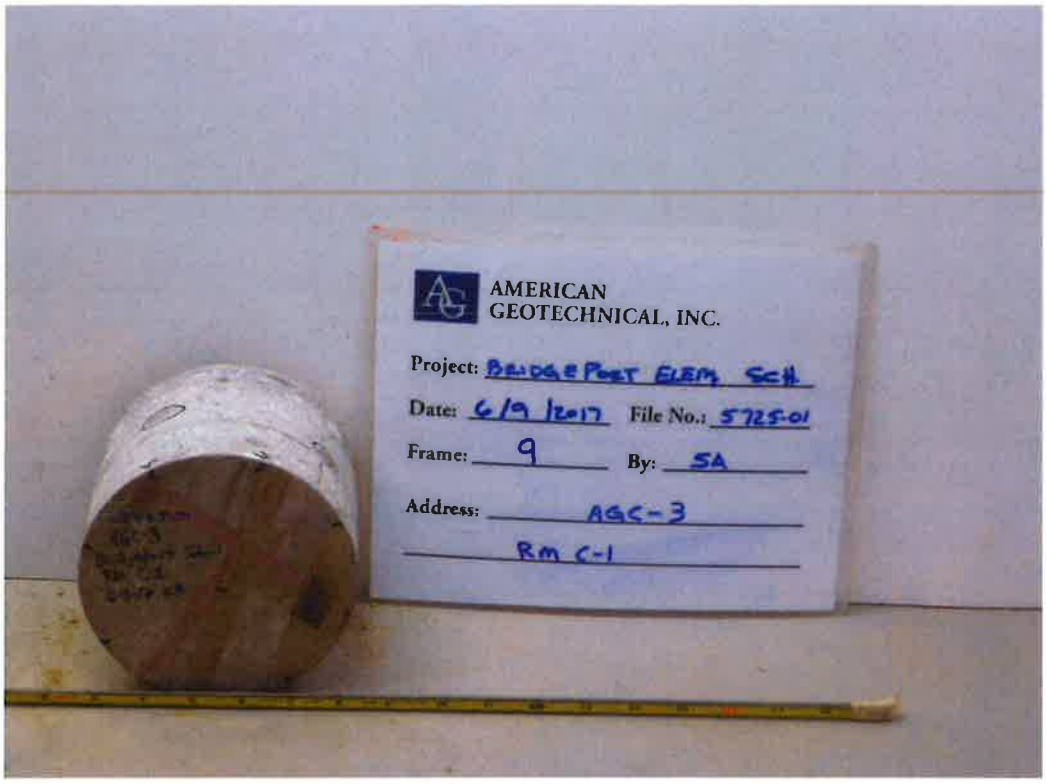


REINFORCEMENT: ☐WIRE MESH ☒REBAR ☐OTHER ____ ☒SIZE 1/2 ☐NO REINF.

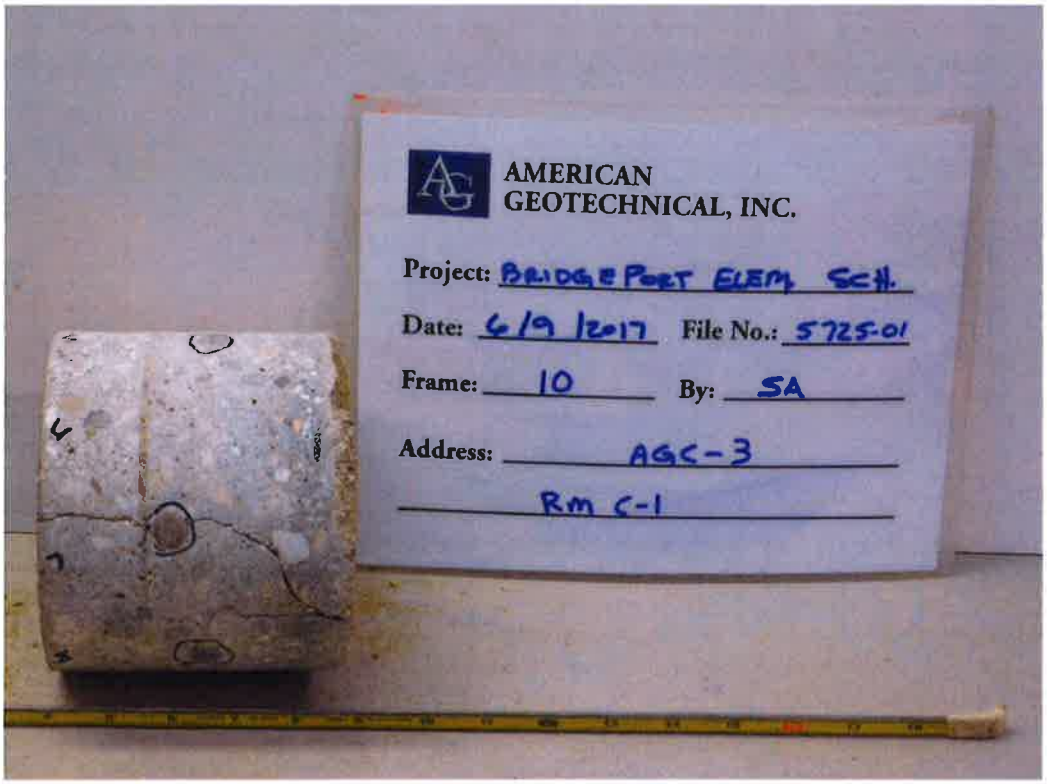
LARGEST ROCK FRAGMENT 1.17 INCHES AIR BUBBLES (YES) NO

COMMENTS CRACK COMPLETLY THROUGH THE CORE.

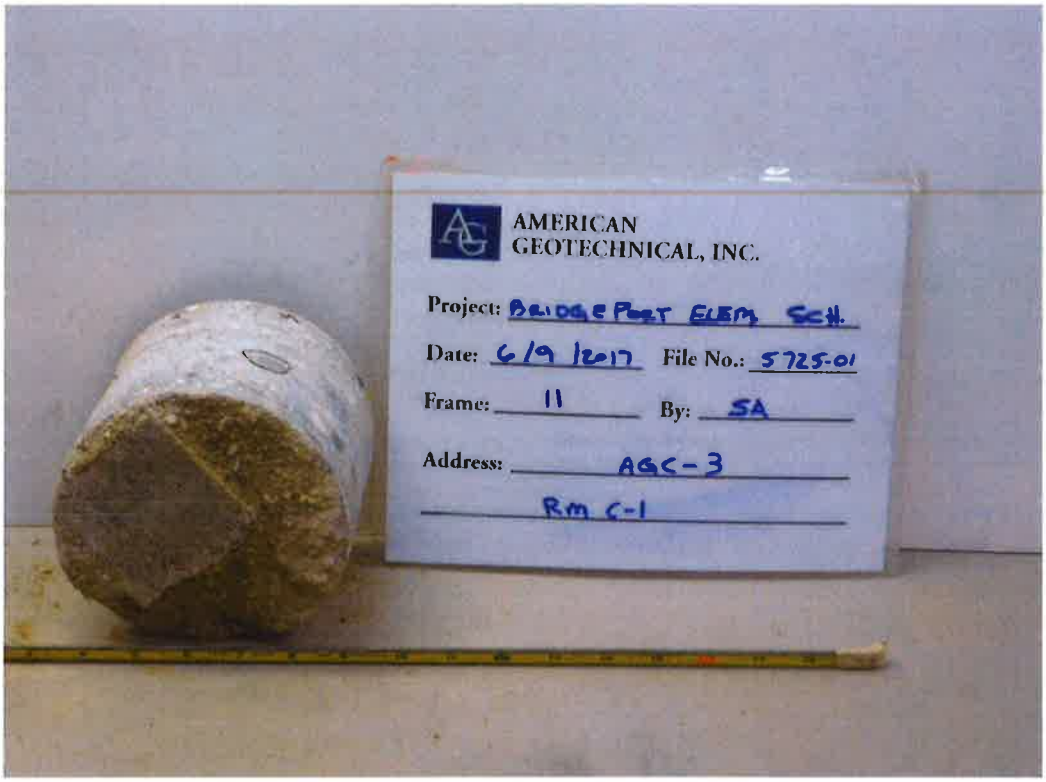
MEMBRANE - STEGO YELLOW 15 MIL HAND CUT



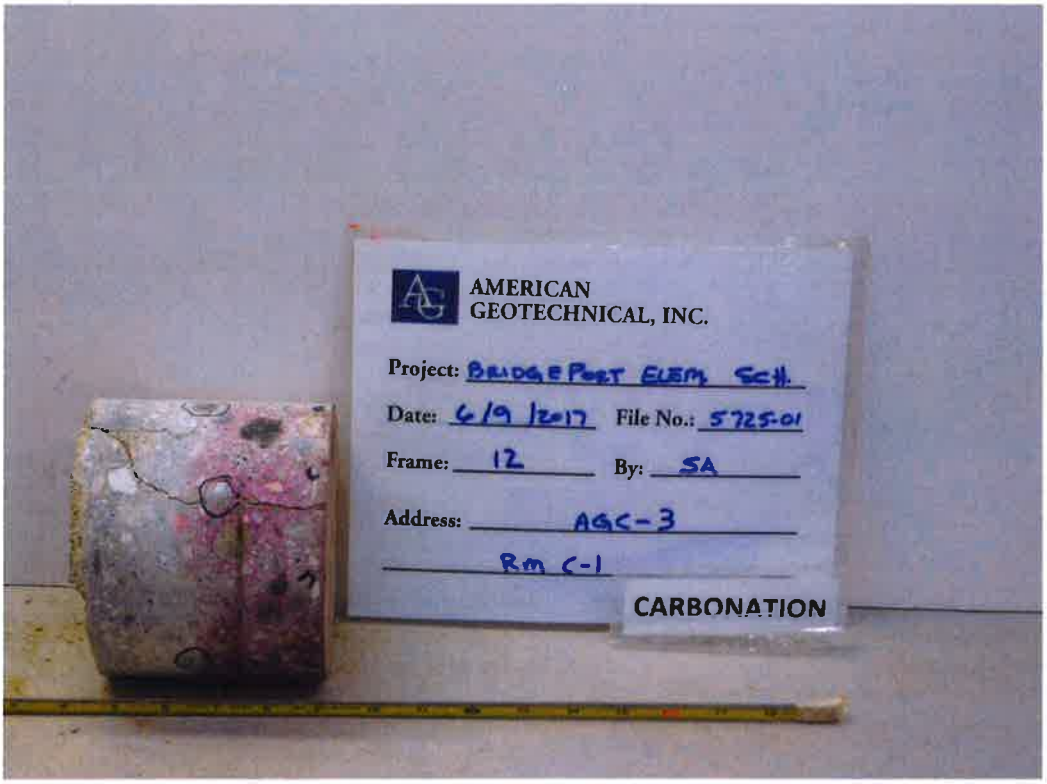
23670 Newhall Ranch Road- SA 6-9-17 (9)



23670 Newhall Ranch Road- SA 6-9-17 (10)



23670 Newhall Ranch Road- SA 6-9-17 (11)



23670 Newhall Ranch Road- SA 6-9-17 (12)

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