GEOTECHNICAL ENGINEERING SERVICES REPORT

For the

PROPOSED ROADWAY IMPROVEMENTS
PALMETTO ROAD FROM MANATEE ROAD TO BAYVIEW DRIVE
TOWN OF BELLAIR, FLORIDA

Prepared for

Department of Public Works
901 Ponce de Leon Boulevard
Belleair, FL 33756

Prepared by

Professional Service Industries, Inc.
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PSI Project No. 0775-2061

May 23, 2014

Information To Build On
Engineering • Consulting • Testing

May 23, 2014

Department of Public Works
901 Ponce de Leon Boulevard
Belleair, FL 33756

Re: Geotechnical Engineering Services Report
Proposed Roadway Improvements
Palmetto Road from Manatee Road to Bayview Drive
Town of Belleair, Florida
PSI Project No.: 0775-2061

Gentlemen:

Professional Service Industries, Inc. (PSI) is pleased to present our geotechnical engineering services report for the referenced roadway. The results of the study are discussed in the accompanying report.

Should there be any questions, please do not hesitate to contact our office at (813) 886-1075. PSI would be pleased to continue providing construction materials testing (CMT) services throughout the implementation of the project. We look forward to working with you and your organization on this and future projects.

Respectfully submitted,

Professional Service Industries, Inc.

MARTIN E. MILLBURG LICENSE No. 36584 STATE OF FLORIDA PROFESSIONAL ENGINEER

5/23/2014

Martin E. Millburg, P.E.
Senior Geotechnical Engineer
Florida License No. 36584

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Staff Specialist

Enclosures

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1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI) has completed a geotechnical exploration for the proposed Roadway Improvement at Palmetto Road from Manatee Road to Bayview Drive town of Belleair, Florida. Our services were authorized by the Department of Public Works on May 12, 2014 by an email from Mr. Keith Bodeker, Construction Project Supervisor for the Town of Belleair. This study has been performed in general accordance with our Geotechnical Engineering Services Proposal dated May 8, 2014, PSI Proposal No. 0775-123269.

1.2 PROJECT DESCRIPTION

PSI understands the project includes roadway improvements extending about 3,200 feet along Palmetto Road from Manatee Road to Bayview Drive. Full depth restoration is planned.

The geotechnical recommendations presented in this report are based on the available project information, site location, and the subsurface materials described in this report. If any of this project description information is incorrect or has changed, please inform PSI so that we may amend, if appropriate, the recommendations presented in this report.

1.3 PURPOSE AND SCOPE OF SERVICES

Based upon the requested scope of work and our current understanding of the project, we have outlined below a scope of services to provide a geotechnical study for the primary purpose of developing pavement and recommendations for the planned development.

PSI performed a total of eight (8) pavement cores with 6 feet deep auger borings. During the performance of the auger borings, soil samples were obtained at regular intervals to allow for classification of the soils. After completion of the soil borings, the borehole locations were backfilled and the pavement repaired with cold patch asphalt.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE LOCATION AND DESCRIPTION

The proposed Roadway Improvements are planned for Palmetto Road from Manatee Road to Bayview Drive. The site is in a residential area with many trees and vegetation present. The existing roadway pavement surface is worn with significant cracking and repaired areas present.

2.2 FIELD INVESTIGATION

A field exploration program was conducted consisting of eight (8) auger borings at a depth of 6 feet along the proposed road. The boring location was backfilled and the pavement repaired with cold patch asphalt. The boring locations and soil/rock profiles are shown in the attached **Appendix**.

2.3 SUBSURFACE CONDITIONS

In general, the performed eight (8) auger borings at a depth of 6 feet encountered medium to fine sands (AASHTO Classification A-3). All auger boring locations proved to have uniform strata.

The soil profiles presented on **Sheets 1** and **2** of the **Appendix** include soil descriptions and stratifications. Water level information obtained during field operations is also shown on these soil profiles.

2.4 GROUNDWATER INFORMATION

Groundwater was found at depths ranging from 3 to 4 feet. It should be noted that groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. In addition, a seasonal effect will also occur in which higher groundwater levels are normally recorded in rainy seasons. We estimate the normal seasonal high water level (SHWL) at this site will be approximately 1 ½ to 2 ½ feet in depth.

PSI recommends that the contractor determine the actual groundwater levels at the site at the time of the construction activities.

3.0 EVALUATION AND RECOMMENDATIONS

3.1 GENERAL

Based upon the observed pavement condition and subsurface evaluation, the roadway base and subgrade appear to be satisfactory

We anticipate the roadway be designed to the Residential Light to Medium traffic level of Pinellas County Standards. Our pavement recommendations are presented below.

3.2 PAVEMENT RECOMMENDATIONS

Pinellas County Public Works recommended base thickness for Residential Light to Medium traffic ranges from 6 to 8 inches.

The recommended thickness of the stabilized subgrade for Residential Light to Medium traffic ranges from 9 to 12 inches.

Generic pavement recommendations for issues such as compaction, filling, FDOT procedures and other issues are presented below.

Any fill utilized to elevate the cleared pavement areas to subgrade elevation should consist of clean to slightly silty fine sands uniformly compacted to a minimum density of 95 percent of the modified Proctor maximum dry density (AASHTO T 180) up to the bottom of the pavement subgrade.

The upper 12 inches of subgrade immediately beneath the pavement section should be compacted to a density of no less than 98 percent of the modified Proctor value. We anticipate this subgrade will need to be stabilized to bring the LBR value up to the required value of 40.

The choice of pavement base type will depend on final pavement grades. If there is a minimum separation of 18-inches between the bottom of the base and the normal seasonal high groundwater level at this site, limerock can be utilized. However we think in many areas, the SHWL will be too high to allow a conventional limerock base be used. We suggest crushed concrete, shell, or Asphalt Base Course can be considered for this purpose. Base materials should meet FDOT requirements including compaction to 98 percent of its maximum dry density as determined by the modified Proctor test (ASTM D-1557) and a minimum LBR of 100 percent. Crushed concrete should be graded in accordance with FDOT Standard Specification Section 204. The subgrade should be firm and true to line and grade prior to paving. Traffic should not be allowed on the subgrade as the base is placed to avoid rutting.

Based on the results of our evaluation, it is recommended that the total asphaltic concrete thickness consist of Type S-1 (or SP-9.5) asphaltic concrete material with a minimum of 1½ inches. The asphaltic concrete should meet standard FDOT material requirements and placement procedures as outlined in the current FDOT Standard Specifications for Road and Bridge Construction. The asphaltic concrete should be compacted to a minimum of 98% of the Marshall maximum laboratory unit weight (or 93% of the maximum theoretical specific gravity (Gmm) if using type SP-9.5). Flexible pavement design recommendations are summarized in the following table. The range in base and subgrade section recommendations reflects the range in values for Pinellas County Public Works guidelines.

Component	Thickness, Inches
Asphaltic Concrete, Type SP-9.5	1 ½
Base	6-8
Stabilized Subgrade	9-12

Type B-12.5 asphaltic base could be used to replace the subgrade and base. Six (6) to eight (8) inches of B-12.5 will be required depending upon whether the roadway design is

designed for light or medium traffic. The subgrade soils supporting the Type B-12.5 base should be compacted to a minimum dry density of at least 98% of its modified Proctor value.

3.3 FILL AVAILABILITY

The fine sands encountered in the borings can be used as fill material provided it is free of large rocks (>1/2 inch), significant clay, organics or other deleterious materials.

4.0 REPORT LIMITATIONS

The Geotechnical Engineer warrants that the findings, recommendations, specifications or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

The scope of services also does not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on or below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

Florida is underlain by a soluble limestone formation, which can dissolve and result in surface subsidence and the formation of sinkholes. A more comprehensive assessment of the site for the potential for sinkhole development typically includes Ground Penetrating Radar (GPR) studies and the extension of deeper soil borings into the underlying limestone formation. Such an assessment is beyond the scope of this proposed study, but can be performed at significant additional cost, if desired.

The recommendations submitted are based on the available subsurface information obtained by PSI and design details furnished by the Town of Bellair for the proposed project. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during development, PSI should be notified immediately to determine if changes in the recommendations are required.

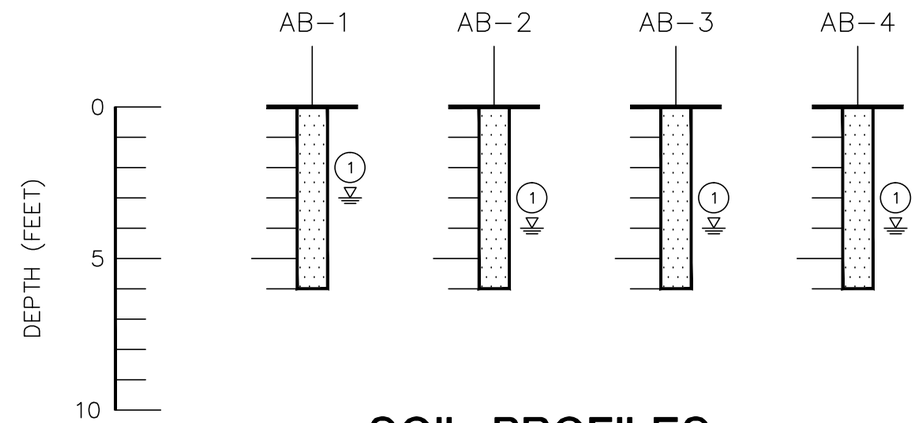
After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of the Town of Bellair and its consultants for the specific application to the proposed roadway improvements to be located at Palmetto Road from Manatee Road to Bayview Drive.

APPENDIX

BORING LOCATION PLAN

0 200'

PLAN SCALE



SOIL PROFILES

0 5'

VERTICAL SCALE

LEGEND

(1) Light gray/gray/dark brown/brown/light brown medium to fine SAND (SP)

A-3 AASHTO group symbol as determined by visual review

Groundwater level, May 2014

Approximate Pavement Core and Hand Auger boring location

DRAWN	DJG
CHECKED	MEM
APPROVED	MEM
SCALE	NOTED

GEOTECHNICAL SERVICES
PROPOSED ROADWAY IMPROVEMENTS
TOWN OF BELLAIR, FLORIDA

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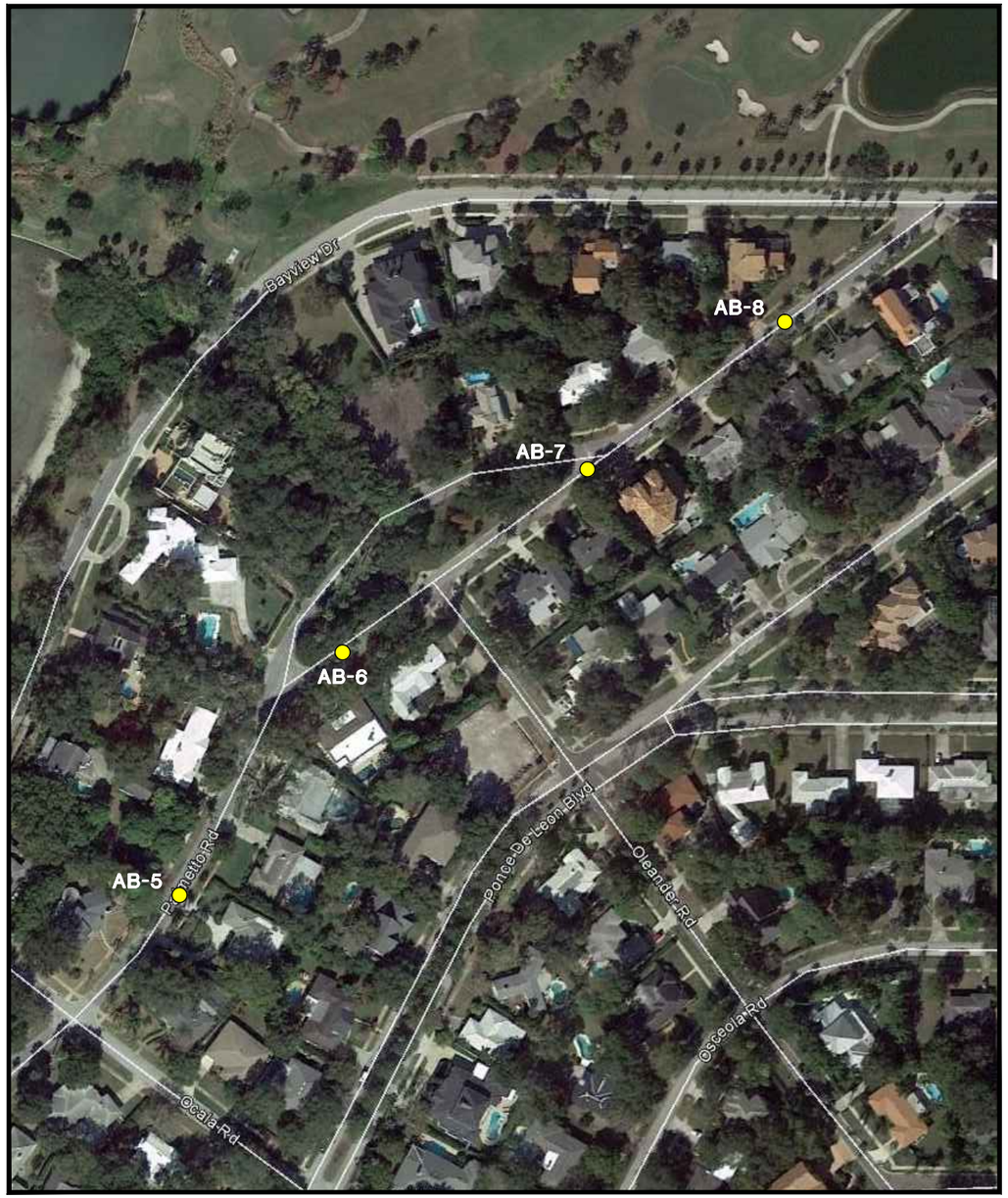
DATE	PROJ. NO.	
MAY 14	07752061	SHEET 1

P:\775-Geo\07752061 Belleair Palmetto Avenue\cad\07752061



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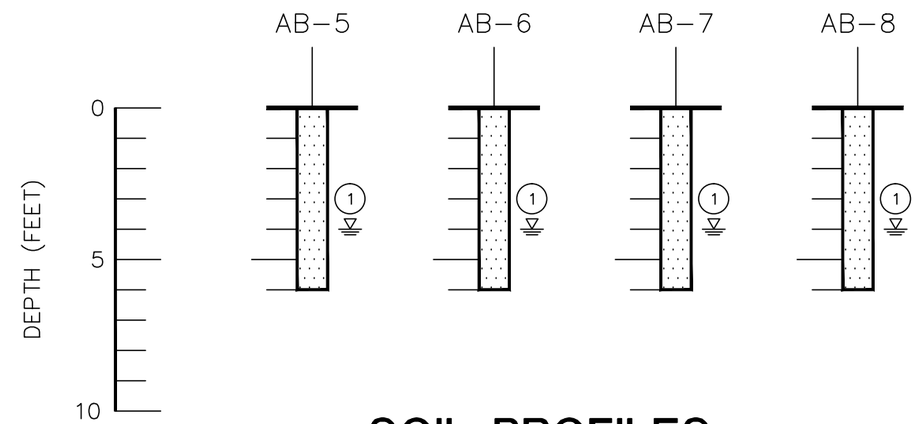

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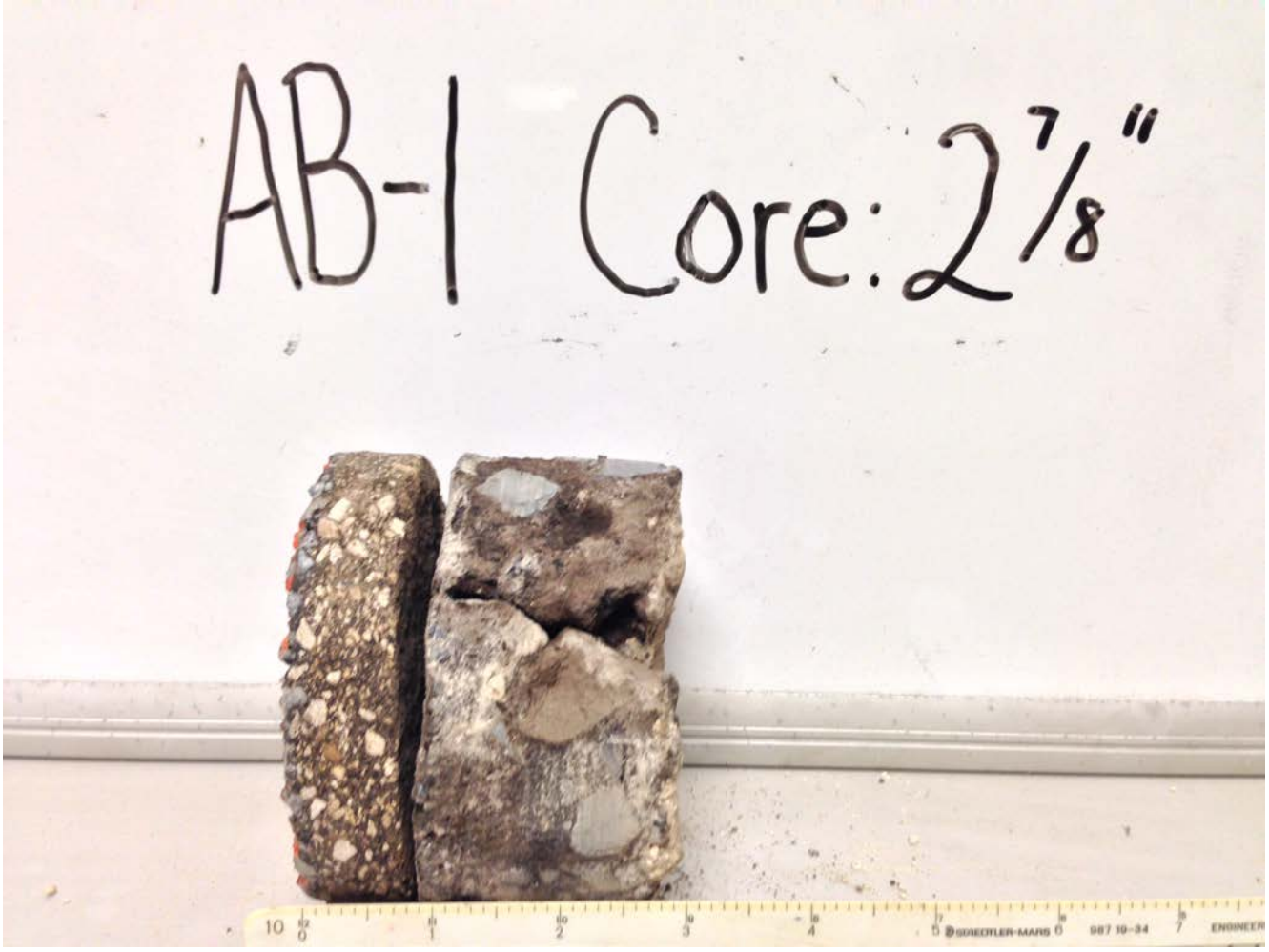
DATE	PROJ. NO.	
MAY 14	07752061	SHEET 2

P:\775-Geo\07752061 Bellear Palmetto Avenue\cad\07752061

Palmetto Road Pavement Cores		
Boring	Core (inches)	Base (inches)
AB-1	2 7/8	6
AB-2	2 5/8	6
AB-3	2	6
AB-4	3	6
AB-5	2 5/8	6
AB-6	3 5/8	6
AB-7	2 3/4	6
AB-8	4	6

A limerock base was found at all borings.

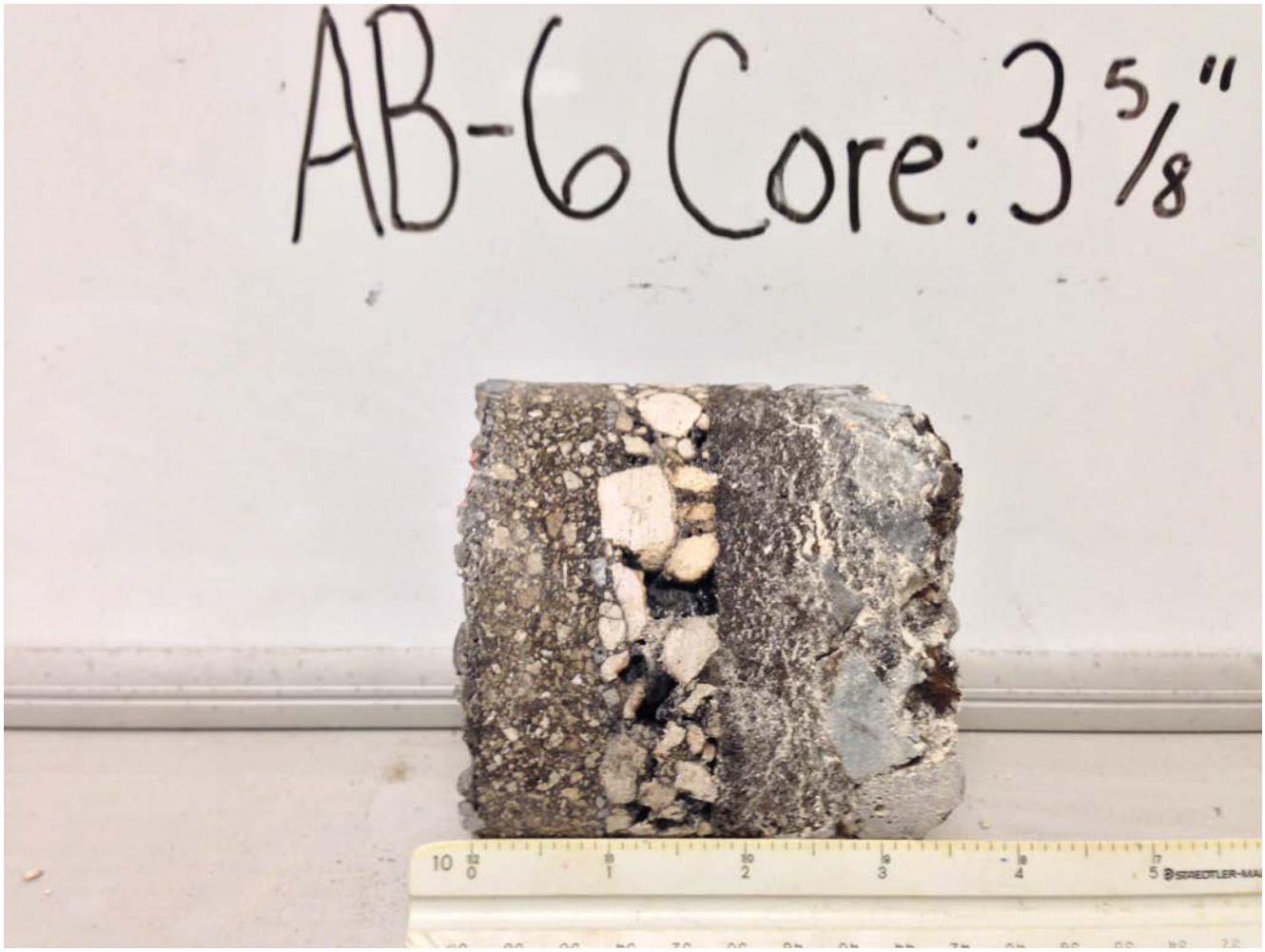

AB-1 Core: 2 7/8"

AB-2 Core: 2 5/8"

AB-3 Core: 2"

AB-4 Core: 3"

AB-5 Core: 2 5/8"


AB-6 Core: 3 5/8"

AB-7 Core: 2¾"

AB-8 Core: 4"
STAEDTLER-MARS
987 19-34