



April 9, 2021

The Lakes Homeowners Association
529 Saluda River Road
Myrtle Beach, South Carolina 29588

Attention: Mr. Doug Owens

Reference: **Report of Pavement Exploration Services**
Pavement Inventory and Rehabilitation Plan – The Lakes
Surfside Beach, South Carolina
S&ME Project No. 3563-20-064

Dear Mr. Owens:

As requested, we have completed our work for the above referenced project. Our work was conducted in general accordance with our Proposal No. 35-2000327, dated August 10, 2020, and authorized by Doug Owens on December 2, 2020.

◆ Project Information

Project information was provided during a phone call on July 27, 2020 between Doug Owens (The Lakes) and Josh Jordan (S&ME). From this phone call we understood that there are approximately 5 ½ miles of two-lane roadway within The Lakes which are approximately 35 years old. We were contracted to perform a pavement inventory and exploration, including geophysical characterization using Ground Penetrating Radar (GPR), and develop a generalized future pavement rehabilitation plan. A Site Vicinity Map is attached to this report as **Figure 1**.

To perform the pavement inventory, we made use of Ground Penetrating Radar (GPR), in conjunction with a limited core sampling program. The Coring Test Locations are shown on **Figure 2** attached.

◆ Exploration Procedures

Representatives of S&ME visited the site on January 13, 2021 and February 11, 2021, to observe and test the existing pavement areas located within the community.

GPR Methodology, Field Survey, and Data Processing

On January 13, 2021, S&ME conducted a Ground Penetrating Radar (GPR) survey to estimate the layering and thicknesses of the pavement structures within the community. For presentation purposes, the GPR survey areas are identified as Areas A, B, and C on **Figure 3** attached.

GPR transmits electromagnetic waves into the pavement from an antenna at a specific frequency and measures the travel time for wave reflections to be received from interfaces between materials with differing dielectric properties (e.g. asphalt/base course, etc.). The intensity of the reflected GPR signal is a function of the contrast in



the electrical properties (i.e. dielectric permittivity) at the interface, the conductivity of the material that the signal is traveling through, and the frequency of the signal. GPR antennas can be either air-launched (horn-type) or ground-based. However, horn antennas are generally necessary for high speed data acquisition as they are suspended about 18 inches off the ground. Layer-specific dielectric permittivity used for depth calculations are also automatically generated when using an air-launched antenna and preferred for pavement evaluations. A distance measuring interval (DMI) encoder, attached to the vehicle, is used for triggering the GPR signal and to have a distance reference. These measurements are also typically supported with a global positioning system (GPS), which sends a continuous data output stream to the GPR controller during acquisition.

We used a Geophysical Survey Systems, Inc. (GSSI) RoadScan™ 30 system equipped with a 2 GHz air-launched horn antenna using a sub-meter GPS as positioning support in general accordance with ASTM D4748 *"Determining the Thickness of Bound Pavement Layers Using Short-Pulse Radar"*. GPR profiles were collected in both directions at 3 scans per foot (i.e. every 4 inch) and post-processed using the GSSI Radan® 7 software with RoadScan™ module. Cores performed at the site were used to assist with our interpretations.

Pavement Core Sampling

On February 11, 2021, S&ME visited the site to core through the pavement at nine test locations. The core test locations were chosen based upon the initial GPR data and were assigned to help calibrate and more accurately define the pavement layers. These coring locations are shown on **Figure 2** attached to this report, and are labeled as C-1 through C-9. Asphalt and concrete pavement layers were sampled using a diamond bit coring device in general accordance with ASTM D 979, *"Standard Practice for Sampling Bituminous Paving Mixtures."* Coring of the pavement also allowed penetration of the underlying layers by soil drilling equipment.

The base layer and subsoils encountered were identified in the field by cuttings brought to the surface. Penetrations of asphalt or concrete surfaces made during the drilling process were patched with commercially available asphalt patch or grout material after drilling and sampling was complete. Patch material was placed to provide a surface flush with the existing pavement adjacent to the boring. The patches are intended to be temporary until new paving work is performed, and are not intended for permanent use.

◆ Summary of Findings

The pavement conditions that we observed appear to be generally consistent with our expectations for pavements of these types and ages. Approximately half of the roadways explored were Portland cement concrete (PCC) pavements placed directly over subgrade soils. Of the asphalt roadways explored, many were asphalt over crushed concrete, and the rest were asphalt over Marine Limestone Base Course (MLBC) over subgrade soils. The types of distress that we observed in the PCC roadways consisted of isolated cracked concrete panels, some of which had depressions present. The forms of distress observed in the asphalt roadways consisted of widespread aggregate polishing, as well as isolated alligator fatigue cracking and transverse cracking. The observed distresses are described below with example photos.



Although distresses were present in all the pavements, this is not uncommon for pavements of this age. Where cracking was present the cracks were typically thin and widely spaced, not resulting in complete pavement failure. Where depressions are present it is possible that subgrade fill was not compacted properly and over time areas of the pavement settled following the soil beneath it.

Aggregate Polishing

Polished aggregates were observed on most of the asphalt pavement surfaces observed. Polishing occurs when the bitumen (the asphaltic material) on top of the aggregates in the asphalt mixture has worn away. Over time, most aggregates are susceptible to wearing to a smooth finish or texture under repeated traffic. This may reduce traction and contribute to loss of ductility. It also reduces the adhesion of surface sealers that may be applied. See **Photo 1** below for an example of the distress observed.

Photo 1: Aggregate Polishing





Transverse Cracking

Slight to moderate transverse cracking was observed on each of the roadways except Harbor Drive. Transverse cracks are those oriented generally perpendicular to the pavement centerline. This type of cracking may be caused by fatigue or shrinkage of the asphalt, or deformation of the base or subgrade. Transverse cracking can also be caused by shrinkage of the underlying base material which then reflects up through the overlying asphalt, which is a typical response to cement-stabilized base materials. See **Photo 2** below for an example of transverse cracking.

Photo 2: Transverse Cracking

		Date: 2/11/2021
		Photographer: A. Limeburner
Location / Orientation	Waccamaw River Road	
Remarks	Moderate Transverse Cracking	



“Alligator” Fatigue Cracking

Fatigue (“alligator”) cracking was observed in some isolated locations on the asphalt roadways. Alligator cracking generally indicates areas where the base course and/or subgrade are weaker than necessary to support the applied traffic loads, and/or the asphalt is too thin for the wheel loads applied. The deflection of the pavement under traffic loading in these areas eventually causes the asphalt to break up and separate into small pieces due to excess tensile stress and strain at the bottom of the asphalt layer. Some of the roadways that we explored displayed moderate to severe alligator cracking, indicating a prolonged period of distress. See **Photo 3** below for an example of the distress observed.

Photo 3: “Alligator” Fatigue Cracking

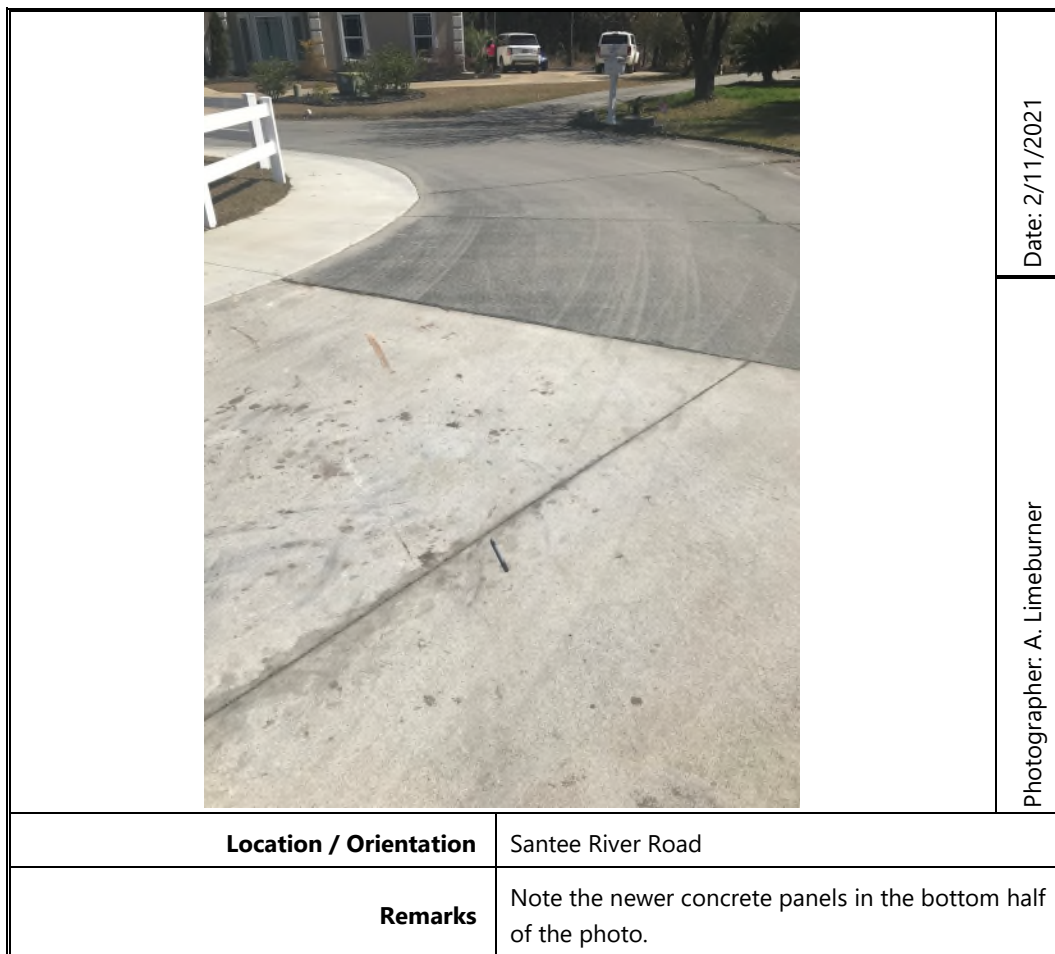
		Date: 2/11/2020
		Photographer: A. Limeburner
Location / Orientation	Hatteras River Road	
Remarks	Isolated but severe alligator cracking.	



Previously Replaced Concrete Panels

On some of the PCC roadways it was observed that some of the concrete panels have been replaced in the past. This indicates that the concrete panels may have failed due to age or poor subgrade conditions. See **Photo 4** below for an example of the replaced concrete panels observed.

Photo 4: Existing PCC Patch



Cracks and Depressions in the Concrete

We also observed depressions (with or without significant associated cracking) on many of the concrete roadways in the exploration area. These depressions appeared randomly through the concrete pavement and may be a result of loose or softened subgrade or base materials underneath. The cracks and depressions may also be a result of poor subsurface drainage. **Photo 5** below shows an area of cracked and depressed concrete with standing water around it. This photo was taken after a period of relatively dry weather.

Photo 5: Cracked and Depressed Concrete

		Date: 2/11/2021
		Photographer: A. Limeburner
Location / Orientation	Enoree Court	
Remarks	Note the standing water and the water coming through the cracked concrete.	

Summary of GPR Survey Results

This section summarizes the findings of the GPR survey. For additional details refer to **Figures 3 through 13**.

1. Based on the core data, three (3) primary pavement layers were interpreted from the GPR data sets: asphalt, PCC, and MLBC. Three types of pavement sections were encountered:
 - A. Asphalt overlaying crushed concrete and subgrade soils.
 - B. PCC overlaying subgrade soils.
 - C. Asphalt overlaying MLBC and subgrade soils.



2. Asphalt thickness appears to generally range between about 1 and 5 inches. PCC thickness appears to generally range between about 4 and 12 inches. MLBC thickness appears to generally range between about 4 and 12 inches.
 - A. Areas colored in **orange** and **red** on **Figures 4, 7 and 10** indicate areas where the asphalt layer appears to be less than 2 inches thick, which only occurred in a few of the explored roadways. Areas colored in **yellow** on **Figures 4, 7 and 10** indicate areas where the asphalt layer appears to be less than 2.5 inches thick, which only occurred in a few isolated spots.
 - B. Areas colored in **orange** and **red** on **Figures 5, 8 and 11** indicate areas where the PCC layer appears to be less than 6 inches thick, which occurred in several isolated spots. Areas colored in **yellow** on **Figures 5, 8, and 11** indicate areas where the PCC layer appears to be less than 7 inches thick, which was common throughout significant portions of the evaluated area.
 - C. Areas colored in **orange** and **red** on **Figures 6 and 9** indicate areas where the MLBC layer appears to be less than 6 inches thick, which occurred in only a few isolated areas. Areas colored in **yellow** on **Figures 6 and 9** indicate areas where the MLBC layer appears to be less than 7 inches thick, which occurred in several areas of the evaluated area.
3. Interpreted color-coded thickness plots for each of the pavement layers evaluated are presented in **Figures 4 through 11**.
4. Example GPR data cross-sectional vertical profiles highlighting the identified layers that we used for our interpretations at core test locations C-5 and C-6 are presented in **Figures 12 and 13**.

The color-coded thickness plots based on the GPR data are also available digitally in Google Earth (.KMZ) files.

Asphalt, Concrete, and Base Course Thicknesses at Core Test Locations

This section describes the results of the core sampling that was performed at test locations C-1 through C-9.

Beneath the asphaltic concrete (“asphalt”) pavement, crushed concrete was encountered at test locations C-2, C-5, and C-7. Marine limestone base course was encountered beneath the asphalt at test locations C-4, C-6, and C-9. At test locations C-3 and C-8 the roadways consisted of PCC underlain by subgrade soils.

The individual thickness of the layers observed within the pavement sections were measured and recorded, and these results are summarized in Table 1 below. Asphalt thicknesses ranged from 1 ½ to 9 inches at our core test locations. PCC thicknesses range from 5 ½ to 11 inches at our core test locations. MLBC thicknesses ranged from 5 ½ to 11 ¾ inches at our core test locations. This information was used to help calibrate the GPR data to generate the maps presented in **Figures 4 through 11**.



Table 1 – Existing Asphalt, Concrete, and Base Course Material Type and Thickness

Boring ID	Street Name	Asphalt Thickness (inches)	Concrete Thickness (inches)	Base Course Material Thickness (inches)	Base Material Type	Subgrade Soil Type (USCS)
C-1	Waccamaw River Rd.	9	-	-	-	SP
C-2	Waccamaw River Rd.	7	8	-	-	SC
C-3	Seneca River Rd.	-	5 ³ / ₄	-	-	SC
C-4	Broad River Rd.	1 ³ / ₄	-	11 ³ / ₄	Marine Limestone	SP
C-5	Ashley River Rd.	4	11	-	-	-
C-6	Pamlico Court	1 ¹ / ₂	-	5 ¹ / ₂	Marine Limestone	SP
C-7	Catawba River Rd.	5 ¹ / ₄	5 ¹ / ₂	-	-	SC
C-8	Black River Rd.	-	5 ³ / ₄	-	-	SC
C-9	Waccamaw River Rd.	2 ³ / ₄	-	9 ¹ / ₄	Marine Limestone	SC
Averages (where present):		4 ¹ / ₂	7 ¹ / ₄	8 ³ / ₄		

Subgrade Soil Conditions

Beneath the asphalt and base course material at each test location, our borings generally encountered brown poorly graded sand (USCS Classification “SP”) or gray clayey sand (SC). The soil was generally observed to be in a moist to wet condition.

Surface and Subsurface Water

Standing water was observed at many locations throughout the community both on the roadway and in the shallow drainage ditches adjacent to many of the roadways. Subsurface water was not encountered within the depth explored by the hand auger at any of the test locations. Water levels may fluctuate seasonally at the site, being influenced by rainfall variation, irrigation, and other factors.

◆ Conclusions

The pavements on this site generally exhibit evidence of excessive age and wear but do not generally exhibit a widespread failed condition. Based upon our observations, core samples, and geophysical test results, we have grouped the streets into three qualitative categories for rehabilitation planning purposes.

Category 1 includes roads that are currently experiencing the most distress and/or are the most heavily traveled.

Category 2 includes roads that exhibiting some distress but not as severely as Category 1 roads and/or appear to



be less heavily traveled. **Category 3** includes roads that appear to be in good overall condition and are not anticipated to require rehabilitation for some time.

1. Category 1

- A.** Waccamaw River Road
- B.** Hatteras River Road (asphalt portion)
- C.** Pamlico Court
- D.** Broad River Road
- E.** Seneca River Road

2. Category 2

- A.** Cooper River Road
- B.** Ashley River Road
- C.** Saluda River Road
- D.** Catawba River Road
- E.** Catawba Court (cul-de-sac)
- F.** Saluda River Road
- G.** Reedy River Road
- H.** Seneca Court
- I.** Santee Circle
- J.** Little Pee Dee Road
- K.** New River Road
- L.** Santee River Road

3. Category 3

- A.** Enoree Court
- B.** Acadian Way
- C.** Reedy Court
- D.** Hatteras Court
- E.** Lumber River Road
- F.** Lumber Court
- G.** Black River Road
- H.** Edisto Court
- I.** Tyger River Court
- J.** Lynches River Court

Drainage Issues

Drainage issues were observed within the community that we recommend be addressed. We understand that evaluation of the drainage systems was excluded from the scope of this exploration; however, to properly improve the condition of the roadways for long term stability the drainage of the community should be evaluated and improved as determined by the results of that evaluation.



The pavement rehabilitation steps that are recommended in the following section of this report will likely need to be performed sooner and more frequently if the drainage issues are not addressed.

◆ Recommendations

This section of our report describes our general recommendations for pavement rehabilitation at The Lakes. Our recommendations do not contain specific area measurements or quantities, nor should this report be considered as specifications for construction, as this was excluded from our scope of services; however, we do offer those consulting services and we would be happy to assist you with the development of project specifications suitable to solicit contractors for bidding purposes, or to measure quantities for each work item, if desired.

Rehabilitation Approaches

The following recommendations are considered to apply to all three of the Categories described above, where applicable.

Isolated Concrete Panel Replacement

Concrete panels that are exhibiting cracking and depressions should be individually removed and replaced, as follows.

1. Demolish the existing PCC pavement within the affected area including a nominal buffer around it to extend reliably into the surrounding unstressed area.
2. After removal of the distressed panel(s), undercut the existing subgrade soils to a nominal depth of 1 foot below bottom of the existing pavement elevation, and tamp the exposed soil subgrade with light, portable compaction equipment. Have the engineer observe this process to confirm suitable subgrade stability; perform any further necessary stabilization measures as directed by the engineer.
3. Install a layer of non-woven filter fabric such as TenCate Mirafi model 140N geotextile in the bottom of the excavation in general accordance with the manufacturer's recommended installation procedures.
4. Backfill the over-excavated zone to 6 inches below final grade elevation with washed, coarse, manufactured (crushed) granitic gravel size SCDOT No. 57 or No. 67.
 - ◆ Note: Do not substitute marine limestone aggregates for the recommended crushed granite.
5. Once the No. 57/67 gravel has been placed and compacted in place with a heavy vibratory roller, install steel load transfer dowels at the joints between the new PCC panel(s) and the surrounding retained PCC panel(s).
6. Place the new fresh mixed PCC into the panel. The PCC should be entrained with between 4 and 6 percent air using an air-entraining admixture (AEA) and should achieve a design compressive strength of at least 4,000 psi at the 28 day age.
 - A. In order to allow traffic onto the new concrete more quickly, you may wish to specify Type III (high early strength) Portland cement be used in the mix; otherwise, if Type I/II Portland cement is used in the mix, the new panel should be kept free from traffic load for at least 7 days after placement.
 - B. The concrete should be moist cured in place for at least 72 hours after placement.



If you would like for us to develop these recommendations into a contractor specification with design details, please contact us. These repairs are anticipated to be needed on isolated portions of many of the concrete roadways within the community.

Hot Mix Asphalt Mill and Overlay

The pavements at The Lakes have concrete curb and gutter on both sides. In order to prevent from creating a lip of asphalt in front of the gutter when the pavement is overlaid, the pavement in front of the gutters should be milled prior to overlaying the existing pavement. See **Figure 14** attached in the appendix for the taper milling detail instruction that we typically specify on our rehabilitation projects where curb and gutter are present.

Prior to performing the taper milling, any areas of the roadway surface that are exhibiting severe fatigue (alligator) cracking should be removed and replaced with a full-depth asphalt patch. This involves cutting and removing the asphalt from the fatigued area including a buffer that extends a nominal distance into the surrounding unstressed area. The depth of the cut may vary from 4 to 8 inches, depending upon the conditions encountered. The area is then filled with hot mix asphalt to 2 inches below final grade elevation. (Note: the last 2 inches will be part of the overlay of the entire roadway).

The outermost 6 feet of the existing pavement surface along both sides of each road should be taper-milled to a nominal depth of about 1 ½ to 1 ¾ inches below the existing surface immediately in front of the gutter, tapering up to a milling depth of zero inches approximately 6 feet off the gutter face, as depicted in **Figure 13**. Adjustments may be made to the milling depth to accommodate desired surface grade adjustments. For example, if the surface is slightly depressed in a certain area, the milling depth may be slightly reduced.

Meter valve covers or manhole covers that are located within the center third of the roadway and therefore outside of the taper-milled edge zones may require that riser collars be installed to accommodate the increase in the post-overlay road surface elevation.

After milling, the milled surface shall be cleaned and tacked, and then a new hot mix asphalt (HMA) overlay should be constructed on top of the milled surface. We recommend the construction of 2 inches of HMA Surface Course Type C as defined by the South Carolina Department of Transportation (SCDOT) "Specifications for Highway Construction", 2007 edition. Taking the milling depths into account, this overlay thickness should result in a net grade elevation increase of about ¼ to ½ inch above current grade elevations at the gutter interface, and a net grade elevation increase of about 2 inches above current grade elevations in the center portion of the road. Note that this will result in an increase in the cross-slope gradient of the pavement surface, which typically helps to improve the runoff of water towards the gutters on either side¹.

If we are retained to develop project specifications for construction, the specific procedures that should be used for the full-depth patching, milling, and the HMA overlay will be addressed in those documents.

¹ This recommendation does not apply to super-elevated sections of roadway where the entire surface slopes to one side of the road rather than being crowned in the center.



◆ Next Steps

The next step in this process is for The Lakes to determine the limits of work for the first construction project. For example, decide whether you want to proceed with Category 1, or Categories 1 and 2, or Categories 1, 2, and 3.

We have prepared a preliminary Engineer's Estimate for rehabilitation of the Category 1 and Category 2 roads, which is attached to this report.

S&ME can also be retained to draft project specifications for contractors to propose on, and we can solicit proposals from local contractors for the work, if desired. Finally, once construction begins, we can help you manage the project and provide observation and quality assurance (QA) testing services during the actual work.

◆ Geophysical Limitations

Regardless of the thoroughness of a geophysical and coring survey, there is always a possibility that actual conditions may not match the interpretations. The results of this study should be considered accurate only to the degree implied by the method used and the method's limitations and data coverage. Accordingly, the possibility exists that not all features at a project site will be located due to either pavement/subsurface conditions or the occurrence of features outside the lateral limits and below the depth of penetration of the method used. As with most surface geophysical methods, resolution of the subsurface also decreases with depth. As such, the size and/or contrast of features compared to the imaged subsurface media must be significant enough to produce the anticipated response. The location and/or determination (or the lack thereof) of pavement structure thickness was based on our review of provided information and of the geophysical survey. Under no circumstances does S&ME assume any responsibility for damages resulting from the presence of subsurface features that may exist but which were not identified by our survey.

The GPR method used for this survey also has inherent limitations. Items such as the age of the target, pavement structure thicknesses, lack of dielectric contrast, etc. may make the determination of layer boundaries and target locations difficult. The average maximum depth of penetration for the 2 GHz horn antenna is typically about 24 inches below the pavement surface. However, properties of the subsurface materials (e.g. moisture, etc.) can have a significant impact on the effective depth of penetration of the GPR survey. In addition, the GPS that was used for this survey is limited to sub-meter accuracy or higher when used at high speeds.

◆ General Limitation of Use

This report has been prepared in accordance with generally accepted engineering practice for specific application to this project. The conclusions and recommendations in this report are based on the applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the geophysical survey and limited coring exploration. The nature and extent of variations across the site may not become evident until construction. If variations appear evident, then we should be provided with a reasonable opportunity to re-evaluate the recommendations of this report. In the event that any changes in the nature,



Report of Pavement Exploration Services
Pavement Inventory and Rehabilitation Plan – The Lakes
Surfside Beach, South Carolina
S&ME Project No. 3563-20-064

design, or location of the development are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions modified or verified in writing by the submitting engineers.

Assessment of site environmental conditions; sampling of soils, ground water or other materials for environmental contaminants; identification of jurisdictional wetlands, rare or endangered species, geological hazards or potential air quality and noise impacts were beyond the scope of this exploration.

◆ **This is an exploration results report and is not intended or authorized to be used as a specification for construction.**

◆ **Closure**

S&ME, Inc. appreciates this opportunity to provide pavement exploration and inventory services to you on this project. We look forward to assisting you with the “next steps”, and would be happy to provide you with a proposal to continue our consulting into the next phases of the work. If you have any questions or need any further information in regard to this report, please do not hesitate to contact us.

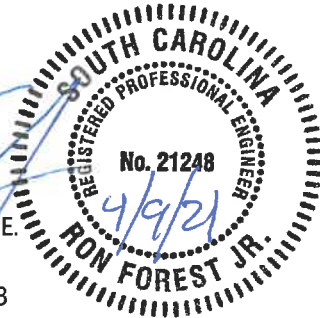
Sincerely,

S&ME, Inc.

Adam R. Limeburner, E.I.T.
Staff Professional



Ronald P. Forest, Jr., P.E.
Senior Engineer
Registration No. 21248

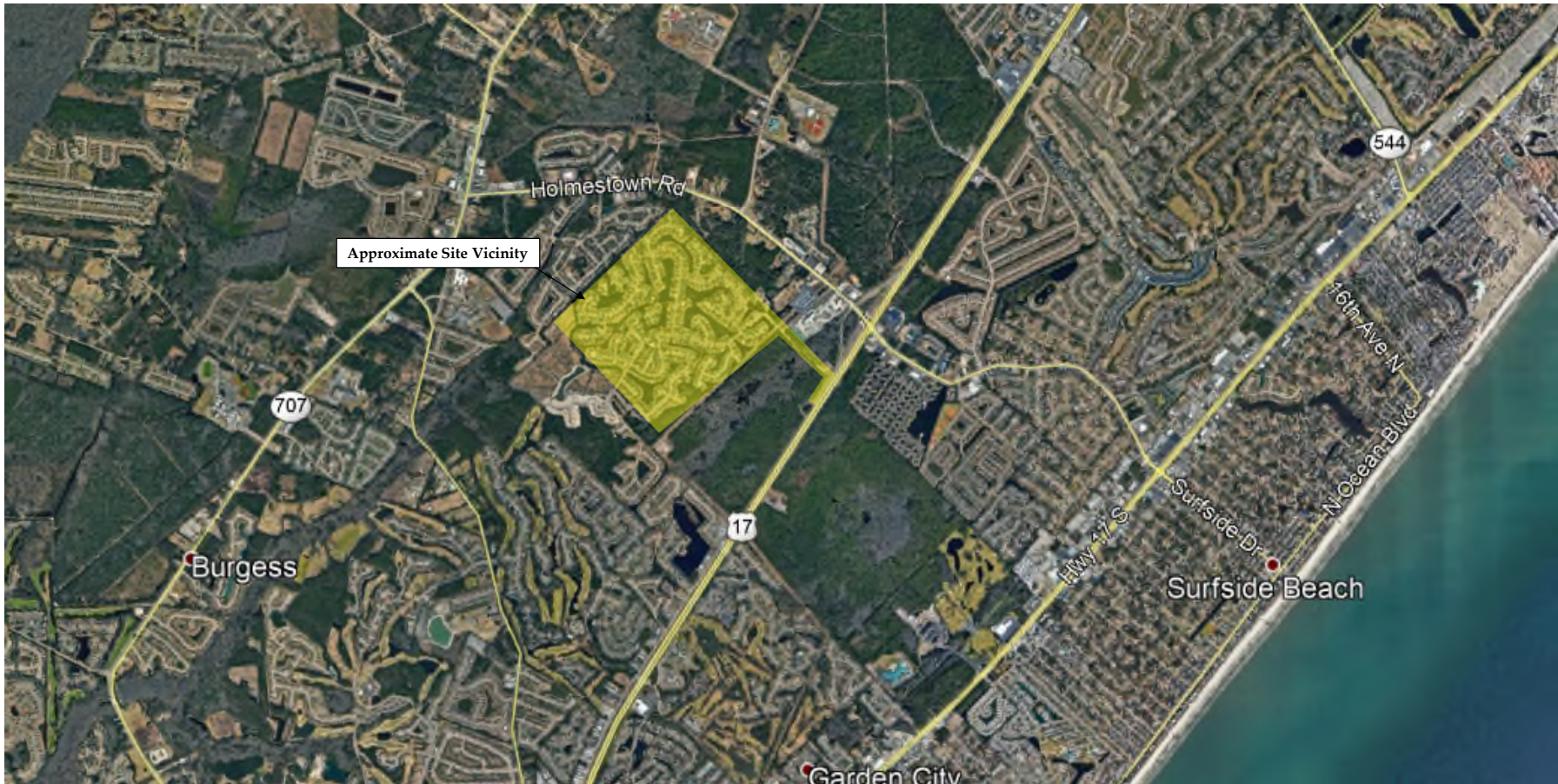


Attachments: Appendix

Appendix



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



SITE VICINITY MAP

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

1



Legend
 Coring Test Location

REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



CORING TEST LOCATIONS

THE LAKES PAVEMENT STUDY
Horry County, South Carolina

SCALE:
AS SHOWN

DATE:
4/9/2021

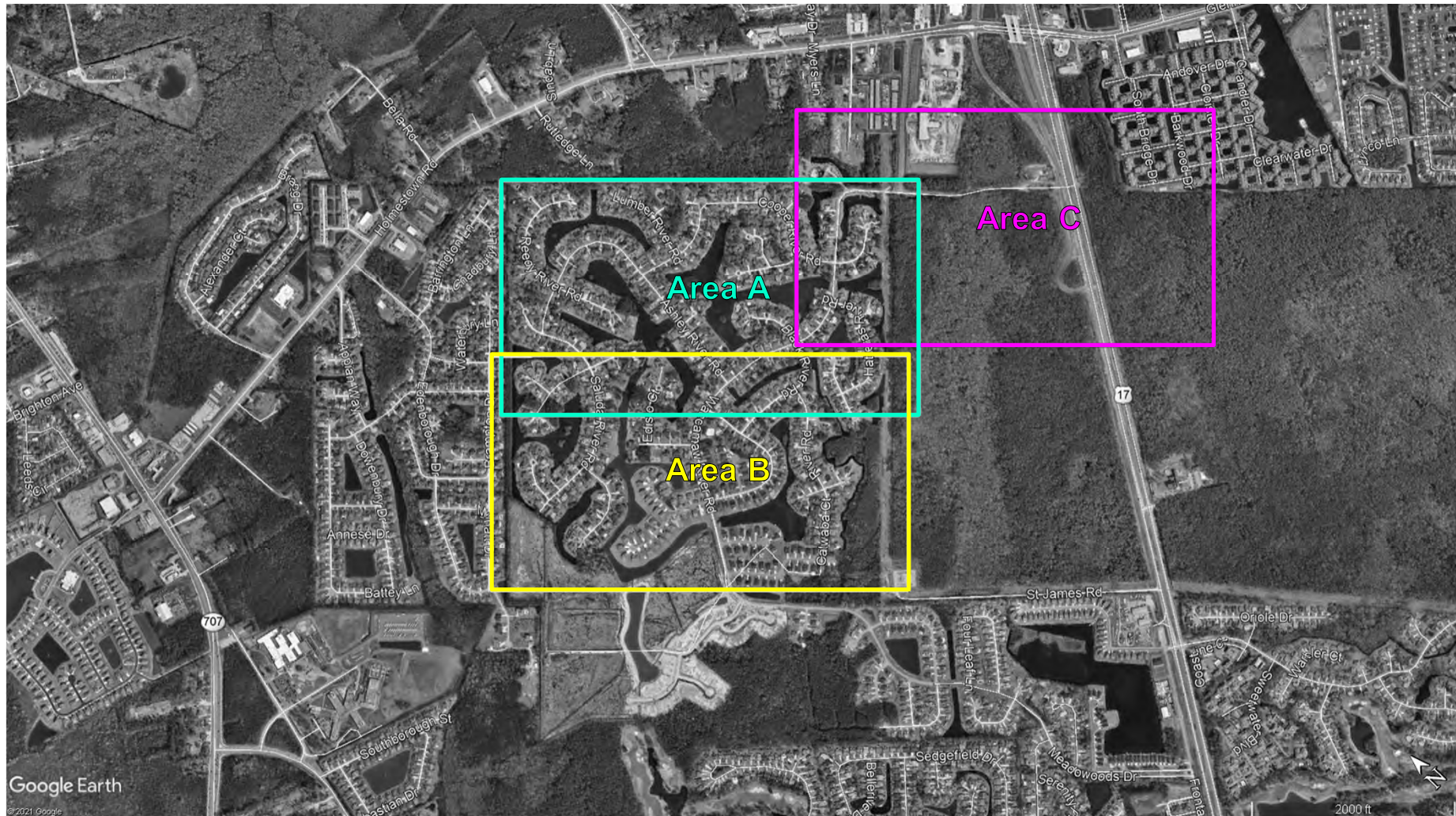
PROJECT NUMBER
3563-20-064

FIGURE NO.

2



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



GPR SURVEY LOCATION PLAN - OVERVIEW

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

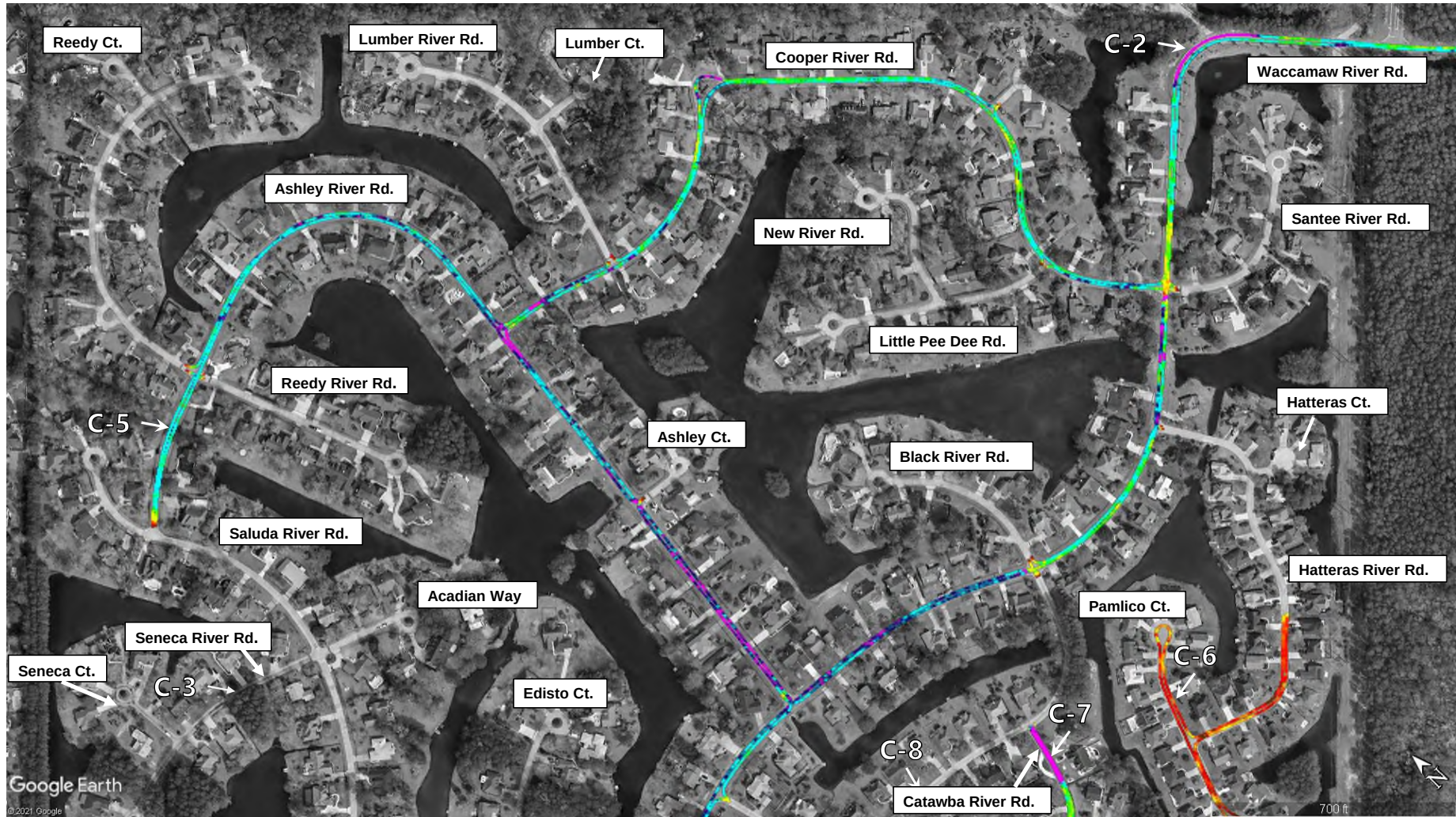
PROJECT NUMBER
3563-20-064

FIGURE NO.

3



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Asphalt Thickness (in)



ASPHALT THICKNESS PLOT - AREA A

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
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FIGURE NO.

4



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Concrete Thickness (in)



CONCRETE THICKNESS PLOT - AREA A

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

5



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Limestone Thickness (in)



MARINE LIMESTONE THICKNESS PLOT - AREA A

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

6



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Asphalt Thickness (in)



ASPHALT THICKNESS PLOT - AREA B

THE LAKES PAVEMENT STUDY
Horry County, South Carolina

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

7



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Concrete Thickness (in)



CONCRETE THICKNESS PLOT - AREA B

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

8



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Limestone Thickness (in)



MARINE LIMESTONE THICKNESS PLOT - AREA B

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

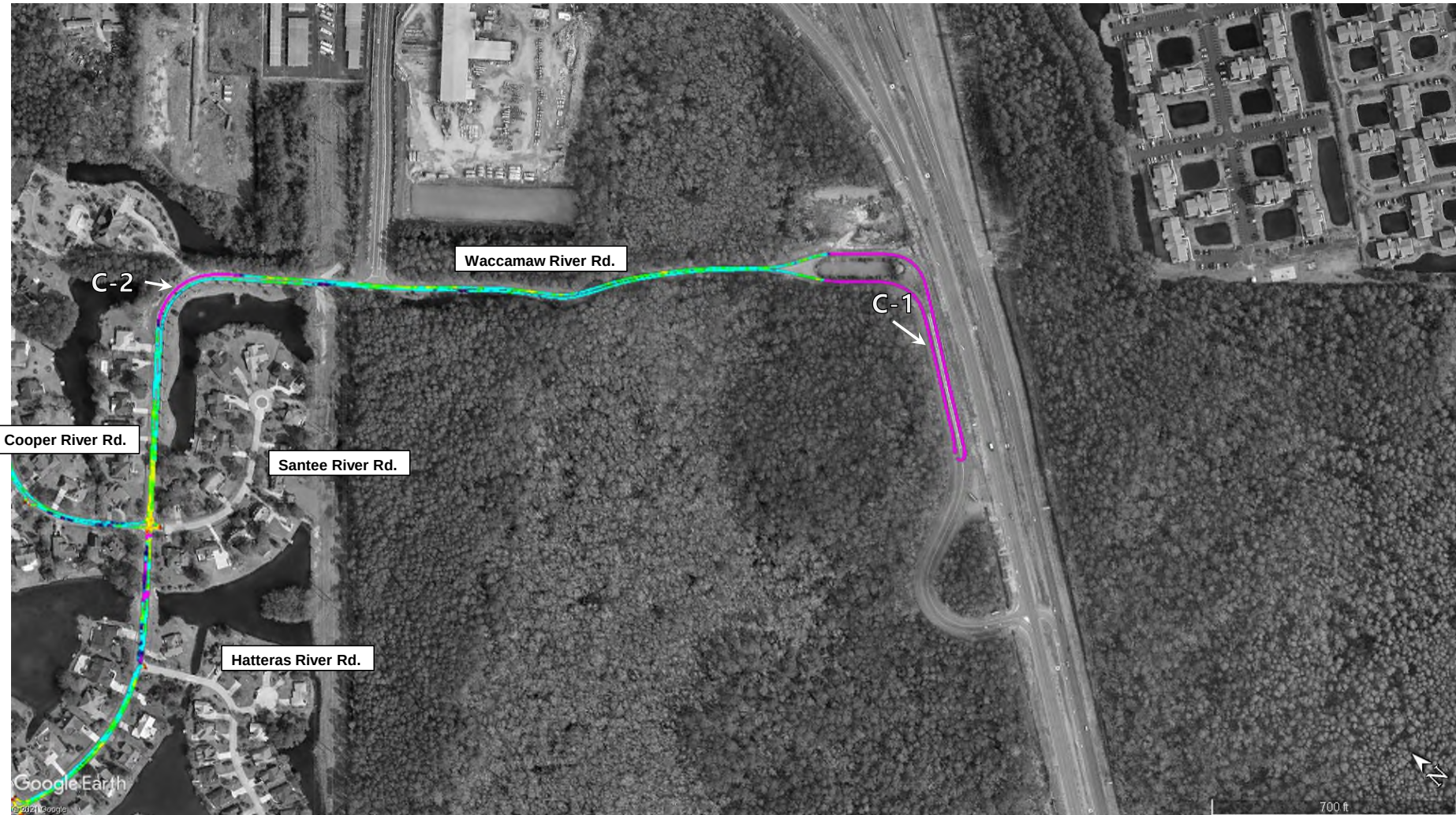
PROJECT NUMBER
3563-20-064

FIGURE NO.

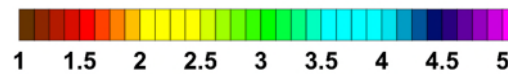
9



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Asphalt Thickness (in)



ASPHALT THICKNESS PLOT - AREA C

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

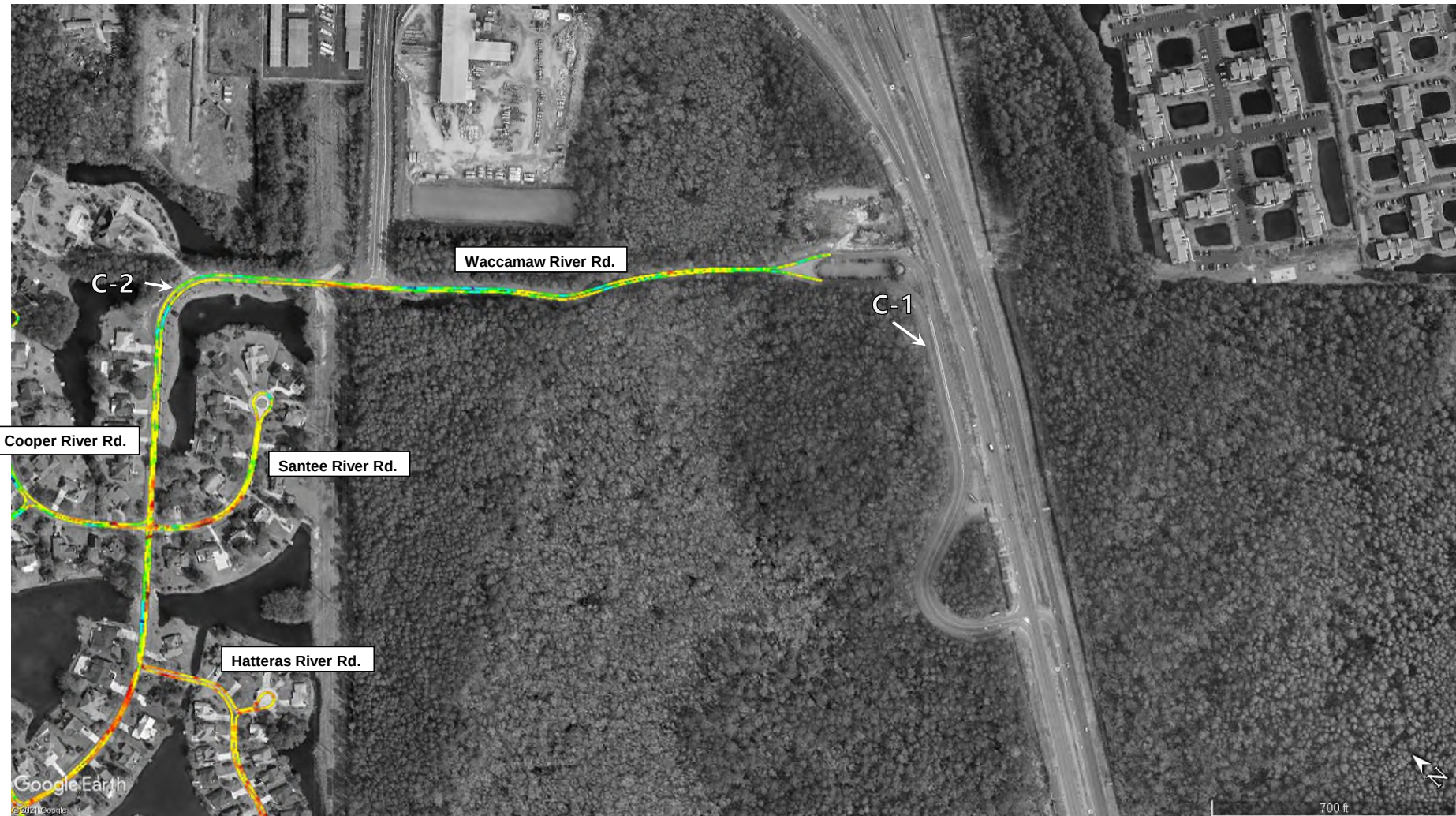
PROJECT NUMBER
3563-20-064

FIGURE NO.

10



REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH
(DATED FEBRUARY 2, 2020)



Interpreted Concrete Thickness (in)



CONCRETE THICKNESS PLOT - AREA C

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

11



EXAMPLE GPR PROFILE - CORE C-5

THE LAKES PAVEMENT STUDY
Horry County, South Carolina

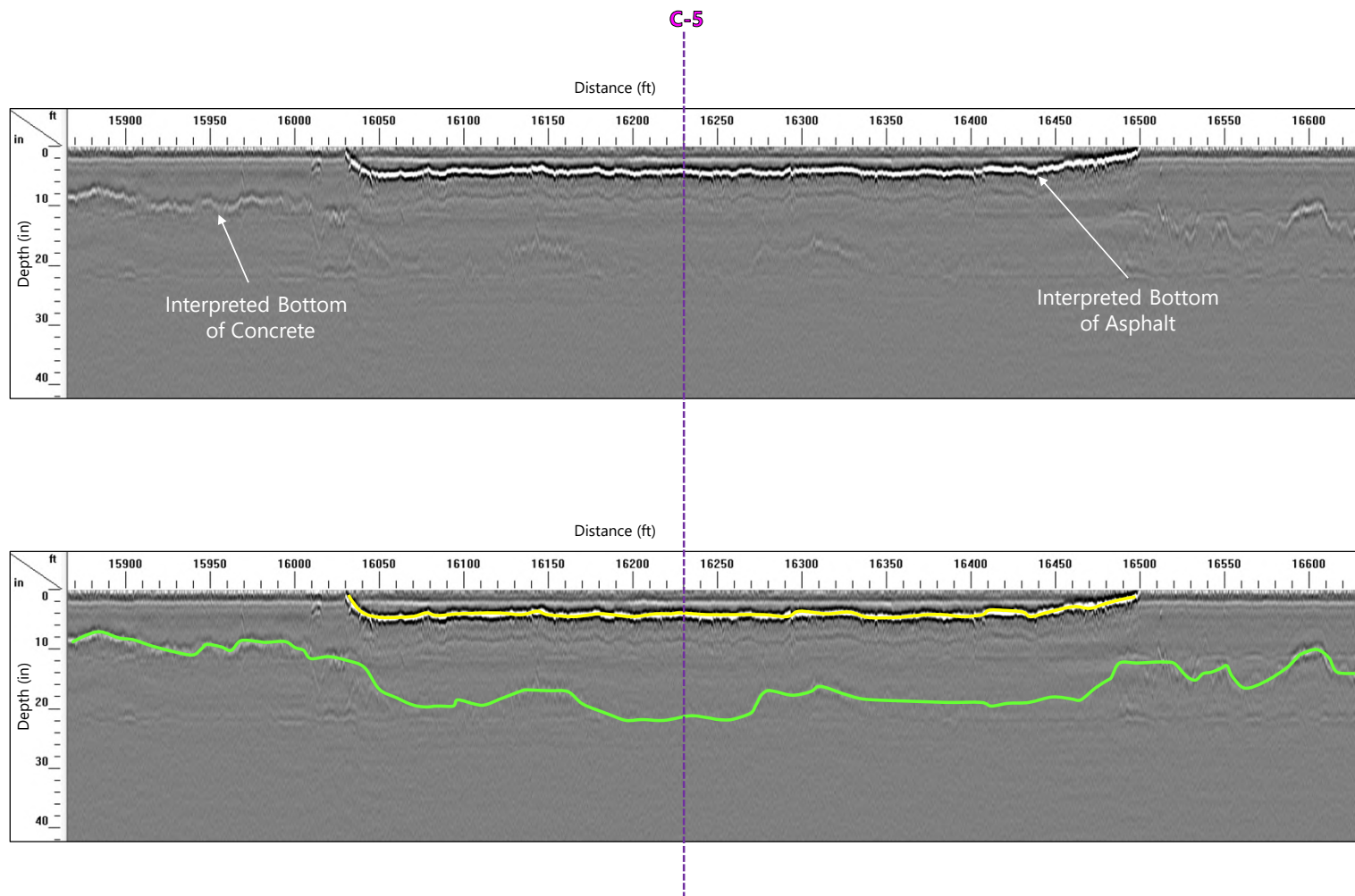
SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

12



Legend

— Interpreted Bottom of Asphalt — Interpreted Bottom of Concrete

Note: Depths in the raw GPR data profiles presented above are based on uncorrected data and should be considered approximate. Final color-coded thicknesses and plots presented in the previous figures, however, are based on corrected dielectric values. In addition, distances in the raw GPR profiles presented above are based on field effort distances rather than actual project distances. Final data distances in the previous figures are presented based on GPS positioning collected during the GPR survey.



EXAMPLE GPR PROFILE - CORE C-6

THE LAKES PAVEMENT STUDY
Horry County, South Carolina

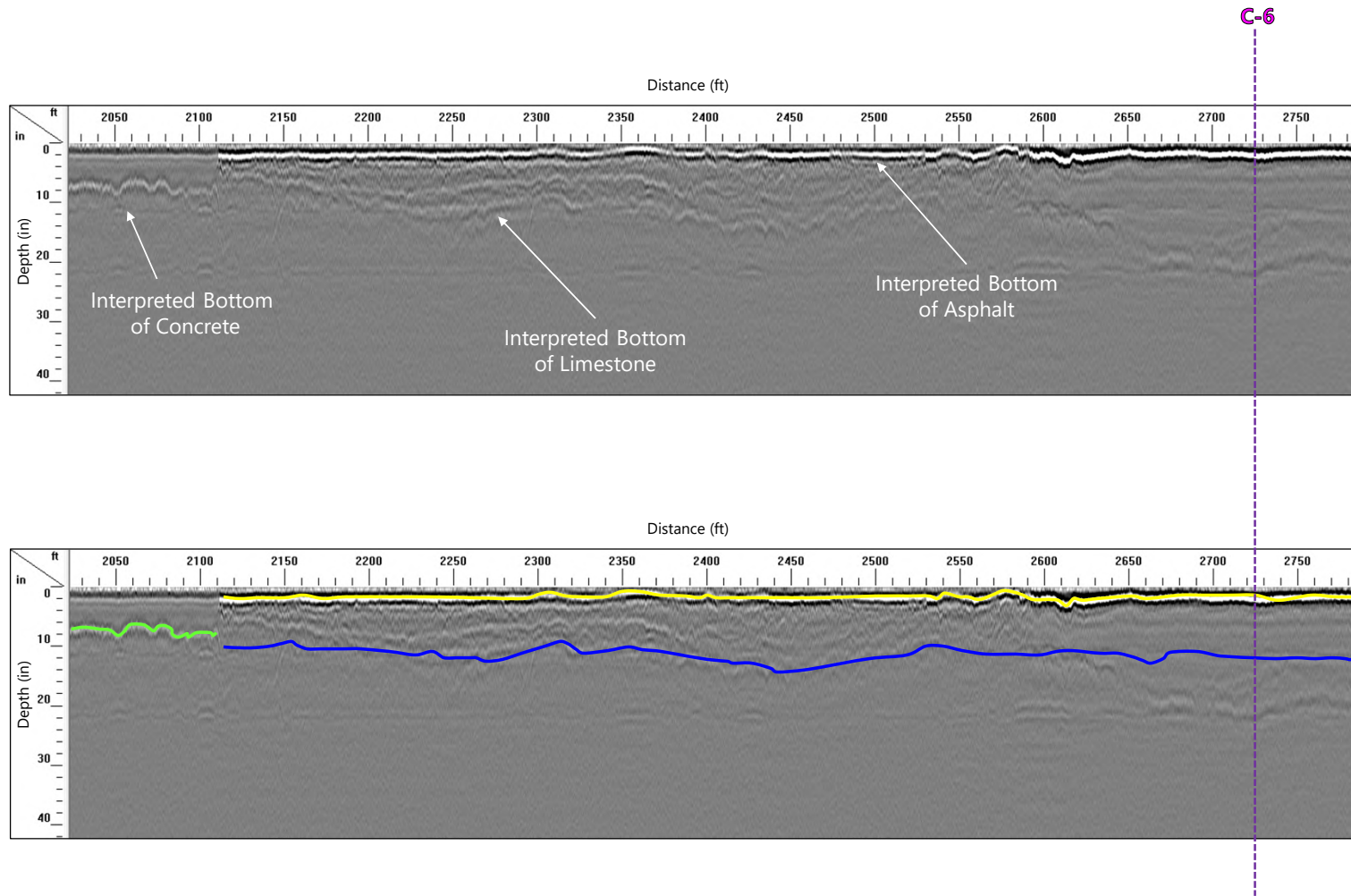
SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
3563-20-064

FIGURE NO.

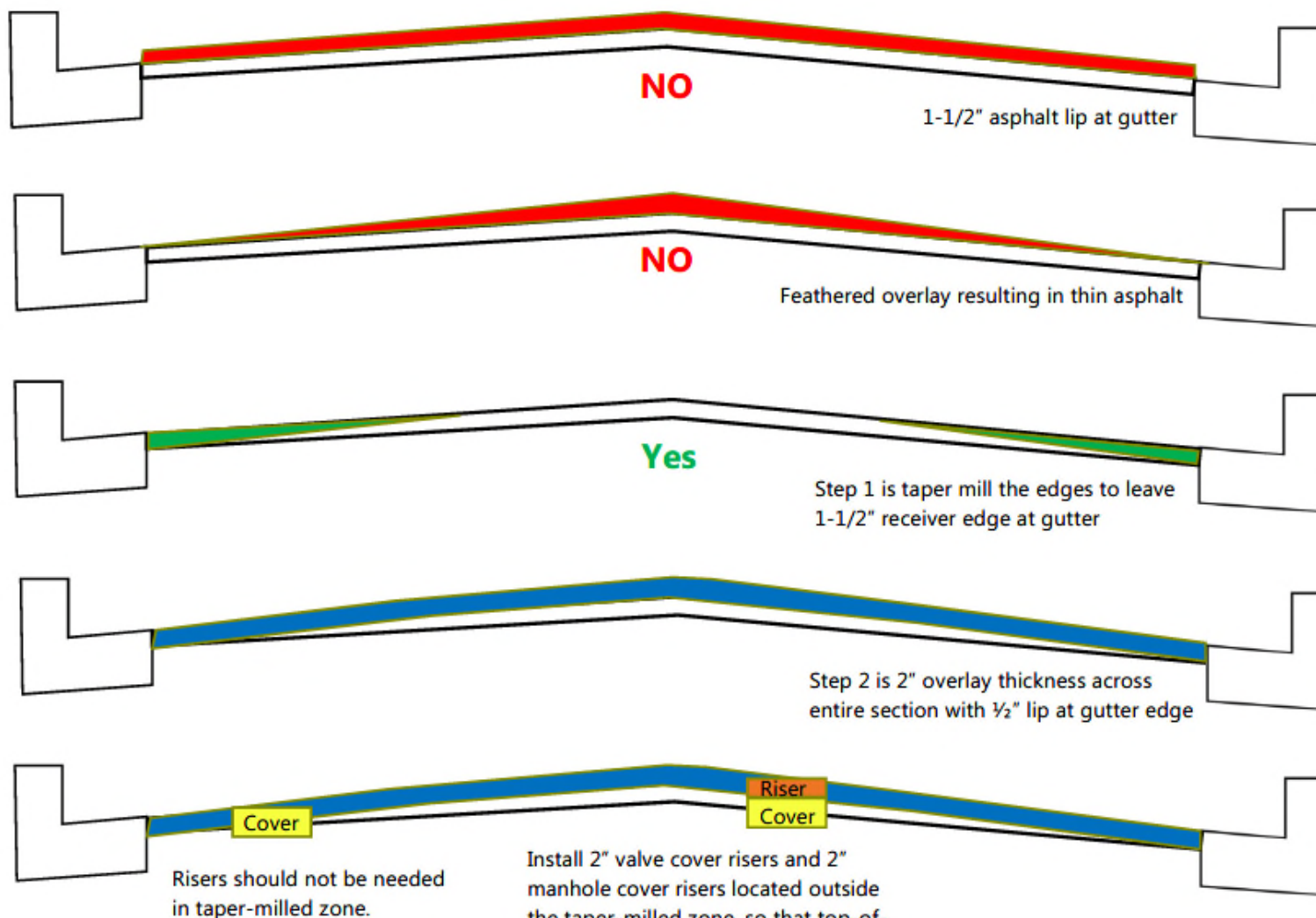
13



Legend

- Interpreted Bottom of Asphalt — Interpreted Bottom of Concrete
- Interpreted Bottom of Marine Limestone

Note: Depths in the raw GPR data profiles presented above are based on uncorrected data and should be considered approximate. Final color-coded thicknesses and plots presented in the previous figures, however, are based on corrected dielectric values. In addition, distances in the raw GPR profiles presented above are based on field effort distances rather than actual project distances. Final data distances in the previous figures are presented based on GPS positioning collected during the GPR survey.



NOT TO SCALE

Figure 1: Milling/Overlay Detail



TAPER MILL DETAIL

THE LAKES PAVEMENT STUDY
HORRY COUNTY, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
4/9/2021

PROJECT NUMBER
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FIGURE NO.

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