JWN John C. Tune Airport
NASHVILLE'S EXECUTIVE AIRPORT®

NOTICE OF AVAILABILITY (NOA) JOHN C. TUNE AIRPORT NORTH SIDE PARCELS

ADDENDUM #1

Questions:

1. Can you join lots for 1 large hangar?
    - Yes, Respondents may propose for as many parcels as they wish.
2. How big can you go for a hangar; Is 100x100 the largest size?
    - There is no maximum width hangar size requirement from the MNAA. Based on the configuration example provided in the NOA, the MNAA determined that 110 feet is the maximum depth hangar the parcels can accommodate while maintaining adequate space for aircraft parking.
    - The minimum size requirement as stated in the NOA is 100 feet by 100 feet.
3. What is the largest hangar one parcel can handle?
    - Based on the configuration example provided in the NOA, the MNAA has determined that the parcels can accommodate a hangar with a maximum depth of 110 feet and a maximum width of 100 feet. Respondents who wish to take more than one parcel may propose a different configuration that meets their needs and maintains adequate space for aircraft and vehicle parking.
4. What are the specifications for the apron and who will maintain it?
    - The pavement thickness for the apron must be sufficient to accommodate at least Aircraft Design Group (ADG) II aircraft or the maximum take-off weight for the aircraft using the hangar, whichever is greater.
    - Respondents will be responsible to maintain the apron area which is included in their lease lot. The area being constructed by the MNAA will be maintained by the airport. The areas of responsibility are clarified in Exhibit A to the NOA.
5. What are the height restrictions for a hangar?
    - The MNAA does not have a specified vertical height restriction.

6. Is it vertical for the 110 feet?
    - No, the MNAA does not have a specified vertical height restriction. Based on the configuration example provided in the NOA, the MNAA determined that 110 feet is the maximum depth hangar the parcels can accommodate while maintaining adequate space for aircraft parking.
7. Are there 68 feet between hangars?
    - Based on the potential configuration for the property as shown in Exhibit A to the NOA the distance between each hangar (if constructed as 100 ft x 100 ft) would be 68 feet, but the actual distance between hangars will depend on proposals and setback requirements.
8. What are setbacks between buildings?
    - The Respondent is responsible for conducting their own research regarding setbacks and may contact Metro codes.
9. Is there any space in between the parcels?
    - No, there will be no space between each parcel.
10. What weight bearing capacity is it (the apron) being built to; asphalt or concrete?
    - Respondents will be responsible for constructing the apron area which must be sufficient to accommodate at least ADG II aircraft or the maximum take-off weight for the aircraft using the hangar, whichever is greater. The area being constructed by the MNAA will be built for ADG III aircraft. The type of pavement for the MNAA Improvements has not yet been determined.
11. Is there a limit to how far the site can be off the runway?
    - The Respondent must design their improvements within the confines of the parcels shown in the NOA but may configure that design as they see fit for their own use. However, the design must provide adequate space for aircraft and vehicle parking within the confines of the parcel(s) that the Respondent proposes on.
12. What is the minimum distance a hangar can be built from the lot line?
    - The Respondent is responsible for conducting their own research regarding setbacks and may contact Metro codes.

13. Has at least a phase 1 site assessment been accomplished?
    - No, Respondents will need to perform their own environmental assessment.
14. Is the geotechnical report available?
    - The geotechnical report referenced in the NOA is beginning in May. The MNAA anticipates receiving those results prior to Respondent's construction but will not have it prior to the proposal deadline.
    - The MNAA has attached a geotechnical report for the area where the access road will be constructed.
15. Is a topographical survey available?
    - The current JWN topographical survey is included on the attached form titled Exhibit A JWN Airfield Layout.
    - The MNAA has also obtained an exhibit showing preliminary proposed contours for the topography upon completion of the MNAA Improvements. This is also attached and is labeled John C. Tune Airport North Hangar Access Road Preliminary Gradings Exhibit - Taxilane and Access Road. It should be noted that this is preliminary and may change as MNAA's design progresses.
    - Respondents should anticipate that grading work for their parcel(s) will need to be done.
16. Will the site be pad ready?
    - No.
17. What happens after the 30-year lease; is there an option to renew?
    - Respondents may propose renewal options in their proposal, but the hangar must vest in MNAA after 30 years.
18. Is the $1.29 PSF, annual or monthly?
    - This is an annual rate per square foot.
19. When does the 18 months begin?
    - The maximum timeframe for construction is 18 months. That period will begin upon the execution of a lease agreement with MNAA.

20. Will lessees of the parcel be responsible for property taxes?
    - The Metropolitan Government of Nashville & Davidson County controls property tax regulations at our airports. Respondents should consult with them regarding their tax requirements.
21. What does revenue made from assignment mean? Net or gross sales?
    - In the event of an assignment of the ground lease/sale of the hangar, the MNAA expects to share in any revenue received from the assignment/sale. The amount and whether this is net or gross sales is negotiable, Respondents are encouraged to submit their strongest proposal.
22. Conveyance or sale constrictions?
    - The MNAA will hold the right to approve any conveyance or sale of the leasehold interest throughout the term of the lease.
23. Is a draft of the lease available?
    - The MNAA does not have a template lease available for this project.
24. What is included in base rent? Any additional expenses to MNAA?
    - Base rent includes the market value of the land, a portion of the MNAA's improvement costs, and an operating cost factor.
    - If the Respondent plans to engage in self fueling there will be a fuel flowage fee due to the MNAA. The current fuel flowage fee at JWN is $0.06 per gallon.
25. Is the lease rate based on an appraisal or FAA requirements?
    - The base rent is based on market value plus a portion (prorata share) of the MNAA's improvement costs and ongoing operating costs.
26. Is the cost of the road being passed onto the respondent?
    - A portion of the MNAA improvements, including the access road, is included in the base rent.
27. Is the lessee responsible to maintain the portion of the apron they construct?
    - Yes, the future lessee will be responsible to maintain the apron that they construct which will be within their leasehold.

28. Can proposers develop fueling capabilities? Are there restrictions?
    - Respondents may propose to install fuel facilities. This must be in compliance with applicable local, state, and federal requirements, as well as the MNAA's Minimum Standards which can be found on our website at https://flynashville.com/wp-content/uploads/2021/07/JWN-Minimum-Standards-2021.pdf
29. What are the security requirements for each parcel?
    - The Respondents will be responsible to maintain compliance with all federal security requirements, including FAA requirements, in addition to the JWN safety and security plan (attached here). Installation and maintenance of approved security fencing on the tenant's leasehold is the responsibility of the tenant.
30. What are the fire protection standards?
    - Respondents are responsible to ensure their own conformance to all fire code requirements.
31. Can we access the hangars from the road?
    - Each parcel will have access directly from the access road being constructed by the MNAA. The access road will be open to the public. Respondents will be responsible to tie their own parcel to the access road.
32. Aprons – any preferred vendor to do the contracting?
    - No.
33. What is the desire for the aesthetic from the Airports perspective? Higher quality preferred?
    - Developments must meet the requirements of the Airport Improvement Request (AIR) Manual. Which can be found on our website at https://flynashville.com/wp-content/uploads/2020/04/BNA-AIR-Manual_reduced-size.pdf
34. Is the appraisal available at some point?
    - The appraisal can be requested via a public records request.
35. Any plans for another phase or future hangars?
    - There may be additional land available for development at JWN in the future, but when that will be or what use it will be reserved for is uncertain at this time.

36. How many hangars are currently at JWN? Are they all occupied?
    - Upon the completion of the reconstruction in early May there will be a total of 135 MNAA owned hangars at JWN, there will also be 10 plane ports/shade hangars. MNAA anticipates that these will all be fully occupied and that a wait list will remain.
37. What if all 10 sites are not leased? Will less than 10 sites be allowed to develop?
    - While MNAA fully expects all 10 parcels to be developed, it is not all or nothing. If fewer than 10 acceptable proposals are submitted, MNAA will move forward with those proposals.
38. Are there any minimum guidelines or standards that this development will be required to adhere to?
    - Yes, the development must meet all the minimum requirements listed in the NOA as well as meet the requirements of the John C. Tune Minimum Standards for Operators of Aeronautical Activities.
    - The development will also be required to comply will all applicable local, state and federal requirements in addition to the MNAA's Airport Improvement Request (AIR) manual (link below).
39. Will MNAA be conducting a survey inclusive of topography, utility as built, boundaries, etc. for the developers use?
    - The current JWN topographical survey is included on the attached form titled Exhibit A JWN Airfield Layout.
    - The MNAA has also obtained an exhibit showing preliminary proposed contours for the topography upon completion of the MNAA Improvements. This is also attached and is labeled John C. Tune Airport North Hangar Access Road Preliminary Gradings Exhibit - Taxilane and Access Road. It should be noted that this is preliminary and may change as MNAA's design progresses.
    - Upon the completion of MNAA improvements all "as-built" drawings for the utilities and utility corridor will be provided to the successful Respondents, for connection to their hangar.
40. Will MNAA conduct an Environmental Site Assessment – Phase 1?
    - No, Respondents will need to perform their own environmental assessment.

41. Except for MNAA improvements, the site will be delivered in "as is" condition. How do you propose to handle subsurface conditions and hazardous materials if they become an issue upon further investigation?
    - The Respondents will be responsible for preparing the site for their development. The MNAA will not be assisting with any work outside of the improvements listed in the NOA.
42. If a single developer were to develop the entire site, would MNAA be providing utility stub-ups at each of the hangar units, or will they bring utilities to a single parcel, and all hangar units will be fed from there?
    - The plan is to provide utility stub-ups to each of the 10 parcels.
43. Has MNAA sized the utilities that they will be providing (Water? Sewer? Phone/DATA, Power, etc.) If so, can those details be provided.
    - The design of the road and utility corridor is currently on-going and will not be ready for bidding/construction until July.
44. How should we delineate the asphalt paving at the apron between MNAA improvements and the successful Respondent's scope of work?
    - Detailed metes and bounds surveys will be completed prior to the execution of any lease agreement(s) with Respondents. This will clearly outline each party's area of responsibility.
45. Would MNAA consider funding and constructing the entire apron/ramp area if a Respondent were to increase its annual ground rent payment to offset the upfront cost of doing so?
    - The MNAA currently does not have funding approved to construct ramp/apron area inside the leasehold areas.

46. Please provide all details associated with the asphalt (or concrete) specifications and intended design for the taxiway and apron that MNAA is constructing. The goal is to understand the Aircraft Design Group, Taxiway Design Group and what is the largest Aircraft contemplated for accessing the 10 parcels. What is the maximum weight and ACN/PCN that will be allowed to operate on the future apron?
    - See the attached exhibit "JWN North Development and Airside Improvements".
    - It should be noted that the MNAA is currently in the design phase of the project for their improvements, which includes the taxilane and runway connections, not the apron. It has not yet been determined whether asphalt or concrete will be used. It should also be noted and understood that until the full geotechnical report for this area is completed, the design pavement thickness cannot be guaranteed.
47. Will MNAA provide apron and taxiway lighting?
    - Standard taxi lane and cross taxiway LED lights will be installed as part of the MNAA improvements.
48. Does the Airport have a Master Stormwater Plan for these parcels and are there any requirements for onsite storage or retention?
    - The MNAA anticipates addressing all stormwater requirements for the site.
49. We were told there would be no need for an underground stormwater drainage system. Assuming the successful respondent will need area drains in the asphalt apron, what size stormwater pipe should we assume will be connecting to those drains? Is that pipe being provided by MNAA?
    - Design (including stormwater/detention design) is currently ongoing and will not be completed until July 2022. The successful Respondent(s) will be provided with any plan information they need for improvements to their own property at that time.
50. Will MNAA be striping their improvements (Taxiway, apron, etc…) improvements?
    - Yes. Taxi lane and cross taxiway striping will be completed as part of the MNAA improvements. "Lead-in" markings to the individual hangars will NOT be part of the project.

51. The improvements provided by MNAA indicate they are providing pad-ready sites for each of the 10 parcels. In other words, these pads are set to subgrade elevation. If a respondent wishes to change the hangar configuration from 10 individual parcels to larger buildings, will these be made pad-ready by MNAA as well? If so, it seems there will be no grading work for the successful respondent to do except for fine grading of the apron once it is ready to pave. Is that correct?

    - These sites will not be pad ready. The only grading work being completed by the MNAA is that which is incidental to the improvements to be completed by the MNAA. Respondents should expect to be responsible for their own parcel(s) grading requirements.

52. Since MNAA will be providing geotechnical borings on each site, how will they handle any rock, unsuitable soil or hazardous material if it is encountered? Assuming that MNAA will be delivering a site pad ready, can we assume that the respondent will not have to handle any unsuitable soil, rock or hazardous material?

    - The MNAA is not delivering a pad ready site. The Respondent will be responsible for all site work outside of those improvements being completed by the MNAA as described in the NOA.

53. Maximum construction time is set at 18 months. Can we assume that this timeline does not start until design and permitting are complete?

    - The 18 month timeline will begin once a lease agreement is executed. Respondents may progress their design work during the lease negotiations and this solicitation.

54. Can MNAA provide an estimated timeline for a respondent to complete the permitting process?

    - Respondents will need to work with Metro on any permitting questions or concerns.

55. What portion of the permanent AOA Fence will MNAA provide? Can MNAA provide their specification for MNAA AOA fence.

    - The MNAA will provide the airport perimeter fencing the length of the access road. Respondents will be responsible for the AOA fence that separates their secured areas from their non secured areas. Specific fence requirements can be found in the AIR manual (link below).

56. Will MNAA require all exterior pedestrian doors to have card/badge readers?

    - Any exits or entrances that go between unsecured areas and secured areas must have access control.

57. Would MNAA consider completing and publishing the geotechnical report to include the 4 geotechnical borings as outlined in the NOA prior to the submission due date of this bid to allow respondents to understand site conditions enabling them to put forward their best financial offer to MNAA? If these details are not immediately available, could the deadline for submission be delayed by 1-2 months to allow for more due diligence time and delivery of these reports?

    - The geotechnical report referenced in the NOA is beginning in May. The MNAA anticipates receiving those results prior to Respondent's construction but will not have it prior to the proposal deadline nor will the deadline be extended.
    - The MNAA has attached a geotechnical report for the area where the access road will be constructed.

58. Will MNAA authorize the design, construction, and management of a fuel farm on the development site?

    - Fuel facilities will be allowed as long as they meet all requirements listed in the John C. Tune Minimum Standards for Operators of Aeronautical Activities in addition to any local, state or federal requirements.

59. Please confirm that the total area where the successful respondent(s) will pay ground rent on the site will be approximately 1,680' x 218' = 366,240 square feet.

    - That is correct. Each parcel is approximately 168' x 218' = 36,624 square feet. Therefore, the approximate total for all ten parcels is 366,240 square feet.

60. Is MNAA considering adding a customs facility to JWN in the near future?
    - There are no current plans to add a customs facility to JWN.
61. Would MNAA consider granting a 30-year base ground lease with two 10 year options?
    - The MNAA will accept proposals with options, however Respondents are encouraged to submit their strongest proposal.
62. Can MNAA provide a copy of a sample lease prior to the submission deadline?
    - The MNAA does not have a sample lease available for this project.
63. Under what circumstances would the MNAA cancel this NOA and instead elect to issue a formal RFP?
    - If the MNAA receives a large volume of responsive proposals it may determine to short list the strongest responses and issue a formal RFP for those Respondents.
64. Please list fuel sales in gallons by month for the previous 3 years for both Jet A and AvGas.
    - JWN fuel flowage information can be found at https://flynashville.com/nashville-airport-authority/airport-data-and-reports under the Aviation Statistics section for that month/year.
65. Would a bid for multiple sites be allowed to site plan minimum hangar requirements in aggregate? e.g., If the proposal is for 5 parcels, instead of placing one 100' x 100' = 10,000sf hangar on each parcel, could they build one 110' x 455' = 50,000sf hangar and use remaining space efficiently for ramp and auto-parking?
    - As long as the Respondent proposes to construct at least the minimum requirement the MNAA will consider various layouts/configurations.
66. Will property tax be assessed on the parcels? If so how is the rate calculated? Are there any additional fees or taxes not included in the $1.29 minimum lease rate?
    - The Metropolitan Government of Nashville & Davidson County controls property tax regulations at our airports. Respondents should consult with them regarding their tax requirements.
    - The $1.29 psf includes all rent payments to MNAA. Any Respondent who proposes their own fuel facilities will also be charged fuel flowage fees. The current JWN fuel flowage fee is $0.06 per gallon.

67. Is it possible to extend the envelope of a hangar onto the ramp section of the parcel? If so, by how much?
    - Yes, but Respondent(s) must design their improvements within the confines of the parcels shown in the NOA and maintain adequate space for aircraft and vehicle parking.
68. Assuming a lease is awarded, how long does the respondent have to begin construction?
    - Respondents have 18 months to complete construction once a lease has been executed. There is no required start date.
69. Once a lease is awarded, how soon do lease payments begin?
    - As stated in the NOA, the payment of base rent to the MNAA will begin upon execution of the lease, not the start or completion of construction.
70. Is there an option to extend the lease at a discounted rate at the end of 30 years?
    - No.
71. We are trying to determine the hangar size with the available plots offered. What is the minimum setback for the structure from the taxiway depicted as MNAA responsibility on the plot depiction provided?
    - The Respondent must design their improvements within the confines of the parcels shown in the NOA. The configuration provided by the MNAA in the NOA is an example only.
72. Is there a published maximum height of the hangar structure?
    - The MNAA does not have a specified vertical height restriction.
73. What is the minimum required distance between hangars as per code?
    - The Respondent is responsible for conducting their own research regarding setbacks and may contact Metro codes.
74. Are the parking lots required to be on the NE side of the structure as per your depiction?
    - No.

75. What is the status of the soil/compaction at the depicted plots? Are the plots pad ready in regard to soil quality and core samples? Will soil improvements need to be made to reach a specified compaction? If so, what improvements do you see will need to be made?
    - The status of the soil/compaction at the sites is unknown. The sites are not pad ready. The Respondent will be responsible for any soil improvements needed to accommodate their improvements.

References/Attachments:

1. Geotechnical Report JWN North Hangar Access Road
2. Current JWN Topographical Map "Exhibit A JWN Airfield Layout"
3. Preliminary Grading Exhibit "John C. Tune Airport North Hangar Access Road Preliminary Gradings Exhibit - Taxilane and Access Road"
4. JWN North Development and Airside Improvements Exhibit
5. JWN Safety and Security Plan
6. JWN Minimum Standards for Operators of Aeronautical Activities – https://flynashville.com/wp-content/uploads/2021/07/JWN-Minimum-Standards-2021.pdf
7. Airport Improvement Request (AIR) Manual – https://flynashville.com/wp-content/uploads/2020/04/BNA-AIR-Manual_reduced-size.pdf
8. JWN Fuel Flowage – https://flynashville.com/nashville-airport-authority/airport-data-and-reports under the Aviation Statistics section for that month/year

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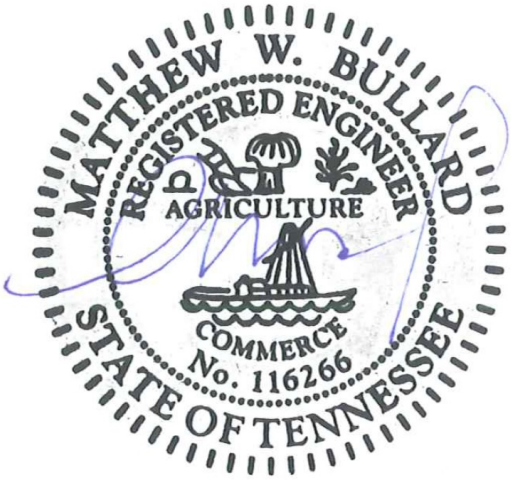
March 24, 2022



03/24/2022

Mr. David Schilling, PE
Senior Project Manager, Aviation
Atkins North America
404 BNA Drive, Suite 600
Nashville, Tennessee 37217

Re: Geotechnical Engineering Report
North Hangar Access Road Project
John C. Tune Airport (JWN)
Nashville, Tennessee
CIA Project No. 2021-142

Dear Mr. Schilling:

CIA, LLC is pleased to submit this Geotechnical Engineering Report for the referenced project. This proposal is based on project information provided to us and was conducted in accordance with our Proposal No. 2021-142P.

PROJECT AND BACKGROUND INFORMATION

Initial project information was provided to us by Atkins via an email transmission on Monday December 13, 2021. At that time, we were provided a site plan showing the location of the new roadway. We were instructed to develope a geotechnical scope to provide geotechnical subgrade information earthwork and pavement design.

Based on the provided drawing, we understand that the project will consist of adding approximately 2,200 linear feet of new asphalt roadway spanning from the Centennial Place gate to the TDOT Aeronautics entrance.

SITE CONDITIONS

The John C. Tune Airport Complex is located in the Cockrill Bend area of west Nashville. The bend reference refers to the bend of the Cumberland River. This area is raised in elevation above the Cumberland River by approximately 100 feet at an average elevation of 500 FT, MSL. According to the drawings provided to us, the proposed road will parallel the existing access road from the intersection with Centennial Place (at Emergency Point East Gate 2) and extends to the TDOT Aeronautics Division Building. The existing road is a narrow two lane, unpaved road which follows the existing ground contours. The profile of the existing road starts at a low point of approximate elevation 472 and ascends a gradual hill for the middle segment at an approximate high elevation of 491 before ascending back down in grade. The proposed new road profile will require fills on the order of less than 10 feet for the majority of alignment with some cut of less than 8 feet near the higher hill area near the middle portion of the alignment. This area is currently maintained with grass cover. See the attached Site View Plan and Profile which was provide to us.

SITE GEOLOGY

The project site lies geologically in the Central Basin which is underlain by sedimentary bedrock (primarily limestone) of the Ordovician geologic age; however, some Devonian-age shale exists as remnants of the Highland Rim.

According to the Geologic Map of the Scottsboro quadrangle, Tennessee, 1979 created by the Tennessee Geological Survey the site lies within the Leipers and Catheys Formation. This formation is characterized by limestone beds. The typical layer structure is described as Limestone, argillaceous, nodular and shaley, medium dark-gray to brownish gray, thin bedded, fossiliferous; limestone, dark gray (weathers to pale yellow brown), fine grained, thin to medium bedded , lower units can be cross-bedded, and contain brown phosphatic pellets. The limestone rock units typically weather into brown clay of medium plasticity.

EXPLORATION AND TESTING

The subsurface exploration was conducted by advancing a total of nine borings (R-1 to R-9) at the locations and to the depths shown on the appended Plan and Logs. The borings were located in the field by measuring distances from known landmarks. After drilling was completed, CIA's Survey Department located the as-drilled locations shown on the appended Boring Location Plan.

The borings were drilled until encountering auger refusal using hollow stem auger methods. In order to assess the soil's consistency, the overburden for the upper 6.0 feet in each hole was drive sampled in general accordance with ASTM D 1586 "*Penetration Test and Split-Barrel Sampling of Soils."* Upon completion, the borings were observed for the presence of groundwater and subsequently backfilled auger cuttings.

A member of our professional staff visually classified the soil samples obtained. Select soil samples were subjected to laboratory testing in order to determine fundamental engineering characteristics including the determination of the soil's Atterberg Limits and natural moisture content. A bulk sample was collected by combining auger cuttings. The bulk soil sample was tested in accordance with ASTM D1557 (modified Proctor) to determine the soil's moisture-density relationship and ASTM D1883 (California Bearing Ratio).

Results of the laboratory tests are appended. Soil descriptions, along with standard penetration test results ('N'-values) and changes in soil lithology, are shown on the individual boring logs contained in the appendix. The samples not consumed during laboratory testing will remain stored at our Murfreesboro office for 60 days from time of acquisition and may then be discarded, unless we are directed otherwise.

SUBSURFACE CONDITIONS

The borings initially encountered a thin layer of grass and topsoil ranging in thickness from 1 to 4 inches. Below the initial topsoil, the borings encountered a heterogeneous mix of brown to dark brown silty clay and limestone fragments to the deepest SPT testing depth of 6.0 feet (where auger refusal was not encountered). Based on the material composition along with the known history of the site, this material is judged to be fill material. Due to the inclusion of rock fragments within the material, the soil consistency as measured from SPT testing is erratic. Where predominately clay soil was recovered, the soil consistency was firm to very stiff. Borings that encountered auger refusal at depths shallower than 8 feet, the auger refusal material is judged to

be dense limestone fill or boulders while borings that encountered auger refusal deeper than 8 feet, the refusal material is judged to be in-place limestone rock.

No free water was observed within the borings at time of boring completion. Groundwater levels may fluctuate due to recent rainfall, construction activity, or other site-specific factors.

The table below shows a summary of subsurface materials encountered along with boring termination depths:

SUMMARY OF BORING RESULTS AND BORING TERMINATION DEPTHS

Test Location	Topsoil thickness (in)	Soil Thickness (ft)	Boring Termination Depth (FT)
R1	1	9.2	9.2 (Refusal)
R2	2	20.6	20.6(Refusal)
R3	3	12.6	12.6(Refusal)
R4	1	5.0	5.0 (Refusal)
R5	1	3.3	3.3 (Refusal)
R6	1	16.1	16.1 (Refusal)
R7	2	7.3	7.3 (Refusal)
R8	2	7.9	7.9(Refusal)
R9	4	5.3	5.3(Refusal)

Laboratory testing indicates that the soils are classified as CL, silty clay of low to medium plasticity, by the Unified Soil Classification System and natural moisture content testing on the soil samples obtained indicate moisture contents ranging from 10.2 to 22.7 for samples consisting of the clay soil material. For samples consisting of predominantly rock fragment material, the moisture content was negligible. A bulk sample of soil consisting of a combination of auger cuttings from the various borings was tested for maximum dry density and optimum moisture content in accordance with ASTM D1557 (Modified Proctor). The test results indicated a maximum dry density of 120.1 pounds per cubic foot at an optimum moisture content of 11.9 percent. California Bearing Ratio (CBR) testing performed on the bulk sample indicated a CBR of 5.0 percent at 95 percent compaction would be applicable for pavement design of the roadway.

Comments and Recommendations

As discussed in the Project Information Section, the planned roadway widening will involve at grade construction to cuts of less than 8 feet and fills of 10 feet or less. Existing vegetation, topsoil, pavement and any utilities within the zone of planned grading will have to be removed. Based on the boring data and planned construction, all of the planned grading construction will encounter the heterogeneous mix of soil and rock fill.

Both cut and fill slope ratios of 2H:1V or flatter are recommended for long term slope stability. The slopes should be vegetated as soon as possible to enhance stability. Slopes flatter than 2H:1V may be preferred for erosion control and maintenance purposes.

The excavated soil material can be utilized as fill material where required. Any fill material place shall be placed and compacted in accordance with either local government construction requirements or with the design governing agency applicable requirements.

Note that the surface soils can become saturated during periods of precipitation. Depending on time of construction relative to precipitation events, the surface soils may become unstable and may require scarifying and drying, possible undercutting and replacement.

In any case, upon achieving planned elevations, the exposed subgrade should be proofrolled with heavy, rubber-tired equipment (such as a loaded, tandem-axle dump truck) in order to delineate any soft zones or unstable areas. Unstable soils revealed by the proofrolling operations may be scarified, moisture conditioned, and re-compacted as engineered fill.

It will be of particular importance for the contractor to maintain the site in a positively drained condition both during and after construction. Ponding water can lead to the deterioration of the subgrade surface necessitating over-excavation of the softened soil.

While blasting of rock is not anticipated for the cuts, the excavations may encounter isolated limestone boulders that may require the use of a large Trackhoe mounted hoe-ram.

Note that this access road will tie into the current roadway adjacent to the TDOT Aeronautics Division Building. There is an apparent modular block retaining mechanically stabilized earth wall forming the east boundary of the current roadway. This wall appears to have a maximum height of approximately 15 feet and wall ends vertically with some limestone rock fill placed at the end of the wall and wrapping around in front of the wall. It is possible the proposed access road will need to tie into the existing road by means of extending the current retaining wall. We have not been provided detailed plans of the tie in area. A geotechnical exploration and analysis of a retaining wall was not part of our scope of services. If Atkins determines a retaining wall is required and needs geotechnical data for retaining wall design, please contact us regarding an amended scope of services.

Monitoring and Testing

We recommend that all aspects of the site preparation and construction be monitored by representatives of the geotechnical engineer, whose services should be employed directly by the owner. Particularly, the site stripping, proofrolling and fill compaction, and remedial treatment of the subgrade will require monitoring by knowledgeable field personnel. As your geotechnical consultant, we will be able to provide these and the other materials testing services normally specified for quality assurance.

LIMITATIONS

The foregoing subsurface data are based on observations of the subsurface conditions at the explored locations. It is possible that different conditions may exist away from the explored location, and such unknown conditions could have an impact on design and construction. No other warranty, express or implied, is made. Additionally, subsurface conditions can change with the passage of time. Because it is not possible to know every detail of the conditions hidden beneath the surface, our comments and recommendations are presented as opinions and judgments, as opposed to statements of fact. Should any conditions at variance with this report be encountered during construction, this office should be notified immediately so that further studies can be made and supplemental recommendations can be provided. The purpose of this report is to provide information and recommendations for use by the project designers. While the subsurface information may be helpful to contractors, the study is not intended to provide all

information that a contractor may need to evaluate construction costs and material quantities. The data and recommendations are specific to the site and project described herein.

Closing

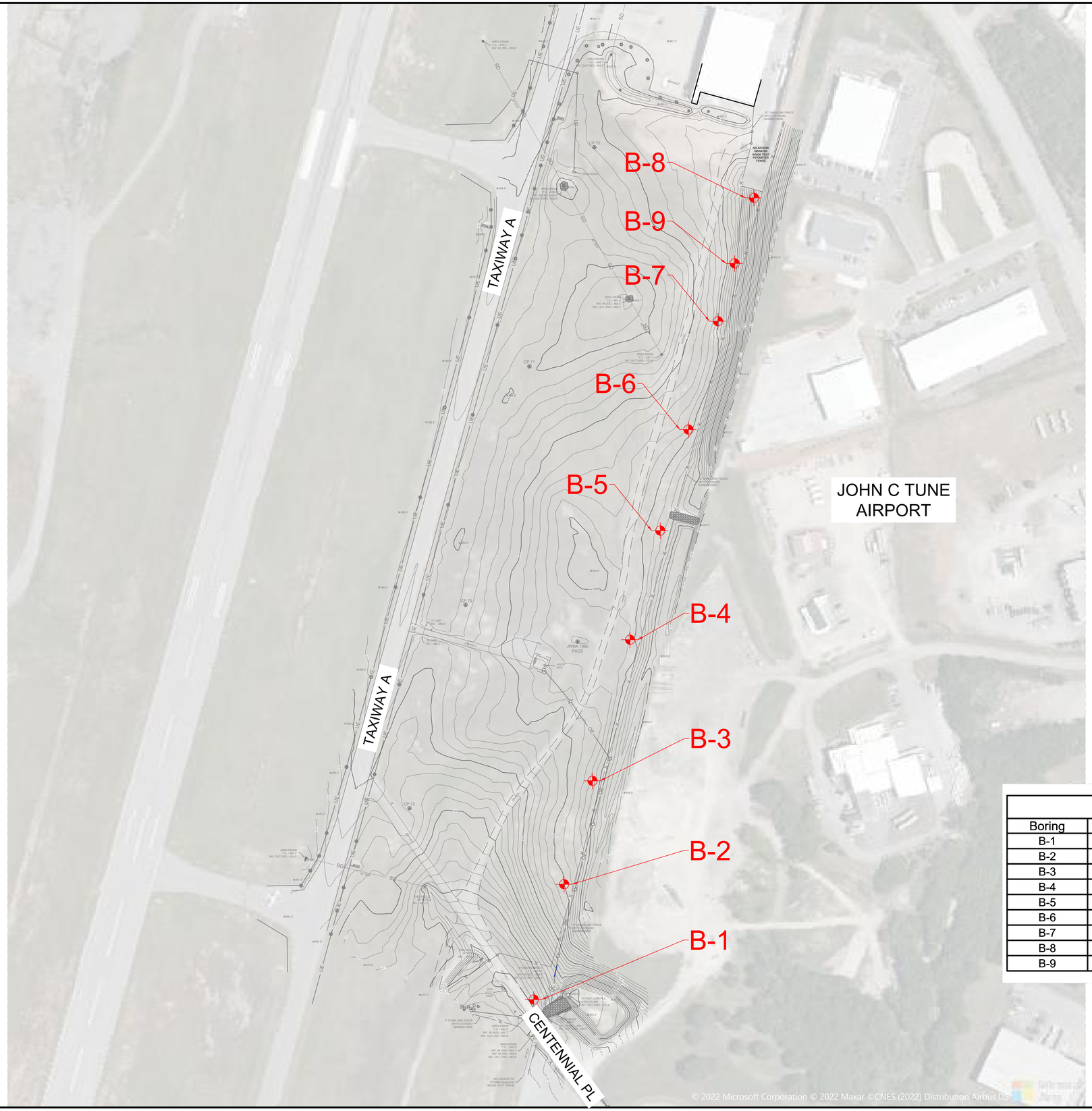
We appreciate the opportunity to support this project and look forward to working with you in the future. If you have any questions, please feel free to contact our office.

Sincerely,
CIA, CIVIL INFRASTRUCTURE ASSOCIATES, LLC



Matt Bullard, PE
Vice President
Director of Geotechnical Services

Attachments:
Site View Plan (with Boing Locations Amended)
Boring Records
Laboratory Test Results



STATE PLANE

0 100' 200' 300'

SCALE: 1"= 100'

Boring Locations			
Boring	Northing	Easting	Elevation
B-1	674570.61	1707809.21	470.80
B-2	674809.39	1707872.07	489.88
B-3	675023.60	1707930.59	493.60
B-4	675315.66	1708008.52	494.17
B-5	675541.67	1708071.08	496.42
B-6	675750.83	1708129.42	494.00
B-7	675975.44	1708190.52	494.25
B-8	676230.94	1708265.08	506.84
B-9	676095.03	1708225.18	498.34

Know what's **below.**
Call before you dig.

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MURFREESBORO, TENNESSEE 37129
PHONE: 615-663-7678

JWN NORTH HANGAR ACCESS ROAD

110 TUNE AIRPORT DR, NASHVILLE, TN 37209
DAVIDSON COUNTY

CIA PROJECT No: 2021-136 | DRAWN BY: MSW | CHECKED BY:

REVISIONS

◇ PRELIMINARY SET ISSUE DATE △ POST BID SET ISSUE DATE

DATE		DESCRIPTION

ORIGINAL ISSUE DATE: March 23rd, 2022

BORING LOCATION MAP

C1.00

PLOT DATE: 3/24/2022 11:00:24 AM (MWARNER)
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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-1	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 470.8**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Dark brown silty Clay with black mineral staining	3-2-1= 3		
	SPT	1.5	3.0	Mottled brown and tan silty CLAY	4-6-5= 11		
	SPT	3.0	4.5	Mottled Very dark brown to brown and silty Clay	3-4-5= 9		
	SPT	4.5	6.0		2-3-4= 7		
9.2				Boring Terminated at 9.2 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-2	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 489.9**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 2 inches Brown silty Clay with limestone rock fragments and fine roots- Fill	3-13-6= 19		
	SPT	1.5	3.0	Brown silty Clay and limestone rock fragments - Fill	2-27-6= 33		
	SPT	3.0	4.5		7-7-11= 18		
	SPT	4.5	6.0		6-5-3= 8		
20.6				Boring Terminated at 20.6 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-3	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 493.6**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 3 inches Mottled Tan and brown silty Clay with fine limestone rock pieces and fine roots- Fill	1-3-2= 5		
	SPT	1.5	3.0	Dark Brown silty Clay and limestone rock fragments- Fill	4-4-4= 8		
	SPT	3.0	4.5		4-6-4= 10		
	SPT	4.5	6.0		2-2-3= 5		
12.6				Boring Terminated at 12.6 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-4	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 494.2**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 1 inch Brown silty Clay and limestone rock fragments- Fill	3-7-8= 15		
	SPT	1.5	3.0	Brown silty Clay and limestone rock fragments with fine roots- Fill	3-4-5= 9		
	SPT	3.0	4.5		2-3-6= 9		
	SPT	4.5	5.0	Dark brown silty Clay with limestone rock fragments- Fill	50/5"= 50+		
5.0				Boring Terminated at 5.0 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-5	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 496.4**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 1 inch Dark brown silty Clay and limestone rock fragments-Fill	6-9-10= 19		
	SPT	1.5	3.0		3-6-8= 14		
	SPT	3.0	3.3		50/3"= 50+		
3.3				Boring Terminated at 3.3 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-6	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 494.0**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 1 inch Dark brown silty Clay with some small limestone rock pieces and fine roots	3-4-3= 7		
	SPT	1.5	3.0	Mottled brown to dark brown silty Clay and limestone rock fragments	6-7-6= 13		
	SPT	3.0	4.5		4-2-3= 5		
	SPT	4.5	6.0		11-6-3= 9		
16.1				Boring Terminated at 16.1 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-7	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 494.3**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 2 inches Mottled brown to dark brown silty Clay with limestone fragment and fine roots.- Fill	7-9-7= 16		
	SPT	1.5	3.0	Dark brown silty Clay and limestone rock fragments - Fill	3-6-7= 13		
	SPT	3.0	4.5		4-9-6= 13		
	SPT	4.5	6.0		3-4-3= 7		
7.3				Boring Terminated at 7.3 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-8	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 506.8**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 2 inches Brown silty Clay and fine roots-Fill	3-3-3= 6		
	SPT	1.5	3.0	Dark Brown silty Clay with small rock fragments-Fill	2-4-3= 7		
	SPT	3.0	4.5	Brown to dark brown silty Clay with some sand and limestone rock fragments -Fill	2-1-1= 2		
	SPT	4.5	6.0		6-3-2= 5		
7.9				Boring Terminated at 7.9 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

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BORING RECORD

Project Description: John C. Tune Airport Access Road	**Project Client: Atkins North America**
CIA, Inc. Project No.: 2021-142	**Project Location: Nashville, TN**
Boring ID/Location: R-9	**Date of Boring: 02/11/2022**
Driller:Tri-State Drilling/J.B.	**Field Engineer/Logger: Matt Bullard, CIA**
Water Level- FT (Time of Boring)- Dry	**Boring Top Hole Elevation: 498.3**
Water Level- FT (24 Hour)-	**Drill Rig: Geoprobe**

Stratum Depth (Ft)	Sample Type*	Sample Depth (FT)		Material Description	SPT Blow Counts= N	Rock Core Recovery (FT/%)	Rock Core RQD
0.0	SPT	0.0	1.5	Topsoil 4 inches	3-3-4= 7		
	SPT	1.5	3.0	Dark brown silty Clay and limestone rock fragments- Fill	9-7-15= 22		
	SPT	3.0	4.5		23-50/1"= 50+		
	SPT	4.5	5.3		21-50/3"= 50+		
5.3				Boring Terminated at 5.3 Feet Auger Refusal			

*Sample Type
1- SPT= Standard Penetration Test
2-NQ =Rock core utilizing NQ Wireline Core barrel
3- Relatively Undisturbed Soil (Shelby tube)

ATTERBERG LIMITS

ASTM D 4318-17

Client:	Civil Infrastructure Associates	Boring No.:	R-9
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	0-1.5
Project No.:	N2022-037-001	Sample No.:	1
Lab ID:	N2022-037-001-007	Soil Description:	GRAYISH BROWN LEAN CLAY

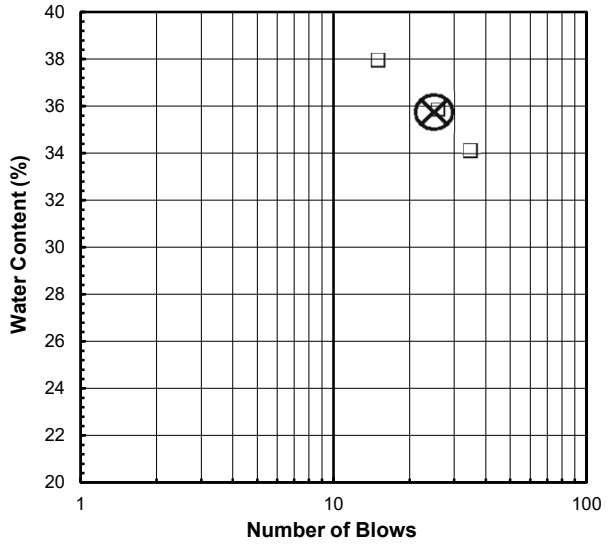
Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Air dried)

As Received Moisture Content ASTM D2216-19		**Liquid Limit Test**			
		1	**2**	**3**	**M**
Tare Number:	1561	1	2	3	**U**
Wt. of Tare & Wet Sample (g):	703.02	26.54	28.77	28.71	**L**
Wt. of Tare & Dry Sample (g):	666.67	24.13	26.04	25.96	**T**
Weight of Tare (g):	308.61	17.06	18.42	18.71	**I**
Weight of Water (g):	36.4	2.4	2.7	2.8	**P**
Weight of Dry Sample (g):	358.1	7.1	7.6	7.3	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**10.2**	**34.1**	**35.8**	**37.9**	**N**
Number of Blows:		**35**	**26**	**15**	**T**

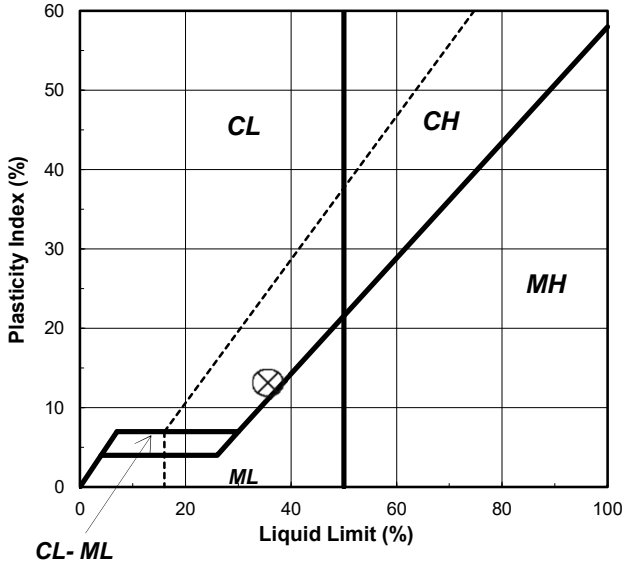
Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	15	16	
Wt. of Tare & Wet Sample (g):	30.24	32.13	
Wt. of Tare & Dry Sample (g):	28.18	29.57	
Weight of Tare (g):	19.30	18.55	
Weight of Water (g):	2.1	2.6	
Weight of Dry Sample (g):	8.9	11.0	
Moisture Content (%):	**23.2**	**23.2**	**0.0**
Note: The acceptable range of the two Moisture Contents is ±			1.12

Test Results	
Liquid Limit (%):	**36**
Plastic Limit (%):	**23**
Plasticity Index (%):	**13**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By JV *Date* 3/15/22 *Checked By* NC *Date* 3/16/22

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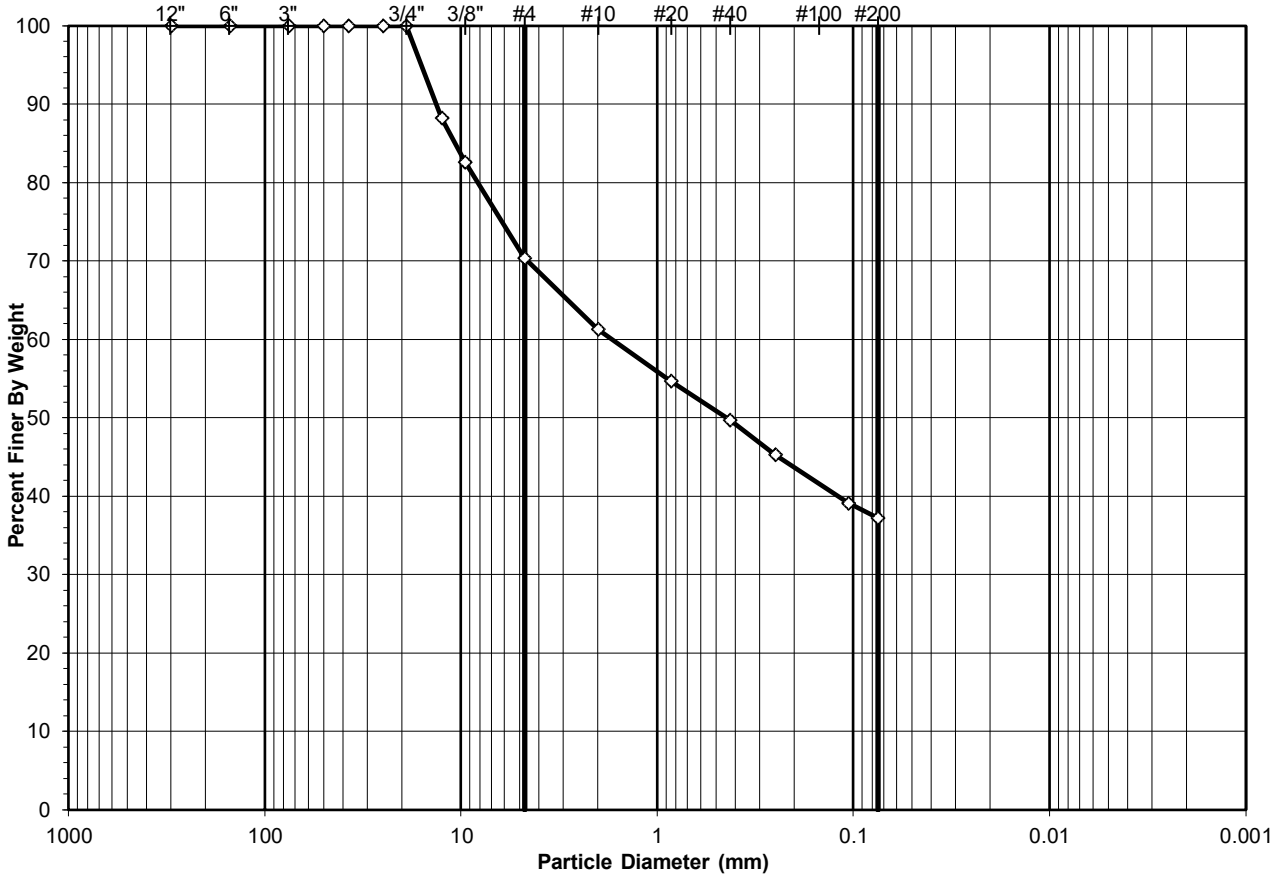
SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-9
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	0-1.5
Project No.:	N2022-037-001	Sample No.:	1
Lab ID:	N2022-037-001-007	Soil Color:	Grayish Brown

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	29.62
#4 To #200	*Sand*	33.14
Finer Than #200	*Silt & Clay*	37.24

USCS Symbol:
SC, TESTED

USCS Classification:
CLAYEY SAND WITH GRAVEL

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0

S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-9
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	0-1.5
Project No.:	N2022-037-001	Sample No.:	1
Lab ID:	N2022-037-001-007	Soil Color:	Grayish Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1561	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	661.12	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	661.12	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	308.51	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	352.61	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	352.61
Dry Weight of - 3/4" Sample (g)	352.61	Weight of Minus #200 Material (g):	131.31
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	221.30
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	352.61		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	41.54		11.78	11.78	88.22	**88.22**
3/8"	9.50	19.85		5.63	17.41	82.59	**82.59**
#4	4.75	43.07		12.21	29.62	70.38	**70.38**
#10	2.00	32.03		9.08	38.71	61.29	**61.29**
#20	0.85	23.32	(**)	6.61	45.32	54.68	**54.68**
#40	0.425	17.51		4.97	50.29	49.71	**49.71**
#60	0.250	15.63		4.43	54.72	45.28	**45.28**
#140	0.106	21.74		6.17	60.89	39.11	**39.11**
#200	0.075	6.61		1.87	62.76	37.24	**37.24**
Pan	-	131.31		37.24	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By JV Date 3/17/22 Checked By NC Date 3/17/22

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0 *S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls*

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ATTERBERG LIMITS

ASTM D 4318-17

Client:	Civil Infrastructure Associates	Boring No.:	R-1
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	1.5-3.0
Project No.:	N2022-037-001	Sample No.:	2
Lab ID:	N2022-037-001-008	Soil Description:	BROWN LEAN CLAY

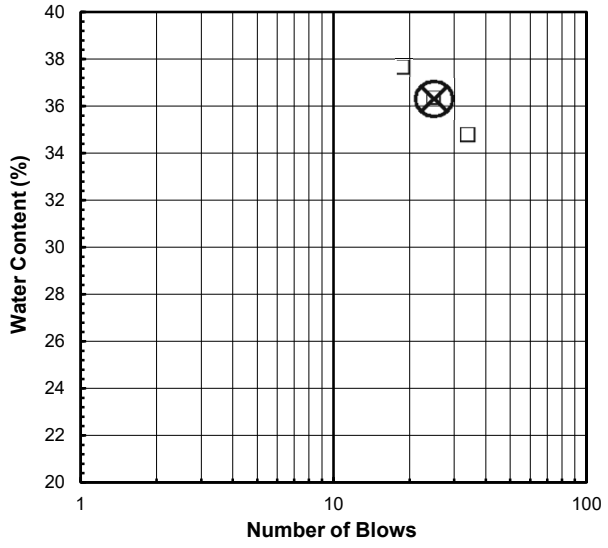
Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Air dried)

As Received Moisture Content		Liquid Limit Test			
ASTM D2216-19		1	2	3	M
Tare Number:	586	4	5	6	U
Wt. of Tare & Wet Sample (g):	883.96	28.37	29.81	28.69	L
Wt. of Tare & Dry Sample (g):	788.91	25.66	26.81	25.95	T
Weight of Tare (g):	307.27	17.86	18.55	18.67	I
Weight of Water (g):	95.1	2.7	3.0	2.7	P
Weight of Dry Sample (g):	481.6	7.8	8.3	7.3	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**19.7**	**34.7**	**36.3**	**37.6**	N
Number of Blows:		**34**	**25**	**19**	T

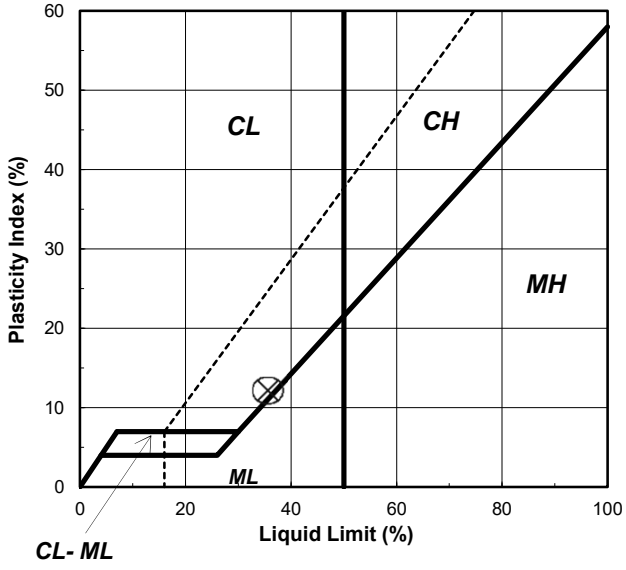
Plastic Limit Test	1	2	Range	
Tare Number:	17	18		
Wt. of Tare & Wet Sample (g):	27.88	30.00		
Wt. of Tare & Dry Sample (g):	26.08	27.93		
Weight of Tare (g):	18.49	19.21		
Weight of Water (g):	1.8	2.1		
Weight of Dry Sample (g):	7.6	8.7		
Moisture Content (%):	**23.7**	**23.7**	**0.0**	
Note: The acceptable range of the two Moisture Contents is ±				1.12

Test Results	
Liquid Limit (%):	**36**
Plastic Limit (%):	**24**
Plasticity Index (%):	**12**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



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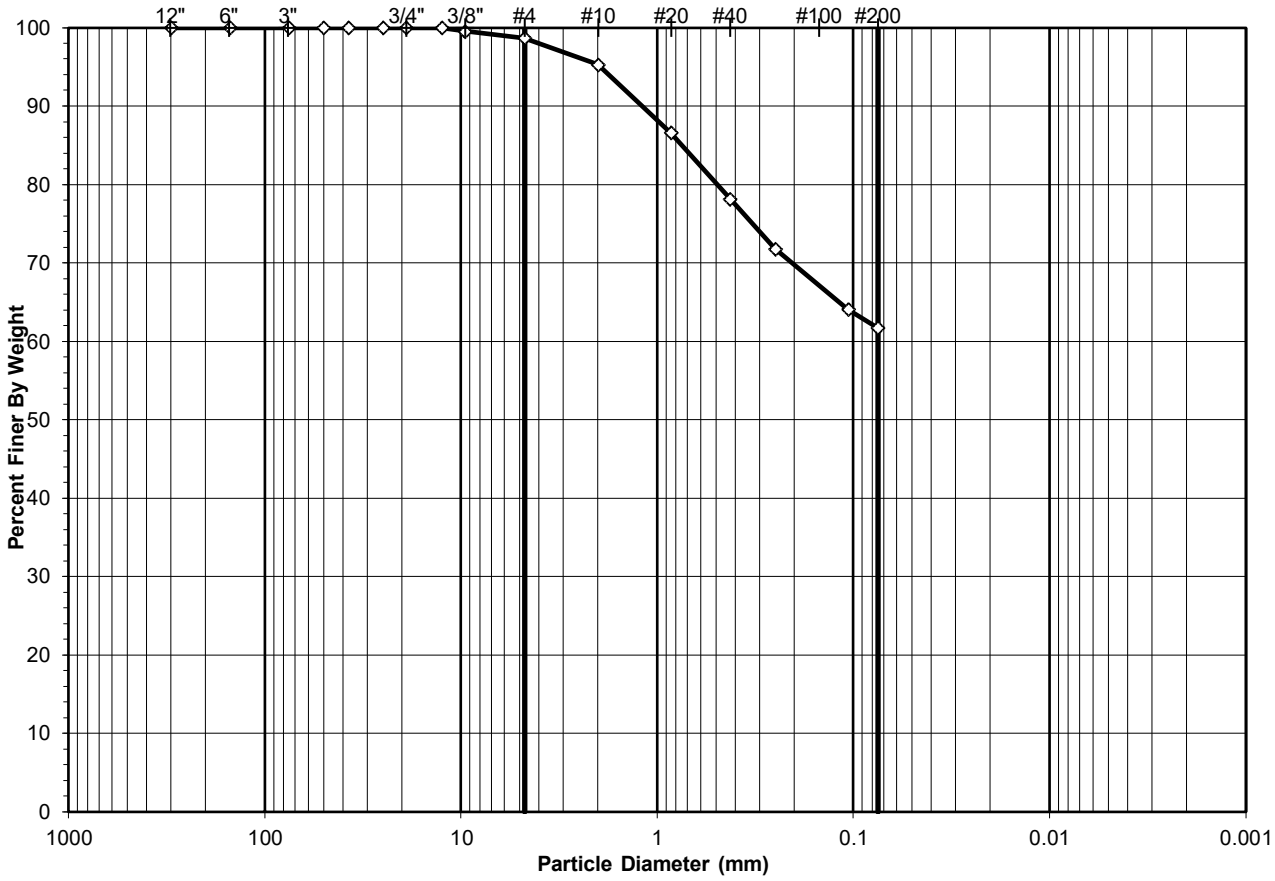
SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-1
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	1.5-3.0
Project No.:	N2022-037-001	Sample No.:	2
Lab ID:	N2022-037-001-008	Soil Color:	Brown

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	1.34
#4 To #200	*Sand*	36.91
Finer Than #200	*Silt & Clay*	61.74

USCS Symbol:
CL, TESTED

USCS Classification:
SANDY LEAN CLAY

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0

S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-1
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	1.5-3.0
Project No.:	N2022-037-001	Sample No.:	2
Lab ID:	N2022-037-001-008	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	586	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	784.94	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	784.94	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	307.27	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	477.67	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	477.67
Dry Weight of - 3/4" Sample (g)	477.67	Weight of Minus #200 Material (g):	294.93
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	182.74
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	477.67		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00		0.00	0.00	100.00	**100.00**
3/8"	9.50	2.21		0.46	0.46	99.54	**99.54**
#4	4.75	4.20		0.88	1.34	98.66	**98.66**
#10	2.00	16.20		3.39	4.73	95.27	**95.27**
#20	0.85	41.44	(**)	8.68	13.41	86.59	**86.59**
#40	0.425	40.41		8.46	21.87	78.13	**78.13**
#60	0.250	30.35		6.35	28.22	71.78	**71.78**
#140	0.106	36.77		7.70	35.92	64.08	**64.08**
#200	0.075	11.16		2.34	38.26	61.74	**61.74**
Pan	-	294.93		61.74	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By JV Date 3/17/22 Checked By NC Date 3/17/22

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0 *S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls*

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ATTERBERG LIMITS

ASTM D 4318-17

Client:	Civil Infrastructure Associates	Boring No.:	R-3
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	4.5-6.0
Project No.:	N2022-037-001	Sample No.:	4
Lab ID:	N2022-037-001-009	Soil Description:	BROWN LEAN CLAY

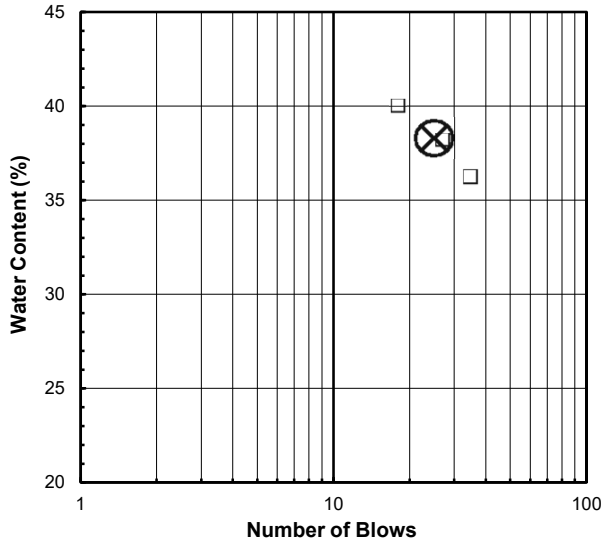
Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Air dried)

As Received Moisture Content		Liquid Limit Test			
ASTM D2216-19		1	2	3	M
Tare Number:	579	7	8	9	U
Wt. of Tare & Wet Sample (g):	703.04	28.87	27.90	27.59	L
Wt. of Tare & Dry Sample (g):	630.01	26.23	25.28	25.05	T
Weight of Tare (g):	308.18	18.94	18.42	18.70	I
Weight of Water (g):	73.0	2.6	2.6	2.5	P
Weight of Dry Sample (g):	321.8	7.3	6.9	6.4	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**22.7**	**36.2**	**38.2**	**40.0**	N
Number of Blows:		**35**	**27**	**18**	T

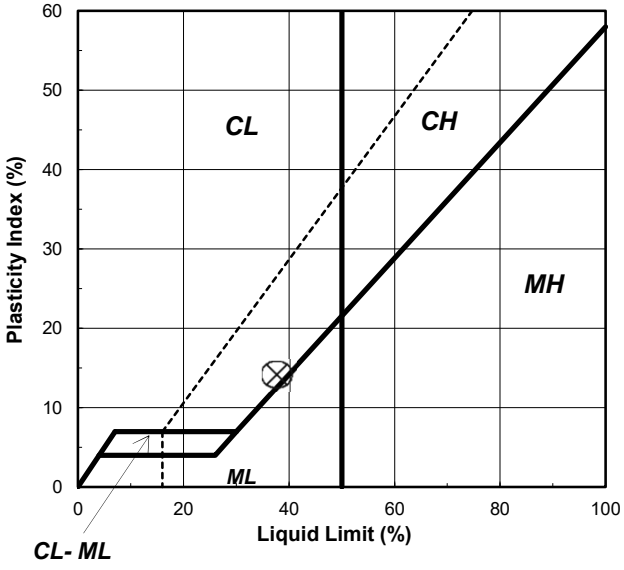
Plastic Limit Test	1	2	Range
Tare Number:	19	20	
Wt. of Tare & Wet Sample (g):	26.10	25.08	
Wt. of Tare & Dry Sample (g):	24.63	23.77	
Weight of Tare (g):	18.47	18.23	
Weight of Water (g):	1.5	1.3	
Weight of Dry Sample (g):	6.2	5.5	
Moisture Content (%):	**23.9**	**23.6**	**0.2**
Note: The acceptable range of the two Moisture Contents is ±			1.12

Test Results	
Liquid Limit (%):	**38**
Plastic Limit (%):	**24**
Plasticity Index (%):	**14**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



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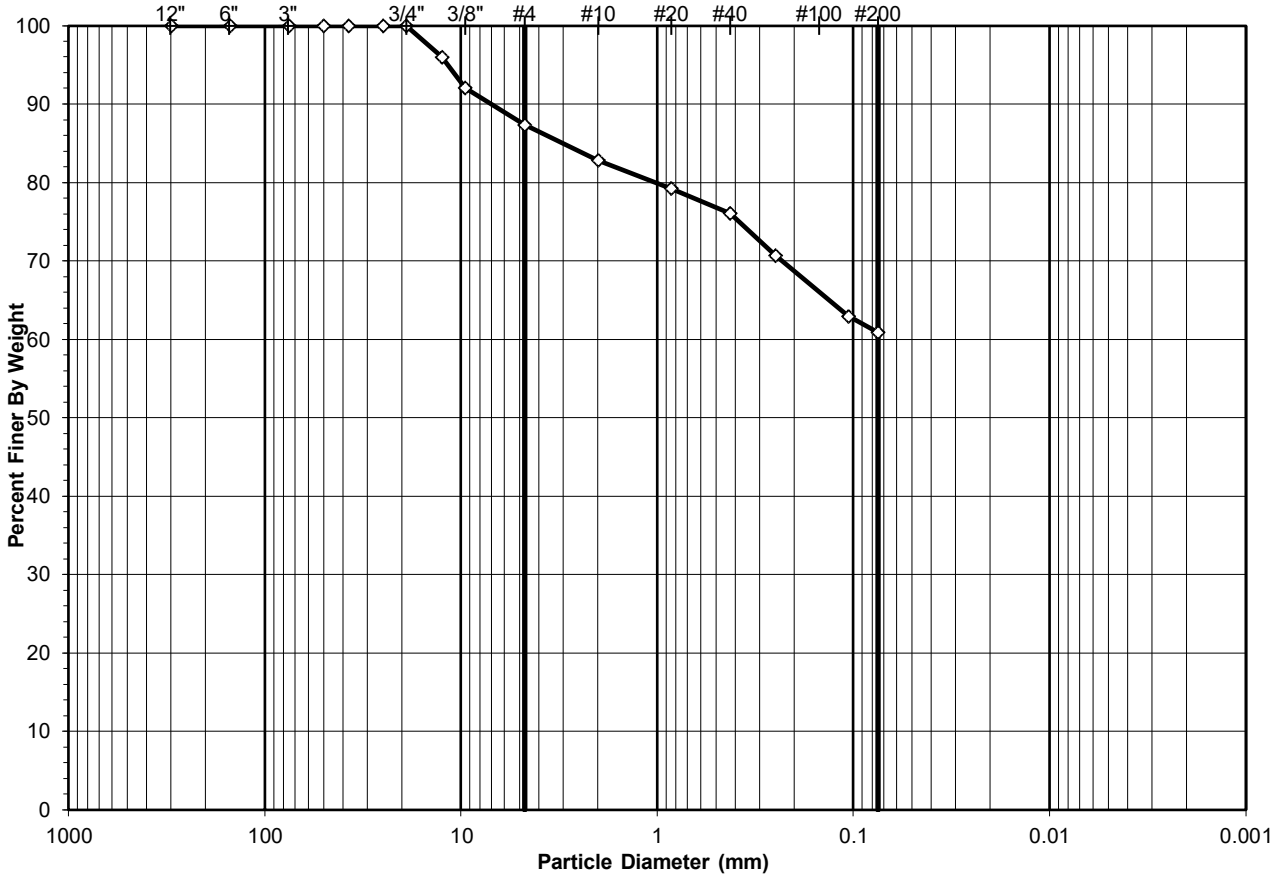
SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-3
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	4.5-6.0
Project No.:	N2022-037-001	Sample No.:	4
Lab ID:	N2022-037-001-009	Soil Color:	Brown

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary		
Sieve Sizes (mm)		**Percentage**
Greater Than #4	*Gravel*	12.63
#4 To #200	*Sand*	26.49
Finer Than #200	*Silt & Clay*	60.89

USCS Symbol:
CL, TESTED

USCS Classification:
SANDY LEAN CLAY

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0

S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-3
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	4.5-6.0
Project No.:	N2022-037-001	Sample No.:	4
Lab ID:	N2022-037-001-009	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	579	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	624.59	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	624.59	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	308.18	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	316.41	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	316.41
Dry Weight of - 3/4" Sample (g)	316.41	Weight of Minus #200 Material (g):	192.65
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	123.76
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	316.41		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	12.53		3.96	3.96	96.04	**96.04**
3/8"	9.50	12.60		3.98	7.94	92.06	**92.06**
#4	4.75	14.82		4.68	12.63	87.37	**87.37**
#10	2.00	14.29		4.52	17.14	82.86	**82.86**
#20	0.85	11.41	(**)	3.61	20.75	79.25	**79.25**
#40	0.425	10.14		3.20	23.95	76.05	**76.05**
#60	0.250	16.92		5.35	29.30	70.70	**70.70**
#140	0.106	24.45		7.73	37.03	62.97	**62.97**
#200	0.075	6.60		2.09	39.11	60.89	**60.89**
Pan	-	192.65		60.89	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By JV Date 3/17/22 Checked By NC Date 3/17/22

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0 *S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls*

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ATTERBERG LIMITS

ASTM D 4318-17

Client:	Civil Infrastructure Associates	Boring No.:	R-6
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	3.0-4.5
Project No.:	N2022-037-001	Sample No.:	3
Lab ID:	N2022-037-001-010	Soil Description:	GRAYISH BROWN LEAN CLAY

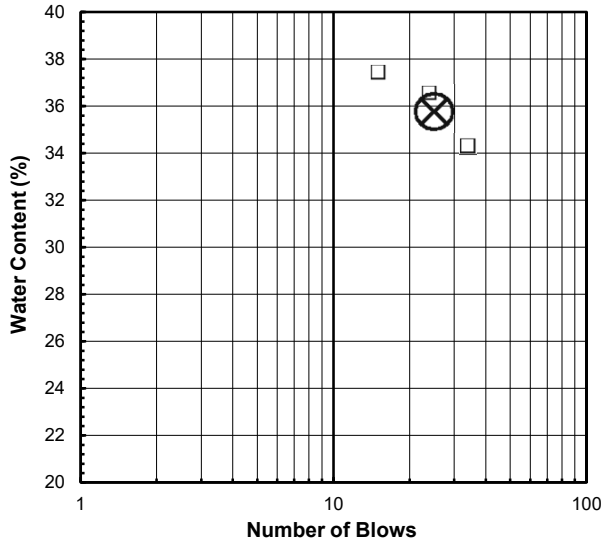
Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Air dried)

As Received Moisture Content		Liquid Limit Test			
ASTM D2216-19		1	2	3	M
Tare Number:	576	10	11	12	U
Wt. of Tare & Wet Sample (g):	823.73	28.52	26.74	28.38	L
Wt. of Tare & Dry Sample (g):	769.60	25.90	24.52	25.72	T
Weight of Tare (g):	308.38	18.26	18.44	18.61	I
Weight of Water (g):	54.1	2.6	2.2	2.7	P
Weight of Dry Sample (g):	461.2	7.6	6.1	7.1	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**11.7**	**34.3**	**36.5**	**37.4**	N
Number of Blows:		**34**	**24**	**15**	T

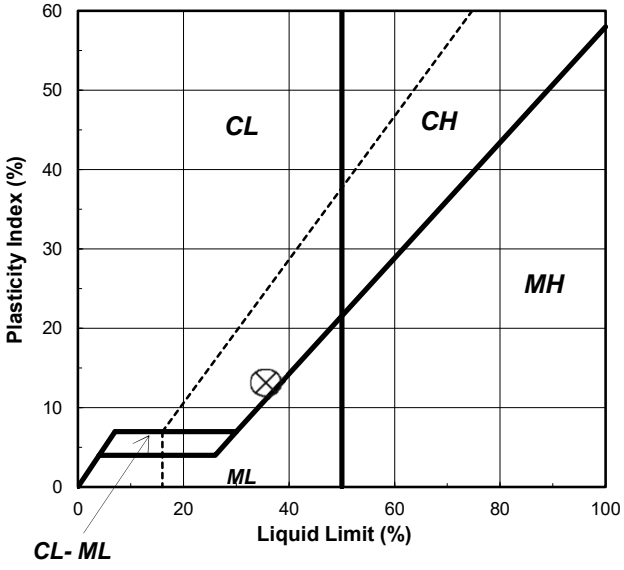
Plastic Limit Test	1	2	Range
Tare Number:	21	22	
Wt. of Tare & Wet Sample (g):	26.33	26.18	
Wt. of Tare & Dry Sample (g):	25.03	24.88	
Weight of Tare (g):	19.37	19.24	
Weight of Water (g):	1.3	1.3	
Weight of Dry Sample (g):	5.7	5.6	
Moisture Content (%):	**23.0**	**23.0**	**-0.1**
Note: The acceptable range of the two Moisture Contents is ±			1.12

Test Results	
Liquid Limit (%):	**36**
Plastic Limit (%):	**23**
Plasticity Index (%):	**13**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



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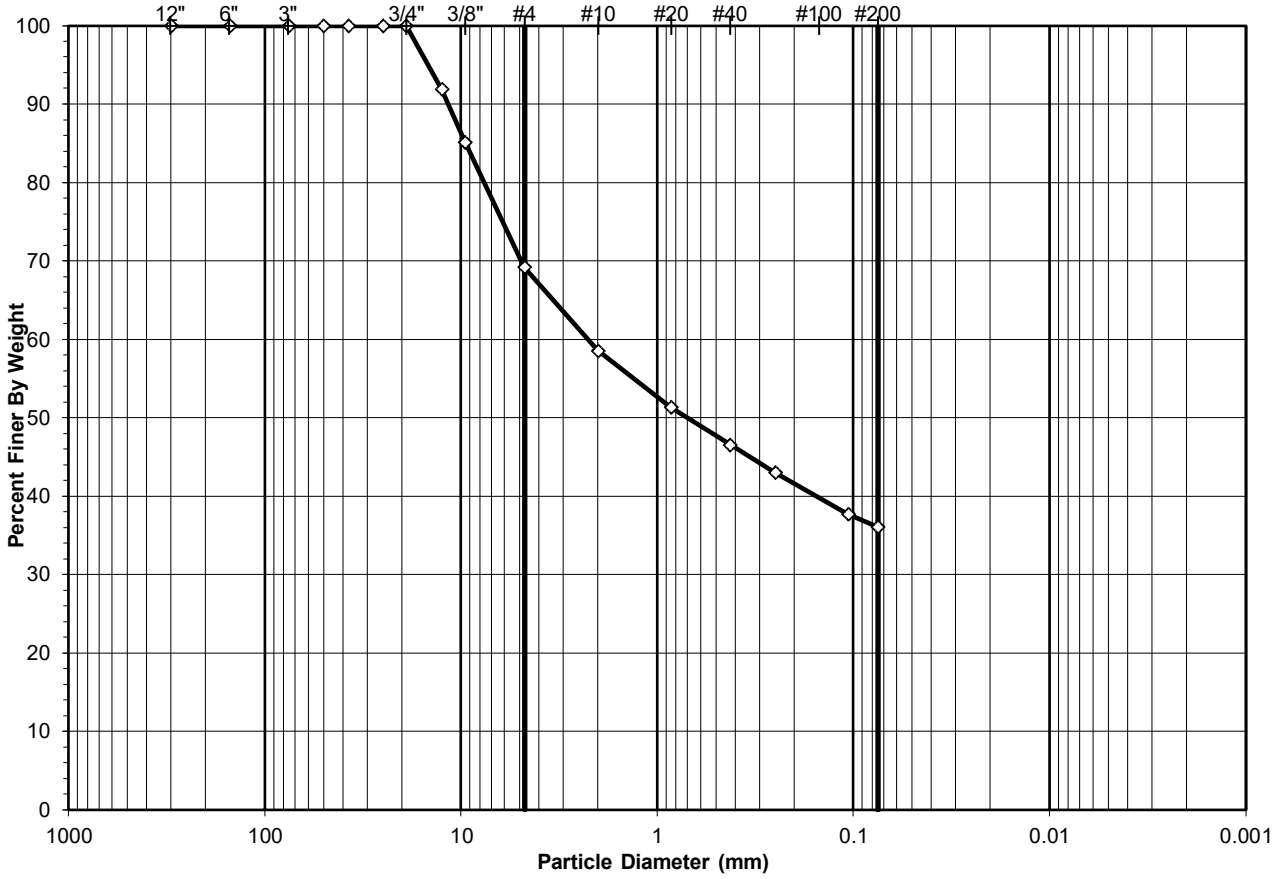
SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-6
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	3.0-4.5
Project No.:	N2022-037-001	Sample No.:	3
Lab ID:	N2022-037-001-010	Soil Color:	Grayish Brown

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	30.79
#4 To #200	*Sand*	33.17
Finer Than #200	*Silt & Clay*	36.05

USCS Symbol:
SC, TESTED

USCS Classification:
CLAYEY SAND WITH GRAVEL

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0

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WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Civil Infrastructure Associates	Boring No.:	R-6
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	3.0-4.5
Project No.:	N2022-037-001	Sample No.:	3
Lab ID:	N2022-037-001-010	Soil Color:	Grayish Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	576	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	766.23	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	766.23	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	308.38	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	457.85	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	457.85
Dry Weight of - 3/4" Sample (g)	457.85	Weight of Minus #200 Material (g):	165.05
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	292.80
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	457.85		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	37.02		8.09	8.09	91.91	**91.91**
3/8"	9.50	31.11		6.79	14.88	85.12	**85.12**
#4	4.75	72.82		15.90	30.79	69.21	**69.21**
#10	2.00	48.89		10.68	41.46	58.54	**58.54**
#20	0.85	32.99	(**)	7.21	48.67	51.33	**51.33**
#40	0.425	21.80		4.76	53.43	46.57	**46.57**
#60	0.250	16.27		3.55	56.98	43.02	**43.02**
#140	0.106	24.30		5.31	62.29	37.71	**37.71**
#200	0.075	7.60		1.66	63.95	36.05	**36.05**
Pan	-	165.05		36.05	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By JV Date 3/17/22 Checked By NC Date 3/17/22

DCN: CT-S3TW DATE: 8/19/19 REVISION: 0 *S:Excel\Excel QA\Spreadsheets\SieveHydJ.xls*

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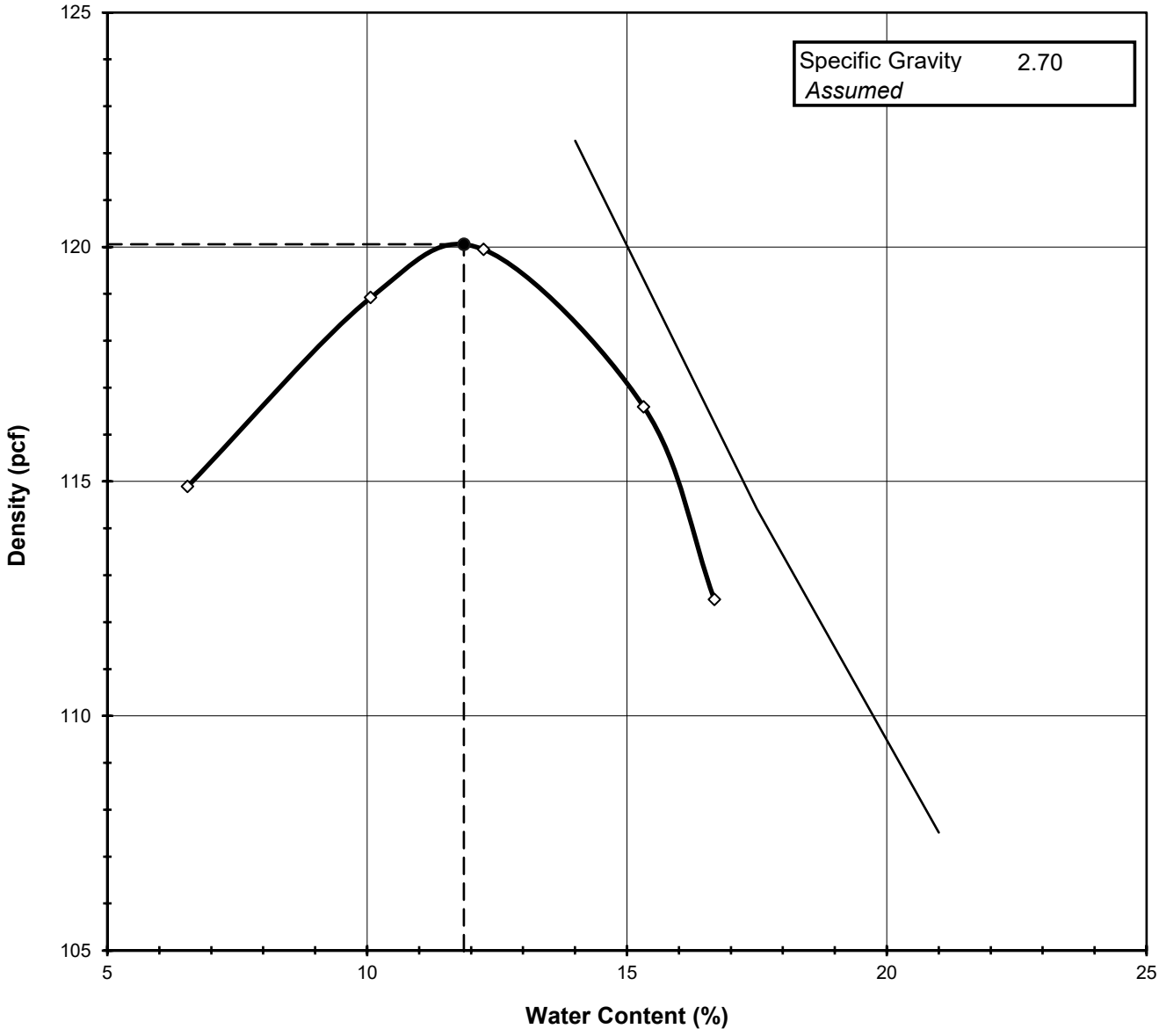
MOISTURE DENSITY RELATIONSHIP

ASTM D1557-12

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-035-001-006	Test Method	**MODIFIED**

Visual Description: Brown and Gray Clay w/ Rock

Optimum Water Content **11.9**
Maximum Dry Density **120.1**



Tested By *WDS* *Date* *03/03/22* *Checked By* *NC* *Date* 3/4/22

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MOISTURE - DENSITY RELATIONSHIP

ASTM D1557-12

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Roadway	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-035-001-006		

Visual Description: Brown and Gray Clay w/ Rock

Total Weight of the Sample (g):	NA
As Received Water Content (%):	NA
Assumed Specific Gravity:	2.70
Percent Retained on 3/4":	NA
Percent Retained on 3/8":	NA
Percent Retained on #4:	NA
Oversize Material:	Not included
Procedure Used:	C

Test Type:		**MODIFIED**
Rammer Weight (lb):		10.0
Rammer Drop (in):		18
Rammer Type:		MECHANICAL
Machine ID:	N	062
Mold ID:	N	296
Mold diameter:		6"
Weight of the Mold (g):		5716
Volume of the Mold (cm^3):		2120

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Weight of Mold & Wet Sample (g):	9875	10163	10290	10284	10175
Weight of Mold (g):	5716	5716	5716	5716	5716
Weight of Wet Sample (g):	4159	4447	4574	4568	4459
Mold Volume (cm^3):	2120	2120	2120	2120	2120

Moisture Content / Density

Tare Number:	7	19	2	1	12
Weight of Tare & Wet Sample (g):	857.04	702.38	1401.28	1161.67	1111.78
Weight of Tare & Dry Sample (g):	809.75	646.07	1257.95	1018.94	965.36
Weight of Tare (g):	87.16	86.69	87.20	87.39	87.61
Weight of Water (g):	47.29	56.31	143.33	142.73	146.42
Weight of Dry Sample (g):	722.59	559.38	1170.75	931.55	877.75

Wet Density (g/cm^3):	1.96	2.10	2.16	2.15	2.10
Wet Density (pcf):	122.4	130.9	134.6	134.5	131.2
Moisture Content (%):	**6.5**	**10.1**	**12.2**	**15.3**	**16.7**
Dry Density (pcf):	**114.9**	**118.9**	**119.9**	**116.6**	**112.5**

Zero Air Voids

Moisture Content (%):	14.0	17.5	21.0
Dry Unit Weight (pcf):	122.3	114.4	107.5

Tested By WDS *Date* 3/3/22 *Checked By* NC *Date* 3/4/22

DCN:CT-S12 DATE:5/1/13 REVISION: 14

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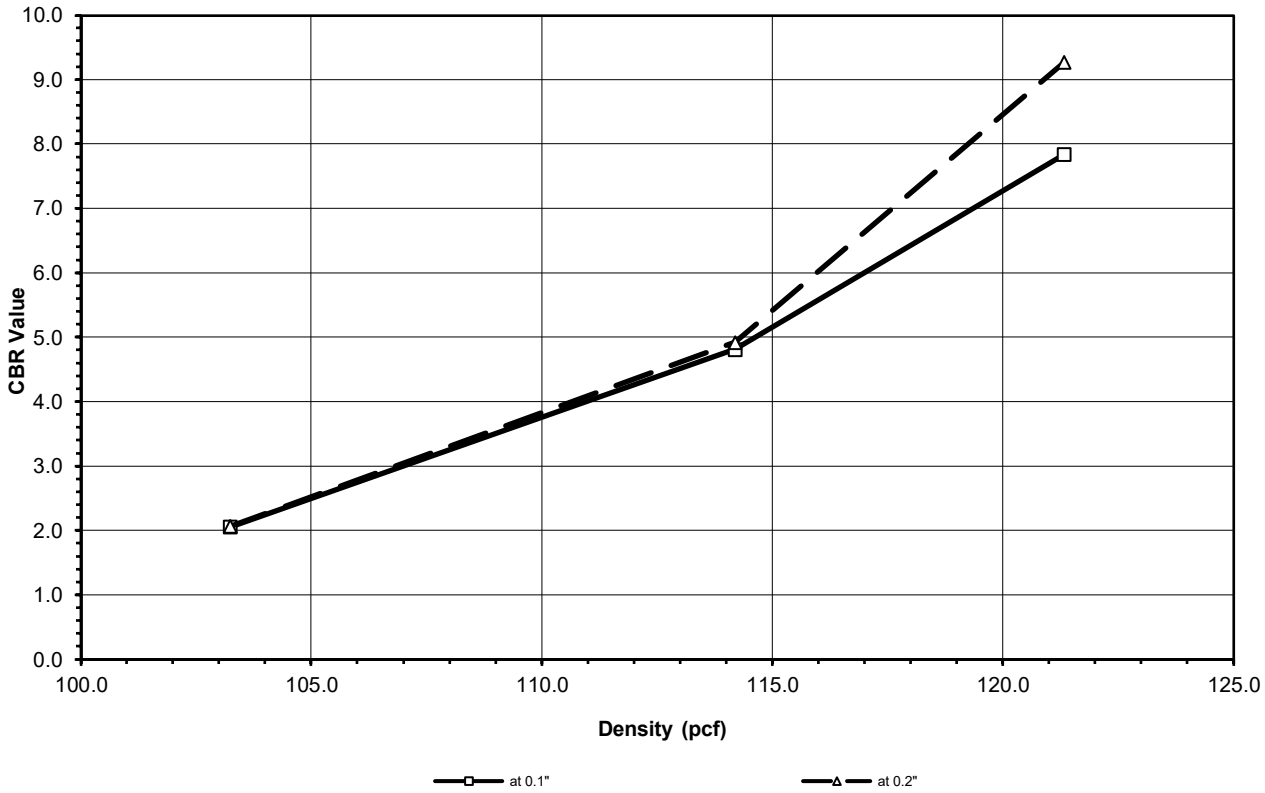
3 POINT CBR TEST

ASTM D 1883-16 / AASHTO T193-13

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Road\	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-037-001-006	Visual Description:	Brown and Gray Clay w/ Rock

Point No.	**1**	**2**	**3**
Blows per Layer	10	25	56
Dry Density (pcf)	103.2	114.2	121.3
Dry Density (g/cm^3)	1.65	1.83	1.94
Corrected Penetration Stress @ 0.1"	20.57	48.13	78.40
Corrected Penetration Stress @ 0.2"	30.97	73.80	139.07
Corrected CBR Values @ 0.1"	**2.06**	**4.81**	**7.84**
Corrected CBR Values @ 0.2"	**2.06**	**4.92**	**9.27**



Tested By NC *Date* 3/15/22 *Input Checked By* WDS *Date* 3/16/22

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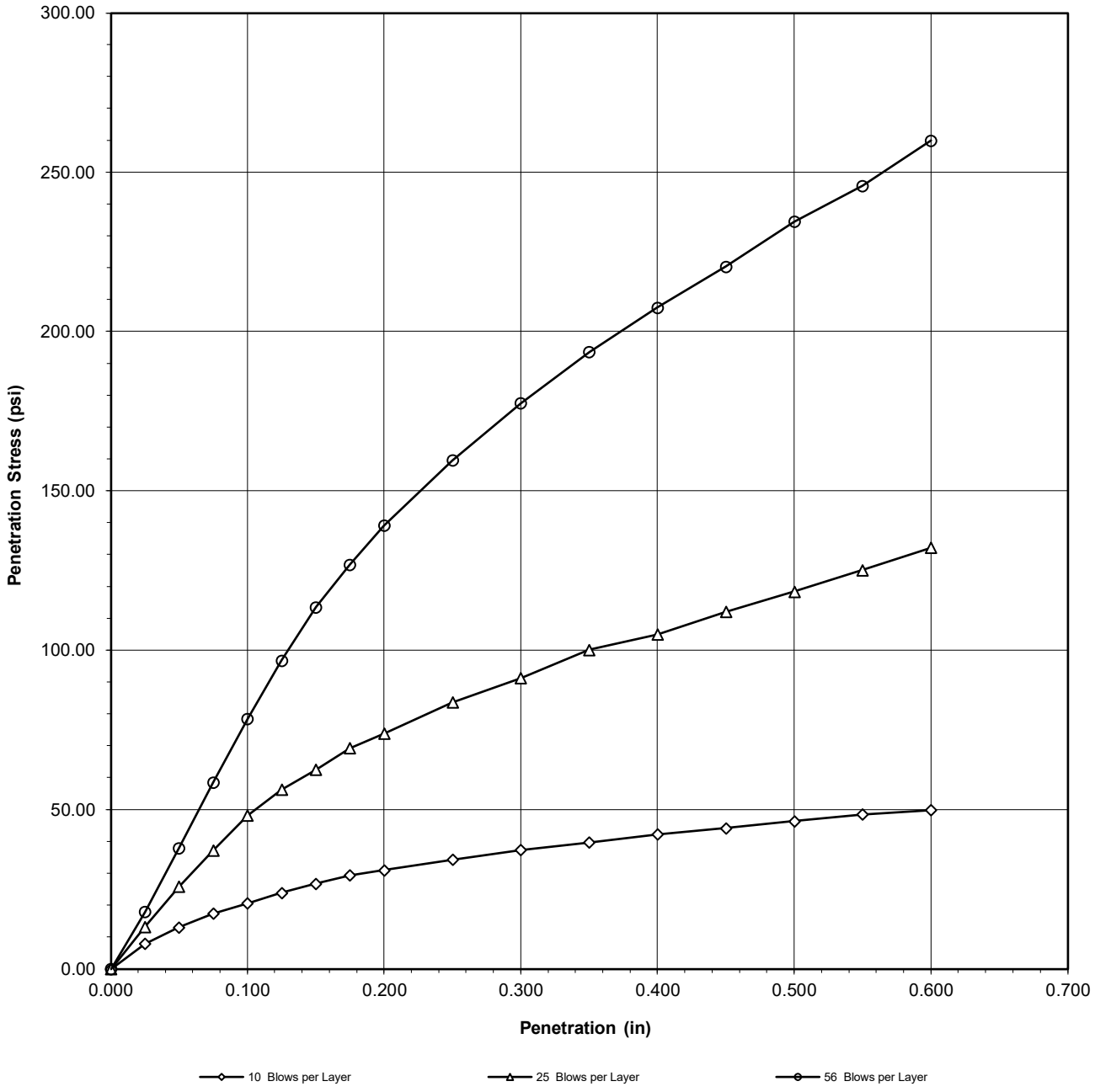
3 POINT CBR TEST
ASTM D 1883-16 / AASHTO T193-13

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Road\	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-037-001-006	Visual Description:	Brown and Gray Clay w/ Rock

Penetration Stress vs. Penetration



Tested By NC *Date* 3/15/22 *Input Checked By* WDS *Date* 3/16/22

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3 POINT CBR TEST

ASTM D 1883-16 / AASHTO T193-13

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Roadw	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-037-001-006	Visual Description:	Brown and Gray Clay w/ Rock

Test Type	**Modified**
Molding Method	D1557 C
Mold ID	N260
Weight of Mold (g)	7204
Mold Volume (cm^3)	2123.8
Surcharge (lb)	**10**
Piston Area (in^2)	3
Sample Height (in)	4.58
Sample Conditions	Soaked
Blows per Layer	**10**

+3/4" Scalped & Replaced (%) 2

Density Measurement	**Before Soaking**	**After Soaking**
Wt. of Mold & Wet Sample (g)	11122	11483
Wt. of Wet Sample (g)	3918	4279
Sample Volume (cm^3)	2123.8	2181
Wet Density (g/cm^3)	1.84	1.96
Wet Density (pcf)	115.2	122.5
Dry Density (pcf)	**103.2**	**101.5**
Dry Density (g/cm^3)	**1.65**	**1.63**

Water Contents	**As Rec'd**	**Beginning Compaction**	**After Compaction**	**Average Begin&Aft**	**After Soaking**
Tare No.	T18	3	9		20
Wt. of Tare & Wet Sample (g)	142.37	460.02	446.31		669.82
Wt. of Tare & Dry Sample (g)	120.9	419.53	410.87		569.97
Wt of Tare (g)	8.41	86.74	87.31		87.35
Moisture Content (%)	19.1	12.2	11.0	11.6	20.7

Piston Displacement (in)	**Load (lb)**	**Penetration Stress (psi)**
0	0	0.0
0.025	23.6	7.9
0.050	39	13.0
0.075	52.1	17.4
0.100	61.7	20.6
0.125	71.6	23.9
0.150	80.3	26.8
0.175	88.1	29.4
0.200	92.9	31.0
0.250	102.7	34.2
0.300	111.8	37.3
0.350	119	39.7
0.400	126.6	42.2
0.450	132.4	44.1
0.500	139.1	46.4
0.550	145.4	48.5
0.600	149.7	49.9

Swell Measurement

Elapsed Time (hr)	Dial Gauge (Div)	Percent Swell
0.00	599	0.00%
70.50	720	2.64%
96.00	722	2.69%
96.00	722	2.69%
96.00	722	2.69%
96.00	722	2.69%

1 Division = 0.001 (in)

Tested By NC *Date* 3/15/22 *Input Checked By* WDS *Date* 3/16/22

DCN: CT-S27 REVSI0N: 11 DATE: 9/1/17

C:\Users\TenLab#02\Desktop\Projects Folder\Nashville Projects\2022\N2022-037 - CIA - JWN-Apron Expansion & Roadway\001\[N2022-037-001-006 D1883.xls]SHEET1

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3 POINT CBR TEST

ASTM D 1883-16 / AASHTO T193-13

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Road\	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-037-001-006	Visual Description:	Brown and Gray Clay w/ Rock

Test Type	**Modified**
Molding Method	D1557 C
Mold ID	N261
Weight of Mold (g)	7282
Mold Volume (cm^3)	2126.6
Surcharge (lb)	**10**
Piston Area (in^2)	3
Sample Height (in)	4.58
Sample Conditions	Soaked
Blows per Layer	**25**

+3/4" Scalped & Replaced (%) 2

Density Measurement	**Before Soaking**	**After Soaking**
Wt. of Mold & Wet Sample (g)	11627	11873
Wt. of Wet Sample (g)	4345	4591
Sample Volume (cm^3)	2126.6	2196
Wet Density (g/cm^3)	2.04	2.09
Wet Density (pcf)	127.5	130.4
Dry Density (pcf)	**114.2**	**110.6**
Dry Density (g/cm^3)	**1.83**	**1.77**

Water Contents	**As Rec'd**	**Beginning Compaction**	**After Compaction**	**Average Begin/Aft**	**After Soaking**
Tare No.	T18	12	20		9
Wt. of Tare & Wet Sample (g)	142.37	431.47	491.77		735.84
Wt. of Tare & Dry Sample (g)	120.9	394.28	451.12		637.18
Wt of Tare (g)	8.41	87.59	87.35		87.18
Moisture Content (%)	19.1	12.1	11.2	11.7	17.9

Piston Displacement (in)	**Load (lb)**	**Penetration Stress (psi)**
0	0	0.0
0.025	39.7	13.2
0.050	77.5	25.8
0.075	111.5	37.2
0.100	144.4	48.1
0.125	168.8	56.3
0.150	187.5	62.5
0.175	207.7	69.2
0.200	221.4	73.8
0.250	250.9	83.6
0.300	273.6	91.2
0.350	300.3	100.1
0.400	314.7	104.9
0.450	336.2	112.1
0.500	355.1	118.4
0.550	375.4	125.1
0.600	396.5	132.2

Swell Measurement

Elapsed Time (hr)	Dial Gauge (Div)	Percent Swell
0.00	557	0.00%
70.08	704	3.21%
96.00	707	3.28%
96.00	707	3.28%
96.00	707	3.28%
96.00	707	3.28%

1 Division = 0.001 (in)

Tested By NC *Date* 3/15/22 *Input Checked By* WDS *Date* 3/16/22

DCN: CT-S27 REVSI0N: 11 DATE: 9/1/17

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3 POINT CBR TEST

ASTM D 1883-16 / AASHTO T193-13

Client:	Civil Infrastructure Associates	Boring No.:	BULK
Client Reference:	JWN - Apron Expansion & Road\	Depth (ft):	Varies
Project No.:	N2022-037-001	Sample No.:	Mixed
Lab ID:	N2022-037-001-006	Visual Description:	Brown and Gray Clay w/ Rock

Test Type	**Modified**
Molding Method	D1557 C
Mold ID	N278
Weight of Mold (g)	7168
Mold Volume (cm^3)	2123.8
Surcharge (lb)	**10**
Piston Area (in^2)	3
Sample Height (in)	4.58
Sample Conditions	Soaked
Blows per Layer	**56**

+3/4" Scalped & Replaced (%) 2

Density Measurement	**Before Soaking**	**After Soaking**
Wt. of Mold & Wet Sample (g)	11795	11956
Wt. of Wet Sample (g)	4627	4788
Sample Volume (cm^3)	2123.8	2178
Wet Density (g/cm^3)	2.18	2.20
Wet Density (pcf)	135.9	137.2
Dry Density (pcf)	**121.3**	**119.6**
Dry Density (g/cm^3)	**1.94**	**1.92**

Water Contents	**As Rec'd**	**Beginning Compaction**	**After Compaction**	**Average Begin/Aft**	**After Soaking**
Tare No.	T18	1	2		12
Wt. of Tare & Wet Sample (g)	142.37	480.97	521.44		731.11
Wt. of Tare & Dry Sample (g)	120.9	437.87	475.57		648.37
Wt of Tare (g)	8.41	87.35	87.19		87.59
Moisture Content (%)	19.1	12.3	11.8	12.1	14.8

Piston Displacement (in)	**Load (lb)**	**Penetration Stress (psi)**
0	0	0.0
0.025	53.5	17.8
0.050	113.6	37.9
0.075	175.2	58.4
0.100	235.2	78.4
0.125	290.3	96.8
0.150	340.4	113.5
0.175	380.5	126.8
0.200	417.2	139.1
0.250	478.6	159.5
0.300	532.3	177.4
0.350	580.5	193.5
0.400	622.5	207.5
0.450	660.9	220.3
0.500	703.3	234.4
0.550	737.1	245.7
0.600	779.8	259.9

Swell Measurement

Elapsed Time (hr)	Dial Gauge (Div)	Percent Swell
0.00	155	0.00%
69.50	261	2.31%
96.00	271	2.53%
96.00	271	2.53%
96.00	271	2.53%
96.00	271	2.53%

1 Division = 0.001 (in)

Tested By NC *Date* 3/15/22 *Input Checked By* WDS *Date* 3/16/22

DCN: CT-S27 REVSI0N: 11 DATE: 9/1/17

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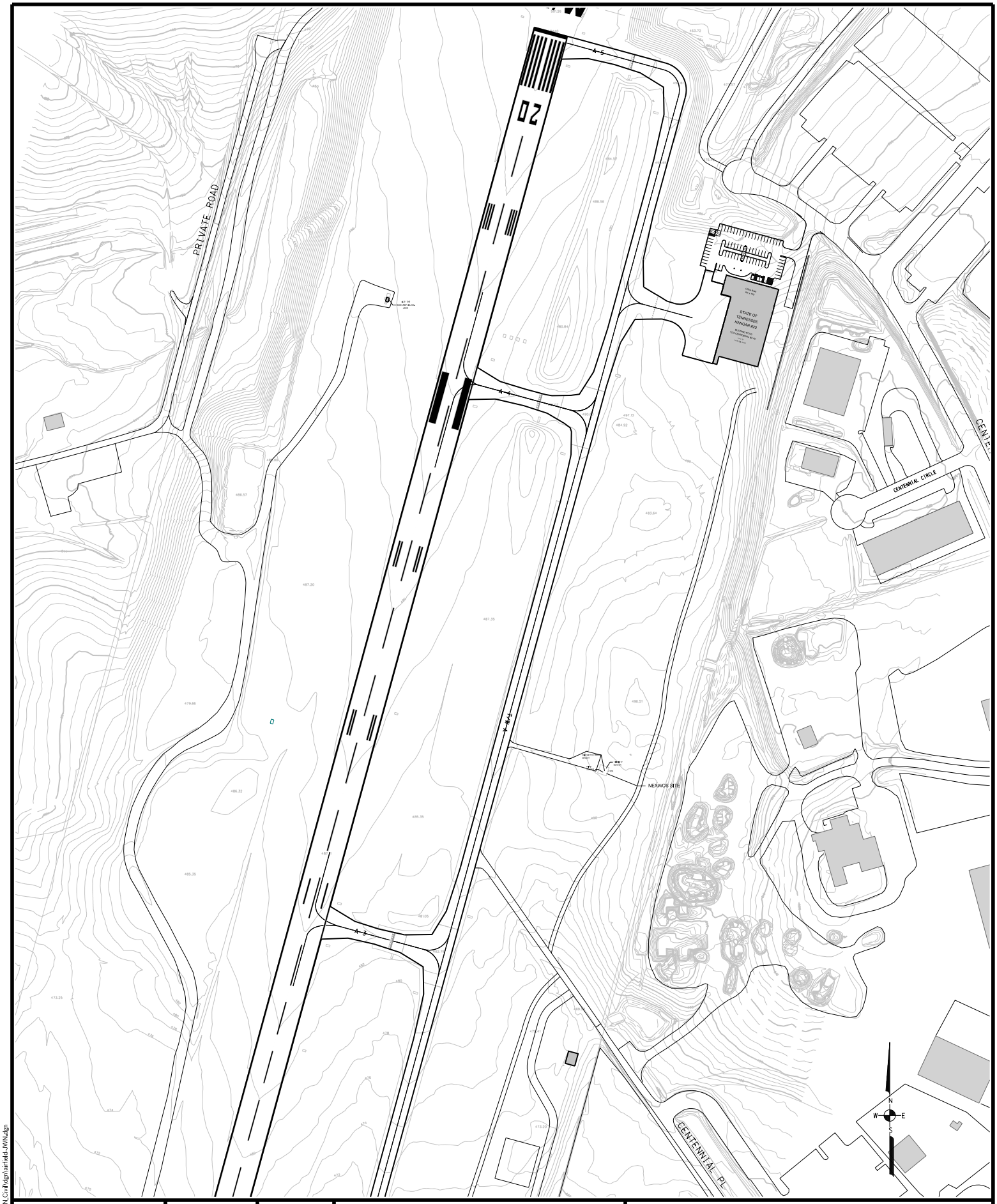

DRAWN BY: MSR

CK. BY: -

DATE: 04-21-2022

PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

SHEET NUMBER

EXHIBIT A

JWN

AIRFIELD LAYOUT

JWN John C. Tune Airport®

4/21/2022
M:\19\Worksapace\Projects\JWN_Civil\dgn\airfield-JWN.dgn

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
EG vs FG Road	full	1.000	1.000	116421.05	27562.88	5.61	27557.27<Cut>
EG vs FG Taxilane	full	1.000	1.000	393592.26	8884.11	13425.50	4541.39<Fill>

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	510013.31	36446.99	13431.11	23015.88<Cut>

* Value adjusted by cut or fill factor other than 1.0

RUNWAY 2-20

TAXIWAY A

0.30%

TDOT HANGAR

AIR TRAFFIC CONTROL TOWER

KEY MAP

DESC. OF REVISIONS	DATE	REV. APPR. BY

ISSUED FOR	DATE	ISSUED APPR. BY

JWN® John C. Tune Airport®

CLIENT: JOHN C. TUNE AIRPORT

PROJECT: NORTH HANGAR ACCESS ROAD

SHEET TITLE: PRELIMINARY GRADING EXHIBIT - TAXILANE AND ACCESS ROAD

ATKINS
Member of the SNC-Lavalin Group

CORPORATE OFFICE:
4030 W. BOY SCOUT BLVD.
TAMPA, FL 33607
FBPR CERTIFICATE OF AUTHORIZATION NO.24

LOCAL OFFICE:
404 BNA DRIVE, SUITE 600
NASHVILLE, TN 37217
TEL: 615.365.1461

WWW.ATKINSGLOBAL.COM

JOB NO.: 100078738	
DESIGNED: ---	CHECKED: ---
DRAWN: ---	APPROVED: DWS
SHEET NO.	

0 50' 100' 200'

N

PLOT DATE: 3/23/2022 3:19 PM
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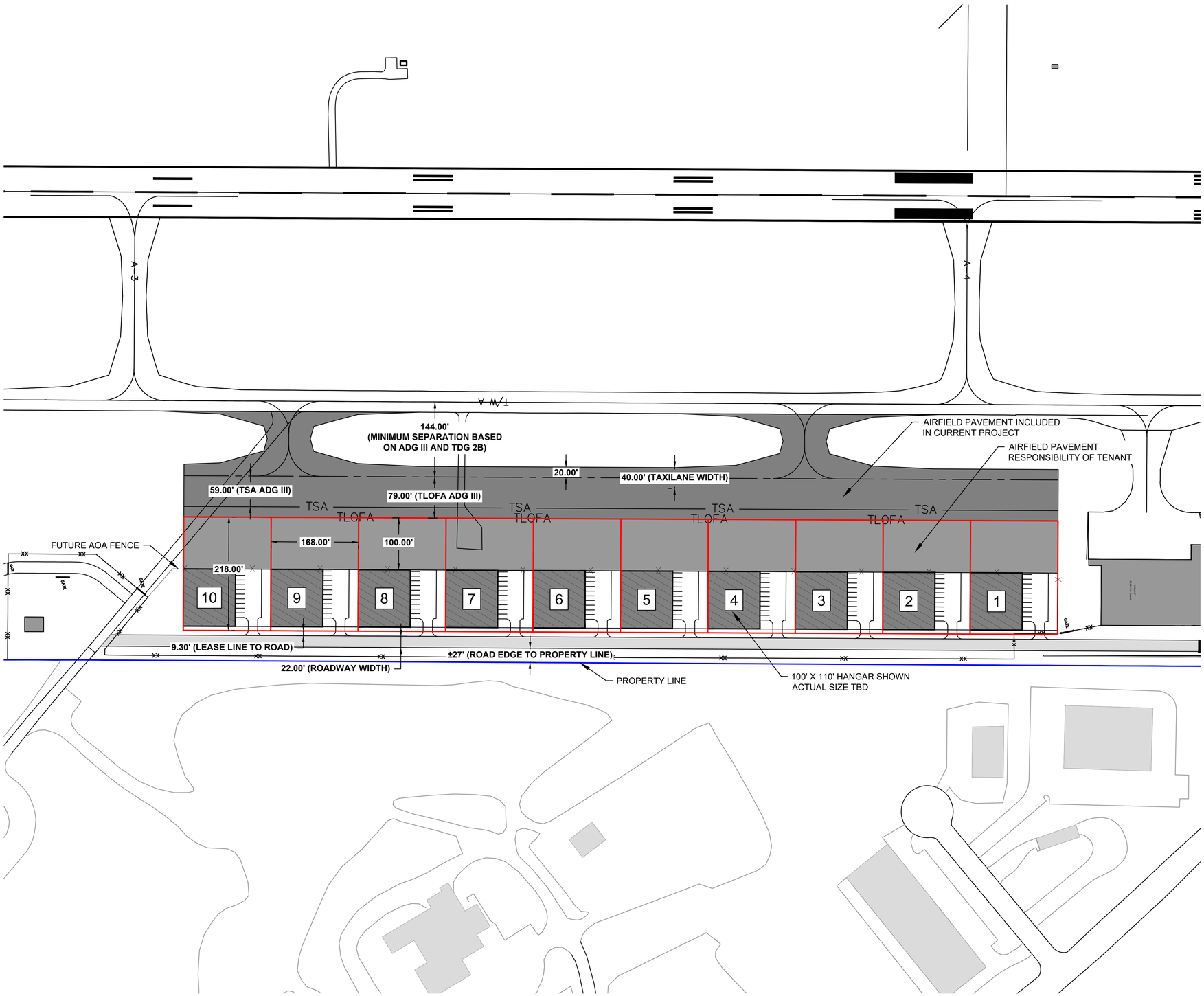
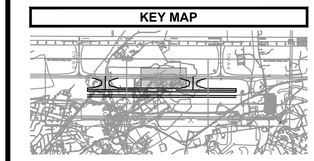


KEY MAP



ISSUE NO	APPR BY	DATE	ISSUED FOR	REV NO	APPR BY	DATE	DESC. OF REVISIONS

JWN® John C. Tune Airport®

CLIENT: **JOHN C. TUNE AIRPORT**

PROJECT: **JWN NORTH DEVELOPMENT AND AIRSIDE IMPROVEMENTS**

SHEET TITLE: DESIGN LAYOUT BASED ON ADG III AND TDG 2B

ATKINS
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TAMPA, FL 33607
FBPR CERTIFICATE OF
AUTHORIZATION NO.24

LOCAL OFFICE:
404 BNA DRIVE, SUITE 600
NASHVILLE, TN 37217
TEL. 615.365.1461

WWW.ATKINSGLOBAL.COM

JOB NO.: 100078738

DESIGNED: - - - | CHECKED: - - -

DRAWN: - - - | APPROVED: DWS

SHEET NO.

PLOT DATE: 5/5/2022 11:14 AM
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Nashville, Tennessee 37214
615-350-5000
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JWN John C. Tune Airport

John C. Tune Airport

Security Plan

Approvals:

DocuSigned by:
Jeff Roach
1AE0725266A0460...
6/28/2021
Jeff Roach Date
Executive Director,
John C. Tune Airport

DocuSigned by:
4AE74A68A707428...
7/1/2021
Robert Ramsey Date
Chief Operating Officer

Updated 6/15/2021

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Emergency Phone Numbers	5
Access Control System	7
Appendix A – Airport Map	9
Appendix B – Access Control Readers	10
Appendix C - Metro EMS Response Route	11

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Introduction

A. PURPOSE

This Security Program is developed in compliance with the State of Tennessee Department of Transportation Aeronautics Division requirement for a Security and Emergency Plan. The facilities and procedures contained in this program are designed to provide for the safety of persons and property using John Tune Airport (JWN).

B. NAME, LOCATION, AND ADDRESS

Metropolitan Nashville Airport Authority
John C. Tune Airport
110 Tune Airport Drive
Nashville, Tennessee 37209
(615) 969-2089

C. DESCRIPTION

John C. Tune Airport (JWN) serves the needs of regional, corporate, and private aircraft and is owned and managed by the Metropolitan Nashville Airport Authority (herein referred to as the Authority). The airport is enclosed by a commercial grade chain link fence. The fence consists of 32,823 linear feet with three strands of barbwire. The airfield has vehicle gate openings at seven perimeter locations. There are five gates that are identified as *Emergency Points* North, East, West, South, and Terminal (Appendix A). They are double vehicle gates, operated manually, and secured by chain and locks except for Emergency Point Terminal (Gate 2) which is a card reader gate.

The aircraft parking ramp and public vehicular parking areas are separated by security fencing with one vehicle gate. The gate next to the Terminal, Gate 2, is *Emergency Point* Terminal.

Terminal Building – A 4,700 square foot terminal building that is leased by Contour Flight Support, serves as the focal point of the airport and offices of the Fixed Based Operator.

Hangars and Storage Buildings – The airport consists of 124 executive type T-Hangars, 14 Box Hangars, and 10 Plane Ports.

Aircraft Parking and Ramp Area – The apron has 49 aircraft tie-downs.

Services – Contour Flight Support is the Fixed Based Operator and maintains personnel on duty 24-hours seven days a week. Wings of Eagle and Harmony Air provide flight training. Cumberland Avionics provides aircraft avionics and maintenance repair. Helicorp provides helicopter parts and repair.

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D. AIRPORT LOCATION

John C. Tune Airport is located in the Cockrill Bend Industrial Park off Briley Parkway in West Nashville.

E. ADMINISTRATION

John C. Tune Airport is owned and managed by the Metropolitan Nashville Airport Authority herein referred to as the Authority. The Authority is responsible for management, operation, and maintenance of the facility. The Authority is responsible for total Airport Security.

The Authority management, operations, maintenance, and security are accomplished by the following key personnel:

President/CEO	Doug Kreulen, A.A.E.
Executive Vice President/COO	Robert Ramsey, A.A.E.
Executive Vice President/CFO	Marge Basrai
Vice President, Administration	Gale LaRoche
Chief of Public Safety	David Griswold
Vice President, Commercial Development	Margaret Martin
Executive Director, JWN	Jeff Roach, A.A.E.

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Emergency phone numbers

A.	METROPOLITAN NASHVILLE AIRPORT AUTHORITY	Office (615)
1.	Airport Communications Center (24 hours)	275-1703, 1704 and 1705
2.	President	275-1668
3.	Executive VP/Chief Operating Officer	275-1825
4.	Executive Director, JWN	275-1783, 629-204-0547
5.	Executive VP, Finance	275-1621
6.	Corporate Communications	275-1611
7.	Director of Operations	275-1605
8.	Director of Facilities and Maintenance	275-1687
9.	Legal Counsel	275-1637
10.	Chief, Dept. of Public Safety	275-2340
11.	Human Resources	275-1619
12.	Materials Control	275-1422
13.	Planning, Design and Construction	275-1646
14.	Procurement	275-2300

B.	METROPOLITAN NASHVILLE	
1.	Police/Fire/EMS emergency	911
2.	Police/Fire/EMS non-emergency	862-8600
3.	Medial Examiner	743-1800
4.	Metro Office of Emergency Management	862-8530

C.	FEDERAL AVIATION ADMINISTRATION	
1.	BNA FAA Control Tower	695-4590
2.	Nashville FAA Flight Standards District Office	324-1382
3.	Automated Flight Service Station	695-6645
4.	Airway Facilities Sector	695-4600
5.	FAA Representative (local)	695-4600

D.	AIRCRAFT ACCIDENT INVESTIGATION	
1.	NTSB	202-314-6185/6395
2.	FBI	615-232-7538
3.	FBI Memphis	901-747-4300
4.	TN Highway Patrol	615-744-3091

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E. TRANSPORTATION SECURITY ADMINISTRATION (TSA)

1. TSA Administration	615-354-6700
2. Federal Security Director	615-354-6701

F. JWN TENANT SERVICES

1. Contour Flight Support (CFS)	350-5000
2. CFS President	516-946-0482
3. CFS JWN Manager	350-5000, 516-902-1566
4. Wings of Eagles (flight school)	979-9222
5. Harmony Air	350-8550
6. Helicorp	350-1122

G. AIRCRAFT REMOVAL

1. MNAA Mobile Equipment	275-1696
2. West Nashville Wrecker	350-5800
3. Elliot Crane Service	883-3900
4. Collier Wrecker Service	256-8835

H. PRISONS (West of JWN)

1. Riverbend Maximum Security Institution	350-3100
2. Lois M. DeBerry Special Needs Facility	350-2700

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Access Control System

There are thirteen card reader systems, one at Gate 2 adjacent to the Terminal, one at Gate 6 on the southeast perimeter, two inside the terminal, one at Vehicle Gate 1 next to TDOT, and eight at the Air Traffic Control Tower. The system is integrated into the access control system at BNA. Gates can be manipulated from the Airport Communications Center (ACC) 615-275-1703.

Each reader system operates a gate or door it is connected to by allowing access when a card is swiped, and the encoded card number has been downloaded into memory.

The vehicle gates will automatically close after a prescribed time limit.
Pedestrian gates have hydraulic closures to activate when an individual releases the gate.

Each card reader system works off AC current and is backed up by DC battery supply.
Battery backup will allow access control for 36 hours if power is lost. Operations, Maintenance or DPS personnel will monitor gate access if outage is more than 36 hours. Gate operation may be locked out by chain and lock.

E. IDENTIFICATION MEDIA

Identification Media for John C. Tune is supplied at the John C. Tune Airport. A specific color (Black) has been assigned to signify identity of a John C. Tune identification badge. Expiration is one year from the date of issuance on the last day of the month.

Each badge displays the following:

- Frontal photo of cardholder
- The wording “JOHN C. TUNE”
- The cardholder’s first and last name and hangar number (if a hangar tenant)
- A black box on both sides of card with the card number
- Phone number, if badge is lost and found off Airport Property
- The expiration date of the card

F. APPLICATION PROCEDURE

Individuals seeking access to John C. Tune Airport must submit an application to John C. Tune airport management for approval and gate access assignments. Tenants and based customers will be eligible to receive badges. Transient customers will not be eligible to receive a badge. Gate access will only be to gates that the applicant has an operational need to access. Tenants losing their badge will be required to get a new badge.

Access levels are:

1 - All readers (MNAA employees)
2 - All readers except ATCT (CFS employees)
3 - All readers except behind the counter (corporate pilots, tenants, students)

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F. PERSONAL SECURITY

A valid JWN badge is required for individuals wishing to access the ramp within the perimeter fence. Driving privileges are reserved for valid JWN badgeholders or drivers under escort of a valid JWN badgeholder. Individuals within the perimeter fence must have an operational need to be there.

Each cardholder will be responsible to:

- Ensure that all gates are closed and secured before leaving gate.
- Ensure that piggybacking and any other unauthorized access is not given. If there is unauthorized access the cardholder will promptly notify JWN Airport Management.
- Notify FBO, JWN Airport Management, or ACC if gate does not secure.
- Maintain security of area that is leased by cardholder.
- Secure and lock all hangars when not in use.
- Secure and lock aircraft when not in use.
- Report any individual in the operations area that appears suspicious to JWN Airport Management or the ACC 615-275-1703.

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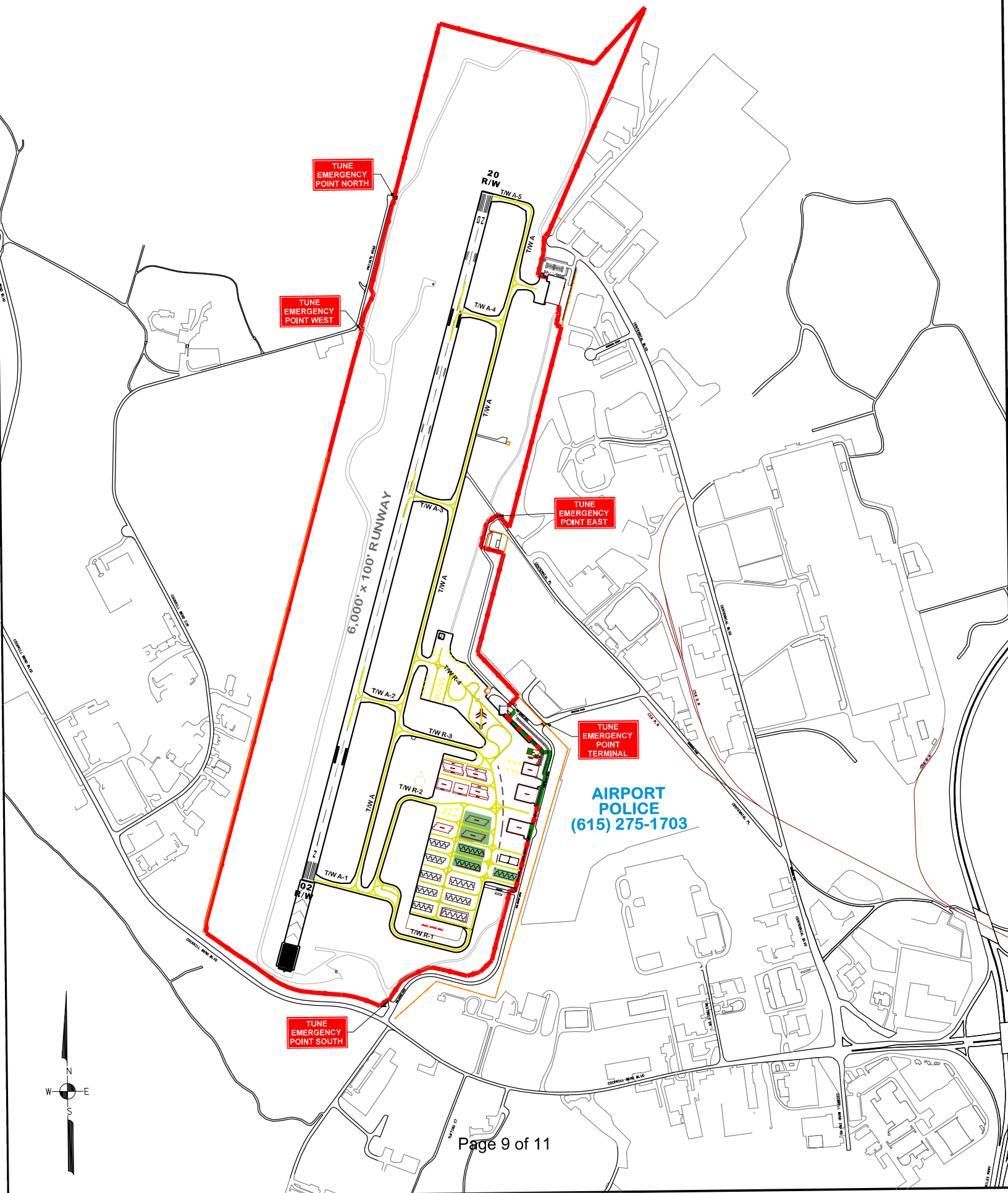
John C. Tune Airport

Appendix A

Airport Map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TUNE EMERGENCY POINT WEST
TUNE EMERGENCY POINT EAST
TUNE EMERGENCY POINT TERMINAL
TUNE EMERGENCY POINT SOUTH
20 R/W
02 R/W
6,000' x 100' RUNWAY
T/W A
T/W A-1
T/W A-2
T/W A-3
T/W A-4
T/W A-5
T/W R-1
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T/W R-4
AIRPORT POLICE (615) 275-1703
CENTENNIAL BLVD
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OSBORN DR EXT
OSBORN AVE
OSBORN AVE EXT
OSBORN RD
OSBORN RD EXT
OSBORN WAY
OSBORN WAY EXT
OSBORN PL
OSBORN PL EXT
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OSBORN BLVD EXT

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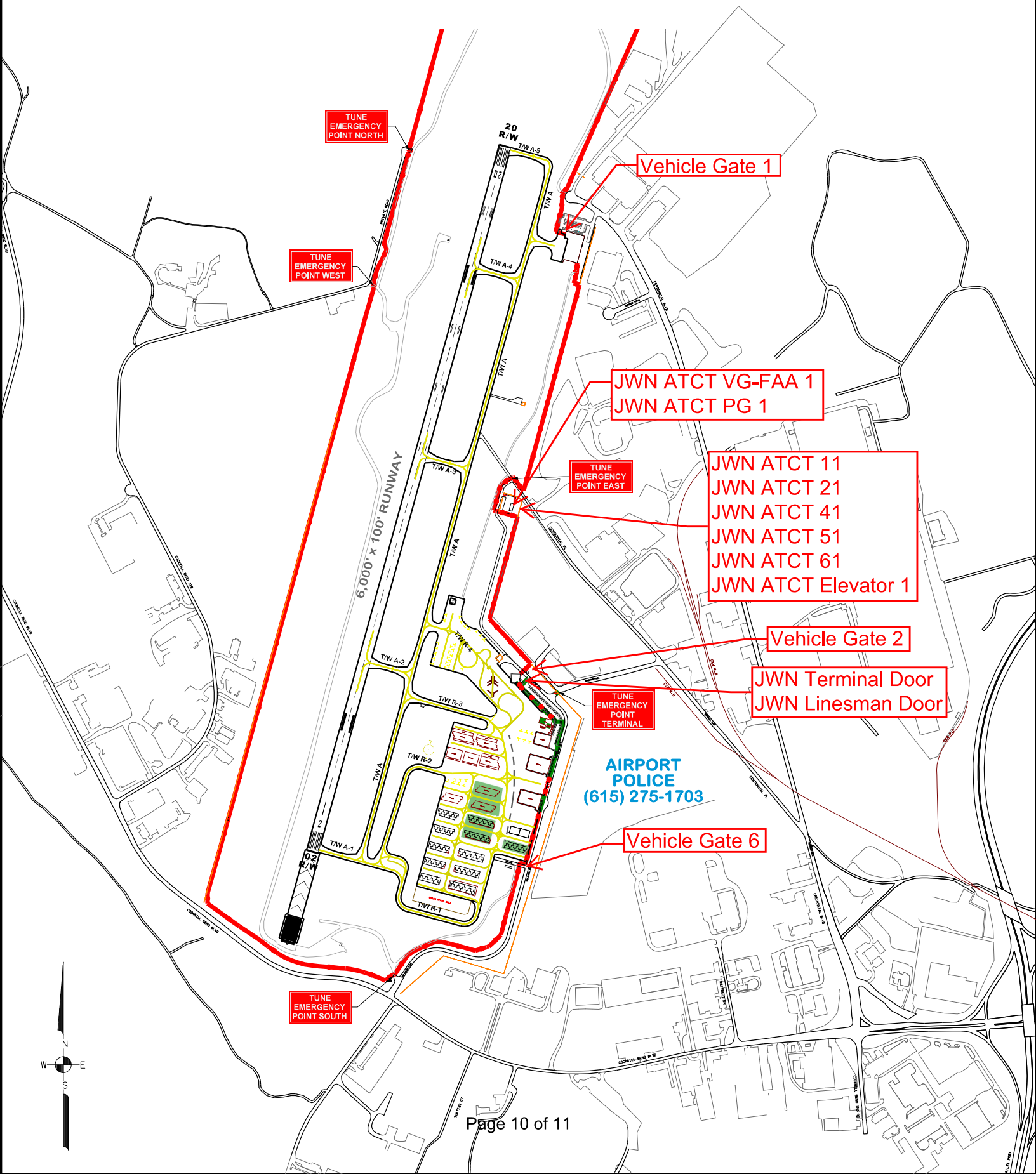
John C. Tune Airport

Appendix B

Access Control Readers



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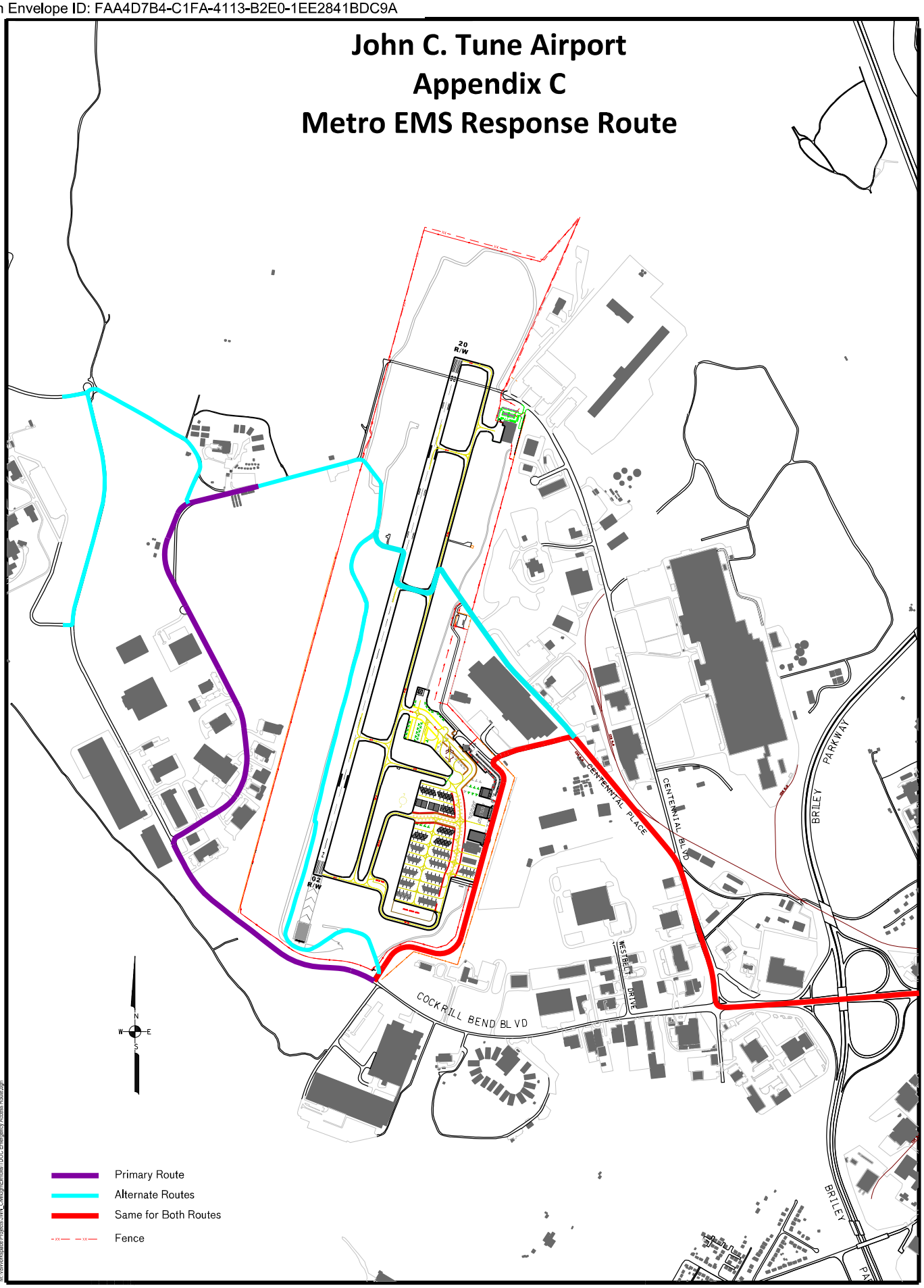
John C. Tune Airport
Appendix C
Metro EMS Response Route



6/10/2021
M:\VB\Workspace Projects\JWN_Civil\cgn\Exhibits\TDOC Emergency Access Route.dgn

DRAWN BY: MSR CK. BY: DATE: 06/10/21	REV.#	DR. BY	DATE	DESCRIPTION

TDOC EMERGENCY ACCESS ROUTES

JWN John C. Tune Airport