

REFERENCE: B-4439

PROJECT: 38366

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

| LINE | STATION | PLAN |
|------|----------------|------|
| -L- | 13+00 TO 21+00 | 4 |

CROSS SECTIONS

| LINE | STATION | SHEETS |
|------|----------------|--------|
| -L- | 13+00 TO 20+50 | 5-10 |

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL ENGINEERING UNIT

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY BRUNSWICK
 PROJECT DESCRIPTION BRIDGE NO. 100 ON -L- (SR 1342)
OVER MUDDY BRANCH

INVENTORY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C. | B-4439 | 1 | 10 |

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

S.N. ZIMARINO
R.E. SMITH

INVESTIGATED BY T.C. BOTTOMS
 DRAWN BY T.C. BOTTOMS
 CHECKED BY D.N. ARGENBRIGHT
 SUBMITTED BY D.N. ARGENBRIGHT
 DATE AUGUST 2019



DocuSigned by:
Tyler C. Bottoms 9/16/2019
 48A2D3BD08... SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. Includes sub-sections like SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, and INDURATION.

09/08/19

See Sheet 1A For Index of Sheets

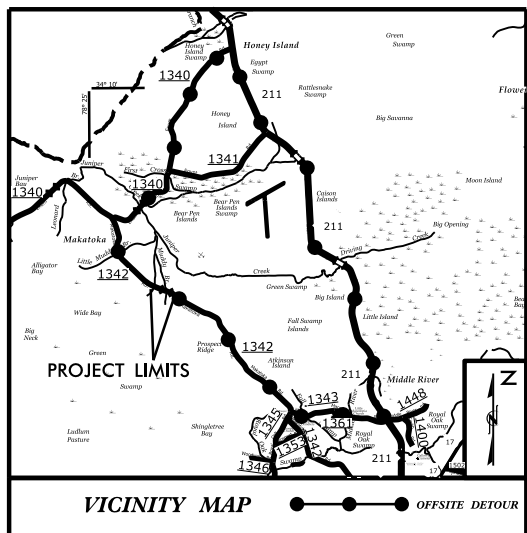
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: REPLACE BRIDGE NO. 100 OVER MUDDY BRANCH
ON SR 1342 (MAKATOKA RD.)

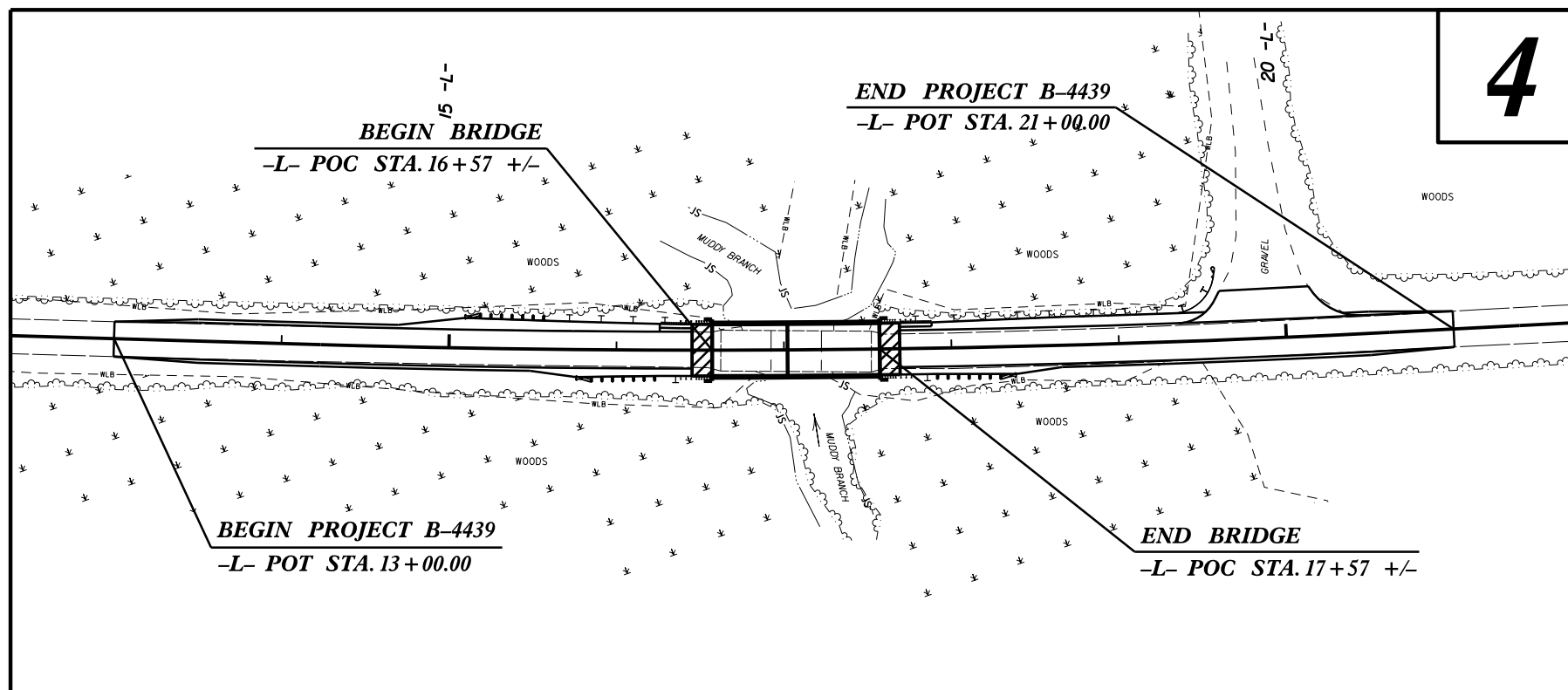
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

| | | | |
|-----------------|-----------------------------|-------------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C. | B-4439 | 3 | 10 |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 38366.1.2 | BRZ-1342(005) | PE | |
| | | | |
| | | | |
| | | | |
| | | | |



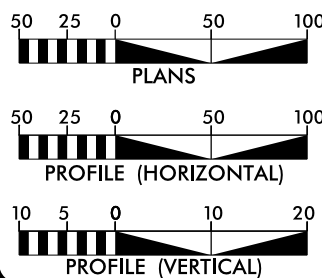
25% PLANS

CONTRACT: TIP PROJECT: B-4439



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2013 = 350
ADT 2025 = 700
K = 10 %
D = 60 %
T = 6 % *
V = 60 MPH
* TTST = 2% DUAL 4%
FUNC CLASS =
LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT B-4439 = 0.133 MILES
LENGTH OF STRUCTURE PROJECT B-4439 = 0.019 MILES
TOTAL LENGTH OF PROJECT B-4439 = 0.152 MILES

PREPARED IN THE OFFICE OF:
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: 0-1554
FOR NCDOT DIVISION 3

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 18, 2019

LETTING DATE:
APRIL 16, 2020

ROY H. TELLIER, PE
PROJECT ENGINEER

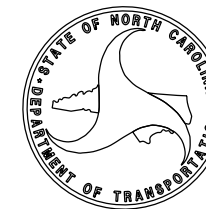
DEREK PIELECH, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



20-AUG-2019 15:06
\\B4439_R0Y_TSH.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

CONTRACT:



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 21, 2019

State Project: 38366.1.2 (B-4439)
F.A. Project: BRZ-1342(005)
County: Brunswick
Description: Bridge No. 100 on -L- (SR 1342) over Muddy Branch
Subject: Geotechnical Inventory Report

Project Description

This project begins approximately 350 feet west of Bridge Number 100 over Muddy Branch on Makatoka Road (SR 1342) in Brunswick County, and extends east along Makatoka Road for approximately 0.15 miles. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork was conducted in August of 2019. Hand auger borings and push probes were completed at various offsets along the project corridor. Representative soil samples were collected for visual classification in the field.

The following alignment was investigated. Selected cross sections of this alignment is included in this report.

| <u>Line</u> | <u>Station(±)</u> |
|-------------|-------------------|
| -L- | 13+00 to 21+00 |

Areas of Special Geotechnical Interest

- 1) The entire project was found to exhibit seasonal high ground water.
- 2) The following section contains organic soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

| <u>Line</u> | <u>Station(±)</u> |
|-------------|-------------------|
| -L- | 13+00 to 19+70 |

- 3) The following section contains cohesive soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

| <u>Line</u> | <u>Station(±)</u> |
|-------------|-------------------|
| -L- | 19+60 to 21+00 |

Physiography and Geology

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Natural ground elevations ranged from 42± to 49± feet above sea level.

Surficial soils in this area are generally classified as undivided coastal plain sediments and are underlain by formational soils belonging to the Peedee Formation.

Ground Water

Ground water data was collected in August of 2019. Ground water elevations ranged from 44± to 45± feet above sea level.

Soils

Soils encountered within this project area have been divided into two categories: Roadway Embankment and alluvial soils.

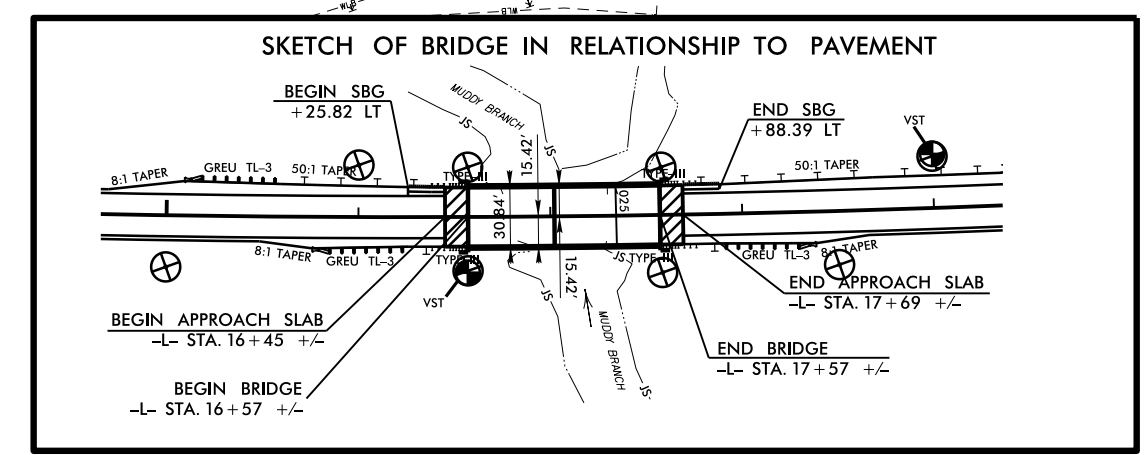
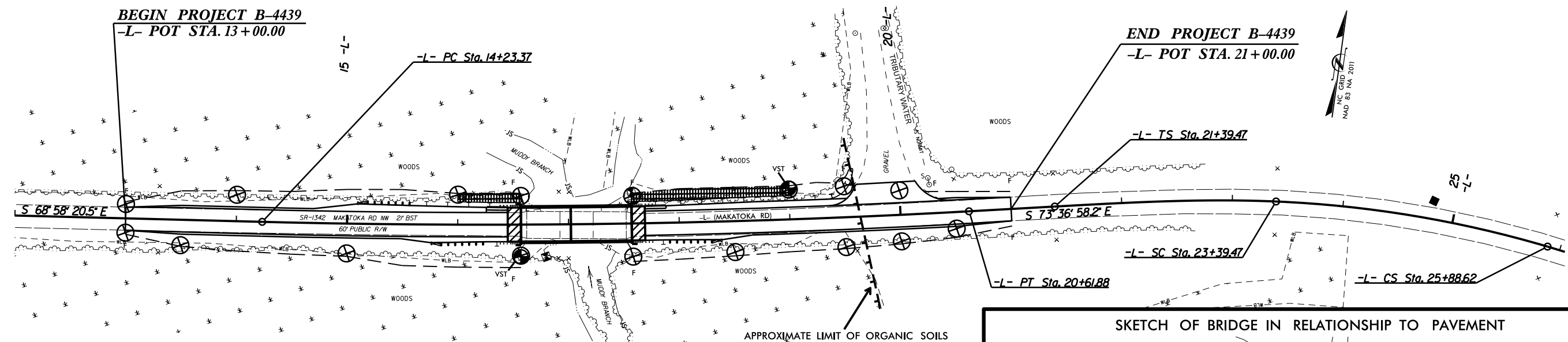
Roadway embankment soils were found along the existing Makatoka Road corridor. Where encountered it was composed of 1± to 7± feet of loose sand (A-2-4, A-1-b).

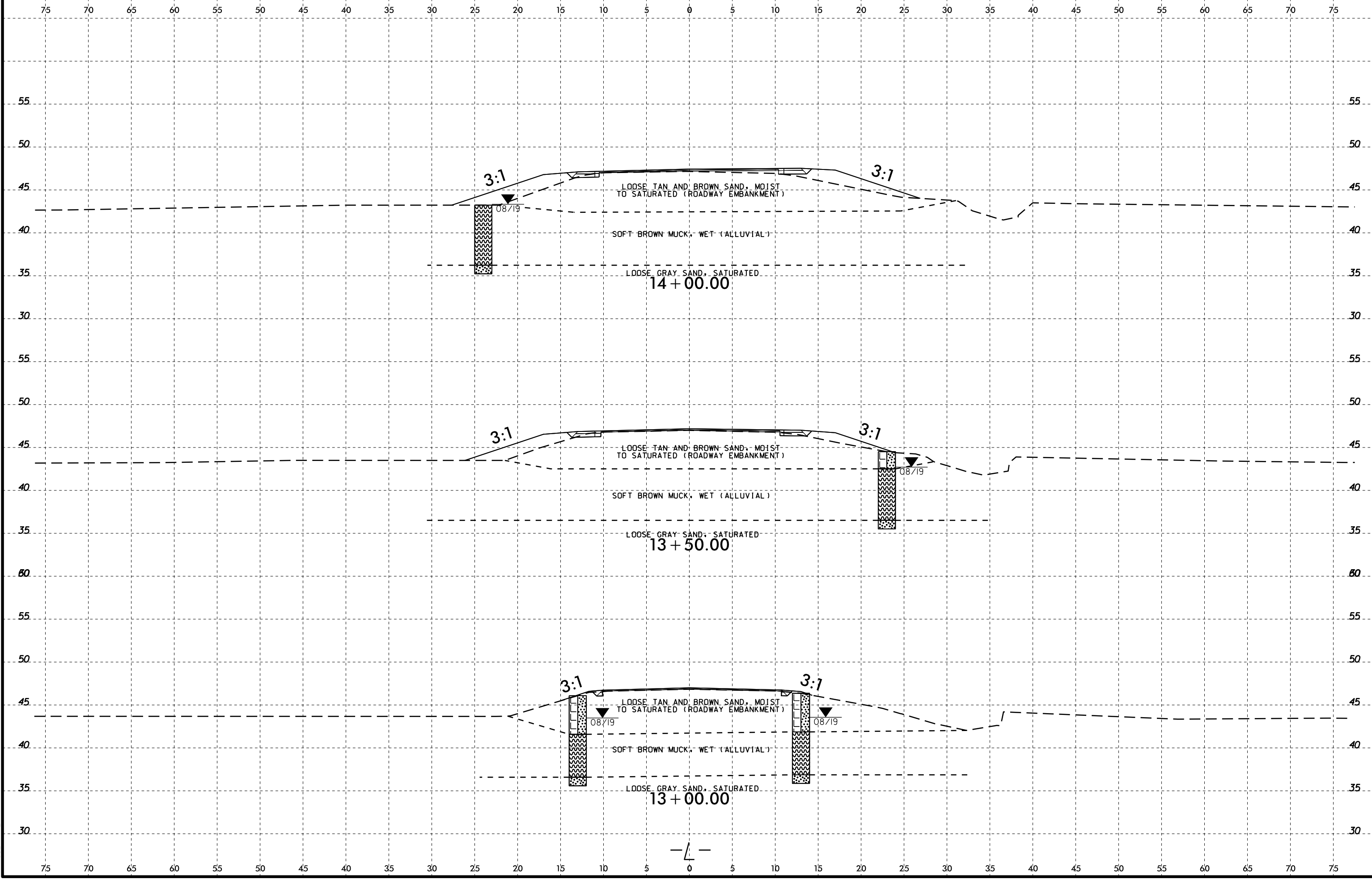
Soils identified as alluvial were encountered beneath Makatoka Road and within the floodplain of Muddy Branch. These soils are composed of 4± to 10± feet of soft muck, 2 or more feet of loose sand (A-2-4), and 4 or more feet of medium stiff silty clay (A-7-6). Vane Shear tests taken within the muck suggest shear strengths ranging from 0 to 1357 PSF. The varying degree of shear strength values is due to the abundance of wood within the muck.

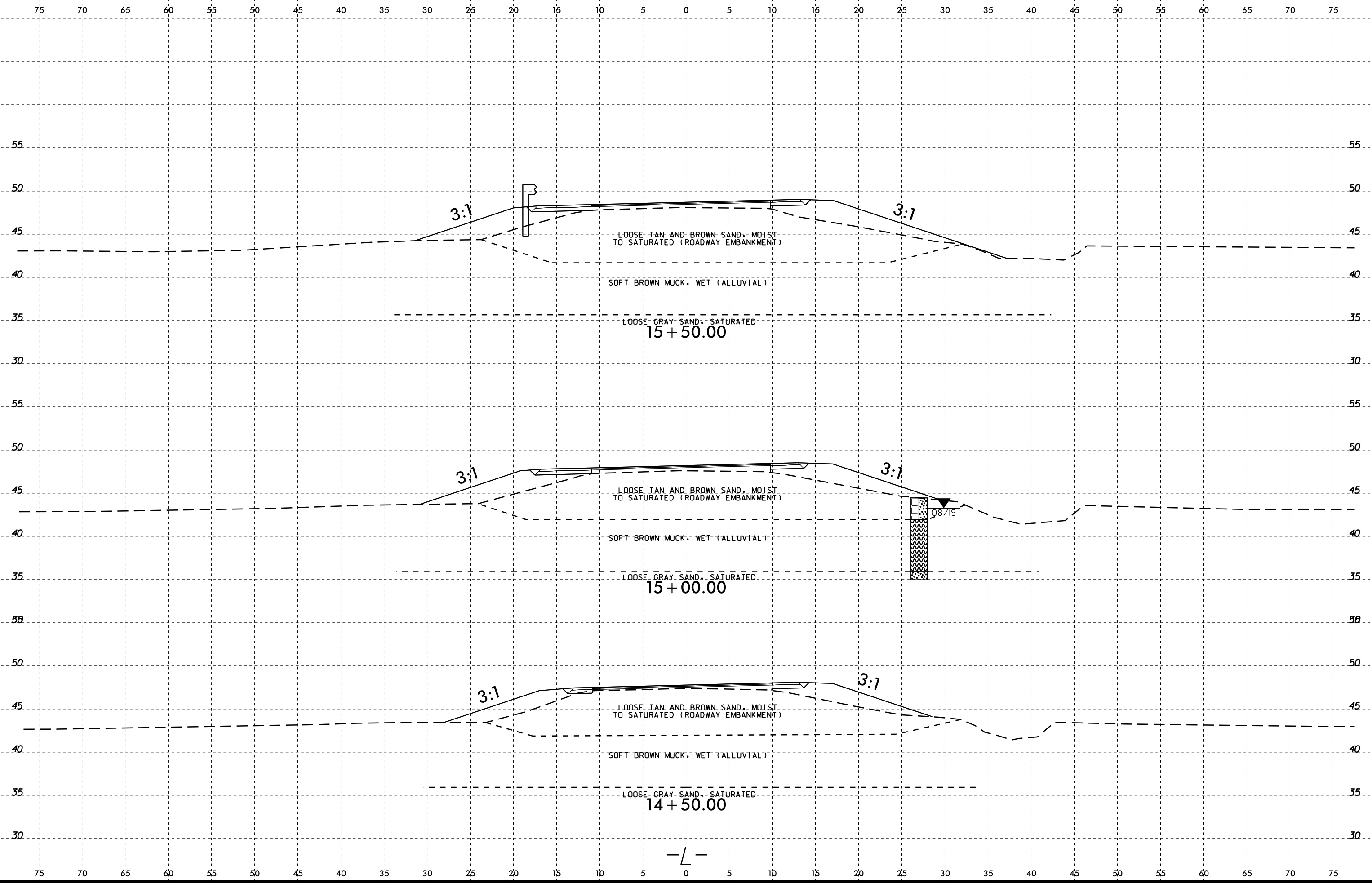
SITE PLAN

0 100 200

FEET



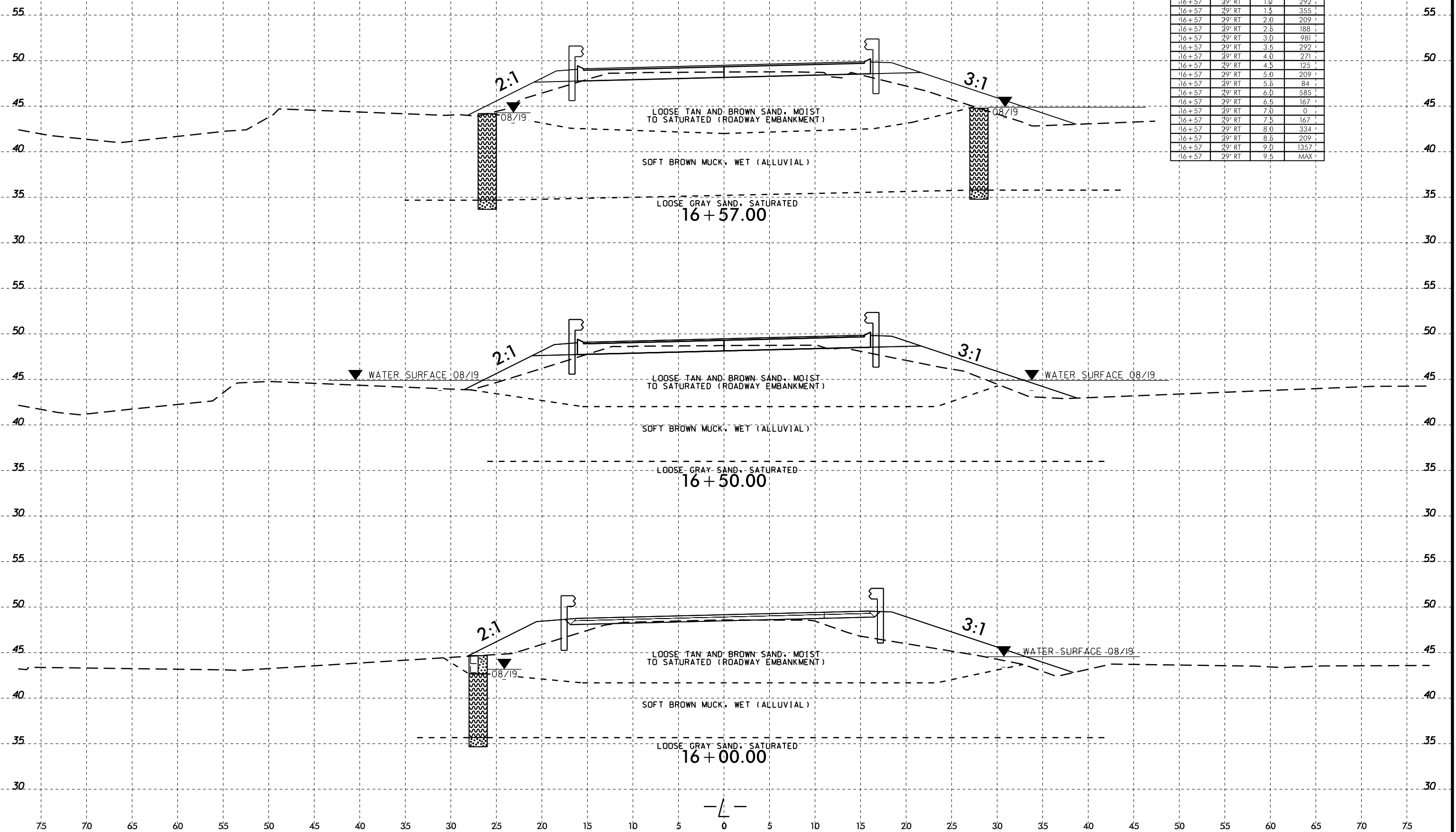


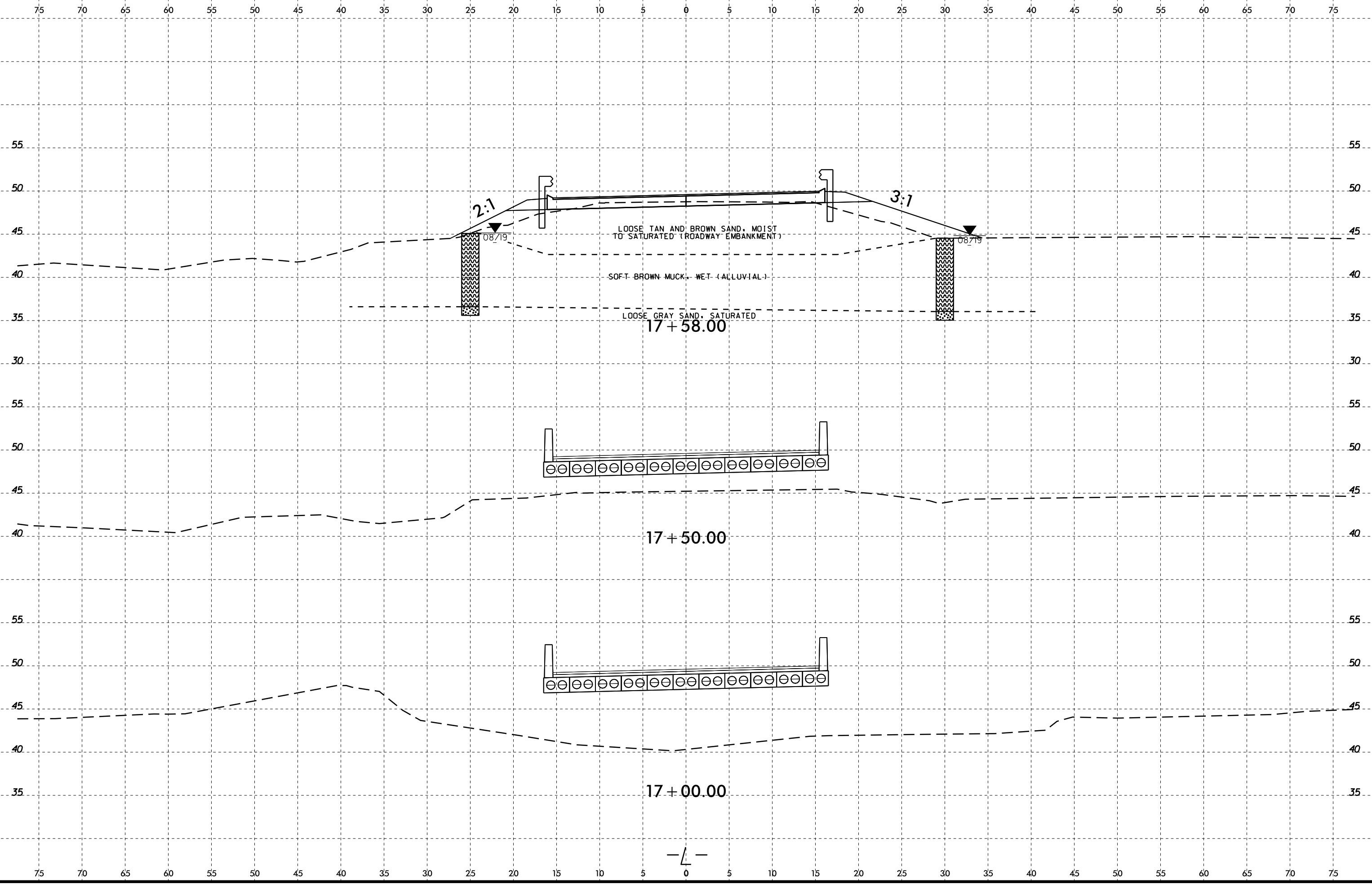


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

VANE SHEAR TESTS

| STATION | OFFSET | DEPTH | S (psf) |
|---------|--------|-------|---------|
| 16+57 | 29' RT | 0.5 | 606 |
| 16+57 | 29' RT | 1.0 | 292 |
| 16+57 | 29' RT | 1.5 | 355 |
| 16+57 | 29' RT | 2.0 | 209 |
| 16+57 | 29' RT | 2.5 | 188 |
| 16+57 | 29' RT | 3.0 | 981 |
| 16+57 | 29' RT | 3.5 | 292 |
| 16+57 | 29' RT | 4.0 | 271 |
| 16+57 | 29' RT | 4.5 | 125 |
| 16+57 | 29' RT | 5.0 | 209 |
| 16+57 | 29' RT | 5.5 | 84 |
| 16+57 | 29' RT | 6.0 | 585 |
| 16+57 | 29' RT | 6.5 | 167 |
| 16+57 | 29' RT | 7.0 | 0 |
| 16+57 | 29' RT | 7.5 | 167 |
| 16+57 | 29' RT | 8.0 | 334 |
| 16+57 | 29' RT | 8.5 | 209 |
| 16+57 | 29' RT | 9.0 | 1357 |
| 16+57 | 29' RT | 9.5 | MAX |





VANE SHEAR TESTS

| STATION | OFFSET | DEPTH | S _v (psf) |
|---------|--------|-------|----------------------|
| 19+00 | 28' LT | 0.5 | 142 |
| 19+00 | 28' LT | 1.0 | 876 |
| 19+00 | 28' LT | 1.5 | 167 |
| 19+00 | 28' LT | 2.0 | 355 |
| 19+00 | 28' LT | 2.5 | 876 |
| 19+00 | 28' LT | 3.0 | 418 |
| 19+00 | 28' LT | 3.5 | 251 |
| 19+00 | 28' LT | 4.0 | MAX |
| 19+00 | 28' LT | 4.5 | 501 |
| 19+00 | 28' LT | 5.0 | 183 |
| 19+00 | 28' LT | 5.5 | 876 |
| 19+00 | 28' LT | 6.0 | 1295 |
| 19+00 | 28' LT | 6.5 | MAX |

