

Auburn University Jordan-Hare Stadium Geotechnical Projects

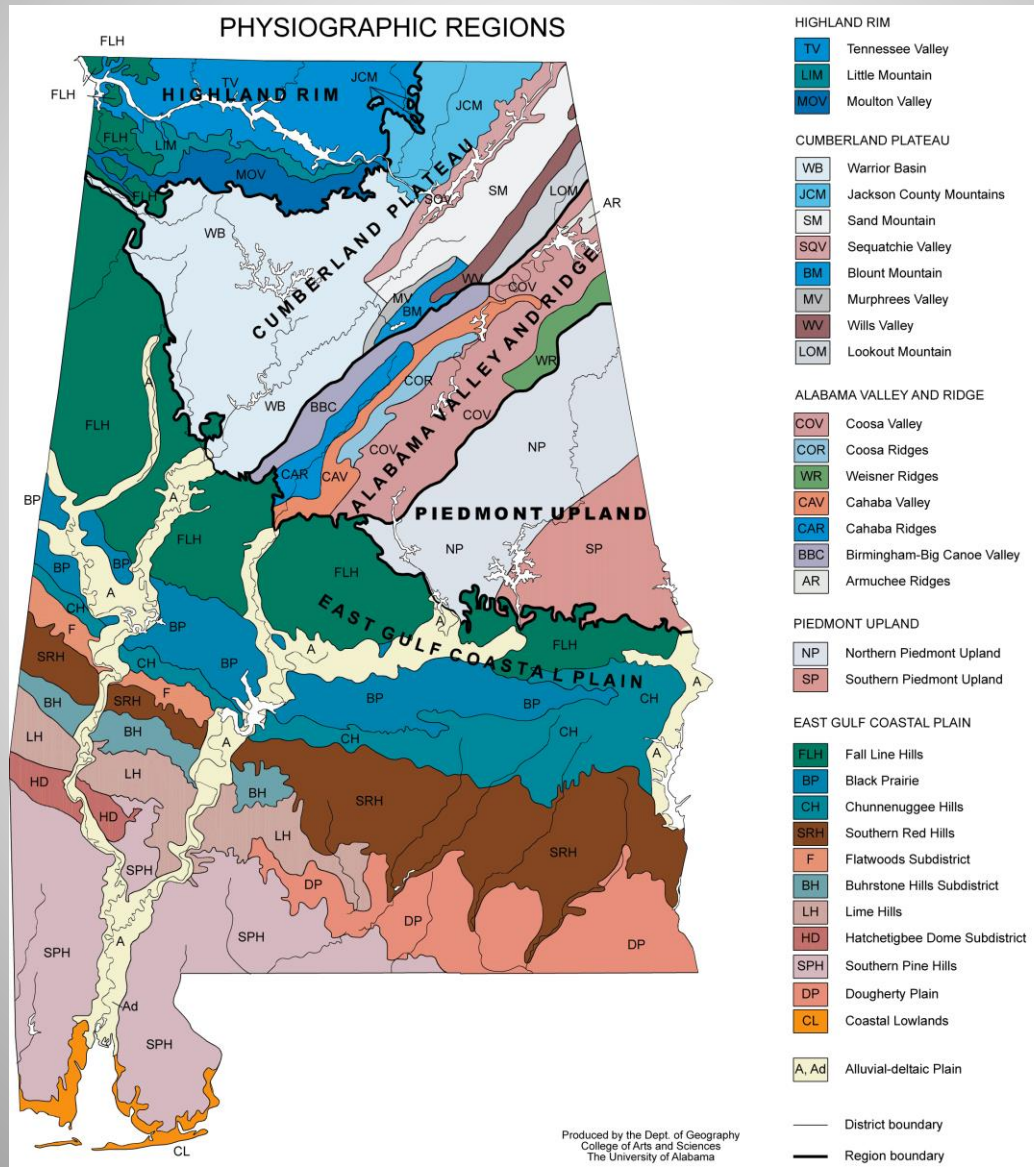
ASCE Winter Meeting – February 2018

Presented by: Kevin M. Blake P.E.

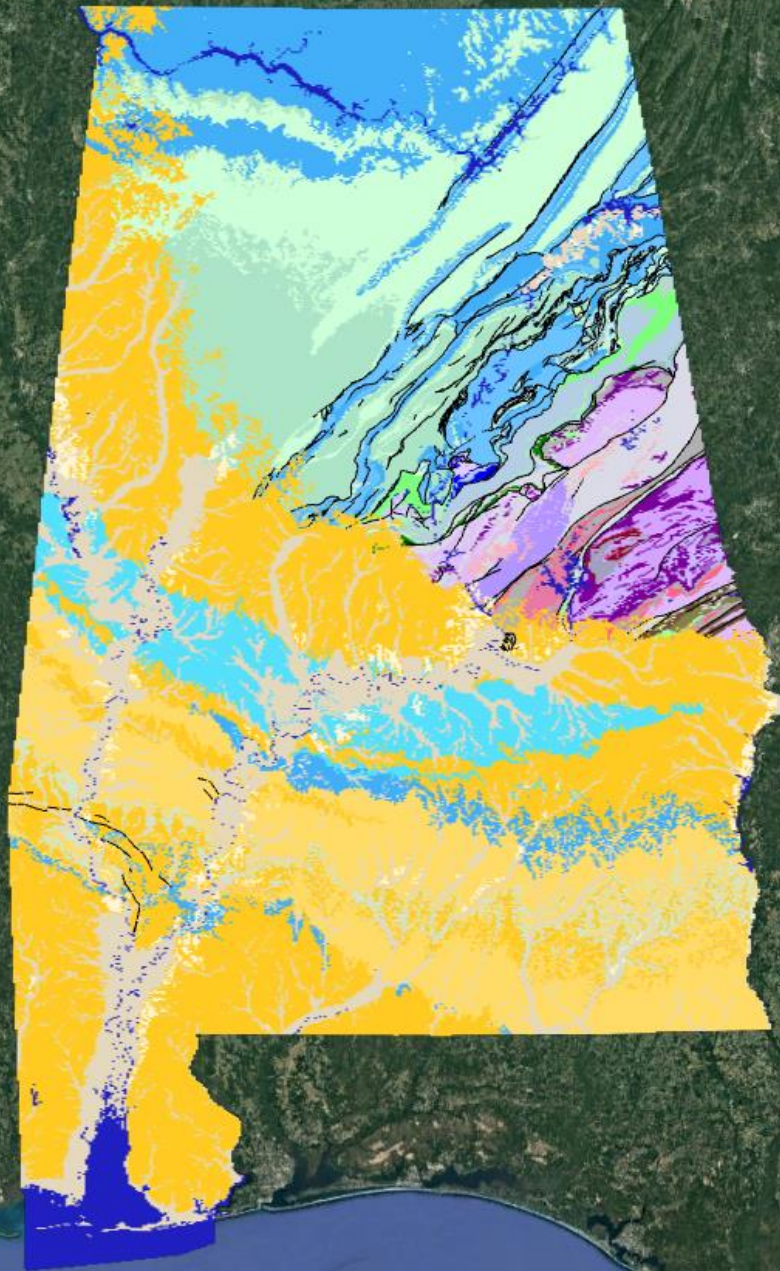
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Alabama Physiographic Regions



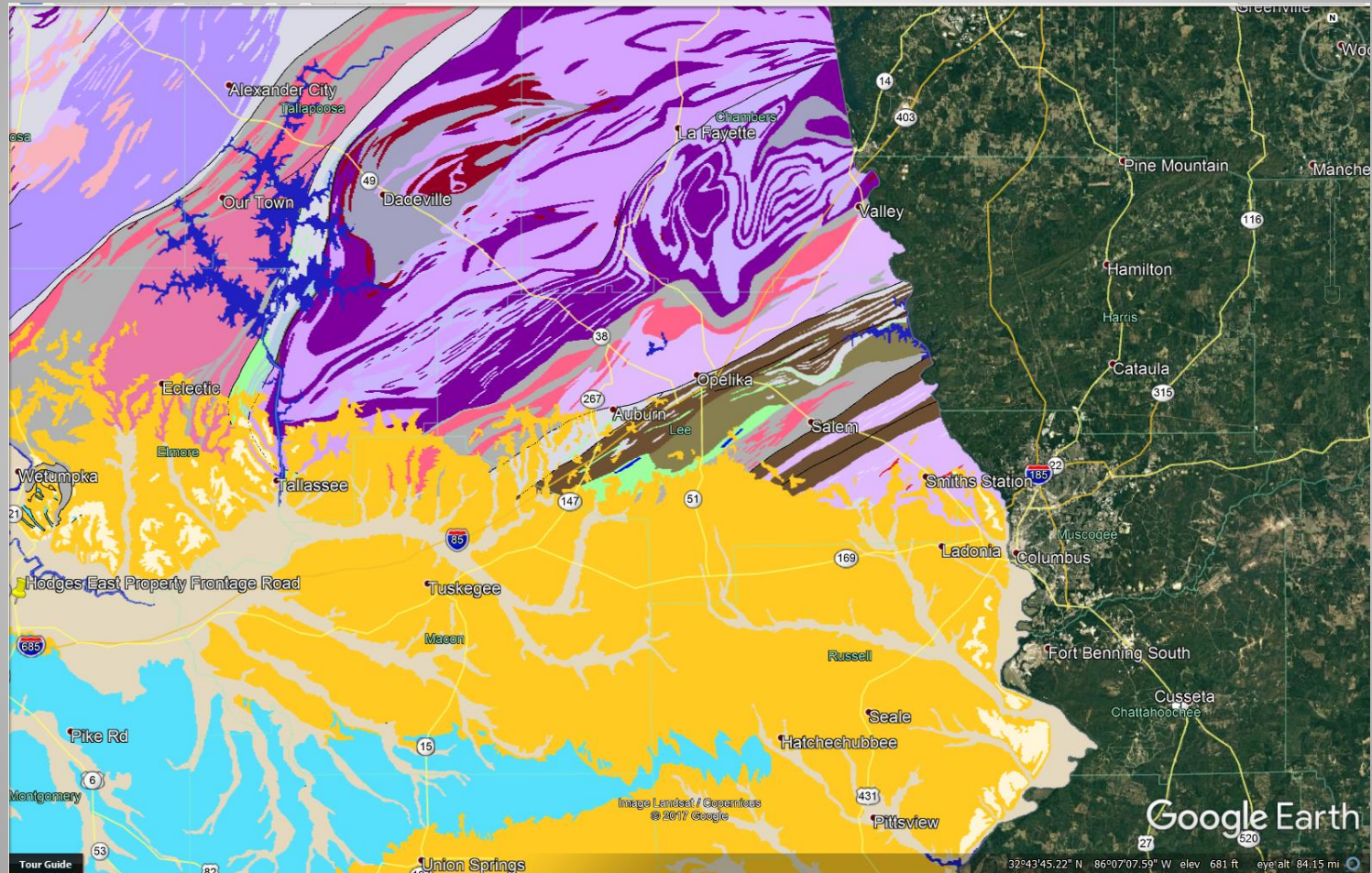
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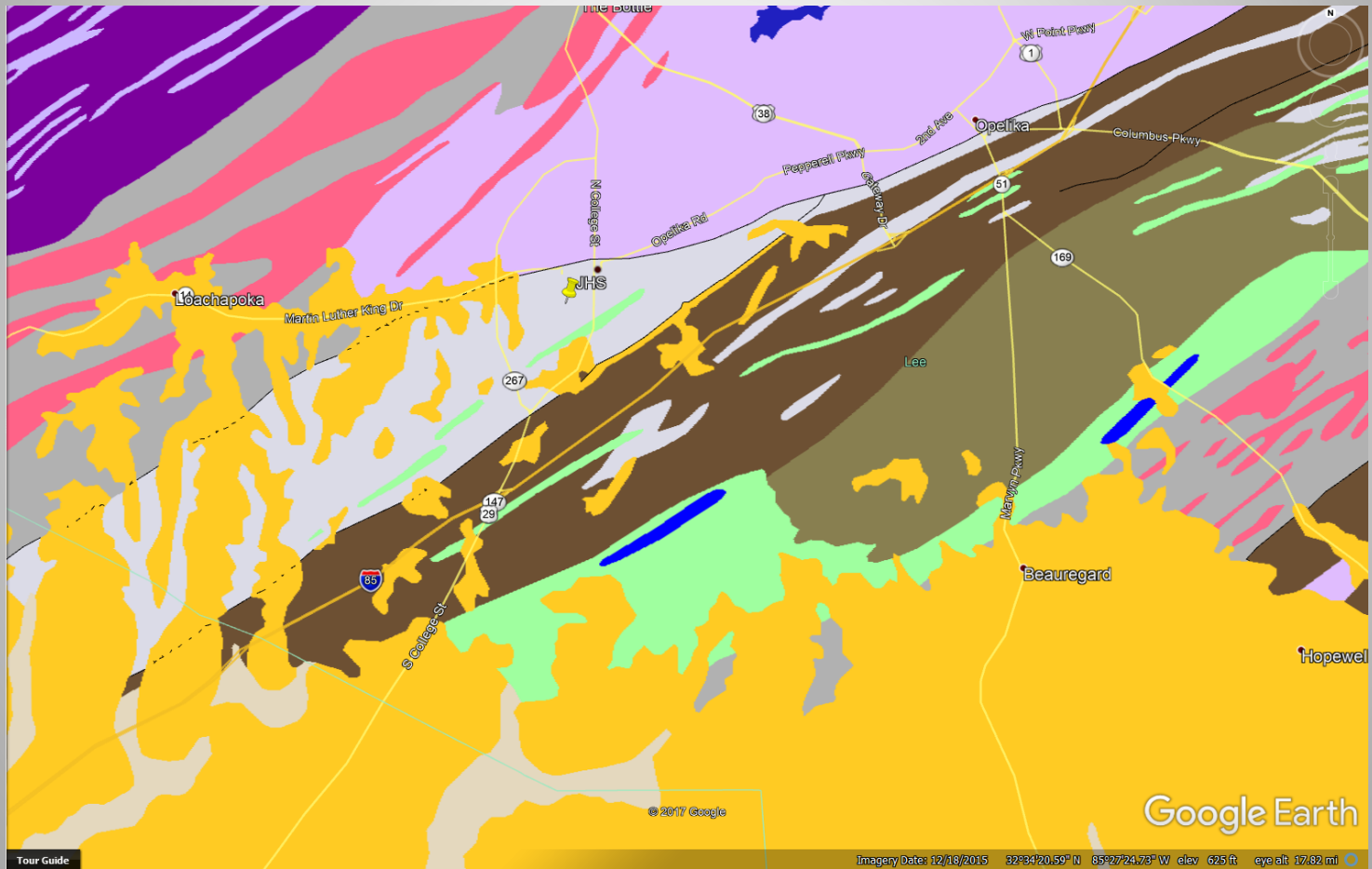
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

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Geology of East Alabama



Auburn Geology



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Cliff Hare Stadium

1939 to 1949

JORDAN-HARE STADIUM

1939



Construction of Auburn Stadium began in 1939. A grandstand was erected on the west sidelines in time for the season finale against Florida.

1949



Cliff Hare Stadium was officially dedicated in 1949 when 14,000 seats were added on the east sidelines which raised the capacity to 21,290.

Cliff Hare Stadium – 1950's



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Cliff Hare Stadium – Late 1950's



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Cliff Hare Stadium – 1960's



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Cliff Hare Stadium – Late 1960's



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JHS – 1970's



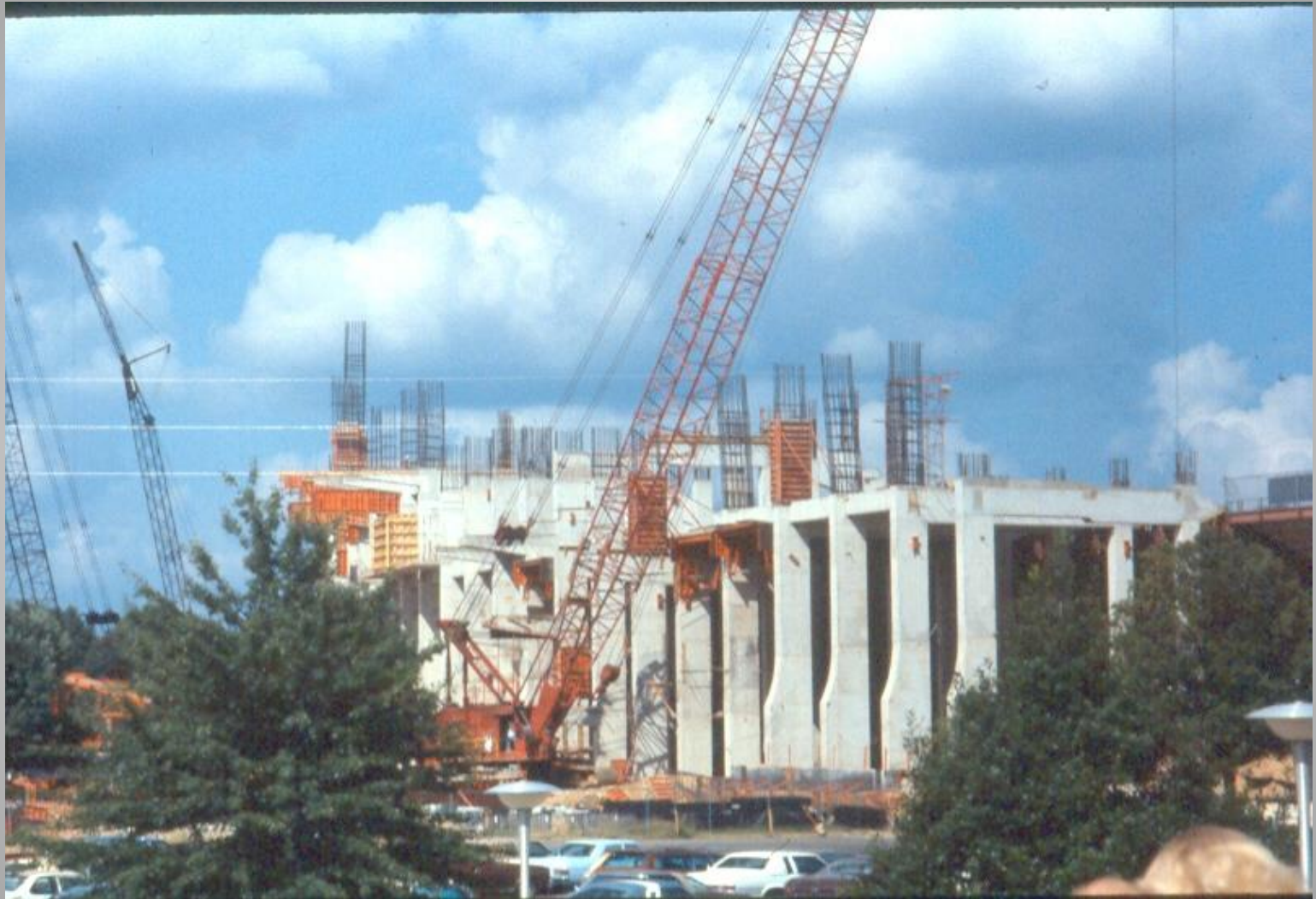
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West Upper Deck Expansion - 1979



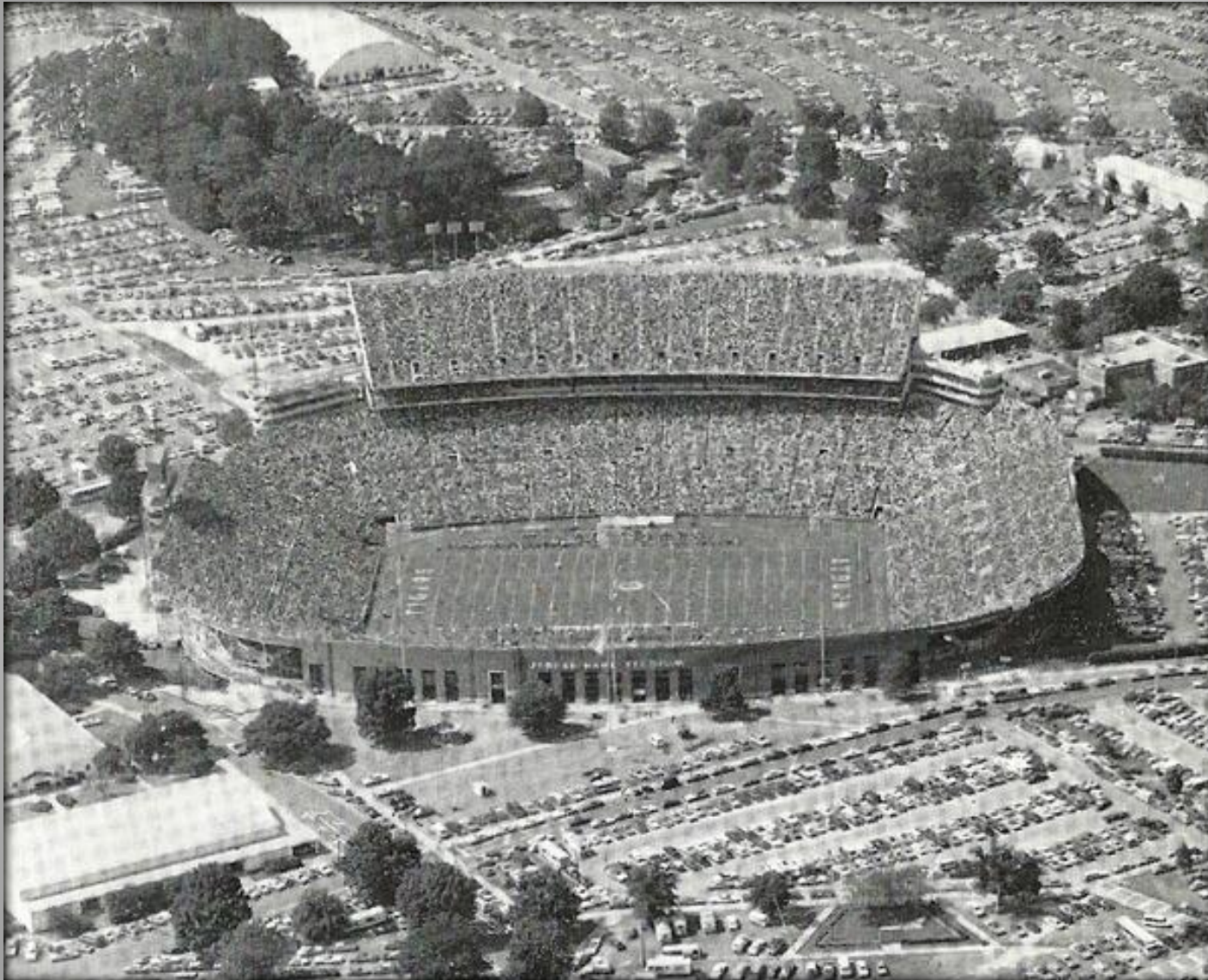
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West Upper Deck Expansion - 1979



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Jordan-Hare Stadium - 1981



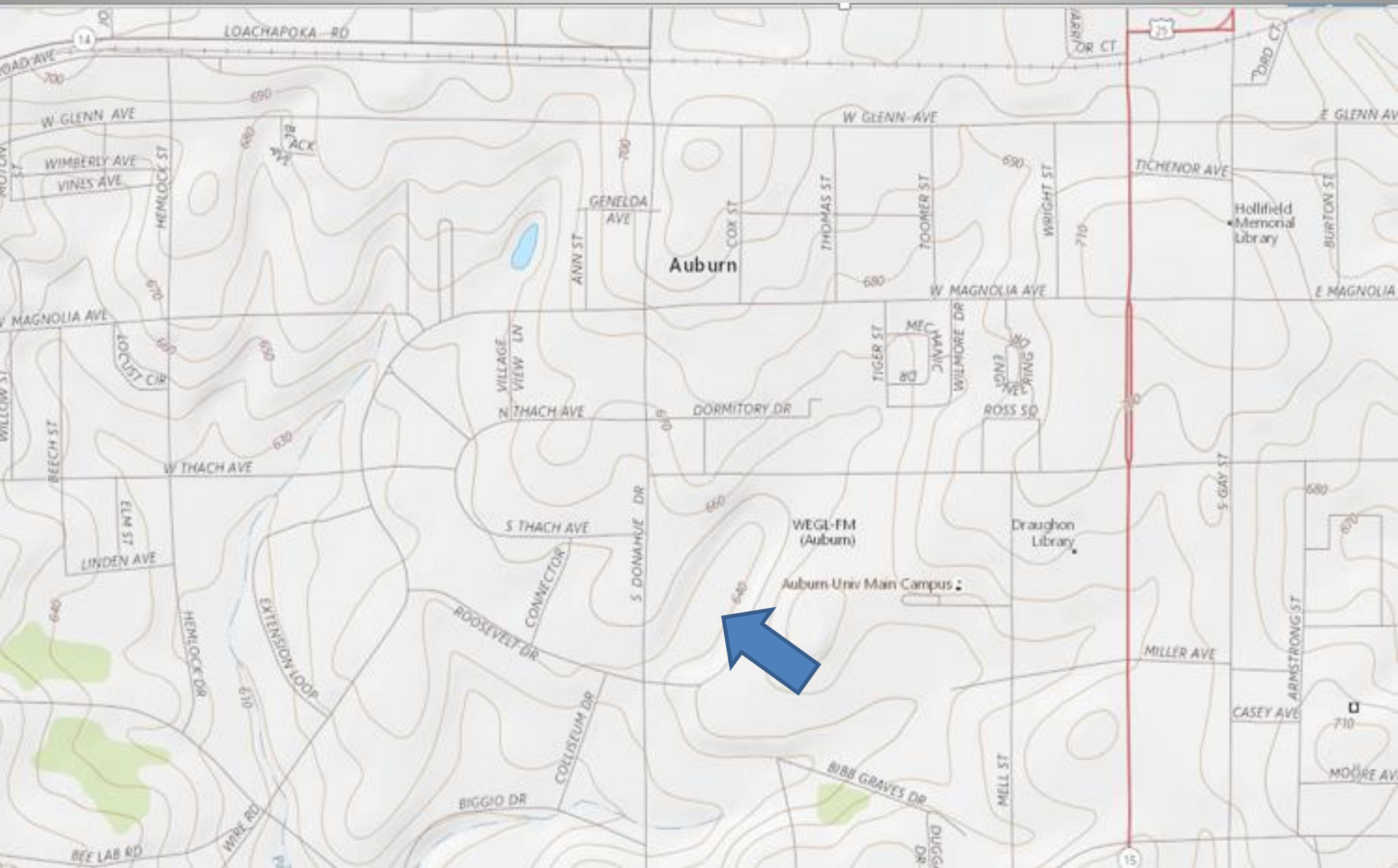
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Jordan-Hare Stadium - 2008



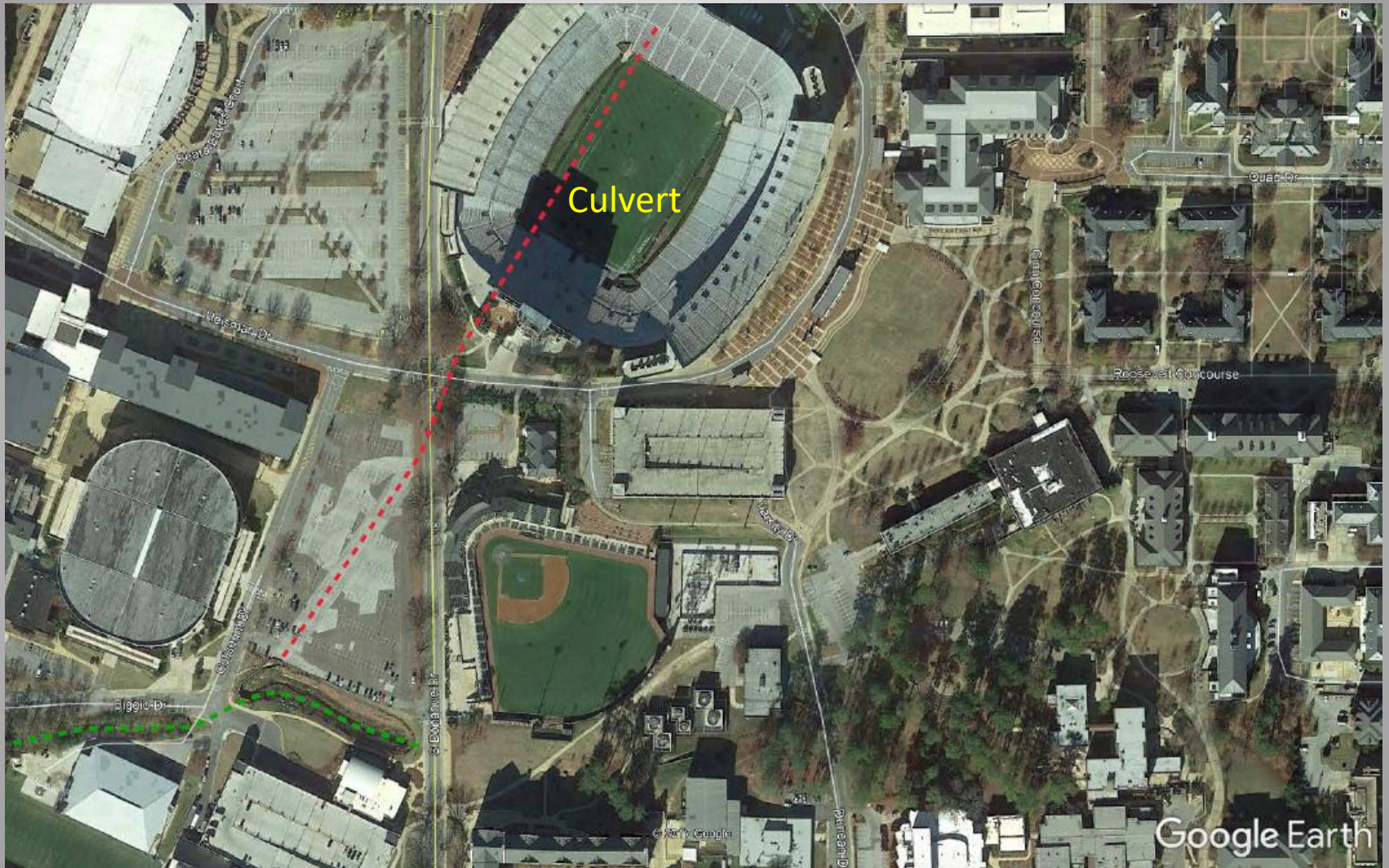
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Auburn Topographic Map



[illegible]**TTL**

Campus Map



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1998 South End Score Board Addition



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Video Board Tower



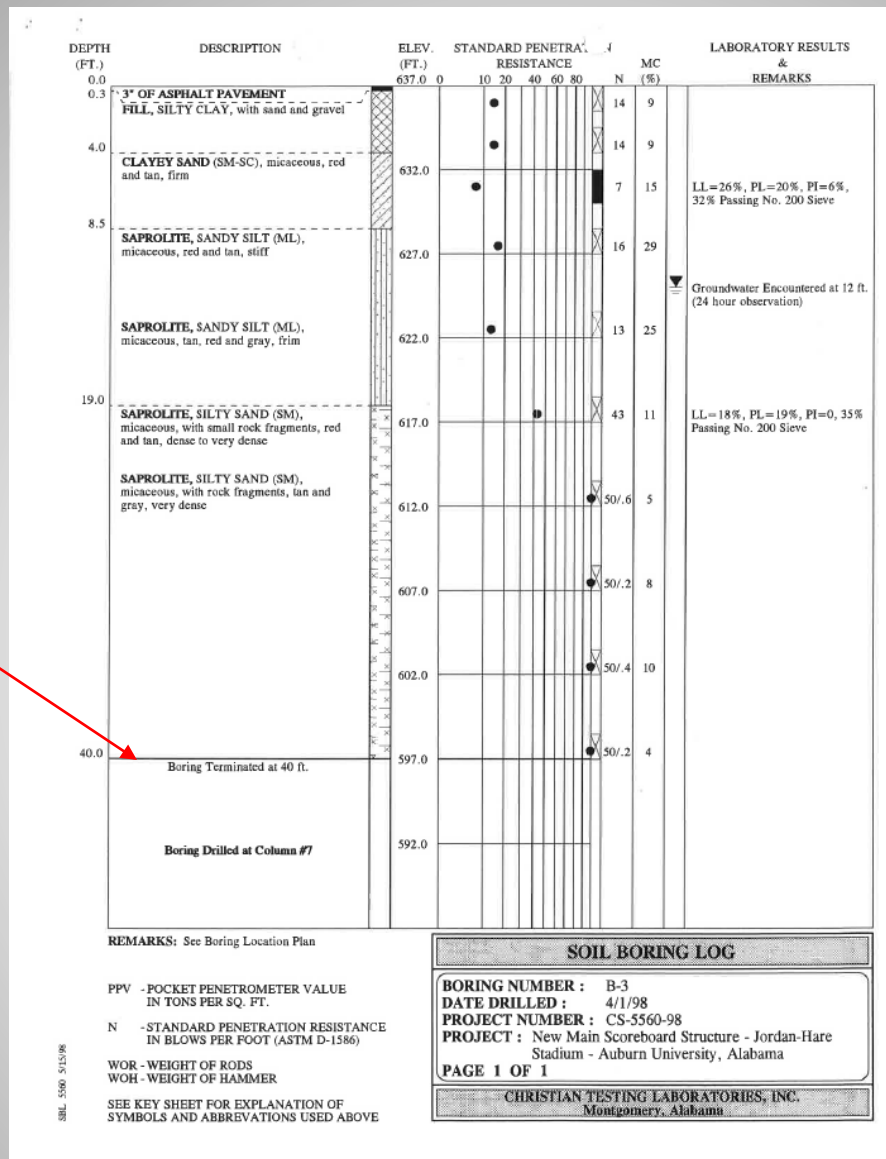
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1998 South End Score Board Addition



TTL

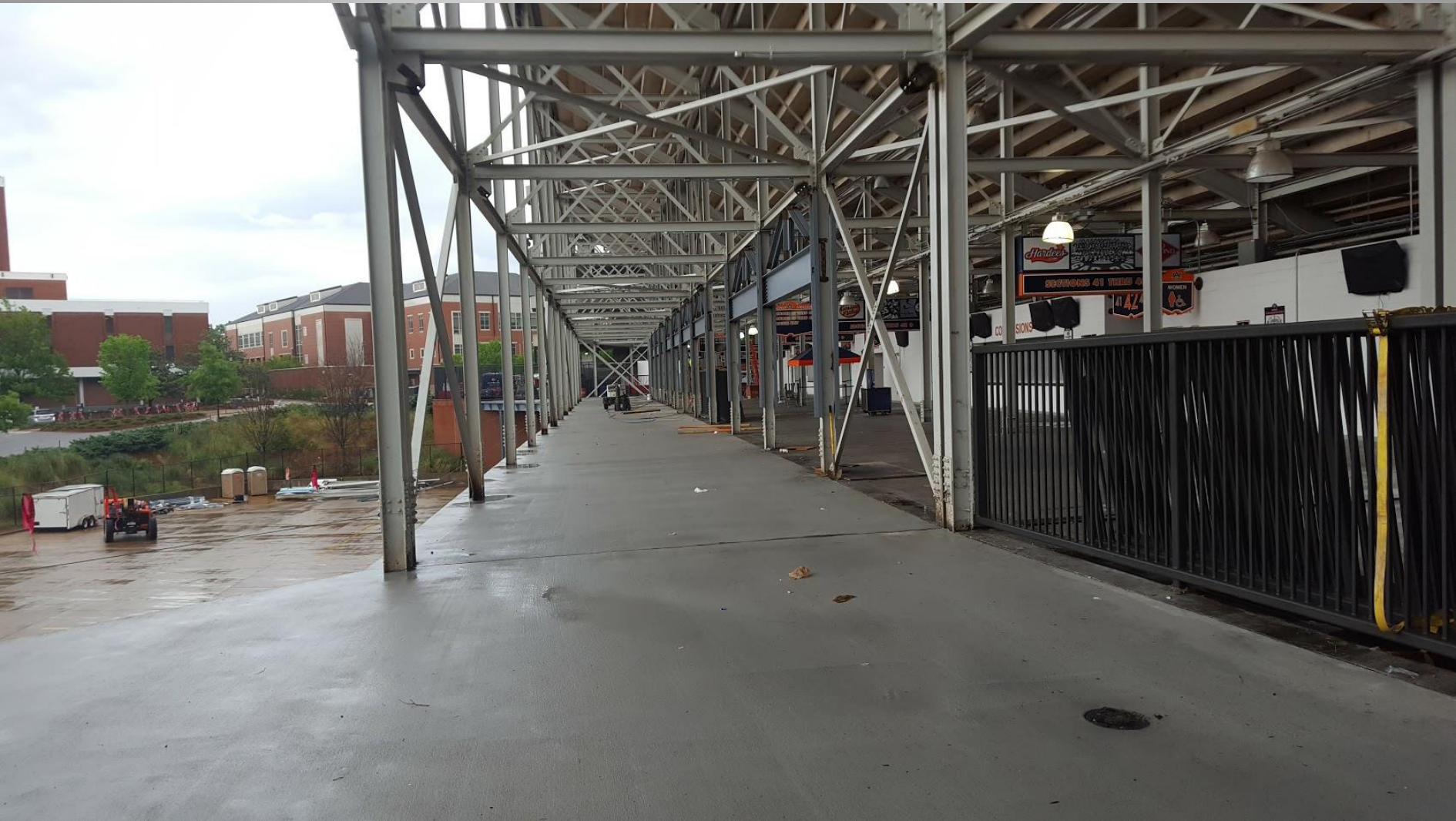
Rock @ 40 ft.



Boring Log 1998

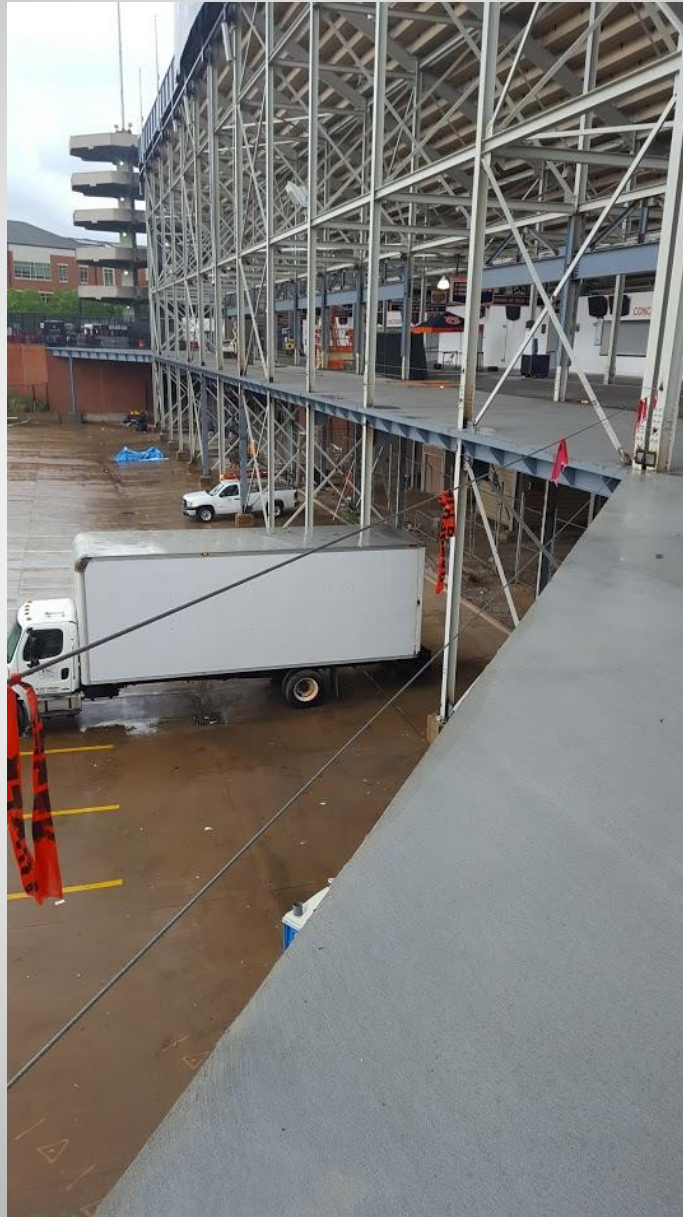
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NEZ Concourse Expansion 2012 - 2017



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NEZ Concourse Expansion - 2017



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NEZ Concourse Expansion Borings in 2012



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NEZ Concourse Expansion Borings in 2012



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NEZ Concourse Expansion Test Pits



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NEZ Concourse Expansion Test Pits



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South End Zone Video Board – 2014 -2016



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South End Zone Video Board - 2014



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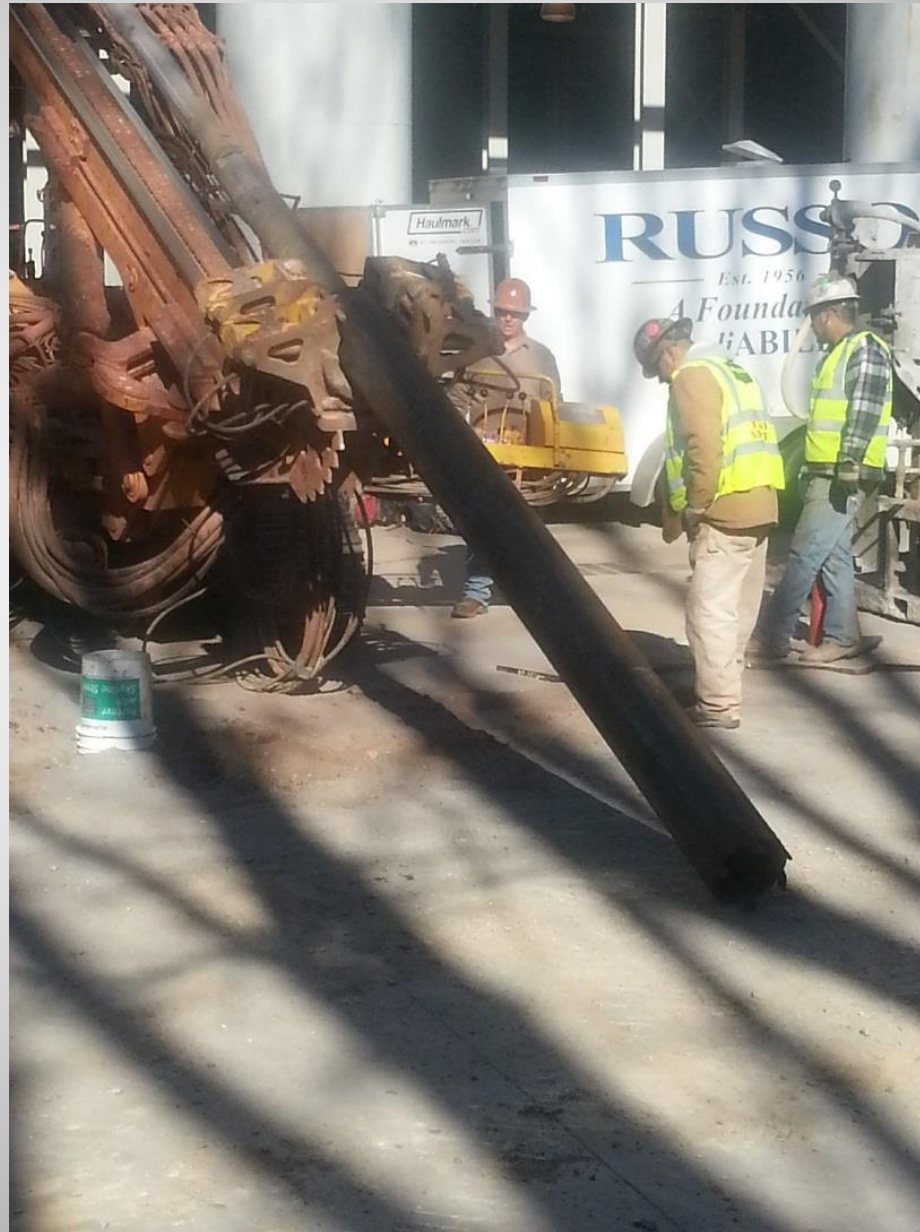
Micro Pile Foundations - 2015

Initial design included
Drilled Shafts

Contractor VE with
Micro Piles

125 ton piles

March 2015



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Micro Pile Foundations



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Micro Pile Foundations



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Micro Pile Foundations



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Micro Pile Foundations



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Micro Pile Load Test



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Micro Pile Load Test

Jack on top of
load frame



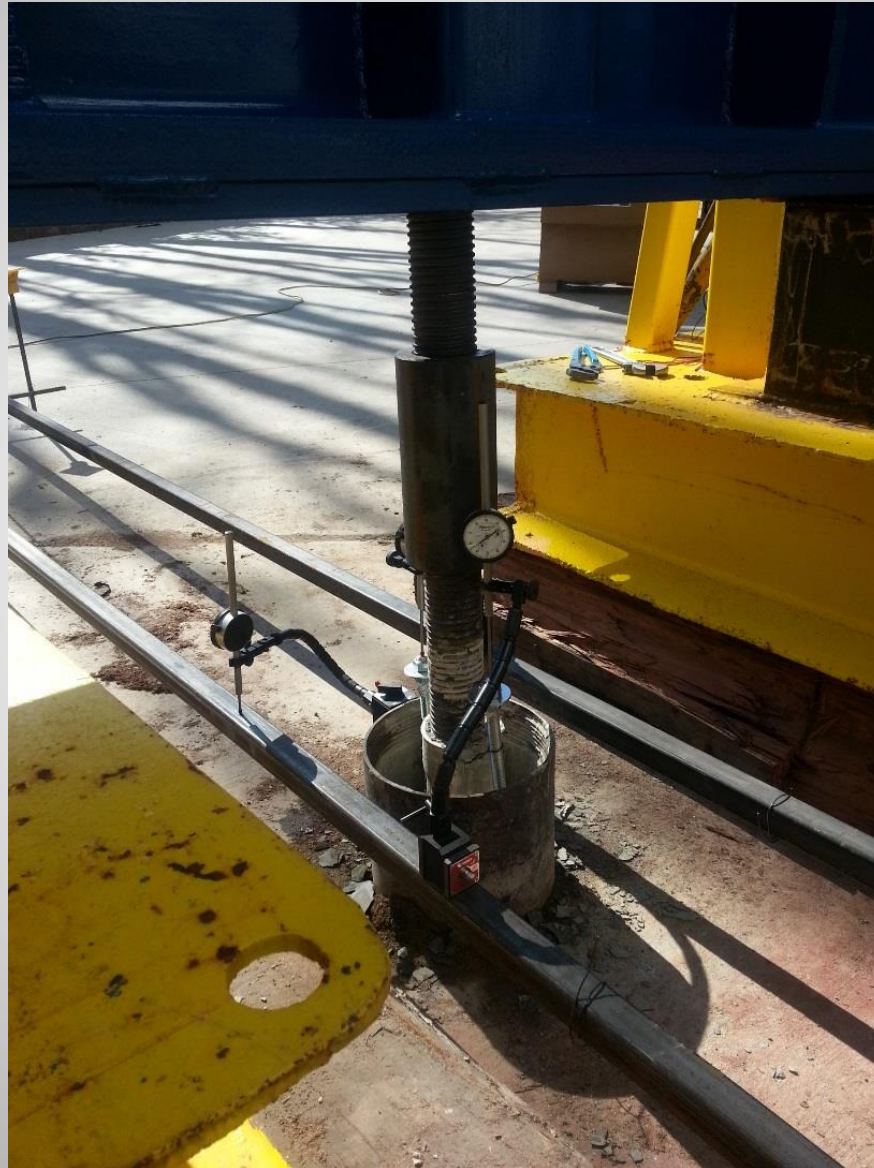
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Micro Pile Load Test



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Micro Pile Load Test



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Test Pile Installation - Video



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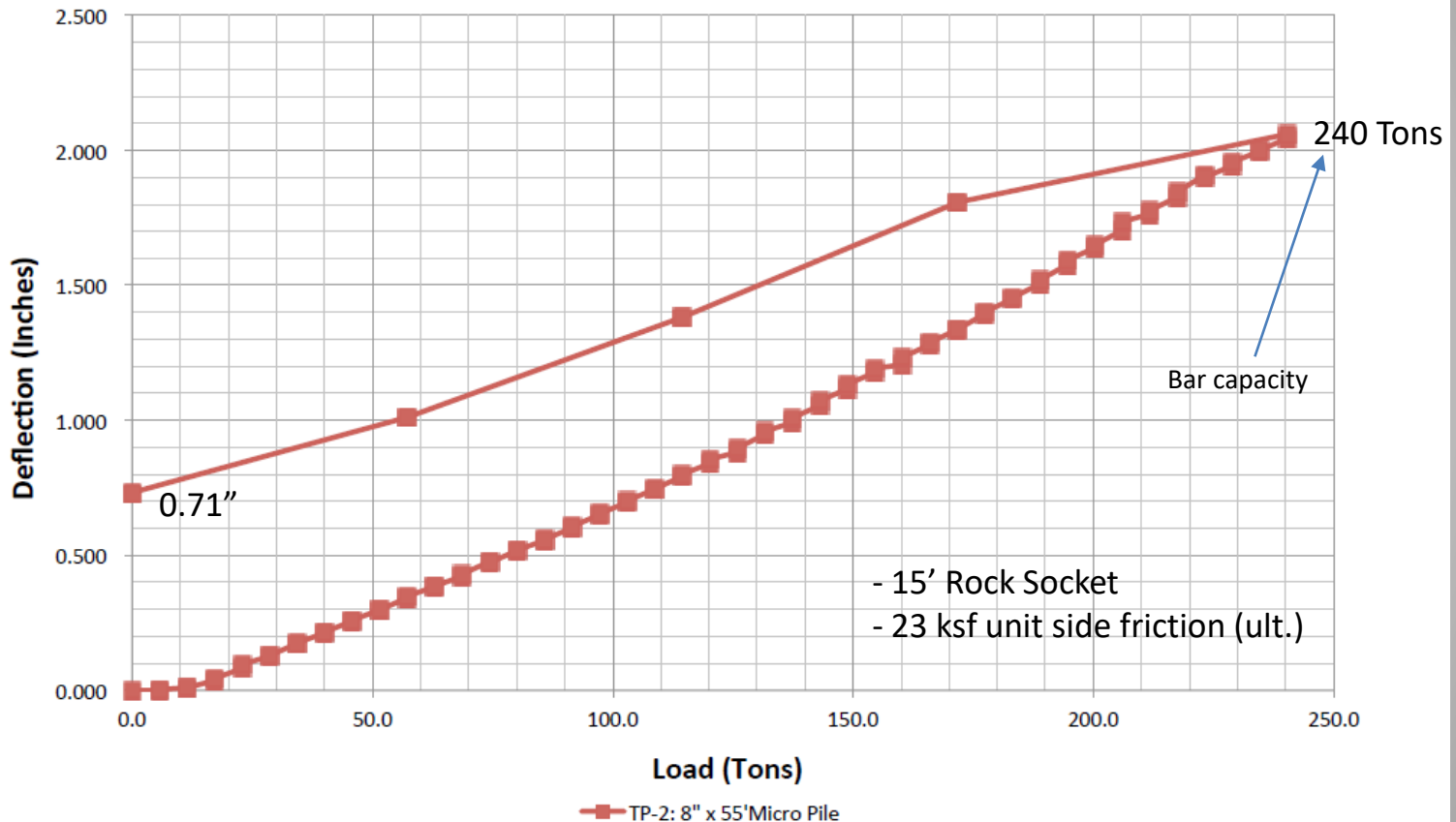
Test Pile Installation - Video

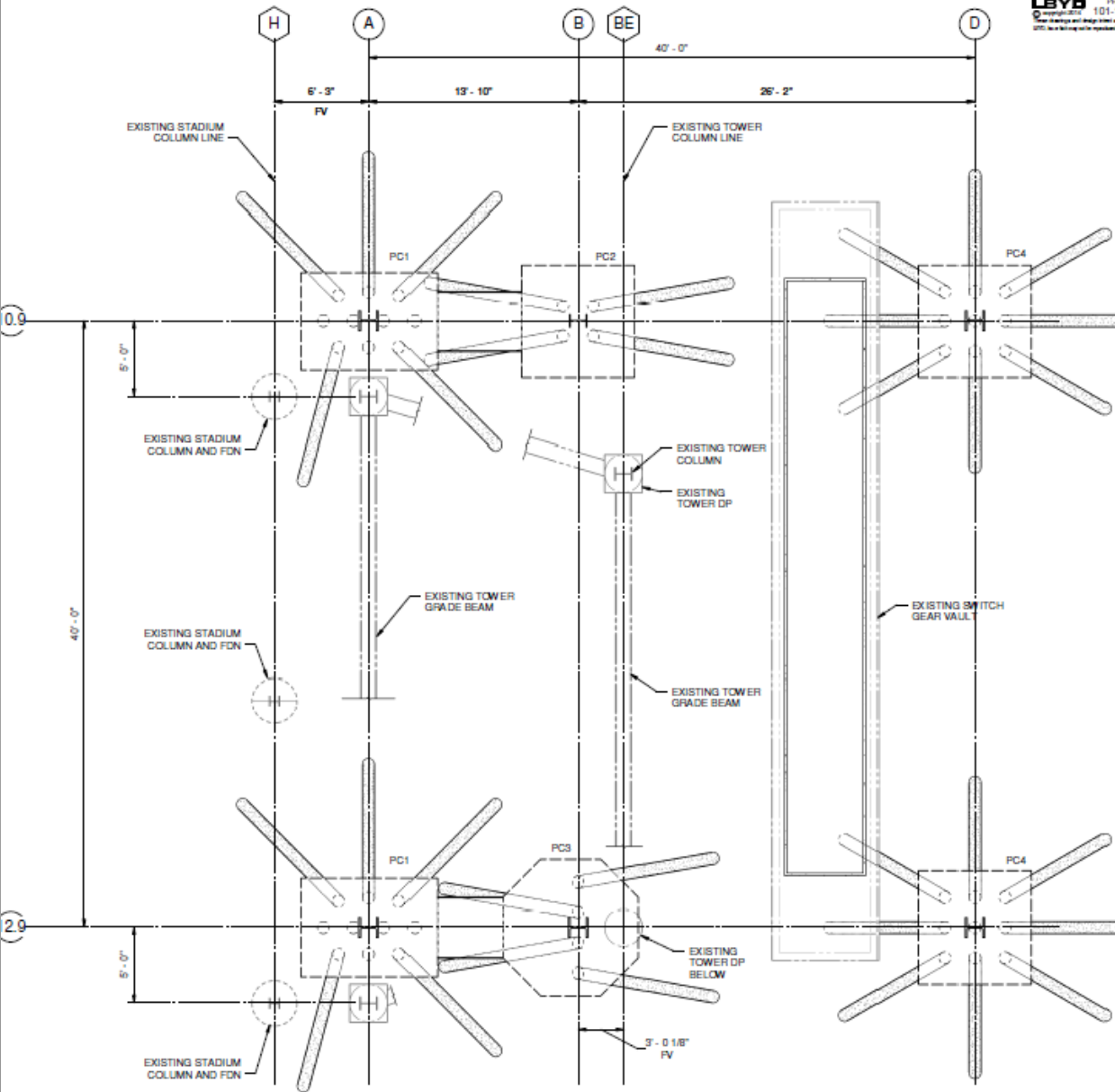


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Load Test Results

Auburn Football Stadium Project:
TP-2 Tension Test Load - Deflection Plot

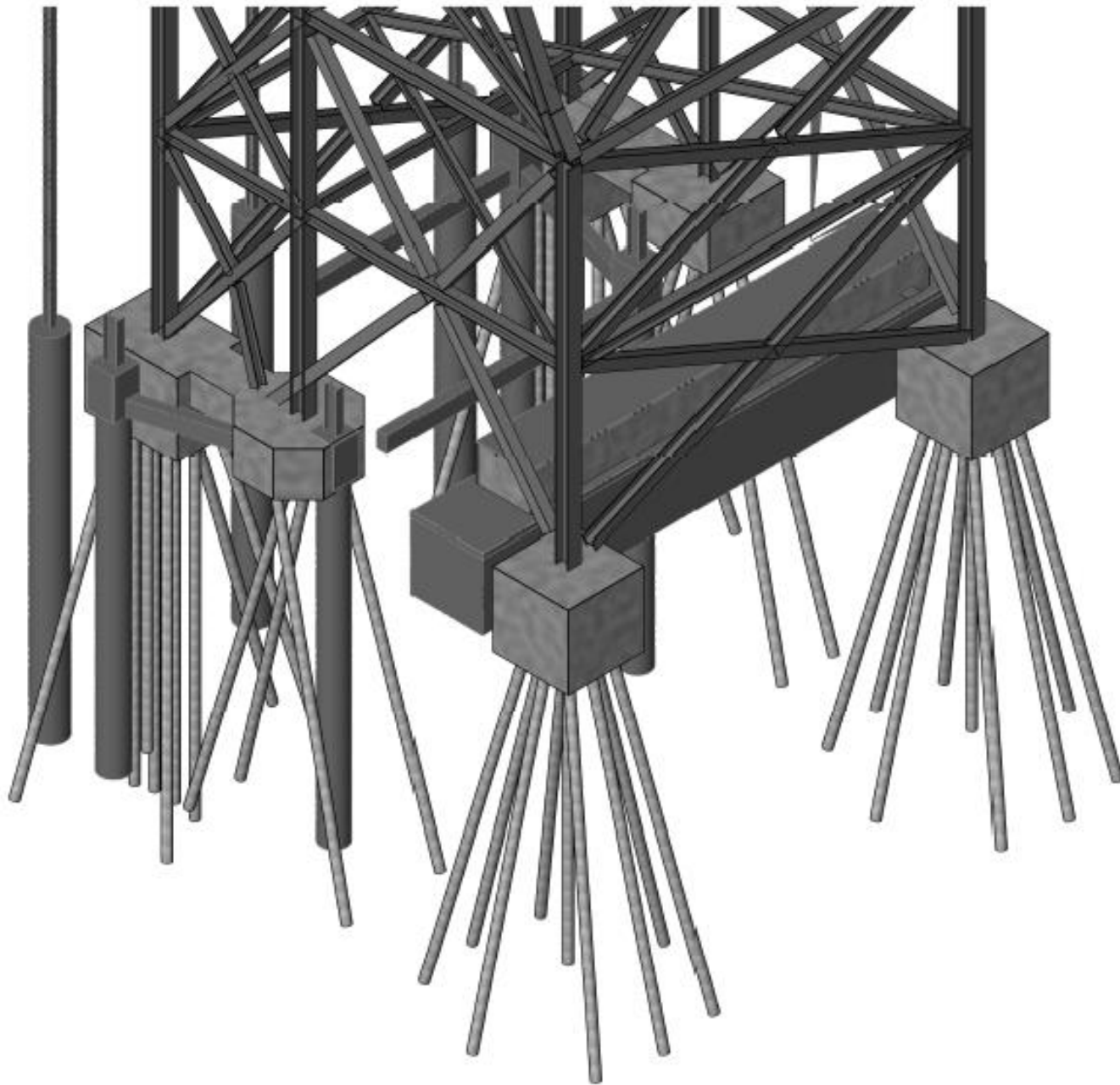




2 Foundation Plan
 82.0 1/4" = 1'-0"

Foundation Plan

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Foundation Plan
Isometric View

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Foundation Construction

March – April 2016



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Foundation Construction



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Foundation Construction



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Foundation Construction



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Foundation Construction



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Tremmie Cement Grout



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Pile Construction - Video



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Pile Construction - Video



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Pile Cap Construction



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Pile Cap Construction



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Pile Cap Construction



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Pile Cap Construction



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Pile Cap Construction



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Pile Cap Construction



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Pile Cap Construction



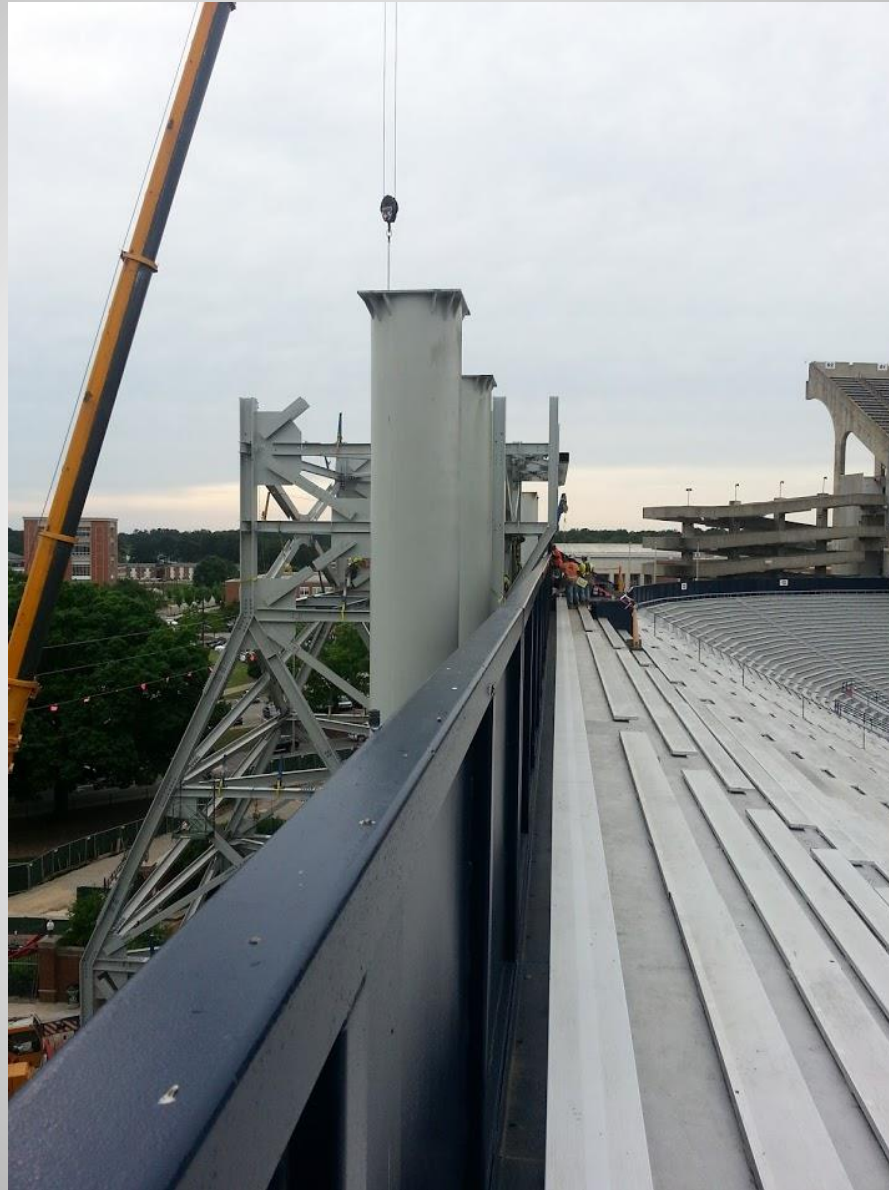
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Pile Cap Construction



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Tower Construction



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Tower Construction



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Tower Construction



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Tower Construction



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Construction - 2016



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Construction - 2016



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Future North End Zone Expansion



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Future North End Zone Expansion



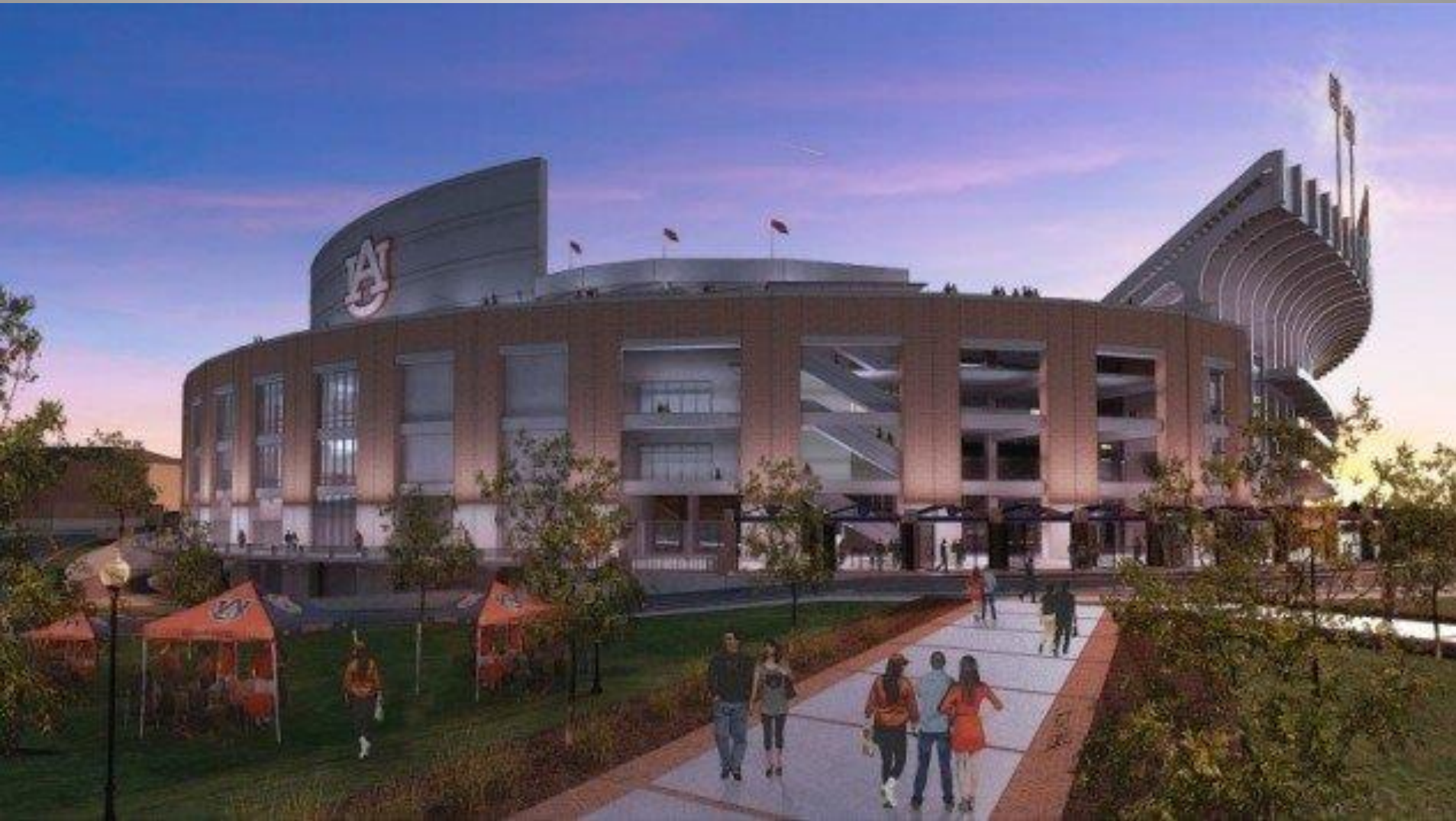
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Future North End Zone Expansion



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Future North End Zone Expansion



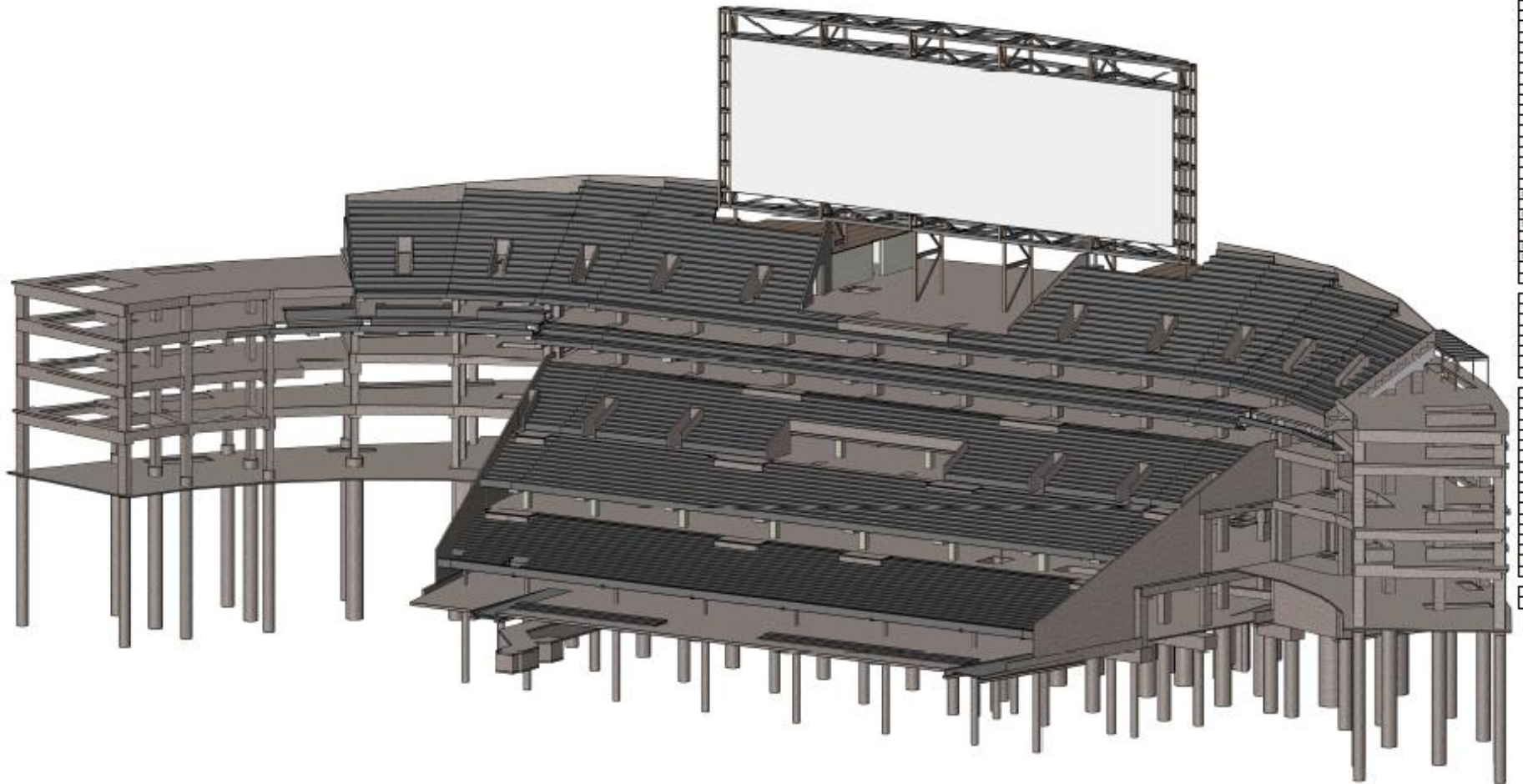
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Future North End Zone Expansion



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Future North End Zone Expansion



Isometric View

North End Zone – Borings 2015



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North End Zone – Borings 2015

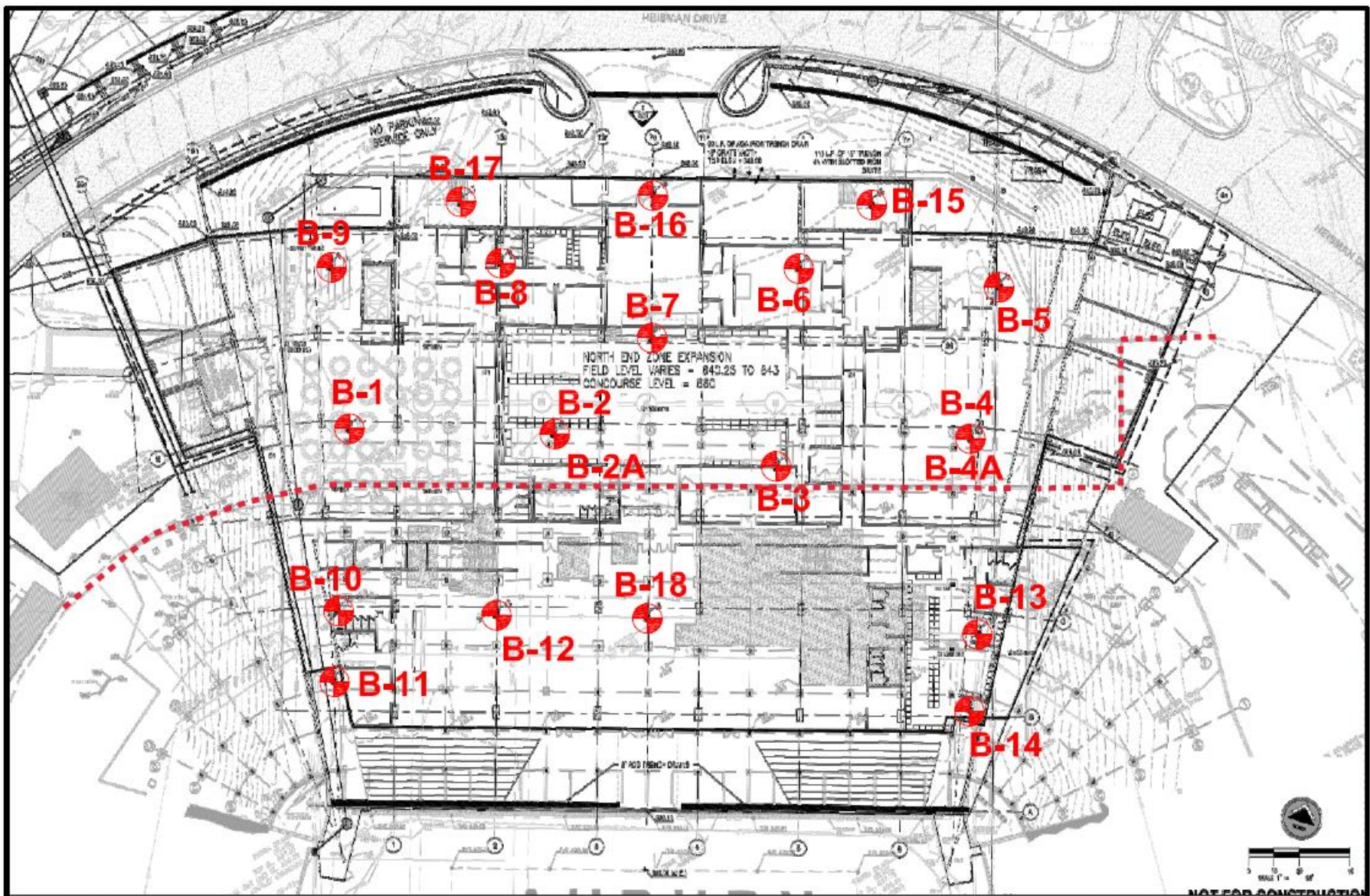


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North End Zone – Borings 2015



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Reduced Scale

Boring Location Plan

 - Soil Test Boring

Project:
Jordan Hare Stadium
North Endzone Expansion
Auburn University
Auburn, Alabama

Rock @ 19 ft.

DEPTH (FT.)	DESCRIPTION	ELEV. (FT.)	STANDARD PENETRATION RESISTANCE					MC N (%)	LABORATORY RESULTS & REMARKS	
0.0		638.7	0	10	20	40	60	80		
0.8	9 1/2" Concrete Pavement									
1.1	4" Crushed Stone Base									
2.5	Fill, Sandy Clay (CL), red, brown and gray, stiff								21	14
									7	17
	Clayey Sand (SC), micaceous, yellowish-brown and black, loose	633.7							14	24
	Clayey Sand (SC), micaceous, brown and tan, firm									
8.0										
	Saprolite, Silty Sand (SM), micaceous, yellowish-brown, gray and black, loose	628.7							6	23
	Saprolite, Silty Sand (SM), micaceous, gray, tan and yellowish-brown, very dense	623.7							50/5"	3
19.0	Auger Refusal at 19 ft.	618.7							50/6"	2
	Gneiss, slightly-fractured, micaceous, gray and white, very hard	613.7								
29.0	Boring Terminated at 29 ft.	608.7								

REMARKS:

N - STANDARD PENETRATION RESISTANCE
IN BLOWS PER FOOT (ASTM D-1586)

SEE SOIL BORING LEGEND FOR EXPLANATION OF
SYMBOLS AND ABBREVIATIONS USED ABOVE

SOIL BORING LOG

BORING NUMBER : B-08
DATE DRILLED : 3/4/15
PROJECT NUMBER : CS-9281-15
PROJECT : Jordan Hare Stadium - North End Zone
Expansion, Auburn University
PAGE 1 OF 1

CHRISTIAN TESTING LABORATORIES, INC.
Montgomery, Alabama

SHL CS-9281-15.GPJ 4/29/15

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Prepared For
Facilities Management
1101 West Sanford Avenue
Auburn University, AL 36849
Phone: (334) 844-9450
Fax: (334) 844-9450



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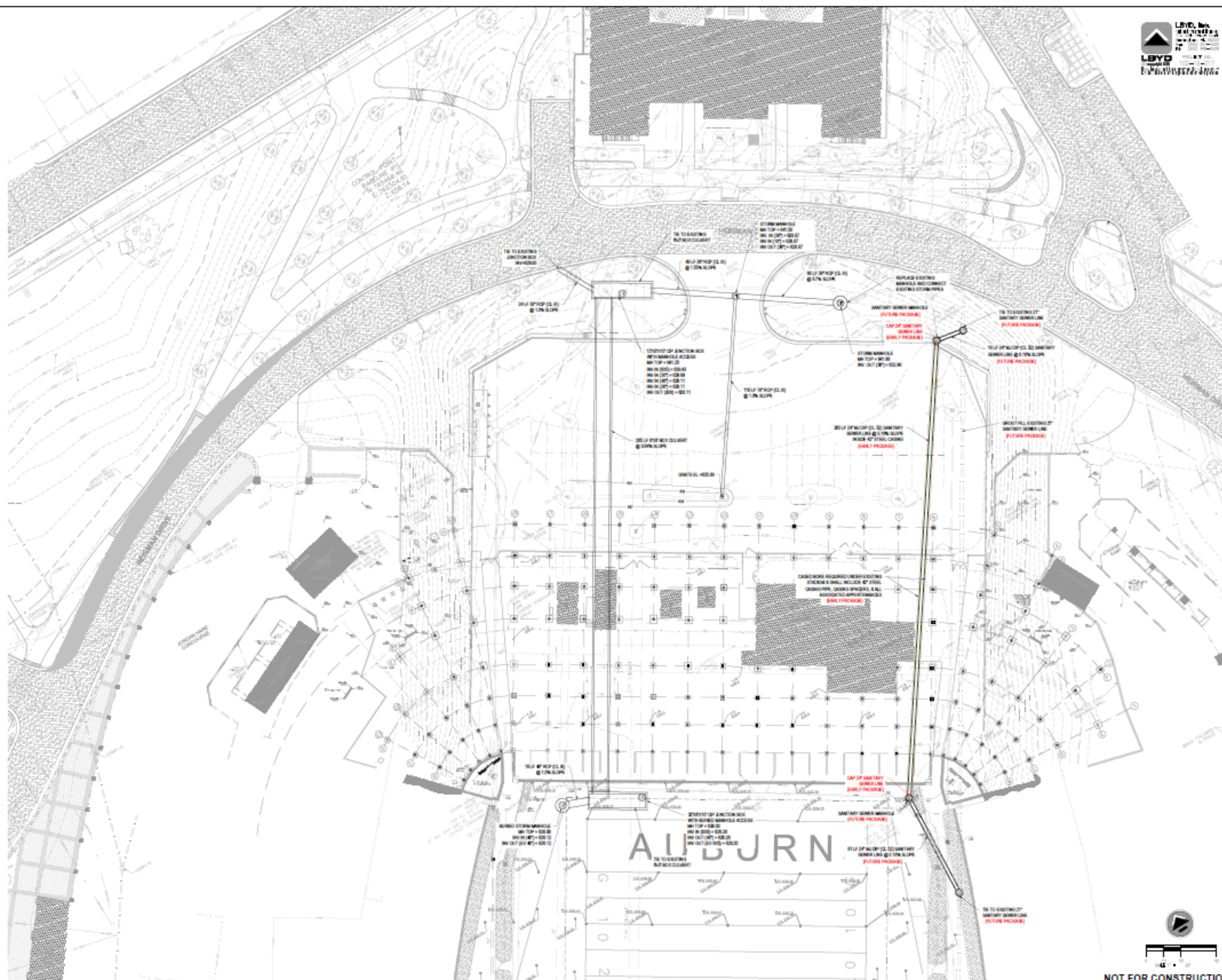
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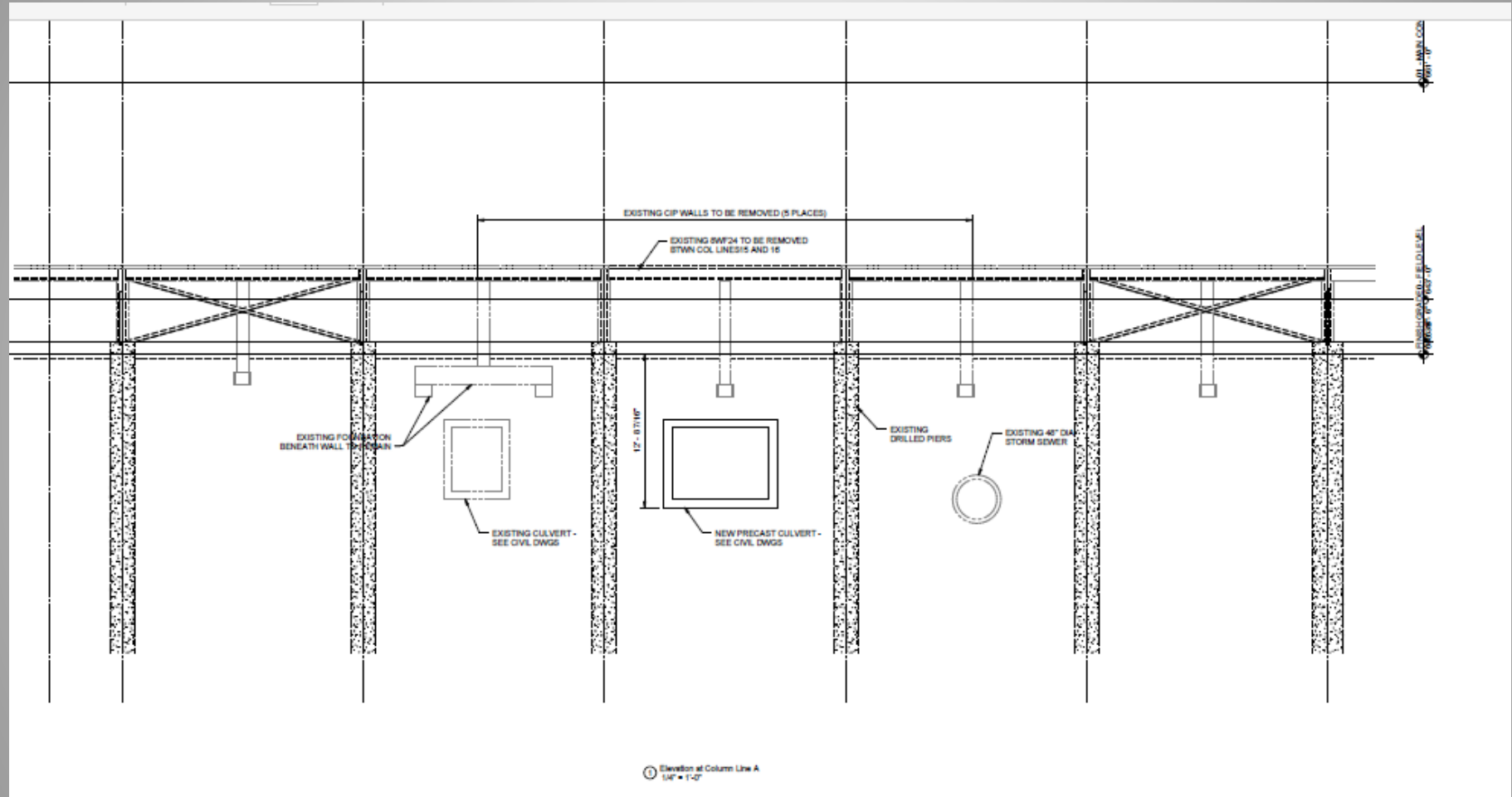
SITE GRADING
PLAN

Original drawing in 4:2 is 25%. The red marks contents of blue drawing

C300



Culvert Replacement - 2015



Culvert Replacement



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Culvert Replacement



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Culvert Replacement



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Culvert Replacement - PIT



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Culvert Replacement - PIT



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Culvert Replacement - PIT



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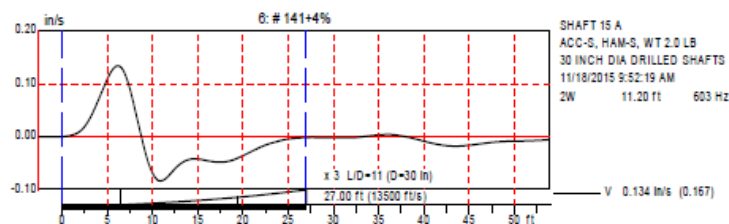
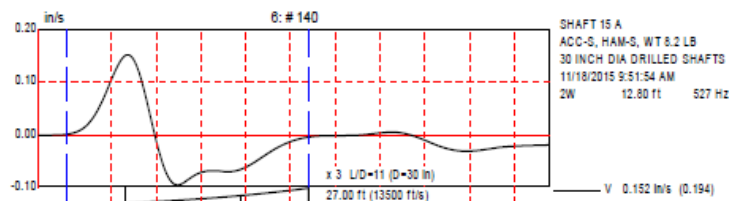
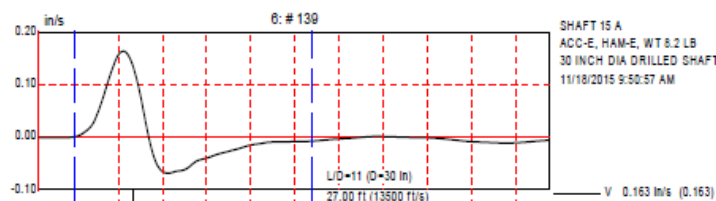
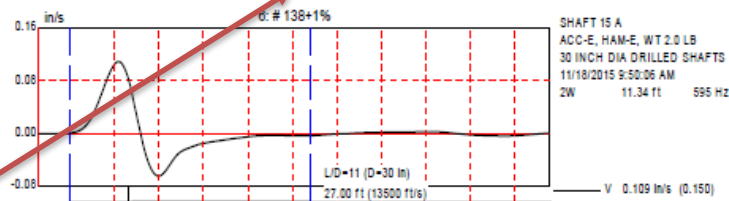
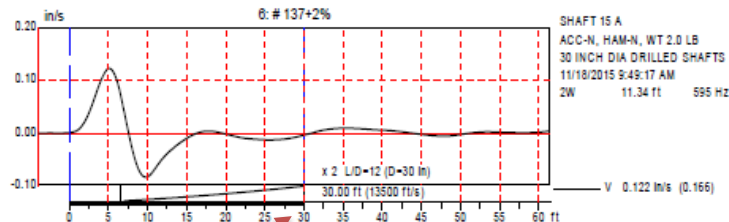
PIT Results

Terracon Consultants, Inc.

11/24/2015

Data

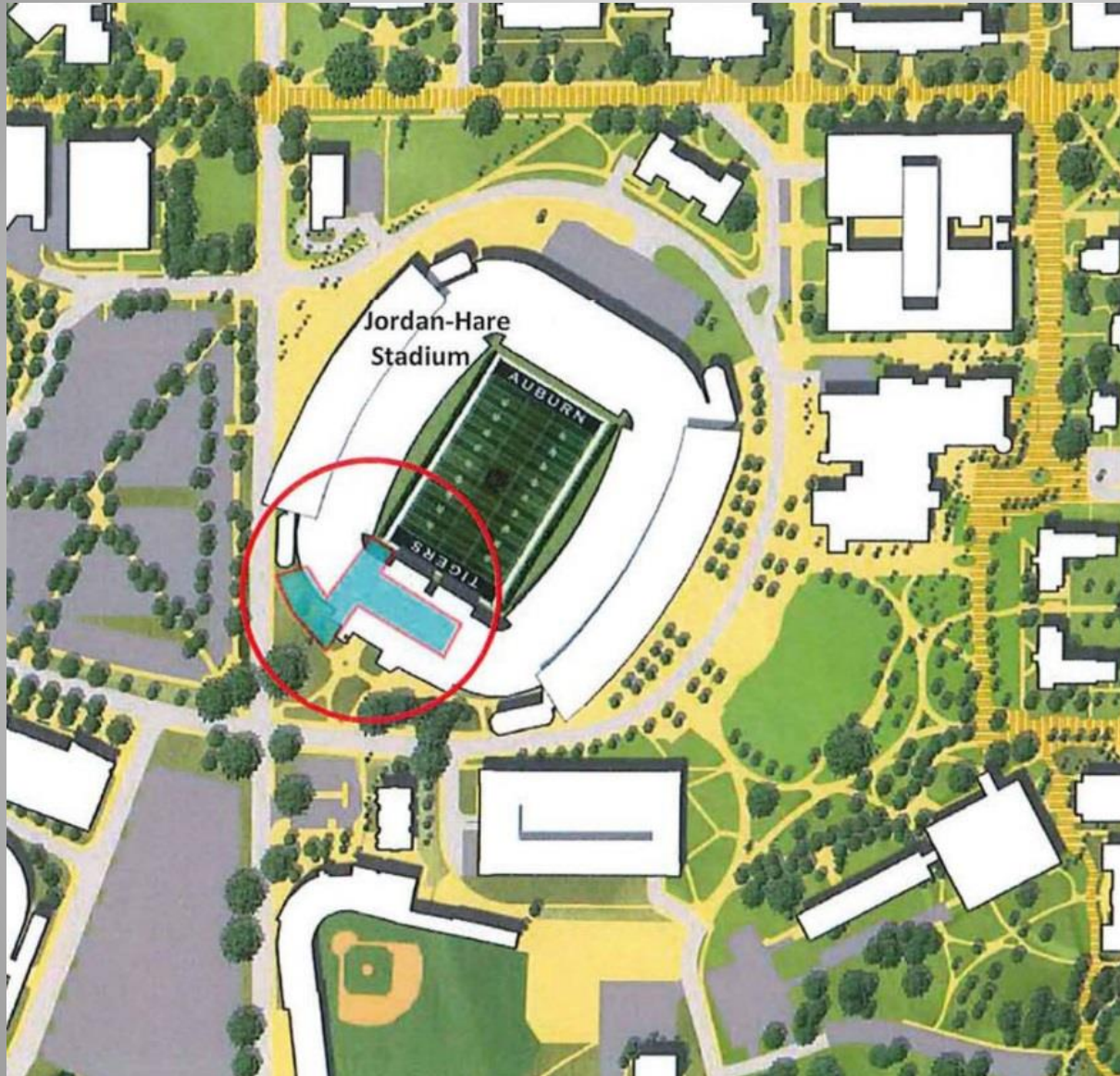
C:\Users\lahhartley\Projects\E1155218 Drilled Shaft Foundation Evaluation, Jordan Hare StadPIT-W™ 2003-2 Rows 15 and 16.PIT



27 ft.

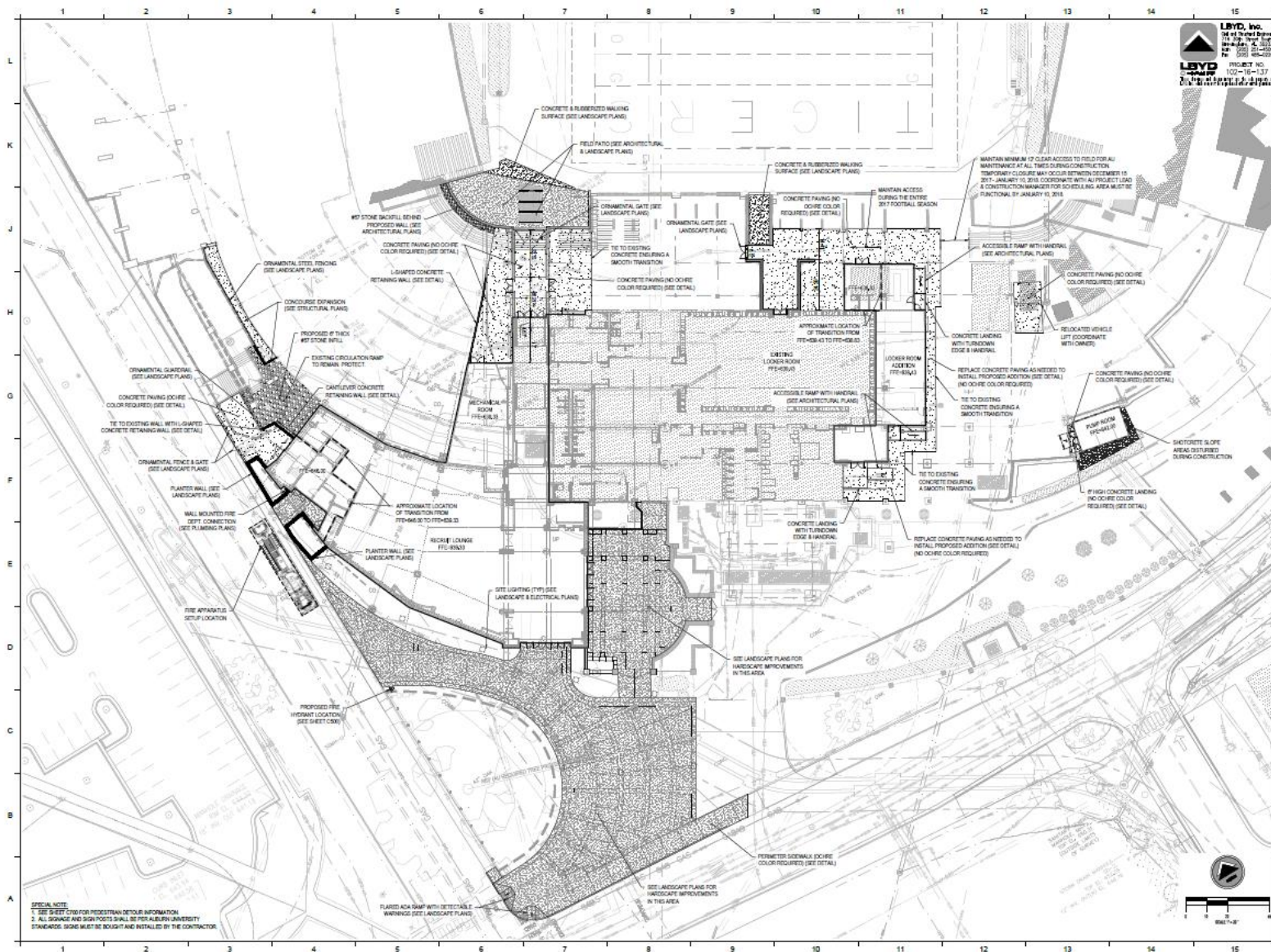
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South End Zone Project 2016 - 2018



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SEZ Game Day Support Facility



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251 South Converse Drive
Auburn University, AL 36849
Prepared For
Facilities Management
1161 West Sanford Avenue
Auburn University, AL 36849
Phone: (334) 844-4810
Fax: (334) 844-9458
Contract No: 15-055



HOK Architects, Inc.
300 West 2nd Street
Kansas City, MO 64108 USA
t+1 816 472 3360 f+1 816 472 2100

Goodwyn, Mills and Cawood, Inc.
Associate Architect

BL Harbert International
Construction Manager

LBVD, Inc.
Architectural and Civil

Conway Owen
MEP, Fire Protection, Security, Lighting

Holcomb Norton Partners
Landscape

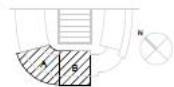
FBC Inc.
Civil and Site Safety

EG Roether Consulting, LLC
Accessibility

SZO Consultants
Pool Design

Advent
Environmental Graphics

Key Plan



Drawn By: [Signature] Date: [Blank]

APR 15/16 ISSUE FOR CONSTRUCTION: 1517-04-05

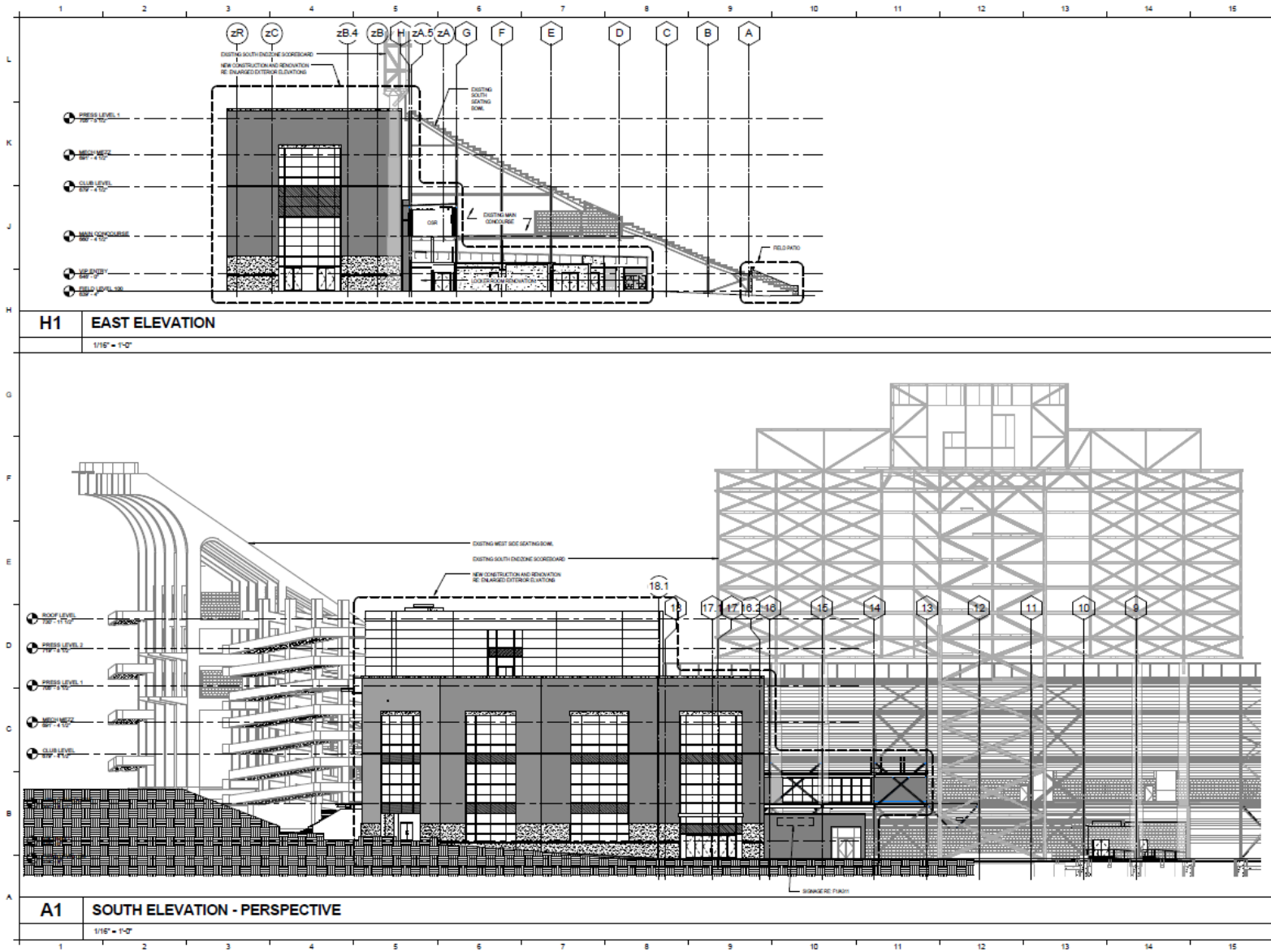
Date of First Issue: 2015-08-19
Project No: 15.70016.04

Sheet Title:
SITE LAYOUT PLAN

Original is on 24 x 36. Do not make copies of this drawing.
Sheet Number

C200

SEZ Game Day Support Facility



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2511 South Donahue Drive
Auburn University, AL 36849
Prepared For:
Facilities Management
1161 West Sanford Avenue
Auburn University, AL 36849
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Fax: (334) 844-9458
Contract No: 15-055



HOK Architects, Inc.
300 West 22nd Street
Kansas City, MO 64108 USA
T: 816 472 3360 F: 816 472 2100

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HOK Architecture, Inc.

Goodwyn, Mills and Cawood, Inc.
Associate Architect

SL Harbert International
Construction Manager

LEVD, Inc.
Structural and Civil

Conway Owen
MEP, Fire Protection, Security, Lighting

Holcomb Norton Partners
Landscape

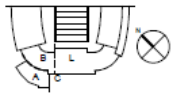
FSC Inc.
Code and Life Safety

Ed Roether Consulting, LLC
Accessibility

S20 Consultants
Food Service

Advent
Environmental Graphics

Key Plan



Professional Seal



Checklist Date

SEP 2 10AM 1000 PM CONSTRUCTION 2015 08 02

Date of Final Issue: 2015-08-19

Project No: 15-055-04

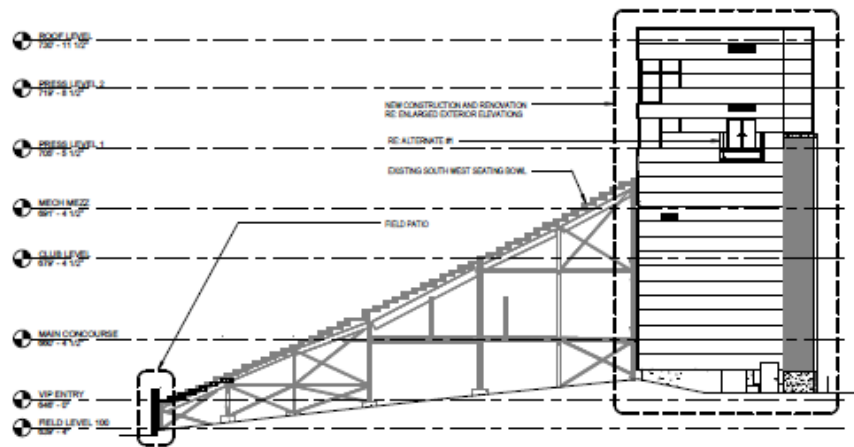
Drawn By:

BUILDING ELEVATIONS

Original: Working in 2015-08-19. Do not make changes to this drawing.

Sheet Number:

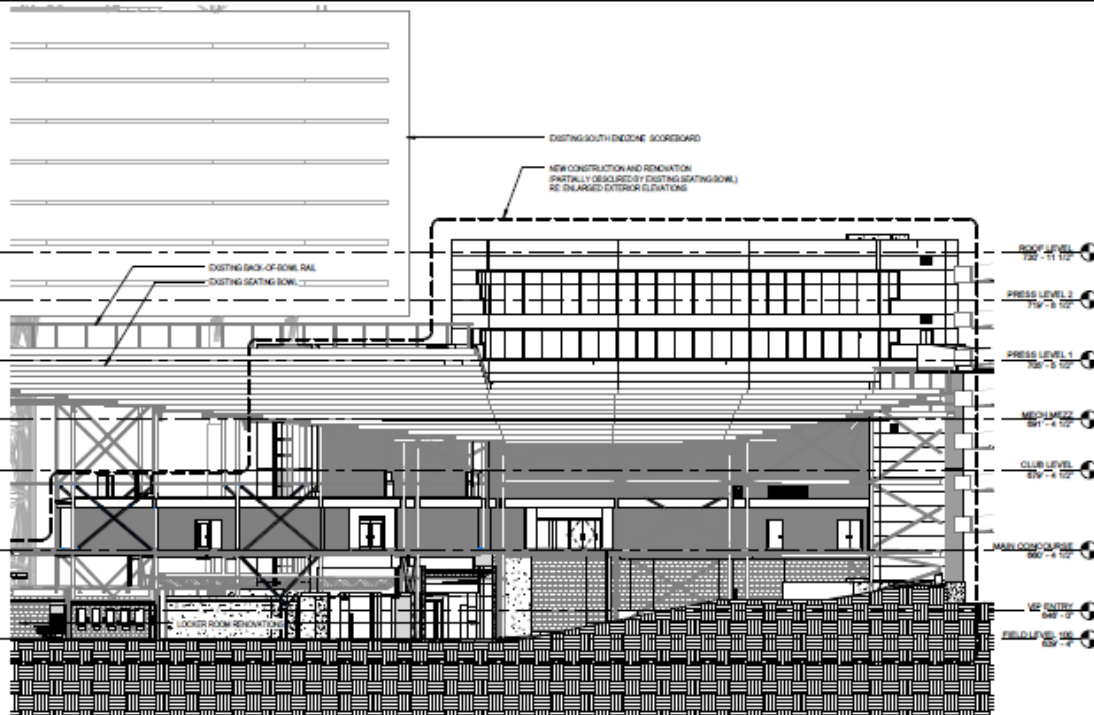
A301



SEZ Game Day Support Facility

G7 WEST ELEVATION

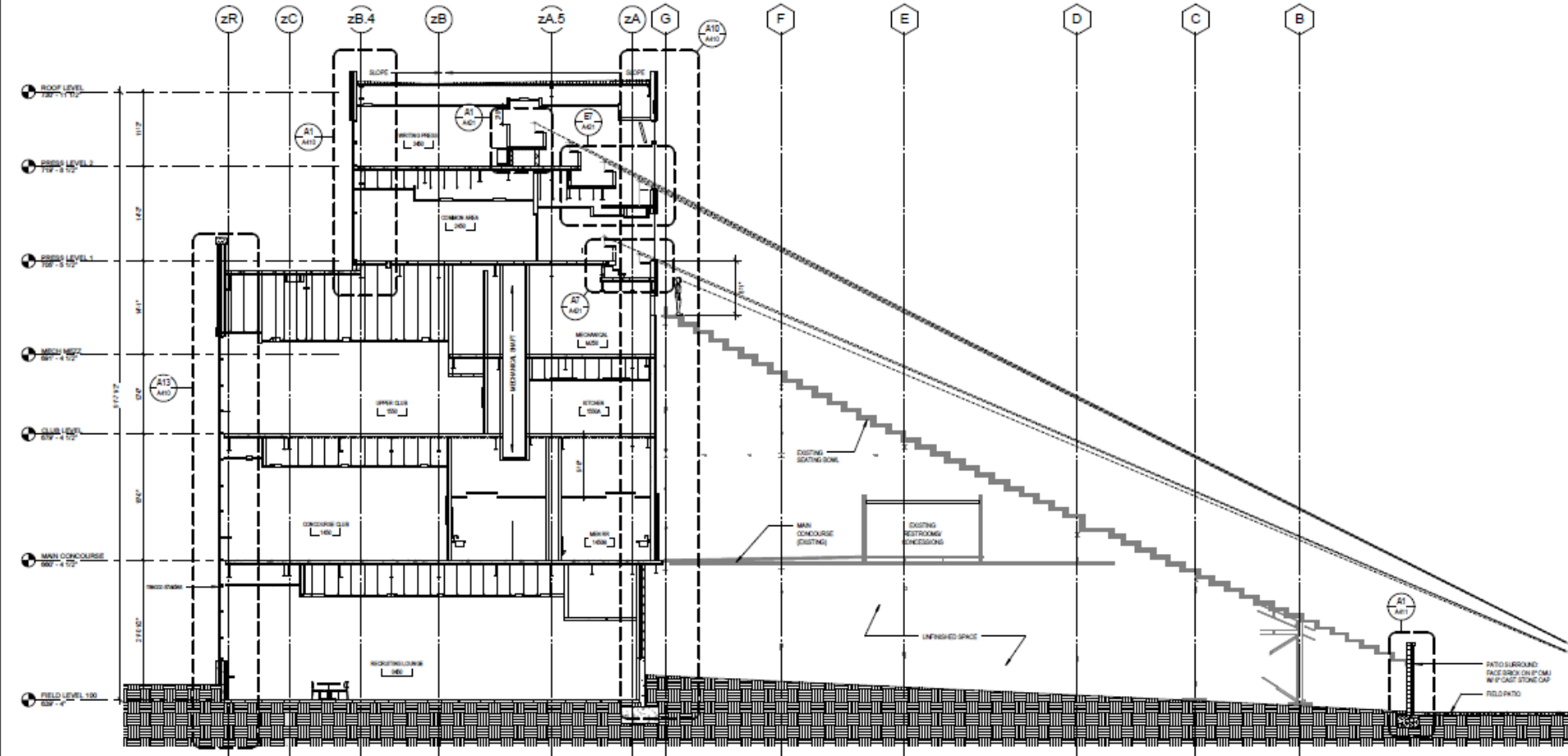
1/16" = 1'-0"



A7 NORTH ELEVATION - PERSPECTIVE

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SEZ Game Day Support Facility



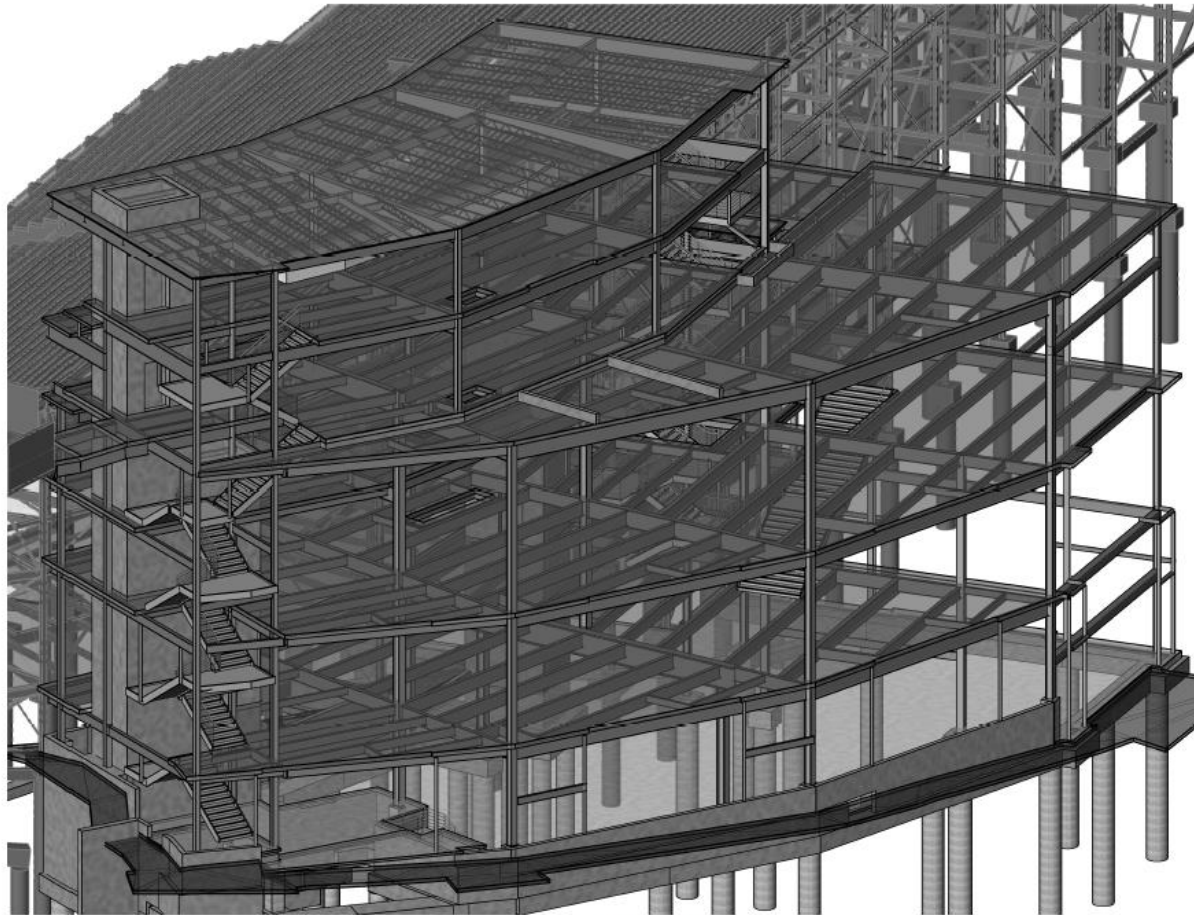
A1	TRANSVERSE SECTION AT PRESS BOX.
----	----------------------------------

1/8" - 1'-0"

Game Day Support Facility

LBVD, Inc.
Civil and Structural Engineers
716 South 30th Street
Birmingham, AL 35233
Main: (205) 251-4500
Fax: (205) 224-4181

LBVD PROJECT NO.
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Isometric View

mo 3/16")

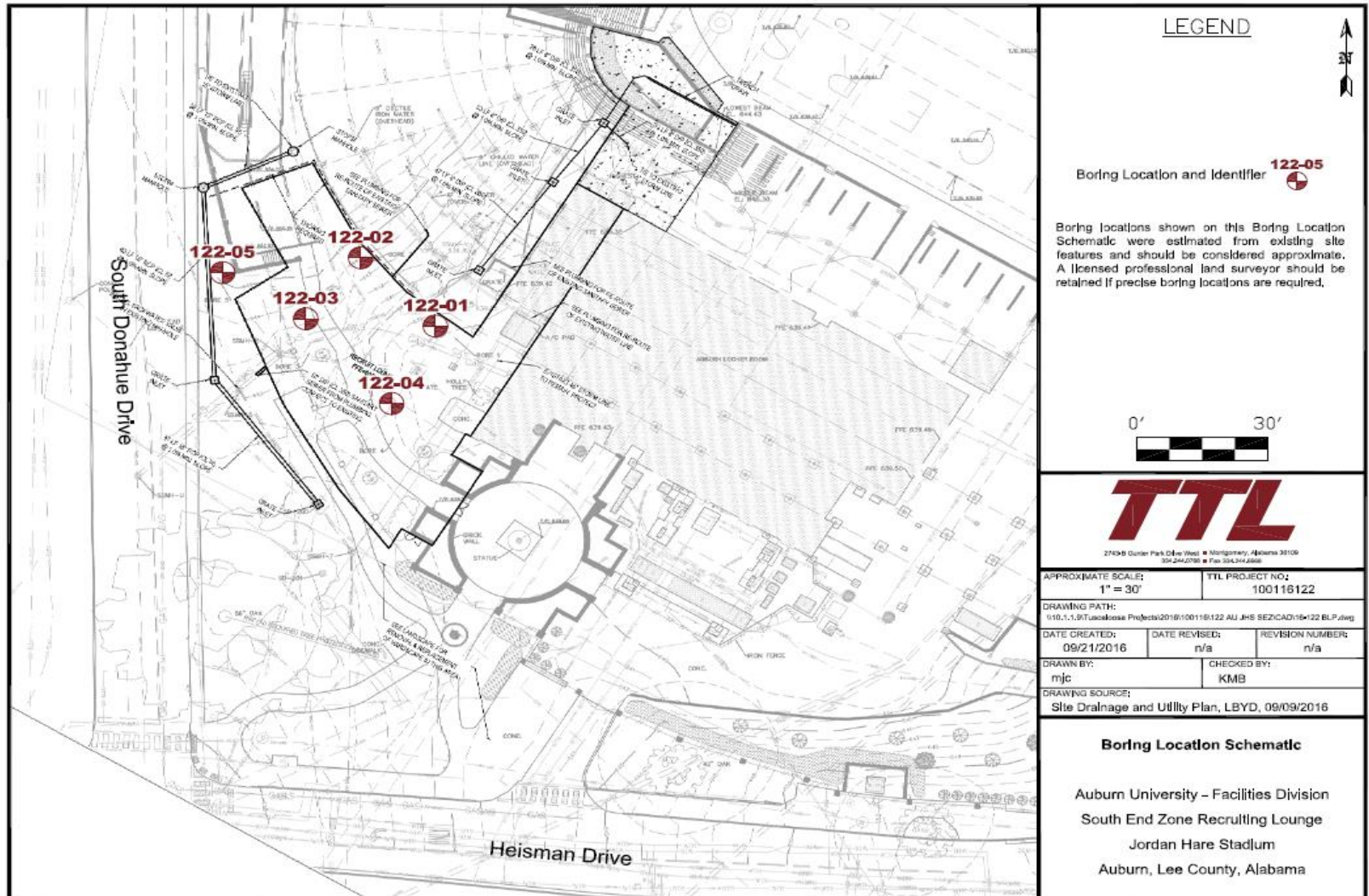
Name
and Legends
Notes
tes (Cont)
and Abbreviations

Sheet List		
Sheet Number	Sheet Name	
S102C	Main Concourse Framing Plan - Sector C	
S102E	Existing Main Concourse Bracing Plan	
S103	Club Level Framing Plan	
S103M	Mechanical Mezzanine Framing Plan	

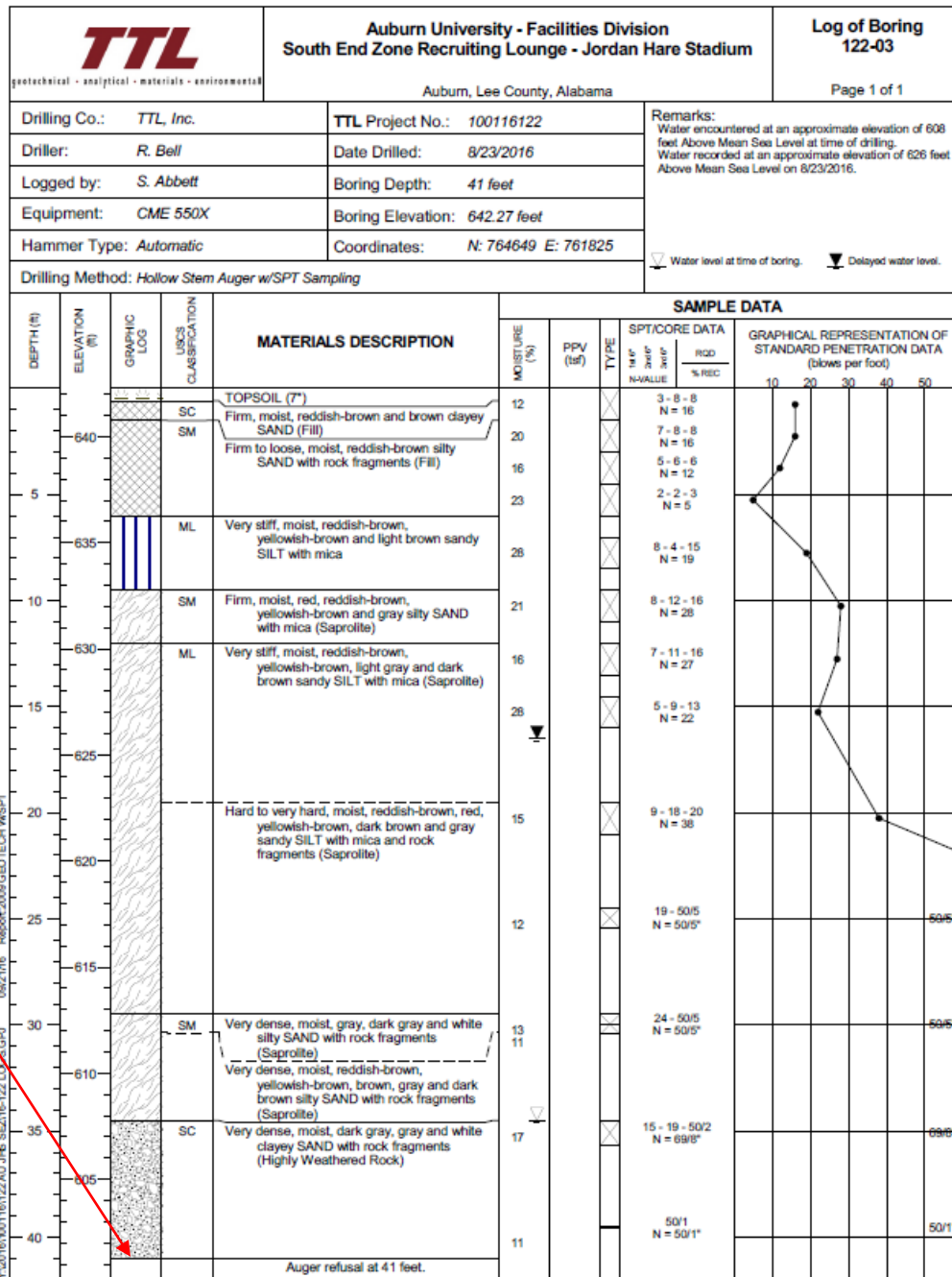
Sheet List		
Sheet Number	Sheet Name	
S423	Sections	
S425	Sections	
S430	Sections	
S431	Sections	

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Game Day Support Facility **Geotech** - August 2016



Rock @ 41 ft.



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Game Day Support Facility **Geotech** - **August 2016**



TFL

Game Day Support Facility

Geotech - August 2016



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Game Day Support Facility

Geotech - August 2016



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Game Day Support Facility

Geotech - August 2016



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Game Day Support Facility

Geotech - August 2016



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TTL

Game Day Support Facility

Construction – June - July 2016



TTL

Game Day Support Facility

Construction – June - July 2016



TTL

Game Day Support Facility Construction – June - July 2016



TTL

Game Day Support Facility Construction – June - July 2016



TTL

Game Day Support Facility

Construction – June - July 2016



TTL

Game Day Support Facility

Construction – June - July 2016



TTL

Game Day Support Facility Construction – June - July 2016



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Game Day Support Facility

Construction – June - July 2016



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Game Day Support Facility

Construction – June - July 2016



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Game Day Support Facility

Construction – June - July 2016



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AU Special Inspector



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Structural Framing – Nov 2017



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Construction – January 2018



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Construction – March 2018



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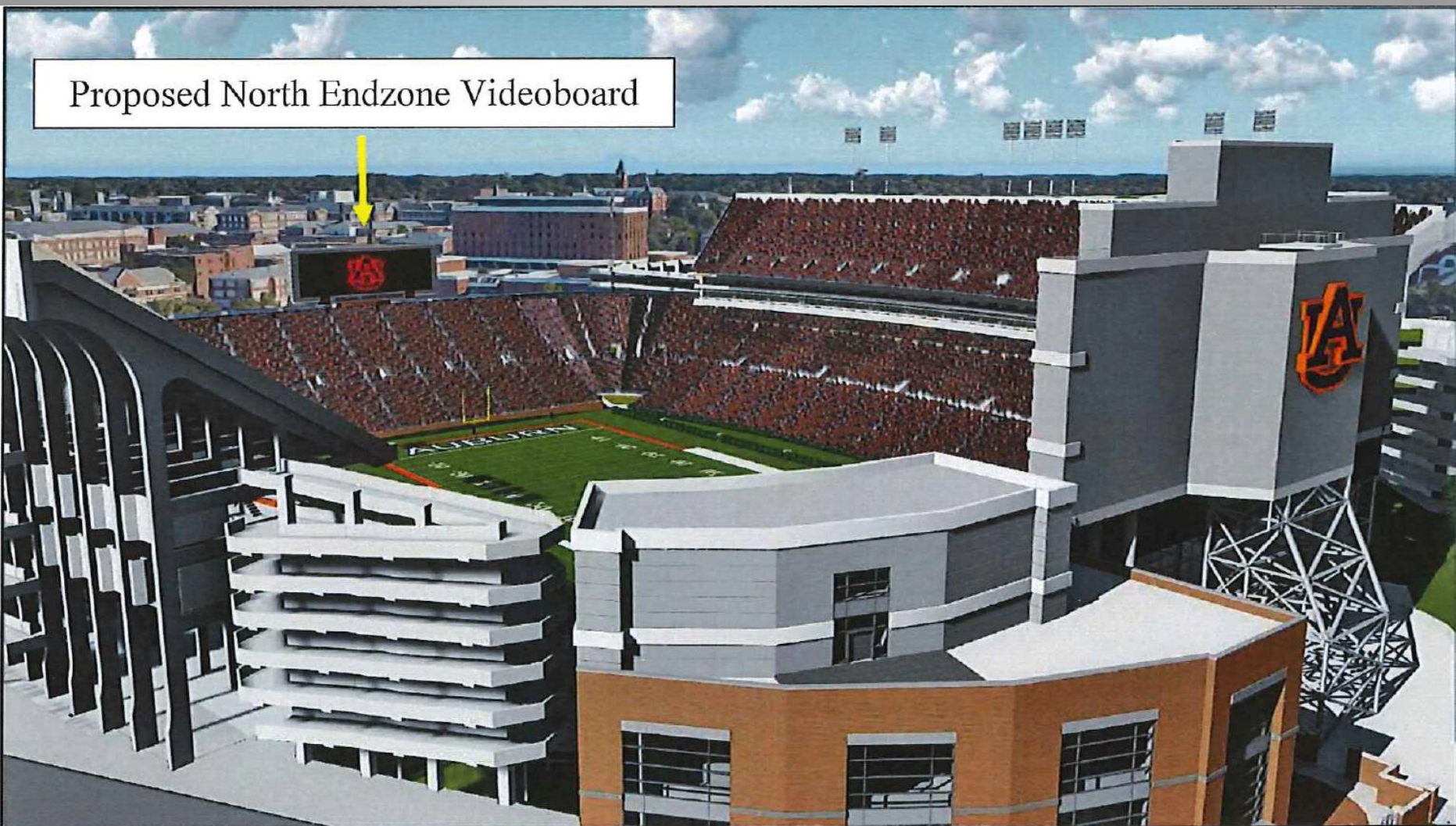
North End Zone Video Board

Geotechnical – Oct. 2017



View of the North Endzone Videoboard from inside Jordan-Hare Stadium

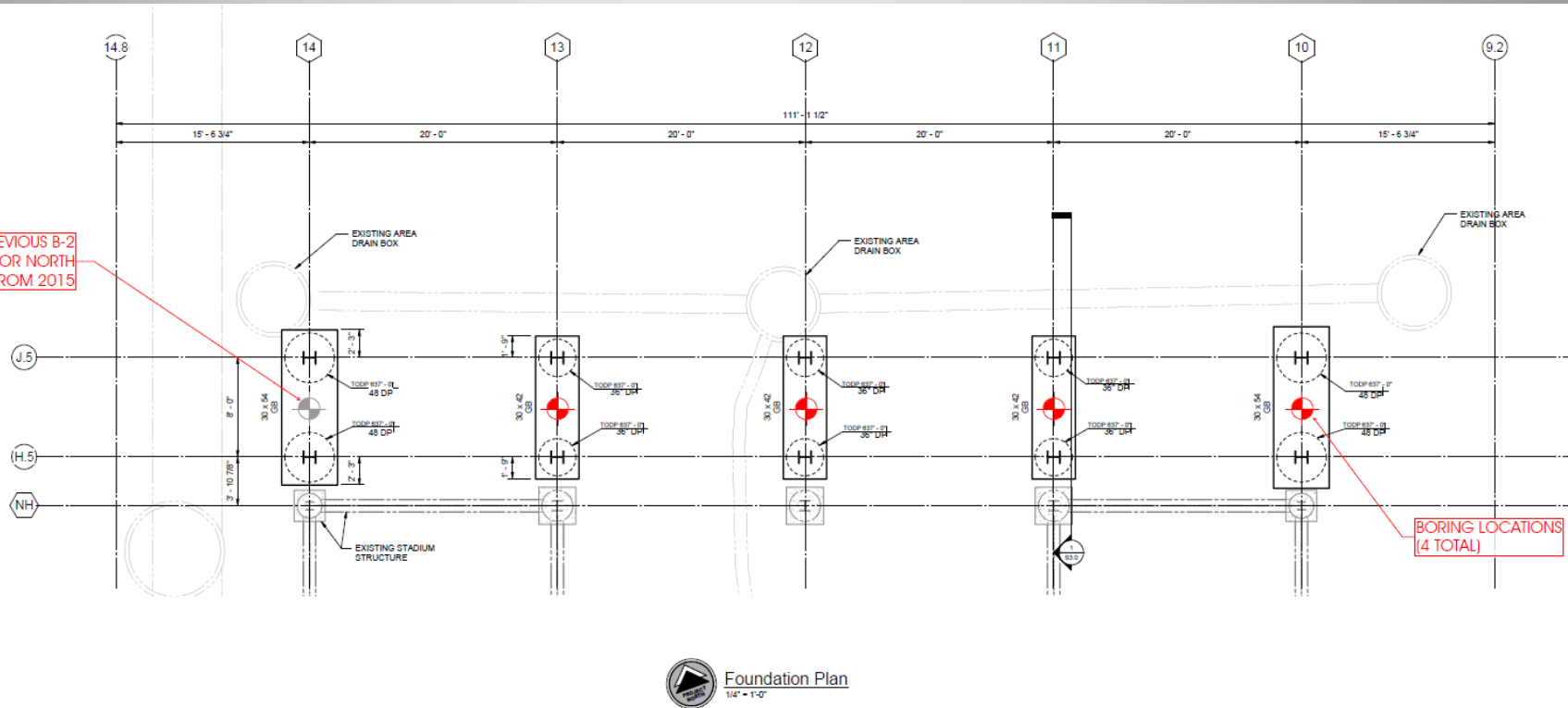
Proposed North Endzone Videoboard



View of the North Endzone Videoboard looking North

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Foundation Plan



- 36" and 48" Dia. Drilled Shafts
- 11 to 12 foot Rock Sockets
- 28 to 44 ft. Shaft Lengths

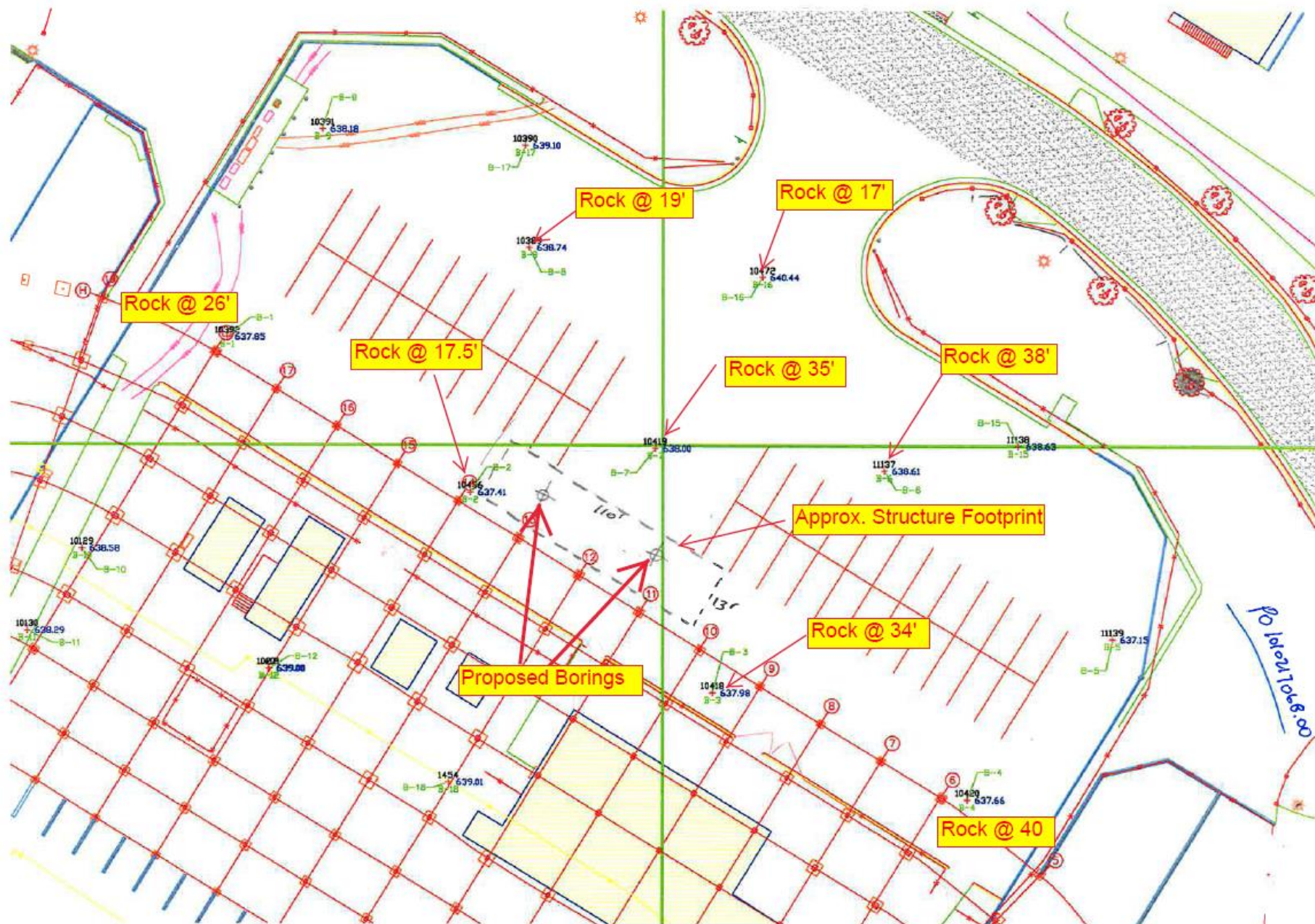
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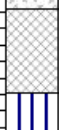
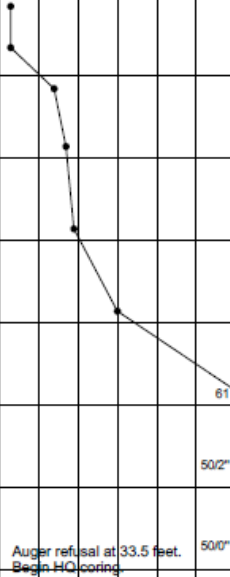
North End Zone Video Board

Geotechnical – Oct. 2017



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		Auburn University - Facilities Division Proposed North End Zone Video Board Jordan Hare Stadium Auburn, Lee County, Alabama			Log of Boring 038-02 Page 1 of 1					
Drilling Co.: <i>Technical Drilling Services</i>		TTL Project No.: <i>001010217038.00</i>		Remarks: Water encountered at an approximate elevation of 625 feet Above Mean Sea Level at time of drilling. Water encountered at an approximate depth of 12 feet Below Land Surface at time of drilling.  Water level at time of boring.						
Driller: <i>K. Peak</i>		Date Drilled: <i>10/11/2017</i>								
Logged by: <i>S. Abbett</i>		Boring Depth: <i>55 feet</i>								
Equipment: <i>CME 75</i>		Boring Elevation: <i>637.1 feet</i>								
Hammer Type: <i>Automatic</i>		Coordinates: <i>Not Available</i>								
Drilling Method: <i>Hollow Stem Auger w/SPT Sampling</i>										
DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	UNCS CLASSIFICATION	MATERIALS DESCRIPTION	MOISTURE (%)	PPV (tsf)	TYPE	SPT/CORE DATA		GRAPHICAL REPRESENTATION OF STANDARD PENETRATION DATA (blows per foot)
								14" 30" 48" N-VALUE	RQD % REC	
5	635		CL	CONCRETE (11") FILL, moist, soft, sandy lean clay, reddish-brown and brown	20			2 - 2 - 1 N = 3		
					21			2 - 2 - 1 N = 3		
10	630		ML	Moist, stiff, SILT, micaceous, brown, reddish-brown, black and pale red	23			4 - 5 - 9 N = 14		
15	625	ML	SAPROLITE, moist, stiff, silt, reddish-brown, brown, black and gray	21			5 - 8 - 9 N = 17			
20	620	SM	PARTIALLY WEATHERED ROCK, moist, firm to very dense, silty sand, micaceous, gray, black and white	18			7 - 7 - 12 N = 19			
25	615						6 - 16 - 14 N = 30			
30	610						15 - 37 - 24 N = 61			
35	605			GNEISS, dark gray and gray			50/2 N = 50/2"		50/2"	
40	600						50/0 N = 50/0"		50/0"	
45	595									
50	590									
55	585									
Boring terminated at 55 feet.										

Rock @ 33 ft.



West Press Box Renovations

Geotechnical – Nov. 2017



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Construction Manager

LEVD, Inc.
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MEP, Fire Protection, Security, Lighting

WJHW
Broadcasting Consultant

S20 Consultants
Food Service

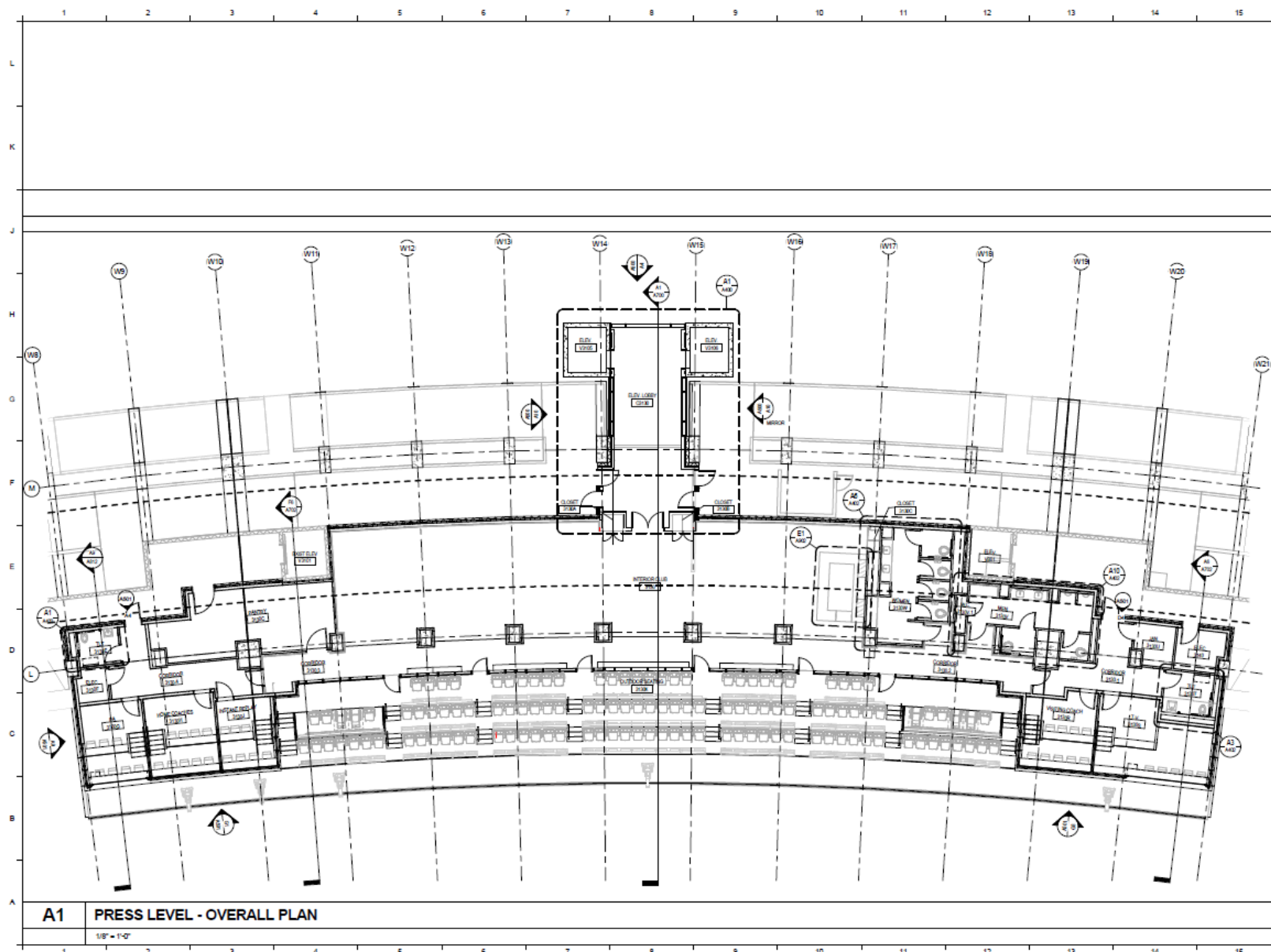
FSC Inc.
Code and U.K. Safety

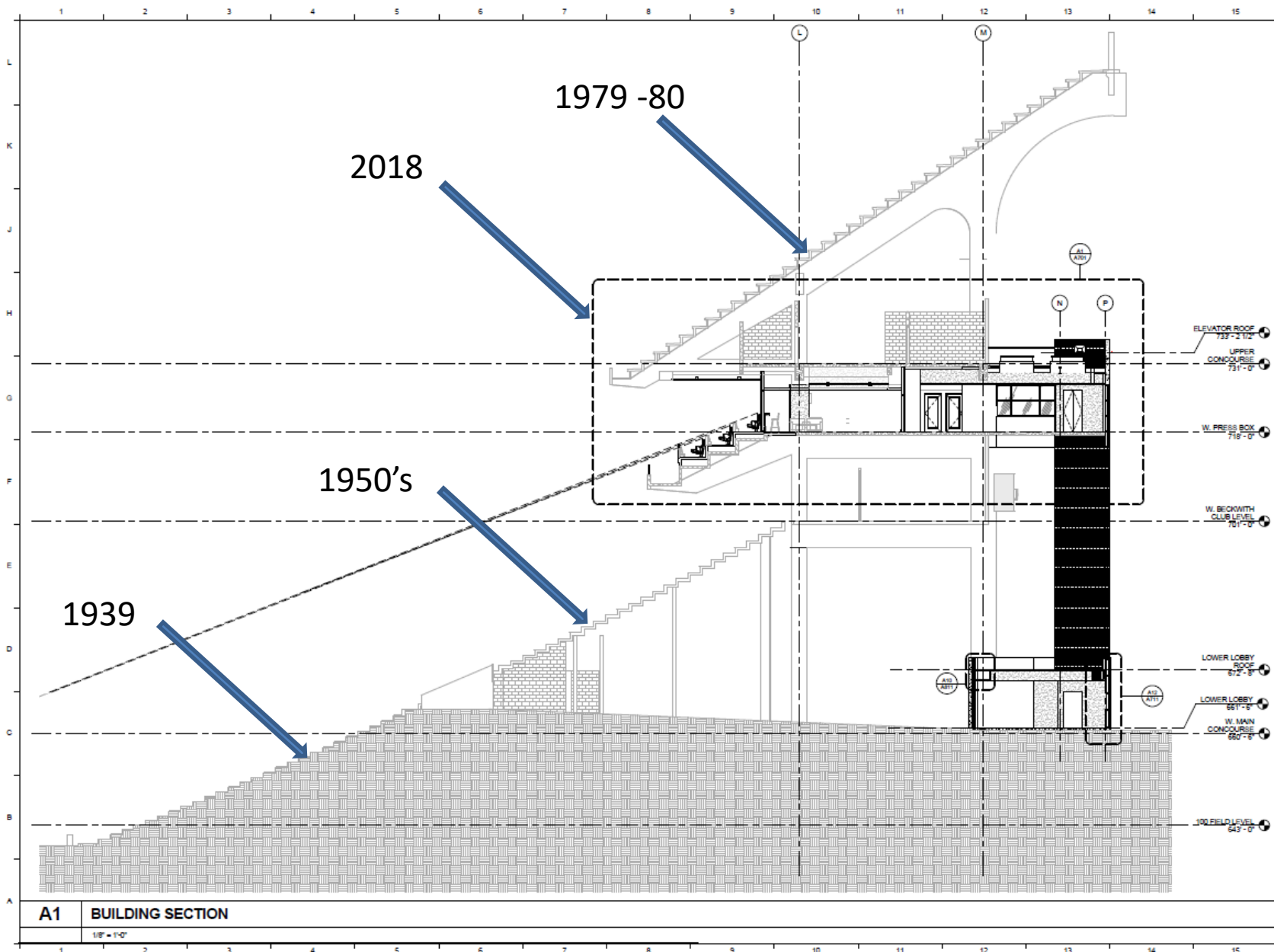
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AccessibilityDate of First Issue: 2017-11-10

Sheet Title
**PRESS LEVEL -
OVERALL PLAN**

Original drawing is 24 x 36. Do not scale contents of this sheet.

A103





A1 BUILDING SECTION
1/8" = 1'-0"

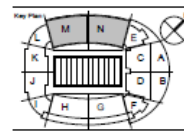


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Prepared For
Facilities Management
1161 West Sanford Avenue
Auburn University, AL 36849
Phone: (334) 844-9450
Fax: (334) 844-9458
Contract No: 16-500



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- Ed Roether Consulting, LLC**
Accessibility



Description	Date
DESIGN FOR CONSTRUCTION	2017-11-10

Date of Final Issue: 2017-11-10
Project No: 16-20016.06
Sheet Title
BUILDING SECTION - OVERALL

Original drawing is 1/8" = 1'-0". Do not make alterations to this drawing.
Sheet Number:

A700

The site plan illustrates the layout of the Concourse Level Lobby, which is a rectangular structure with a finished floor elevation (FFE) of 661.50. The plan includes several key features and annotations:

- ADA Ramp with Handrails:** A ramp is shown with a 4.71% slope, accompanied by handrails as per architectural plans. The ramp is flanked by concrete pavement (no ochre color required).
- Concrete Pavement:** Areas of concrete pavement are indicated, with a note specifying "CONCRETE PAVEMENT (NO OCHRE COLOR REQUIRED) (SEE DETAIL)".
- ADA Landing:** A landing area is shown with a 2.0% maximum slope, noted as "ADA LANDING 2.0% MAX SLOPE IN ANY DIRECTION".
- Concrete Turndown Edge:** The edge of the concrete pavement is detailed as a "CONCRETE TURNDOWN EDGE (SEE DETAIL)".
- Dimensions:** Various dimensions are provided, including a 17.77' length for a section and a 4.71' width for the ramp area.
- Orientation:** The plan is oriented with Heisman Drive to the left and a north arrow pointing towards the top right.
- Other Labels:** The plan includes labels for "CONCRETE PAVEMENT (NO OCHRE COLOR REQUIRED) (SEE DETAIL)" and "ADA LANDING 2.0% MAX SLOPE IN ANY DIRECTION".

044-02



TTL
geochemical & analytical & materials & environment

APPROXIMATE SCALE: 1" = 10'		TTL PROJECT NO.: 001010217044.00	
DRAWING PATH: H:\NA\W\Construction\Projects\2017\2017-102 One World\102-02\TOM A1.dwg User: Director\2017-102\TOM A1.dwg			
DATE CREATED: 11/10/2017	DATE REVISED: n/a	REVISION NUMBER: n/a	
DRAWN BY: mjc		CHECKED BY: SLA	
MODIFIED FROM DRAWING: Provided by client			

Boring Location Schematic

Auburn University - Facilities Division
Proposed West Elevator Tower Addition
Jordan Hare Stadium
Auburn, Lee County, Alabama



Auburn University - Facilities Division
Proposed West Elevator Tower Addition
Jordan Hare Stadium

Auburn, Lee County, Alabama

Log of Boring
044-01

Page 1 of 1

Drilling Co.: TTL, Inc.

TTL Project No.: 001010217044.00

Remarks:

Water encountered at an approximate elevation of 631 feet Above Mean Sea Level at time of drilling.

Driller: J. Hoskins

Date Drilled: 11/6/2017

Logged by: S. Abbett

Boring Depth: 32 feet

Equipment: CME 45

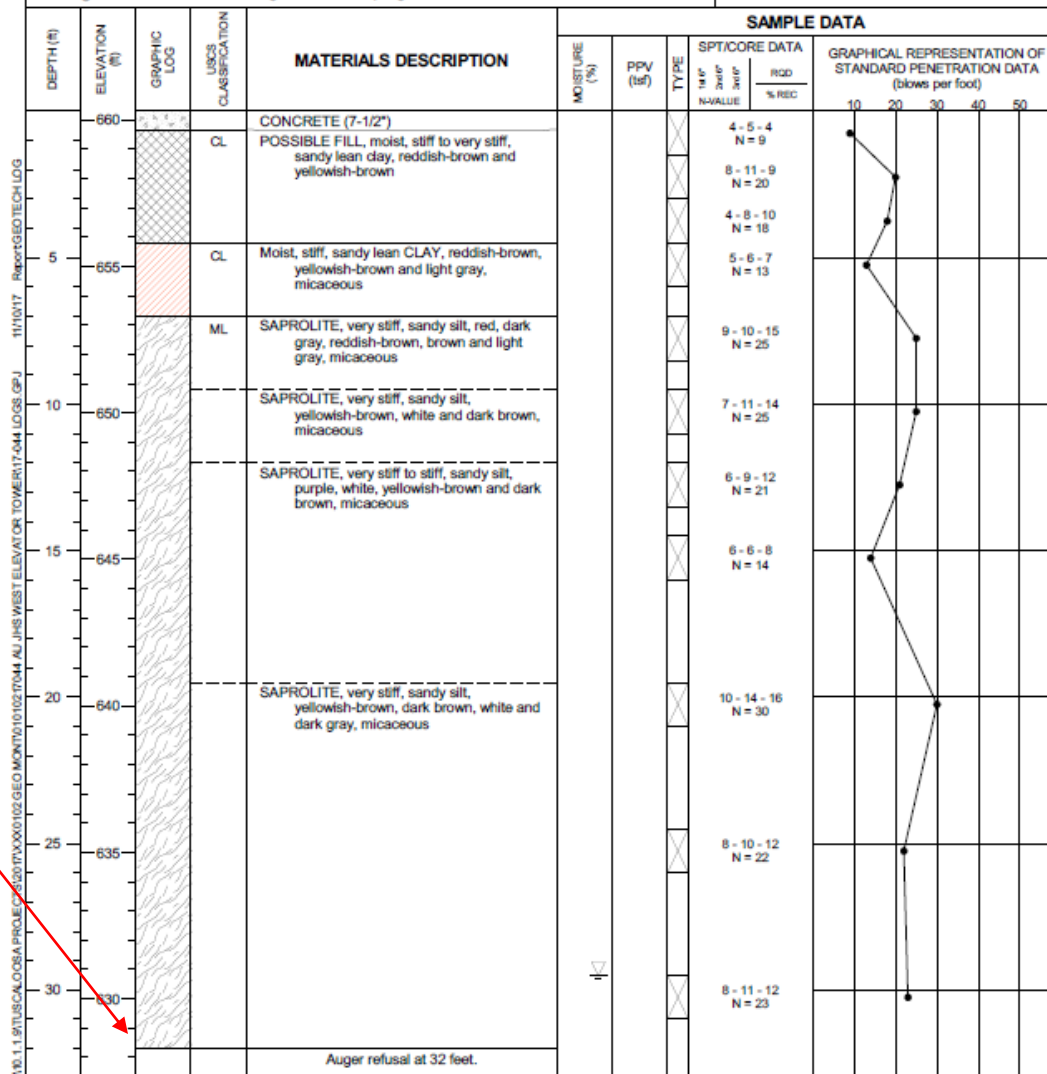
Boring Elevation: 660.3 feet

Hammer Type: Automatic

Coordinates: Not Available

Water level at time of boring.

Drilling Method: Hollow Stem Auger w/SPT Sampling



Rock @ 32 ft.



January 2018

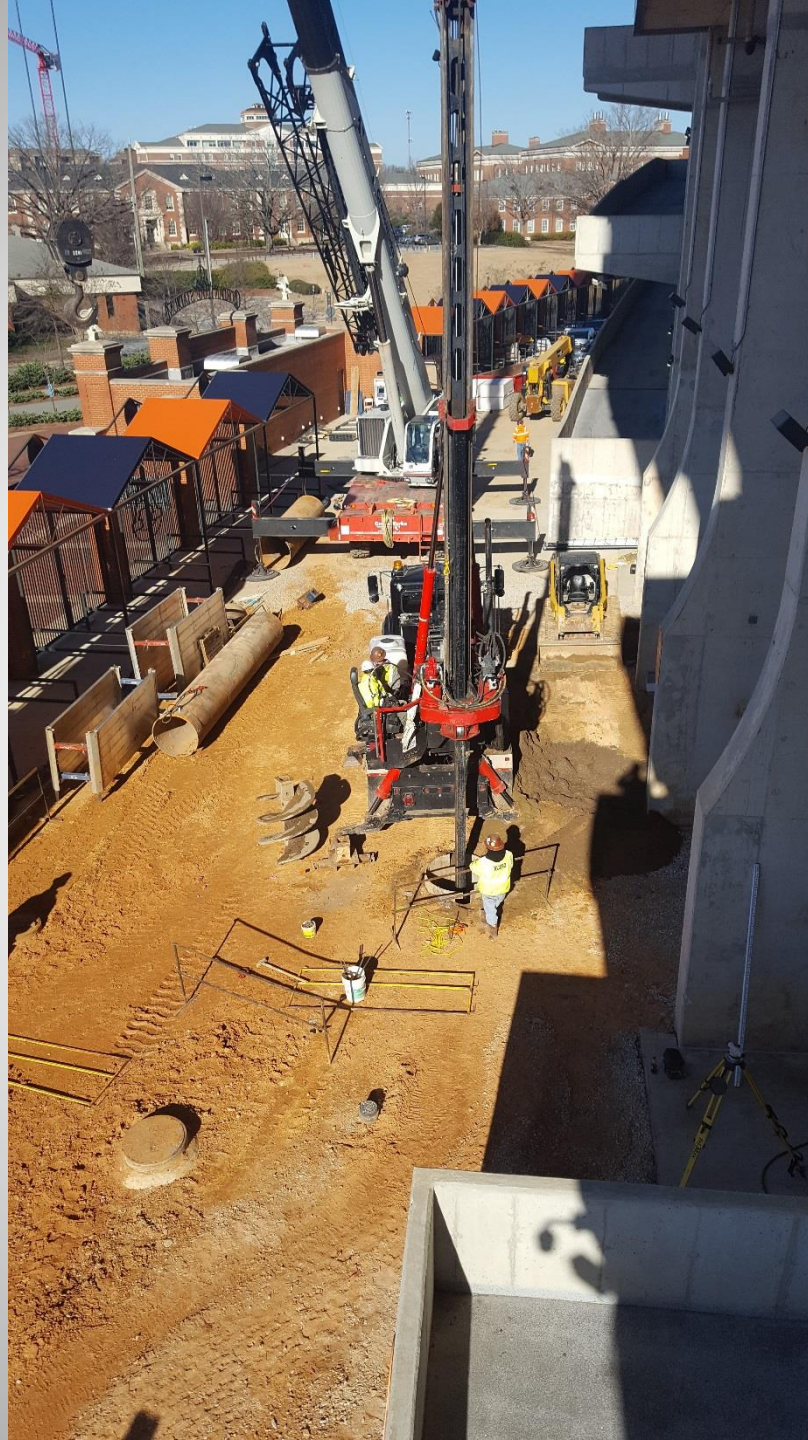
Looking North



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Drilled Shaft Construction

January 2018



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Drilled Shaft Construction



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Drilled Shaft Construction



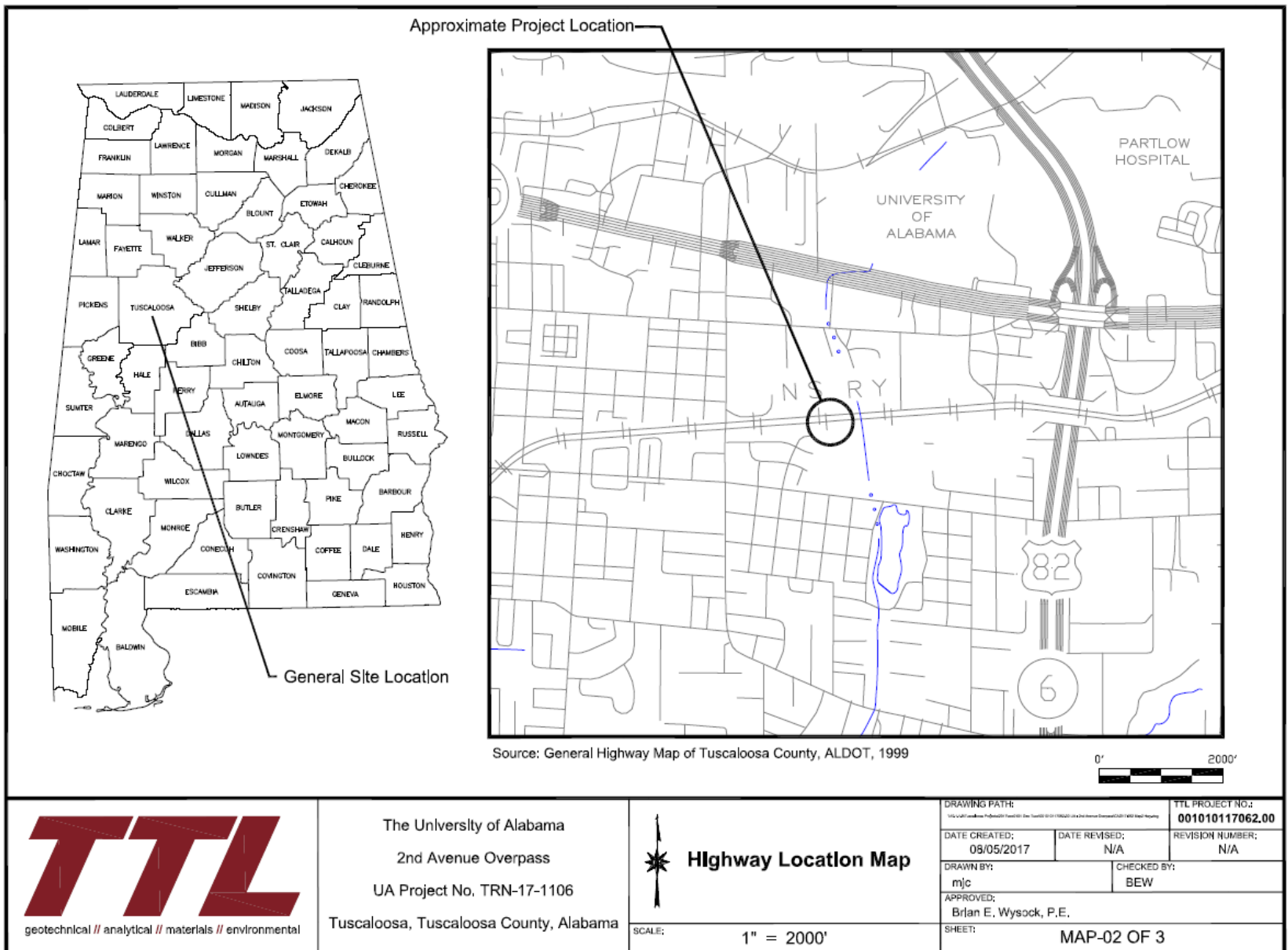
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WAR EAGLE



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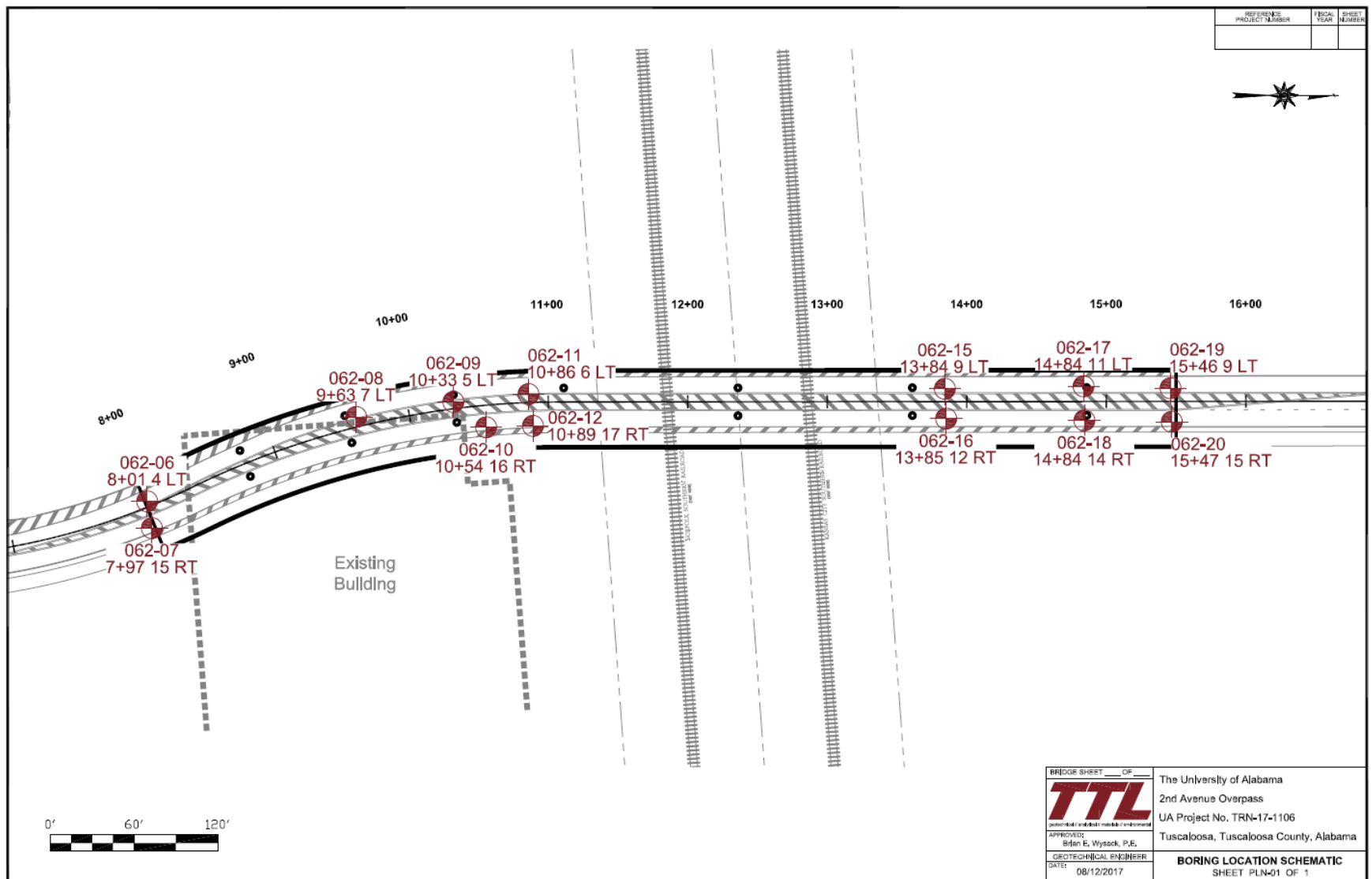
University of Alabama

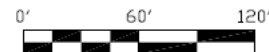
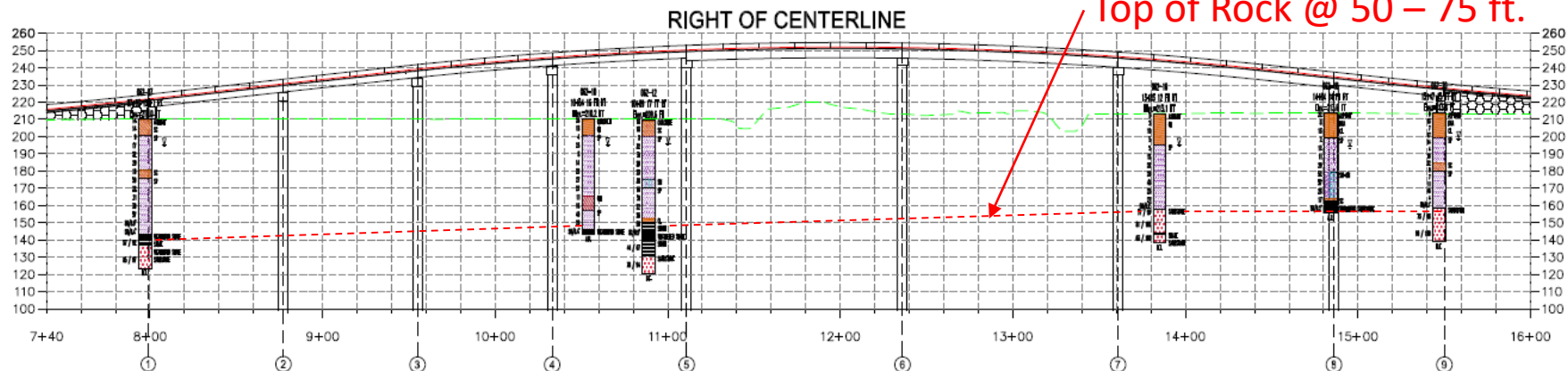
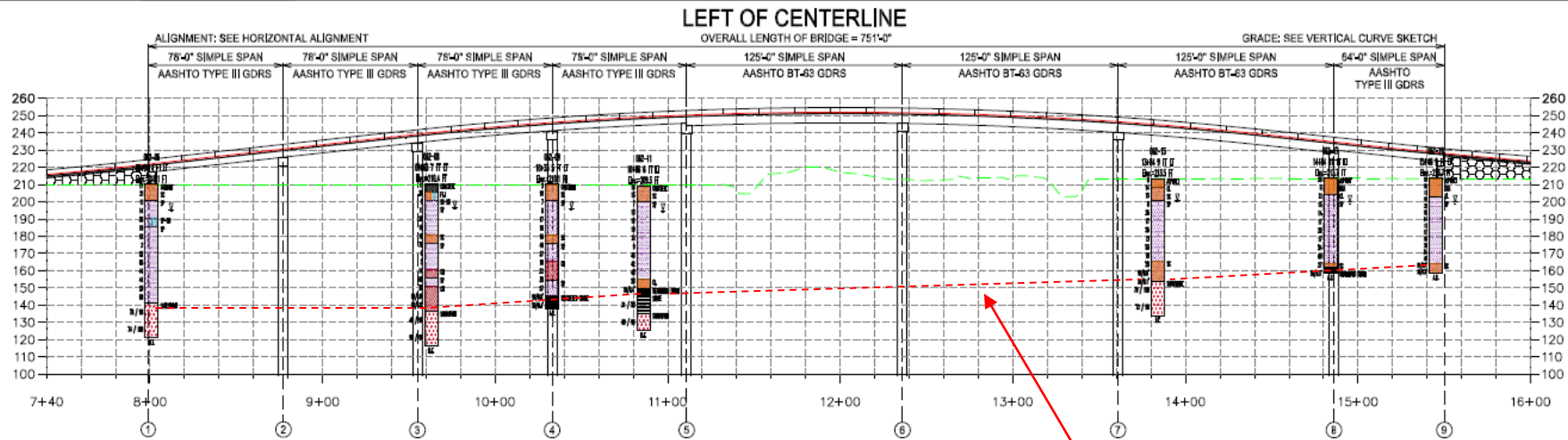




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Bridge Boring Locations

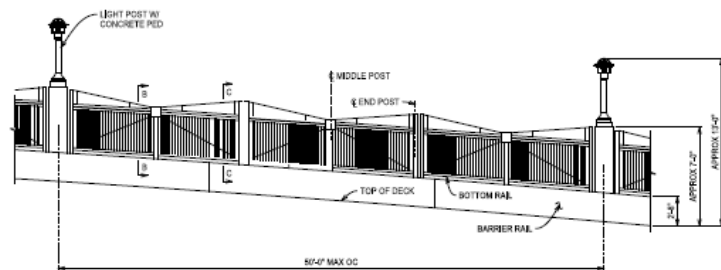
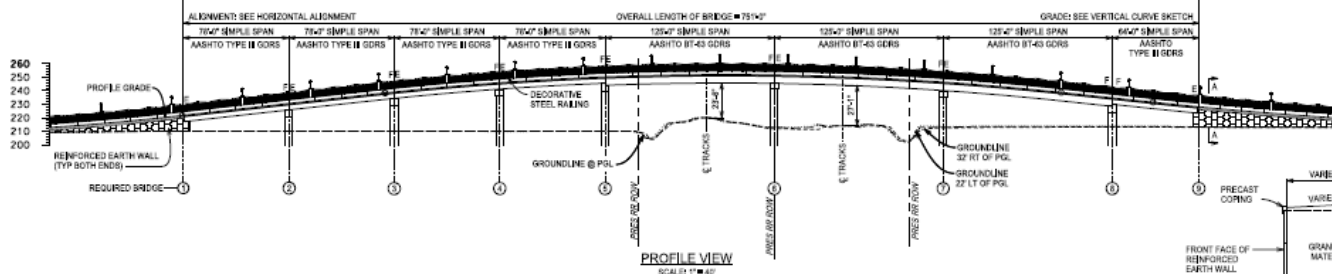
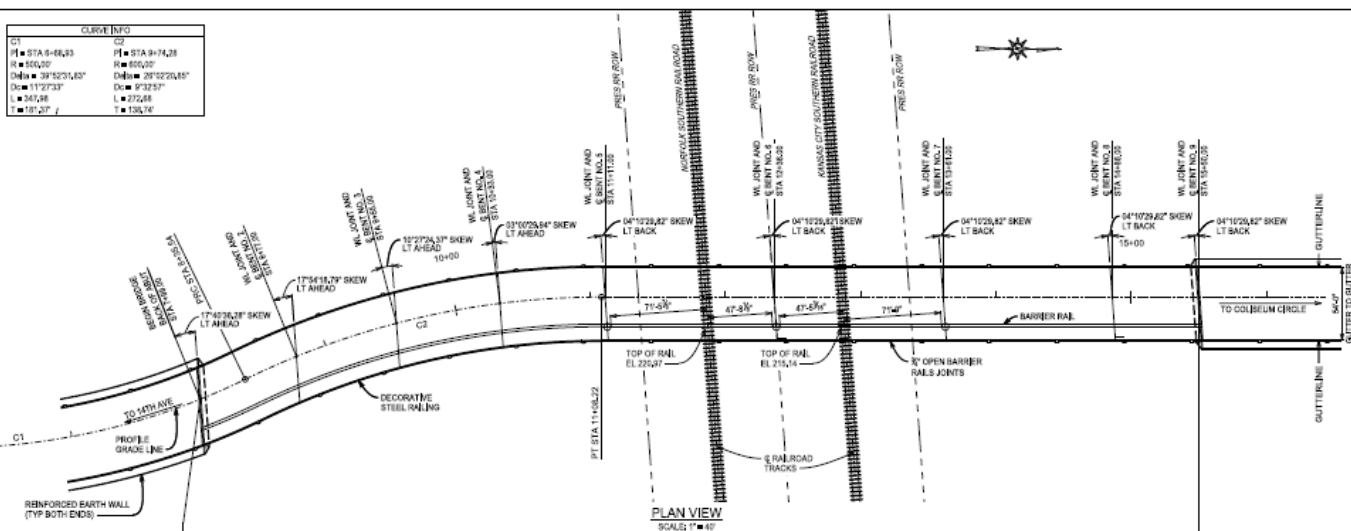




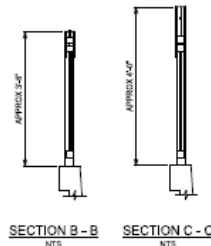
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AND MAY NEED TO BE MODIFIED FOR FINAL DESIGN PLANS

SUBSURFACE PROFILE			
TTL <small>THE TUSCALOOSA TRAIL</small>			
The University of Alabama 2nd Avenue Overpass UA Project No. TRN-17-1106 Tuscaloosa, Tuscaloosa County, Alabama			
DATE: 08/12/2017	CREATED BY: mjc	DESIGNED BY: BEW	
DATE REVIEWED: N/A	REVIEWED BY: N/A	REVISIONS: N/A	
TTL PROJECT #4: 001010117062.00	SCALE: 1" = 60'	SHEET: PRF-01 OF 1	
DESIGNED BY: Brian E. Wysock, P.E.		CHECKED BY: McGilfert and Associates, LLC	

CURVE INFO	
C1	C2
P1 = STA 6+66.83	P1 = STA 9+74.28
R = 500.00'	R = 600.00'
Delta = 39°52'31.63"	Delta = 28°52'20.85"
Dc = 11°27'33"	Dc = 9°32'57"
L = 347.68	L = 272.68
T = 181.57'	T = 138.74'

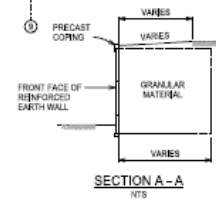


TYPICAL ELEVATION OF STEEL RAILING

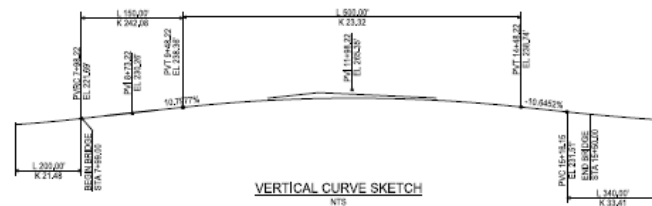


SECTION B - E
NTS

SECTION C - C
NTS



SECTION A - A
NTS



VERTICAL CURVE SKETCH
NTS

PRELIMINARY
NOT FOR CONSTRUCTION



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TUSCALOOSA, ALABAMA 35402-0559
WWW.HCI-UNIT.COM (205)756-1521 FAX (205)756-1522

REVISION		
DATE	DESCRIPTION	BY

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A THE UNIVERSITY OF ALABAMA
2nd AVENUE OVERPASS PROJECT

GENERAL PLAN AND ELEVATION

FILE NAME:	SCALE: 1/8"=1'-0"	DWG. No.	SHEET No.
DATE OF FIELD SURVEY: 12/21/16	FIELD BOOK:	DRAWN BY: C. R. T.	S1
JOHN R. T. & SONS	OWNER:	CLASSIFIED BY: C. R. T.	