MEMORANDUM

ROBERTSON COUNTY DEVELOPMENT OFFICE
527 SOUTH BROWN STREET, SPRINGFIELD, TN 37172
TEL. (615) 384-3666

TO: Planning Commission Members
FROM: Planning Staff
DATE: January 22, 2024

The Robertson County Planning Commission will hold its monthly meeting on **Thursday January 25, 2024, at 7:00 P. M.** on the 2nd Floor, Judicial Complex, Robertson County Office Building. Chief Deputy Planner, Hunter Mantooth, is available to answer questions at (615) 384-3666 or hmantooth@robcotn.org.

AGENDA

1. Roll Call

2. Comments from Citizens: Persons wishing to speak for or against any item must sign the log sheet prior to the meeting.

3. Announcements: Rezonings from this agenda will be heard at the next County Commission meeting on February 26, 2024.

4. Approval of Minutes: Approval of Minutes from December 28, 2023, meeting.

5. Old Business: None

6. New Business:

   A. **Ian and Jared Leftrick:** Rezoning Request for 2.50 acres of property located at 5225 Ezbon Holland Rd., Springfield. Tax Map 019, Parcel 090.00 from AG-2 to R-40 (8th Voting District). Represented by Applicant.

   B. **Jacob and Morgan (Baggett) Fann:** Rezone Request for 7.64 acres of property located at 3211 Will Head Rd., Cedar Hill. Tax Map 099, Parcel 094.04 from AG-2 to RP-80 (11th Voting District). Represented by Nettie Boyle, CSR Engineering.

   C. **Gina Zylstra, Executor:** Rezoning Request for 21.70 acres of property located on Burgess Gower Rd. Cedar Hill. Tax Map 099, Parcel 094.00 from AG-2 to RP-80 (11th Voting District). Represented by Nettie Boyle, CSR Engineering.

   D. **Johnnie S Marlin:** Rezone Request for 20.84 acres of the 32.20 acres of property located at 4160 Armstrong Rd., Springfield. Tax Map 082, Part of Parcel 005.00 from AG-2 to RP-80 (8th Voting District). Represented by Steve Artz, Steve Artz and Associates, Inc.

E. **Philip Palma:** Final Site Plan for Delta Demo Headquarters, located on Hwy 49 W., Springfield. Tax Map 100, Parcel 069.00 (11th Voting District). Represented by Kyle Schneider, Klober Engineering.

7. Reports from Staff: None

8. Adjourn

The Robertson County Planning Commission met on December 28, 2023 at 7:00 p.m. in the Judicial Complex, Second Floor, Robertson County Office Building, Springfield, Tennessee.

Roll Call:

MEMBERS PRESENT:	MEMBERS ABSENT:	OTHERS PRESENT:
Bill Jones	Keith Hoover	Hunter Mantooth
Daniel Borthick	Jeremy Stinson	Pam Groves
Charles "Gene" Federman	Allan Heard	
William B. Henry		
Cheryl Elliott		
Jeremiah Pierce		

Meeting was called to order by Chairman, Bill Jones at 7:33 pm and apologized for the late start due to BZA meeting and wants staff to see what can be done, so that won't happen again in the future.

Announcements: Chairman Bill Jones announced that the zoning from this agenda will be heard at the County Commission on January 22, 2024. Any citizens wishing to speak for or against any items on the agenda will need to sign in on the sheet provided.

Motion to approve Minutes from previous meeting of November 16, 2023, was made by Daniel Borthick with a second by William B Henry.
Motion passed unanimously 6-0.

1. Old Business: None

2. New Business:

   A. **John Hallmark:** Rezoning Request for 1.87 acres of the 6.53 acres of property located at 3943 Fykes Grove Rd., Cedar Hill. Tax Map 056, Part of Parcel 133.00 from AG-2 to RP-80 (7th Voting District). Represented by Steven Artz, Steve Artz & Associates, Inc.
   Motion to recommend was made by Daniel Borthick with a second from Gene Federman.
   Motion passed 5-1 (Jeremiah Pierce voted no)

   B. **David Sircy:** Rezone Request for 6.13 acres of property located at 2518 Union Rd., White House. Tax Map 117, Parcels 177.00 and 191.00 from AG-2 to RP-80 (2nd Voting District). Represented by Steve Artz, Steven Artz & Associates, Inc.
   Motion to recommend was made by Daniel Borthick with a second from William B. Henry.
   Motion passed 3-1 (Jeremiah Pierce voted no) (Bill Jones and Chery Elliot abstained)

   C. **Brittney Graves:** Rezoning Request for 5.16 acres of property located at 2030 Friendship Rd., Cross Plains. Tax Map 049, Parcel 098.00 from AG-2 to R-40 (1st Voting District). Represented by Steve Artz, Steven Artz & Associates, Inc.
   Motion to recommend was made by William B Henry with a second by Gene Federman.
   Motion passed 5-1 (Jeremiah Pierce voted no)

D. **Mark and Pam Stone:** Rezone Request for 3.32 acres of property located at 4458 Hwy 49W, Springfield. Tax Map 101 Parcel 019.00 from AG-2 to R-40 (11th Voting District). Represented by Applicant.
Motion to recommend was made by Gene Federman with a second from Cheryl Elliott.
Motion passed unanimously 6-0.

E. **William Miller and Joseph Miller:** Final Plat for Stillwater Estates, located at Airport Rd. & Kinneys School Rd., Springfield. Tax Map 068 Part of Parcel 140.00 (11th Voting District). Represented by Steve Artz, Steven Artz & Associates, Inc.
Motion to approve was made by Daniel Borthick with a second from Gene Federman.
Motion passed unanimously 6-0.

A. **Reports from Staff:** Hunter Mantooth presented lot width comparisons just for the board members to be aware of the differences in surrounding counties.

A motion to adjourn was made by Daniel Borthick with a second by Cheryl Elliott.
Motion passed unanimously 6-0 and the meeting was adjourned.

Respectfully submitted,

Charles E. Federman

Gene Federman, Secretary

New Business: A

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:

Name: Ian & Jared Leftrick
Mailing Address (No P.O. Boxes, please): 5225 Ezbon Holland Rd Springfield, TN 37172
Email: ian.leftrick@davita.com
Telephone Number: 6154194856

Applicant's Representative Information:

Name:
Name of Firm:
Mailing Address (No P.O. Boxes, please):
Email:
Telephone Number:

Property Information:

Address: 5225 Ezbon Holland Rd Springfield, TN 37172
Tax Map and Parcel Number: 019 090.00
Current Zoning Designation: AG 2
Requested Zoning Designation: R40/R40

Will this property be subdivided (or combined) in some way within the next year? **Yes** No

Purpose of rezoning request:
To deed 1 acre to family member

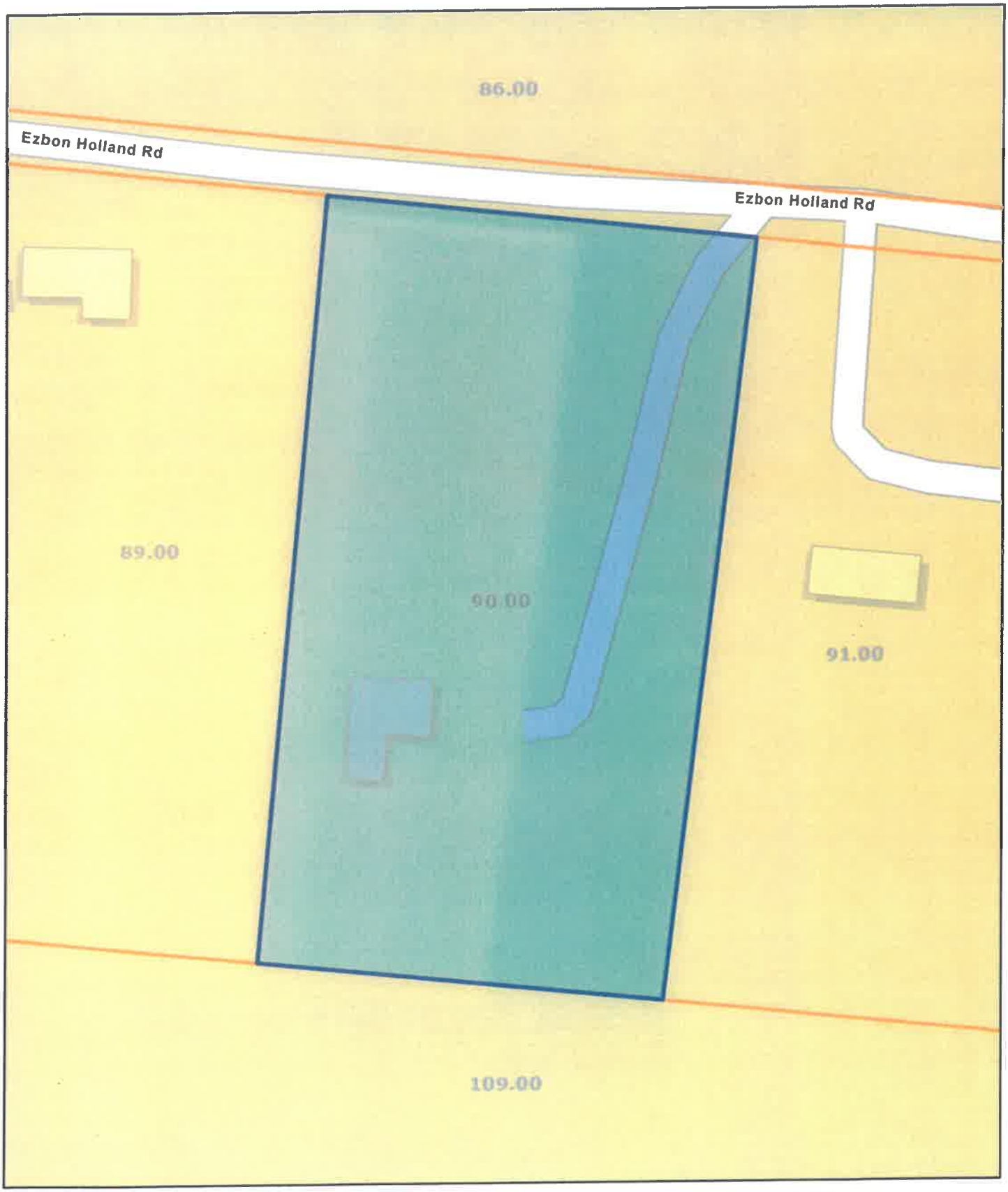
SUBMITTAL REVIEW PROCEDURE:

1. Deliver one (1) copies of this application & any supporting materials to the Development Office before or by the final due date (Please see attached schedule- the "Corrections Due" does not apply to this type of application)
2. Provide copy of deed to prove ownership.
3. Provide aerial photograph of the property from TN Property Viewer
4. Pay the review fee.
5. Email a .PDF of the application & supporting materials (items 1-3) to hmantooth@robcotn.org
6. Attend the Planning Commission meeting. Be ready to present and answer questions. Failure to appear at the Planning Commission meeting may result in the denial of the application.

Ian Leftrick 12/15/23
Owner of Record Signature & DATE

Ian Leftrick 12/15/2023
Jared T. Leftrick 12/15/2023
Applicant's Signature & DATE

Robertson County - Parcel: 019 090.00



Date: January 4, 2024

County: Robertson
Owner: BRIAR- GRAYSON LEFTRICK IAN
Address: EZBON HOLLAND RD 5225
Parcel Number: 019 090.00
Deeded Acreage: 2.5
Calculated Acreage: 0

1:1,128

0 0.01 0.01 0.03 mi

0 0.01 0.02 0.04 km

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The property lines are compiled from information maintained by your local

Robertson County - Parcel: 019 090.00



Date: January 4, 2024

County: Robertson
Owner: BRIAR- GRAYSON LEFTRICK IAN
Address: EZBON HOLLAND RD 5225
Parcel Number: 019 090.00
Deeded Acreage: 2.5
Calculated Acreage: 0
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

1:1,128

0 0.01 0.01 0.03 mi

0 0.01 0.02 0.04 km

Esri Community Maps Contributors, Tennessee STS GIS, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, State of Tennessee, Comptroller of the Treasury

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Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
January 25, 2024

Applicant: Ian and Jared Leftrick

Request: Rezone ***2.50 acres***
Tax Map 019, Parcel 090.00
from AG-2 to R-40



Figure 1: TN Property Viewer: Tax Map 019, Parcel 090.00
In its entirety is highlighted

Property Information:

- Tax Map 019, Parcel 090.00
- 5225 Ezbon Holland Rd., Springfield
- Total lot acreage: 2.50 acres (108,900 sq. ft.)
- **Rezone Request: 2.50 acres (108,900 sq. ft.)**

Project Narrative:
R-40 Minimum Requirements
Minimum Lot Size: 40,000 sq. ft.
Front: 50'
Side: 20'
Rear: 30'
Min. Lot Width @ Front Bldg. Setback Line: 150'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 40%.

Discussion & Observations:
The applicant wishes to rezone 2.50 *acres*. Requesting R-40 due to lot width requirements per the zoning regulations. The subject property has a mixture of AG-2 zones in the immediate vicinity with varying lot sizes. Several of the surrounding lots are nonconforming that would be considered RP-80 and R-40 by today's zoning regulations.

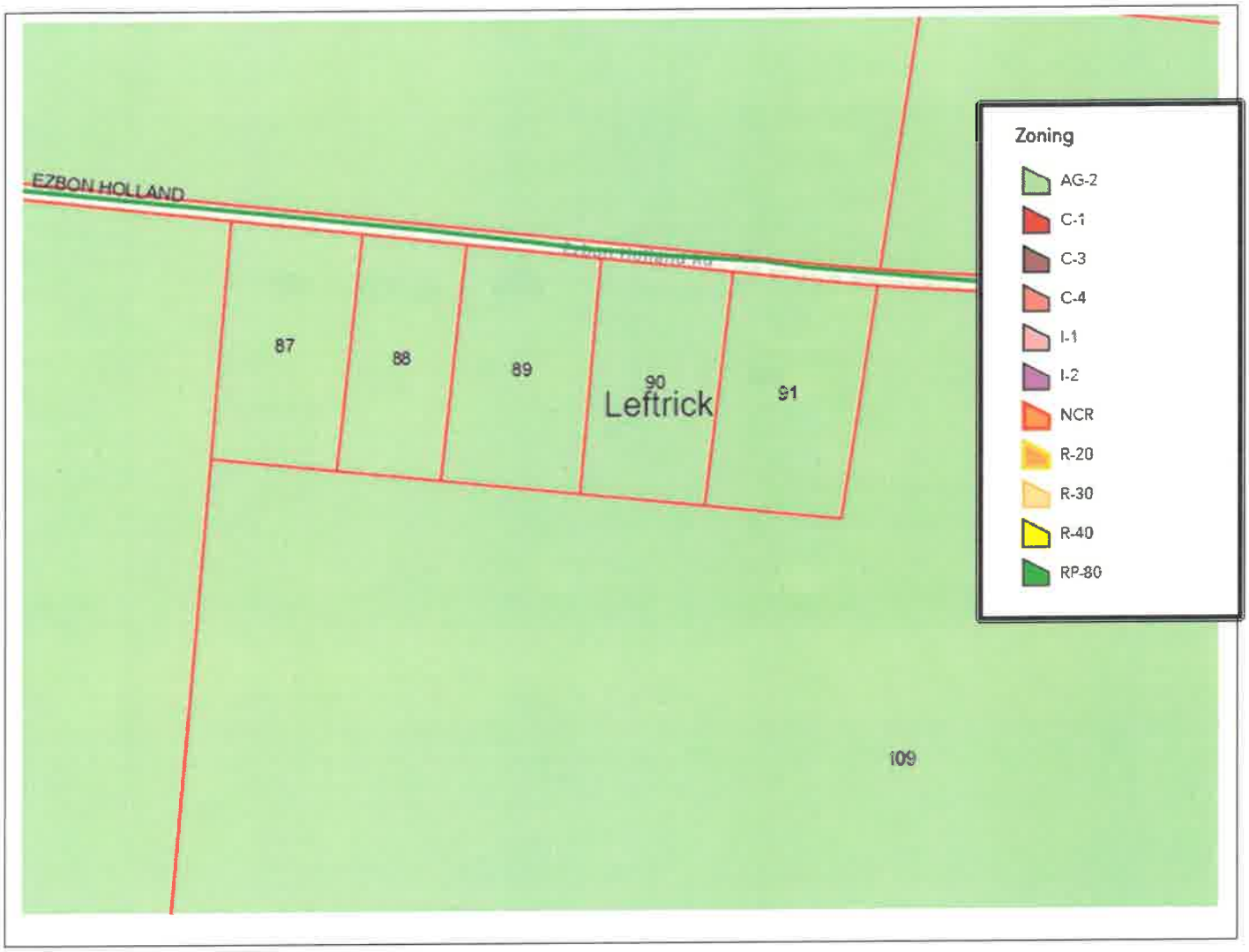
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone R-40 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



New Business: B

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:
Name: JACOB & MORGAN FANN (AKA MORGAN BAGETT)
Mailing Address (No P.O. Boxes, please): 3211 WILL HEAD ROAD CEDAR HILL, TN 37032
Email: JRFLLCTN@GMAIL.COM
Telephone Number: (615) 380-7576

Applicant's Representative Information:
Name: NETTIE BOYLE, P.E.
Name of Firm: CSR ENGINEERING
Mailing Address (No P.O. Boxes, please): 118 N. GREENWOOD ST. LEBANON, TN 37087
Email: NETTIE.BOYLE@CSRENGINEERS.COM
Telephone Number: (615)619-9877

Property Information:
Address: 3211 WILL HEAD ROAD CEDAR HILL, TN 37032
Tax Map and Parcel Number: MAP 99, PARCEL 94.04
Current Zoning Designation: AG-2 AGRICULTURAL / RESIDENTIAL DISTRICT
Requested Zoning Designation: RP-80 RURAL PRESERVATION DISTRICT

Will this property be subdivided (or combined) in some way within the next year? (Yes) No

Purpose of rezoning request:
FOR THE PROPOSED DEVELOPMENT OF LOW DENSITY SINGLE FAMILY RESIDENTIAL LOTS

SUBMITTAL REVIEW PROCEDURE:

1. Deliver one (1) copies of this application & any supporting materials to the Development Office before or by the final due date (Please see attached schedule- the "Corrections Due" does not apply to this type of application)
2. Provide copy of deed to prove ownership
3. Provide aerial photograph of the property from TN Property Viewer
4. Pay the review fee.
5. Email a .PDF of the application & supporting materials (items 1-3) to hmautooth@robcotn.org
6. Attend the Planning Commission meeting. Be ready to present and answer questions Failure to appear at the Planning Commission meeting may result in the denial of the application.

Jacob Fann Morgan Fann
Owner of Record Signature & DATE 11-21-23

Applicant's Signature & DATE

Robertson County - Parcel: 099 094.04



Date: October 30, 2023

County: Robertson
Owner: FANN JACOB ETAL
Address: WILL HEAD RD 3211
Parcel Number: 099 094.04
Deeded Acreage: 7.64
Calculated Acreage: 0
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

1:4,514

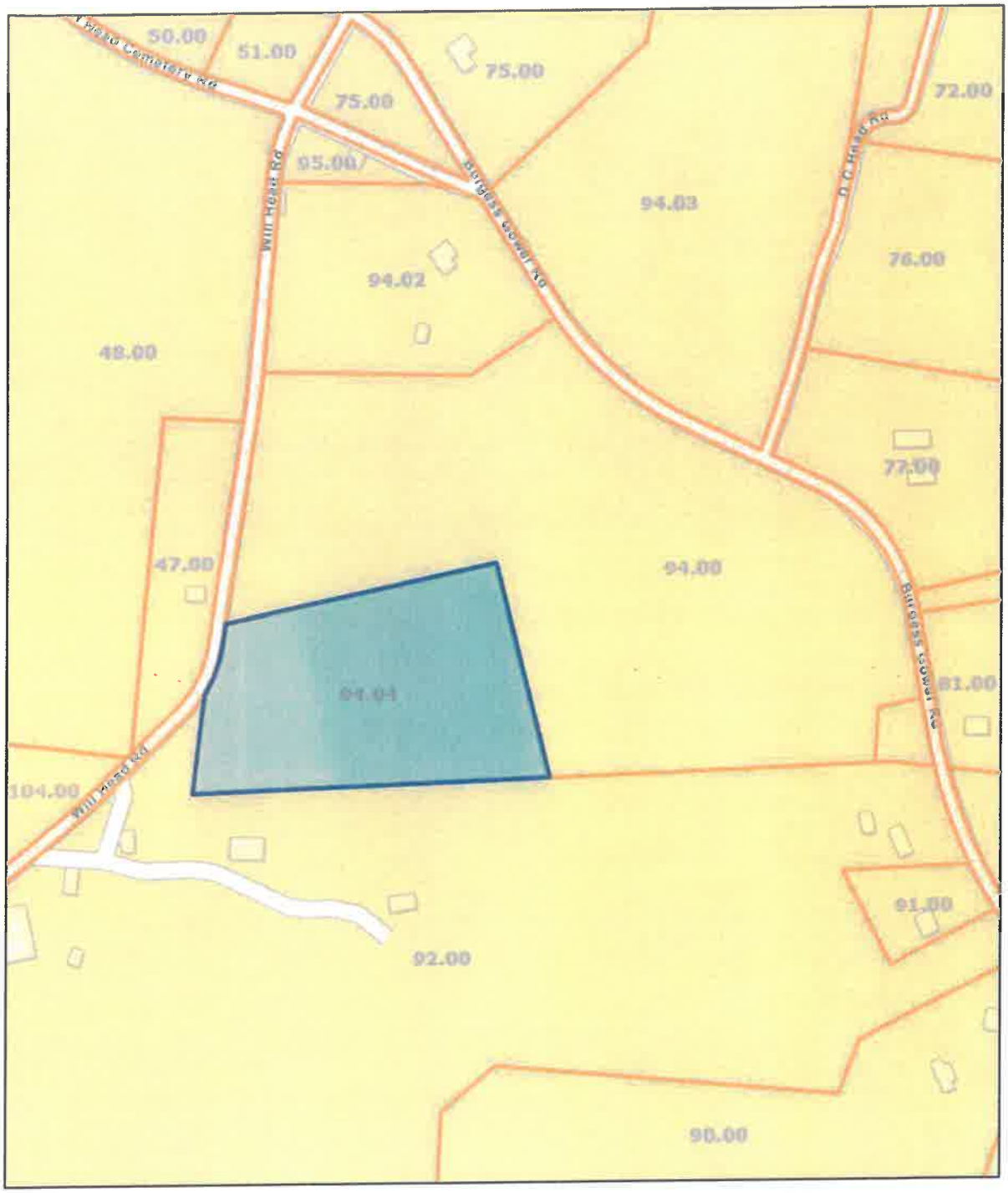
0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

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The property lines are compiled from information maintained by your local county Assessor's office but are not conclusive evidence of property ownership in any court of law.

Robertson County - Parcel: 099 094.04



Date: October 30, 2023

County: Robertson
Owner: FANN JACOB ETAL
Address: WILL HEAD RD 3211
Parcel Number: 099 094.04
Deeded Acreage: 7.64
Calculated Acreage: 0
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

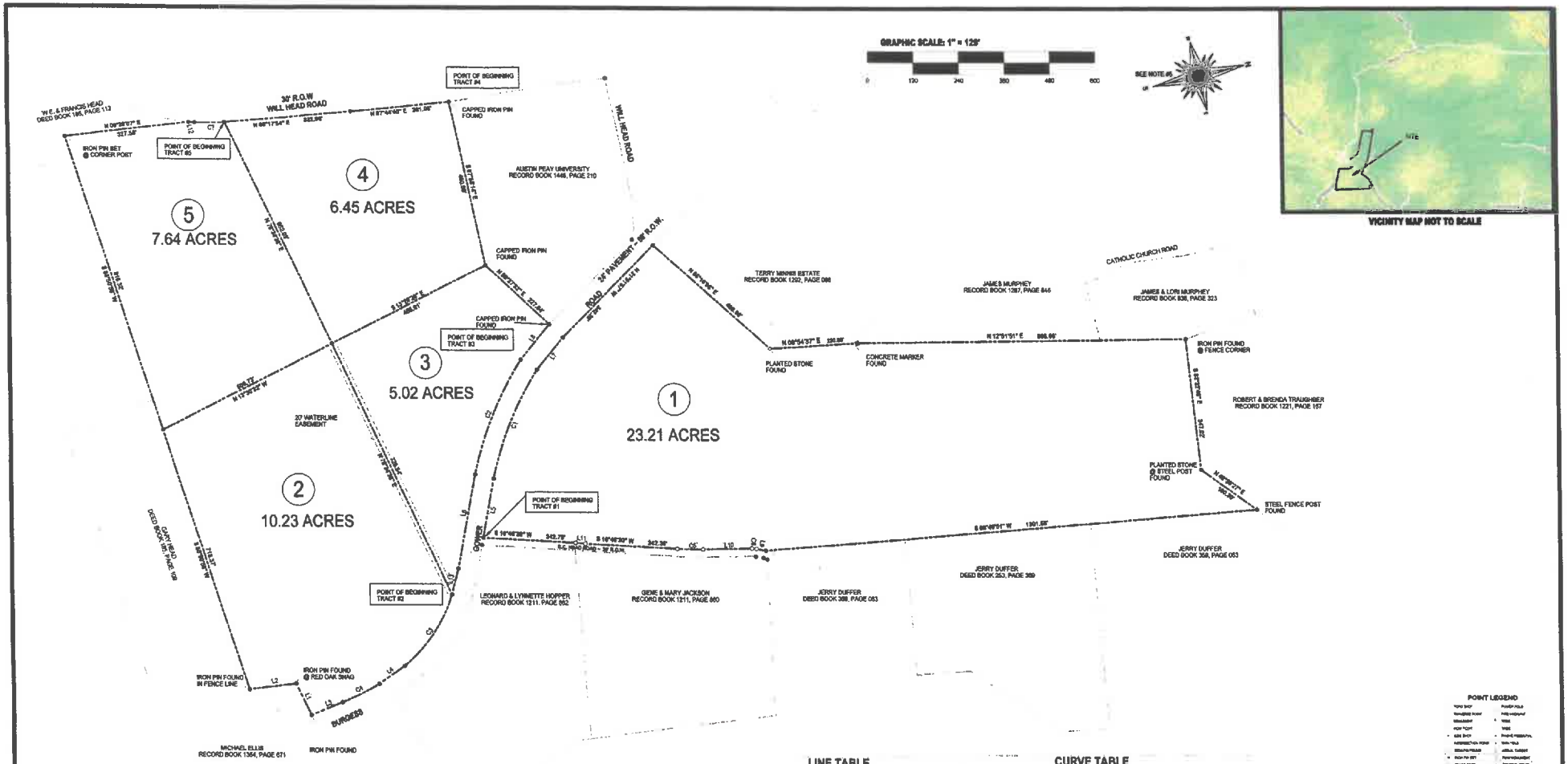
1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

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LINE TABLE

Id	Bearing	Distance
L1	S 78°35'43" W	90.90'
L2	S 06°33'11" W	123.47'
L3	S 08°11'42" E	88.34'
L4	S 21°33'32" E	83.06'
L5	N 85°52'28" W	158.65'
L6	S 65°52'28" E	252.38'
L7	N 37°15'56" W	109.41'
L8	S 37°19'24" E	119.96'
L9	S 24°10'53" W	24.94'
L10	S 12°33'07" W	128.75'
L11	S 18°19'37" W	26.19'
L12	N 17°17'34" E	15.44'
L13	S 61°36'25" E	70.25'

CURVE TABLE

Id	Delta	Radius	Arc Length	Chord	Ch Bear
C1	20°19'16"	878.88'	311.72'	310.08'	N 54°06'15" W
C2	20°19'16"	928.88'	329.45'	327.73'	S 54°06'15" E
C3	32°57'42"	401.47'	230.97'	227.79'	S 42°44'46" E
C4	07°25'42"	844.43'	109.48'	109.40'	S 12°57'16" E
C5	04°14'35"	921.01'	68.20'	68.19'	S 14°39'03" W
C6	03°24'12"	203.03'	12.06'	12.06'	S 16°20'16" W
C7	05°14'31"	857.84'	78.48'	78.45'	N 12°47'01" E

POINT LEGEND

NOTES:

1. SOURCE OF TITLE: RECORD BOOK 1449, PAGE 035.
2. THE METHOD OF SURVEY WAS BY RANDOMED CLOSED TRAVERSE WITH AN UNADJUSTED FIELD TRAVERSE ERROR OF CLOSURE OF 1 IN 10000 .
3. THIS SURVEY IS SUBJECT TO ANY AND ALL FACTS THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.
4. THIS PLAT OF SURVEY IS NOT INTENDED IN ANY WAY WHATSOEVER TO INDICATE THE NON-EXISTENCE OF ANY EASEMENTS.
5. ALL BEARINGS ARE BASED ON GEODETIC NORTH. OBSERVATION DATE:03-01-2012 .
6. ALL SET IRON PINS ARE 5/8" REBAR WITH PLASTIC CAP STAMPED K. CROWE KY3875/TN1979.
7. ANY EASEMENTS, CONDITIONS, OR RESTRICTIONS, WRITTEN OR UNWRITTEN THAT PREVIOUSLEY APPLIES TO THIS PROPERTY SHALL REMAIN IN EFFECT AND APPLY TO THIS PLAT AS WELL.
8. TOTAL AREA 52.56 ACRES.

KEVIN DAVID CROWE — LICENSED LAND SURVEYOR — TENNESSEE NO. 1979

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS IS A CATEGORY 1 SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS 1:10000 AS SHOWN HEREON.

KEVIN DAVID CROWE, RLS
TENN. REG. NO. #1979

BOUNDARY SURVEY AND SUBDIVISION OF THE WKU REAL ESTATE CORP. PROPERTY

PREPARED BY:

CROWE-WHEELER AND ASSOCIATES
539 PARK STREET, SUITE D1
BOWLING GREEN, KY. 42101
270-393-3999

DRAWN BY: KDC	SCALE: 1" = 120'
SURVEY DATE:03-01-2012	FILE:12-016.PCS
PLAT DATE:04-20-12	

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
January 25, 2024

Applicant: Jacob and Morgan (Baggett) Fann
Surveyor: Nettie Boyle, CSR Engineering

Request: Rezone **7.64 *acres*** of Tax Map 099, Parcel 094.04 from AG-2 to RP-80



Figure 1: TN Property Viewer: Tax Map 099, Parcel 094.04 In its entirety is highlighted.

Property Information:

- Tax Map 099, Parcel 094.04
- 3211 Will Head Rd., Cedar Hill
- Total lot acreage: 7.64 acres (332,798 sq. ft.)
- **Rezone Request: 7.64 acres. (332,798 sq. ft.)**

Project Narrative:

RP-80 Minimum Requirements
Minimum Lot Size: 80,000 sq. ft.
Front: 60'
Side: 25'
Rear: 25'
Min. Lot Width @ Front Bldg. Setback Line: 175'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 30%.

Discussion & Observations:

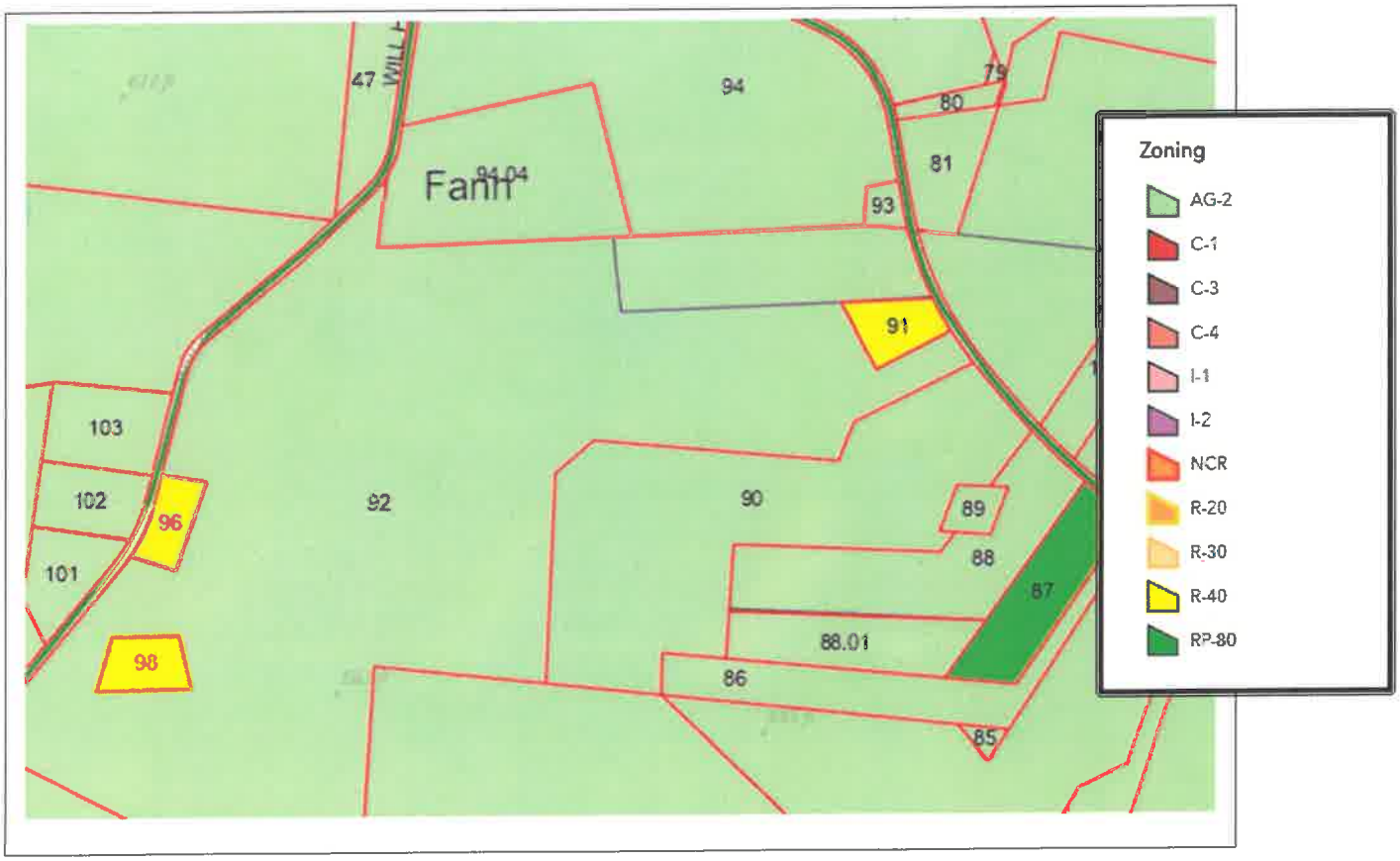
The applicant wishes to rezone 7.64 acres. The subject property has a mixture of AG-2, RP-80, and R-40 property in the immediate vicinity with varying lot sizes. Several of the surrounding lots are nonconforming and would be considered RP-80 by today's zoning regulations.
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone RP-80 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



New Business: C

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:
Name: BRENDA HAYNES
Mailing Address (No P.O. Boxes, please): 6245 COX RD ARRINGTON, TN 37014
Email: JRFLLCTN@GMAIL.COM
Telephone Number: (615) 380-7576

Applicant's Representative Information:
Name: NETTIE BOYLE, P.E.
Name of Firm: CSR ENGINEERING
Mailing Address (No P.O. Boxes, please): 118 N. GREENWOOD ST. LEBANON, TN 37087
Email: NETTIE.BOYLE@CSRENGINEERS.COM
Telephone Number: (615)619-9877

Property Information:
Address: BURGESS GOWER RD. CEDAR HILL, TN 37032
Tax Map and Parcel Number: MAP 99, PARCEL 94.00
Current Zoning Designation: AG-2 AGRICULTURAL / RESIDENTIAL DISTRICT
Requested Zoning Designation: RP-80 RURAL PRESERVATION DISTRICT

Will this property be subdivided (or combined) in some way within the next year? (Yes) No

Purpose of rezoning request:
FOR THE PROPOSED DEVELOPMENT OF LOW DENSITY SINGLE FAMILY RESIDENTIAL LOTS

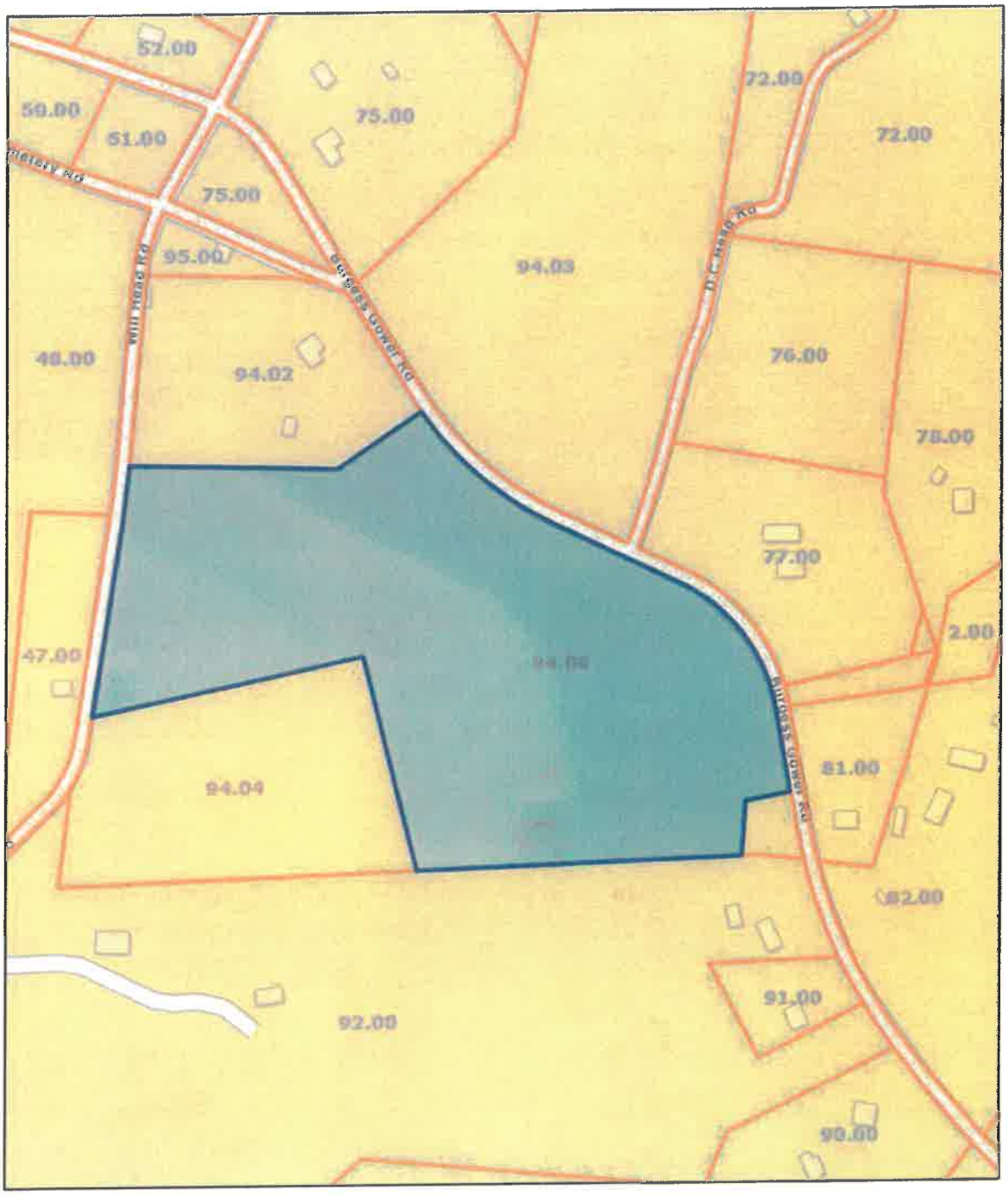
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6. Attend the Planning Commission meeting. Be ready to present and answer questions. **Failure to appear at the Planning Commission meeting may result in the denial of the application.**

Owner of Record Signature & DATE
Estate of Brenda Haynes

Applicant's Signature & DATE

Robertson County - Parcel: 099 094.00



Date: October 30, 2023

County: Robertson
Owner: HAYNES BRENDA
Address: BURGESS GOWER RD
Parcel Number: 099 094.00
Deeded Acreage: 0
Calculated Acreage: 21.7
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

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Robertson County - Parcel: 099 094.00



Date: October 30, 2023

County: Robertson
Owner: HAYNES BRENDA
Address: BURGESS GOWER RD
Parcel Number: 099 094.00
Deeded Acreage: 0
Calculated Acreage: 21.7
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

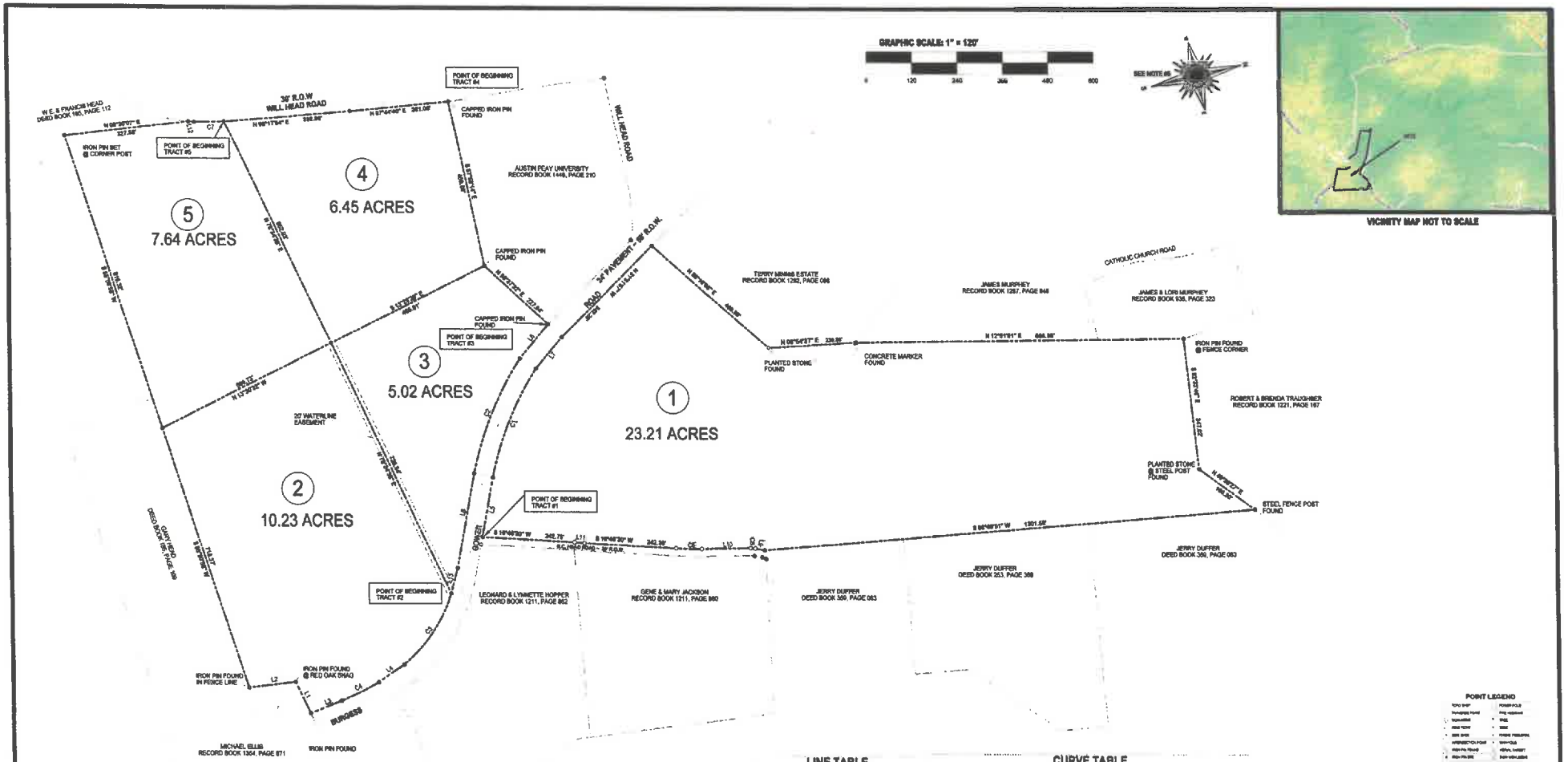
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0 0.03 0.06 0.12 mi

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POINT LEGEND

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C7	05°14'31"	857.84'	78.48'	78.45'	N 12°47'01" E

NOTES:

1. SOURCE OF TITLE: RECORD BOOK 1448, PAGE 035.
2. THE METHOD OF SURVEY WAS BY RANDOMED CLOSED TRAVERSE WITH AN UNADJUSTED FIELD TRAVERSE ERROR OF CLOSURE OF 1 IN 10000 .
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4. THIS PLAT OF SURVEY IS NOT INTENDED IN ANY WAY WHATSOEVER TO INDICATE THE NON-EXISTENCE OF ANY EASEMENTS.
5. ALL BEARINGS ARE BASED ON GEODETIC NORTH, OBSERVATION DATE:03-01-2012 .
6. ALL SET IRON PINS ARE 5/8" REBAR WITH PLASTIC CAP STAMPED K. CROWE KY3875/TN1979.
7. ANY EASEMENTS, CONDITIONS, OR RESTRICTIONS, WRITTEN OR UNWRITTEN THAT PREVIOUSLY AFFLICTS TO THIS PROPERTY SHALL REMAIN IN EFFECT AND APPLY TO THIS PLAT AS WELL.
8. TOTAL AREA 32.56 ACRES.

KEVIN DAVID CROWE — LICENSED LAND SURVEYOR — TENNESSEE NO. 1979

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS IS A CATEGORY 1 SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS 1:10000 AS SHOWN HEREON.

KEVIN DAVID CROWE, RLS

TENN. REG. NO. 01979

BOUNDARY SURVEY AND SUBDIVISION OF THE WKU REAL ESTATE CORP. PROPERTY.

AS RECORDED IN [illegible] WARREN COUNTY, KENTUCKY, LYING SOUTH OF THE CITY OF BOWLING GREEN, KENTUCKY AND NORTH OF [illegible] BOWLING GREEN, TENNESSEE

PREPARED BY:

CROWE-WHEELER AND ASSOCIATES
909 PARK STREET, SUITE 01
BOWLING GREEN, KY. 42101
270-282-0888

DRAWN BY: KDC	SCALE: 1" = 120'
SURVEY DATE:03-01-2012	FILE:12-016.PCS
PLAT DATE:04-20-12	

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
January 25, 2024

Applicant: Gina Zylstra, Executor (Brenda Haynes Estate)
Surveyor: Nettie Boyle, CSR Engineering

Request: Rezone **21.70 *acres*** of Tax Map 099, Parcel 094.00 from AG-2 to RP-80



Figure 1: TN Property Viewer: Tax Map 099, Parcel 094.04 In its entirety is highlighted.

Property Information:

- Tax Map 099, Parcel 094.00
- Burgess Gower Rd., Cedar Hill
- Total lot acreage: 21.70 acres (945,252 sq. ft.)
- **Rezone Request: 21.70 acres. (945,252 sq. ft.)**

Project Narrative:
RP-80 Minimum Requirements
Minimum Lot Size: 80,000 sq. ft.
Front: 60'
Side: 25'
Rear: 25'
Min. Lot Width @ Front Bldg. Setback Line: 175'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 30%.

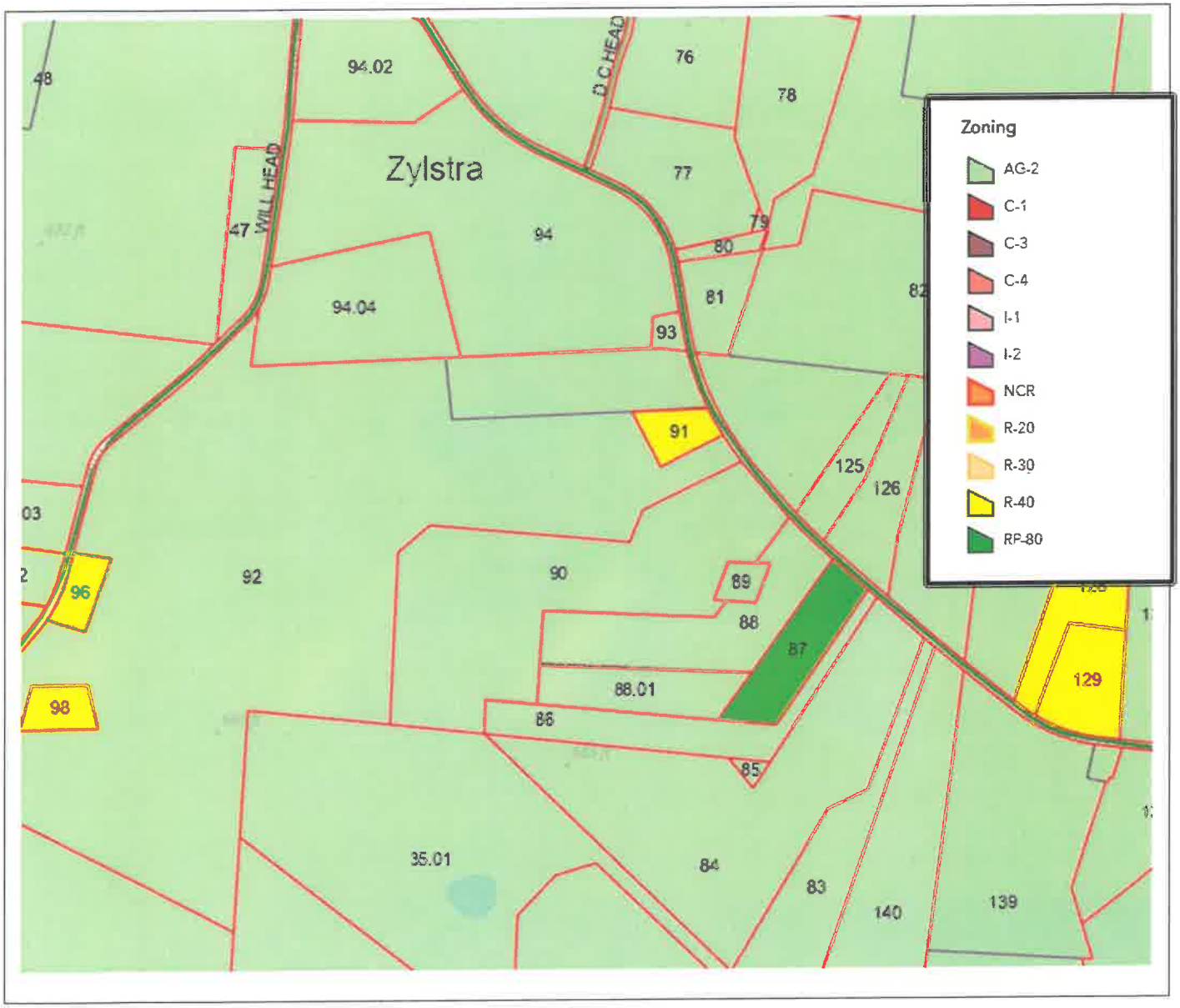
Discussion & Observations:
The applicant wishes to rezone 21.70 acres. The subject property has a mixture of AG-2, RP-80, and R-40 property in the immediate vicinity with varying lot sizes. Several of the surrounding lots are nonconforming and would be considered RP-80 by today's zoning regulations.
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone RP-80 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



New Business: D

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:

Name: Johnnie S. Marlin
Mailing Address (No P.O. Boxes, please): 4160 Armstrong RD Springfield, TN. 37172
Email:
Telephone Number: 615-756-9866

Applicant's Representative Information:

Name: Steven Artz
Name of Firm: Steven E. Artz and Associates, inc.
Mailing Address (No P.O. Boxes, please): 4800 Hwy 431 N Springfield, TN. 37172
Email: artz.steve@gmail.com
Telephone Number: 615-382-0481

Property Information:

Address: 4160 Armstrong RD Springfield, TN. 37172 (20.84 acres)
Tax Map and Parcel Number: Map 82, part of Parcel 5
Current Zoning Designation: AG-2
Requested Zoning Designation: RP80

Will this property be subdivided (or combined) in some way within the next year? (Yes) No

Purpose of rezoning request:
We are wishing to divide the subject property into four (4) 5 acre tracts and are requesting the change of zoning to reduce tract width.

SUBMITTAL REVIEW PROCEDURE:

1. Deliver one (1) copies of this application & any supporting materials to the Development Office before or by the final due date (Please see attached schedule- the "Corrections Due" does **not** apply to this type of application)
2. Provide copy of deed to prove ownership.
3. Provide aerial photograph of the property from TN Property Viewer
4. Pay the review fee.
5. Email a .PDF of the application & supporting materials (items 1-3) to hmantooth@robcotn.org
6. Attend the Planning Commission meeting. Be ready to present and answer questions. **Failure to appear at the Planning Commission meeting may result in the denial of the application.**

Johnnie S. Marlin 11-30-23
Owner of Record Signature & DATE

Applicant's Signature & DATE

Robertson County - Parcel: 082 005.00



Date: November 17, 2023

County: Robertson
Owner: MARLIN JOHNNIE S ETUX
Address: ARMSTRONG RD 4160
Parcel Number: 082 005.00
Deeded Acreage: 0
Calculated Acreage: 32.2
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

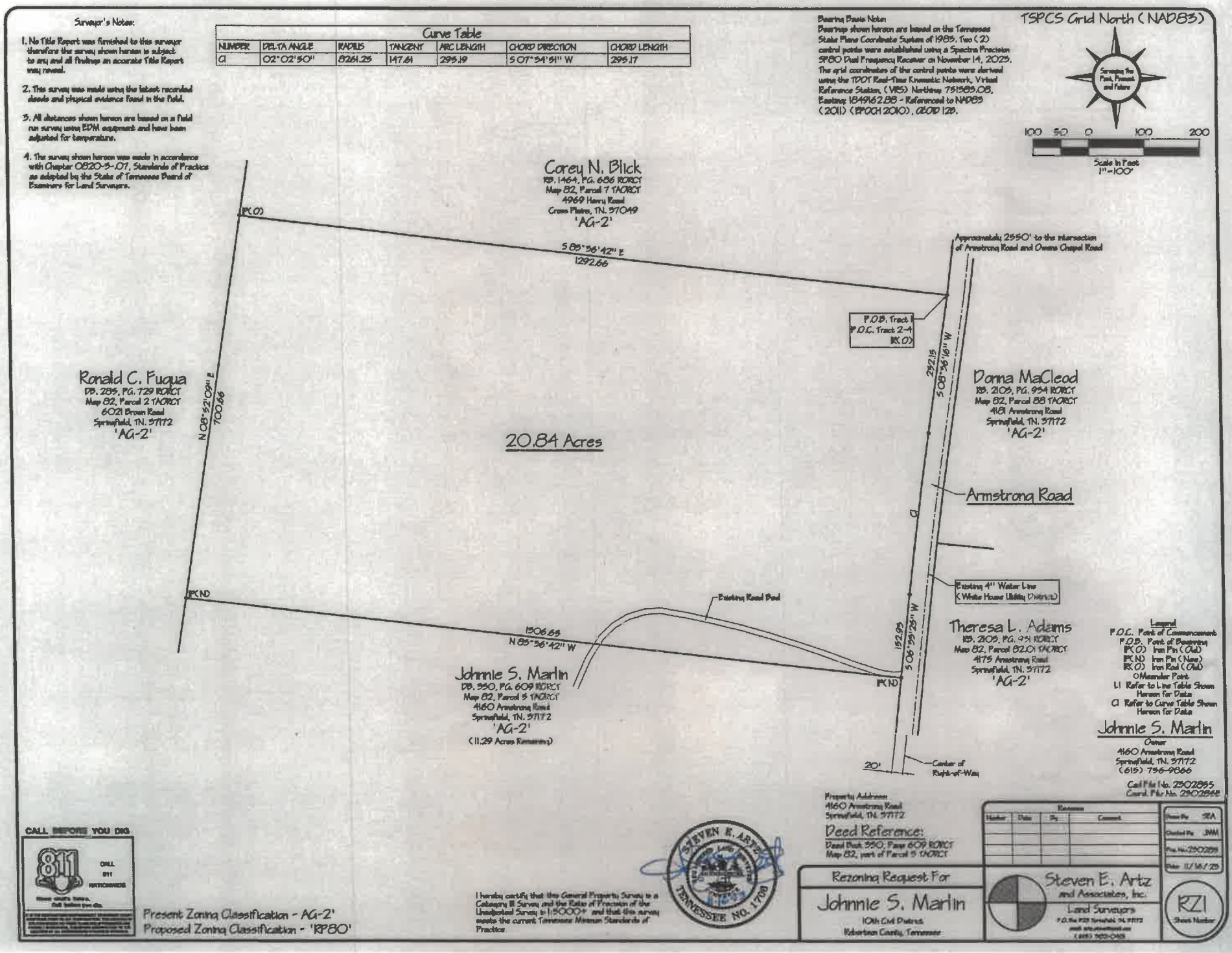
1:9,028

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Esri Community Maps Contributors, Tennessee STS GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, State of Tennessee, Comptroller of the Treasury

The property lines are compiled from information maintained by your local county Assessor's office but are not conclusive evidence of property ownership in any court of law.


Surveyor's Notes:
1. No Title Report was furnished to this surveyor therefore the survey shown hereon is subject to any and all findings an accurate Title Report may reveal.
2. This survey was made using the latest recorded deeds and physical evidence found in the field.
3. All distances shown hereon are based on a field run survey using EDM equipment and have been adjusted for temperature.
4. The survey shown hereon was made in accordance with Chapter 0820-3-.07, Standards of Practice as adopted by the State of Tennessee Board of Examiners for Land Surveyors.
Curve Table
NUMBER | DELTA ANGLE | RADIUS | TANGENT | ARC LENGTH | CHORD DIRECTION | CHORD LENGTH
C1 | 02°02'50" | 8261.25 | 147.61 | 295.19 | S 07°34'51" W | 295.17
Bearing Basis Note:
Bearings shown hereon are based on the Tennessee State Plane Coordinate System of 1983. Two (2) control points were established using a Spectra Precision SP80 Dual Frequency Receiver on November 14, 2025. The grid coordinates of the control points were derived using the TDOT Real-Time Kinematic Network, Virtual Reference Station, (VRS) Northing: 751589.08, Easting: 1834962.88 - Referenced to NAD83 (2011) (EPOCH 2010), GEOID 12B.
TSPCS Grid North (NAD83)
Surveying the Past, Present and Future
100 50 0 100 200
Scale in Feet
1"=100'
Corey N. Blick
RB. 1464, PG. 686 RORCT
Map 82, Parcel 7 TAORCT
4969 Henry Road
Cross Plains, TN. 37049
'AG-2'
IPC.O
S 85°36'42" E
1292.86
Approximately 2550' to the intersection of Armstrong Road and Owens Chapel Road
P.O.B. Tract 1
P.O.C. Tract 2-4
IPC.O
292.15
S 08°36'18" W
Donna MaCleod
RB. 2109, PG. 934 RORCT
Map 82, Parcel 88 TAORCT
4181 Armstrong Road
Springfield, TN. 37172
'AG-2'
Ronald C. Fuqua
DB. 2315, PG. 729 ROR CT
Map 82, Parcel 2 TAORCT
6021 Brown Road
Springfield, TN. 37172
'AG-2'
N 08°52'09" E
700.66
20.84 Acres
Armstrong Road
C1
Existing 4" Water Line (White House Utility District)
IPC.ND
Existing Road Bed
1306.69
N 85°36'42" W
152.93
S 06°39'25" W
Theresa L. Adams
RB. 2109, PG. 934 ROR CT
Map 82, Parcel 82.01 TAORCT
4175 Armstrong Road
Springfield, TN. 37172
'AG-2'
Johnnie S. Marlin
DB. 350, PG. 609 ROR CT
Map 82, Parcel 5 TAORCT
4160 Armstrong Road
Springfield, TN. 37172
'AG-2'
(11.29 Acres Remaining)
20'
Center of Right-of-Way
Legend
P.O.C. Point of Commencement
P.O.B. Point of Beginning
IPC.O Iron Pin (Old)
IPC.ND Iron Pin (New)
IRC.O Iron Rod (Old)
Meander Point
L1 Refer to Line Table Shown Hereon for Data
C1 Refer to Curve Table Shown Hereon for Data
Johnnie S. Marlin
Owner
4160 Armstrong Road
Springfield, TN. 37172
(615) 756-9666
Call File No. 2502855
Coord. File No. 2502848
CALL BEFORE YOU DIG
811
CALL 811 NOTICE WARNING
Present Zoning Classification - AG-2'
Proposed Zoning Classification - 'RP80'
I hereby certify that this General Property Survey is a Category III Survey and the Ratio of Precision of the Unadjusted Survey is 1:5000+ and that this survey meets the current Tennessee Minimum Standards of Practice.
STEVEN E. ARTZ
TENNESSEE NO. 1709
Property Address:
4160 Armstrong Road
Springfield, TN. 37172
Deed Reference:
Deed Book 350, Page 609 ROR CT
Map 82, part of Parcel 5 TAORCT
Revisions
Number | Date | By | Comment
Drawn By: SEA
Checked By: JMM
Proj. No.: 2502299
Date: 11/14/25
Rezoning Request For
Johnnie S. Marlin
10th Civil District
Robertson County, Tennessee
Steven E. Artz and Associates, Inc.
Land Surveyors
RZ1
Sheet Number

Steven E. Artz and Associates, Inc.

Surveyor's Description
November 16, 2023

The following paragraph describes a tract of land in the 10th Civil District of Robertson County, Tennessee, said tract being a portion of that property which was conveyed to Johnnie S. Marlin, et ux, by Bruce W. Minnick, Sr. and Todd Johnson Tregoning, in a deed of record which is recorded in Deed Book 330, Page 609, Register's Office for Robertson County, Tennessee, (RORCT).

Beginning at an iron rod (old), in the westerly margin of Armstrong Road, the southeast corner of a tract of land which belongs to Corey N. Blick, having a deed reference in Record Book 1464, Page 686 RORCT, the northeast corner of this tract and continuing with the westerly margin of said road, as follows:
S 08°36'16" W, 252.15 feet;
thence with a curve to the left, having a radius of 8261.25 feet, an arc distance of 295.19 feet, and a chord bearing and distance of S 07°34'51" W, 295.17 feet;
thence, S 06°33'25" W, 152.93 feet to an iron pin (new), in the westerly margin of Armstrong Road;
thence with a new line, N 83°36'42" W, 1306.65 feet to an iron pin (new), in the easterly boundary of a tract of land which belongs to Ronald C. Fuqua, having a deed reference in Deed Book 285, Page 729, RORCT;
thence, N 08°52'09" E, 700.66 feet to an iron pin (old), in the easterly boundary of said tract of land which belongs to Ronald C. Fuqua, a corner of said tract of land which belongs to Corey N. Blick;
thence, S 83°36'42" E, 1292.66 feet, to the point of beginning, containing **20.84 acres,** as surveyed by Steven E. Artz, Tennessee License No. 1708, d/b/a, Steven E. Artz & Associates, Inc., 4800 Highway 431 North, Springfield, Tennessee 37172, dated November 16, 2023.

The above described tract of land may be found on Tax Map 82, part of Parcel 5, in the Tax Assessor's Office for Robertson County, Tennessee.

File: Steve\230285LRZ

Land Surveyors-Tennessee and Kentucky
Phone: (615) 382-0481 **Fax: (615) 382-0262**
4800 Highway 431 North **Springfield, Tennessee 37172**

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
January 25, 2024

Applicant: Johnnie S. Marlin
Surveyor: Steve Artz

Request: Rezone **20.84 *acres*** of the 32.20 acres.
Tax Map 082, Part of Parcel 005.00 from AG-2 to RP-80



Figure 1: TN Property Viewer: Tax Map 082, Part of Parcel 005.00 In its entirety is highlighted.

Property Information:

- Tax Map 082, Part of Parcel 005.00
- 4160 Armstrong Rd., Springfield
- Total lot acreage: 32.20 acres (1,402,632 sq. ft.)
- **Rezone Request: 20.84 acres. (907,790 sq. ft.)**

Project Narrative:
RP-80 Minimum Requirements
Minimum Lot Size: 80,000 sq. ft.
Front: 60'
Side: 25'
Rear: 25'
Min. Lot Width @ Front Bldg. Setback Line: 175'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 30%.

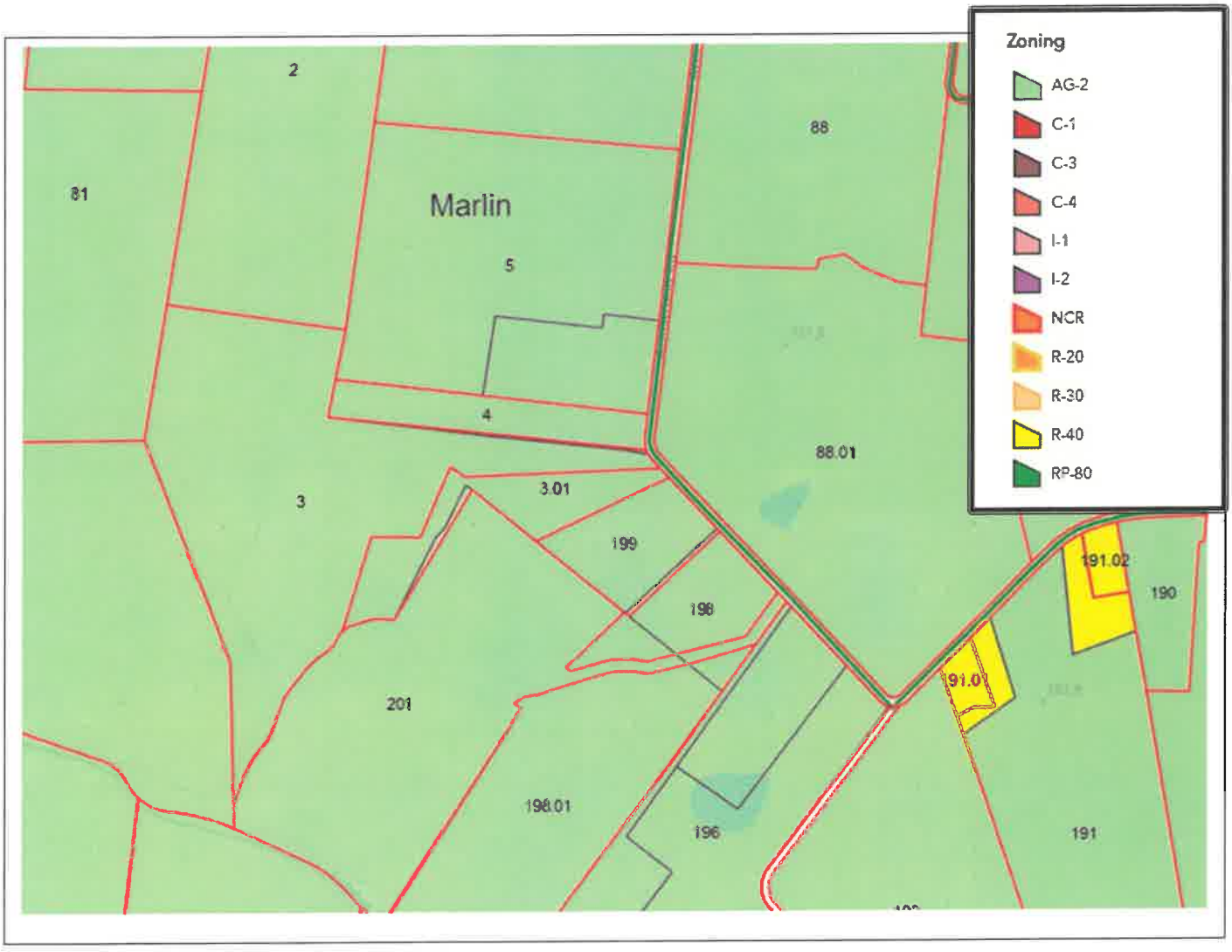
Discussion & Observations:
The applicant wishes to rezone 20.84 acres of the 32.20 acres. The subject property has a mixture of AG-2, and R-40 property in the immediate vicinity with varying lot sizes.
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone RP-80 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



New Business: E

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615- 384-3666

Application for Site Plan Approval

Type of Site Plan (Please Circle One): *Sketch Site Plan* *Preliminary Site Plan* (*Final Site Plan*)

Property Information:

1. Current Zoning of Property: C-1
2. Physical Address of Property: Highway 49 West, Springfield, TN 37172
3. Tax Map & Parcel Number: Map 100, Parcel 069.00
4. Size of Property (square feet or acres): 236,966 SF = 5.44 Acres

5. Owner of Record Information
   Name: Philip Palma | Forefront Robotic Services, Inc. DBA Delta Demo Group
   Mailing Address (No P.O. Boxes, please): 2870 Battle Creek Road, Springfield, TN 37172
   Email: philip@deltademogroup.com
   Telephone Number: 770-401-3725

6. Owner's Representative Information (Surveyor, Self, Engineer, etc.)
   Name: Kyle Schneider P.E.
   Name of Firm: Klober Engineering Services
   Mailing Address (No P.O. Boxes, please): 3556 Tom Austin Hwy, Ste 1, Springfield, TN 37172
   Email: kyle@klobereng.com
   Telephone Number: 615-382-2000

7. Purpose of Site Plan:
   11,454 SF shopping center, 5,000 SF Warehouse, & 9,000 SF office complex

SUBMITTAL REVIEW PROCEDURE:

1. Submit 1 hard copy (no smaller than 17" x 22") of the site plan, this completed application, and fee payment to the Robertson County Development Office. **Please ensure the application is signed.** ***Attach proof of ownership of property (copy of deed is typical). Pay the review fee.***
2. Email a .PDF of the submitted site plan to hmantooth@robcotn.org (Hunter Mantooth).
3. Application and site plan will be reviewed, and corrective comments provided, by date listed on calendar (see attached).
4. Submit corrections by date listed on Planning Commission Submittal & Meeting Calendar
5. FINAL SUBMITTAL: Deliver one (1) folded hard copies of the corrected plat, no smaller than 17" x 22", and any supporting documentation to the Development Office before or by the final due date.
6. Email a .PDF of the corrected site plan to hmantooth@robcotn.org
7. Attend the Planning Commission meeting. Be ready to present and answer questions. Failure to appear at the Planning Commission meeting may result in the denial of the application.

12/13/2023
Owner's Signature & DATE

Owner's Representative Signature & DATE

SITE PLAN FOR

DELTA DEMO HEADQUARTERS

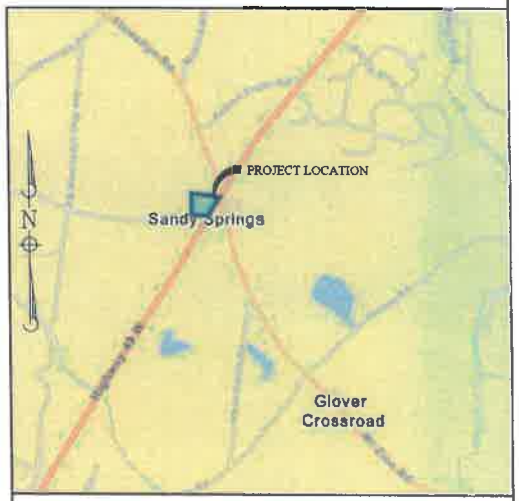
HIGHWAY 49 WEST
SPRINGFIELD, TN 37172
ROBERTSON COUNTY

DELTA DEMO HEADQUARTERS

DATE: 01/17/2024

SHEET INDEX

NOTE	PROJECT NOTES
C1.01	DEMO AND INITIAL EPSC
C1.02	SITE PLAN
C1.03	GRADING PLAN
C1.04	INTERMEDIATE EPSC
C1.05	DRAINAGE PLAN
C1.06	FINAL STABILIZATION
C1.07	LIGHTING PLAN
C2.01	CONSTRUCTION DETAILS
C2.02	CONSTRUCTION DETAILS
C2.03	CONSTRUCTION DETAILS
C2.04	CONSTRUCTION DETAILS



Vicinity Map
Not to Scale

KLOBER
ENGINEERING SERVICES

KYLE A. SCHNEIDER, P.E. TN#121687

NOT FOR CONSTRUCTION

APPLICANT/PROPERETY OWNER:

MACHS-PALM HOLDINGS LLC
HIGHWAY 49 WEST
SPRINGFIELD, TN 37172

DEED REFERENCE:

MAP 103, PARCEL 88 DEKET
PB 2243, PG 303 ROKT

PROPERTY INFORMATION:

ZONING: C-1, GENERAL COMMERCIAL
138,966 S.F. = 3.44 ACRES

SITE USE

EXISTING USE: VACANT
PROPOSED USE: WAREHOUSING/RETAIL

PARKING INFORMATION:

REQUIRED PARKING:
1/2,000 S.F. (WAREHOUSING) = 14,100/2,000 = 7 SPACES
1/1,000 S.F. (OFFICE) = 2,400/1,000 = 2 SPACES
1/250 S.F. (GENERAL RETAIL SALES AND SERVICES) = 11,464/250 = 46 SPACES
PROVIDED: 86 SPACES INCLUDING 4 ACCESSIBLE SPACE

LOT COVERAGE

EXISTING BUILDING AREA = 0 S.F.
NEW BUILDING AREA = 23,464 S.F.
BUILDING COVERAGE = 10.7%
MAX BUILDING HEIGHT: 35'-0"
PROPOSED CONCRETE SURFACE: 638,438 S.F.
PROPOSED ASPHALT SURFACE: 444,132 S.F.
IMPERVIOUS AREA: 6108,021 S.F. = 46%

TEMPORARY BENCHMARK:

FLANGE BOLT BETWEEN UL SYMBOL AND THE WORD "LISTED"
ELEVATION = 711.51'
VERTICAL DATUM: NAVD88

SIGN NOTE:

ALL SIGNS SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE JURISDICTIONAL ZONING ORDINANCE. SEPARATE SIGN PERMIT MAY BE REQUIRED.

LANDSCAPE NOTE:

ALL LANDSCAPING SHALL COMPLY WITH THE MOST CURRENT EDITION OF THE JURISDICTIONAL DESIGN STANDARDS AND ZONING REGULATIONS. PLANT TYPES SHOWN MAY BE SUBSTITUTED WITH SIMILAR TYPES AND SIZES THAT ARE NATIVE TO THE AREA AND APPROVED BY THE GOVERNING JURISDICTION.

UTILITIES NOTE:

COORDINATE LOCATION AND INSTALLATION OF UTILITIES WITH MECHANICAL, ELECTRICAL, AND PLUMBING PLANS. SPRINGFIELD WATER DEPARTMENT AND TENNESSEE WATER RESOURCES

WATER: SPRINGFIELD WATER & WASTEWATER
CONTACT: TERRY BEERS
624 CENTRAL AVENUE
SPRINGFIELD, TENNESSEE 37172
TELEPHONE: (615) 382-1600

SEWER: TENNESSEE DIVISION OF WATER RESOURCES
501 S. BROWN ST.
SPRINGFIELD, TENNESSEE 37172
TELEPHONE: (615) 384-0240

ELECTRIC: SPRINGFIELD ELECTRIC
1000 CENTRAL AVENUE WEST
SPRINGFIELD, TENNESSEE 37172
TELEPHONE: (615) 384-4770

GAS: SPRINGFIELD GAS
1311 WE GORDON
SPRINGFIELD, TENNESSEE 37172
TELEPHONE: (615) 382-1621

GENERAL NOTES:

1. PRIOR TO BEGINNING CONSTRUCTION ON THIS SITE THE LOCATION OF UTILITIES MUST BE IDENTIFIED BY CALLING THE TOLL-FREE TENNESSEE ONE CALL REFERENCE NUMBER 1-800-351-1111.
2. ALL CONSTRUCTION ON THIS SITE SHALL COMPLY WITH APPLICABLE REGULATIONS AS SPECIFIED BY THE ROBERTSON COUNTY PLANNING COMMISSION AND THE STATE OF TENNESSEE.
3. THE BOUNDARY SURVEY SHOWN HEREON WAS TAKEN FROM A SURVEY BY STEVEN E. ARTZ SURVEYING OF SPRINGFIELD, TN, DATED 05/03/2023. VERTICAL DATUM: NAVD 88, HORIZONTAL DATUM: NAD83.
4. ACCORDING TO MAP 47147C0350C, DATED 04/11/2008, THIS SITE IS NOT IN A FLOOD HAZARD AREA.
5. SITE CONSTRUCTION WILL BEGIN FOLLOWING PLAN APPROVAL BY THE ROBERTSON COUNTY PLANNING COMMISSION.

GENERAL UTILITY NOTES:

1. WATER AND SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL CODES AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL PAY ALL FEES AND OBTAIN ALL PERMITS.
3. ALL EXISTING UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE AND ARE BASED ON TOPOGRAPHIC SURVEYS AND RECORD DRAWINGS FROM THE FACILITY. ADDITIONAL UTILITIES MAY BE PRESENT. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE FOR INSTRUCTIONS.
4. THE CONTRACTOR SHALL NOTIFY THE TENNESSEE ONE-CALL SYSTEM, INC. (TOCS) AT 1-800-351-1111 OF 811 AND ANY NON-TOCS MEMBER UTILITY INDIVIDUALLY, AT LEAST 3 WORKING DAYS PRIOR TO ANY EXCAVATION AND/OR DEMOLITION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE LOCAL UTILITY COMPANY NO LESS THAN 72 HOURS PRIOR TO COMMENCING WORK.
5. MAINTAIN 10-FOOT HORIZONTAL AND 18-INCH VERTICAL SEPARATION BETWEEN SANITARY SEWER AND WATER SUPPLY LINES UNLESS NOTED OTHERWISE.
6. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES INCLUDING IRRIGATION. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. REPAIR DAMAGE ACCORDING TO LOCAL STANDARDS AND AT THE CONTRACTOR'S EXPENSE. COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANY. RELOCATE IRRIGATION LINES AS NECESSARY FOR CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES AND UNDERGROUND ELECTRIC DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO FINAL PAVEMENT CONSTRUCTION.
8. BACKFILL UTILITY TRENCHES UNDER PAVEMENT AREAS WITH CRUSHED STONE OR GRAVEL. BACKFILL UTILITY TRENCHES IN LAWN AREAS WITH SATISFACTORY FILL MATERIAL COMPACTED TO AT LEAST 95% OF MAXIMUM PER ASTM D698.
9. ADJUST ALL EXISTING CASTINGS TO MATCH PROPOSED FINISH GRADE.
10. THRUST BLOCK ALL WATERLINE FITTINGS WITH CONCRETE (4,000 P.S.I. MINIMUM) POURED AGAINST UNDISTURBED EARTH TO SUSTAIN TEST PRESSURE SPECIFIED. FORM THRUST BLOCKING SO AS TO NOT EMBED JOINTS, BOLTS, VALVE BOXES, OR OPERATING NUTS.
11. PROVIDE VENTS AT HIGH POINTS IN WATERLINE AS NECESSARY FOR EXPELLING AIR DURING FILLING OF WATERLINE. PROVIDE BRONZE CORPORATION STOP FOR CLOSING VENT DURING TESTING AND SERVICE. LEAVE VENT COMPONENTS PLUGGED AND ATTACHED TO PIPE AFTER SUCCESSFUL TEST.
12. EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR OFF THE OWNER'S PROPERTY AT NO ADDITIONAL COST IN A LEGAL MANNER.
13. ALL SANITARY SEWER PIPE SHALL BE CLASS SDR 35 PVC UNLESS NOTED OTHERWISE.
14. ALL WATER MAINS SHALL BE PRESSURE C900 PVC UNLESS NOTED OTHERWISE.
15. ALL FIRE HYDRANT ASSEMBLIES SHALL BE INSTALLED BETWEEN 3' AND 7' FROM PAVED SURFACE.
16. PROVIDE AS-BUILT DRAWINGS WHICH INCLUDE AT LEAST TWO DIMENSIONS TO EACH VALVE AND MANHOLE FROM KNOWN SITE FEATURES. DRAWINGS SHALL INCLUDE VERTICAL AND HORIZONTAL INFORMATION ON ALL NEW UTILITIES AS WELL AS EXISTING UTILITIES ENCOUNTERED.

LAYOUT AND PAVING NOTES:

1. THE CONTRACTOR SHALL CHECK EXISTING GRADES, DIMENSIONS, AND INVERTS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO BEGINNING WORK.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES, INCLUDING IRRIGATION LINES. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN, AND REPAIR CONTRACTOR CAUSED DAMAGE ACCORDING TO CURRENT LOCAL STANDARDS AND AT THE CONTRACTOR'S EXPENSE. COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANY. RELOCATE IRRIGATION LINES AS NECESSARY FOR CONSTRUCTION.
3. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES. OBTAIN ALL PERMITS, AND PAY ALL FEES PRIOR TO BEGINNING WORK.
4. PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY. INSTALL ALL UTILITIES PRIOR TO INSTALLATION OF PAVEMENT.
5. THE CONTRACTOR SHALL PROTECT ALL TREES TO REMAIN, IN ACCORDANCE WITH THE SPECIFICATIONS. DO NOT OPERATE OR STORE HEAVY EQUIPMENT, NOR HANDLE, NOR STORE MATERIALS WITHIN THE DRIPLINES OF TREES OR OUTSIDE THE LIMIT OF GRADING.
6. CONCRETE WALKS AND PADS SHALL HAVE A BROOM FINISH. ALL CONCRETE SHALL BE 3,500 P.S.I. UNLESS OTHERWISE NOTED. CURB RAMPS, SIDEWALK SLOPES, AND DRIVEWAY RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL CURRENT ADA & LOCAL REQUIREMENTS. IF APPLICABLE, THE CONTRACTOR SHALL REQUEST INSPECTION OF SIDEWALK AND RAMP FORMS PRIOR TO PLACEMENT OF CONCRETE.
7. ALL DAMAGE TO EXISTING ASPHALT PAVEMENT TO REMAIN WHICH RESULTS FROM NEW CONSTRUCTION SHALL BE REPLACED WITH LIKE MATERIALS AT CONTRACTOR'S EXPENSE.
8. DIMENSIONS ARE TO THE FACE OF CURB, EDGE OF CONCRETE, OR TO THE FACE OF BUILDING, UNLESS OTHERWISE NOTED.
9. COORDINATES ARE FOR FACE OF BUILDINGS, CENTER LINES OF DRAINS, CENTER OF SANITARY SEWER MANHOLES, AND CENTER AT FACE OF CURB ON CURB INLETS, UNLESS OTHERWISE NOTED.
10. EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR OFF THE OWNER'S PROPERTY AT NO ADDITIONAL COST IN A LEGAL MANNER.
11. MAINTAIN ONE SET OF APPROVED CONSTRUCTION DRAWINGS ON THE JOB SITE, WITH FIELD REVISIONS, FOR DISTRIBUTION TO THE ENGINEER UPON COMPLETION.
12. PARKING STRIPES SHALL BE 4-INCH WHITE PAVEMENT PAINT.
13. CONTRACTION JOINTS SHALL BE CONSTRUCTED TO A DEPTH OF AT LEAST 1/4 THE CONCRETE THICKNESS, AND SHALL DIVIDE THE CONCRETE ROUGHLY INTO SQUARES WITH MAXIMUM 10' SEGMENTS.
14. REFER TO THE MOST CURRENT ARCHITECTURAL PLANS FOR BUILDING LAYOUT AND DIMENSIONS

GRADING AND DRAINAGE NOTES:

1. TOPSOIL SHALL BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM DEPTH OF 6 INCHES. MAKE STOCKPILES FREE DRAINING AND PROVIDE EROSION AND SEDIMENTATION CONTROLS AROUND STOCKPILES.
2. ALL GRADED AREAS SHALL BE SEEDED AND MULCHED WITHIN 14 DAYS AFTER GRADING IS COMPLETED.
3. CONSTRUCT TEMPORARY EROSION CONTROL AS SHOWN ON THE DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.
4. ALL DRAINAGE STRUCTURES, PIPES WITHIN THE LIMITS OF CONSTRUCTION, AND DETENTION PONDS SHALL HAVE SEDIMENT REMOVED PRIOR TO FINAL ACCEPTANCE.
5. THE GRATE ELEVATIONS FOR CURB INLETS ARE GIVEN TO THE CENTER OF THE INLETS AT THE FACE OF CURB. THE GRATES SHALL SLOPE LONGITUDINALLY WITH THE PAVEMENT GRADE. ADJUST THE CASTING TO FALL ALONG THE CURB LINE.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES, PROTECT UTILITIES TO REMAIN, AND REPAIR CONTRACTOR-CAUSED DAMAGE ACCORDING TO LOCAL STANDARDS AT CONTRACTOR'S EXPENSE.
7. NOTIFY LOCAL UTILITY LOCATOR SERVICE OF INTENDED EXCAVATION/UTILITY TRENCHING OPERATIONS.
8. IN THE EVENT OF ANY DISCREPANCIES FOUND IN THE DRAWINGS OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
9. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND OBTAIN ALL PERMITS.
10. SPOT ELEVATIONS AND CONTOURS REPRESENT PROPOSED FINISHED GRADE AND TOP OF FINISHED PAVEMENT.
11. CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS AND INVERTS PRIOR TO BEGINNING WORK.
12. EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR OFF THE OWNER'S PROPERTY AT NO ADDITIONAL COST IN A LEGAL MANNER.
13. CONTOUR LINES AND SPOT ELEVATIONS ARE THE RESULT OF A DETAILED ENGINEERING GRADING DESIGN AND REFLECT A PLANNED INTENT WITH REGARD TO DRAINAGE. SHOULD THE CONTRACTOR HAVE ANY QUESTIONS OF THIS INTENT OR ANY PROBLEMS WITH THE CONTINUITY OF GRADES, THE ENGINEER SHALL BE CONTACTED PRIOR TO BEGINNING WORK.
14. EXISTING MANHOLE CASTINGS TO REMAIN SHALL BE RESET TO MATCH NEW GRADE.
15. ALL CURBS AND SIDEWALKS SHALL BE BACKFILLED WITH TOPSOIL, AND SEEDED AND MULCHED, UNLESS OTHERWISE NOTED.
16. ALL PIPES UNDER PAVED AREAS SHALL BE BACKFILLED WITH CRUSHED STONE. ALL PIPES UNDER LAWN AREAS SHALL BE BACKFILLED WITH SATISFACTORY MATERIAL COMPACTED TO 95% MAXIMUM PER ASTM D698.
17. ALL STORM DRAINAGE PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED. PIPE LENGTHS SHOWN ARE APPROXIMATE.
18. ALL CUT AND FILL SLOPES TO BE 3:1 MAXIMUM, UNLESS NOTED OTHERWISE.
19. SATISFACTORY TOPSOIL IS DEFINED AS SOIL BEING FREE OF SUBSOIL, CLAY LUMPS, STONES, OTHER OBJECTS OVER 1 INCH IN DIAMETER, OR CONTAMINANTS.
20. AFTER STRIPPING TOPSOIL, PROOFROLL SUBGRADE WITH A LOADED DUMP TRUCK WITH A MINIMUM WEIGHT OF 20 TONS. A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED WITH DURING PROOFROLLS.
21. FINISH GRADES TOLERANCES ARE 0.10 FOOT ABOVE OR BELOW DESIGN ELEVATIONS.
22. MAXIMUM SLOPES IN ALL DIRECTIONS OF HANDICAP PARKING SPACES/AISLES SHALL BE 2%.
23. EARTHWORK FILL SHALL INCLUDE STRIPPING TOPSOIL AND PLACING ENGINEERED FILL IN MAXIMUM 8" COMPACTED LIFTS WITH DENSITY OF 95% OF MAXIMUM PER ASTM D698. CONSULT WITH CURRENT GEOTECHNICAL REPORT.
24. AN AS-BUILT TOPOGRAPHIC SURVEY OF THE FINAL STORMWATER MANAGEMENT POND(S) AND OUTLET STRUCTURE(S) SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW FOR COMPLIANCE WITH THE ORIGINAL DESIGN. THE CONTRACTOR MAY SUBMIT A PRELIMINARY TOPOGRAPHIC SURVEY TO THE ENGINEER PRIOR TO FINAL TOPSOIL APPLICATION.
25. THE STORMWATER RUNOFF CALCULATIONS ON THIS SITE HAVE BEEN PERFORMED USING THE TR-55 METHOD AND RATIONAL METHOD. RAINFALL DATA WAS OBTAINED FROM NRCS WEB PROGRAM. THE DETENTION BASIN IS SIZED TO HANDLE A 2 THROUGH 100 YEAR STORM EVENTS WITHOUT OVERTOPPING THE POND. STORMWATER PIPES HAVE BEEN SIZED TO HANDLE A 25 YEAR STORM EVEN UNDER FREEFLOW CONDITIONS.
26. IF PRESENT THE WATER QUALITY FEATURES SHALL BE INSPECTED AND CLEANED PER THE APPROVED LONG TERM MAINTENANCE PLAN.
27. IF A STORMWATER QUALITY UNIT/SYSTEM IS REQUIRED ON A SITE PLAN/SUBDIVISION PLAT, THE ENGINEER OF RECORD WILL BE REQUIRED TO INSPECT AND CERTIFY TO THE CONSTRUCTION/INSTALLATION OF THE FACILITY PER THE PLANS APPROVED BY THE ROBERTSON COUNTY PLANNING COMMISSION. WRITTEN CERTIFICATION SHALL INCLUDE AS-BUILT DRAWINGS, PICTURES OF INSTALLATION AND VARIOUS ANALYSES THAT MAY BE REQUIRED BY THE STORMWATER DEPARTMENT.
28. ALL TEMPORARY AND PERMANENT BMP'S, INCLUDING DETENTION, SHALL BE INSPECTED BY THE ENGINEER OF RECORD AND CERTIFIED TO BE IN ACCORDANCE WITH THE APPROVED CONSTRUCTION PLANS PRIOR TO THE COMMENCEMENT OF WORK AND THE ISSUANCE OF AN OCCUPANCY PERMIT.

EP&SC NOTES:

1. THE CONTRACTOR SHALL DESIGNATE, IN WRITING, THE NAME AND PHONE NUMBER OF THE INDIVIDUAL RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS.
2. THE CONSTRUCTION ACTIVITY ANTICIPATED ON THIS PROJECT INCLUDES CLEARING, GRUBBING, GRADING, TOPSOILING, AND SEEDING.
3. THE PROJECT IS SUBJECT TO INSPECTION BY THE CITY AT ANY TIME AND ITEMS FOUND DEFICIENT SHALL BE IMMEDIATELY CORRECTED. THE CITY MAY STOP CONSTRUCTION OF PROPERTIES, OR ADMINISTER OTHER ENFORCEMENT ACTIONS AS DEFINED BY THE CITY.
4. INSPECTIONS SHALL BE CONDUCTED PER THE LATEST EDITION OF THE TDEC CONSTRUCTION GENERAL PERMIT, SEE SECTION 3.5.8.2.
5. THE APPROXIMATE TOTAL AREA OF THE SITE IS 3.44 ACRES. THE APPROXIMATE TOTAL AREA OF GRADING PROPOSED IS 3.44 ACRES.
6. THE INCREASE IN POST-CONSTRUCTION IMPERVIOUS AREA IS 2.3 ACRES.
7. THE ANTICIPATED FILL MATERIAL WILL CONSIST OF ON-SITE SOIL AND/OR OFF-SITE SOIL BORROW MATERIALS.
8. IF REQUIRED, THE OWNER AND THE CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO DISCHARGE CONSTRUCTION ACTIVITY STORMWATER APPLICATION TO THE LOCAL TENNESSEE ENVIRONMENTAL ASSISTANCE CENTER AT LEAST 30 DAYS PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR AND OWNER SHALL PROVIDE (WITH THE NOI FOR THIS PROJECT) EXISTING NPDES PERMIT TRACKING NUMBERS FOR SITE WHERE BORROW MATERIAL MAY BE OBTAINED AND WHERE SPOIL MATERIAL MAY BE PLACED. SHOULD PERMITS NOT EXIST FOR BORROW AND SPOIL SITES, SEPARATE NOI'S SHALL BE PROVIDED BY THE OWNER OR CONTRACTOR.
9. IF REQUIRED, THE NOTICE OF COVERAGE (NOC) OF THE PERMIT TO DISCHARGE CONSTRUCTION ACTIVITY STORMWATER SHALL BE POSTED NEAR THE CONSTRUCTION ENTRANCE. THE CONTRACTOR SHALL HAVE A SET OF APPROVED EROSION CONTROL PLANS ON SITE DURING ALL CONSTRUCTION.
10. IF REQUIRED, AN EROSION PREVENTION SEDIMENT CONTROL PLAN (EPSC) AND LAND DISTURBANCE PERMIT SHALL BE IN PLACE PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY. EROSION CONTROL DEVICES SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD, GENERALLY CONSIDERED TO BE THROUGH THE COMPLETION OF RESTORATION. IF REQUIRED, THE EPSC PLAN ALONG WITH AN INSPECTION CHECKLIST AND STORMWATER PERMIT MUST BE AT THE PROJECT SITE AT ALL TIMES. THE INSPECTION CHECKLIST SHALL HAVE A RECORD OF DATES EPSC DEVICES ARE INSPECTED AND ANY CORRECTION ACTION TAKEN OR MAJOR OBSERVATIONS. BMP'S MUST BE INSPECTED BY A QUALIFIED PERSON WHO HAS TAKEN AN APPROVED EROSION AND SEDIMENTATION COURSE.
11. APPROVED INLET PROTECTIONS FOR NEARBY STORM SEWER CURB AND DROP INLETS MUST BE INSTALLED PRIOR TO GRADING COMMENCEMENT.
12. SILT FENCE, OR OTHER SEDIMENT BARRIERS ARE TO BE INSTALLED PROPERLY ALONG TOPOGRAPHICAL CONTOURS DOWN SLOPE OF THE AREA TO BE DISTURBED PRIOR TO ANY GRADING, CLEARING AND/OR ANY OTHER CONSTRUCTION ACTIVITY.
13. ALL EPSC DEVICES ARE TO REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED AND A GOOD STAND OF GRASS HAS BEEN ESTABLISHED.
14. STABILIZATION MEASURES MUST BE PERFORMED WITHIN SEVEN (7) DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, AND WITHIN FOURTEEN (14) DAYS AFTER FINAL GRADING. ALL SLOPES 3:1 OR GREATER SHALL BE STABILIZED WITHIN SEVEN (7) DAYS.
15. REFER TO STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR ADDITIONAL REQUIREMENTS.
16. PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE REMOVED MORE THAN 14 CALENDAR DAYS PRIOR TO GRADING. ALL GRADED AREAS EXPECTED TO REMAIN UNFINISHED AND UNWORKED FOR MORE THAN 14 CALENDAR DAYS SHALL BE COVERED WITH TEMPORARY GRASS, SOD, STRAW, MULCH, OR FABRIC MATS. PERMANENT SOIL STABILIZATION SHALL BE INSTALLED WITHIN 14 CALENDAR DAYS OF FINAL GRADING.
17. EXCAVATED TOPSOIL TO BE REUSED MUST BE STOCKPILED AND ENCIRCLED WITH SILT FENCING.
18. THIS SITE SHALL CONTAIN A TEMPORARY STONE CONSTRUCTION ENTRANCE THAT CONFORMS TO REQUIRED SPECIFICATIONS PRIOR TO GRADING COMMENCEMENT. THE STONE SHALL BE 2 TO 3 INCH IN DIAMETER AND SHALL BE KEPT CLEAN BY ADDING STONE AS NEEDED. IT SHALL BE AT LEAST 8 INCHES DEEP UNDERLAIN WITH FILTER FABRIC AND 20 FEET WIDE.
19. VEGETATIVE BUFFERS OR OTHER PROTECTION MUST BE PROVIDED ALONG STREAMS, RIVERS, AND PONDS TO AVOID EROSION OF BANKS.
20. ALL TREES DESIGNATED TO REMAIN, MUST BE PROTECTED. HEAVY EQUIPMENT SHOULD NOT BE OPERATED OR STORED, NOR MATERIALS HANDLED OR STORED, WITHIN THE DRIP LINES OF TREES.
21. SEDIMENT MUST BE REMOVED FROM SEDIMENT BARRIERS, PONDS, AND OTHER SEDIMENT CONTROLS WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%.
22. SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN THE STREET OR DRAINAGE STRUCTURES MUST IMMEDIATELY BE PHYSICALLY REMOVED.
23. BUILDING AND WASTE MATERIALS, AND NON STORM WATER DISCHARGES, SUCH AS CONCRETE, PAINT WASH WATER, OR MACHINERY LEAKAGE, OR SPILLAGE MUST BE MANAGED TO PREVENT THEM FROM ENTERING THE STORM WATER SYSTEM, GROUND WATER, OR NEARBY WATER BODY.
24. ALL EPSC'S HAVE BEEN DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 2 YEAR, 24 HOUR STORM EVENT.
25. TEMPORARY SEEDING FOR TENNESSEE PROJECTS INCLUDE THE FOLLOWING OPTIONS:
    JAN 1 – MAY 1 — BALBOA RYE / KOREAN LESPEDEZA / SUMMER OATS
    MAY 1 – JULY 15 — SUDAN OR SUDAN MILLET
    JULY 15 – JAN 1 — BALBOA RYE / ITALIAN RYE
26. MULCHING SHALL CONSIST OF LOOSE HAY OR STRAW APPLIED AT THE RATE OF 2 TONS/ACRE.
27. UPON COMPLETION OF SITE STABILIZATION, THE OWNER AND CONTRACTOR SHALL PROVIDE A NOTICE OF TERMINATION (NOT) FOR THE PROJECT TO THE LOCAL ENVIRONMENTAL ASSISTANCE CENTER. A COPY OF THE NOT SHALL BE PROVIDED TO THE ENGINEER.
28. THE CONTRACTOR SHALL MAINTAIN RECORDS OF EROSION CONTROL INSPECTIONS AND REPAIRS FOR A MINIMUM OF 3 YEARS AFTER COMPLETION OF CONSTRUCTION.
29. TOPSOIL SHALL BE PLACED ON DISTURBED AREAS WHICH REQUIRE NEW VEGETATION. GROUND COVER SHALL BE REESTABLISHED WITH KENTUCKY 31 FESCUE SEEDED AT A MINIMUM OF 250 LBS. PER ACRE WITHIN 72 HOURS OF FINAL GRADING. SLOPES 3:1 OR GREATER, AND AREAS INDICATED ON PLANS, SHALL BE LINED WITH NORTH AMERICAN GREEN S150 GRASS MATTING OR EQUAL. SOD MAY BE SUBSTITUTED FOR MATTING OR SEED IN STRAW AREAS.
30. SILT FENCE SHALL BE INSTALLED IN ALL EROSION AREAS WHICH COULD ALLOW UNTREATED STORMWATER RUNOFF TO BE DISCHARGED FROM THE PROPERTY. ALL EROSION CONTROL MEASURES SHALL BE CONSISTENT WITH THE PROVISIONS DESCRIBED IN THE MOST CURRENT EDITION OF THE TENNESSEE EROSION & SEDIMENT CONTROL HANDBOOK.
31. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 1/3 FILLED.
32. ALL LOCATIONS OF TEMPORARY EROSION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER.
33. WHEN THE TEMPORARY EROSION CONTROL DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE THEY SHALL BE REMOVED.
34. REPLACE DAMAGED AND WORN OUT SILT BARRIERS AS DIRECTED BY THE CITY/ENGINEER.
35. PROVIDE TEMPORARY SEEDING ON STOCKPILES AND ALL OTHER AREAS OF THE SITE THAT WILL REMAIN UNDISTURBED FOR 14 DAYS OR MORE.
36. I CERTIFY THAT THESE PLANS HAVE BEEN PREPARED BY ME AND/OR UNDER MY DIRECT SUPERVISION. THIS PROJECT IS PLANNED TO DISTURB MORE THAN ONE ACRE, IT THEREFORE FALLS UNDER THE TENNESSEE DIVISION OF WATER POLLUTION CONTROL'S GENERAL NPDES PERMIT TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY. KLOBER ENGINEERING SERVICES WILL ASSIST THE CONTRACTOR IN SUBMITTING THE "NOTICE OF INTENT (NOI) TO CONSTRUCT" TO THE STATE AT LEAST 30 DAYS PRIOR TO BEGINNING LAND DISTURBANCE. THE TN GENERAL CONSTRUCTION PERMIT IS TNR247006.

KYLE A. SCHNEIDER, P.E., PROJECT ENGINEER — 01/17/24 DATE

LANDSCAPE NOTES:

1. PLANT TYPES FOR ALL AREAS OTHER THAN THE BIORETENTION ARE AT THE DISCRETION OF THE OWNER. SEVERAL NATIVE VARIETY SHALL BE USED.
2. THE LANDSCAPE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES AND TAKE PRECAUTIONS TO PREVENT DAMAGE TO THESE UTILITIES.
3. THE LANDSCAPE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE TO UTILITIES.
4. ALL PLANTING BEDS OR MULCH BEDS SHALL BE SPRAYED WITH WEED-KILLER/HERBICIDE OR HAND WEEDED (CONTRACTOR'S OPTION) PRIOR TO THE INSTALLATION OF MULCH OR STONE COVER.
5. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINE GRADING OF ALL PLANTING AREAS. INSURE POSITIVE DRAINAGE OF LANDSCAPE BERMS.
6. ALL PLANTING AREAS SHALL BE FERTILIZED WITH 12 lbs./1000 S.F. OF 10-10-10 FERTILIZER.
7. ALL PLANTING BEDS SHALL HAVE A MINIMUM OF 3" DEPTH OF PINE BARK MULCH OR STONE AS SPECIFIED BY OWNER.
8. THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL MATERIAL TYPES AND QUANTITIES WITH THE OWNER.
9. THE LANDSCAPE CONTRACTOR SHALL PROVIDE THE OWNER WITH WRITTEN INSTRUCTIONS ON THE PROPER CARE OF ALL SPECIFIED PLANT MATERIALS PRIOR TO FINAL PAYMENT.
10. ALL DISTURBED AREAS NOT SODDED SHALL BE SEEDED AND STRAWED.
11. INSTALL EROSION CONTROL MATTING ON ALL SLOPES GREATER THAN 3:1, DITCH LINE AND WHERE SHOWN ON THE STABILIZATION PLAN.
12. GROUND COVER, WHEN USED, SHOULD EXTEND UNDER SHRUBS AND TREES.
13. NO TREES SHALL BE PLANTED WITHIN THE 40 FT. SIGHT TRIANGLE AT THE ENTRANCE. ALL SHRUBS MUST BE MAINTAINED AT A MAXIMUM HEIGHT OF 2 1/2'.
14. SPREADING SHRUB SPECIES SHALL BE 18 INCH MINIMUM SPREAD & 3 GAL TRUNK.
15. STREET TREE CALIPERS SHALL BE 2 INCH MINIMUM.
16. ONLY GRADE "A" PLANT MATERIAL WILL BE ACCEPTED. INFERIOR/DAMAGED PLANT MATERIAL WILL BE REJECTED. ALL PLANT MATERIAL MUST COMPLY WITH CURRENT ANSI NURSERY STOCK STANDARDS.
17. VOID AREAS BETWEEN TREES AND SHRUBS MAY BE INTERSPERSED WITH PERENNIALS SUCH AS MARSH MILKWEED, SLENDER MOUNTAIN MINT, LYRE-LEAF SAGE, OR GRAY GOLDENROD.

LEGEND:

EXISTING SYMBOLS

- EXISTING POWER POLE
- EXISTING LIGHT POLE
- EXISTING WALL PACK LIGHT
- EXISTING SANITARY SEWER BOX
- EXISTING SANITARY SEWER MANHOLE
- EXISTING PRESSURE SEWER VALVE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING AIR RELEASE
- EXISTING BLOW OFF
- EXISTING HEADWALL
- PROPOSED HANDICAP SYMBOL

PROPOSED SYMBOLS

- PROPOSED POWER POLE
- PROPOSED LIGHT POLE
- PROPOSED WALL PACK LIGHT
- PROPOSED SANITARY SEWER BOX
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED PRESSURE SEWER VALVE
- PROPOSED WATER METER
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELEASE
- PROPOSED BLOW OFF
- PROPOSED HEADWALL
- PROPOSED HANDICAP SYMBOL
- PROPOSED WHEEL STOP
- PROPOSED SIGN
- PROPOSED FLOW ARROW / DOWNHILL SLOPE DIRECTION
- PROPOSED SPOT ELEVATION
- PROPOSED PIPE INVERT
- TOP OF WALL ELEVATION
- BOTTOM OF WALL ELEVATION @ FINISHED GRADE

PROPOSED CURB INLET

PROPOSED CATCH BASIN

PROPOSED TRAFFIC FLOW ARROWS

PROPOSED STABILIZATION

EXISTING LINE TYPES

- ROAD LINE
- EXISTING CONTOURS MINOR 1' INTERVAL
- EXISTING CONTOURS MAJOR 5' INTERVAL
- EXISTING COMMUNICATIONS OVERHEAD
- EXISTING COMMUNICATIONS UNDERGROUND
- EXISTING FLUE
- EXISTING EASEMENTS WATER & SEWER
- EXISTING ELECTRIC OVERHEAD
- EXISTING ELECTRIC UNDERGROUND
- EXISTING FIBER OPTIC
- EXISTING FENCE
- EXISTING GAS
- EXISTING BUILDING
- EXISTING CONCRETE
- EXISTING GRAVEL/RIP RAP
- EXISTING PROPERTY LINE
- EXISTING PROPERTY LINE ADJACENT
- EXISTING RAILROAD
- EXISTING SEWER LINE
- EXISTING FORCE MAIN
- EXISTING SEWER SERVICE
- EXISTING WATER LINE
- EXISTING WATER SERVICE
- EXISTING SETBACKS
- EXISTING STORM SEWER

PROPOSED LINE TYPES

- PROPOSED CONTOURS MINOR 1' INTERVAL
- PROPOSED COMMUNICATIONS OVERHEAD
- PROPOSED COMMUNICATIONS UNDERGROUND
- PROPOSED FLUE
- PROPOSED EASEMENTS WATER & SEWER
- PROPOSED ELECTRIC OVERHEAD
- PROPOSED ELECTRIC UNDERGROUND
- PROPOSED FIBER OPTIC
- PROPOSED FENCE
- PROPOSED GAS
- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED GRAVEL/RIP RAP
- PROPOSED PROPERTY LINE
- PROPOSED EXTRUDED/POST CURB
- PROPOSED CURB AND GUTTER
- PROPOSED RETAINING WALL
- PROPOSED SEWER LINE
- PROPOSED FORCE MAIN
- PROPOSED SEWER SERVICE
- PROPOSED WATER LINE
- PROPOSED WATER SERVICE
- PROPOSED SETBACKS
- PROPOSED STORM SEWER
- PROPOSED SILT FENCE
- PROPOSED GUARD RAIL
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED REVISION CLOUD

LEGEND NOTES:

1. SCALES OF HATCHING WILL VARY FROM LEGEND DUE TO SCALE OF SHEETS
2. LINE THICKNESS WILL VARY FROM SHEET TO SHEET. THICKER LINE WEIGHT IS USE TO EMPHASIZE THE MOST RELEVANT INFORMATION ON EACH SHEET.

RECORD SURVEY REQUIRED OF STORMWATER POND:

A RECORD SURVEY OF THE STORMWATER DETENTION POND AND FACILITIES PERFORMED BY A LICENSED TN SURVEYOR, IS REQUIRED PRIOR TO THE CITY ISSUING A CERTIFICATE OF OCCUPANCY. THE CERTIFICATE OF OCCUPANCY WILL BE WITHHELD UNTIL THE STORMWATER DETENTION POND AND FACILITIES ARE SUBSTANTIALLY CONSTRUCTED IN ACCORDANCE WITH THE DESIGN. THE DETERMINATION OF SUBSTANTIAL COMPLETION SHALL BE MADE BY THE CITY. THE APPLICANT SHOULD ANTICIPATE THAT ADDITION ENGINEERING CALCULATIONS MAY BE REQUIRED BY THE CITY AS PART OF THEIR DETERMINATION.

STORMWATER POND MAINTENANCE REQUIREMENTS:

THE PROPERTY OWNER SHALL BE REQUIRED TO MAINTAIN THE STORMWATER DETENTION POND AND FACILITIES IN PERPETUITY. THIS INCLUDES MAINTAINING THE ORIFICES, BERMS AND DISCHARGE AREAS IN A WORKING AND NON-PLUGGED STATE. THIS ALSO INCLUDES, BUT IS NOT LIMITED TO, MAINTAINING VEGETATION AND CLEARING DEBRIS, SILT, TRASH ETC FROM THE STORMWATER POND.

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PHONE: (615) 382-3000 FAX: (888) 373-4466
www.klobereng.com

NO.	BY	DATE	DESCRIPTION
REVISIONS			

KYLE A. SCHNEIDER, P.E. TN#121887

NOT FOR CONSTRUCTION

DELTA DEMO HEADQUARTERS

HIGHWAY 49 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

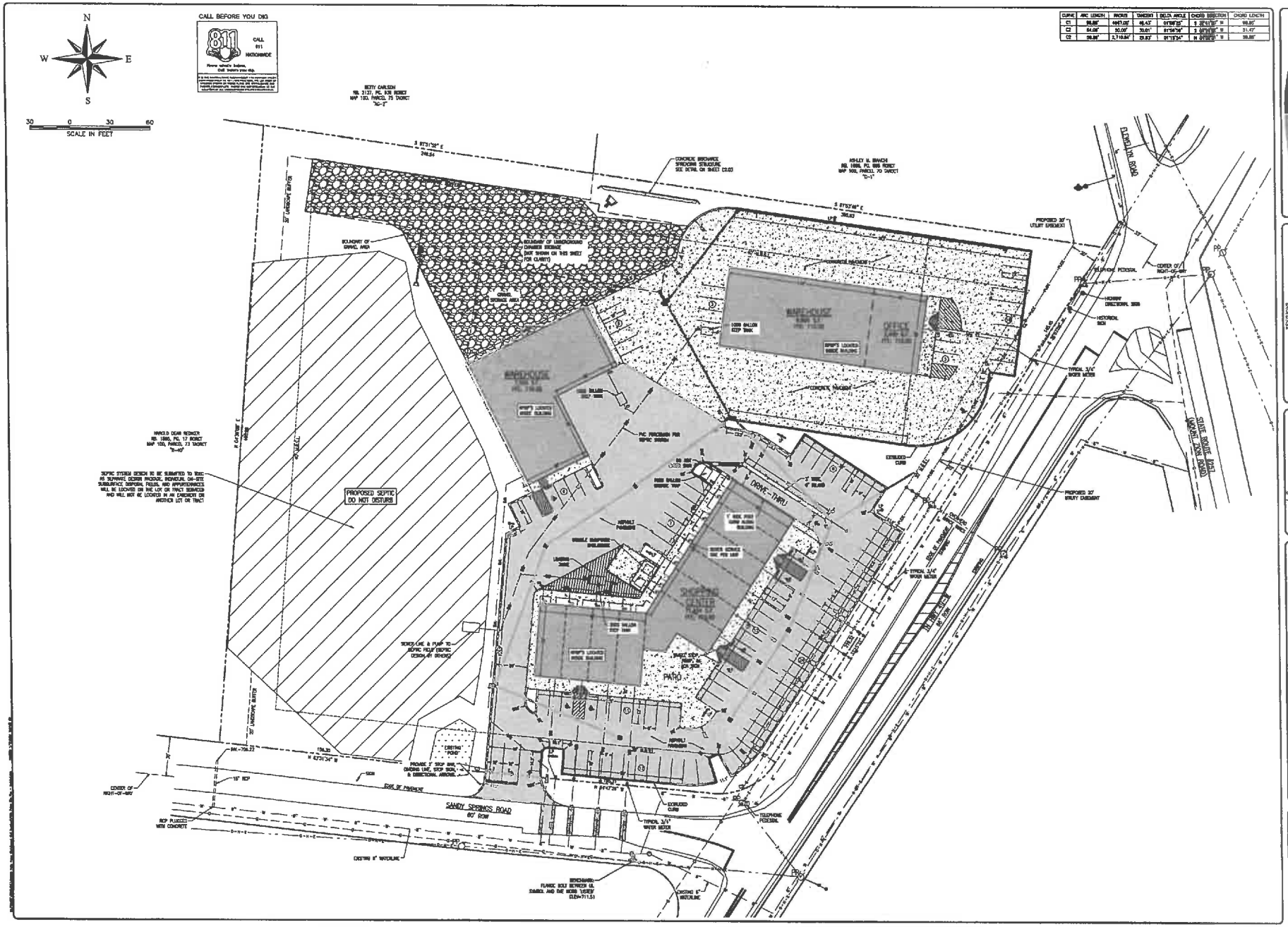
DRAWN BY: CTN
CHECKED BY: KAS
PROJECT NO.: CT0023

PROJECT NOTES

SHEET NUMBER
NOTE

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CURVE	ARC LENGTH	RADIUS	TANGENT	DELTA ANGLE	CHORD DIRECTION	CHORD LENGTH
C1	99.88'	4947.28'	49.43'	01°09'25"	S 22°41'32" W	99.85'
C2	64.06'	90.09'	33.01'	81°36'36"	S 40°54'05" W	31.47'
C3	99.99'	2,710.64'	29.83'	01°15'34"	N 87°09'51" W	39.88'

KLOBER
ENGINEERING SERVICES
SERVING CLIENTS WITH CIVIL ENGINEERING & LAND DEVELOPMENT SERVICES
3868 YGM AUSTIN HWY, SUITE 3, SPRINGFIELD, TN 37172
PHONE (615) 384-5005 FAX (615) 384-5006
www.kloberweg.com

NO	BY	DATE	DESCRIPTION

KYLE A. SCHNEIDER, P.E. TN#121697

NOT FOR CONSTRUCTION

DELTA DEMO HEADQUARTERS

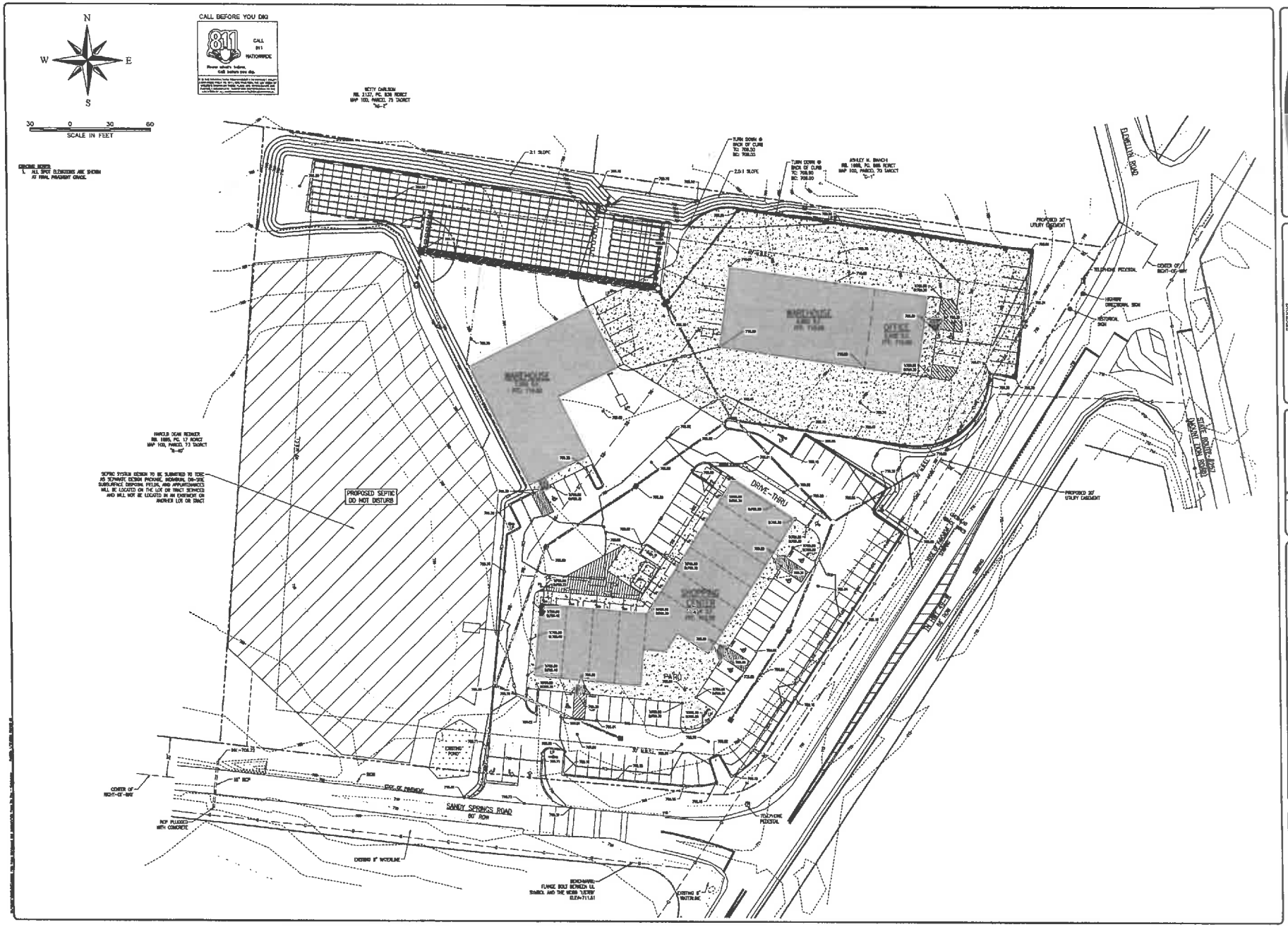
HIGHWAY 68 WEST
SANDY SPRINGS, TN
ROBERTSON COUNTY

DRAWN BY:	CJN
CHECKED BY:	KAS
PROJECT NO:	C03021

SITE LAYOUT

SHEET NUMBER
C1.02

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NO	BY	DATE	DESCRIPTION

REVISIONS

KYLE A. SCHNEIDER, P.E. TN#121987

NOT FOR CONSTRUCTION

DELTA DEMO HEADQUARTERS

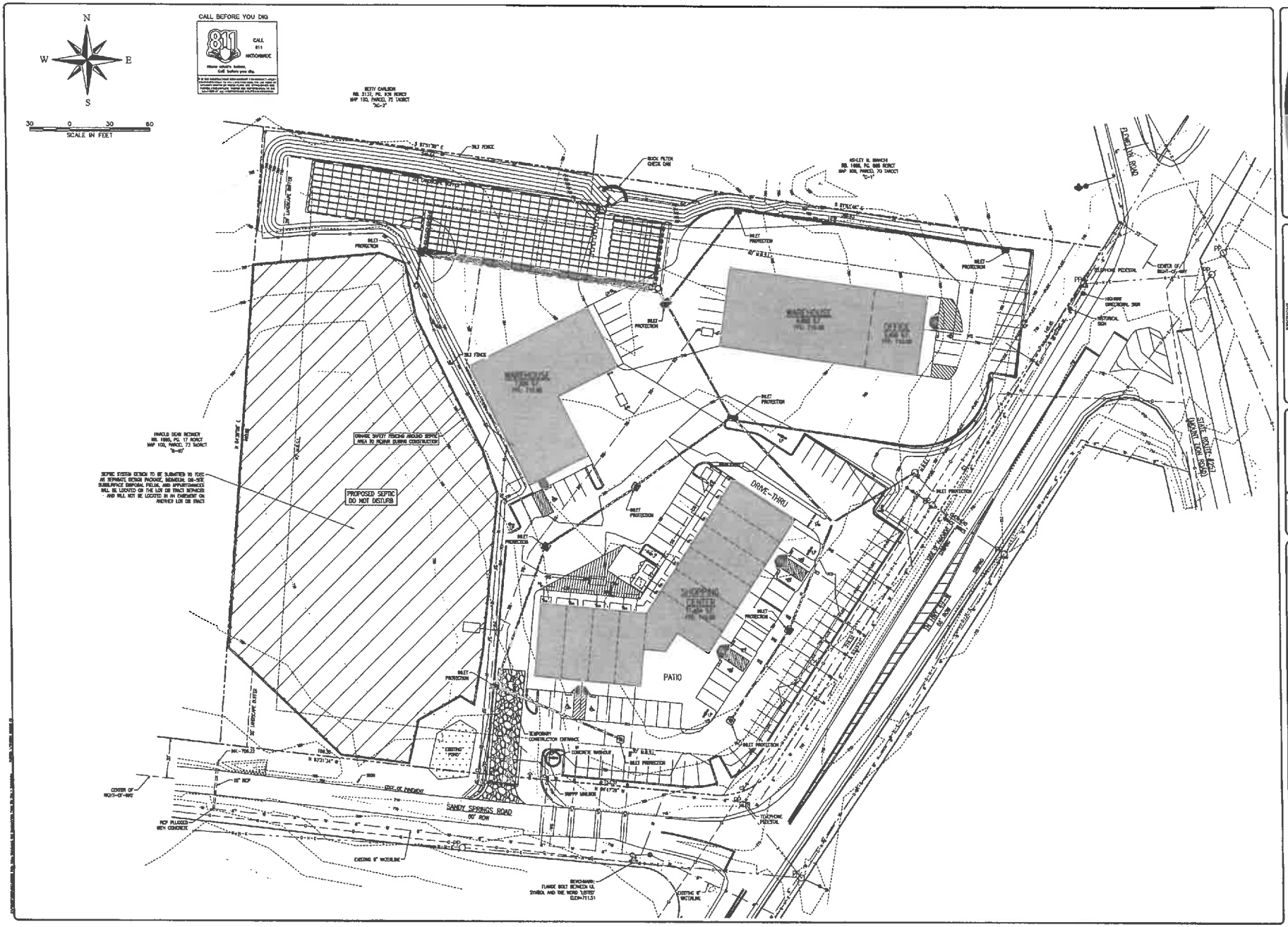
HIGHWAY 49 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

DRAWN BY:	CJN
CHECKED BY:	KAS
PROJECT NO.:	C01023

GRADING PLAN

SHEET NUMBER
C1.03

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PHONE (615) 384-2005 FAX (615) 384-2006
www.kloberpe.com

NO	BY	DATE	DESCRIPTION

REVISIONS

KYLE A. SCHNEIDER, P.E. TN#121867

NOT FOR CONSTRUCTION

DELTA DEMO HEADQUARTERS

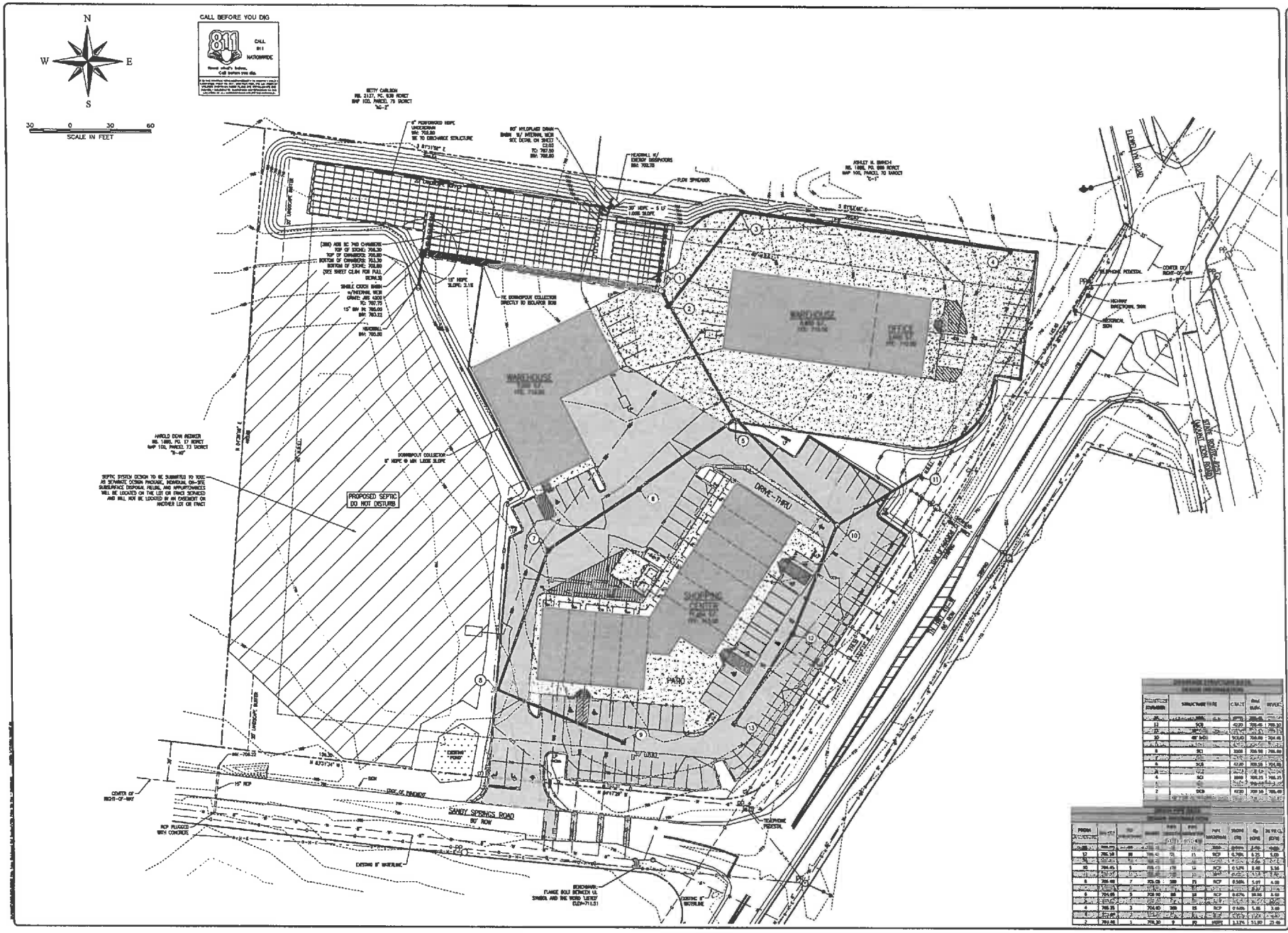
HIGHWAY 49 WEST
ROBERTSON COUNTY

DRAWN BY	CDN
CHECKED BY	KAS
PROJECT NO.	C03023

INTERMEDIATE EPSC

SHEET NUMBER
C1.04

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PROJECTION NUMBER	STRUCTURE TYPE	C.M.P.	Grad SLOPE	REVISED
12	SCB	42.00	709.45	709.30
11	SCB	42.00	709.15	709.00
10	SCB	30.00	708.85	708.40
9	SCB	30.00	708.55	708.40
8	SCB	30.00	708.25	708.10
7	SCB	42.00	708.05	707.90
6	SCB	42.00	707.75	707.60
5	SCB	30.00	707.45	707.30
4	SCB	30.00	707.15	707.00
3	SCB	42.00	706.85	706.70
2	DCB	42.00	706.55	706.40

FROM	TO	PIPE SIZE	PIPE TYPE	PIPE MATERIAL	SLOPE	Qp	Qp 10 YR Q
12	11	18"		RCP	0.50%	6.25	5.00
11	10	18"		RCP	0.50%	6.25	5.00
10	9	18"		RCP	0.50%	6.25	5.00
9	8	18"		RCP	0.50%	6.25	5.00
8	7	18"		RCP	0.50%	6.25	5.00
7	6	18"		RCP	0.50%	6.25	5.00
6	5	18"		RCP	0.50%	6.25	5.00
5	4	18"		RCP	0.50%	6.25	5.00
4	3	18"		RCP	0.50%	6.25	5.00
3	2	18"		RCP	0.50%	6.25	5.00
2	1	18"		RCP	0.50%	6.25	5.00

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PHONE (615)-384-2220 FAX (615)-384-2221
www.kloberengineering.com

NO	BY	DATE	DESCRIPTION

REVISIONS

KYLE A. SCHNEIDER, P.E. TN#121807

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DELTA DEMO HEADQUARTERS

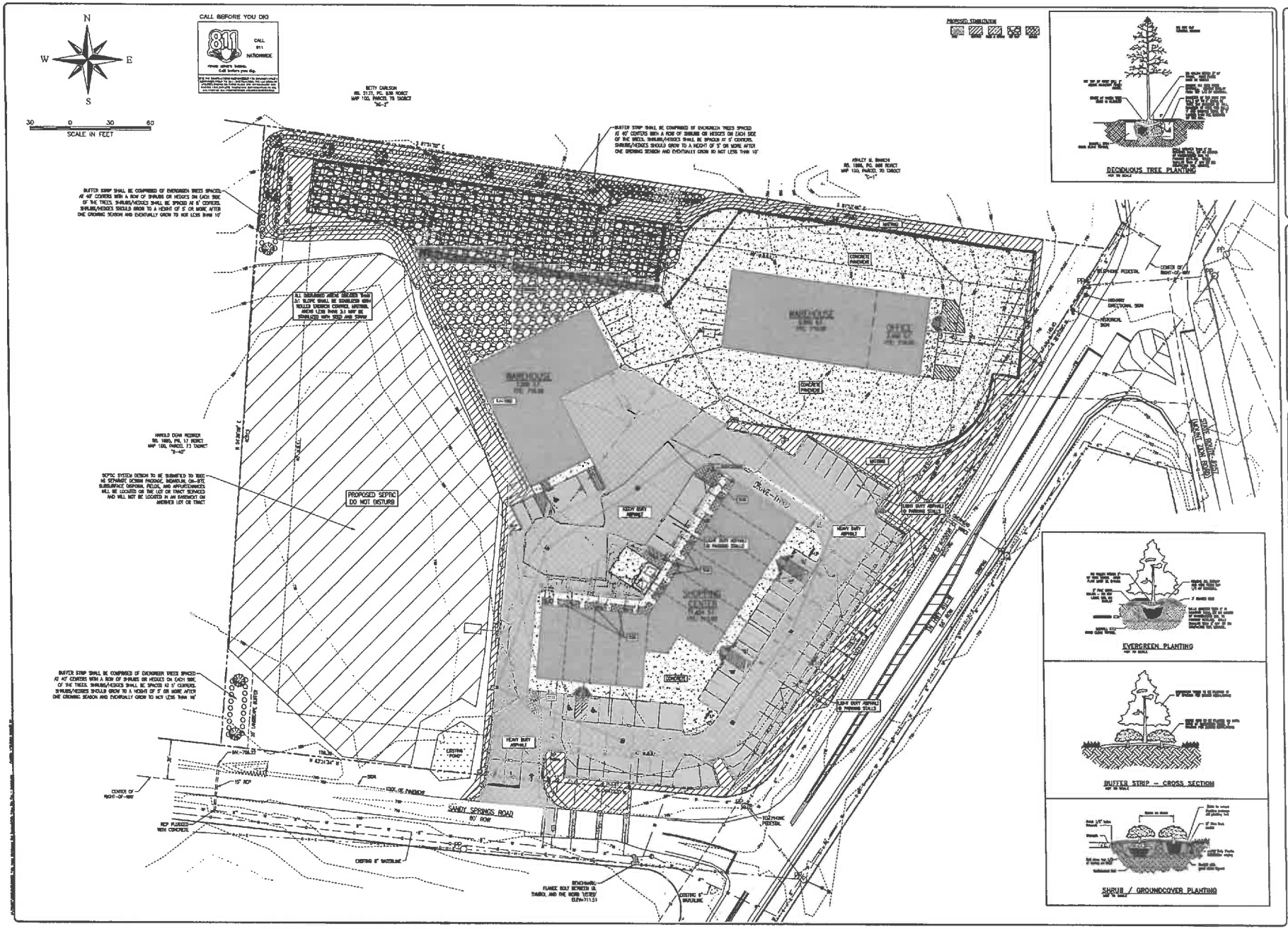
HIGHWAY 49 WEST
ROBERTSON COUNTY

DRAWN BY:	CDJ
CHECKED BY:	KAS
PROJECT NO.:	C05023

DRAINAGE PLAN

SHEET NUMBER
C1.05

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www.klobereng.com

NO	BY	DATE	DESCRIPTION

KYLE A. SCHNEIDER, P.E. TN#121697

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DELTA DEMO HEADQUARTERS

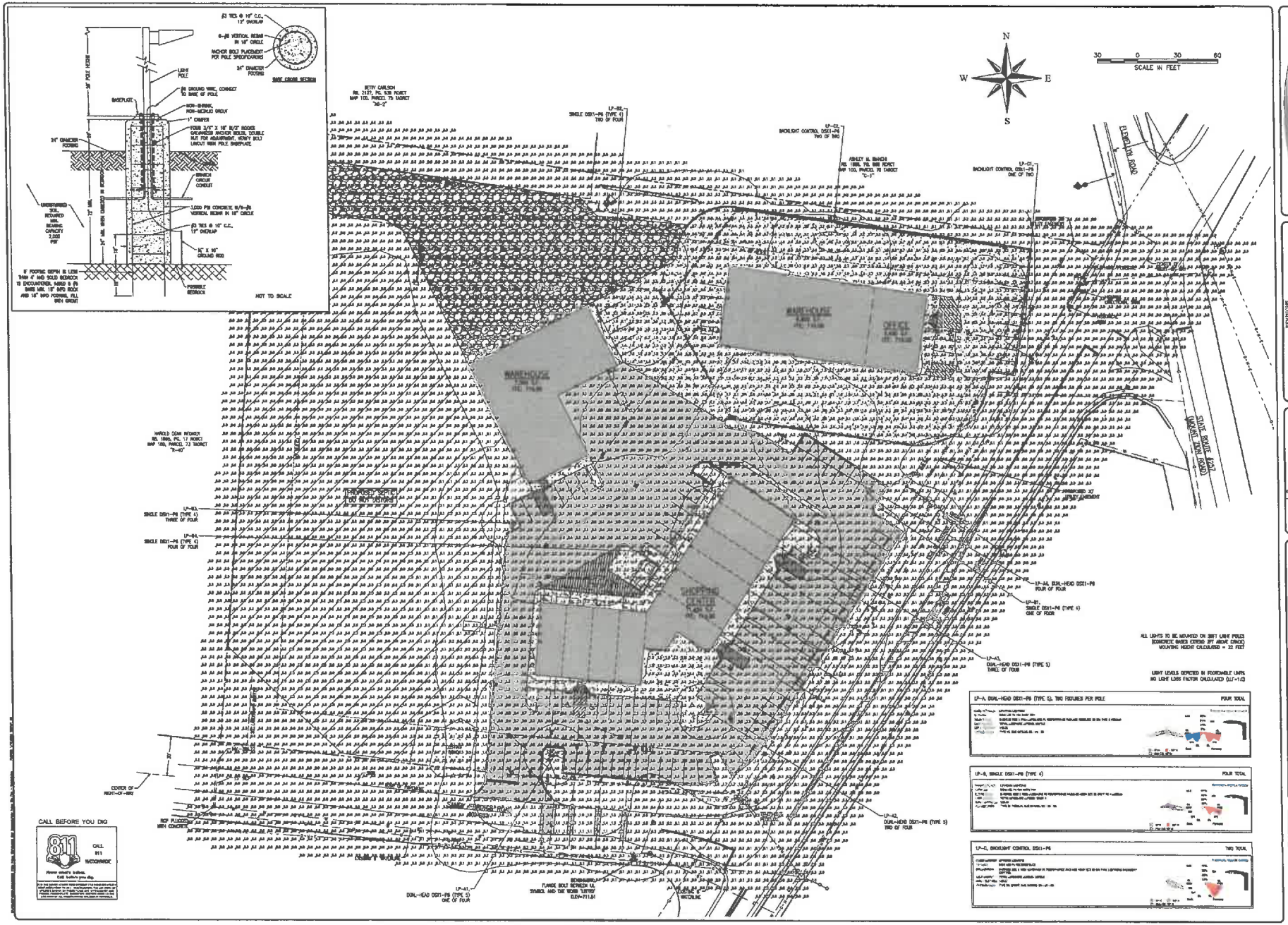
HIGHWAY 69 WEST
HENDERSON, TN
ROBERTSON COUNTY

DRAWN BY	CTU
CHECKED BY	KAS
PROJECT NO.	C03021

FINAL STABILIZATION

SHEET NUMBER
C1.06

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NO	BY	DATE	DESCRIPTION

REVISIONS

KYLE A. SCHNEIDER, P.E. TN#121697
NOT FOR CONSTRUCTION

DELTA DEMO HEADQUARTERS

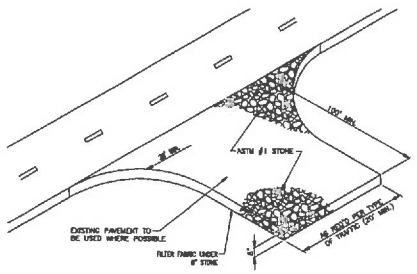
HIGHWAY 64 @ WEST
BOLIVAR, TN
BOLIVAR/HARDEMAN COUNTY

DRAWN BY	CJN
CHECKED BY	KAS
PROJECT NO	030023

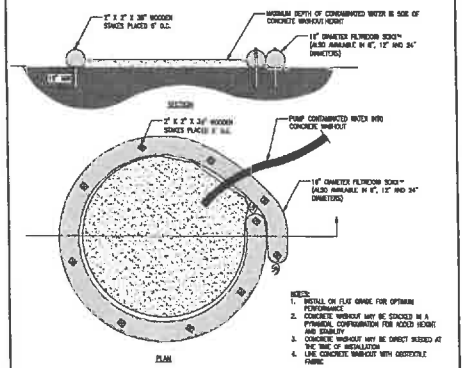
LIGHTING PLAN

SHEET NUMBER
C1.07

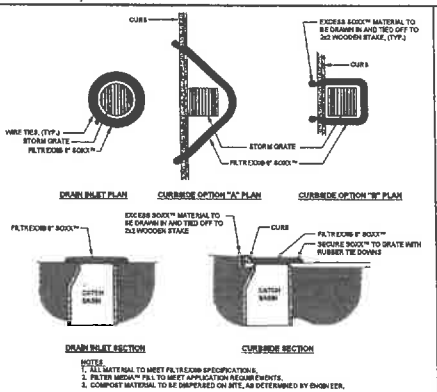
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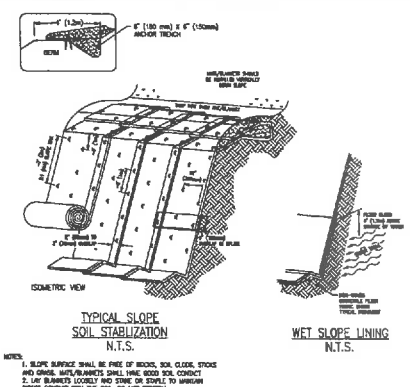
TEMPORARY CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE METRO STORMWATER MANAGEMENT MANUAL TCP-03



FILTREXX® CONCRETE WASHOUT
NOT TO SCALE



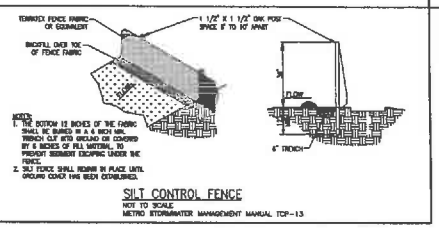
FILTREXX® INLET PROTECTION
NTS



TYPICAL SLOPE SOIL STABILIZATION
N.T.S.

WET SLOPE LINING
N.T.S.

GRASS MATTING PLACEMENT
METRO STORMWATER MANAGEMENT MANUAL PESC-02



SILT CONTROL FENCE
NOT TO SCALE
METRO STORMWATER MANAGEMENT MANUAL TCP-13

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REVISIONS



KYLE A. SCHNEIDER, P.E. TN#121987

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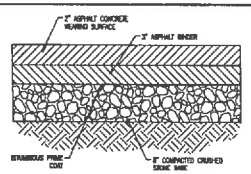
DELTA DEMO HEADQUARTERS
1201 HWY 41 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

DRAWN BY:	CJN
CHECKED BY:	KAS
PROJECT NO:	C04023

CONSTRUCTION DETAILS

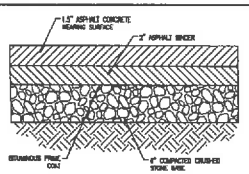
SHEET NUMBER
C2.01

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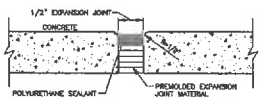
HEAVY DUTY ASPHALT PAVING DETAIL
NOT TO SCALE

VERIFY PAVEMENT AND STONE THICKNESS WITH ANY CURRENT GEOTECH REPORT

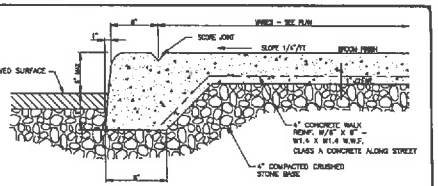


LIGHT DUTY ASPHALT PAVING DETAIL
NOT TO SCALE

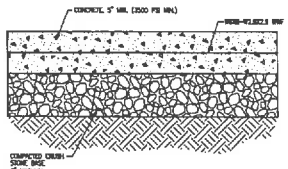
VERIFY PAVEMENT AND STONE THICKNESS WITH ANY CURRENT GEOTECH REPORT



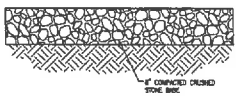
EXPANSION JOINT
NOT TO SCALE



CONCRETE SIDEWALK & HAUNCHED CURB
NOT TO SCALE

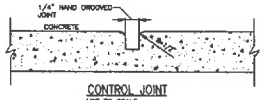


CONCRETE PAVING DETAIL
NOT TO SCALE

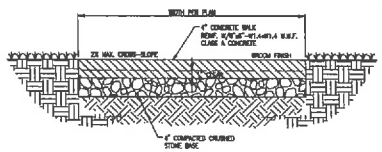


HEAVY DUTY GRAVEL PAVING DETAIL
NOT TO SCALE

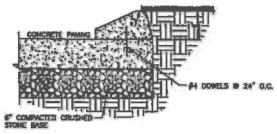
VERIFY PAVEMENT AND STONE THICKNESS WITH ANY CURRENT GEOTECH REPORT



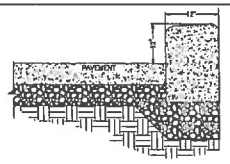
CONTROL JOINT
NOT TO SCALE



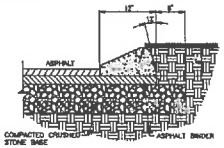
CONCRETE SIDEWALK CROSS SECTION
NOT TO SCALE



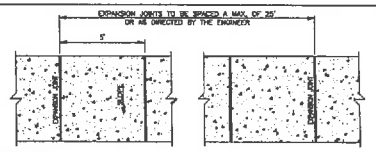
EXTRUDABLE CURB W/CONCRETE PAVING
NOT TO SCALE



POST TYPE CURB DETAIL (AT BUILDING)
NOT TO SCALE

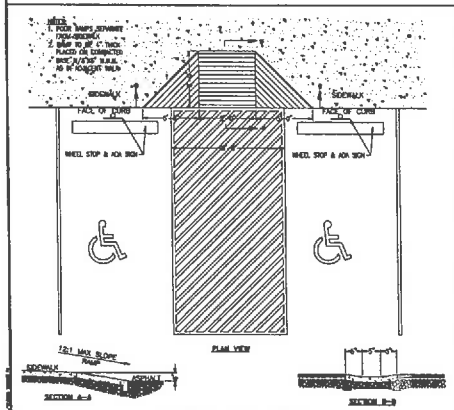


EXTRUDED CURB DETAIL
NOT TO SCALE

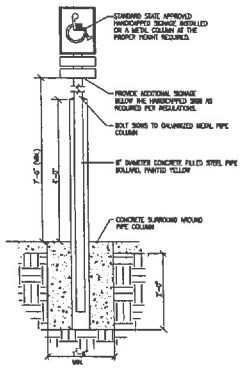


GENERAL NOTES:
1. SIDEWALKS SHALL BE A MIN. OF 4' IN THICKNESS AND MAINTAIN A MIN. OF 3' CLEARANCE THROUGH THE PATH
2. MAXIMUM CROSS SLOPE FOR SIDEWALKS SHALL BE 1:48 (VERTICAL:HORIZONTAL).

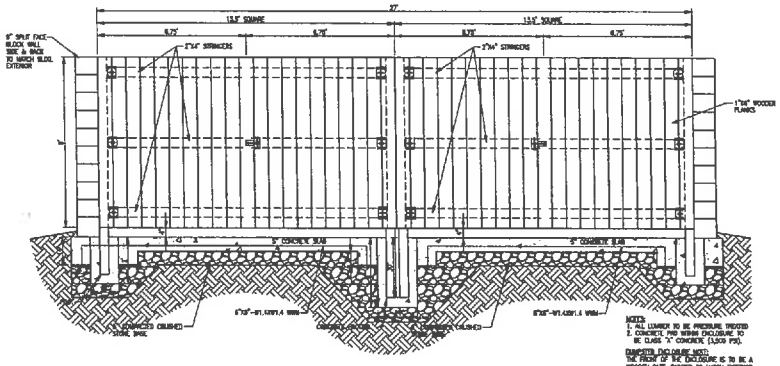
TYPICAL CONCRETE SIDEWALK
NOT TO SCALE



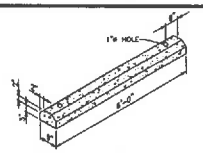
HANDICAP RAMP DETAIL
NOT TO SCALE



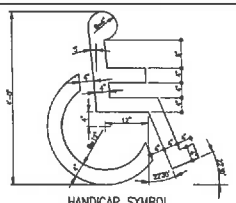
EXTERIOR HANDICAPPED SIGN
NOT TO SCALE



DOUBLE DUMPSTER PAD & ENCLOSURE DETAIL
NOT TO SCALE



TYPICAL PARKING CURB
NOT TO SCALE



HANDICAP SYMBOL
NOT TO SCALE

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2648 TOM AUSTIN HWY., SUITE 3, SPRINGFIELD, TN 37172
PHONE 615.384.0000 FAX 615.384.0001
www.kloberengr.com

NO	BY	DATE	DESCRIPTION

KYLE A. SCHNEIDER, P.E. TN#121697

NOT FOR CONSTRUCTION

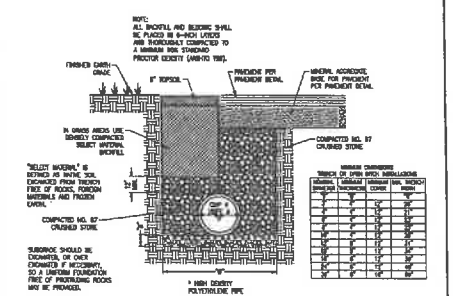
DELTA DEMO HEADQUARTERS
HIGHWAY 60 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

DRAWN BY	CJN
CHECKED BY:	KAS
PROJECT NO.	C03023

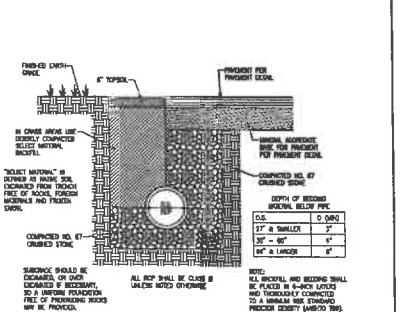
CONSTRUCTION DETAILS

SHEET NUMBER
C2.02

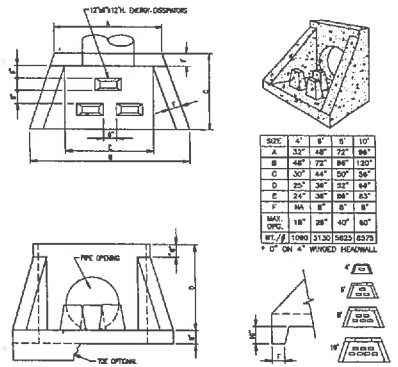
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CMP OR HDPE* BEDDING (NON-PERFORATED)
NOT TO SCALE



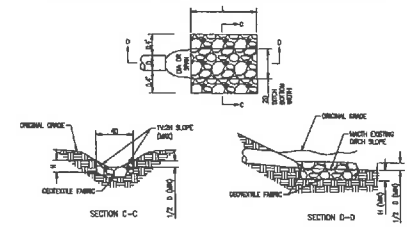
RCP BEDDING - CLASS B
NOT TO SCALE



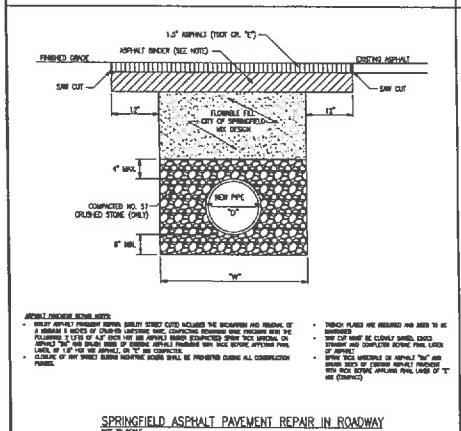
WINGED HEADWALL W/ENERGY DISSIPATORS
NOT TO SCALE CLOUD SW-301 OR EQUAL

OUTLET WITH DITCH
PROTECTIVE APRON DIMENSIONS AND ESTIMATED QUANTITIES

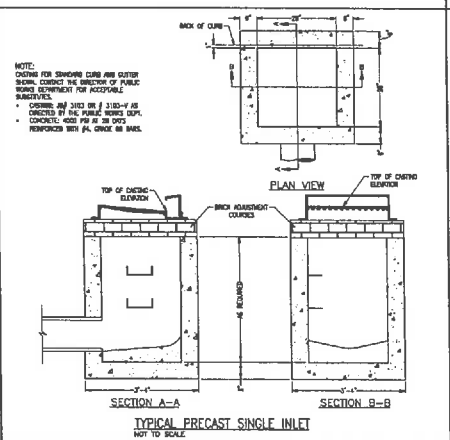
	(W) - OUTLET BOX IN INCHES	RIPRAP CLASS	(L) LENGTH OF APRON IN FEET	(W) DEPTH OF APRON IN FEET	(CY) ESTIMATED RIPRAP QUANTITY	(SY) ESTIMATED GEOTEXTILE FAB.
WITH END SECTION	12	1	4.0	1.0	0.9	5
	18	2	8.0	1.5	2.8	8
	24	2	8.0	1.5	3.8	13
	30	3	12.5	2.0	6.3	24
	36	3	18.0	2.5	12.8	36
	42	4	21.0	2.5	17.3	53
	48	4	24.0	2.5	20.6	86



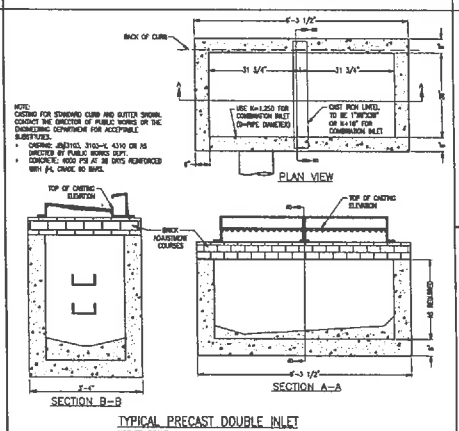
TYPICAL RIP-RAP APRON AT HEADWALL
NOT TO SCALE



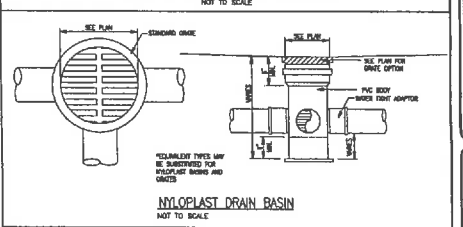
SPRINGFIELD ASPHALT PAVEMENT REPAIR IN ROADWAY
NOT TO SCALE



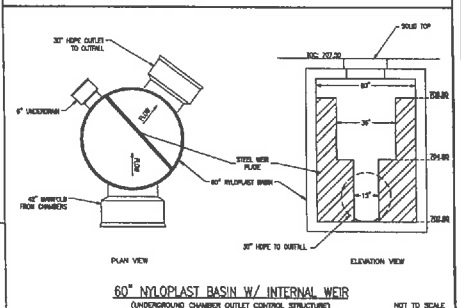
TYPICAL PRECAST SINGLE INLET
NOT TO SCALE



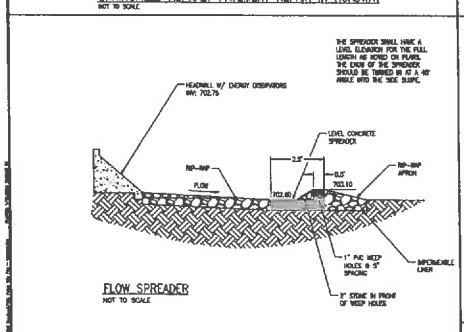
TYPICAL PRECAST DOUBLE INLET
NOT TO SCALE



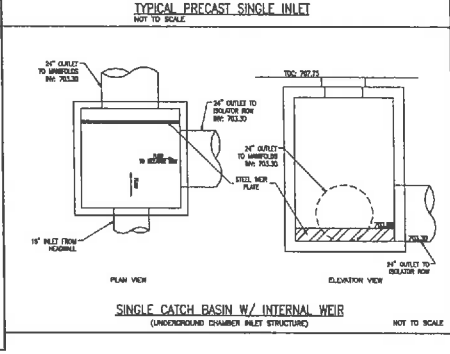
NYLOPLAST DRAIN BASIN
NOT TO SCALE



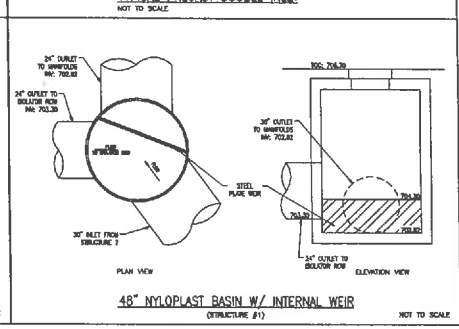
60" NYLOPLAST BASIN W/ INTERNAL WEIR
(UNDERGROUND CHAMBER OUTLET CONTROL STRUCTURE) NOT TO SCALE



FLOW SPREADER
NOT TO SCALE



SINGLE CATCH BASIN W/ INTERNAL WEIR
(UNDERGROUND CHAMBER INLET STRUCTURE) NOT TO SCALE



48" NYLOPLAST BASIN W/ INTERNAL WEIR
(STRUCTURE #1) NOT TO SCALE

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REVISIONS

KYLE A. SCHNEIDER, P.E. TN#121897

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DELTA DEMO HEADQUARTERS

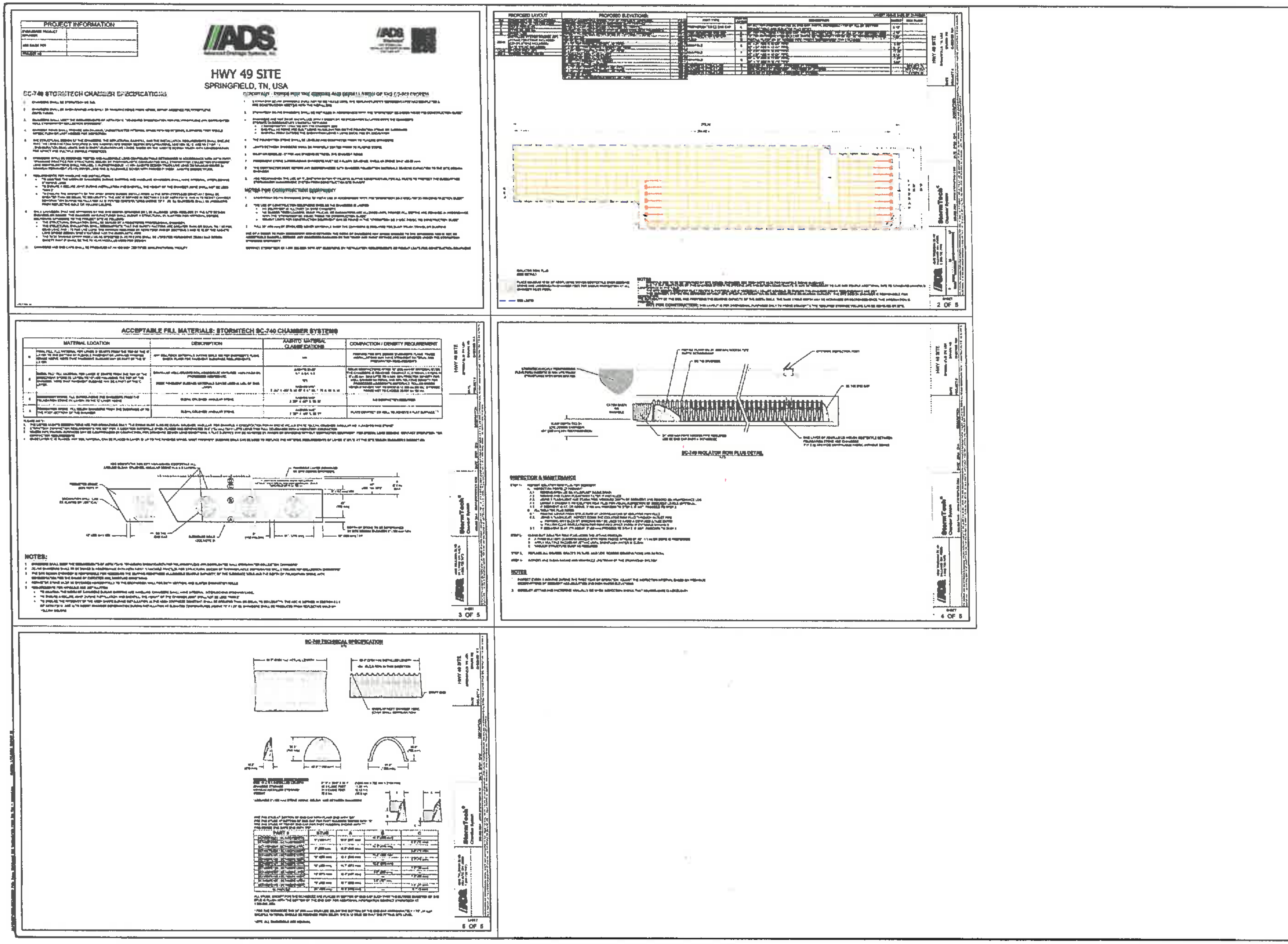
HIGHWAY 49 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

DRAWN BY	CJN
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PROJECT NO.:	C03025

CONSTRUCTION DETAILS

SHEET NUMBER
C2.03

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DELTA DEMO HEADQUARTERS

HIGHWAY 49 WEST
SPRINGFIELD, TN
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CONSTRUCTION DETAILS

SHEET NUMBER
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STORMWATER DESIGN CALCULATIONS

FOR

Delta Demo Headquarters

Highway 49 West
Springfield, TN

January 15th, 2023



Prepared By

KLOBER ENGINEERING SERVICES
3556 Tom Austin Hwy, Suite 1
Springfield, Tennessee 37172
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STORM WATER CALCULATIONS

NOTE: Storm water runoff is calculated using the TR-55 Method. All flow calculations are based on methods established in the Nashville / Davidson County Stormwater Management Manual.

Stormwater Detention:

As seen on DM-1, the current site conditions convey runoff to the north towards the existing site outfall. The existing outfall drains towards Hood Branch, located north of the project. The post developed site was analyzed by conveying a majority of the site runoff to an underground chamber storage bed on the northwest side of the site and will be discharged at the existing outfall point. The intent of this project is to develop retail, office, and warehousing facilities with concrete and asphalt pavement.

The following table illustrates storm water runoff data for pre and post developed conditions for the above referenced property.

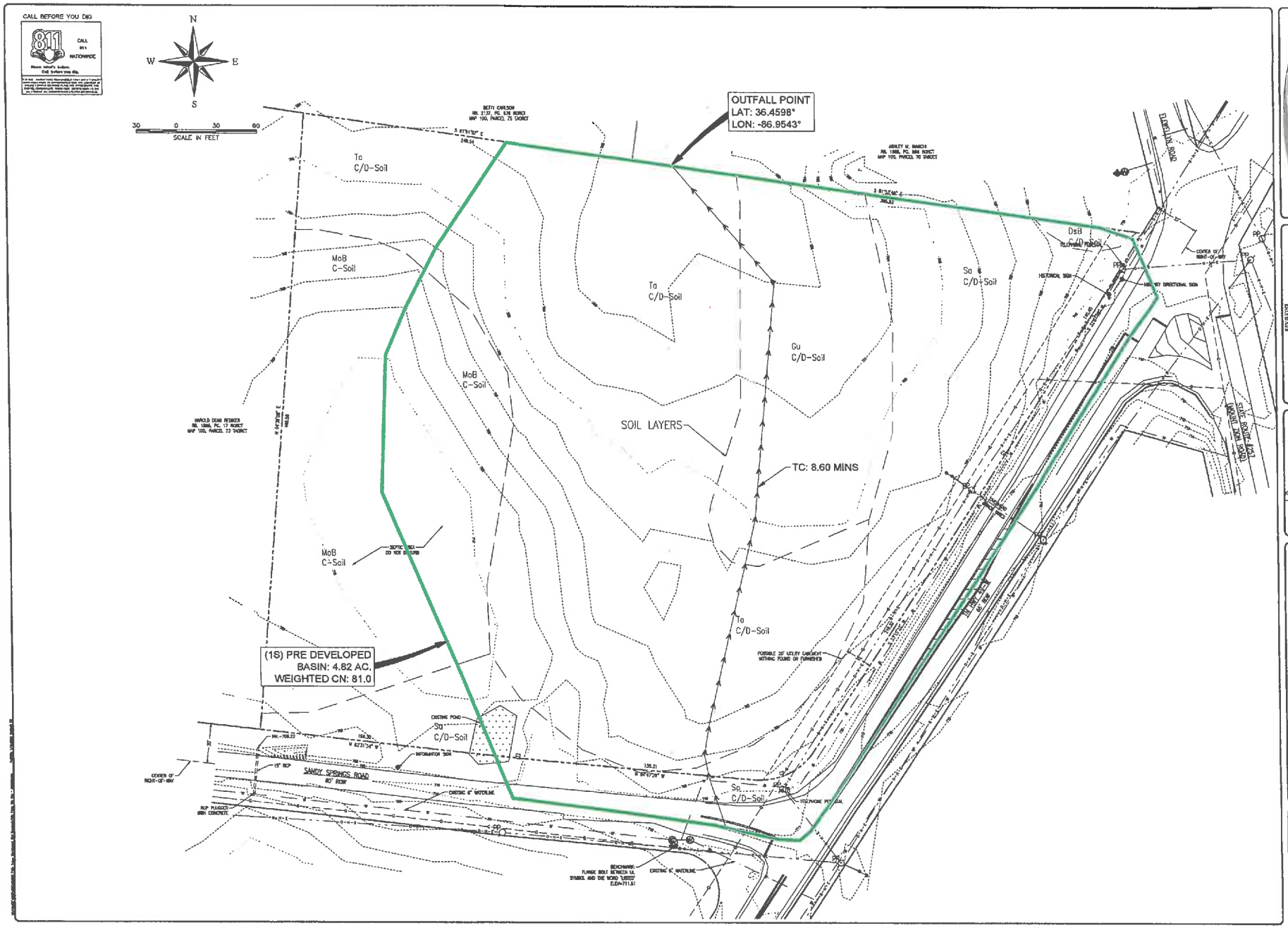
Table 1

Storm Event	Pre-Dev. Runoff (1S) (cfs)	Post Dev. to UG Chambers (2S) (cfs)	UG Chamber Discharge (1P) (cfs)	Post-Dev. Bypass (3S) (cfs)	Total Post Dev. Discharge (1R) (cfs)
2 yr.	11.27	18.75	7.76	0.61	8.03
5 yr.	15.47	23.69	10.24	0.85	10.68
10 yr.	18.96	27.67	12.63	1.05	13.21
25 yr.	23.92	33.24	17.28	1.33	17.94
50 yr.	27.97	37.73	21.37	1.57	22.19
100yr.	32.20	42.38	26.11	1.81	27.14

Table 1: Total Drainage Basin Calculation Results

The proposed 368 underground chambers on this site have been conservatively sized to handle the additional stormwater runoff generated by the site development. A HydroCAD report is attached modeling the behavior of the underground chambers.

PRE-DEVELOPED



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DELTA DEMO HEADQUARTERS

HIGHWAY 49 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

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PRE DEVELOPED DRAINAGE MAP

SHEET NUMBER
DM-1

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Pre Developed Runoff

Subcat Reach Pond Link

Routing Diagram for Philip Palma-Drainage
Prepared by Klober Engineering, Printed 12/15/2023
HydroCAD® 10.20-2g s/n 09895 © 2022 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Pre Developed Runoff

Runoff = 11.27 cfs @ 12.16 hrs, Volume= 0.660 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.56"

Area (ac)	CN	Description
0.321	98	Paved roads w/curbs & sewers, HSG B
0.067	96	Gravel surface, HSG C
0.501	79	50-75% Grass cover, Fair, HSG C
3.928	79	50-75% Grass cover, Fair, HSG C
0.017	98	Water Surface, HSG C
4.834	81	Weighted Average
4.496		93.01% Pervious Area
0.338		6.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0394	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
1.6	435	0.0950	4.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.6	535	Total			

Summary for Subcatchment 1S: Pre Developed Runoff

Runoff = 15.47 cfs @ 12.16 hrs, Volume= 0.913 af, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.35"

Area (ac)	CN	Description
0.321	98	Paved roads w/curbs & sewers, HSG B
0.067	96	Gravel surface, HSG C
0.501	79	50-75% Grass cover, Fair, HSG C
3.928	79	50-75% Grass cover, Fair, HSG C
0.017	98	Water Surface, HSG C
4.834	81	Weighted Average
4.496		93.01% Pervious Area
0.338		6.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0394	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
1.6	435	0.0950	4.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.6	535	Total			

Summary for Subcatchment 1S: Pre Developed Runoff

Runoff = 18.96 cfs @ 12.16 hrs, Volume= 1.126 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.99"

Area (ac)	CN	Description
0.321	98	Paved roads w/curbs & sewers, HSG B
0.067	96	Gravel surface, HSG C
0.501	79	50-75% Grass cover, Fair, HSG C
3.928	79	50-75% Grass cover, Fair, HSG C
0.017	98	Water Surface, HSG C
4.834	81	Weighted Average
4.496		93.01% Pervious Area
0.338		6.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0394	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
1.6	435	0.0950	4.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.6	535	Total			

Summary for Subcatchment 1S: Pre Developed Runoff

Runoff = 23.92 cfs @ 12.16 hrs, Volume= 1.435 af, Depth> 3.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.89"

Area (ac)	CN	Description
0.321	98	Paved roads w/curbs & sewers, HSG B
0.067	96	Gravel surface, HSG C
0.501	79	50-75% Grass cover, Fair, HSG C
3.928	79	50-75% Grass cover, Fair, HSG C
0.017	98	Water Surface, HSG C
4.834	81	Weighted Average
4.496		93.01% Pervious Area
0.338		6.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0394	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
1.6	435	0.0950	4.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.6	535	Total			

Summary for Subcatchment 1S: Pre Developed Runoff

Runoff = 27.97 cfs @ 12.16 hrs, Volume= 1.692 af, Depth> 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.62"

Area (ac)	CN	Description
0.321	98	Paved roads w/curbs & sewers, HSG B
0.067	96	Gravel surface, HSG C
0.501	79	50-75% Grass cover, Fair, HSG C
3.928	79	50-75% Grass cover, Fair, HSG C
0.017	98	Water Surface, HSG C
4.834	81	Weighted Average
4.496		93.01% Pervious Area
0.338		6.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0394	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
1.6	435	0.0950	4.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.6	535	Total			

Summary for Subcatchment 1S: Pre Developed Runoff

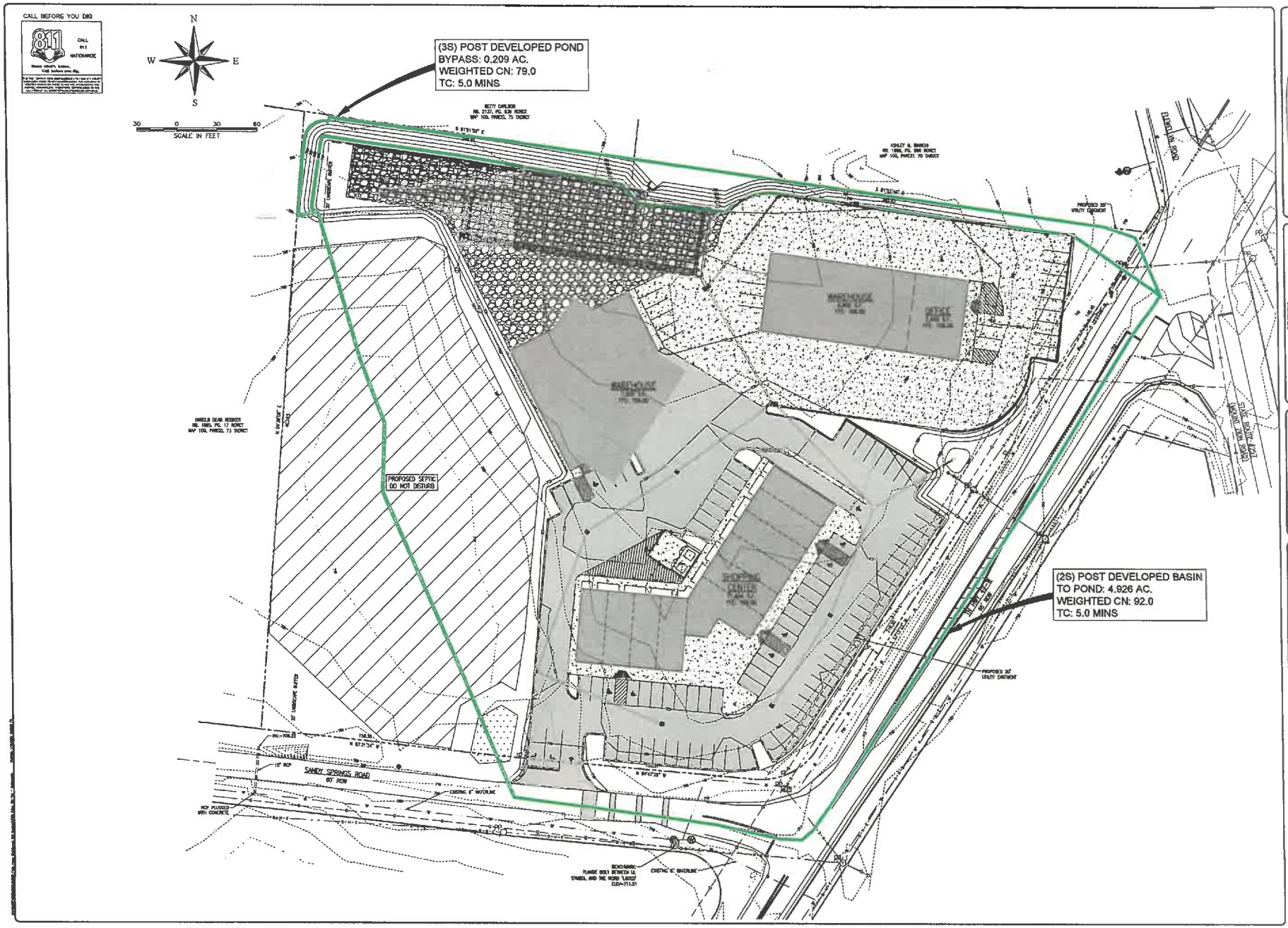
Runoff = 32.20 cfs @ 12.16 hrs, Volume= 1.964 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.38"

Area (ac)	CN	Description
0.321	98	Paved roads w/curbs & sewers, HSG B
0.067	96	Gravel surface, HSG C
0.501	79	50-75% Grass cover, Fair, HSG C
3.928	79	50-75% Grass cover, Fair, HSG C
0.017	98	Water Surface, HSG C
4.834	81	Weighted Average
4.496		93.01% Pervious Area
0.338		6.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0394	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.60"
1.6	435	0.0950	4.62		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.6	535	Total			

POST-DEVELOPED



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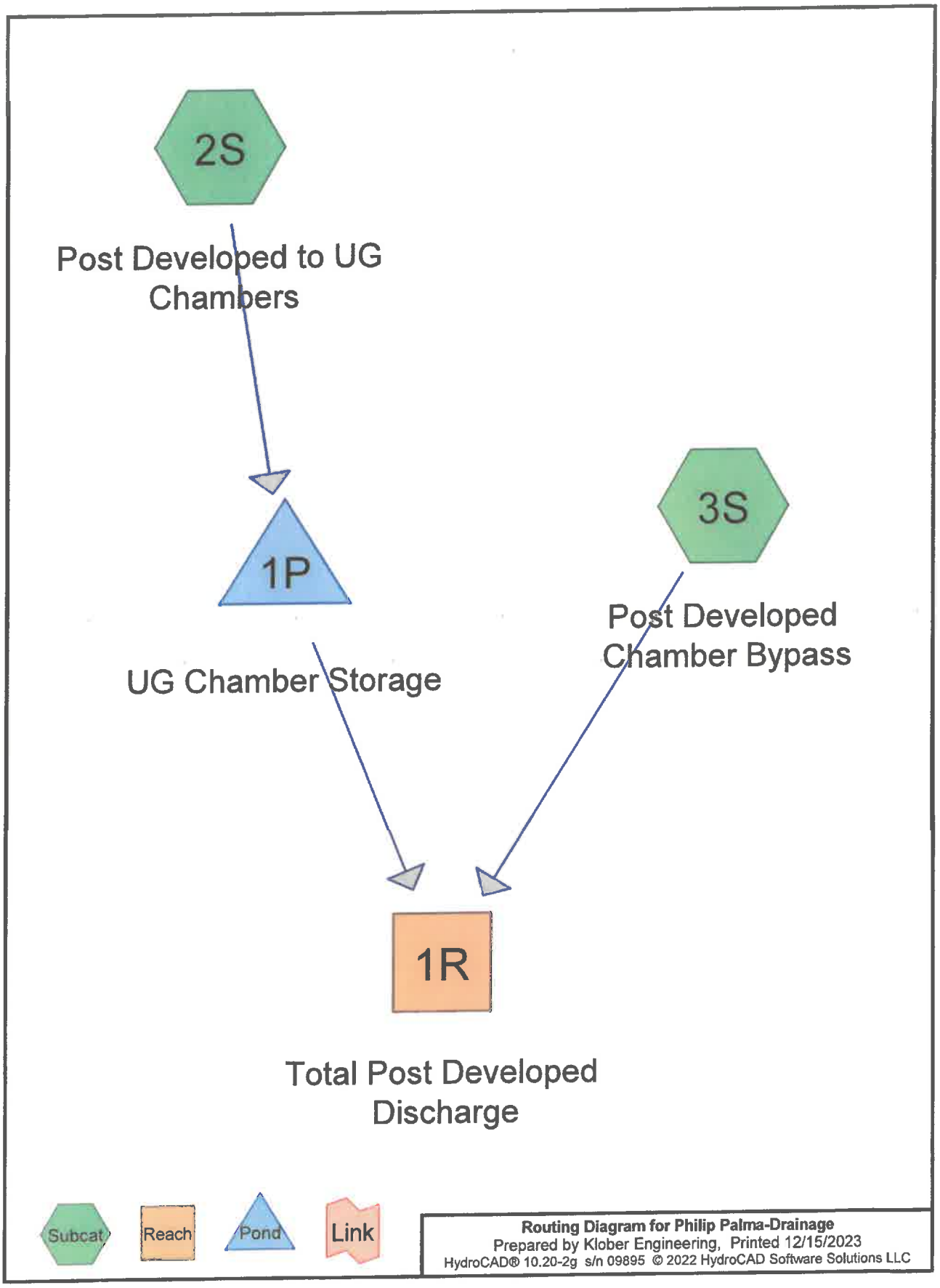
HIGHWAY 64 WEST
SPRINGFIELD, TN
ROBERTSON COUNTY

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CHECKED BY:	KAS
PROJECT NO.	C03023

POST DEVELOPED DRAINAGE MAP

SHEET NUMBER
DM-2

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2S
Post Developed to UG Chambers
1P
UG Chamber Storage
3S
Post Developed Chamber Bypass
1R
Total Post Developed Discharge
Subcat
Reach
Pond
Link
Routing Diagram for Philip Palma-Drainage
Prepared by Klober Engineering, Printed 12/15/2023
HydroCAD® 10.20-2g s/n 09895 © 2022 HydroCAD Software Solutions LLC

Summary for Subcatchment 2S: Post Developed to UG Chambers

Runoff = 18.75 cfs @ 12.11 hrs, Volume= 1.049 af, Depth> 2.56"
Routed to Pond 1P : UG Chamber Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.56"

	Area (ac)	CN	Description
*	0.897	98	Concrete
	0.642	98	Roofs, HSG C
	1.553	79	50-75% Grass cover, Fair, HSG C
	1.834	98	Paved parking, HSG C
	4.926	92	Weighted Average
	1.553		31.53% Pervious Area
	3.373		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: Post Developed Chamber Bypass

Runoff = 0.61 cfs @ 12.12 hrs, Volume= 0.032 af, Depth> 1.50"
Routed to Reach 1R : Total Post Developed Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 2-Year Rainfall=3.56"

Area (ac)	CN	Description
0.253	79	50-75% Grass cover, Fair, HSG C
0.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 1R: Total Post Developed Discharge

Inflow Area = 5.179 ac, 65.13% Impervious, Inflow Depth > 2.50" for 2-Year event
Inflow = 8.03 cfs @ 12.24 hrs, Volume= 1.077 af
Outflow = 8.03 cfs @ 12.24 hrs, Volume= 1.077 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: UG Chamber Storage

Inflow Area = 4.926 ac, 68.47% Impervious, Inflow Depth > 2.56" for 2-Year event
Inflow = 18.75 cfs @ 12.11 hrs, Volume= 1.049 af
Outflow = 7.76 cfs @ 12.25 hrs, Volume= 1.046 af, Atten= 59%, Lag= 8.2 min
Primary = 7.76 cfs @ 12.25 hrs, Volume= 1.046 af
Routed to Reach 1R : Total Post Developed Discharge

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 704.35' @ 12.25 hrs Surf.Area= 14,108 sf Storage= 12,379 cf

Plug-Flow detention time= 23.1 min calculated for 1.046 af (100% of inflow)
Center-of-Mass det. time= 21.7 min (781.7 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1	703.00'	12,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 49,378 cf Overall - 16,906 cf Embedded = 32,472 cf x 40.0% Voids
#2	703.50'	16,906 cf	**ADS_StormTech SC-740 +Cap** x 368 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		29,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
703.00	14,108	0	0
706.50	14,108	49,378	49,378

Device	Routing	Invert	Outlet Devices
#1	Primary	702.80'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 702.80' / 702.75' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	702.80'	**15.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	704.80'	**3.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=7.76 cfs @ 12.25 hrs HW=704.35' (Free Discharge)
↑—**1=Culvert** (Passes 7.76 cfs of 9.58 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 7.76 cfs @ 4.00 fps)
—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 2S: Post Developed to UG Chambers

Runoff = 23.69 cfs @ 12.11 hrs, Volume= 1.347 af, Depth> 3.28"
Routed to Pond 1P : UG Chamber Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.35"

	Area (ac)	CN	Description
*	0.897	98	Concrete
	0.642	98	Roofs, HSG C
	1.553	79	50-75% Grass cover, Fair, HSG C
	1.834	98	Paved parking, HSG C
	4.926	92	Weighted Average
	1.553		31.53% Pervious Area
	3.373		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: Post Developed Chamber Bypass

Runoff = 0.85 cfs @ 12.12 hrs, Volume= 0.044 af, Depth> 2.10"
Routed to Reach 1R : Total Post Developed Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 5-Year Rainfall=4.35"

Area (ac)	CN	Description
0.253	79	50-75% Grass cover, Fair, HSG C
0.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 1R: Total Post Developed Discharge

Inflow Area = 5.179 ac, 65.13% Impervious, Inflow Depth > 3.22" for 5-Year event
Inflow = 10.68 cfs @ 12.22 hrs, Volume= 1.388 af
Outflow = 10.68 cfs @ 12.22 hrs, Volume= 1.388 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: UG Chamber Storage

Inflow Area = 4.926 ac, 68.47% Impervious, Inflow Depth > 3.28" for 5-Year event
Inflow = 23.69 cfs @ 12.11 hrs, Volume= 1.347 af
Outflow = 10.24 cfs @ 12.24 hrs, Volume= 1.343 af, Atten= 57%, Lag= 7.7 min
Primary = 10.24 cfs @ 12.24 hrs, Volume= 1.343 af
Routed to Reach 1R : Total Post Developed Discharge

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 704.67' @ 12.24 hrs Surf.Area= 14,108 sf Storage= 15,719 cf

Plug-Flow detention time= 23.6 min calculated for 1.339 af (99% of inflow)
Center-of-Mass det. time= 22.2 min (777.2 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1	703.00'	12,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 49,378 cf Overall - 16,906 cf Embedded = 32,472 cf x 40.0% Voids
#2	703.50'	16,906 cf	**ADS_StormTech SC-740 +Cap** x 368 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		29,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
703.00	14,108	0	0
706.50	14,108	49,378	49,378

Device	Routing	Invert	Outlet Devices
#1	Primary	702.80'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 702.80' / 702.75' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	702.80'	**15.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	704.80'	**3.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=10.21 cfs @ 12.24 hrs HW=704.66' (Free Discharge)
↑—**1=Culvert** (Passes 10.21 cfs of 13.13 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 10.21 cfs @ 4.38 fps)
—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 2S: Post Developed to UG Chambers

Runoff = 27.67 cfs @ 12.11 hrs, Volume= 1.591 af, Depth> 3.87"
Routed to Pond 1P : UG Chamber Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.99"

	Area (ac)	CN	Description
*	0.897	98	Concrete
	0.642	98	Roofs, HSG C
	1.553	79	50-75% Grass cover, Fair, HSG C
	1.834	98	Paved parking, HSG C
	4.926	92	Weighted Average
	1.553		31.53% Pervious Area
	3.373		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: Post Developed Chamber Bypass

Runoff = 1.05 cfs @ 12.12 hrs, Volume= 0.055 af, Depth> 2.62"
Routed to Reach 1R : Total Post Developed Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.99"

Area (ac)	CN	Description
0.253	79	50-75% Grass cover, Fair, HSG C
0.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 1R: Total Post Developed Discharge

Inflow Area = 5.179 ac, 65.13% Impervious, Inflow Depth > 3.80" for 10-Year event
Inflow = 13.21 cfs @ 12.22 hrs, Volume= 1.641 af
Outflow = 13.21 cfs @ 12.22 hrs, Volume= 1.641 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: UG Chamber Storage

Inflow Area = 4.926 ac, 68.47% Impervious, Inflow Depth > 3.87" for 10-Year event
Inflow = 27.67 cfs @ 12.11 hrs, Volume= 1.591 af
Outflow = 12.63 cfs @ 12.23 hrs, Volume= 1.585 af, Atten= 54%, Lag= 7.1 min
Primary = 12.63 cfs @ 12.23 hrs, Volume= 1.585 af
Routed to Reach 1R : Total Post Developed Discharge

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 704.92' @ 12.23 hrs Surf.Area= 14,108 sf Storage= 18,283 cf

Plug-Flow detention time= 23.7 min calculated for 1.580 af (99% of inflow)
Center-of-Mass det. time= 22.2 min (774.3 - 752.1)

Volume	Invert	Avail.Storage	Storage Description
#1	703.00'	12,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 49,378 cf Overall - 16,906 cf Embedded = 32,472 cf x 40.0% Voids
#2	703.50'	16,906 cf	**ADS_StormTech SC-740 +Cap** x 368 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		29,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
703.00	14,108	0	0
706.50	14,108	49,378	49,378

Device	Routing	Invert	Outlet Devices
#1	Primary	702.80'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 702.80' / 702.75' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	702.80'	**15.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	704.80'	**3.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=12.55 cfs @ 12.23 hrs HW=704.91' (Free Discharge)
↑—**1=Culvert** (Passes 12.55 cfs of 16.18 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 12.18 cfs @ 4.87 fps)
—**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.37 cfs @ 1.10 fps)

Summary for Subcatchment 2S: Post Developed to UG Chambers

Runoff = 33.24 cfs @ 12.11 hrs, Volume= 1.933 af, Depth> 4.71"
Routed to Pond 1P : UG Chamber Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.89"

	Area (ac)	CN	Description
*	0.897	98	Concrete
	0.642	98	Roofs, HSG C
	1.553	79	50-75% Grass cover, Fair, HSG C
	1.834	98	Paved parking, HSG C
	4.926	92	Weighted Average
	1.553		31.53% Pervious Area
	3.373		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: Post Developed Chamber Bypass

Runoff = 1.33 cfs @ 12.12 hrs, Volume= 0.071 af, Depth> 3.37"
Routed to Reach 1R : Total Post Developed Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=5.89"

Area (ac)	CN	Description
0.253	79	50-75% Grass cover, Fair, HSG C
0.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 1R: Total Post Developed Discharge

Inflow Area = 5.179 ac, 65.13% Impervious, Inflow Depth > 4.63" for 25-Year event
Inflow = 17.94 cfs @ 12.21 hrs, Volume= 1.997 af
Outflow = 17.94 cfs @ 12.21 hrs, Volume= 1.997 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: UG Chamber Storage

Inflow Area = 4.926 ac, 68.47% Impervious, Inflow Depth > 4.71" for 25-Year event
Inflow = 33.24 cfs @ 12.11 hrs, Volume= 1.933 af
Outflow = 17.28 cfs @ 12.22 hrs, Volume= 1.925 af, Atten= 48%, Lag= 6.3 min
Primary = 17.28 cfs @ 12.22 hrs, Volume= 1.925 af
Routed to Reach 1R : Total Post Developed Discharge

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 705.27' @ 12.22 hrs Surf.Area= 14,108 sf Storage= 21,576 cf

Plug-Flow detention time= 23.5 min calculated for 1.919 af (99% of inflow)
Center-of-Mass det. time= 21.6 min (770.3 - 748.8)

Volume	Invert	Avail.Storage	Storage Description
#1	703.00'	12,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 49,378 cf Overall - 16,906 cf Embedded = 32,472 cf x 40.0% Voids
#2	703.50'	16,906 cf	**ADS_StormTech SC-740 +Cap** x 368 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		29,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
703.00	14,108	0	0
706.50	14,108	49,378	49,378

Device	Routing	Invert	Outlet Devices
#1	Primary	702.80'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 702.80' / 702.75' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	702.80'	**15.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	704.80'	**3.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=16.99 cfs @ 12.22 hrs HW=705.25' (Free Discharge)
↑—**1=Culvert** (Passes 16.99 cfs of 20.36 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 14.15 cfs @ 5.66 fps)
—**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.83 cfs @ 2.18 fps)

Summary for Subcatchment 2S: Post Developed to UG Chambers

Runoff = 37.73 cfs @ 12.11 hrs, Volume= 2.212 af, Depth> 5.39"
Routed to Pond 1P : UG Chamber Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.62"

	Area (ac)	CN	Description
*	0.897	98	Concrete
	0.642	98	Roofs, HSG C
	1.553	79	50-75% Grass cover, Fair, HSG C
	1.834	98	Paved parking, HSG C
	4.926	92	Weighted Average
	1.553		31.53% Pervious Area
	3.373		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: Post Developed Chamber Bypass

Runoff = 1.57 cfs @ 12.12 hrs, Volume= 0.084 af, Depth> 3.99"
Routed to Reach 1R : Total Post Developed Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 50-Year Rainfall=6.62"

Area (ac)	CN	Description
0.253	79	50-75% Grass cover, Fair, HSG C
0.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 1R: Total Post Developed Discharge

Inflow Area = 5.179 ac, 65.13% Impervious, Inflow Depth > 5.30" for 50-Year event
Inflow = 22.19 cfs @ 12.20 hrs, Volume= 2.286 af
Outflow = 22.19 cfs @ 12.20 hrs, Volume= 2.286 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: UG Chamber Storage

Inflow Area = 4.926 ac, 68.47% Impervious, Inflow Depth > 5.39" for 50-Year event
Inflow = 37.73 cfs @ 12.11 hrs, Volume= 2.212 af
Outflow = 21.37 cfs @ 12.21 hrs, Volume= 2.202 af, Atten= 43%, Lag= 5.8 min
Primary = 21.37 cfs @ 12.21 hrs, Volume= 2.202 af
Routed to Reach 1R : Total Post Developed Discharge

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 705.53' @ 12.21 hrs Surf.Area= 14,108 sf Storage= 23,840 cf

Plug-Flow detention time= 23.1 min calculated for 2.202 af (100% of inflow)
Center-of-Mass det. time= 21.0 min (767.7 - 746.7)

Volume	Invert	Avail.Storage	Storage Description
#1	703.00'	12,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 49,378 cf Overall - 16,906 cf Embedded = 32,472 cf x 40.0% Voids
#2	703.50'	16,906 cf	**ADS_StormTech SC-740 +Cap** x 368 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		29,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
703.00	14,108	0	0
706.50	14,108	49,378	49,378

Device	Routing	Invert	Outlet Devices
#1	Primary	702.80'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 702.80' / 702.75' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	702.80'	**15.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	704.80'	**3.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=21.11 cfs @ 12.21 hrs HW=705.51' (Free Discharge)
↑—**1=Culvert** (Passes 21.11 cfs of 23.66 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 15.51 cfs @ 6.20 fps)
—**3=Sharp-Crested Rectangular Weir** (Weir Controls 5.60 cfs @ 2.76 fps)

Summary for Subcatchment 2S: Post Developed to UG Chambers

Runoff = 42.38 cfs @ 12.11 hrs, Volume= 2.502 af, Depth> 6.10"
Routed to Pond 1P : UG Chamber Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.38"

	Area (ac)	CN	Description
*	0.897	98	Concrete
	0.642	98	Roofs, HSG C
	1.553	79	50-75% Grass cover, Fair, HSG C
	1.834	98	Paved parking, HSG C
	4.926	92	Weighted Average
	1.553		31.53% Pervious Area
	3.373		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 3S: Post Developed Chamber Bypass

Runoff = 1.81 cfs @ 12.11 hrs, Volume= 0.098 af, Depth> 4.66"
Routed to Reach 1R : Total Post Developed Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=7.38"

Area (ac)	CN	Description
0.253	79	50-75% Grass cover, Fair, HSG C
0.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 1R: Total Post Developed Discharge

Inflow Area = 5.179 ac, 65.13% Impervious, Inflow Depth > 6.00" for 100-Year event
Inflow = 27.14 cfs @ 12.20 hrs, Volume= 2.588 af
Outflow = 27.14 cfs @ 12.20 hrs, Volume= 2.588 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: UG Chamber Storage

Inflow Area = 4.926 ac, 68.47% Impervious, Inflow Depth > 6.10" for 100-Year event
Inflow = 42.38 cfs @ 12.11 hrs, Volume= 2.502 af
Outflow = 26.11 cfs @ 12.20 hrs, Volume= 2.490 af, Atten= 38%, Lag= 5.3 min
Primary = 26.11 cfs @ 12.20 hrs, Volume= 2.490 af
Routed to Reach 1R : Total Post Developed Discharge

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 705.81' @ 12.20 hrs Surf.Area= 14,108 sf Storage= 25,916 cf

Plug-Flow detention time= 22.7 min calculated for 2.481 af (99% of inflow)
Center-of-Mass det. time= 20.4 min (765.3 - 744.9)

Volume	Invert	Avail.Storage	Storage Description
#1	703.00'	12,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 49,378 cf Overall - 16,906 cf Embedded = 32,472 cf x 40.0% Voids
#2	703.50'	16,906 cf	**ADS_StormTech SC-740 +Cap** x 368 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		29,895 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
703.00	14,108	0	0
706.50	14,108	49,378	49,378

Device	Routing	Invert	Outlet Devices
#1	Primary	702.80'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 702.80' / 702.75' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	702.80'	**15.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	704.80'	**3.0' long x 2.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=26.08 cfs @ 12.20 hrs HW=705.81' (Free Discharge)
↑—**1=Culvert** (Passes 26.08 cfs of 27.05 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 16.86 cfs @ 6.74 fps)
—**3=Sharp-Crested Rectangular Weir** (Weir Controls 9.22 cfs @ 3.28 fps)

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ROBERTSON COUNTY

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CHECKED BY	KAS
PROJECT NO	0743

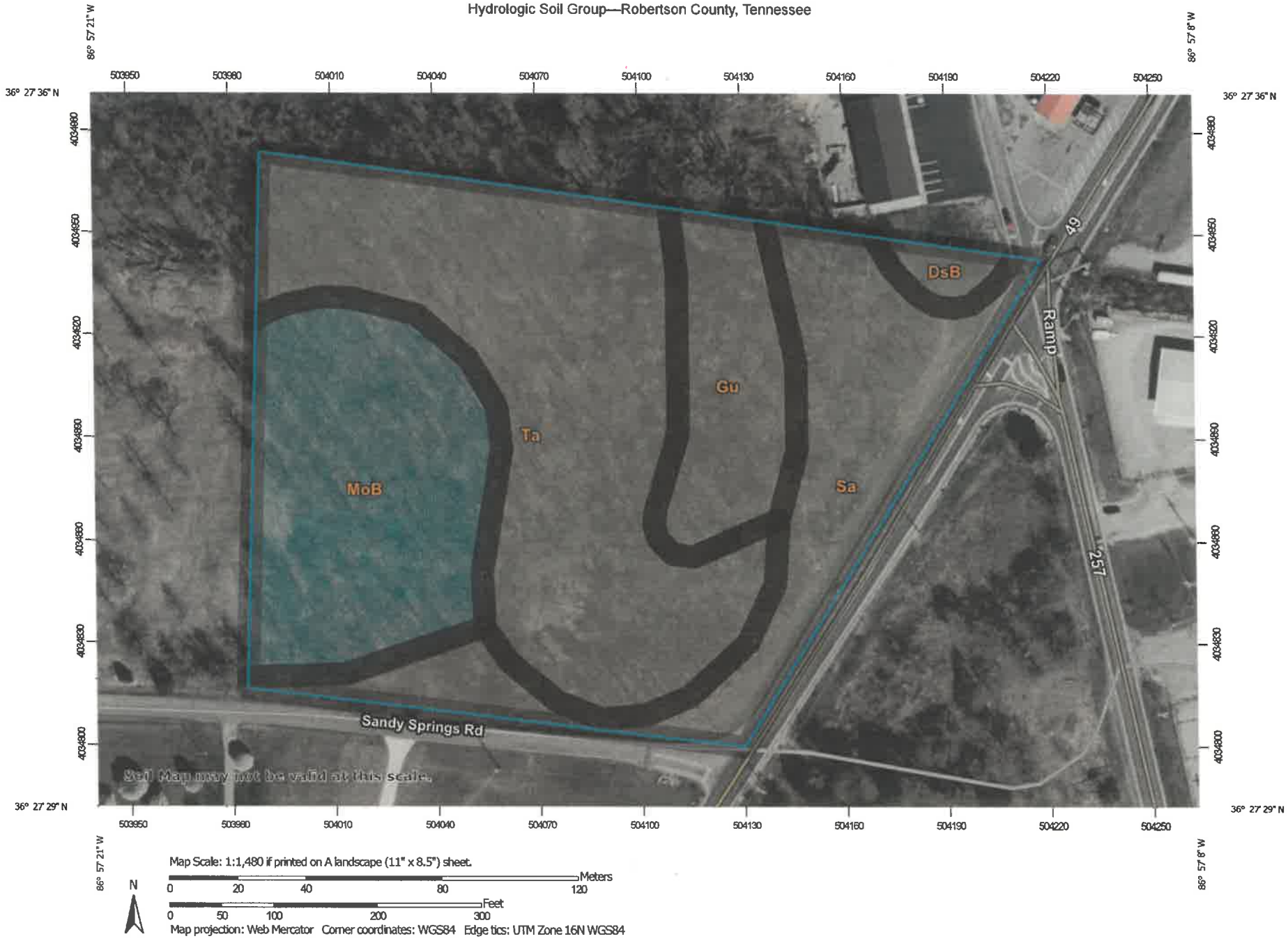
SUBCATCHMENT MAP

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Hydrologic Soil Group—Robertson County, Tennessee



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Robertson County, Tennessee
Survey Area Data: Version 21, Sep 12, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 21, 2021—Mar 30, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DsB	Dickson silt loam, 2 to 5 percent slopes	C/D	0.1	1.7%
Gu	Guthrie silt loam, 0 to 2 percent slopes, frequently ponded	C/D	0.8	10.9%
MoB	Mountview silt loam, 2 to 5 percent slopes	C	1.7	24.0%
Sa	Sango silt loam, 0 to 2 percent slopes	C/D	1.6	22.7%
Ta	Taft silt loam, 0 to 2 percent slopes	C/D	3.0	40.7%
Totals for Area of Interest			**7.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

EARL R. MAYO **CONSULTING ENGINEER AND SURVEYOR**
119 SUESAND COURT PLEASANT VIEW, TN 37146 (615)522-4704

January 18, 2024

Hunter Mantooth
Chief Deputy, Planning
Robertson County Planning and Zoning
527 South Brown Street
Springfield, Tennessee 37172

RE: Review of Revised Delta Demo Headquarters Site Plan

Dear Hunter:

I have reviewed the referenced revised site plan that I received on January 17, 2024 for the January 25, 2024 Planning Commission meeting. All of my previous comments have been addressed.

Only a very cursory review has been performed of these documents in order to get an overall sense of general compliance with the surveying and engineering requirements contained in the Robertson County Subdivision Regulations. No planning related review was performed. This review is not intended as a check of accuracy of the documents or compliance with other state or federal laws and regulations, including Erosion Protection and Sediment Control design that was not reviewed by me but is to be reviewed by TDEC. No liability for the correctness or completeness of design or surveying performed by others is assumed by me or Robertson County by my review of these documents.

Please contact me if you have any questions or comments. Thank you for the opportunity to serve you.

Sincerely,

Rick Mayo, PE, RLS