



The Columbia Planning Commission Development Review Committee will meet on Tuesday, May 9, 2023 at 10:00 AM in Conference Room A, basement level, City Hall, to consider the following:

I. Items for Additional Review

1. Case #23-0018 Request from Chapdelaine and Associates for Preliminary Plat and Site Development Plan approval for 35 lots in Fieldstone Farms Section 5 Phase 2 off Williamsport Pike and [Golden Place](#).

Documents:

1. 23-0018_Preliminary Plat Ph 2_4-17-2023
2. 23-0018_DRC Response to Comments_4-17-2023
3. 23-0018_Project Narrative_4-17-2023
4. 23-0018_C2.2 Fieldstone Farm Road Plan Profile_4-17-2023
5. 23-0018_C3.0 Fieldstone Farm Phase I Erosion Control Plan_4-17-2023
6. 23-0018_C3.1 Fieldstone Farm Phase I Erosion Control Plan_4-17-2023
7. 23-0018_C3.2 Fieldstone Farm Phase II Erosion Control Plan_4-17-2023
8. 23-0018_C3.3 Fieldstone Farm Phase II Erosion Control Plan_4-17-2023
9. 23-0018_C3.4 Fieldstone Farm Phase III Erosion Control Plan_4-17-2023
10. 23-0018_C3.5 Fieldstone Farm Phase III Erosion Control Plan_4-17-2023
11. 23-0018_C4.0 Fieldstone Farm Details_4-17-2023
12. 23-0018_C4.1 Fieldstone Farm Details_4-17-2023
13. 23-0018_C4.2 Fieldstone Farm Details_4-17-2023
14. 23-0018_D1.0 Fieldstone Farm Pre developed Conditions_4-17-2023
15. 23-0018_D2.0 Fieldstone Farm Post developed Conditions_4-17-2023
16. 23-0018_C0.0 Fieldstone Farm Cover_4-17-2023
17. 23-0018_C0.1 Fieldstone Farm Notes_4-17-2023
18. 23-0018_C0.2 Fieldstone Farm Typical Roadway Section_4-17-2023
19. 23-0018_C1.0 Fieldstone Farm Layout Plan_4-17-2023
20. 23-0018_C1.1 Fieldstone Farm Layout Plan_4-17-2023

21. 23-0018_C1.2 Fieldstone Farm Utilitiest Plan_4-17-2023
22. 23-0018_C1.3 Fieldstone Farm Utilitiest Plan_4-17-2023
23. 23-0018_C1.4 Fieldstone Farm sewer Plan Profile_4-17-2023
24. 23-0018_C1.5 Fieldstone Farm Sewer Main Plan Profile_4-17-2023
25. 23-0018_C2.0 Fieldstone Farm Grading and Drainage Plan_4-17-2023
26. 23-0018_C2.1 Fieldstone Farm Grading and Drainage Plan_4-17-2023
27. 23-0018_C2.1 Fieldstone Farm Road Plan and Profile_4-17-2023

23-0018 - January 17th Submittal

Documents:

1. 23-0018_FFfieldstone Farms Phase 2 Preliminary Plat_1-17-2023
2. 23-0018_Fieldstone Application and Fee Payment_1-17-2023

II. Items For Review

1. 23-0104 - Request from Larry Owens for comprehensive plan amendment from Urban Neighborhood to Suburban Neighborhood along with rezoning from CD-3L (Neighborhood Large Lot Character District) to CD-3 (Neighborhood Character District) at [1205 East End Street](#).

Documents:

1. 23-0104_Application_4-17-2023
 2. 23-0104_Checklist_4-17-2023
 3. 23-0104_Concept Plan_4-17-2023
 4. 23-0104_Water Availability Letter_4-17-2023
 5. 23-0104_Hydrant Analysis Report_4-17-2023
2. 23-0129 - Request from Chet Rhodes for revision of a Final PUD Master Plan during initial construction forTenn Pin Alley located at [730 Mooresville Pike](#).

Documents:

1. 23-0129_Application_4-17-2023
 2. 23-0129_PUD Plan_4-17-2023
3. 23-0134 - Request from Nelson Crowe to correct a mistake on the official zoning map and rezone property from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District) at [Tax Map 41 Parcel 15 at Cleburne Road and Freehand Lane](#).

Documents:

1. 23-0134_Application_4-17-2023
 2. 23-0134_Boundary Map_4-17-2023
 3. 23-0134_Zoning Ord 3638_4-17-2023
 4. 23-0134_Zoning Ord 4400_4-17-2023
4. 23-0136 -
Request from Greg Gamble for rezoning of [Tax Map 90 Parcel 7.08 off River Road](#) from MU-PUD (Planned Unit Development - Mixed Use) to CD-5 (Urban Center Character District).

Documents:

1. 23-0136_Application_4-17-2023
 2. 23-0136_Concept Plan_4-17-2023
 3. 23-0136_Property Description_4-17-2023
 4. 23-0136_Water Availability Letter_4-17-2023
 5. 23-0136_Hydrant Analysis Report_4-17-2023
 6. 23-0136_Wastewater Letter_4-17-2023
5. 23-0138 - Request from Allen O'Leary for Final Plat approval with surety for Drumwright Phase 2A consisting of 29 lots off [Scooter Street and Lyman Ridge Road](#).

Documents:

1. 23-0138_Application_4-17-2023
 2. 23-0138_Submittal Letter_4-17-2023
 3. 23-0138_Drumwright Phase 2A - Final Plat_4-17-2023
6. 23-0140 - Request from Allen O'Leary for Final Plat approval with surety for Drumwright Phase 2B consisting of 14 lots off [Steadman Street and Lyman Ridge Road](#).

Documents:

1. 23-0140_Final Plat_4-17-2023
2. 23-0140_Submittal Letter_4-17-2023
3. 23-0140_Application_4-17-2023

7. 23-0141 -
Request from Allen O'Leary for Final Plat approval with surety for Drumwright Phase 2C consisting of 20 lots off [Sage Meadows Street and Jacobs Valley Court](#).

Documents:

1. Final Plat v1
 2. Submittal Letter
 3. Application
8. 23-0142 - Request from Allen O'Leary for Final Plat approval with surety for Drumwright 2D consisting of 51 townhome units off [Drumwright Way and Fordham Street](#).

Documents:

1. 23-0142_Final Plat_4-17-2023
 2. 23-0142_Submittal Letter_4-17-2023
 3. 23-0142_Application_4-17-2023
9. 23-0144 - Request from Joseph Ahler for Preliminary Plat and Development Plan approval for Highland Pointe at Bear Creek located at [1451 Lasea Road](#).

Documents:

1. 23-0144_Application_4-17-2023
 2. 23-0144_Preliminary Plat_4-17-2023
 3. 23-0144_Traffic Impact Study_Oct-2021_4-17-2023
 4. 23-0144_Water Availability Letter_4-17-2023
 5. 23-0144_Wastewater Letter_4-17-2023
- 10 23-0145 - Request from Adam Crunk for Preliminary PUD Master Plan for Honey Farm Townhomes consisting of 197 units off [Honey Farm Way](#).

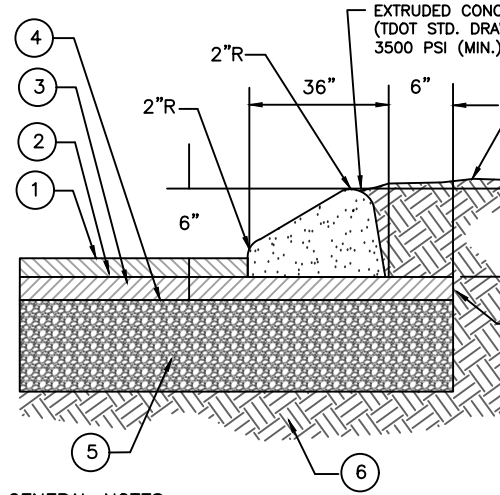
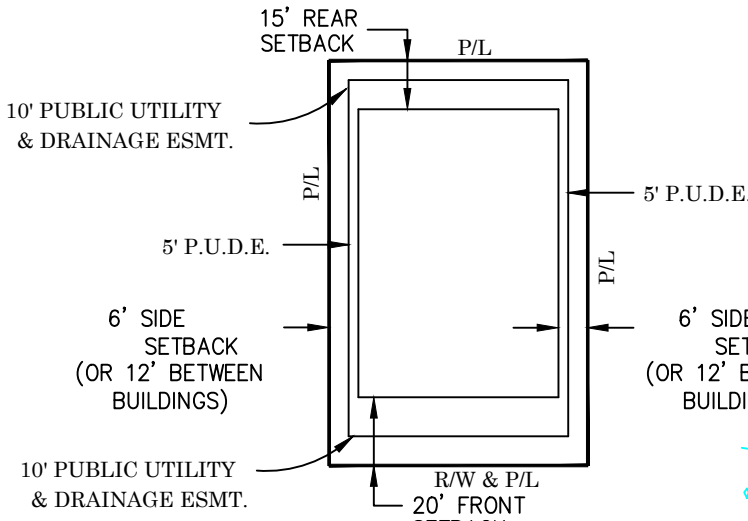
Documents:

1. 23-0145_Application_4-17-2023
2. 23-0145_PUD Plan_4-17-2023
3. 23-0145_Checklist_4-17-2023
4. 23-0145_Legal Description_4-17-2023
5. 23-0145_Owner Statement_4-17-2023

6. 23-0145_TIS Letter of Commitment_4-17-2023
7. 23-0145_Sewer Capacity_4-17-2023
8. 23-0145_Water Availability Letter_4-17-2023

- GENERAL NOTES
- 1.) THE PURPOSE OF THIS PLAT IS TO CREATE A 31 LOT SUBDIVISION.
 - 2.) ALL DISTANCES SHOWN HEREON ARE BASED UPON A FIELD--RUN SURVEY USING E.D.M. EQUIPMENT AND OR ALL GPS, AND ARE ADJUSTED FOR TEMPERATURE.
 - 3.) UTILITIES, IF SHOWN WERE TAKEN FROM VISIBLE STRUCTURES AT THE SITE, VERIFICATION OF THEIR EXISTENCE, LOCATION, SIZE, AND DEPTH SHOULD BE MADE BEFORE MAKING DECISIONS REGARDING THEM. AVAILABILITY OF SERVICE SHOULD BE CONFIRMED WITH APPROPRIATE LOCAL UTILITY COMPANY. TENNESSEE ONE CALL (811) SHOULD BE CALLED BEFORE ANY CONSTRUCTION OR DIGGING.
 - 4.) THIS SURVEY WAS MADE WITHOUT THE BENEFIT OF A TITLE REPORT. IT IS THEREFORE SUBJECT TO THE FINDINGS OF AN ACCURATE TITLE REPORT.
 - 5.) THIS PROPERTY IS SUBJECT TO BOTH RECORDED EASEMENTS, AND TO THOSE UNKNOWN TO THIS SURVEYOR.
 - 6.) THE SUBJECT PROPERTY LIES IN A ZONE "X" (AREAS OUTSIDE OF THE 100 YEAR FLOOD PLAIN) AS SHOWN ON FIRM MAP 4719C0285E DATED 04-16-2007.
 - 7.) PROPERTY ZONED CD-4
 - 8.) SETBACKS ARE FRONT=6' / 20', SIDE =6' TOTAL; REAR=15'
 - 9.) THERE IS A 10' P.U.D.E. ON ALL PROPERTY LINES PARALLEL AND ABUTTING PUBLIC ROADS AND 5' P.U.D.E. ALONG ALL INTERIOR LOT LINES.
 - 10.) POWER & WATER SERVED BY CPWS COLUMBIA POWER & WATER SYSTEMS.
 - 11.) SEWER IS SERVED BY COLUMBIA WASTEWATER DEPARTMENT.
 - 12.) NO DRIVEWAY ACCESS OFF WILLIAMSPORT PIKE.
 - 13.) ALL STORM WATER RUNOFF WILL FLOW AWAY FROM THE ROAD AND TOWARD THE STREAM. FOR CALCULATIONS SEE C3.0 STORM WATER PLAN ENGINEERING PLAN.
 - 14.) ALL FIRST FLOOR ELEVATIONS AND MECHANICAL SYSTEMS TO BE ABOVE 622' ELEVATION DUE TO POSSIBLE FLOODING.
 - 15.) TOPOGRAPHY DATUM BASED ON NAVD 1988 TAKEN FROM TENNESSEE LIDAR MAPPING AND FIELD CHECKED.

TYPICAL LAYOUT (LOTS 146-176)

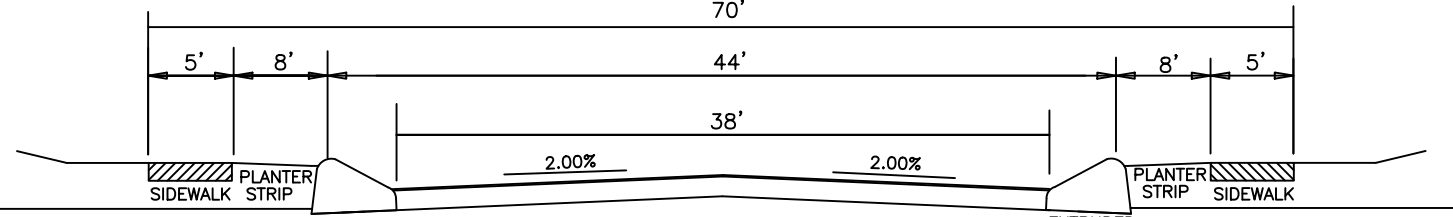


GENERAL NOTES:

1. EXPANSION JOINTS TO BE SPACED A MAXIMUM OF 100 FEET APART AND ALIGN WITH RAMPS, INLETS AND OTHER REQUIRED TARGET POINTS.
2. CONTRACTION/CONSTRUCTION JOINTS ARE REQUIRED AND ARE TO BE CUT INTO CURB EVERY 10 FEET.
3. DETAILS SHALL MEET THE STANDARDS AS SET FORTH IN THE LATEST VERSION OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN GUIDELINES.
4. THE EXTRUDED 8" MOUNTABLE CONCRETE CURB IS TO BE USED ONLY IN SPECIAL CONDITIONAL SUCH AS LOW SPEED VOLUME LOCAL STREETS AND WHEN TRYING TO SIMILAR CURBS ON SUBDIVISION STREETS OR IN PARKING LOTS.
5. WHERE CONCRETE MEDIAN PAVEMENT IS POURED BEHIND EXTRUDED 8" MOUNTABLE CONCRETE CURB, IT MAY BE POURED MONOLITHICALLY WITH THE CURB.

TYPICAL STREET SECTION

NOT TO SCALE



PROPOSED NORMANDY DRIVE
LOT LINE TABLES

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	20.00'	31.00'	27.99'	N 66°12'02" E	88°49'15"
C2	182.03'	18.40'	18.40'	S 72°17'07" E	5°47'33"
C3	182.03'	44.58'	44.47'	S 82°11'50" E	14°01'52"
C4	90.00'	7.40'	7.40'	S 86°20'58" E	4°42'41"
C5	90.00'	144.17'	129.24'	S 38°06'16" E	91°46'45"
C6	90.00'	17.41'	17.38'	S 13°19'32" W	11°04'50"
C7	160.00'	60.18'	59.83'	S 77°55'45" E	21°33'00"
C8	160.00'	56.78'	56.48'	S 56°59'19" E	20°19'59"
C9	160.00'	53.42'	53.17'	S 37°15'26" E	19°07'48"
C10	160.00'	129.78'	126.26'	S 04°27'16" E	46°28'32"
C11	25.08'	38.01'	34.48'	S 65°22'51" W	86°51'16"

LINE	BEARING	DISTANCE
L1	N 88°42'19" W	12.41'
L2	N 85°33'52" E	18.56'
L3	N 85°33'52" E	9.64'
L4	S 81°01'19" E	40.27'
L5	N 72°20'30" E	8.68'
L6	N 72°20'30" E	19.29'
L7	N 87°44'21" E	8.15'
L8	S 45°59'59" E	22.01'
L9	N 63°44'16" E	23.88'
L10	N 83°33'07" E	5.44'
L11	S 78°02'23" E	15.52'
L12	S 72°54'29" E	11.08'
L13	S 13°27'51" W	19.05'
L14	S 69°23'21" E	30.42'
L15	S 69°23'21" E	31.66'
L16	S 88°42'18" E	7.32'
L17	S 18°51'57" W	32.64'
L18	N 19°19'11" E	23.33'
L19	N 19°19'11" E	9.99'
L20	N 14°29'46" E	16.77'
L21	N 21°47'24" E	11.76'
L22	S 71°11'00" E	19.00'
L23	N 71°12'13" W	12.98'
L24	N 71°12'13" W	29.36'
L25	N 16°12'58" E	20.77'

FIELDSTONE FARMS PHASE II
AREA TO BE DEVELOPED:

COMBINED LOT AREA:	177,276 Sq. Ft. 4.07 Acres
AQUATIC BUFFER AREA:	34,079 Sq. Ft. 0.78 Acres
COMMON SPACE AREA (19.8% OF DEVELOPMENT):	71,303 Sq. Ft. 1.64 Acres
R.O.W AREA:	76,594 Sq. Ft. 1.76 Acres
TOTAL AREA TO BE DEVELOPED:	359,252 Sq. Ft. 8.25 Acres

EXISTING ROADWAY WILL
TIE INTO PROPOSED ROAD

UTILITY OWNERS

ELECTRIC
OWNER: COLUMBIA POWER & WATER
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (603) 388-4833

WATER
OWNER: COLUMBIA POWER & WATER
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (603) 388-4833

SEWER
OWNER: COLUMBIA WASTEWATER SYSTEM
ADDRESS: 1244 TREATMENT PLANT ROAD
ADDRESS: COLUMBIA, TN 38401
PHONE # (603) 388-4833

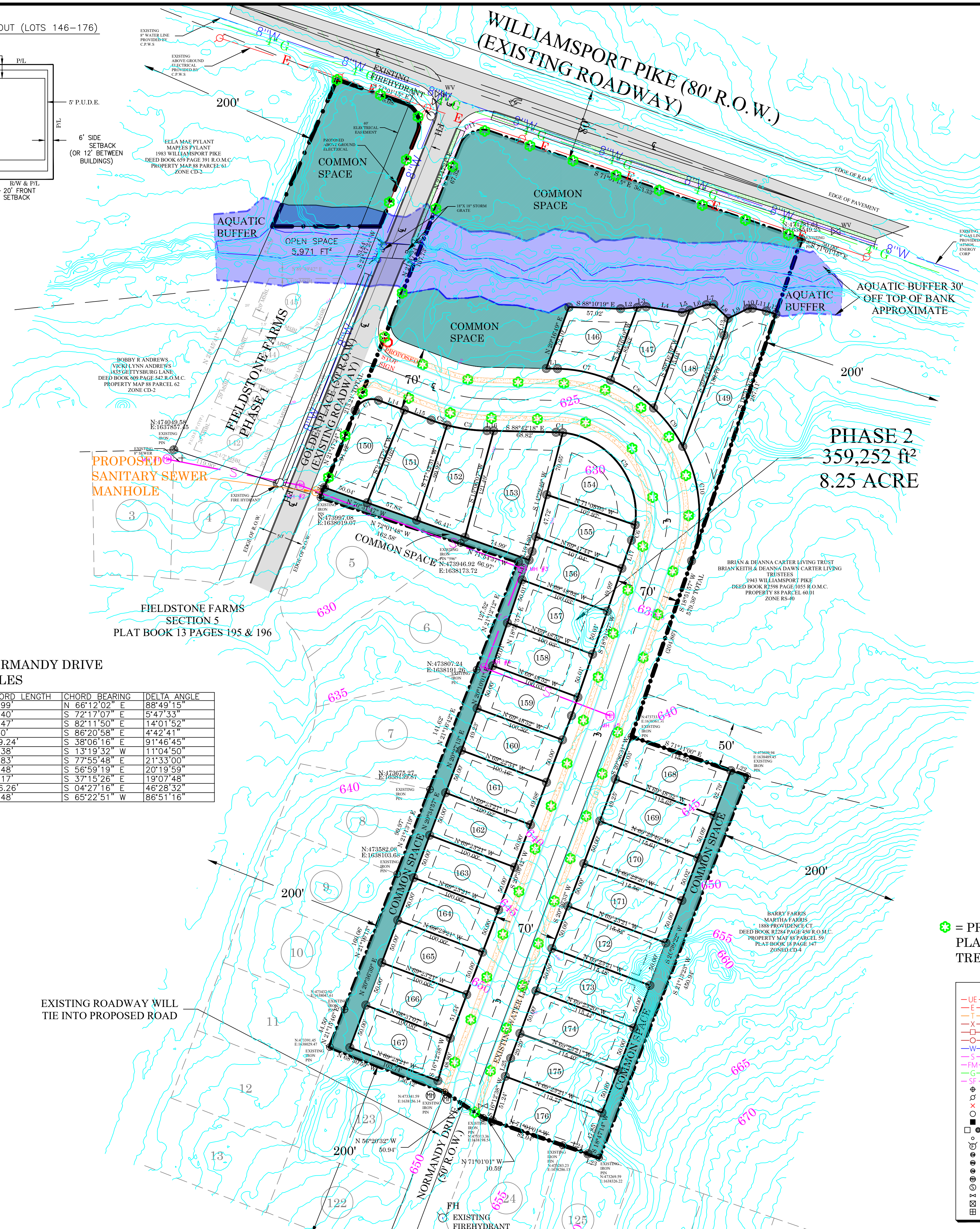
GAS
OWNER: ATMOS ENERGY CORP
ADDRESS: 810 NASHVILLE HWY
ADDRESS: COLUMBIA, TN 38401
PHONE # (603) 388-9136

TELEPHONE
OWNER: CPWS
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (603) 388-4833



IF YOU DIG TENNESSEE...
CALL US FIRST!
811
TENNESSEE ONE CALL
IT'S THE LAW

SEWER STRUCTURE	
EXISTING MH #1	MH TOP 619.97' 8" S. IN 616.59' 8" E. IN 614.23' 8" W. OUT 614.17'
EXISTING MH #2	MH TOP 624.65' 4" PLASTIC SL. IN 621.69' 8" E. IN 616.90' 8" W. OUT 616.88'
EXISTING MH #3	MH TOP 630.31' 8" S. IN 623.51' 8" W. OUT 623.35'
EXISTING MH #4	MH TOP 633.24' 8" S. IN 627.13' 8" N. OUT 627.03'
EXISTING MH #5	MH TOP 636.35' 8" S. IN 630.74' 8" W. OUT 630.66'



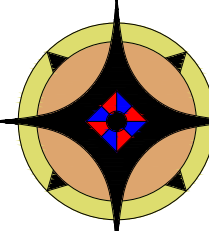
LOT(S) AREA

PROPERTY	SQ FT
LOT 146	5,344 ft²
LOT 147	5,381 ft²
LOT 148	6,141 ft²
LOT 149	9,776 ft²
LOT 150	5,544 ft²
LOT 151	5,909 ft²
LOT 152	6,148 ft²
LOT 153	9,990 ft²
LOT 154	6,066 ft²
LOT 155	5,002 ft²
LOT 156	5,002 ft²
LOT 157	5,001 ft²
LOT 158	5,001 ft²
LOT 159	5,017 ft²
LOT 160	4,973 ft²
LOT 161	5,003 ft²
LOT 162	5,000 ft²
LOT 163	4,999 ft²
LOT 164	4,999 ft²
LOT 165	4,999 ft²
LOT 166	5,066 ft²
LOT 167	5,023 ft²
LOT 168	5,946 ft²
LOT 169	5,743 ft²
LOT 170	5,780 ft²
LOT 171	5,777 ft²
LOT 172	5,775 ft²
LOT 173	5,773 ft²
LOT 174	5,771 ft²
LOT 175	5,752 ft²
LOT 176	5,575 ft²

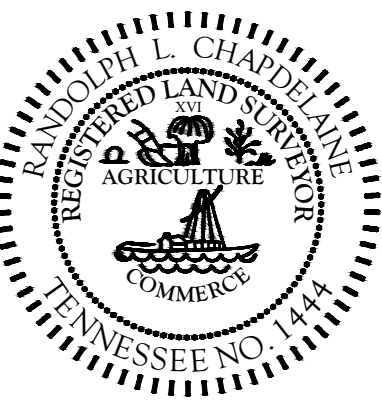
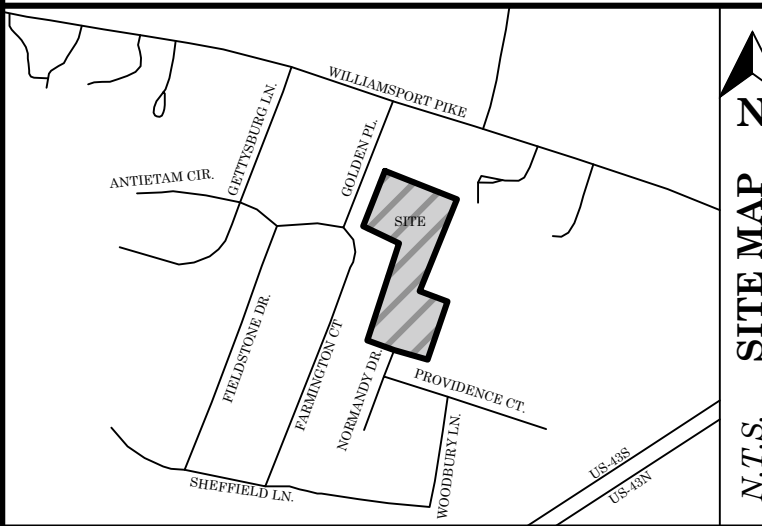
🌳 = PROPOSED
PLANTED
TREES/LANDSCAPING

LEGEND
—UE— UNDERGROUND ELECTRIC LINE
—E— OVERHEAD ELECTRIC LINE
—T— TELECOMMUNICATION LINE
—X— WIRE FENCE
—W— WOOD FENCE
—C— CHAIN LINK FENCE
—W— WATER LINE
—S— SEWER LINE
—FM— FORCE MAIN SEWER
—G— GAS LINE
—SF— SILT FENCE
⊕ WELL
⊕ UTILITY POLE
⊕ GRID STAKE
⊕ EXISTING IRON PIN (UNLESS NOTED)
⊕ EXISTING CONCRETE MONUMENT
⊕ IRON PIN SET (UNLESS NOTED)
⊕ POINT
⊕ FIRE HYDRANT
⊕ ELECTRIC METER
⊕ WATER METER
⊕ GAS METER
⊕ SEWER MANHOLE
⊕ STORM MANHOLE
⊕ WATER VALVE
⊕ ELECTRIC TRANSFORMER BOX
⊕ ELECTRIC PULL BOX

CHAPDELAINE
& ASSOCIATES
LAND SURVEYING



7376 WALKER ROAD,
FAIRVIEW, TENNESSEE 37062
(615) 799-8104
chapsurveyors@msn.com
Randolph L. Chapdelaine
TN R.L.S. #1444



CERTIFICATE OF ACCURACY

I HEREBY CERTIFY THAT THIS IS A CATEGORY IV SURVEY AND THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION. THIS SURVEY WAS DONE IN COMPLIANCE WITH CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE, AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE SURVEY:

- a. REAL TIME KINEMATIC & BASE SOKKIA GRX 3
- b. POSITIONAL ACCURACY: 0.05 FEET
- c. DATE OF SURVEY: 02/01/2021
- d. DATUM / EPOCH: NAD83 (2011) EPOCH PUBLISHED / FIXED CONTROL: TDOT CORS
- e. NETWORK
- f. GEOID MODEL: GEOID 12B
- g. COMBINED GRID FACTOR: 0.99992837

RANDOLPH L. CHAPDELAINE, R.L.S. # 1444 DATE

HABITAT FOR HUMANITY
WILLIAMSON-MAURY
WILLIAMSPORT PIKE
DEED BOOK R-2465 PAGE 1181
R.O.M.C.
9th CIVIL DISTRICT OF MAURY COUNTY,
TENNESSEE
PROPERTY MAP 88 PARCEL 70.01
ZONE CD-4
TOTAL ACRES 8.14
TOTAL AREA BEING DEVELOPED: 8.14
ACRES
CITY OF COLUMBIA

REVISION #	DATE
REVISION # 1	4/17/2023
DATE:	JANUARY 17, 2023
DRAWN BY:	NAB
JOB #:	6171
SCALE:	1" = 60'

V-1.1

P.U.D PRELIMINARY PLAT-MAJOR SUBDIVISION FOR FIELDSTONE SECTION 5 PHASE 2

DEVELOPMENT REVIEW COMMITTEE MEETING
Tuesday, February 7, 2023



ITEM NO.

23-0018

DESCRIPTION: 35 Lot Subdivision.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Fire

1. You will need to get a required fire flow letter from the Fire Marshal's Office. **Received fire flow letter 2/13/2023.**
2. Once you get the required fire flow letter, you will need to send that to Columbia Power & Water System to get a water availability letter. **Received water availability letter 3/3/2023.**

Planning

3. Typical lot layout shows 30' front setback but max is 20'. **Front setback is set at 20'.**
4. Will need Development Plan showing Civic Space types, playground areas, and tree preservation plan. A landscaping plan will be provided.
5. Please correct number of lots listed in notes on plat. **Corrected to 31 lots.**
6. Section 5.3.3.B (p. 335) of the Zoning Ordinance requires a playground within 800 feet of each lot or building site in residential use. Please add playground spaces and show distance from all residential lots/building sites. **Does not apply because 20 acres is needed for Section 5.3.3.B. to apply regarding the playground.**
7. Note indicates 18 lots, application and preliminary plat depicts 36. **Corrected to 31 lots.**
8. Due to site altering comments re submittal will need Development Review. **Concurred.**

Engineering

9. Preliminary Plat shall be submitted and stamped by a registered engineer. **Signed sealed preliminary plat will be submitted.**
10. Provide proposed contours at vertical intervals of not more than two (2) feet. **One foot contours are provided.**
11. Minimum horizontal curvature for roadways is 125 ft. **Horizontal curves are at min. 125'.**
12. Cross section should match the applicable detail in the ESS for the zoning. **Typical cross section is corrected.**
13. Aquatic buffer shall be located in open space. **A 30' buffer from top of back is shown on the plan.**

TECHNICAL
23-0018
Page 1 of 1

14. Reverse curves shall be separated by a minimum tangent length of fifty (50) feet. **Horizontal curves are min. 50' apart.**
15. Lots adjacent to a river, stream, waterbody, aquatic buffer, or large drainage channel that do not have a base flood elevation established shall at minimum be elevated two (2.0) feet above the nearest top of bank for the entire building footprint of any primary and accessory structure. **Proposed grading concurs with the requirement.**
16. This item will return to Development Review Committee. **Understood.**

Building

17. No comments.

Police

18. No comments provided.

City Attorney

19. No comments provided.

Columbia Power

20. Columbia Power System has an existing power line near your proposed residential development. We are willing to serve this residential development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction. [Information will be provided to Columbia Power System.](#)

Maury County E911

21. Normandy Drive and Golden PL connection Maury County 911 have no comment to add.

Atmos Energy

22. Gas Available on TN Hwy 50. Contact Bradie Armstrong 615-485-6377.

Maury County Schools

23. Baker Elementary School, Whittorne Middle School, Central High School. 1) No residence is guaranteed zone to a specific school. 2) All zones are subject to change yearly. 3) No concerns with neighborhood design.

Wastewater

24. Columbia Wastewater does not allow grinder pump systems.

Public Works

25. No comment.

Duck River Electric Membership Corp

26. No comments provided.

Columbia Water

27. "The project is within Columbia Power and Water's service area, however a water availability letter had not been issued at the time of the writing. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. CPWS will study the existing infrastructure and determine its ability to serve the proposed development. Should adequate facilities not currently exist the study will determine any required off-site improvements necessary to serve your development. Off-site improvements needed to serve a development are the responsibility of the developer/owner. All water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements." **Received water availability letter 3/3/2023.**

Maury County Highway Department (Collier Engineering Company, Inc.)

28. No comment.

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

Project Description and the Scope of Site Work for

Habitat for Humanity Subdivision

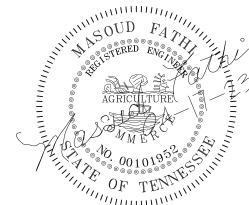
Williamsport Pike at Golden Place,
Columbia, Tennessee 38401

Owner:

Habitat for Humanity
511 W. Meade Blvd.
Franklin, Tennessee 37062

Prepared by:

Masoud Fathi, PE
Civil & Environmental Engineering Services, LLC
803 Albemarle Court
Brentwood, Tennessee 37027
(615) 504-9915 Cell
masoudfathi@comcast.net
April 17, 2023

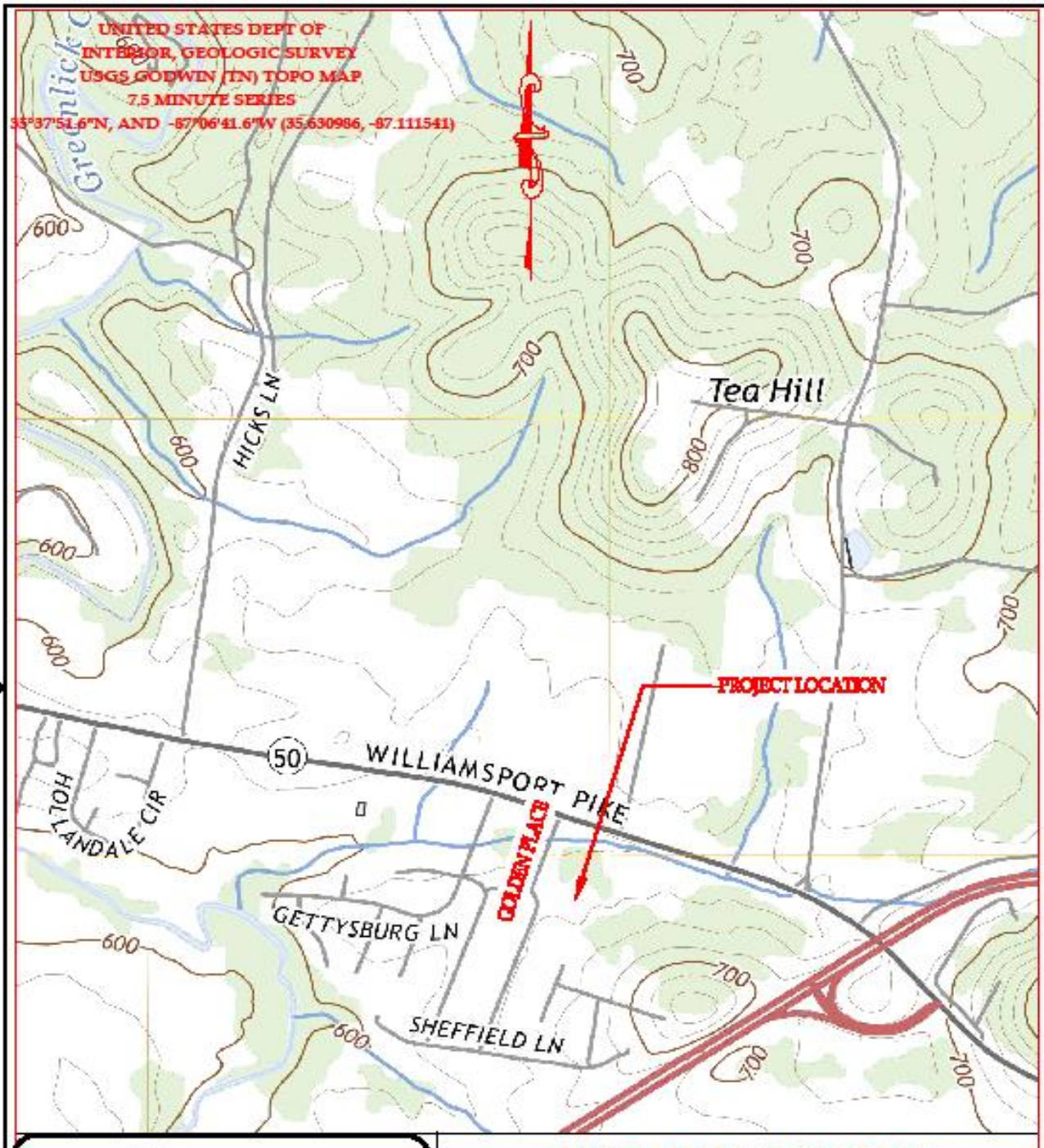


Habitat for Humanity Subdivision

Site Information:

Property Location: The site is located on the Southeast corner of Williamsport Pike and Golden Place in Columbia, Tennessee 38401. It is located at LATITUDE 35°37'51.6"N, and LONGITUDE -87°06'41.6"W (35.630986, -87.111541). It is described in Subdivision Deed Book R2495 page 1181 of the 9th Civil District of Maury County in the City of Columbia Register of Deeds Office.

Tax Map/Parcel:	Map 88 - Parcel 70.01
Acreage of property:	8.14± AC
Zoning:	Character District CD-4
Owner:	Habitat For Humanity Williamson-Maury 511 W. Meade Blvd. Franklin, Tennessee 37062
Applicant Representative:	MSS. Lexi Bolinski Habitat For Humanity Williamson-Maury 511 W. Meade Blvd. Franklin, Tennessee 37062 lbolinski@hfhwm.org Cell: 615-550-5619



**CIVIL AND ENVIRONMENTAL
ENGINEERING SERVICES, LLC**
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SITE LOCATION MAP

**HABITAT FOR HUMANITY SUBDIVISION
A SINGLE FAMILY RESIDENTIAL DEVELOPMENT
WILLIAMSPORT PIKE AT GOLDEN PLACE
COLUMBIA, TENNESSEE 38401
MAP 88, PARCEL TO 61, COLUMBIA, TENNESSEE**

SCALE NTA

SHEET

Project Description

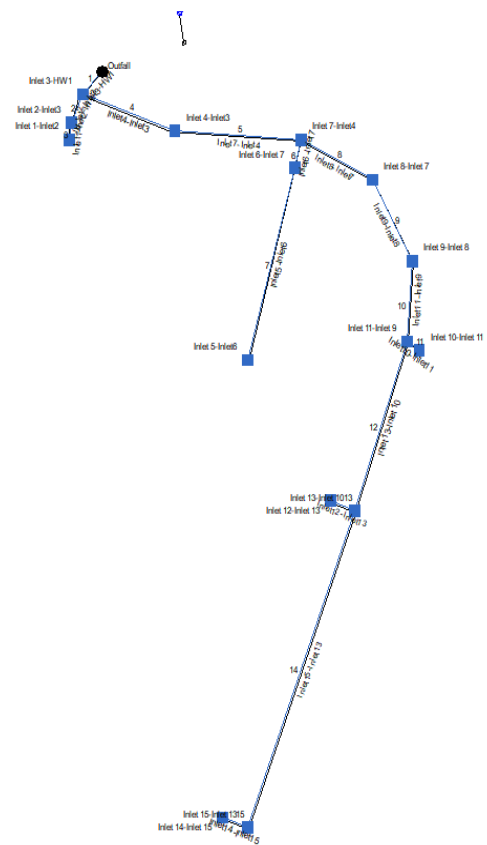
The subject property is a vacant lot zoned CD-4. The scope of site work is to subdivide the lot into 32 lots. The existing property is a vacant lot. An existing water line and sewer line is extended into the property. Stormwater run-off drains from the south end of the property to the north where is a stream that crosses the lot. The stream has a 30' buffer from the top of the bank. The Normandy Drive on the southside of the property is to be extended to Golden Place to provide access to each lot. A new 8" sanitary sewer line will be installed along the center line of extension of Normandy Drive to the existing sewer manhole. Also, the water line will be extended and tied to the existing line in Golden Place. The proposed road pavement will be 26' with 12" extruded curb, 4' grass strip and 5' sidewalk on both sides. The Right-of-Way is set at 70'. A 10' PUDE is established along the road Right-Of-Way and a 5' PUDE is established along the side lot lines.

At current conditions the stormwater run-off from the property flows from south and east side of the property to north and northwest direction. Refer to sheet D1.0 for existing conditions flow pattern, and flow rates. Hydraflow model is used to calculate the flow rates. To minimize the run-on from adjacent properties, a perimeter ditch along eastern property lines will intercept the flow and divert it to the off-site. The stormwater contributing drainage area (CDA) for this site is approximately 266,983 S.F. or 6.13 acres. The CDA slopes vary between 4 % to 8%. The longest flow path is shown on sheet D1.0. Based on this flow path the time of concentration for pre-developed conditions is 12.3 minutes. Based on USDA website, majority of soil on this site is Braxton cherty silty clay loam with hydrologic Soils Group "C" and a CN of 79.

After installation of the initial erosion control measures and installation of the interceptor ditches, the site will be graded to drain to a temporary sediment basin. The detention pond initially will be utilized as a sediment basin before it is converted to a detention pond. Refer to sheet C3.2 and C3.3 for details of the Phase II erosion control plan. Also refer to details on sheet C3.3 for the temporary outlet structure details. Once the grading is finalized and the site is stabilized, all the sediment deposited in the sediment basin will be removed and the basin will be regraded to accommodate for the permanent detention pond. After all the grading work is completed and all pavement is installed, the remaining disturbed areas will receive topsoil and will be stabilized with seeding. Sodding or reinforcing matt. Refer to sheet C3.4 and C3.5 for final erosion control measures.

Refer to sheets D2.0 for Post Developed drainage conditions and drainage pattern. Based on the longest flow path shown on this sheet, t_c is determined to be 10.9 minutes. A table of the impervious areas is shown on this sheet. The post developed CN is determined to be 86. The post developed contributing drainage is subdivided to 16 sub areas. Hydraflow Storm Sewer Model is utilized to evaluate each subarea. A weighted run-off coefficient is calculated for each sub area and entered in the model. The time of concentration for each subarea is assumed to be minimum of 5 minutes. A report of the model is attached to this narrative. The detention pond is designed to detain the run-off for 2-year through 100-year storm events to pre developed run-off rates. A summary of the 2-year through 100-year run-off rates is shown on sheet D2.0 and sheet C2.1 along with the detail of the pond's outlet structure. The stormwater treatment volume calculations are shown on sheet D2.0. Based on these calculations a 3" orifice is sized to be installed on the outlet structure at elevation 615.75. the treatment volume will be stored below this elevation. A 5' rectangular weir is designed at elevation 616.2 to route the stormwater.

Hydraflow Plan View



Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.
1	Inlet3-HW1	15.79	24 c	27.0	614.50	615.04	2.000	616.00	616.45	n/a	616.45	End
2	Inlet2-Inlet3	4.36	18 c	28.0	615.24	615.80	2.000	617.01	617.03	0.07	617.10	1
3	Inlet1-Inlet2	3.68	15 c	15.0	616.00	616.30	2.000	617.10	617.07	n/a	617.07 j	2
4	Inlet4-Inlet3	12.79	24 c	95.0	615.24	617.56	2.442	616.88	618.83	n/a	618.83 j	1
5	Inlet7-Inlet4	12.67	24 c	124.0	617.76	620.24	2.000	619.15	621.50	n/a	621.50 j	4
6	Inlet6-Inlet7	9.82	18 c	26.0	620.44	620.96	2.000	621.59	622.16	n/a	622.16	5
7	Inlet5-Inlet6	8.98	18 c	177.0	621.16	624.50	1.887	622.41	625.64	n/a	625.64 j	6
8	Inlet8-Inlet7	5.73	24 c	78.0	621.16	623.50	3.000	622.02	624.35	n/a	624.35 j	5
9	Inlet9-Inlet8	5.63	18 c	82.0	623.70	626.66	3.610	624.51	627.57	n/a	627.57 j	8
10	Inlet11-Inlet9	5.52	18 c	72.0	626.86	627.82	1.333	627.81	628.72	n/a	628.72 j	9
11	Inlet10-Inlet11	4.56	15 c	14.0	628.02	628.30	2.000	628.89	629.16	n/a	629.16	10
12	Inlet13-Inlet10	2.05	15 c	159.0	628.50	632.61	2.585	629.06	633.18	n/a	633.18 j	10
13	Inlet12-Inlet13	0.93	15 c	26.0	632.81	633.33	2.000	633.39	633.72	n/a	633.72 j	12
14	Inlet15-Inlet13	0.87	15 c	300.0	632.81	640.93	2.707	633.39	641.30	n/a	641.30 j	12
15	Inlet14-Inlet15	0.35	15 c	26.0	641.13	641.65	2.000	641.43	641.89	n/a	641.89 j	14

Fieldstone Farms

Number of lines: 15

Run Date: 04-14-2023

NOTES: c = cir; e = ellip; b = box; Return period = 10 Yrs. ; j - Line contains hyd. jump.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	Inlet 3-HW1	0.29	3.44	0.59	3.13	Comb	6.0	3.00	0.00	3.00	2.00	0.011	0.01	0.080	0.020	0.012	0.21	10.47	0.38	10.47	2.00	Off
2	Inlet 2-Inlet3	0.69	0.00	0.36	0.34	Comb	6.0	6.00	0.00	6.00	2.00	0.028	0.01	0.080	0.020	0.012	0.10	4.97	0.26	4.67	2.00	1
3	Inlet 1-Inlet2	3.68	0.00	3.68	0.00	DrGrt	0.0	0.00	6.00	3.00	2.00	Sag	0.01	0.020	0.020	0.000	0.31	33.31	0.31	33.31	0.00	Off
4	Inlet 4-Inlet3	0.41	3.03	0.34	3.10	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.18	8.97	0.34	8.52	2.00	1
5	Inlet 7-Inlet4	0.23	3.13	0.33	3.03	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.17	8.47	0.33	8.42	2.00	4
6	Inlet 6-Inlet 7	1.10	0.00	0.17	0.93	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.12	5.97	0.28	5.57	2.00	5
7	Inlet 5-Inlet6	8.98	0.00	8.98	0.00	DrGrt	0.0	0.00	6.00	3.00	2.00	Sag	0.01	0.020	0.020	0.000	0.57	58.76	0.57	58.76	0.00	Off
8	Inlet 8-Inlet 7	0.23	2.25	0.28	2.20	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.16	7.97	0.32	7.52	2.00	5
9	Inlet 9-Inlet 8	0.23	2.30	0.28	2.25	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.16	7.97	0.32	7.57	2.00	8
10	Inlet 11-Inlet 9	0.46	2.13	0.29	2.30	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.16	7.97	0.32	7.67	2.00	9
11	Inlet 10-Inlet 11	4.56	0.00	4.56	0.00	DrGrt	0.0	0.00	6.00	3.00	2.00	Sag	0.01	0.020	0.020	0.000	0.36	38.13	0.36	38.13	0.00	Off
12	Inlet 13-Inlet 10	0.93	1.47	0.27	2.13	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.15	7.47	0.31	7.42	2.00	10
13	Inlet 12-Inlet 13	0.93	0.00	0.16	0.77	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.11	5.47	0.27	5.22	2.00	12
14	Inlet 15-Inlet 13	0.58	0.27	0.15	0.70	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.11	5.47	0.27	5.02	2.00	12
15	Inlet 14-Inlet 15	0.35	0.00	0.09	0.27	Comb	6.0	3.00	0.00	3.00	2.00	0.028	0.01	0.080	0.020	0.012	0.08	3.97	0.24	3.62	2.00	14
Fieldstone Farms														Number of lines: 15				Run Date: 04-14-2023				
NOTES: Inlet N-Values = 0.016 ; Intensity = 65.85 / (Inlet time + 12.20) ^ 0.80; Return period = 10 Yrs. ; * Indicates Known Q added																						

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Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	-----	9.82	-----	16.07	20.37	25.96	30.15	34.31	Fieldstone Predeveloped
2	SCS Runoff	-----	-----	13.59	-----	20.33	24.81	30.53	34.76	38.93	Fieldstone Post Developed
3	Reservoir	2	-----	7.89	-----	15.36	20.33	25.74	29.54	33.20	Fieldstone Pond
Proj. file: Fieldstone Pond.gpw Friday, Apr 14 2023, 10:56 AM											

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	9.82	6	720	30,896	----	-----	-----	Fieldstone Predeveloped
2	SCS Runoff	13.59	6	720	41,749	----	-----	-----	Fieldstone Post Developed
3	Reservoir	7.89	6	732	41,705	2	616.79	16,791	Fieldstone Pond
Fieldstone Pond.gpw					Return Period: 2 Year			Friday, Apr 14 2023, 10:56 AM	

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Friday, Apr 14 2023, 10:56 AM

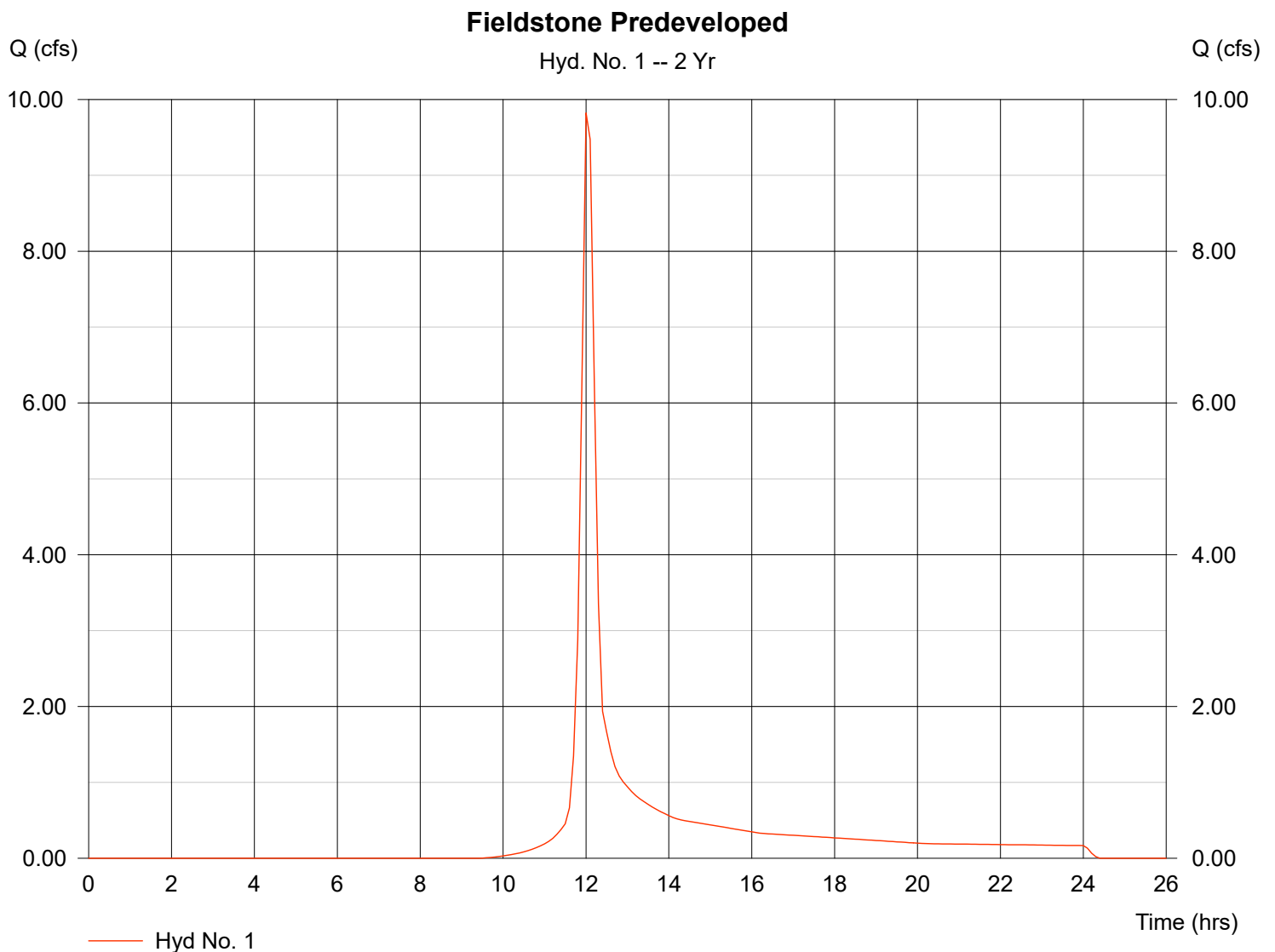
Hyd. No. 1

Fieldstone Predeveloped

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Drainage area = 6.130 ac
Basin Slope = 0.0 %
Tc method = TR55
Total precip. = 3.39 in
Storm duration = 24 hrs

Peak discharge = 9.82 cfs
Time interval = 6 min
Curve number = 79
Hydraulic length = 0 ft
Time of conc. (Tc) = 12.30 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 30,896 cuft



TR55 Tc Worksheet

4

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Fieldstone Predeveloped

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.150	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 843.00	0.00	0.00				
Watercourse slope (%)	= 4.00	0.00	0.00				
Surface description	= Unpaved	Unpaved	Unpaved				
Average velocity (ft/s)	= 3.23	0.00	0.00				
Travel Time (min)	= 4.35	+	0.00	+	0.00	=	4.35
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	= 0.00	0.00	0.00				
Flow length (ft)	= 0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							12.30 min

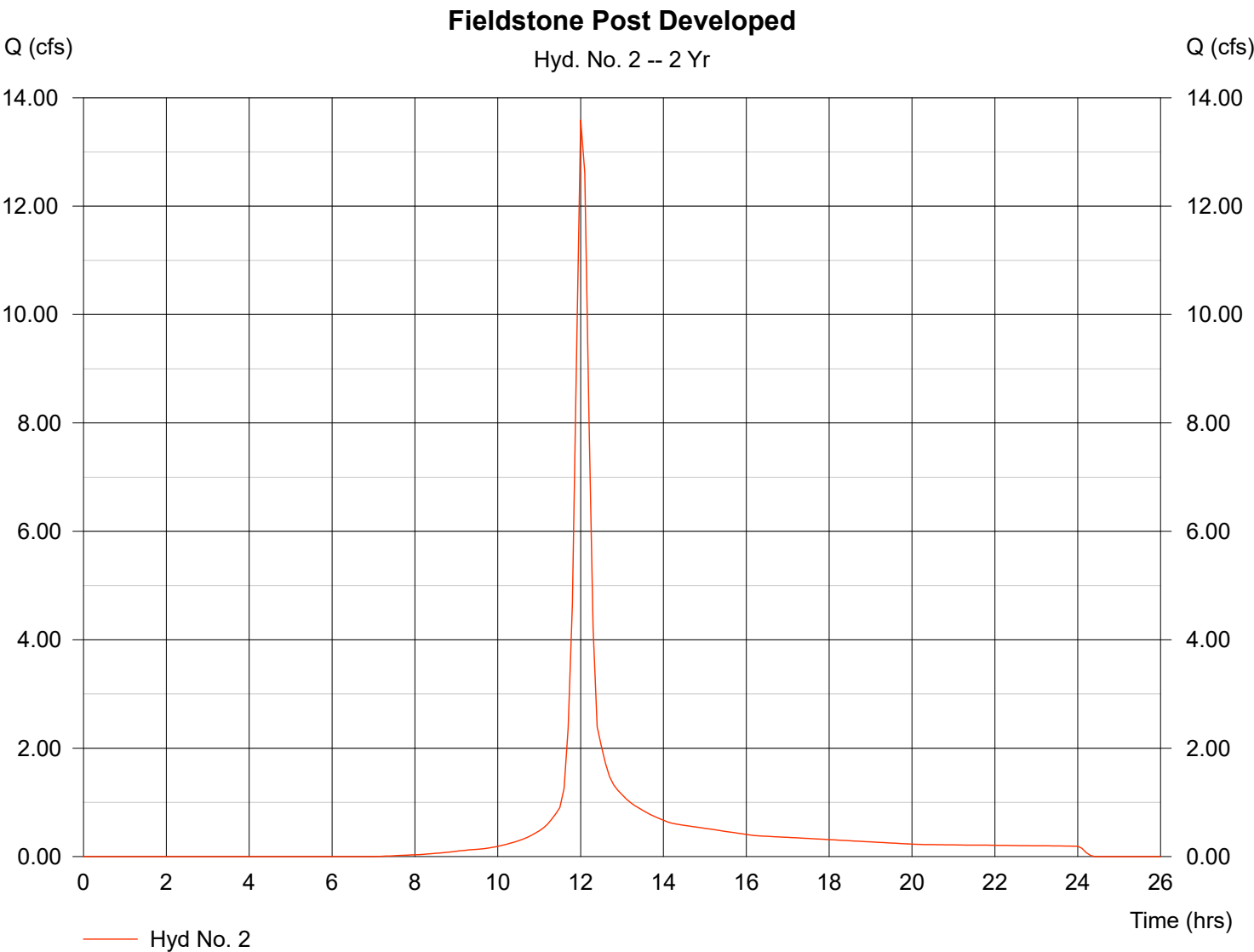
Hydrograph Plot

Hyd. No. 2

Fieldstone Post Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.59 cfs
Storm frequency	=	2 yrs	Time interval	=	6 min
Drainage area	=	6.130 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.10 min
Total precip.	=	3.39 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Volume = 41,749 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Fieldstone Post Developed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 74.00	0.00	0.00				
Watercourse slope (%)	= 11.00	0.00	0.00				
Surface description	= Unpaved	Paved	Unpaved				
Average velocity (ft/s)	= 5.35	0.00	0.00				
Travel Time (min)	= 0.23	+	0.00	+	0.00	=	0.23
Channel Flow							
X sectional flow area (sqft)	= 6.00	1.77	0.00				
Wetted perimeter (ft)	= 7.10	4.71	0.00				
Channel slope (%)	= 2.60	2.60	0.00				
Manning's n-value	= 0.025	0.015	0.015				
Velocity (ft/s)	= 8.59	8.31	0.00				
Flow length (ft)	= 440.0	500.0	0.0				
Travel Time (min)	= 0.85	+	1.00	+	0.00	=	1.86
Total Travel Time, Tc					10.10 min		

Hydrograph Plot

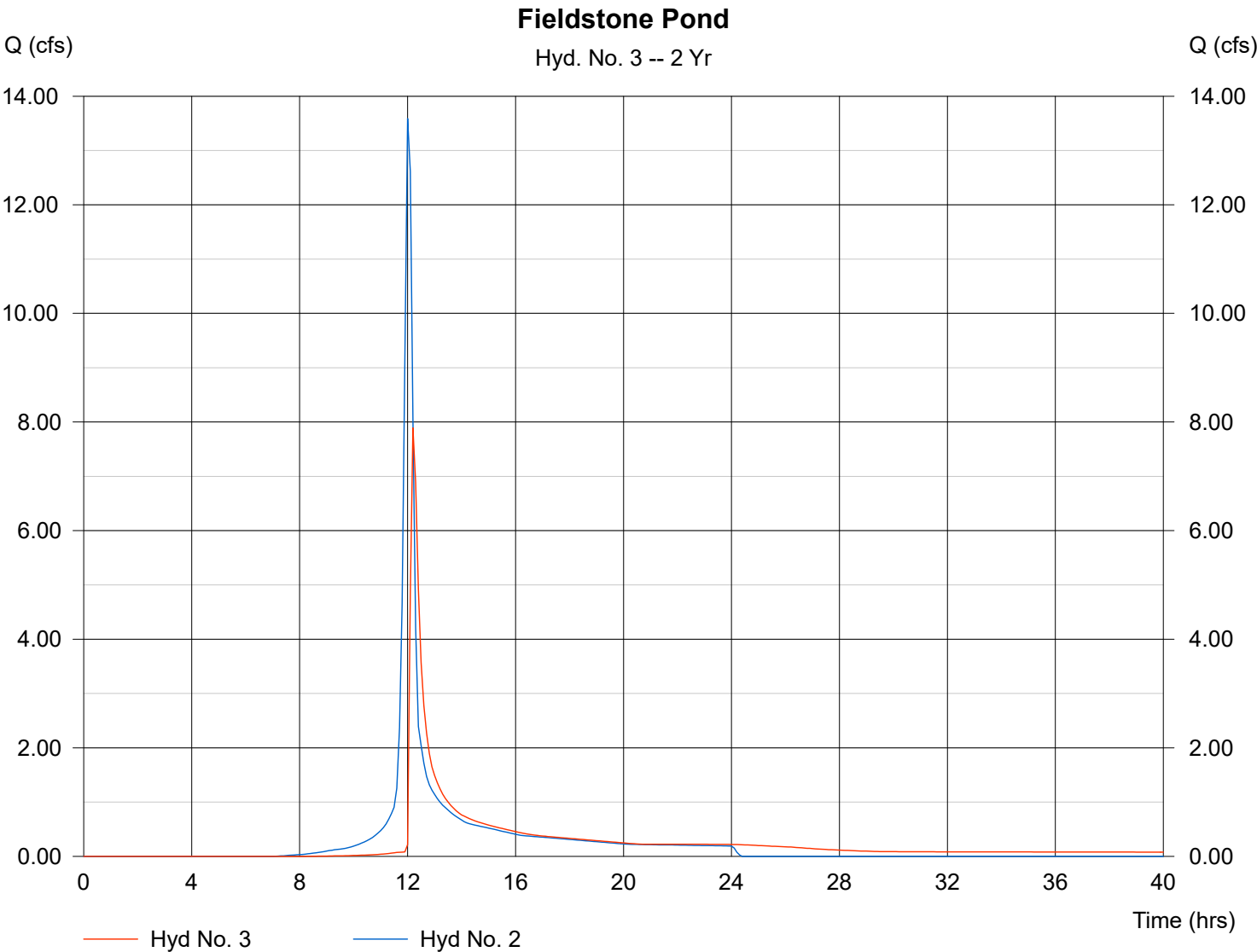
Hyd. No. 3

Fieldstone Pond

Hydrograph type	= Reservoir	Peak discharge	= 7.89 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 2	Max. Elevation	= 616.79 ft
Reservoir name	= Fieldstone Pond	Max. Storage	= 16,791 cuft

Storage Indication method used.

Hydrograph Volume = 41,705 cuft



Pond Report

Pond No. 1 - Fieldstone Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	614.00	00	0	0
1.00	615.00	6,405	3,203	3,203
2.00	616.00	7,578	6,992	10,194
3.00	617.00	9,105	8,342	18,536
4.00	618.00	11,557	10,331	28,867

Culvert / Orifice Structures

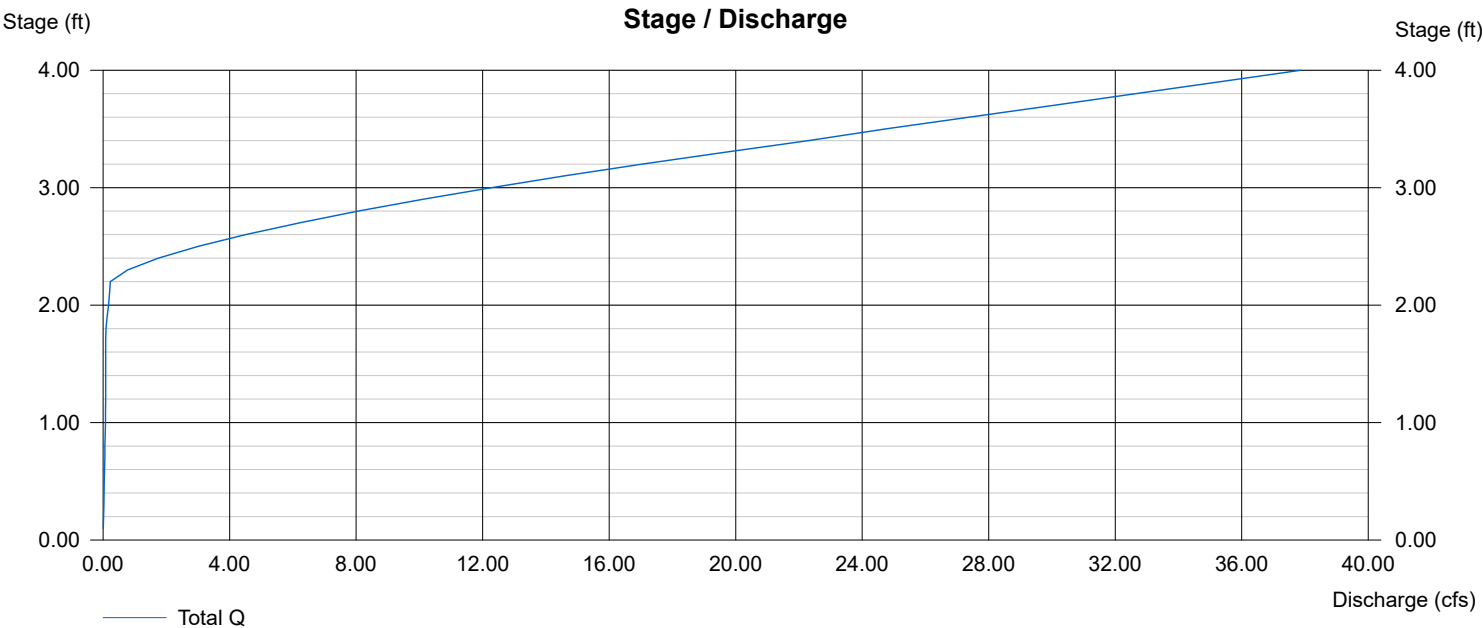
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 613.30	615.75	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.10	0.00	0.00	0.00
N-Value	= .012	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	5.00	0.00	0.00
Crest El. (ft)	= 618.00	616.20	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfiltration = 0.500 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	16.07	6	720	49,576	----	-----	-----	Fieldstone Predeveloped
2	SCS Runoff	20.33	6	720	62,651	----	-----	-----	Fieldstone Post Developed
3	Reservoir	15.36	6	726	62,608	2	617.13	19,898	Fieldstone Pond
Fieldstone Pond.gpw					Return Period: 5 Year			Friday, Apr 14 2023, 10:56 AM	

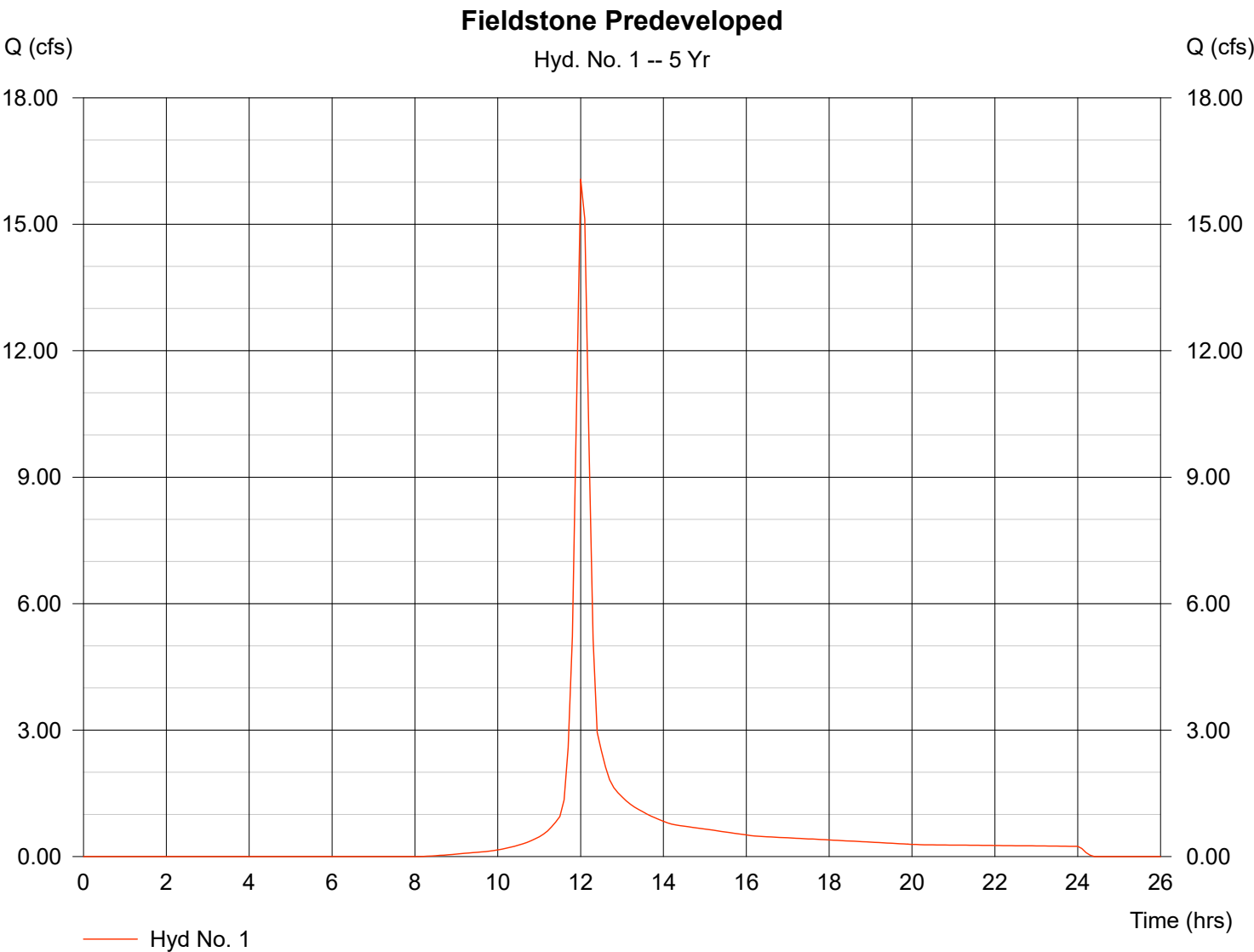
Hydrograph Plot

Hyd. No. 1

Fieldstone Predeveloped

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.07 cfs
Storm frequency	=	5 yrs	Time interval	=	6 min
Drainage area	=	6.130 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Volume = 49,576 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Fieldstone Predeveloped

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.150	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 843.00	0.00	0.00				
Watercourse slope (%)	= 4.00	0.00	0.00				
Surface description	= Unpaved	Unpaved	Unpaved				
Average velocity (ft/s)	= 3.23	0.00	0.00				
Travel Time (min)	= 4.35	+	0.00	+	0.00	=	4.35
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	= 0.00	0.00	0.00				
Flow length (ft)	= 0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							12.30 min

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Friday, Apr 14 2023, 10:56 AM

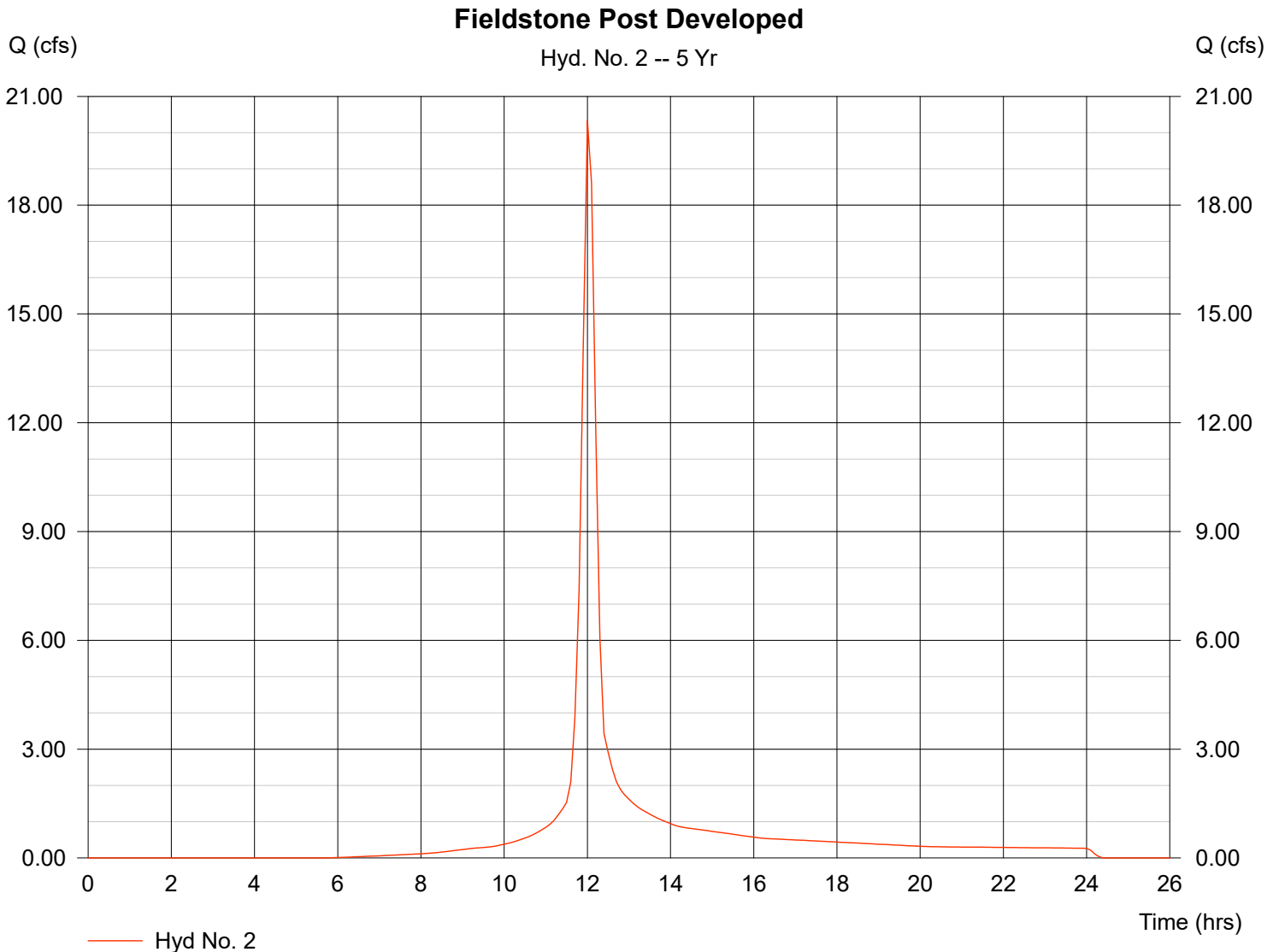
Hyd. No. 2

Fieldstone Post Developed

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Drainage area = 6.130 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 4.50 in
 Storm duration = 24 hrs

Peak discharge = 20.33 cfs
 Time interval = 6 min
 Curve number = 86
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 10.10 min
 Distribution = Type II
 Shape factor = 484

Hydrograph Volume = 62,651 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Fieldstone Post Developed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 74.00	0.00	0.00				
Watercourse slope (%)	= 11.00	0.00	0.00				
Surface description	= Unpaved	Paved	Unpaved				
Average velocity (ft/s)	= 5.35	0.00	0.00				
Travel Time (min)	= 0.23	+	0.00	+	0.00	=	0.23
Channel Flow							
X sectional flow area (sqft)	= 6.00	1.77	0.00				
Wetted perimeter (ft)	= 7.10	4.71	0.00				
Channel slope (%)	= 2.60	2.60	0.00				
Manning's n-value	= 0.025	0.015	0.015				
Velocity (ft/s)	= 8.59	8.31	0.00				
Flow length (ft)	= 440.0	500.0	0.0				
Travel Time (min)	= 0.85	+	1.00	+	0.00	=	1.86
Total Travel Time, Tc					10.10 min		

Hydrograph Plot

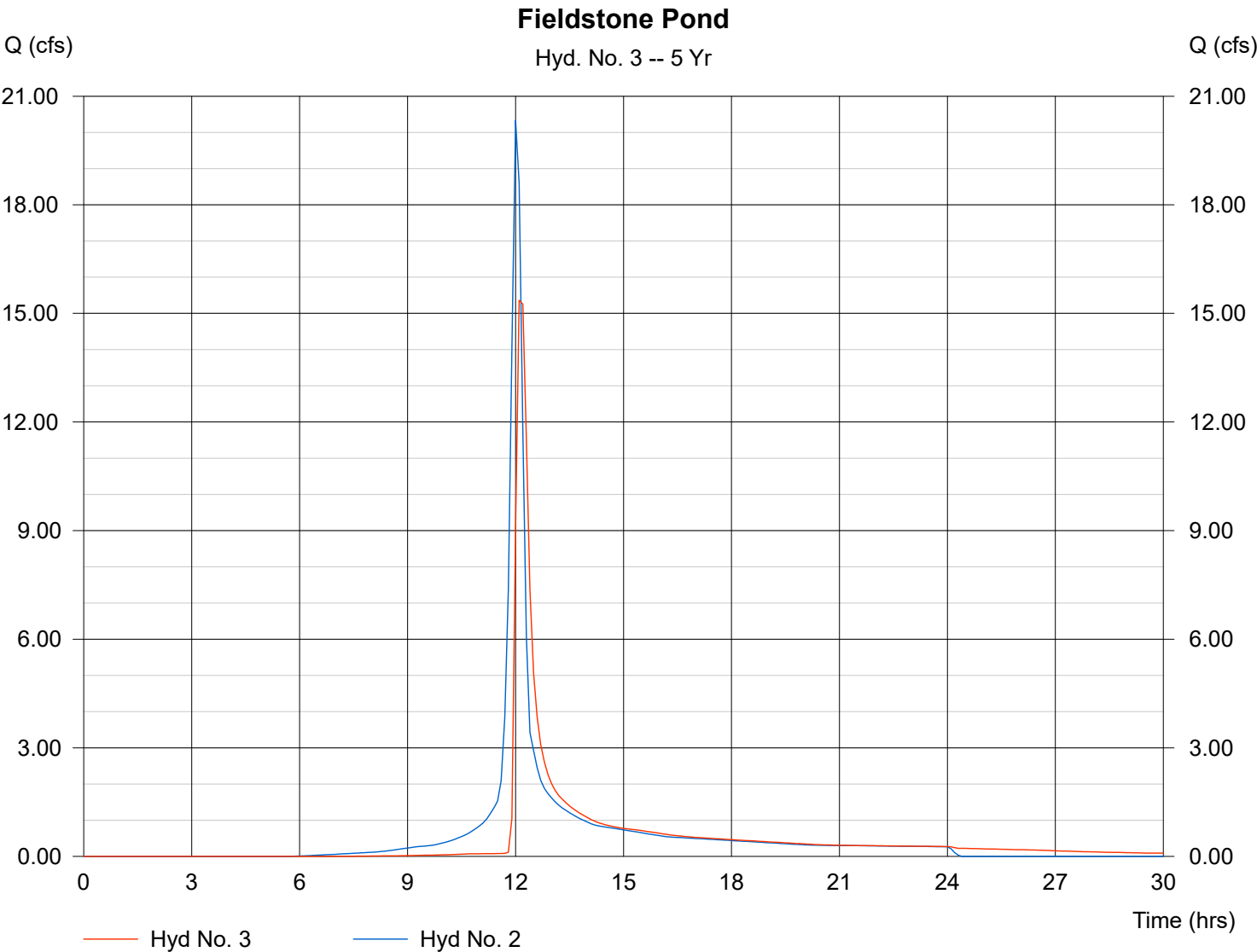
Hyd. No. 3

Fieldstone Pond

Hydrograph type	= Reservoir	Peak discharge	= 15.36 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Inflow hyd. No.	= 2	Max. Elevation	= 617.13 ft
Reservoir name	= Fieldstone Pond	Max. Storage	= 19,898 cuft

Storage Indication method used.

Hydrograph Volume = 62,608 cuft



Pond No. 1 - Fieldstone Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	614.00	00	0	0
1.00	615.00	6,405	3,203	3,203
2.00	616.00	7,578	6,992	10,194
3.00	617.00	9,105	8,342	18,536
4.00	618.00	11,557	10,331	28,867

Culvert / Orifice Structures

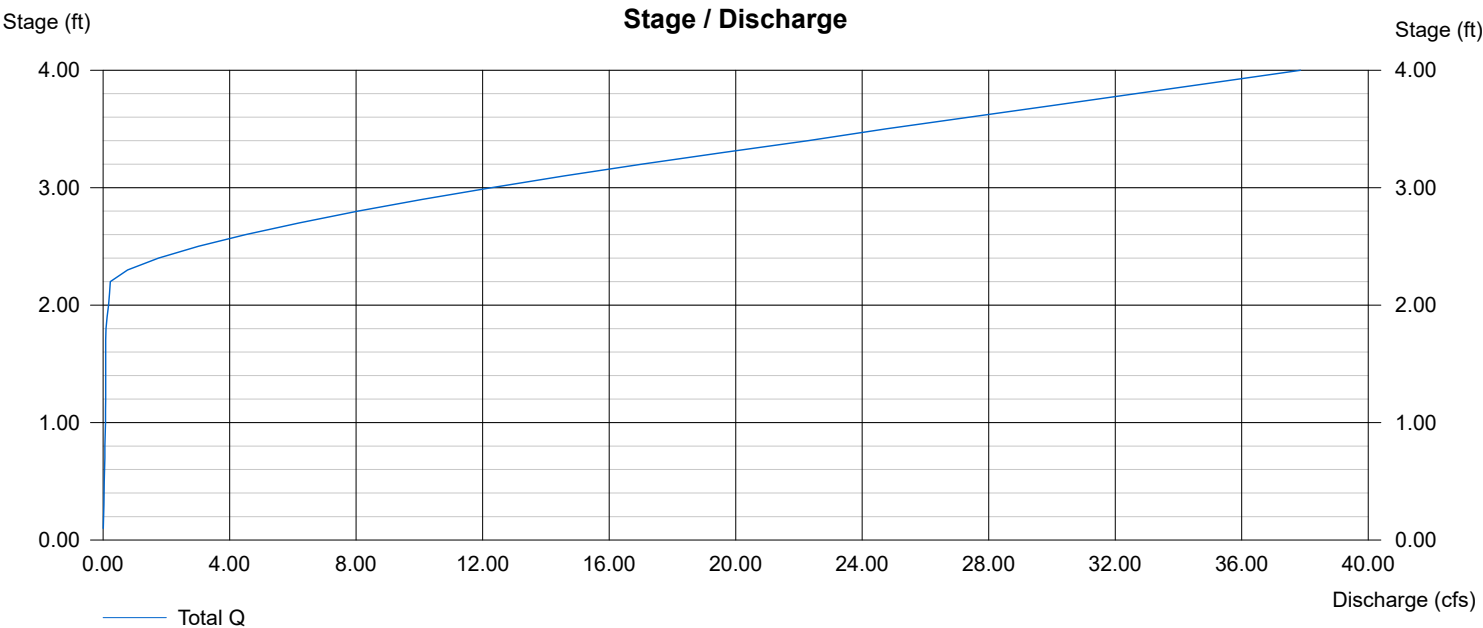
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 613.30	615.75	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.10	0.00	0.00	0.00
N-Value	= .012	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	5.00	0.00	0.00
Crest El. (ft)	= 618.00	616.20	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfiltration = 0.500 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	20.37	6	720	62,597	----	-----	-----	Fieldstone Predeveloped
2	SCS Runoff	24.81	6	720	76,815	----	-----	-----	Fieldstone Post Developed
3	Reservoir	20.33	6	726	76,772	2	617.33	21,914	Fieldstone Pond
Fieldstone Pond.gpw					Return Period: 10 Year			Friday, Apr 14 2023, 10:56 AM	

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

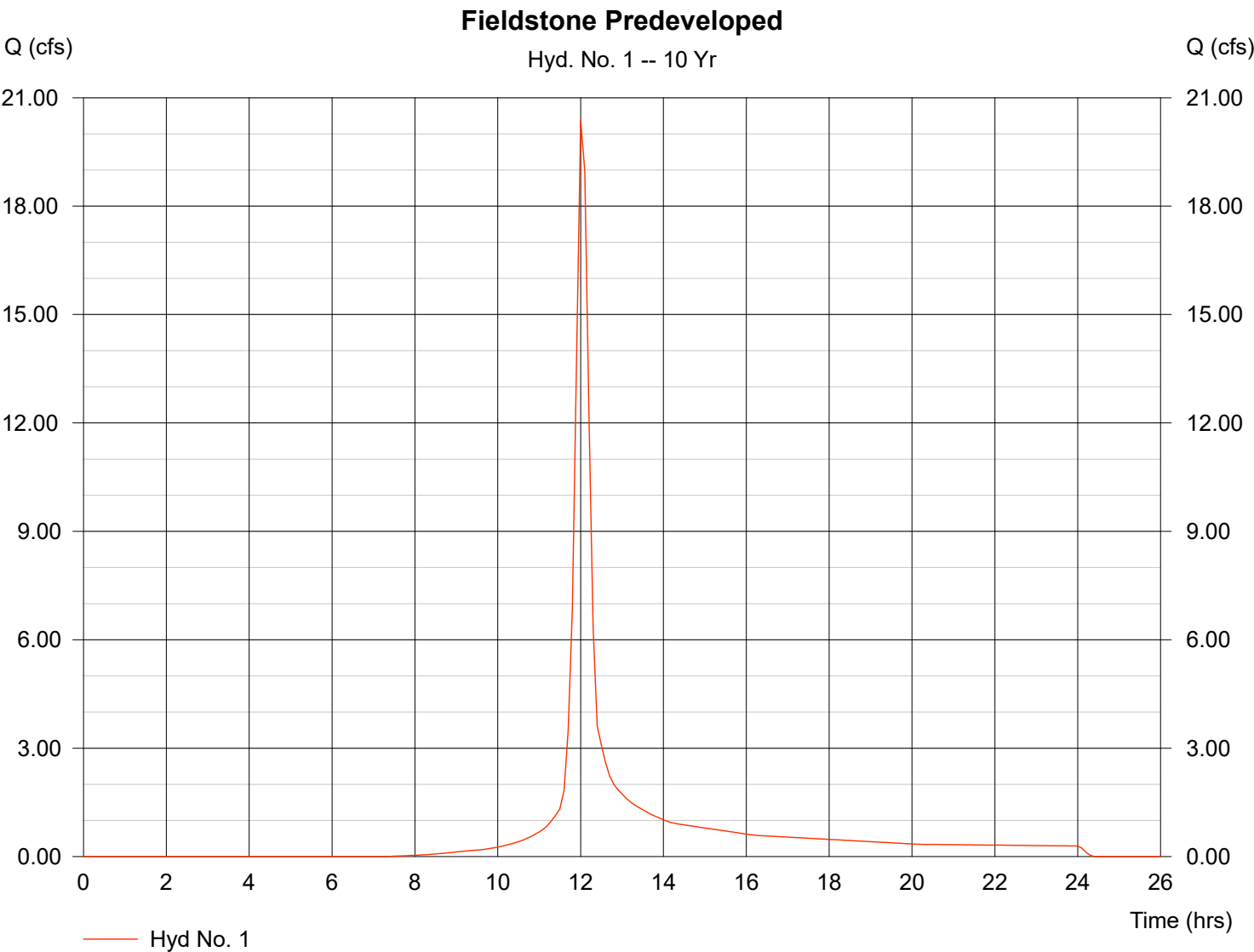
Friday, Apr 14 2023, 10:57 AM

Hyd. No. 1

Fieldstone Predeveloped

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.37 cfs
Storm frequency	=	10 yrs	Time interval	=	6 min
Drainage area	=	6.130 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	5.23 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Volume = 62,597 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Fieldstone Predeveloped

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.150	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 843.00	0.00	0.00				
Watercourse slope (%)	= 4.00	0.00	0.00				
Surface description	= Unpaved	Unpaved	Unpaved				
Average velocity (ft/s)	= 3.23	0.00	0.00				
Travel Time (min)	= 4.35	+	0.00	+	0.00	=	4.35
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	= 0.00	0.00	0.00				
Flow length (ft)	= 0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							12.30 min

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Friday, Apr 14 2023, 10:57 AM

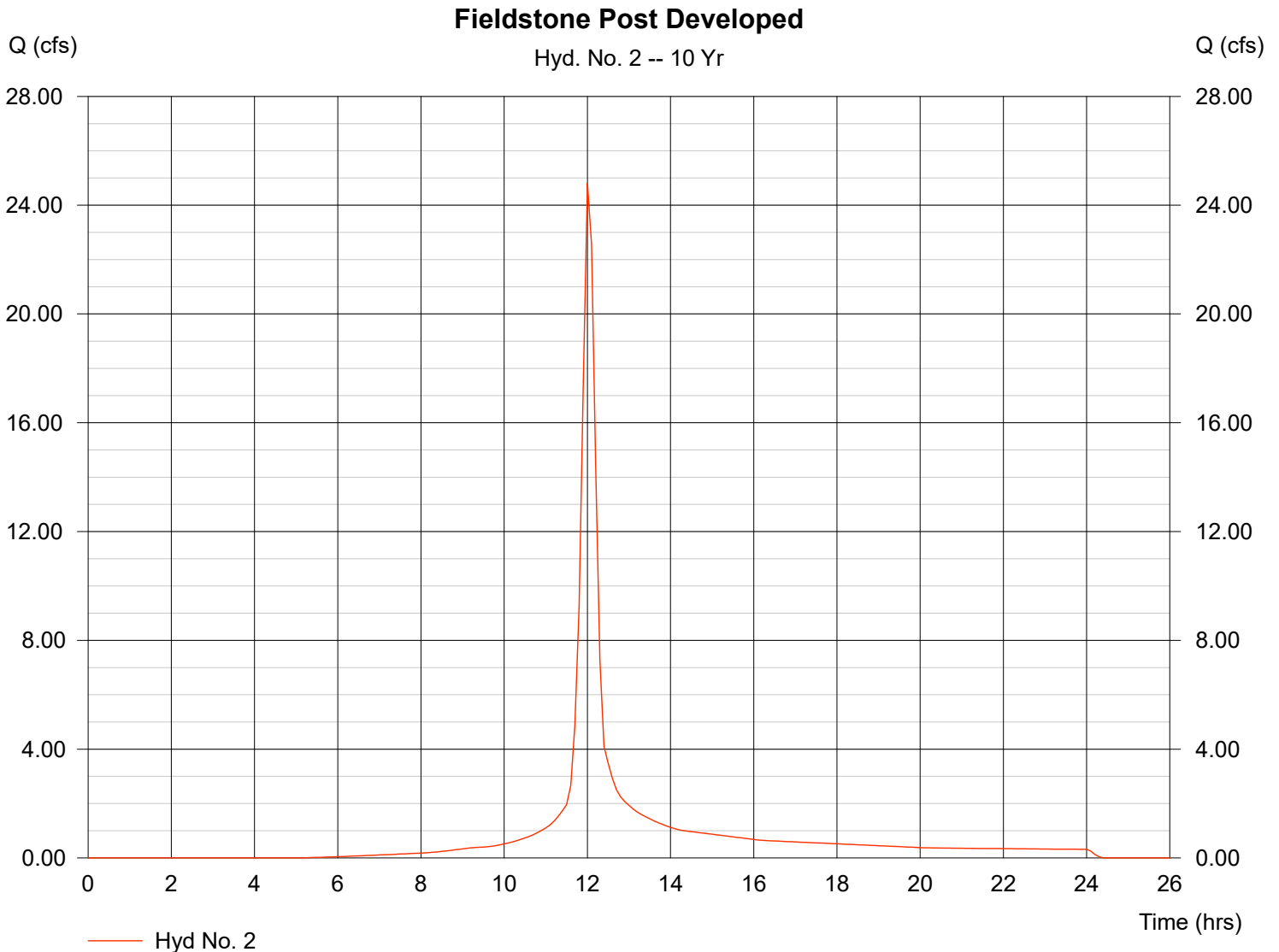
Hyd. No. 2

Fieldstone Post Developed

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Drainage area = 6.130 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 5.23 in
 Storm duration = 24 hrs

Peak discharge = 24.81 cfs
 Time interval = 6 min
 Curve number = 86
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 10.10 min
 Distribution = Type II
 Shape factor = 484

Hydrograph Volume = 76,815 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Fieldstone Post Developed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 74.00	0.00	0.00				
Watercourse slope (%)	= 11.00	0.00	0.00				
Surface description	= Unpaved	Paved	Unpaved				
Average velocity (ft/s)	= 5.35	0.00	0.00				
Travel Time (min)	= 0.23	+	0.00	+	0.00	=	0.23
Channel Flow							
X sectional flow area (sqft)	= 6.00	1.77	0.00				
Wetted perimeter (ft)	= 7.10	4.71	0.00				
Channel slope (%)	= 2.60	2.60	0.00				
Manning's n-value	= 0.025	0.015	0.015				
Velocity (ft/s)	= 8.59	8.31	0.00				
Flow length (ft)	= 440.0	500.0	0.0				
Travel Time (min)	= 0.85	+	1.00	+	0.00	=	1.86
Total Travel Time, Tc					10.10 min		

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Friday, Apr 14 2023, 10:57 AM

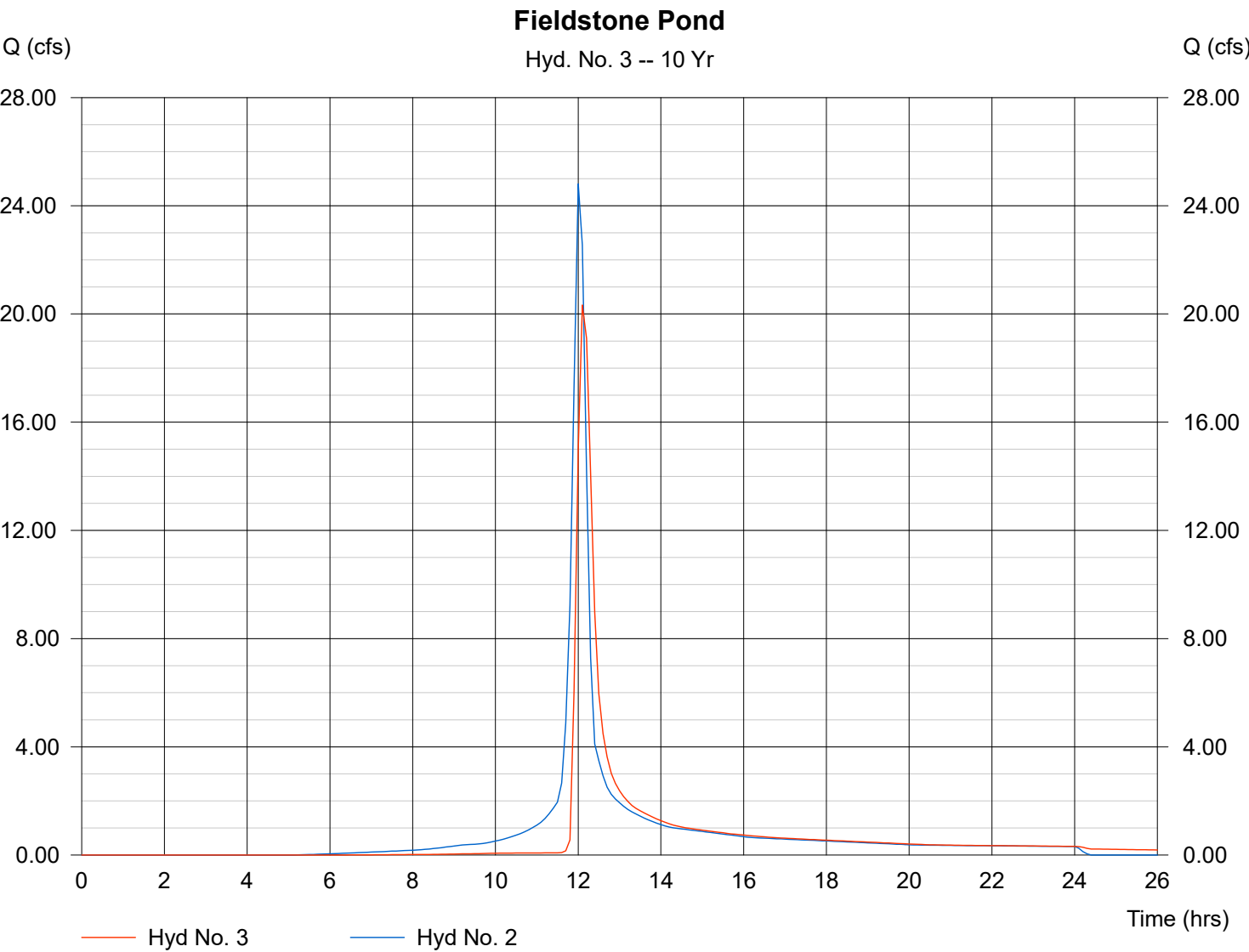
Hyd. No. 3

Fieldstone Pond

Hydrograph type	= Reservoir	Peak discharge	= 20.33 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 2	Max. Elevation	= 617.33 ft
Reservoir name	= Fieldstone Pond	Max. Storage	= 21,914 cuft

Storage Indication method used.

Hydrograph Volume = 76,772 cuft



Pond No. 1 - Fieldstone Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	614.00	00	0	0
1.00	615.00	6,405	3,203	3,203
2.00	616.00	7,578	6,992	10,194
3.00	617.00	9,105	8,342	18,536
4.00	618.00	11,557	10,331	28,867

Culvert / Orifice Structures

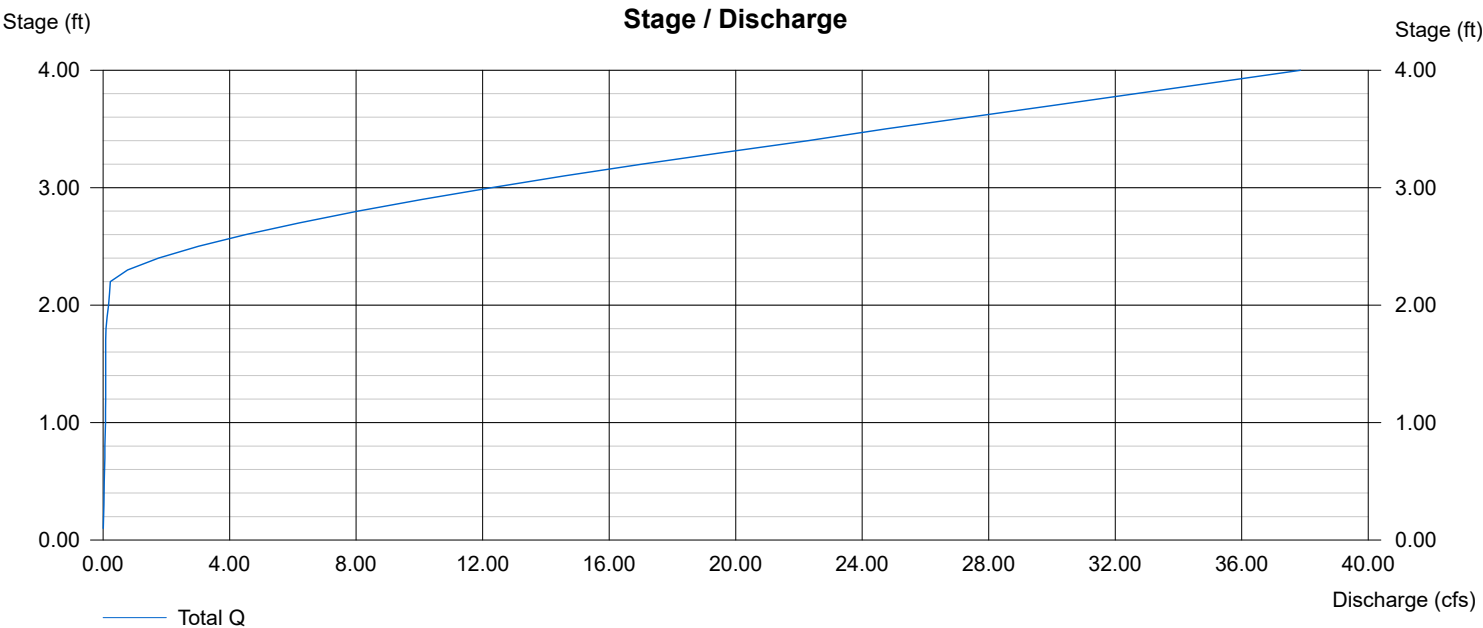
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 613.30	615.75	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.10	0.00	0.00	0.00
N-Value	= .012	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	5.00	0.00	0.00
Crest El. (ft)	= 618.00	616.20	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfiltration = 0.500 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	25.96	6	720	79,749	----	-----	-----	Fieldstone Predeveloped
2	SCS Runoff	30.53	6	720	95,161	----	-----	-----	Fieldstone Post Developed
3	Reservoir	25.74	6	726	95,118	2	617.54	24,088	Fieldstone Pond
Fieldstone Pond.gpw					Return Period: 25 Year			Friday, Apr 14 2023, 10:57 AM	

Hydrograph Plot

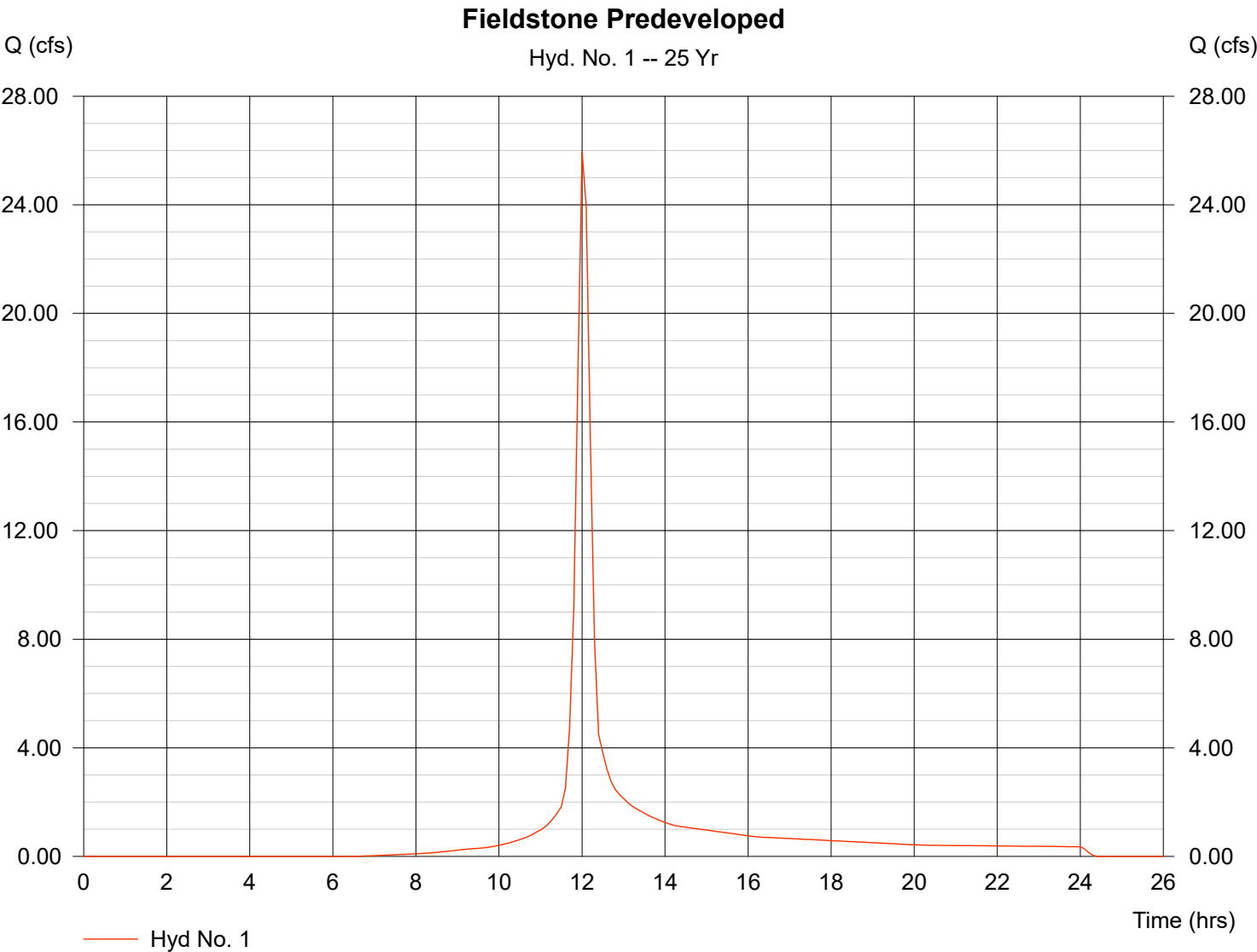
Hyd. No. 1

Fieldstone Predeveloped

Hydrograph type = SCS Runoff
Storm frequency = 25 yrs
Drainage area = 6.130 ac
Basin Slope = 0.0 %
Tc method = TR55
Total precip. = 6.16 in
Storm duration = 24 hrs

Peak discharge = 25.96 cfs
Time interval = 6 min
Curve number = 79
Hydraulic length = 0 ft
Time of conc. (Tc) = 12.30 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 79,749 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Fieldstone Predeveloped

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.150	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 843.00	0.00	0.00				
Watercourse slope (%)	= 4.00	0.00	0.00				
Surface description	= Unpaved	Unpaved	Unpaved				
Average velocity (ft/s)	= 3.23	0.00	0.00				
Travel Time (min)	= 4.35	+	0.00	+	0.00	=	4.35
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	= 0.00	0.00	0.00				
Flow length (ft)	= 0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc					12.30 min		

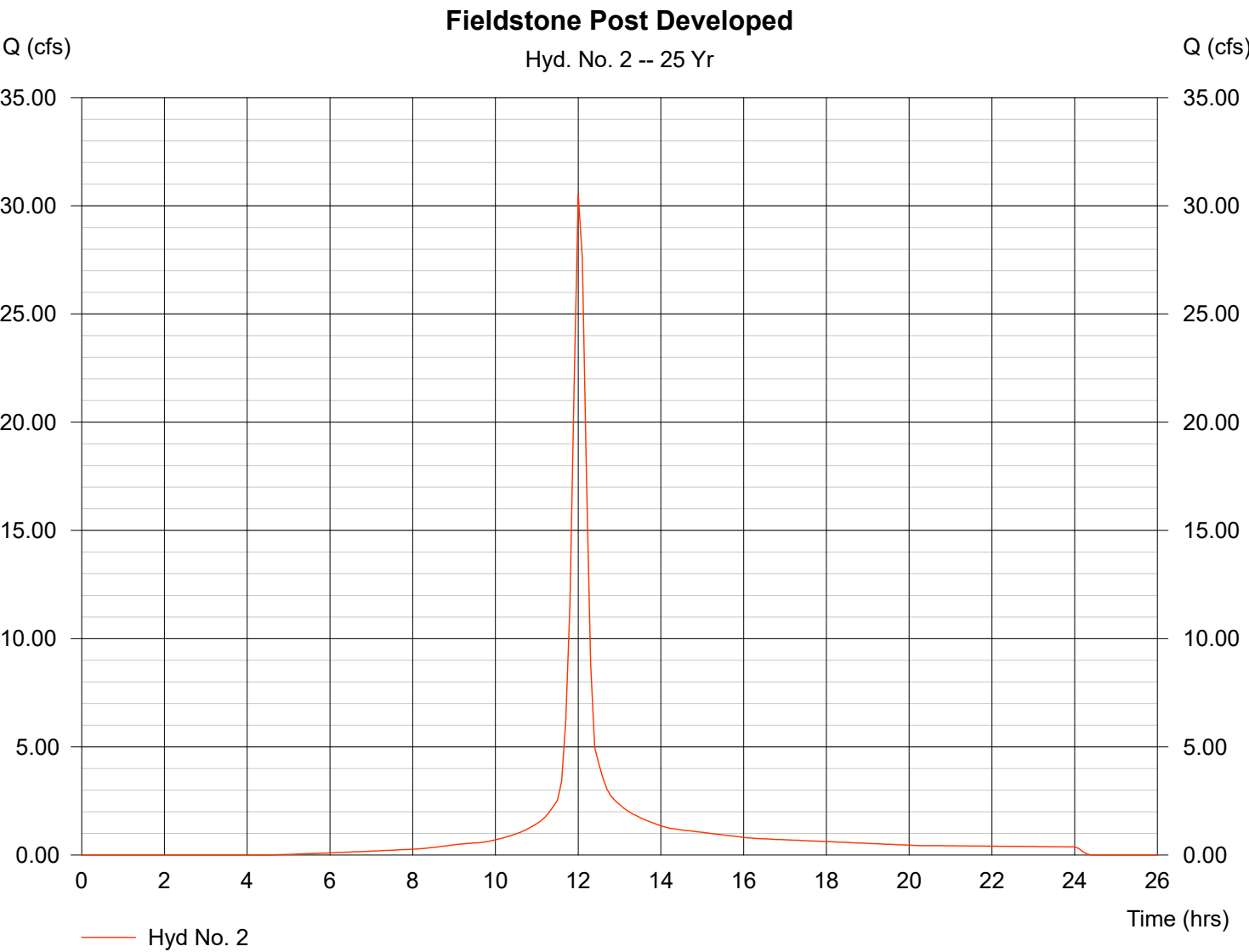
Hydrograph Plot

Hyd. No. 2

Fieldstone Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 30.53 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 6.130 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.10 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 95,161 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Fieldstone Post Developed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 74.00	0.00	0.00				
Watercourse slope (%)	= 11.00	0.00	0.00				
Surface description	= Unpaved	Paved	Unpaved				
Average velocity (ft/s)	= 5.35	0.00	0.00				
Travel Time (min)	= 0.23	+	0.00	+	0.00	=	0.23
Channel Flow							
X sectional flow area (sqft)	= 6.00	1.77	0.00				
Wetted perimeter (ft)	= 7.10	4.71	0.00				
Channel slope (%)	= 2.60	2.60	0.00				
Manning's n-value	= 0.025	0.015	0.015				
Velocity (ft/s)	= 8.59	8.31	0.00				
Flow length (ft)	= 440.0	500.0	0.0				
Travel Time (min)	= 0.85	+	1.00	+	0.00	=	1.86
Total Travel Time, Tc					10.10 min		

Hydrograph Plot

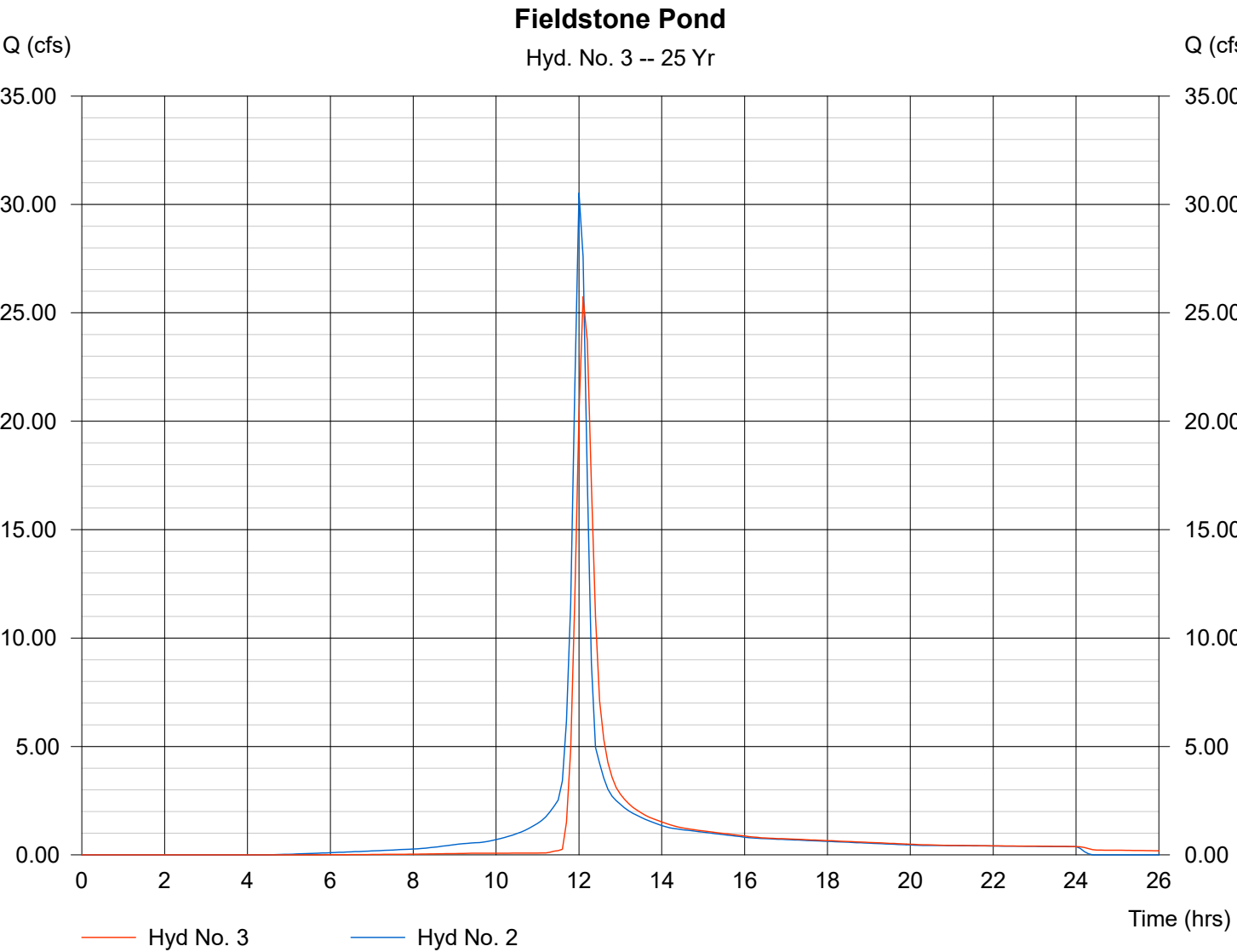
Hyd. No. 3

Fieldstone Pond

Hydrograph type	= Reservoir	Peak discharge	= 25.74 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Inflow hyd. No.	= 2	Max. Elevation	= 617.54 ft
Reservoir name	= Fieldstone Pond	Max. Storage	= 24,088 cuft

Storage Indication method used.

Hydrograph Volume = 95,118 cuft



Pond No. 1 - Fieldstone Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	614.00	00	0	0
1.00	615.00	6,405	3,203	3,203
2.00	616.00	7,578	6,992	10,194
3.00	617.00	9,105	8,342	18,536
4.00	618.00	11,557	10,331	28,867

Culvert / Orifice Structures

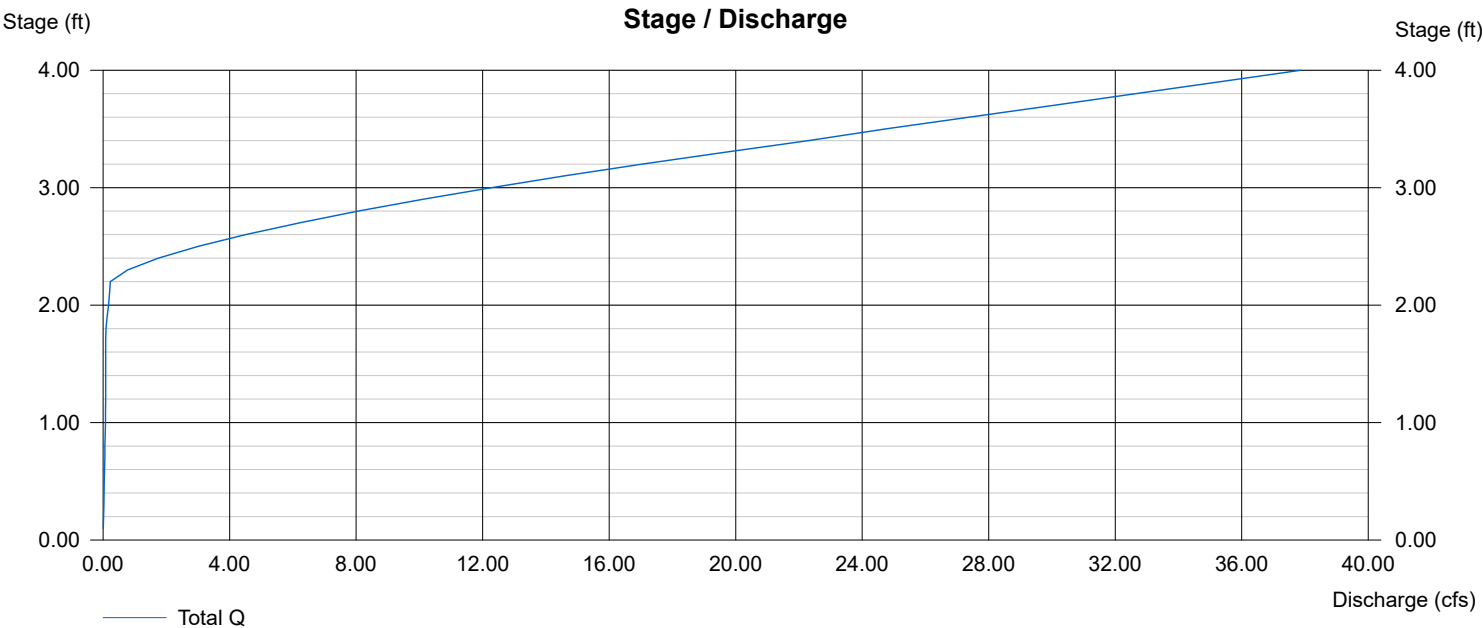
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 613.30	615.75	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.10	0.00	0.00	0.00
N-Value	= .012	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	5.00	0.00	0.00
Crest El. (ft)	= 618.00	616.20	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfiltration = 0.500 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	30.15	6	720	92,776	----	-----	-----	Fieldstone Predeveloped
2	SCS Runoff	34.76	6	720	108,928	----	-----	-----	Fieldstone Post Developed
3	Reservoir	29.54	6	726	108,885	2	617.68	25,580	Fieldstone Pond
Fieldstone Pond.gpw					Return Period: 50 Year			Friday, Apr 14 2023, 10:57 AM	

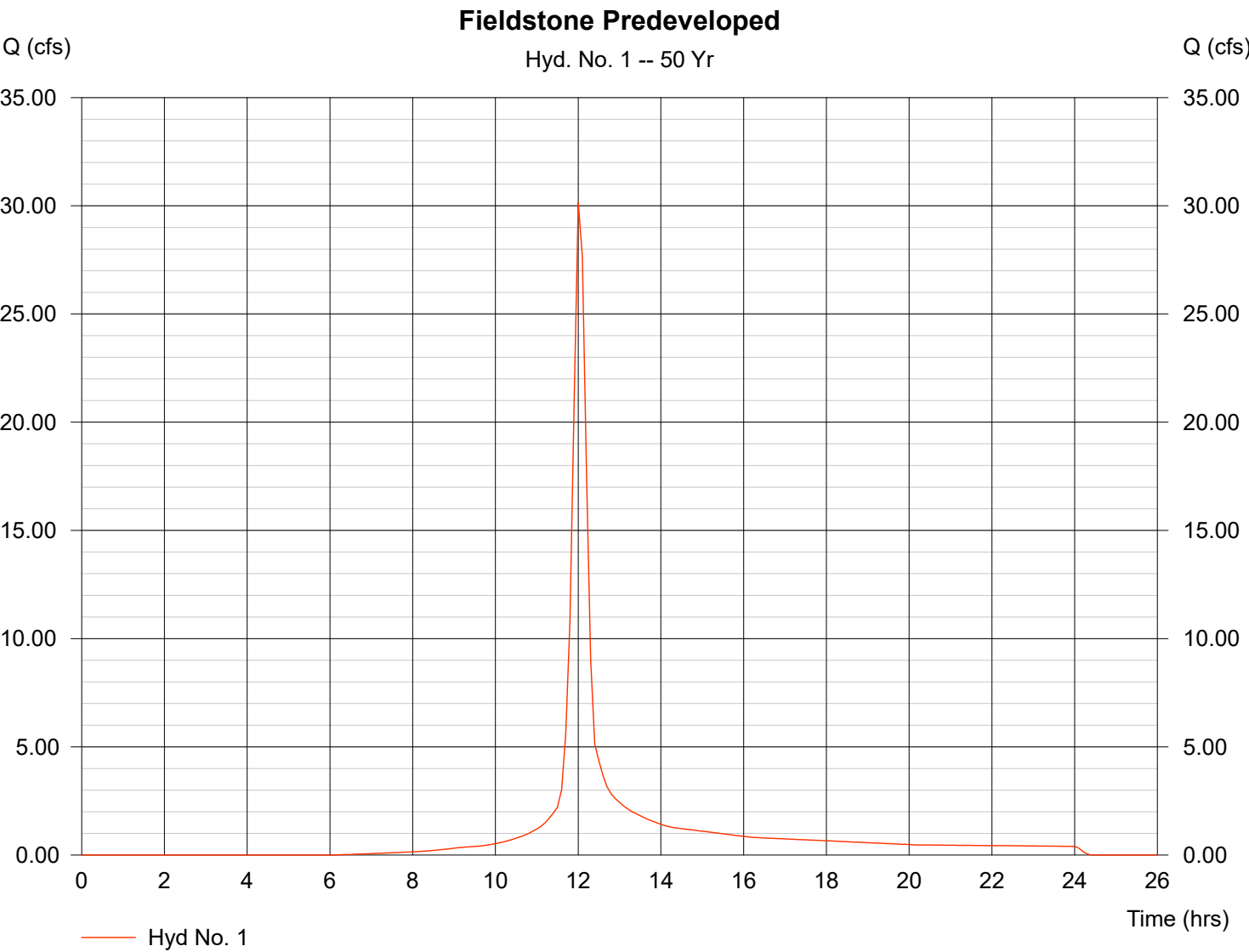
Hydrograph Plot

Hyd. No. 1

Fieldstone Predeveloped

Hydrograph type	=	SCS Runoff	Peak discharge	=	30.15 cfs
Storm frequency	=	50 yrs	Time interval	=	6 min
Drainage area	=	6.130 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	6.85 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Volume = 92,776 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Fieldstone Predeveloped

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.150	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 843.00	0.00	0.00				
Watercourse slope (%)	= 4.00	0.00	0.00				
Surface description	= Unpaved	Unpaved	Unpaved				
Average velocity (ft/s)	= 3.23	0.00	0.00				
Travel Time (min)	= 4.35	+	0.00	+	0.00	=	4.35
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	= 0.00	0.00	0.00				
Flow length (ft)	= 0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc					12.30 min		

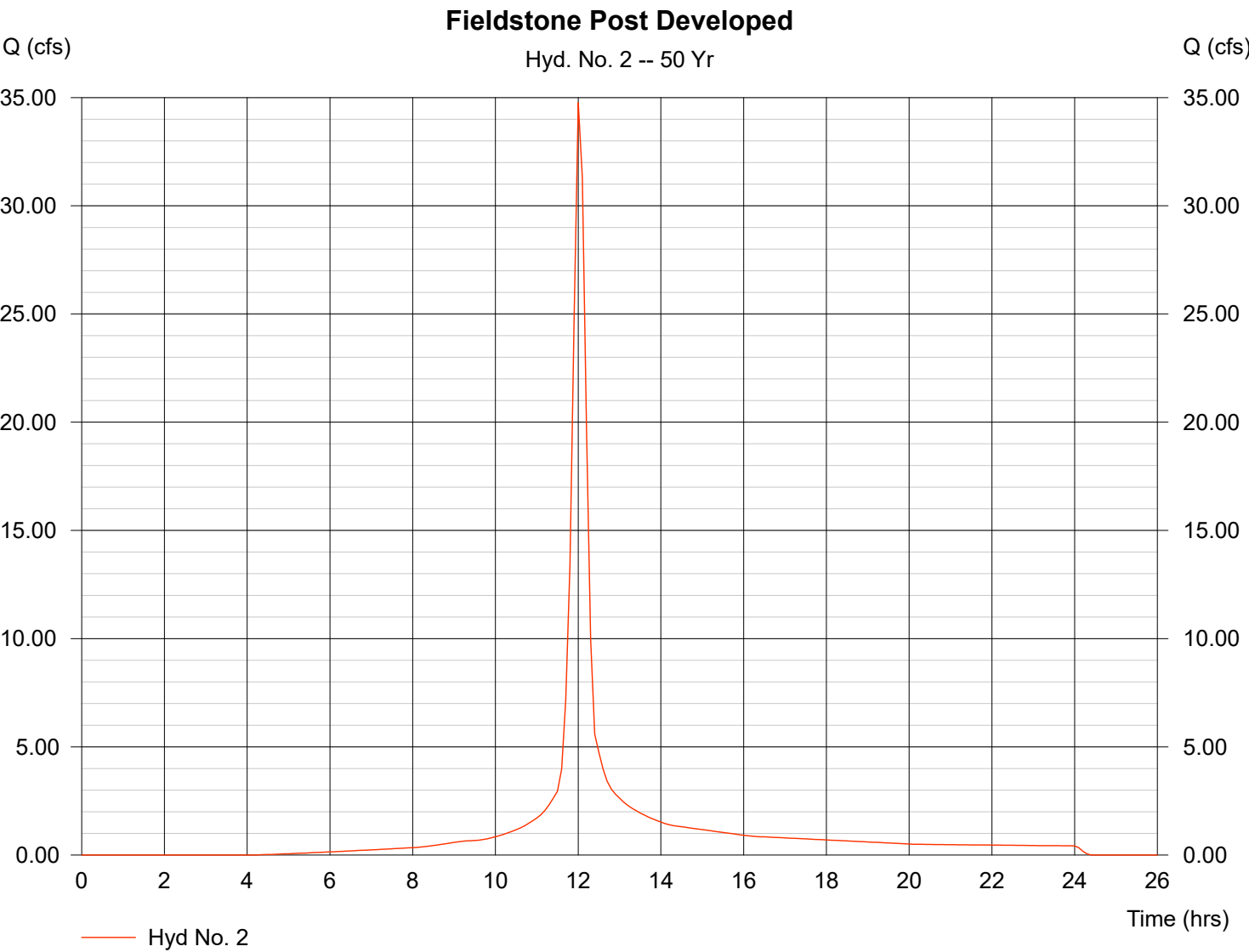
Hydrograph Plot

Hyd. No. 2

Fieldstone Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 34.76 cfs
Storm frequency	= 50 yrs	Time interval	= 6 min
Drainage area	= 6.130 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.10 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 108,928 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Fieldstone Post Developed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 74.00	0.00	0.00				
Watercourse slope (%)	= 11.00	0.00	0.00				
Surface description	= Unpaved	Paved	Unpaved				
Average velocity (ft/s)	= 5.35	0.00	0.00				
Travel Time (min)	= 0.23	+	0.00	+	0.00	=	0.23
Channel Flow							
X sectional flow area (sqft)	= 6.00	1.77	0.00				
Wetted perimeter (ft)	= 7.10	4.71	0.00				
Channel slope (%)	= 2.60	2.60	0.00				
Manning's n-value	= 0.025	0.015	0.015				
Velocity (ft/s)	= 8.59	8.31	0.00				
Flow length (ft)	= 440.0	500.0	0.0				
Travel Time (min)	= 0.85	+	1.00	+	0.00	=	1.86
Total Travel Time, Tc					10.10 min		

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Friday, Apr 14 2023, 10:57 AM

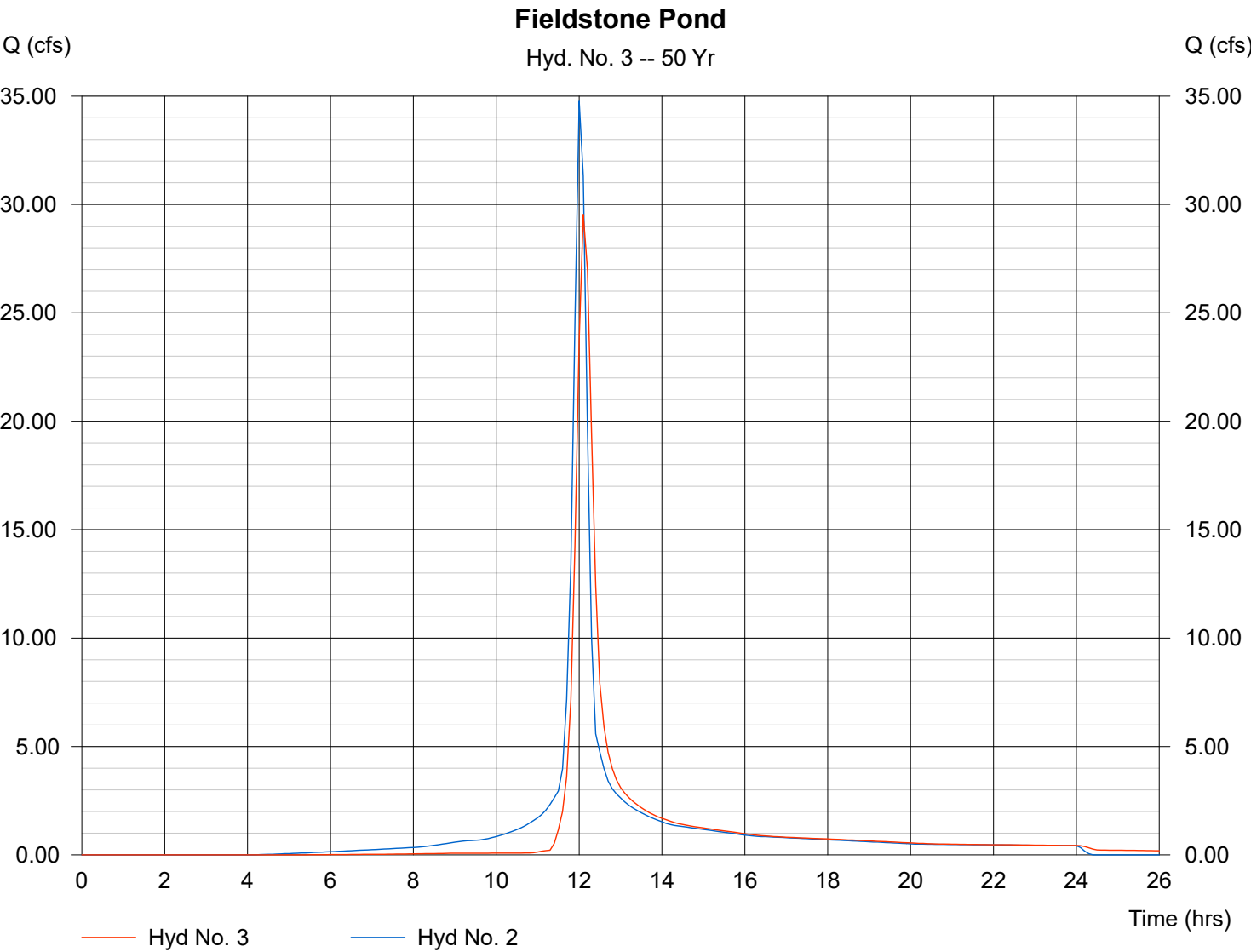
Hyd. No. 3

Fieldstone Pond

Hydrograph type	= Reservoir	Peak discharge	= 29.54 cfs
Storm frequency	= 50 yrs	Time interval	= 6 min
Inflow hyd. No.	= 2	Max. Elevation	= 617.68 ft
Reservoir name	= Fieldstone Pond	Max. Storage	= 25,580 cuft

Storage Indication method used.

Hydrograph Volume = 108,885 cuft



Pond No. 1 - Fieldstone Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	614.00	00	0	0
1.00	615.00	6,405	3,203	3,203
2.00	616.00	7,578	6,992	10,194
3.00	617.00	9,105	8,342	18,536
4.00	618.00	11,557	10,331	28,867

Culvert / Orifice Structures

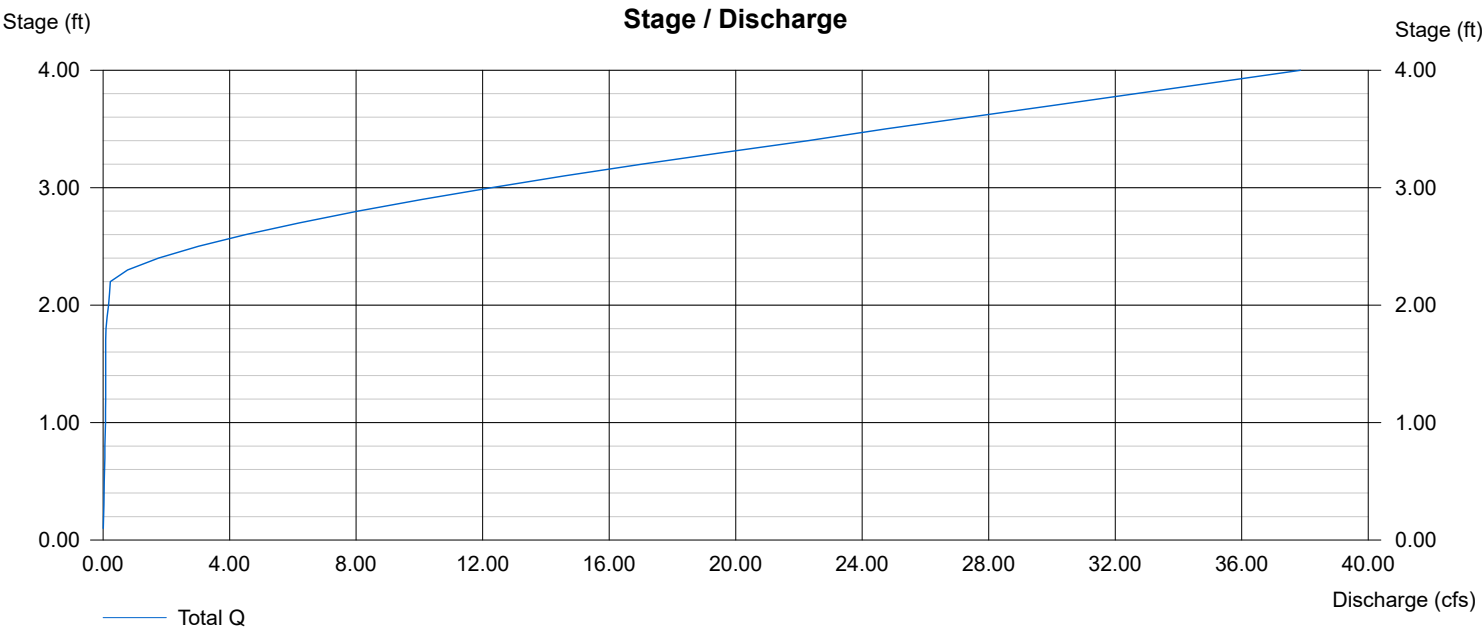
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 613.30	615.75	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.10	0.00	0.00	0.00
N-Value	= .012	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	5.00	0.00	0.00
Crest El. (ft)	= 618.00	616.20	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfiltration = 0.500 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	34.31	6	720	105,805	----	-----	-----	Fieldstone Predeveloped
2	SCS Runoff	38.93	6	720	122,592	----	-----	-----	Fieldstone Post Developed
3	Reservoir	33.20	6	726	122,548	2	617.82	27,018	Fieldstone Pond
Fieldstone Pond.gpw					Return Period: 100 Year			Friday, Apr 14 2023, 10:57 AM	

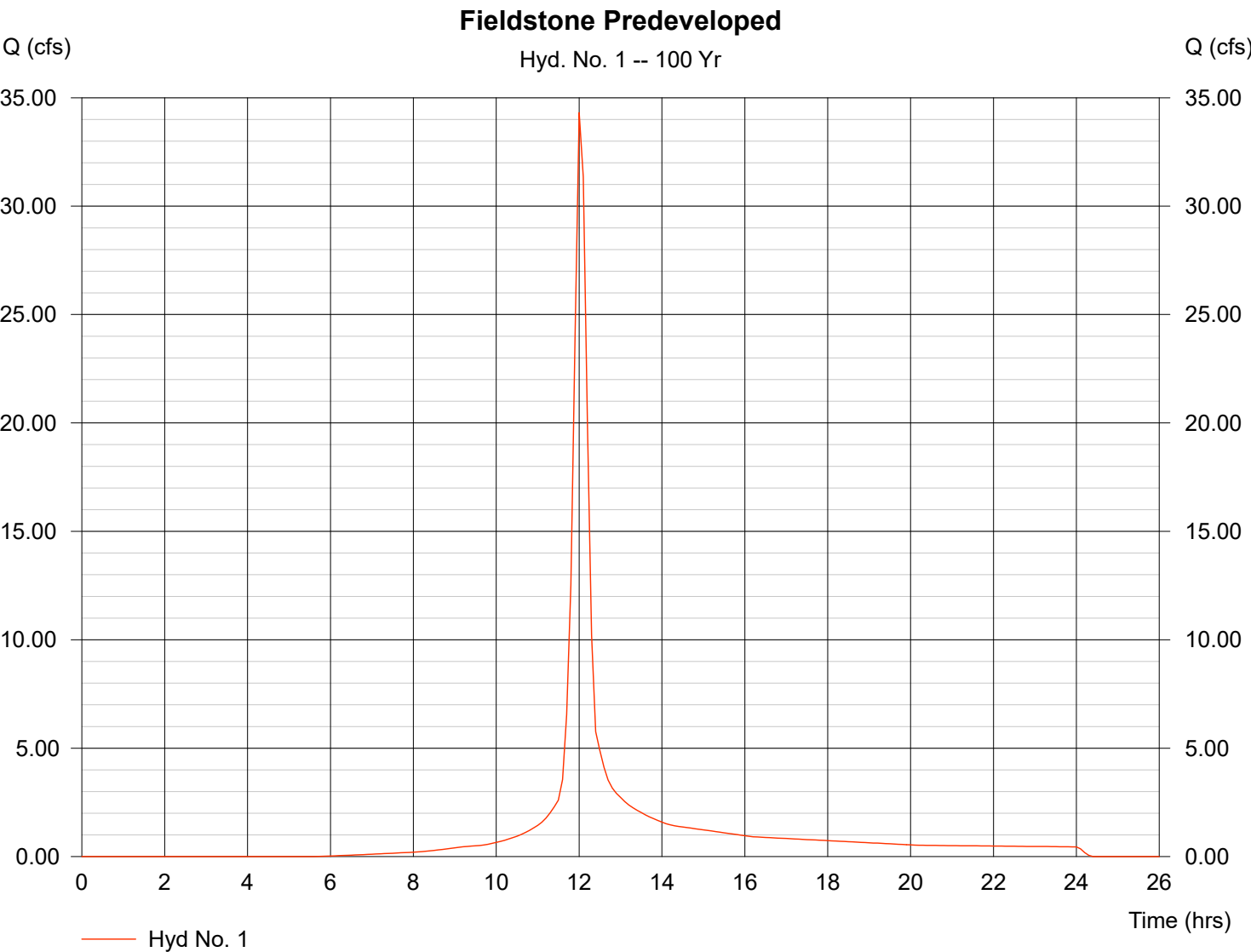
Hydrograph Plot

Hyd. No. 1

Fieldstone Predeveloped

Hydrograph type	=	SCS Runoff	Peak discharge	=	34.31 cfs
Storm frequency	=	100 yrs	Time interval	=	6 min
Drainage area	=	6.130 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	7.53 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Volume = 105,805 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Fieldstone Predeveloped

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.150	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00	
Land slope (%)	= 8.00	0.00	0.00	
Travel Time (min)	= 7.96	+	0.00	+
			0.00	= 7.96
Shallow Concentrated Flow				
Flow length (ft)	= 843.00	0.00	0.00	
Watercourse slope (%)	= 4.00	0.00	0.00	
Surface description	= Unpaved	Unpaved	Unpaved	
Average velocity (ft/s)	= 3.23	0.00	0.00	
Travel Time (min)	= 4.35	+	0.00	+
			0.00	= 4.35
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	= 0.00	0.00	0.00	
Flow length (ft)	= 0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				12.30 min

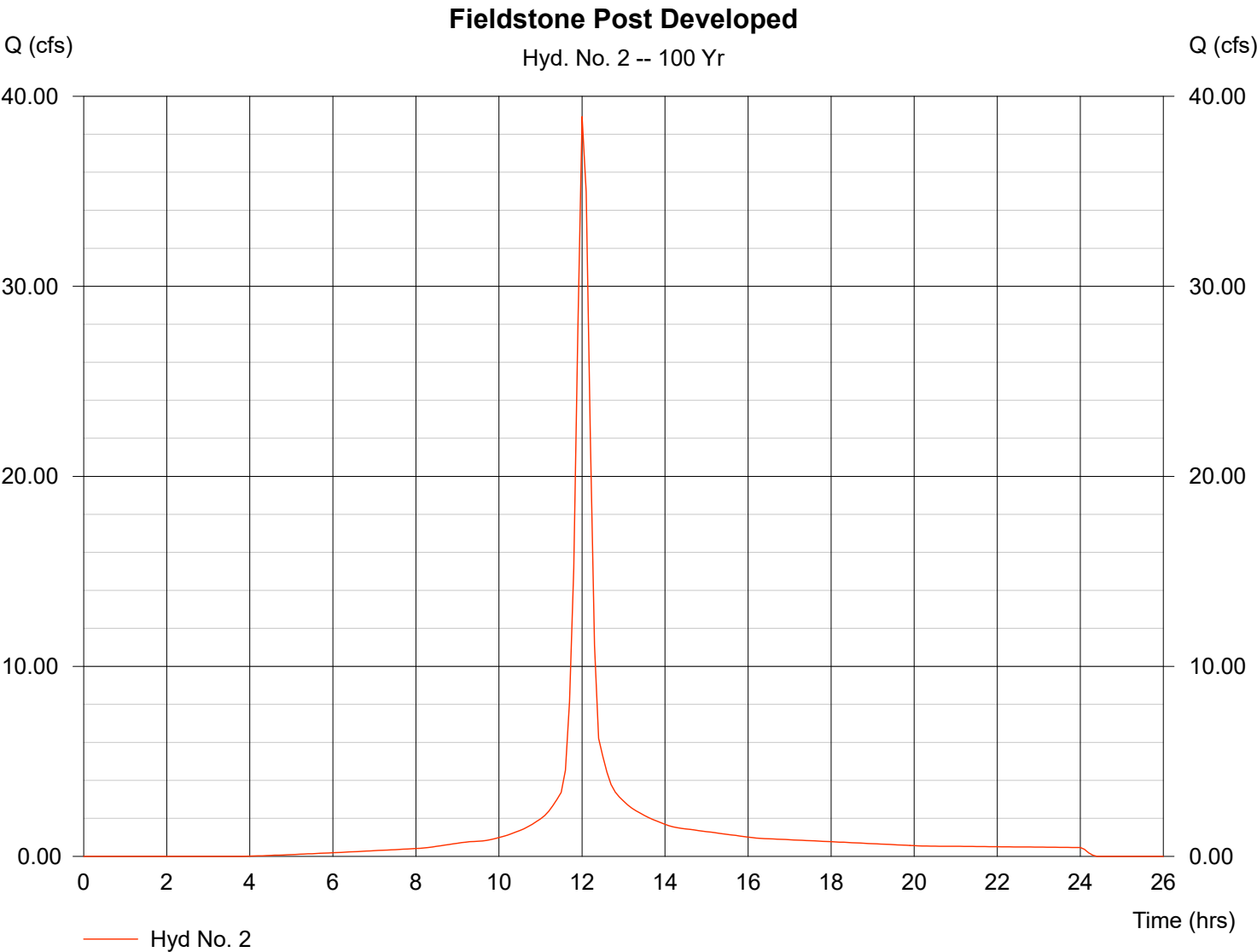
Hydrograph Plot

Hyd. No. 2

Fieldstone Post Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.93 cfs
Storm frequency	=	100 yrs	Time interval	=	6 min
Drainage area	=	6.130 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.10 min
Total precip.	=	7.53 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Volume = 122,592 cuft



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Fieldstone Post Developed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.39	0.00	0.00				
Land slope (%)	= 8.00	0.00	0.00				
Travel Time (min)	= 7.96	+	0.00	+	0.00	=	7.96
Shallow Concentrated Flow							
Flow length (ft)	= 74.00	0.00	0.00				
Watercourse slope (%)	= 11.00	0.00	0.00				
Surface description	= Unpaved	Paved	Unpaved				
Average velocity (ft/s)	= 5.35	0.00	0.00				
Travel Time (min)	= 0.23	+	0.00	+	0.00	=	0.23
Channel Flow							
X sectional flow area (sqft)	= 6.00	1.77	0.00				
Wetted perimeter (ft)	= 7.10	4.71	0.00				
Channel slope (%)	= 2.60	2.60	0.00				
Manning's n-value	= 0.025	0.015	0.015				
Velocity (ft/s)	= 8.59	8.31	0.00				
Flow length (ft)	= 440.0	500.0	0.0				
Travel Time (min)	= 0.85	+	1.00	+	0.00	=	1.86
Total Travel Time, Tc							10.10 min

Hydrograph Plot

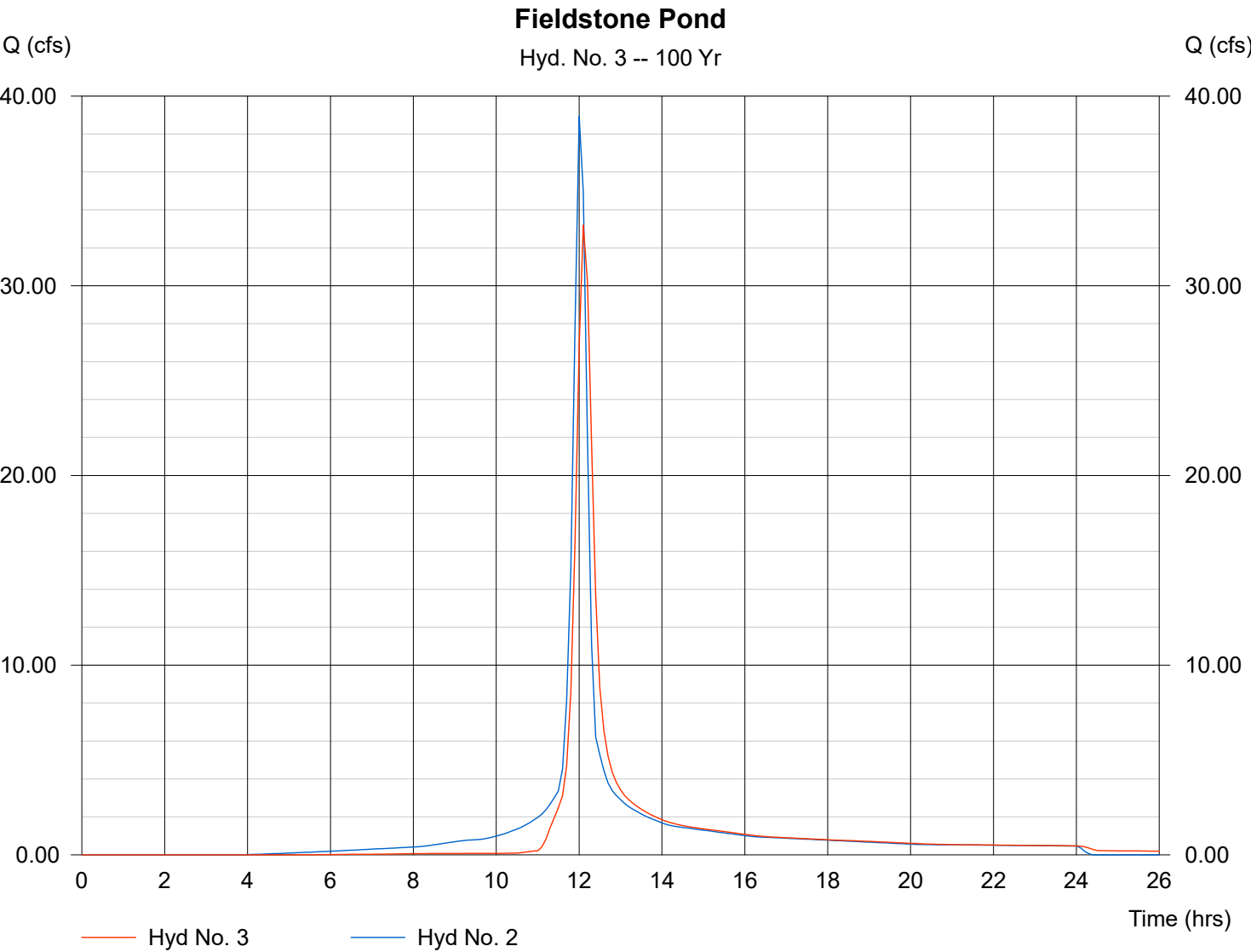
Hyd. No. 3

Fieldstone Pond

Hydrograph type	= Reservoir	Peak discharge	= 33.20 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 2	Max. Elevation	= 617.82 ft
Reservoir name	= Fieldstone Pond	Max. Storage	= 27,018 cuft

Storage Indication method used.

Hydrograph Volume = 122,548 cuft



Pond No. 1 - Fieldstone Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	614.00	00	0	0
1.00	615.00	6,405	3,203	3,203
2.00	616.00	7,578	6,992	10,194
3.00	617.00	9,105	8,342	18,536
4.00	618.00	11,557	10,331	28,867

Culvert / Orifice Structures

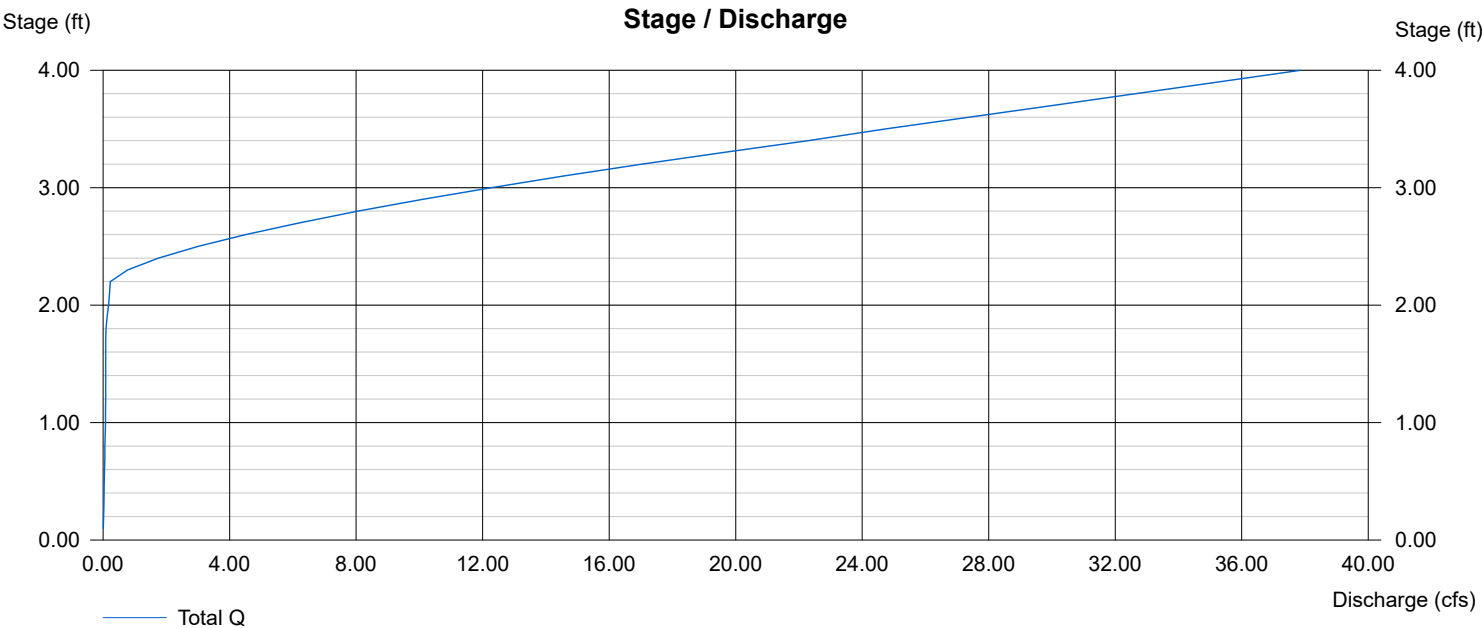
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	3.00	0.00	0.00
Span (in)	= 36.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 613.30	615.75	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.10	0.00	0.00	0.00
N-Value	= .012	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	5.00	0.00	0.00
Crest El. (ft)	= 618.00	616.20	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfiltration = 0.500 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.



MATCH LINE

SEE SHEET C3.1

DISTURBED AREA 285,183 S.F. OR 6.55 AC.

DISTURBED AREA 285,183 S.F. OR 6.55 AC.

DISTURBED AREA 285,183 S.F. OR 6.55 AC.

FIELDSTONE FARMS
SECTION 4
PLAT BOOK P18 PAGE 148

OWNER / DEVELOPER
HABITAT FOR HUMANITY
WILLIAMSON/MAURY COUNTY
511 W MEADE BOULEVARD
FRANKLIN, TN 37064

DEEDBOOK R2421 PAGE 788 R.O.M.C.

PHASE I EROSION CONTROL PLAN

UTILITY OWNERS

WATER
COLUMBIA WATER SYSTEMS
201 PICKENS LANE
P.O. BOX 379
COLUMBIA, TN 38402
(931) 388-4633

ELECTRIC
COLUMBIA POWER SYSTEMS
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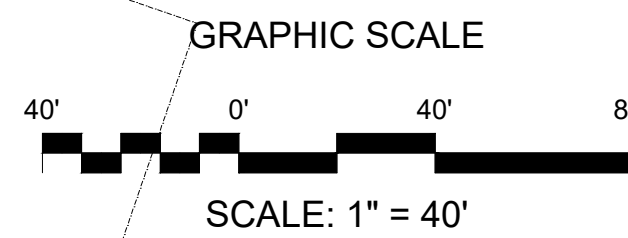
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(931) 384-0578

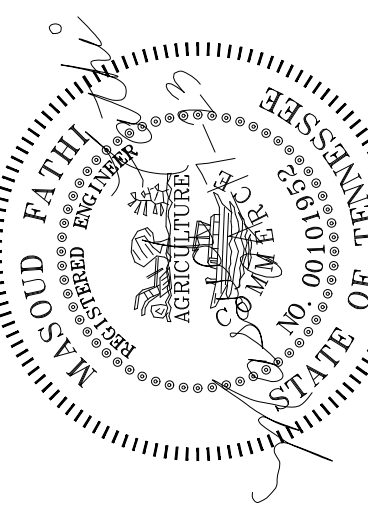
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BRENTWOOD, TENNESSEE 37027
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SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

General Notes

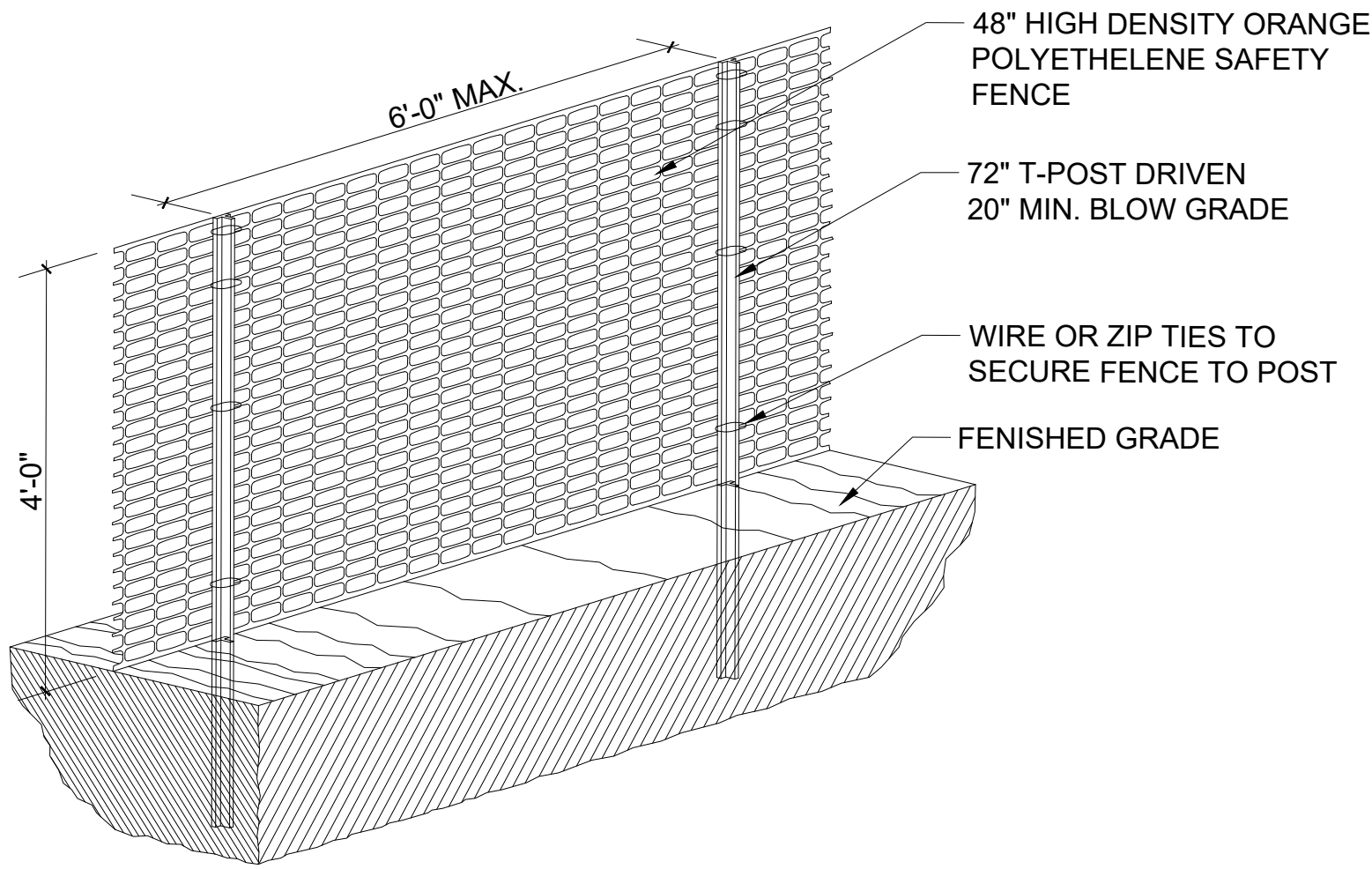
No.	Revision/Issue	Date
1		
2		
3		
4		

Date: APR. 17, 2023
Sheet: C3.0 OF
Project No. 2023-15 Prepared By: MF

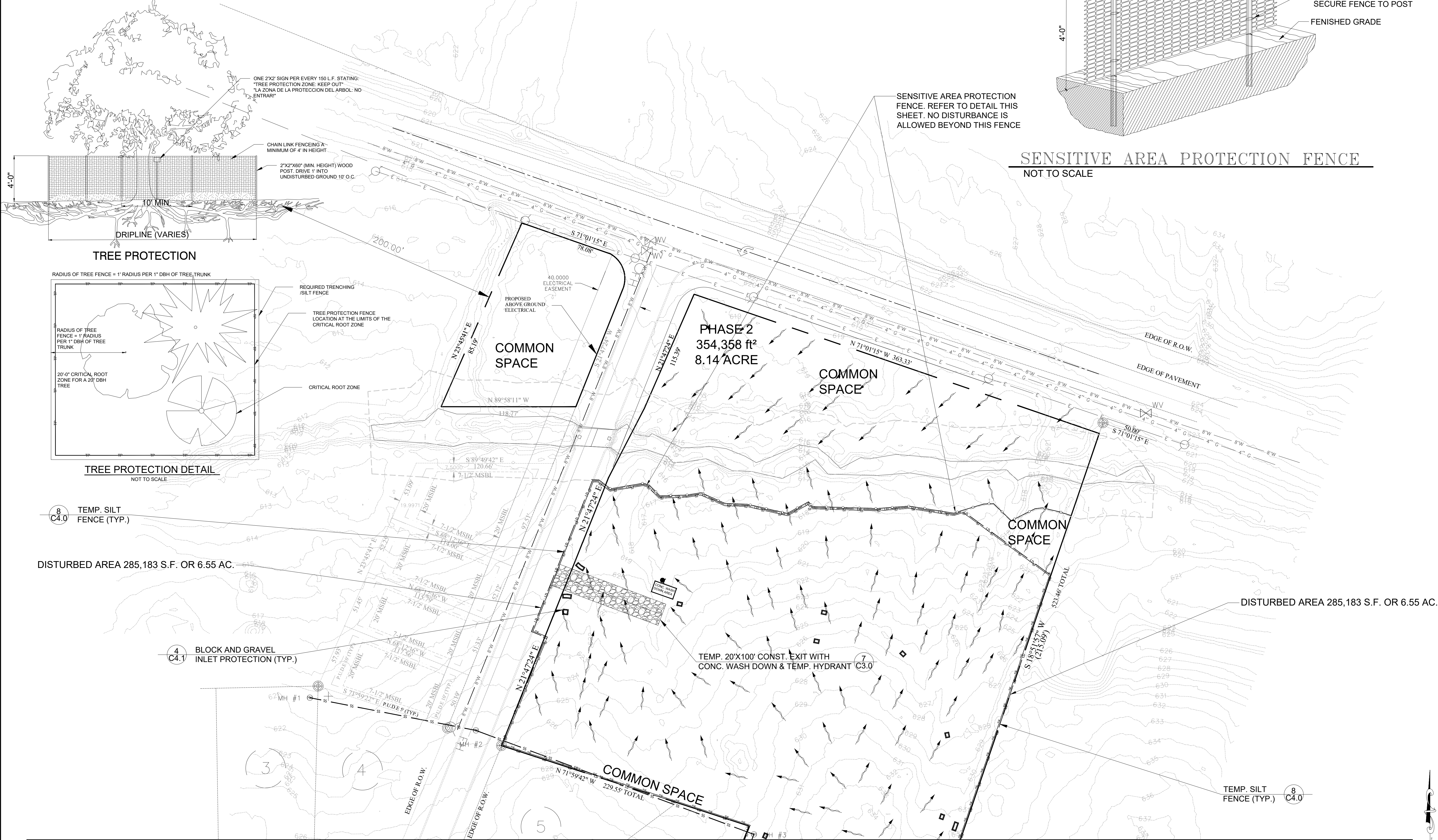
AREAS WITH SLOPES 3:1 OR STEEPER MUST BE STABILIZED BY EROSION CONTROL BLANKETS. REFER TO SHEET C4.1 FOR DETAIL. EROSION CONTROL BLANKET SHALL BE NORTH AMERICAN GREEN SC250 OR APPROVED EQUAL INSTALLED AS RECOMMENDED BY MANUFACTURER AND METHODS APPROVED BY THE CITY.

INSTALL J-HOOKS SILT FENCE WHEREVER SILT FENCE IS NOT INSTALLED ALONG CONTOUR LINES. INSTALL ALL SPECIFIED SOD AS SHOWN ON SHEET C2.2. AND STABILIZE ANY GRADED AREA WITHIN AREA NOT RECEIVING PAVEMENT, GRAVEL, WITHIN 7 DAYS OF COMPLETION OF ANY PHASE OF GRADING. NO DISTURBED AREA SHALL BE LEFT BARE FOR MORE THAN 7 DAYS. SILT FENCE TO REMAIN IN OPERATION DURING PHASE 2.

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
3. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
4. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS.
5. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION. ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.



SENSITIVE AREA PROTECTION FENCE
NOT TO SCALE

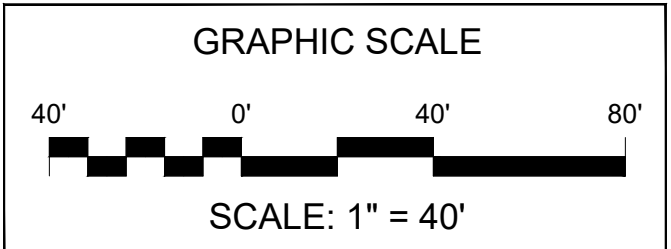


GENERAL CONTRACTOR SHALL REMOVE ALL SEDIMENT, AND ALL TEMPORARY STRUCTURES FROM THE SEDIMENT TRAP AND STABILIZE THE BASIN PRIOR TO CONVERTING THE BASIN TO THE PERMANENT DETENTION POND.

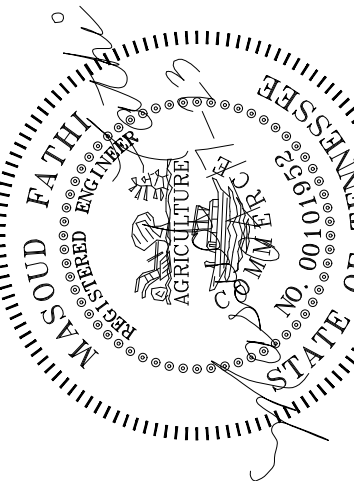
ALL EROSION CONTROL MEASURES SHALL REMAIN IN GOOD WORKING CONDITIONS DURING THE CONSTRUCTION UNTIL SUCH TIME THAT ALL DISTURBED AREAS ARE STABILIZED.

PHASE I EROSION PROTECTION PLAN

NOTE:
CONTRACTOR TO PROVIDE AN AREA FOR CONCRETE WASH DOWN AND EQUIPMENT FUELING IN ACCORDANCE WITH THE CITY OF COLUMBIA STANDARDS. CONTRACTOR TO COORDINATE EXACT LOCATION WITH THE CITY ENGINEERING DEPARTMENT DURING PRE-CONSTRUCTION MEETING. CONTROL OF OTHER SITE WASTES SUCH AS DISCARDED BUILDING MATERIALS, CHEMICALS, LITTER, AND SANITARY WASTES THAT MAY CAUSE ADVERSE IMPACTS TO WATER QUALITY IS ALSO REQUIRED BY THE GRADING PERMITTEE."



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SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

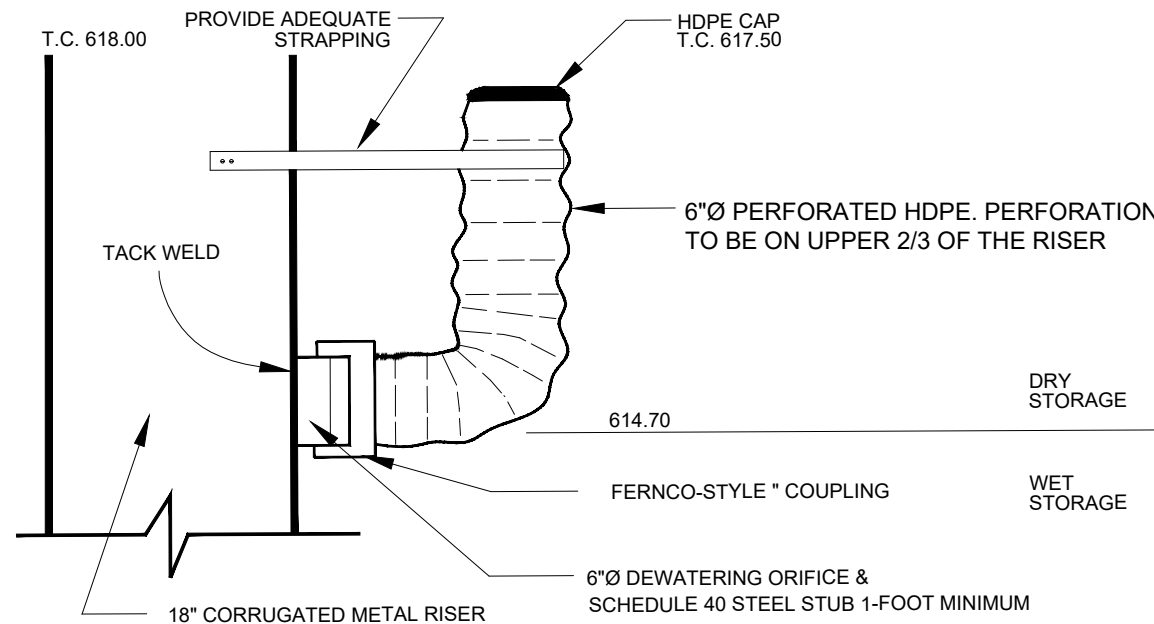
General Notes

No.	Revision/Issue	Date
1		
2		
3		
4		

Date: APR. 17, 2023
Sheet: C3.1 OF
Project No. 2023-15 Prepared By: MF

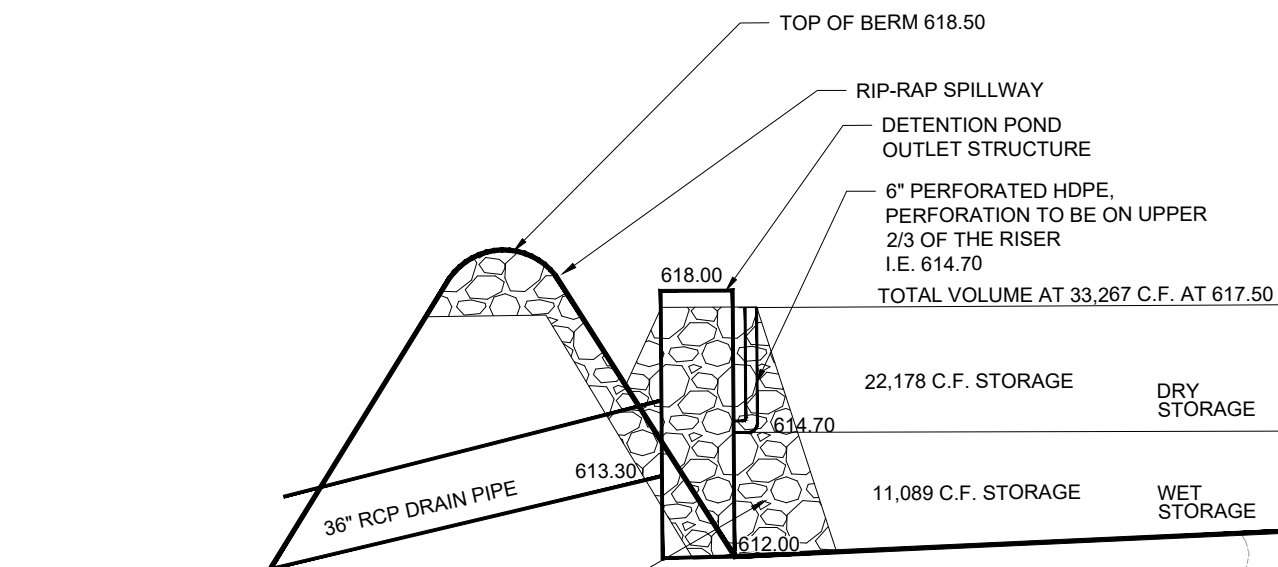
NOTE:
1. G.C. TO UTILIZE THE DETENTION POND PIT AS TEMPORARY SEDIMENT TRAP. AFTER THE EARTHWORK IS STABILIZED, REMOVE ALL SEDIMENT FROM SEDIMENT TRAP PRIOR TO CONVERTING TO DETENTION POND.
2. ALL PERIMETER EROSION CONTROL MEASURES SHALL REMAIN IN GOOD WORKING CONDITION DURING THE ENTIRE CONSTRUCTION PERIOD. IT IS CONTRACTOR'S RESPONSIBILITY TO REMOVE ALL TEMPORARY EROSION CONTROL MEASURES NO LATER THAN 14 DAYS AFTER FINAL GRADING AND SITE STABILIZATION AT NO EXTRA CHARGE.

NOTE:
ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 7 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING.



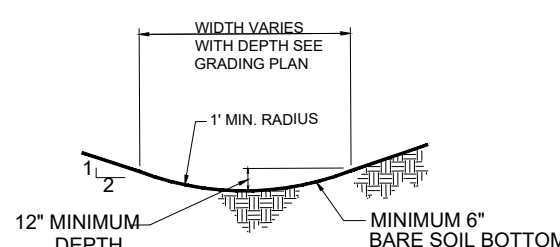
SEDIMENT TRAP CALCULATIONS
6.13 ACRES X 3,618 C.F. = 22,178 C.F.
REQUIRED WET STORAGE = 134 C.Y./AC. X 6.13 X 27 = 22,178 C.F.
REQUIRED DRY STORAGE = 67 C.Y./AC. X 6.13 X 27 = 11,089 C.F.
TOTAL VOLUME REQUIRED = 33,267 C.F.
VOLUME PROVIDED = 38,496 C.F. AT ELEV. 517.50
25 YR. STORM TO THE SEDIMENT TRAP = 0.02 CFS
25 YR. STORM THROUGH OUTLET STRUCTURE = 1.29 CFS 25 YR.
STORM ELEVATION = 565.51

SEDIMENT TRAP VOLUME	ELEV.	CNTR. AREA	VOLUME
612.00	0	0	0
613.00	4,296	2148	
614.00	5,323	6,958	
614.70	6,077	11,089	
615.00	6,405	12,822	
616.00	7,578	19,813	
617.00	9,105	28,155	
617.50	10,341	33,267	
618.00	11,577	38,496	



PIPE CAPACITY
18" RCP FROM SEDIMENT BASIN TO OUTFALL POND 100 YR INFLOW = 11.3 CFS

PIPE CAPACITY:
36" CMP AT 1.1%
A=7.07 S.F., WP=9.421', HR=0.75, n=0.012
Q=75.78 CFS, V=10.72 FPS



TEMP. DIVERSION CHANNEL
NOT TO SCALE

DIVERSION DITCH CAPACITY:
2:1 SIDE SLOPE
LONGITUDINAL SLOPE = 1%
n = 0.03
B = 2'
D = 12"
A = 4.0 S.F.
W.P. = 8.47'
H.R. = 0.62'
V = 3.6 FPS
Q = 14.4 CFS
100 YR. STORM FROM DISTURBED AREA = 11.3 CFS

UTILITY OWNERS

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(931) 388-4833

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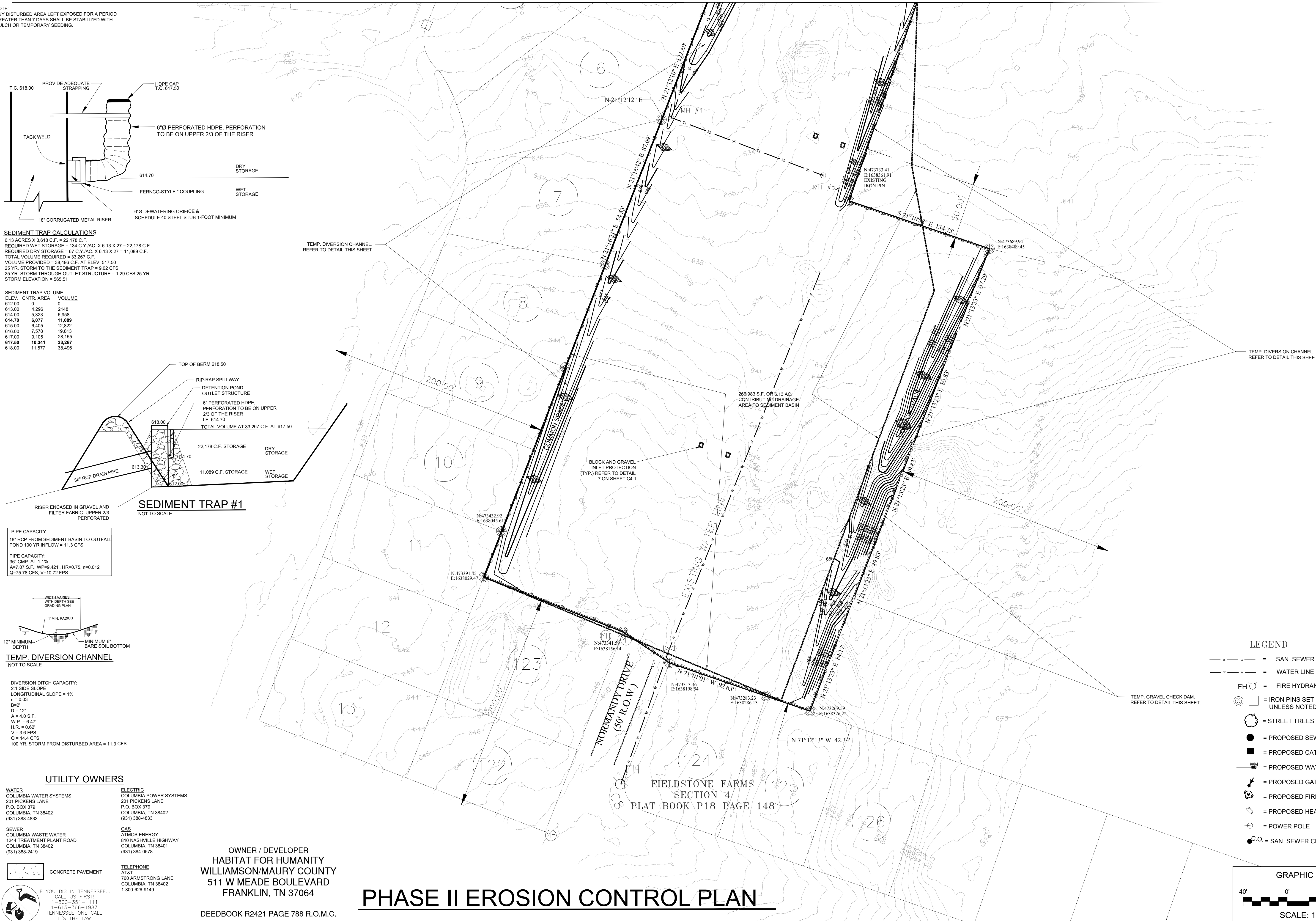
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FRANKLIN, TN 37064

DEEDBOOK R2421 PAGE 788 R.O.M.C.

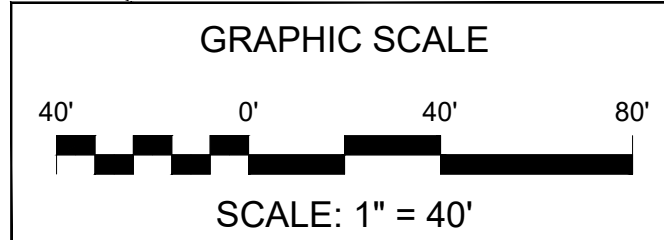
MATCH LINE

SEE SHEET C3.3

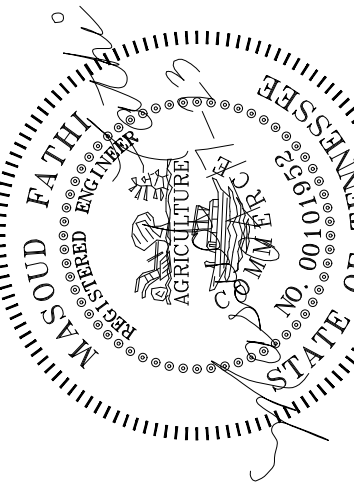


LEGEND

- SAN. SEWER LINE
- WATER LINE
- FH = FIRE HYDRANT
- ⊙ = IRON PINS SET UNLESS NOTED
- ⊙ = STREET TREES
- = PROPOSED SEWER MANHOLE
- = PROPOSED CATCH BASIN
- WM = PROPOSED WATER METER & CAP
- ⚡ = PROPOSED GATE VALVE
- ⊙ = PROPOSED FIRE HYDRANT
- ▽ = PROPOSED HEADWALL
- ⊙ = POWER POLE
- O = SAN. SEWER CLEAN OUT



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SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

General Notes

No.	Revision/Issue	Date
1		
2		
3		
4		

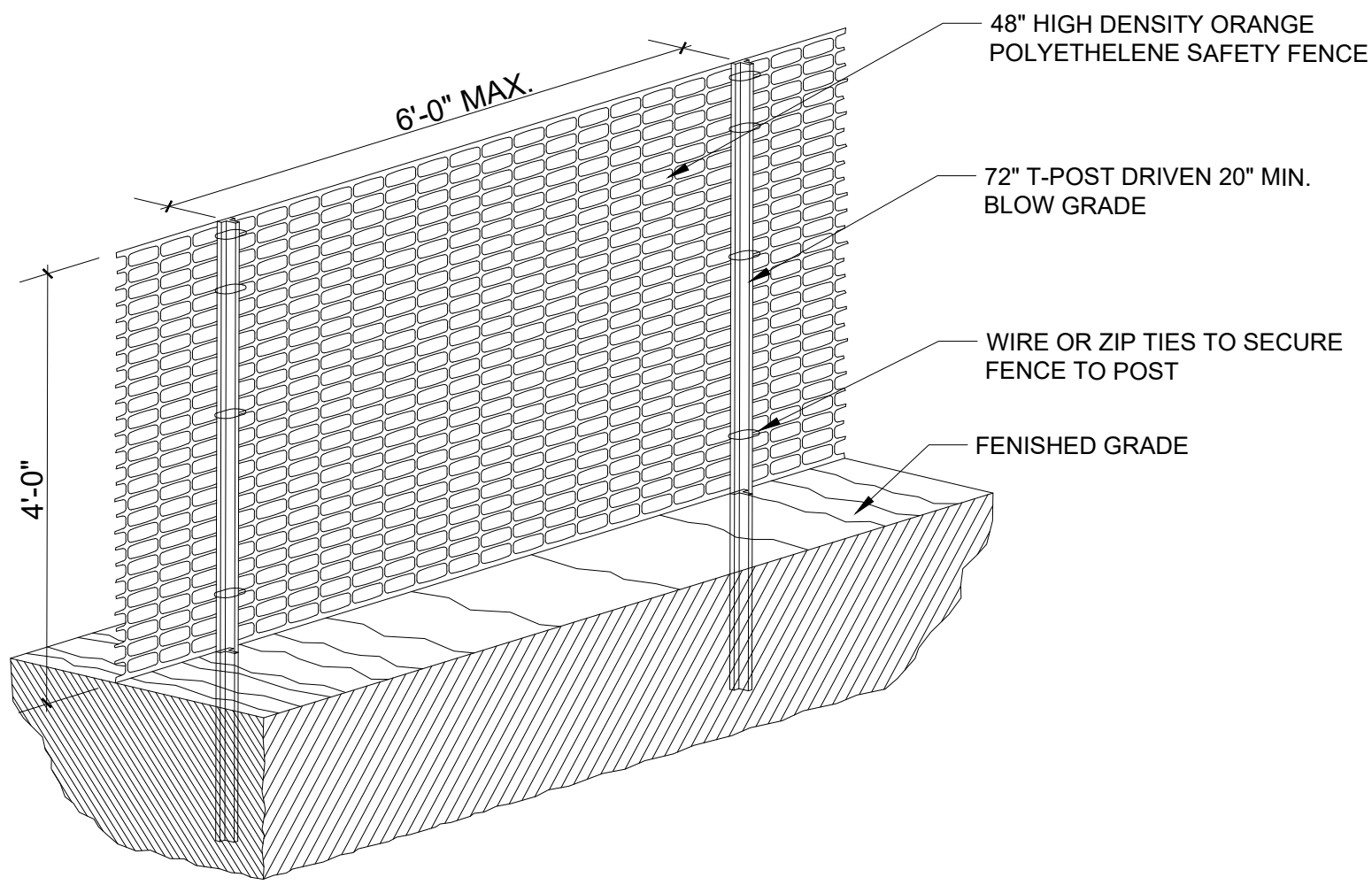
Date: **APR. 17, 2023** Scale:
Sheet: **C3.2** OF
Project No. **2023-15** Prepared By: **MF**

AREAS WITH SLOPES 3:1 OR STEEPER MUST BE STABILIZED BY EROSION CONTROL BLANKETS. REFER TO DETAIL 6 ON SHEET C4.1. EROSION CONTROL BLANKET SHALL BE BIONET® 700BN™ LONG-TERM BIODEGRADABLE COIR-NET COCONUT BLANKET OR APPROVED EQUAL. INSTALLED AS RECOMMENDED BY MANUFACTURER AND METHODS APPROVED BY THE CITY.

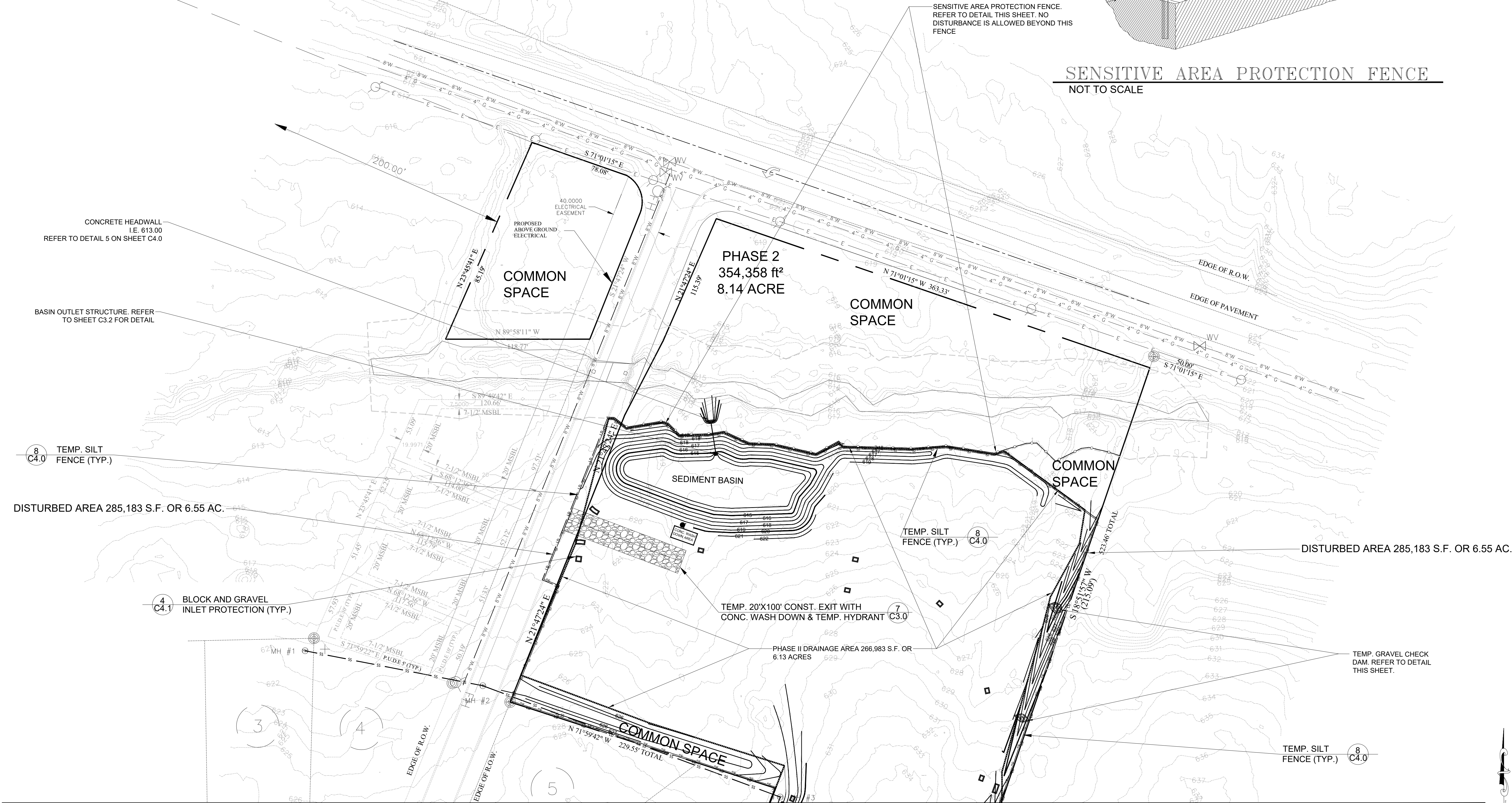
INSTALL J-HOOKS SILT FENCE WHEREVER SILT FENCE IS NOT INSTALLED ALONG CONTOUR LINES.

INSTALL ALL SPECIFIED SOD AS SHOWN ON SHEET C3.5, AND STABILIZE ANY GRADED AREA WITHIN AREA NOT RECEIVING PAVEMENT, OR GRAVEL WITHIN 7 DAYS OF COMPLETION OF ANY PHASE OF GRADING. NO DISTURBED AREA SHALL BE LEFT BARE FOR MORE THAN 7 DAYS. SILT FENCE TO REMAIN IN OPERATION DURING PHASE II.

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
3. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
4. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION. ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.



SENSITIVE AREA PROTECTION FENCE
NOT TO SCALE

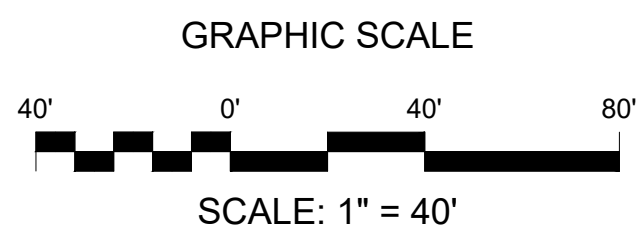


GENERAL CONTRACTOR SHALL REMOVE ALL SEDIMENT, AND ALL TEMPORARY STRUCTURES FROM THE SEDIMENT TRAP AND STABILIZE THE BASIN PRIOR TO CONVERTING THE BASIN TO THE PERMANENT DETENTION POND.

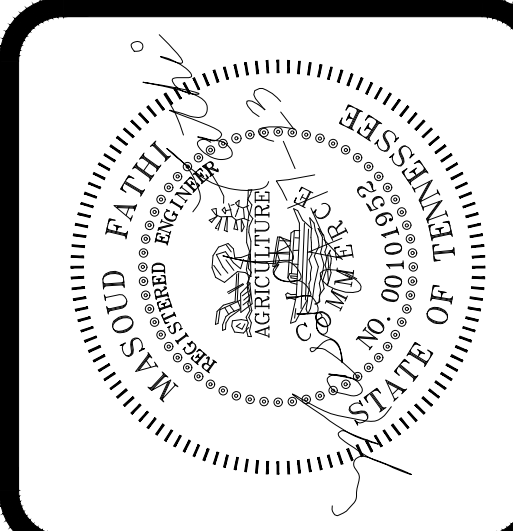
ALL EROSION CONTROL MEASURES SHALL REMAIN IN GOOD WORKING CONDITIONS DURING THE CONSTRUCTION UNTIL SUCH TIME THAT ALL DISTURBED AREAS ARE STABILIZED.

PHASE II EROSION CONTROL PLAN

NOTE:
CONTRACTOR TO PROVIDE AN AREA FOR CONCRETE WASH DOWN AND EQUIPMENT FUELING IN ACCORDANCE WITH THE CITY OF COLUMBIA STANDARDS. CONTRACTOR TO COORDINATE EXACT LOCATION WITH THE CITY ENGINEERING DEPARTMENT DURING PRE-CONSTRUCTION MEETING. CONTROL OF OTHER SITE WASTES SUCH AS DISCARDED BUILDING MATERIALS, CHEMICALS, LITTER, AND SANITARY WASTES THAT MAY CAUSE ADVERSE IMPACTS TO WATER QUALITY IS ALSO REQUIRED BY THE GRADING PERMITTEE."



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SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

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MATCH LINE

SEE SHEET C3.5

ALL AREAS WITH SLOPES 3:1 OR FLATTER SHALL BE SODDED WITH KENTUCKY 31 FESCUE (FESTUCA ELATIOR); NEW SOD CONSISTING OF LIVE, DENSE, WELL ROOTED GROWTH; WELL SUITED FOR THE INTENDED PURPOSE AND SOIL CONDITIONS; COMPLETELY FREE OF NOXIOUS WEEDS AND GRASSES (BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, CANADA THISTLE), AND CONTAINING LESS THAN 5 PLANTS OF OBJECTIONABLE WEEDS PER 100 SQUARE FEET IF NURSERY GROWN OR 10 SUCH PLANTS IF FIELD GROWN.

- GRAVEL/
RIP-RAP
- CONCRETE
SIDEWALK
- SODDING
- REINFORCED
MATTING
- DETENTION
POND
- PAVEMENT

UTILITY OWNERS

WATER
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(931) 388-4833

SEWER
COLUMBIA WASTE WATER
1244 TREATMENT PLANT ROAD
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(931) 388-2419

GAS
ATMOS ENERGY
810 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
(931) 384-0578

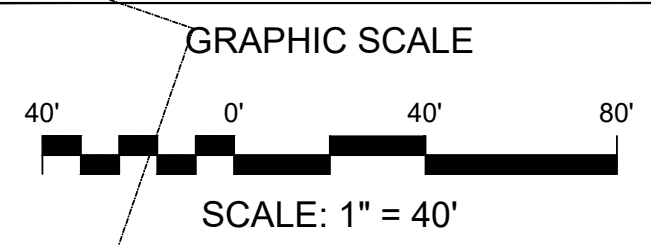
CONCRETE PAVEMENT

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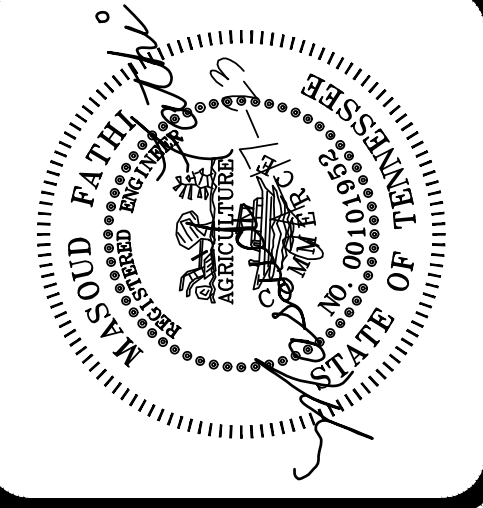
OWNER / DEVELOPER
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PHASE III EROSION CONTROL PLAN



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SITE CONSTRUCTION PLANS FOR
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WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
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General Notes

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Date: APR. 17, 2023
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ALL AREAS WITH SLOPES 3:1 OR FLATTER SHALL BE SODDED WITH KENTUCKY 31 FESCUE (FESTUCA ELATIOR); NEW SOD CONSISTING OF LIVE, DENSE, WELL ROOTED GROWTH; WELL SUITED FOR THE INTENDED PURPOSE AND SOIL CONDITIONS; COMPLETELY FREE OF NOXIOUS WEEDS AND GRASSES (BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, CANADA THISTLE); AND CONTAINING LESS THAN 5 PLANTS OF OBJECTIONABLE WEEDS PER 100 SQUARE FEET IF NURSERY GROWN OR 10 SUCH PLANTS IF FIELD GROWN.

- GRAVEL/ RIP-RAP
- CONCRETE SIDEWALK
- SODDING
- REINFORCED MATTING
- DETENTION POND
- PAVEMENT

30' STREAM BUFFER

COMMON SPACE

PHASE 2
354,358 ft²
8.14 ACRE

COMMON SPACE

COMMON SPACE

30' STREAM BUFFER

DIVERSION DITCH LINED WITH NORTH AMERICAN GREEN SC250. REFER TO DETAIL 6 SHEET C4.1

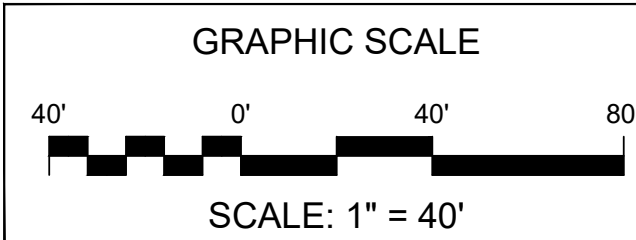
MATCH LINE

SEE SHEET C3.4

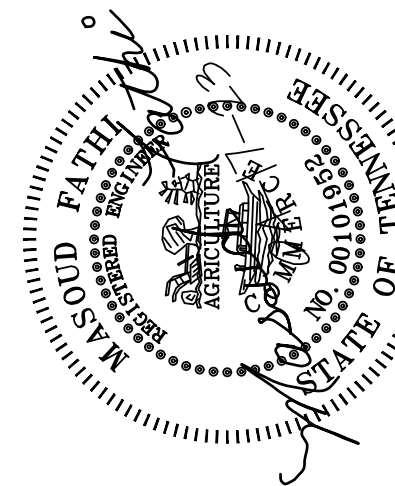
PHASE III EROSION CONTROL PLAN

SENSITIVE AREA PROTECTION FENCE. REFER TO DETAIL ON SHEET C3.3. NO DISTURBANCE IS ALLOWED BEYOND THIS FENCE

DIVERSION DITCH LINED WITH NORTH AMERICAN GREEN SC250. REFER TO DETAIL 6 SHEET C4.1



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General Notes

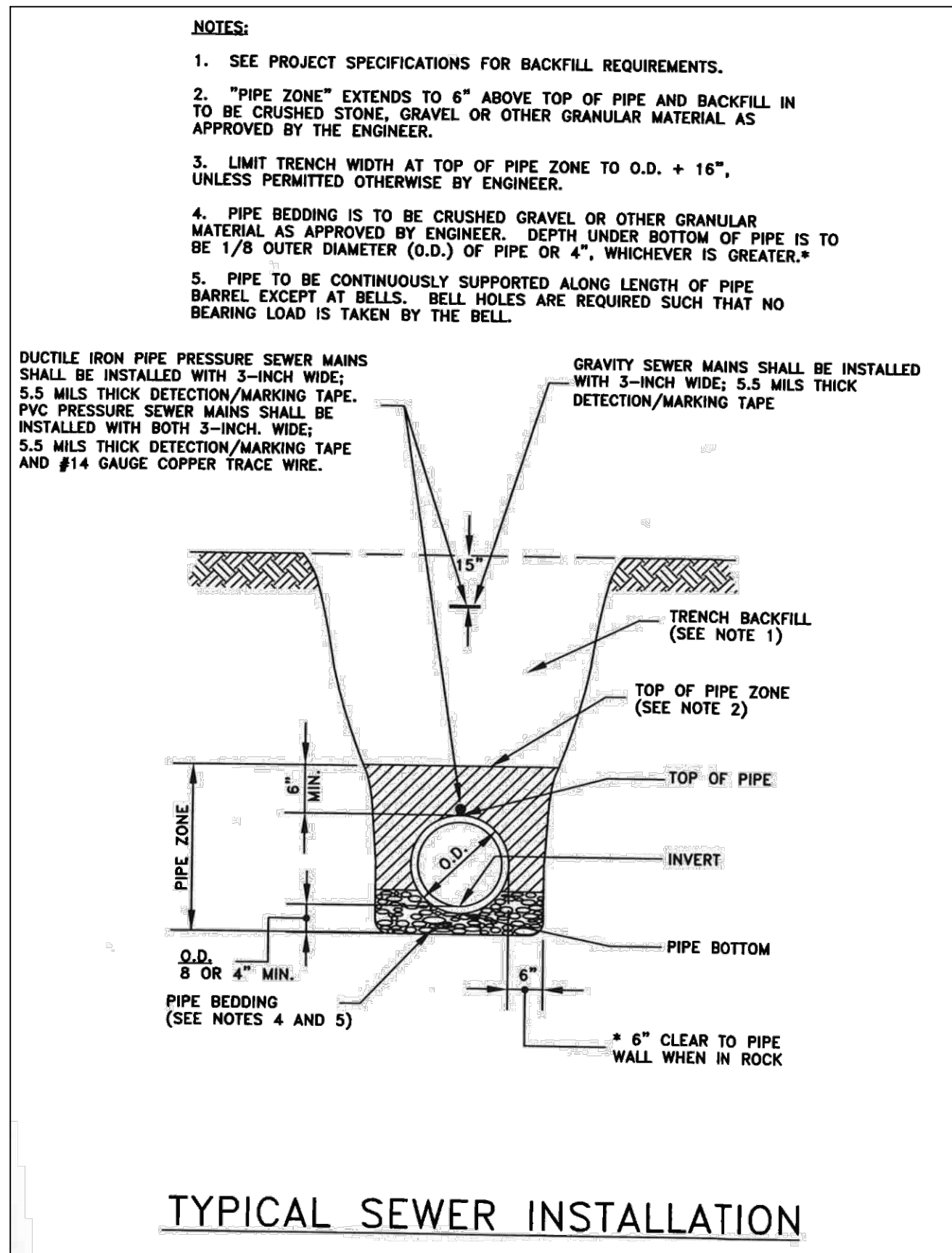
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Project No. 2023-15	Prepared By: MF		

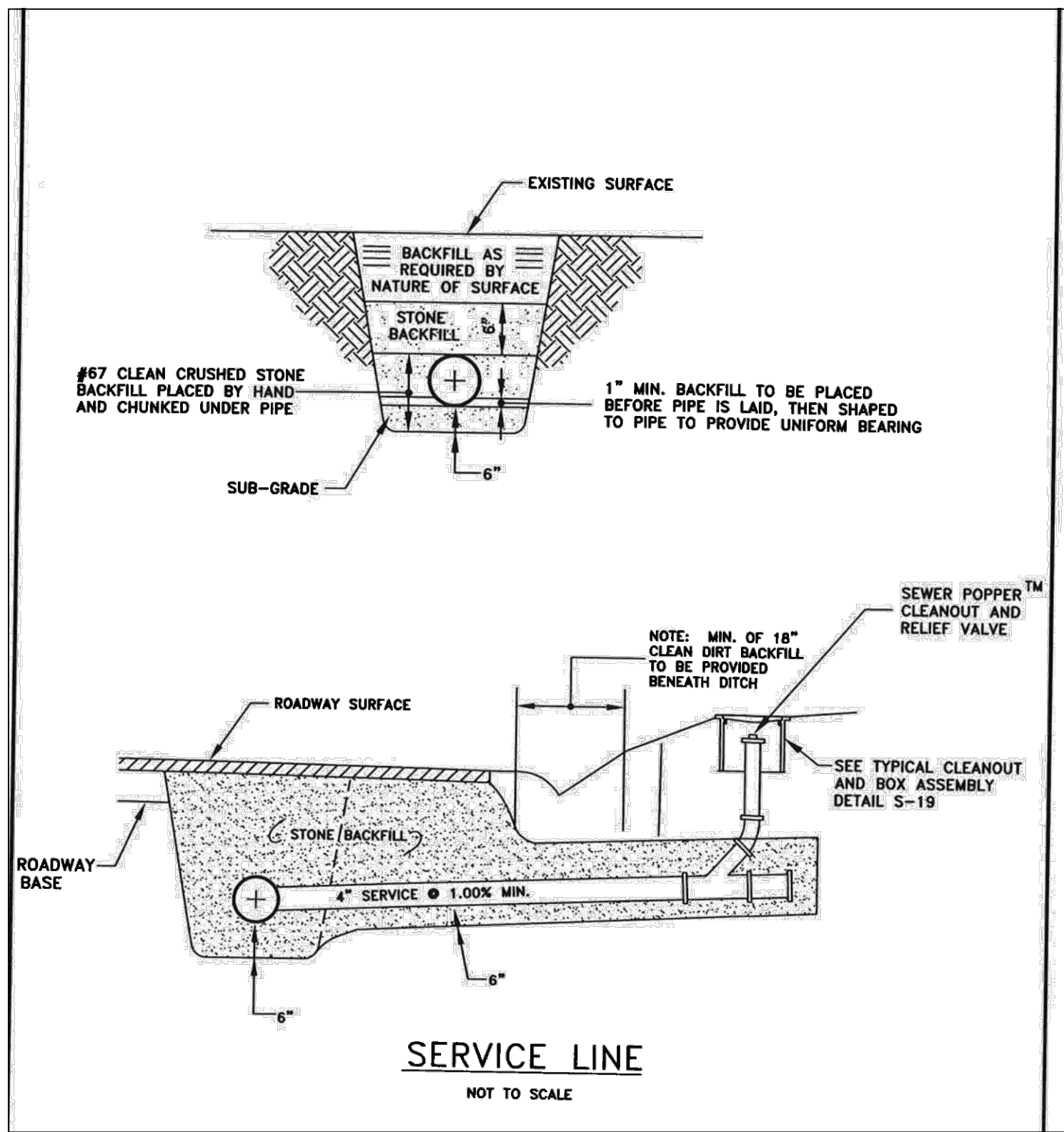


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DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

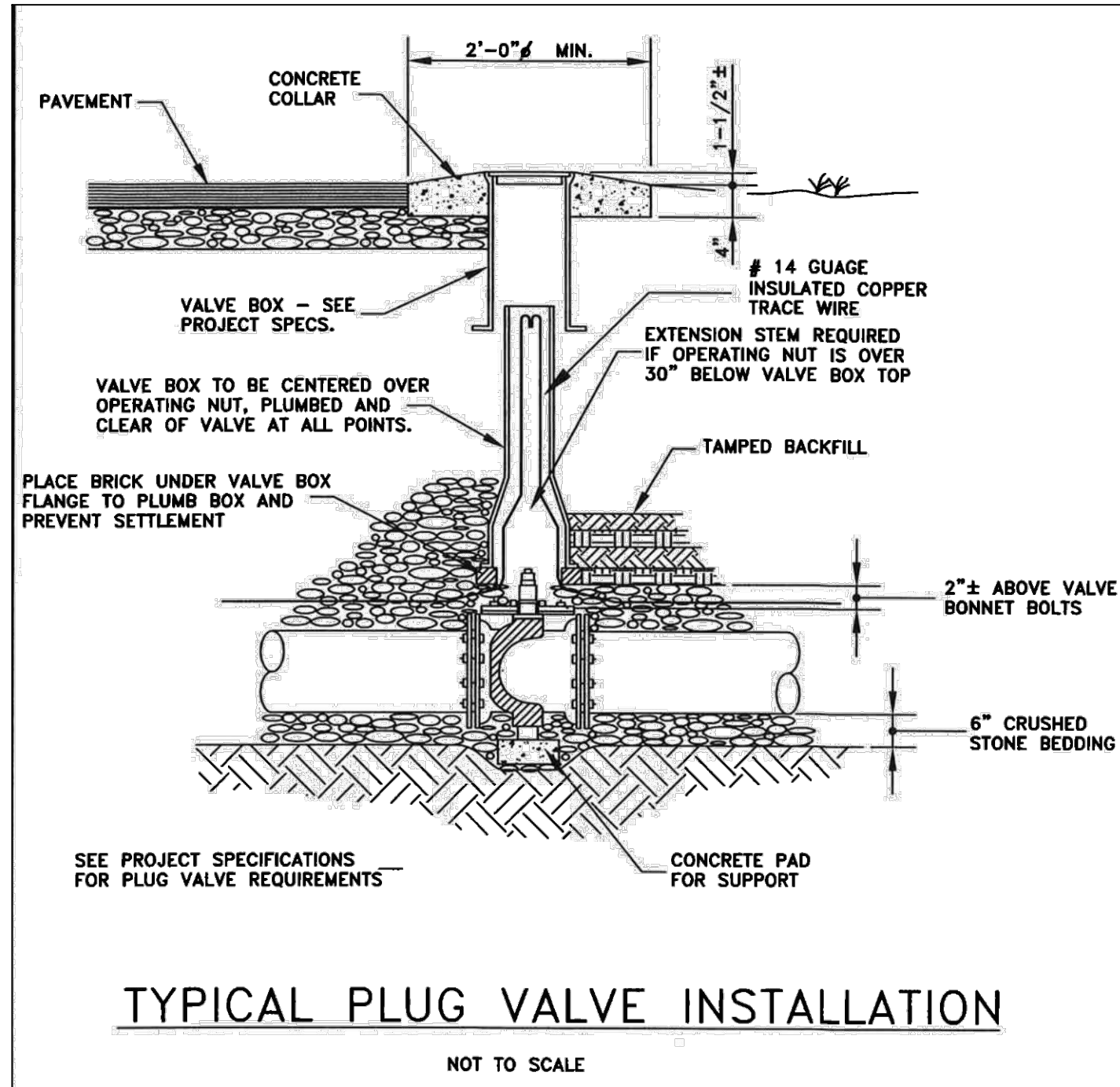
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C4.0	
OF	
Project No. 2023-15	Prepared By: MF



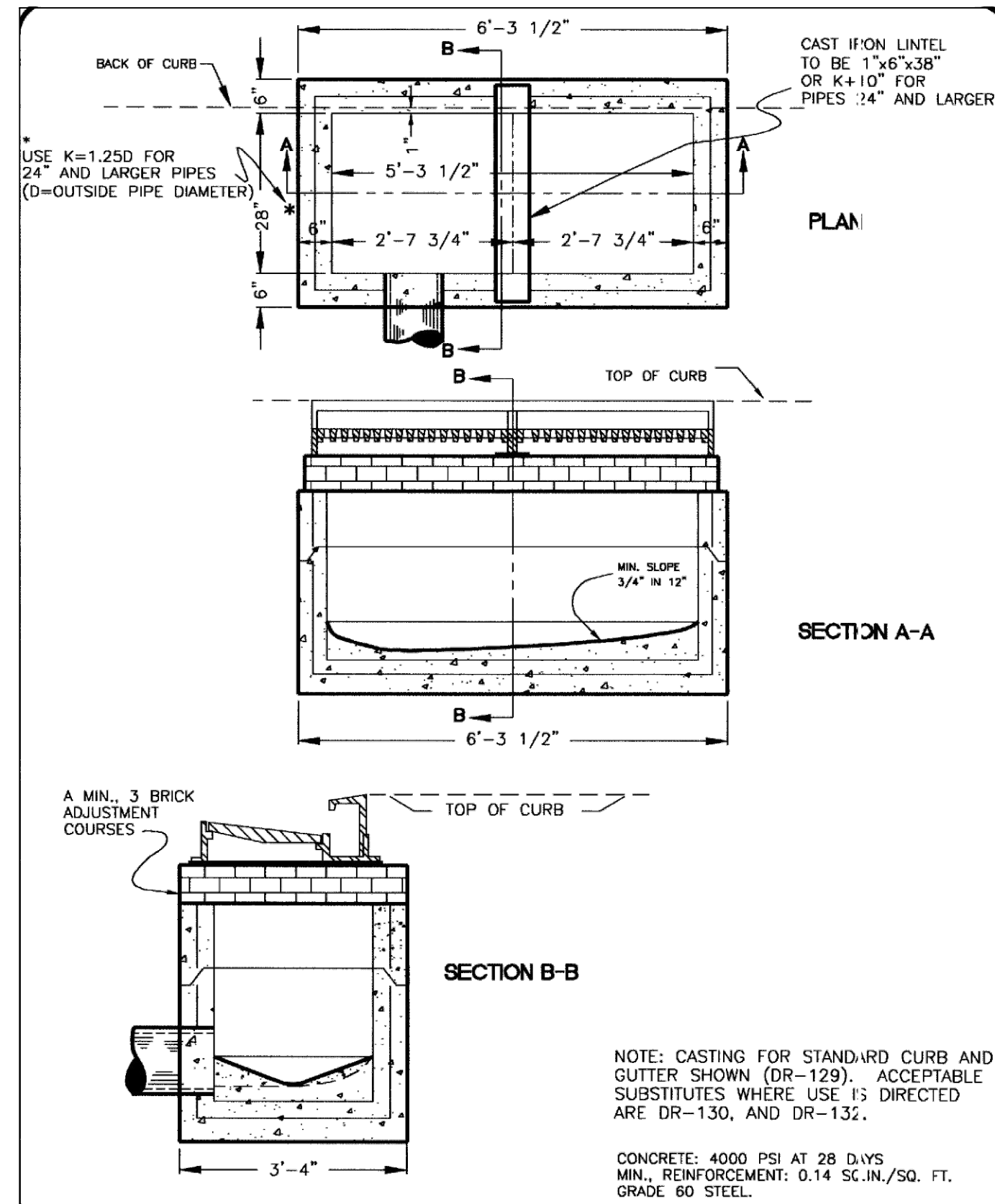
TYPICAL SEWER INSTALLATION 1
NOT TO SCALE C1.1



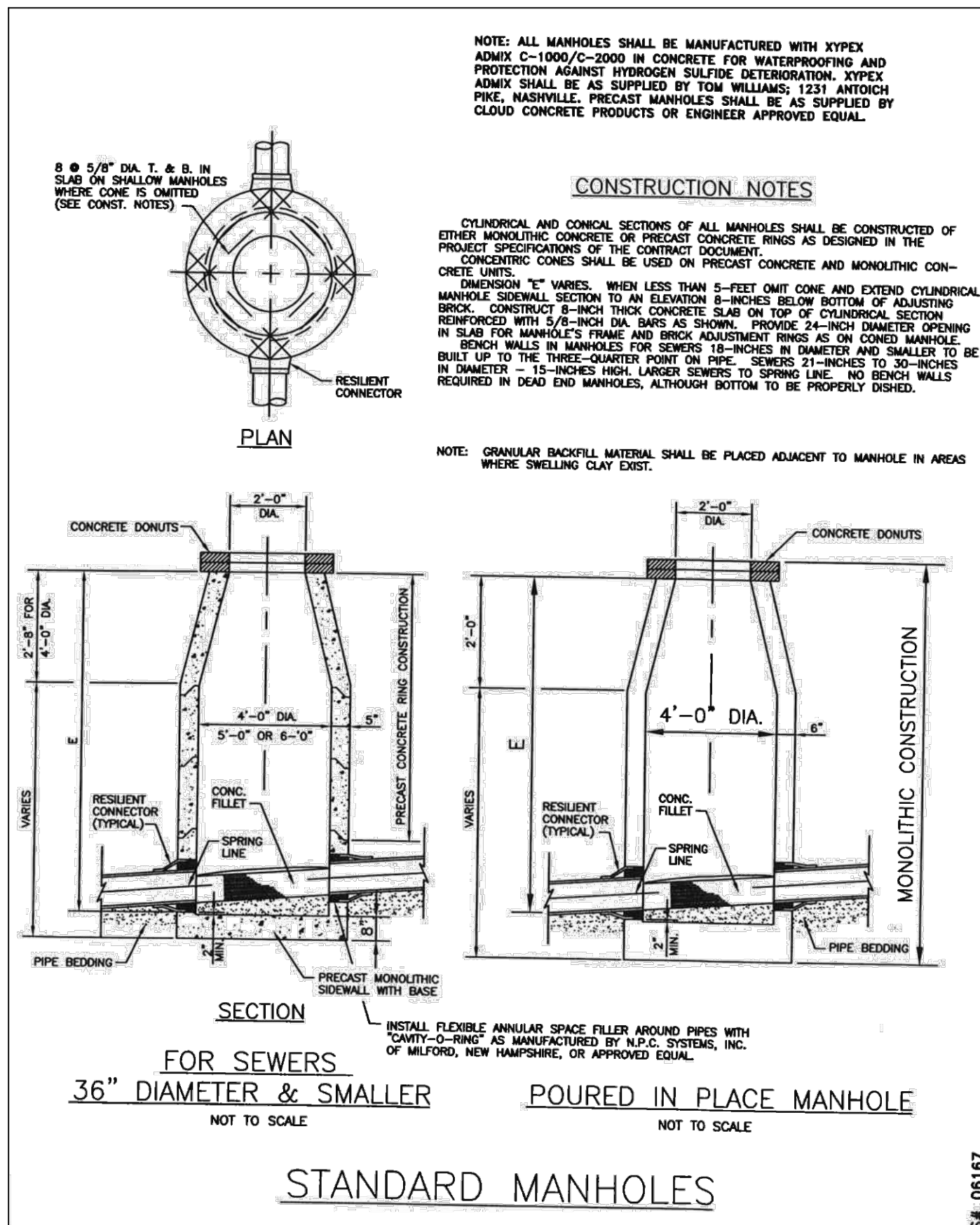
SEWER SERVICE LINE CONNECTION 3
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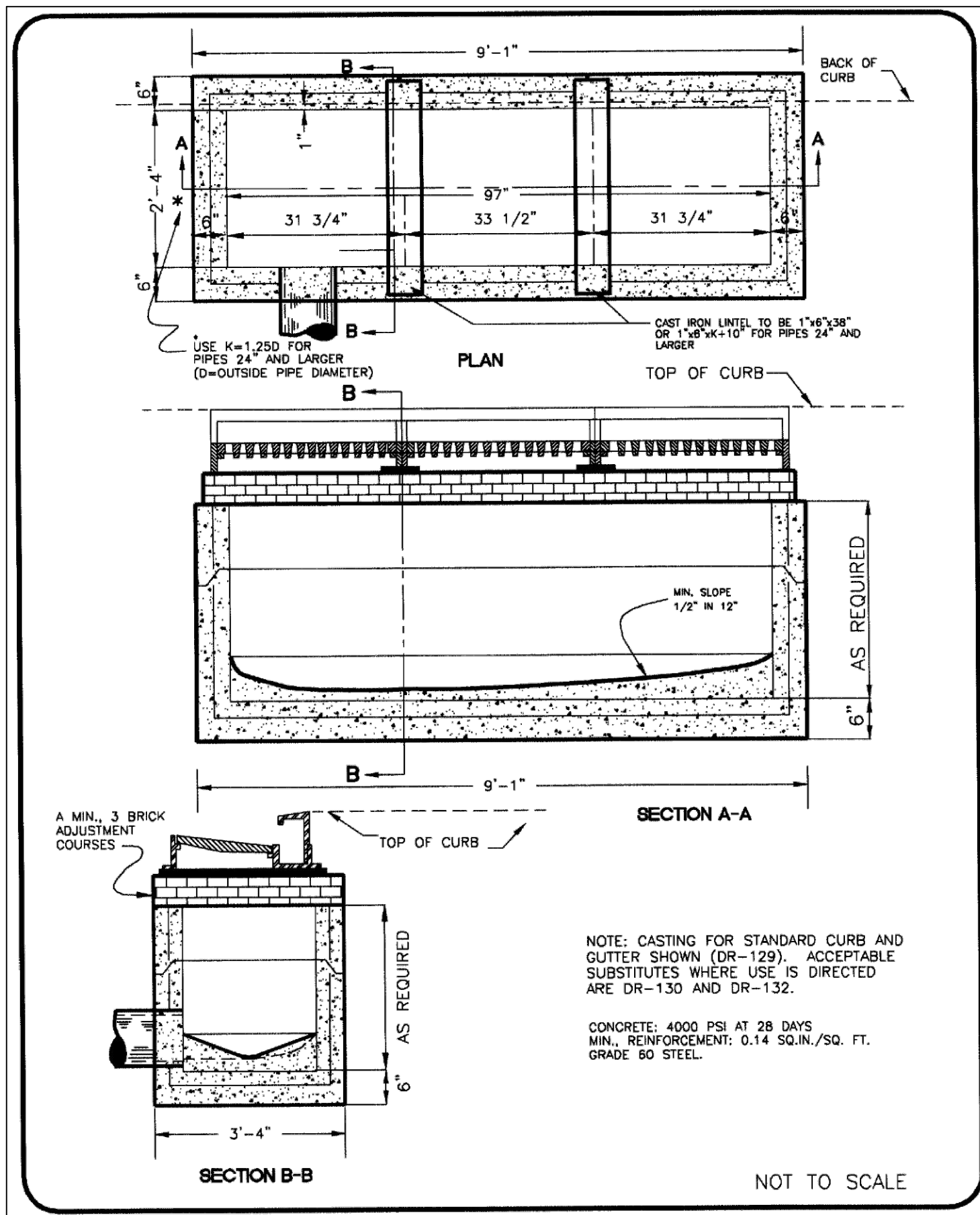
TYP. VALVE INSTALLATION 5
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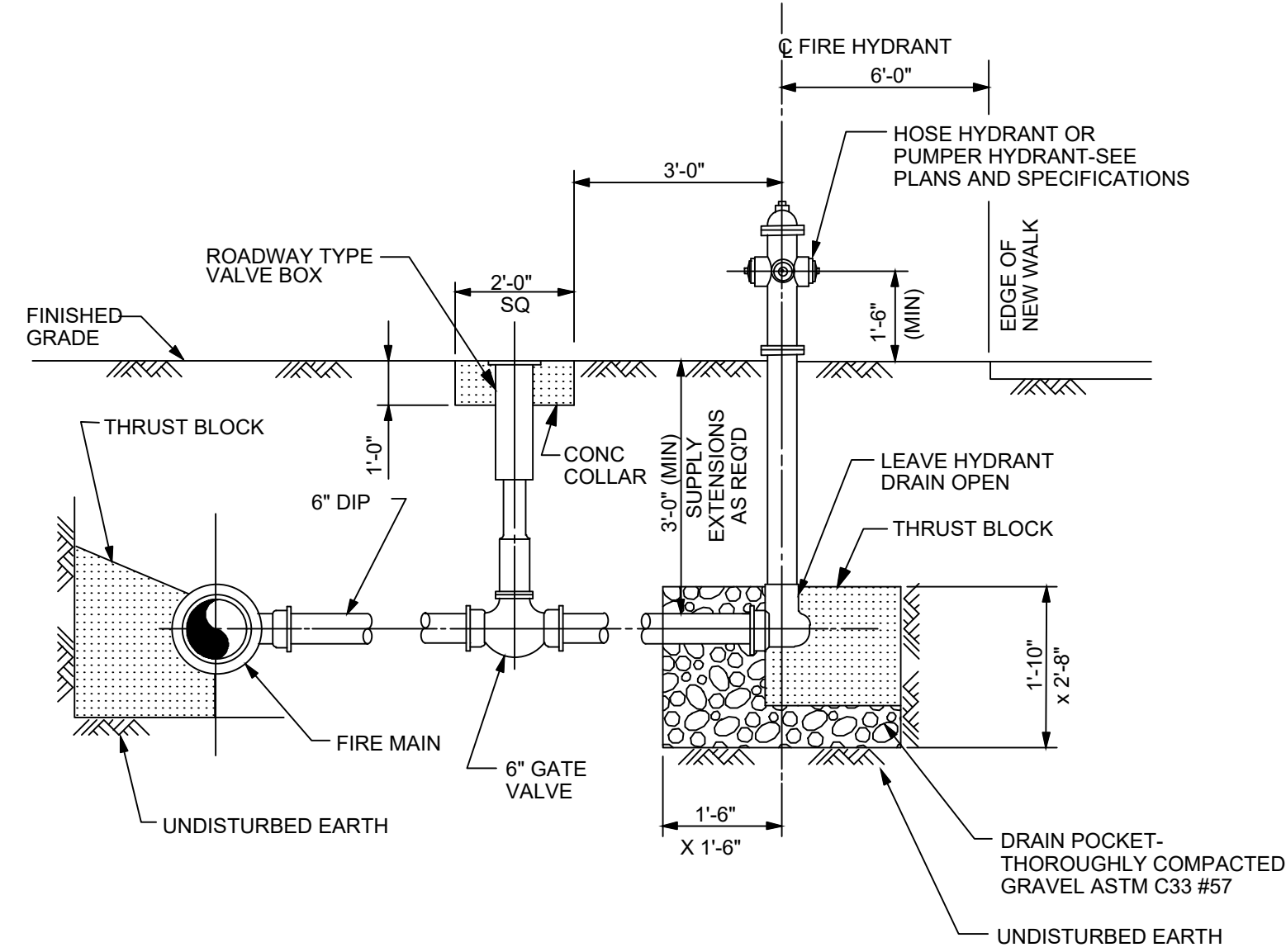
COMBINATION DOUBLE INLET 7
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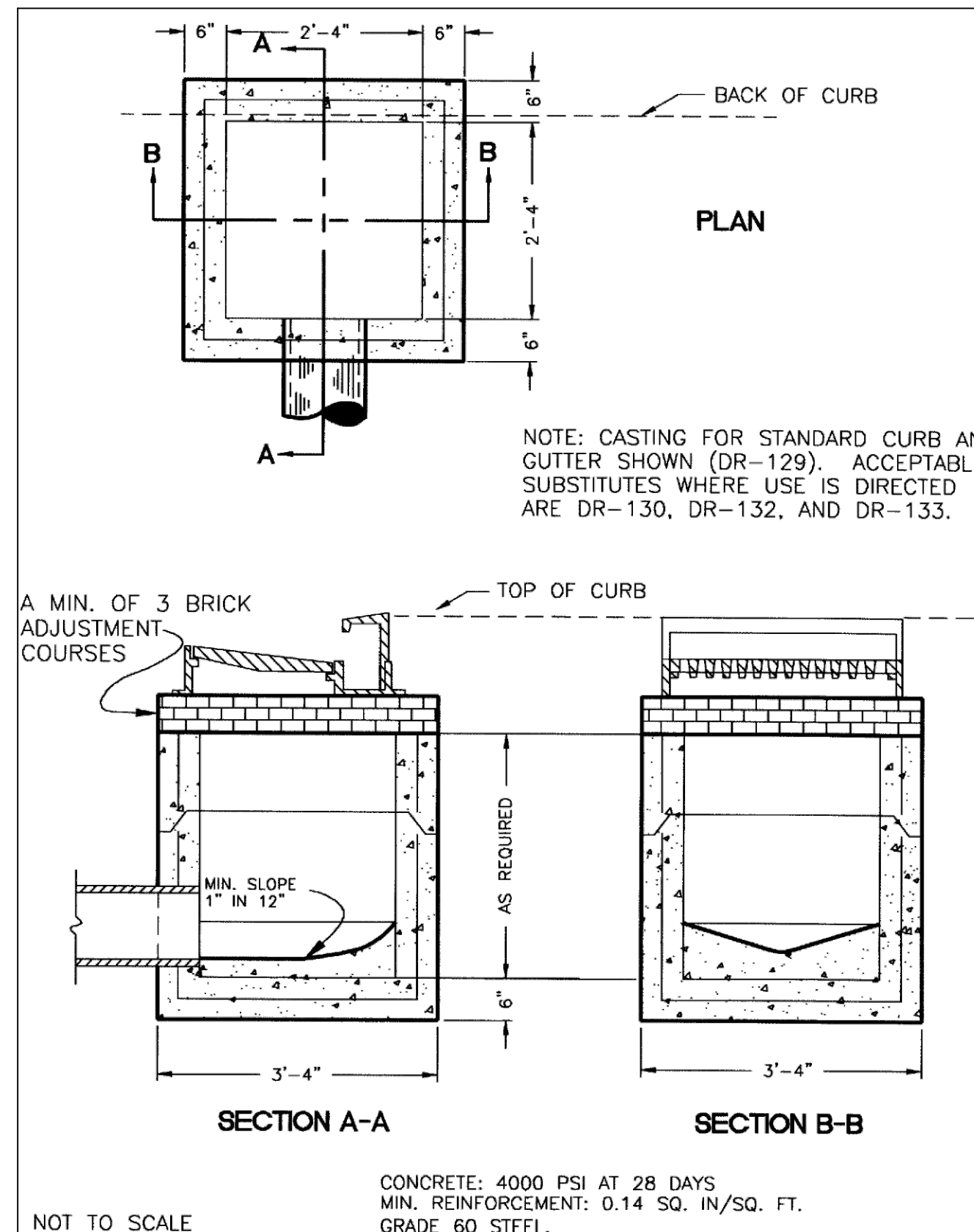
TYP. MANHOLE DETAIL 2
NOT TO SCALE C1.1



COMBINATION TRIPLE INLET 4
NOT TO SCALE C1.1



FIRE HYDRANT INSTALLATION DETAIL 6
NOT TO SCALE C1.1



COMBINATION SINGLE INLET 8
NOT TO SCALE C1.1

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SITE CONSTRUCTION PLANS FOR
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WILLIAMSPORT PIKE AT GOLDEN PLACE
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PRE-DEVELOPED RUN-OFF

STORM EVENT	ALLOWABLE FLOW
Q2	9.82
Q5	16.07
Q10	20.37
Q25	25.96
Q50	30.15
Q100	34.31

Tc = 12.6 MIN. (FROM HYDRAFLOW MODEL)
CN = 79 (HYDROLOGIC SOILS GROUP "C"
USDA WEBSITE)



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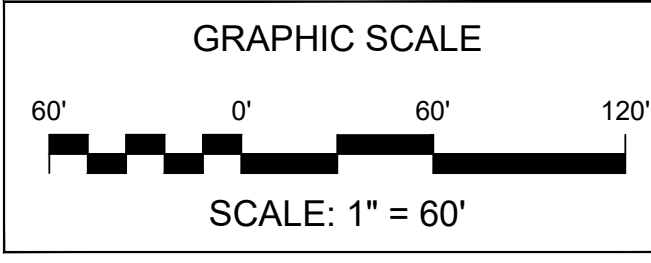
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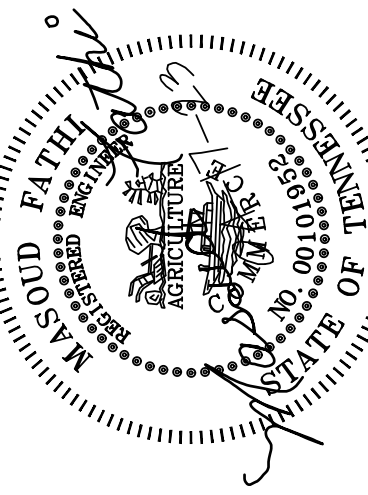
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DEEDBOOK R2421 PAGE 788 F.O.M.C.

PRE-DEVELOPED DRAINAGE PLAN



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SITE CONSTRUCTION PLANS FOR
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WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

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Project No. **2023-15** Prepared By: **MF**

DETENTION POND SUMMARY

STORM EVENT	POND IN-FLOW	POND OUT-FLOW	ALLOWABLE FLOW	H.W. ELEVATION
Q2	13.59	7.89	9.82	616.79
Q5	20.33	15.36	16.07	617.13
Q10	24.81	20.33	20.37	617.33
Q25	30.53	25.74	25.96	617.54
Q50	34.76	29.54	30.15	617.68
Q100	38.98	33.20	34.31	617.82

Tc = 10.1 MIN. (FROM HYDRAFLOW MODEL)
CN = 86 (HYDROLOGIC SOILS GROUP "C"
USDA WEBSITE)

	SQ. FT.	ACRES
CONTRIBUTING DRAINAGE AREA	266,983	6.13
HEAVY DUTY PAVEMENT	29,165	0.67
CONCRETE SIDEWALK	11,028	0.25
EXTRUDED CURB	2250	0.05
32 HOMES (AT 1,200 S.F. FOOTPRINT)	38,400	0.88
32 DRIVEWAY (AT 450 S.F. EACH)	14,400	0.33
REMAINING GRASS	171,740	3.94
TOTAL IMPERVIOUS SURFACE	95,243	2.19

CONCRETE TRIPLE COMBINATION CURB INLET #3
T.C. 619.75
I.E. (18" RCP IN) 615.24
I.E. (18" RCP OUT) 615.04

CONCRETE TRIPLE COMBINATION CURB INLET #2
T.C. 620.10
I.E. (15" RCP IN) 616.00
I.E. (15" RCP OUT) 615.80

15 L.F. 15" RCP AT 2.0%

CONCRETE AREA DRAIN #1
T.C. 620.50
I.E. (15" RCP OUT) 616.30

95 L.F. 18" RCP AT 2.44%

CONCRETE COMBINATION CURB INLET #4
T.C. 622.48
I.E. (15" RCP IN) 617.76
I.E. (15" RCP OUT) 617.56

124 L.F. 18" RCP AT 2.0%

CONCRETE DOUBLE INLET #5
T.C. 627.50
I.E. (15" RCP OUT) 624.50

CONCRETE COMBINATION CURB INLET #12
T.C. 636.25
I.E. (15" RCP OUT) 633.33

CONTRIBUTING DRAINAGE AREA
266,983 S.F. OR 6.13 AC.

CONCRETE COMBINATION CURB INLET #14
T.C. 644.65
I.E. (15" RCP OUT) 641.65

26 L.F. 15" RCP AT 2.0%

CONTRIBUTING DRAINAGE AREA
266,983 S.F. OR 6.13 AC.

PRE-DEVELOPED DRAINAGE PLAN

OWNER / DEVELOPER
HABITAT FOR HUMANITY
WILLIAMSON/MAURY COUNTY
511 W MEADE BOULEVARD
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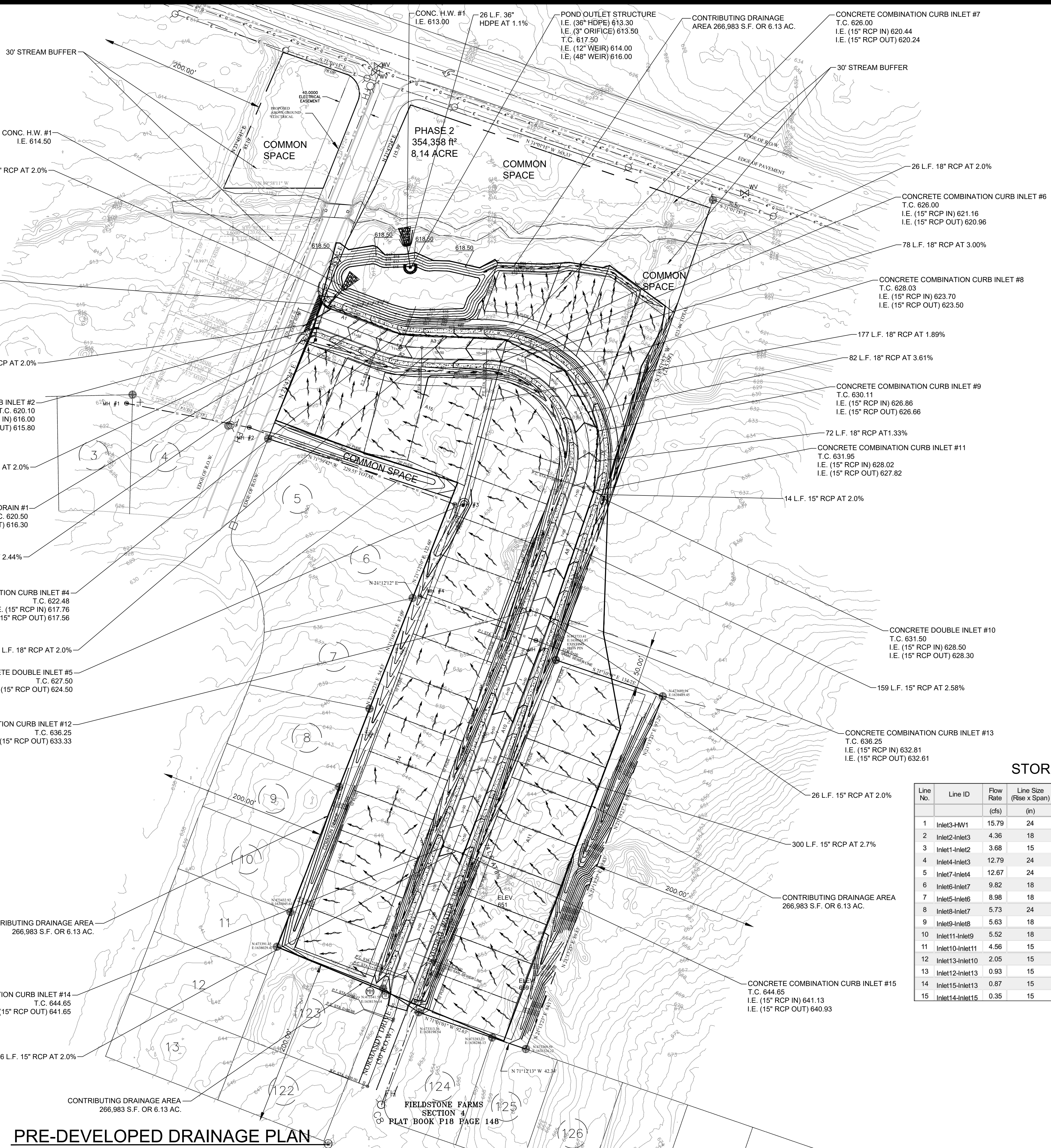
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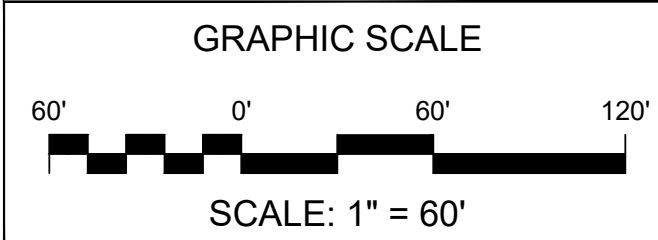
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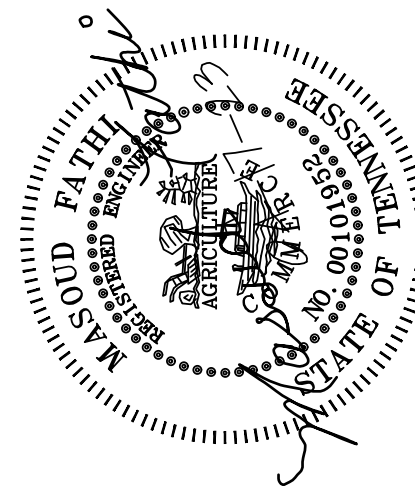


STORMWATER SUMMARY REPORT

Line No.	Line ID	Flow Rate (cfs)	Line Size (Rise x Span) (in)	Line Type	Invert Elev. Down (ft)	Invert Elev. Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor Loss (ft)	HGL Junct (ft)	Dn Str Line No.
1	Inlet3-HW1	15.79	24	Cir	614.50	615.04	2.00	616.00	616.45	n/a	616.45	Outfall
2	Inlet2-Inlet3	4.36	18	Cir	615.24	615.80	2.00	617.01	617.03	0.07	617.10	1
3	Inlet1-Inlet2	3.68	15	Cir	616.00	616.30	2.00	617.10	617.07	n/a	617.07	2
4	Inlet4-Inlet3	12.79	24	Cir	615.24	617.56	2.44	616.88	618.83	n/a	618.83	1
5	Inlet7-Inlet4	12.67	24	Cir	617.76	620.24	2.00	619.15	621.50	n/a	621.50	4
6	Inlet6-Inlet7	9.82	18	Cir	620.44	620.96	2.00	621.59	622.16	n/a	622.16	5
7	Inlet5-Inlet6	8.98	18	Cir	621.16	624.50	1.89	622.41	625.64	n/a	625.64	6
8	Inlet8-Inlet7	5.73	24	Cir	621.16	623.50	3.00	622.02	624.35	n/a	624.35	5
9	Inlet9-Inlet8	5.63	18	Cir	623.70	626.66	3.61	624.51	627.57	n/a	627.57	8
10	Inlet11-Inlet9	5.52	18	Cir	626.86	627.82	1.33	627.81	628.72	n/a	628.72	9
11	Inlet10-Inlet11	4.56	15	Cir	628.02	628.30	2.00	628.89	629.16	n/a	629.16	10
12	Inlet13-Inlet10	2.05	15	Cir	628.50	632.61	2.58	629.06	633.18	n/a	633.18	10
13	Inlet12-Inlet13	0.93	15	Cir	632.81	633.33	2.00	633.39	633.72	n/a	633.72	12
14	Inlet15-Inlet13	0.87	15	Cir	632.81	640.93	2.71	633.39	641.30	n/a	641.30	12
15	Inlet14-Inlet15	0.35	15	Cir	641.13	641.65	2.00	641.43	641.89	n/a	641.89	14



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SITE CONSTRUCTION PLANS FOR
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WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

General Notes

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Date: **APR. 17, 2023**

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Project No. **2023-15** Prepared By: **MF**

SITE CONSTRUCTION PLANS FOR

HABITAT FOR HUMANITY WILLIAMSON/MAURY COUNTY

FIELDSTONE FARMS, PHASE II

A SINGLE FAMILY RESIDENTIAL DEVELOPMENT

WILLIAMSPORT PIKE, 9TH CIVIL DISTRICT

GENERAL NOTES

1. THE PURPOSE OF THIS PLAN IS TO CREATE AN 32 LOT SUBDIVISION.
2. THE SUBJECT PROPERTY LIES IN A ZONE "X" (AREAS OUTSIDE OF THE 100 YEAR FLOOD PLAIN) AS SHOWN ON FIRM MAP 47119C0285E DATED 04-16-2007.
3. PROPERTY ZONED CD-4
4. SETBACKS ARE FRONT=20'; SIDE =6'; REAR=20'
5. THERE IS A 10' P.U.D.E. ON ALL PROPERTY LINES PARALLEL AND ABUTTING PUBLIC ROADS AND 5' P.U.D.E. ALONG ALL INTERIOR LOT LINES.
6. POWER & WATER SERVED BY CPWS COLUMBIA POWER & WATER SYSTEMS.
7. SEWER IS SERVED BY COLUMBIA WASTEWATER DEPARTMENT.
8. NO DRIVEWAY ACCESS OFF WILLIAMSPORT PIKE.
9. ALL FIRST FLOOR ELEVATIONS AND MECHANICAL SYSTEMS TO BE ABOVE 622'
- 10.ELEVATION DUE TO POSSIBLE FLOODING.
- 11.TOPOGRAPHY DATUM BASED ON NAVD 1988 TAKEN FROM TENNESSEE LIDAR MAPPING AND FIELD CHECKED.

PREPARED BY:

CIVIL AND ENVIRONMENTAL
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ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833

WATER
OWNER: COLUMBIA POWER & WATER
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833

SEWER
OWNER: COLUMBIA WASTEWATER SYSTEM
ADDRESS: 1244 TREATMENT PLANT ROAD
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833

GAS
OWNER:ATMOS ENERGY CORP
ADDRESS: 810 NASHVILLE HWY
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-9136

TELEPHONE
OWNER: CPWS
ADDRESS:201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833



IF YOU DIG TENNESSEE...
CALL US FIRST!
811
TENNESSEE ONE CALL
IT'S THE LAW

PREPARED FOR

HABITAT FOR HUMANITY WILLIAMSON-MAURY

511 W MEADE BLVD

FRANKLIN, TENNESSEE 37062



VICINITY MAP

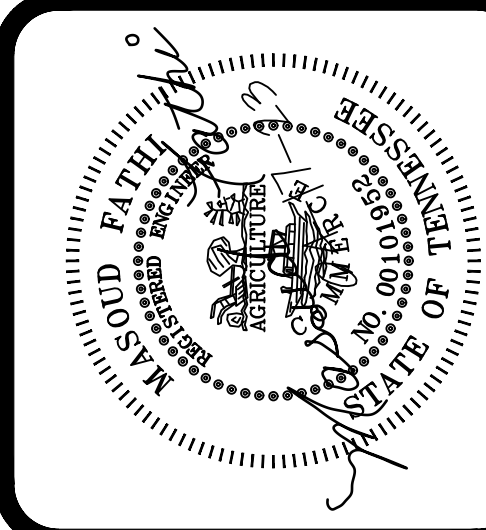
(N.T.S.)

ZONE CD-4
TOTAL ACRES 8.14

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C1.1	SITE LAYOUT PLAN
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CIVIL AND ENVIRONMENTAL
ENGINEERING SERVICES, LLC
803 ALBEMARLE COURT
BRENTWOOD, TENNESSEE 37027
CELL: (615) 504-9915
masoudfathi@comcast.net



SITE CONSTRUCTION PLANS FOR

HABITAT FOR HUMANITY WILLIAMSON-MAURY

WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

General Notes

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No.	Revision/Issue	Date

Date:	Scale:
APR. 17, 2023	
Sheet:	
C0.0	OF
Project No. 2023-15	Prepared By: MF

GENERAL NOTES

1. BASE BOUNDARY AND TOPO SURVEY IS PROVIDED BY CHAPDELAINE AND ASSOCIATES, 7376 WALKER ROAD, FAIRVIEW, TN 37062, (615) 799-8104. ALL REFERENCES REQUIRING ACCURACY SHOULD BE DIRECTED TO THE ORIGINAL SURVEY DATA. THIS DRAWING IS BELIEVED TO CONTAIN ACCURATE BASE INFORMATION, BUT VERIFICATION AGAINST SURVEY DATA IS REQUIRED.
2. OBTAIN WRITTEN AUTHORIZATION FROM THE OWNER AND UTILITY PROVIDERS PRIOR TO INTERRUPTING ANY EXISTING UTILITY (IE: WATER, SEWER, ELECTRICAL, OR TELEPHONE).
3. LOCATE, PROTECT AND FLAG ALL PROPERTY CORNERS AND MONUMENTS ADJACENT TO THE CONSTRUCTION AREA. DO NOT DISTURB ANY TREES OR VEGETATION OUTSIDE THE PROPERTY OR OUTSIDE THE LIMITS OF GRADING WITHOUT ANY AUTHORIZATION FROM THE OWNERS.
4. CONTRACTORS SHALL COMPLY WITH TENNESSEE EROSION AND SEDIMENT CONTROL REGULATIONS. A CERTIFIED EROSION AND SEDIMENT CONTROL PERSON SHALL BE CONTACTED FOR INSPECTION OF THE CONTROL MEASURES AS A 24 HR. P.O.C. NOTES SHALL BE POSTED "ON SITE" WITH INSPECTIONS PERFORMED EVERY 72- HRS.
5. TEMPORARY CONSTRUCTION ACCESS TO BE AT LOCATION DESIGNATED BY THE CITY OF COLUMBIA STORM WATER ENGINEERING DEPARTMENT. INSTALL MINIMUM 20'-0" WIDE 8" THICK GRAVEL AT EXISTING ROAD FOR A MINIMUM LENGTH OF 100 FEET AT ANY CONSTRUCTION ACCESS. USE 2'-3" GRADED ROCK.
6. PROVIDE TEMPORARY CULVERTS TO MAINTAIN ACCESS TO WORKING AREAS. REMOVE CULVERTS WHEN DIRECTED BY ENGINEER.
7. AGGREGATE BASE MATERIAL SHALL MEET THE REQUIREMENTS OF TENNESSEE D. O. T. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
8. THREE WORKING DAYS BEFORE YOU DIG, DRILL, BLAST OR BORE, CALL 1-800-351-1111. CALL ALL OTHER UTILITY OWNERS PRIOR TO WORK.
9. DURING GRADING OPERATIONS, IF DUE TO ADJUSTMENTS FOR SUBGRADE, WATER BECOMES TRAPPED, CONTRACTOR IS TO CUT A SWALE ALLOWING WATER TO DRAIN.
10. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND LICENSES FOR EXECUTION OF THE WORK. ALL MATERIALS AND EXECUTION OF THE WORK SHALL BE IN ACCORDANCE WITH FEDERAL, STATE OF TENNESSEE, AND CITY OF COLUMBIA RULES AND REGULATIONS. ALL UTILITY CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION. CONTRACTOR SHALL PAY ALL REQUIRED FEES.
11. CONTRACTOR SHALL COMPLY WITH ALL PERTINENT PROVISIONS OF THE "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" ISSUED BY AGC OF AMERICA, INC., AND THE SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION ISSUED BY THE U.S. DEPARTMENT OF LABOR. ALL SLOPES SHALL CONFORM WITH OSHA CONSTRUCTION STANDARDS FOR EXCAVATION, 29 CFR, PART 1926, SUBPART P.
12. THE CONTRACTOR SHALL VERIFY SITE CONDITIONS, DIMENSIONS, ELEVATIONS, AND LOCATIONS OF EXISTING FEATURES BEFORE STARTING WORK. THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IN WRITING OF ANY INTERFERENCE OR DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. WORK DONE AFTER SUCH DISCOVERY, UNTIL AUTHORIZED TO PROCEED IN WRITING, SHALL BE AT THE CONTRACTOR'S RISK.
13. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. EXISTING UTILITIES SHOWN ON DRAWINGS ARE APPROXIMATE IN DEPTH AND LOCATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES DAMAGED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
14. MAINTAIN AND PROTECT EXISTING PAVEMENT OR GRAVEL SURFACES WHICH ARE TO REMAIN. CONTRACTOR SHALL REPLACE DAMAGED AREAS, MATCHING DEPTH, MATERIAL, AND GRADE OF EXISTING SURFACES.
15. EARTHWORK INCLUDING FINAL DRESSING, BASE & SUBGRADE TREATMENT, FLEXIBLE SURFACE & RIGID PAVEMENT, AND ANY OTHER APPLICABLE WORK SHALL, AS A MINIMUM MEET THE TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
16. A GEOTECHNICAL REPORT HAS BEEN PROVIDED BY TERRA NOVA ENGINEERING PLLC., DATED JUNE 2018.
17. CHECK GRADES, LINES, LEVELS, AND DIMENSIONS SHOWN BY THE DRAWINGS AND PROMPTLY REPORT TO OWNER'S REPRESENTATIVE IN WRITING DISCREPANCIES FOR CLARIFICATION BEFORE COMMENCING WORK. EMPLOY A REGISTERED SURVEYOR CONTINUOUSLY ON WORK DURING ENTIRE PERIOD WHEN SUCH GRADES, LINES, LEVELS AND DIMENSIONS ARE NECESSARY FOR WORK. THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR CORRECTNESS OF GRADES, LINES, LEVELS, AND DIMENSIONS.
18. LEVEL ONE CERTIFIED EROSION CONTROL NOTES SHALL BE POSTED AT THE SITE AT ALL TIMES.
19. ALL CONCRETE SHALL BE CLASS "A" CLASS 4,000 PSI (U.N.O.)
20. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE ORDERING MATERIALS AND PROCEEDING WITH THE WORK.
21. ALL DAMAGE TO EXISTING PAVEMENT AND CURBS RESULTING FROM NEW CONSTRUCTION SHALL BE REPLACED WITH LIKE MATERIALS AT THE CONTRACTOR'S EXPENSE.
22. THE CONTRACTOR MUST UNDERSTAND THAT THE WORK IS ENTIRELY AT HIS RISK UNTIL SAME IS ACCEPTED, AND HE WILL BE HELD RESPONSIBLE FOR ITS SAFETY.
23. THE CONTRACTOR SHALL OFFSET ALL CENTERLINE STAKES BEFORE BEGINNING THE CLEANING AND GRADING OPERATION AND SET ALL NECESSARY STAKES FOR PROPER EXECUTION OF THE WORK.
24. CARE SHALL BE TAKEN TO PROTECT ANY UTILITIES, TREES, BUILDINGS, ETC. WHICH ARE TO REMAIN AND NOT TO BE DISTURBED BY THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO SUCH PROPERTY.
25. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND OBTAIN ALL PERMITS AND PAY ALL LEGAL FEES. HE SHALL ALSO COMPLY WITH ALL CITY AND STATE BUILDING LAWS, ORDINANCES OR REGULATIONS RELATING TO BUILDING SIDEWALKS, STREETS, WATER MAINS, SEWERS, BLASTING, ETC.
26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE PREMISES AND ADJACENT PREMISES, OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION OF WHAT WORK, CAUSED BY HIMSELF, HIS CONTRACTORS OR THE CARELESSNESS OF ANY OF HIS EMPLOYEES.
27. THE CONTRACTOR SHALL BE REQUIRED TO REIMBURSE THE CITY AND THE STATE FOR ALL INSPECTION COSTS.
28. CONTROL POINTS, GRADES AND OFFSET STAKES ARE TO BE SET BY THE CONTRACTOR.
29. IN THE EVENT OF ANY DISCREPANCIES AND/OR ERRORS FOUND IN THE DRAWINGS, OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. IF THE ENGINEER IS NOT NOTIFIED, THE CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE COST OF ANY FIELD ADJUSTMENTS.
30. THE CONTRACTOR SHALL CONFORM TO ALL LOCAL CODES AND OBTAIN ALL PERMITS PRIOR TO BEGINNING WORK.
31. 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.
32. CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD ELECTRICAL WIRES AND SERVICES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK, THE CONTRACTOR MUST WORK IN CLOSE PROXIMITY OF THE ABOVE-NOTED WIRES, THE ELECTRICAL COMPANY SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN.
33. SURPLUS MATERIAL NOT REQUIRED FOR SITE CONSTRUCTION SHALL BE DISPOSED OF BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AFTER THE OWNER'S APPROVAL.
34. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT PROVISIONS OF THE "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" ISSUED BY AGC OF AMERICA, INC., AND THE "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION" ISSUED BY THE U.S. DEPARTMENT OF LABOR.
35. ALL PIPES UNDER EXISTING OR PROPOSED PAVED AREAS SHALL BE BACKFILLED TO TOP OF SUBGRADE WITH CRUSHED STONE.
36. DIMENSIONS ARE TO THE FACE OF CURBS, EDGE OF CONCRETE, OR TO THE FACE OF BUILDINGS UNLESS OTHERWISE NOTED.
37. ALL SIDEWALKS WILL HAVE A SIDEWALK HEADER AT THE JUNCTION TO PAVEMENT, UNLESS OTHERWISE DETAILED.
38. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE DAMAGE OR LOSS OF ANY REFERENCE POINTS, MONUMENTS, HUBS, AND STAKED LOT CORNERS DURING THE CONSTRUCTION OF HIS WORK, AND SHALL BEAR THE COST OF REPLACING SAME.
39. THE CONTRACTOR SHALL PROVIDE SUCH BRACING, SHEETING AND SHORING, BLASTING PROTECTION, WARNING LIGHTS AND BARRICADES, ETC., AS MAY BE NECESSARY FOR THE PROTECTION OF LIFE AND PROPERTY FOR HIS OWN EMPLOYEES AND THE GENERAL PUBLIC. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY STATUTES AND RULES REQUIRING CERTAIN PROTECTIVE PERSONAL APPAREL SUCH AS HARD HATS, EAR PLUGS, EYE SHIELDS, PROTECTIVE SHOES, ETC. THE OWNER AND ENGINEER ASSUME NO RESPONSIBILITY OR LIABILITY FOR ACTIONS TAKEN BY THE CONTRACTOR ENDANGERING LIFE OR PROPERTY.

SITE WORK
CONSTRUCTION SEQUENCE

1. SUBMIT NOTICE OF INTENT (N.O.I.) TO THE TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION AND APPLY FOR GRADING PERMIT FROM THE CITY OF COLUMBIA STORM WATER DEPARTMENT. WORK MAY NOT BEGIN UNTIL N.O.C. IS RECEIVED.
2. CONTRACTOR, ENGINEER, AND REPRESENTATIVES FROM THE CITY OF COLUMBIA STORM WATER DEPARTMENT SHALL MEET AT A PRE-CONSTRUCTION MEETING TO DISCUSS IMPLEMENTATION OF EROSION AND SEDIMENTATION CONTROL DEVICES
3. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, PRIOR TO START OF ANY WORK, UNLESS OTHERWISE INSTRUCTED BY THE CITY BUILDING AND ZONING OFFICE.
4. INSTALL SILT FENCE, CONSTRUCTION ENTRANCE AND GRAVEL CHECK DAMS.
5. INSPECTION OF SEDIMENTATION CONTROL DEVICES BY ENGINEER AND REPRESENTATIVE OF THE LOCAL AUTHORITIES, INCLUDING INSPECTION OF THE CONSTRUCTION ENTRANCE.
6. OBTAIN GRADING PERMIT AND BEGIN EXCAVATION AND GRADING OF THE SITE.
7. INSTALL ALL NECESSARY UTILITIES AND STORM WATER STRUCTURES. INSTALL ALL NECESSARY PAVEMENTS. INSTALL ALL SPECIFIED REINFORCED MAT OR SEED, AND STABILIZE WITH MULCH, ANY GRADED RIP-RAP, WITHIN AREA NOT RECEIVING PAVEMENT, GRAVEL, OR 14 DAYS OF COMPLETION OF ANY PHASE OF GRADING. NO DISTURBED AREA SHALL BE LEFT BARE FOR MORE THAN 14 DAYS.
8. PROVIDE EVERY 72 HOUR INSPECTION AND MAINTENANCE OF SEDIMENTATION CONTROL DEVICES AND AFTER EVERY STORM EVENT.
9. COMPLETE SITE IMPROVEMENTS AND INSTALL PERMANENT EROSION CONTROL SYSTEMS.

NOTE:

1. CONTRACTOR TO EXPOSE ALL UNDERGROUND UTILITIES, VERIFY DEPTH AND IDENTIFY ANY AND ALL CONFLICTS WITH PROPOSED UTILITIES DESIGN. INFORM ENGINEER IN WRITING PRIOR TO START OF WORK.
2. THERE ARE NO EXEMPTIONS OR EXCLUSIONS. ALL MATERIAL, LABOR AND EQUIPMENT SHALL BE PROVIDED BY THE CONTRACTOR FOR EXECUTION OF THIS WORK. ALL WORK INCLUDING MATERIAL, INSTALLATION SHALL BE COMPLETED TO SATISFACTION OF THE OWNER AND ALL AGENCIES HAVING JURISDICTION.
3. FINAL AS-BUILD DRAWINGS OF ALL SITE AND UTILITIES SHALL BE PROVIDED BY CONTRACTOR. AS-BUILD PLANS SHALL BE SUFFICIENTLY DETAILED TO MEET THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION.
4. AFTER COMPLETION OF WORK AND ACCEPTANCE BY THE CITY OF COLUMBIA AND THE OWNER, ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AT CONTRACTORS COST.

THE PROJECT ASSOCIATED WITH THESE SUBMITTED PLANS IS COVERED UNDER TENNESSEE CONSTRUCTION GENERAL PERMIT _____ THE TOTAL DISTURBED AREA IS: 6.55 ACRES.

CHECK ALL THAT APPLY: THIS SITE DISCHARGES INTO WATERS IDENTIFIED BY TDEC AS:
☐ IMPAIRED FOR SILTATION ☐ IMPAIRED FOR HABITAT ALTERATION ☐ EXCEPTIONAL

SIGNATURE: Masoud Fathi DATE: APRIL 17, 2023
CIRCLE ONE: DEVELOPER ☒ PROJECT ENGINEER ☐ OTHER _____

EPSC Signature

I, Masoud Fathi, CERTIFIED EROSION CONTROL SPECIALIST,
HAVE REVIEWED THIS PLAN FOR SUFFICIENT ONSITE EROSION AND SEDIMENT
CONTROL PROVISIONS.
Date: APRIL 17, 2023

SITE DEMOLITION NOTES

1. OBTAIN ALL NECESSARY LICENSES AND PERMITS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. CONTRACTOR TO PROVIDE ALL ASSOCIATED FEES AND COSTS.
2. CONTRACTOR TO CONTACT TENNESSEE "ONE CALL" LINE LOCATORS TO AID IN IDENTIFYING & LOCATING EXISTING BURIED UTILITIES PRIOR TO COMMENCING WITH ANY CONSTRUCTION ACTIVITIES.
3. CONTRACTOR TO VERIFY THE PROJECT LIMITS AND FIELD CONDITIONS BEFORE BIDDING THIS PROJECT. NO EXTRAS WILL BE ALLOWED DUE TO THE IRREGULAR SURFACE CONDITIONS THAT MAY BE ENCOUNTERED ON THIS SITE. EXCAVATION IS UNCLASSIFIED, AND INCLUDES EXCAVATION TO SUBGRADE ELEVATIONS INDICATED, REGARDLESS OF CHARACTER OF MATERIALS AND OBSTRUCTIONS ENCOUNTERED. IT SHALL BE UNDERSTOOD THAT ANY REFERENCE TO ROCK, EARTH, OR ANY OTHER MATERIAL ON THE DRAWINGS IS NOT TO BE TAKEN AS AN INDICATION OF CLASSIFIED EXCAVATION OR THE QUANTITY OF EITHER ROCK, EARTH, OR ANY OTHER MATERIAL INVOLVED. THE CONTRACTOR SHALL DRAW HIS OWN CONCLUSIONS AS TO THE CONDITIONS TO BE ENCOUNTERED.
4. ANY EXISTING PAVEMENT, SIDEWALKS, DRAINAGE STRUCTURES, UTILITIES, OR ANY OTHER EXISTING STRUCTURES THAT ARE DISTURBED AND ARE TO REMAIN, SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
5. SAW-CUT ASPHALT PAVING AND CONCRETE SIDEWALKS ON SMOOTH AND STRAIGHT LINE AT THE BOUNDARY OF EXISTING TO REMAIN AND EXISTING TO BE REMOVED.
6. THE BURNING OF CONSTRUCTION DEBRIS OR TRASH ON THE OWNER'S PROPERTY IS FORBIDDEN. ALL DEMOLITION DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF OFF THE OWNER'S PROPERTY. ALL DEBRIS SHALL BE DISPOSED OF IN A LANDFILL LICENSED BY THE STATE TO RECEIVE THE SPECIFIC DEMOLITION DEBRIS.
7. COORDINATE REMOVALS/ADJUSTMENT OF ANY EXISTING MANHOLES, CATCH BASINS, OR OTHER STRUCTURES WITH THE LAYOUT, GRADING & UTILITY PLANS.
8. ALL TREES THAT ARE TO BE REMOVED SHALL BE CLEARLY MARKED & FLAGGED IN THE FIELD PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. ANY TREES THAT ARE TO REMAIN WITHIN THE LIMITS OF CONSTRUCTION SHALL BE PROTECTED.
9. ADJUST ALL M.H., C.B., INLETS, VALVE COVERS, ETC. TO NEW GRADE.

SOIL EROSION AND
SEDIMENTATION CONTROL NOTES

1. PERFORM ALL EARTHWORK OPERATIONS IN SUCH A MANNER AS TO CONTROL EROSION AND PREVENT SEDIMENTATION FROM ENTERING STREAMS OR BEING TRACKED ONTO ROADWAYS. COMPLY SPECIFICALLY AND COMPLETELY WITH STATE & LOCAL GOVERNMENT AGENCIES AND WITH EROSION AND SEDIMENTATION CONTROL PERMIT REQUIREMENTS.
2. INSTALL AND OBTAIN APPROVAL OF ALL EROSION AND SEDIMENTATION CONTROL DEVICES PRIOR TO COMMENCEMENT OF GRADING OPERATIONS.
3. ALL EROSION AND WATER QUALITY CONTROL STRUCTURES SHALL BE INSPECTED FOR STABILITY AND OPERATION FOLLOWING EVERY RUN-OFF PRODUCING RAINFALL DURING CONSTRUCTION, AS DIRECTED IN THE NPDES PERMIT.
4. MAKE NEEDED REPAIRS TO CONTROL STRUCTURES IMMEDIATELY UPON DETECTION OF DEFICIENCIES.
5. CLEAN SEDIMENT FROM BASIN(S) WHEN STORAGE CAPACITY IS DIMINISHED.
6. REMOVE SEDIMENT FROM SILT FENCES WHEN THE DEPTH REACHES APPROXIMATELY 4". SILT FENCES AND DIVERSION DITCHES SHALL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER.
7. REMOVE ALL TEMPORARY SEDIMENTATION CONTROL DEVICES NOT DESIGNATED TO REMAIN UPON COMPLETION OF GRADING AND FINAL ACCEPTANCE OF GRASSING, BUT NO LATER THAN 14 DAYS AFTER FINAL SITE STABILIZATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY MEASURES NECESSARY TO PREVENT SITE EROSION AND SEDIMENTATION AS DETERMINED BY TDEC.
9. INLET PROTECTION SHALL BE PROVIDED FOR CATCH BASINS AND FOR CURB INLETS. CLEAN SEDIMENT FROM PIPE AFTER VEGETATION IS ESTABLISHED.
10. EXISTING AND PROPOSED INLETS RECEIVING DRAINAGE FROM DISTURBED AREAS SHALL HAVE INLET PROTECTION AS INDICATED ON PLANS.

UTILITIES NOTES

1. ALL WATER AND SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT SPECIFICATIONS OF THE RESPECTIVE UTILITY OWNER.
2. THE CONTRACTOR IS RESPONSIBLE FOR REIMBURSING THE CITY AND THE UTILITY PROVIDERS FOR THE COST OF INSPECTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING THE ELEVATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
4. SEE MECHANICAL, PLUMBING, AND ELECTRICAL PLANS FOR EQUIPMENT LAYOUT AND UTILITY ENTRANCES.
5. PIPE LENGTHS ARE APPROXIMATE, CONTRACTOR TO VERIFY ACTUAL PIPE LENGTHS REQUIRED.
6. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK IN EACH AREA. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.
7. THE CONTRACTOR SHALL COORDINATE THE TIE-INS TO THE EXISTING WATER & SEWER LINES WITH THE RESPECTIVE UTILITY OWNERS, PRIOR TO COMMENCING THIS WORK.
8. THRUST BLOCKING SHALL BE PROVIDED FOR PRESSURE LINES WHEN THERE ARE DIRECTIONAL CHANGES (AT BENDS, TEES AND WYES), STOPS (AT DEAD ENDS) OR CHANGES IN SIZE (AT REDUCERS).
9. ALL SANITARY SEWER SERVICE LINES SHALL MAINTAIN A MINIMUM 1% SLOPE (U.N.O.)
10. ALL UTILITY LINES ON-SITE SHALL BE UNDER-GROUND.
11. CONTRACTOR SHALL VERIFY ALL MATERIAL TYPES AND INSTALLATION METHODS WITH UTILITY PROVIDERS AND OBTAIN APPROVAL.

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masoudfathi@comcast.net



SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

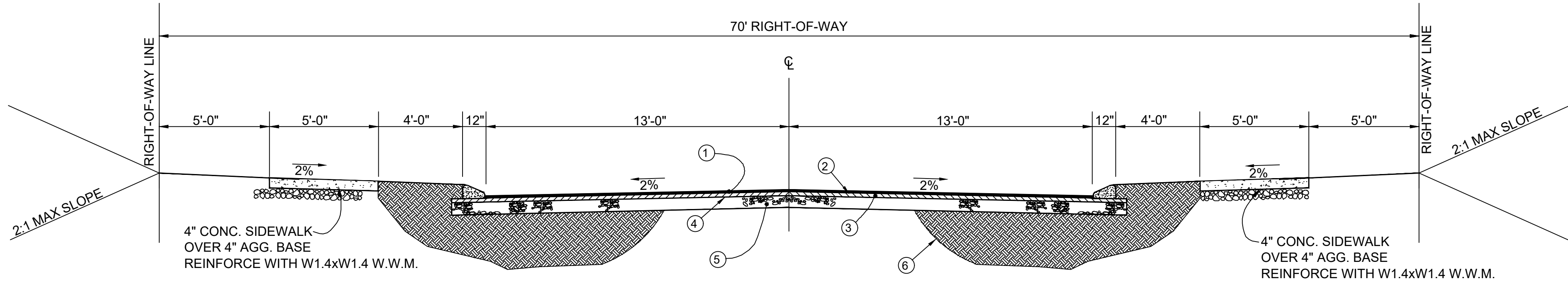
General Notes

No.	Revision/Issue	Date

Date:	Scale:
APR. 17, 2023	
Sheet:	
C0.1	OF
Project No. 2023-15	Prepared By: MF

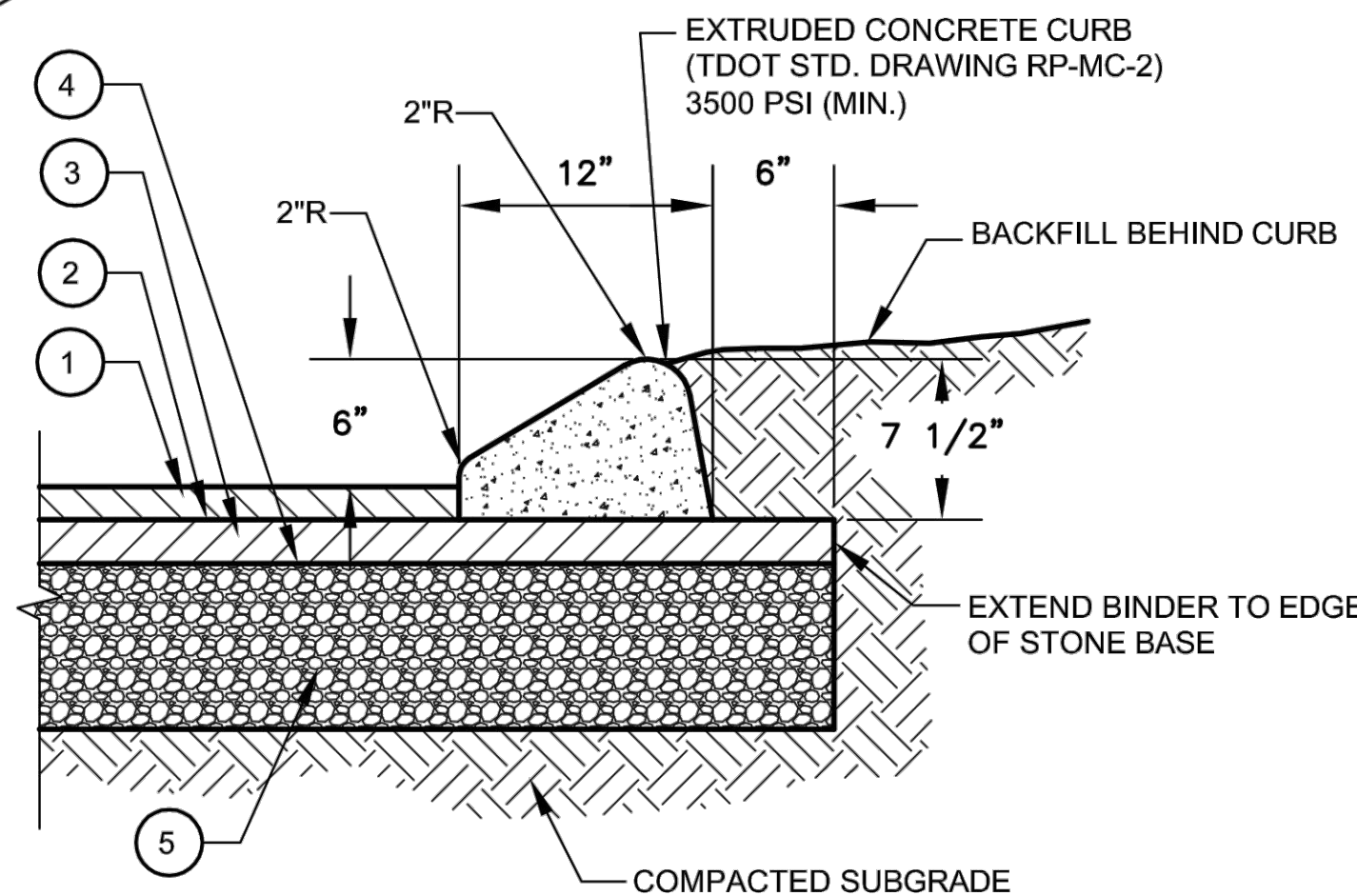
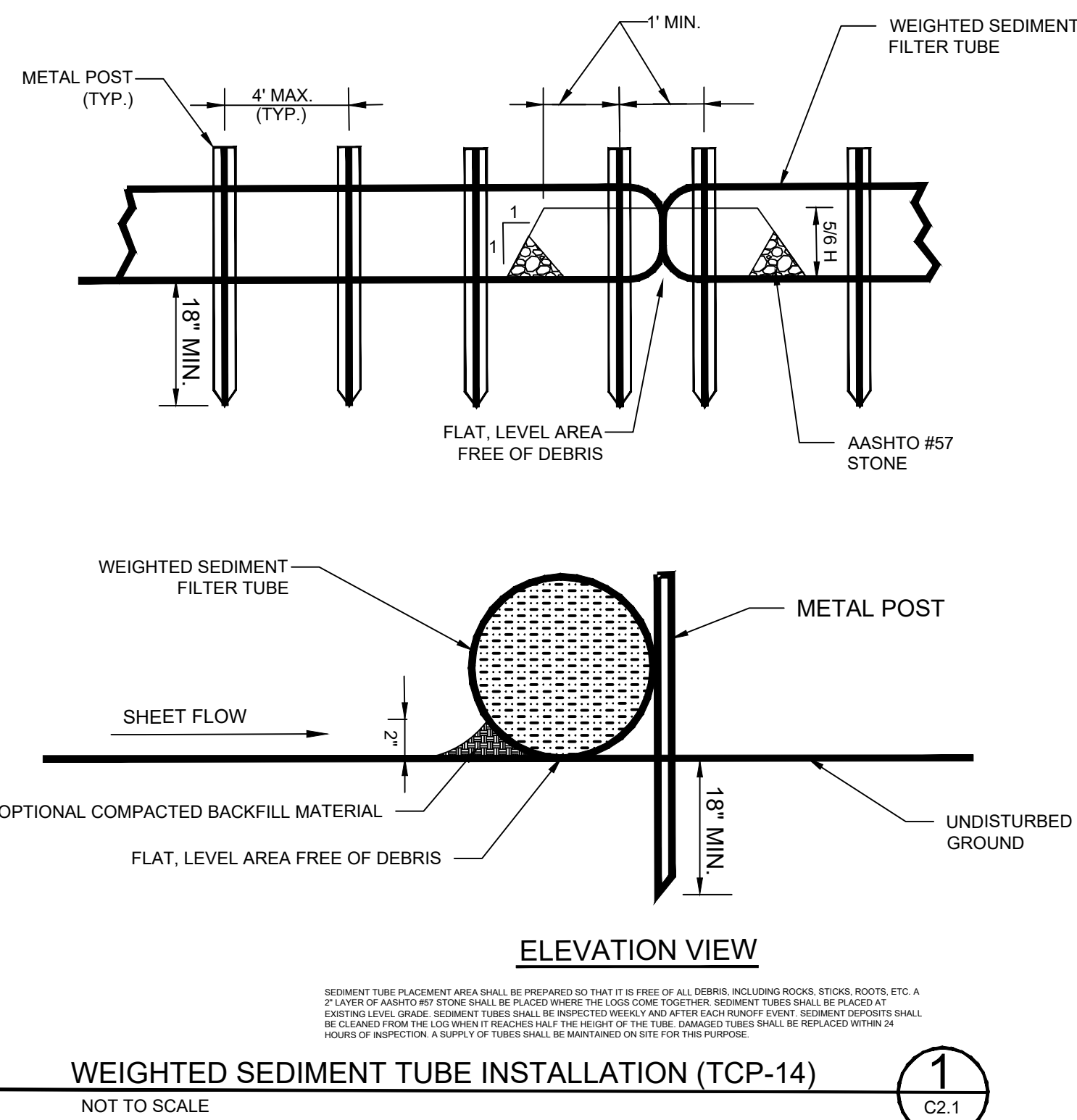
GENERAL
NOTES

GENERAL NOTE:
1. PLACEMENT OF SIDEWALK SHALL BE IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS OF THE CITY OF COLUMBIA, LATEST VERSION.
2. CONSTRUCTION SHALL CONFIRM TO THE CITY OF COLUMBIA ENGINEERING DEPARMENT SPECIFICATIONS, LATEST REVISION.



TYPICAL SUBDIVISION ROADWAY SECTION SD-04
NOT TO SCALE

- ① 1-1/2" ASPHALTIC CONCRETE SURFACE (HOT MIX) (TDOT 411-01.11)
- ② BITUMINOUS TACK COAT (RS-2) ITEM NO. 403-01
- ③ 2" ASPHALT CONCRETE BASE (GRADING B-M2) ITEM NO. 307-01.06
- ④ BITUMINOUS PRIME COAT (AE-P) ITEM NO. 402-01
- ⑤ 8" STONE (GRADING D PUG MILL MIX) ITEM NO.303-01
- ⑥ APPROVED COMPACTED SUBGRADE



- ① 1 1/2" ASPHALTIC CONCRETE SURFACE (GRADING E) ITEM NO. 411-01.11
- ② TACK COAT (RS-2) ITEM NO. 403-01
- ③ 2" ASPHALTIC CONCRETE BASE (GRADING B) ITEM NO. 307-01.06
- ④ PRIME COAT (AE-P) ITEM NO. 402-01
- ⑤ 8" STONE (GRADING D PUG MILL MIX) ITEM NO. 303-01

ITEM NUMBERS ARE TO MEET TDOT SPECIFICATIONS

General Notes:

- 1. Expansion joints to be spaced a maximum of 100 feet apart and align with ramps, inlets and other required target points.
- 2. Contraction/construction joints are required and are to be cut into curb every 10 feet.
- 3. Details shall meet the standards as set forth in the latest version of the Tennessee Department of Transportation Roadway Design Guidelines.
- 4. The extruded 6" mountable concrete curb is to be used only in special conditions such as low speed low volume local streets and when tying to similar curbs on subdivision streets or in parking lots.
- 5. Where concrete median pavement is poured behind extruded 6" mountable concrete curb, it may be poured monolithically with the curb.

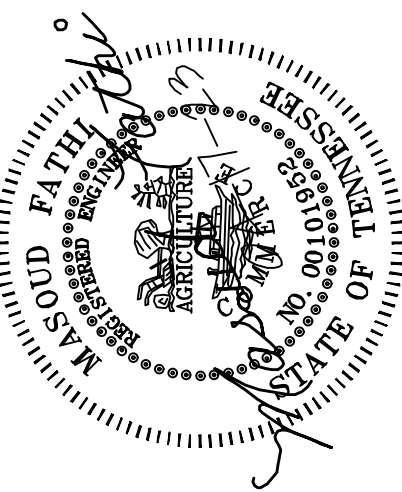


MOUNTABLE CURB DETAIL
(NTS)

DATE
4-23-2012

DWG. NO.
SD-09

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SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

General Notes

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1		
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4		

Date:	Scale:
APR. 17, 2023	
Sheet:	
C0.2	OF
Project No. 2023-15	Prepared By: MF

MATCH LINE

SEE SHEET C1.1

SITE DATA

PROJECT NAME: HABITAT FOR HUMANITY COLUMBIA
PROJECT ADDRESS: WILLIAMSPORT PARKWAY AT GOLDEN PLACE
CITY: COLUMBIA
COUNTY: MAURY
STATE: TENNESSEE
EXISTING AND PROP. ZONING: RESIDENTIAL (CD-4)
MAP 88 PARCEL 70.01
DEEDBOOK R2495 PAGE 1181 R.O.M.C.
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
EXISTING LAND USE: VACANT PARCEL
PROPOSED LAND USE: SINGLE FAMILY RESIDENTIAL
MINIMUM LOT AREA REQ: 5,000 S.F.

PROPERTY	SQ. FT.	ACRES
BUILDING FOOTPRINT	354,358	8.13
(32 BUILDING AT 1200 S.F.)	38,400	0.88
DRIVEWAY (10'X45')	14,400	0.33
SIDEWALK	11,028	0.25
EXTRUDED CURB	2,250	0.05
PAVEMENT	29,165	0.67
REMAINING GRASS	259,115	5.95

NOTE:
QUANTITIES LISTED ARE NOT FOR BIDDING PURPOSES.
CONTRACTOR TO VERIFY ALL QUANTITIES.

GENERAL NOTES

- THE PURPOSE OF THIS PLAT IS TO CREATE UNIVERSITY GROVE SUBDIVISION A 31 LOT SUBDIVISION PLAT. BY REVIEW OF THE SURVEYOR THE SUBJECT PROPERTY LIES IN A ZONE "X" (AREAS OUTSIDE OF THE 500 YEAR FLOOD PLAN) AS SHOWN ON FIRM MAP 47119C0285E DATED 04-16-2007.
- PROPERTY CURRENTLY ZONED (CD-4).
- CONVENTIONAL RESIDENTIAL SETBACKS UNLESS NOTED ARE: FRONT 20', SIDE 6', REAR 20'.
- PUBLIC UTILITY AND DRAINAGE EASEMENTS WHERE SHOWN HEREON ARE INTENDED TO INDICATE AN EASEMENT FOR CONSTRUCTION, OPERATION, AND MAINTENANCE OF PUBLIC UTILITIES AND DRAINAGE STRUCTURES, INCLUDING BUT NOT LIMITED TO, SANITARY SEWERS, WATER LINES, TELEPHONE SIGNAL CONDUITS, ELECTRIC CONDUCTORS, DRAINAGE PIPES, AND NATURAL GAS LINES.
- MINIMUM DRIVEWAY CULVERT SIZE FOR IS 15" DIAMETER.
- THE H.O.A. SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR OF THE DETENTION POND. THE FREQUENCY OF REQUIRED POND MAINTENANCE, I.E. MOWING THE EASEMENT AREAS AT LEAST TWICE A MONTH DURING THE GROWING SEASON, MARCH TO OCTOBER, REMOVING ALL DEBRIS AND TRASH FROM THE EASEMENT AREAS AT LEAST MONTHLY.

ALL FIRST FLOOR ELEVATIONS AND MECHANICAL SYSTEMS TO BE ABOVE 425' ELEVATION DUE TO POSSIBLE FLOODING

LEGEND

- — — — — = SAN. SEWER LINE
- — — — — = WATER LINE
- FH = FIRE HYDRANT
- = IRON PINS SET UNLESS NOTED
- = STREET TREES
- = PROPOSED SEWER MANHOLE
- = PROPOSED CATCH BASIN
- = PROPOSED WATER METER & CAP
- = PROPOSED GATE VALVE
- = PROPOSED FIRE HYDRANT
- = PROPOSED HEADWALL
- = POWER POLE
- = SAN. SEWER CLEAN OUT

UTILITY OWNERS

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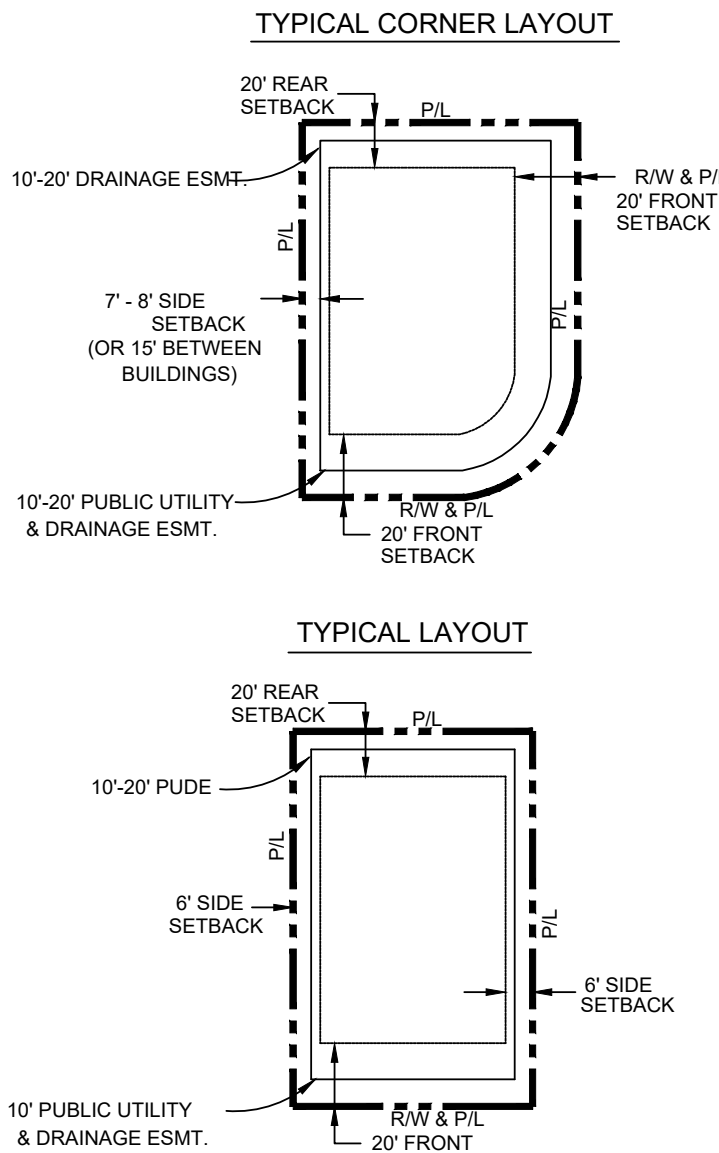
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SITE LAYOUT PLAN



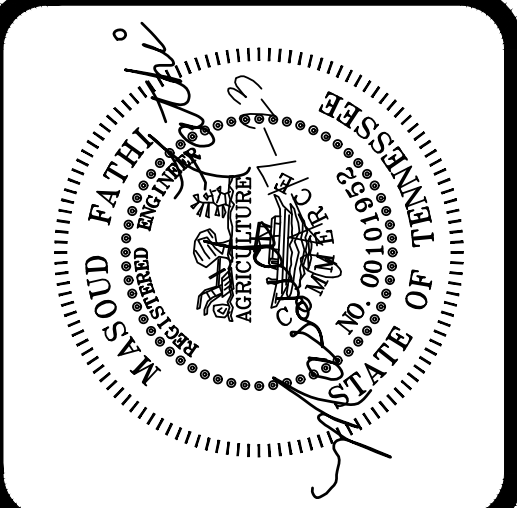
TYPICAL LOT LAYOUT
(N.T.S.)



SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
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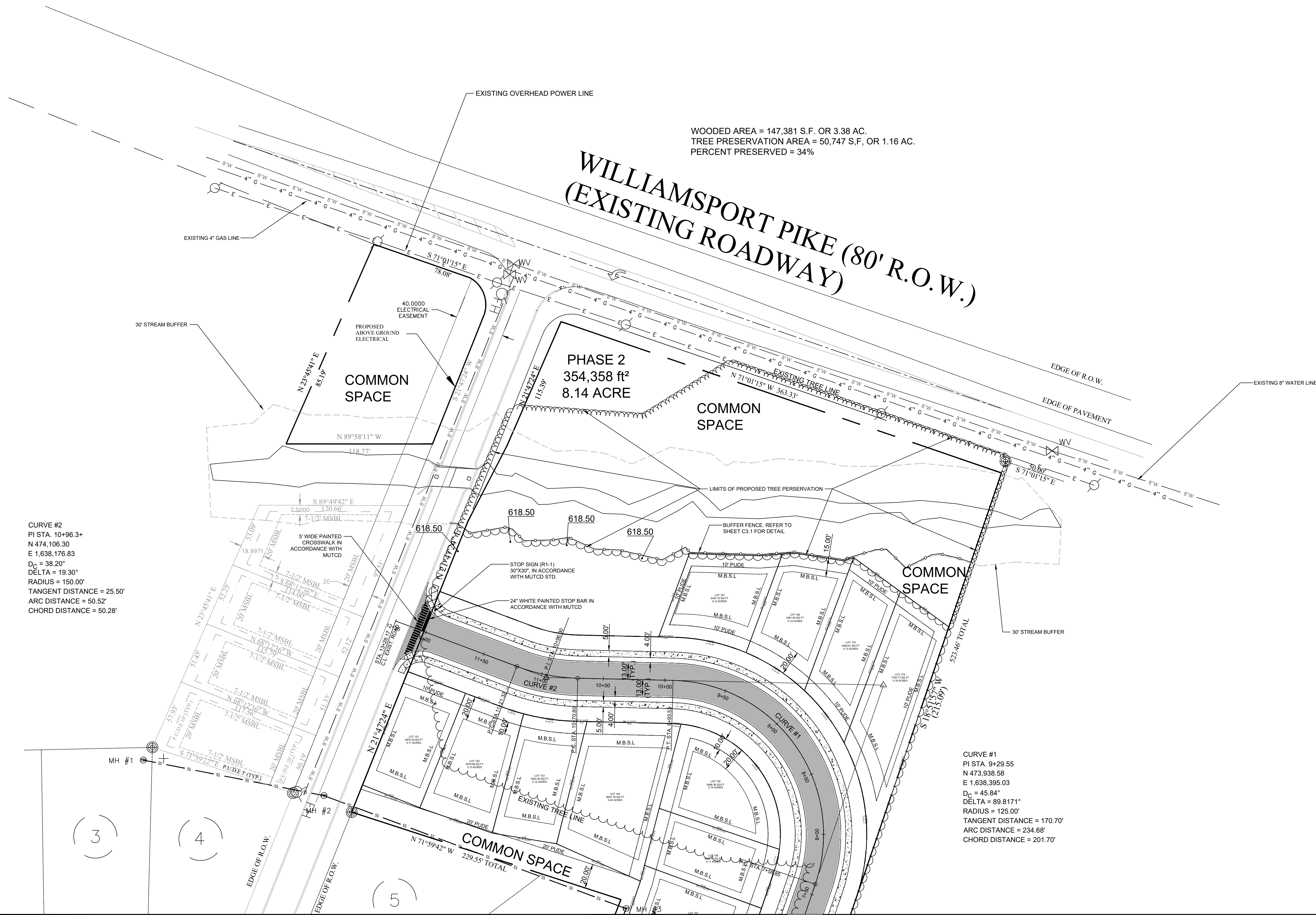
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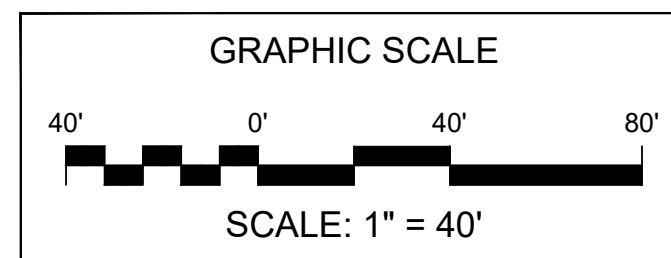
CURVE #2
PI STA. 10+96.3+
N 474.106.30
E 1,638.176.83
D_c = 38.20°
DELTA = 19.30°
RADIUS = 150.00'
TANGENT DISTANCE = 25.50'
ARC DISTANCE = 50.52'
CHORD DISTANCE = 50.28'

CURVE #1
PI STA. 9+29.55
N 473.938.58
E 1,638.395.03
D_c = 45.84°
DELTA = 89.8171°
RADIUS = 125.00'
TANGENT DISTANCE = 170.70'
ARC DISTANCE = 234.68'
CHORD DISTANCE = 201.70'

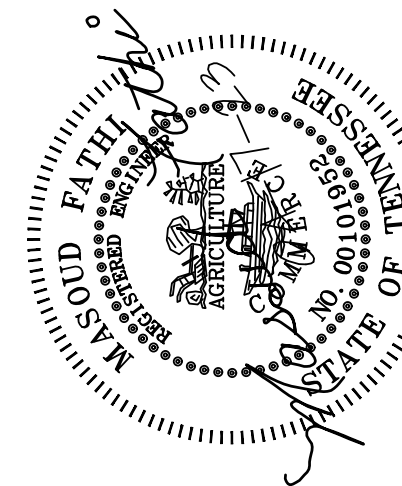
MATCH LINE

SEE SHEET C1.0

SITE LAYOUT PLAN



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MATCH LINE

SEE SHEET C1.3



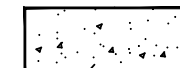
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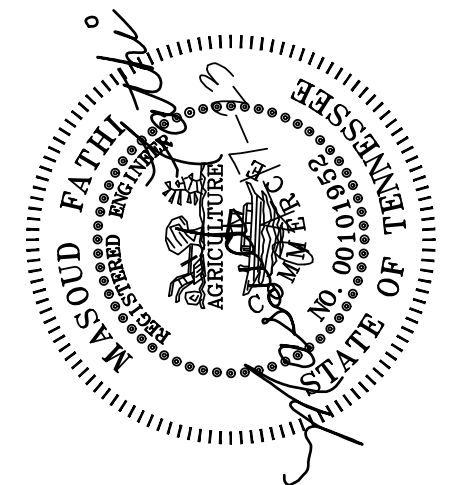
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SITE UTILITIES PLAN

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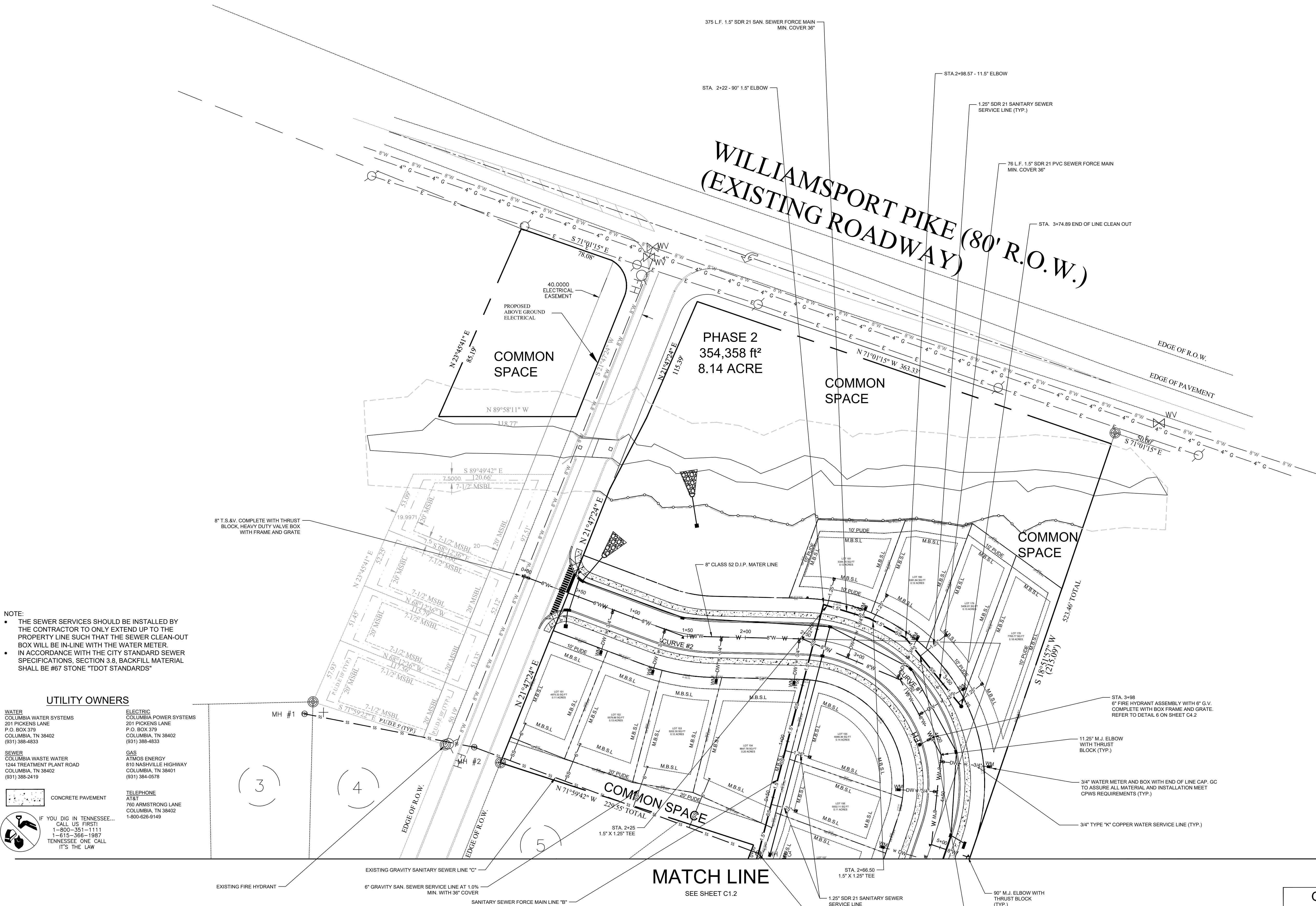
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- NOTE:
- THE SEWER SERVICES SHOULD BE INSTALLED BY THE CONTRACTOR TO ONLY EXTEND UP TO THE PROPERTY LINE SUCH THAT THE SEWER CLEAN-OUT BOX WILL BE IN-LINE WITH THE WATER METER.
 - IN ACCORDANCE WITH THE CITY STANDARD SEWER SPECIFICATIONS, SECTION 3.8, BACKFILL MATERIAL SHALL BE #67 STONE "TDOT STANDARDS"

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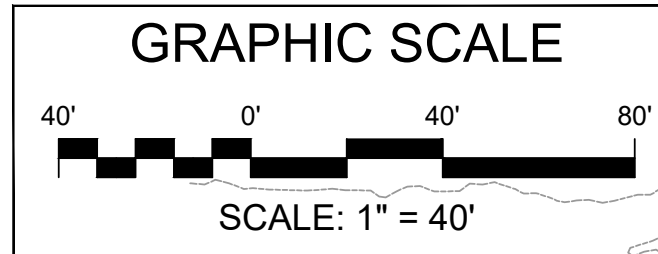


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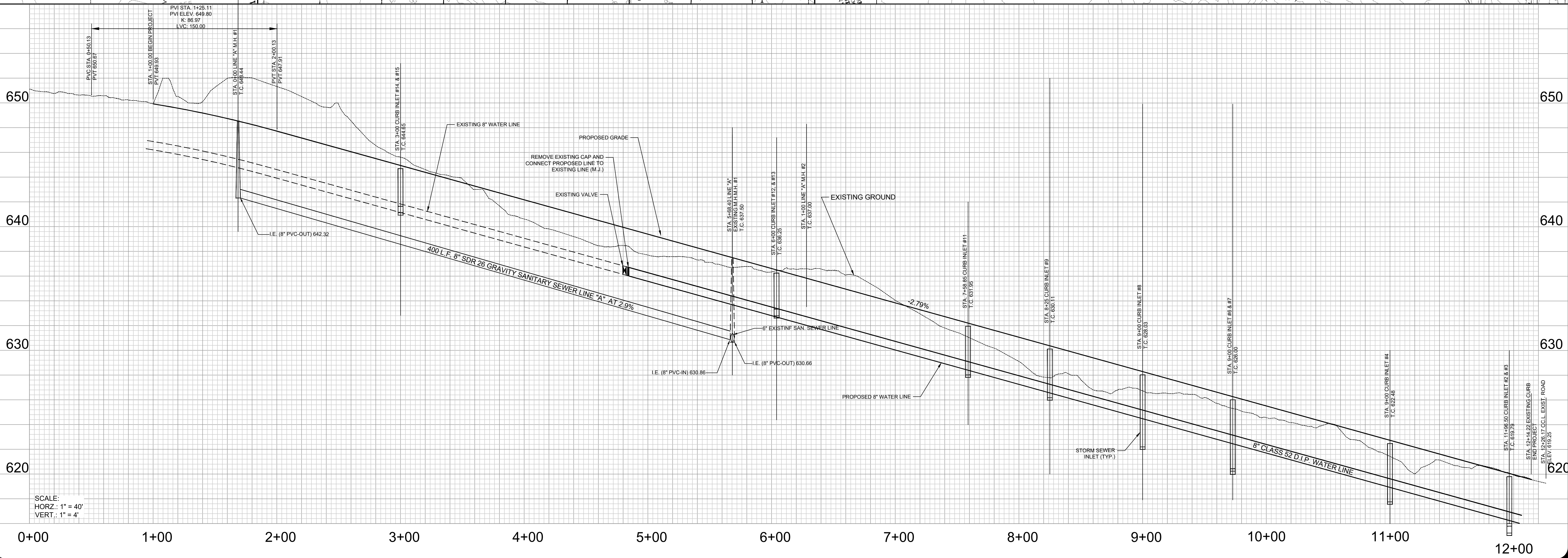
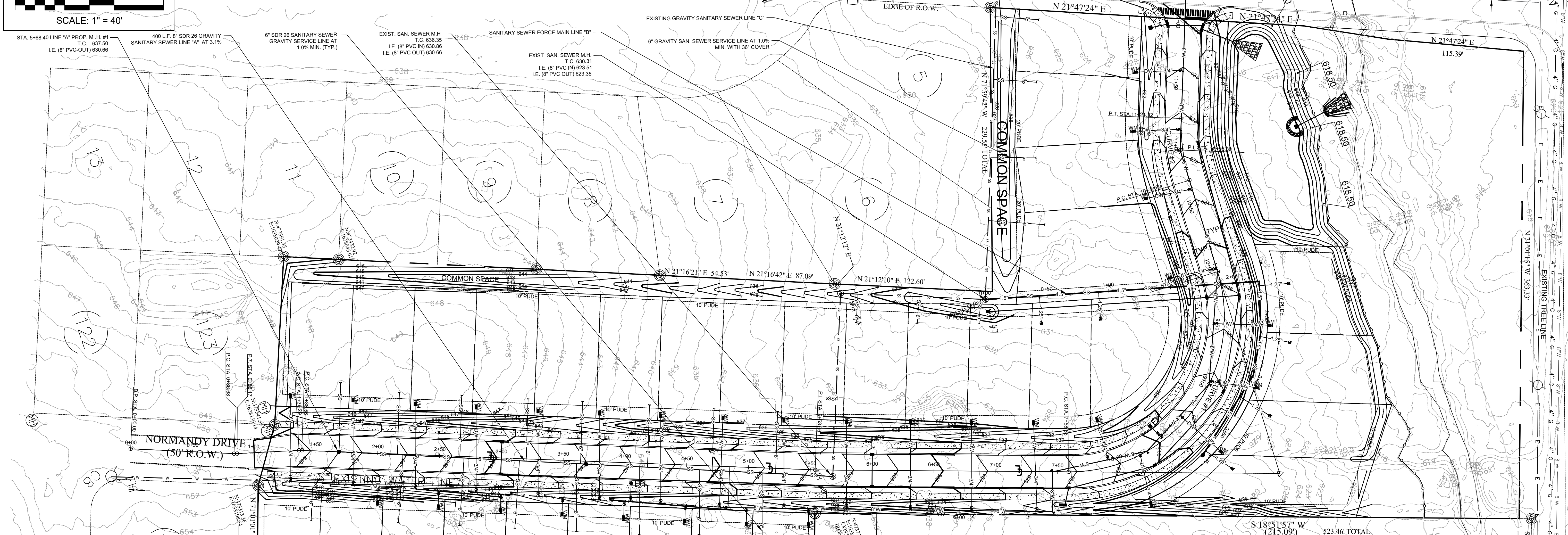
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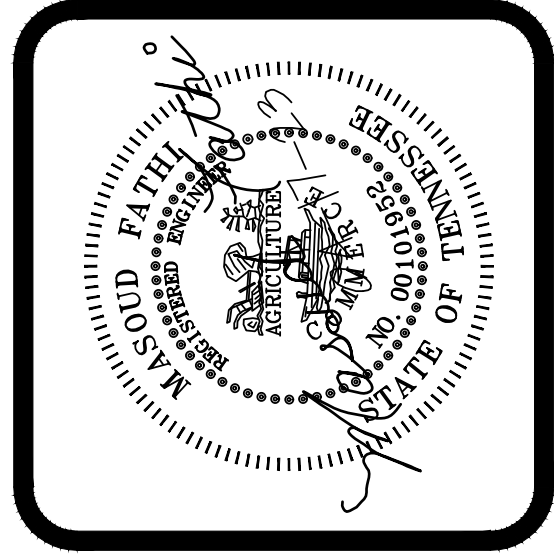
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SANITARY SEWER LINE "A" PLAN AND PROFILE



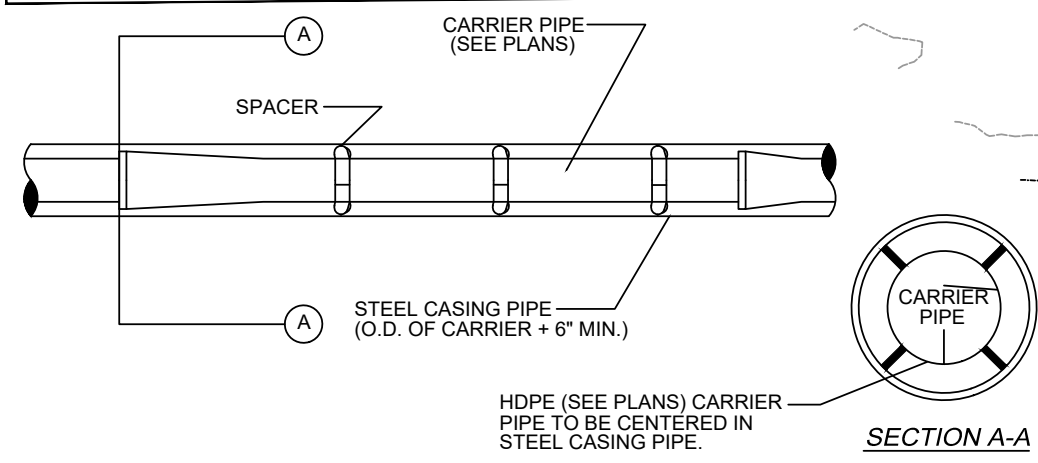
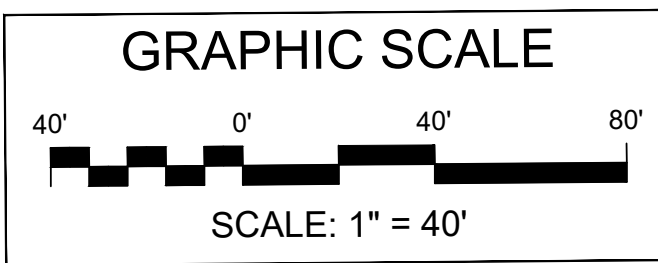
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SITE CONSTRUCTION PLANS FOR
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NOTES:

SPACERS TO BE PLACED ON 6'0" CENTERS OR THREE (3) TO A PIPE SEGMENT. SEE SPECIFICATIONS FOR SPACER MATERIAL REQUIREMENTS.

CASING PIPE TO BE SEALED ON BOTH ENDS WITH NON-SHRINK GROUT.

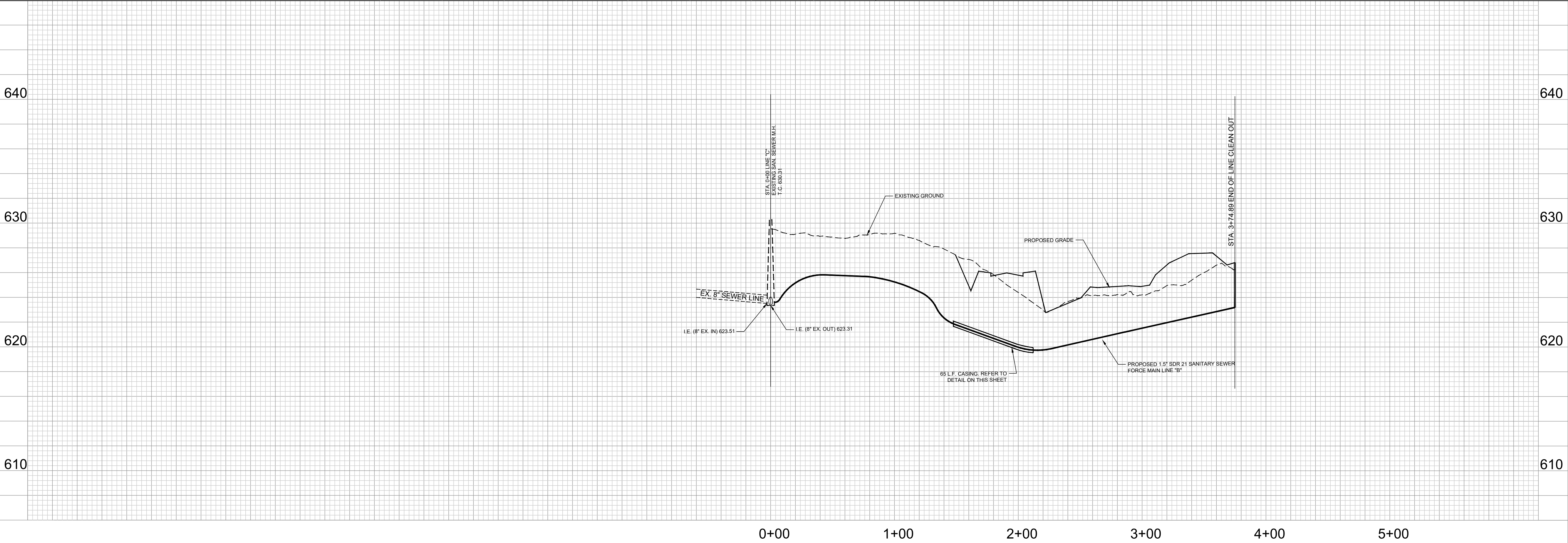
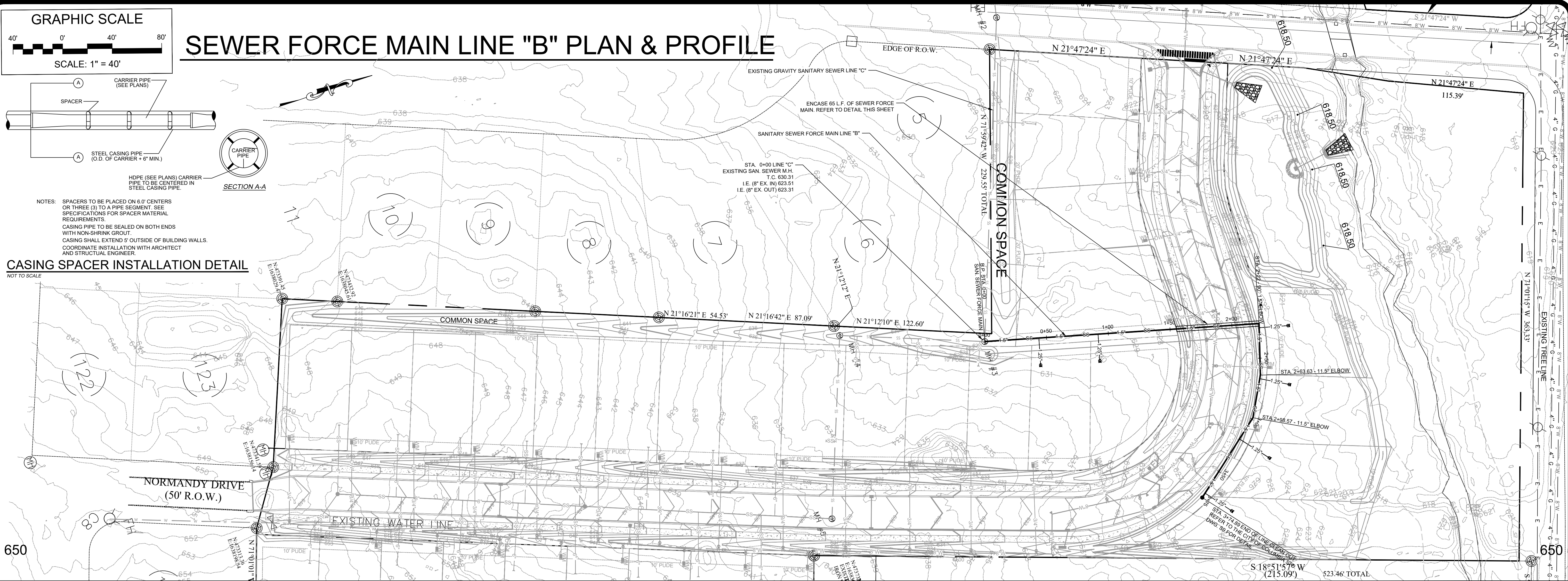
CASING SHALL EXTEND 5' OUTSIDE OF BUILDING WALLS.

COORDINATE INSTALLATION WITH ARCHITECT AND STRUCTURAL ENGINEER.

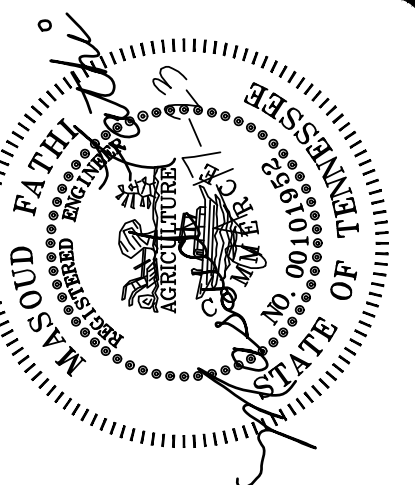
CASING SPACER INSTALLATION DETAIL

NOT TO SCALE

SEWER FORCE MAIN LINE "B" PLAN & PROFILE



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SITE CONSTRUCTION PLANS FOR
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WILLIAMSPORT PIKE AT GOLDEN PLACE
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
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STORM WATER QUALITY CONTROL:
CONTRIBUTING AREA 266,983 S.F. 6.13 AC.
TOTAL IMPERVIOUS SURFACE 95,243 2.19
REMAINING GRASS 171,740 3.94

WATER QUALITY:
WQV = P * Rv * A/12
Rv = 0.015 + 0.00921
I = 2.5 IN/HR
Rv = 0.015 + 0.0092(36) = 0.35
WQV = 1.1 * 0.35 * 6.13/12 = 0.19 AC.-FT. OR 8,474 C.F.

FLOW RATE:

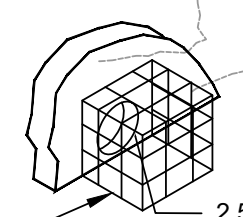
Q = C * I * A
I = 2.45 IN/HR
C = (0.35 * 3.94) + (0.95 * 2.19) / 6.13 = 0.56
Q = 0.56 * 2.45 * 6.13 = 8.41 CFS

ORIFICE SIZE:

WATER SURFACE AREA AT DEPTH OF 1.02' (WQV ELEV. 615.75) = 7,267 S.F.
A = (24" * H) * (3600' CT/20') * S
A = (2 * 7267) * (617.5-615.75) * (3600' * 0.66 * 24' * ((2'32.2') * 0.5))
A = 0.042 S.F. OR 6.05 SQ. INCH
R = 1.39", D = 2.75" INSTALL 3" ORIFICE

DETENTION POND VOLUME:		
CONTOUR	AREA	VOLUME
614	0	0
615	6,405	3203
615.75	7,267	8,474 W.Q.V.
616	7,576	10,104
617	9,105	18,536
618	11,577	26,867

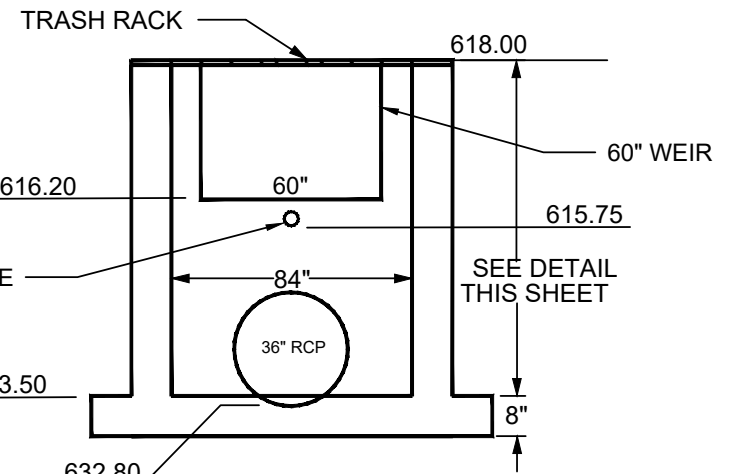
TRASH RACK



2.5" DEWATERING ORIFICE

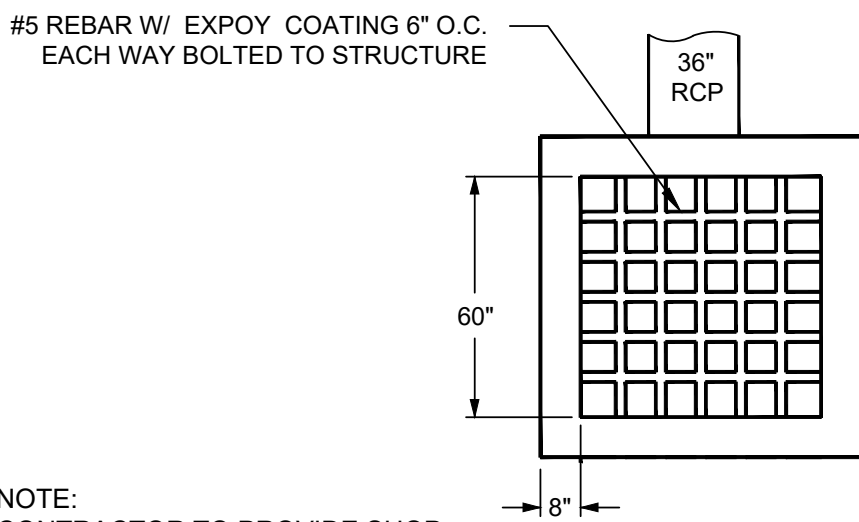
INSTALL TRASH RACK "X"Y"X"
USE #4 EPOXY COATED REBAR
4" E.W. O.C. EA. SIDE. COVER WITH 6" MIN. STONE

OUTLET-SIDE VIEW



STORM EVENT	POND IN-FLOW	POND OUT-FLOW	ALLOWABLE FLOW	H.W. ELEVATION
Q2	13.59	7.89	9.82	616.79
Q5	20.33	15.36	16.07	617.13
Q10	24.81	20.33	20.37	617.33
Q25	30.53	25.74	25.96	617.54
Q50	34.76	29.54	30.15	617.68
Q100	38.98	33.20	34.31	617.82

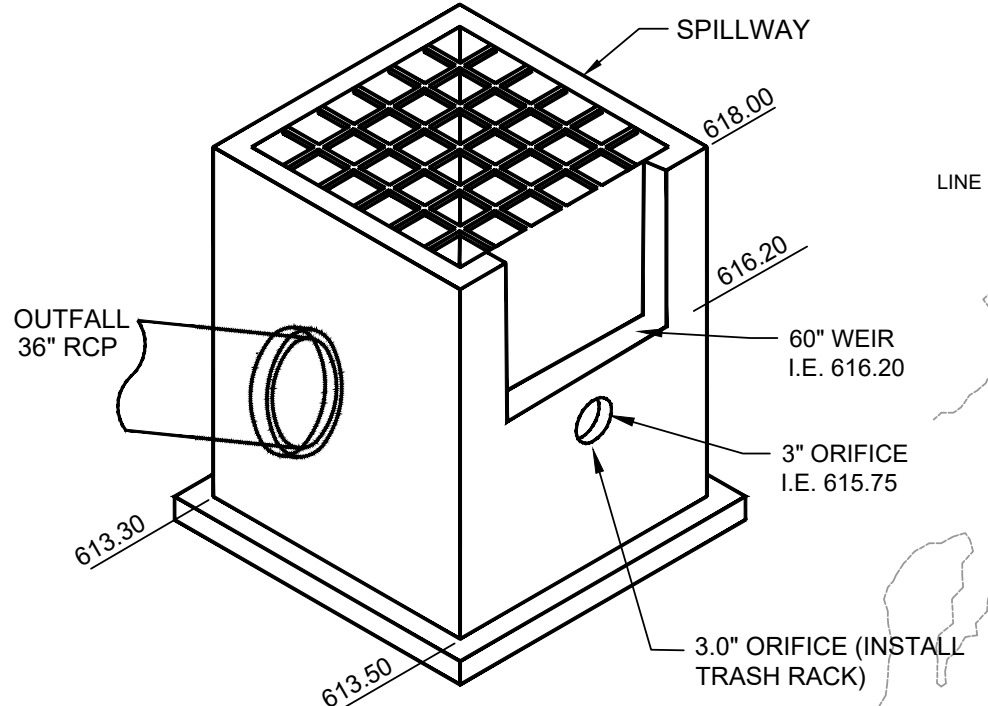
TOP VIEW



NOTE:

CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ANCHORING AND SECURING THE STRUCTURE.

ISOMETRIC VIEW



DETENTION POND OUTLET STRUCTURE DETAIL

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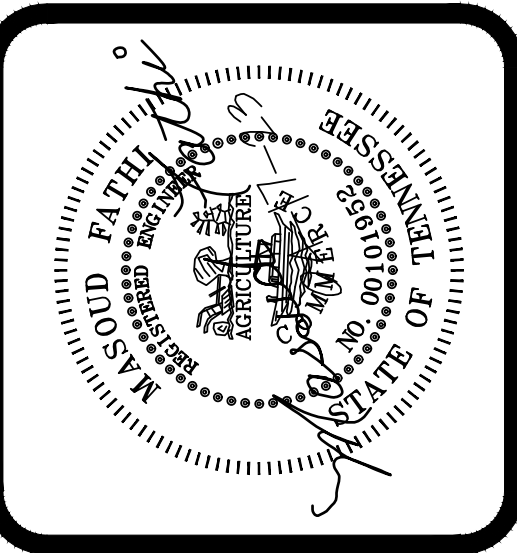
SITE GRADING AND DRAINAGE PLAN

MATCH LINE

SEE SHEET C2.1



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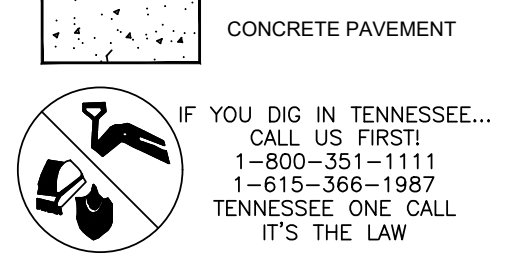
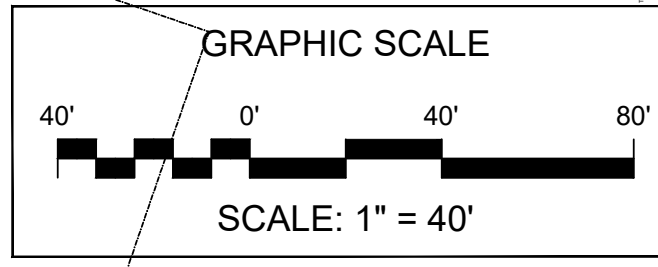


SITE CONSTRUCTION PLANS FOR
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WILLIAMSPORT PIKE AT GOLDEN PLACE
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
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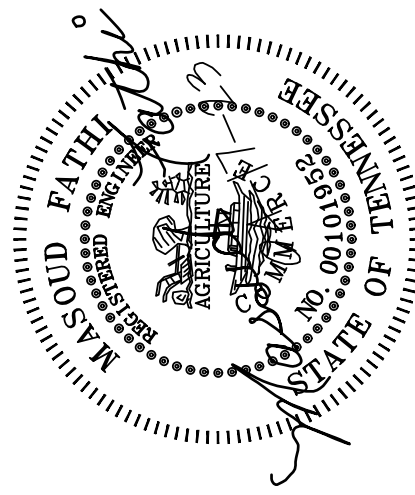
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- GENERAL NOTES**
- PERFORM ALL EARTHWORK OPERATIONS IN SUCH A MANNER AS TO CONTROL EROSION AND PREVENT SEDIMENTATION FROM ENTERING STREAMS OR BEING TRACKED ONTO ROADWAYS. COMPLY SPECIFICALLY AND COMPLETELY WITH STATE & LOCAL GOVERNMENT AGENCIES AND WITH EROSION AND SEDIMENTATION CONTROL PERMIT REQUIREMENTS.
 - INSTALL AND OBTAIN APPROVAL OF ALL EROSION AND SEDIMENTATION CONTROL DEVICES PRIOR TO COMMENCEMENT OF GRADING OPERATIONS.
 - ALL EROSION AND WATER QUALITY CONTROL STRUCTURES SHALL BE INSPECTED FOR STABILITY AND OPERATION FOLLOWING EVERY RUN-OFF PRODUCING RAINFALL. DURING CONSTRUCTION, AS DIRECTED IN THE NPDES PERMIT.
 - MAKE NEEDED REPAIRS TO CONTROL STRUCTURES IMMEDIATELY UPON DETECTION OF DEFICIENCIES.
 - CLEAN SEDIMENT FROM BASIN(S) WHEN STORAGE CAPACITY IS DIMINISHED.
 - REMOVE SEDIMENT FROM SILT FENCES WHEN THE DEPTH REACHES APPROXIMATELY 4". SILT FENCES AND DIVERSION DITCHES SHALL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER.
 - REMOVE ALL TEMPORARY SEDIMENTATION CONTROL DEVICES NOT DESIGNATED TO REMAIN UPON COMPLETION OF GRADING AND FINAL ACCEPTANCE OF GRASSING, BUT NO LATER THAN 14 DAYS AFTER FINAL SITE STABILIZATION.
 - THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY MEASURES NECESSARY TO PREVENT SITE EROSION AND SEDIMENTATION AS DETERMINED BY TDEC.
 - INLET PROTECTION SHALL BE PROVIDED FOR CATCH BASINS AND FOR CURB INLETS. CLEAN SEDIMENT FROM PIPE AFTER VEGETATION IS ESTABLISHED.
 - EXISTING AND PROPOSED INLETS RECEIVING DRAINAGE FROM DISTURBED AREAS SHALL HAVE INLET PROTECTION AS INDICATED ON PLANS.

- GRADING, DRAINAGE, AND EROSION CONTROL NOTES:**
- NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE.
 - TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND DISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
 - CONSTRUCT EROSION CONTROL MEASURES AS SHOWN ON THE DRAWINGS PRIOR TO BEGINNING OF GRADING OPERATIONS.
 - ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO THE ACCEPTANCE.
 - SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 50% FILLED WITH SUCH SEDIMENT.
 - ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DESIGNATED BY THE CITY INSPECTOR.
 - WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE CITY INSPECTOR, THEY SHALL BE REMOVED.
 - REPLACE SILT BARRIERS AS DIRECTED BY THE CERTIFIED EROSION CONTROL SPECIALIST.
 - THE CONTRACTOR SHALL PROVIDE THE NECESSARY PROTECTION, IN ACCORDANCE WITH THE SPECIFICATIONS FOR TREES TO REMAIN, DO NOT OPERATE OR STORE HEAVY EQUIPMENTS, NOR HANDLE OR STORE MATERIALS, WITHIN THE DRIPLINES OF TREES TO REMAIN.
 - CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS PRIOR TO BEGINNING WORK.
 - CONTOUR LINES AND SPOT ELEVATIONS ARE THE RESULT OF A DETAILED ENGINEERING GRADING DESIGN AND REFLECT A PLANNED INTENT WITH REGARD TO DRAINAGE AND MOVEMENT OF MATERIALS. SHOULD THE CONTRACTOR HAVE ANY QUESTION OF THE INTENT OR ANY PROBLEMS WITH CONTINUITY OF GRADES, THE ENGINEER SHOULD BE CONTACTED IMMEDIATELY PRIOR TO BEGINNING WORK.
 - ALL SOIL SPOILS EXCAVATED AND REMOVED FROM SITE MUST BE TAKEN TO A SITE WITH A VALID METRO GRADING PERMIT.

CIVIL AND ENVIRONMENTAL
ENGINEERING SERVICES, LLC
803 ALBEMARLE COURT
BRENTWOOD, TENNESSEE 37027
CELL: (615) 504-9915
masoudfathi@comcast.net



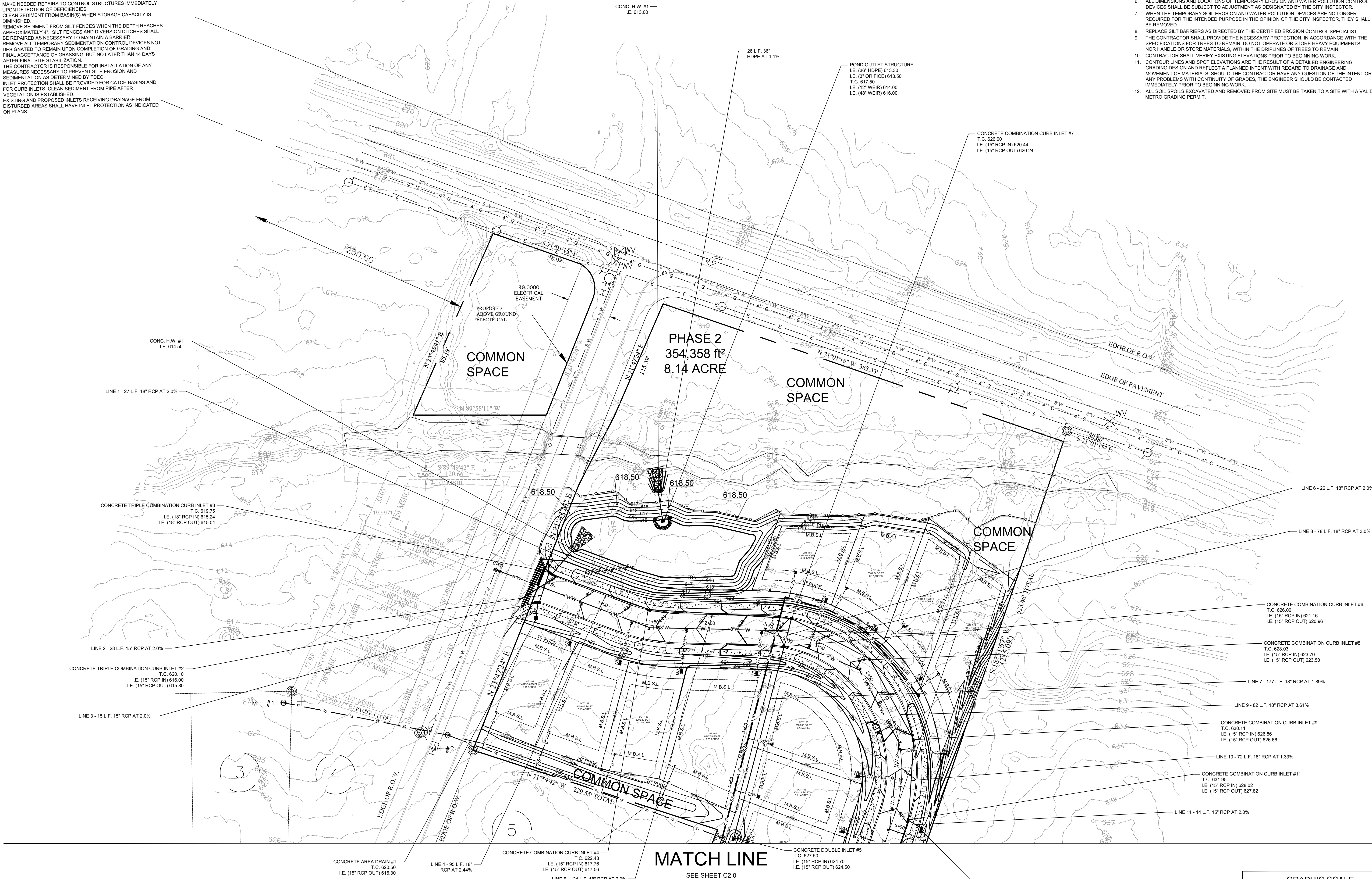
SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE

9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

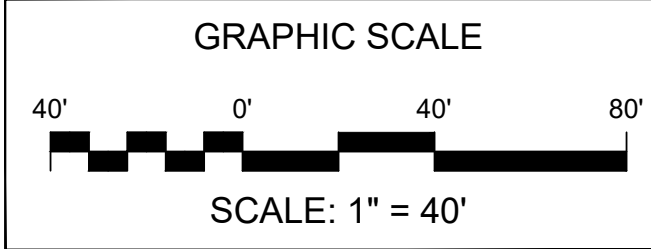
General Notes

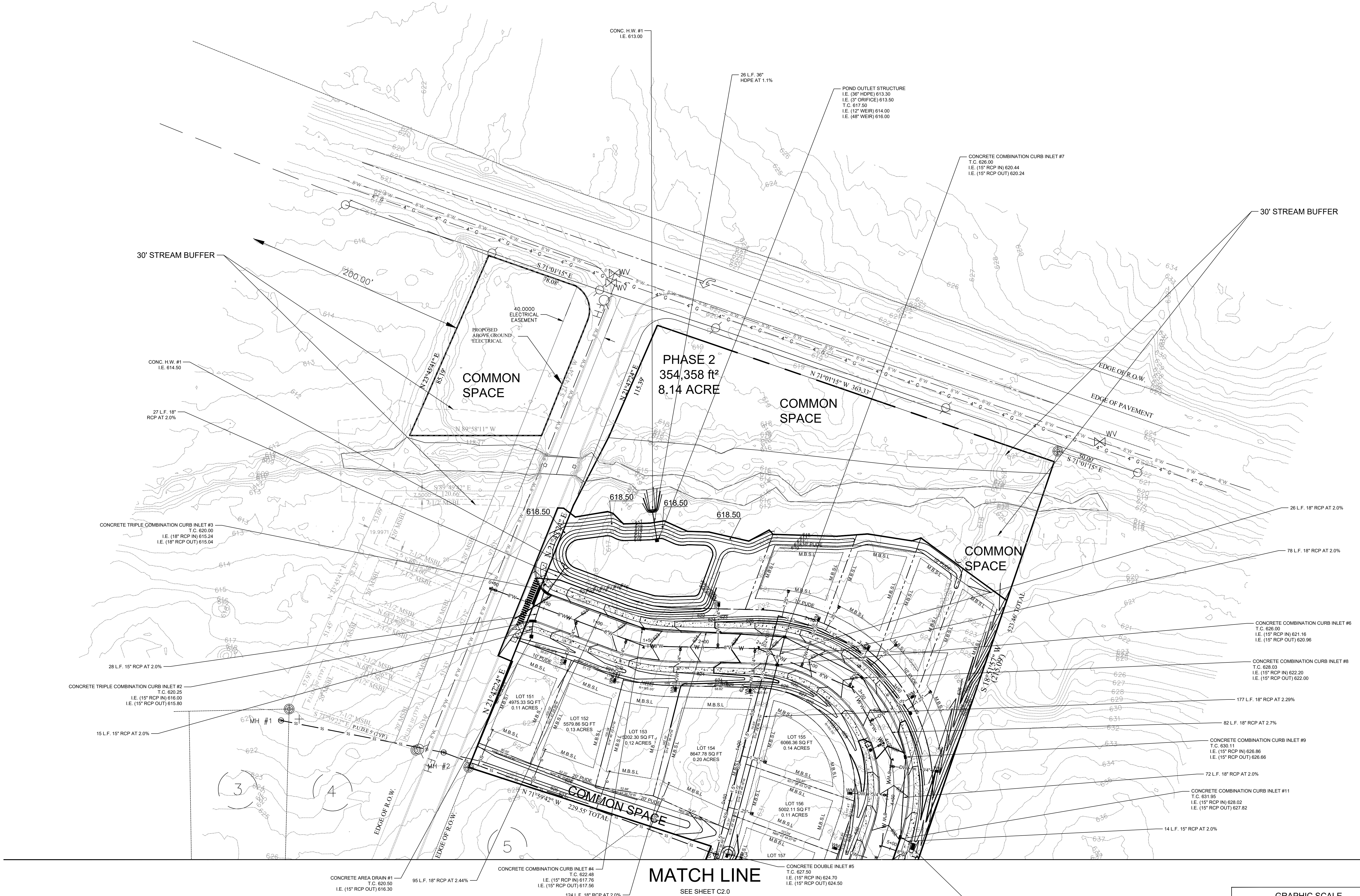
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No.	Revision/Issue	Date

Date:	APR. 17, 2023	Scale:
Sheet:	C2.1	OF
Project No.	2023-15	Prepared By: MF

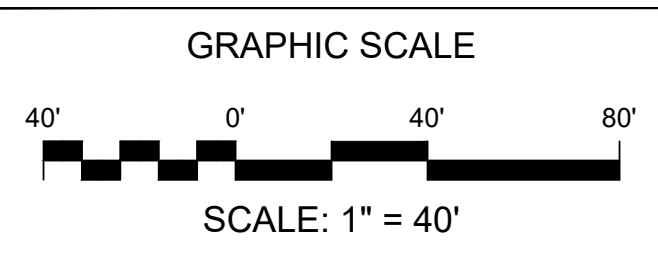


SITE GRADING AND DRAINAGE PLAN

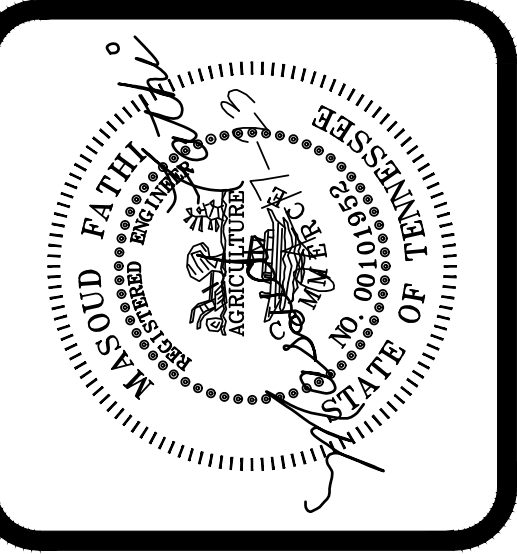




SITE GRADING AND DRAINAGE PLAN



CIVIL AND ENVIRONMENTAL
ENGINEERING SERVICES, LLC
803 ALBEMARLE COURT
BRENTWOOD, TENNESSEE 37027
CELL: (615) 504-9915
masoudfathi@comcast.net



SITE CONSTRUCTION PLANS FOR
HABITAT FOR HUMANITY WILLIAMSON-MAURY
WILLIAMSPORT PIKE AT GOLDEN PLACE
9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE
DEED BOOK R-2495 PAGE 1181 R.O.M.C., PROPERTY MAP 88 PARCEL 70.01

General Notes		
1	2	3
4	5	6
7	8	9
10	11	12
No.	Revision/Issue	Date

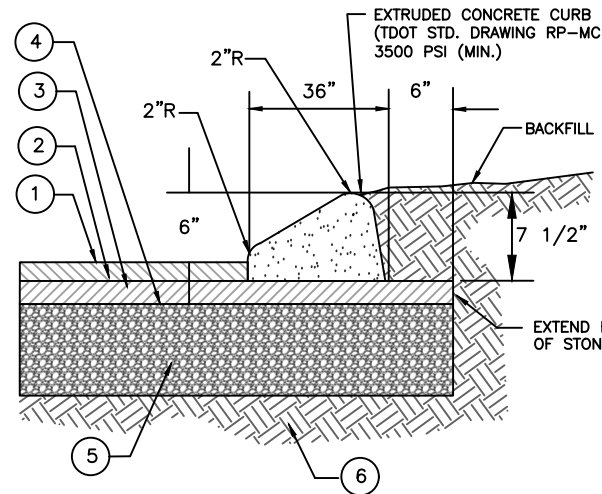
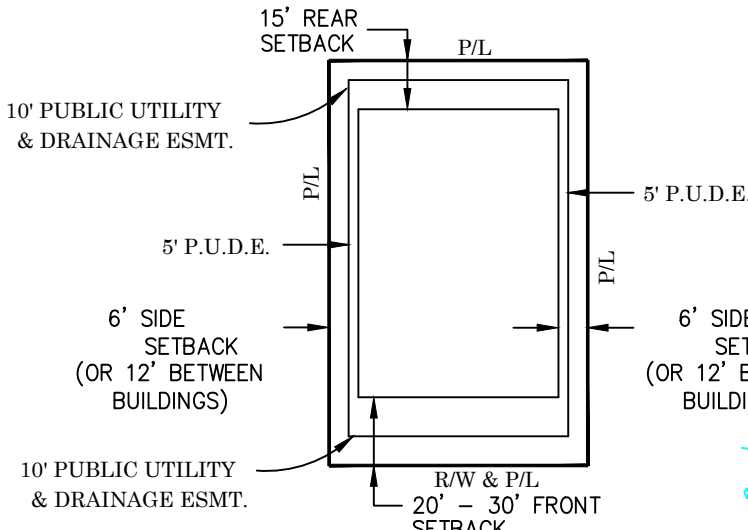
Date: APR. 17, 2023

Sheet: C2.1 OF

Project No. 2023-15 Prepared By: MF

- GENERAL NOTES
- 1.) THE PURPOSE OF THIS PLAT IS TO CREATE AN 18 LOT SUBDIVISION.
 - 2.) ALL DISTANCES SHOWN HEREON ARE BASED UPON A FIELD--RUN SURVEY USING E.D.M. EQUIPMENT AND OR ALL GPS, AND ARE ADJUSTED FOR TEMPERATURE.
 - 3.) UTILITIES, IF SHOWN WERE TAKEN FROM VISIBLE STRUCTURES AT THE SITE, VERIFICATION OF THEIR EXISTENCE, LOCATION, SIZE, AND DEPTH SHOULD BE MADE BEFORE MAKING DECISIONS REGARDING THEM. AVAILABILITY OF SERVICE SHOULD BE CONFIRMED WITH APPROPRIATE LOCAL UTILITY COMPANY. TENNESSEE ONE CALL (811) SHOULD BE CALLED BEFORE ANY CONSTRUCTION OR DIGGING.
 - 4.) THIS SURVEY WAS MADE WITHOUT THE BENEFIT OF A TITLE REPORT. IT IS THEREFORE SUBJECT TO THE FINDINGS OF AN ACCURATE TITLE REPORT.
 - 5.) THIS PROPERTY IS SUBJECT TO BOTH RECORDED EASEMENTS, AND TO THOSE UNKNOWN TO THIS SURVEYOR.
 - 6.) THE SUBJECT PROPERTY LIES IN A ZONE "X" (AREAS OUTSIDE OF THE 100 YEAR FLOOD PLAIN) AS SHOWN ON FIRM MAP 47119C0285E DATED 04-16-2007.
 - 7.) PROPERTY ZONED CD-4
 - 8.) SETBACKS ARE FRONT=6'/20'; SIDE =6' TOTAL; REAR=15'
 - 9.) THERE IS A 10' P.U.D.E. ON ALL PROPERTY LINES PARALLEL AND ABUTTING PUBLIC ROADS AND 5' P.U.D.E. ALONG ALL INTERIOR LOT LINES.
 - 10.) POWER & WATER SERVED BY CPWS COLUMBIA POWER & WATER SYSTEMS.
 - 11.) SEWER IS SERVED BY COLUMBIA WASTEWATER DEPARTMENT.
 - 12.) NO DRIVEWAY ACCESS OFF WILLIAMSPORT PIKE.
 - 13.) ALL STORM WATER RUNOFF WILL FLOW AWAY FROM THE ROAD AND TOWARD THE STREAM. FOR CALCULATIONS SEE C3.0 STORM WATER PLAN ENGINEERING PLAN.
 - 14.) ALL FIRST FLOOR ELEVATIONS AND MECHANICAL SYSTEMS TO BE ABOVE 622' ELEVATION DUE TO POSSIBLE FLOODING.
 - 15.) TOPOGRAPHY DATUM BASED ON NAVD 1988 TAKEN FROM TENNESSEE LIDAR MAPPING AND FIELD CHECKED.

TYPICAL LAYOUT (LOTS 146-180)

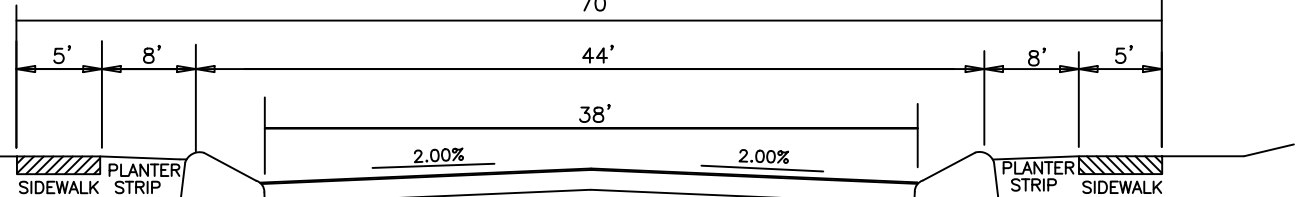


GENERAL NOTES:

1. EXPANSION JOINTS TO BE SPACED A MAXIMUM OF 100 FEET APART AND ALIGN WITH RAMP, INLETS AND OTHER REQUIRED TARGET POINTS.
2. CONTRACTION/CONSTRUCTION JOINTS ARE REQUIRED AND ARE TO BE CUT INTO CURB EVERY 10 FEET.
3. DETAILS SHALL MEET THE STANDARDS AS SET FORTH IN THE LATEST VERSION OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN GUIDELINES.
4. THE EXTRUDED 8" MOUNTABLE CONCRETE CURB IS TO BE USED ONLY IN SPECIAL CONDITIONAL SUCH AS LOW SPEED VOLUME LOCAL STREETS AND WHEN TRYING TO SIMILAR CURBS ON SUBDIVISION STREETS OR IN PARKING LOTS.
5. WHERE CONCRETE MEDIAN PAVEMENT IS POURED BEHIND EXTRUDED 8" MOUNTABLE CONCRETE CURB, IT MAY BE POURED MONOLITHICALLY WITH THE CURB.

TYPICAL STREET SECTION

NOT TO SCALE



UTILITY OWNERS

ELECTRIC
OWNER: COLUMBIA POWER & WATER
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833

WATER
OWNER: COLUMBIA POWER & WATER
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833

SEWER
OWNER: COLUMBIA WASTEWATER SYSTEM
ADDRESS: 1244 TREATMENT PLANT ROAD
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833

GAS
OWNER: ATMOS ENERGY CORP
ADDRESS: 810 NASHVILLE HWY
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-9136

TELEPHONE
OWNER: CPWS
ADDRESS: 201 PICKENS LANE
ADDRESS: COLUMBIA, TN 38401
PHONE # (931) 388-4833



IF YOU DIG TENNESSEE...
CALL US FIRST!
811
TENNESSEE ONE CALL
IT'S THE LAW

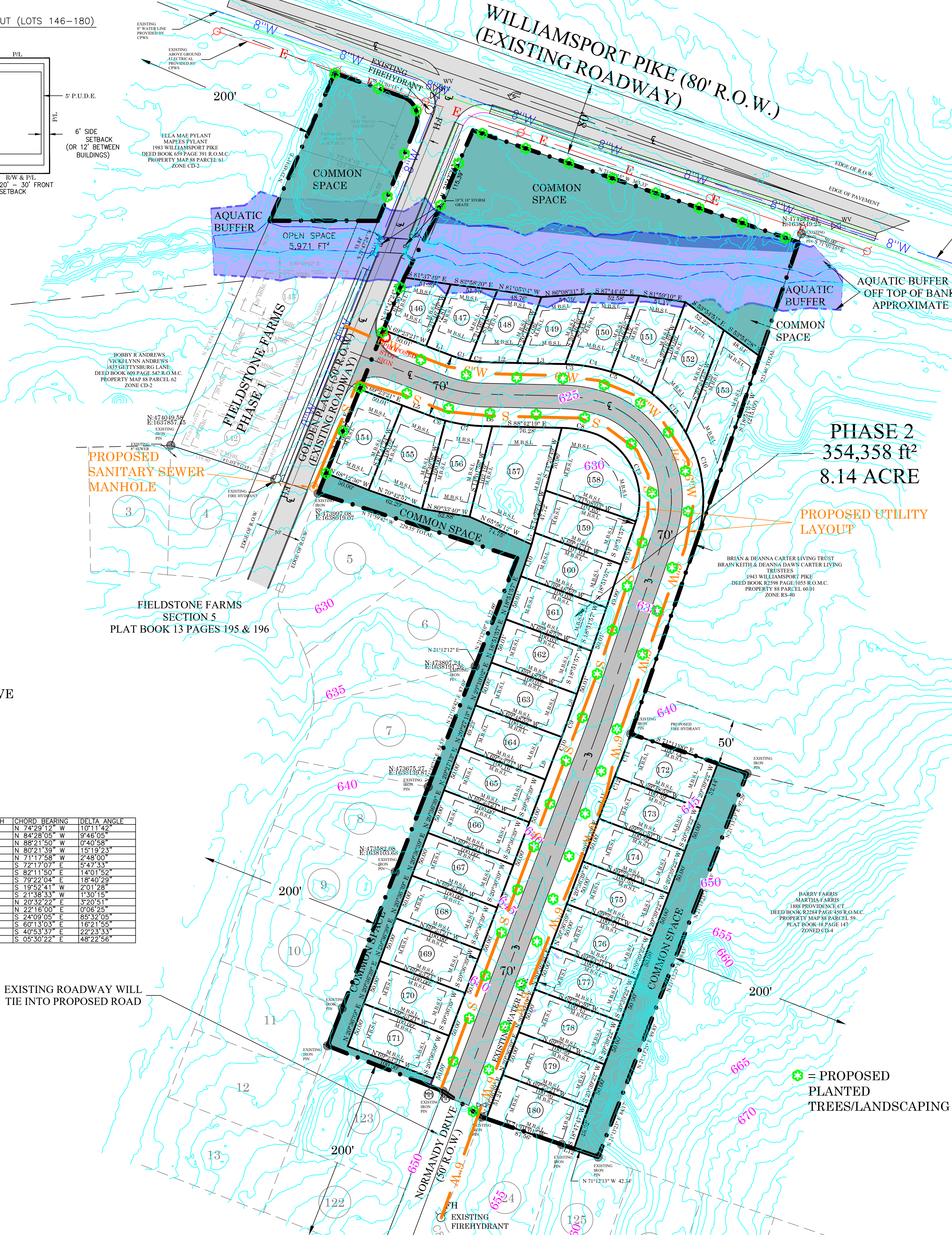
PROPOSED NORMANDY DRIVE
R.O.W TABLES

LINE	BEARING	DISTANCE			
L1	N 69°23'21" W	30.22'			
L2	N 88°42'19" W	33.35'			
L3	N 88°42'19" W	50.60'			
L4	N 69°23'21" W	40.68'			
L5	S 69°23'21" E	31.66'			
L6	S 88°42'19" E	7.32'			
L7	S 14°29'49" W	13.31'			
L8	S 18°51'57" W	22.24'			
L9	S 20°36'39" W	29.35'			
L10	N 18°51'57" E	36.77'			
L11	N 20°36'39" E	47.65'			
L12	N 71°12'13" W	14.36'			
CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	112.03'	19.91'	19.91'	N 74°29'12" W	107°11'42"
C2	112.03'	19.10'	19.08'	N 84°28'05" W	9°46'05"
C3	190.80'	2.27'	2.27'	N 88°21'50" W	0°40'58"
C4	190.80'	51.03'	50.87'	N 80°21'39" W	15°19'23"
C5	190.80'	9.32'	9.32'	N 71°17'58" W	2°48'00"
C6	182.03'	18.40'	18.40'	S 72°17'07" E	5°47'33"
C7	182.03'	44.58'	44.47'	S 82°11'50" E	14°01'52"
C8	120.80'	39.37'	39.20'	S 79°22'04" E	18°40'29"
C9	785.97'	27.77'	27.77'	S 19°52'41" W	2°01'28"
C10	785.97'	20.63'	20.63'	S 21°38'33" W	1°30'15"
C11	855.97'	50.01'	50.00'	N 20°32'22" E	3°20'51"
C12	855.97'	1.60'	1.60'	N 22°16'00" E	0°06'25"
C13	76.91'	114.82'	104.45'	S 24°09'05" E	85°32'05"
C14	144.90'	41.39'	41.25'	S 60°13'03" E	16°21'58"
C15	146.91'	57.42'	57.05'	S 40°53'37" E	22°23'33"
C16	146.91'	124.06'	120.41'	S 05°30'22" E	48°22'56"

FIELDSTONE FARMS PHASE II
AREA TO BE DEVELOPED:

	AREA IN Sq. Ft.
COMBINED LOT AREA:	176,182 Sq. Ft. 4.04 Acres
AQUATIC BUFFER AREA:	31,263 Sq. Ft. 0.72 Acres
COMMON SPACE AREA (19.7% OF DEVELOPMENT):	69,858 Sq. Ft. 1.60 Acres
R.O.W AREA:	77,055 Sq. Ft. 1.77 Acres
TOTAL AREA TO BE DEVELOPED:	354,358 Sq. Ft. 8.135 Acres

EXISTING ROADWAY WILL
TIE INTO PROPOSED ROAD



LOT(S) AREA

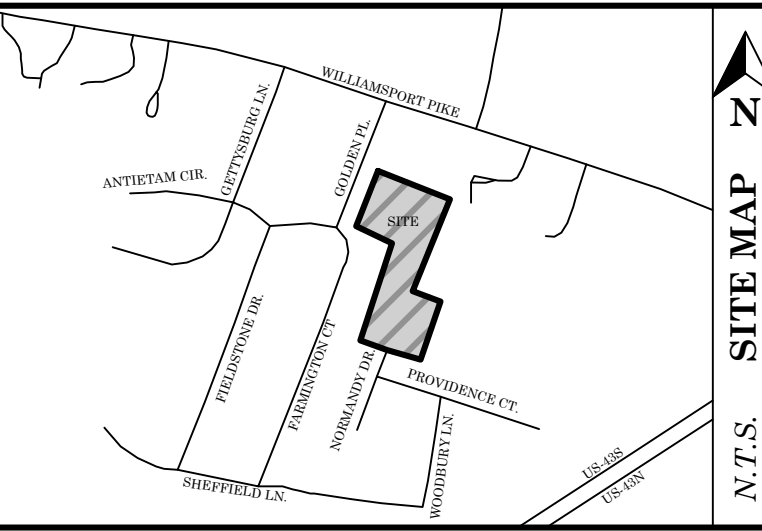
PROPERTY	SQ FT
LOT 146	3,367 ft²
LOT 147	3,932 ft²
LOT 148	3,931 ft²
LOT 149	3,982 ft²
LOT 150	4,227 ft²
LOT 151	4,815 ft²
LOT 152	5,570 ft²
LOT 153	7,105 ft²
LOT 154	4,975 ft²
LOT 155	5,583 ft²
LOT 156	5,196 ft²
LOT 157	8,648 ft²
LOT 158	6,892 ft²
LOT 159	5,011 ft²
LOT 160	5,006 ft²
LOT 161	5,001 ft²
LOT 162	5,001 ft²
LOT 163	5,025 ft²
LOT 164	4,976 ft²
LOT 165	5,004 ft²
LOT 166	5,000 ft²
LOT 167	5,000 ft²
LOT 168	5,000 ft²
LOT 169	5,000 ft²
LOT 170	5,000 ft²
LOT 171	5,000 ft²
LOT 172	5,143 ft²
LOT 173	4,992 ft²
LOT 174	5,028 ft²
LOT 175	5,026 ft²
LOT 176	5,024 ft²
LOT 177	5,022 ft²
LOT 178	5,020 ft²
LOT 179	5,018 ft²
LOT 180	5,036 ft²

LEGEND

- UE— UNDERGROUND ELECTRIC LINE
- E— OVERHEAD ELECTRIC LINE
- T— TELECOMMUNICATION LINE
- X— WIRE FENCE
- W— WOOD FENCE
- O— CHAIN LINK FENCE
- W— WATER LINE
- S— SEWER LINE
- FM— FORCE MAIN SEWER
- G— GAS LINE
- SF— SILT FENCE
- ⊕ WELL
- ⊙ UTILITY POLE
- ⊙ GRID STAKE
- ⊙ EXISTING IRON PIN (UNLESS NOTED)
- ⊙ EXISTING CONCRETE MONUMENT
- ⊙ IRON PIN SET (UNLESS NOTED)
- ⊙ POINT
- ⊙ FIRE HYDRANT
- ⊙ ELECTRIC METER
- ⊙ WATER METER
- ⊙ GAS METER
- ⊙ SEWER MANHOLE
- ⊙ STORM MANHOLE
- ⊙ WATER VALVE
- ⊙ ELECTRIC TRANSFORMER BOX
- ⊙ ELECTRIC PULL BOX

**CHAPDELAINE & ASSOCIATES
LAND SURVEYING**

7376 WALKER ROAD,
FAIRVIEW, TENNESSEE 37062
(615) 799-8104
chapsurveyors@msn.com
Randolph L. Chapdelaine
TN R.L.S. #1444



CERTIFICATE OF ACCURACY

I HEREBY CERTIFY THAT THIS IS A CATEGORY IV SURVEY AND THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION, THIS SURVEY WAS DONE IN COMPLIANCE WITH CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE, AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE SURVEY:

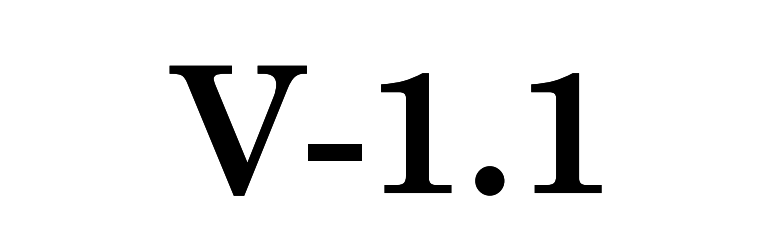
- a. REAL TIME KINEMATIC & BASE SOKKIA GRX 3
- b. POSITIONAL ACCURACY: 0.05 FEET
- c. DATE OF SURVEY: 02/01/2021
- d. DATUM / EPOCH: NAD83 (2011) EPOCH PUBLISHED / FIXED CONTROL: TDOT CORS NETWORK
- e. GEIOD MODEL: GEIOD 12B
- f. COMBINED GRID FACTOR: 0.99992837

RANDOLPH L. CHAPDELAINE, R.L.S. # 1444 DATE

HABITAT FOR HUMANITY
WILLIAMSON-MAURY
WILLIAMSPORT PIKE
DEED BOOK R-2485 PAGE 1181
R.O.M.C.
9th CIVIL DISTRICT OF MAURY COUNTY,
TENNESSEE
PROPERTY MAP 88 PARCEL 70.01
ZONE CD-4
TOTAL ACRES 8.14
TOTAL AREA BEING DEVELOPED: 8.14
ACRES
CITY OF COLUMBIA

REVISION #	DATE

DATE: JANUARY 17, 2023
DRAWN BY: NAB
JOB #: 6171
SCALE: 1" = 60'



V-1.1

P.U.D PRELIMINARY PLAT-MAJOR SUBDIVISION FOR FIELDSTONE SECTION 5 PHASE 2



CITY OF
COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

* 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)
Fold hard copy submittals larger than 8½"x11"

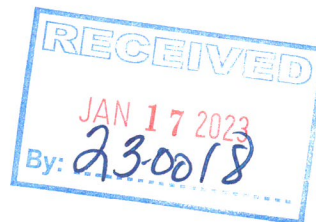
ADDRESS/LOCATION	088		
	TAX MAP:	GROUP:	070.01 PARCEL:
SUMMARY OF NATURE OF REQUEST AND WORK	35 lot subdivision		

DATE OF PRE-APPLICATION CONFERENCE	Pre-application meetings are scheduled for Wednesdays.
------------------------------------	--

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☒ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	Annexations/Rezoning/PUD's: ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter Plats/PUDs: ☐ Project Name (include Sections & Phases) Fieldstone Farms Section 5 Phase 2 ☐ Total Number of Lots 35 lots ☐ Total acreage 8.14 acres

*File naming nomenclature examples:

Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat



Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Chapdelaine & Associates Land Surveying	PHONE	931-799-8104
ADDRESS	7376 Walker Rd Fairview, TN	EMAIL	Lchapsurveys@gmail.com

PROPERTY OWNER NAME	Jennee Galland	PHONE	615-550-5617
ADDRESS	109 Noah Drive Franklin, TN	EMAIL	jgalland@hfnwm.org

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Ram Randolph L. Chapdelaine Randolph S. Chapdelaine
Jennee Galland Jennee Galland 1/17/23
 APPLICANT NAME APPLICANT SIGNATURE DATE

Jennee Galland Jennee Galland 1/17/23
 PROPERTY OWNER NAME PROPERTY OWNER SIGNATURE DATE

STAFF USE ONLY

DOCKET NO.	23-0018	FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			

Receipt Date: 1/18/2023

City Of Columbia
700 North Garden Street
Columbia, TN 38401
(931) 560-1500
Receipt Number: 10088980

Miscellaneous Receipt

Name: CHAPDELAINE & ASSOCIATES

Code: 206-ZONING PERMITS AND FEES

Amt: \$700.00

MR #: 10070768

Description: PRELIMINARY PLAT- 35

Reference: FIELDSTONE FARMS SECTION 5 PHASE 2

Notes:

GL Account	Description	Amount
110-32660-	Zoning Permits & Fees	700.00

Payment Information

Check 1986 \$700.00

Paid By: CHAPDELAINE &
ASSOCIATES

Amount Tendered: \$700.00

Total Paid: \$700.00

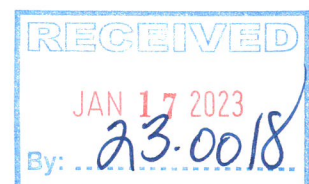
Change: \$0.00

☐ Voided

Batch: LS - 1/18/2023

1/18/2023 7:40 Page 1 of 1

Collecting Official, City Of Columbia



Receipt Date: 1/18/2023

City Of Columbia
700 North Garden Street
Columbia, TN 38401
(931) 560-1500
Receipt Number: 10088980

Miscellaneous Receipt

Name: CHAPDELAINE & ASSOCIATES
Code: 206-ZONING PERMITS AND FEES Description: PRELIMINARY PLAT- 35
Amt: \$700.00 Reference: FIELDSTONE FARMS SECTION 5 PHASE 2
MR #: 10070768 Notes:

GL Account	Description	Amount
110-32660-	Zoning Permits & Fees	700.00

Payment Information

Check	1986	\$700.00	Paid By: CHAPDELAINE & ASSOCIATES
Amount Tendered:		\$700.00	
Total Paid:		\$700.00	
Change:		\$0.00	

Collecting Official, City Of Columbia

☐ Voided
Batch: LS - 1/18/2023
1/18/2023 7:40 Page 1 of 1

DEVELOPMENT SERVICES PLANNING DIVISION - FEES RECORD

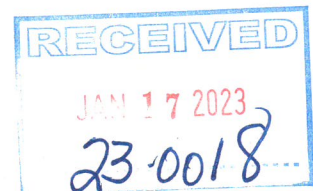
#206

MEETING DATE

____ BOARD OF ZONING APPLICATION	\$200.00	
____ PLATS		
____ MINOR		
____ SKETCH	\$125.00	
✓ PRELIMINARY	\$100.00	
____ FINAL	\$20/lot	
____ ANNEXATION FEES	\$15/lot	
____ REZONING FEES	\$300.00	
SUBDIVISIONS AND PLANS	\$300.00/\$500.00	
____ SITE PLAN		
____ PUD MASTER PLAN		
____ RESIDENTIAL		
____ COMMERCIAL/INDUSTRIAL		
AMENDMENTS		
____ COMP PLAN TEXT GUIDELINE		
____ ACCESS MGMT EXCEPTION		
____ OTHER		
#575		
____ MOBILE VENDING	\$50	

TOTAL \$ 700.00

Chapdelaine & Associates
Fieldstone Farm Section 5 Phase 2
CK 1986





PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

* 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)

Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	1205 E EDN, COLUMBIA, TN 38401		
	TAX MAP: 099	GROUP:	PARCEL: 59.04
SUMMARY OF NATURE OF REQUEST AND WORK	REQUEST AMENDMENTS TO COMP PLAN REQUEST RE ZONING TO CD-3 <i>Urban neighborhood to Suburban neighborhood.</i>		

DATE OF PRE-APPLICATION CONFERENCE	Pre-application meetings are scheduled for Wednesdays.
------------------------------------	--

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☒ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☒ Other: <i>*File naming nomenclature examples: Freedom Point Site Plan Freedom Point Master Plan Freedom Point Final Plat</i>	<u>Annexations/Rezoning/PUD's:</u> ☒ Written Legal Description copy ☒ Requested Zone Listed ☒ Compliance with Comprehensive Plan ☒ Annexation Permission Form ☒ Plans and/or Plats conforming to City standards with check list completed ☒ Columbia Water System Availability Letter <u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) <u>OWENS PRELIMINARY CONCEPT PLAN</u> ☒ Total Number of Lots <u>THREE</u> ☒ Total acreage <u>1.02 ACRES</u>

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	LARRY OWENS	PHONE	(615)924-5337
ADDRESS	2458 STEVE DR, COLUMBIA	EMAIL	g2gpropertiesllc@mail.com

PROPERTY OWNER NAME	GENERATION 2 GENERATION LLC	PHONE	(615)924-5337
ADDRESS	2458 STEVE DR, COLUMBIA	EMAIL	g2gpropertiesllc@mail.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

LARRY OWENS
APPLICANT NAME


APPLICANT SIGNATURE

3-21-23
DATE

GENERATION 2 GENERATION LLC
PROPERTY OWNER NAME

PROPERTY OWNER SIGNATURE

DATE

STAFF USE ONLY

DOCKET NO.	23-0104	FEE PAID	\$500.00
RECEIPT NO.	10091211	REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			



Preliminary Plat, Site Development Plan, and PUD Checklist

Development: 1205 E END ST

This checklist shall be completed, and included with the submittal documents. If the submittal does not contain a completed checklist, it shall be deemed incomplete. All below listed items shall be included in the submittal documents and plans, as well as any further information required by the City of Columbia to evaluate compliance and to perform a full and complete review. See Zoning Ordinance Article 8 and Subdivision Regulations.

General

- ☒ Name of development
- ☒ Contact info for the owner and licensed design professional(s) preparing plan: name, address, email, phone
- ☒ Plan sealed by a Design Professional licensed in the State of Tennessee.
- ☒ North Arrow, legend, and site vicinity map
- ☒ Graphic Scale: between 1 in. = 10 ft. and 1 in. =100 ft.
- ☒ Survey stamped by a State of Tennessee Licensed Professional Land Surveyor, with all project boundaries including bearings and angles to the nearest hundredth, utilities, and existing streets and rights-of-way.
- ☒ Note referencing Tennessee State Plane Coordinate System, NAD 83 Datum
- ☒ All property boundaries, existing easements, and encumbrances
- ☒ Parcel identification, owner, and deed and plat references of adjoining properties
- ☐ Proposed phasing and timetable for all phases of development
- ☐ Traffic Impact Study, as required.
- ☒ The substance of all existing and proposed covenants, easements, or other restrictions.

Lots and Land-Use

- ☒ The size of total property to be developed in square feet and acres
- ☒ Lot numbers of all proposed lots, with dimensions, locations, and square footage
- ☒ A tabulation of the land area to be devoted to various uses and activities and overall densities.
- ☒ Typical lot layout depicting proposed setbacks, yards, and easements, where applicable

Structures

- ☐ Location and approximate dimensions of all existing and proposed structures.
- ☐ Location of all earth retaining structures, with approximate top and bottom of wall elevations.
- ☐ Existing and intended use of all buildings and structures on site, including the number of dwelling units and density, where applicable
- ☐ Location, type, and size of proposed signs
- ☐ Approximate height, bulk, and the utilization of structures including activities and the number of living units.



Grading, Drainage, and Storm

- ☐ Existing conditions and contours at vertical intervals of not more than two (2) feet
- ☐ General proposed contours at vertical intervals of not more than two (2) feet
- ☒ FEMA Special Flood Hazard Area (SFHA), 100-year Floodplain (F-P), and Floodway (F-W) boundaries with elevations and the exact location of the nearest benchmark. Indicate the Flood Insurance Rate Map (FIRM) panel number, its effective date, and flood insurance zones
- ☐ Location and dimension of aquatic buffer zones
- ☐ General layout of the proposed storm drainage system including surface and subsurface drainage systems, areas for detention, and water quality devices.
- ☐ Identification of all critical lots

Streets, Parking, and Pedestrian Elements

- ☐ Proposed street and alley rights-of-way, typical sections, widths, classification, names, and proposed ownership and maintenance responsibility
- ☐ Proposed connections to existing and proposed streets (including classification) located outside the development
- ☐ Proposed improvements as identified in the Traffic Impact Study, as required
- ☒ Existing and proposed sidewalks, trails, and other pedestrian elements
- ☐ Existing and proposed on-street and off-street parking and loading areas
- ☐ Summary of all provided and required parking

Landscaping, Open Space, and Amenities

- ☐ Natural features on site including, but not limited to, wetlands, streams, ponds, springs, sinkholes, wells, rock outcroppings, excessive slopes, and forested areas
- ☐ Landscaped areas and buffers with details on proposed plantings, existing vegetation, and other features.
- ☐ The location and size of all common open space, parkland dedications, and dedications and reservations of land for public uses.
- ☐ Any amenity features and structures for private or public benefit.
- ☐ Location, dimension, and materials of fences and walls
- ☐ Tree Canopy retention

Utilities

- ☒ General layout and location of existing and proposed utilities and utility features including, but not limited to potable water, fire hydrants, sanitary sewer, storm sewer, and power and communication facilities.
- ☒ Acknowledgement from water, sewer, and power utility providers that the proposed development may be adequately served with existing infrastructure, or if improvements are required to adequately serve the development, a general statement of the improvements.



PUD Specific Items

- ☐ Legal Description of Property
- ☐ Owner's Affidavit
- ☐ List of all variances requested
- ☐ The nature of the landholder's interest in the land proposed to be developed and a written statement of concurrence from all parties having a beneficial interest in the affected property.
- ☐ Location and approximate dimensions of all existing and proposed structures including approximate height, bulk, and the utilization of structures including activities and the number of living units. Include architectural renderings of all proposed structures with materials listed.
- ☐ The substance of covenants, grants of easements or other restrictions to be imposed upon the use of the land, buildings and structures including proposed easements for public utilities on the property or documentation of off-site easements.
- ☐ Exterior lighting

If the application is deemed incomplete by the Zoning Administrator, a written request shall be made within ten days after the original submittal, for further information. In such case the application shall be held in abeyance until deemed complete for final review. No plan shall be formally presented for Planning Commission action until such plan is found complete, compliant with City standards, and ready for review.

Checklist Completed By:

LARRY OWENS

Print Name

Signature

Date

PRELIMINARY CONCEPT PLAN

REZONING REQUEST OF THE
LARRY OWENS PROPERTY
9TH CIVIL DISTRICT OF MAURY COUNTY
TAX MAP 99, PARCEL 59.04
DEED BOOK 409, PAGE 182
PLAT BOOK P23, PAGE 12 (TRACT-2)
R.O.M.C.

NOTES:
1. THE PURPOSE OF THIS PLAT IS TO
ILLUSTRATE THE SUBDIVISION OF DEED
BOOK 409, PAGE 182 INTO TWO TRACTS
AND REQUEST REZONING FROM CD-3L TO
CD-3

2. I, TRACY SEIBER, HEREBY CERTIFY THAT
THIS MAP WAS DRAWN FROM AN CAT IV
GPS SURVEY AND THE FOLLOWING
INFORMATION WAS USED TO PERFORM THE
SURVEY:

A. TYPE OF SURVEY: RTK
B. POSITIONAL ACCURACY: 0.05'
C. PUBLISHED/FIXED CONTROL: TDOT
CORS NETWORK
D. GEOID MODEL: GEOID 12B
E. DATUM/EPOCH: NAD83(2011)
F. GPS: CARLSON BRX7 (BASE/ROVER)
G. DISTANCES: GRID

3. SUBJECT PARCELS ARE NOT WITHIN A
FLOOD ZONE ACCORDING TO FIRM MAP
47119C0285E DATED 4/16/2007.

4. PROPERTY IS ZONED R-20 CITY OF
COLUMBIA ZONING ORDINANCE.
BUILDING SETBACKS:
FRONT 30'
REAR 30'
SIDE 12' TOTAL EQUALS 30'

5. THIS PROPERTY IS SUBJECT TO ANY AND
ALL RIGHT-OF-WAYS, EASEMENTS,
EXCEPTIONS, AND/OR RESTRICTIONS,
RECORDED AND UNRECORDED, WHICH
MAY AFFECT THIS PROPERTY.

6. PROPERTY ADDRESS:
1205 E. END ST
COLUMBIA, TN 38401

7. ALL UNDERGROUND UTILITIES ARE NOT
VERIFIED BY UTILITY OWNERS AND BASED
ONLY ON FIELD EVIDENCE AND SCALED
FROM UTILITY OWNER MAPS. CALL 811
BEFORE ANY EXCAVATION.

8. ELECTRIC & WATER PROVIDED BY
COLUMBIA POWER AND WATER
201 PICKENS LN
COLUMBIA, TN 38401

9. 10' PUDE ON PARALLEL OR ABUTTING
STREET AND 5' PUDE ON INTERIOR LOT
LINES.

CHURCH
BLOCK
BUILDING

EVERGREEN BAPTIST CHURCH TR
TAX MAP 099G ,GROUP D, PARCEL 50.00
DEED BOOK 435, PAGE 470
R.O.M.C.
ZONED CD-3L

LOT-1
0.33 ACRES
14252.8 SQ-FT

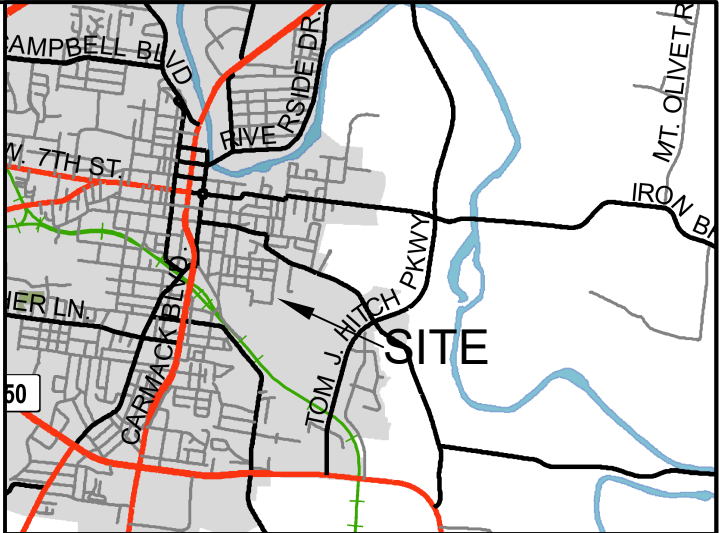
LOT-2
0.32 ACRES
14091.7 SQ-FT

LOT-3
0.37 ACRES
16134.6 SQ-FT

AMERICAN LEGION POST 170
TAX MAP 099, PARCEL 59.00
DEED BOOK 409, PAGE 182
R.O.M.C.
ZONED CD-3L

AMERICAN LEGION POST 170
TAX MAP 099, PARCEL 59.00
DEED BOOK 409, PAGE 182
R.O.M.C.
ZONED CD-3L

AMERICAN LEGION POST 170
BLOCK BUILDING



VICINITY MAP
(NOT TO SCALE)



TN-NAD83

LEGEND

- GM GAS METER
- SM SEWER METER
- MH SEWER MANHOLE
- (F) IRON PIN FOUND
- (S) IRON PIN SET
- ◇ WATER METER
- RAIL ROAD SPIKE
- LIGHT POLE
- UTILITY POLE
- ◆ ANT. ANCHOR
- ANT. SUPPORT
- SS SANITARY SEWER
- OHP OVERHEAD POWER
- G GAS LINE
- W WATER LINE
- RIGHT OF WAY
- ZONING SETBACK
- X FENCE
- EASEMENT

TRACY
SEIBER

102 AVALON DRIVE
COLUMBIA, TN 38401
SEIBERSURVEYING@GMAIL.COM (931)446-6677
DRAWING BY: T. SEIBER DATE: 1/25/2023
SCALE: 1"=30' JOB NO.: 57-2022
RO



CERTIFICATE OF SURVEY ACCURACY

I hereby certify that to the best of my knowledge and belief this is a true
and accurate survey of the property shown hereon; that this is a
Class "C" Land Survey as defined in Title 62, Chapter 18, Tennessee Code
Annotated, and that the ratio of precision is greater than or equal to 1:
10,000.

1/25/2023
Date
TRACY SEIBER, RLS #2397





March 17, 2023

Mr. Larry Owens

Generation 2 Generation LLC

Columbia, TN 38401

Sent via email: g2gpropertiesllc@gmail.com

RE: Water Availability Letter
 Larry Owens Development – 2 New Units
 1205 E. End St. Columbia, TN 38401
 Tax Map 99, Parcel 059.04
 Columbia, Maury County, TN

Dear Mr. Owens:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, subject to availability of all CPWS furnished equipment and materials appropriate for the development and provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development is a rezoning and subdivision of an existing lot with a single service to three lots, with two new services requested. CPWS has evaluated the projected water demands for the proposed residential development in the water system hydraulic model and is able to meet a fire-flow capacity of 1,000 gpm at 20 psi while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Domestic waterline connection will be made to the existing 8-inch water main located on East End Street.



- No existing hydrants are located within 250 feet of the entire frontage of the parcel. A single public hydrant may be installed at the edge of right-of-way of East End Street, equidistant from existing system hydrants at Hardwick Avenue and E 11th St. Any additional hydrants required to meet fire protection requirements for the development will be considered private hydrants and must be located on the customer side of a fire protection meter.

All of the above requirements are to be constructed and paid for by the Applicant and dedicated to CPWS once complete up to and including the meter. No construction of CPWS infrastructure shall be initiated until final construction plans have been approved by TDEC and all parties have fully executed a water service agreement.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached hydrant analysis report for coordination and approval of development from the Columbia Fire & Rescue Fire Marshall.
- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings.
- Remit to CPWS new water service fees:

New Water Service Fee: \$250 + \$370 per SFU (2 SFUs)	\$990.00
---	----------

- CPWS will then develop water construction drawings and submit to TDEC for approval. Upon approval by TDEC and payment of meter and impact fees by the applicant, applicant may then schedule a pre-construction meeting with CPWS. Pre-construction meeting will not be scheduled until fees are paid in full or surety is provided in lieu of full payment. Final meter and impact fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid.

Meter Fee: \$1,000 per 3/4" meter (2 meters, tap and service by CPWS)	\$2,000.00
Impact Fee: \$4,500 per 3/4" meter (2 meters)	\$9,000.00
Total Meter and Impact Fees Due =	\$11,000.00

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.



If you have any questions, please feel free to contact me at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) days from the date of this letter.

Sincerely,

A handwritten signature in blue ink that reads "Eric King". The signature is written in a cursive, flowing style.

Eric King, P.E.

Inflo Design Group, LLC

on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS

File 23-018



HYDRANT FLOW ANALYSIS



HYDRANT # & LOCATION: 535 East End @ Hardwick Ave DATE: 3/17/2023
MODEL BY: Inflo Design Group, LLC SYS. DEMAND Max Day DURATION: 1 hrs.
WATER SUPPLIED BY: Columbia Power and Water Systems
PURPOSE OF TEST: 1205 East End St

MODEL DATA

FLOW HYDRANT(S) 535 n/a n/a
GPM: 1000 0 0
TOTAL FLOW DURING SIMULATION: 1000 GPM

GAUGE HYDRANT

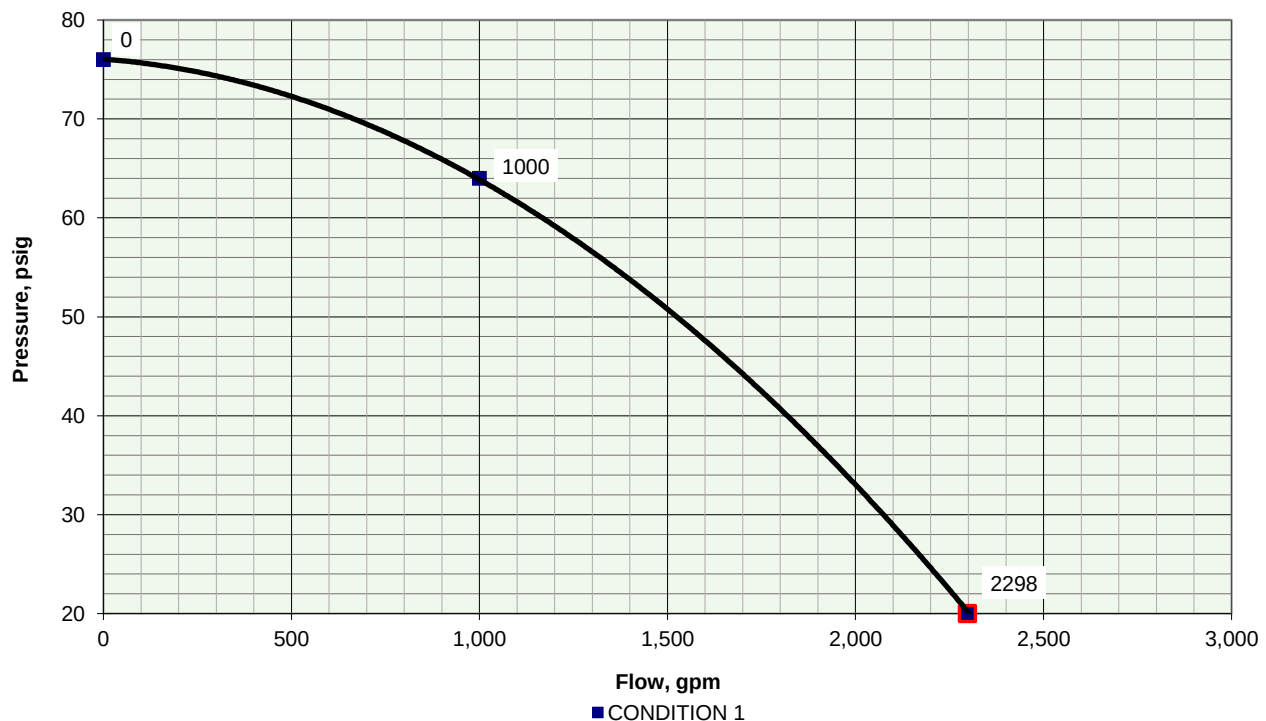
HYDRANT # & LOCATION: 513 East End @ East 11th

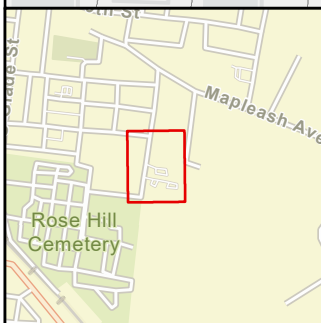
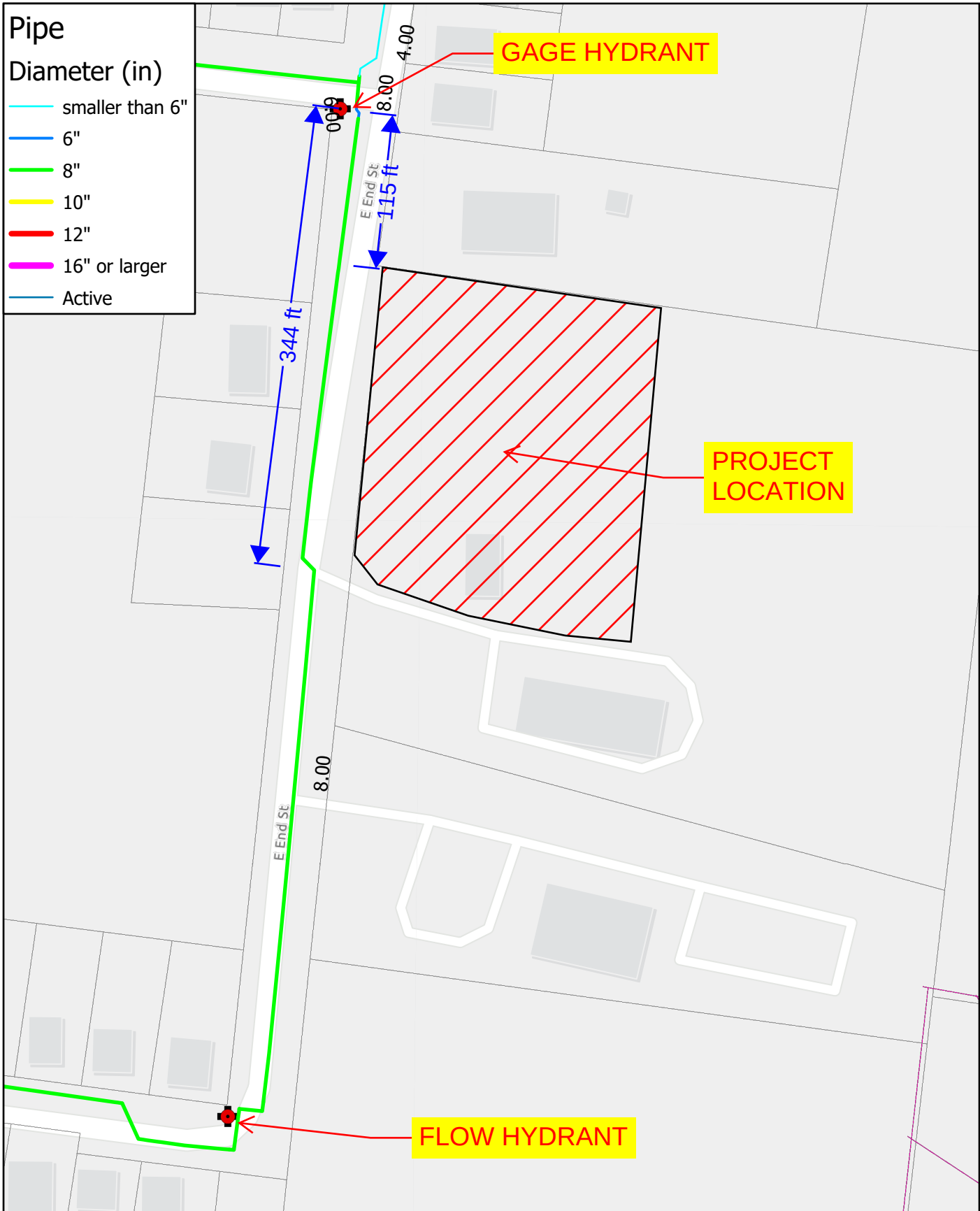
CONDITION 1
STATIC 76 PSI RESIDUAL: 64 PSI
CONDITION 2
STATIC PSI RESIDUAL: PSI

RESULTS: AT 20 PSI RESIDUAL

CONDITION 1 2298 GPM
CONDITION 2 --- GPM

REMARKS: Performance based on service elevation of 663' and current CPWS water infrastructure and does not account for additional losses associated with development piping.





Hydrant Analysis Location Map 1205 East End Street Tax Map 99, Parcel 59.04	
Esri Community Maps Contributors, Tennessee STS GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA	2023
Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet	

N

0 0.01 0.02 Mi

0 62.5 125 Feet



CITY OF
COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*

Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION			
	TAX MAP: 114	GROUP:	PARCEL: 014.00
SUMMARY OF NATURE OF REQUEST AND WORK	FINAL PUD SITE PLAN TENN-PIN ALLEY (7.32 ACRES) 730 MOORESVILLE PIKE COLUMBIA, TN. 38401		

DATE OF PRE-APPLICATION CONFERENCE	4/5/2023	Pre-application meetings are scheduled for Wednesdays.
------------------------------------	----------	--

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☒ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) _____ ☐ Total Number of Lots _____ ☐ Total acreage 7.32 ACRES

**File naming nomenclature examples:*

*Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat*

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	CHET RHODES	PHONE	615-480-7535
ADDRESS	807 NASHVILLE HWY SUMER	EMAIL	rhodesengineering@gmail.com

PROPERTY OWNER NAME	DEREK RANSON	PHONE	615-423-2567
ADDRESS	730 MOORESVILLE PIKE	EMAIL	derek@tennpi.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

<u>CHET RHODES</u> APPLICANT NAME	<u>Chet Rhodes</u> APPLICANT SIGNATURE	<u>4/14/2023</u> DATE
<u>DEREK RANSON</u> PROPERTY OWNER NAME	<u>Derek Ranson</u> PROPERTY OWNER SIGNATURE	<u>4/14/23</u> DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			



APPLICABLE CODE(S): (NASHVILLE, TN)

BUILDING CODE:	2018 INTERNATIONAL BUILDING CODE WITH LOCAL AMENDMENTS*
PLUMBING CODE:	2018 INTERNATIONAL PLUMBING CODE WITH LOCAL AMENDMENTS*
MECHANICAL CODE:	2018 INTERNATIONAL MECHANICAL CODE WITH LOCAL AMENDMENTS*
ELECTRICAL CODE:	2017 NATIONAL ELECTRIC CODE WITH LOCAL AMENDMENTS*
ACCESSIBILITY CODE:	2017 ICC/ANSI A-117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
LIFE SAFETY CODE:	2018 LIFE SAFETY CODE NFPA 1 AND NFPA 101 WITH LOCAL AMENDMENTS*

GENERAL NOTE(S):

1. THE LIST OF "APPLICABLE CODES" IS PROVIDED AS A CONVENIENCE AND IS NOT TO BE CONSIDERED ALL INCLUSIVE OF CODES AND REGULATIONS THAT MAY APPLY. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT CODES, STANDARDS, REGULATIONS AND LAWS.

BUILDING AND ZONING:

OCCUPANCY CLASSIFICATION:

A2 ASSEMBLY BAR / RESTAURANT

TYPE OF CONSTRUCTION:

5B WOOD AND METAL ARE BOTH USED. ONE STORY BUILDING
GRADE.

OCCUPANT LOAD EXISTING PLUS 520 SF NEW AREA

1. 115 OCCUPANT LOAD EXISTING BUILDING +COVERED DECK = 115
2. NEW 520 SF KITCHEN + 2 PEOPLE (400 SF PER PERSON)
3. NEW DECK SEATING 4 TABLES x 9 PER TABLE = 36

COVER SHEET

MEANS OF EGRESS / EXIT REQUIREMENTS

SHEET INDEX			
DESCRIPTION	BUSINESS	MAXIMUM TRAVEL DISTANCE	
OCCUPANCY	A2	ALLOWED	ACTUAL
AREA (SQ. FT.)	60	100'-0"	NOT EXCEEDED
SQ. FT. / PERSON	400 SQ. FT. / PERSON	*PER 2018 IBC	
OCCUPANT LOAD	2	EXIT CORRIDOR WIDTH	
		MIN. ALLOWED	ACTUAL
ACTUAL EXIT WIDTH PROVIDED	36"		

GENERAL NOTES:

- 1) OWNER: THIS TRACT WAS OBTAINED IN DEED BOOK R2460, PAGES 1448-1450.
- 2) THE PURPOSE OF THIS SITE PLAN IS TO CONSTRUCT A PUTT-PUTT GOLF COURSE AND A GO - GART TRACK AND ADD TO THIS 7.32 AC. SITE. THIS TRACT IS IN ZONE X AND NOT IN A FLOODPLAIN AS PER F.E.M.A. F.I.R.M. # 47119CO285E EFFECTIVE DATE 04-16-2007.
- 3) WATER LINES INSIDE THIS PROPERTY ARE PRIVATE AND DO NOT HAVE EASEMENTS.
- 4) THIS TRACT IS SUBJECT TO ALL UTILITY EASEMENTS TO BE VERIFIED BY EACH UTILITY..
- 5) SURVEY PROVIDED BY WES ENGINEERING & SURVEYOR, COLUMBIA, TN.
- 6) NOTE THAT WITH THIS SUBMITTAL AN ADDITIONAL 0.26 ACRES IN PAVEMENT & PARKING WAS ADDED IN THE NORTH PARKING AREA SECTION AFTER THIS SITE WAS PREVIOUSLY APPROVED. SEE SHEET C-3.1 FOR 0.26 ACRES (IMPERVIOUS) HATCHED AREA ADDED .
- 7) IN ADDITION TO THIS REVISION ABOVE , A DRAINAGE PIPE NETWORK WAS ADDED TO CARRY 0.39 ACRES OF IMPERVIOUS PARKING DRAINAGE OVER TO THE PROPOSED DETENTION POND AT REAR , MINIMIZING OFFSITE RUNOFF. SEE SHEET C-5.0 AT DETENTION.

PARKING SUMMARY

EXISTING PARKING = 218
 PROPOSED PARKING = 262
 REQ'D FOR BOWLING ALLEY @ 1/500 sf = 130 SPACES
 REQ'D FOR OUTDOOR ENTERTAINMENT @ 1/1000 sf = 57 SPACES

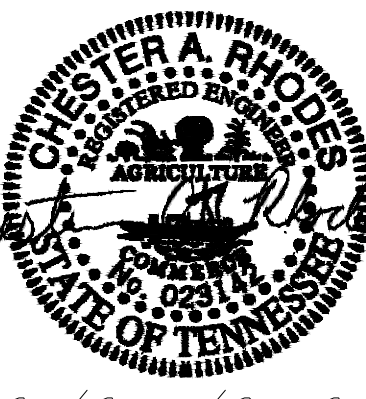
PARKING REQUIRED = 187 SPACES
PARKING SHOWN = 262 SPACES

SHEET INDEX

<u>SHEET INDEX</u>	
C-0.0	COVER SHEET
C-1.0	EXISTING CONDITIONS
C-2.0	PROPOSED SITE PLAN
CU-1.0	EXISTING UTILITIES
C-3.0	GRADING PLAN (NORTH)
C-3.1	GRADING PLAN (NORTHEAST)
C-3.2	GRADING PLAN (SOUTH)
C-3.3	EPSC PLAN (NORTH)
C-3.4	EPSC PLAN (SOUTH)

C-4.0	DRAINAGE AREA (SOUTH)
C-5.0	DRAINAGE AREA (NORTH)
A-1.0	GO-KART STORAGE AREA
A-2.0	CANOPY PLAN VIEW
A-2.1	CANOPY ELEVATIONS
A-2.2	CANOPY ELEVATIONS
A-2.3	CANOPY DETAILS
A-2.4	CANOPY COLORS
A-3.0	FENCE DETAILS
L-1.1	LANDSCAPE PLAN

BRANDEE & DEREK RANSOM
730 MOORESVILLE PIKE
COLUMBIA, TN 38401
PH # OFFICE 931.381.2695
CELL 615.423.2567
EMAIL: randee@mcewengroup.com
derek@tennpin.com



GINEER



**RHODES ENGINEERING
AND ENVIRONMENTAL
SERVICES, LLC**
PHONE: 615.480.7535
EMAIL: RhodesEngineering@gmail.com
1117 WHITNEY DRIVE
COLUMBIA, TN 38401
CIVIL ENVIRONMENTAL
SITE DEVELOPMENT WATER/WASTEWATER

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Engineering & Environmental Service, LLC.

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APPROVAL

DRAWN	PWB	
DESIGN		
CHECKED		
APPROVED		
SAVED DATE: 2/22/2023 9:17:07 AM		Pwbrh

BRANDEE & DEREK RANSOM
TENN-PIN ALLEY BOWLING CENTER
730 MOORESVILLE PIKE, COLUMBIA, TN 38401

BRANDEE & DEREK RANSOM

730 MOORESVILLE PIKE, COLUMBIA, TN 38401

COVER SHEET

WG. No

C-0.0

SCALE: NOTED

JOB N



BRANDEE & DEREK RANSOM
730 MOORESVILLE PIKE
COLUMBIA, TN 38401
PH # OFFICE 931.381.2695
CELL 615.423.2567
EMAIL: randee@mcwengroup.com
derek@tennpin.com



2/20/2023

ENGINEER:



R E

RHODES ENGINEERING
AND ENVIRONMENTAL
SERVICES, LLC

PHONE: 615.480.7535

EMAIL: RhodesEngineering@gmail.com

1117 WHITNEY DRIVE
COLUMBIA, TN 38401

CIVIL, ENVIRONMENTAL
SITE DEVELOPMENT, WASTEWATER

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APPROVAL		
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APPROVED		

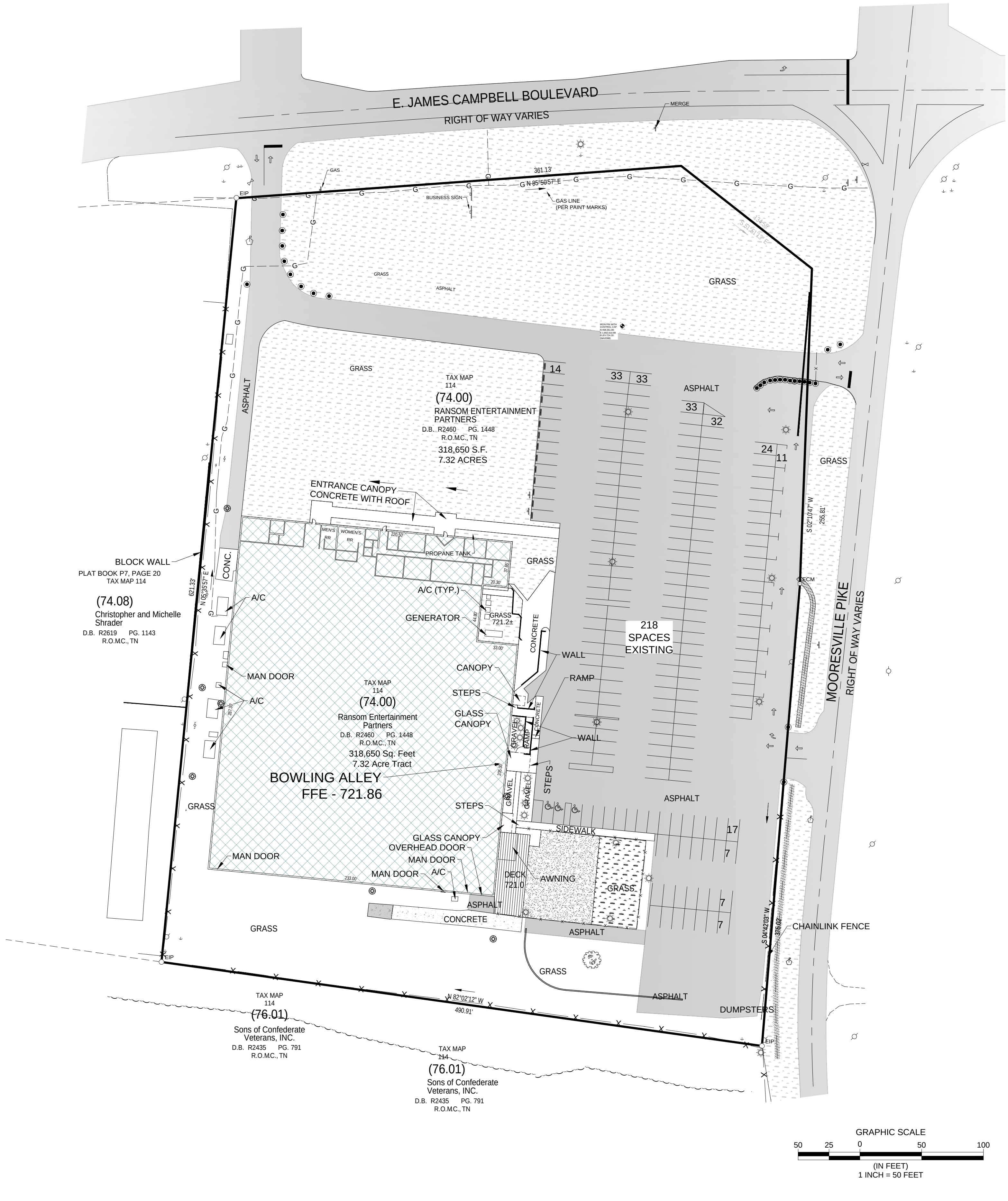
BRANDEE & DEREK RANSOM
TENN-PIN ALLEY BOWLING CENTER
730 MOORESVILLE PIKE, COLUMBIA, TN 38401

DWG. No.

C-1.0

DFILE: 2004-FW-ALLEN_COLUMBIA_TN_0404_00-00-0003

JOB No. _____



EXISTING CONDITIONS

NOTED

GINEER:



R E

RHODES ENGINEERING
AND ENVIRONMENTAL
SERVICES, LLC

PHONE: 615.480.7535

EMAIL: RhodesEngineering@gmail.com

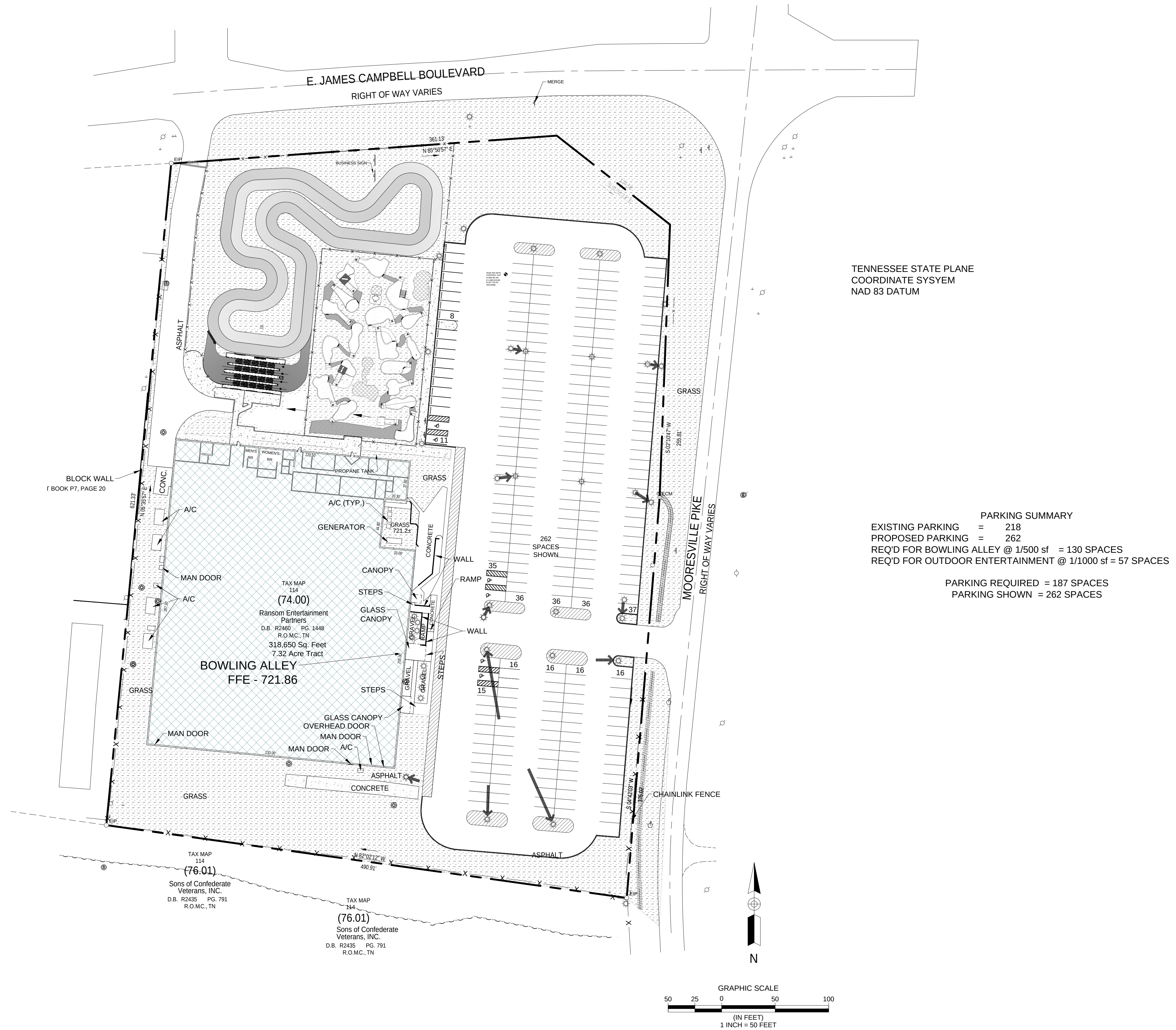
1117 WHITNEY DRIVE
COLUMBIA, TN 38401

CIVIL, ENVIRONMENTAL
SITE DEVELOPMENT, WATER/WASTEWATER

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DWG. No.	
C-2.0	
SCALE:	NOTED
DFILE: \\001-PRJ-ALLEY_CO\000004_74_0000_00-00-000	
JOB No.	REV. — △



BRANDEE & DEREK RANSOM
730 MOORESVILLE PIKE
COLUMBIA, TN 38401
PH # OFFICE 931.381.2695
CELL 615.423.2567
EMAIL: randee@mcewengroup.com
derek@tennpin.com



2/20/2023

GINEER:



R E

RHODES ENGINEERING
AND ENVIRONMENTAL
SERVICES, LLC

PHONE: 615.480.7535

EMAIL: RhodesEngineering@gmail.com

1117 WHITNEY DRIVE
COLUMBIA, TN 38401

CIVIL, ENVIRONMENTAL
SITE DEVELOPMENT WATER/WASTEWATER

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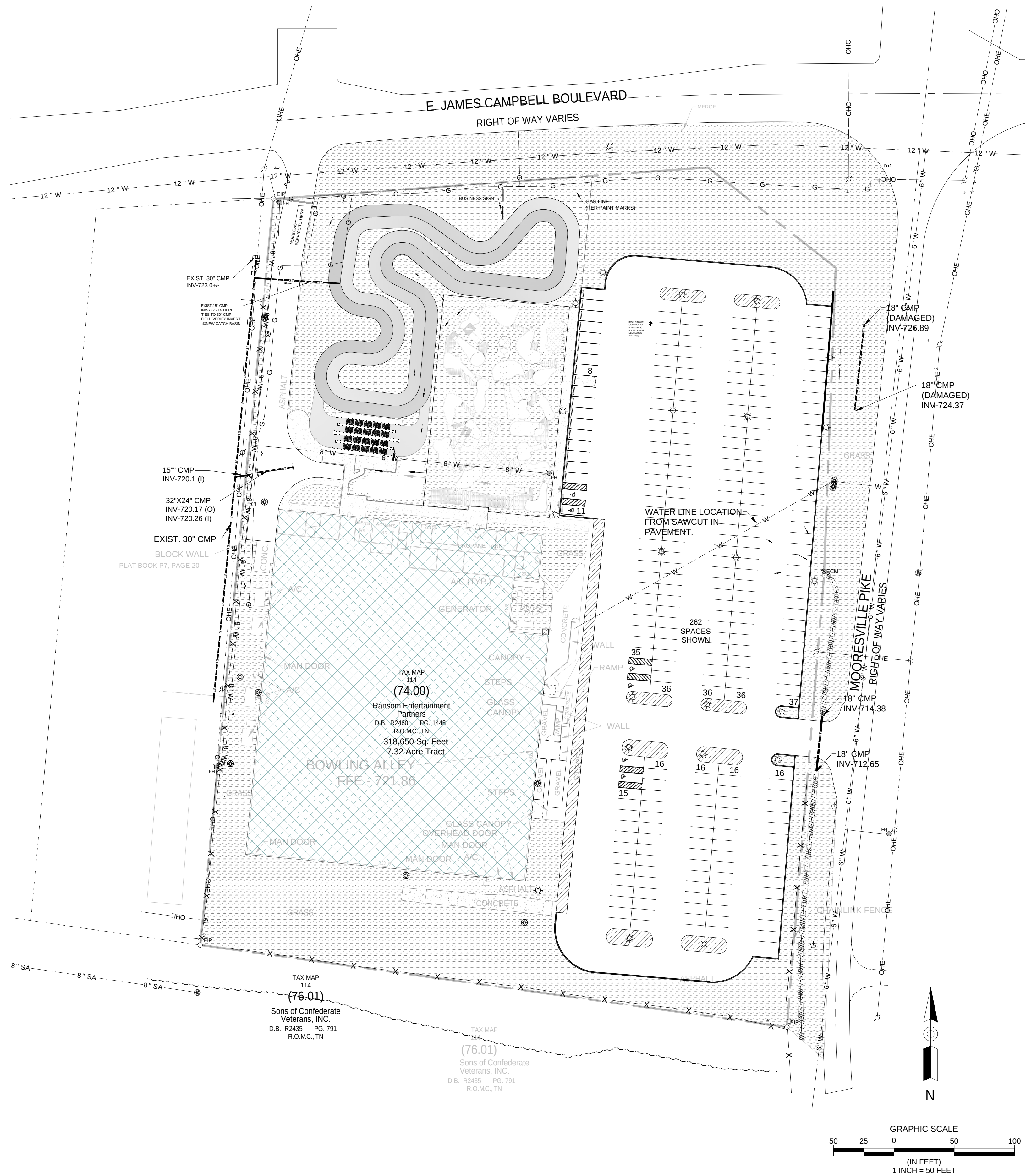
[illegible]

APPROVAL		
DRAWN	PWB	
DESIGN		
CHECKED		
APPROVED		
ISSUED DATE: 2/22/2023 9:17:07 AM		Pwb

BRANDEE & DEREK RANSOM
TENN-PIN ALLEY BOWLING CENTER
730 MOORESVILLE PIKE, COLUMBIA, TN 38401

DWG. No.
CU-1.0

SCALE:	NOTED
DFILE: 1004-PR-AILEY_COLUMBIA_TL30401_00-0002	
JOB No.	RE △ -



GENERAL NOTES

- 1) WATER LINES INSIDE THIS PROPERTY BOUNDARY ARE PRIVATE AND DO NOT HAVE EASEMENTS. UTILITIES INSIDE ROAD R.O.W. HAVE TO BE LOCATED BEFORE DIGGING. DIAL 811 FOR UTILITY LOCATIONS TO BE LOCATED AND VERIFIED.
- 2) THIS TRACT IS SUBJECT TO ALL UTILITY EASEMENTS TO BE VERIFIED BY EACH UTILITY. BOUNDARY SURVEY OBTAINED MAY NOT SHOW ALL UTILITY EASEMENTS.

EXISTING UTILITIES

NOTED

GINEER: R E

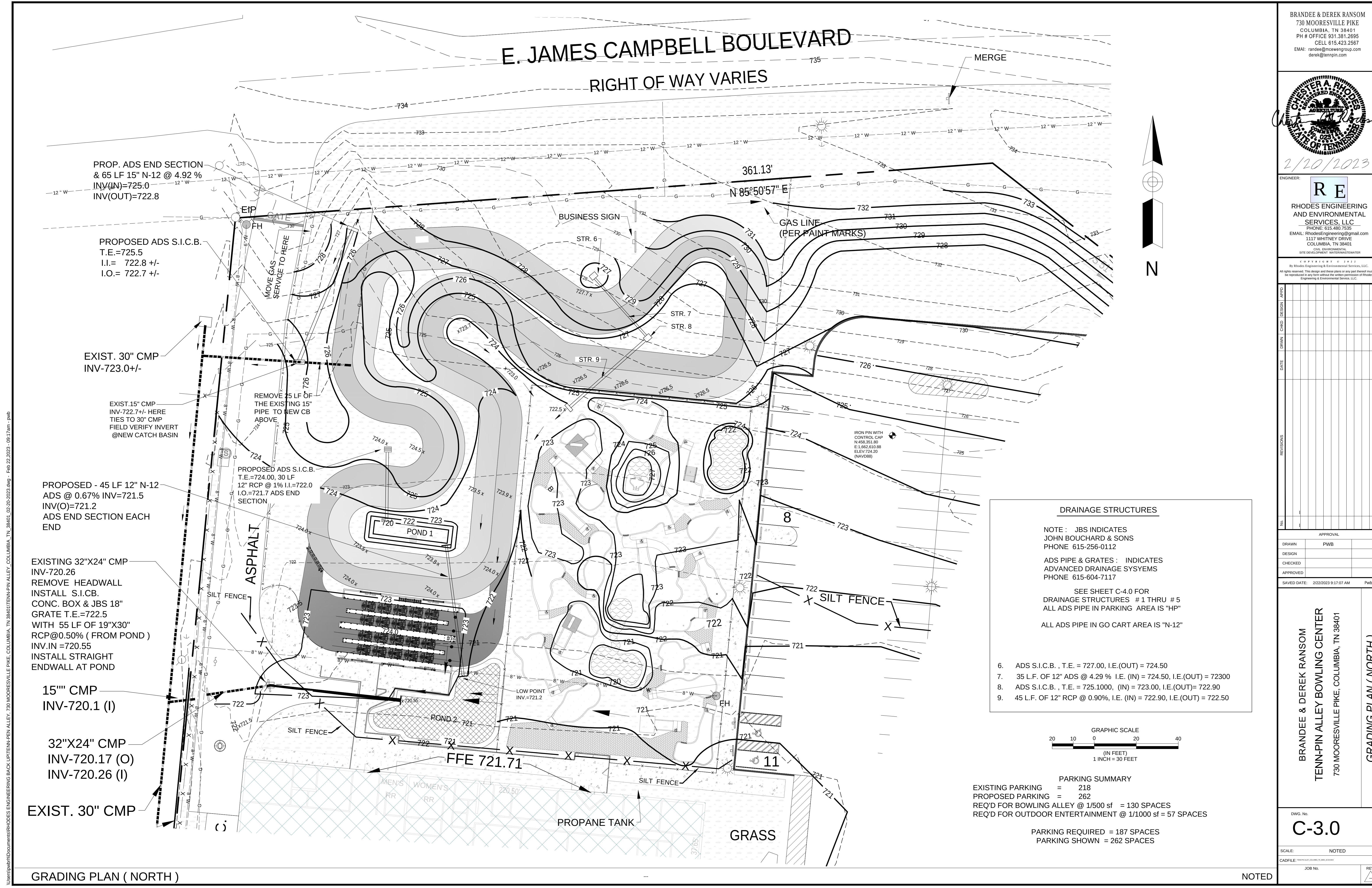
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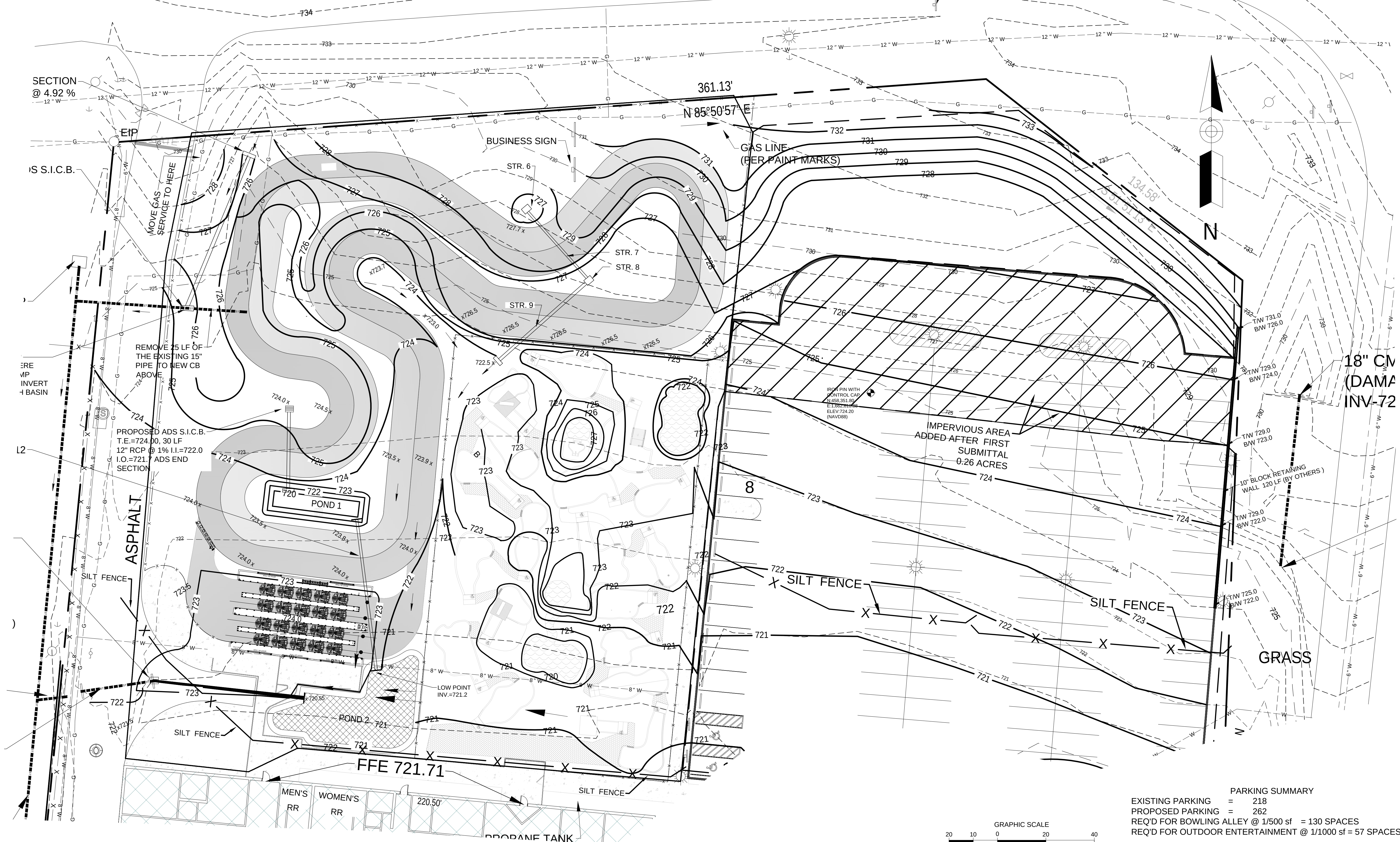
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C-3.0

SCALE:	NOTED
DFILE: TOWNSHIP ALLEY, COLUMBIA, TN, 38401, 22-05-003	
JOB No.	REV. △ —



E. JAMES CAMPBELL BOULEVARD
RIGHT OF WAY VARIES



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COLUMBIA, TN 38401
CIVIL, ENVIRONMENTAL
SITE DEVELOPMENT, WASTEWATER

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730 MOORESVILLE PIKE, COLUMBIA, TN 38401

GRADING PLAN (NORTHEAST)

DWG. No.
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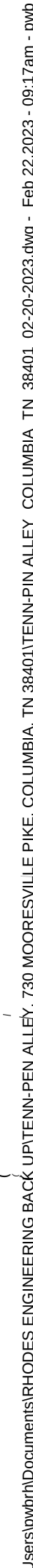
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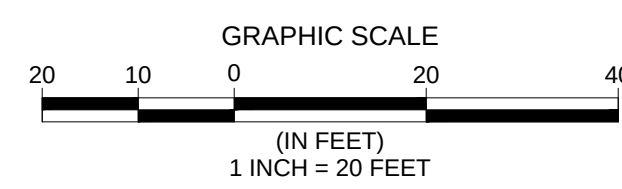
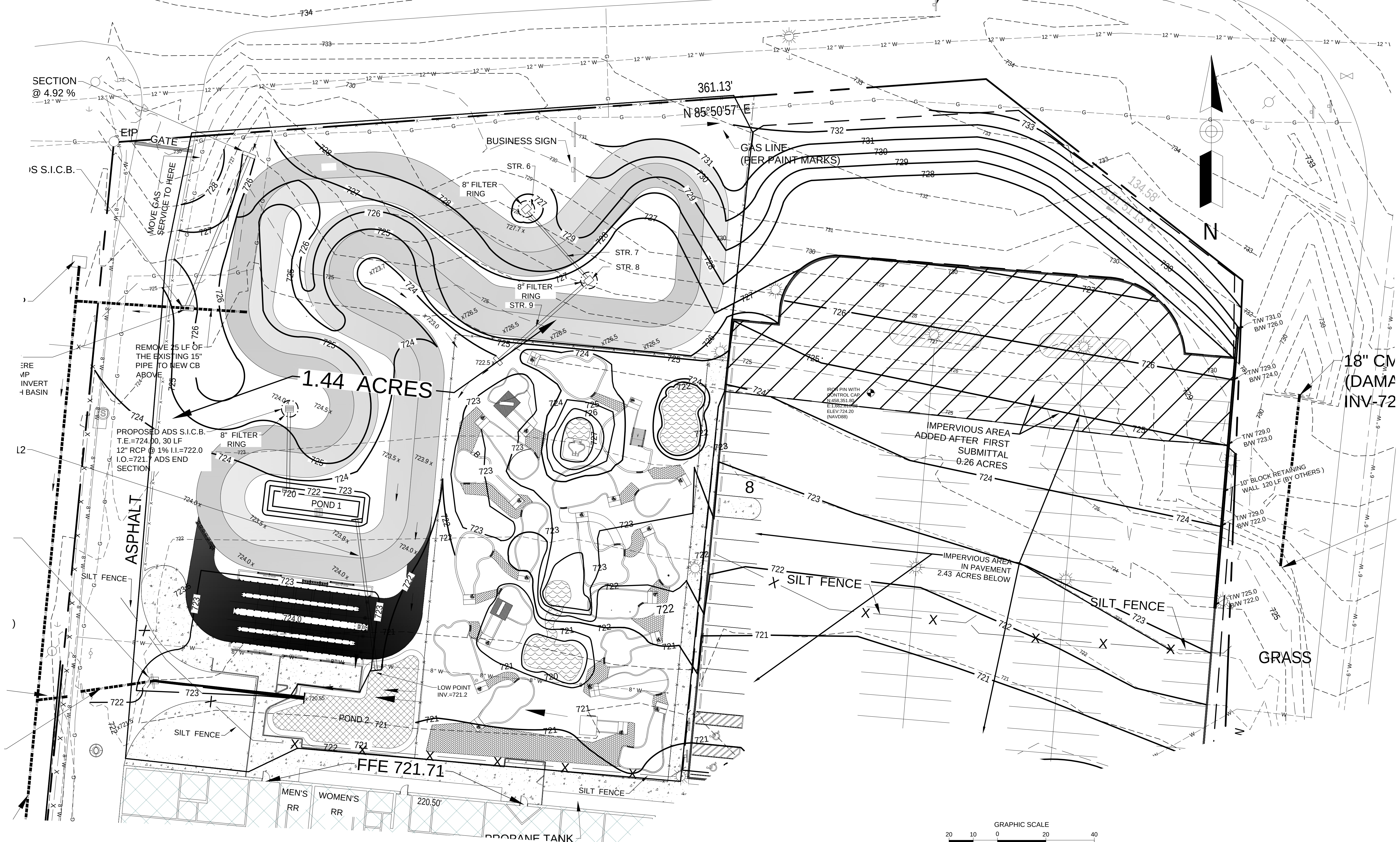
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GRADING PLAN (NORTHEAST)

NOTED



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EPSC PLAN (NORTH)

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DATE	DRAWN	CHKD	DESIGN	APPROV

NO.	REVISIONS

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TENN-PIN ALLEY BOWLING CENTER
730 MOORESVILLE PIKE, COLUMBIA, TN 38401
EPSC PLAN (NORTH)

DWG. No.
C-3.4
SCALE: NOTED
CADFILE: 20230220_001.dwg, TN 38401, 38401
JOB No.
REV.

NOTED



EPSC PLAN (SOUTH)

DWG SIZE A SCALE 1:25 SHEET 1 OF 1 DWG NO. 7001-110-190 REV E

NOTED

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EPSC PLAN (SOUTH)

DWG. No.

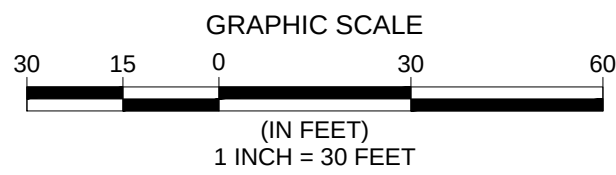
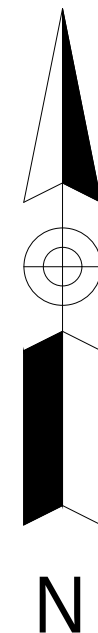
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JOB No.

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NOTED

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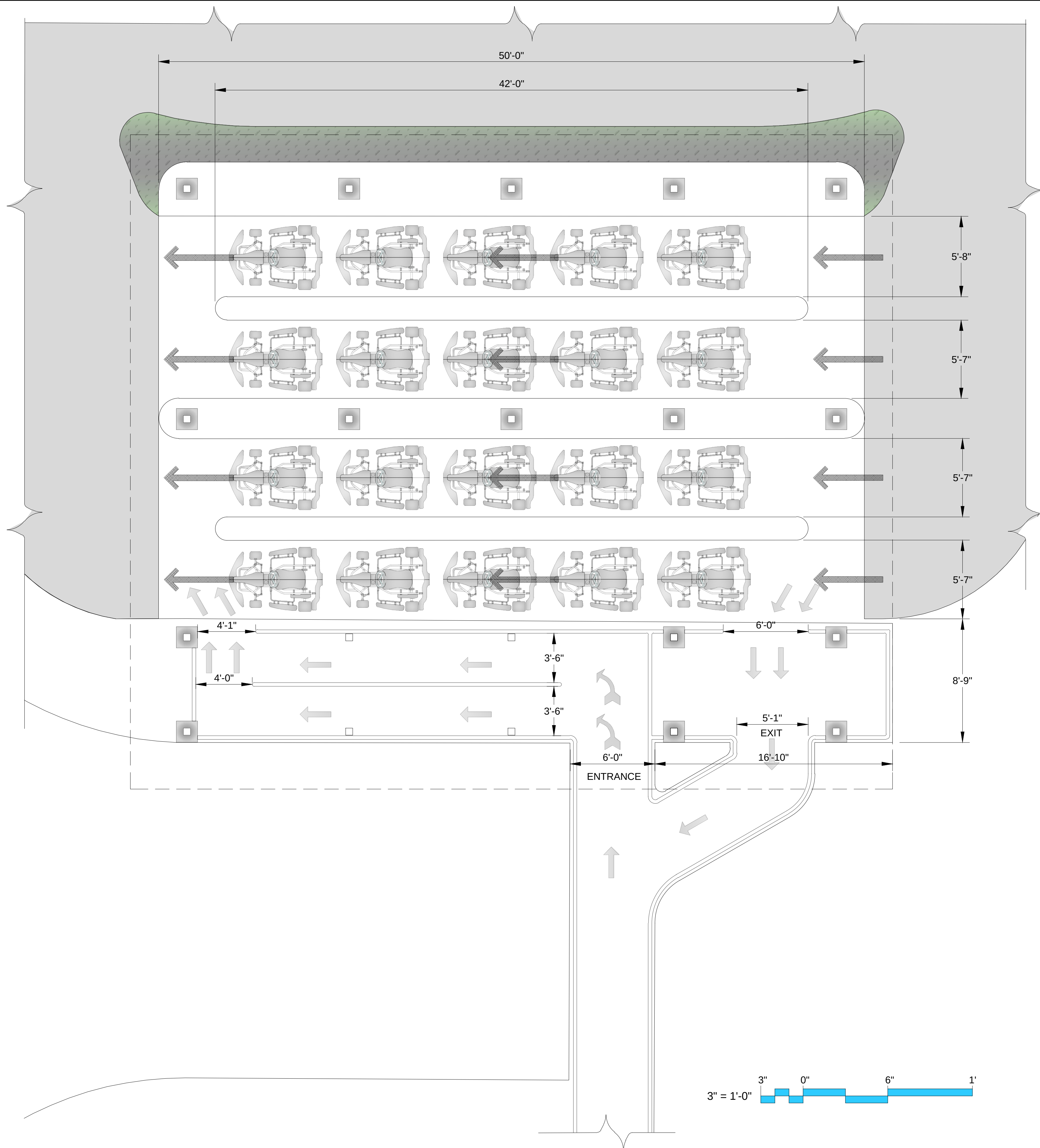
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730 MOORESVILLE PIKE, COLUMBIA, TN 38401

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SCALE:	NOTED
DFILE: TOWN OF ALLEY, COLUMBIA, TN, 38401, 38-0000	
JOB No.	RE -





GO-KART STORAGE AREA

NOTED

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The logo consists of a light blue square with a thin black border. Inside the square, the letters 'R' and 'E' are displayed in a large, black, serif font, separated by a small gap.

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1117 WHITNEY DRIVE
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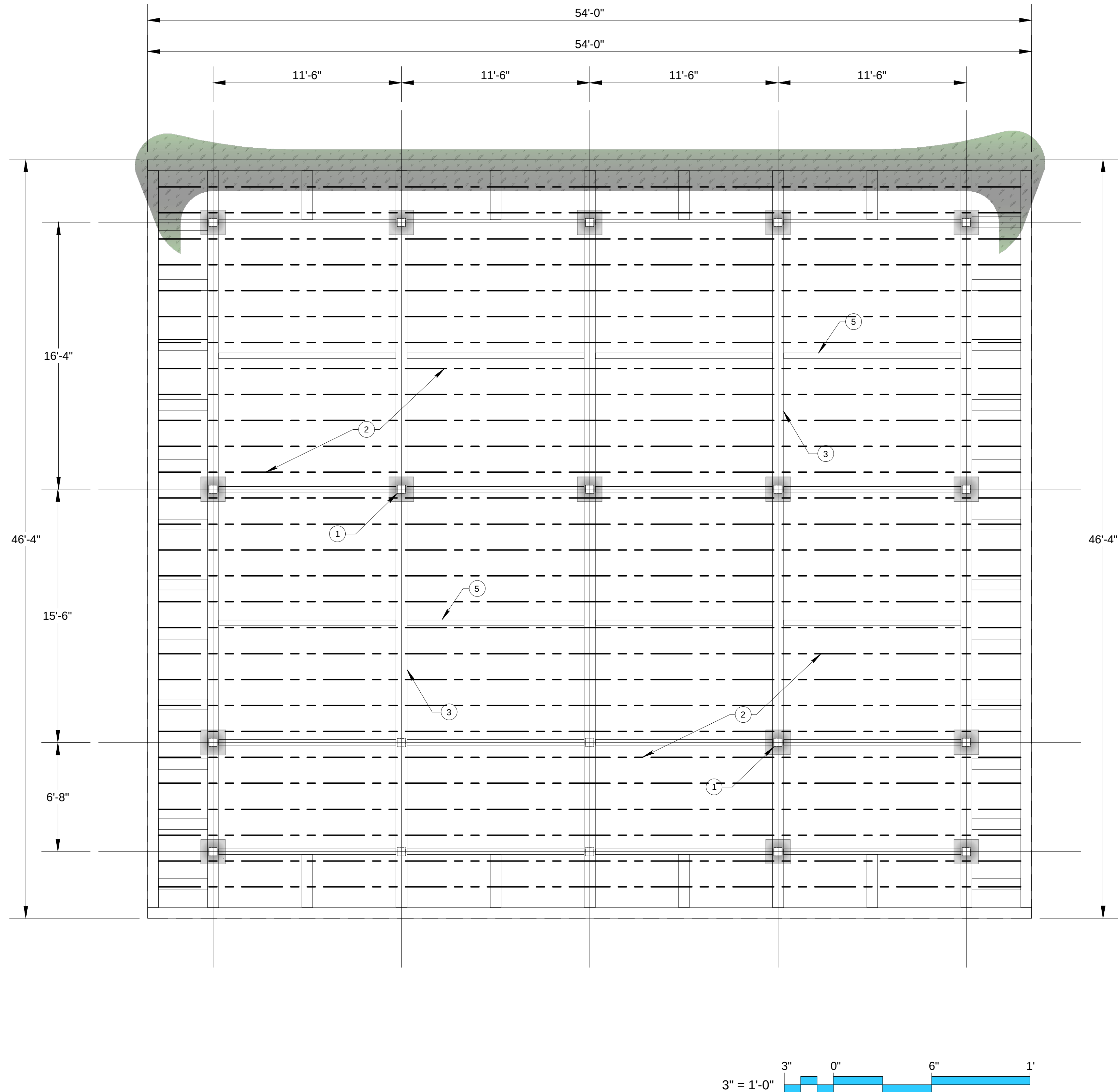
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GO-KART STORAGE AREA

DWG. No. A-1.0	
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JOB No.	REV. 



CANOPY PLAN VIEW

NOTES:

1. MC 8 x 18.7 MC 8 CHANNEL COLUMN
2. 12K1x16" BAR JOIST @ 19.2" O.C.
3. MC 7x19.1 LATERAL OUT-RIGGER
4. SHEAR CONNECTION FOR BEAM-TO-COLUMN CONNECTION - (3) THREE 3/4" A-325 CARBON STEEL ANCHOR NUTS/BOLTS PER SIDE OF THE CHILD MEMBER (L-SHAPED BRACKET).
5. MC 8 x 18.7 MC 8 CHANNEL BEAM

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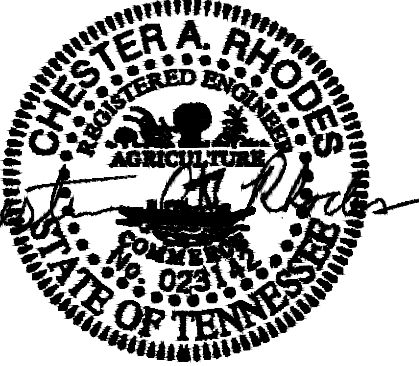
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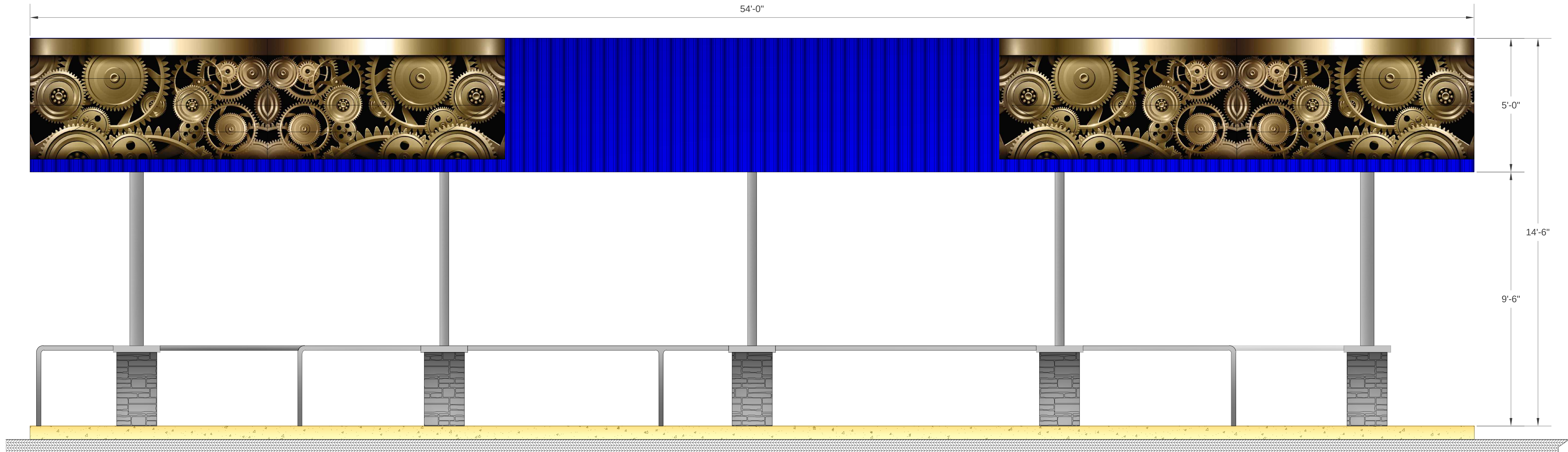
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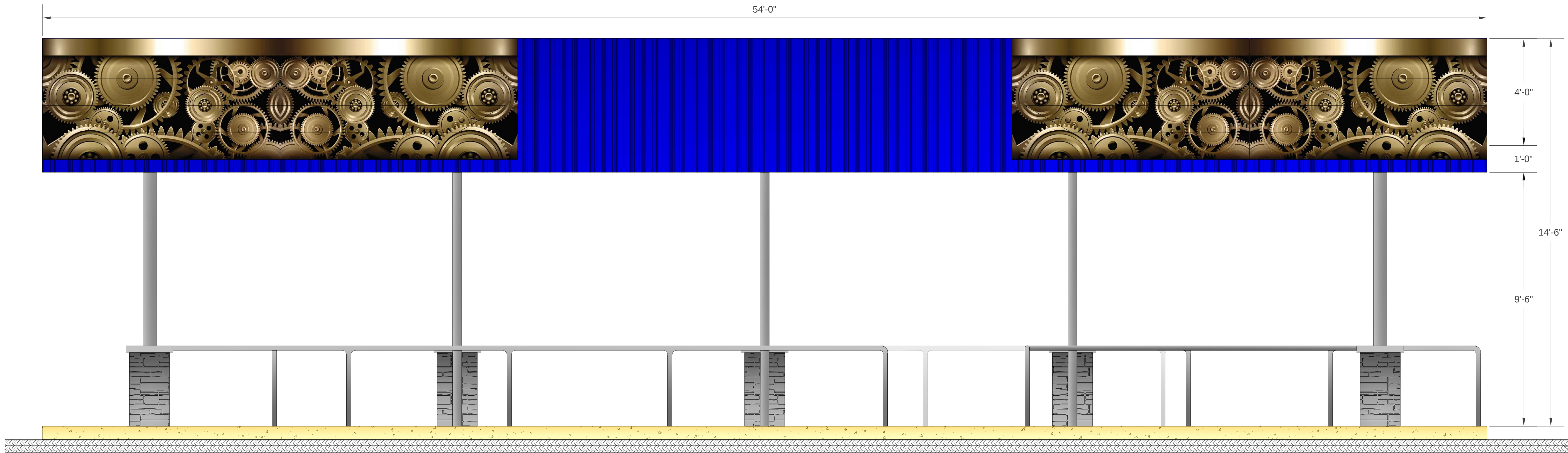
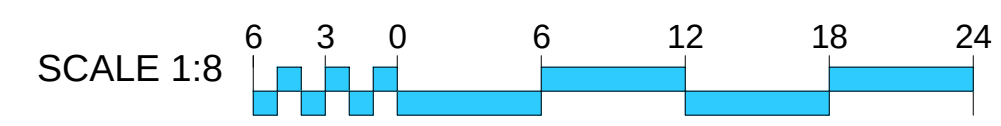
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TENN-PIN ALLEY BOWLING CENTER
730 MOORESVILLE PIKE, COLUMBIA, TN 38401

CANOPY ELEVATIONS

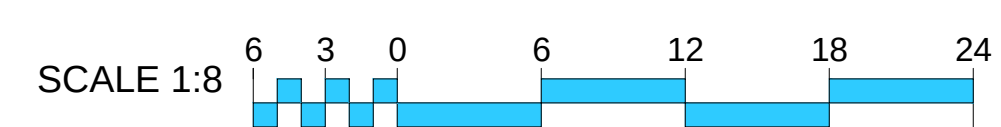
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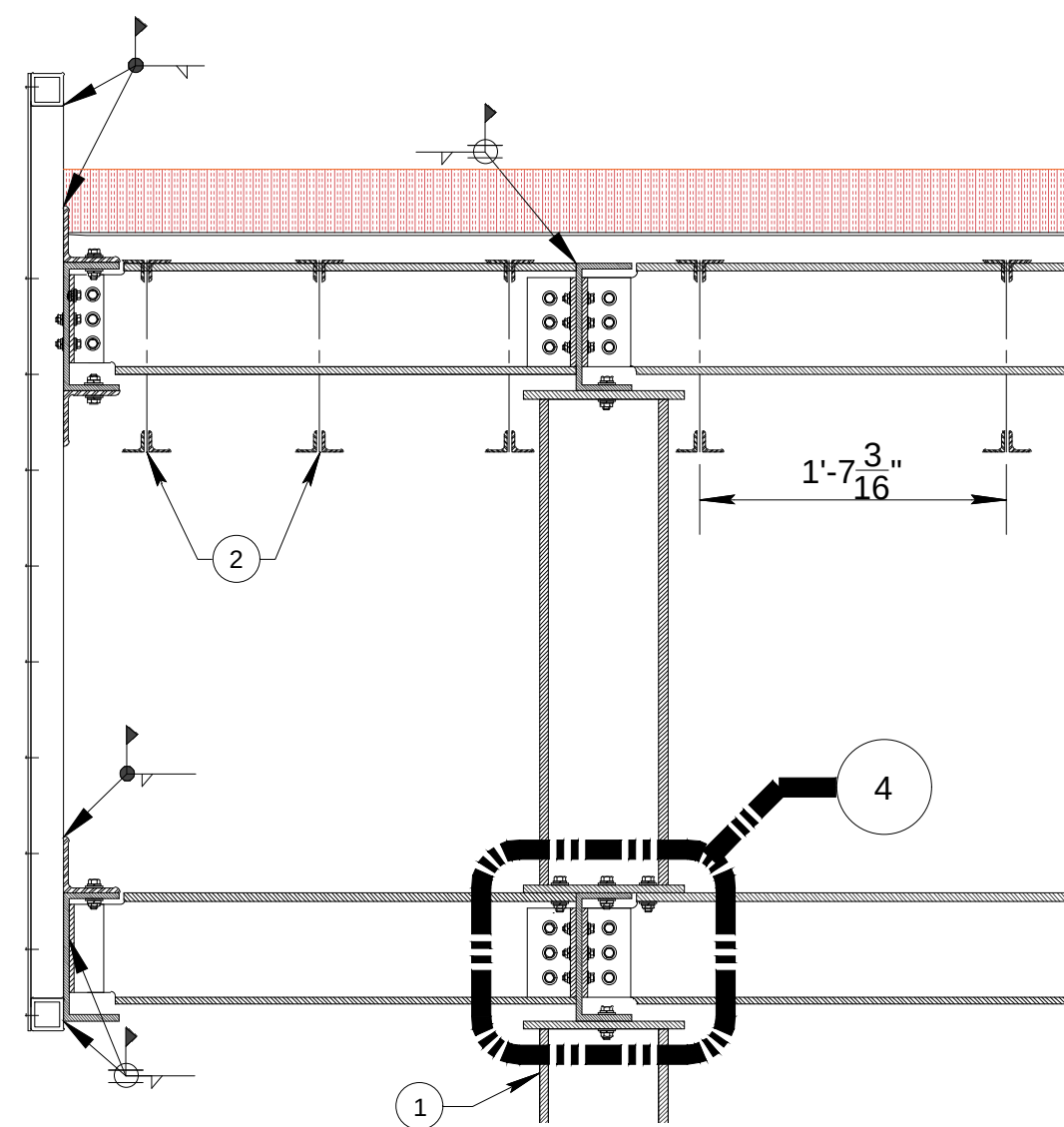


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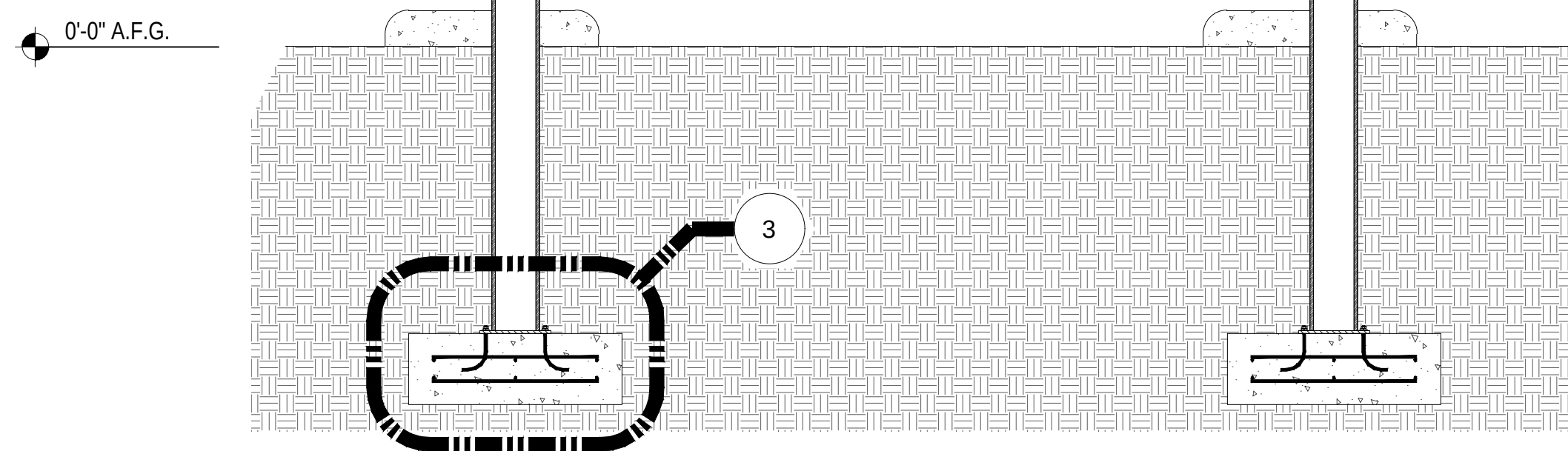
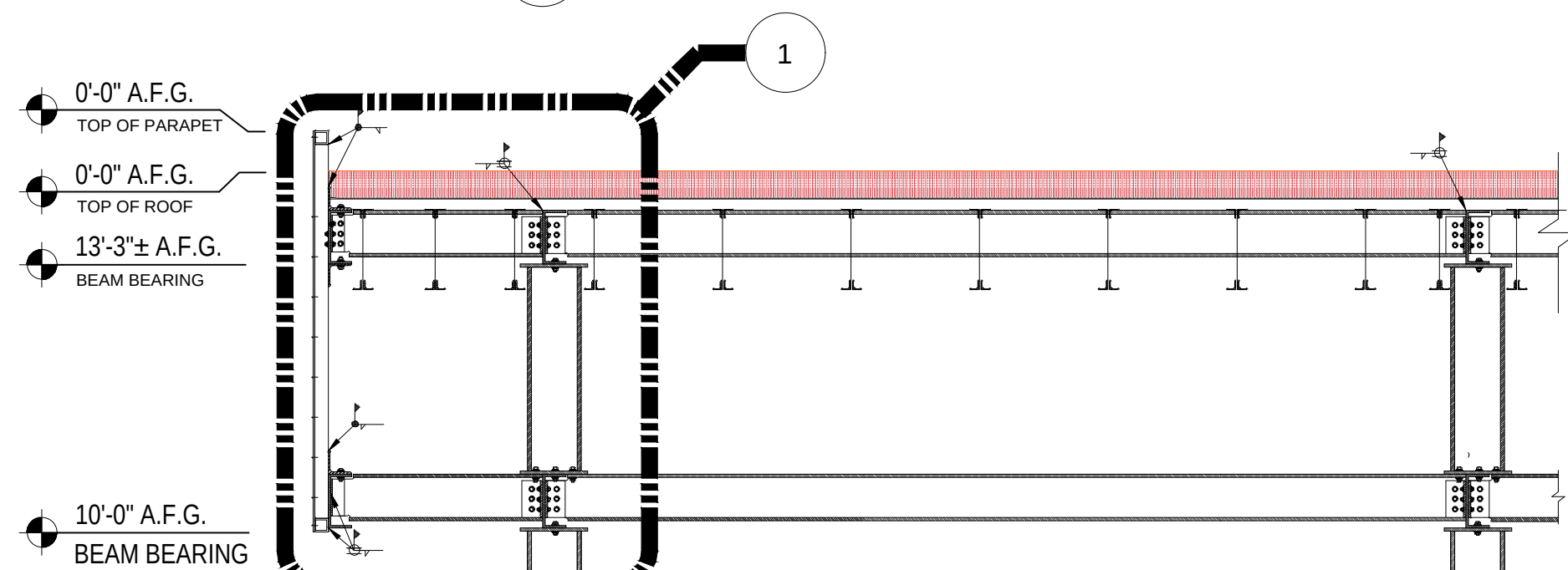


CANOPY ELEVATIONS

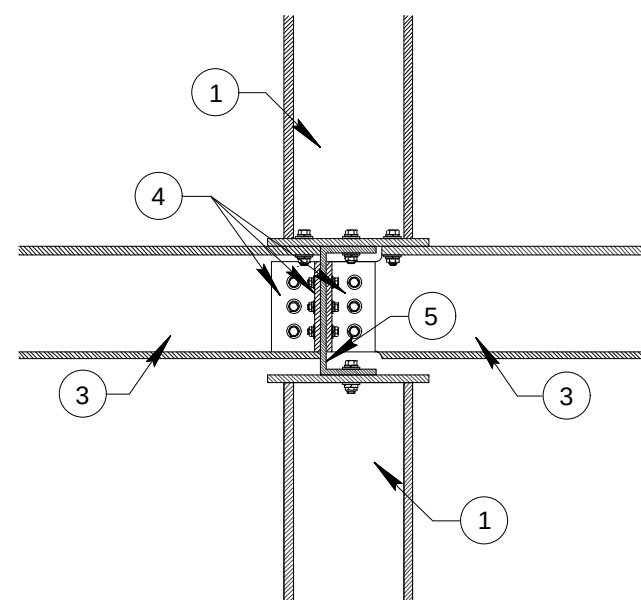
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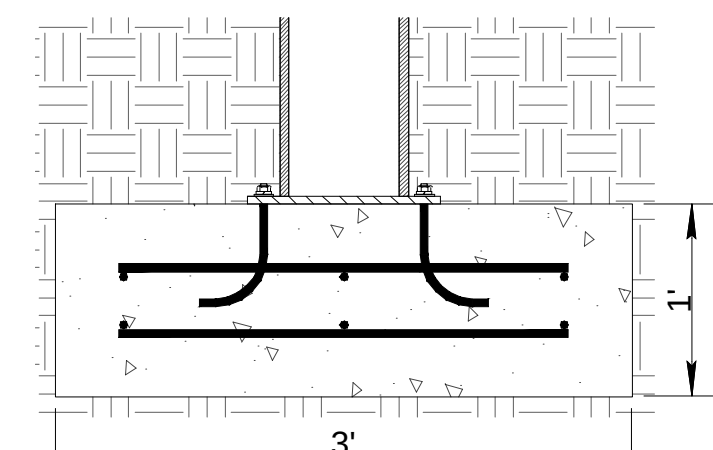
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1 PARTIAL BUILDING SECTION
Scale: 6" = 1'-0"



3 BUILDING SECTION @ FOOTING
Scale: 6" = 1'-0"

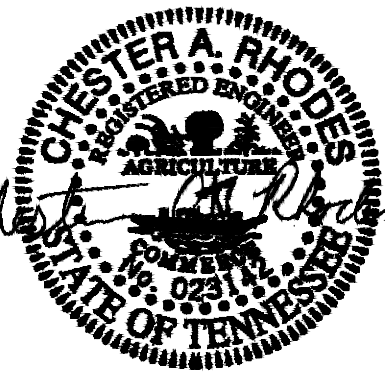


3 BUILDING SECTION @ FOOTING

NOTES:

1. MC 8 x 18.7 MC 8 CHANNEL COLUMN
2. 12K1x16" BAR JOIST @ 19.2" O.C.
3. MC 7x19.1 LATERAL OUT-RIGGER
4. SHEAR CONNECTION FOR BEAM-TO-COLUMN
CONNECTION - (3) THREE ¾" A-325 CARBON STEEL
ANCHOR NUTS/BOLTS PER SIDE OF THE CHILD
MEMBER (L-SHAPED BRACKET).
5. MC 8 x 18.7 MC 8 CHANNEL BEAM

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CIVIL ENVIRONMENTAL
SITE DEVELOPMENT WATER/WASTEWATER

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CANOPY DETAILS

DWG. No.

A-2.3

SCALE: AS NOTED

JOB No.	
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CANOPY DETAILS

AS NOTED

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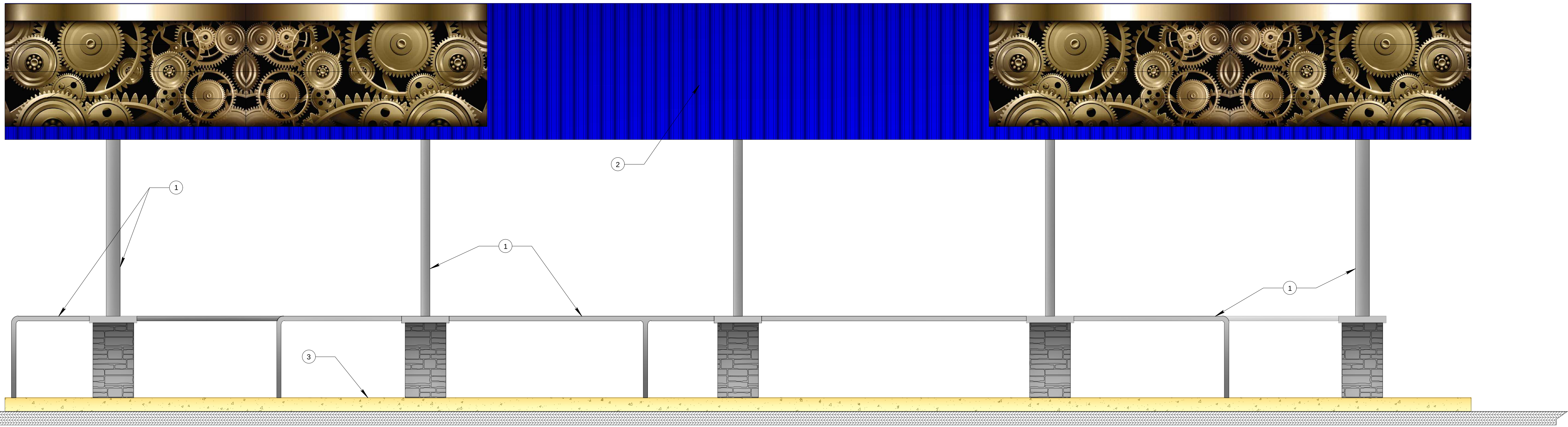
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TENN-PIN ALLEY BOWLING CENTER
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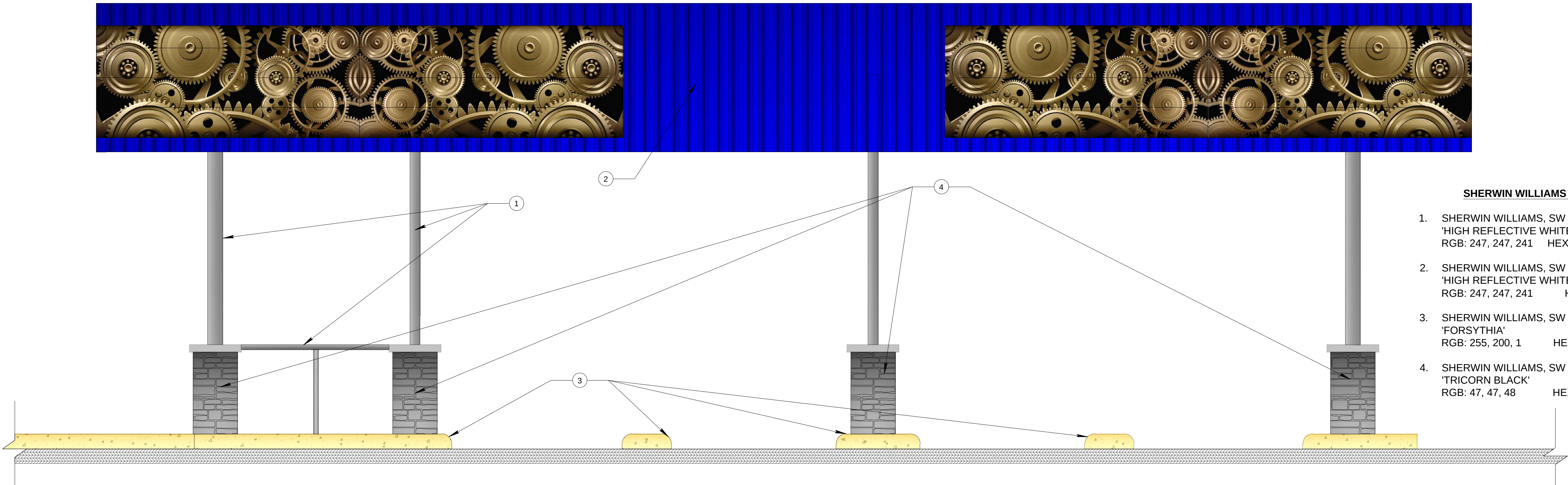
JOB No.	REV. A
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1 SOUTH ELEVATION
SCALE: NOTED

SCALE 1:8

Number of people	Frequency
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3	1
0	1
6	3
12	3
18	3
24	3



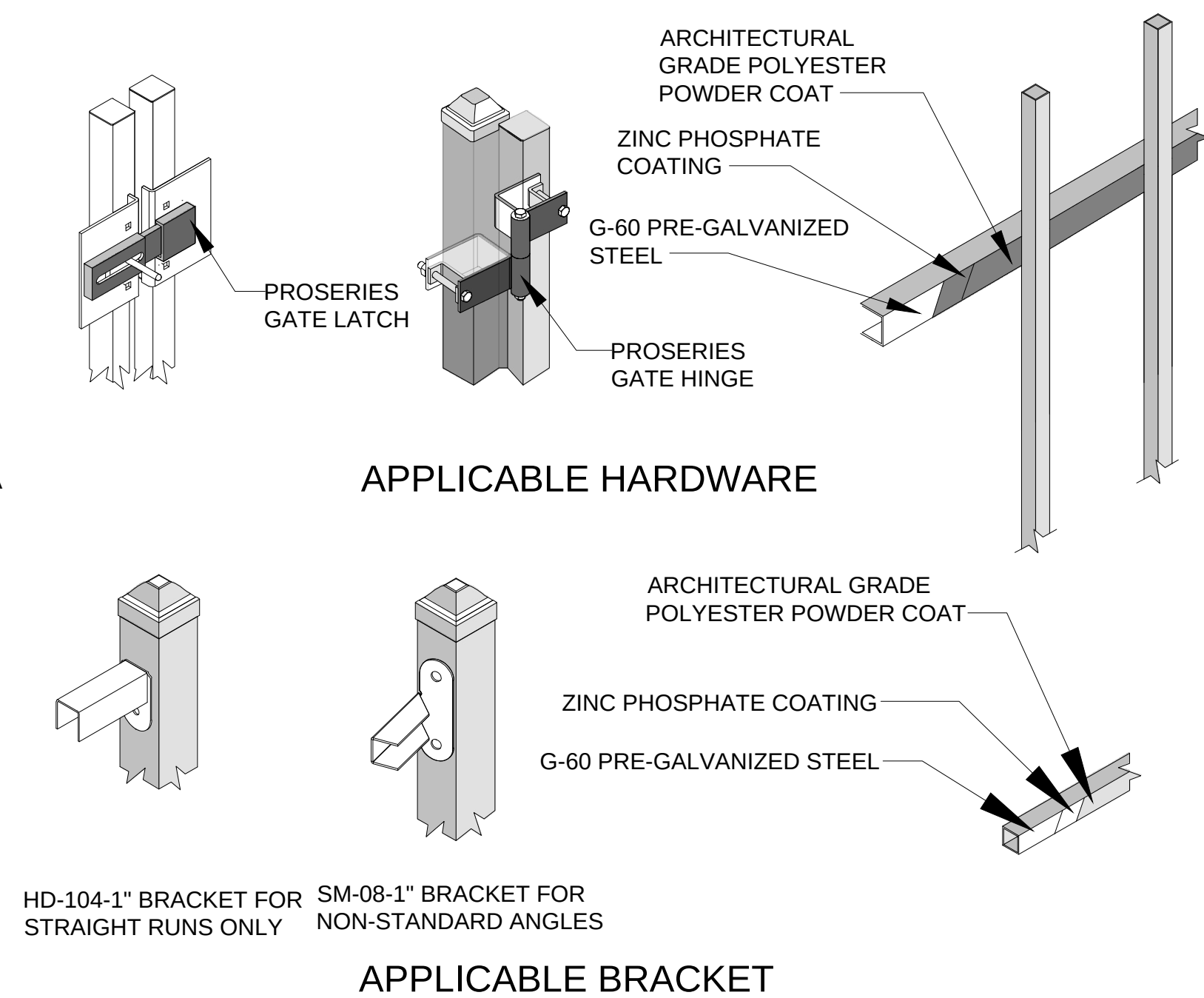
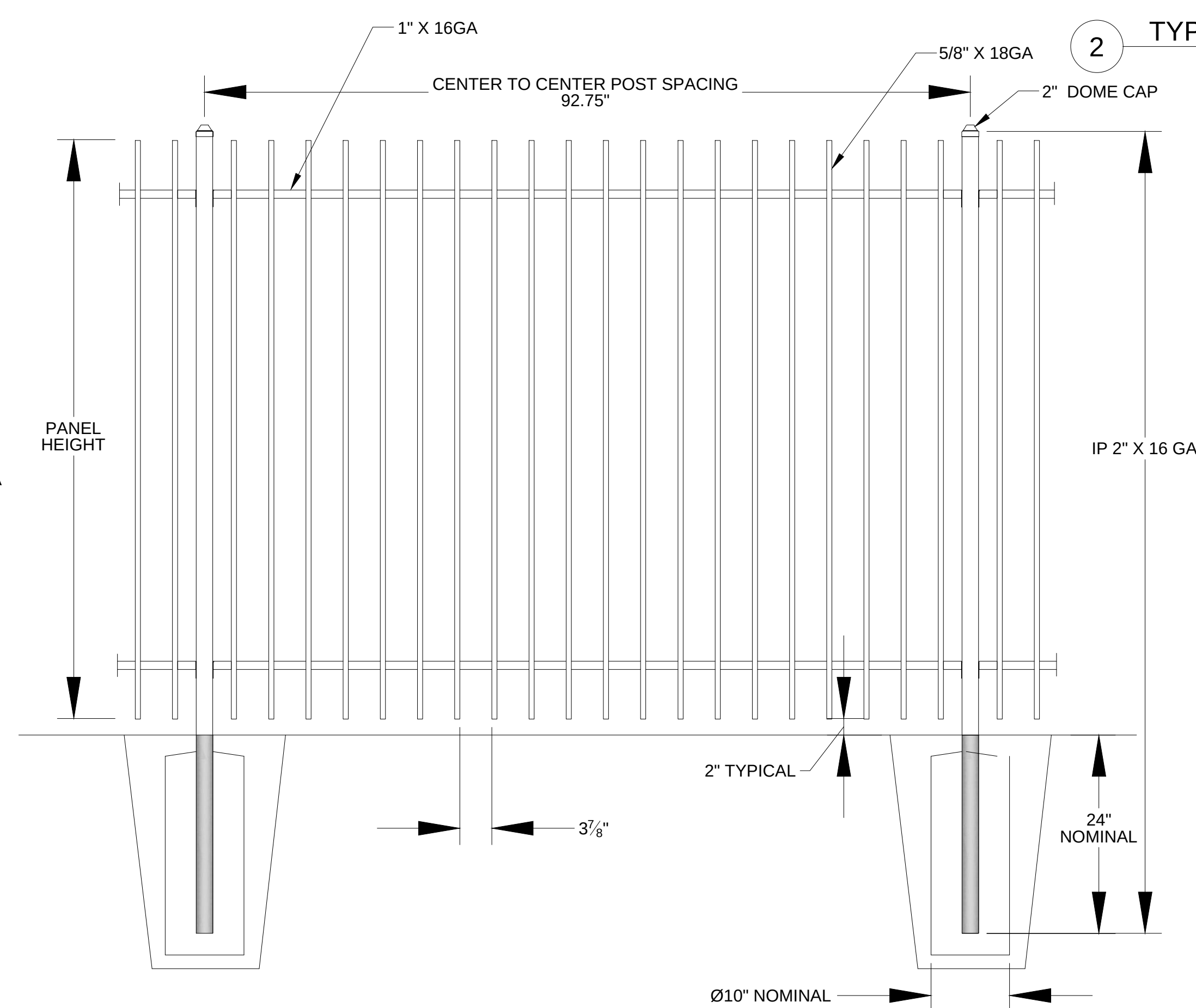
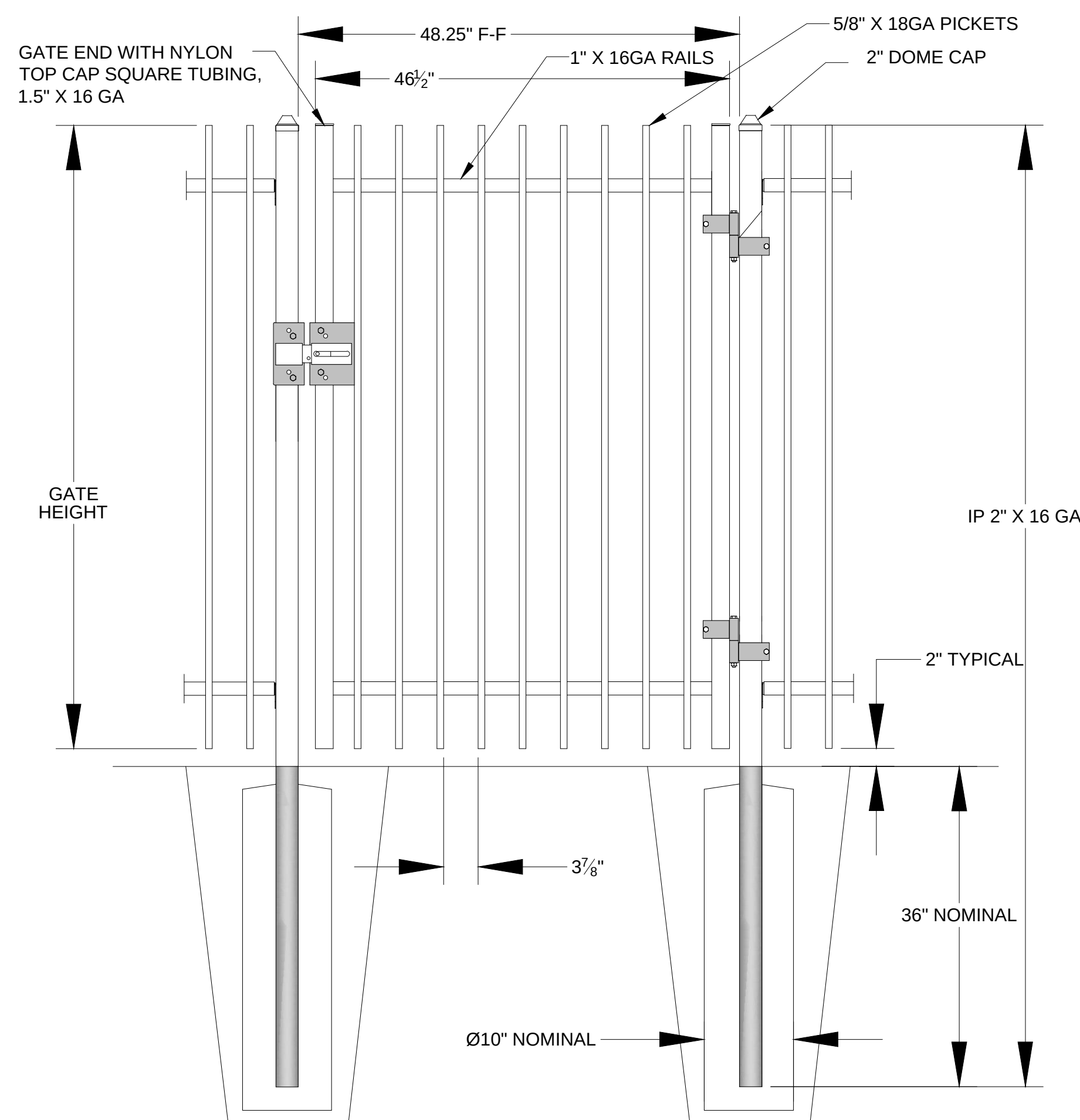
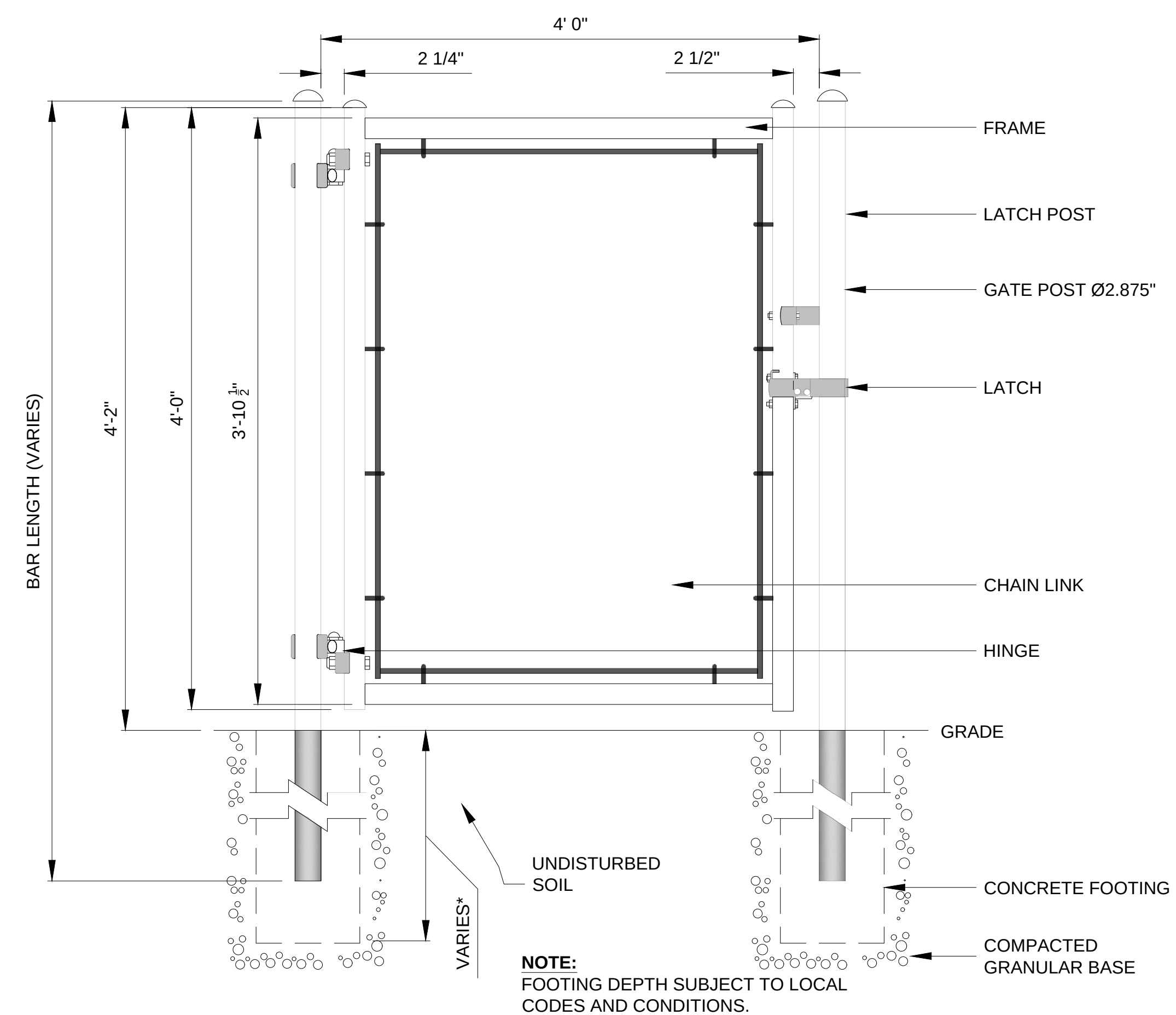
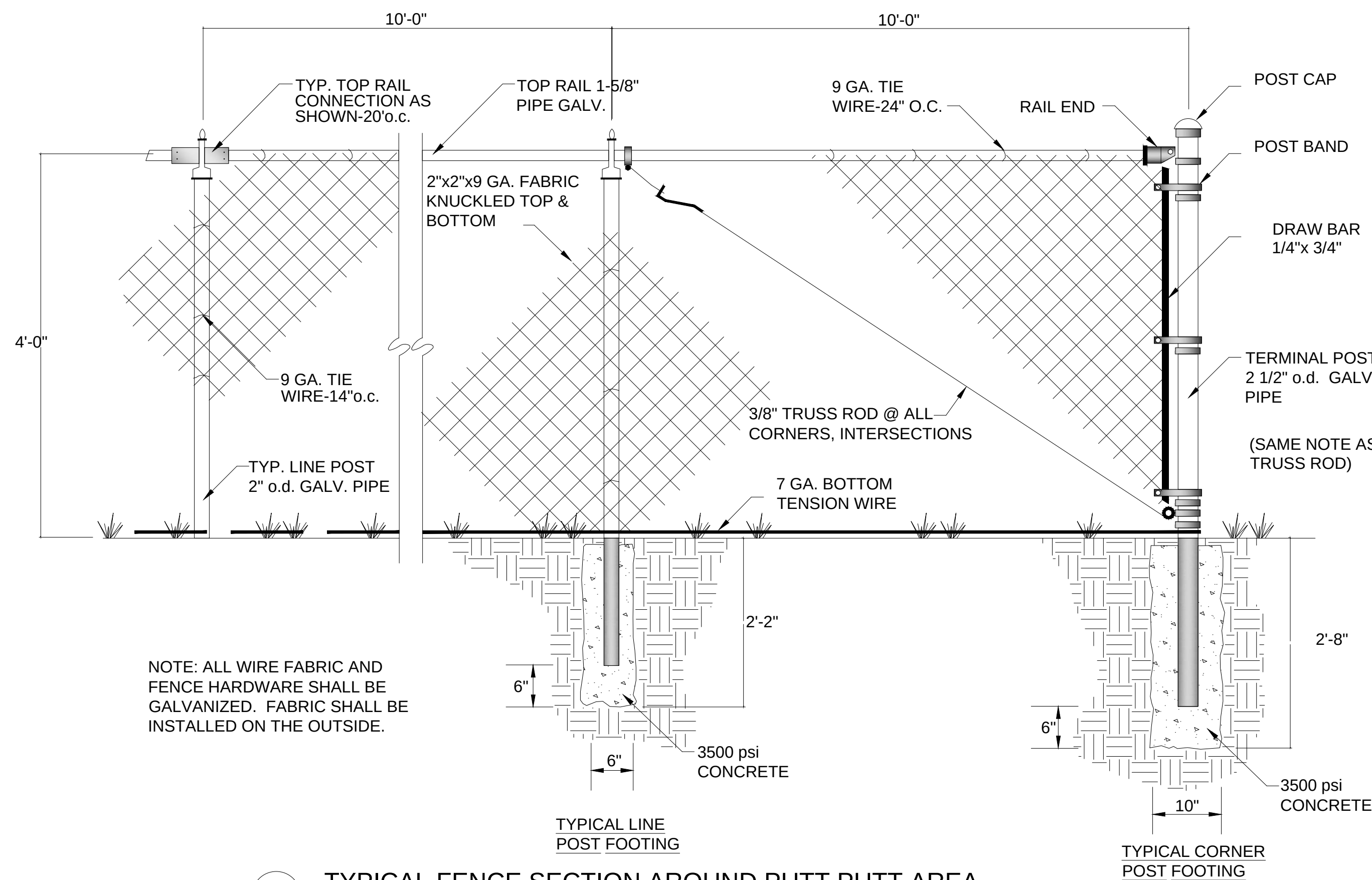
2 WEST ELEVATION
SCALE: NOTED

SCALE 1:8

Value	Frequency
0	6
3	3
6	0
9	6
12	12
15	18
18	24

SHERWIN WILLIAMS COLOR TABLE

1. SHERWIN WILLIAMS, SW 7757, LRV: 93
'HIGH REFLECTIVE WHITE'
RGB: 247, 247, 241 HEX: #F7F7F1
2. SHERWIN WILLIAMS, SW 7757, LRV: 9
'HIGH REFLECTIVE WHITE'
RGB: 247, 247, 241 HEX: #F7F711
3. SHERWIN WILLIAMS, SW 6907, LRV: 63
'FORSYTHIA'
RGB: 255, 200, 1 HEX: #FFC801
4. SHERWIN WILLIAMS, SW 6258, LRV: 3
'TRICORN BLACK'
RGB: 47, 47, 48 HEX: #2F2F30



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730 MOORESVILLE PIKE, COLUMBIA, TN 38401

DWG. No.

A-3.0

SCALE: AS NOTED

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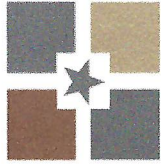
AS NOTED

LANDSCAPE NOTES:

1. WHEN APPLICABLE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT EXISTING TREES TO REMAIN. NO HEAVY EQUIPMENT SHOULD BE PERMITTED TO OPERATE OR BE STORED, NOR ANY MATERIALS TO BE HANDLED OR STORED, WITHIN THE DRIPLINES OF TREES OUTSIDE THE LIMIT OF GRADING.
2. THE QUANTITIES INDICATED ON THE PLANT LIST AND PLAN ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN QUANTITY CALCULATIONS AND THE LIABILITY WHICH PERTAINS TO THOSE QUANTITIES AND TO ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS. QUESTIONS SHOULD BE DIRECTED TO THE LANDSCAPE ARCHITECT.
3. ALL PLANT MATERIALS SHALL BE NURSERY GROWN, GRADE "A" QUALITY, UNLESS OTHERWISE NOTED AND SHALL COMPLY WITH THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z-60.1, LATEST EDITION, FOR SIZE AND QUALITY.
4. NO SUBSTITUTIONS AS TO TYPE, SIZE, OR SPACING OF PLANT MATERIALS SPECIFIED ON THIS PLAN MAY BE MADE WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT. KITA SUSTAINABLE DESIGNS, LLC (615) 469-1222.
5. THE CONTRACTOR IS TO VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES AND TO PROTECT UTILITIES THAT ARE TO REMAIN. THE CONTRACTOR SHALL REPAIR ANY DAMAGE ACCORDING TO LOCAL STANDARDS AT THE CONTRACTOR'S EXPENSE. COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANY.
6. SEE CIVIL SHEET C-5.3 (EROSION CONTROL PLAN) FOR LOCATIONS OF SEED/SOD.
7. SOIL USED FOR PLANTING SHALL CONSIST OF (5) PARTS TOPSOIL, (1) PART SAND AND (2) PARTS ORGANIC MATTER, MIXED WITH 1 POUND OF FERTILIZER PER CUBIC YARD.
A. SAND SHALL BE CLEAN MASONRY SAND.
B. ORGANIC MATTER SHALL BE PEAT MOSS, OR WELL COMPOSTED PINE BARK, OR APPROVED EQUAL AND SHALL BE FINELY GROUND AND FREE OF WEEDS.
C. ALL FERTILIZER SHALL BE 10-10-10 WITH MINOR ELEMENTS. FERTILIZER SHALL HAVE 40-50% OF ITS TOTAL NITROGEN IN A WATER INSOLUBLE FORM.
8. PRE-EMERGENT HERBICIDE SHALL BE APPLIED TO ALL PLANT BEDS AND SOD AREAS PRIOR TO INSTALLATION. TREFLAN OR AN APPROVED EQUAL SHALL BE USED.
9. ALL PLANT BEDS SHALL HAVE A MINIMUM OF 3" DEEP MULCH. MULCH SHALL BE SHREDDED HARDWOOD.
10. IT IS THE LANDSCAPE CONTRACTOR'S RESPONSIBILITY TO CONFIRM MATERIAL QUANTITIES. IN THE EVENT OF A DISCREPANCY, THE QUANTITIES SHOWN ON THE PLAN SHALL TAKE PRECEDENCE OVER QUANTITIES SHOWN ON THE PLANT LIST.
11. PRIOR TO FINAL PAYMENT, THE LANDSCAPE CONTRACTOR SHALL PROVIDE THE OWNER WITH COMPLETE WRITTEN INSTRUCTIONS ON PROPER CARE OF ALL SPECIFIED PLANT MATERIALS.
12. THE LANDSCAPE INSTALLATION SHALL BE COORDINATED WITH THE IRRIGATION INSTALLATION WHEN APPLICABLE.
13. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM STRUCTURES AND TAKE SPECIAL CARE TO INSURE THAT BED PREPARATION DOES NOT INHIBIT DRAINAGE.
14. ALL LAWN AREAS SHALL BE CULTIVATED TO A DEPTH OF 4" PRIOR TO SODDING AND SEEDING. PREPARED TURF BEDS SHALL BE FREE FROM STONES OVER 2" DIAMETER, WEEDS AND OTHER DELETERIOUS MATERIAL.
15. THE LANDSCAPE CONTRACTOR SHALL RAKE SMOOTH ALL SEED OR SOD AREAS PRIOR TO INSTALLATION.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BACKFILLING BEHIND THE CURB SO GRADE IS LEVEL WITH TOP OF CURB.
17. SODDED AREAS SHALL HAVE NO BARE AREAS. SEEDDED AREAS SHALL BE CONSIDERED ACCEPTABLE WHEN FULL COVERAGE OF THE PERMANENT TURF GRASS SPECIES IS ESTABLISHED. SEE CIVIL SHEETS FOR SEEDING, MATTING OR SODDING AREAS.
18. CUT AWAY ROPES OR WIRES FROM B&B PLANTS. PULL BACK BURLAP FROM TOP OF ROOT BALL. DO NOT ALLOW BURLAP TO BE EXPOSED AT SURFACE. TOTALLY REMOVE BURLAP IF IT IS SYNTHETIC.
19. IF CONTAINER GROWN PLANTS SHOW SIGNS OF BEING ROOT BOUND, SCORE ROOTS VERTICALLY.
20. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
21. ALL REPLACEMENTS SHALL BE OF THE SAME TYPE, SIZE, AND QUALITY AS SPECIFIED ON THE PLANT LIST, UNLESS APPROVED OTHERWISE IN WRITING BY THE LANDSCAPE ARCHITECT.
22. ANY MATERIAL THAT IS DEEMED TO BE 25% DEAD OR MORE SHALL BE CONSIDERED DEAD, AND MUST BE REPLACED AT NO CHARGE. A TREE IS CONSIDERED DEAD WHEN THE MAIN LEADER HAS DIED BACK, OR MORE THAN 25% OF THE CROWN IS DEAD.
23. REPLACEMENTS SHALL BE MADE DURING THE NEXT PLANTING SEASON UNLESS THE LANDSCAPE CONTRACTOR AGREES TO AN EARLIER DATE.
PLANTING DATES
SPRING: MARCH 15 - APRIL 15
FALL: OCTOBER 1 - NOVEMBER 30
24. THE LANDSCAPE CONTRACTOR WILL NOT BE RESPONSIBLE FOR PLANT MATERIAL THAT HAS BEEN DAMAGED BY VANDALISM, FIRE, RELOCATION, WILDLIFE, THEFT, OR OTHER ACTIVITIES BEYOND THE LANDSCAPE CONTRACTOR'S CONTROL.
25. CONTRACTOR TO IRRIGATE ALL NEW LANDSCAPE PLANTINGS AND LAWN AREAS WITH AN AUTOMATED UNDERGROUND IRRIGATION SYSTEM. IRRIGATION SYSTEM TO BE DESIGN-BUILD.
26. WATER WILL BE PROVIDED BY HOSE BIBS ON THE EXISTING BUILDING.

PLANT SCHEDULE					
QTY.	COMMON NAME	BOTANICAL NAME	HEIGHT	TRUNK	COMMENTS
CANOPY TREES					
27	'Arnold' Tulip Poplar	Liriodendron tulipifera 'Arnold'	10' - 12'	2" Cal.	B&B
27	TOTAL - CANOPY TREES				
UNDERSTORY/COLUMNAR TREES					
0					
0	TOTAL - UNDERSTORY TREES				
27	TOTAL - ALL TREES				
SHRUBS					
	TOTAL - SHRUBS				
TURF					
-	Hybrid Fescue Seed/Sod	Drought tolerant fescue blend			





CITY OF
COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*

Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	TAX MAP: 41	GROUP:	PARCEL: 015.00
SUMMARY OF NATURE OF REQUEST AND WORK	Correct zoning classification from CD3 to CD4 to be consistent with old regulation zoning of MRC		

DATE OF PRE-APPLICATION CONFERENCE	Pre-application meetings are scheduled for Wednesdays.
------------------------------------	--

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☒ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) _____ ☐ Total Number of Lots _____ ☐ Total acreage _____

**File naming nomenclature examples:*

*Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat*

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

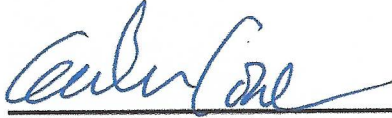
APPLICANT

All communications go to the Applicant's email that is provided.

NAME	G. Nelson Crowe	PHONE	615-969-6080
ADDRESS	135 Hampton Pl. Nashville, TN 37215	EMAIL	nelson@fortunale.net

PROPERTY OWNER NAME	FP TCI CCS, LLC	PHONE	615-969-6080
ADDRESS	135 Hampton Pl. Nashville, TN 37215	EMAIL	nelson@fortunale.net

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

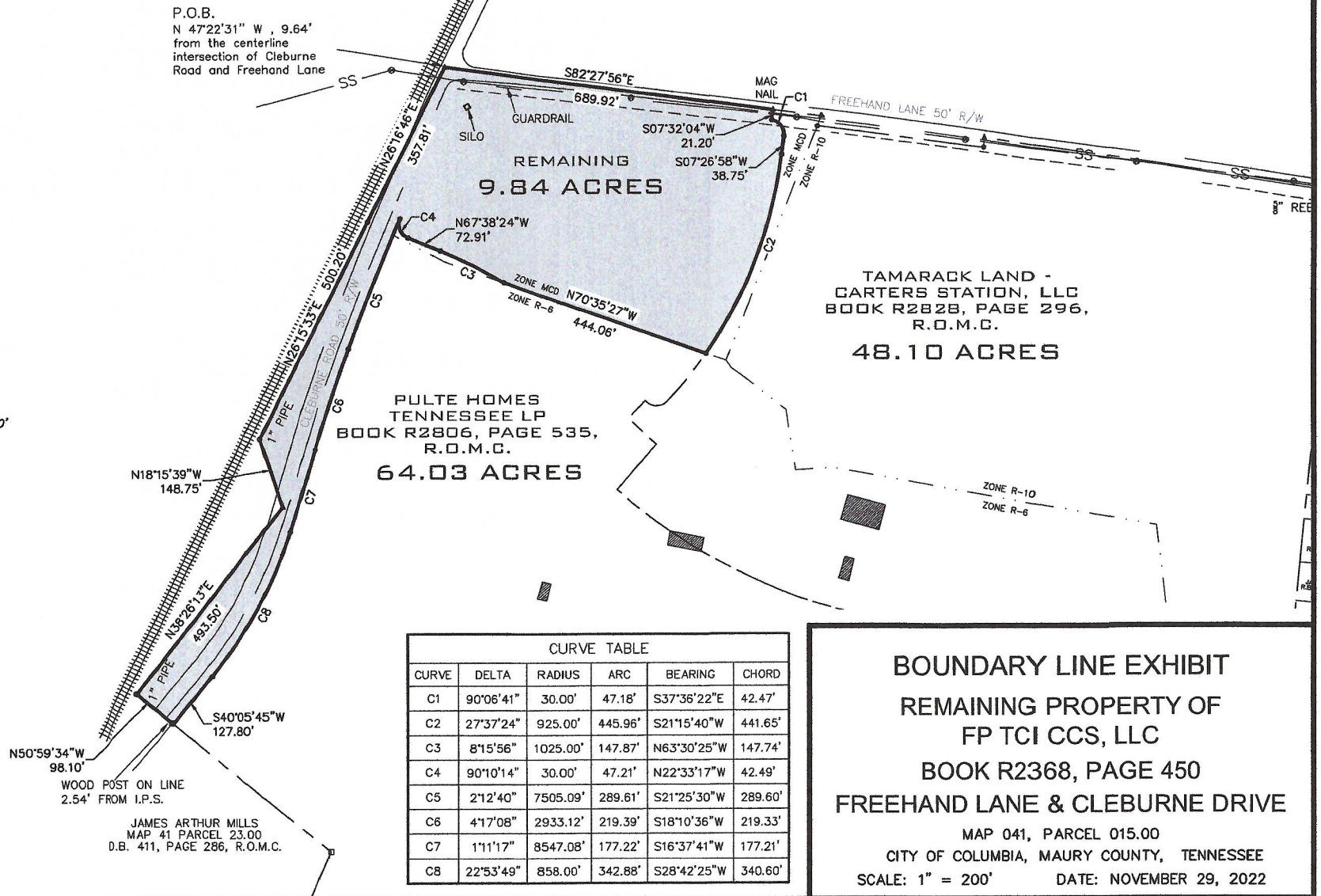
<u>G. Nelson Crowe</u> APPLICANT NAME	<u></u> APPLICANT SIGNATURE	<u>4/12/23</u> DATE
<u>FP TCI CCS, LLC</u> PROPERTY OWNER NAME	<u></u> PROPERTY OWNER SIGNATURE	<u>4/12/23</u> DATE

STAFF USE ONLY

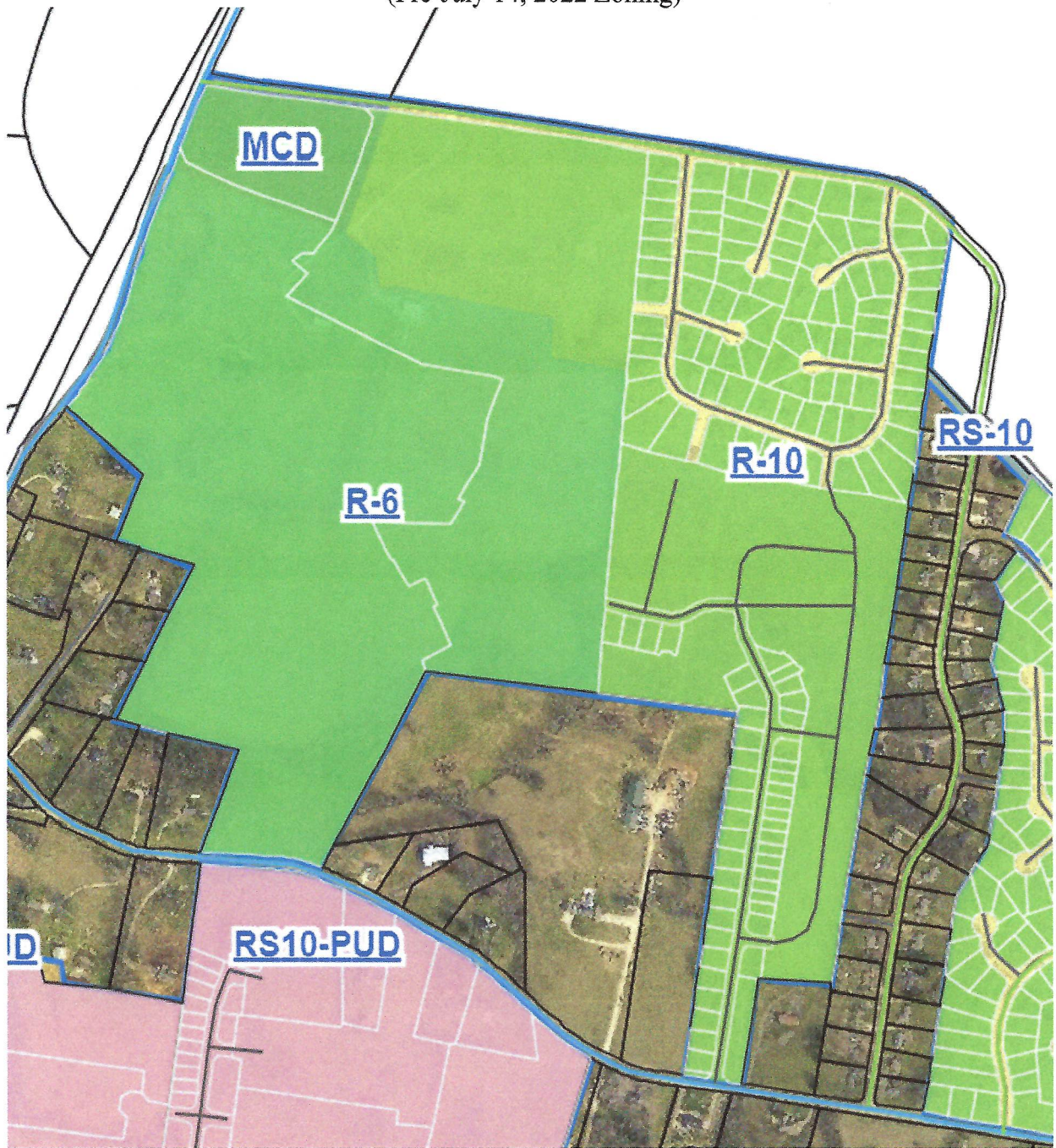
DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			



0' 100' 200' 400'
SCALE: 1" = 200'



Former Zoning Designation
(Pre-July 14, 2022 Zoning)



Current Zoning Designation: CD-3





PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*

Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	RIVER ROAD		
	TAX MAP: 090	GROUP:	PARCEL: 7.08
SUMMARY OF NATURE OF REQUEST AND WORK	REZONING REQUEST FOR A +/-5.88 AC PARCEL, WHICH WAS PREVIOUSLY A PORTION OF A NOW EXPIRED MIXED-USE PUD. REQUEST FOR CD-5 ZONING WHICH IS CONSISTENT WITH THE URBAN NEIGHBORHOOD LAND USE DISTRICT. INTENT TO DEVELOP MULTI-FAMILY AND TOWNHOMES.		

DATE OF PRE-APPLICATION CONFERENCE	4.5.2023	<i>Pre-application meetings are scheduled for Wednesdays.</i>
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SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☒ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other: <i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Annexations/Rezoning/PUD's:</u> ☒ Written Legal Description copy ☒ Requested Zone Listed ☒ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☒ Plans and/or Plats conforming to City standards with check list completed ☒ Columbia Water System Availability Letter <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) _____ ☐ Total Number of Lots _____ ☐ Total acreage _____

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	GREG GAMBLE	PHONE	615.975.5765
ADDRESS	3020 STANSBERRY LANE, SUITE 201 FRANKLIN, TN 37069	EMAIL	INFO@GDC-TN.COM

PROPERTY OWNER NAME	David Taylor	PHONE	931-619-1103
ADDRESS	3006 Knoll Dr	EMAIL	davidctaylor46@gmail.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

GREG GAMBLE

APPLICANT NAME



APPLICANT SIGNATURE

APRIL 17, 2023

DATE

David Taylor

PROPERTY OWNER NAME



PROPERTY OWNER SIGNATURE

3-10-23

DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			



LOCATION MAP

LEGAL DESCRIPTION OF PROPERTY:

DAVID TAYLOR PROPERTY
PROPERTY MAP 090, PARCEL 007.08
RIVER ROAD / GANDER CROSSING
CITY OF COLUMBIA, MAURY COUNTY, TENNESSEE

Being a certain tract or parcel of land lying and being in the Ninth (9th) Civil District of Maury County, city of Columbia, Tennessee and being more particularly described as follows:

Being the 6.16-acre tract as shown on the final plat entitled "Final Minor Subdivision Plat for Patricia Taylor Clayborne, Glenda Taylor Marshall, Julie Taylor Thompson, & David Charles Taylor" of record in Plat Book 11, page 173, Register's Office for Maury County, Tennessee to which plat reference is hereby made for a more complete description of the subject property.

Included in the above-described property, but expressly excluded is the 0.28-acre tract as shown on the final plat entitled "Final Minor Subdivision Plat for David Taylor Enterprises, LLC" of record in Plat Book 11, page 356, Register's Office for Maury County, Tennessee.

Said 0.28-acre tract being a portion of the same property conveyed to David Taylor Enterprises, LLC from David Charles Taylor by Quitclaim Deed of record in Record Book R1428, page 657, Register's Office for Maury County, Tennessee.

Containing approximately 5.88 acres, as calculated by information contained in the above-referenced plats of record. No field work has been performed by Ragan-Smith-Associates to verify the accuracy of the property lines, corners or areas shown on said recorded plats.

Being a portion of the same property conveyed to David Charles Taylor from David Charles Taylor, Patricia Lee Taylor Clayborne, Glenda Kaye Taylor Marshall and Julie Ann Taylor Thompson by Quitclaim Deed of record in Book 1389, page 58, Register's Office for Maury County, Tennessee.

SKETCH PLAN CD-4 DESIGN CRITERIA:

GROSS SITE AREA: +/-5.88 AC
GROSS DENSITY: 20.7 DUA
TOTAL UNITS: 122 UNITS
26 TOWN HOME
96 MULTI-FAMILY UNITS (12 TO 24 UNITS PER BUILDING)

PROVIDED CIVIC SPACE: 0.92 AC (15.6% GROSS AREA)
CIVIC SPACE REQUIREMENT: 5% TO 20% OF GROSS SITE

IMPERVIOUS SURFACE COVERAGE: 100% MAX.

CONCEPT PLAN LOT DIMENSIONS:

TYPICAL TOWN HOME LOT	MULTI-FAMILY BUILDING
UNIT WIDTH: 20'	FRONT SETBACK: 0-15'
UNIT DEPTH: 60'	SIDE SETBACK: 0-24'
FRONT SETBACK: 0-15'	REAR SETBACK: NOT REGULATED
SIDE SETBACK: 0-24'	MAXIMUM BUILDING WIDTH: 120'
REAR SETBACK: NOT REGULATED	MAXIMUM UNITS PER BUILDING: 24
MAXIMUM BUILDING WIDTH: 8 ATTACHED UNITS MAX.	PARKING PROVIDED IN SURFACE PARKED LOT (THIRD LAYER),
PARKING PROVIDED IN GARAGE (THIRD LAYER),	OR ON STREET
IN DRIVEWAY (THIRD LAYER), OR	
ON STREET.	

PROJECT INFORMATION:

PARCEL: MAP 90 PARCEL 7.08
ADDRESS: RIVER ROAD
AREA: +/-5.88 AC

APPLICANT/LANDSCAPE ARCHITECT:
GREG GAMBLE OR KELI FRYMIRE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069
615-975-5765
greg.gamble@gdc-tn.com
keli@gdc-tn.com

DEVELOPER:
CLIFF SMITH
CPS LAND
213 OVERLOOK CIRCLE, SUITE B2
BRENTWOOD, TN 37027
615.477.3186

REZONING REQUEST:

EXISTING ZONING: PUD-MU
FUTURE LAND USE: URBAN NEIGHBORHOOD
REQUESTED ZONING: CD-5

SKETCH PLAN REQUEST THE FOLLOWING USES, COMPLIANT WITH CD-5 ZONING:
TOWN HOMES AND MULTI-FAMILY RESIDENTIAL

URBAN NEIGHBORHOOD: THE URBAN NEIGHBORHOOD CHARACTER AREA IS APPROPRIATE FOR LOW, MEDIUM AND HIGH DENSITY RESIDENTIAL INTERMIXED WITH COMPATIBLE CIVIC USES. GREEN SPACES LOCATED IN POCKET/COMMUNITY PARKS AND PEDESTRIAN CONNECTIONS ARE ALSO CHARACTERISTICS OF THIS LAND USE CATEGORY.

THE CONCEPT PLAN DEMONSTRATES A RESIDENTIAL NEIGHBORHOOD CONSISTING OF MULTI-FAMILY BUILDINGS ADJACENT TO EXISTING COMMERCIAL USES AND TOWN HOMES ADJACENT TO EXISTING TOWN HOMES AND SINGLE-FAMILY HOMES. THE PLAN INCORPORATES CIVIC SPACE/POCKET PARKS, PROVIDES A MIX OF ON-STREET PARKING AND PARKING AREAS IN THE 3RD LAYER (BEHIND) THE BUILDINGS. SIDEWALKS THROUGH OUT THE NEIGHBORHOOD WOULD CONNECT PEDESTRIANS WITHIN THE SITE AND TO THE LARGER AREA AND CITY PARK TO THE SOUTH AT CARTER STREET AND RIVERSIDE DRIVE.

THE EXISTING ZONING FOR THIS PARCEL IS PUD. THE PUD IS NOW EXPIRED AND A PORTION OF THE PREVIOUS PUD HAS BEEN INCORPORATED INTO A NEW PUD, WHICH IS UNDER CONSTRUCTION. AS THE INTENT OF THIS DEVELOPMENT IS A CENTRALLY LOCATED, RESIDENTIAL INFILL DEVELOPMENT, THE APPLICANT SEEKS TO REZONE THE PROPERTY TO A ZONING DISTRICT CONSISTENT WITH THE URBAN NEIGHBORHOOD LAND USE DISTRICT: CD-5 ZONING. THIS DISTRICT ALLOWS AN URBAN FORMED TRANSITION FROM THE COMMERCIAL CORRIDOR ALONG NASHVILLE HWY TO THE TOWN HOME AND SMALL-LOT SINGLE FAMILY DEVELOPMENT TO THE NORTH. THE DENSITY TRANSITIONS ACROSS THE SITE AND FOCUSES THE PARKING AND SERVICE AREAS OF THIS DEVELOPMENT TOWARDS THE SERVICE AREAS OF THE ADJACENT COMMERCIAL DEVELOPMENT.

ROADWAYS: THE FRONTAGE OF THE PROPERTY IS ON RIVER ROAD (MAJOR LOCAL) AND TAYLOR BEND ROAD (MAJOR LOCAL), WHICH TERMINATES INTO THE PARKING LOT OF THE ADJACENT COMMERCIAL PROPERTY.

HISTORY: THIS PARCEL WAS ORIGINALLY PART OF THE WATERS EDGE AT TAYLOR BEND PUD, APPROVED UNDER ORDINANCE 3619 IN 2005. THIS DEVELOPMENT WAS A MIXED-USE PUD, WHICH INCLUDED MULTI-FAMILY RESIDENTIAL. WHILE THE OLDER PLAN IS DIFFICULT TO READ, THIS PARCEL APPEARS TO HAVE THREE LARGE-SCALE MULTI-FAMILY RESIDENTIAL BUILDINGS. BASED ON THE BUILDING FOOTPRINTS, THIS LIKELY YIELDED BETWEEN 150-176 UNITS WITH A THREE STORY BUILDING OR 98-117 UNITS WITH A TWO STORY BUILDING.



RIVER ROAD PARCEL
REZONING REQUEST & CONCEPTUAL DEVELOPMENT PLAN
Columbia, Tennessee



Date: April 17, 2023
Revision Date
△
△
△

REZONING
REQUEST

SHEET

L1.0

**DAVID TAYLOR PROPERTY
PROPERTY MAP 090, PARCEL 007.08
RIVER ROAD / GANDER CROSSING
CITY OF COLUMBIA, MAURY COUNTY, TENNESSEE**

Being a certain tract or parcel of land lying and being in the Ninth (9th) Civil District of Maury County, city of Columbia, Tennessee and being more particularly described as follows:

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February 3, 2023

Mr. Cliff Smith

CPS Land, LLC

213 Overlook Circle

Brentwood, TN 37027

Sent via email: cliff.smith@cpsland.com; sbernick@ragansmith.com

RE: Water Availability Letter
River Road Residential, Single- and Multi-Family
Tax Map 90, Parcel 7.08
Columbia, Maury County, TN

Dear Mr. Smith:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development is mixed single-family townhomes (45) and multi-family apartment buildings (55 units). CPWS has evaluated the projected water demands for the proposed residential development in the water system hydraulic model and is able to meet a fire-flow capacity of 1,500 gpm at 20 psi while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Domestic waterline connections will be made to the existing 8-inch water main located on River Road and the existing 6-inch water main on Taylor Bend.



- Townhomes will be served with gang meter vaults. Multi-family buildings will be served with redundant master meters, one at each entrance.

All of the above requirements are to be constructed and paid for by the Applicant and dedicated to CPWS once complete up to and including the meter. No construction of CPWS infrastructure shall be initiated until final construction plans have been approved by TDEC and all parties have fully executed a water service agreement.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached hydrant analysis report for coordination and approval of development from the Columbia Fire & Rescue Fire Marshall.
- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings.
- Remit to CPWS new water service fees:

New Water Service Fee: \$1,500 + \$370 per SFU (164.2 SFUs)	\$62,254.00
---	-------------

- CPWS will then develop water construction drawings and submit to TDEC for approval. Upon approval by TDEC and payment of meter and impact fees by the applicant, applicant may then schedule a pre-construction meeting with CPWS. Pre-construction meeting will not be scheduled until fees are paid in full or surety is provided in lieu of full payment. Final meter and impact fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid.

Meter Fee (cost of meter): TBD per 6" meter (2 meters)	TBD
Vault Fee: \$2,500 per meter vault, 2" or larger (2 vaults)	\$5,000.00
Impact Fee: \$375,000 for a 6" metered connection	\$375,000.00
Meter Fee: \$540 per 3/4" meter (45 meters)	\$24,300.00
Impact Fee: \$4500 per 3/4" meter (45 meters)	\$202,500.00
Total Meter and Impact Fees Due =	\$606,800.00

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.



If you have any questions, please feel free to contact Mr. Jonathan Hardin or myself at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) days from the date of this letter.

Sincerely,

A handwritten signature in blue ink that reads "Eric King". The signature is written in a cursive, flowing style.

Eric King, P.E.

Inflo Design Group, LLC

on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS

File 22-093



HYDRANT FLOW ANALYSIS



HYDRANT # & LOCATION: 1034 River Rd DATE: 2/3/2023
MODEL BY: Inflo Design Group, LLC SYS. DEMAND Max Day DURATION: 2 hrs.
WATER SUPPLIED BY: Columbia Power and Water Systems
PURPOSE OF TEST: River Road Residential

MODEL DATA

FLOW HYDRANT(S) 1034 n/a n/a
GPM: 1500 0 0
TOTAL FLOW DURING SIMULATION: 1500 GPM

GAUGE HYDRANT

HYDRANT # & LOCATION: 1033 River Rd

CONDITION 1

STATIC 117 PSI

RESIDUAL: 98 PSI

CONDITION 2

STATIC PSI

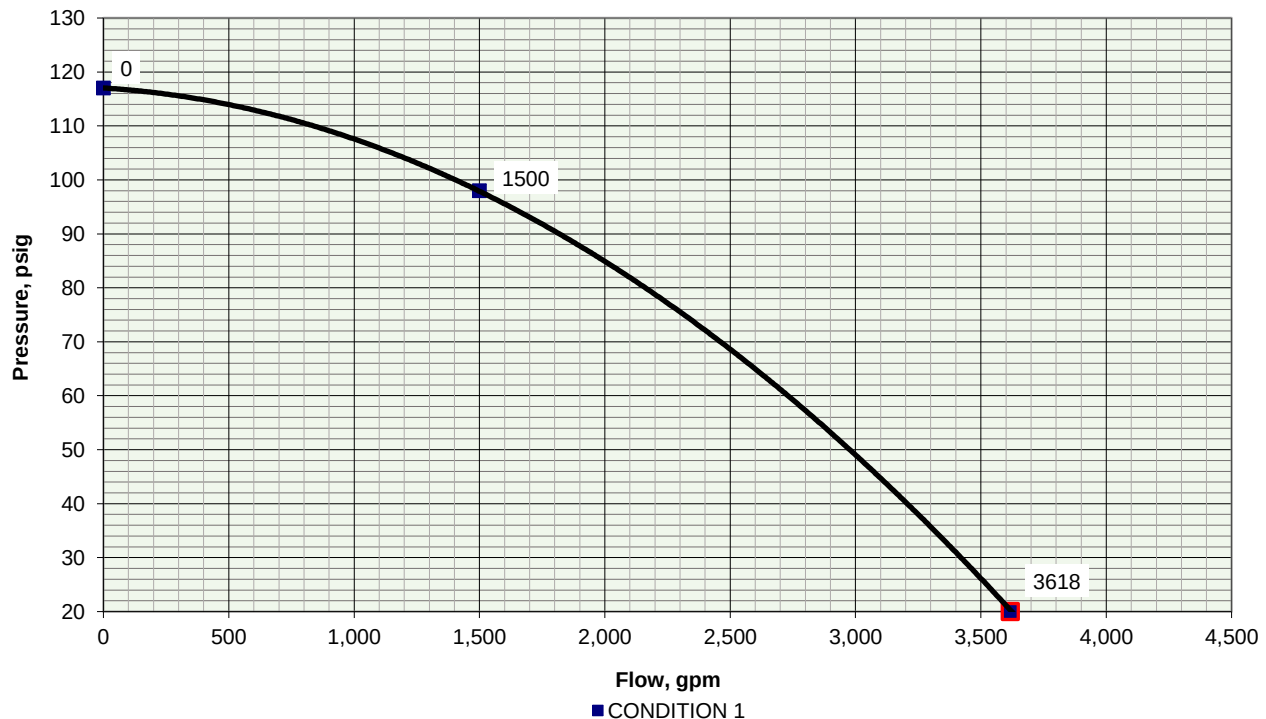
RESIDUAL: PSI

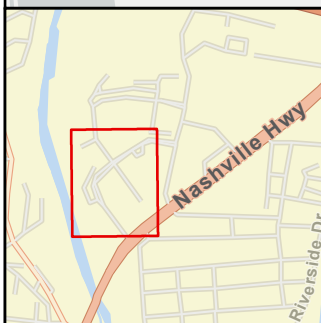
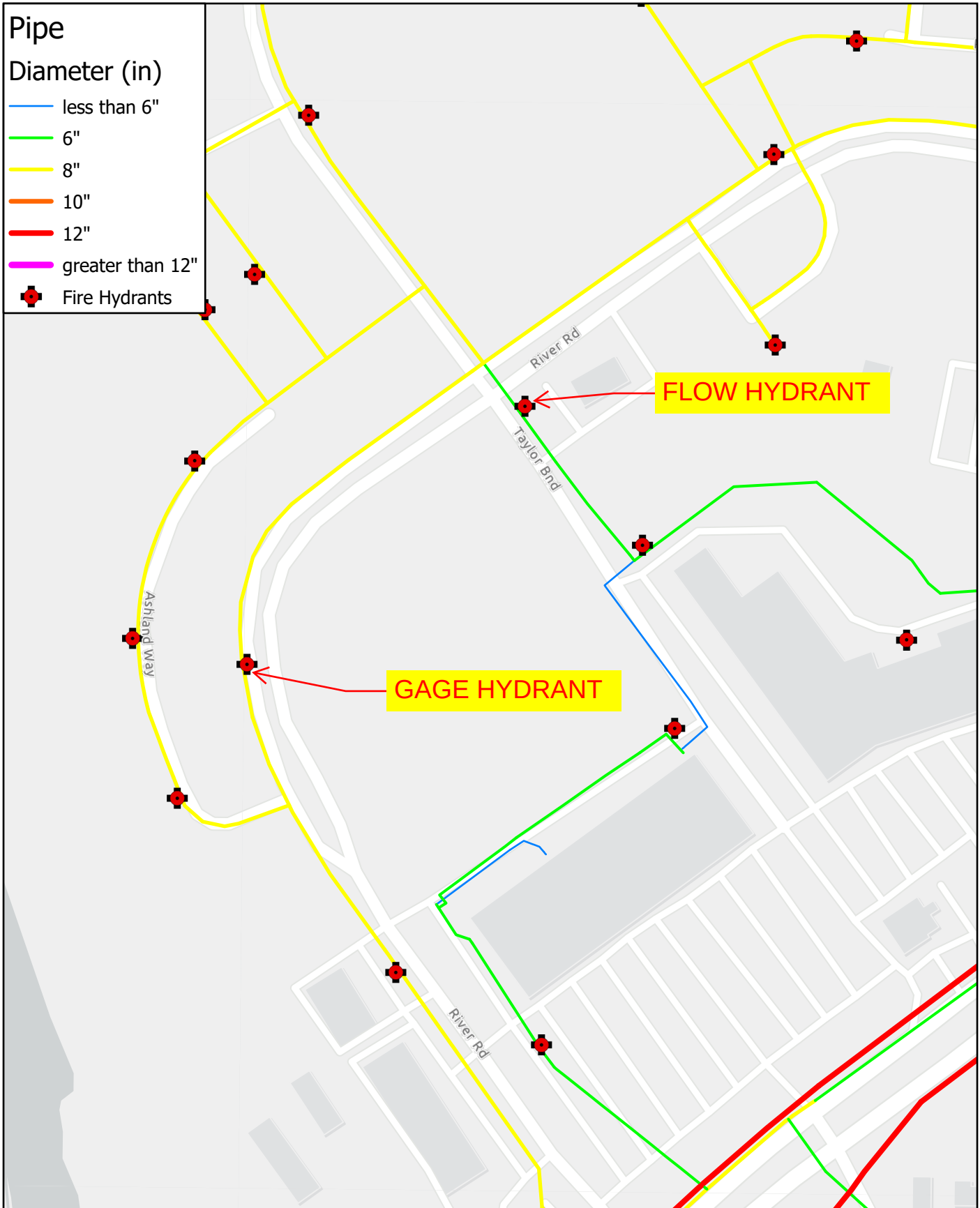
RESULTS: AT 20 PSI RESIDUAL

CONDITION 1 3618 GPM

CONDITION 2 --- GPM

REMARKS: Performance based on service elevation of 597' and current CPWS water infrastructure and does not account for additional losses associated with development piping.



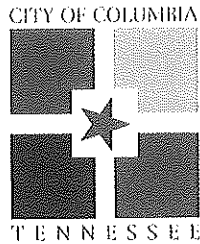


Hydrant Analysis Location Map River Road Residential Tax Map 90, Parcel 7.08	
Esri Community Maps Contributors, Tennessee STS GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA	2023
Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet	

N

0 0.02 0.04 Mi

0 0.04 0.07 Km



WASTEWATER DEPARTMENT

28 February 2023

Cliff Smith
CPS Land, LLC
213 Overlook Circle Suite B-2
Brentwood, TN 37027

RE: River Road 5.8 Map 090, Parcel 007.08

Cliff,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the above-referenced development. Any extension to the existing sewer infrastructure will be initiated by the owner/developer, reviewed by our department and approved by the State of Tennessee. The project must be advanced in accordance with local, state and federal rules, regulations and policies. Funding and construction of those improvements will remain the responsibility of the owner/developer. New customers will be required to pay all fees applicable at the time of connection. No detailed design plan for an extension of the sewer has been proposed at this time.

A handwritten signature in black ink, appearing to read "Donnie Boshers".

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department



DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

**PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION**

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)
Fold hard copy submittals larger than 8½"x11"*

ADDRESS/LOCATION	Nashville Hwy, Columbia, TN		
	TAX MAP: 051	GROUP:	PARCEL: 032.01
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 29 single family residential lots - Phase 2A of Drumwright.		

DATE OF PRE-APPLICATION CONFERENCE		<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	--	---

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Preliminary Plat ☒ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter
<i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Drumwright, Phase 2A ☒ Total Number of Lots 29 ☒ Total acreage ±5.30

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Allen B. O'Leary	PHONE	931-388-2329
ADDRESS	2486 Nashville Hwy, Columbia, TN	EMAIL	allen@wesengineers.com

PROPERTY OWNER NAME	AG Essential House Multi State 2, LLC	PHONE	
ADDRESS	2372 Nashville Highway Columbia, TN 38401	EMAIL	

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Lennar Homes of Tennessee LLC
Nick Branum

APPLICANT NAME
Steven S. Benson, the manager of
AGWIP Asset Management, LLC, an
Arizona limited liability company, the
Authorized Agent of AG Essential
Housing Multi State 2, LLC



APPLICANT SIGNATURE

04-04-2023

DATE

DocuSigned by:



5267235E778A4E5

4/4/2023

PROPERTY OWNER NAME

PROPERTY OWNER SIGNATURE

DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			



April 17, 2023

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: Project Name: Drumwright P.U.D., Phase 2A, Final Plat
City of Columbia Staff Review Submittal

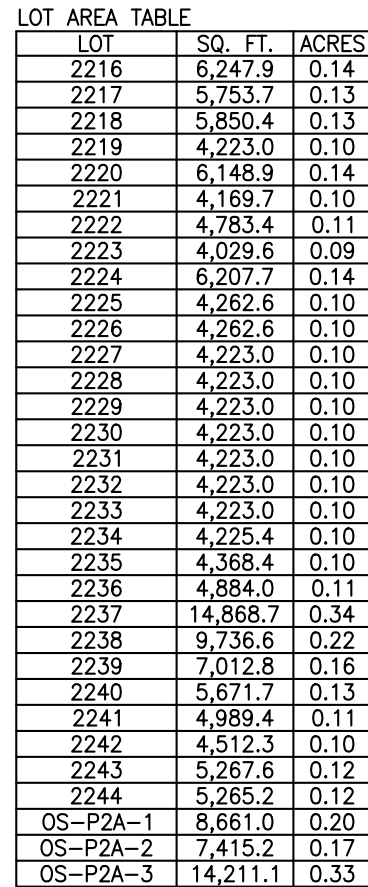
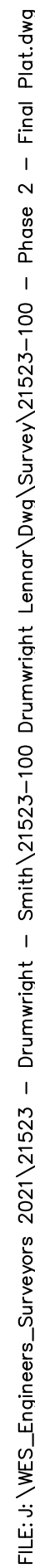
On behalf of AG Essential Housing Multi State 2, LLC, the owner of these 29 proposed single family lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for Planning Commission approval.

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

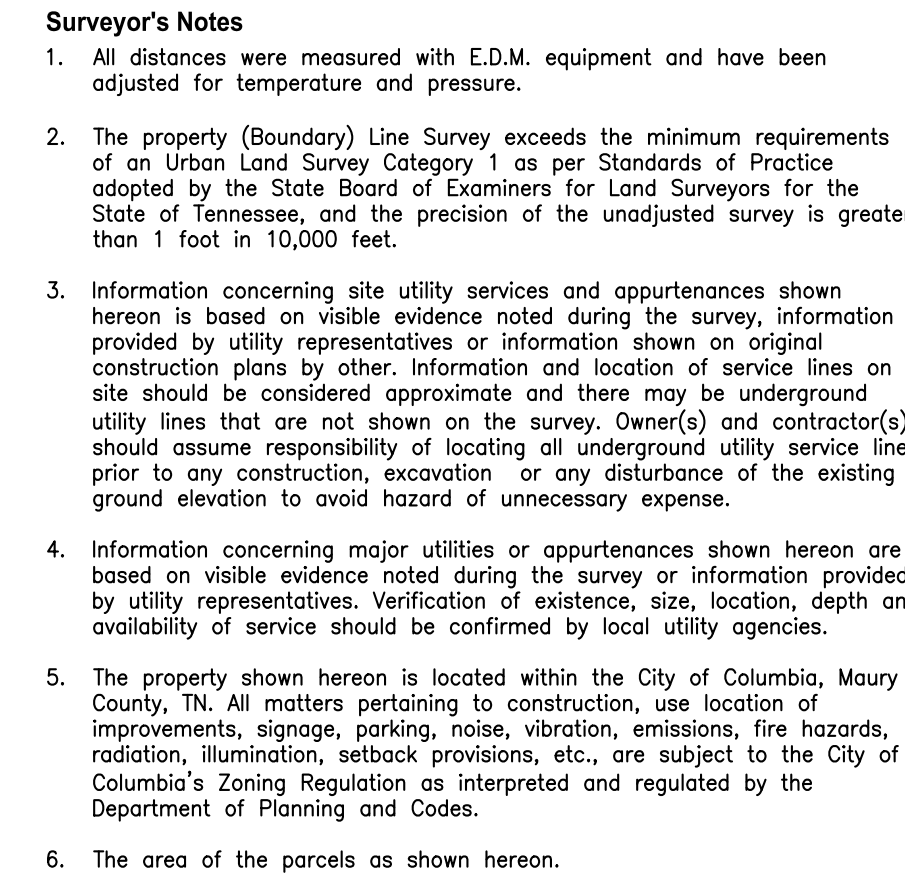
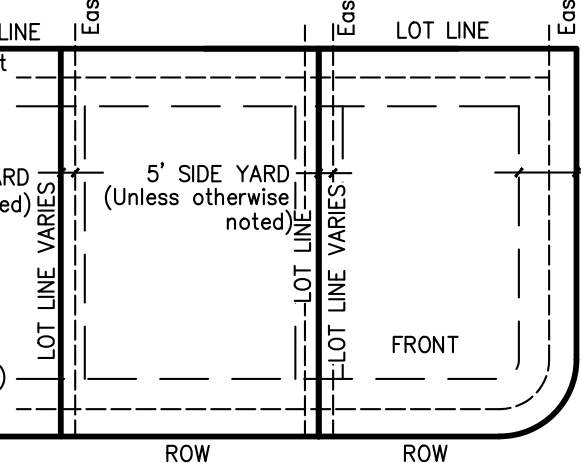
Sincerely,
WES Engineers & Surveyors

A handwritten signature in black ink that reads "Allen B. O'Leary". The signature is written in a cursive style with a large, looping "O" at the end.

Allen B. O'Leary, RLS
Principal



CURVE TABLE					
CURVE RADII	ARC LENGTH	CHORD LENGTH	CHORD BEARINGS	DELTA ANGLE	
C41	190.00	41.78	14.01	S 091°29'50" W	41°13'30"
C42	190.00	41.78	14.01	S 17°36'54" W	12°36'30"
C43	190.00	44.84	44.73	S 30°42'52" W	13°31'16"
C44	190.00	30.63	30.59	S 42°03'14" W	9°14'30"
C45	190.00	30.27	30.24	S 51°14'10" W	8°07'44" W
C46	190.00	34.24	34.23	S 81°25'58" W	11°15'08"
C47	190.00	37.32	37.26	S 72°41'18" W	11°15'14"
C48	190.00	37.27	37.21	S 83°06'56" W	11°14'24"
C49	190.00	24.99	24.97	N 86°40'39" E	7°32'06"
C50	200.00	24.98	24.97	N 1°18'42" E	11°14'24"
C50	200.00	37.33	37.27	N 76°15'07" W	10°41'36"
C51	200.00	35.87	35.83	N 65°26'13" W	10°26'37"
C52	200.00	1.45	1.45	N 68°05'23" W	07°14'38"
C53	175.00	12.75	12.75	S 30°51'56" W	3°07'56"
C163	25.00	39.27	35.95	S 25°05'24" E	9°00'00"
C170	150.00	58.35	58.36	S 71°40'41" E	22°17'11"
C171	140.00	1.46	1.46	S 83°12'15" E	0°35'58"
C172	140.00	58.41	57.99	S 84°16'18" E	2°45'15"
C173	140.00	158.04	146.78	S 40°13'45" E	9°00'00"
C174	140.00	2.00	2.00	N 07°29'57" E	0°49'07"
C175	25.00	39.27	35.96	N 37°54'36" E	6°40'00"
C176	175.00	29.73	29.69	N 78°02'36" E	9°44'01"
C177	175.00	41.20	41.19	N 70°51'56" E	7°03'56"
C178	175.00	41.20	41.11	N 59°17'56" E	13°29'24"



© 2023

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS

22486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE: (931) 388-2329
www.wesengineers.com

**Lennar Homes of Tennessee, LLC.
381 Mallory Station Road, Suite 200**

Client

DATE

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April 17, 2023

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: Project Name: Drumwright P.U.D., Phase 2B, Final Plat
City of Columbia Staff Review Submittal

On behalf of AG Essential Housing Multi State 2, LLC, the owner of these 14 proposed single family lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for Planning Commission approval.

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

Sincerely,
WES Engineers & Surveyors

A handwritten signature in black ink that reads 'Allen B. O'Leary'. The signature is written in a cursive style with a large, looping 'L' at the end.

Allen B. O'Leary, RLS
Principal



DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

**PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION**

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)
Fold hard copy submittals larger than 8½"x11"*

ADDRESS/LOCATION	Nashville Hwy, Columbia, TN		
	TAX MAP: 051	GROUP:	PARCEL: 032.01
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 14 single family residential lots - Phase 2B of Drumwright.		

DATE OF PRE-APPLICATION CONFERENCE		<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	--	---

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Preliminary Plat ☒ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter
<i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Drumwright, Phase 2B ☒ Total Number of Lots 14 ☒ Total acreage ±3.81

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Allen B. O'Leary	PHONE	931-388-2329
ADDRESS	2486 Nashville Hwy, Columbia, TN	EMAIL	allen@wesengineers.com

PROPERTY OWNER NAME	AG Essential House Multi State 2, LLC	PHONE	
ADDRESS	2372 Nashville Highway Columbia, TN 38401	EMAIL	

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Lennar Homes of Tennessee LLC
Nick Branum

APPLICANT NAME

Nick Branum

APPLICANT SIGNATURE

04.04.2023

DATE

Steven S. Benson, the manager of AGWIP Asset Management, LLC, an Arizona limited liability company, the Authorized Agent of AG Essential Housing Multi State 2, LLC

PROPERTY OWNER NAME

DocuSigned by:

Steve Benson

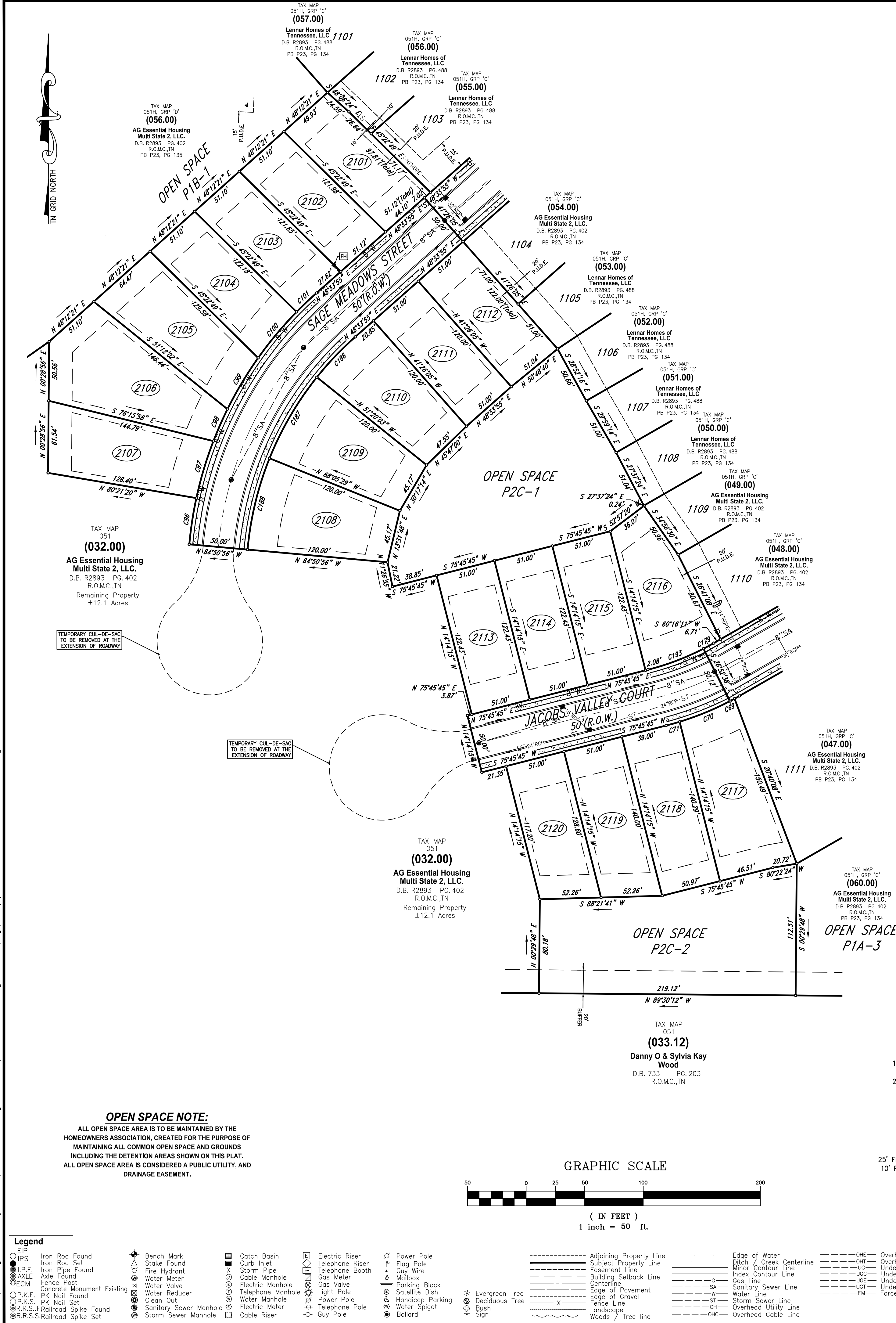
PROPERTY OWNER SIGNATURE

4/4/2023

DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			





April 17, 2023

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: Project Name: Drumwright P.U.D., Phase 2C, Final Plat
City of Columbia Staff Review Submittal

On behalf of AG Essential Housing Multi State 2, LLC, the owner of these 20 proposed single family lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for Planning Commission approval.

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

Sincerely,
WES Engineers & Surveyors

A handwritten signature in black ink that reads 'Allen B. O'Leary'. The signature is written in a cursive style with a large, looping 'L' at the end.

Allen B. O'Leary, RLS
Principal



CITY OF
COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*

Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	Nashville Hwy, Columbia, TN		
	TAX MAP: 051	GROUP:	PARCEL: 032.00
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 20 single family residential lots - Phase 2C of Drumwright.		

DATE OF PRE-APPLICATION CONFERENCE		<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	--	---

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Preliminary Plat ☒ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter
<i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Drumwright, Phase 2C ☒ Total Number of Lots 20 ☒ Total acreage ±4.84

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Allen B. O'Leary	PHONE	931-388-2329
ADDRESS	2486 Nashville Hwy, Columbia, TN	EMAIL	allen@wesengineers.com

PROPERTY OWNER NAME	AG Essential House Multi State 2, LLC	PHONE	
ADDRESS	2372 Nashville Highway Columbia, TN 38401	EMAIL	

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Lennar Homes of Tennessee LLC
Nick Branum

APPLICANT NAME

Steven S. Benson, the manager of AGWIP Asset Management, LLC, an Arizona limited liability company, the Authorized Agent of AG Essential Housing Multi State 2, LLC

PROPERTY OWNER NAME



APPLICANT SIGNATURE

04-04-2023

DATE

DocuSigned by:



PROPERTY OWNER SIGNATURE

4/4/2023

DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			



April 17, 2023

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: Project Name: Drumwright P.U.D., Phase 2D, Final Plat
City of Columbia Staff Review Submittal

On behalf of AG Essential Housing Multi State 2, LLC, the owner of these 51 proposed townhome lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for Planning Commission approval.

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

Sincerely,
WES Engineers & Surveyors

A handwritten signature in black ink that reads 'Allen B. O'Leary'. The signature is written in a cursive style with a large, looping 'L' at the end.

Allen B. O'Leary, RLS
Principal



DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

**PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION**

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)
Fold hard copy submittals larger than 8½"x11"*

ADDRESS/LOCATION	Nashville Hwy, Columbia, TN		
	TAX MAP: 051	GROUP:	PARCEL: 032.00
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 51 townhome lots - Phase 2D of Drumwright.		

DATE OF PRE-APPLICATION CONFERENCE		<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	--	---

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Preliminary Plat ☒ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other:	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter
<i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Drumwright, Phase 2D ☒ Total Number of Lots 51 ☒ Total acreage ±5.38

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Allen B. O'Leary	PHONE	931-388-2329
ADDRESS	2486 Nashville Hwy, Columbia, TN	EMAIL	allen@wesengineers.com

PROPERTY OWNER NAME	AG Essential House Multi State 2, LLC	PHONE	
ADDRESS	2372 Nashville Highway Columbia, TN 38401	EMAIL	

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Lennar Homes of Tennessee LLC
Nick Branum

APPLICANT NAME

Steven S. Benson, the manager of AGWIP Asset Management, LLC, an Arizona limited liability company, the Authorized Agent of AG Essential Housing Multi State 2, LLC

PROPERTY OWNER NAME

Nick Branum

APPLICANT SIGNATURE

04-04-2023

DATE

DocuSigned by:

Steve Benson

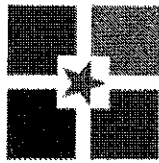
4/4/2023

PROPERTY OWNER SIGNATURE

DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
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BOARD ACTION			



CITY OF
COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)
Fold hard copy submittals larger than 8½"x11"*

ADDRESS/LOCATION	1451 Lasea Road, Columbia, TN		
	TAX MAP: 073	GROUP:	PARCEL: 051.00
SUMMARY OF NATURE OF REQUEST AND WORK	Preliminary Development Plan and Preliminary Plat of residential development		

DATE OF PRE-APPLICATION CONFERENCE	2/22/2023	Pre-application meetings are scheduled for Wednesdays.
------------------------------------	-----------	--

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☒ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☒ Other: Preliminary Development plan	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter
<i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) <u>Highland Point @ Bear Creek</u> ☐ Total Number of Lots <u>143</u> ☐ Total acreage <u>29.5 acres</u>

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Joseph Ahler P.E., R.L.S.	PHONE	615-481-3106
ADDRESS	P.O. Box 1636, Spring Hill, TN	EMAIL	joe.ahler@gmail.com

37174

PROPERTY OWNER NAME	Imer Development, LLC	PHONE	615-788-1320
ADDRESS	1909 Columbia Ave., Franklin	EMAIL	stuart@nasonhomes.com

TN, 37064

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Joseph Ahler

APPLICANT NAME

Joseph Ahler

APPLICANT SIGNATURE

4/17/2023

DATE

Imer Development, LLC

PROPERTY OWNER NAME

AA

PROPERTY OWNER SIGNATURE

4/17/2023

DATE

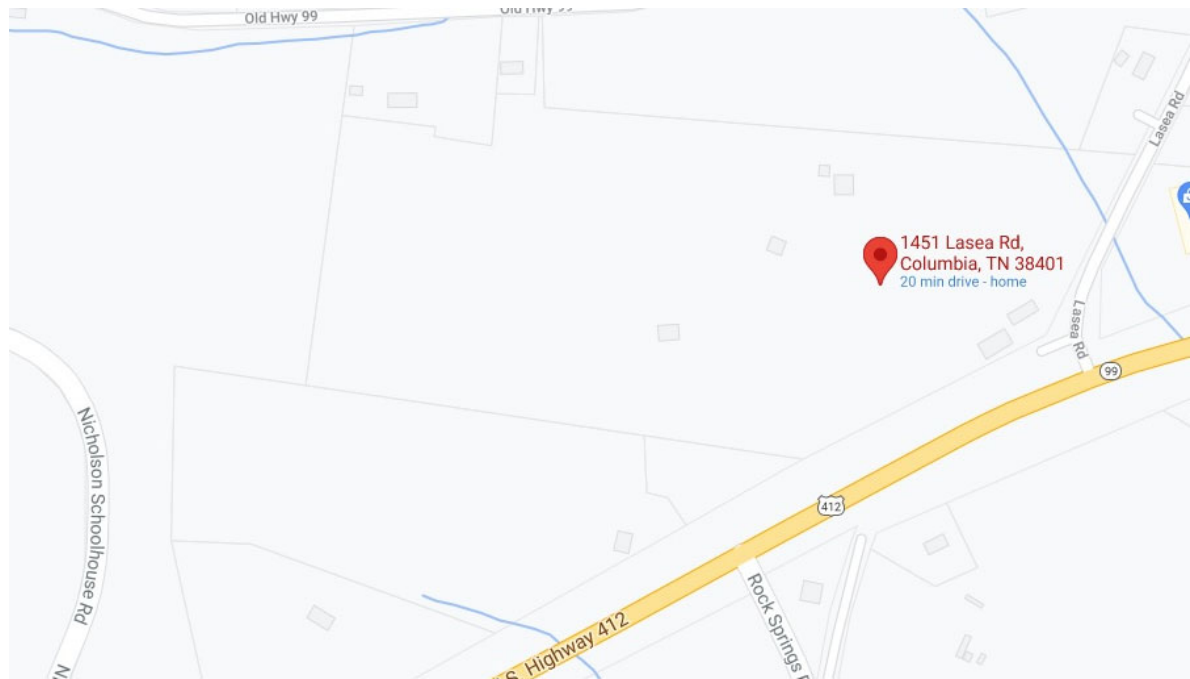
STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			

PRELIMINARY DEVELOPMENT PLAN
HIGHLAND POINTE AT BEAR CREEK
1451 LASEA ROAD
COLUMBIA, TENNESSEE
MAP 73, PARCEL 51

SHEET INDEX

C0.0-COVER SHEET
C1.0- GENERAL NOTES
C2.0-EXISTING CONDITIONS
C3.0-SITE PLAN
C4.0-UTILITY PLAN
C5.0-GRADING PLAN
C6.0-EROSION CONTROL PLAN-PH. 1
C7.0-EROSION CONTROL PLAN-PH. 2
C8.0-EROSION CONTROL PLAN-PH. 3
C9.0-TREE PRESERVATION PLAN



VICINITY MAP
NTS

UTILITY COMPANIES

WATER

COLUMBIA POWER & WATER SYSTEM
201 PICKENS LANE
COLUMBIA, TN 38401
931-388-4833

SEWER

COLUMBIA WASTEWATER SYSTEM
1244 TREATMENT PLANT ROAD
COLUMBIA, TN 38401
931-560-1011

NATURAL GAS

ATMOS ENERGY
810 NASHVILLE HWY.
COLUMBIA, TN 38401
931-388-9136

ELECTRIC

COLUMBIA POWER & WATER SYSTEM
201 PICKENS LANE
COLUMBIA, TN 38401
931-388-4833

OWNER

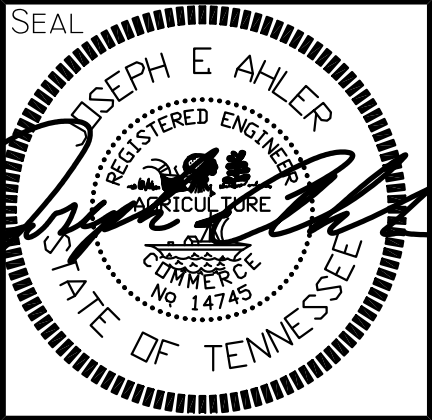
IMER DEVELOPMENT, LLC
1909 COLUMBIA AVENUE
FRANKLIN, TN 37064
615-788-1320

A

Ahler & Associates, LLC
CONSULTING ENGINEERS & LAND SURVEYORS

SURVEYING
PLANNING
DESIGN
CIVIL

P.O. BOX 1636
SPRING HILL, TN 37174
PH 615.481.3106
FAX 615.523.1517



HIGHLAND POINTE AT BEAR CREEK

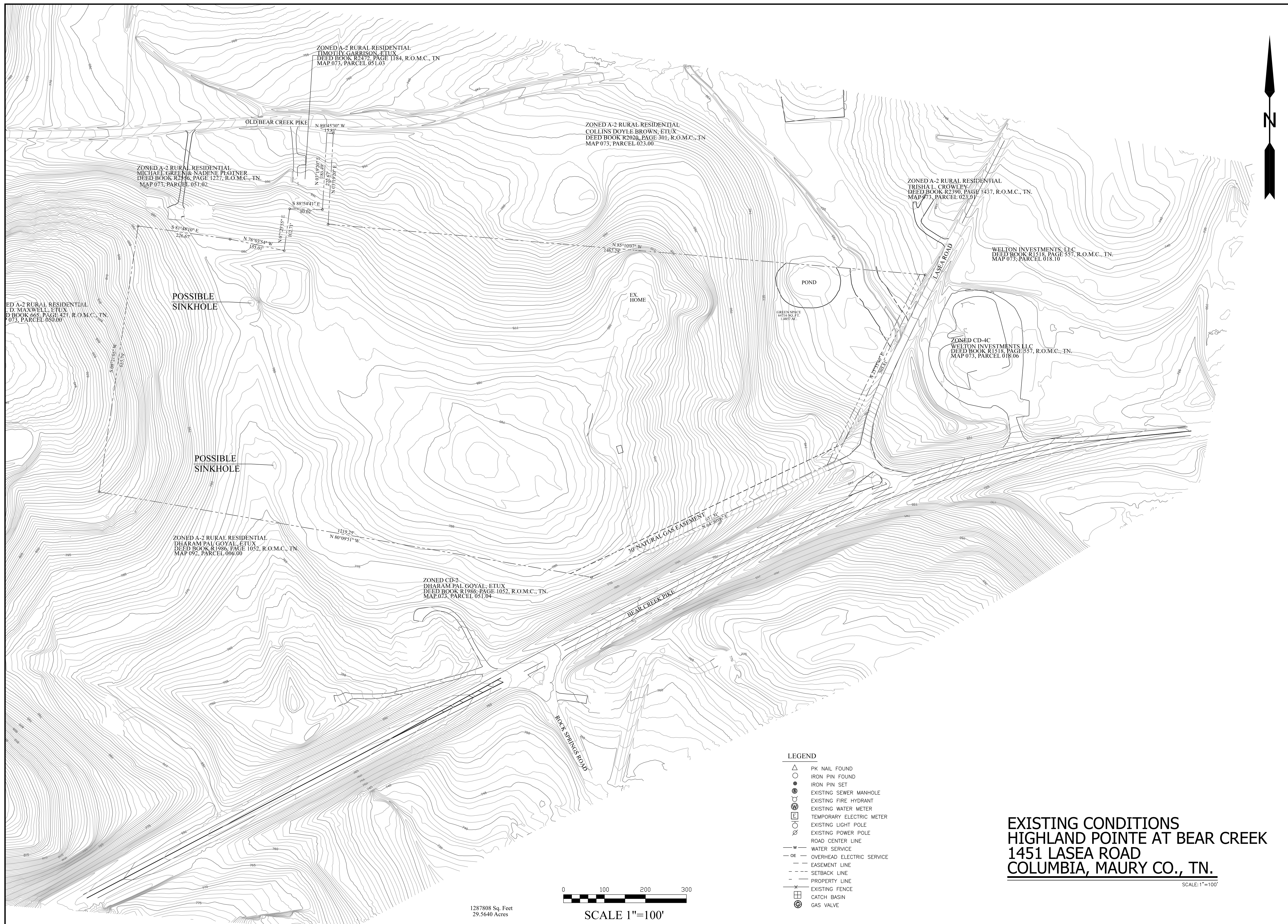
1451 LASEA ROAD
COLUMBIA, MAURY CO., TN

ISSUE:		ORIGINAL	ISSUE
		1/17/23	DESCRIPTION

PROJECT No:	NUMBER
DWG. FILE:	DWGFILE
DRAWN BY:	JEA
CHK'D BY:	JEA

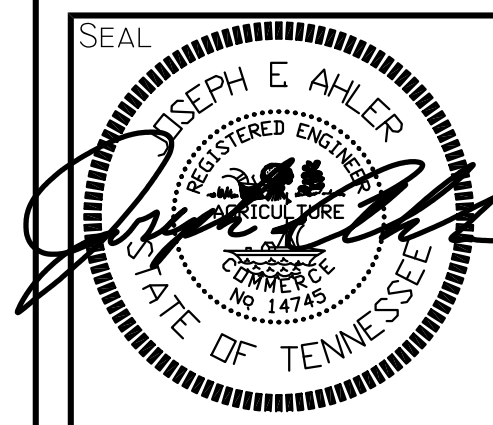
SHEET DESCRIPTION
COVER SHEET

C0.0



Ahlher & Associates, LLC
CONSULTING ENGINEERS & LAND SURVEYORS

SUPERVISING
PLANNING
DESIGN
CIVIL



HIGHLAND POINTE AT BEAR CREEK

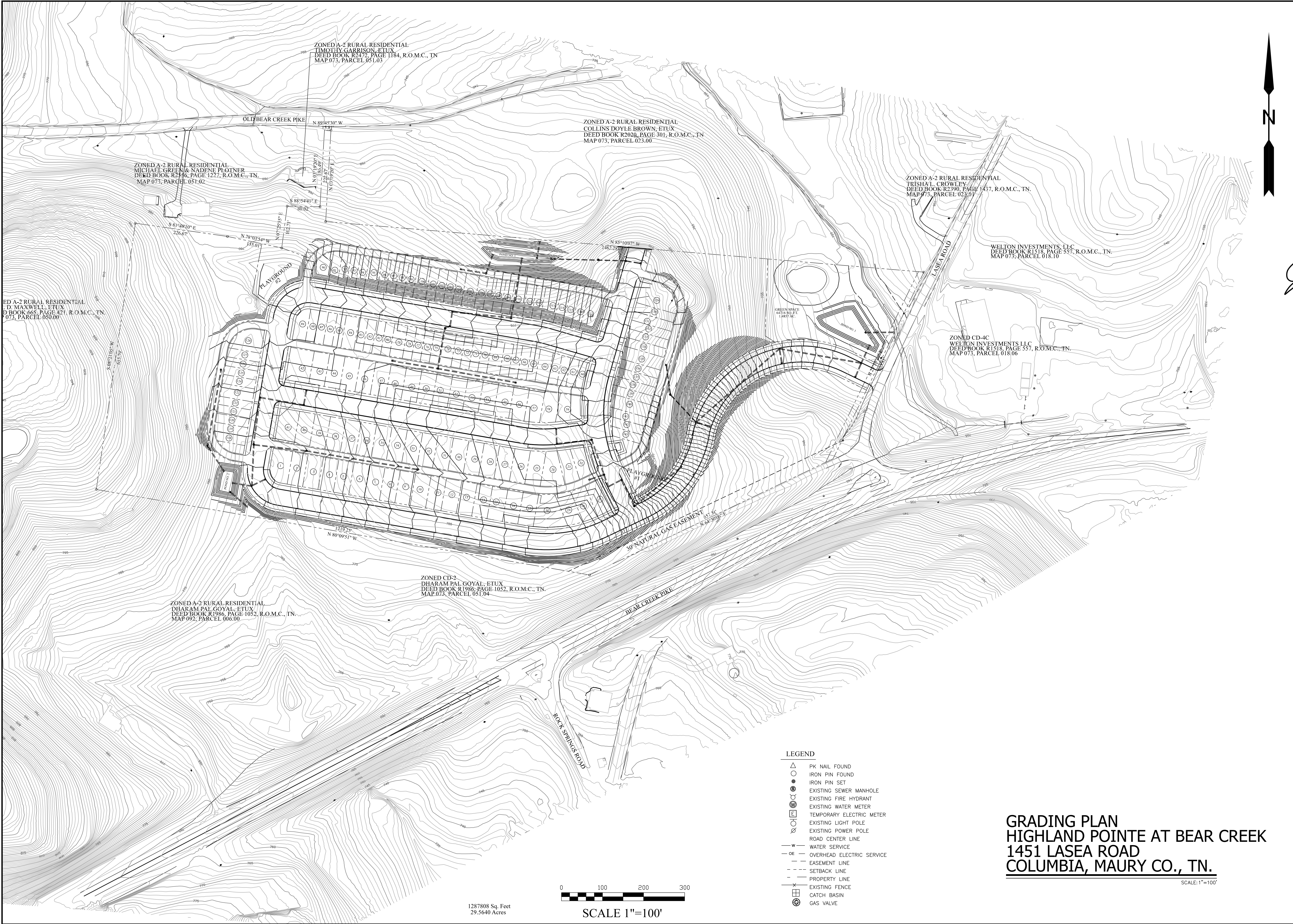
1451 LASEA ROAD
COLUMBIA, MAURY CO., TN

ISSUE:	
-	1/04/23 ORIGINAL ISSUE
MARK	DATE DESCRIPTION

PROJECT NO:	NUMBER
DWG. FILE:	DWGFILE
DRAWN BY:	JEA
CHK'D BY:	JEA

SHEET DESCRIPTION
EXISTING CONDITIONS -

C2.0



ZONED A-2 RURAL RESIDENTIAL
D. MAXWELL, ETUX
DEED BOOK 665, PAGE 421, R.O.M.C., TN.
MAP 073, PARCEL 050.00

ZONED A-2 RURAL RESIDENTIAL
MICHAEL GREEN & NADINE PLOTNER
DEED BOOK R2746, PAGE 1227, R.O.M.C., TN.
MAP 073, PARCEL 051.02

ZONED A-2 RURAL RESIDENTIAL
TIMOTHY GARRISON, ETUX
DEED BOOK R2772, PAGE 1184, R.O.M.C., TN.
MAP 073, PARCEL 051.03

ZONED A-2 RURAL RESIDENTIAL
COLLINS DOYLE BROWN, ETUX
DEED BOOK R2020, PAGE 301, R.O.M.C., TN.
MAP 073, PARCEL 023.00

ZONED A-2 RURAL RESIDENTIAL
TRISHA L. CROWLEY
DEED BOOK R2390, PAGE 1437, R.O.M.C., TN.
MAP 073, PARCEL 023.01

WELTON INVESTMENTS, LLC
DEED BOOK R1518, PAGE 557, R.O.M.C., TN.
MAP 073, PARCEL 018.10

ZONED CD-4C
WELTON INVESTMENTS, LLC
DEED BOOK R1518, PAGE 557, R.O.M.C., TN.
MAP 073, PARCEL 018.06

ZONED A-2 RURAL RESIDENTIAL
DHARAM PAL GOYAL, ETUX
DEED BOOK R1986, PAGE 1052, R.O.M.C., TN.
MAP 092, PARCEL 006.00

ZONED CD-2
DHARAM PAL GOYAL, ETUX
DEED BOOK R1986, PAGE 1052, R.O.M.C., TN.
MAP 073, PARCEL 051.04

LEGEND

- △ PK NAIL FOUND
- IRON PIN FOUND
- IRON PIN SET
- ⊙ EXISTING SEWER MANHOLE
- ⊙ EXISTING FIRE HYDRANT
- ⊙ EXISTING WATER METER
- ⊙ TEMPORARY ELECTRIC METER
- ⊙ EXISTING LIGHT POLE
- ⊙ EXISTING POWER POLE
- ROAD CENTER LINE
- WATER SERVICE
- OE OVERHEAD ELECTRIC SERVICE
- EASEMENT LINE
- SETBACK LINE
- - - PROPERTY LINE
- x EXISTING FENCE
- ⊕ CATCH BASIN
- ⊙ GAS VALVE



SCALE 1"=100'

1287808 Sq. Feet
29.5640 Acres

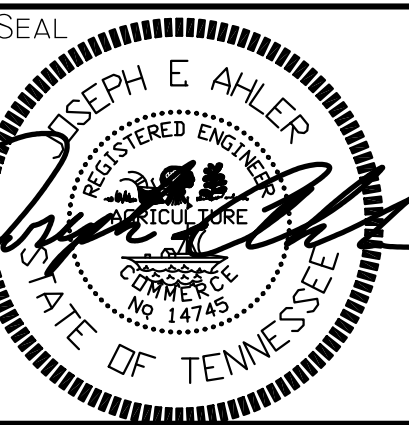
GRADING PLAN
HIGHLAND POINTE AT BEAR CREEK
1451 LASEA ROAD
COLUMBIA, MAURY CO., TN.

SCALE: 1"=100'

A
Ahler & Associates, LLC
CONSULTING ENGINEERS & LAND SURVEYORS

P.O. BOX 1636
SPRING HILL, TN 37174
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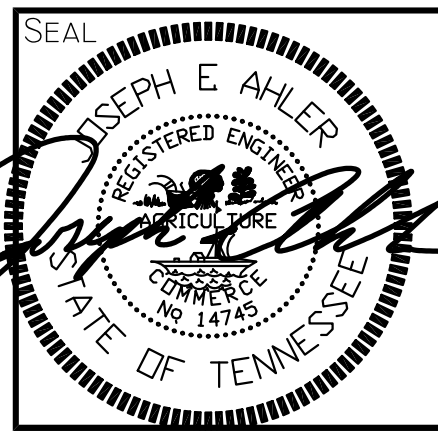
HIGHLAND POINTE AT BEAR CREEK
1451 LASEA ROAD
COLUMBIA, MAURY CO., TN

ISSUE:		DATE	DESCRIPTION

PROJECT No:	NUMBER
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DRAWN BY:	JEA
CHK'D BY:	JEA

SHEET DESCRIPTION	
GRADING PLAN	-

C5.0



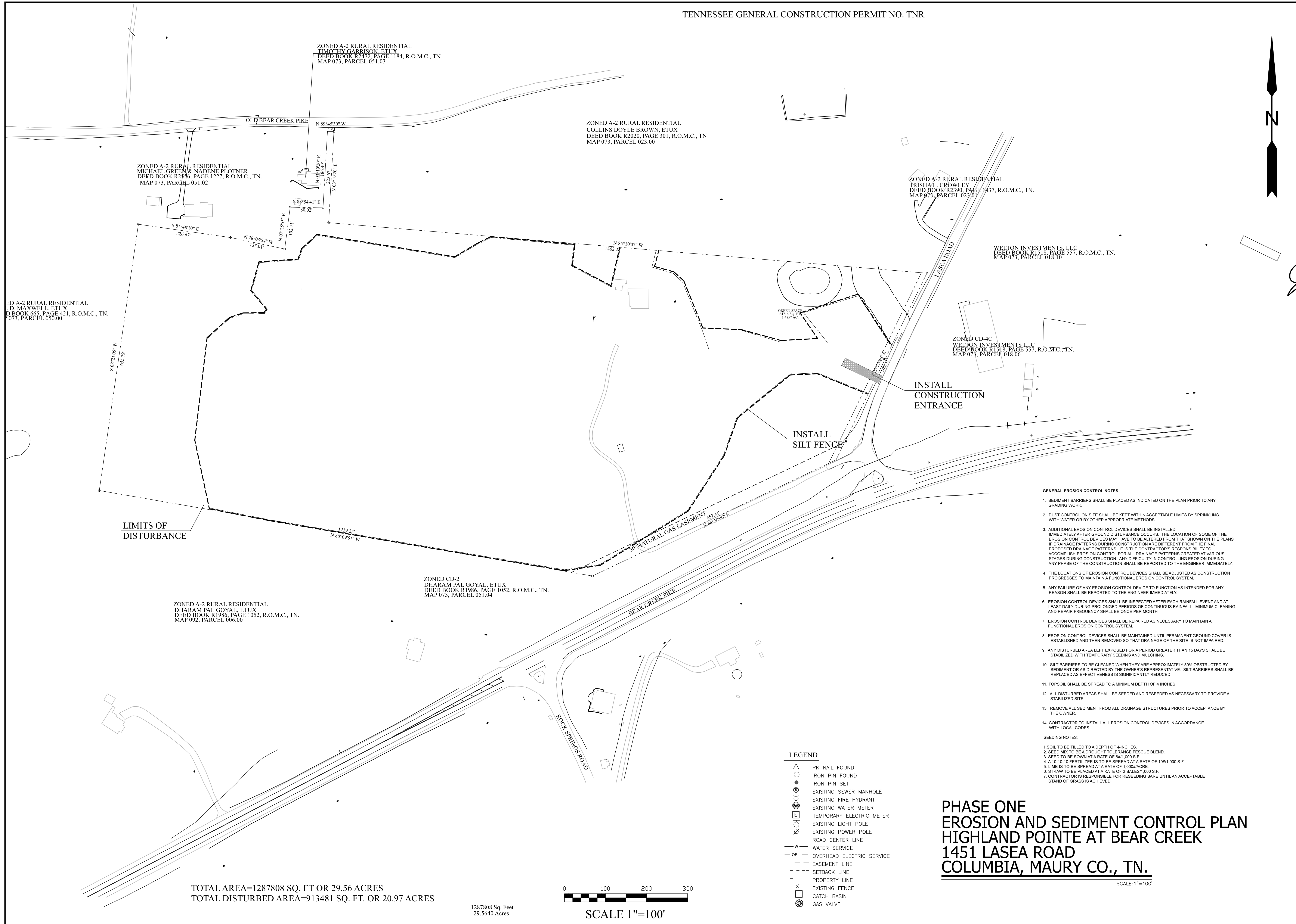
1451 LASEA ROAD
COLUMBIA, MAURY CO., TN

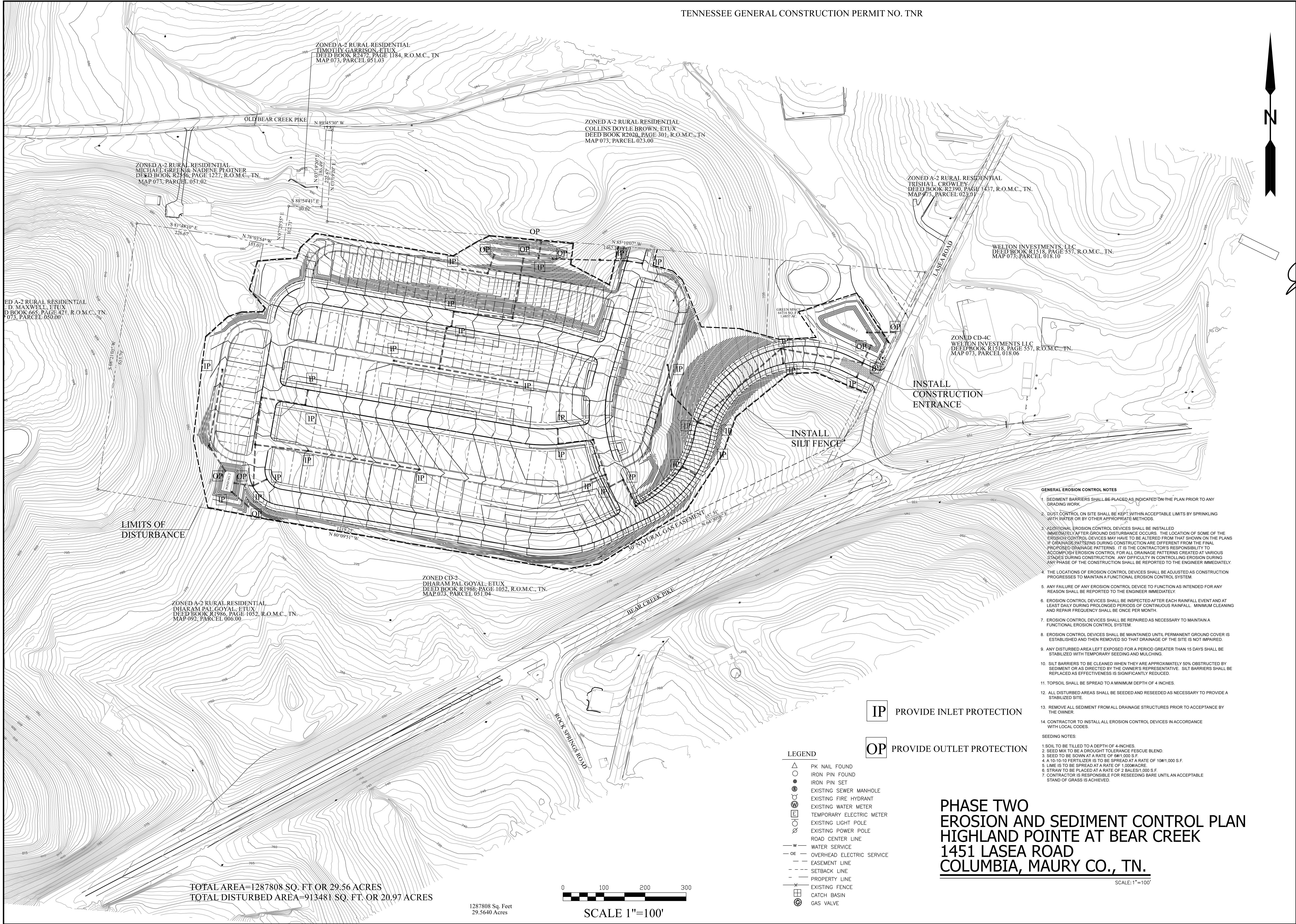
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-	4/10/23 ORIGINAL ISSUE
MARK	DATE DESCRIPTION

PROJECT NO:	NUMBER
DWG. FILE:	DWGFILE
DRAWN BY:	JEA
CHK'D BY:	JEA

EROSION
CONTROL
PLAN

Page 164 of 292





STABILIZATION SYMBOLS

(SS) SEED AND STRAW(ALL AREAS BETWEEN CURB & SIDEWALK)

(AP) ASPHALT PAVING

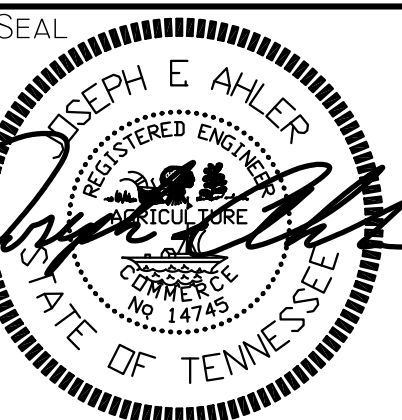


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HIGHLAND POINTE AT BEAR CREEK

1451 LASEA ROAD
COLUMBIA, MAURY CO., TN

ISSUE:

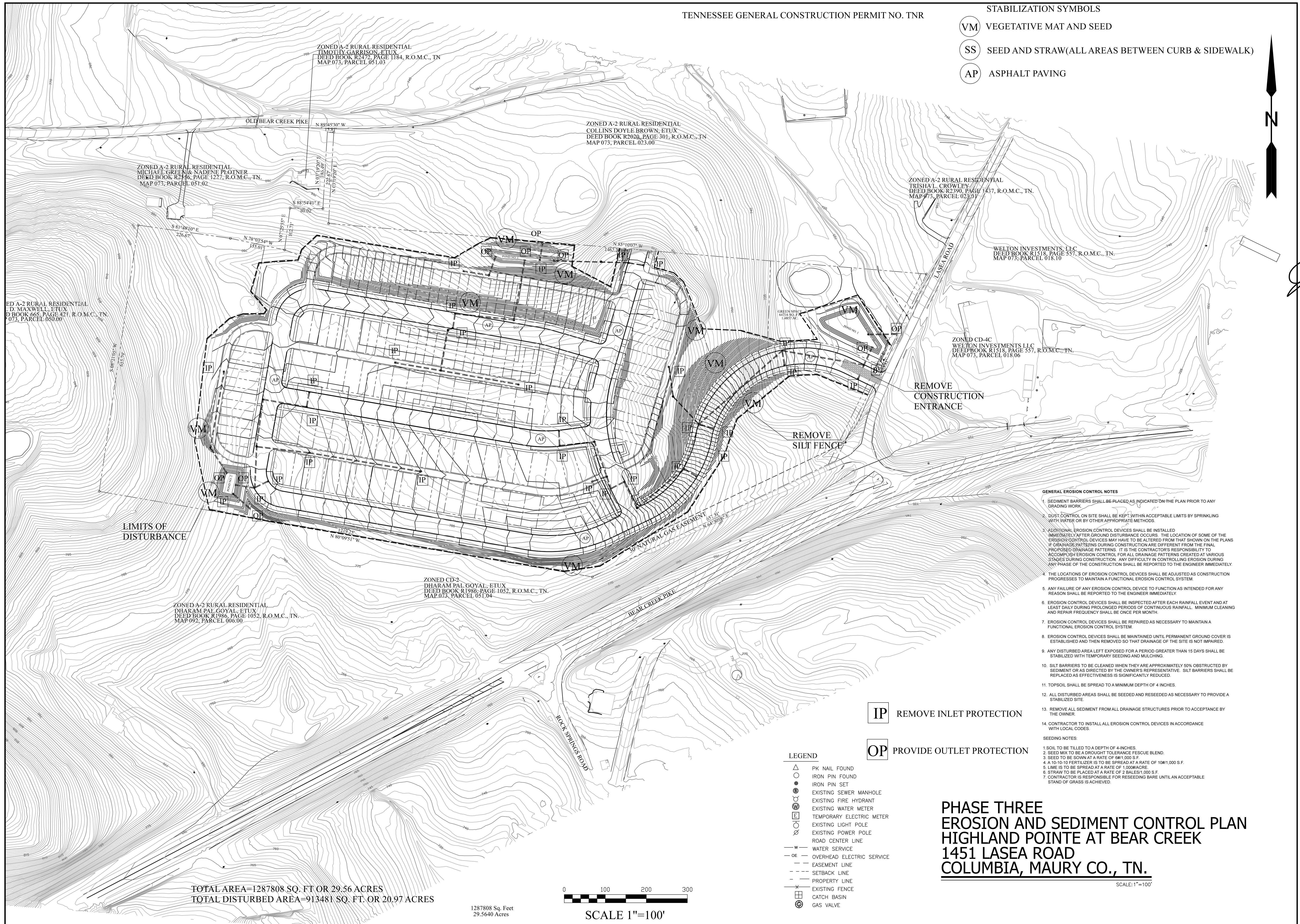
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CHK'D BY:	JEAN

SHEET DESCRIPTION

EROSION
CONTROL
PLAN

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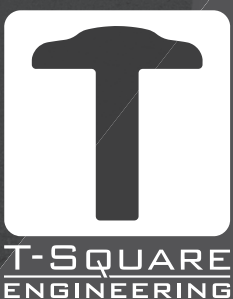


TRAFFIC IMPACT STUDY

Crichton Property
Development

Map 112 Parcel 003.00
Columbia, TN

T2-Eng.com



TRAFFIC IMPACT STUDY

1451 Lasea Road Development
Tax Map 73 Parcel 51
Columbia, TN

Prepared for:



1909 Columbia Avenue
Franklin, TN 37064

Prepared by:



T-SQUARE ENGINEERING

1329 West Main Street
Franklin, TN 37064
615.678.8212
www.T2-eng.com



Certification

I certify that this Traffic Impact Study has been prepared by me and under my immediate supervision and that I have the experience and training in the field of traffic and transportation engineering.



10/18/21

James O. Ensley, III, P.E.
T-Square Engineering, Inc.
Project Manager – Traffic Division

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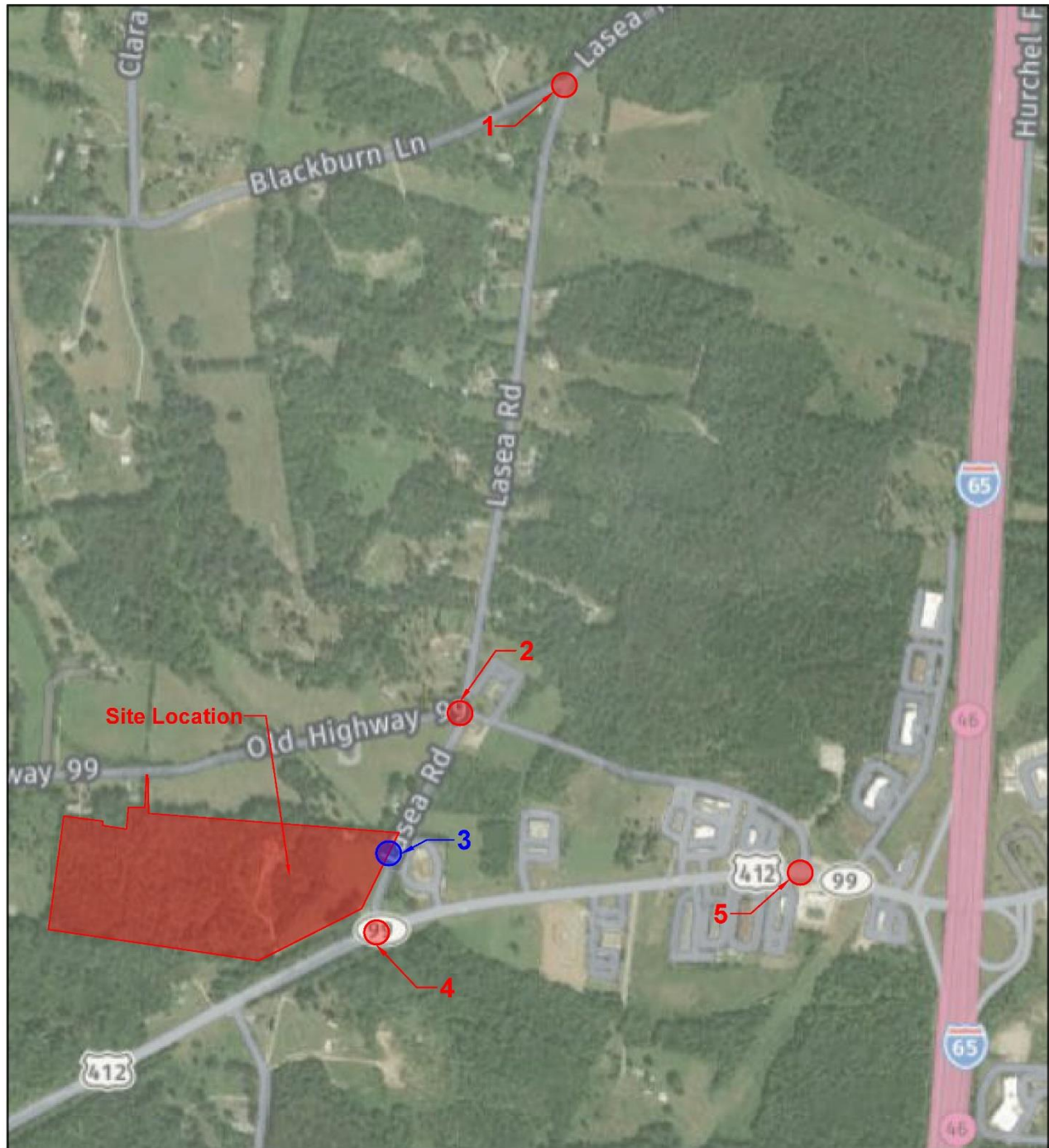
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Introduction

The purpose of this study is to analyze the traffic impacts on the surrounding roadway network associated with the proposed 1451 Lasea Road Development along Lasea Road in Columbia, TN. The proposed development will consist of approximately 208 multi-family (low-rise) housing units.

As shown on the Location Map and Preliminary Site Plan on Figures 1 and 2, respectively, the proposed development is located along the west side of Lasea Road in Columbia, TN. The development is proposing one (1) site access located approximately 400 feet north of the intersection of Lasea Road and Bear Creek Pike. The surrounding area is predominantly residential.

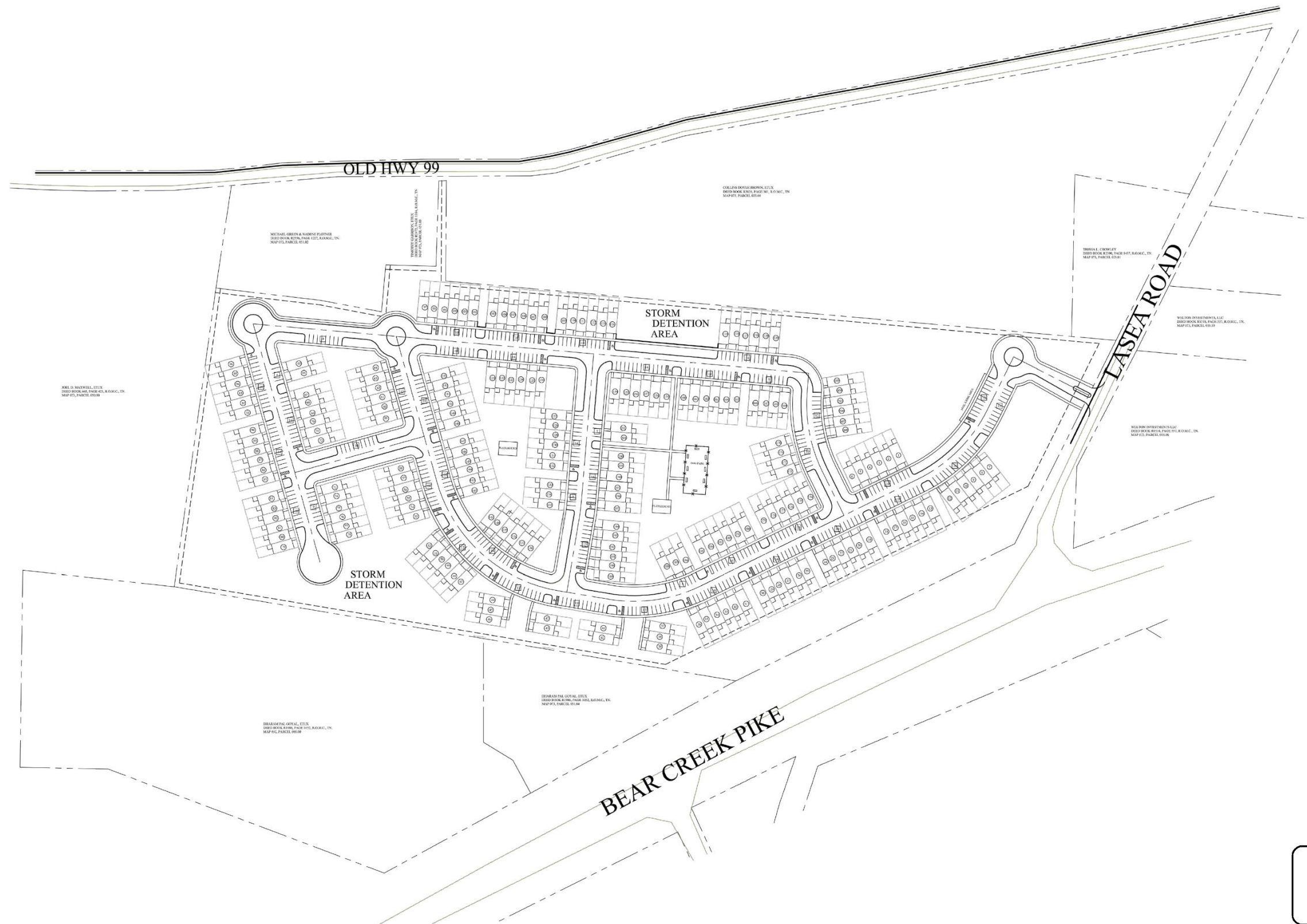
This study analyzes the existing and projected traffic operations of the roadway networks and intersections surrounding the proposed development. To evaluate the projected traffic operations, existing traffic volumes were grown (background traffic volumes) to a 2023 design year based on average traffic growth rates and combined with the generated traffic volumes from nearby background developments and estimated trips generated from the proposed development. Lastly, improvement recommendations were presented to alleviate the anticipated traffic volumes' effect on the existing roadway network near the site.



LEGEND	
●	Existing Study Intersection
●	Proposed Study Intersection



Figure 1
Location Map



Existing Study Area

Existing Roadway Network

The existing roadway network surrounding the proposed Quail Run Meadows Subdivisions includes Lasea Road, Bear Creek Pike (US-412), Old Highway 99, and Blackburn Lane. Below is a description of each roadway. Below is a description of each roadway serving the proposed development:

Lasea Road

Lasea Road is not functionally classified in the City of Columbia, and therefore assumed to be classified as a local roadway. Lasea Road is oriented in a north-south direction and provides a connection between Bear Creek Pike (US-412) to the south and Joe Brown Road to the north. Near the project site, Lasea Road is a two (2) lane roadway with one (1) ten (10) foot travel lane in each direction (northbound and southbound) and three (3) foot shoulders. There is no posted speed limit along Lasea Road. The assumed speed limit for Lasea Road is 35 MPH.



Bear Creek Pike (US-412)

Bear Creek Pike (US-412) is functionally classified by the City of Columbia as an arterial roadway. Bear Creek Pike (US-412) is oriented in an east-west direction and provides a connection between I-65 to the east and Nashville Highway to the west. Near the project site, Bear Creek Pike (US-412) is a three (3) lane roadway with one (1) twelve (12) foot travel lane in each direction (eastbound and westbound), a center two-way left turn lane (TWLTL), and four (4) foot shoulders. The posted speed limit along Bear Creek Pike (US-412) is 45 MPH.



Old Highway 99

Old Highway 99 is functionally classified by the City of Columbia as a collector roadway. Near the project site, Old Highway 99 is oriented in an east-west direction and provides a connection to Bear Creek Pike (US-412) to the east and west. Near the project site, Old Highway 99 is a two (2) lane roadway with one (1) nine (9) foot travel lane in each direction (eastbound and westbound) and one (1) foot shoulders. The posted speed limit along Old Highway 99 is 25 MPH.



Blackburn Lane

Blackburn Lane is not functionally classified in the City of Columbia, and therefore assumed to be classified as a local roadway. Near the project site, Blackburn Lane is oriented in an east-west direction and provides a connection from Lasea Road to the east and Old Highway 99 to the west. Blackburn Lane is a two (2) lane roadway with one (1) nine (9) foot travel lane in each direction (eastbound and westbound). No shoulders currently exist along Blackburn Lane. The posted speed limit along Blackburn Lane is 45 MPH.



Existing Intersections

This study analyzed four (4) existing intersections within the vicinity of the project site. The intersections analyzed are listed below with a brief description of each, and Figure 3 shows the existing lane geometry at the intersections.

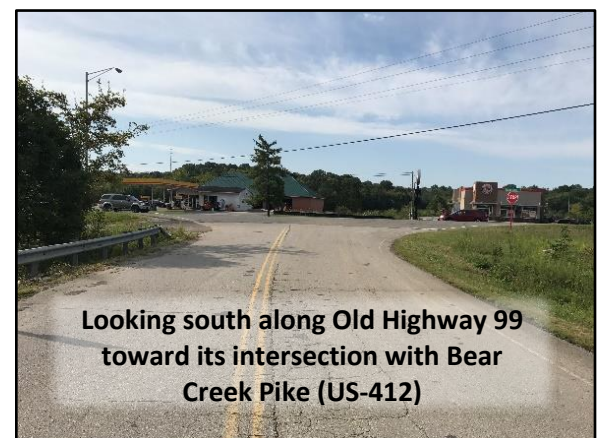
Lasea Road and Bear Creek Pike (US-412)

The existing intersection of Lasea Road and Bear Creek Pike (US-412) is an unsignalized intersection with three (3) approaches. The southbound approach of Lasea Road has one (1) shared lane for left and right turn movements operating under a stop condition. The eastbound approach of Bear Creek Pike (US-412) has one (1) exclusive lane for left turn movements that transitions into a two-way left-turn lane and one (1) exclusive lane for through movements operating under a free-flow condition. The westbound approach of Bear Creek Pike (US-412) has one (1) shared lane for through and right turn movements operating under a free-flow condition.



Old Highway 99 and Bear Creek Pike (US-412)

The existing intersection of Old Highway 99 and Bear Creek Pike (US-412) is an unsignalized intersection with three (3) approaches. The southbound approach of Old Highway 99 has one (1) shared lane for left and right turn movements operating under a stop condition. The eastbound approach of Bear Creek Pike (US-412) has one (1) exclusive lane for left turn movements that transitions into a two-way left-turn lane and one (1) exclusive lane for through movements operating under a free-flow condition. The westbound approach of Bear Creek Pike (US-412) has one (1) shared lane for through and right turn movements operating under a free-flow condition.



Lasea Road and Old Highway 99

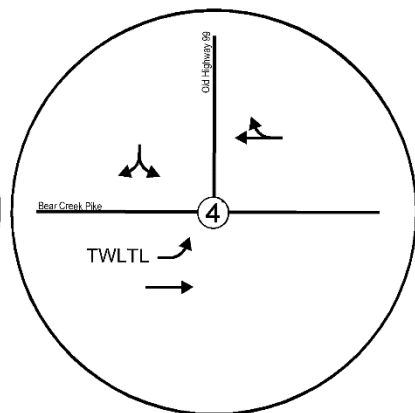
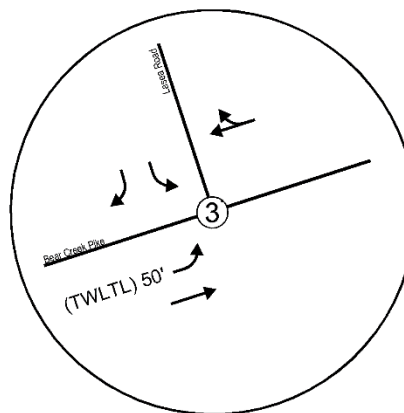
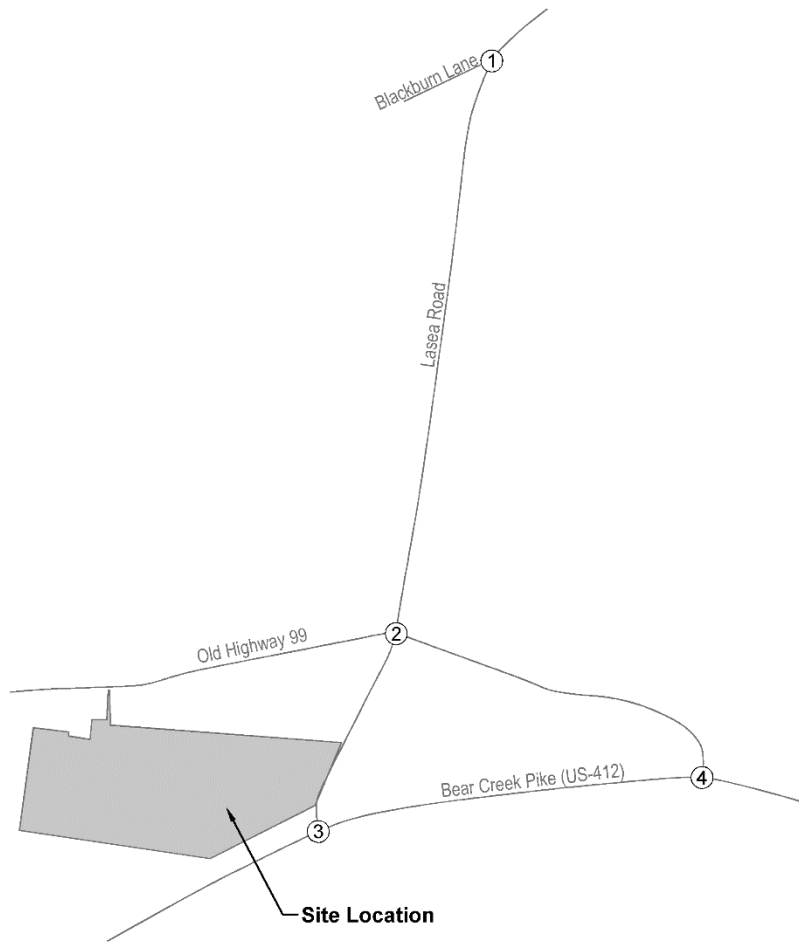
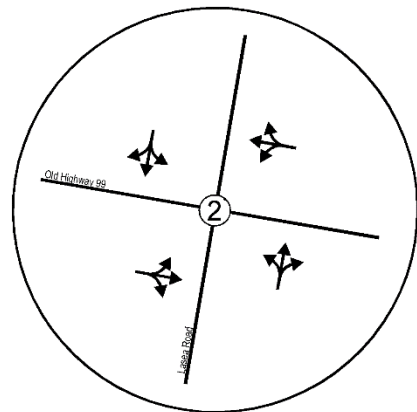
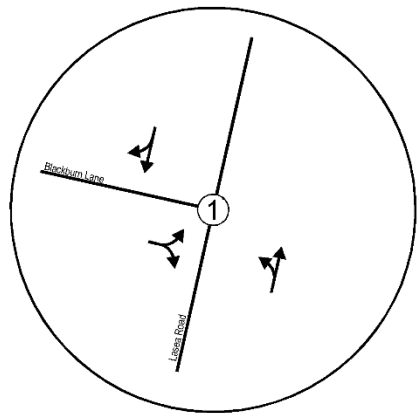
The existing intersection of Lasea Road and Old Highway 99 is an unsignalized intersection with four (4) approaches. The southbound approach of Lasea Road has one (1) shared lane for left turn, through, and right turn movements operating under a stop condition. The northbound approach of Lasea Road has one (1) shared lane for left turn, through, and right turn movements operating under a stop condition. The eastbound approach of Old Highway 99 has one (1) shared lane for left turn, through, and right turn movements operating under a stop condition. The westbound approach of Old Highway 99 has one (1) shared lane for left turn, through, and right turn movements operating under a stop condition.



Lasea Road and Blackburn Lane

The existing intersection of Lasea Road and Blackburn Lane is an unsignalized intersection with three (3) approaches. The eastbound approach of Blackburn Lane has one (1) shared lane for left and right turn movements operating under a stop condition. The northbound approach of Lasea Road has one (1) shared lane for left turn and through movements operating under a free-flow condition. The southbound approach of Lasea Road has one (1) shared lane for through and right turn movements operating under a free-flow condition.





LEGEND
XX' - Storage Length



Figure 3
Existing Lane Geometry

Existing Traffic Volumes

To establish existing traffic volumes within the study area (as requested and provided by the City of Columbia), T-Square Engineering utilized the turning movement counts conducted by T-Square Engineering as part of the Quail Run Meadows Traffic Impact Study (TIS) in February 2018 for the following intersections:

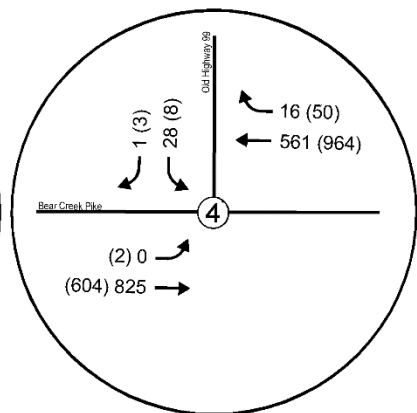
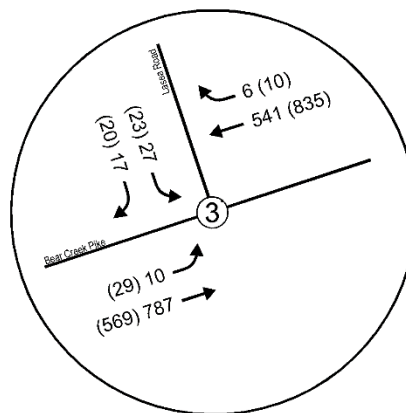
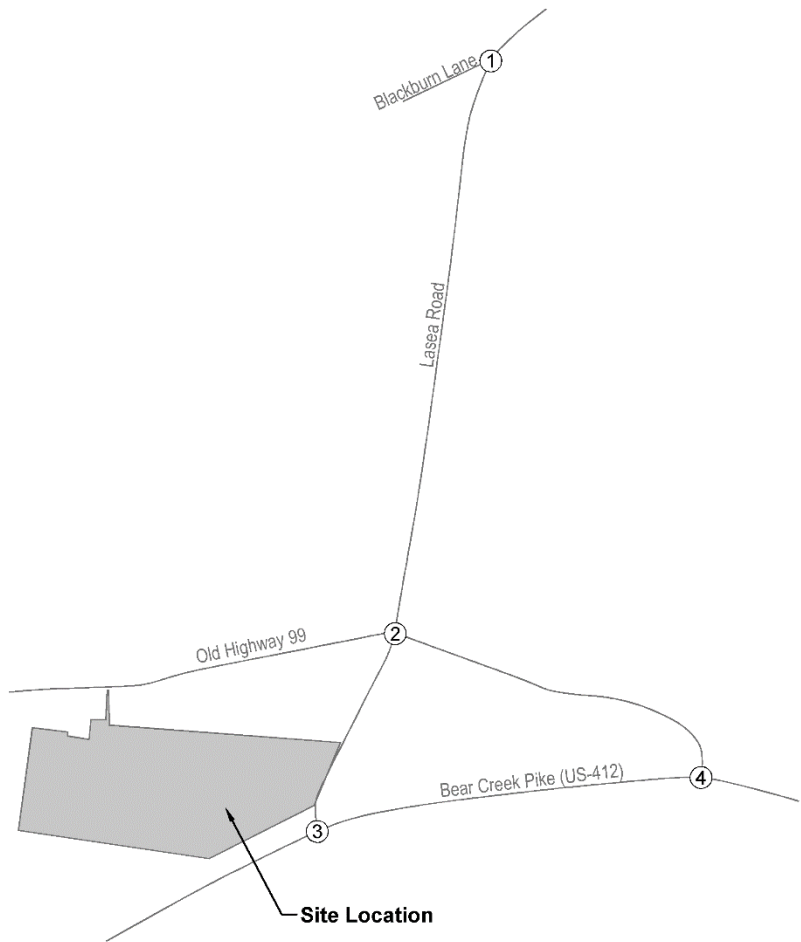
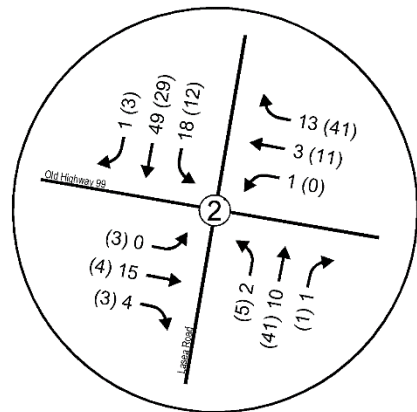
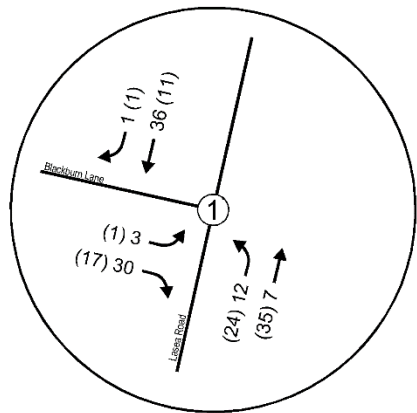
- Lasea Road and Blackburn Lane
- Lasea Road and Old Highway 99
- Bear Creek Pike (US-412) and Old Highway 99

To establish existing (2021) traffic volumes, it should be noted that the traffic count volumes for the above intersections were grown for four (4) years by a rate of 2.00% which was determined based on information provided by the City of Columbia regarding growth within the surrounding area. The AM and PM peak hour traffic volumes for these intersections were established and determined to occur between 6:45 AM – 7:45 AM and 4:15 PM – 5:15 PM, respectively.

In addition, as requested by the City of Columbia, T-Square Engineering utilized the turning movement counts conducted by Ragan-Smith Associates as part of the 1449 Rock Springs Road PUD Traffic Impact Study (TIS) in April 2021 for the following intersection:

- Lasea Road and Bear Creek Pike (US-412)

For this analysis, the AM and PM peak hour traffic volumes for this intersection was established and determined to occur between 6:45 AM – 7:45 AM and 4:00 PM – 5:00 PM, respectively. As outlined in the 1449 Rock Springs Road PUD Traffic Impact Study (TIS), the AM peak hour volumes were grown by approximately 1.121 to account for the changes in travel patterns due to COVID-19. Figure 4 shows the adjusted existing peak hour totals at the study intersections for the AM and PM peak hour periods. Appendix A contains the adjusted peak hour turning movement counts.



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



Figure 4
 Existing Traffic Volumes
 (Adjusted 2021)

Existing Capacity Analysis

To evaluate the existing traffic operations at the study intersections within the vicinity of the project site, AM and PM peak hour capacity analyses were performed per the calculations outlined in the Highway Capacity Manual¹(HCM). Levels of service (LOS), corresponding average delays, and 95th percentile queues were calculated for each turning movement. An LOS is a qualitative measure or grade used to distinguish how traffic is serviced at an intersection or along a roadway. The range of LOS is A to F, with A being the highest and F the lowest. The 95th percentile queue is the queue length (in vehicles) that has only a five (5) percent probability of being exceeded during the analysis period. The 95th percentile queue is not typical of what an average driver would experience, and driver experiences would be better characterized by the mean queue length. The table below details each LOS for signalized and unsignalized intersections, as specified within the HCM.

Table 1. Level of Service (LOS) Details

Level of Service*	Average Control Delay (seconds per vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Source: HCM 2010, Exhibits 18-4 and 19-1

To determine the effectiveness of traffic operations within the study area a minimum LOS or baseline needs to be established. Any LOS below the established baseline will be considered unsatisfactory. LOS C is generally acceptable for typical roadway function while LOS D is typically considered to be the minimum acceptable LOS. According to the City of Columbia's *Transportation Master Plan (2018)*, "In urban areas, LOS D is typically considered to be the minimum acceptable level of service." The following conditions shall be considered unsatisfactory for the purposes of this study:

1. Overall intersections with an LOS E or F.
2. Individual traffic movements with an LOS E or F.

The existing intersections within the study area were analyzed with existing traffic volumes under existing roadway conditions/geometries. The existing capacity analyses were conducted using *Synchro/SimTraffic* software by Trafficware for the unsignalized intersections. Appendix C contains the detailed capacity analyses results.

¹ Transportation Research Board (TRB). Highway Capacity Manual, 5th Edition (2010). Washington, DC: 2010

Table 2. Existing Capacity Analyses

Study Intersection	Control	Approach	2021 Existing Conditions					
			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
1. Lasea Road and Bear Creek Pike (US-412)	TWSC	SB Left/Right EB Left	C A	17.6 8.7	59 19	C B	20.5 10.1	56 41
2. Bear Creek Pike (US-412) and Old Highway 99	TWSC	SB Left/Right EB Left	C A	20.0 0.0	51	C B	21.3 10.7	35 9
3. Lasea Road and Old Highway 99	TWSC	NB L/T/R	A	7.1	16	A	7.4	26
		SB L/T/R	A	7.4	48	A	7.4	50
		EB L/T/R/	A	7.1	34	A	7.1	28
		WB L/T/R	A	6.8	38	A	6.9	56
4. Lasea Road and Blackburn Lane	TWSC	NB Left/Thru	A	7.3	10	A	7.3	9
		EB Left/Right	A	8.7	37	A	8.5	22

The following assessments are based on the results of the Existing Capacity Analyses as shown in the table above:

- All critical movements to the study intersections surrounding the proposed development currently operate at a minimum of LOS C during the AM and PM peak hours with adjusted 2021 existing traffic volumes.

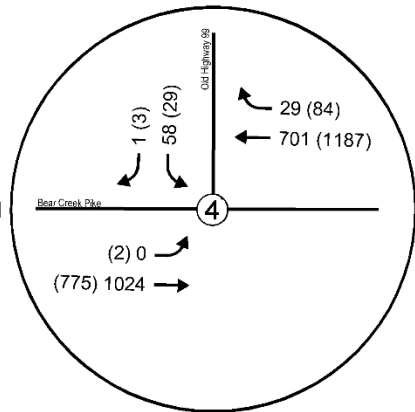
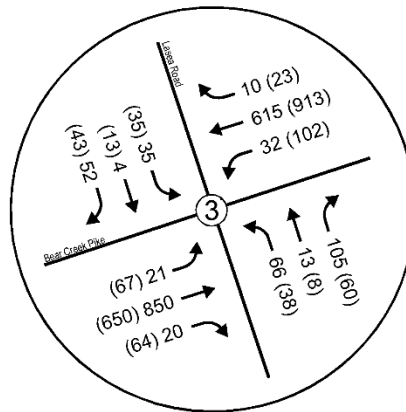
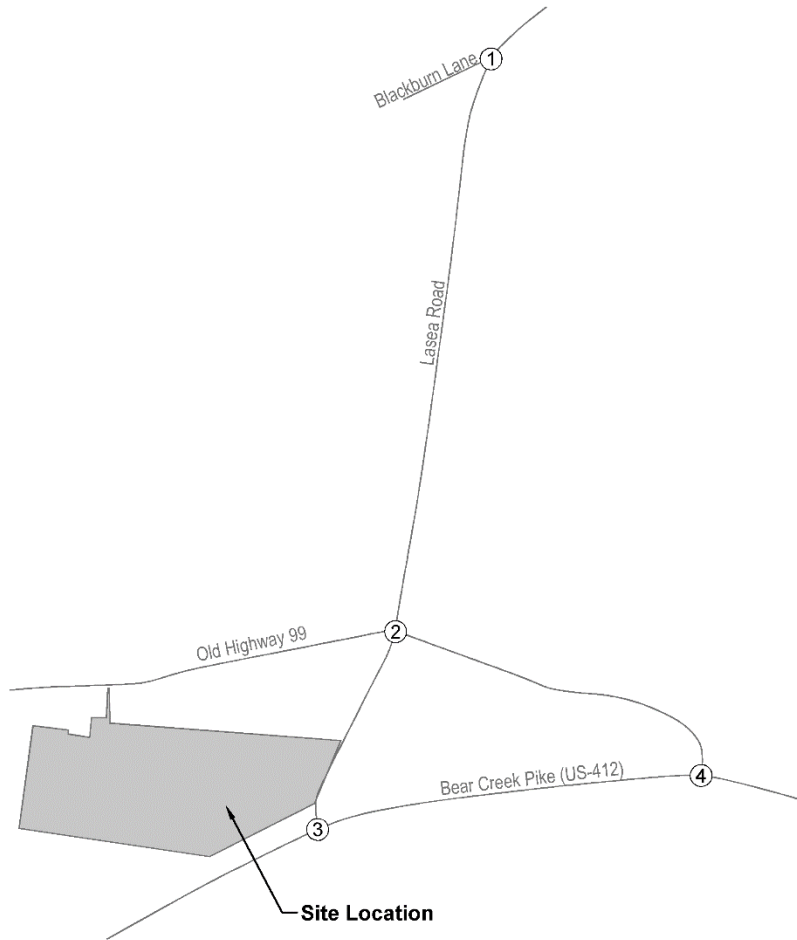
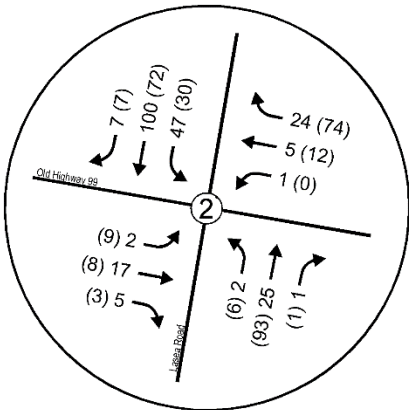
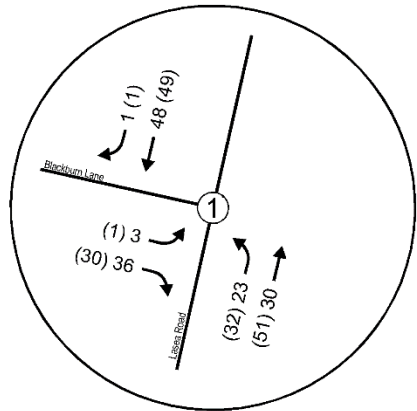
Background Traffic Volumes

To account for traffic growth within the vicinity of the project site prior to the completion of the proposed 1451 Lasea Road Development, background traffic volumes were established. A growth trend was used as a multiplication factor to grow the existing traffic volumes to the 2023 design year (expansion completion). The turning movement counts conducted by T-Square Engineering as part of the Quail Run Meadows Subdivision Traffic Impact Study (TIS) in February 2018 were grown for six (6) years by a rate of 2.00% to establish 2023 background traffic volumes. The turning movement counts conducted by Ragan-Smith Associates as part of the 1449 Rock Springs Road PUD Traffic Impact Study (TIS) in April 2021 were grown by +2.00% per year for two (2) years to establish 2023 background traffic volumes. Figure D1 in Appendix D shows the 2023 background peak hour totals at the study intersections for the AM and PM peak hour periods.

To account for the additional traffic growth within the vicinity of the project site, the generated traffic volumes from previously conducted Traffic Studies near the project site were added to the grown 2023 background traffic volumes. These Traffic Studies include the following:

- Quail Run Meadows Subdivision Traffic Impact Study in February 2018
- Bear Creek Hotel Traffic Impact Study in July 2018
- I-65 and Bear Creek Pike Traffic Impact Study in December 2020
- 1449 Rock Springs Road PUD Traffic Impact Study in April 2021

The generated traffic volumes from each development above are shown on Figures D2-D5 in Appendix D. The 2023 background traffic volumes as shown on Figure D1 were combined with the generated traffic volumes from each development above as shown on Figures D2, resulting in the total combined background peak hour traffic volumes for the study intersections, as shown on Figure 5.



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



Figure 5
 Combined Background
 Traffic Volumes (2023)
 (Including Offsite Developments Trip Gen)

Background Capacity Analyses

To evaluate the background traffic operations at the study intersections within the vicinity of the project site, the AM and PM peak hour capacity analyses were performed based on calculations outlined in the Highway Capacity Manual (HCM). Levels of service (LOS), corresponding average delays, and 95th percentile queues were calculated for each turning movement.

The previously conducted Traffic Studies for the background developments resulted in multiple recommended roadway improvements to the study intersections. These recommended improvements will be utilized as part of the background roadway conditions and have been included in the background capacity analyses. The improvements are listed below by intersection. Figure 6 shows a summary of the off-site improvements from previously conducted traffic studies for background developments.

Lasea Road and Bear Creek Pike (US-412)

- Remove the existing raised median island and install an exclusive right-turn lane along the southbound approach of Lasea Road. (Quail Run Meadows Subdivision)
- Construct the Rock Spring PUD Access Drive along the northbound approach to the intersection of Lasea Road and Bear Creek Pike (US-412) with one (1) inbound lane and two (2) outbound lanes consisting of an exclusive left-turn lane with approximately 175 feet of storage and one (1) shared lane for through and right-turn movements. (1449 Rock Springs Road PUD)
- Install an exclusive eastbound right-turn lane along Bear Creek Pike (US-412) with approximately 230 feet of storage. (1449 Rock Springs Road PUD)
- Signalize the intersection. (1449 Rock Springs Road PUD)
- Install an exclusive westbound right-turn lane along Bear Creek Pike (US-412) with approximately 120 feet of storage. (Quail Run Meadows Subdivision)

Bear Creek Pike (US-412) and Old Highway 99

- Install an exclusive westbound right-turn lane along Bear Creek Pike (US-412) with approximately 100 feet of storage. (Quail Run Meadows Subdivision).

The study intersections were analyzed based on background roadway conditions and lane geometries. It should be noted that optimized traffic signal timings were utilized at the intersection of Lasea Road and Bear Creek Pike (US-412) for this analysis. The background capacity analyses were conducted using *Synchro/SimTraffic* software by Trafficware for both signalized and unsignalized intersections. Appendix C contains the detailed capacity analyses results.

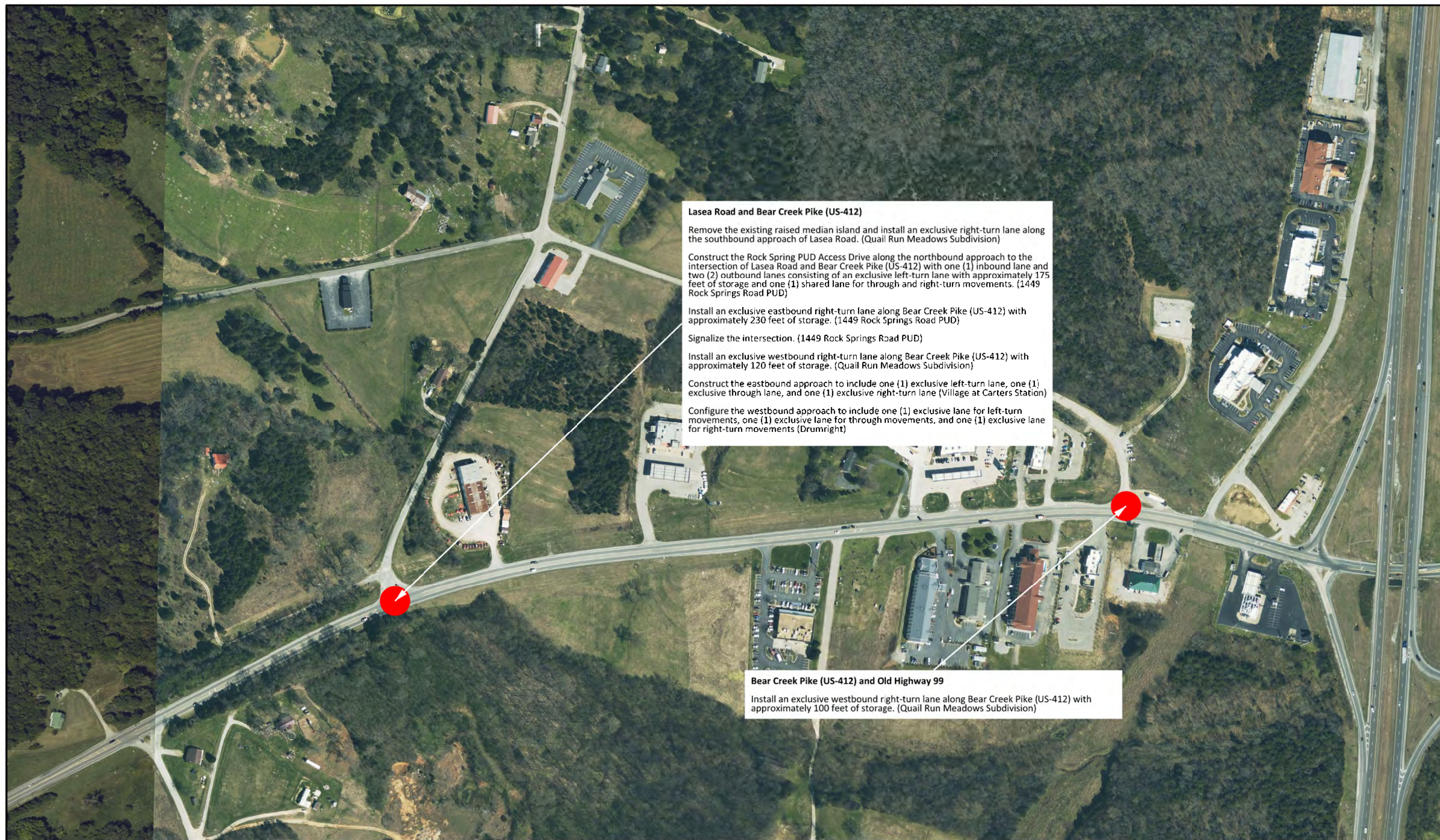


Figure 6 - Off-Site Improvements for Background Developments

1451 Lasea Road Development • Columbia, TN • Approximate Scale: 1" = 300'

Prepared by T-Square Engineering, Inc.

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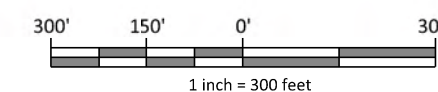


Table 3. Background Capacity Analyses

Study Intersection	Control	Approach	2023 Background Conditions					
			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
1. Lasea Road and Bear Creek Pike (US-412)	Signal	NB Left	C	34.3	65	D	37.6	52
		NB Thru/Right	D	46.3	113	D	47.7	58
		SB Left	C	33.2	47	D	36.0	51
		SB Thru/Right	D	38.1	48	D	41.0	57
		EB Left	B	11.4	32	C	21.0	125
		EB Thru	C	28.3	388	B	15.8	254
		EB Right	A	9.6	28	A	9.3	39
		WB Left	B	18.5	82	B	11.6	192
		WB Thru	B	15.2	219	C	33.0	475
		WB Right	A	9.2	108	A	8.7	83
		Overall	C	25.0	--	C	25.8	--
2. Bear Creek Pike (US-412) and Old Highway 99	TWSC	SB Left/Right	D	30.2	152	D	31.4	73
		EB Left	A	9.4	0	B	12.3	9
3. Lasea Road and Old Highway 99	TWSC	NB L/T/R	A	7.4	28	A	7.9	46
		SB L/T/R	A	8.1	67	A	8.0	63
		EB L/T/R/	A	7.4	37	A	7.7	32
		WB L/T/R	A	7.1	42	A	7.4	60
4. Lasea Road and Blackburn Lane	TWSC	NB Left/Thru	A	7.4	9	A	7.4	10
		EB Left/Right	A	8.8	43	A	8.7	37

The following assessments are based on the results of the Background Capacity Analyses as shown in the table above:

- All critical movements to the study intersections surrounding the proposed development currently operate at a minimum of LOS D during the AM and PM peak hours with background 2023 traffic volumes.

Impacts

Trips were generated to establish projected traffic volumes for the proposed 1451 Lasea Road Development. Daily and peak hour trips were generated by formulas presented in the Trip Generation Manual² based on the number of proposed housing units by the development. As previously stated, the development will consist of approximately 208 multi-family (low-rise) housing units. The Multi-Family (Low-Rise) Housing (220) ITE Land Use was used to estimate the generated traffic volumes. The table below provides the new trips generated for the proposed development. Appendix B contains detailed trip generation calculations.

Table 4. Crichton Property Development Trip Generation

ITE Land Use (Code)	Size	Generated Traffic Volumes				
		Daily	AM Peak		PM Peak	
			Enter	Exit	Enter	Exit
Multi-Family (Low-Rise) Housing (220)	208 Units	1,532	22	74	71	42

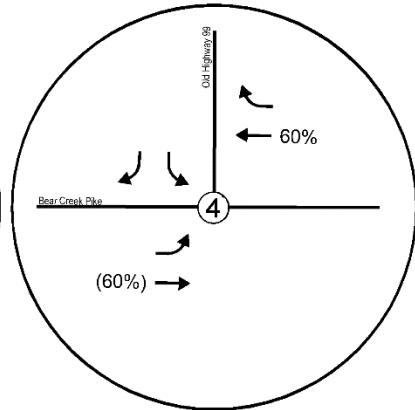
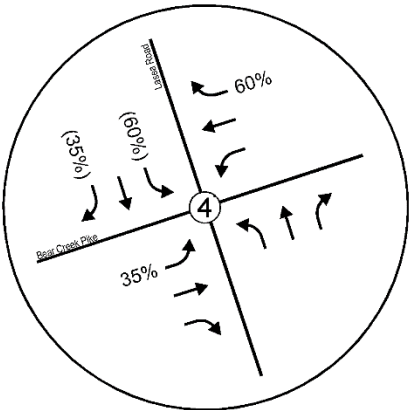
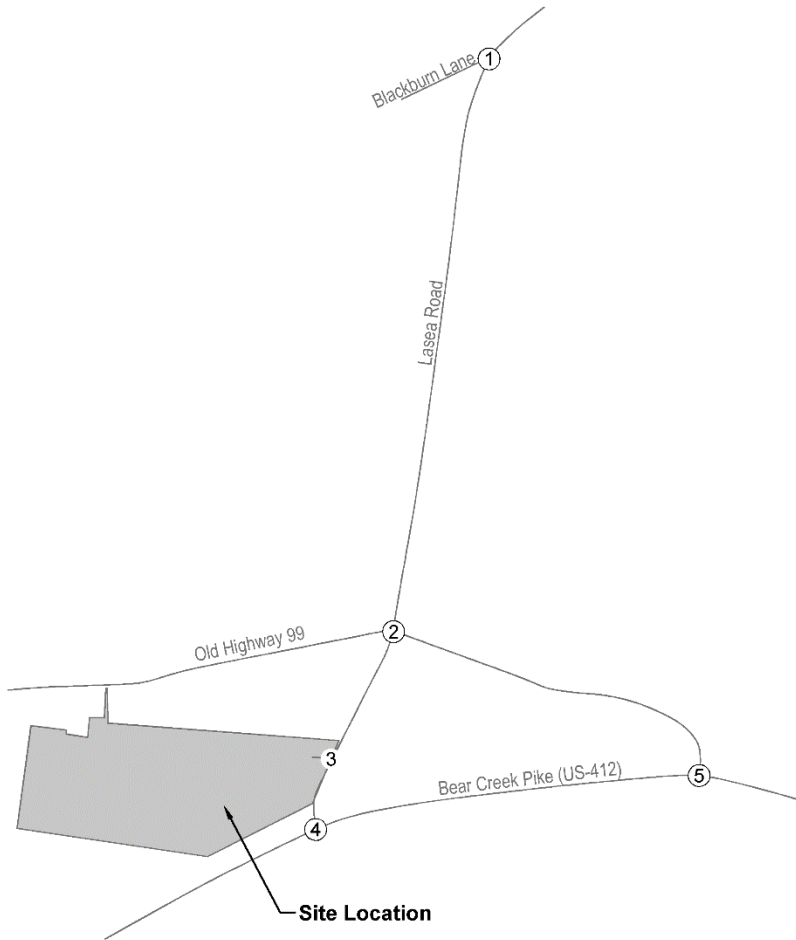
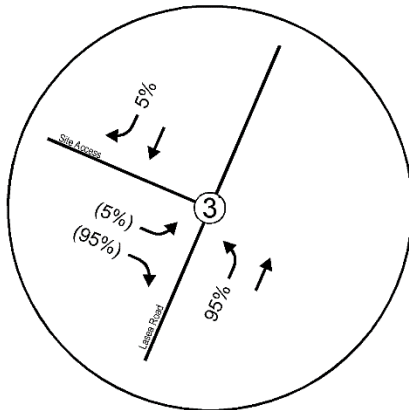
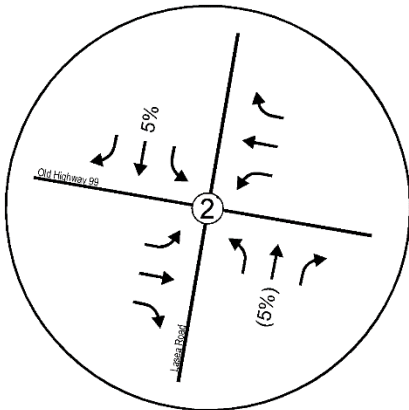
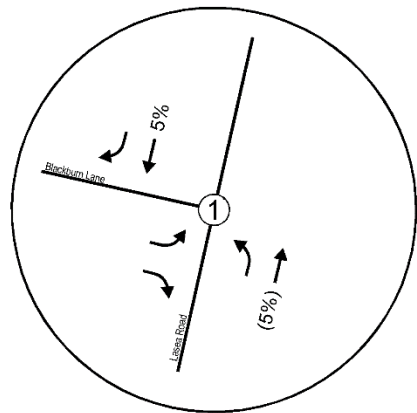
Projected Traffic Distribution and Assignments

For the purposes of this study, estimated directional distributions shown on Figure 7 were established for the proposed development's generated traffic volumes. The development of these directional distributions was established based on the following:

- Conducted hourly turning movement counts
- Proposed land use characteristics
- Existing roadway network
- Existing lane geometry of surrounding intersections
- The developments proposed access locations
- Locations of populations centers within the surrounding area

The primary trips generated were assigned to the existing roadway network per the distributions shown on Figure 7, resulting in the generated peak hour traffic volumes shown on Figure 8. The generated peak hour traffic volumes were then added to the 2023 background volumes as shown on Figure 5, resulting in the total projected peak hour traffic volumes in Figure 9.

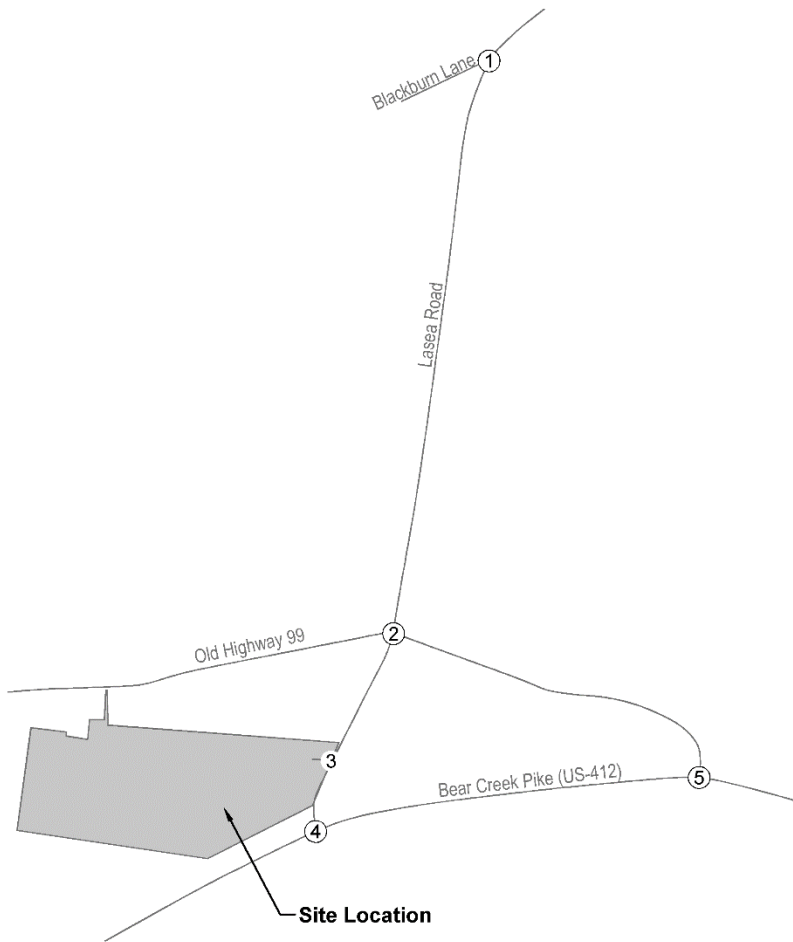
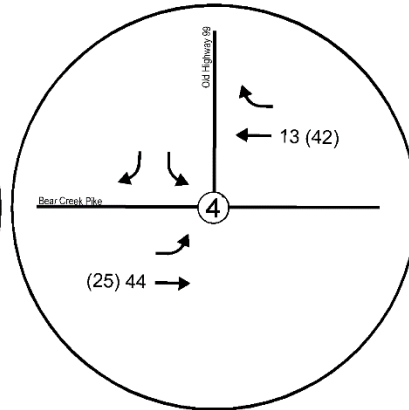
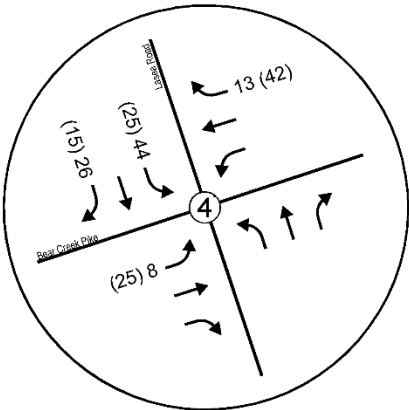
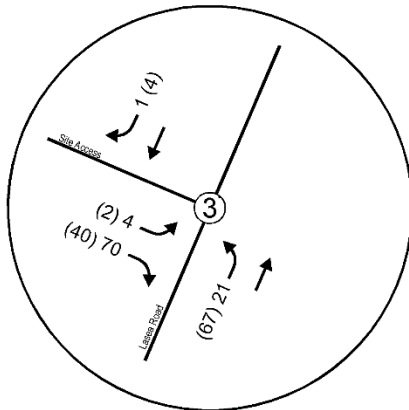
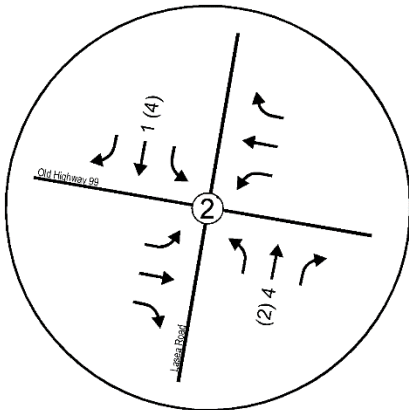
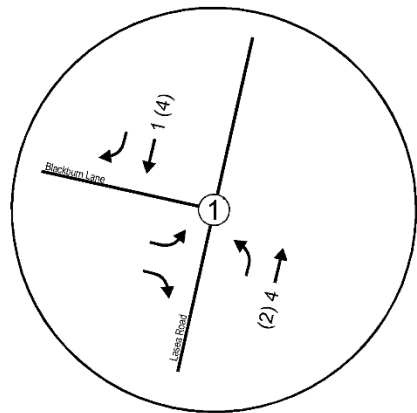
² Institute of Transportation Engineers (ITE). Trip Generation Manual, 10th Edition. Washington, DC: ITE, 2018



LEGEND
 XX% - Entering Traffic Volumes
 (XX%) - Exiting Traffic Volumes



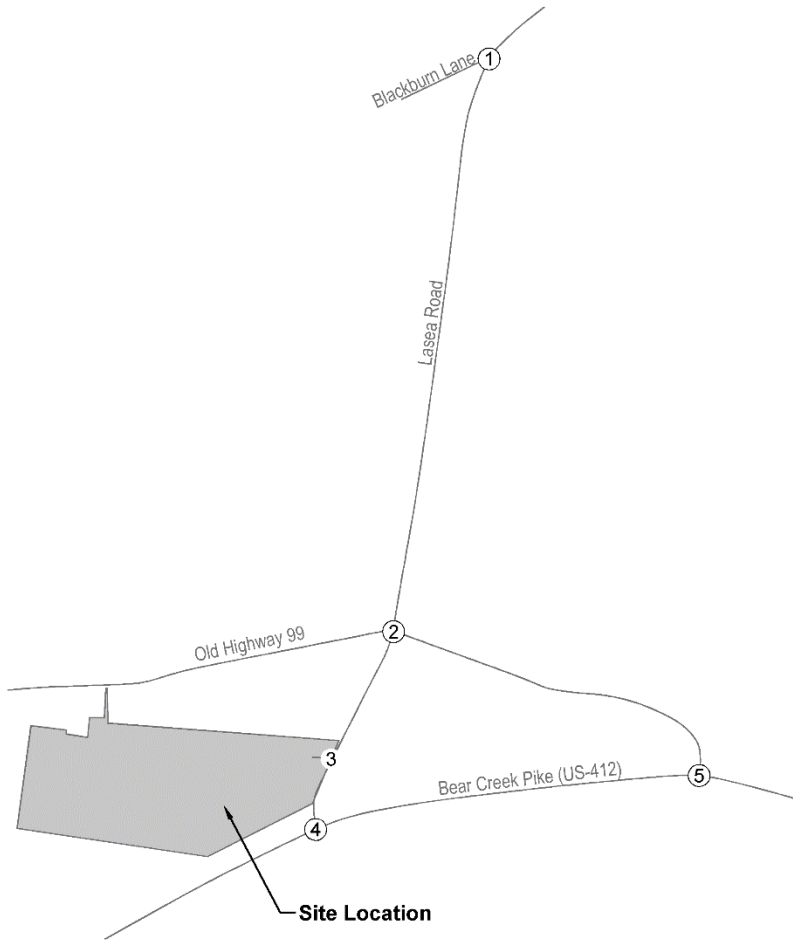
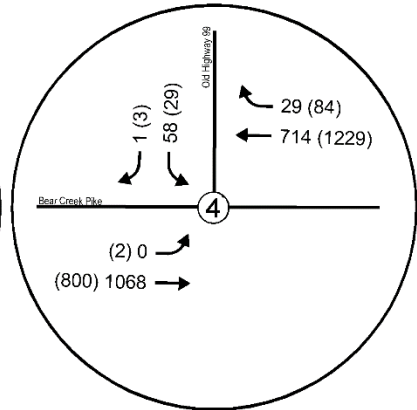
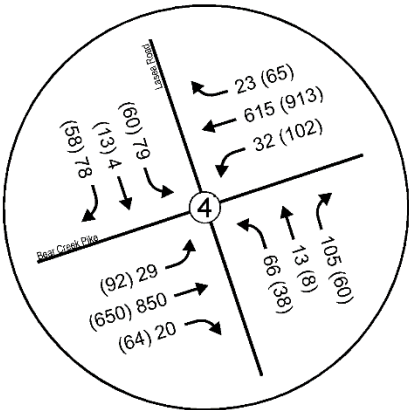
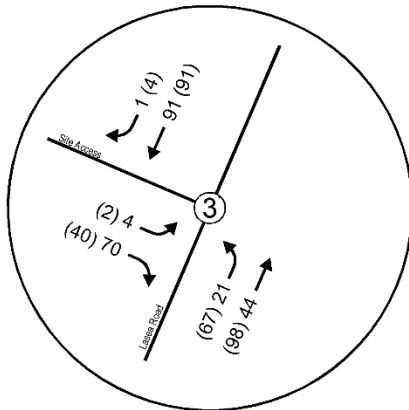
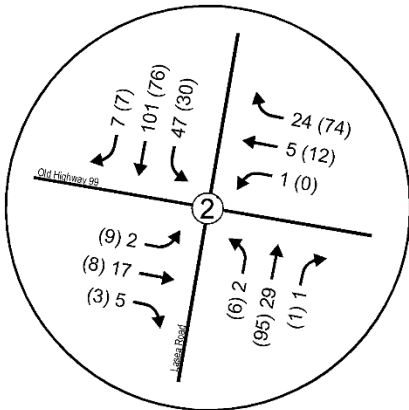
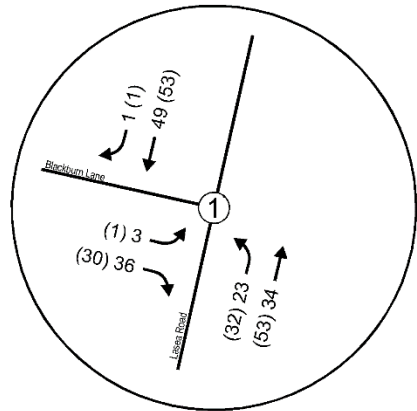
Figure 7
 Distribution of Generated
 Peak Hour Traffic Volumes



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



Figure 8
 Assignment of Generated
 Peak Hour Traffic Volumes



XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes



Figure 9
Projected Traffic Volumes
(2023)

Projected Capacity Analysis

To evaluate the projected traffic operations at the study intersections within the vicinity of the project site, AM and PM peak hour capacity analyses were performed. The capacity analyses include the total projected traffic volumes generated from the proposed development in addition to background traffic volumes. Levels-of-service (LOS), corresponding average delays, and 95th percentile queues were calculated for each turning movement. The intersections were analyzed based on background roadway conditions and lane geometries as outlined previously with projected traffic volumes.

The intersections were analyzed based on background roadway conditions and lane geometries as outlined in the Background Traffic Volumes section above. It should be noted that optimized traffic signal timings were utilized at the intersection of Lasea Road and Bear Creek Pike (US-412) for this analysis. The projected capacity analyses were conducted using *Synchro/SimTraffic* software by Trafficware for both signalized and unsignalized intersections. Appendix C contains the detailed capacity analyses results.

Table 5. Projected Capacity Analyses

Study Intersection	Control	Approach	2023 Projected Conditions					
			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
1. Lasea Road and Bear Creek Pike (US-412)	Signal	NB Left	D	35.3	64	D	38.2	49
		NB Thru/Right	D	47.6	94	D	48.3	56
		SB Left	C	34.9	84	D	37.4	74
		SB Thru/Right	D	39.6	62	D	42.8	45
		EB Left	B	12.0	101	C	22.6	138
		EB Thru	C	29.7	354	B	15.7	289
		EB Right	A	10.0	8	A	9.2	36
		WB Left	B	19.2	44	B	11.6	237
		WB Thru	B	16.2	241	C	33.9	913
		WB Right	A	9.9	29	A	9.2	176
		Overall	C	26.4	--	C	26.2	--
2. Bear Creek Pike (US-412) and Old Highway 99	TWSC	SB Left/Right	D	31.9	122	D	33.2	51
		EB Left	A	0.0	0	B	12.6	19
3. Lasea Road and Old Highway 99	TWSC	NB L/T/R	A	7.4	28	A	8.0	39
		SB L/T/R	A	8.1	65	A	8.1	53
		EB L/T/R/	A	7.4	39	A	7.7	26
		WB L/T/R	A	7.1	50	A	7.4	50
4. Lasea Road and Blackburn Lane	TWSC	NB Left/Thru	A	7.4	0	A	7.4	0
		EB Left/Right	A	8.8	38	A	8.7	34
5. Lasea Road and Site Access	TWSC	NB Left/Thru	A	7.4	10	A	7.5	26
		EB Left/Right	A	9.2	44	A	9.1	50

The following assessments are based on the results of the Projected Capacity Analyses as shown in the table above:

- All critical movements to the study intersections surrounding the proposed development currently operate at a minimum of LOS D during the AM and PM peak hours with projected 2023 traffic volumes.

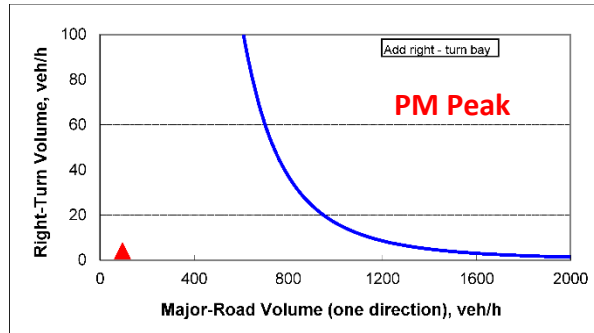
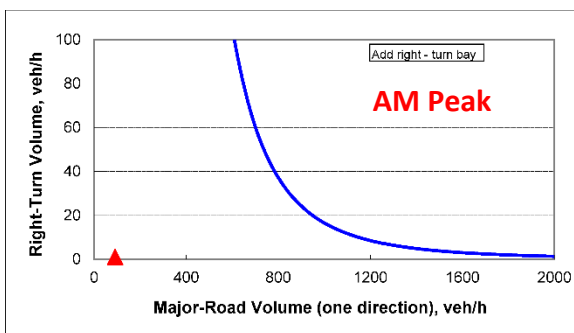
Intersection Assessments (Projected Conditions)

Engineering assessments were performed on the intersections within the study area to identify underlying inefficiencies and solutions to alleviate any concerns associated with intersection geometries and traffic volumes along the roadway network. Major-road approach left-turn lane warrants were performed based on Figures 2-5 and 2-6 in the *NCHRP Report 457 – Evaluating Intersection Improvements: An Engineering Study Guide*³ and projected traffic volumes. Minor-road approach geometric warrants were performed based on Figure 2-4 in the *NCHRP Report 457 – Evaluating Intersection Improvements: An Engineering Study Guide*⁴. The results of the warrants are shown below.

Lasea Road and Site Access

Table 6. Major-Road Approach Geometry, SBR Lasea Road at Site Access

Variable	AM Peak	PM Peak
Major-road speed, mph:	35	35
Major-road volume (one direction), veh/h:	92	95
Major-road right-turn volume, veh/h:	1	4
Limiting right-turn volume, veh/h:	1000+	1000+
Right-turn bay warranted:	NO	NO
Source: <i>NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide</i>		



As shown in Table 6 and the corresponding graphs, it was determined that a southbound right-turn lane is not warranted along Lasea Road at its intersection with the proposed Site Access during either of the peak hour periods with projected traffic volumes.

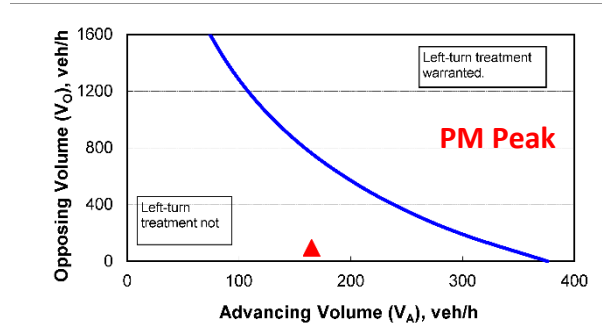
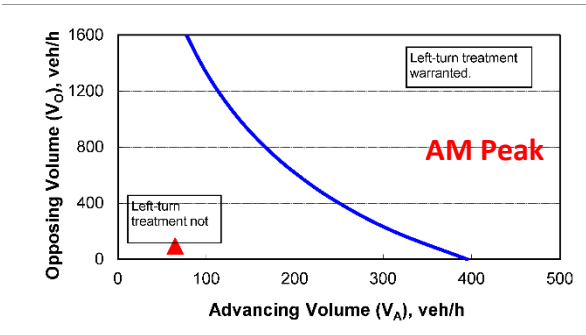
³ Transportation Research Board (TRB). *Evaluating Intersection Improvements: An Engineering Study Guide*. Washington, DC: 2001

⁴ Transportation Research Board (TRB). *Evaluating Intersection Improvements: An Engineering Study Guide*. Washington, DC: 2001

Table 7. Major-Road Approach Geometry, NBL Lasea Road at Site Access

Variable	AM Peak	PM Peak
85 th percentile speed, mph:	35	35
Percent of left-turns in advancing volume (V_A), %:	32%	41%
Advancing volume (V_A), veh/h:	65	165
Opposing volume (V_O), veh/h:	92	95
Limiting advancing volume (V_A), veh/h:	353	335
Left-turn bay warranted:	NO	NO

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

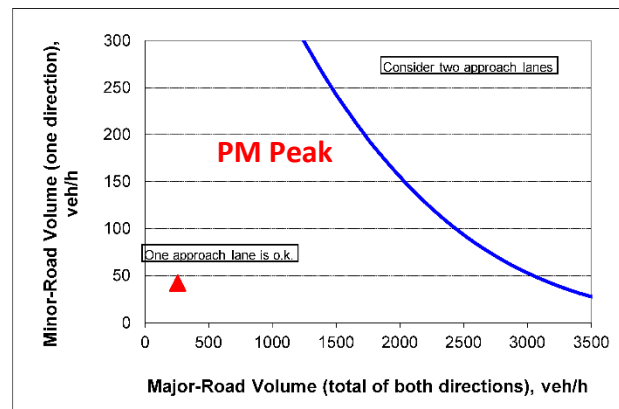
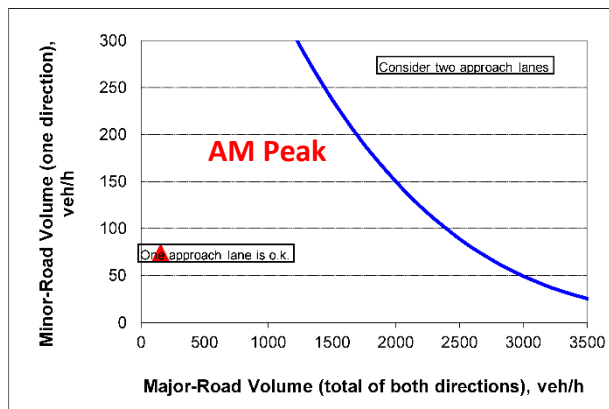


As shown in Table 7 and the corresponding graphs, it was determined that a northbound left-turn lane is not warranted along Lasea Road at its intersection with the proposed Site Access during either of the peak hour periods with projected traffic volumes.

Table 8. Minor-Road Approach Geometry, EBR Site Access at Lasea Road

Variable	AM Peak	PM Peak
Major-road volume (total both directions), veh/h:	157	260
Percentage of right-turns on minor road, %:	95%	95%
Minor-road volume (one direction), veh/h:	74	42
Limiting minor-road volume (one direction), veh/h:	673	628
Right-turn bay warranted:	One (1) approach lane is sufficient	One (1) approach lane is sufficient

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide



As shown in Table 8 and the corresponding graphs, it was determined that one (1) shared lane for left-turn and right-turn movements on the eastbound approach of the proposed Site Access at its intersection with Lasea Road is sufficient with projected traffic volumes.

Conclusions

Existing Conditions

Intersection Capacity Analyses

- All critical movements to the study intersections surrounding the proposed development currently operate at a minimum of LOS C during the AM and PM peak hours with adjusted 2021 existing traffic volumes.

Background Conditions

Intersection Capacity Analyses

- All critical movements to the study intersections surrounding the proposed development currently operate at a minimum of LOS D during the AM and PM peak hours with background 2023 traffic volumes.

Projected Conditions

Intersection Capacity Analyses

- All critical movements to the study intersections surrounding the proposed development currently operate at a minimum of LOS D during the AM and PM peak hours with projected 2023 traffic volumes.

Turn Lane Analyses

- It was determined that the eastbound approach of the proposed Site Access at its intersection with Lasea Road will be sufficient with one (1) shared lane for left-turn and right-turn movements with projected traffic volumes.

Recommendations

Based on the analyses within this study, and a review of the proposed development's access plan, the recommendations below have been presented to be implemented as part of the proposed 1451 Lasea Road Development in Columbia, TN. These recommendations will be implemented in addition to the various improvements at the study intersections outlined in previously conducted traffic studies within the area. Figure 10 shows a summary of the recommended improvements for this development and other nearby developments.

Improvement Recommendations for the 1451 Lasea Road Development

Lasea Road and Bear Creek Pike (US-412)

- No improvements are recommended for this intersection as part of the construction of the 1451 Lasea Road Development.

Bear Creek Pike (US-412) and Old Highway 99

- No improvements are recommended for this intersection as part of the construction of the 1451 Lasea Road Development.

Lasea Road and Old Highway 99

- No improvements are recommended for this intersection as part of the construction of the 1451 Lasea Road Development.

Lasea Road and Blackburn Lane

- No improvements are recommended for this intersection as part of the construction of the 1451 Lasea Road Development.

Lasea Road and Site Access

- Construct the proposed Site Access along Lasea Road with one (1) inbound lane and one (1) outbound lane operating under a stop condition for Lasea Road according to MUTCD, AASHTO, TDOT, and City of Columbia standards.
- All radii for the proposed access shall be designed via coordination with the City of Columbia to accommodate the largest turning vehicle requirements that will service the development according to MUTCD, AASHTO, TDOT, and City of Columbia standards.
- Ensure the departure sight distance triangles for all driveways, internal intersections, and site access intersections are designed to be clear of all sight obstructions (including vegetation) as specified by AASHTO. The design of proposed internal roadway system should be completed according to the MUTCD, AASHTO, TDOT, and City of Columbia standards.

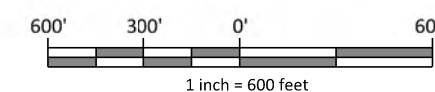


Figure 10 - Recommended Improvements for 1451 Lasea Road Development

1451 Lasea Road Development • Columbia, TN • Approximate Scale: 1" = 600'

Prepared by T-Square Engineering, Inc.

1329 West Main Street • Franklin, TN 37064 • www.T2-Eng.com



APPENDIX

APPENDIX A – DETAILED TURNING MOVEMENT COUNTS

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs) - Ragan Smith and Assoc

Count Sites: 4
Intersection #: 1
Intersection: Lasea Road and Bear Creek Pike (US-412)

Southbound: Lasea Road
Westbound: Bear Creek Pike (US-412)
Northbound: N/A
Eastbound: Bear Creek Pike (US-412)

Lat/Long: N/A

Count Date: 3/4/2021

Time Period: 0600 - 0900 (Weekday AM Peak)

Figure 1 - Turning Movement Designation

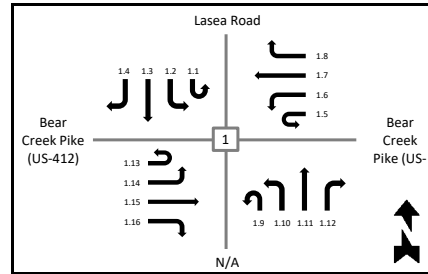
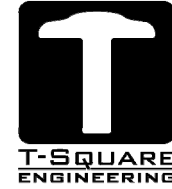
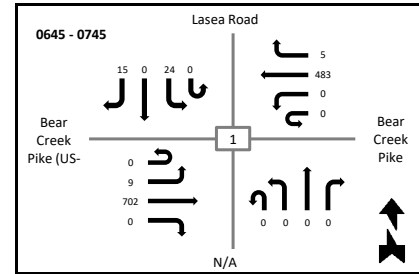


Figure 2 - AM Peak Hour TMC



Time	Southbound						Westbound						Northbound						Eastbound					
	Lasea Road						Bear Creek Pike (US-412)						N/A						Bear Creek Pike (US-412)					
	U-Turn 1.1	Left 1.2	Thru 1.3	Right 1.4	Peds X-Walk	App Total	U-Turn 1.5	Left 1.6	Thru 1.7	Right 1.8	Peds X-Walk	App Total	U-Turn 1.9	Left 1.10	Thru 1.11	Right 1.12	Peds X-Walk	App Total	U-Turn 1.13	Left 1.14	Thru 1.15	Right 1.16	Peds X-Walk	App Total
0600 - 0615	0	8	0	0	0	8	0	0	47	0	0	47	0	0	0	0	0	0	0	3	137	0	0	140
0615 - 0630	0	2	0	6	0	8	0	0	93	2	0	95	0	0	0	0	0	0	0	1	132	0	0	133
0630 - 0645	0	5	0	4	0	9	0	0	76	0	0	76	0	0	0	0	0	0	0	1	179	0	0	180
0645 - 0700	0	6	0	5	0	11	0	0	113	0	0	113	0	0	0	0	0	0	0	2	187	0	0	189
0700 - 0715	0	7	0	6	0	13	0	0	111	0	0	111	0	0	0	0	0	0	0	3	172	0	0	175
0715 - 0730	0	6	0	2	0	8	0	0	116	2	0	118	0	0	0	0	0	0	0	0	175	0	0	175
0730 - 0745	0	5	0	2	0	7	0	0	143	3	0	146	0	0	0	0	0	0	0	4	168	0	0	172
0745 - 0800	0	4	0	2	0	6	0	0	119	0	0	119	0	0	0	0	0	0	0	3	151	0	0	154
0800 - 0815	0	4	0	3	0	7	0	0	109	4	0	113	0	0	0	0	0	0	0	4	158	0	0	162
0815 - 0830	0	4	0	5	0	9	0	0	95	1	0	96	0	0	0	0	0	0	0	1	131	0	0	132
0830 - 0845	0	3	0	6	0	9	0	0	93	0	0	93	0	0	0	0	0	0	0	1	106	0	0	107
0845 - 0900	0	4	0	1	0	5	0	0	73	1	0	74	0	0	0	0	0	0	0	3	129	0	0	132
Grand Total	0	58	0	42	0	100	0	0	1188	13	0	1201	0	0	0	0	0	0	0	26	1825	0	0	1851
Peak Hour Total																								
0645 - 0745	0	24	0	15	0	39	0	0	483	5	0	488	0	0	0	0	0	0	0	9	702	0	0	711
App %	0.00%	58.00%	0.00%	42.00%			0.00%	0.00%	98.92%	1.08%			0.00%	0.00%	0.00%	0.00%			0.00%	1.40%	98.60%	0.00%		
Int %	0.00%	1.84%	0.00%	1.33%		3.17%	0.00%	0.00%	37.69%	0.41%		38.10%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.82%	57.90%	0.00%		58.72%
Cars Total	0	58	0	42			0	0	1188	13			0	0	0	0			0	26	1825	0		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	100.00%	0.00%	100.00%			0.00%	0.00%	100.00%	100.00%			0.00%	0.00%	0.00%	0.00%			0.00%	100.00%	100.00%	0.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs) - Ragan Smith and Assoc

Count Sites: 4
Intersection #: 1
Intersection: Lasea Road and Bear Creek Pike (US-412)

Southbound: Lasea Road
Westbound: Bear Creek Pike (US-412)
Northbound: N/A
Eastbound: Bear Creek Pike (US-412)

Lat/Long: N/A

Count Date: 3/4/2021

Time Period: 1500 - 1800 (Weekday PM Peak)

Figure 1 - Turning Movement Designation

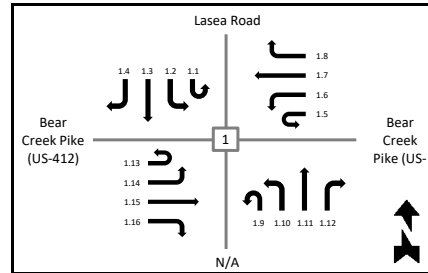
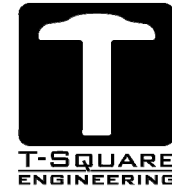
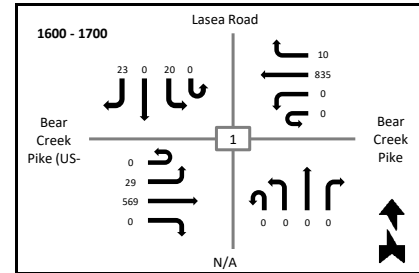


Figure 2 - PM Peak Hour TMC



Time	Southbound Lasea Road						Westbound Bear Creek Pike (US-412)						Northbound N/A						Eastbound Bear Creek Pike (US-412)					
	U-Turn 1.1	Left 1.2	Thru 1.3	Right 1.4	Peds X-Walk	App Total	U-Turn 1.5	Left 1.6	Thru 1.7	Right 1.8	Peds X-Walk	App Total	U-Turn 1.9	Left 1.10	Thru 1.11	Right 1.12	Peds X-Walk	App Total	U-Turn 1.13	Left 1.14	Thru 1.15	Right 1.16	Peds X-Walk	App Total
1500 - 1515	0	4	0	6	0	10	0	0	158	2	0	160	0	0	0	0	0	0	0	7	125	0	0	132
1515 - 1530	0	3	0	5	0	8	0	0	180	2	0	182	0	0	0	0	0	0	0	4	132	0	0	136
1530 - 1545	0	5	0	6	0	11	0	0	214	4	0	218	0	0	0	0	0	0	0	8	129	0	0	137
1545 - 1600	0	4	0	6	0	10	0	0	205	1	0	206	0	0	0	0	0	0	0	4	159	0	0	163
1600 - 1615	0	7	0	7	0	14	0	0	219	1	0	220	0	0	0	0	0	0	0	5	137	0	0	142
1615 - 1630	0	3	0	5	0	8	0	0	217	7	0	224	0	0	0	0	0	0	0	8	138	0	0	146
1630 - 1645	0	7	0	8	0	15	0	0	228	1	0	229	0	0	0	0	0	0	0	6	165	0	0	171
1645 - 1700	0	3	0	3	0	6	0	0	171	1	0	172	0	0	0	0	0	0	0	10	129	0	0	139
1700 - 1715	0	4	0	5	0	9	0	0	189	5	0	194	0	0	0	0	0	0	0	5	135	0	0	140
1715 - 1730	0	5	0	2	0	7	0	0	175	3	0	178	0	0	0	0	0	0	0	11	157	0	0	168
1730 - 1745	0	4	0	9	0	13	0	0	152	5	0	157	0	0	0	0	0	0	0	5	135	0	0	140
1745 - 1800	0	4	0	3	0	7	0	0	167	3	0	170	0	0	0	0	0	0	0	4	106	0	0	110
Grand Total	0	53	0	65	0	118	0	0	2275	35	0	2310	0	0	0	0	0	0	0	77	1647	0	0	1724
Peak Hour Total																								
1600 - 1700	0	20	0	23	0	43	0	0	835	10	0	845	0	0	0	0	0	0	0	29	569	0	0	598
App %	0.00%	44.92%	0.00%	55.08%			0.00%	0.00%	98.48%	1.52%			0.00%	0.00%	0.00%	0.00%			0.00%	4.47%	95.53%	0.00%		
Int %	0.00%	1.28%	0.00%	1.57%		2.84%	0.00%	0.00%	54.79%	0.84%		55.64%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	1.85%	39.67%	0.00%		41.52%
Cars Total	0	53	0	65			0	0	2275	35			0	0	0	0			0	77	1647	0		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	100.00%	0.00%	100.00%			0.00%	0.00%	100.00%	100.00%			0.00%	0.00%	0.00%	0.00%			0.00%	100.00%	100.00%	0.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs)

Count Sites: 4
Intersection #: 2
Intersection: Bear Creek Pike (US-412) and Old Highway 99

Southbound: Old Highway 99
Westbound: Bear Creek Pike (US-412)
Northbound: N/A
Eastbound: Bear Creek Pike (US-412)

Lat/Long: N/A

Count Date: 9/6/2017

Time Period: 0600 - 0900 (Weekday AM Peak)

Figure 1 - Turning Movement Designation

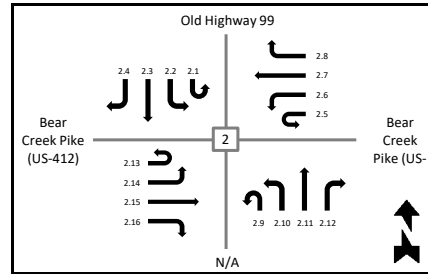
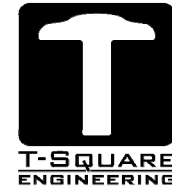
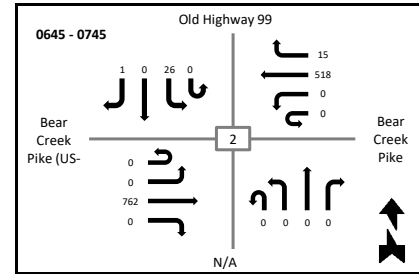


Figure 2 - AM Peak Hour TMC



Time	Southbound						Westbound						Northbound						Eastbound						
	Old Highway 99						Bear Creek Pike (US-412)						N/A						Bear Creek Pike (US-412)						
	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds X-Walk	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds X-Walk	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds X-Walk	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds X-Walk	App Total	
0600 - 0615	0	13	0	0	0	13	0	0	69	1	0	70	0	0	0	0	0	0	0	0	0	260	0	0	260
0615 - 0630	0	7	0	0	0	7	0	0	81	0	0	81	0	0	0	0	0	0	0	0	0	204	0	0	204
0630 - 0645	0	3	0	0	0	3	0	0	104	3	0	107	0	0	0	0	0	0	0	1	190	0	0	191	
0645 - 0700	0	8	0	1	0	9	0	0	110	1	0	111	0	0	0	0	0	0	0	0	201	0	0	201	
0700 - 0715	0	10	0	0	0	10	0	0	144	2	0	146	0	0	0	0	0	0	0	0	200	0	0	200	
0715 - 0730	0	4	0	0	0	4	0	0	142	5	0	147	0	0	0	0	0	0	0	0	191	0	0	191	
0730 - 0745	0	4	0	0	0	4	0	0	122	7	0	129	0	0	0	0	0	0	0	0	170	0	0	170	
0745 - 0800	0	8	0	1	0	9	0	0	108	2	0	110	0	0	0	0	0	0	0	0	152	0	0	152	
0800 - 0815	0	8	0	0	0	8	0	0	100	2	0	102	0	0	0	0	0	0	0	0	158	0	0	158	
0815 - 0830	0	2	0	1	0	3	0	0	106	3	0	109	0	0	0	0	0	0	0	1	139	0	0	140	
0830 - 0845	0	6	0	1	0	7	0	0	107	4	0	111	0	0	0	0	0	0	0	0	135	0	0	135	
0845 - 0900	0	5	0	0	0	5	0	0	103	1	0	104	0	0	0	0	0	0	0	1	102	0	0	103	
Grand Total	0	78	0	4	0	82	0	0	1296	31	0	1327	0	0	0	0	0	0	0	3	2102	0	0	2105	
Peak Hour Total																									
0645 - 0745	0	26	0	1	0	27	0	0	518	15	0	533	0	0	0	0	0	0	0	0	762	0	0	762	
App %	0.00%	95.12%	0.00%	4.88%			0.00%	0.00%	97.66%	2.34%			0.00%	0.00%	0.00%	0.00%			0.00%	0.14%	99.86%	0.00%			
Int %	0.00%	2.22%	0.00%	0.11%		2.33%	0.00%	0.00%	36.88%	0.88%		37.76%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.09%	59.82%	0.00%		59.90%	
Cars Total	0	78	0	4			0	0	1296	31			0	0	0	0			0	3	2102	0			
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0			
% Cars	0.00%	100.00%	0.00%	100.00%			0.00%	0.00%	100.00%	100.00%			0.00%	0.00%	0.00%	0.00%			0.00%	100.00%	100.00%	0.00%			
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs)

Count Sites: 4
Intersection #: 2
Intersection: Bear Creek Pike (US-412) and Old Highway 99

Southbound: Old Highway 99
Westbound: Bear Creek Pike (US-412)
Northbound: N/A
Eastbound: Bear Creek Pike (US-412)

Lat/Long: N/A

Count Date: 9/6/2017

Time Period: 1500 - 1800 (Weekday PM Peak)

Figure 1 - Turning Movement Designation

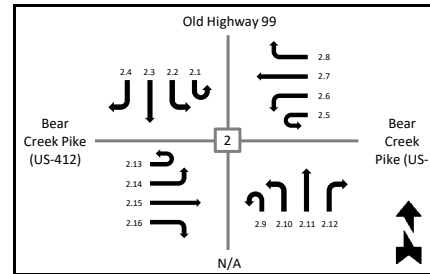
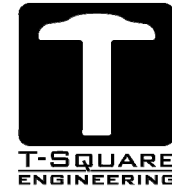
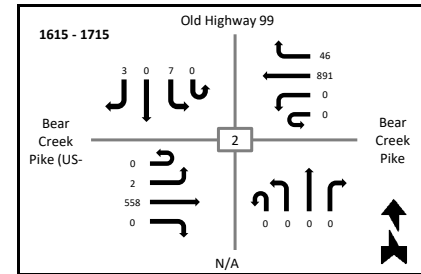


Figure 2 - PM Peak Hour TMC



Time	Southbound Old Highway 99						Westbound Bear Creek Pike (US-412)						Northbound N/A						Eastbound Bear Creek Pike (US-412)					
	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds X-Walk	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds X-Walk	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds X-Walk	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds X-Walk	App Total
1500 - 1515	0	4	0	0	0	4	0	0	171	3	0	174	0	0	0	0	0	0	0	0	128	0	0	128
1515 - 1530	0	3	0	1	0	4	0	0	170	4	0	174	0	0	0	0	0	0	0	0	137	0	0	137
1530 - 1545	0	8	0	3	0	11	0	0	190	16	0	206	0	0	0	0	0	0	0	2	127	0	0	129
1545 - 1600	0	2	0	3	0	5	0	0	179	11	0	190	0	0	0	0	0	0	0	0	112	0	0	112
1600 - 1615	0	5	0	4	0	9	0	0	196	9	0	205	0	0	0	0	0	0	0	0	125	0	0	125
1615 - 1630	0	2	0	0	0	2	0	0	212	10	0	222	0	0	0	0	0	0	0	1	148	0	0	149
1630 - 1645	0	3	0	2	0	5	0	0	232	16	0	248	0	0	0	0	0	0	0	0	121	0	0	121
1645 - 1700	0	1	0	1	0	2	0	0	233	9	0	242	0	0	0	0	0	0	0	1	148	0	0	149
1700 - 1715	0	1	0	0	0	1	0	0	214	11	0	225	0	0	0	0	0	0	0	0	141	0	0	141
1715 - 1730	0	4	0	0	0	4	0	0	205	10	0	215	0	0	0	0	0	0	0	0	129	0	0	129
1730 - 1745	0	4	0	0	0	4	0	0	204	13	0	217	0	0	0	0	0	0	0	0	133	0	0	133
1745 - 1800	0	5	0	1	0	6	0	0	177	13	0	190	0	0	0	0	0	0	0	1	118	0	0	119
Grand Total	0	42	0	15	0	57	0	0	2383	125	0	2508	0	0	0	0	0	0	0	5	1567	0	0	1572
Peak Hour Total																								
1615 - 1715	0	7	0	3	0	10	0	0	891	46	0	937	0	0	0	0	0	0	0	2	558	0	0	560
App %	0.00%	73.68%	0.00%	26.32%			0.00%	0.00%	95.02%	4.98%			0.00%	0.00%	0.00%	0.00%			0.00%	0.32%	99.68%	0.00%		
Int %	0.00%	1.02%	0.00%	0.36%		1.38%	0.00%	0.00%	57.60%	3.02%		60.62%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.12%	37.88%	0.00%		38.00%
Cars Total	0	42	0	15			0	0	2383	125			0	0	0	0			0	5	1567	0		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	100.00%	0.00%	100.00%			0.00%	0.00%	100.00%	100.00%			0.00%	0.00%	0.00%	0.00%			0.00%	100.00%	100.00%	0.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs)

Count Sites: 4
Intersection #: 3
Intersection: Lasea Road and Old Highway 99

Southbound: Lasea Road
Westbound: Old Highway 99
Northbound: Lasea Road
Eastbound: Old Highway 99

Lat/Long: N/A

Count Date: 9/6/2017

Time Period: 0600 - 0900 (Weekday AM Peak)

Figure 1 - Turning Movement Designation

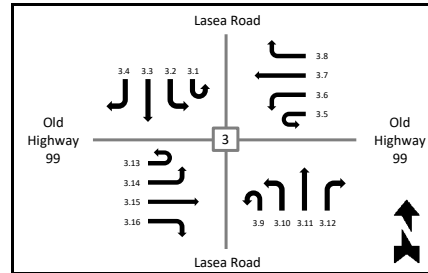
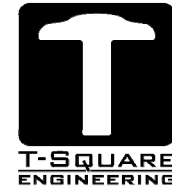
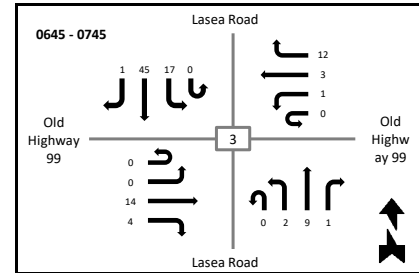


Figure 2 - AM Peak Hour TMC



Time	Southbound Lasea Road						Westbound Old Highway 99						Northbound Lasea Road						Eastbound Old Highway 99					
	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds X-Walk	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds X-Walk	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds X-Walk	App Total	U-Turn 3.13	Left 3.14	Thru 3.15	Right 3.16	Peds X-Walk	App Total
0600 - 0615	0	8	15	0	0	23	0	0	1	0	0	1	0	0	1	0	0	1	0	0	5	1	0	6
0615 - 0630	0	5	15	0	0	20	0	0	0	0	0	0	0	1	3	0	0	4	0	0	1	1	0	2
0630 - 0645	0	5	10	0	0	15	0	1	0	1	0	2	0	0	3	0	0	3	0	2	0	3	0	5
0645 - 0700	0	3	11	0	0	14	0	0	0	2	0	2	0	0	4	0	0	4	0	0	6	2	0	8
0700 - 0715	0	5	9	1	0	15	0	0	0	2	0	2	0	0	0	1	0	1	0	0	4	1	0	5
0715 - 0730	0	5	14	0	0	19	0	0	2	4	0	6	0	1	2	0	0	3	0	0	2	1	0	3
0730 - 0745	0	4	11	0	0	15	0	1	1	4	0	6	0	1	3	0	0	4	0	0	2	0	0	2
0745 - 0800	0	9	7	0	0	16	0	0	1	2	0	3	0	1	2	0	0	3	0	0	1	1	0	2
0800 - 0815	0	4	6	0	0	10	0	0	1	2	0	3	0	0	3	0	0	3	0	0	3	1	0	4
0815 - 0830	0	1	5	0	0	6	0	0	2	1	0	3	0	0	8	0	0	8	0	0	1	0	0	1
0830 - 0845	0	5	10	1	0	16	0	0	1	3	0	4	0	0	5	0	0	5	0	0	0	0	0	0
0845 - 0900	0	6	4	0	0	10	0	0	0	2	0	2	0	0	2	0	0	2	0	0	2	0	0	2
Grand Total	0	60	117	2	0	179	0	2	9	23	0	34	0	4	36	1	0	41	0	2	27	11	0	40
Peak Hour Total																								
0645 - 0745	0	17	45	1	0	63	0	1	3	12	0	16	0	2	9	1	0	12	0	0	14	4	0	18
App %	0.00%	33.52%	65.36%	1.12%			0.00%	5.88%	26.47%	67.65%			0.00%	9.76%	87.80%	2.44%			0.00%	5.00%	67.50%	27.50%		
Int %	0.00%	20.41%	39.80%	0.68%		60.88%	0.00%	0.68%	3.06%	7.82%		11.56%	0.00%	1.36%	12.24%	0.34%		13.95%	0.00%	0.68%	9.18%	3.74%		13.61%
Cars Total	0	60	117	2			0	2	9	23			0	4	36	1			0	2	27	11		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	100.00%	100.00%	100.00%			0.00%	100.00%	100.00%	100.00%			0.00%	100.00%	100.00%	100.00%			0.00%	100.00%	100.00%	100.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs)

Count Sites: 4
Intersection #: 3
Intersection: Lasea Road and Old Highway 99

Southbound: Lasea Road
Westbound: Old Highway 99
Northbound: Lasea Road
Eastbound: Old Highway 99

Lat/Long: N/A

Count Date: 9/6/2017

Time Period: 1500 - 1800 (Weekday PM Peak)

Figure 1 - Turning Movement Designation

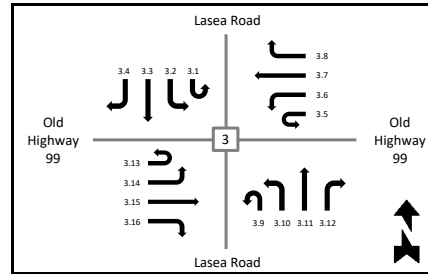
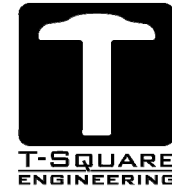
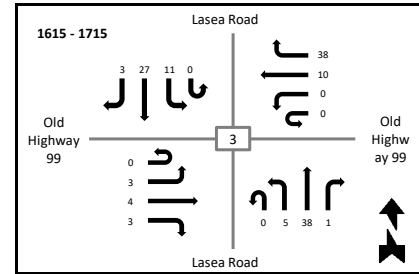


Figure 2 - PM Peak Hour TMC



Time	Southbound Lasea Road						Westbound Old Highway 99						Northbound Lasea Road						Eastbound Old Highway 99					
	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds X-Walk	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds X-Walk	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds X-Walk	App Total	U-Turn 3.13	Left 3.14	Thru 3.15	Right 3.16	Peds X-Walk	App Total
1500 - 1515	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1515 - 1530	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1530 - 1545	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
1545 - 1600	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
1600 - 1615	0	2	2	0	0	4	0	0	1	4	0	5	0	2	8	0	0	10	0	0	0	1	0	1
1615 - 1630	0	3	7	0	0	10	0	0	2	9	0	11	0	2	14	0	0	16	0	1	3	1	0	5
1630 - 1645	0	4	8	2	0	14	0	0	1	15	0	16	0	0	8	0	0	8	0	1	1	0	0	2
1645 - 1700	0	1	10	0	0	11	0	0	3	9	0	12	0	3	10	1	0	14	0	1	0	0	0	1
1700 - 1715	0	3	2	1	0	6	0	0	4	5	0	9	0	0	6	0	0	6	0	0	0	2	0	2
1715 - 1730	0	1	4	0	0	5	0	0	4	5	0	9	0	1	10	0	0	11	0	1	1	1	0	3
1730 - 1745	0	3	9	0	0	12	0	0	2	13	0	15	0	1	6	0	0	7	0	0	1	1	0	2
1745 - 1800	0	2	7	0	0	9	0	0	5	7	0	12	0	3	7	0	0	10	0	1	0	0	0	1
Grand Total	0	19	50	3	0	72	0	0	23	67	0	90	0	13	70	1	0	84	0	5	6	6	0	17
Peak Hour Total	0	11	27	3	0	41	0	0	10	38	0	48	0	5	38	1	0	44	0	3	4	3	0	10
1615 - 1715	0	11	27	3	0	41	0	0	10	38	0	48	0	5	38	1	0	44	0	3	4	3	0	10
App %	0.00%	26.39%	69.44%	4.17%			0.00%	0.00%	25.56%	74.44%			0.00%	15.48%	83.33%	1.19%			0.00%	29.41%	35.29%	35.29%		
Int %	0.00%	7.22%	19.01%	1.14%		27.38%	0.00%	0.00%	8.75%	25.48%		34.22%	0.00%	4.94%	26.62%	0.38%		31.94%	0.00%	1.90%	2.28%	2.28%		6.46%
Cars Total	0	19	50	3			0	0	23	67			0	13	70	1			0	5	6	6		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	100.00%	100.00%	100.00%			0.00%	0.00%	100.00%	100.00%			0.00%	100.00%	100.00%	100.00%			0.00%	100.00%	100.00%	100.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs)

Count Sites: 4
Intersection #: 4
Intersection: Lasea Road and Blackburn Lane

Southbound: Lasea Road
Westbound: N/A
Northbound: Lasea Road
Eastbound: Blackburn Lane

Lat/Long: N/A

Count Date: 9/7/2017

Time Period: 0600 - 0900 (Weekday AM Peak)

Figure 1 - Turning Movement Designation

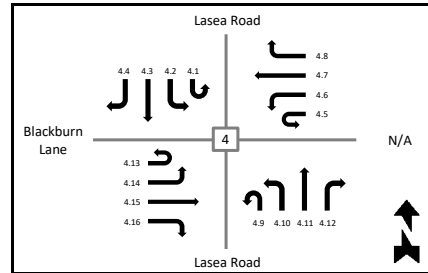
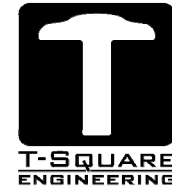
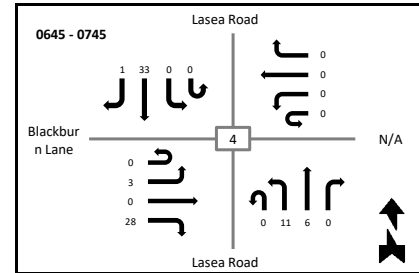


Figure 2 - AM Peak Hour TMC



Time	Southbound Lasea Road						Westbound N/A						Northbound Lasea Road						Eastbound Blackburn Lane					
	U-Turn 4.1	Left 4.2	Thru 4.3	Right 4.4	Peds X-Walk	App Total	U-Turn 4.5	Left 4.6	Thru 4.7	Right 4.8	Peds X-Walk	App Total	U-Turn 4.9	Left 4.10	Thru 4.11	Right 4.12	Peds X-Walk	App Total	U-Turn 4.13	Left 4.14	Thru 4.15	Right 4.16	Peds X-Walk	App Total
0600 - 0615	0	0	9	0	0	9	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	10	0	10
0615 - 0630	0	0	9	0	0	9	0	0	0	0	0	0	0	1	5	0	0	6	0	0	0	11	0	11
0630 - 0645	0	0	7	2	0	9	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	9	0	9
0645 - 0700	0	0	9	1	0	10	0	0	0	0	0	0	0	5	3	0	0	8	0	0	0	6	0	6
0700 - 0715	0	0	11	0	0	11	0	0	0	0	0	0	0	3	1	0	0	4	0	1	0	9	0	10
0715 - 0730	0	0	9	0	0	9	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	5	0	5
0730 - 0745	0	0	4	0	0	4	0	0	0	0	0	0	0	2	2	0	0	4	0	2	0	8	0	10
0745 - 0800	0	0	1	0	0	1	0	0	0	0	0	0	0	3	2	0	0	5	0	0	0	7	0	7
0800 - 0815	0	0	6	0	0	6	0	0	0	0	0	0	0	5	4	0	0	9	0	0	0	3	0	3
0815 - 0830	0	0	2	0	0	2	0	0	0	0	0	0	0	3	6	0	0	9	0	0	0	2	0	2
0830 - 0845	0	0	6	0	0	6	0	0	0	0	0	0	0	4	1	0	0	5	0	0	0	4	0	4
0845 - 0900	0	0	4	0	0	4	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	3	0	3
Grand Total	0	0	77	3	0	80	0	0	0	0	0	0	0	32	26	0	0	58	0	3	0	77	0	80
Peak Hour Total																								
0645 - 0745	0	0	33	1	0	34	0	0	0	0	0	0	0	11	6	0	0	17	0	3	0	28	0	31
App %	0.00%	0.00%	96.25%	3.75%			0.00%	0.00%	0.00%	0.00%			0.00%	55.17%	44.83%	0.00%			0.00%	3.75%	0.00%	96.25%		
Int %	0.00%	0.00%	35.32%	1.38%		36.70%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	14.68%	11.93%	0.00%		26.61%	0.00%	1.38%	0.00%	35.32%		36.70%
Cars Total	0	0	77	3			0	0	0	0			0	32	26	0			0	3	0	77		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	0.00%	100.00%	100.00%			0.00%	0.00%	0.00%	0.00%			0.00%	100.00%	100.00%	0.00%			0.00%	100.00%	0.00%	100.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

Location: Maury County (Columbia)
Count Type: Turning Movement Counts (TMCs)

Count Sites: 4
Intersection #: 4
Intersection: Lasea Road and Blackburn Lane

Southbound: Lasea Road
Westbound: N/A
Northbound: Lasea Road
Eastbound: Blackburn Lane

Lat/Long: N/A

Count Date: 9/7/2017

Time Period: 1500 - 1800 (Weekday PM Peak)

Figure 1 - Turning Movement Designation

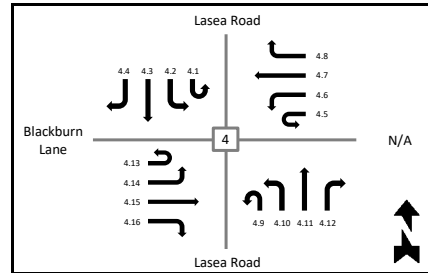
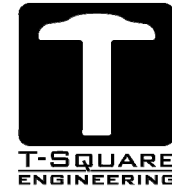
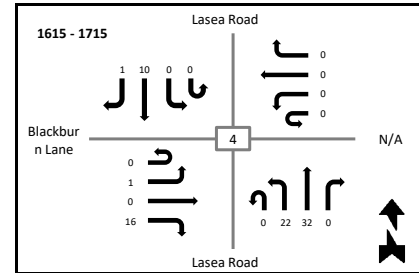


Figure 2 - PM Peak Hour TMC



Time	Southbound Lasea Road						Westbound N/A						Northbound Lasea Road						Eastbound Blackburn Lane					
	U-Turn 4.1	Left 4.2	Thru 4.3	Right 4.4	Peds X-Walk	App Total	U-Turn 4.5	Left 4.6	Thru 4.7	Right 4.8	Peds X-Walk	App Total	U-Turn 4.9	Left 4.10	Thru 4.11	Right 4.12	Peds X-Walk	App Total	U-Turn 4.13	Left 4.14	Thru 4.15	Right 4.16	Peds X-Walk	App Total
1500 - 1515	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
1515 - 1530	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
1530 - 1545	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
1545 - 1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
1600 - 1615	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
1615 - 1630	0	0	2	0	0	2	0	0	0	0	0	0	0	5	4	0	0	9	0	0	0	3	0	3
1630 - 1645	0	0	4	0	0	4	0	0	0	0	0	0	0	6	10	0	0	16	0	0	0	3	0	3
1645 - 1700	0	0	2	0	0	2	0	0	0	0	0	0	0	4	8	0	0	12	0	0	0	4	0	4
1700 - 1715	0	0	2	1	0	3	0	0	0	0	0	0	0	7	10	0	0	17	0	1	0	6	0	7
1715 - 1730	0	0	4	0	0	4	0	0	0	0	0	0	0	5	6	0	0	11	0	1	0	5	0	6
1730 - 1745	0	0	5	0	0	5	0	0	0	0	0	0	0	7	7	0	0	14	0	0	0	7	0	7
1745 - 1800	0	0	2	0	0	2	0	0	0	0	0	0	0	9	3	0	0	12	0	0	0	2	0	2
Grand Total	0	0	21	1	0	22	0	0	0	0	0	0	0	46	50	0	0	96	0	2	0	30	0	32
Peak Hour Total																								
1615 - 1715	0	0	10	1	0	11	0	0	0	0	0	0	0	22	32	0	0	54	0	1	0	16	0	17
App %	0.00%	0.00%	95.45%	4.55%			0.00%	0.00%	0.00%	0.00%			0.00%	47.92%	52.08%	0.00%			0.00%	6.25%	0.00%	93.75%		
Int %	0.00%	0.00%	14.00%	0.67%		14.67%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	30.67%	33.33%	0.00%		64.00%	0.00%	1.33%	0.00%	20.00%		21.33%
Cars Total	0	0	21	1			0	0	0	0			0	46	50	0			0	2	0	30		
Heavy Total	0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0		
% Cars	0.00%	0.00%	100.00%	100.00%			0.00%	0.00%	0.00%	0.00%			0.00%	100.00%	100.00%	0.00%			0.00%	100.00%	0.00%	100.00%		
% Heavy	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%		

APPENDIX B – DETAILED TRIP GENERATION CALCULATIONS



TRIP GENERATION

Project:	1451 Lasea Road – Columbia, TN
ITE Land Use:	Multi-Family Housing (Low-Rise)
ITE Code:	220
Trip Ends vs:	ITE 220 – 208 DU
Daily Equation:	Weekday – Fitted Curve Equation
AM Equation:	Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 AM – Fitted Curve Equation
PM Equation:	Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 PM – Fitted Curve Equation

Time Period	Formula ¹	Calculation	Trips
Daily	$T = 7.56(X) - 40.86$	$T = 7.56(208) - 40.86$	1,532
AM Peak (Total)	$\ln(T) = 0.95\ln(X) - 0.51$	$\ln(T) = 0.95\ln(208) - 0.51$	96
AM Peak (Entering)	$T = 0.23(\text{Total AM Trips})$	$T = 0.23(96)$	22
AM Peak (Exiting)	$T = 0.77(\text{Total AM Trips})$	$T = 0.77(96)$	74
PM Peak (Total)	$\ln(T) = 0.89\ln(X) - 0.02$	$\ln(T) = 0.89\ln(208) - 0.02$	113
PM Peak (Entering)	$T = 0.63(\text{Total PM Trips})$	$T = 0.63(113)$	71
PM Peak (Exiting)	$T = 0.37(\text{Total PM Trips})$	$T = 0.37(113)$	42

¹ Institute of Transportation Engineers (ITE). Trip Generation Manual, 10th Edition. Washington, DC: ITE, 2020

Multifamily Housing (Low-Rise) (220)

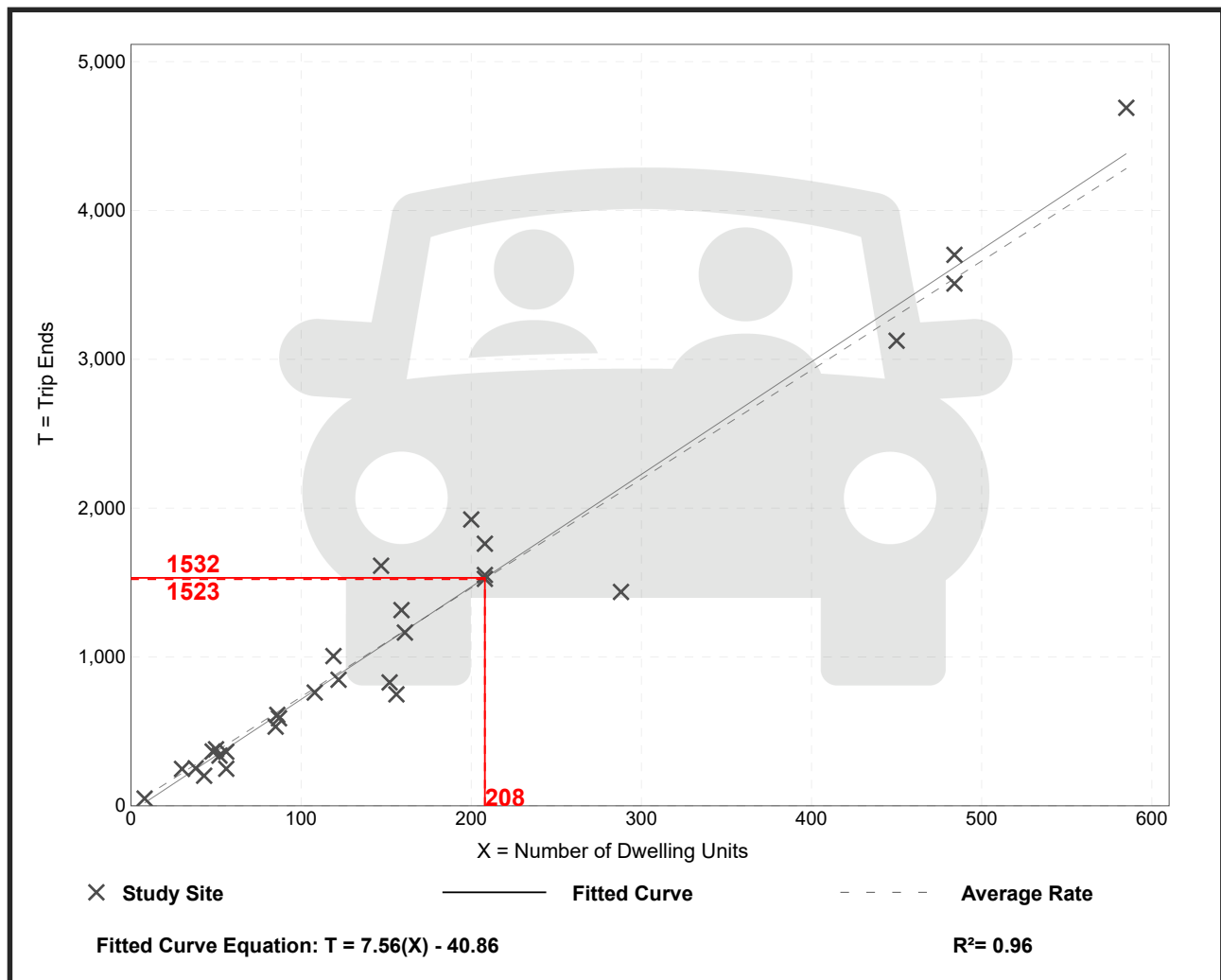
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



Trip Gen Manual, 10th Ed + Supplement • Institute of Transportation Engineers

Multifamily Housing (Low-Rise)

(220)

Vehicle Trip Ends vs:

Dwelling Units

On a:

Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Number of Studies:

42

Avg. Num. of Dwelling Units:

199

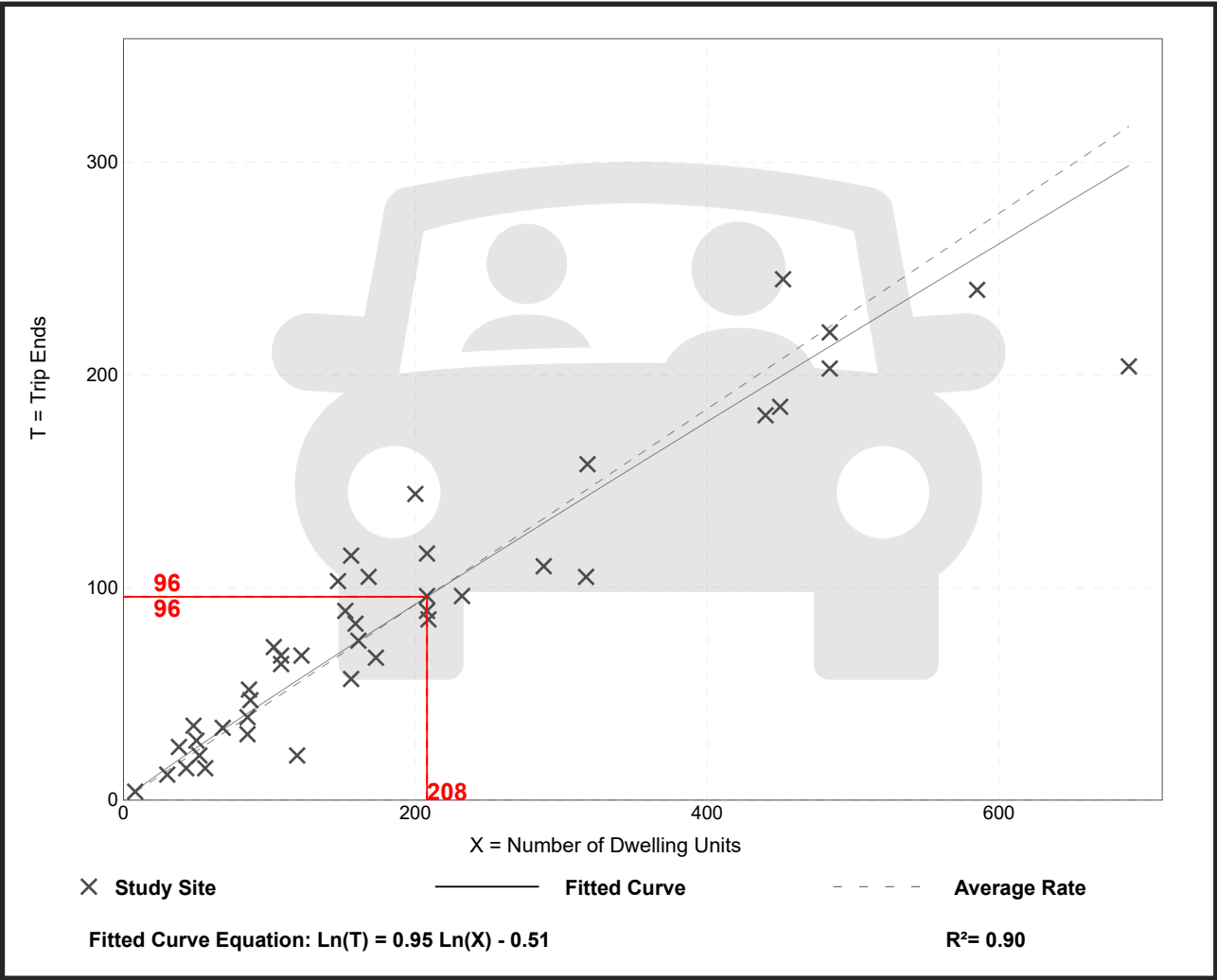
Directional Distribution:

23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 50

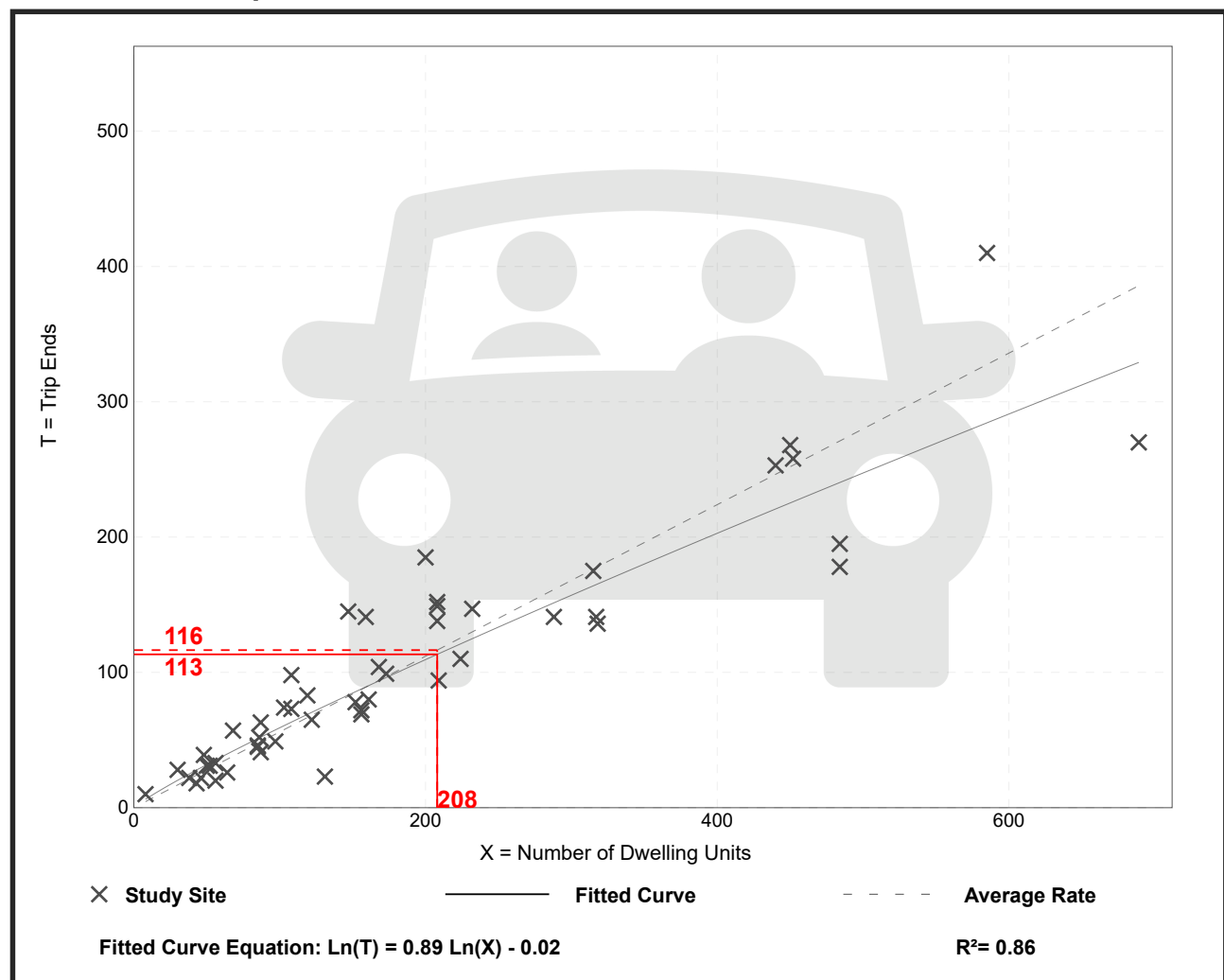
Avg. Num. of Dwelling Units: 187

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



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APPENDIX C – CAPACITY ANALYSES

EXISTING CAPACITY ANALYSES

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	787	541	6	27	17
Future Vol, veh/h	10	787	541	6	27	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	855	588	7	29	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	595	0	0 1469 592
Stage 1	-	-	- 592 -
Stage 2	-	-	- 877 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	981	-	- 140 506
Stage 1	-	-	- 553 -
Stage 2	-	-	- 407 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	981	-	- 138 506
Mov Cap-2 Maneuver	-	-	- 274 -
Stage 1	-	-	- 547 -
Stage 2	-	-	- 407 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	981	-	-	-	333
HCM Lane V/C Ratio	0.011	-	-	-	0.144
HCM Control Delay (s)	8.7	-	-	-	17.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	825	561	16	28	1
Future Vol, veh/h	0	825	561	16	28	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	897	610	17	30	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	627	0	0 1516 619
Stage 1	-	-	- 619 -
Stage 2	-	-	- 897 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	955	-	- 131 489
Stage 1	-	-	- 537 -
Stage 2	-	-	- 398 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	955	-	- 131 489
Mov Cap-2 Maneuver	-	-	- 267 -
Stage 1	-	-	- 537 -
Stage 2	-	-	- 398 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	955	-	-	-	271
HCM Lane V/C Ratio	-	-	-	-	0.116
HCM Control Delay (s)	0	-	-	-	20
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	15	4	1	3	13	2	10	1	18	49	1
Future Vol, veh/h	0	15	4	1	3	13	2	10	1	18	49	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	16	4	1	3	14	2	11	1	20	53	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	6.8	7.1	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	6%	26%
Vol Thru, %	77%	79%	18%	72%
Vol Right, %	8%	21%	76%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	19	17	68
LT Vol	2	0	1	18
Through Vol	10	15	3	49
RT Vol	1	4	13	1
Lane Flow Rate	14	21	18	74
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.023	0.019	0.083
Departure Headway (Hd)	4.041	3.976	3.656	4.056
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	885	897	973	885
Service Time	2.071	2.017	1.699	2.074
HCM Lane V/C Ratio	0.016	0.023	0.018	0.084
HCM Control Delay	7.1	7.1	6.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.1	0.3

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	30	12	7	36	1
Future Vol, veh/h	3	30	12	7	36	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	33	13	8	39	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	74	40	40	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	34	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	930	1031	1570	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	923	1031	1570	-	-	-
Mov Cap-2 Maneuver	923	-	-	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.7	4.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1570	-	1020	-	-	
HCM Lane V/C Ratio	0.008	-	0.035	-	-	
HCM Control Delay (s)	7.3	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection: 1: Bear Creek Pike & Lasea Road

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	28	104
Average Queue (ft)	4	20
95th Queue (ft)	19	59
Link Distance (ft)	1262	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Bear Creek Pike & Old Highway 99

Movement	SB
Directions Served	LR
Maximum Queue (ft)	66
Average Queue (ft)	19
95th Queue (ft)	51
Link Distance (ft)	248
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Lasea Road & Old Highway 99

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	27	31	19	55
Average Queue (ft)	12	13	4	34
95th Queue (ft)	34	38	16	48
Link Distance (ft)	892	1948	1262	3595
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Lasea Road & Blackburn Lane

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	68	29
Average Queue (ft)	14	1
95th Queue (ft)	37	10
Link Distance (ft)	911	3595
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	569	835	10	23	20
Future Vol, veh/h	29	569	835	10	23	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	618	908	11	25	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	919	0	0 1596 914
Stage 1	-	-	- 914 -
Stage 2	-	-	- 682 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	743	-	- 117 331
Stage 1	-	-	- 391 -
Stage 2	-	-	- 502 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	743	-	- 112 331
Mov Cap-2 Maneuver	-	-	- 245 -
Stage 1	-	-	- 374 -
Stage 2	-	-	- 502 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	20.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	743	-	-	-	279
HCM Lane V/C Ratio	0.042	-	-	-	0.168
HCM Control Delay (s)	10.1	-	-	-	20.5
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	604	964	50	8	3
Future Vol, veh/h	2	604	964	50	8	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	657	1048	54	9	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1102	0	-	0	1736	1075
Stage 1	-	-	-	-	1075	-
Stage 2	-	-	-	-	661	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	633	-	-	-	96	267
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	633	-	-	-	96	267
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	514	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		21.3		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	633	-	-	-	233	
HCM Lane V/C Ratio	0.003	-	-	-	0.051	
HCM Control Delay (s)	10.7	-	-	-	21.3	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	4	3	0	11	41	5	41	1	12	29	3
Future Vol, veh/h	3	4	3	0	11	41	5	41	1	12	29	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	4	3	0	12	45	5	45	1	13	32	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	6.9	7.4	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	30%	0%	27%
Vol Thru, %	87%	40%	21%	66%
Vol Right, %	2%	30%	79%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	10	52	44
LT Vol	5	3	0	12
Through Vol	41	4	11	29
RT Vol	1	3	41	3
Lane Flow Rate	51	11	57	48
Geometry Grp	1	1	1	1
Degree of Util (X)	0.058	0.012	0.057	0.055
Departure Headway (Hd)	4.097	4.029	3.64	4.104
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	874	882	977	872
Service Time	2.125	2.083	1.69	2.133
HCM Lane V/C Ratio	0.058	0.012	0.058	0.055
HCM Control Delay	7.4	7.1	6.9	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0.2	0.2

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	17	24	35	11	1
Future Vol, veh/h	1	17	24	35	11	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	18	26	38	12	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	103	13	13
Stage 1	13	-	-
Stage 2	90	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	895	1067	1606
Stage 1	1010	-	-
Stage 2	934	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	880	1067	1606
Mov Cap-2 Maneuver	880	-	-
Stage 1	993	-	-
Stage 2	934	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1606	-	1055	-	-
HCM Lane V/C Ratio	0.016	-	0.019	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection: 1: Bear Creek Pike & Lasea Road

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	49	22	79
Average Queue (ft)	20	1	20
95th Queue (ft)	41	7	56
Link Distance (ft)		2447	1262
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Bear Creek Pike & Old Highway 99

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	27	31
Average Queue (ft)	1	11
95th Queue (ft)	9	35
Link Distance (ft)		248
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Lasea Road & Old Highway 99

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	27	56	19	54
Average Queue (ft)	8	31	16	23
95th Queue (ft)	28	56	26	50
Link Distance (ft)	892	1948	1262	3595
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Lasea Road & Blackburn Lane

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	24	29
Average Queue (ft)	7	1
95th Queue (ft)	22	9
Link Distance (ft)	911	3595
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

BACKGROUND CAPACITY ANALYSES

HCM 2010 Signalized Intersection Summary

1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

1451 Lasea Road Development
Background - AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	850	20	32	615	10	66	13	105	35	4	52
Future Volume (veh/h)	21	850	20	32	615	10	66	13	105	35	4	52
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	23	924	22	35	668	11	72	14	114	38	4	57
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	1009	857	191	1024	870	267	18	149	212	12	166
Arrive On Green	0.02	0.54	0.54	0.03	0.55	0.55	0.05	0.10	0.10	0.06	0.11	0.11
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	176	1434	1774	105	1494
Grp Volume(v), veh/h	23	924	22	35	668	11	72	0	128	38	0	61
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1610	1774	0	1599
Q Serve(g_s), s	0.5	40.6	0.6	0.8	22.7	0.3	3.2	0.0	7.0	1.7	0.0	3.2
Cycle Q Clear(g_c), s	0.5	40.6	0.6	0.8	22.7	0.3	3.2	0.0	7.0	1.7	0.0	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.89	1.00		0.93
Lane Grp Cap(c), veh/h	349	1009	857	191	1024	870	267	0	167	212	0	178
V/C Ratio(X)	0.07	0.92	0.03	0.18	0.65	0.01	0.27	0.00	0.76	0.18	0.00	0.34
Avail Cap(c_a), veh/h	404	1231	1046	232	1231	1046	280	0	322	468	0	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.4	18.8	9.6	18.1	14.2	9.2	33.7	0.0	39.3	32.8	0.0	37.0
Incr Delay (d2), s/veh	0.1	9.5	0.0	0.5	0.9	0.0	0.5	0.0	7.1	0.4	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	23.2	0.3	0.4	11.8	0.1	1.6	0.0	3.4	0.8	0.0	1.5
LnGrp Delay(d),s/veh	11.4	28.3	9.6	18.5	15.2	9.2	34.3	0.0	46.3	33.2	0.0	38.1
LnGrp LOS	B	C	A	B	B	A	C		D	C		D
Approach Vol, veh/h		969			714			200			99	
Approach Delay, s/veh		27.4			15.2			42.0			36.2	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	54.8	10.4	16.0	8.2	55.5	11.0	15.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	59.5	5.0	29.5	5.0	59.5	18.0	18.0				
Max Q Clear Time (g_c+l1), s	2.8	42.6	5.2	5.2	2.5	24.7	3.7	9.0				
Green Ext Time (p_c), s	0.0	6.1	0.0	0.3	0.0	4.6	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				25.0								
HCM 2010 LOS				C								

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1024	701	29	58	1
Future Vol, veh/h	2	1024	701	29	58	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	1113	762	32	63	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	794	0	-	0	1879	762
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	1117	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	827	-	-	-	78	405
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	313	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	827	-	-	-	78	405
Mov Cap-2 Maneuver	-	-	-	-	204	-
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	313	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		30.2		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	827	-	-	-	206	
HCM Lane V/C Ratio	0.003	-	-	-	0.311	
HCM Control Delay (s)	9.4	-	-	-	30.2	
HCM Lane LOS	A	-	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	1.3	

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	17	5	1	5	24	2	25	1	47	100	7
Future Vol, veh/h	2	17	5	1	5	24	2	25	1	47	100	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	18	5	1	5	26	2	27	1	51	109	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.1	7.4	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	8%	3%	31%
Vol Thru, %	89%	71%	17%	65%
Vol Right, %	4%	21%	80%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	24	30	154
LT Vol	2	2	1	47
Through Vol	25	17	5	100
RT Vol	1	5	24	7
Lane Flow Rate	30	26	33	167
Geometry Grp	1	1	1	1
Degree of Util (X)	0.035	0.031	0.036	0.19
Departure Headway (Hd)	4.156	4.295	3.923	4.092
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	853	839	918	874
Service Time	2.221	2.295	1.924	2.129
HCM Lane V/C Ratio	0.035	0.031	0.036	0.191
HCM Control Delay	7.4	7.4	7.1	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.7

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	36	23	30	48	1
Future Vol, veh/h	3	36	23	30	48	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	39	25	33	52	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	136	53	53	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	857	1014	1553	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	843	1014	1553	-	-	-
Mov Cap-2 Maneuver	843	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.8	3.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1553	-	998	-	-	
HCM Lane V/C Ratio	0.016	-	0.042	-	-	
HCM Control Delay (s)	7.4	0	8.8	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection: 1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	40	552	29	199	307	220	66	124	59	87
Average Queue (ft)	11	220	8	24	128	18	35	57	17	16
95th Queue (ft)	32	388	28	82	219	108	65	113	47	48
Link Distance (ft)		2212			2439			620	1247	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		230	100		120	175			40
Storage Blk Time (%)		20			10				6	2
Queuing Penalty (veh)		8			4				3	1

Intersection: 2: Bear Creek Pike & Old Highway 99

Movement	SB
Directions Served	LR
Maximum Queue (ft)	200
Average Queue (ft)	69
95th Queue (ft)	152
Link Distance (ft)	239
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Lasea Road & Old Highway 99

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	27	31	37	78
Average Queue (ft)	16	19	11	42
95th Queue (ft)	37	42	28	67
Link Distance (ft)	892	1948	1247	3595
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Lasea Road & Blackburn Lane

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	66	27
Average Queue (ft)	18	1
95th Queue (ft)	43	9
Link Distance (ft)	911	3595
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 17

HCM 2010 Signalized Intersection Summary

1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

1451 Lasea Road Development
Background - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	650	64	102	913	23	38	8	60	35	13	43
Future Volume (veh/h)	67	650	64	102	913	23	38	8	60	35	13	43
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	73	707	70	111	992	25	41	9	65	38	14	47
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1042	885	385	1052	894	214	14	98	210	33	112
Arrive On Green	0.05	0.56	0.56	0.05	0.56	0.56	0.04	0.07	0.07	0.06	0.09	0.09
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	196	1417	1774	376	1263
Grp Volume(v), veh/h	73	707	70	111	992	25	41	0	74	38	0	61
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1613	1774	0	1640
Q Serve(g_s), s	1.5	24.5	1.8	2.4	45.0	0.6	1.9	0.0	4.1	1.7	0.0	3.2
Cycle Q Clear(g_c), s	1.5	24.5	1.8	2.4	45.0	0.6	1.9	0.0	4.1	1.7	0.0	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	1.00		0.77
Lane Grp Cap(c), veh/h	200	1042	885	385	1052	894	214	0	112	210	0	146
V/C Ratio(X)	0.37	0.68	0.08	0.29	0.94	0.03	0.19	0.00	0.66	0.18	0.00	0.42
Avail Cap(c_a), veh/h	215	1109	943	411	1130	960	249	0	320	464	0	560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	14.2	9.2	11.2	18.4	8.7	37.2	0.0	41.2	35.6	0.0	39.1
Incr Delay (d2), s/veh	1.1	1.6	0.0	0.4	14.6	0.0	0.4	0.0	6.5	0.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	12.8	0.8	1.2	27.1	0.3	1.0	0.0	2.0	0.9	0.0	1.5
LnGrp Delay(d),s/veh	21.0	15.8	9.3	11.6	33.0	8.7	37.6	0.0	47.7	36.0	0.0	41.0
LnGrp LOS	C	B	A	B	C	A	D		D	D		D
Approach Vol, veh/h	850				1128				115		99	
Approach Delay, s/veh	15.7				30.4				44.1		39.1	
Approach LOS	B				C				D		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	56.7	9.2	14.1	10.2	57.2	11.0	12.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	6.0	54.0	5.0	31.0	5.0	55.0	18.0	18.0				
Max Q Clear Time (g_c+I1), s	4.4	26.5	3.9	5.2	3.5	47.0	3.7	6.1				
Green Ext Time (p_c), s	0.0	5.0	0.0	0.3	0.0	4.2	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			25.8									
HCM 2010 LOS			C									

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	775	1187	84	29	3
Future Vol, veh/h	2	775	1187	84	29	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	842	1290	91	32	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1381	0	-	0	2136	1290
Stage 1	-	-	-	-	1290	-
Stage 2	-	-	-	-	846	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	496	-	-	-	54	200
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	496	-	-	-	54	200
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	421	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		31.4		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	496	-	-	-	171	
HCM Lane V/C Ratio	0.004	-	-	-	0.203	
HCM Control Delay (s)	12.3	-	-	-	31.4	
HCM Lane LOS	B	-	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.7	

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	8	3	0	12	74	6	93	1	30	72	7
Future Vol, veh/h	9	8	3	0	12	74	6	93	1	30	72	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	9	3	0	13	80	7	101	1	33	78	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.4	7.9	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	45%	0%	28%
Vol Thru, %	93%	40%	14%	66%
Vol Right, %	1%	15%	86%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	100	20	86	109
LT Vol	6	9	0	30
Through Vol	93	8	12	72
RT Vol	1	3	74	7
Lane Flow Rate	109	22	93	118
Geometry Grp	1	1	1	1
Degree of Util (X)	0.128	0.027	0.103	0.139
Departure Headway (Hd)	4.231	4.541	3.952	4.235
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	836	792	912	835
Service Time	2.317	2.545	1.952	2.318
HCM Lane V/C Ratio	0.13	0.028	0.102	0.141
HCM Control Delay	7.9	7.7	7.4	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.3	0.5

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	30	32	51	49	1
Future Vol, veh/h	1	30	32	51	49	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	33	35	55	53	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	179	54	54	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	811	1013	1551	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	792	1013	1551	-	-	-
Mov Cap-2 Maneuver	792	-	-	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.7	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1551	-	1004	-	-	
HCM Lane V/C Ratio	0.022	-	0.034	-	-	
HCM Control Delay (s)	7.4	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Intersection: 1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	200	313	51	200	573	219	66	86	93	106
Average Queue (ft)	48	152	15	74	276	18	22	27	17	19
95th Queue (ft)	125	254	39	192	475	83	52	58	51	57
Link Distance (ft)		2212			2439			620	1247	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		230	100		120	175			40
Storage Blk Time (%)	0	12		0	24				6	4
Queuing Penalty (veh)	2	16		0	29				3	1

Intersection: 2: Bear Creek Pike & Old Highway 99

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	27	94
Average Queue (ft)	1	30
95th Queue (ft)	9	73
Link Distance (ft)		239
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Lasea Road & Old Highway 99

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	27	76	44	68
Average Queue (ft)	10	37	28	40
95th Queue (ft)	32	60	46	63
Link Distance (ft)	892	1948	1247	3595
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Lasea Road & Blackburn Lane

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	56	29
Average Queue (ft)	15	1
95th Queue (ft)	37	10
Link Distance (ft)	911	3595
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 52

PROJECTED CAPACITY ANALYSES

HCM 2010 Signalized Intersection Summary

1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

1451 Lasea Road Development
Projected - AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	850	20	32	615	23	66	13	105	79	4	78
Future Volume (veh/h)	29	850	20	32	615	23	66	13	105	79	4	78
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	32	924	22	35	668	25	72	14	114	86	4	85
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	344	1004	854	185	1007	856	253	18	148	227	9	183
Arrive On Green	0.03	0.54	0.54	0.03	0.54	0.54	0.05	0.10	0.10	0.07	0.12	0.12
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	176	1434	1774	72	1522
Grp Volume(v), veh/h	32	924	22	35	668	25	72	0	128	86	0	89
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1610	1774	0	1594
Q Serve(g_s), s	0.7	41.9	0.6	0.8	23.7	0.7	3.3	0.0	7.1	3.9	0.0	4.8
Cycle Q Clear(g_c), s	0.7	41.9	0.6	0.8	23.7	0.7	3.3	0.0	7.1	3.9	0.0	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.89	1.00		0.96
Lane Grp Cap(c), veh/h	344	1004	854	185	1007	856	253	0	166	227	0	192
V/C Ratio(X)	0.09	0.92	0.03	0.19	0.66	0.03	0.28	0.00	0.77	0.38	0.00	0.46
Avail Cap(c_a), veh/h	387	1201	1021	225	1201	1021	263	0	314	457	0	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	19.5	9.9	18.8	15.2	9.9	34.7	0.0	40.3	33.8	0.0	37.8
Incr Delay (d2), s/veh	0.1	10.3	0.0	0.5	1.1	0.0	0.6	0.0	7.3	1.0	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	24.2	0.3	0.5	12.4	0.3	1.7	0.0	3.5	2.0	0.0	2.2
LnGrp Delay(d),s/veh	12.0	29.7	10.0	19.2	16.2	9.9	35.3	0.0	47.6	34.9	0.0	39.6
LnGrp LOS	B	C	A	B	B	A	D		D	C		D
Approach Vol, veh/h	978			728			200			175		
Approach Delay, s/veh	28.7			16.2			43.2			37.3		
Approach LOS	C			B			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	55.8	10.5	17.1	8.8	55.9	12.0	15.5				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	59.5	5.0	31.0	5.0	59.5	18.0	18.0				
Max Q Clear Time (g_c+I1), s	2.8	43.9	5.3	6.8	2.7	25.7	5.9	9.1				
Green Ext Time (p_c), s	0.0	5.9	0.0	0.4	0.0	4.6	0.1	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay	26.4											
HCM 2010 LOS	C											

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1068	714	29	58	1
Future Vol, veh/h	0	1068	714	29	58	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1161	776	32	63	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	808	0	-	0	1937	776
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	1161	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	817	-	-	-	72	397
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	298	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	817	-	-	-	72	397
Mov Cap-2 Maneuver	-	-	-	-	195	-
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	298	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		31.9		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	817	-	-	-	197	
HCM Lane V/C Ratio	-	-	-	-	0.326	
HCM Control Delay (s)	0	-	-	-	31.9	
HCM Lane LOS	A	-	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	1.3	

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	17	5	1	5	24	2	29	1	47	101	7
Future Vol, veh/h	2	17	5	1	5	24	2	29	1	47	101	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	18	5	1	5	26	2	32	1	51	110	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.1	7.4	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	8%	3%	30%
Vol Thru, %	91%	71%	17%	65%
Vol Right, %	3%	21%	80%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	24	30	155
LT Vol	2	2	1	47
Through Vol	29	17	5	101
RT Vol	1	5	24	7
Lane Flow Rate	35	26	33	168
Geometry Grp	1	1	1	1
Degree of Util (X)	0.04	0.031	0.036	0.192
Departure Headway (Hd)	4.158	4.308	3.936	4.096
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	853	836	915	874
Service Time	2.224	2.309	1.937	2.133
HCM Lane V/C Ratio	0.041	0.031	0.036	0.192
HCM Control Delay	7.4	7.4	7.1	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.7

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	36	23	34	49	1
Future Vol, veh/h	3	36	23	34	49	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	39	25	37	53	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	141	54	54	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	852	1013	1551	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	838	1013	1551	-	-	-
Mov Cap-2 Maneuver	838	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	997	-	-
HCM Lane V/C Ratio	0.016	-	0.043	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	70	21	44	91	1
Future Vol, veh/h	4	70	21	44	91	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	76	23	48	99	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	194	100	100	0	-	0
Stage 1	100	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	795	956	1493	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	782	956	1493	-	-	-
Mov Cap-2 Maneuver	782	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	930	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1493	-	945	-	-
HCM Lane V/C Ratio	0.015	-	0.085	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection: 1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	199	360	25	64	265	30	85	120	126	88
Average Queue (ft)	21	232	1	16	143	8	32	47	42	23
95th Queue (ft)	101	354	8	44	241	29	64	94	84	62
Link Distance (ft)		2212			2442			620	364	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		230	100		120	175			40
Storage Blk Time (%)		20			12				18	4
Queuing Penalty (veh)		10			7				14	3

Intersection: 2: Bear Creek Pike & Old Highway 99

Movement	SB
Directions Served	LR
Maximum Queue (ft)	134
Average Queue (ft)	70
95th Queue (ft)	122
Link Distance (ft)	239
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Lasea Road & Old Highway 99

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	27	54	41	79
Average Queue (ft)	19	24	11	40
95th Queue (ft)	39	50	28	65
Link Distance (ft)	891	1948	820	3595
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Lasea Road & Blackburn Lane

Movement	EB
Directions Served	LR
Maximum Queue (ft)	48
Average Queue (ft)	15
95th Queue (ft)	38
Link Distance (ft)	911
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Lasea Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	48	31
Average Queue (ft)	26	1
95th Queue (ft)	44	10
Link Distance (ft)	316	364
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 34

HCM 2010 Signalized Intersection Summary

1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

1451 Lasea Road Development
Projected - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	650	64	102	913	65	38	8	60	60	13	58
Future Volume (veh/h)	92	650	64	102	913	65	38	8	60	60	13	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	100	707	70	111	992	71	41	9	65	65	14	63
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	1047	890	387	1049	892	200	14	98	210	27	119
Arrive On Green	0.05	0.56	0.56	0.05	0.56	0.56	0.04	0.07	0.07	0.06	0.09	0.09
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	196	1417	1774	296	1332
Grp Volume(v), veh/h	100	707	70	111	992	71	41	0	74	65	0	77
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	0	1613	1774	0	1628
Q Serve(g_s), s	2.1	24.6	1.9	2.4	45.7	1.9	1.9	0.0	4.1	3.1	0.0	4.1
Cycle Q Clear(g_c), s	2.1	24.6	1.9	2.4	45.7	1.9	1.9	0.0	4.1	3.1	0.0	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	1.00		0.82
Lane Grp Cap(c), veh/h	202	1047	890	387	1049	892	200	0	111	210	0	146
V/C Ratio(X)	0.49	0.68	0.08	0.29	0.95	0.08	0.21	0.00	0.67	0.31	0.00	0.53
Avail Cap(c_a), veh/h	210	1096	932	412	1116	949	234	0	316	458	0	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	14.2	9.2	11.2	18.7	9.2	37.7	0.0	41.7	36.6	0.0	39.9
Incr Delay (d2), s/veh	1.9	1.6	0.0	0.4	15.2	0.0	0.5	0.0	6.7	0.8	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	13.0	0.8	1.2	27.6	0.8	1.0	0.0	2.0	1.5	0.0	2.0
LnGrp Delay(d),s/veh	22.6	15.7	9.2	11.6	33.9	9.2	38.2	0.0	48.3	37.4	0.0	42.8
LnGrp LOS	C	B	A	B	C	A	D		D	D		D
Approach Vol, veh/h	877				1174				115		142	
Approach Delay, s/veh	16.0				30.3				44.7		40.3	
Approach LOS	B				C				D		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	57.6	9.2	14.2	10.6	57.7	11.1	12.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	6.0	54.0	5.0	31.0	5.0	55.0	18.0	18.0				
Max Q Clear Time (g_c+I1), s	4.4	26.6	3.9	6.1	4.1	47.7	5.1	6.1				
Green Ext Time (p_c), s	0.0	5.0	0.0	0.4	0.0	4.0	0.1	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay	26.2											
HCM 2010 LOS	C											

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	800	1229	84	29	3
Future Vol, veh/h	2	800	1229	84	29	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	870	1336	91	32	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1427	0	-	0	2210	1336
Stage 1	-	-	-	-	1336	-
Stage 2	-	-	-	-	874	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	477	-	-	-	49	188
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	408	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	477	-	-	-	49	188
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	408	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		33.2		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	477	-	-	-	162	
HCM Lane V/C Ratio	0.005	-	-	-	0.215	
HCM Control Delay (s)	12.6	-	-	-	33.2	
HCM Lane LOS	B	-	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.8	

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	8	3	0	12	74	6	95	1	30	76	7
Future Vol, veh/h	9	8	3	0	12	74	6	95	1	30	76	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	9	3	0	13	80	7	103	1	33	83	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.4	8	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	45%	0%	27%
Vol Thru, %	93%	40%	14%	67%
Vol Right, %	1%	15%	86%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	102	20	86	113
LT Vol	6	9	0	30
Through Vol	95	8	12	76
RT Vol	1	3	74	7
Lane Flow Rate	111	22	93	123
Geometry Grp	1	1	1	1
Degree of Util (X)	0.13	0.028	0.103	0.145
Departure Headway (Hd)	4.235	4.557	3.967	4.236
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	790	909	835
Service Time	2.324	2.56	1.968	2.321
HCM Lane V/C Ratio	0.133	0.028	0.102	0.147
HCM Control Delay	8	7.7	7.4	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.3	0.5

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	30	32	53	53	1
Future Vol, veh/h	1	30	32	53	53	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	33	35	58	58	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	187	59	59	0	-	0
Stage 1	59	-	-	-	-	-
Stage 2	128	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	802	1007	1545	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	784	1007	1545	-	-	-
Mov Cap-2 Maneuver	784	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.7	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1545	-	998	-	-	
HCM Lane V/C Ratio	0.023	-	0.034	-	-	
HCM Control Delay (s)	7.4	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	40	67	98	91	4
Future Vol, veh/h	2	40	67	98	91	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	43	73	107	99	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	354	101	103	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	644	954	1489	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	611	954	1489	-	-	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	3.1		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1489	-	929	-	-	
HCM Lane V/C Ratio	0.049	-	0.049	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-	

Intersection: 1: Rock Springs Access Drive/Lasea Road & Bear Creek Pike

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	200	399	29	200	982	220	66	80	99	49
Average Queue (ft)	50	170	14	107	493	49	19	24	27	18
95th Queue (ft)	138	289	36	237	913	176	49	56	74	45
Link Distance (ft)		2212			2442			620	364	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		230	100		120	175			40
Storage Blk Time (%)		17		1	32				11	2
Queuing Penalty (veh)		26		9	54				8	1

Intersection: 2: Bear Creek Pike & Old Highway 99

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	48	64
Average Queue (ft)	3	23
95th Queue (ft)	19	51
Link Distance (ft)		239
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Lasea Road & Old Highway 99

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	27	56	43	55
Average Queue (ft)	7	35	23	35
95th Queue (ft)	26	50	39	53
Link Distance (ft)	891	1948	820	3595
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Lasea Road & Blackburn Lane

Movement	EB
Directions Served	LR
Maximum Queue (ft)	42
Average Queue (ft)	15
95th Queue (ft)	34
Link Distance (ft)	911
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

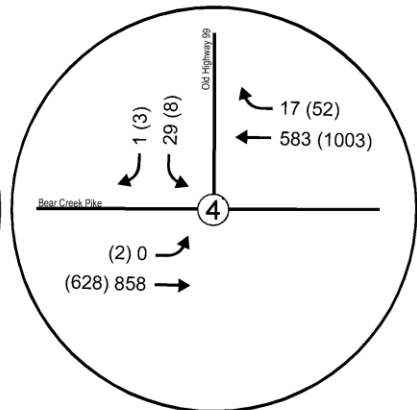
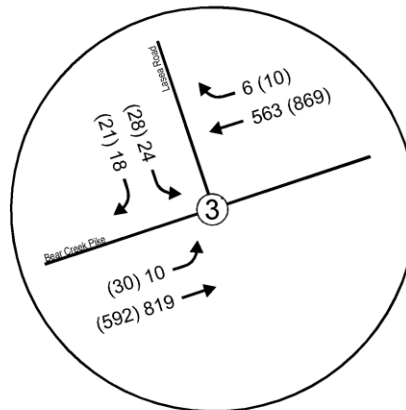
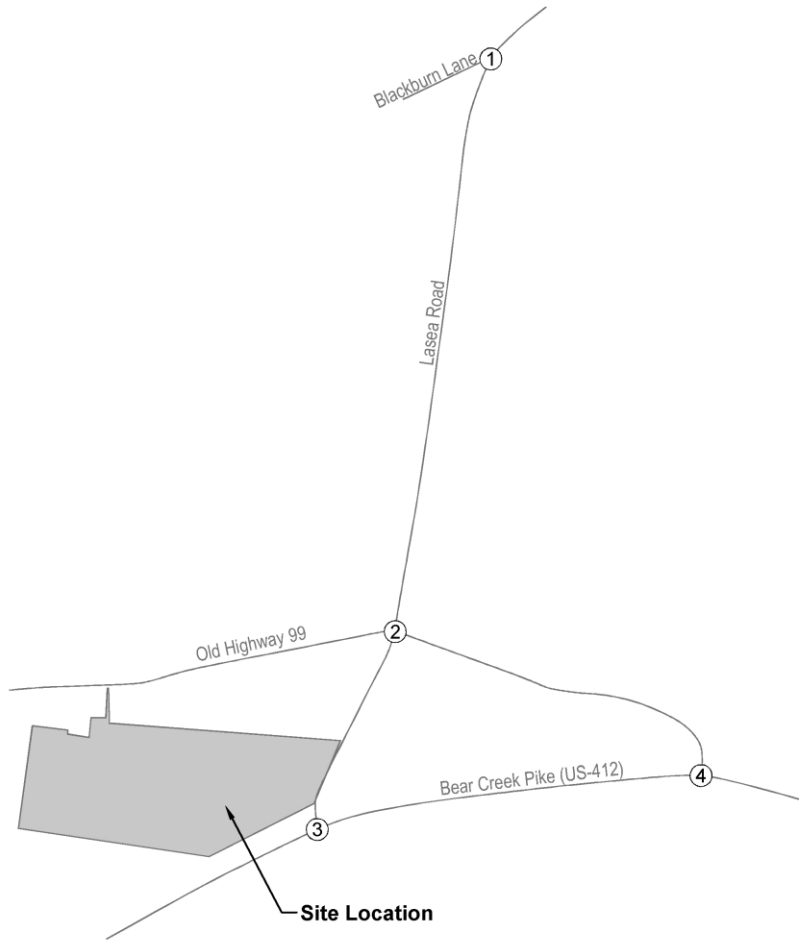
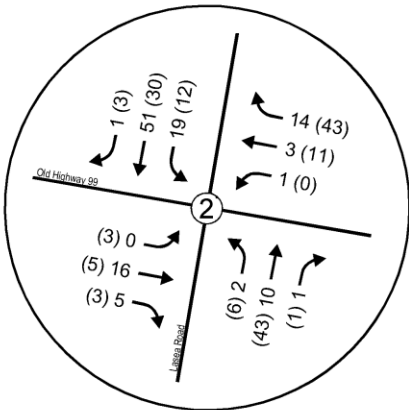
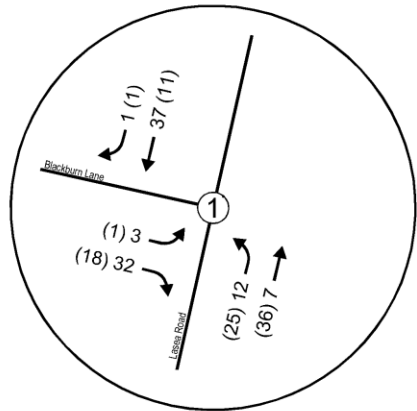
Intersection: 5: Lasea Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	75	32
Average Queue (ft)	23	6
95th Queue (ft)	50	26
Link Distance (ft)	316	364
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 98

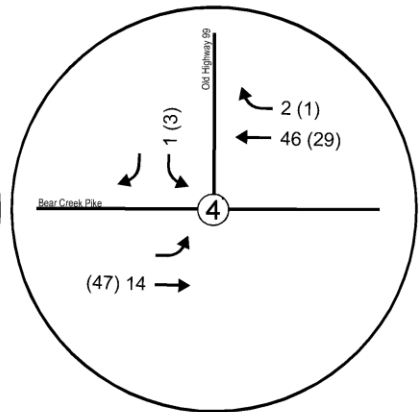
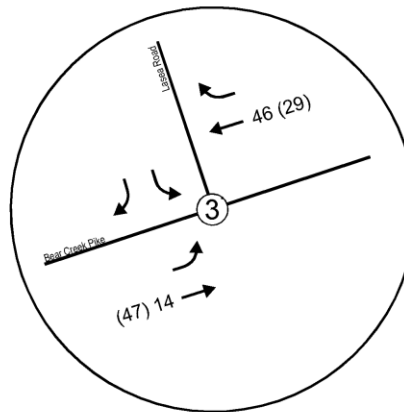
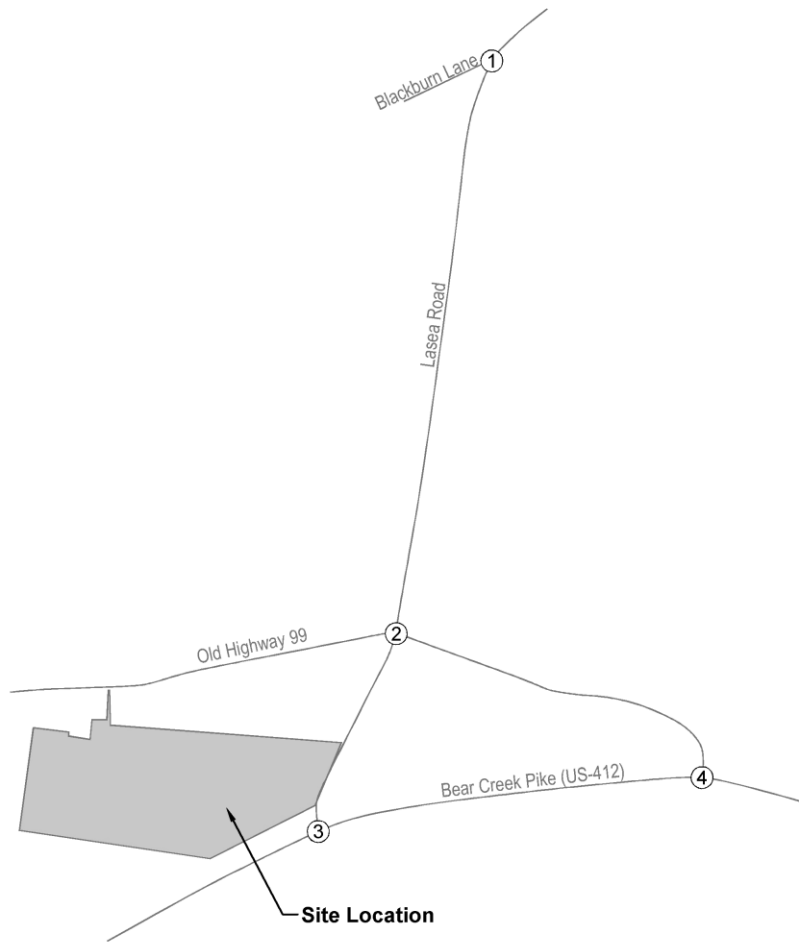
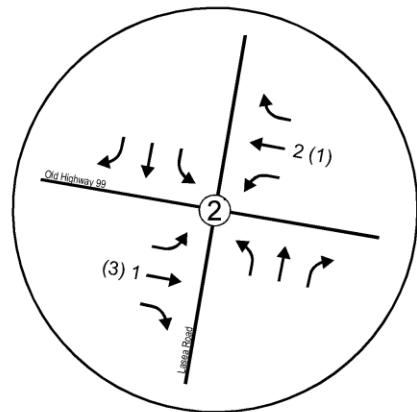
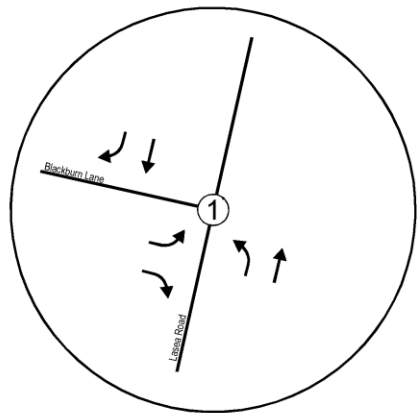
APPENDIX D – ADDITIONAL FIGURES



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



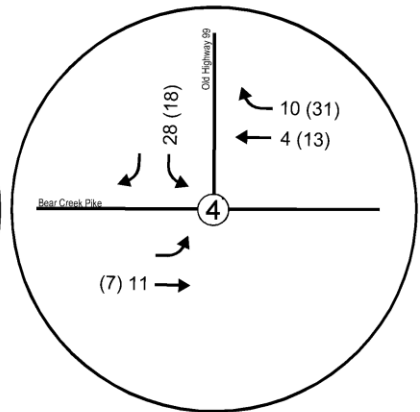
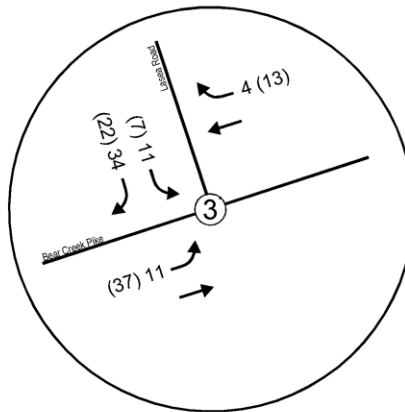
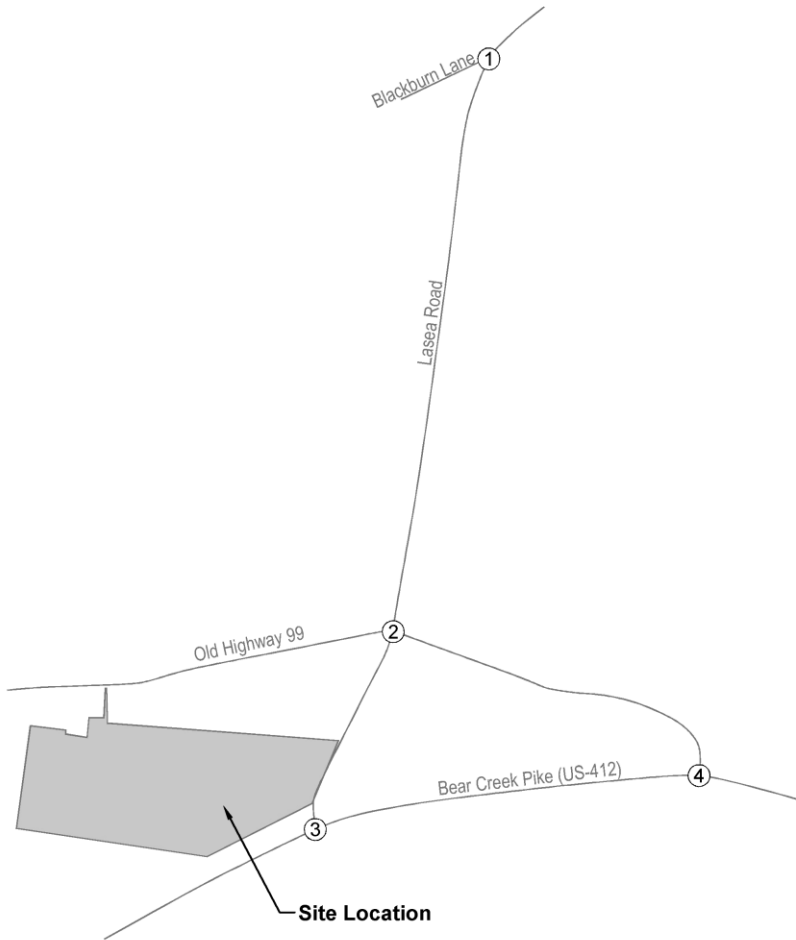
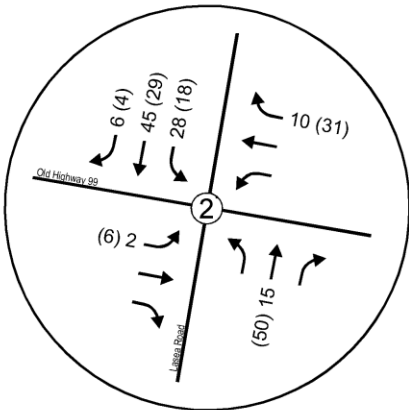
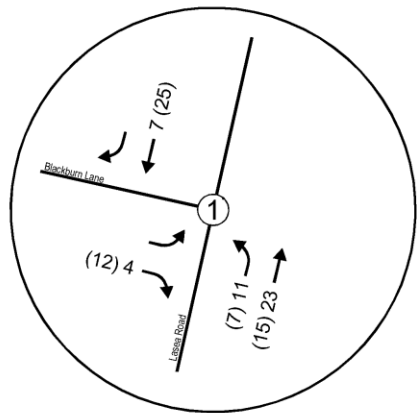
Figure D1
 Background Traffic Volumes
 (2023)



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



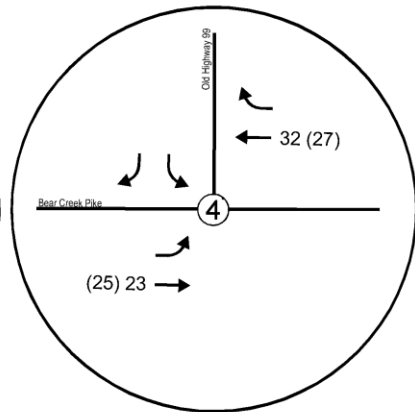
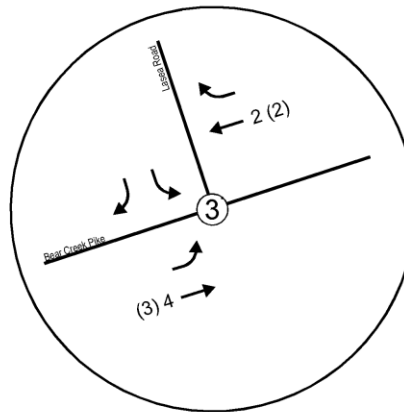
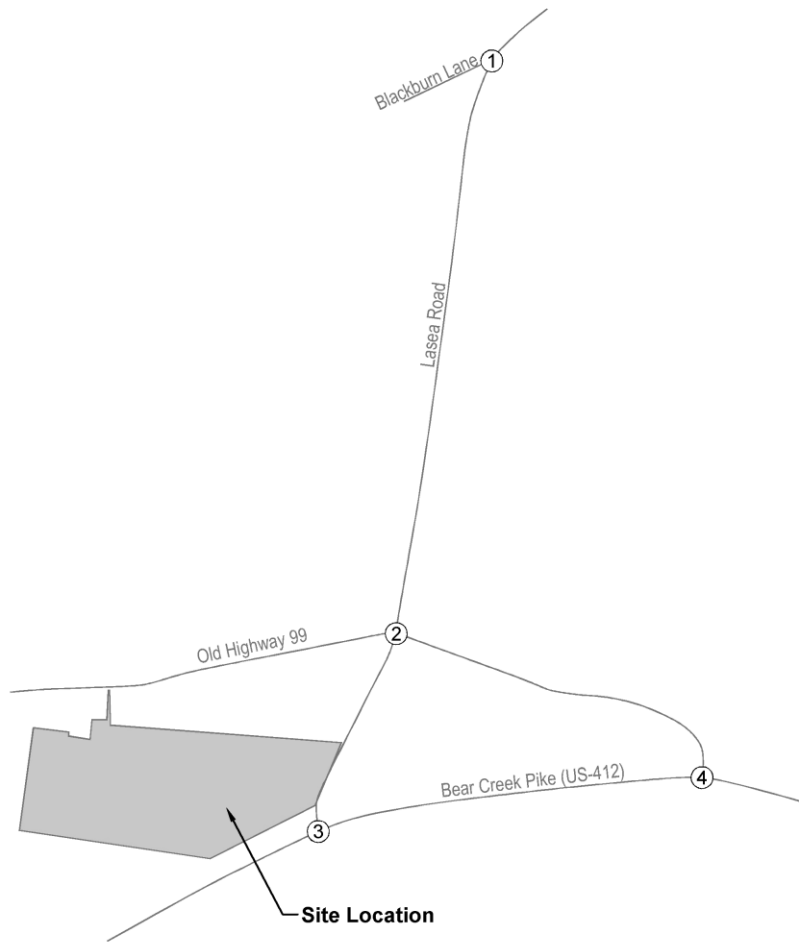
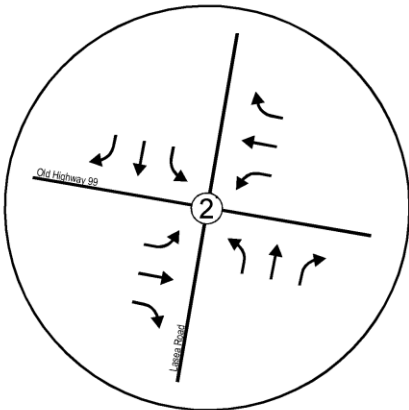
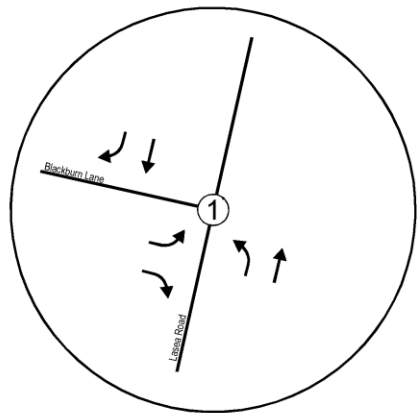
Figure D2
 Generated Background
 Development Volumes
 (I-65 and Bear Creek Pike)



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



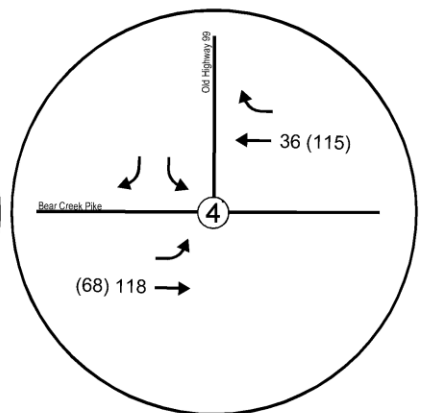
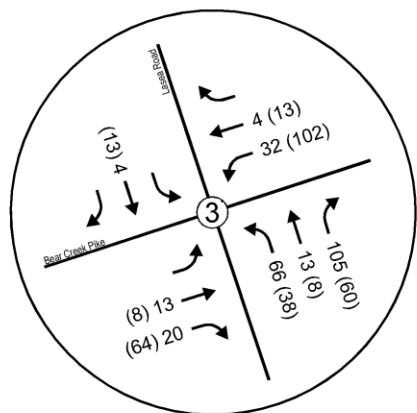
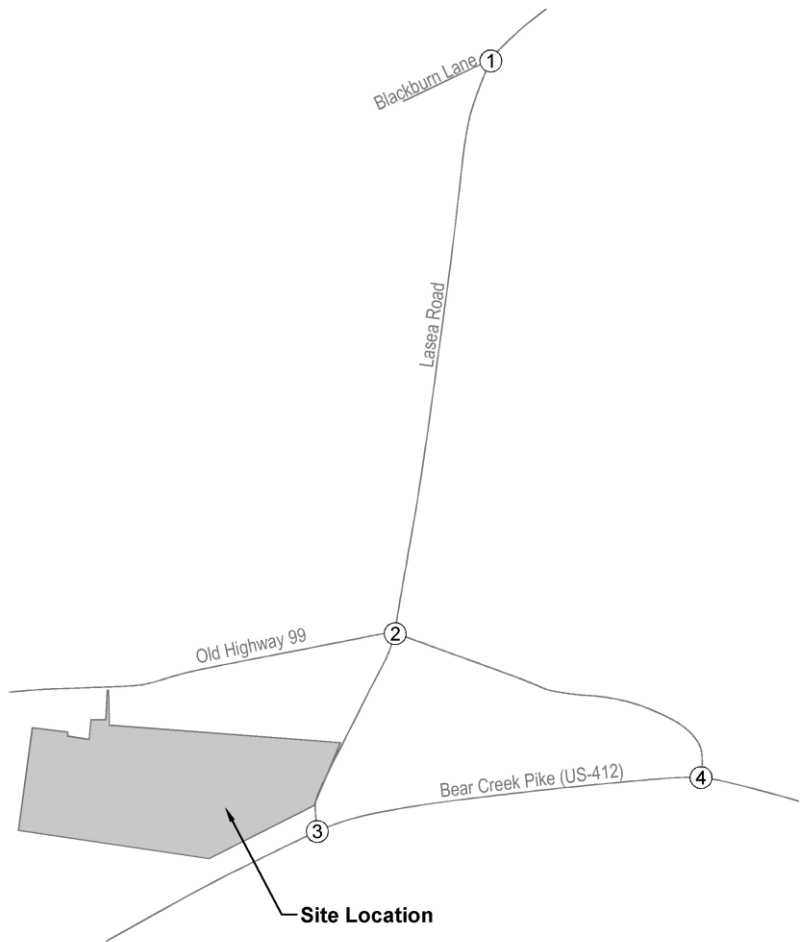
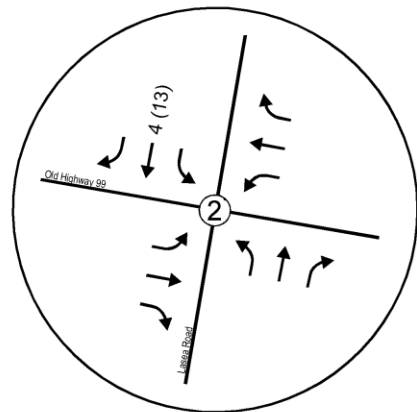
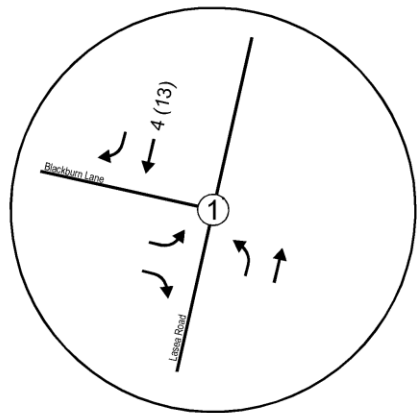
Figure D3
 Generated Background
 Development Volumes
 (Quail Run Meadows)



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



Figure D4
 Generated Background
 Development Volumes
 (Bear Creek Hotel)



LEGEND
 XXX - AM Peak Hour Traffic Volumes
 (XXX) - PM Peak Hour Traffic Volumes



Figure D5
 Generated Background
 Development Volumes
 (1449 Rock Springs Rd PUD)



January 13, 2023

Mr. Joseph Ahler

Ahler & Associates, LLC

Sent via email: joe.ahler@gmail.com

RE: Water Availability Letter

Highland Pointe at Bear Creek – 143 Lots

1451 Lasea Rd

Tax Map 73, Parcel 51

Columbia, Maury County, TN

Dear Mr. Ahler:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development consists of 143 units. CPWS has evaluated the projected water demands for the proposed residential development in the water system hydraulic model and is able to meet a fire-flow capacity of 1,000 gpm at 20 psi while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Domestic waterline connections will be made to the existing 8-inch water main located on Lasea Road and the existing 6-inch water main located on Old Highway 99.
- Minimum size 8-inch, looped water mains are required throughout the development.



All of the above requirements are to be constructed and paid for by the Applicant and dedicated to CPWS once complete up to and including the meter. No construction of CPWS infrastructure shall be initiated until final construction plans have been approved by TDEC and all parties have fully executed a water service agreement.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached hydrant analysis report for coordination and approval of development from the Columbia Fire & Rescue Fire Marshall.
- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings.

- Remit to CPWS new water service fees:

New Water Service Fee: \$1,500 + \$370 per SFU (143 SFUs)	\$54,410.00
---	-------------

- CPWS will then develop water construction drawings and submit to TDEC for approval. Upon approval by TDEC and payment of meter and impact fees by the applicant, applicant may then schedule a pre-construction meeting with CPWS. Pre-construction meeting will not be scheduled until fees are paid in full or surety is provided in lieu of full payment. Final meter and capacity fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid.

Meter Fee: \$540 per ¾" meter (70 meters)	\$77,220.00
Impact Fee: \$4,500 per ¾" meter (70 meters)	\$643,500.00
Total Meter and Impact Fees Due =	\$720,720.00

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.



If you have any questions, please feel free to contact Mr. Jonathan Hardin or myself at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) days from the date of this letter.

Sincerely,

A handwritten signature in blue ink that reads "Eric King". The signature is written in a cursive, flowing style.

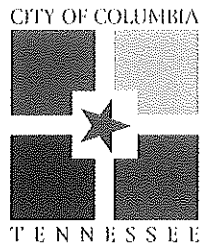
Eric King, P.E.

Inflo Design Group, LLC

on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS

File 22-103



WASTEWATER DEPARTMENT

7 February 2023

Stuart Beattie
Imer Development, LLC
1909 Columbia Avenue
Franklin, TN 37064

RE: Map 73, Parcel 51
CC: Joseph Ahler

Stuart,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the above-referenced development. Major or minor improvements to existing infrastructure may or may not be necessary to satisfactorily convey the additional sanitary sewer flow from the above-referenced proposed development. Any extension to the existing sewer infrastructure will be initiated by the owner/developer, reviewed by our department and approved by the State of Tennessee. Grinder Pump systems are not allowed by the City of Columbia. The project must be advanced in accordance with local, state and federal rules, regulations and policies. Funding and construction of those improvements will remain the responsibility of the owner/developer. New customers will be required to pay all fees applicable at the time of connection. No detailed design plan for an extension of the sewer has been proposed at this time.

A handwritten signature in black ink, appearing to read "Donnie Boshers".

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department



PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)
Fold hard copy submittals larger than 8½"x11"*

ADDRESS/LOCATION	2248 Nashville Highway, Columbia, TN 38401		
	TAX MAP: 051	GROUP:	PARCEL: 051 05800 000
SUMMARY OF NATURE OF REQUEST AND WORK	PUD Plan for development of 3 story townhomes with accompanying infrastructure improvements such as road work, amenities, and utility work.		

DATE OF PRE-APPLICATION CONFERENCE	12-07-2022	<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	------------	---

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Preliminary Plat ☐ Final Plat ☒ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other: <i>*File naming nomenclature examples: Freedom Point Site Plan Freedom Point Master Plan Freedom Point Final Plat</i>	<u>Annexations/Rezoning/PUD's:</u> ☐ Written Legal Description copy ☒ Requested Zone Listed ☒ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☒ Plans and/or Plats conforming to City standards with check list completed ☒ Columbia Water System Availability Letter <u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) <u>Honey Farm Residential Townhomes</u> ☒ Total Number of Lots <u>1 Lot</u> ☒ Total acreage <u>Gross Acreage - 25.87 acres</u>

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Adam Crunk	PHONE	615-873-1795
ADDRESS	7112 Crossroads BLVD Suite 201 Brentwood, TN 37027	EMAIL	adam@crunkeng.com

PROPERTY OWNER NAME	EMG HONEY FARM, LLC, a Tennessee limited liability company	PHONE	469-585-7913
ADDRESS	6148 Lee Highway, Suite 300, Chattanooga, TN 37421	EMAIL	drew.smith@equitasmg.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Adam Crunk
APPLICANT NAME


APPLICANT SIGNATURE

04-13-2023
DATE

EMG HONEY FARM, LLC, a Tennessee limited liability company
PROPERTY OWNER NAME


PROPERTY OWNER SIGNATURE

4.13.2023
DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS			
DATE OF PUBLIC NOTICES IN DAILY HERALD			
BOARD ACTION			

HONEY FARM TOWNHOMES

2248 NASHVILLE HIGHWAY, COLUMBIA, TN 38401

PRELIMINARY MASTER DEVELOPMENT PLAN

GENERAL INFORMATION

DEVELOPER

NAME:
ADDRESS:
Contact:
Phone:

OWNER

NAME: EMG HONEY FARM, LLC, A TENNESSEE LIMITED LIABILITY COMPANY
ADDRESS: P.O. BOX 1715 SPRING HILL, TN 37174
CONTACT: DREW SMITH,
DREW.SMITH@EQUITASMG.COM
Phone: 469-585-7913

CIVIL ENGINEER

Crunk Engineering LLC
7112 Crossroads Boulevard, Suite 201
Brentwood, TN 37027
Contact: Adam Crunk, PE
Phone: 615.873.1795
Email: adam@crunkeng.com

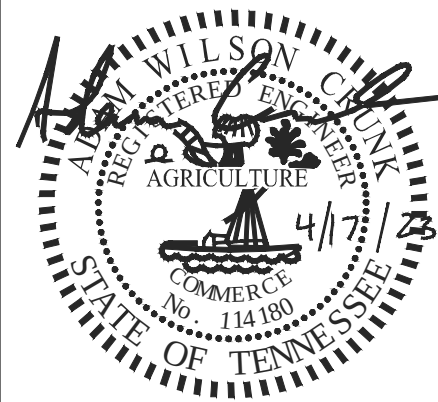


LOCATION MAP
NOT TO SCALE

Sheet List Table	
Sheet Number	Sheet Title
C0.0	COVER SHEET
C1.0	OVERALL SITE LAYOUT PLAN
C1.1	SITE LAYOUT PLAN
C1.2	SITE LAYOUT PLAN
C2.0	OVERALL GRADING, DRAINAGE, AND UTILITY PLAN
C2.1	GRADING, DRAINAGE, AND UTILITY PLAN
C2.2	GRADING, DRAINAGE, AND UTILITY PLAN
L1.0	LANDSCAPE PLAN

SITE DATA TABLE	
PROJECT: HONEY FARM TOWNHOMES	
ADDRESS: NASHVILLE HWY 2248	
PARCEL ID: 051 05800 000	
SITE ACREAGE: 25.87 AC	
EXISTING ZONING: PUD-R	
PROPOSED ZONING: PUD-R	
PROPOSED USE: TOWNHOMES	
PROPOSED LOTS:	
SHALLOWFORD 1A -	37
SHALLOWFORD 1B -	27
MCCALLIE -	130
SHALLOWFORD 2 -	3
TOTAL =	197
BUILDING HEIGHT:	35 FT
LOT WIDTH:	18 FT MIN/180FT MAX
FRONT YARD:	
PRIMARY:	35 FT
SECONDARY:	15 FT
SIDE SETBACK:	10 FT MIN/24 FT MAX
REAR SETBACK:	10 FT MIN
REQUIRED CIVIC USE SPACE:	5% OF TOTAL AREA
PROVIDED CIVIC USE SPACE:	1.29 AC
	5.6%
	1.48 AC

CRUNK ENGINEERING LLC
7112 CROSSROADS BOULEVARD
SUITE 201
BRENTWOOD, TN 37027
(615) 873-1795
WWW.CRUNKENG.COM



HONEY FARM TOWNHOMES

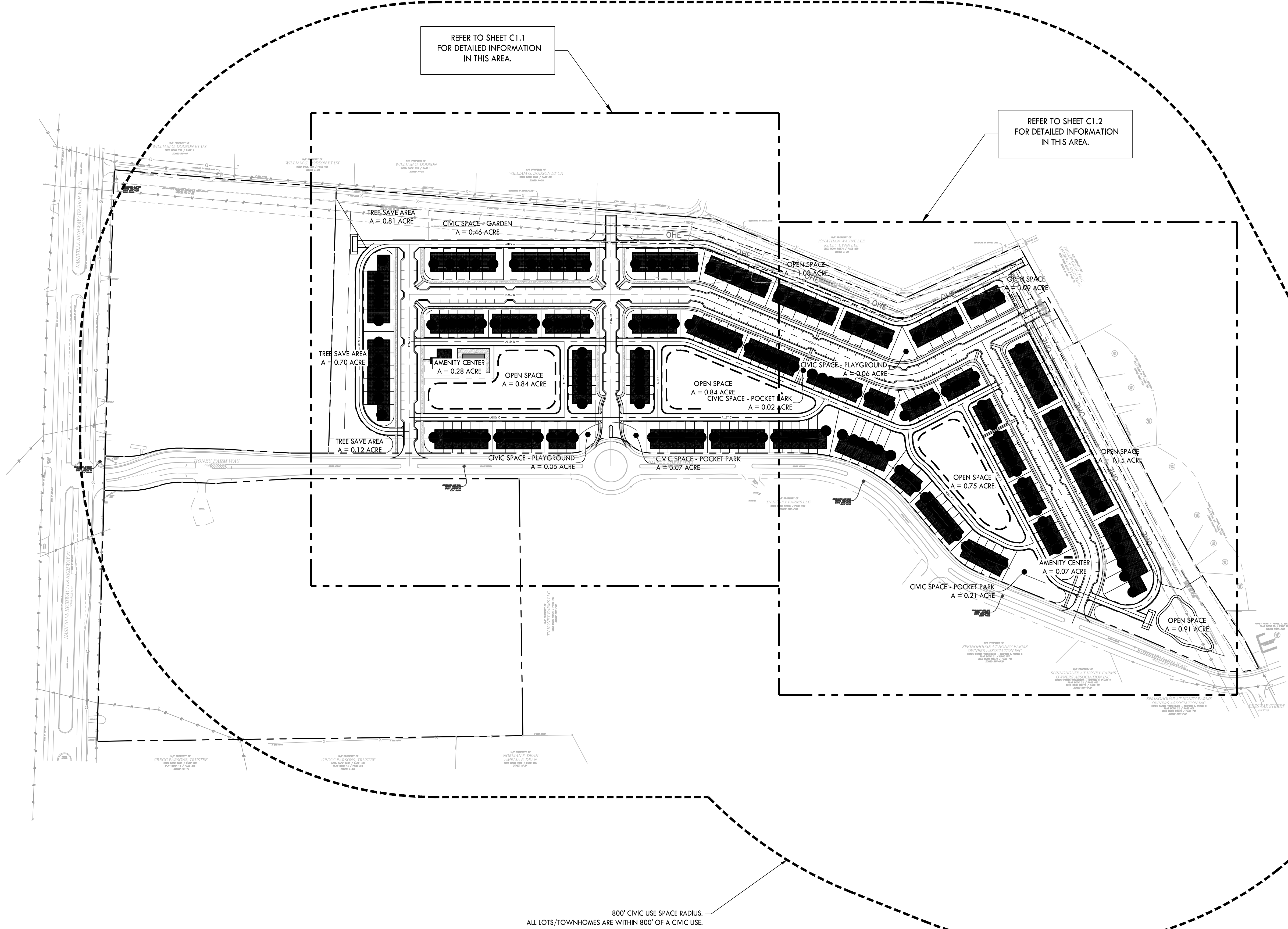
COLUMBIA, TN

REVISIONS	DATE		No.						

4/17/23

22135

C0.0
COVER SHEET



SITE DATA TABLE

PROJECT: HONEY FARM TOWNHOMES
ADDRESS: NASHVILLE HWY 2248
PARCEL ID: 051 05800 000
SITE ACREAGE: 25.87 AC
EXISTING ZONING: PUD-R
PROPOSED ZONING: PUD-R
PROPOSED USE: TOWNHOMES

PROPOSED LOTS:

SHALLOWFORD 1A -	37
SHALLOWFORD 1B -	27
MCCALLIE -	130
SHALLOWFORD 2 -	3
TOTAL =	197

BUILDING HEIGHT: 35 FT
LOT WIDTH: 18 FT MIN/180FT

FRONT YARD:

PRIMARY:	35 FT
SECONDARY:	15 FT

SIDE SETBACK: 10 FT MIN/24 FT
MAX

REAR SETBACK: 10 FT MIN

REQUIRED CIVIC USE SPACE: 5% OF
TOTAL AREA 1.29 AC

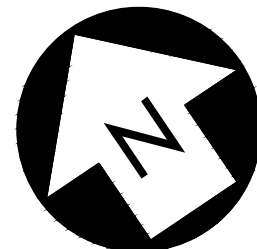
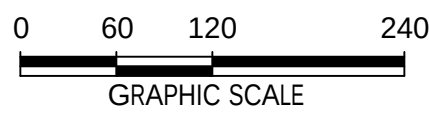
PROVIDED CIVIC USE SPACE: 5.6%
1.48 AC

CIVIC SPACE LIST:

PLAYGROUND - 0.05 AC
PLAYGROUND - 0.06 AC
GARDEN - 0.5 AC
POCKET PARK - 0.07 AC
POCKET PARK - 0.02 AC
POCKET PARK - 0.21 AC
POCKET PARK - 0.17 AC
AMENITY CENTER - 0.1 AC
AMENITY CENTER - 0.30 AC
TOTAL: 1.48 AC

FLOOD HAZARD NOTE:

1. THE SUBJECT PROPERTY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD ZONE ACCORDING TO PANEL NO. 47119C0180E OF THE F.E.M.A. FLOOD INSURANCE RATE MAPS FOR MAURY COUNTY, TENNESSEE, DATED 4/15/2007



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HONEY FARM TOWNHOMES

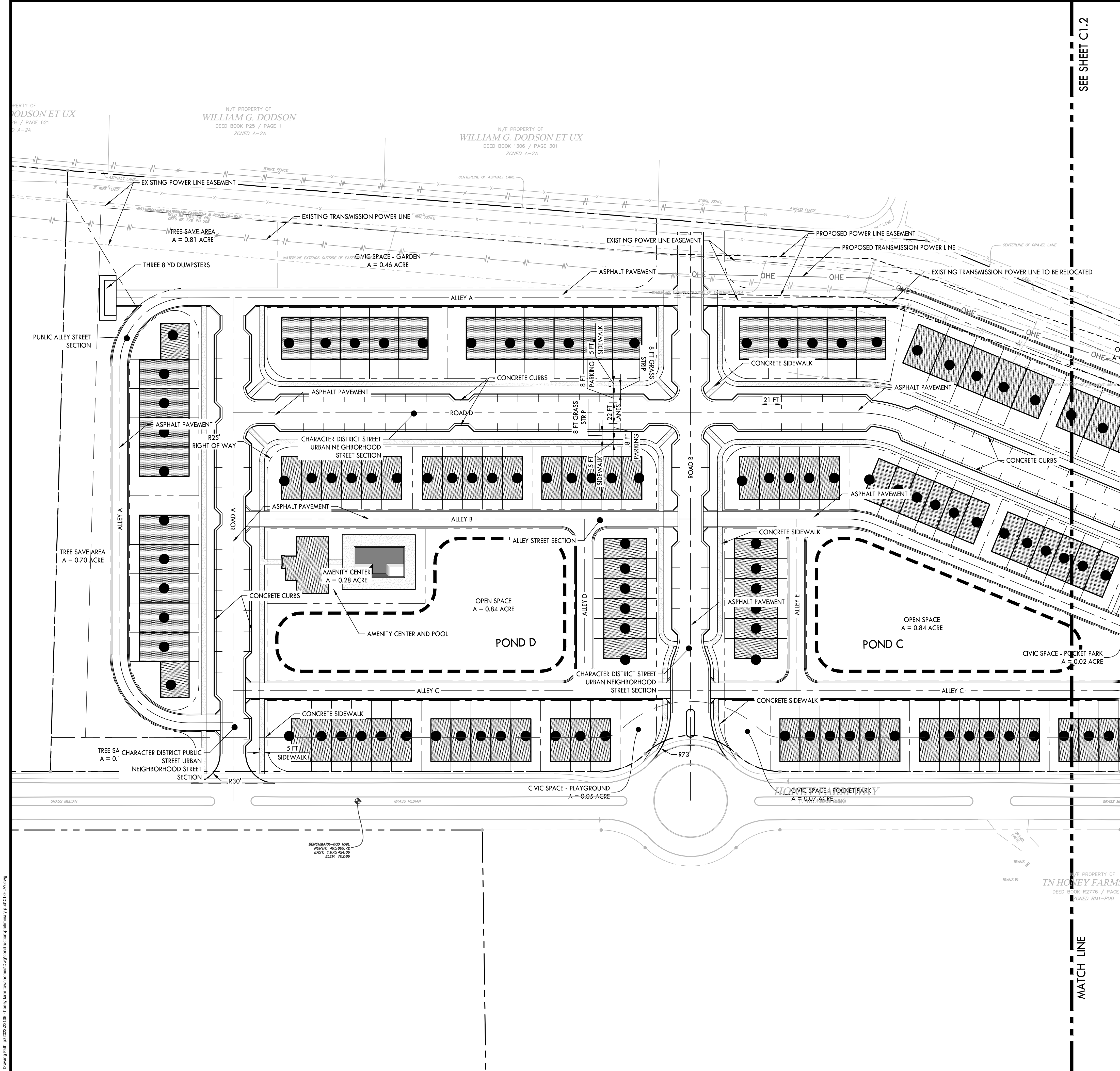
COLUMBIA, TN

REVISIONS	
No.	DATE

4/17/23 22135

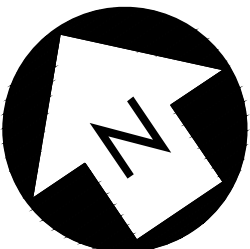
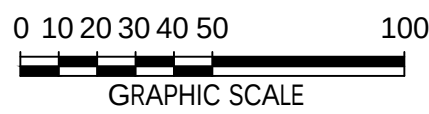
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OVERALL SITE LAYOUT PLAN

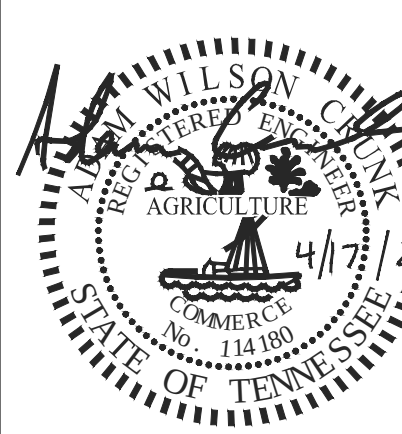


PROPOSED LAYOUT LEGEND

- PROPOSED BUILDING
- HEAVY DUTY ASPHALT PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- PROPERTY LINE
- EDGE OF NEW PAVEMENT



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SUITE 201
BRENTWOOD, TN 37027
(615) 873-1795
WWW.CRUNKENG.COM



HONEY FARM TOWNHOMES
COLUMBIA, TN

REVISIONS	DATE	
	No.	

4/17/23 22135

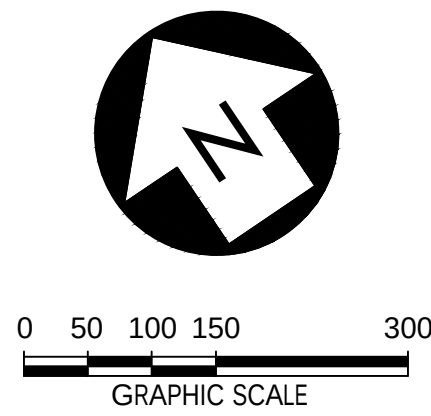
C1.1
SITE LAYOUT PLAN



EXISTING TREE CANOPY EXHIBIT



PROPOSED TREE CANOPY EXHIBIT



TREE CANOPY REQUIREMENTS:	
TOTAL SITE AREA:	25.87 AC
EXISTING TREE CANOPY:	5.18 AC
PERCENTAGE OF TOTAL SITE AREA:	20.0%
REQUIRED TREE CANOPY PERCENTAGE TO REMAIN:	48.0%
	2.49 AC
EXISTING TREE CANOPY TO REMAIN:	1.63 AC
TREE CANOPY TO BE PLANTED:	0.86 AC
TOTAL PROPOSED TREE CANOPY:	2.50 AC
	48.3%

CRUNK ENGINEERING LLC

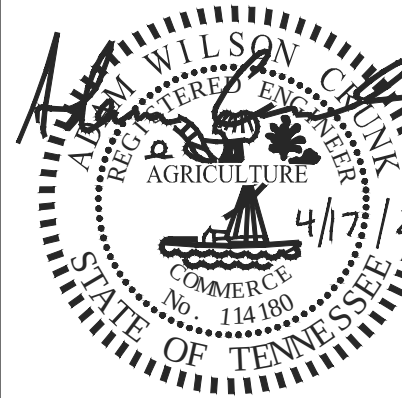
7112 CROSSROADS BOULEVARD

SUITE 201

BRENTWOOD, TN 37027

(615) 873-1795

WWW.CRUNKENG.COM



HONEY FARM TOWNHOMES

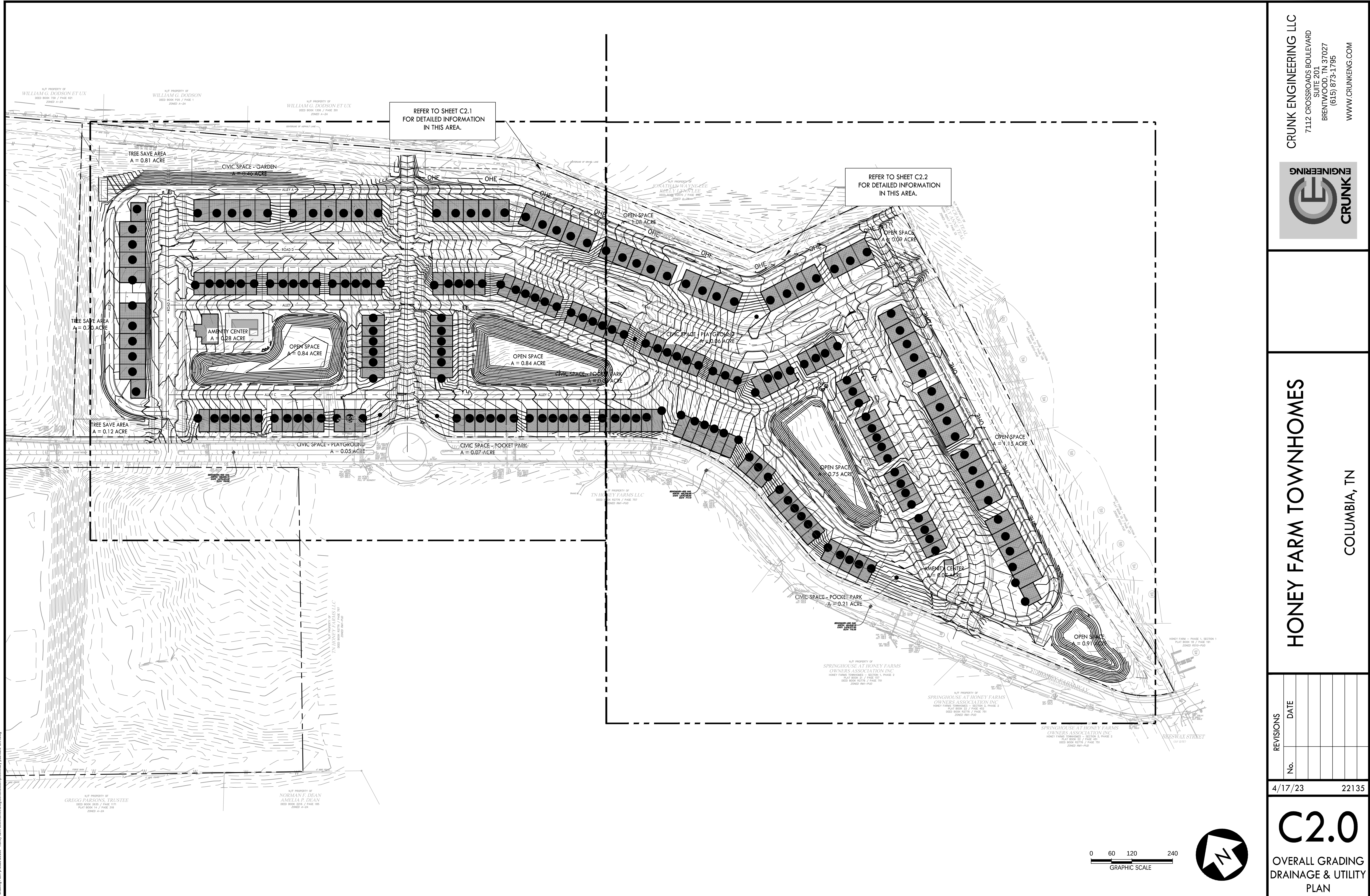
COLUMBIA, TN

REVISIONS	
No.	DATE

4/17/23 22135

C1.3

TREE CANOPY EXHIBIT



CRUNK ENGINEERING LLC
7112 CROSSROADS BOULEVARD
SUITE 201
BRENTWOOD, TN 37027
(615) 873-1795
WWW.CRUNKENG.COM



HONEY FARM TOWNHOMES

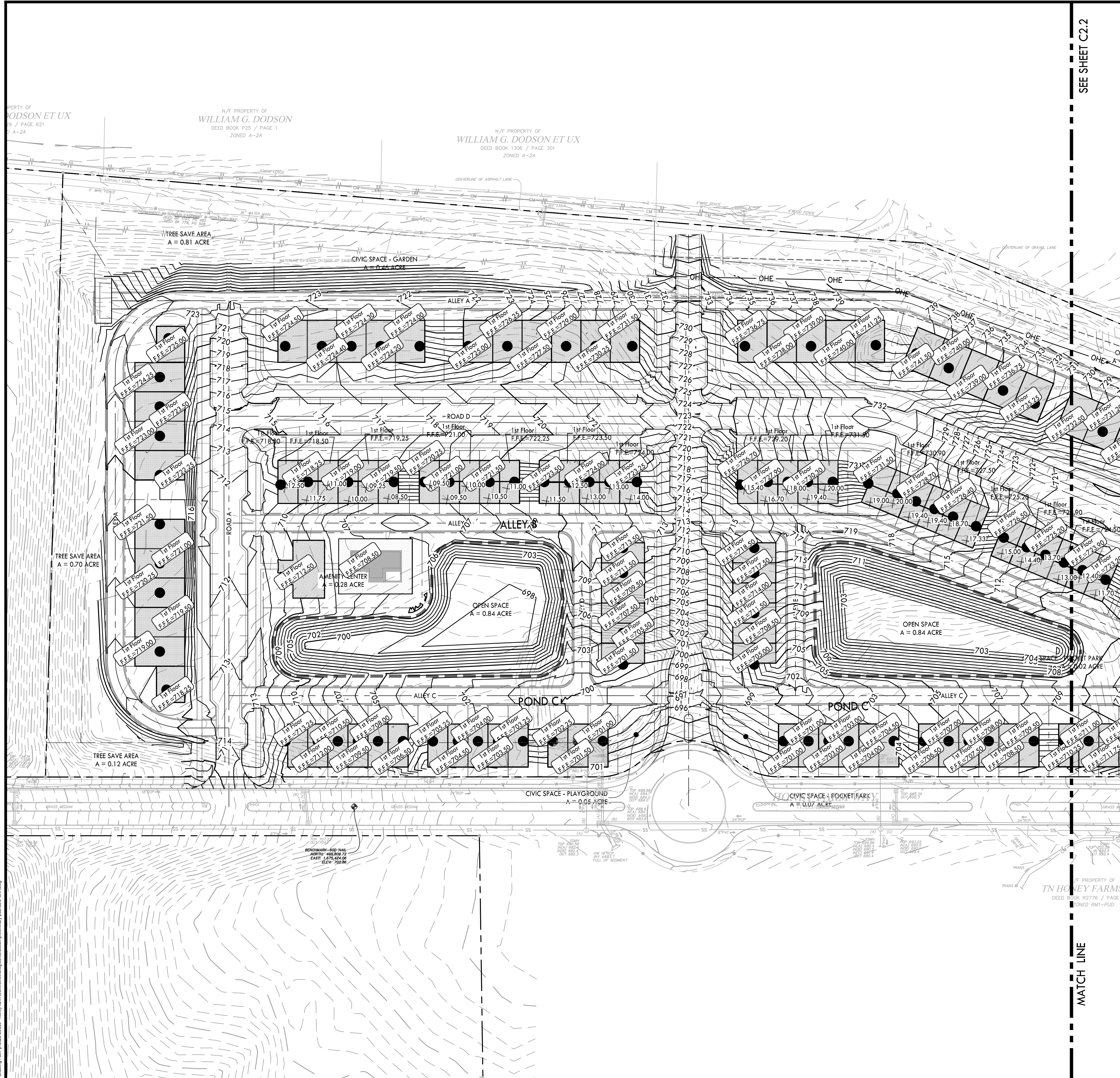
COLUMBIA, TN

No.	REVISIONS	
	DATE	

4/17/23 22135

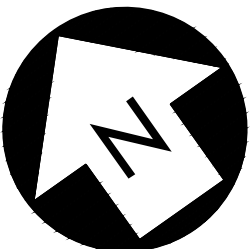
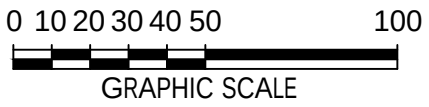
C2.0

OVERALL GRADING
DRAINAGE & UTILITY
PLAN



SEE SHEET C2.2

MATCH LINE



CRUNK ENGINEERING LLC
7112 CROSSROADS BOULEVARD
SUITE 201
BRENTWOOD, TN 37027
(615) 873-1795
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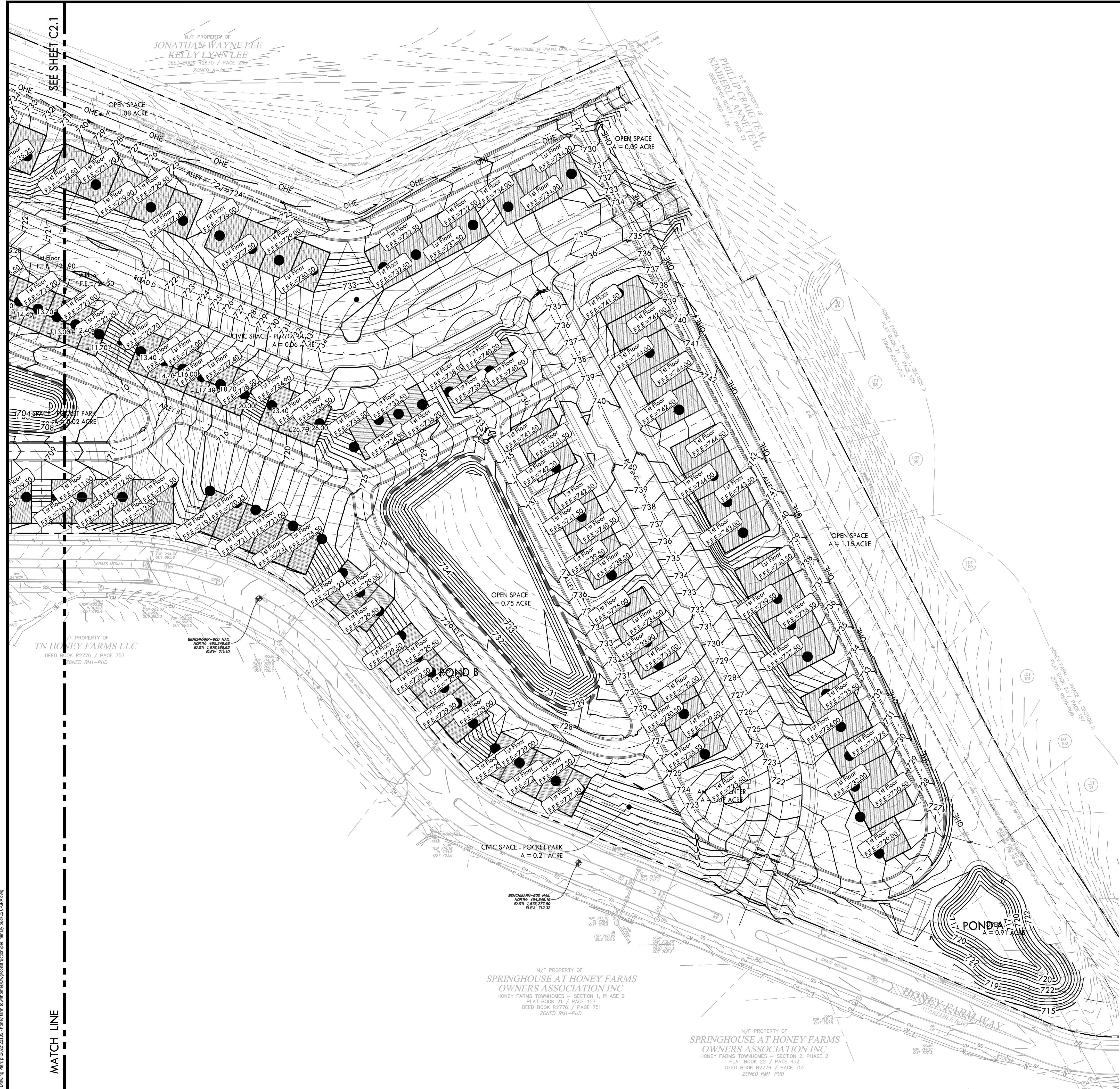
HONEY FARM TOWNHOMES
COLUMBIA, TN

No.	REVISIONS				DATE

4/17/23 22135

C2.1
GRADING
DRAINAGE & UTILITY
PLAN

CrunkEng_Plan_C2.1(20230223) - Honey Farm Townhomes\CrunkEng\Drawings\utility\plan\c2.1.dwg



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HONEY FARM TOWNHOMES

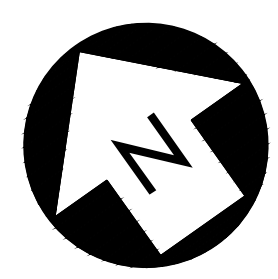
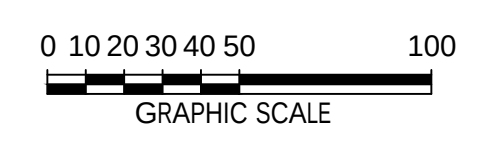
COLUMBIA, TN

No.	REVISIONS				DATE

4/17/23 22135

C2.2

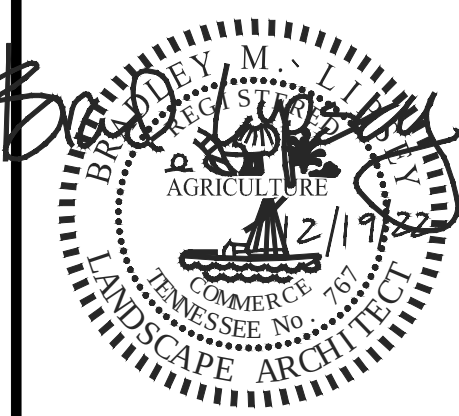
GRADING
DRAINAGE & UTILITY
PLAN



REFER TO SHEET L1.1
FOR DETAILED INFORMATION
IN THIS AREA.

REFER TO SHEET L1.2
FOR DETAILED INFORMATION
IN THIS AREA.

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HONEY FARM TOWNHOMES

COLUMBIA, TN

[illegible]

L1.0

OVERALL
LANDSCAPE PLAN

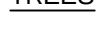


Know what's below.
Call before you dig.



A horizontal line with tick marks at 50, 100, and 200. Below the line is the text "GRAPHIC SCALE".

PLANT SCHEDUL

TREES	CODE	BOTANICAL / COMMON NAME	SIZE	CONTAINER	QTY
	ACE GLO	Acer rubrum 'PNI 0268' / October Glory® Red Maple	2' Cal.	B&B	41
	QUE ALB	Quercus alba / White Oak	2.5" Cal.	B&B	5
	ULM ALL	Ulmus parvifolia 'Allee' / Allee® Lacebark Elm	2' Cal.	B&B	73
	ZEL VIL	Zelkova serrata 'Village Green' / Village Green Japanese Zelkova	2' Cal.	B&B	59

LANDSCAPE NOTES:

- SITE PREP
1. THE LANDSCAPE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES AND TAKE PRECAUTIONS TO PREVENT DAMAGE TO THESE UTILITIES.
 2. THE LANDSCAPE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGES TO UTILITIES.
 3. PLANT MATERIALS AND STUMPS INDICATED FOR REMOVAL SHALL BE REMOVED AND DISPOSED OFF-SITE BY THE CONTRACTOR. BACKFILL HOLES WITH QUALITY TOPSOIL FREE OF ROOTS AND ROCKS. SEE TOPSOIL SPECIFICATION.
 4. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINE GRADING OF ALL PLANTING AREAS.
 5. ALL CONTRACTORS APPLYING CHEMICALS ON SITE SHALL SUBMIT COPIES OF CERTIFICATION(S) AND LICENSES TO THE LANDSCAPE ARCHITECT.
 6. PLANTING BEDS SHALL BE CLEARED OF GRASS AND WEEDS PRIOR TO INSTALLATION OF PLANTS.
 7. SOD ALL AREAS DISTURBED BY CONSTRUCTION AND NOT DESIGNATED AS GROUND COVER AREAS.

- TOPSOIL
1. ALL PLANTED AREAS TO HAVE A MINIMUM OF 6" OF QUALITY TOPSOIL
 2. ALL COMPACTED AREAS TO BE AERATED AND AMENDED AS NEEDED.
 3. TOPSOIL IS TO BE NATURAL, FERTILE, FRIABLE, PRODUCTIVE SOIL, NEITHER EXCESSIVELY ACID NOR ALKALINE, AND FREE FROM TOXIC SUBSTANCES, STONES WEEDS, CLAY, CLOUDS, ROOTS, CINDERS, DEBRIS, AND CONSTRUCTION MATERIAL.

- PLANTING
1. ALL PLANTING BEDS OR MULCH BEDS SHALL BE FREE OF WEEDS PRIOR TO THE INSTALLATION OF MULCH..
 2. THE OPTIMUM TIME OF PLANTING IS FROM OCTOBER 1 TO APRIL 1. SCHEDULING FOR PLANTING AT OTHER TIMES MUST BE APPROVED IN WRITING BY THE LANDSCAPE ARCHITECT.
 3. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT FOR A PRE-INSTALLATION INSPECTION IN ORDER TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATIONS. TREES OF SAME SPECIES ARE TO BE MATCHED IN GROWTH CHARACTER AND UNIFORMITY.
 4. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
 5. AFTER PLANTING, TREE BRANCHES SHALL BE SELECTIVELY TRIMMED BY 25%, MAINTAINING NATURAL SHAPE. ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS SHALL ALSO BE PRUNED. REMOVE TAGS, TWINE, OR OTHER NON-BIODEGRADABLE MATERIAL.
 6. WATERING: ALL TREES AND SHRUBS SHALL BE THOROUGHLY WATERED WITHIN ONE HOUR OF INSTALLATION.

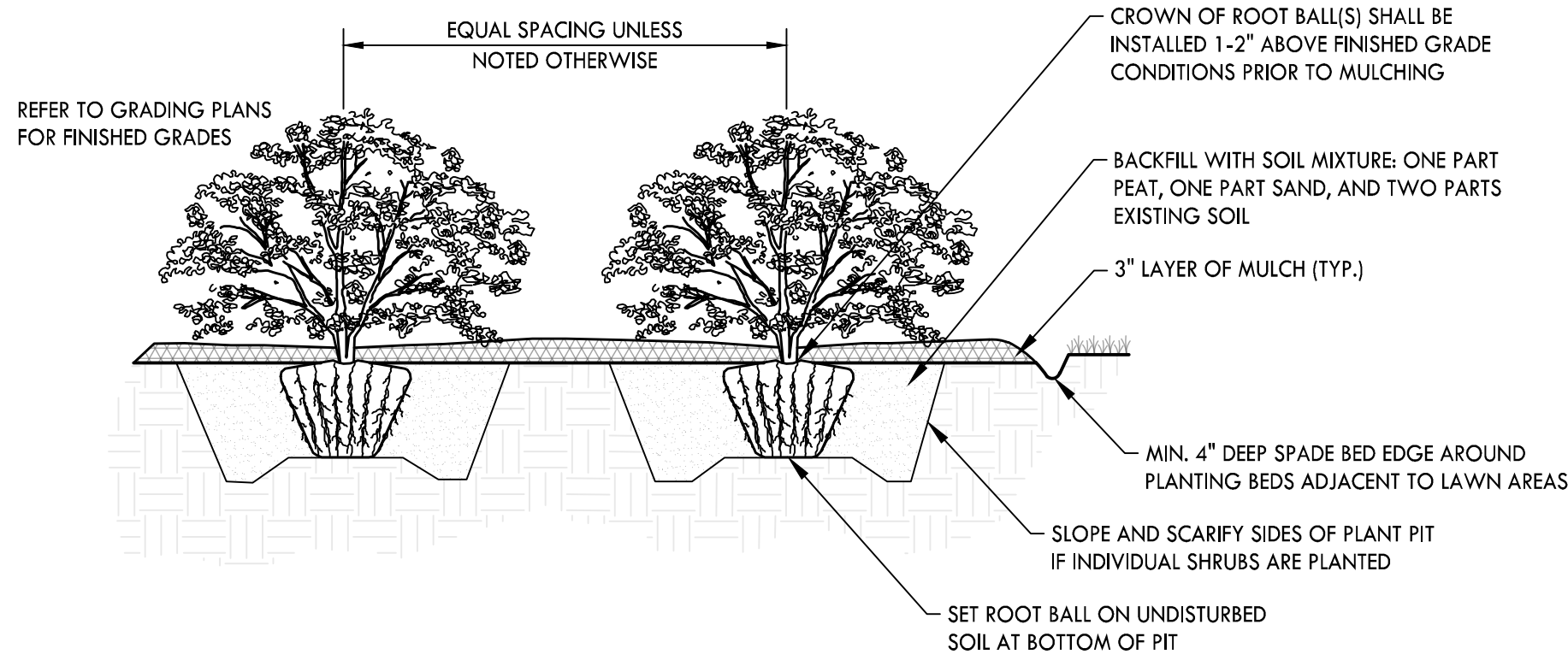
- PLANT MATERIALS
1. THE LANDSCAPE CONTRACTORS SHALL VERIFY ALL MATERIAL QUANTITIES. IN THE EVENT OF A DISCREPANCY, THE QUANTITIES SHOWN ON THE PLAN WILL TAKE PRECEDENCE.
 2. ALL PLANT MATERIALS TO BE NURSERY GROWN AND TO COMPLY WITH THE AMERICAN STANDARDS FOR NURSERY STOCK: ANSI - LATEST EDITION FOR SIZE AND QUALITY.
 3. ONLY GRADE "A" TYPE PLANTS WILL BE ACCEPTED. PLANTS THAT ARE INFERIOR OR DAMAGED WILL NOT BE ACCEPTED.
 4. THE PLANTS DELIVERED TO THE PROJECT SITE SHALL BE PLANTED AS SOON AS SITE CONDITIONS PERMIT. TAKE CARE IN SCHEDULING PLANT DELIVERIES AND THE SIZE OF DELIVERIES SO THAT LONG PERIODS OF STORAGE ARE AVOIDED. ADEQUATELY PROTECT PLANTS PLACED IN TEMPORARY STORAGE FROM THE SUN AND WIND; WATER PLANTS SO AS TO MAINTAIN THEIR APPEARANCE AND HEALTH. PLANTS THAT HAVE NOT BEEN PROPERLY MAINTAINED DURING TEMPORARY STORAGE MAY BE REJECTED BY THE LANDSCAPE ARCHITECT.
 5. ALL TREES SHALL BE FIRST QUALITY REPRESENTATIVES OF THEIR SPECIES AND SHALL MEET ALL REQUIREMENTS OTHERWISE STIPULATED. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT PLANTED MATERIAL IN THE FIELD, AT THE GROWING SITE OR ON THE JOB SITE.

- MULCHING
1. ALL PLANTING BEDS OR MULCH BEDS SHALL HAVE WEEDS REMOVED PRIOR TO THE INSTALLATION OF MULCH.
 2. ALL PLANTING BEDS SHALL HAVE A MINIMUM OF 3" DEPTH OF AGED SHREDDED HARDWOOD BARK MULCH OR A MINIMUM OF 4" DEEP PINE STRAW MULCH.
 3. CONTRACTORS SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
 4. MULCH SHALL NOT CONTACT OUTER BARK AT BASE OF TREES. PULL BACK MULCH 3-4" FROM TRUNK.

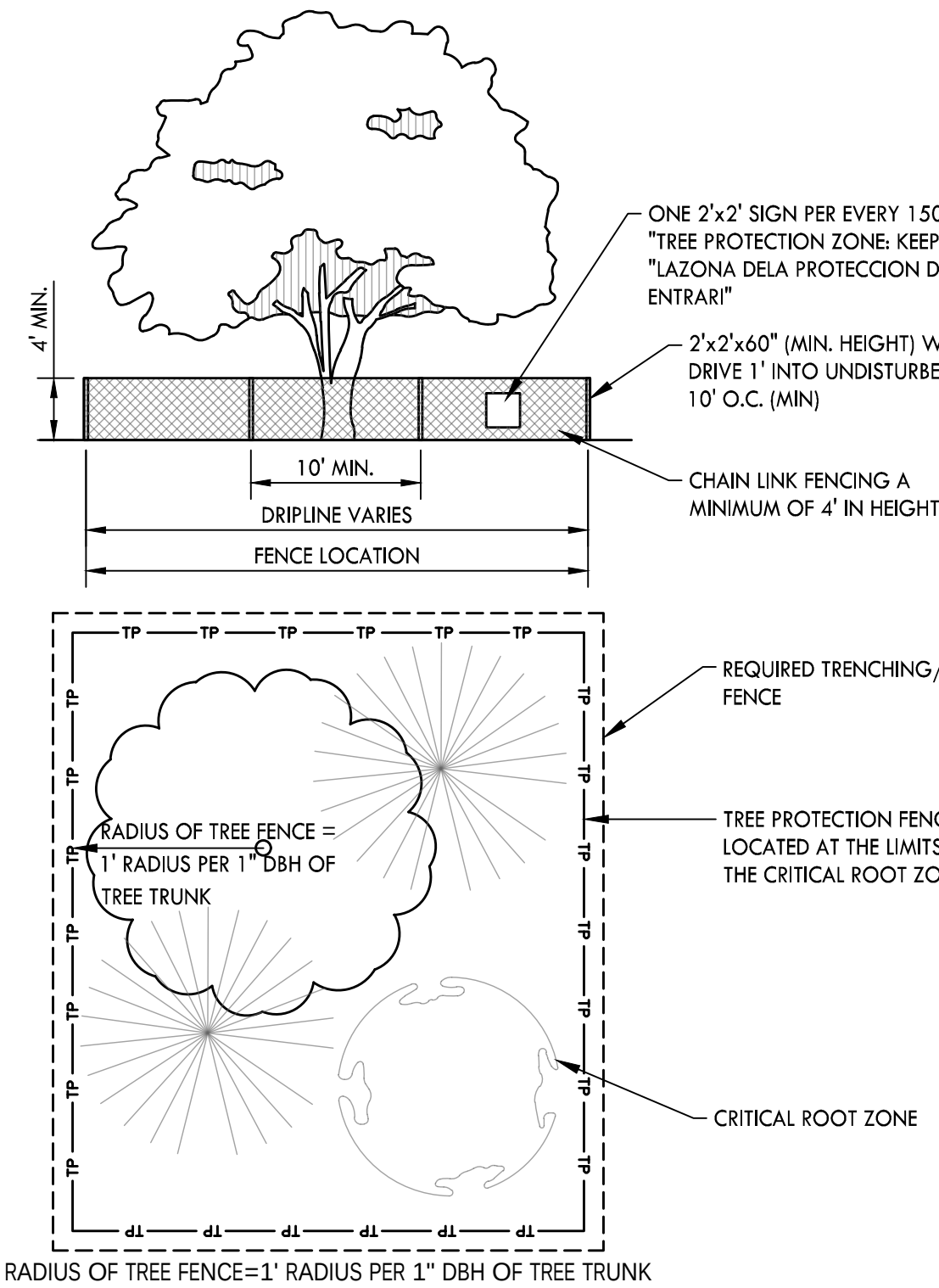
- PLANT MAINTENANCE
1. THE LANDSCAPE CONTRACTOR SHALL PROVIDE OWNER WITH WRITTEN INSTRUCTIONS ON THE PROPER CARE OF ALL SPECIFIED PLANT MATERIALS PRIOR TO FINAL PAYMENT.
 2. CONTRACTOR TO WARRANTY ALL MATERIAL FOR 2 YEARS AFTER DATE OF FINAL ACCEPTANCE.
 3. ALL UNHEALTHY OR DEAD PLANT MATERIAL SHALL BE REPLACED WITHIN ONE YEAR, OR BY THE NEXT PLANTING PERIOD, WHICHEVER COMES FIRST. OTHER DEFECTIVE PLANT MATERIAL SHALL BE REPLACED OR REPAIRED WITHIN THREE (3) MONTHS.

- TREE PROTECTION
1. EXISTING TREES TO REMAIN SHALL BE PROTECTED FROM CONSTRUCTION DAMAGE.
 2. IT IS THE CONTRACTORS RESPONSIBILITY TO PROTECT EXISTING TREES THAT ARE TO REMAIN. NO HEAVY EQUIPMENT OR MATERIALS SHALL BE PERMITTED TO OPERATE OR BE STORED WITHIN THE DRIP LINES OF THE TREES, OUTSIDE THE LIMIT OF GRADING.
 3. TREE PROTECTION STEPS:
 - A) INSTALL TREE PROTECTION FENCING IN ACCORDANCE WITH METRO CODE 17.24.110 "PROTECTION OF TREES DURING DEVELOPMENT ACTIVITIES"
 - B) PLACE FENCE POST AND FENCING AT TREE DRIP LINE OR 10' FROM TRUNK, WHICHEVER IS GREATER.
 - C) POST SHALL NOT BE SPACED MORE THAN 10' APART.
 - D) POST TEMPORARY SIGNS - TREE ROOT PROTECTION ZONE.
 4. FENCING AND SIGNS SHALL REMAIN IN PLACE UNTIL THE SITE HAS BEEN INSPECTED BY URBAN FORESTER FOR USE AND OCCUPANCY PERMIT.

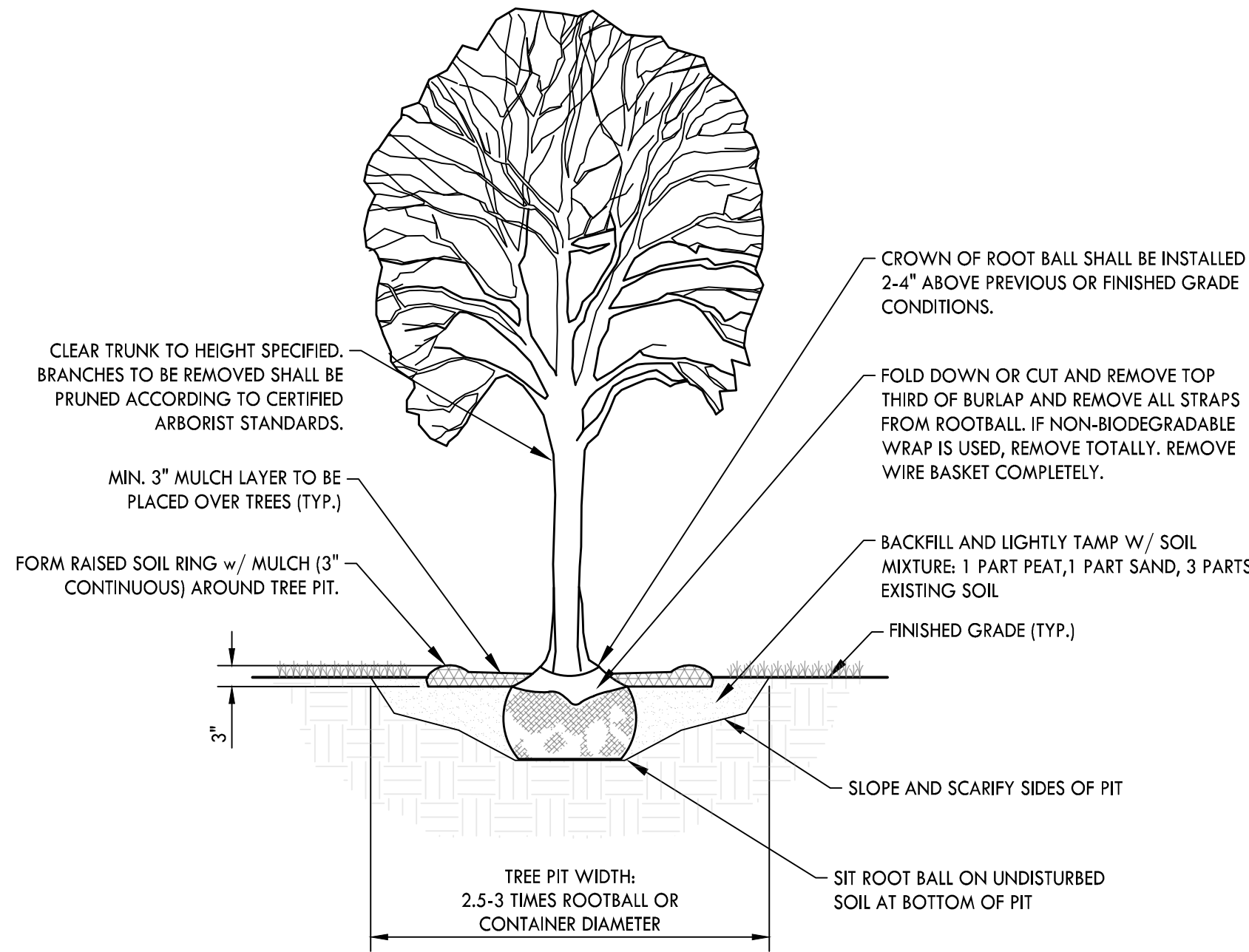
- NOTES:
1. WHERE SHRUBS APPEAR IN BED AREA, 3" OF MULCH SHALL BE SPREAD OVER THE ENTIRE AREA WITHIN THE BED AS INDICATED ON THE PLANS.
 2. DO NOT PRUNE SHRUBS BEFORE ACCEPTANCE.
 3. CAREFULLY REMOVE CONTAINER FROM ROOT BALL USED FOR SHRUB(S). ANY BROKEN OR CRUMBING ROOT BALL(S) WILL BE REJECTED.
 4. IF SHRUB IS B&B, REMOVE BURLAP FROM TOP $\frac{1}{2}$ OF ROOT BALL OR COMPLETELY REMOVE BURLAP IF SOILS ARE POORLY DRAINED.
 5. SCARIFY ROOTBALL IF ROOT BOUND IN CONTAINER PER HORTICULTURE STANDARDS.



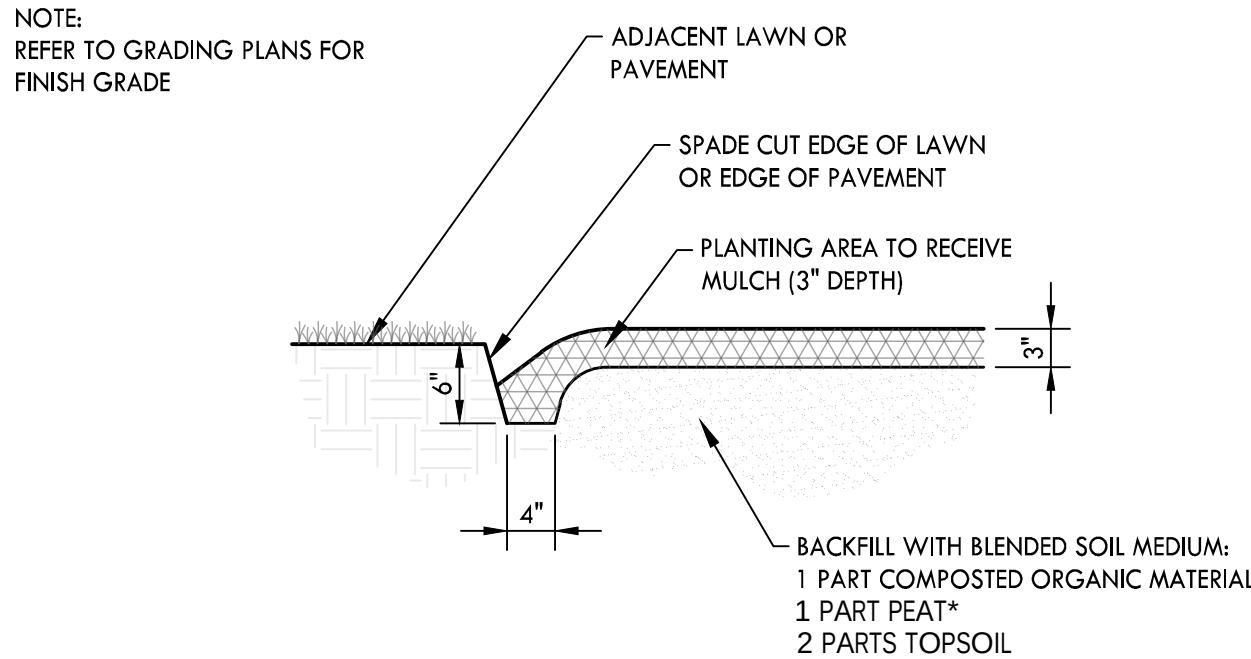
SHRUB PLANTING
NOT TO SCALE



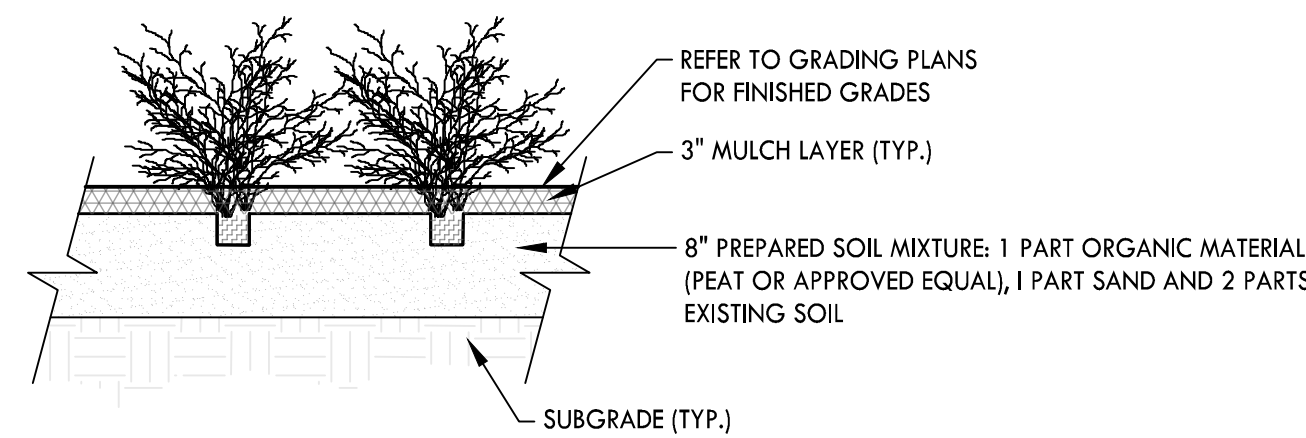
TREE PROTECTION
NOT TO SCALE



DECIDUOUS TREE PLANTING
NOT TO SCALE



SPADE BED EDGE
NOT TO SCALE



GROUNDCOVER PLANTING
NOT TO SCALE

CRUNK ENGINEERING LLC
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HONEY FARM TOWNHOMES

COLUMBIA, TN

REVISONS	DATE				
	No.				

4/17/23 22135

L2.0
LANDSCAPE DETAILS



Preliminary Plat, Site Development Plan, and PUD Checklist

Development: HONEY FARM TOWNHOMES

This checklist shall be completed, and included with the submittal documents. If the submittal does not contain a completed checklist, it shall be deemed incomplete. All below listed items shall be included in the submittal documents and plans, as well as any further information required by the City of Columbia to evaluate compliance and to perform a full and complete review. See Zoning Ordinance Article 8 and Subdivision Regulations.

General

- ☒ Name of development
- ☒ Contact info for the owner and licensed design professional(s) preparing plan: name, address, email, phone
- ☒ Plan sealed by a Design Professional licensed in the State of Tennessee.
- ☒ North Arrow, legend, and site vicinity map
- ☒ Graphic Scale: between 1 in. = 10 ft. and 1 in. = 100 ft.
- ☒ Survey stamped by a State of Tennessee Licensed Professional Land Surveyor, with all project boundaries including bearings and angles to the nearest hundredth, utilities, and existing streets and rights-of-way.
- ☒ Note referencing Tennessee State Plane Coordinate System, NAD 83 Datum
- ☒ All property boundaries, existing easements, and encumbrances
- ☒ Parcel identification, owner, and deed and plat references of adjoining properties
- ☐ Proposed phasing and timetable for all phases of development
- ☐ Traffic Impact Study, as required.
- ☒ The substance of all existing and proposed covenants, easements, or other restrictions.

Lots and Land-Use

- ☒ The size of total property to be developed in square feet and acres
- ☐ Lot numbers of all proposed lots, with dimensions, locations, and square footage
- ☐ A tabulation of the land area to be devoted to various uses and activities and overall densities.
- ☐ Typical lot layout depicting proposed setbacks, yards, and easements, where applicable

Structures

- ☐ Location and approximate dimensions of all existing and proposed structures.
- ☐ Location of all earth retaining structures, with approximate top and bottom of wall elevations.
- ☐ Existing and intended use of all buildings and structures on site, including the number of dwelling units and density, where applicable
- ☐ Location, type, and size of proposed signs
- ☐ Approximate height, bulk, and the utilization of structures including activities and the number of living units.



Grading, Drainage, and Storm

- ☒ Existing conditions and contours at vertical intervals of not more than two (2) feet
- ☒ General proposed contours at vertical intervals of not more than two (2) feet
- ☐ FEMA Special Flood Hazard Area (SFHA), 100-year Floodplain (F-P), and Floodway (F-W) boundaries with elevations and the exact location of the nearest benchmark. Indicate the Flood Insurance Rate Map (FIRM) panel number, its effective date, and flood insurance zones
- ☐ Location and dimension of aquatic buffer zones
- ☒ General layout of the proposed storm drainage system including surface and subsurface drainage systems, areas for detention, and water quality devices.
- ☐ Identification of all critical lots

Streets, Parking, and Pedestrian Elements

- ☒ Proposed street and alley rights-of-way, typical sections, widths, classification, names, and proposed ownership and maintenance responsibility
- ☒ Proposed connections to existing and proposed streets (including classification) located outside the development
- ☐ Proposed improvements as identified in the Traffic Impact Study, as required
- ☒ Existing and proposed sidewalks, trails, and other pedestrian elements
- ☒ Existing and proposed on-street and off-street parking and loading areas
- ☐ Summary of all provided and required parking

Landscaping, Open Space, and Amenities

- ☐ Natural features on site including, but not limited to, wetlands, streams, ponds, springs, sinkholes, wells, rock outcroppings, excessive slopes, and forested areas
- ☒ Landscaped areas and buffers with details on proposed plantings, existing vegetation, and other features.
- ☐ The location and size of all common open space, parkland dedications, and dedications and reservations of land for public uses.
- ☒ Any amenity features and structures for private or public benefit.
- ☐ Location, dimension, and materials of fences and walls
- ☒ Tree Canopy retention

Utilities

- ☒ General layout and location of existing and proposed utilities and utility features including, but not limited to potable water, fire hydrants, sanitary sewer, storm sewer, and power and communication facilities.
- ☒ Acknowledgement from water, sewer, and power utility providers that the proposed development may be adequately served with existing infrastructure, or if improvements are required to adequately serve the development, a general statement of the improvements.



PUD Specific Items

- ☒ Legal Description of Property
- ☐ Owner's Affidavit
- ☐ List of all variances requested
- ☐ The nature of the landholder's interest in the land proposed to be developed and a written statement of concurrence from all parties having a beneficial interest in the affected property.
- ☐ Location and approximate dimensions of all existing and proposed structures including approximate height, bulk, and the utilization of structures including activities and the number of living units. Include architectural renderings of all proposed structures with materials listed.
- ☐ The substance of covenants, grants of easements or other restrictions to be imposed upon the use of the land, buildings and structures including proposed easements for public utilities on the property or documentation of off-site easements.
- ☐ Exterior lighting

If the application is deemed incomplete by the Zoning Administrator, a written request shall be made within ten days after the original submittal, for further information. In such case the application shall be held in abeyance until deemed complete for final review. No plan shall be formally presented for Planning Commission action until such plan is found complete, compliant with City standards, and ready for review.

Checklist Completed By:

Print Name

Signature

Date

Property Line Description
Honey Farm Residential Tract
Maury County, Tennessee

All that tract or parcel of land lying and being in the Third Civil District of Maury County, Tennessee, and being more particularly described as follows:

COMMENCING at a 1/2-inch rebar found at the intersection of the southeasterly right-of-way line of Nashville Highway (variable right-of-way) with the northeasterly right-of-way line of Honey Farm Way (variable right-of-way); Thence along said northeasterly right-of-way line of Honey Farm Way South 53 degrees 26 minutes 48 seconds East for a distance of 44.38 feet to a 1/2-inch rebar found; Thence along the arc of a curve to the left an arc length of 55.71 feet, said curve having a radius of 160.00 feet and being subtended by a chord of 55.43 feet bearing South 63 degrees 22 minutes 30 seconds East to a 1/2-inch rebar found; Thence along the arc of a curve to the right an arc length of 83.46 feet, said curve having a radius of 240.00 feet and being subtended by a chord of 83.04 feet bearing South 63 degrees 11 minutes 32 seconds East to a 1/2-inch rebar found; Thence South 53 degrees 39 minutes 04 seconds East for a distance of 95.90 feet to a 5/8-inch rebar set; Thence South 51 degrees 43 minutes 09 seconds East for a distance of 152.63 feet to a nail set; Thence South 55 degrees 07 minutes 01 seconds East for a distance of 89.78 feet to a 5/8-inch rebar set, said point being the **TRUE POINT OF BEGINNING**; Thence departing said right-of-way line North 36 degrees 32 minutes 46 seconds East for a distance of 616.84 feet to a nail set in the center of a paved lane; Thence with the centerline of said lane South 50 degrees 26 minutes 06 seconds East for a distance of 883.23 feet to a 1/2-inch rebar found to the center of a gravel lane; Thence with the centerline of said lane South 32 degrees 39 minutes 21 seconds East for a distance of 479.97 feet to a 1/2-inch rebar found; Thence South 79 degrees 57 minutes 38 seconds East for a distance of 289.61 feet to a 1/2-inch rebar found; Thence departing said lane South 05 degrees 52 minutes 43 seconds West for a distance of 262.24 feet to a 1/2-inch rebar found; Thence South 82 degrees 33 minutes 59 seconds East for a distance of 14.84 feet to a 5/8-inch rebar set; Thence South 07 degrees 54 minutes 24 seconds West, a distance of 96.17 feet to a 1/2-inch rebar found; Thence South 07 degrees 48 minutes 35 seconds West, a distance of 77.44 feet to a 1/2-inch rebar found; Thence South 07 degrees 42 minutes 38 seconds West for a distance of 107.03 feet to a 1/2-inch rebar found; Thence South 07 degrees 37 minutes 27 seconds West for a distance of 143.40 feet to a 1/2-inch rebar found; Thence South 07 degrees 42 minutes 47 seconds West for a distance of 84.92 feet to a 1/2-inch rebar found; Thence South 05 degrees 44 minutes 16 seconds West for a distance of 41.21 feet to a 1/2-inch rebar found; Thence South 05 degrees 30 minutes 25 seconds West for a distance of 38.38 feet to a 1/2-inch rebar found; Thence South 01 degrees 38 minutes 24 seconds West for a distance of 19.09 feet to a 1/2-inch rebar found; Thence South 01 degrees 27 minutes 54 seconds West for a distance of 105.85 feet to a 5/8-inch rebar set; Thence South 01 degrees 44 minutes 21 seconds West, a distance of 79.62 feet to a 5/8-inch rebar set; Thence South 07 degrees 52 minutes 42 seconds West, a distance of 75.86 feet to a 1/2-inch rebar found on the northeasterly right-of-way line of Honey Farm Way; Thence continuing with said right-of-

way line along the arc of a curve to the right an arc length of 31.03 feet, with a radius of 175.00 feet, being subtended by a chord bearing of North 67 degrees 31 minutes 58 seconds West, for a distance of 30.99 feet to a 1/2-inch rebar found; Thence along the arc of a curve to the right an arc length of 89.74 feet, with a radius of 175.00 feet, being subtended by a chord bearing of North 47 degrees 59 minutes 16 seconds West, for a distance of 88.76 feet to a 1/2-inch rebar found; Thence North 31 degrees 37 minutes 15 seconds West, a distance of 166.27 feet to a 5/8-inch rebar set; Thence North 33 degrees 22 minutes 49 seconds West, a distance of 409.64 feet to a 1/2-inch rebar found; Thence along a curve to the right having an arc length of 83.44 feet, with a radius of 170.00 feet, being subtended by a chord bearing of North 19 degrees 16 minutes 18 seconds West, for a distance of 82.60 feet to a 1/2-inch rebar found; Thence North 05 degrees 12 minutes 29 seconds West, a distance of 147.31 feet to a 5/8-inch rebar set; Thence along a curve to the left having an arc length of 287.52 feet, with a radius of 330.00 feet, being subtended by a chord bearing of North 30 degrees 10 minutes 23 seconds West, for a distance of 278.51 feet to a 1/2-inch rebar found; Thence North 55 degrees 08 minutes 10 seconds West for a distance of 348.87 feet to a 1/2-inch rebar found; Thence along the arc of a curve to the right an arc length of 49.90 feet, said curve having a radius of 65.00 feet and being subtended by a chord of 48.69 feet bearing North 33 degrees 10 minutes 56 seconds West to a 1/2-inch rebar found; Thence along the arc of a curve to the left an arc length of 102.73 feet, said curve having a radius of 67.00 feet and being subtended by a chord of 92.96 feet bearing North 55 degrees 10 minutes 25 seconds West to a 1/2-inch rebar found; Thence along the arc of a curve to the right an arc length of 49.83 feet, said curve having a radius of 65.00 feet and being subtended by a chord of 48.62 feet bearing North 77 degrees 07 minutes 31 seconds West to a 1/2-inch rebar found; Thence North 55 degrees 07 minutes 01 seconds West for a distance of 564.95 feet to a 5/8-inch rebar set, said point being the **TRUE POINT OF BEGINNING**.

Said tract of land contains 25.867 Acres

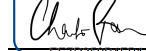
STATEMENT TO ACCOMPANY PUD APPLICATION

The undersigned, Charles Raines and the Estate of J.D. Eatherly ("**Owners**"), are the fee simple owners of certain property located at 2248 Nashville Highway, Columbia, Maury County, Tennessee, known as tax parcel no. 051 058.00 (the "**Property**"). By their signatures below, Owners concur with the application to amend the Planned Unit Development affecting the Property.

Owners have entered into a purchase agreement with Equitas Management Group, LLC ("**Purchaser**") regarding Property, and by its signature below, Purchaser also concurs with the application to amend the Planned Unit Development affecting the Property.

OWNERS:

DocuSigned by:



Charles Raines

DocuSigned by:

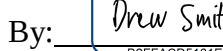


Sandra Cantrell, Executor of the Estate of
J.D. Eatherly

PURCHASER:

Equitas Management Group, LLC

DocuSigned by:



Drew Smith

Senior Vice President



September 15, 2022

Mr. Paul Keltner
Director of Development Services
City of Columbia
700 N Garden Street
Columbia, TN 38401

RE: Honey Farm PUD
2248 Nashville Highway

Dear Mr. Keltner:

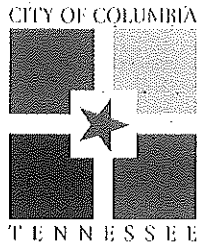
As requested by the Development Services staff of the City of Columbia, the letter confirms our commitment to the City of Columbia to pay for the design and installation of a traffic signal and all required turn lanes and road modifications associated with the traffic signal at the intersection of Nashville Highway and Honey Farm Way.

The installation of the traffic signal will be completed prior to the completion of Phase II of the Honey Farm townhome development.

Sincerely,

A handwritten signature in black ink, appearing to read 'Drew Smith', written over a light grey circular background.

Drew Smith
Senior Vice President



WASTEWATER DEPARTMENT

16 September 2022

Drew Smith
Equitas Management Group
5525 N MacArthur Blvd, Suite 400
Irving, TX 75038

RE: Honey Farms Parcel ID 051 058.00

Drew,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the above-referenced development. Major or minor improvements to existing infrastructure may or may not be necessary to satisfactorily convey the additional sanitary sewer flow from the above-referenced proposed development. Any extension to the existing sewer infrastructure will be initiated by the owner/developer, reviewed by our department and approved by the State of Tennessee. The project must be advanced in accordance with local, state and federal rules, regulations and policies. Funding and construction of those improvements will remain the responsibility of the owner/developer. New customers will be required to pay all fees applicable at the time of connection. No detailed design plan for an extension of the sewer has been proposed at this time.

A handwritten signature in black ink, appearing to read "Donnie Boshers".

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department

Something Good Around Every Corner

1244 Treatment Plant Road Columbia, Tennessee 38401 Phone 931.560.1001



September 15, 2022

Ms. Bridgette Ganter

Bowman

950 North Point Pkwy Suite 200

Alpharetta, GA 30005

Sent via email: bganter@bowman.com

RE: Water Availability Letter
 Honey Comb Farm Townhomes – 250 Units
 Nashville Hwy @ Honey Farm Way
 Tax Map 51, Parcel 58
 Columbia, Maury, TN

Dear Ms. Ganter:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development consists of 250 townhome units. CPWS has evaluated the projected water demands for the proposed residential development in the water system hydraulic model and is able to meet a fire-flow capacity of 1,500 gpm at 20 psi while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Domestic waterline connections will be made to the existing 12-inch water main located on Honey Farm Way.
- Minimum size 8-inch water mains will be required throughout the development.



All of the above requirements are to be constructed and paid for by the Applicant and dedicated to CPWS once complete up to and including the meter. No construction of CPWS infrastructure shall be initiated until final construction plans have been approved by TDEC and all parties have fully executed a water service agreement.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached fire hydrant curve for coordination and approval of development from the Columbia Fire & Rescue Fire Marshall.
- Provide construction drawings for all public water infrastructure for the proposed development in both CAD and PDF format for CPWS review.
- When applicant has resolved all comments provided by CPWS for the construction drawings, CPWS will provide an approval letter and flow calculations to support TDEC approval of the construction drawings.
- Applicant then submits drawings to TDEC for approval. Upon approval by TDEC, applicant may schedule a pre-construction meeting with CPWS. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.

If you have any questions, please feel free to contact Mr. Jonathan Hardin or myself at 615-934-7499 or jason.english@inflodesign.com. This letter is valid for one-hundred twenty (120) days from the date of this letter.

Sincerely,

Jason English, P.E.

Inflo Design Group, LLC

on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS
File 22-085