

AGENDA

La Vergne Board of Zoning Appeals

May 28, 2024 at 5:30 PM

- Call meeting to order.
- Determine quorum.

ORDER OF BUSINESS

1. Approve Minutes: April 30, 2024 Regular Meeting.

OLD BUSINESS

2. Request for Variance to Height Restriction in the La Vergne Zoning Ordinance. Property located at 703 Waldron Road (Tax Map 29, Parcel 22.02). R-3 (High Density Residential) Zoning District. Parcel owned by John M. Gilliland Living Trust.

NEW BUSINESS

3. Request for Special Exception to Allow an Educational Facility, Property located at 2 Ingram Boulevard (Tax Map 17, Parcel 20.02). I-2 (Heavy Industrial) Zoning District. Property owned by David B. Ingram.

ADJOURN

MINUTES OF THE REGULAR MEETING OF THE BOARD OF ZONING APPEALS OF THE CITY OF LA VERGNE, TENNESSEE ON APRIL 30, 2024 IN LA VERGNE CITY HALL, LA VERGNE, TENNESSEE

The La Vergne Board of Zoning Appeals met in a regular meeting on April 30, 2024 in La Vergne City Hall starting at 5:30 p.m. The meeting was called to order by Vice-Chairman Craig Pollock.

Members Present

Members present: Vice-Chairman Craig Pollock, Charles Jones, and Terrence Smith. Chairman Graeme Coates and Alfred Lane were absent.

Staff Members Present

Staff members present: City Attorney Katie Driver, Assistant City Administrator Kyle Brown, Codes Director Joe White, City Planner Bo Logan, Engineering Director Gary Lide, Life Safety Officer Kevin Douglas, Fire Marshal Curtis Brinkley, Executive Assistant Juliet Williams, and Media Services Jerry Davenport.

ORDER OF BUSINESS

1. Approve Minutes: January 30, 2024 Meeting

A motion, made by Terrence Smith, seconded by Vice-Chairman Craig Pollock, to approve the minutes of the January 30, 2024 Meeting, was adopted with all voting AYE.

2. Nominate and Elect a Chairman for 2024.

City Attorney Katie Driver opened the floor for nominations.

A motion was made by Vice-Chairman Craig Pollock to nominate and elect Graeme Coates as the Chairman.

The motion was adopted with all voting AYE.

3. Nominate and Elect a Vice-Chairman for 2024.

A motion, made by Charles Jones, seconded by Terrence Smith, to nominate and elect Craig Pollock as the Vice-Chairman, was adopted with all voting AYE.

NEW BUSINESS

4. Request for Sign Variance - Property located at 1210 Heil Quaker Boulevard (Tax Map 17, Parcel 28.03). I-2 (Heavy Industrial) Zoning District. Property owned by Ryder Truck Rental, Inc.

Mr. Logan gave his report.

Vice-Chairman Pollock swore in Mr. Mike Lebb, with Harbinger Sign Company. He explained his request.

A motion, made by Terrence Smith, seconded by Charlie Jones, to approve the sign variance, was adopted with all voting AYE.

5. Appeal the Decision of the Building Official, Property located at 141 Blue Valley Road (Tax Map 18I, Group B, Parcel 21). R-3 (High Density Residential) Zoning District. Property owned by Brenda Pinkston

Mr. Logan gave his report.

Vice-Chairman Pollock swore in Ms. Brenda Pinkston, 119 Smotherman Drive. She explained her appeal request.

A motion, made by Terrence Smith, seconded by Charlie Jones, to deny the appeal request, was adopted with all voting AYE.

6. Request for Variance to Height Restriction in the La Vergne Zoning Ordinance. Property located at 703 Waldron Road (Tax Map 29, Parcel 22.02). R-3 (High Density Residential) Zoning District. Parcel owned by John M. Gilliland Living Trust.

This item was deferred. No action was taken.

ADJOURNMENT

There being no further business to come before this meeting, Chairman Coates declared the meeting adjourned at 5:49 p.m.

Chairman

City Recorder

Approved: _____



Item #: 2. Request for Variance to Height Restriction in the La Vergne Zoning Ordinance. Property located at 703 Waldron Road (Tax Map 29, Parcel 22.02). R-3 (High Density Residential) Zoning District. Parcel owned by John M. Gilliland Living Trust.

Reviewed By: Bo Logan

Summary: This item was deferred from the April 30th BOZA meeting.

The applicant would like to request a variance to the height restriction in the La Vergne Zoning Ordinance. The applicant is proposing that each apartment building contain 4 stories and be at least 50 feet high.

If the hipped roofs or ridgelings or gables need to be higher than 50 feet then they will be allowed to do so with this approval by BOZA. But the floor limit will be 4 stories regardless of the height.

The current R-3 district prohibits any buildings over 35 feet in height. Also, when adopted, the proposed zoning ordinance will allow a maximum of 4 stories in this area.

Background Information: The property is located at 703 Waldron Road (Tax Map 29, Parcel 22.02). This site is zoned R-3 (High Density Residential) Zoning District. The parcel is owned by the John M. Gilliland Living Trust. The proposed multi-family development will contain 324 apartments.

Other Comments:

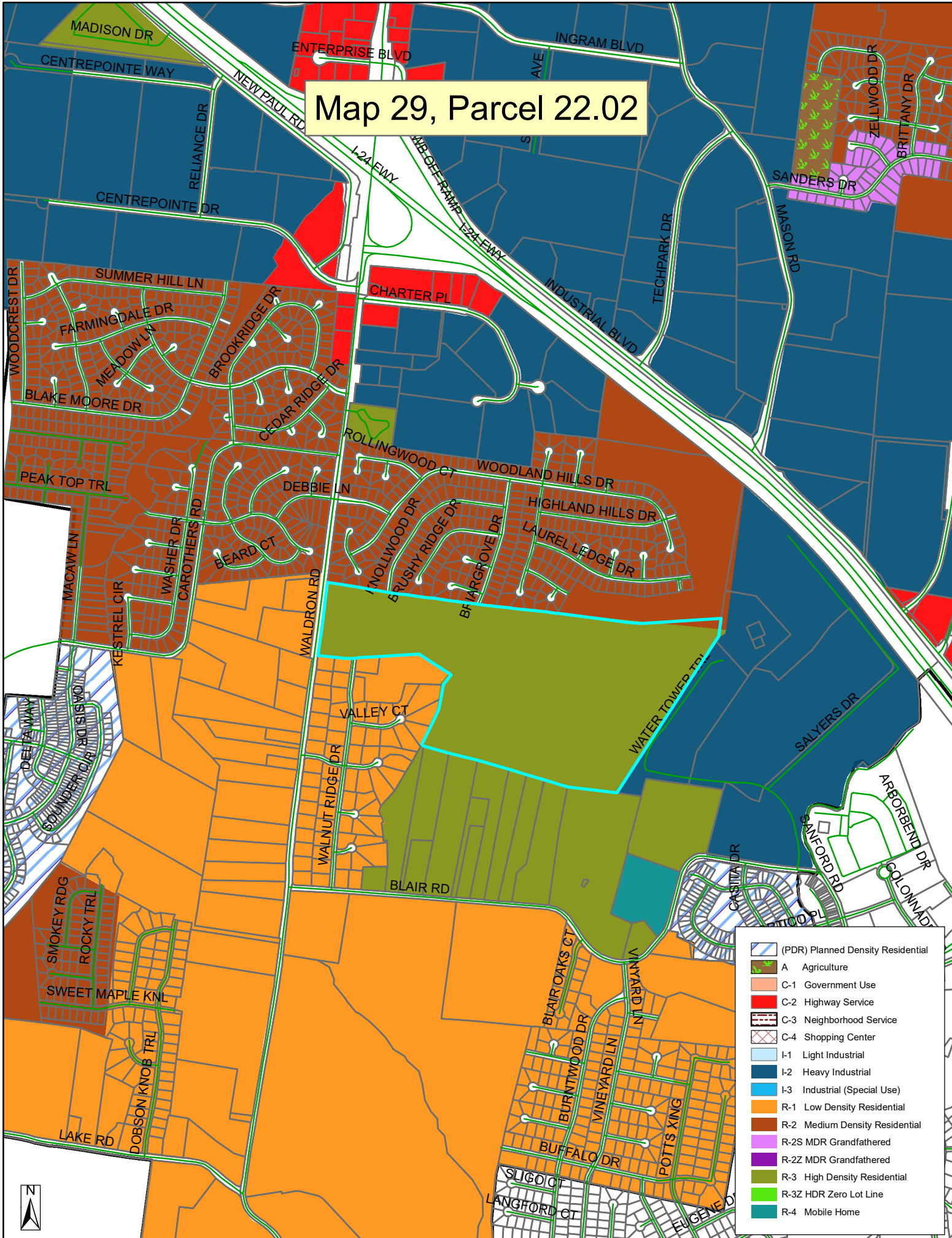
Map 29, Parcel 22.02



Map 29, Parcel 22.02



Map 29, Parcel 22.02



	(PDR) Planned Density Residential
	A Agriculture
	C-1 Government Use
	C-2 Highway Service
	C-3 Neighborhood Service
	C-4 Shopping Center
	I-1 Light Industrial
	I-2 Heavy Industrial
	I-3 Industrial (Special Use)
	R-1 Low Density Residential
	R-2 Medium Density Residential
	R-2S MDR Grandfathered
	R-2Z MDR Grandfathered
	R-3 High Density Residential
	R-3Z HDR Zero Lot Line
	R-4 Mobile Home

BOARD OF ZONING APPEALS APPLICATION

APPLICANT INFORMATION

(Please Print or Type - Any Correspondence will be addressed to the individual.)

1. Date of Application: 4/4/2024 2. Phone Number: 615-977-2363
3. Property Owner's Name: Gilland John M Living Trust
4. Property Owner's Address: 3180 Waterlevel Hwy
Cleveland TN 37311
5. Your Name (If Different): BRS Development LLC
6. Address: 1136 Glenwood Ave
Nashville TN 37204
7. Property Location: 703 Waldron Road La Vergne TN 37086

David Pierce - contact

(If additional space is needed, please use an additional sheet of paper.)

Section 1 - Appeal the Decision of the Building Inspector / Codes Enforcement Officer.

8. Decision of the Building Inspector / Codes Enforcement Officer: _____

(If additional space is needed, please use an additional sheet of paper.)

Section 2 - Application for a Variance / Special Exception.

9. Type of Variance / Special Exception Needed: Height Restriction Requirments for
Multi-Family Design Standards R3 Zoning

10. Peculiar or Unusual conditions which justify the Variance Requested: City of

La Vergne is in the procces of changing the design standards for Multi-Family R3 Zoning to

4 stories. The variance requested is to match those future design standards for the height of 4 stories

(If additional space is needed, please use an additional sheet of paper.)

In granting a variance, the Board shall ascertain that the following criteria are met:

1. Variances shall be granted only where special circumstances or conditions, fully described in the finding of the Board, do not apply generally in the district.
2. Variances shall not be granted to allow a use otherwise excluded from the particular district in which requested.
3. For reasons fully set forth in the findings of the Board, the aforesaid circumstances or conditions are such that the strict application of the provisions of this ordinance would deprive the applicant of any reasonable use of his land. Mere loss in value shall not justify a variance. There must be a deprivation of beneficial use of land.
4. The granting of any variance shall be in harmony with the general purpose and intent of this ordinance and shall not be injurious to the neighborhood, detrimental to the public welfare, or in conflict with the comprehensive plan for development.
5. In reviewing an application for a variance, the burden of showing that the variance should be granted shall be upon the persons applying therefore.
6. Variances must return to the planning commission for site approval and be accompanied by a written explanation from the Board of Zoning Appeals stating the reason the variances was granted or was not granted.



Applicant Signature

Date: 4/4/2024

I, Joseph D. Dixon, Trustee of the John M. Gilliland Trust U/A dtd December 22, 2014, Property Owner, hereby grant permission to BRS Development to represent our interests in an application to be filed with the City of La Vergne, TN Planning Commission for the purpose of obtaining a Preliminary Plat for the property located along Waldron Rd La Vergne, TN.

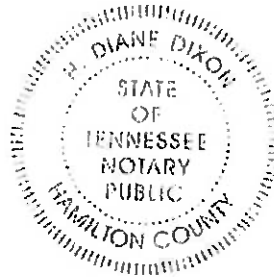
Joseph D. Dixon Trustee
Property Owner

Witness My hand and official seal at Chattanooga, Tennessee this 27th
City State

Day of May, 2022

H. Diane Dixon
Notary Public

My Commission Expires: 1/29/2025

















Item #: 3. **Request for Special Exception to Allow an Educational Facility, Property located at 2 Ingram Boulevard (Tax Map 17, Parcel 20.02). I-2 (Heavy Industrial) Zoning District. Property owned by David B. Ingram.**

Reviewed By: Bo Logan

Summary: The applicant would like to gain permission to allow an educational facility on this property. The site is located at #2 Ingram Boulevard.

This is a 2-story existing office building that was occupied by Ingram Content Group since the 1990s.

The proposed facility would generally operate during normal business hours. The applicant may want to explain the exact operating hours.

According to the **Municipal Zoning Ordinance** as codified in **Article V**, commercial uses and institutional uses allowed in C-1, C-2, C-3 and C-4 zoning can be allowed in I-2 zoning districts if the Board of Zoning Appeals grants a special exception for those commercial uses. Educational facilities, schools, trade schools, etc. are such uses.

Background Information:

Other Comments: There has been a sign posted on the property for approximately four (4) weeks, and Staff has not received any phone calls.

The project's traffic study has recommended the following: "a school speed zone should be established within the study area. Specifically, on eastbound and westbound Ingram Boulevard... This assembly should be installed approximately 500 feet in advance of the property boundary for the school. This assembly, which should be based on a school zone speed limit of 15 mph,..."

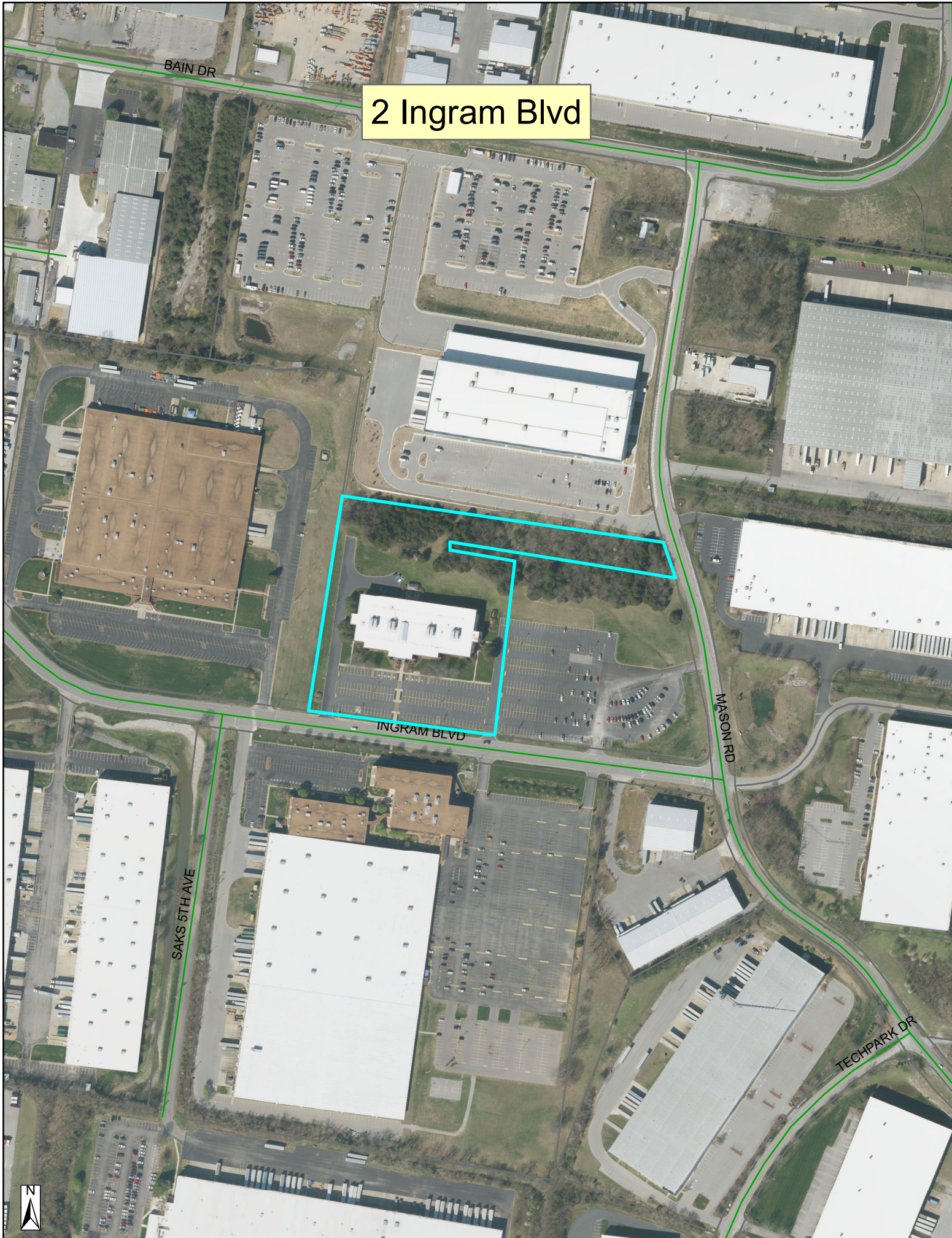
2 Ingram Blvd



INGRAM BLVD

MASON RD





2 Ingram Blvd

BAIN DR

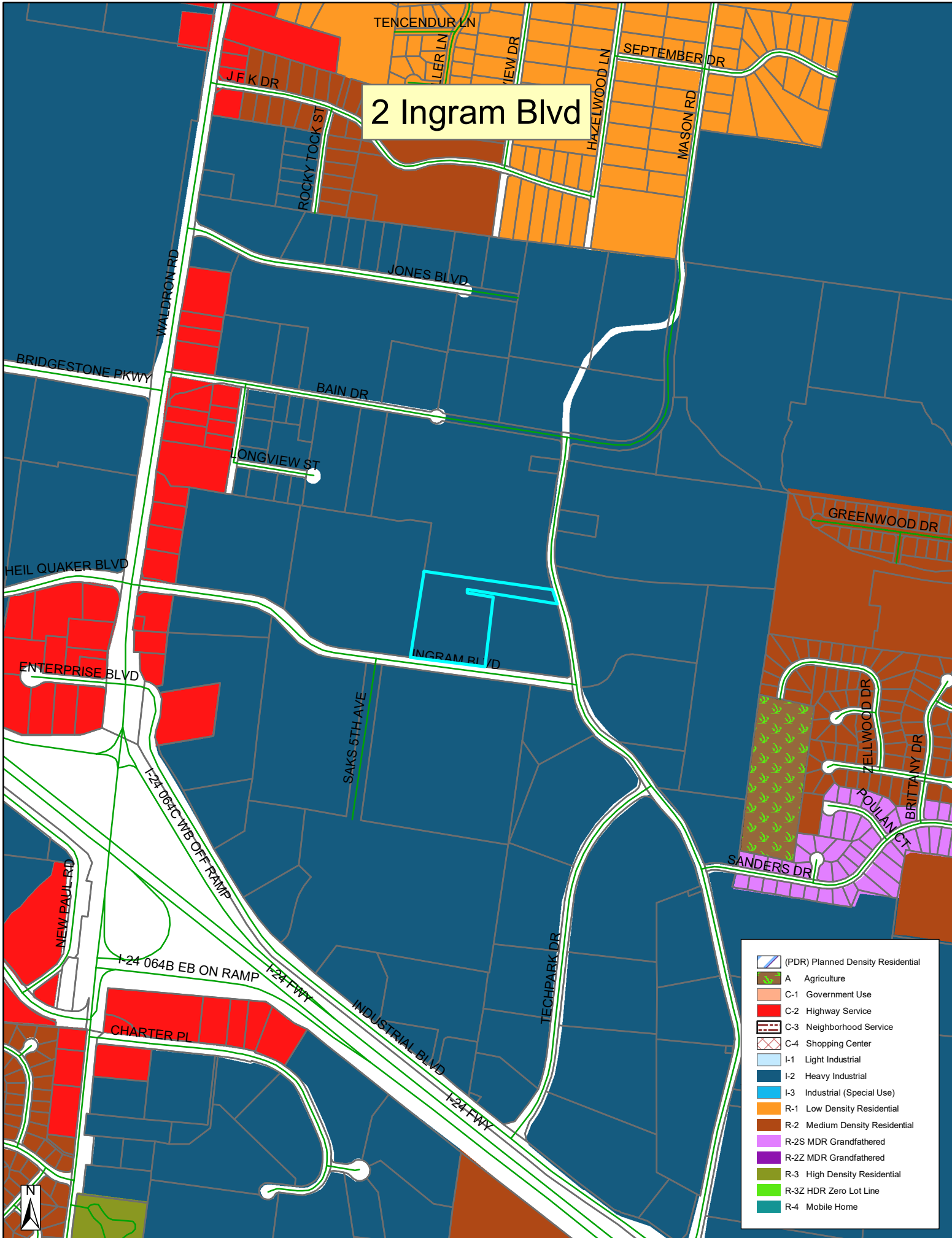
INGRAM BLVD

MASON RD











SAKS 5TH AVE

TECHPARK DR





2 Ingram Blvd

-  (PDR) Planned Density Residential
-  A Agriculture
-  C-1 Government Use
-  C-2 Highway Service
-  C-3 Neighborhood Service
-  C-4 Shopping Center
-  I-1 Light Industrial
-  I-2 Heavy Industrial
-  I-3 Industrial (Special Use)
-  R-1 Low Density Residential
-  R-2 Medium Density Residential
-  R-2S MDR Grandfathered
-  R-2Z MDR Grandfathered
-  R-3 High Density Residential
-  R-3Z HDR Zero Lot Line
-  R-4 Mobile Home





RESERVED
PARKING

RESERVED
PARKING



2

2 Ingram Boulevard

La Vergne, Tennessee

Site Plan & Construction Drawings
BZA Special Exception

Drawing Index

Sheet No.	Title
C0.0	Cover Sheet
C0.1	General Notes
C0.2	Master Plan
C1.0	Existing Conditions/Initial EPSC/Demo Plan
C2.0-2.1	Site Plan
C2.2-2.3	Utility Plan
C3.0	Grading, Drainage & Final EPSC Plan
C4.0	Details
L1.0-L1.4	Landscape Plans
L 2.0	Landscape Details & Notes



Site Location Map
Not To Scale

Owner
David Ingram
4417 Tyne Blvd
Nashville, 37215

Deed Reference:
Tax Map 17, Parcels 20.02 & 20.03
Bk. 366, Pg. 296

Yard Requirements:
Front Yard: 10'
Front Building Setback: 40'
Side Building Setback: 20'
Rear Building Setback: 15'

Existing Use: Office Building (Vacant)
Intended Use: Elementary, Junior High, & High School
Density: N/A

Square Footage Of EACH Use:
Floor Area Ratio: 0.16
Height: 2 Stories, 34 Feet Tall
Sign Height = 10' Tall
Sign Area = 100 s.f.

Land Use Data:
Zoned: I-2
1 Lot on: 14.228 ± Acres

Parking Requirement:
Elementary & Junior High: 2 Spaces/Classroom x 15 Classrooms
Or 1 Space/5 Auditorium Seats x 120 Seats = 24 Spaces Required
High Schools: 5 Spaces/Classroom x 0 Classroom
Or 1 Space/4 Auditorium Seats x 120 Seats = 24 Spaces Required
Total Spaces Required: _ Spaces
Provided: 276 Regular + 8 H.C. = 284 Total Spaces Provided (Existing)

Flood Map No.:
This site lies within Zone X, not in the
100 Year Floodplain, per Community Panel
47149C0015J And 47149C0105J dated May 9, 2023.

Interior Landscape Area
Interior Landscaping Area:
Existing: = 2,818 sq.ft.
Provided: = 5,440 sq.ft.
Imperious Area:
Existing: = 281,841 sq.ft.
Provided: = 281,841 sq.ft.

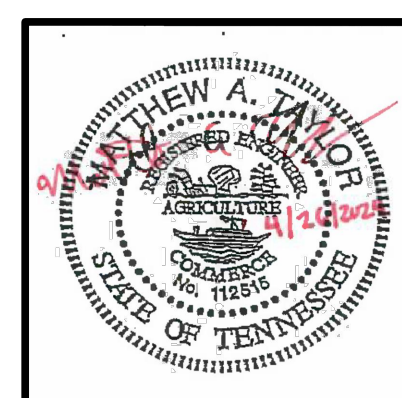
Sheet C0.0
2 Ingram Boulevard
S.E.C. Project #24136
Submitted: 4-29-2024
Revised:

SEC, Inc. SITE ENGINEERING CONSULTANTS
ENGINEERING • SURVEYING • LAND PLANNING
LANDSCAPE ARCHITECTURE

850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
PHONE: (615) 890-7901 E-MAIL: MTAYLOR@SEC-CIVIL.COM FAX: (615) 895-2567

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By: _____ Date: _____
Matthew A. Taylor, P.E. TN. Reg. #112515



Watershed: Hurricane Greek

Site Notes:

- Dimensions shown at curbed areas are to face of curb.
- See architectural drawings for building dimensions.
- Contractor shall immediately notify the engineer of any discrepancies found between these plans, the architectural plans, and/or field conditions prior to construction.
- Apparent errors, discrepancies, or omissions on the drawing shall be brought to the attention of the owner prior to bid submittal. The contractor may not use apparent errors, discrepancies, or omissions present on the drawings presented for bidding for additional charges after bids have been submitted. The architect shall be permitted to make corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the contract documents.
- The contractor shall stake all improvements using the geometric data provided in the drawings. It is the sole responsibility of the contractor to completely stake and check all improvements to ensure adequate positioning, both horizontal and vertical, prior to the installation of any improvements.
- The notes and plans shown call attention to certain required features of the construction but do not claim to cover all details of design and construction. The contractor shall furnish and install the work complete and ready for operation.
- After completion of construction, the contractor shall perform site cleanup to remove all trash, debris, excess materials, equipment, and other deleterious materials associated with construction. The contractor is expressly responsible for ensuring the site is clean and in operable condition at the time of final acceptance.
- A separate R.O.W. Excavation Permit issued from the LaVergne Street Department shall be required for any excavation or construction in the public R.O.W.
- The contractor is responsible for the protection and replacement of all property pins on this site.
- These drawings are intended for use on this site only and as an integrated set for this specific project. These drawings may not be used in whole or in part on any other project under the professional engineer's seal. The owner shall hold harmless and indemnify the architect and engineer from and against any and all claims of any nature whatsoever arising from such use.
- Existing conditions and topo shown herein are taken from a field-run survey by Dale & Associates.

General Utility Notes:

- Existing utility lines shown are approximate locations only. The contractor shall field verify all existing utility line locations prior to any construction. Any deviations from the design locations shall be reported to the owner or engineer prior to beginning construction.
- The contractor will provide all necessary protective measures to safeguard existing utilities from damage during construction of this project. In the event that special equipment is required to work over and around the utilities, the contractor will be required to furnish such equipment. The cost of protecting utilities from damage and furnishing special equipment will be included in the price bid for other items of construction.
- The contractor shall notify each individual utility owner of his plan of operation in the area of the utilities, prior to commencing work, the contractor shall contact the utility owners and request them to properly locate their respective utility on the ground. This notification shall be given at least three (3) business days prior to commencement of operations around the utility.
- The contractor shall refer to architect's plans and specifications for actual location of all utility entrances to include sanitary sewer laterals, domestic and fire protection water service, electrical, telephone and gas service. This contractor shall coordinate installation of utilities in such a manner as to avoid conflicts and assure proper depths are achieved as well as coordinating with the regulatory agency as to location and scheduling of tie-ins/connections to their facilities.
- All underground utilities (water sewer, storm sewer, electrical conduit, irrigation sleeves, and any other miscellaneous), shall be in-place prior to the placement of base course material.
- Location of site utilities shall be verified with proper utility company providing service.
- The owner/developer for budget purposes, should check with City of LaVergne Water & Sewer Dept. for connection fees which may be substantial.
- Contractors for sewer work must be approved by the City of LaVergne Sewer Department. Contractor for water work must be approved by City of LaVergne Water Dept..
- In Tennessee it is a requirement per "the underground utility damage prevention act" that anyone who engages in excavation must notify all known utility owners, no less than three nor more than ten working days, prior to their intended excavation. A list of these utility owners may be obtained from the county register of deeds those utility owners who participate in the Tennessee one call system can be notified toll free at 1-800-351-1111.

Sanitary Sewer Notes:

- The contractor must notify the City of LaVergne Sewer Dept. for sewer inspection prior to starting work.
- Sanitary sewer pick-up points shall terminate five feet outside the face of building unless otherwise noted.
- Contractor shall comply with all requirements of the latest edition of the City of LaVergne specifications.

Waterline Notes:

- All water mains shall be hydrostatically tested and disinfected before acceptance.
- All trenches, pipe laying, and backfilling shall be in accordance with federal O.S.H.A. regulations.
- Contractor shall comply with all requirements of the latest edition of the City of LaVergne specifications.
- Utility contractor shall have approval of all governing agencies having jurisdiction over this system prior to installation.

Grading And Drainage Notes:

- The site work contractor shall coordinate the installation of all underground utilities with his work. All underground utilities (water, sanitary sewer, storm sewer, electrical conduit, irrigation sleeves, and any other miscellaneous underground utilities, devices, or structures), shall be in-place prior to the placement of base course material.
- The contractor shall cut existing pavement as necessary to assure a smooth fit and continuous grade.
- The contractor shall verify horizontal and vertical location of all existing storm sewer structures, pipes and all utilities prior to construction.
- Clearing and grubbing limits shall include all areas disturbed by grading operation.
- Any graded or disturbed areas shall have 4 inches of topsoil, seed, mulch, fertilizer and water applied until a healthy stand of grass is obtained. The restoration shall closely follow construction.
- The soil materials on lots shown hereon may be disturbed by cutting or filling operations performed during or before development. Therefore, the builder of any proposed structure shall investigate the current conditions and consult with a geotechnical expert or other qualified person as he deems appropriate to assure himself that the design of the proposed foundation is adequate.
- No portion of this site lies within the 100 year flood plain per F.E.M.A. Community Panel No. 47149C0105J dated May 9, 2023.
- A separate R.O.W. Permit issued by the City of LaVergne will be required for excavation and construction in the public R.O.W.
- Handicap parking spaces and accessible routes shall be constructed and sloped in accordance with all applicable provisions of the A.D.A.
- In Tennessee it is a requirement per "The Underground Utility Damage Prevention Act" that anyone who engages in excavation must notify all known utility owners, no less than three nor more than ten working days, prior to their intended excavation. A list of these utility owners may be obtained from the county register of deeds. Those utility owners who participate in the Tennessee One Call System can be notified toll free at 1-800-351-1111.

Erosion Control Notes:

- The site contractor is responsible for establishing and maintaining suitable erosion and sediment control devices on-site during construction as required to prevent silt from leaving site. Silt will not be allowed beyond construction limits.
- The contractor is responsible for removing silt from site if not reusable on-site and assuring plan alignment and grade in all ditches at completion of construction.
- The contractor is responsible for cleaning out all storm drainage structures, including flumes, pipes, etc., prior to completion of this project.
- Erosion control shall be provided for all cut and fill operations within the limits of the construction site, throughout the construction period to provide the site with maximum protection from erosion at all times.
- Erosion control measures are to be installed prior to any grading on-site and are to be maintained in place until stabilization of erodible soils has been accomplished.

Purpose Summary:
To Change Building Use From Office To Elementary, Junior High, & High School To Allow A Charter School.

Legend:			
□	EXIST. CONCRETE MONUMENT	⊕	BENCHMARK
●	IRON PIN SET (I.P.S.)	♿	HANDICAP PARKING SYMBOL
○	IRON PIN FOUND (I.P.F.)	V.A.	VAN ACCESSIBLE HANDICAP DESIGNATION
→	EXIST. SIGN POST	→	HC SIGN
○	EXIST. SEWER CLEANOUT	→	PROPOSED SIGN POST
○	EXIST. MANHOLE (SEWER & PHONE)	●	CONCRETE BOLLARD
⊖	EXIST. CATCH BASIN (SEWER & PHONE)	—	WHEEL STOP
⊗	EXIST. WATER/GAS VALVE	▬	CONCRETE SIDEWALK
⌚	EXIST. TELEPHONE RISER	▬	EXTRUDED CURB
⊠	EXIST. GAS RISER	▬	CURB & GUTTER
⊞	ELECTRICAL ENCLOSURE	→	TRAFFIC ARROW
⊗	EXIST. WATER METER	↔	TURN LANE ARROWS
○	EXIST. UTILITY POLE	⚠	REVISION NUMBER
⊕	EXIST. FIRE HYDRANT	#1	DRAINAGE STRUCTURE DESIGNATION
●	POST INDICATOR VALVE	A	DRAINAGE PIPE DESIGNATION
▣	BLOW OFF VALVE	⊗	RIP RAP
▷	REDUCER	↔	RUNOFF FLOW ARROW
⊕	REMOTE FIRE DEPT. CONNECTION	□	INLET FILTER PROTECTION
⊞	CONCRETE THRUST BLOCK	63.25 X	PROPOSED SPOT ELEVATION
▣	DOUBLE DETECTOR CHECK VALVE	(63.25) X	EXIST. SPOT ELEVATION
↔	FIRE DEPT. CONNECTION	▬	SEWER/STORM FLOW DIRECTION
⊕	FIRE HYDRANT	▬	CATCH BASIN
⊗	GATE VALVE & BOX	▣	CURB INLET
W	WATER METER	●	AREA DRAIN
G	GAS METER	—	HEADWALL
⊞	GREASE TRAP	↪	WINGED HEADWALL
○	EXTERIOR CLEANOUT ECO	▬	CONCRETE SWALE
○	MANHOLE	⊞	TYPE- X- HEADWALL

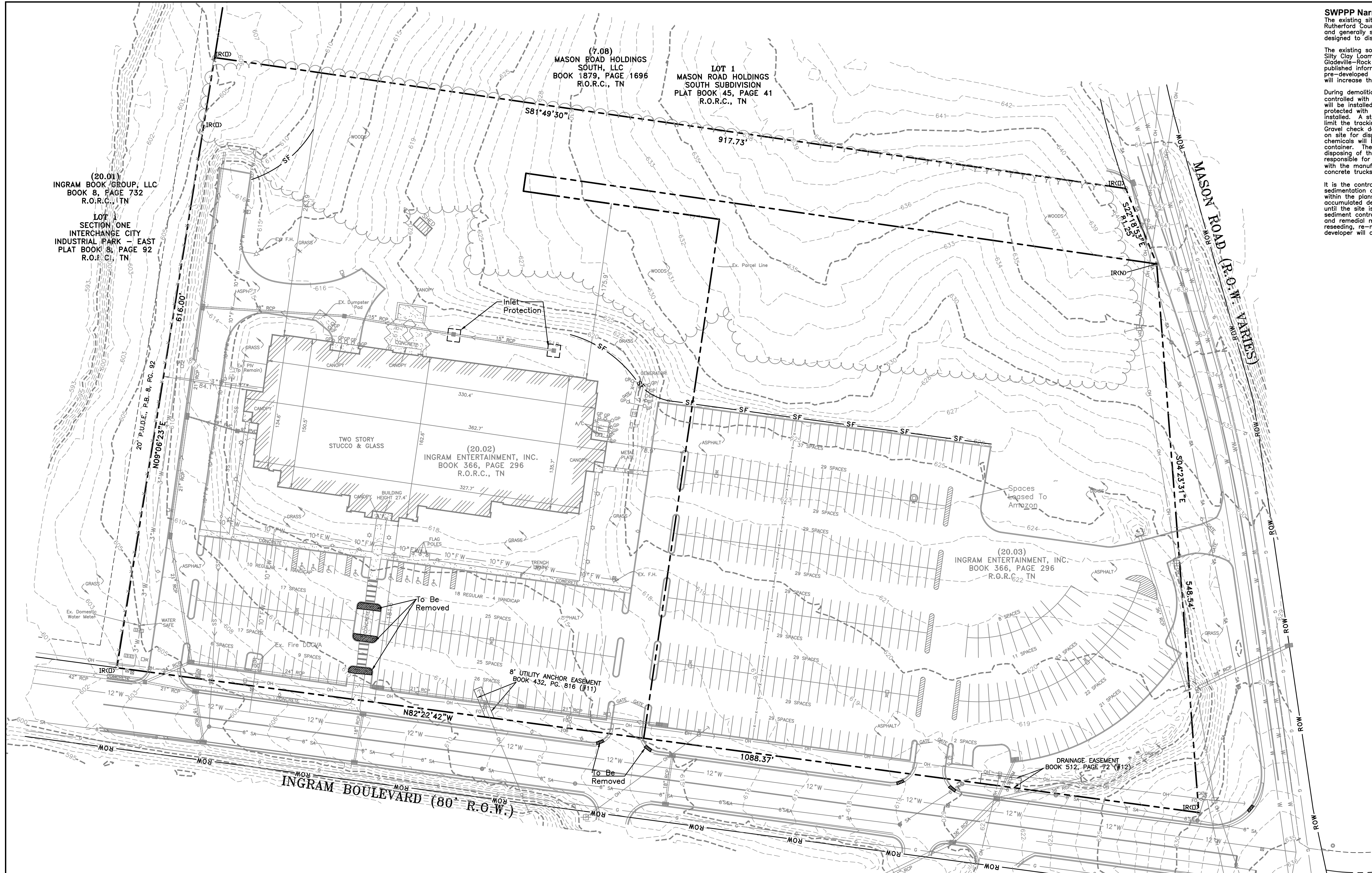
EXISTING PHONE	PH
EXISTING ELECTRIC	OH
PROPERTY LINE	---
EASEMENTS	---
RIGHT OF WAY	ROW
EROSION CONTROL SILT FENCE	SF SF
EROSION EEL	EEL EEL
EXISTING TREELINE	~ ~ ~ ~
EXISTING FENCELINE	X X X X
MINIMUM BUILDING SETBACK LINE	---
PHASE BOUNDARY	■■■■■■■■■■
EXISTING GAS LINE	GAS
PROPOSED GAS LINE	GAS
EXISTING STORM	---
PROPOSED STORM	STM
EXISTING CONTOUR LINES	---601---
PROPOSED CONTOUR LINES	601
EXISTING SANITARY SEWER	SS
PROPOSED SANITARY SEWER	SS
EXISTING WATER	W W
PROPOSED WATER	W W

SEC, Inc.
 ENGINEERING • SURVEYING • LAND PLANNING
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 850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
 PHONE: (615) 890-7901 E-MAIL: MTAYLOR@SEC-CIVIL.COM FAX: (615) 895-2467
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2 Ingram Boulevard
 La Vergne, Tennessee

General Notes

REVISIONS:
 DRAWN: SJA/CFB3
 DATE: 4-29-2024
 CHECKED:
 MAT, MPL
 FILE NAME:
 24136project
 SCALE:
 None
 JOB NO.
 24136
 SHEET:
C0.1



SWPPP Narrative:
 The existing site is located to the west of northwestern end of New Paul Road within Rutherford County in the City of La Vergne. The project site is a 10.00 Acre project and generally sheet flows from the southwest to the northeast. The site has been designed to discharge to existing downstream conveyance system to the northeast.

The existing soils on site consist of approximately 60.7% Egam Silt Loam and Talbott Silty Clay Loam categorized as type C hydrologic soil group and 39.3% Gladville-Rock outcrop Complex categorized as type D hydrologic soil group per published information by the National Resources Conservation Service. The pre-developed site has a runoff curve number of 88. The proposed improvements will increase the runoff curve number to 53.

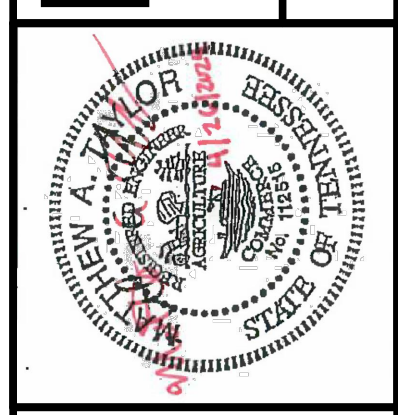
During demolition and mobilization, the sediment and stormwater runoff will be controlled with certain Best Management Practices (BMPs). Silt fence and erosion control will be installed on the downslope sides of the site. The storm inlets will be protected with silt fence inlet protection until the stone base and pavements can be installed. A stone construction entrance will be installed upon mobilization of site to limit the tracking of mud and sediment onto the adjacent pavements and roadways. Gravel check dams will be provided in the existing swales. Covered dumpsters will be on site for disposal of trash and other debris. Paint and other potentially hazardous chemicals will be stored inside the building or otherwise approved weatherproof container. The contractor purchasing the materials will be responsible for legally disposing of the container. The contractor purchasing the materials will be responsible for legally disposing of the containers and excess materials in accordance with the manufacturer's recommendations. A washout area will be provided for the concrete trucks as required.

It is the contractor's responsibility during construction to install and maintain all sedimentation and storm water pollution prevention BMPs described above and detailed within the plans at all times, which includes regular removal and disposal of accumulated debris. All erosion and sediment controls must be maintained properly until the site is stabilized. Maintenance must include inspections of all erosion and sediment controls after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean out, repair replacement, re-grading, reseeding, re-mulching and re-netting must be performed immediately. The developer will own and maintain the site after construction has been completed.

- Construction Sequence:**
1. Stake and/or flag limits of clearing.
 2. During preconstruction meeting all erosion & sediment control facilities & procedures shall be discussed.
 3. Clear & grub, as necessary, for installation of perimeter controls.
 4. Install silt fence perimeter controls as shown on plans.
 5. Install construction entrance and concrete washout facility, if conditions are such that mud is collecting on vehicle tires, the tires must be cleaned before the vehicles enter the public roadway. The site entrance shall be maintained in a condition that will prevent the tracking or flow of mud onto the public right-of-way. All materials spilled, dropped, washed or tracked from vehicles onto the roadway must be removed promptly.
 6. Clear & grub the remaining site as necessary.

General Contractor Shall Install All Initial EPSC Measures Prior To Any Earthwork Beginning.

SEC, Inc.
 ENGINEERING • SURVEYING • LAND PLANNING
 LANDSCAPE ARCHITECTURE
 850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
 PHONE: (615) 890-7901 E-MAIL: MTAYLOR@SEC-CIVIL.COM FAX: (615) 895-2567
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2 Ingram Boulevard
 La Vergne, Tennessee

Notes:
 Staging Area, Worker Parking & Adjoining Drive To Be Constructed Of Stone.

Staging Area is To Be Kept Litter Free With Daily Cleanup. In Addition, All Stored Materials Are To Be Kept In Organized & Stacked Fashion. An unkempt site will not be permitted, and if debris is stored in areas outside of the designated storage area, City Staff will shut down the job site.

All Construction Signage Is To Be Constructed Of 2-4"x4" Painted Posts.

Sign #1 - Display Surface Can Be No More Than 32 S.F. & Must Be Less Than 9 Ft. Tall.

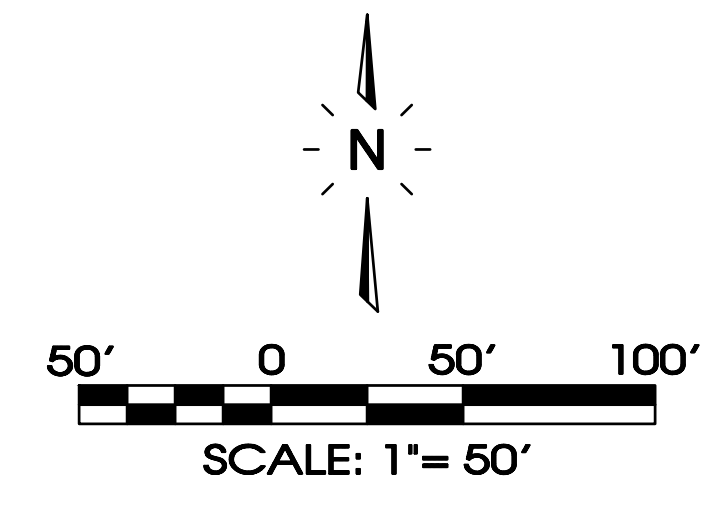
EPSC Phasing

Initial: Silt Fence Along Downgradient Perimeter
 Construction Entrance
 Temp. Conc. Washout

Intermediate: Filter Fabric Inlet Protection
 Silt Fence To Protect Ditches

Final: Landscaping & Grass Sod Of All Pervious Areas (See Landscaping Plan)

Notes:
 Soils Survey Information Referenced Here On Is Taken From The National Resources Conservation Service Web Soil Survey.



REVISIONS:

DATE:	4-29-2024
CHECKED:	MAT, MFL
FILE NAME:	24136project
SCALE:	1"=60'
JOB NO.:	24136
SHEET:	C1.0

Existing Conditions/Initial EPSC/Demo Plan

(20.01)
 INGRAM BOOK GROUP, LLC
 BOOK 8, PAGE 732
 R.O.R.C., TN

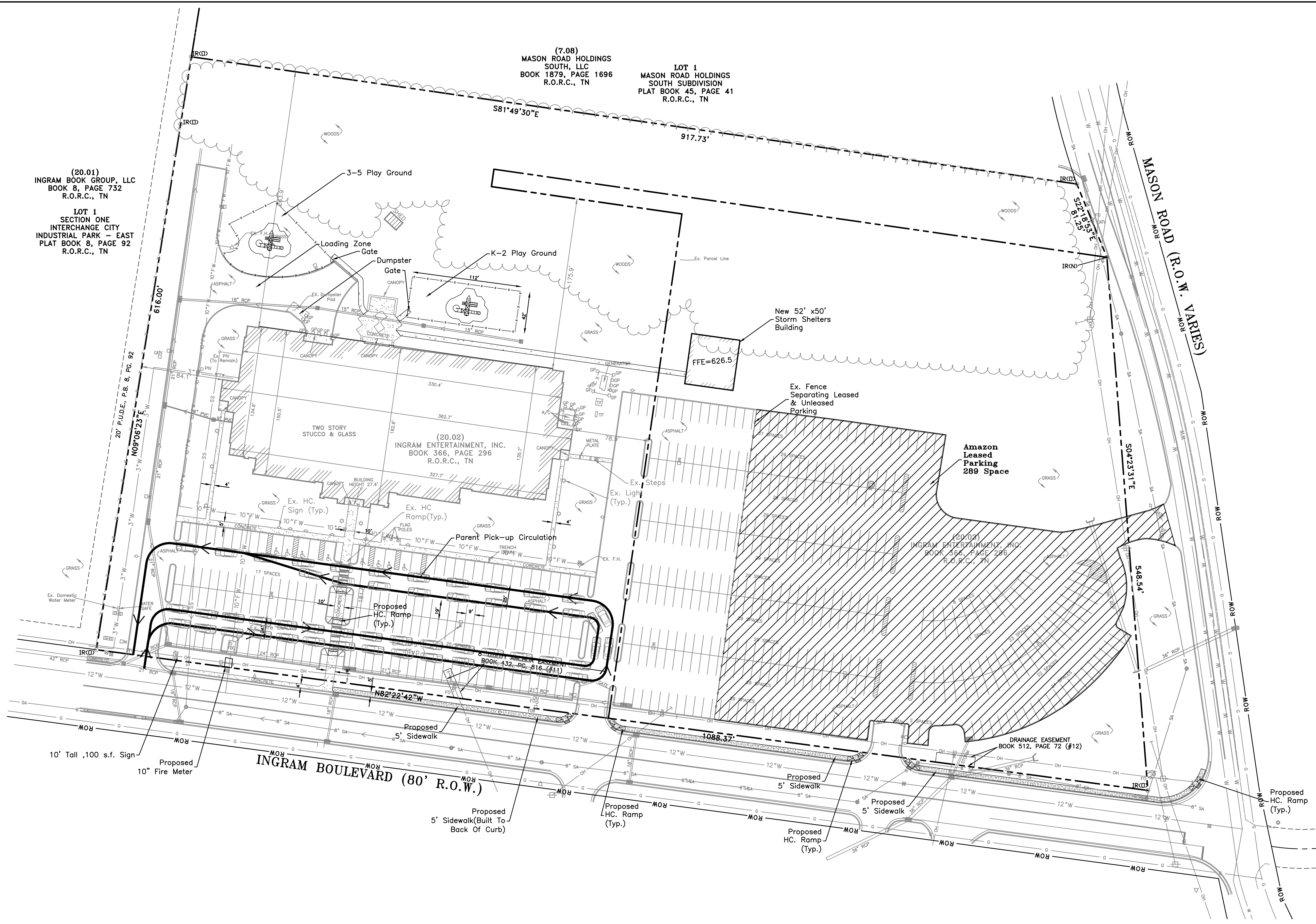
LOT 1
 SECTION ONE
 INTERCHANGE CITY
 INDUSTRIAL PARK - EAST
 PLAT BOOK 8, PAGE 92
 R.O.R.C., TN

(7.08)
 MASON ROAD HOLDINGS
 SOUTH, LLC
 BOOK 1879, PAGE 1696
 R.O.R.C., TN

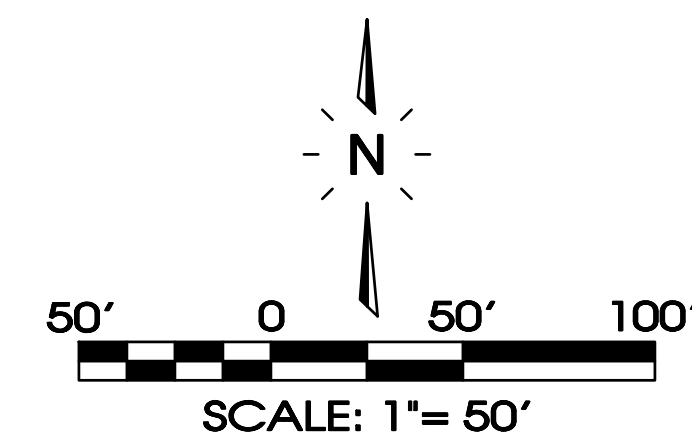
LOT 1
 MASON ROAD HOLDINGS
 SOUTH SUBDIVISION
 PLAT BOOK 45, PAGE 41
 R.O.R.C., TN

(20.02)
 INGRAM ENTERTAINMENT, INC.
 BOOK 366, PAGE 296
 R.O.R.C., TN

(20.03)
 INGRAM ENTERTAINMENT, INC.
 BOOK 366, PAGE 286
 R.O.R.C., TN



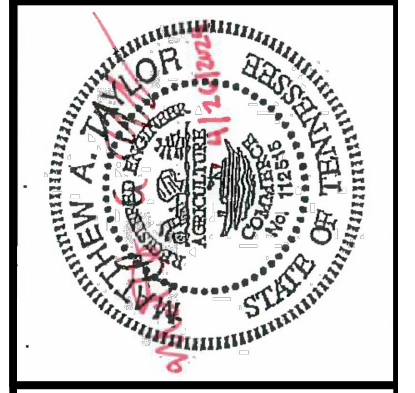
Know what's below.
 Call before you dig.



SEC, Inc.
 SITE ENGINEERING CONSULTANTS
 ENGINEERING • SURVEYING • LAND PLANNING
 LANDSCAPE ARCHITECTURE

850 MIDDLE TENNESSEE BOULEVARD
 MURFREESBORO, TENNESSEE 37129
 PHONE: (615) 890-7901 E-MAIL: MTAYLOR@SEC-CIVIL.COM FAX: (615) 895-2567
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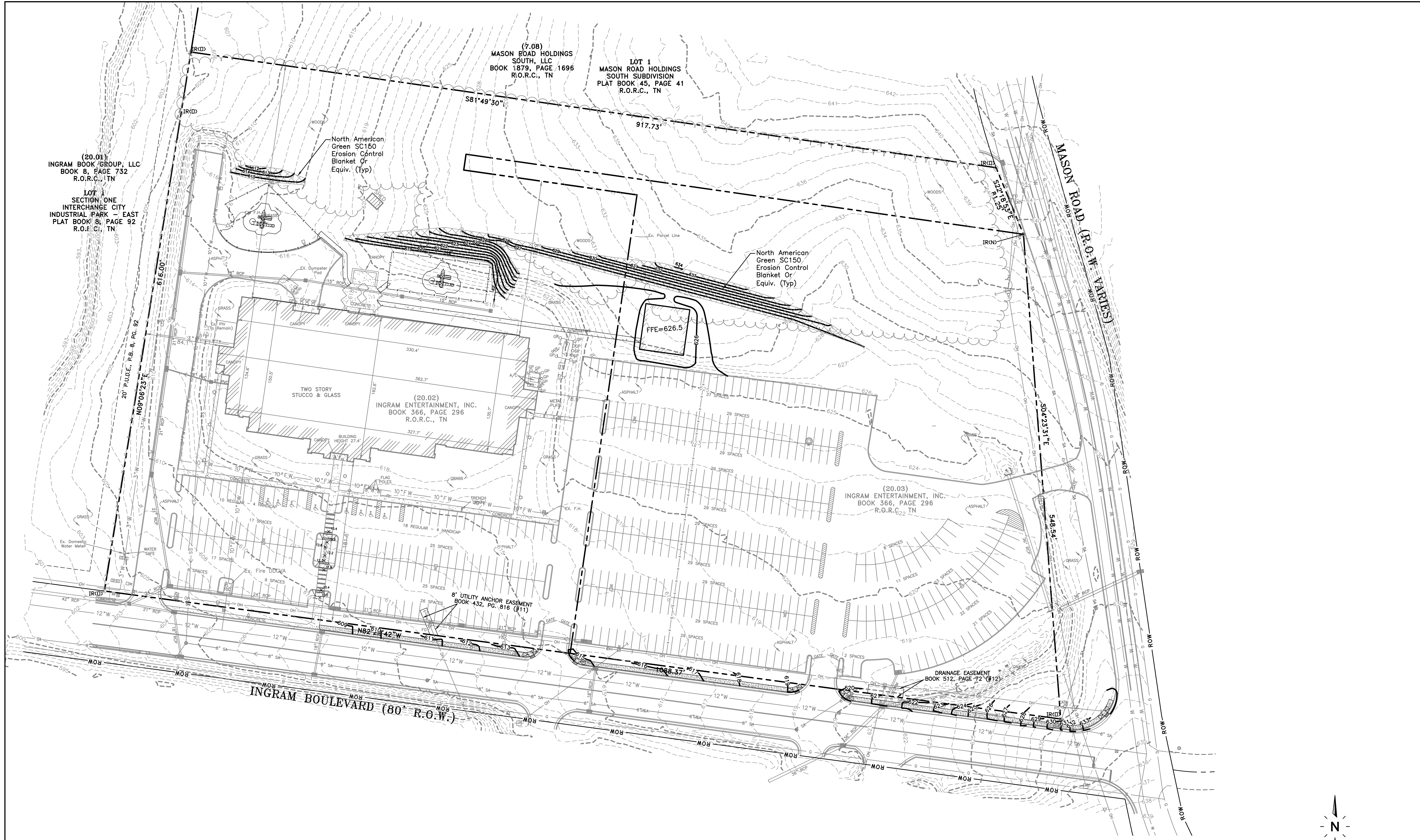
The site plan shows the location of proposed structures, parking, and circulation. It is the sole responsibility of the owner/developer to ensure that the construction of the site shown on these construction drawings is in total accordance with the design as noted, described, and illustrated. The engineer assumes no administrative liability or responsibility in the assurance that the site is constructed in accordance with the construction plans.



2 Ingram Boulevard
 La Vergne, Tennessee

REVISIONS:	
DRAWN: SJA/CFB3	
DATE: 4-29-2024	
CHECKED: MAT, MFL	
FILE NAME: 24136project	
SCALE: 1"=50'	
JOB NO. 24136	
SHEET: C2.0	

Site & Utility Plan



(20.01)
 INGRAM BOOK GROUP, LLC
 BOOK 8, PAGE 732
 R.O.R.C., TN
 LOT 1
 SECTION ONE
 INTERCHANGE CITY
 INDUSTRIAL PARK - EAST
 PLAT BOOK 8, PAGE 92
 R.O.R.C., TN

(7.08)
 MASON ROAD HOLDINGS
 SOUTH, LLC
 BOOK 1879, PAGE 1696
 R.O.R.C., TN
 LOT 1
 MASON ROAD HOLDINGS
 SOUTH SUBDIVISION
 PLAT BOOK 45, PAGE 41
 R.O.R.C., TN

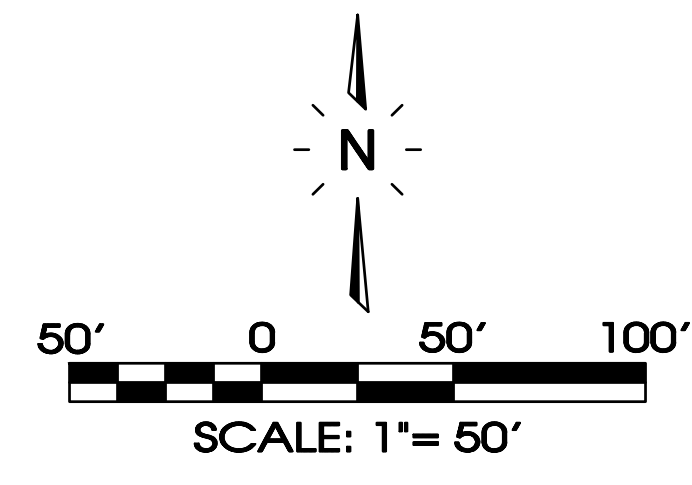
(20.02)
 INGRAM ENTERTAINMENT, INC.
 BOOK 366, PAGE 296
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(20.03)
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 BOOK 366, PAGE 296
 R.O.R.C., TN

INGRAM BOULEVARD (80' R.O.W.)

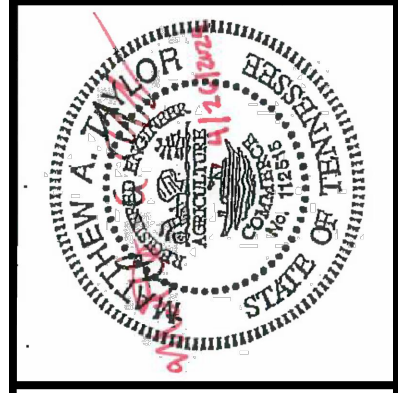
MASON ROAD (R.O.W. VARIES)

NOTES:
 1) Final EPSC Measures Shown Here On Shall Be Enacted
 As Early As Practical During Construction.
 Stabilization Timing Criteria Has Been Established In
 The SWPPP and TNCGP.



Know what's below.
 Call before you dig.

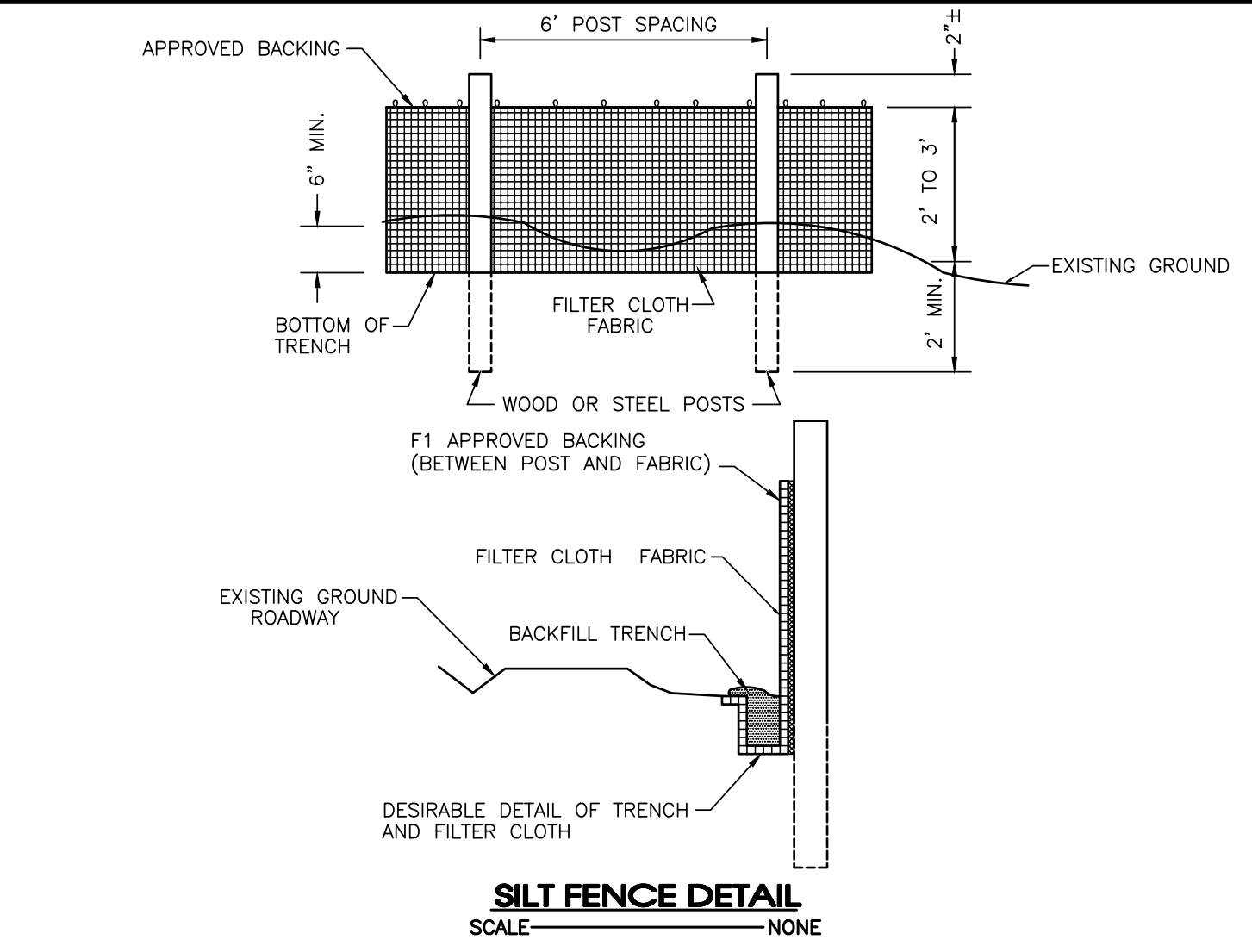
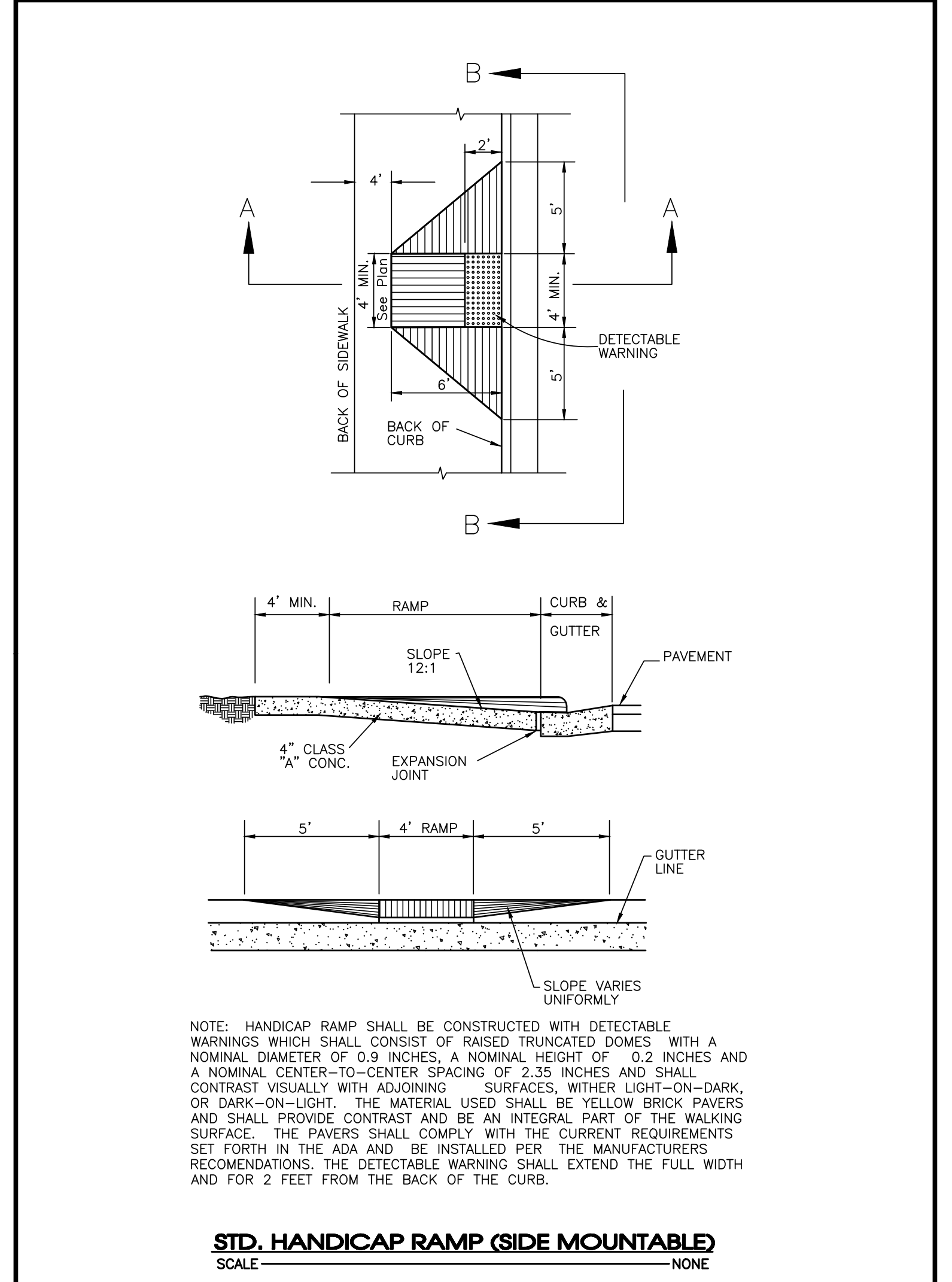
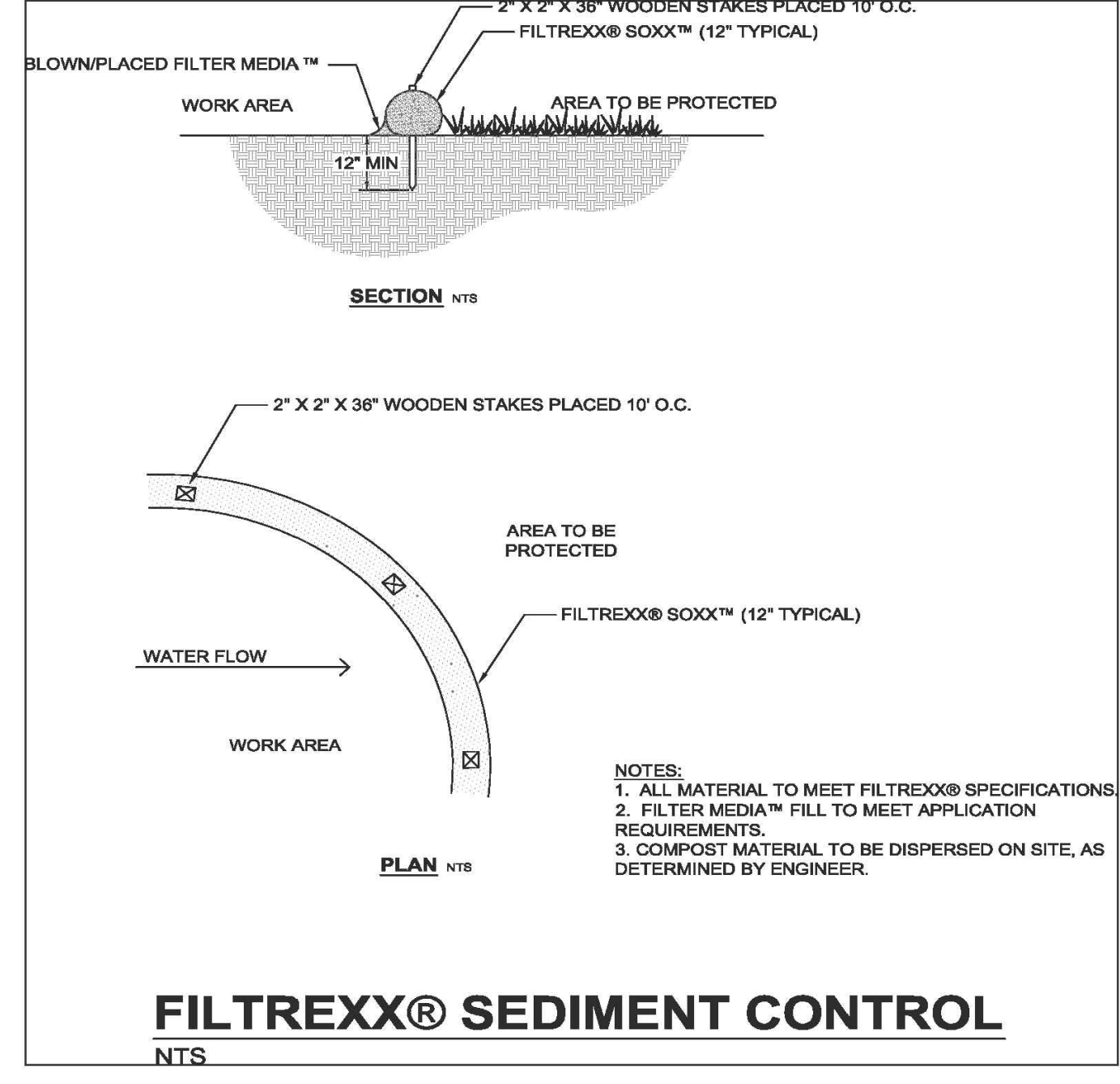
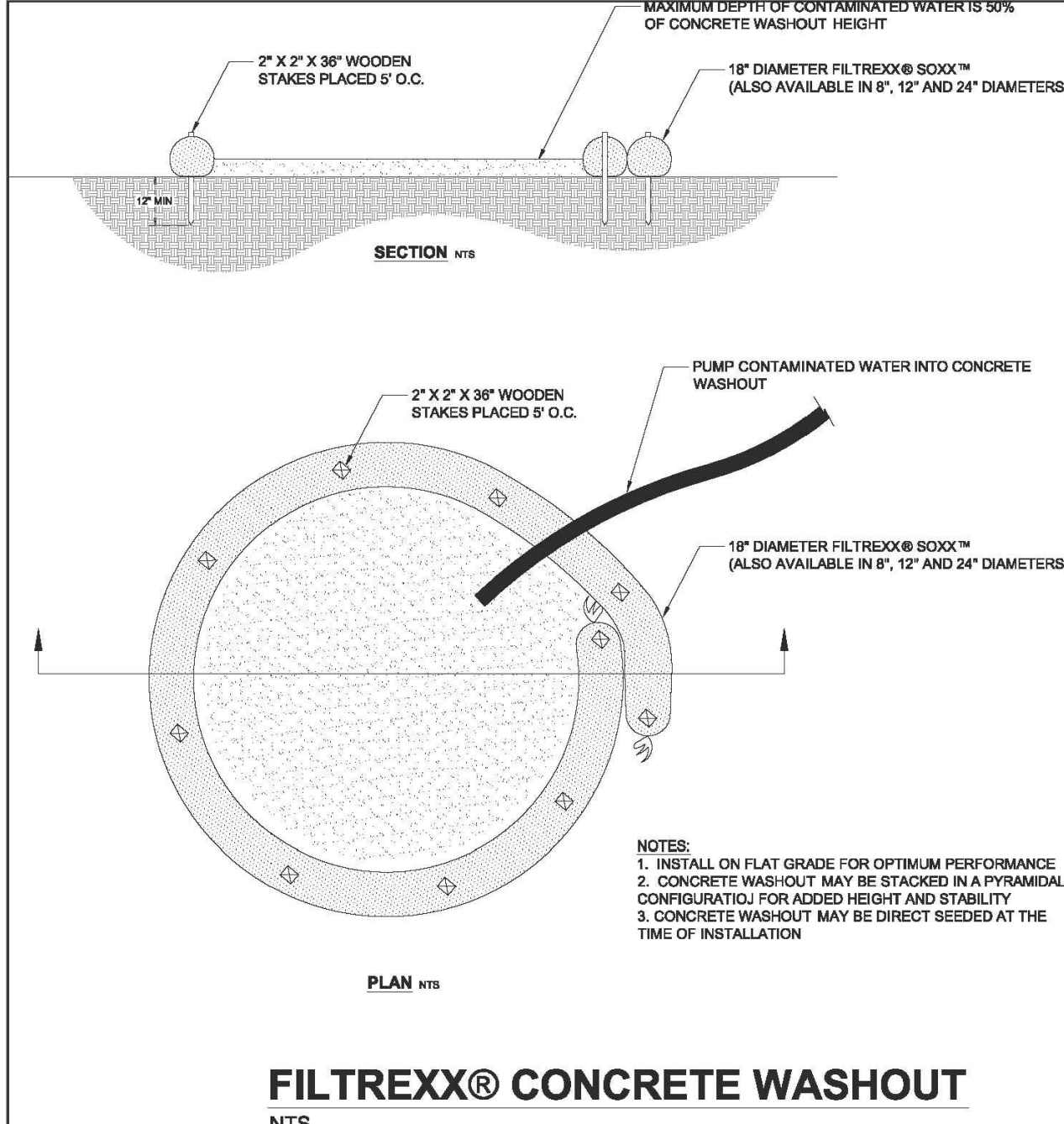
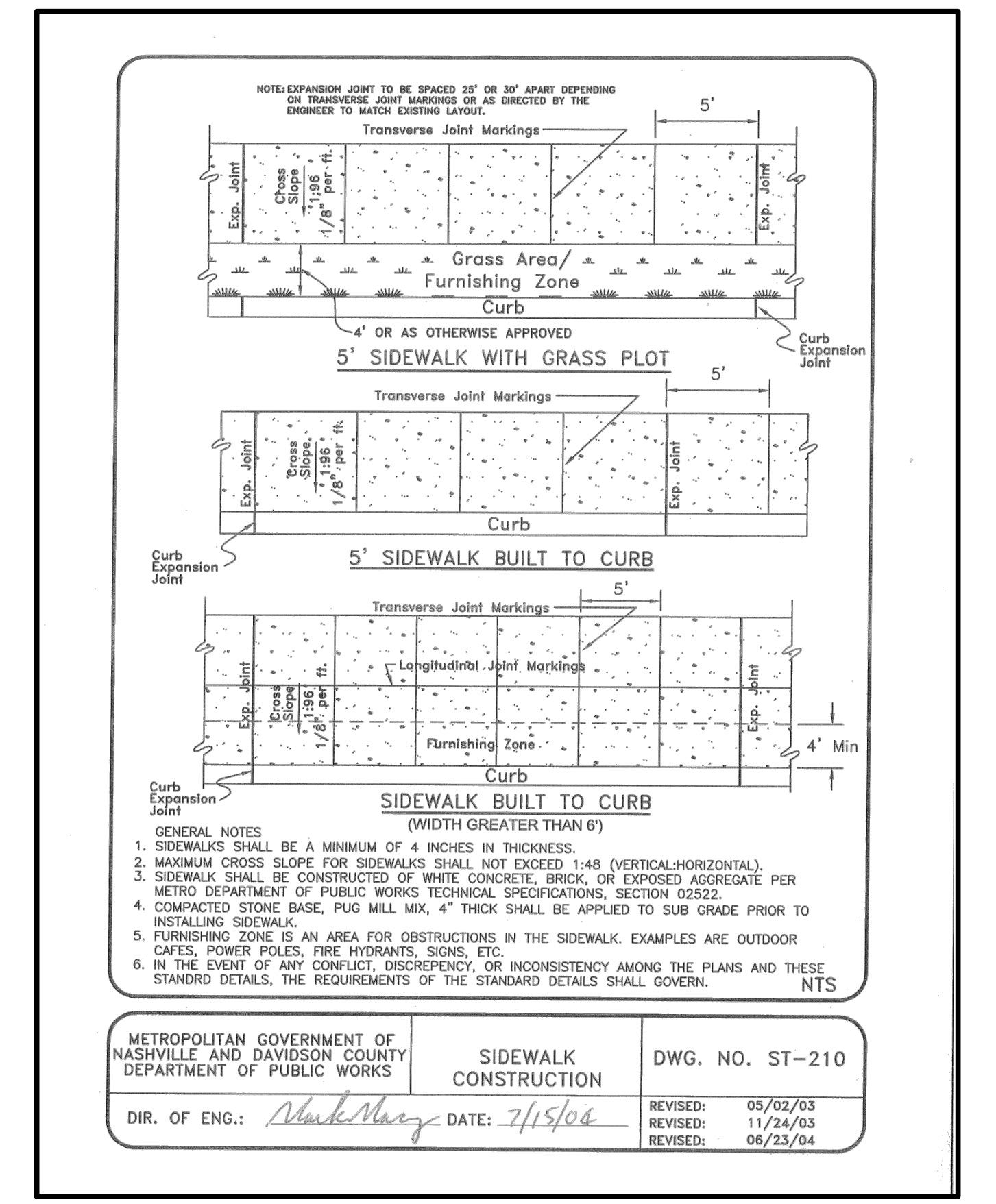
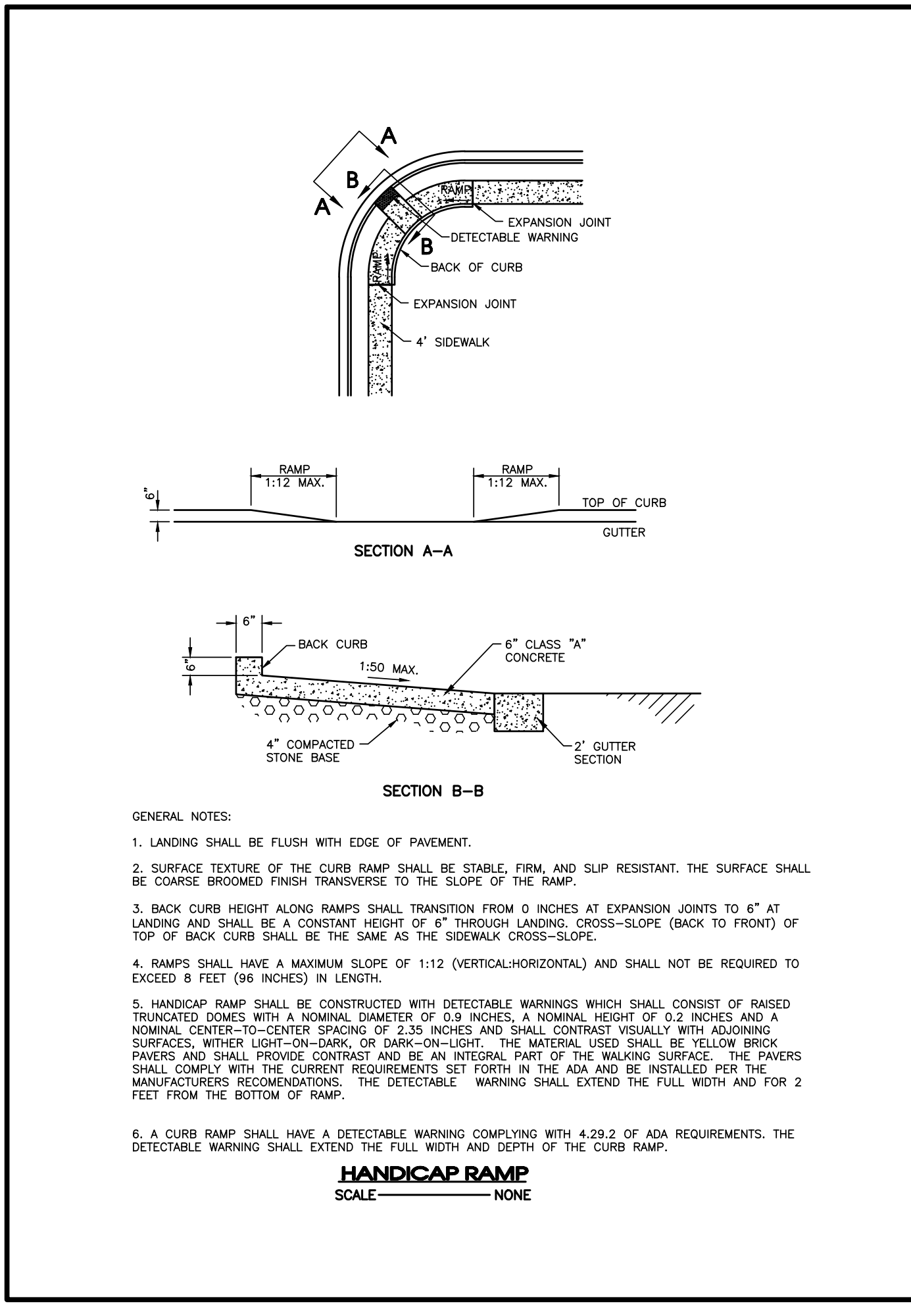
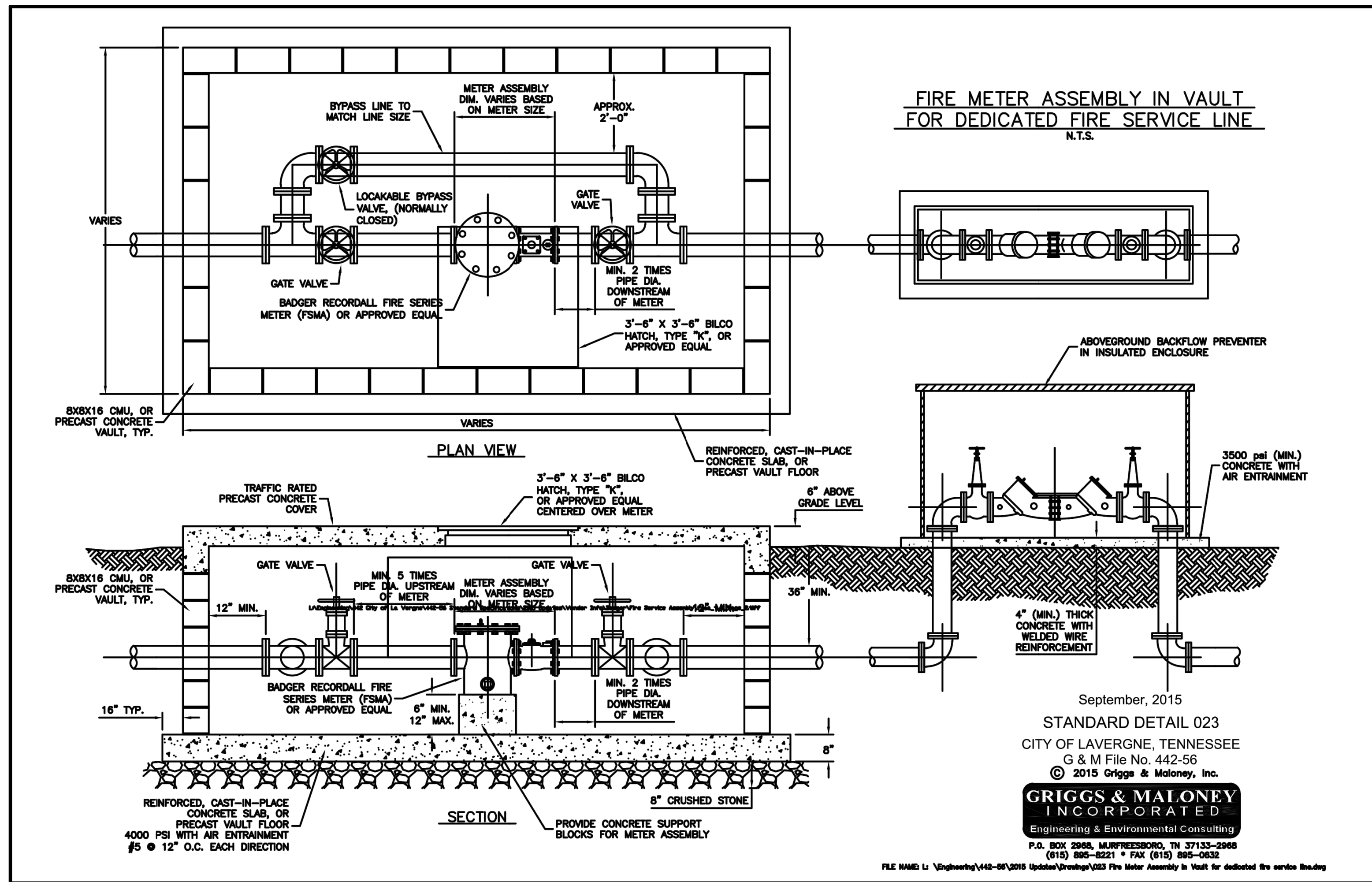
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 MURFREESBORO, TENNESSEE 37129
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2 Ingram Boulevard
 La Vergne, Tennessee

Grading, Drainage Plan, &
 Final EPSC

REVISIONS:
DRAWN: SJA/CFB3
DATE: 4-29-2024
CHECKED:
MAT, MPL
FILE NAME:
24136project
SCALE:
1"=50'
JOB NO.
24136
SHEET:
C3.0



SPEC, Inc.
ENGINEERING • SURVEYING • LAND PLANNING
LANDSCAPE ARCHITECTURE
850 MIDDLE TENNESSEE BOULEVARD
MURFREESBORO, TENNESSEE 37129
PHONE: (615) 890-7900 E-MAIL: M.TAYLOR@SPEC-CIVIL.COM FAX: (615) 895-2567
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SITE ENGINEERING CONSULTANTS

METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY
DEPARTMENT OF PUBLIC WORKS

2 Ingram Boulevard
La Vergne, Tennessee

Details

REVISIONS:

DRAWN: SJA/CFB3
DATE: 4-29-2024
CHECKED: MAT, MFL
FILE NAME: 24136project
SCALE: None
JOB NO. 24136
SHEET: C4.0

2 Ingram Boulevard

LANDSCAPE PLAN

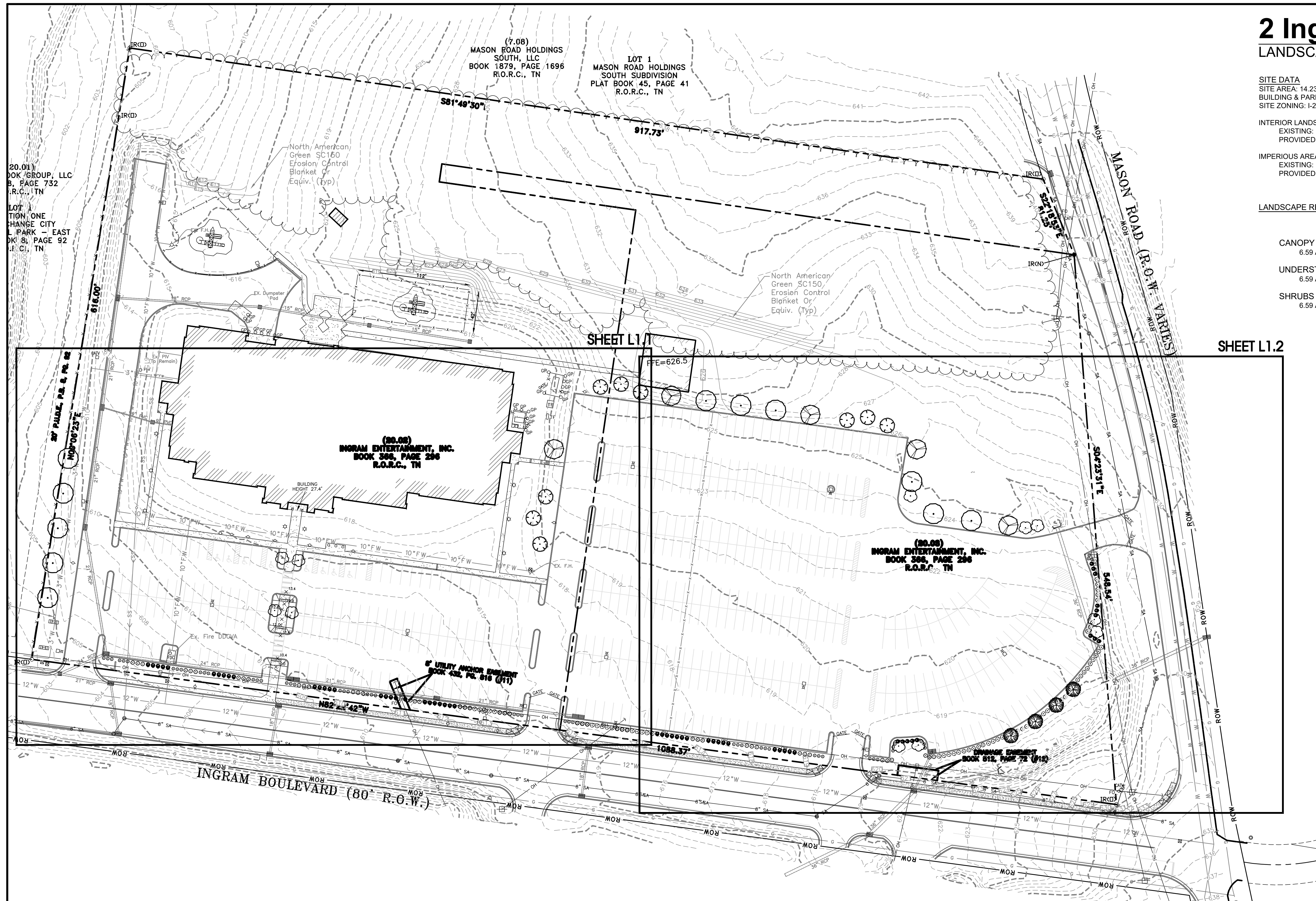
SITE DATA
 SITE AREA: 14.23 ACRES
 BUILDING & PARKING LOT AREA: 6.59 ACRES
 SITE ZONING: I-2

INTERIOR LANDSCAPE AREA:
 EXISTING: = 2,818 SQ. FT.
 PROVIDED: = 5,440 SQ. FT.

IMPERIOUS AREA:
 EXISTING: = 281,841 SQ. FT.
 PROVIDED: = 281,841 SQ. FT.

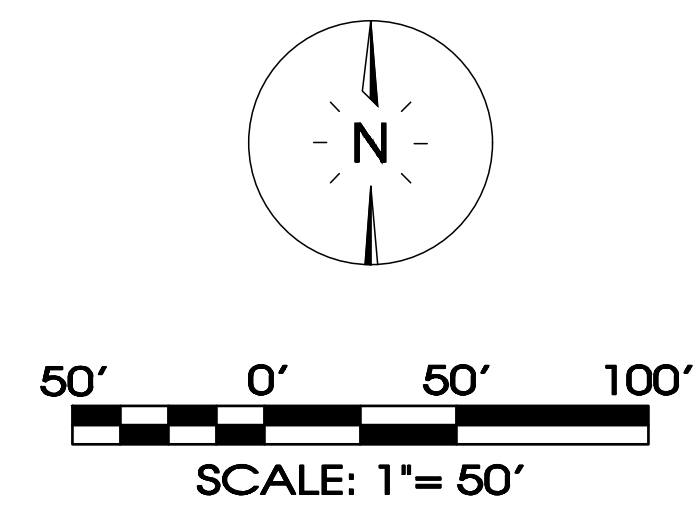
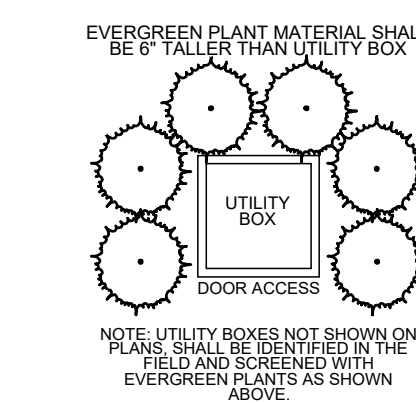
LANDSCAPE REQUIREMENTS (AS PER ARTICLE 3.130 SECTION C)

	REQUIRED	PROVIDED
CANOPY TREES 6.59 ACRES x 3 TREES/ACRE	20 TREES	20 TREES
UNDERSTORY TREES 6.59 ACRES x 3 TREES/ACRE	20 TREES	20 TREES
SHRUBS 6.59 ACRES x 15 SHRUBS/ACRE	99 SHRUBS	99 SHRUBS

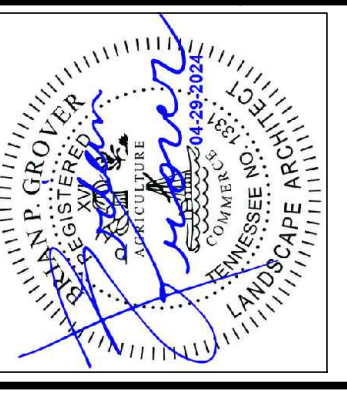


- PLAN NOTES:**
- ANY TREES OR SHRUBS THAT ARE DEAD, DYING OR MISSING OUTSIDE THE SCOPE OF THE CURRENT WORK WILL NEED TO BE REPLACED PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY.
 - ALL LANDSCAPE BEDS TO HAVE NEATLY TRENCHED BED EDGE AND HAVE 4" MINIMUM DEPTH OF HARDWOOD MULCH.
 - ALL TREES AND SHRUBS SHALL BE COORDINATED WITH LIGHTING PLAN PRIOR TO INSTALLATION.
 - ALL NEW PLANT MATERIAL AND TURF AREAS SHOULD BE IRRIGATED.
 - ALL SHRUBS TO BE 3' BACK OF CURB.
 - ALL AREAS OF DISTURBANCE OUTSIDE OF LANDSCAPE BEDS SHALL BE REPAIRED WITH REBEL III FESCUE SEED OR SOD.
 - ANY UTILITY STRUCTURE, LIGHT POLES, SIGN, OR OTHER FEATURE MAY NOT BE ADDED TO ANY REQUIRED LANDSCAPE ISLAND IN SUCH A MANNER THAT WOULD DISPLACE THE REQUIRED ELEMENT(S) (TREES, SHRUBS, ETC.)
 - PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING ALL LANDSCAPING MATERIALS, INCLUDING TURF, AND IRRIGATION MATERIALS BOTH ON SITE, AND INSIDE THE ROW.

- PLANTING SCHEDULE NOTES**
- SHRUBS AND TREES SHALL BE OF THE HIGHEST QUALITY.
 - NO SUBSTITUTIONS ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE OWNER AND LANDSCAPE ARCHITECT OF RECORD.
 - SUBSTITUTIONS AND DEVIATIONS MAY OR MAY NOT BE APPROVED.
 - REVISED LANDSCAPE PLANS MUST BE SUBMITTED AND APPROVED BY THE CITY OF LA VERGNE PLANNING DEPARTMENT 615-213-2624 PRIOR TO INSTALLATION.
 - ALL IRRIGATION, LAWN AND PLANT MATERIALS WITHIN THE ROW MUST BE MAINTAINED BY THE PROPERTY OWNER.



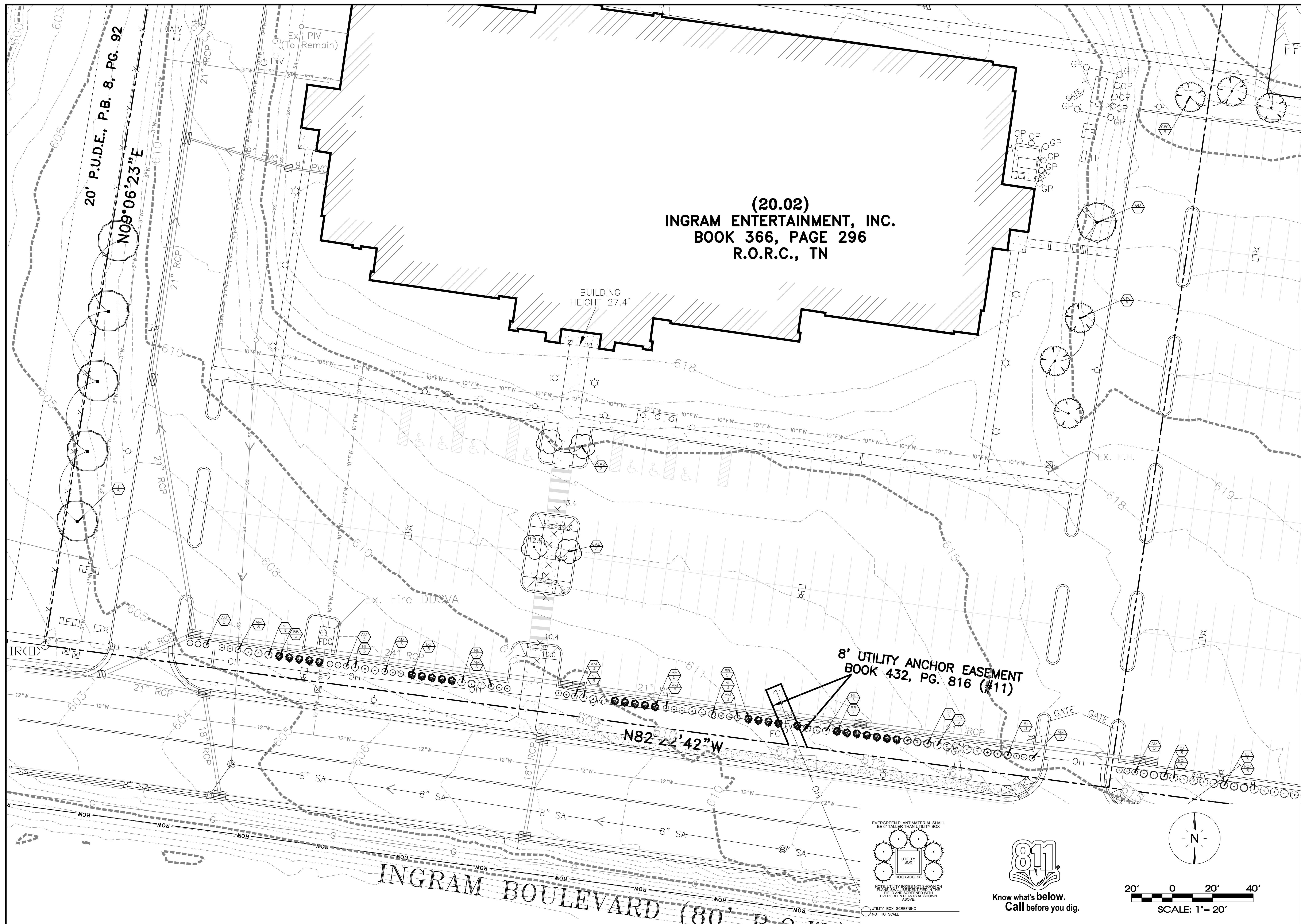
SITE ENGINEERING CONSULTANTS
 ENGINEERING • SURVEYING • LAND PLANNING
SEC, Inc.
 LANDSCAPE ARCHITECTURE
 850 MIDDLE TENNESSEE BOULEVARD
 MURFREESBORO, TENNESSEE 37129
 PHONE: (615) 890-7901 WWW.SEC-CIVIL.COM FAX: (615) 895-2567
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2 Ingram Boulevard
 La Vergne, Tennessee

Landscape Plan

REVISIONS:
 DRAWN: KMG
 DATE: 04-29-2024
 CHECKED: RSM
 FILE NAME: 24136bzg_LA
 SCALE: 1" = 50'
 JOB NO: 24136
 SHEET: L1.0



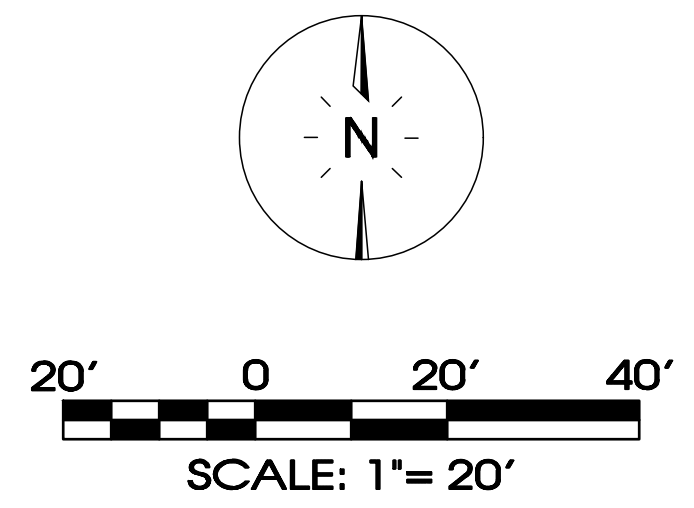
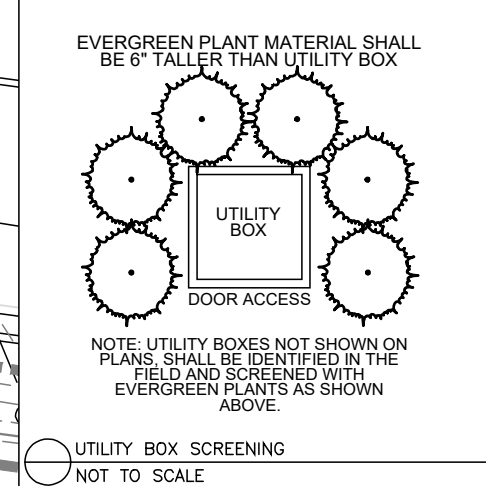
(20.02)
INGRAM ENTERTAINMENT, INC.
 BOOK 366, PAGE 296
 R.O.R.C., TN

BUILDING
 HEIGHT 27.4'

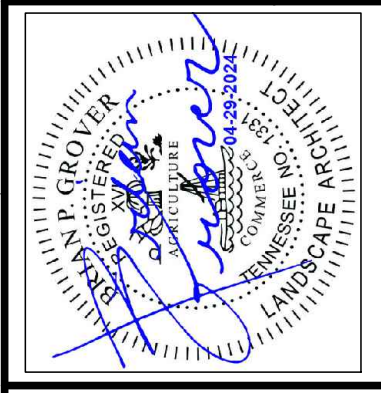
8' UTILITY ANCHOR EASEMENT
 BOOK 432, PG. 816 (#11)

N82°22'42"W

INGRAM BOULEVARD (80' P.O.W.)

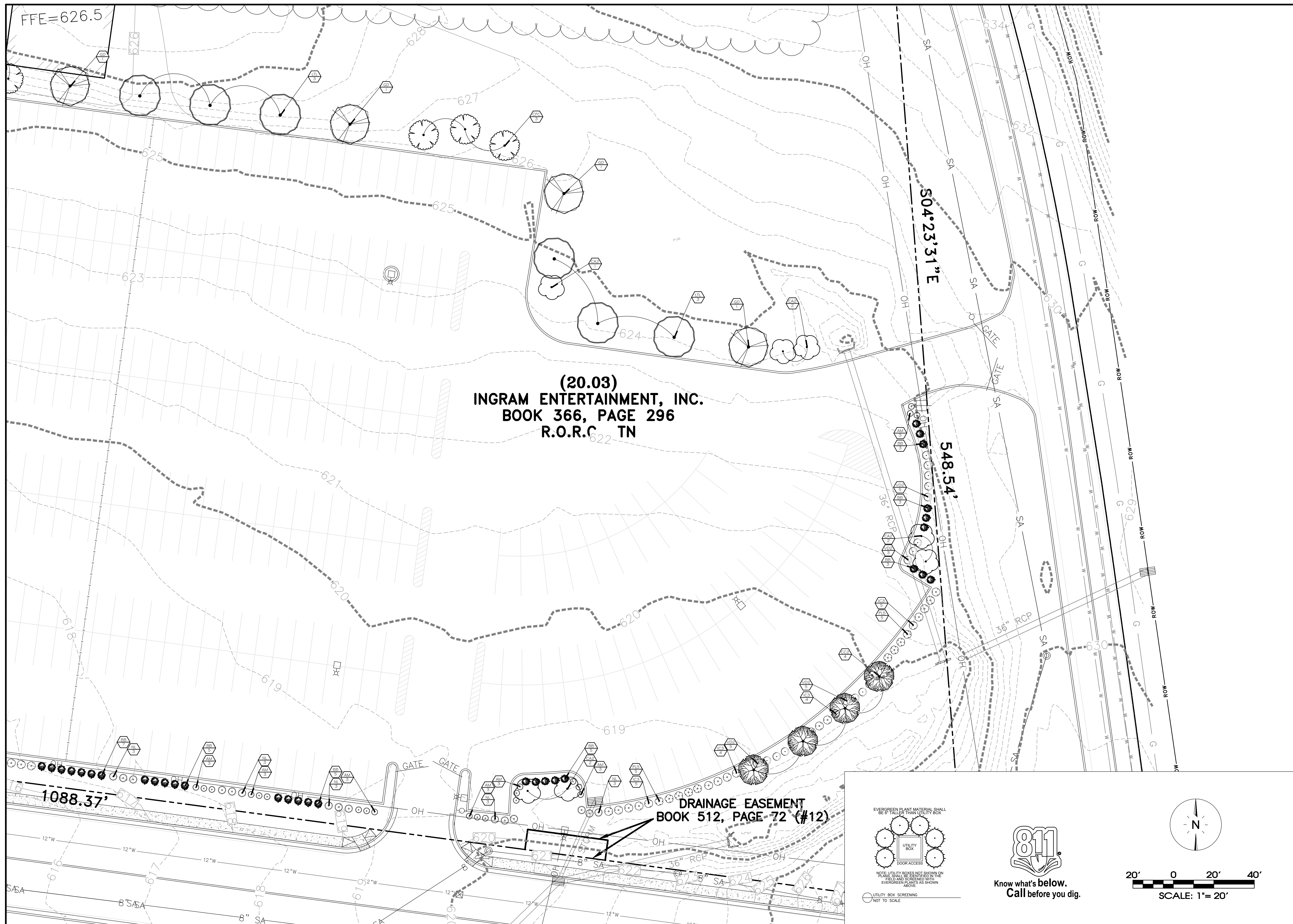


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 850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
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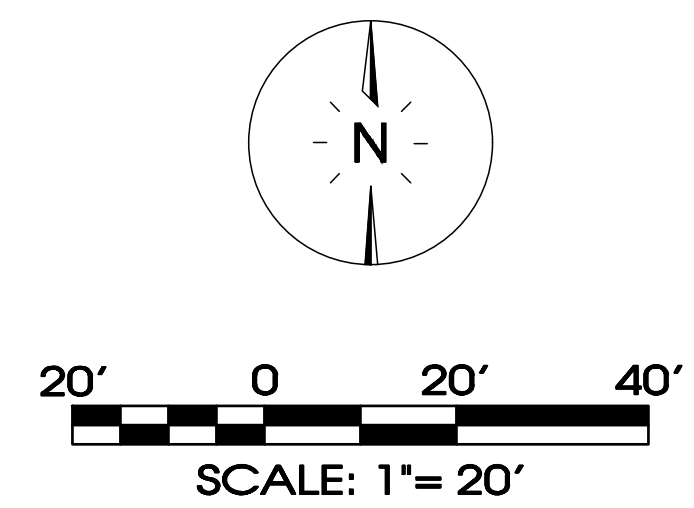
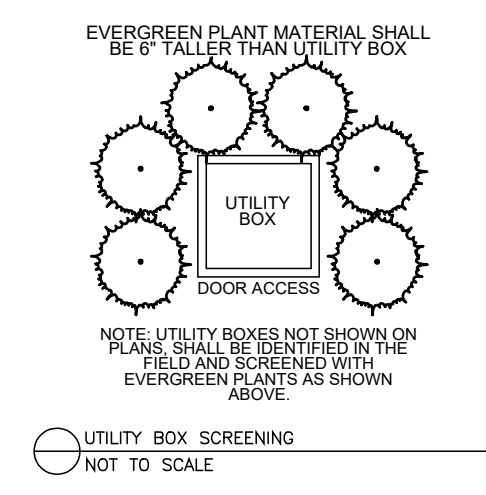
2 Ingram Boulevard
 La Vergne, Tennessee

Landscape Plan
 DRAWN: KMG
 DATE: 04-29-2024
 CHECKED:
 RSM
 FILE NAME:
 24136bzo_LA
 SCALE:
 1" = 20'
 JOB NO.
 24136
 SHEET:
L1.1

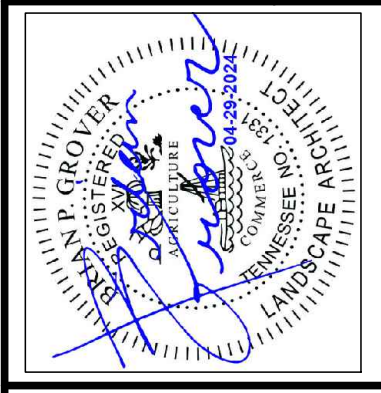


(20.03)
INGRAM ENTERTAINMENT, INC.
 BOOK 366, PAGE 296
 R.O.R.C. TN

DRAINAGE EASEMENT
 BOOK 512, PAGE 72 (#12)



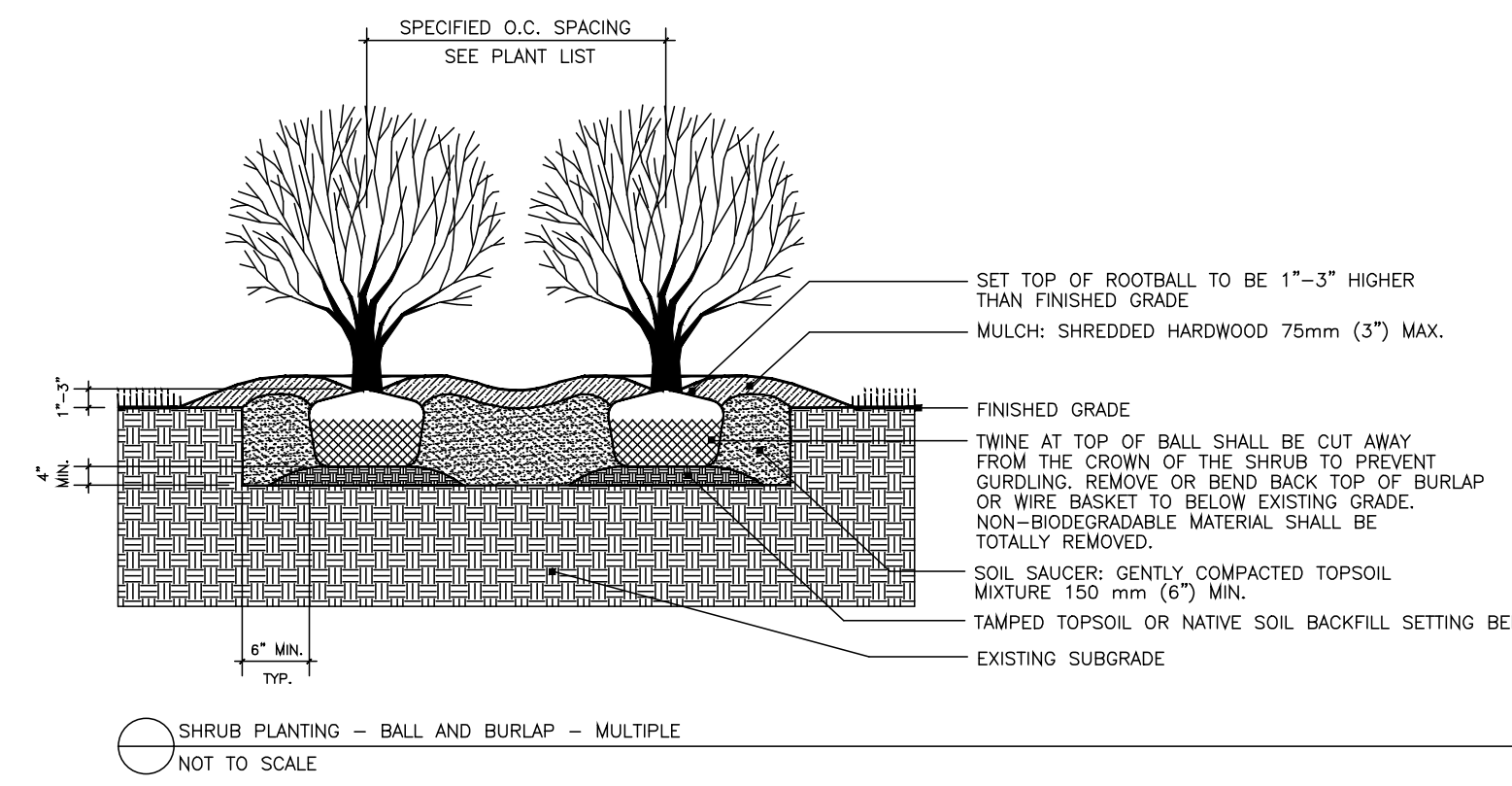
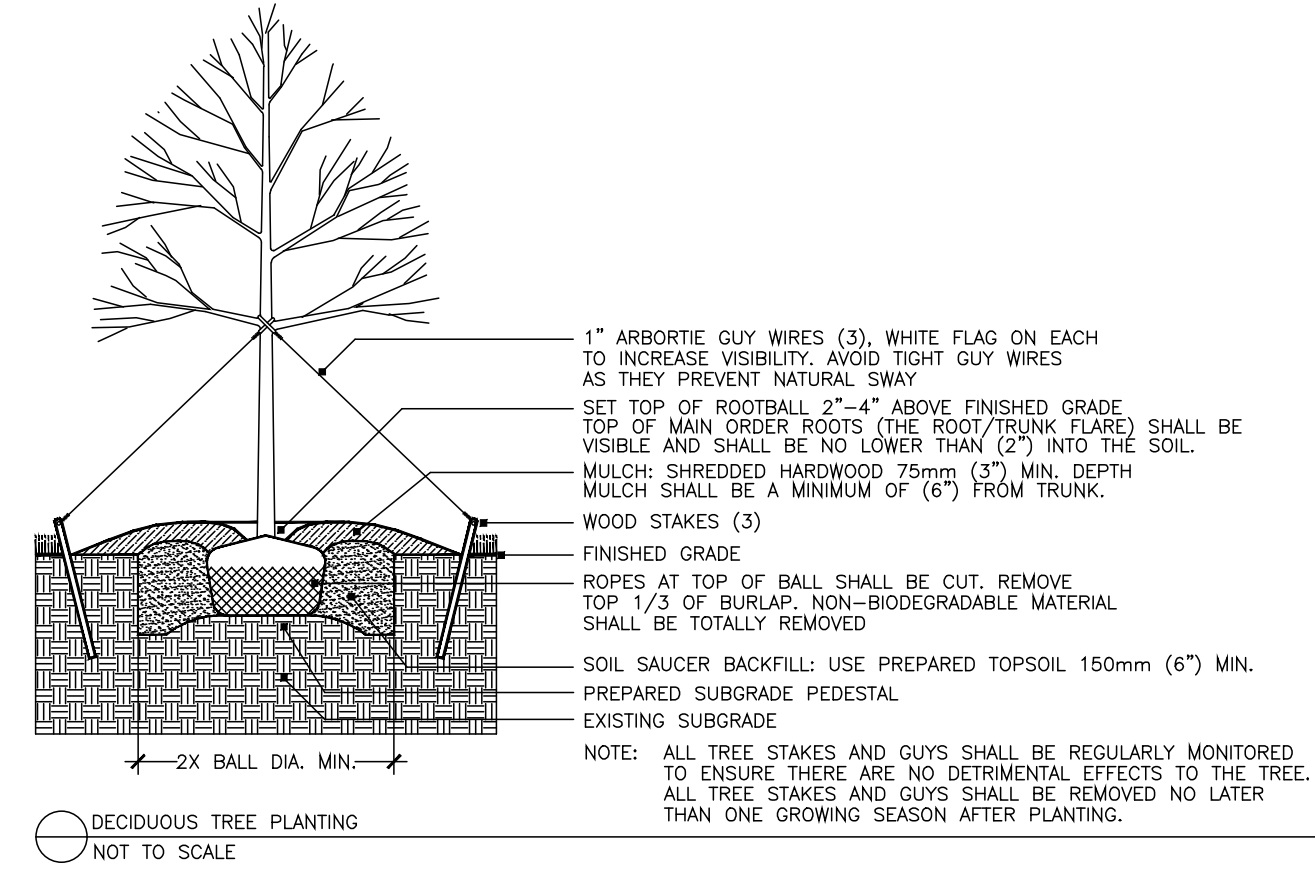
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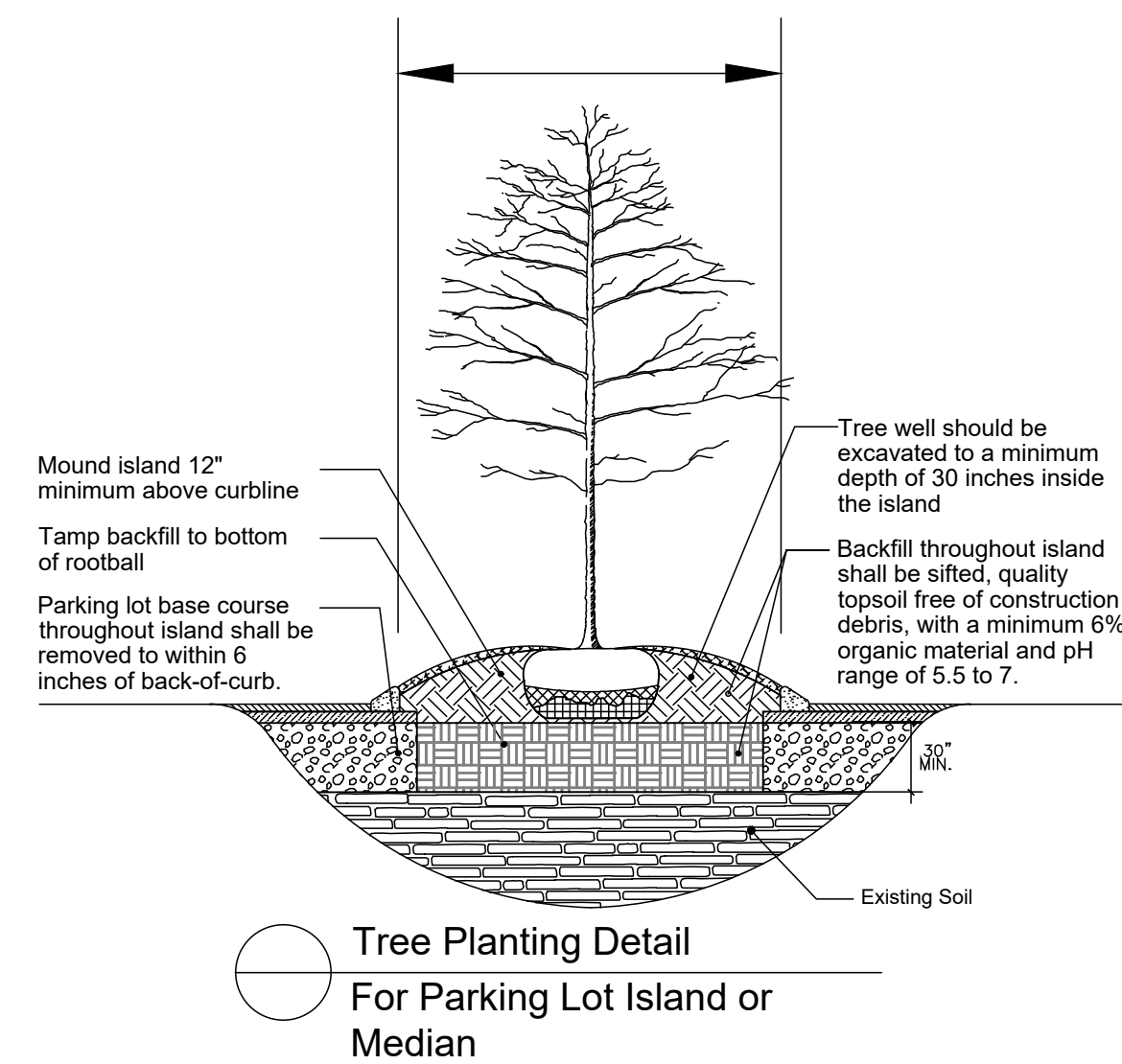
2 Ingram Boulevard
 La Vergne, Tennessee

Landscape Plan

REVISIONS:
 DRAWN: KMG
 DATE: 04-29-2024
 CHECKED:
 RSM
 FILE NAME:
 24136bzo_LA
 SCALE:
 1" = 20'
 JOB NO.
 24136
 SHEET:
L1.2



*Varies (See Plans for Width of Tree Island)

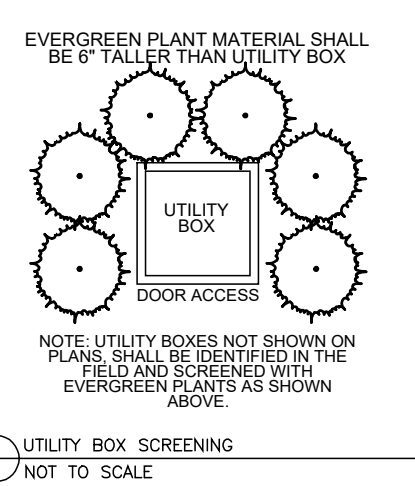


PLANT SCHEDULE									
SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	ROOT	PLANT SIZE	HGT. MIN.	SPREAD MIN.	SPACING	REMARKS
DECIDUOUS TREES									
	CC2	4	CARPINUS BETULUS 'CORNERSTONE' / CORNERSTONE EUROPEAN HORNBEAM	B # B	3" CAL	14' - 16'		AS SHOWN	5' CLEAR TRUNK, SINGLE, STRAIGHT CENTRAL LEADER, EVENLY BRANCHED, SYMMETRICAL CROWN, MATCHED*
	GD	5	GLEDITSIA TRIACANTHOS 'DRAVES' / STREET KEEPER HONEY LOCUST	B # B	3" CAL	14' - 16'		AS SHOWN	5' CLEAR TRUNK, SINGLE, STRAIGHT CENTRAL LEADER, EVENLY BRANCHED, SYMMETRICAL CROWN, MATCHED*
	LTL	11	LIRIODENDRON TULIPIFERA 'LITTLE VOLUNTEER' / LITTLE VOLUNTEER TULIP TREE	B # B	3" CAL	14' - 16'		AS SHOWN	5' CLEAR TRUNK, SINGLE, STRAIGHT CENTRAL LEADER, EVENLY BRANCHED, SYMMETRICAL CROWN, MATCHED*
UNDERSTORY TREES									
	CA2	11	CERCIS CANADENSIS 'ACE OF HEARTS' / ACE OF HEARTS REDBUD	B # B	2" CAL	10' - 12'		AS SHOWN	4' CLEAR TRUNK, FULL CANOPY, MATCHED*
	CFC	9	CORNUS FLORIDA 'CHEROKEE CHIEF' / CHEROKEE CHIEF FLOWERING DOGWOOD	B # B	2" CAL	10' - 12'		AS SHOWN	4' CLEAR TRUNK, FULL CANOPY, MATCHED*
EVERGREEN SHRUBS									
	AM	51	ABELIA X 'MARDI GRAS' / MARDI GRAS ABELIA	CONT.		36"	36"	4' O.C.	WELL-BRANCHED, DENSE, MATCHED
	BB	58	BUXUS MICROPHYLLA JAPONICA 'GREEN BEAUTY' / GREEN BEAUTY BOXWOOD	CONT.		36"	36"	5' O.C.	DENSE, FULL, MATCHED
	EJ	12	EUONYMUS JAPONICUS 'AUREO-MARGINATUS' / GOLDEN EUONYMUS	CONT.		36"	36"	5' O.C.	FULL, WELL-BRANCHED, MATCHED
	IC3	33	ILEX CORNUTA 'CARISSA' / CARISSA HOLLY	CONT.		36"	36"	5' O.C.	DENSE, FULL, MATCHED
	NL	33	NANDINA DOMESTICA 'LEMON LIME' / LEMON LIME NANDINA	CONT.		36"	36"	5' O.C.	DENSE, FULL, MATCHED
	PLS	10	PRUNUS LAUROCERASUS 'SCHIPKAENSIS' / SCHIPKA LAUREL	CONT.		36"	18" - 24"	5' O.C.	FULL TO GROUND, DENSE, WELL-BRANCHED
	VD2	18	VIBURNUM DAVIDII X TINUS 'SPG-3-024' / MOONLIT LACE@ VIBURNUM	CONT.		36"	36"	5' O.C.	DENSE, FULL, MATCHED

MATCHED* - TREES OF THE SAME SPECIES SHALL HAVE THE FOLLOWING CHARACTERISTICS: MATCHED BY BRANCH HEIGHT, CALIPER, HEIGHT OF TREE, SPREAD OF BRANCHES AND BRANCHING STRUCTURE, AND OVERALL CANOPY SHAPE

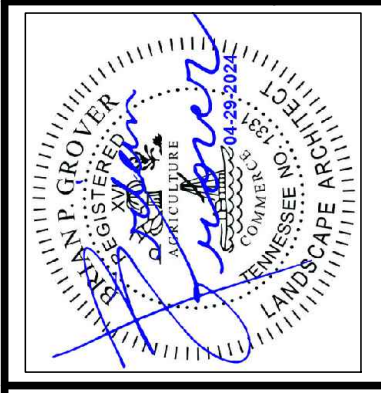
LANDSCAPE NOTES

- THE LANDSCAPE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL UTILITIES AND TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO THESE UTILITIES.
- THE LANDSCAPE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANY AND SHALL BE RESPONSIBLE FOR AND DAMAGE TO UTILITIES.
- PLANT MATERIALS AND STUMPS INDICATED FOR REMOVAL SHALL BE REMOVED AND DISPOSED OFF-SITE BY THE CONTRACTOR. BACKFILL HOLES WITH TOPSOIL FREE OF ROOTS AND ROCKS.
- TREAT ALL LANDSCAPE BEDS WITH PRE-EMERGENT HERBICIDE PRIOR TO PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR ALL WEEDING UNTIL FINAL ACCEPTANCE.
- THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINE GRADING OF ALL PLANTING AREAS.
- THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETELY MAINTAINING THE WORK (INCLUDING BUT NOT LIMITED TO: WATERING, MULCHING, SPRAYING, FERTILIZING, ETC.) OF ALL PLANTING AREAS AND LAWNS PER PROJECT SPECIFICATIONS UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER.
- PROVIDE TREES, SHRUBS, AND PLANTS OF QUALITY, SIZE, GENUS, SPECIES AND VARIETY SHOWN AND SCHEDULED FOR LANDSCAPE WORK AND COMPLYING WITH RECOMMENDATIONS AND REQUIREMENTS OF ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK". HEIGHT AND WIDTH SHOWN ARE MINIMUM SIZES.
- THE LANDSCAPE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR BEGINNING AT THE DATE OF ACCEPTANCE. THE LANDSCAPE CONTRACTOR SHALL MAKE ALL REPLACEMENTS PROMPTLY (AS PER DIRECTION OF OWNER).
- THE LANDSCAPE CONTRACTOR SHALL PROVIDE THE OWNER WITH WRITTEN INSTRUCTIONS ON THE PROPER CARE OF ALL SPECIFIED PLANT MATERIALS PRIOR TO FINAL PAYMENT.
- THE QUANTITIES INDICATED ON THE PLANT SCHEDULE AND PLAN ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATION AND THE LIABILITY WHICH PERTAINS TO THOSE QUANTITIES. ANY DISCREPANCY SHALL BE CALLED TO THE ATTENTION OF THE LANDSCAPE ARCHITECT IMMEDIATELY.
- EXISTING TREES TO REMAIN SHALL BE PROTECTED FROM CONSTRUCTION DAMAGE. SELECTIVELY PRUNE DEAD WOOD.
- SEED OR SOD ALL AREAS DISTURBED BY CONSTRUCTION AND NOT DESIGNATED AS PLANTING BEDS.
- SHRUBS AND GROUND COVER BEDS TO BE PLANTED IN A TRIANGULAR SPACING. SEE PLANTING SCHEDULE FOR DISTANCES.
- UPON COMPLETION AND FINAL ACCEPTANCE OF THE LANDSCAPE INSTALLATION, A THREE (3) YEAR LANDSCAPE MAINTENANCE BOND WILL BE REQUIRED. THIS BOND SHOULD BE SUBMITTED IN THE NAME OF THE PROPERTY OWNER OF RECORD OR A LEASE HOLDER WHO HAS TEN (10) YEARS OR MORE REMAINING ON A CURRENT LEASE. THE PROPERTY OWNER/LEASE HOLDER SHOULD ALLOW ADEQUATE TIME TO OBTAIN THE BOND AS THIS PROCESS MAY BE LENGTHY AND MAY DELAY THE ISSUANCE OF THE CERTIFICATE OF OCCUPANCY.



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LANDSCAPE ARCHITECTURE
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The site as shown on these construction drawings is intended to achieve specific engineering design criteria and objectives. It is the sole responsibility of the owner/developer to ensure that the construction of the site shown on these construction drawings is in total accordance with the design as noted, described, or indicated on these drawings. The owner/developer shall be responsible for any responsibility in the assurance that the site is constructed in accordance with the construction plans.



2 Ingram Boulevard
La Vergne, Tennessee

REVISIONS:

DRAWN: KMG
DATE: 04-29-2024

CHECKED:
RSM

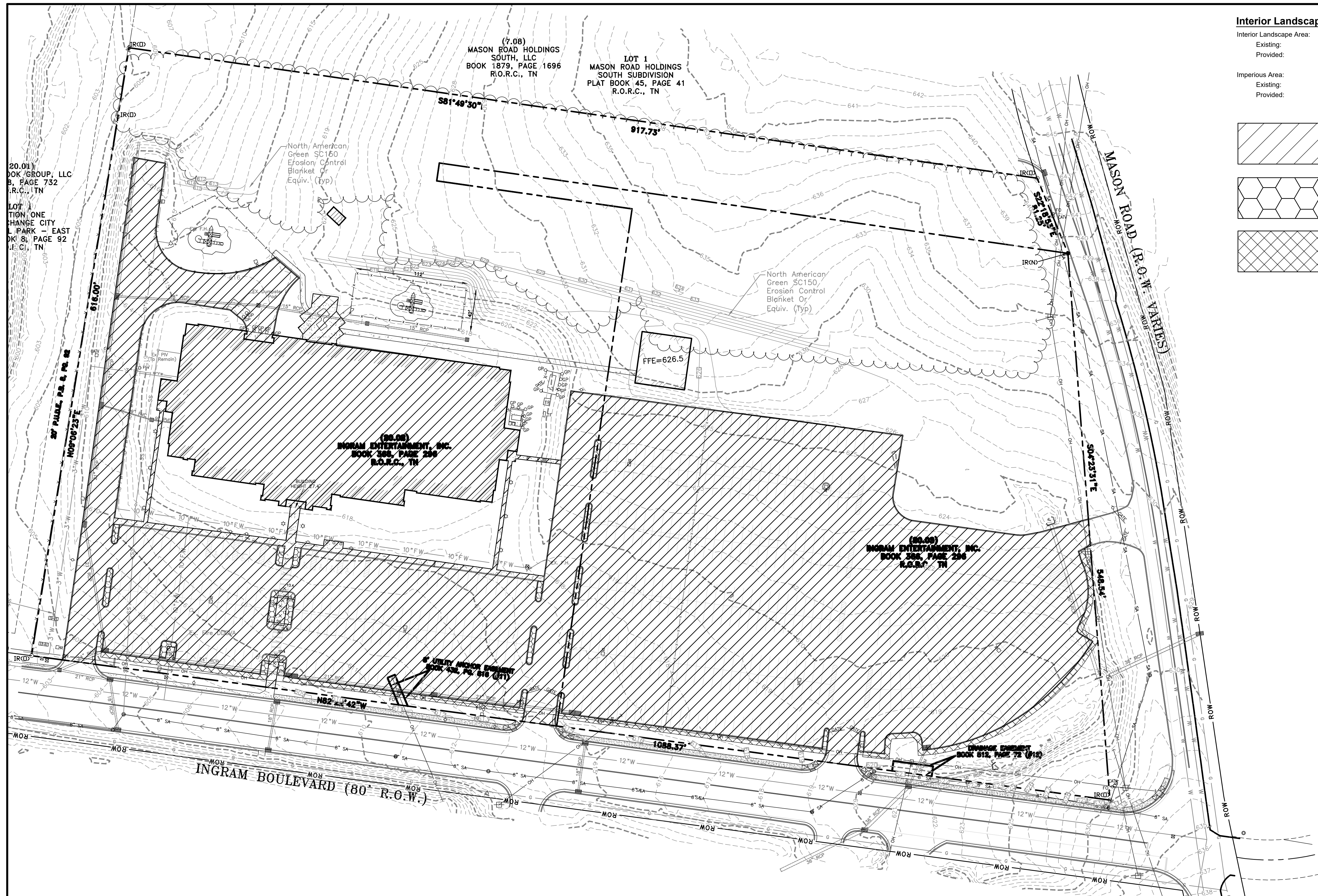
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24136bzo_LA

SCALE:
NA

JOB NO.
24136

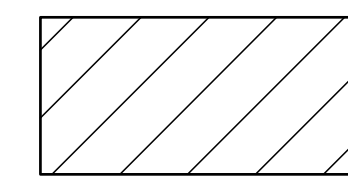
SHEET:
L2.0

Landscaping Details & Notes

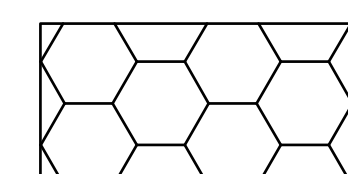


Interior Landscape Area

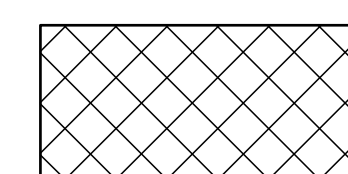
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Existing:	= 2,818 Sq.Ft.
Provided:	= 5,440 Sq.Ft.
Imperious Area:	
Existing:	= 281,841 Sq.Ft.
Provided:	= 281,841 Sq.Ft.



IMPERVIOUS AREA



INTERIOR LANDSCAPE AREA EXISTING



INTERIOR LANDSCAPE AREA PROVIDED

20.01) GROUP, LLC
PAGE 732
R.C., TN

LOT ONE
CHANGE CITY
PARK - EAST
BOOK 8, PAGE 92
R.C., TN

(7.08)
MASON ROAD HOLDINGS
SOUTH, LLC
BOOK 1879, PAGE 1696
R.O.R.C., TN

LOT 1
MASON ROAD HOLDINGS
SOUTH SUBDIVISION
PLAT BOOK 45, PAGE 41
R.O.R.C., TN

North American
Green SC150
Erosion Control
Blanket Or
Equiv. (Typ)

North American
Green SC150
Erosion Control
Blanket Or
Equiv. (Typ)

(20.08)
INGRAM ENTERTAINMENT, INC.
BOOK 206, PAGE 296
R.O.R.C., TN

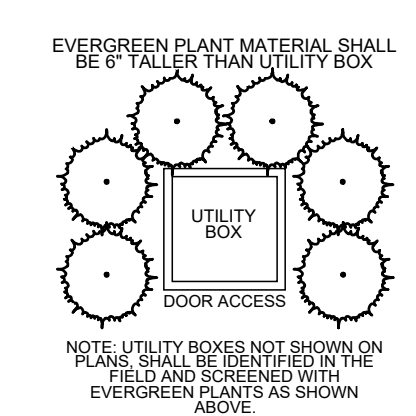
(20.08)
INGRAM ENTERTAINMENT, INC.
BOOK 206, PAGE 296
R.O.R.C., TN

6" UTILITY ANCHOR EREMENT
BOOK 438, PG. 616 (271)

DRAINAGE EREMENT
BOOK 612, PAGE 72 (912)

INGRAM BOULEVARD (80' R.O.W.)

MASON ROAD (80' R.O.W. AHEADS)

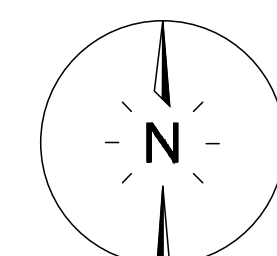


NOTE: UTILITY BOXES NOT SHOWN ON PLANS SHALL BE IDENTIFIED IN THE FIELD AND SCREENED WITH EVERGREEN PLANTS AS SHOWN ABOVE.

UTILITY BOX SCREENING NOT TO SCALE

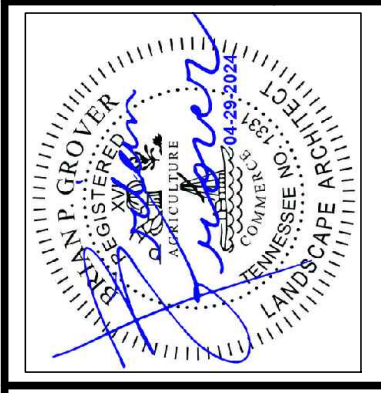


Know what's below.
Call before you dig.



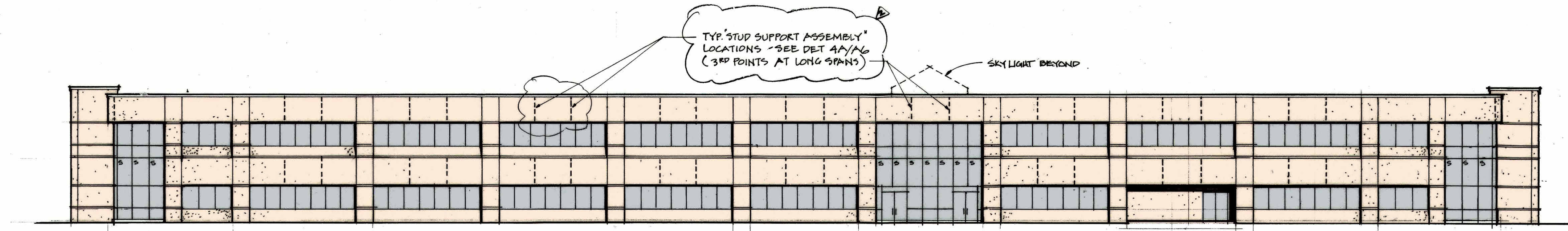
SCALE: 1" = 50'

SEC, Inc.
SITE ENGINEERING CONSULTANTS
ENGINEERING • SURVEYING • LAND PLANNING
LANDSCAPE ARCHITECTURE
850 MIDDLE TENNESSEE BOULEVARD
MURFREESBORO, TENNESSEE 37129
PHONE: (615) 890-7901 WWW.SEC-CIVIL.COM FAX: (615) 895-2567
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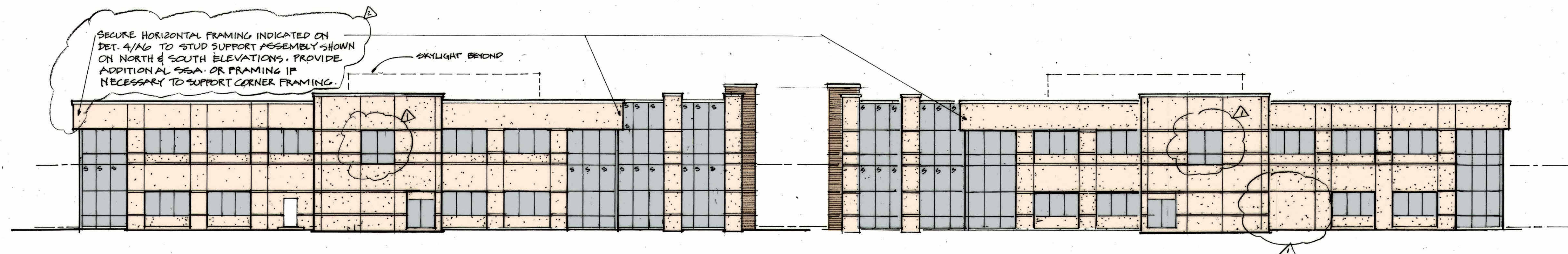


2 Ingram Boulevard
La Vergne, Tennessee

Open Space Plan
DRAWN: KMG
DATE: 04-29-2024
CHECKED: RSM
FILE NAME: 24136bzo_LA
SCALE: 1" = 50'
JOB NO: 24136
SHEET: L3.0

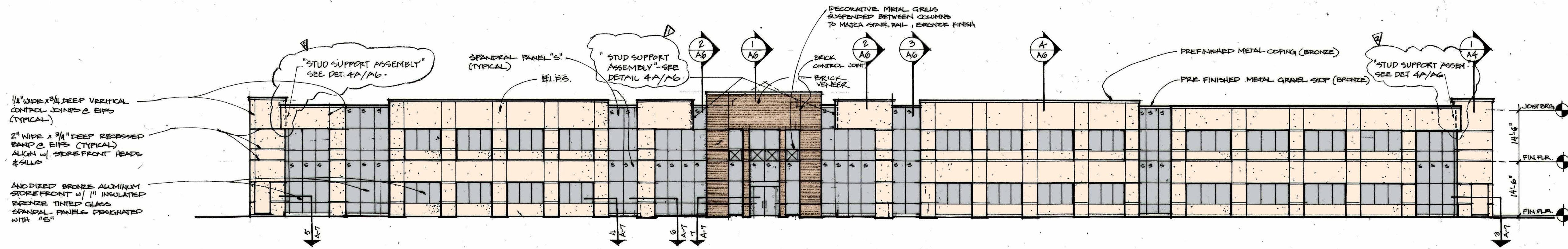


NORTH ELEVATION
SCALE: 1/16" = 1'-0"



WEST ELEV.
SCALE: 1/16" = 1'-0"

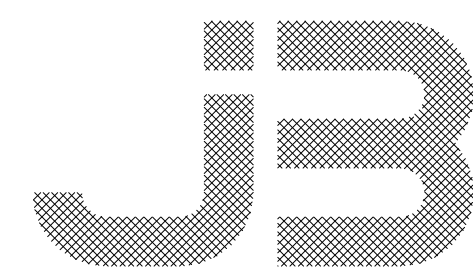
EAST ELEV.
SCALE: 1/16" = 1'-0"



SOUTH ELEV.
SCALE: 1/16" = 1'-0"

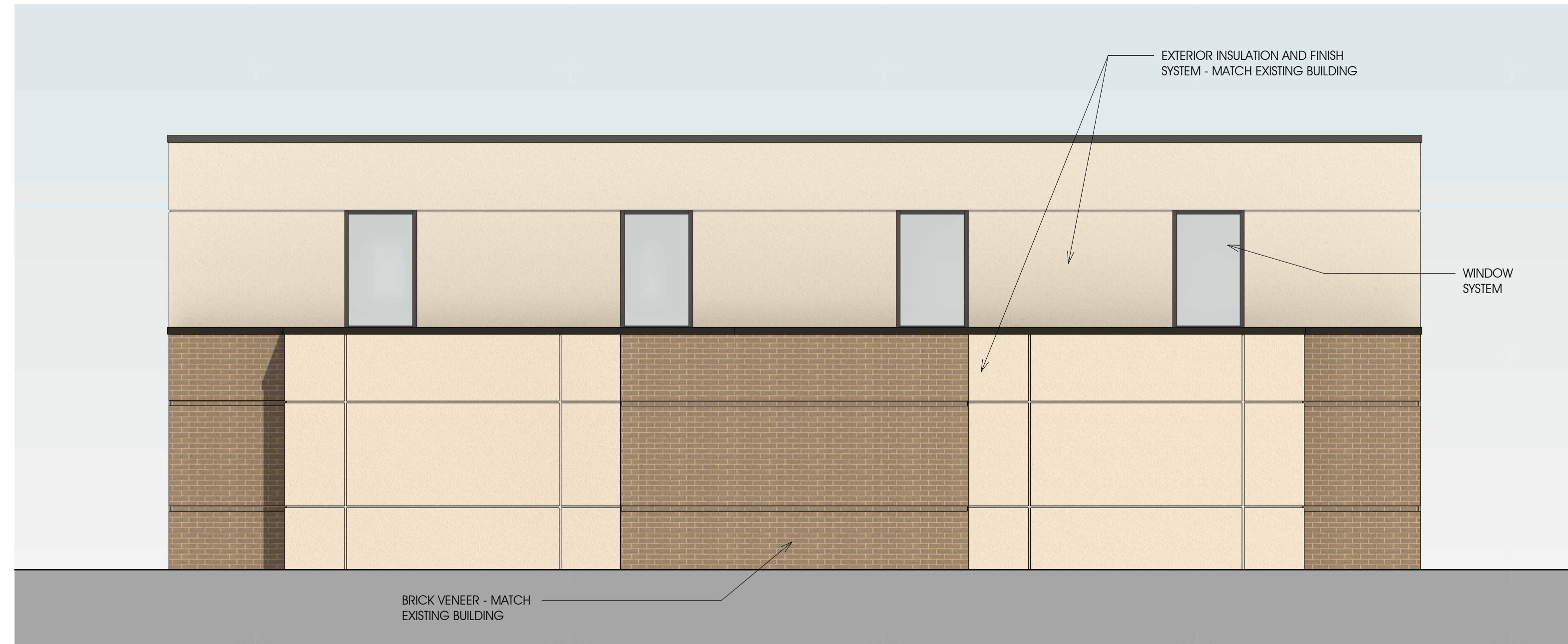
EXISTING BUILDING ELEVATIONS

SCALE 1/16" = 1'-0"



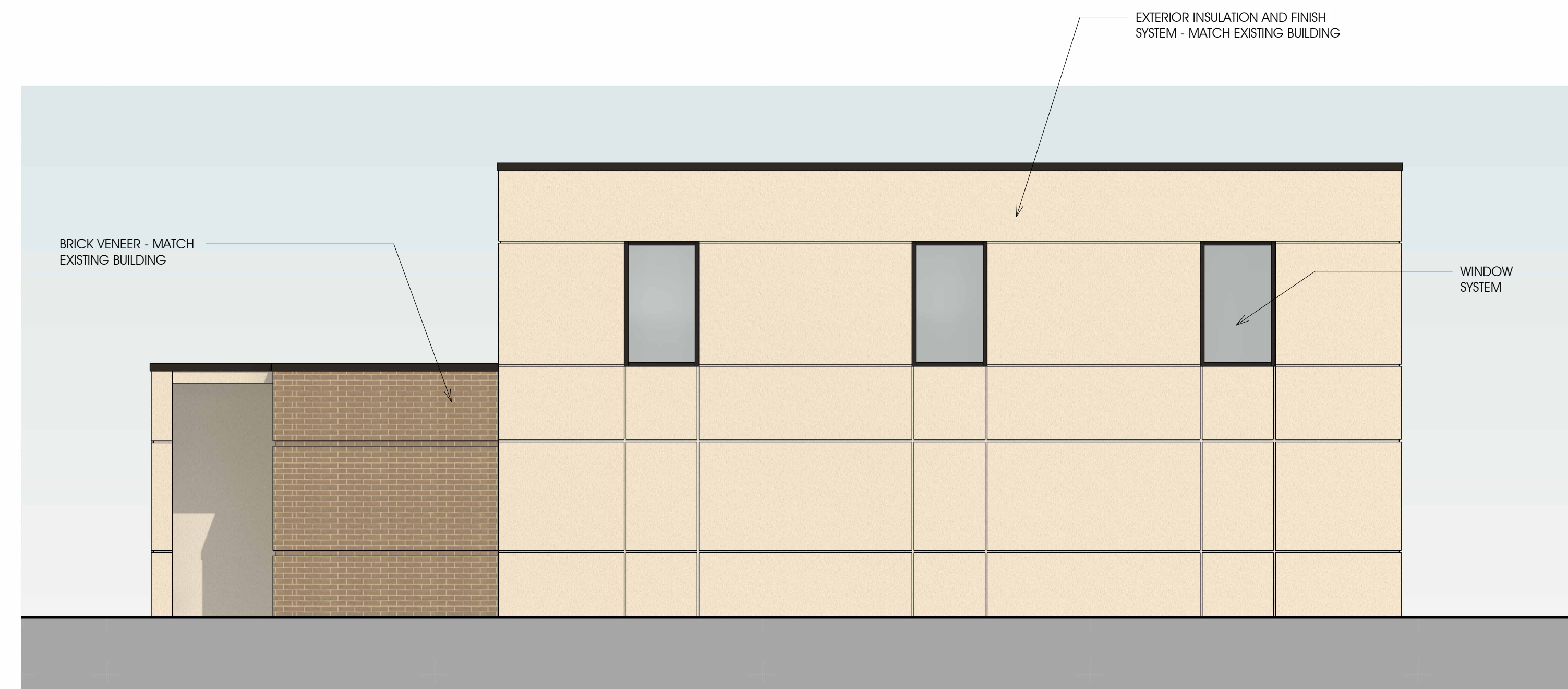
Rutherford Classical Academy - Phase 1 Renovations
JOHNSON + BAILEY ARCHITECTS P.C.

04/26/24



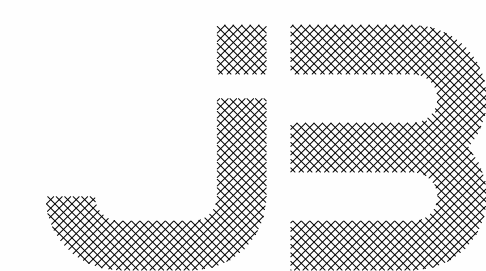
STORM SHELTER - FRONT ELEVATION

SCALE 1/4" = 1'-0"



STORM SHELTER - TYPICAL SIDE ELEVATION

SCALE 1/4" = 1'-0"



Rutherford Classical Academy - Phase 1 Renovations
 JOHNSON + BAILEY ARCHITECTS P.C.

04/26/24

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning

Traffic Impact Study

Proposed Charter School
2 Ingram Boulevard
LaVergne, TN

Prepared May 2024
For SEC, Inc.

FTG, LLC
P.O. Box 682736
Franklin, TN 37068
(615) 771-8022 phone
Gillian@FTGtraffic.com

Traffic Impact Study

Proposed Charter School

2 Ingram Boulevard
LaVergne, Tennessee

Prepared May 2024

PREPARED FOR:

SEC, Inc
850 Middle TN Blvd
Murfreesboro, TN 37129

PREPARED BY:

Ms. Gillian L. Fischbach, P.E., PTOE
Fischbach Transportation Group (FTG, LLC)
P.O. Box 682736
Franklin, TN 37068
Phone: (615) 771-8022
FTG Project Number: 11300

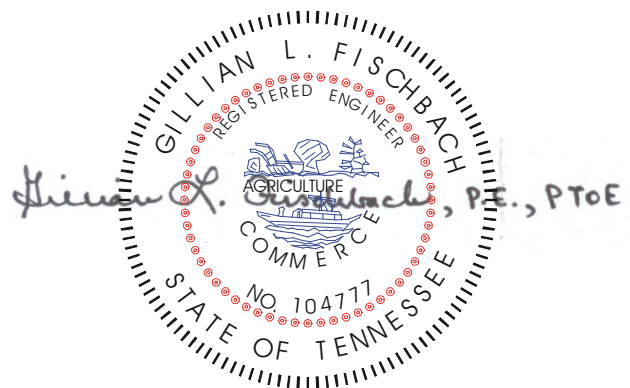


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1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a charter school that is proposed to be established within an existing building on the north side of Ingram Boulevard, west of Mason Road, in LaVergne, Tennessee.

For the purposes of this study, existing and background traffic volumes were established, and capacity analyses were conducted for these conditions. Also, trip generation calculations were performed, and the trips which are expected to be generated by the proposed project were distributed to the roadway system and added to the background traffic volumes. The roadways and intersections which provide access to the site were then re-evaluated to determine the traffic impacts of the proposed project. Access needs for the project were evaluated, and the necessary roadway and/or traffic control improvements were identified. This report presents the results of these analyses and the subsequent recommendations.

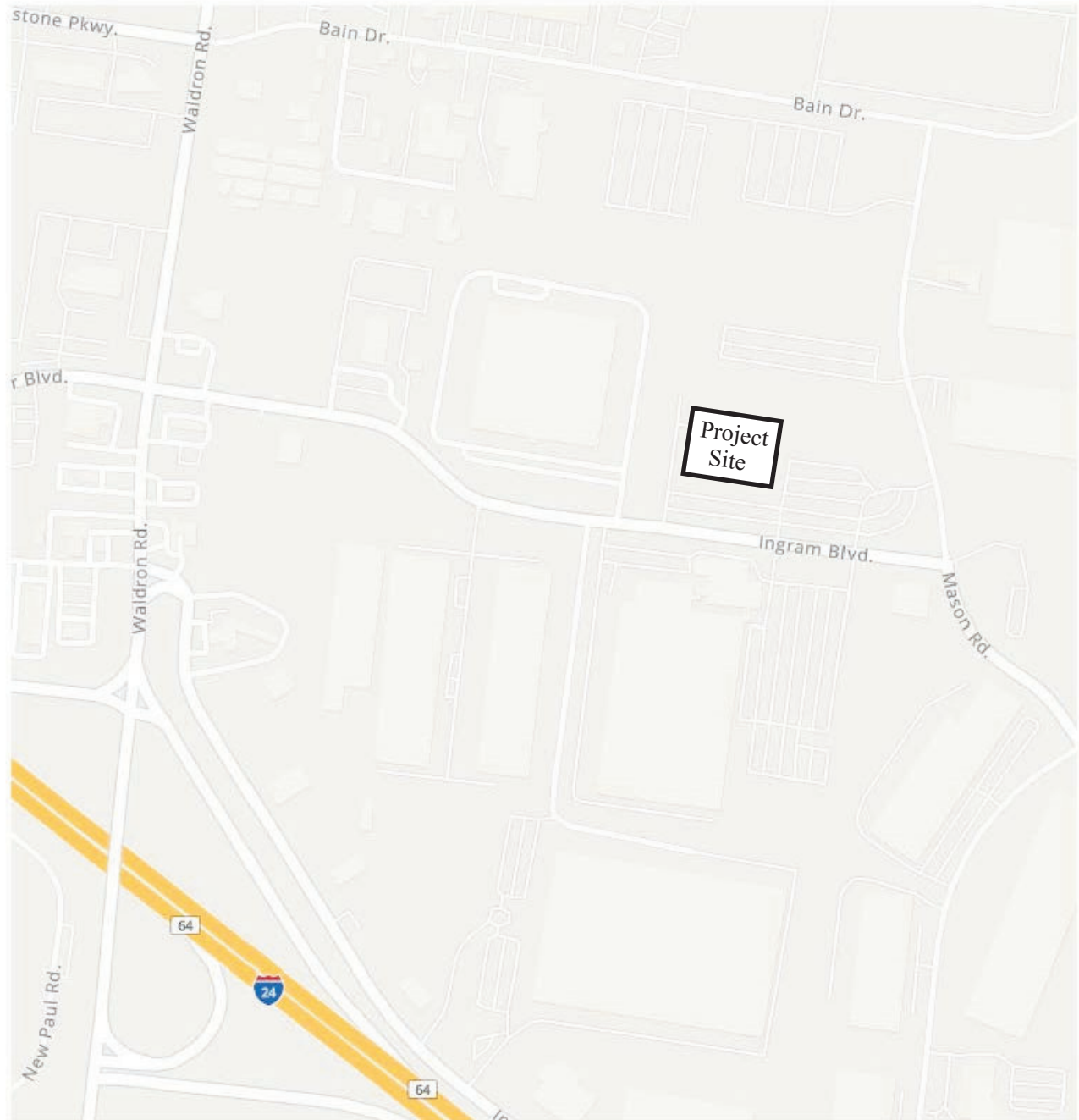
2. PROJECT DESCRIPTION

The location of the proposed project is shown in [Figure 1](#). Currently, an office building and associated parking facilities are constructed on this site, which is on the north side of Ingram Boulevard, west of Mason Road, in LaVergne, Tennessee. The existing office building is currently unoccupied, and the operators of a proposed charter school plan to repurpose the existing building as a school, as shown in [Figure 2](#).

Access to the existing office building is provided by three driveways on Ingram Boulevard and one driveway on Mason Road. Currently, the easternmost portion of the parking facilities are leased by an Amazon distribution facility that is located north of the project site, and so the eastern driveway on Ingram Boulevard and the driveway on Mason Road will not be used by the school. As shown in the site plan, all of the school drop-off and pick-up operations will use the western driveway for entering and exiting vehicles.

In large part, economic and market considerations will dictate the pace and timing with which the proposed project is actually completed. For the purposes of this study, it was assumed that the entire project will be completed by Year 2026.

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Traffic Engineering and Planning



No Scale

Figure 1.
Location of the Proposed Project Site

3. YEAR 2024 EXISTING CONDITIONS

3.1 REGIONAL AND LOCAL ACCESS

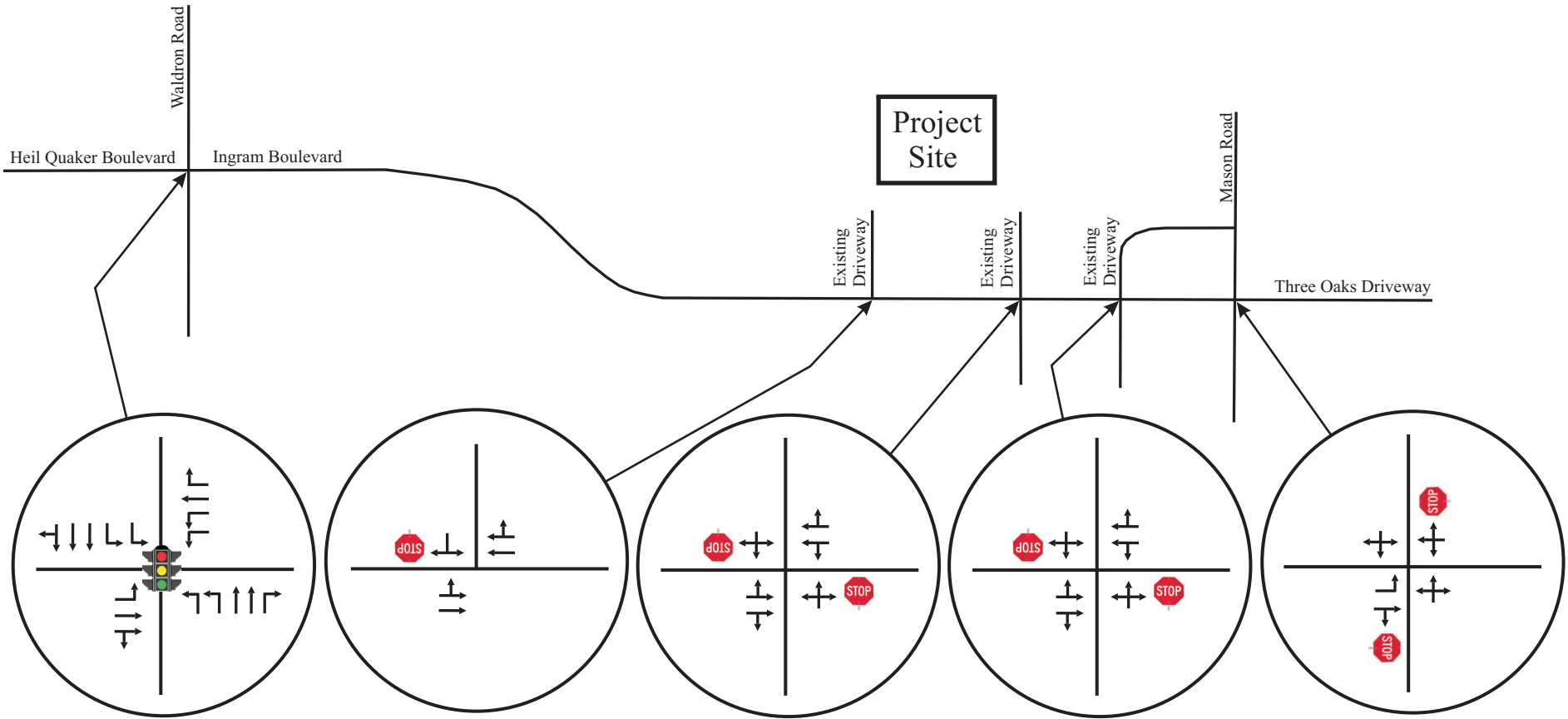
Ingram Boulevard provides access to the project site. This facility is a four-lane collector roadway that includes two 12-foot travel lane in each direction. Curb and gutter drainage and minimum shoulders are provided on both sides of the roadway, and a sidewalk is provided on the north side of Ingram Boulevard along a portion of the project site. A 30 mph speed limit is posted on Ingram Boulevard.

Eastbound Ingram Boulevard at the Project Site



Source: Google Earth (photo taken October 2023)

The existing laneage and traffic control at the intersections within the study area are shown in [Figure 3](#).



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

Figure 3.
Existing Laneage and Traffic Control

3.2 YEAR 2024 EXISTING TRAFFIC VOLUMES

In order to provide data for the traffic impact analysis, peak hour traffic volumes were identified for the following intersections:

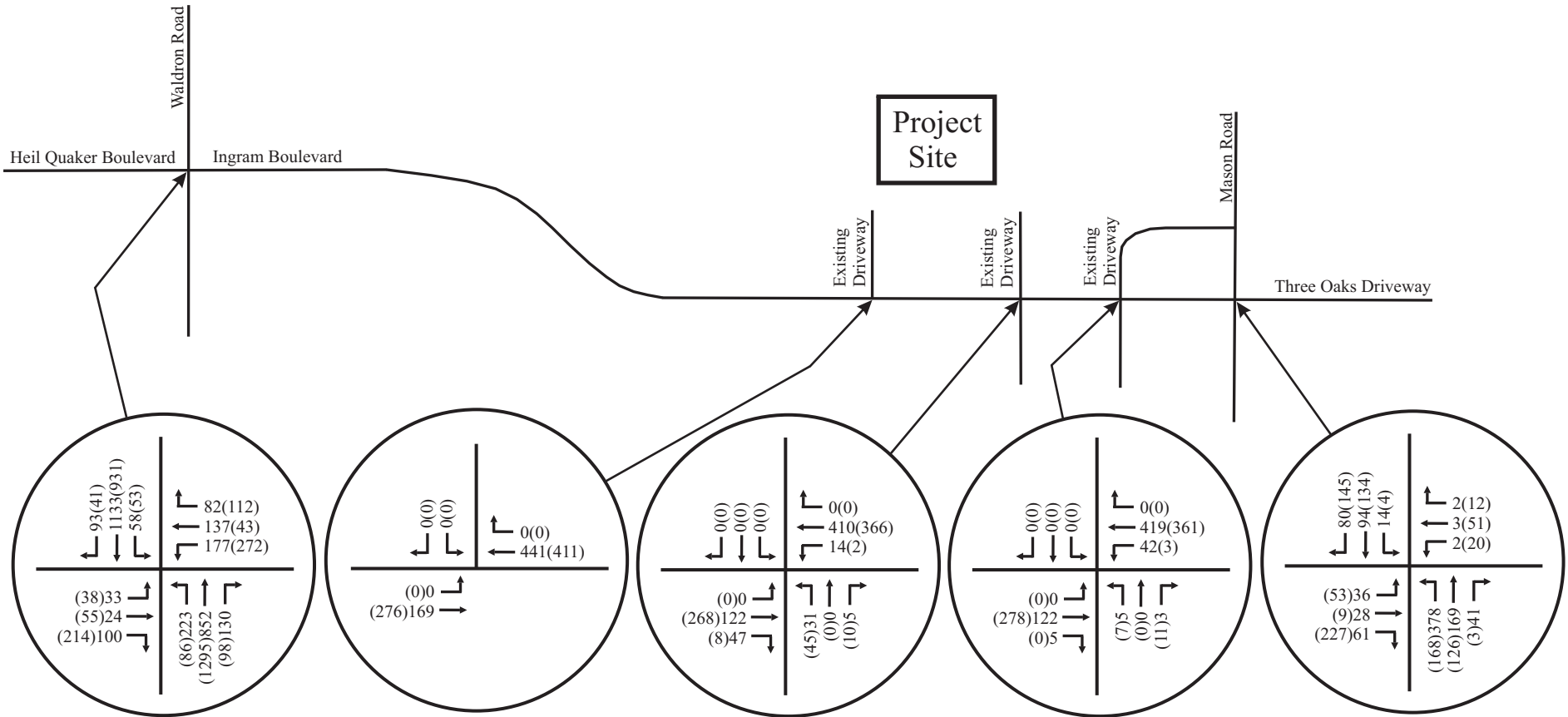
1. Waldron Road and Ingram Boulevard / Heil Quaker Boulevard
2. Ingram Boulevard and Middle Project Driveway / Industrial Driveway
3. Ingram Boulevard and Eastern Project Driveway / Industrial Driveway
4. Mason Road and Ingram Boulevard / Three Oaks Driveway

This data was collected from 6:00 AM – 7:00 PM on typical weekdays in early May 2024, and the traffic count worksheets are included in [Appendix A](#). It is important to note that certain turning movements were increased as needed to show balance traffic flows, and the adjusted peak hour traffic volumes are shown in [Figure 4](#).

Using the existing peak hour traffic volumes shown in [Figure 4](#), capacity analyses were conducted for the intersections studied. Specifically, in order to identify current peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the [Highway Capacity Manual 7](#) (HCM 7). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation is used to describe how well an intersection or roadway operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. In an urbanized area, LOS D is typically considered to be the minimum acceptable LOS. [Table 1](#) presents the descriptions of LOS for signalized intersections, and [Table 2](#) presents the descriptions of LOS for unsignalized intersections.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in [Table 3](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate that:

- The signalized intersection of Waldron Road and Ingram Boulevard / Heil Quaker Boulevard currently operates at LOS C during both peak hours.
- At the unsignalized intersection of Ingram Boulevard and Middle Project Driveway / Industrial Driveway, all of the critical turning movements currently operate at LOS B or better during both peak hours.
- At the unsignalized intersection of Ingram Boulevard and Eastern Project Driveway / Industrial Driveway, all of the critical turning movements currently operate at LOS B or better during both peak hours.
- At the unsignalized intersection of Mason Road and Ingram Boulevard / Three Oaks Driveway, most of the critical turning movements currently operate at LOS D or better during both peak hours. Although the eastbound left turns operate at LOS F and the westbound turning movements operate at LOS E during the AM peak hour, the typical vehicle delays and queues are reasonable.



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

Figure 4.
Existing Year 2024 Peak Hour Traffic Volumes

TABLE 1. DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay per Vehicle (sec)
A	Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	> 20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop.	> 35 and ≤ 55
E	Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios.	> 55 and ≤ 80
F	Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels.	> 80

Source: Highway Capacity Manual 7 (HCM 7)

TABLE 2. DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay (sec/veh)
A	Minimal delay	≤ 10
B	Brief delay	> 10 and ≤ 15
C	Average delay	> 15 and ≤ 25
D	Significant delay	> 25 and ≤ 35
E	Long delay	> 35 and ≤ 50
F	Extreme delay	> 50

Source: Highway Capacity Manual 7 (HCM 7)

TABLE 3. EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR		
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE	
Waldron Road and Ingram Boulevard / Heil Quaker Boulevard	Eastbound Left Turns	LOS D	2 veh (48 sec/veh)	LOS D	2 veh (40 sec/veh)	
	Eastbound Thrus	LOS D	1 veh (51 sec/veh)	LOS D	3 veh (44 sec/veh)	
	Eastbound Right Turns	LOS E	6 veh (57 sec/veh)	LOS D	11 veh (53 sec/veh)	
	Westbound Left Turns	LOS E	5 veh (57 sec/veh)	LOS D	8 veh (55 sec/veh)	
	Westbound Thrus	LOS D	8 veh (51 sec/veh)	LOS D	2 veh (37 sec/veh)	
	Westbound Right Turns	LOS D	4 veh (44 sec/veh)	LOS D	5 veh (35 sec/veh)	
	Northbound Left Turns	LOS E	6 veh (55 sec/veh)	LOS E	2 veh (57 sec/veh)	
	Northbound Thrus	LOS B	11 veh (14 sec/veh)	LOS C	22 veh (27 sec/veh)	
	Northbound Right Turns	LOS A	2 veh (8 sec/veh)	LOS B	2 veh (11 sec/veh)	
	Southbound Left Turns	LOS E	2 veh (57 sec/veh)	LOS E	2 veh (57 sec/veh)	
	Southbound Thrus	LOS B	11 veh (16 sec/veh)	LOS B	10 veh (19 sec/veh)	
	Southbound Right Turns	LOS B	11 veh (17 sec/veh)	LOS B	10 veh (20 sec/veh)	
	OVERALL INTERSECTION		LOS C (26 sec/veh)		LOS C (30 sec/veh)	
	Ingram Boulevard and Middle Driveway for Project / Industrial Driveway	Eastbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)
Westbound Turning Movements		LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	
Northbound Turning Movements		LOS B	1 veh (12 sec/veh)	LOS B	1 veh (13 sec/veh)	
Southbound Turning Movements		LOS A	0 veh (0 sec/veh)	LOS A	0 veh (0 sec/veh)	
Ingram Boulevard and Eastern Driveway for Project / Industrial Driveway	Eastbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	
	Westbound Turning Movements	LOS A	1 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	

	Northbound Turning Movements	LOS B	0 veh (11 sec/veh)	LOS B	1 veh (11 sec/veh)
	Southbound Turning Movements	LOS A	0 veh (0 sec/veh)	LOS A	0 veh (0 sec/veh)
Mason Road and Ingram Boulevard / Three Oaks Driveway	Eastbound Left Turns	LOS F	2 veh (82 sec/veh)	LOS D	1 veh (29 sec/veh)
	Eastbound Thrus / Right Turns	LOS D	2 veh (29 sec/veh)	LOS B	2 veh (12 sec/veh)
	Westbound Turning Movements	LOS E	1 veh (43 sec/veh)	LOS D	2 veh (29 sec/veh)
	Northbound Turning Movements	LOS A	1 veh (9 sec/veh)	LOS A	1 veh (8 sec/veh)
	Southbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)

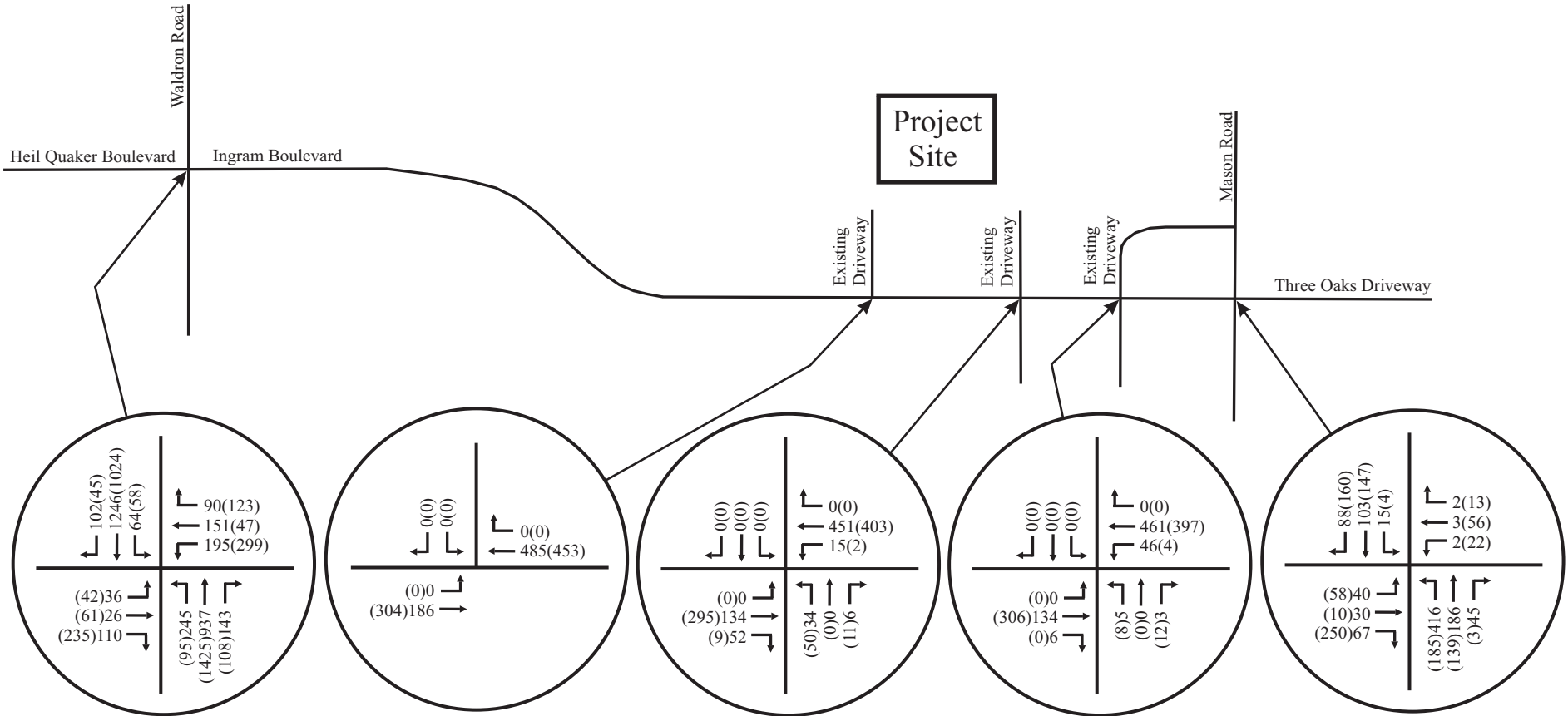
4. YEAR 2026 BACKGROUND TRAFFIC VOLUMES

In order to account for the traffic growth which will occur within the study area because of typical growth, as well as other approved developments, background traffic volumes were established for the intersections within the study area. Specifically, in order to account for growth within the study area, consideration was given to the historical traffic volumes near the project site. The Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations.

As shown in [Table 4](#), the daily traffic volumes within the study area have increased marginally since 2014. For the purposes of this study, the existing traffic volumes at the intersections within the study area were increased by 5% per year, for a total of 10%, in order to represent Year 2026 background traffic volumes, as shown in [Figure 5](#).

TABLE 4. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 2 Waldron Road ADT	Annual Growth	Overall Growth
2014	21,815		
2015	21,105	-3.25%	
2016	24,006	13.75%	
2017	24,402	1.65%	
2018	31,197	27.85%	
2019	26,302	-15.69%	
2020	27,954	6.28%	
2021	31,217	11.67%	
2022	30,129	-3.49%	
2023	31,171	3.46%	4.77%



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

Figure 5.
 Background Year 2026 Peak Hour Traffic Volumes
 (Existing Traffic Volumes Increased 10%)

Using the background peak hour traffic volumes shown in [Figure 5](#), capacity analyses were conducted for the intersections within the study area. For these analyses, it was assumed that all existing laneage and traffic control will be maintained and no improvements will be made.

The results of the capacity analyses for the background peak hour traffic volumes are shown in [Table 5](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate that:

- The signalized intersection of Waldron Road and Ingram Boulevard / Heil Quaker Boulevard will operate at LOS C during both peak hours.
- At the unsignalized intersection of Ingram Boulevard and Middle Project Driveway / Industrial Driveway, all of the critical turning movements will operate at LOS B or better during both peak hours.
- At the unsignalized intersection of Ingram Boulevard and Eastern Project Driveway / Industrial Driveway, all of the critical turning movements will operate at LOS B or better during both peak hours.
- At the unsignalized intersection of Mason Road and Ingram Boulevard / Three Oaks Driveway, most of the critical turning movements will operate at LOS B or better during both peak hours. Although the eastbound and westbound turning movements are expected to operate poorly during both peak hours, the typical vehicle delays and queues will be moderate.

TABLE 5. YEAR 2026 BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR		
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE	
Waldron Road and Ingram Boulevard / Heil Quaker Boulevard	Eastbound Left Turns	LOS D	2 veh (47 sec/veh)	LOS D	2 veh (38 sec/veh)	
	Eastbound Thrus	LOS D	1 veh (51 sec/veh)	LOS D	3 veh (43 sec/veh)	
	Eastbound Right Turns	LOS E	7 veh (57 sec/veh)	LOS D	12 veh (52 sec/veh)	
	Westbound Left Turns	LOS E	6 veh (56 sec/veh)	LOS D	8 veh (54 sec/veh)	
	Westbound Thrus	LOS D	8 veh (50 sec/veh)	LOS D	2 veh (35 sec/veh)	
	Westbound Right Turns	LOS D	5 veh (43 sec/veh)	LOS C	5 veh (33 sec/veh)	
	Northbound Left Turns	LOS D	7 veh (55 sec/veh)	LOS E	3 veh (57 sec/veh)	
	Northbound Thrus	LOS B	12 veh (15 sec/veh)	LOS C	27 veh (34 sec/veh)	
	Northbound Right Turns	LOS A	3 veh (8 sec/veh)	LOS B	3 veh (12 sec/veh)	
	Southbound Left Turns	LOS E	2 veh (57 sec/veh)	LOS E	2 veh (57 sec/veh)	
	Southbound Thrus	LOS B	13 veh (18 sec/veh)	LOS C	11 veh (22 sec/veh)	
	Southbound Right Turns	LOS B	13 veh (19 sec/veh)	LOS C	11 veh (22 sec/veh)	
	OVERALL INTERSECTION		LOS C (27 sec/veh)		LOS C (34 sec/veh)	
	Ingram Boulevard and Middle Driveway for Project / Industrial Driveway	Eastbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)
Westbound Turning Movements		LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	
Northbound Turning Movements		LOS B	1 veh (13 sec/veh)	LOS B	1 veh (14 sec/veh)	
Southbound Turning Movements		LOS A	0 veh (0 sec/veh)	LOS A	0 veh (0 sec/veh)	
Ingram Boulevard and Eastern Driveway for Project / Industrial Driveway	Eastbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	
	Westbound Turning Movements	LOS A	1 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	

	Northbound Turning Movements	LOS B	1 veh (12 sec/veh)	LOS B	1 veh (11 sec/veh)
	Southbound Turning Movements	LOS A	0 veh (0 sec/veh)	LOS A	0 veh (0 sec/veh)
Mason Road and Ingram Boulevard / Three Oaks Driveway	Eastbound Left Turns	LOS F	3 veh (149 sec/veh)	LOS E	2 veh (39 sec/veh)
	Eastbound Thrus / Right Turns	LOS E	3 veh (42 sec/veh)	LOS B	2 veh (13 sec/veh)
	Westbound Turning Movements	LOS F	1 veh (61 sec/veh)	LOS E	3 veh (40 sec/veh)
	Northbound Turning Movements	LOS A	2 veh (9 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)

5. IMPACTS OF PROPOSED DEVELOPMENT

5.1 TRIP GENERATION

Trip generation calculations were conducted in order to identify how much traffic will be generated by the proposed project. Trip generation data for daily and peak hour trips were identified from Trip Generation, 11th Edition, which was published by the Institute of Transportation Engineers (ITE) in 2021. [Table 6](#) presents the daily and peak hour trip generations for proposed project, and these calculations are included in [Appendix C](#).

TABLE 6. TRIP GENERATION

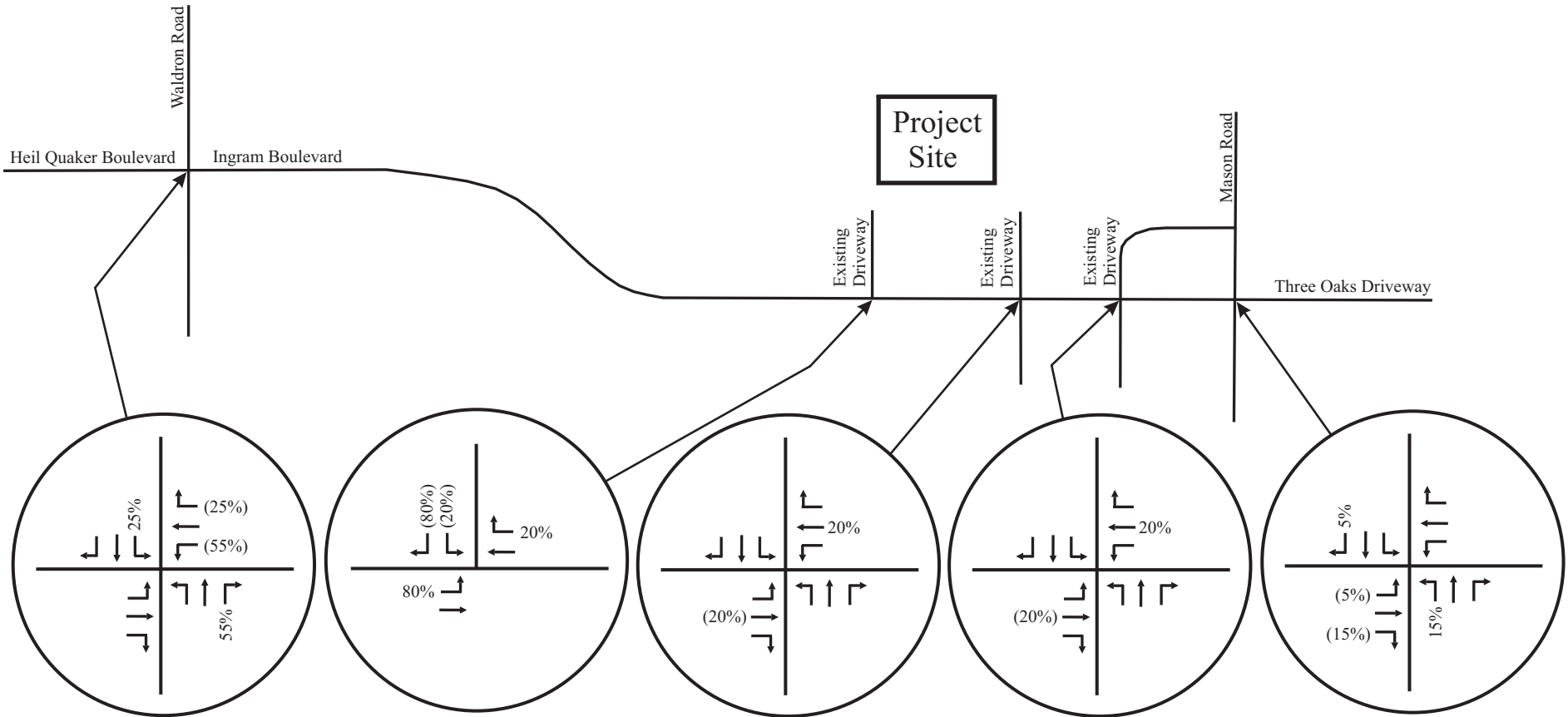
LAND USE	SIZE	DAILY TRAFFIC *	GENERATED TRAFFIC *			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Charter School (LUC 536)	340 students	630	184	170	123	128

5.2 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

For the purposes of this study, it was estimated that the trips generated by the proposed development will access the project site according to the directional distribution shown in [Figure 6](#). The development of this distribution was based on the following factors:

- existing land use characteristics,
- the directions of approach of the existing traffic,
- the access proposed for the project, and
- the locations of population centers in the area.

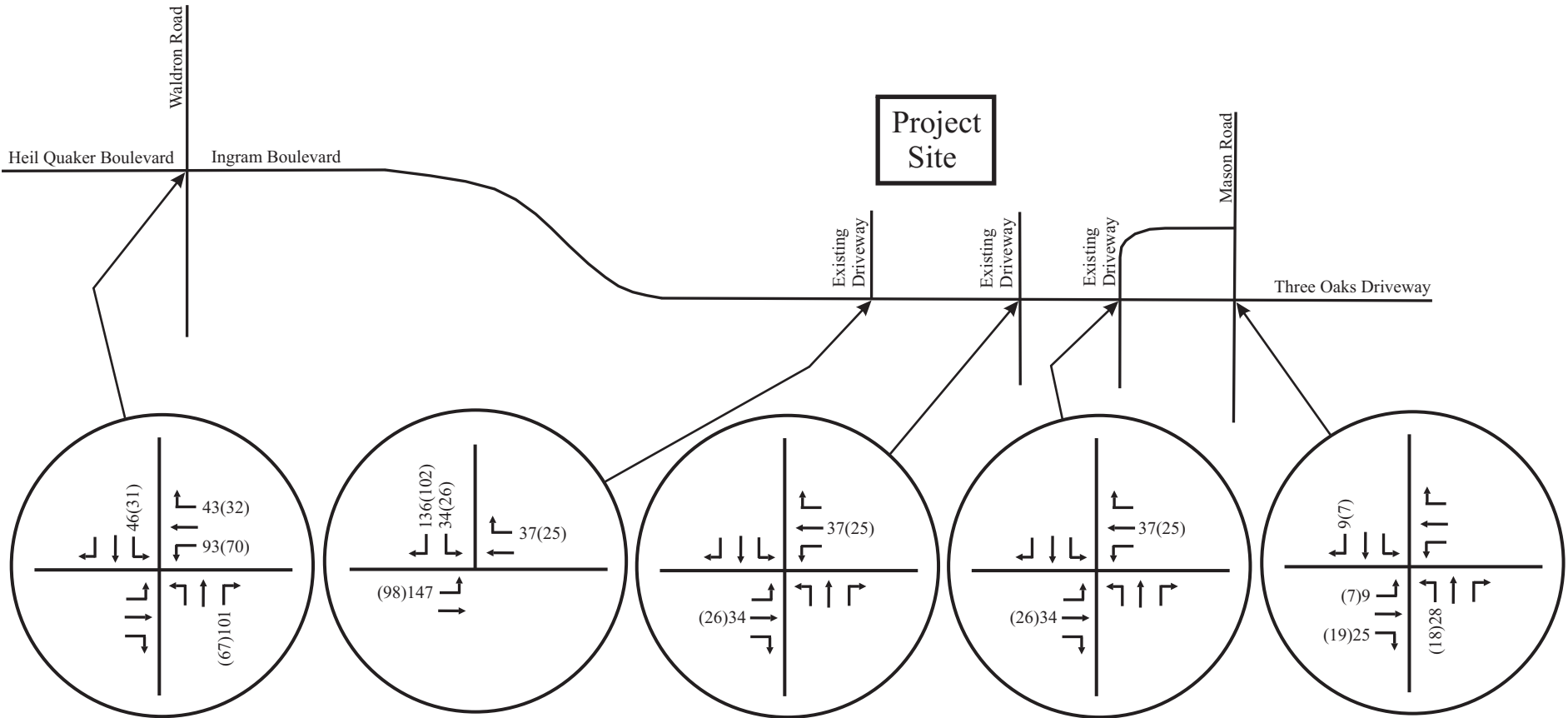
The peak hour trip generations and directional distribution were used to add the site-generated trips to the roadway system. [Figure 7](#) includes the peak hour traffic volumes that are expected to be generated by the proposed project.



No Scale

XX - Entering Volumes
 (XX) - Exiting Volumes

Figure 6.
Directional Distribution of Peak Hour Traffic
Generated by the Proposed Project



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

Figure 7.
Peak Hour Traffic Generated by the Proposed Project

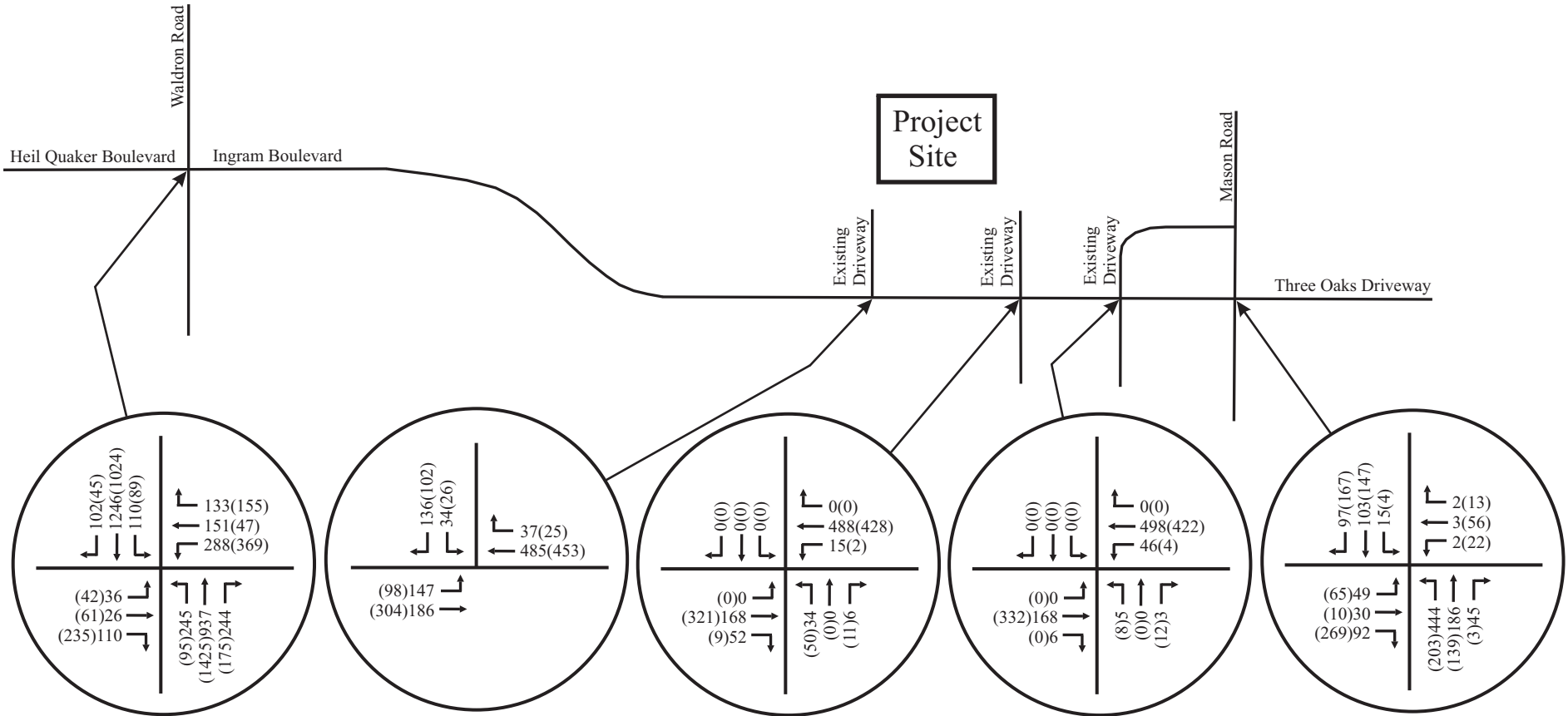
5.3 CAPACITY ANALYSES

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the proposed development were added to the background peak hour traffic volumes within the study area. The resulting peak hour volumes are shown in [Figure 8](#).

Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the proposed project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For the purposes of these analyses, it was assumed that all existing infrastructure will be maintained and no improvements will be made.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in [Table 7](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate that:

- The signalized intersection of Waldron Road and Ingram Boulevard / Heil Quaker Boulevard will operate at LOS C during the AM peak hour and LOS D during the PM peak hour.
- At the unsignalized intersection of Ingram Boulevard and Middle Project Driveway / Industrial Driveway, all of the critical turning movements will operate at LOS B or better during both peak hours.
- At the unsignalized intersection of Ingram Boulevard and Eastern Project Driveway / Industrial Driveway, all of the critical turning movements will operate at LOS B or better during both peak hours.
- At the unsignalized intersection of Mason Road and Ingram Boulevard / Three Oaks Driveway, most of the critical turning movements will operate at LOS B or better during both peak hours. Although the eastbound and westbound turning movements are expected to operate poorly during both peak hours, the typical vehicle delays will be moderate.
- At the unsignalized intersection of Ingram Boulevard and Western Project Driveway, most of the critical turning movements will operate at LOS C or better during both peak hours.



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

Figure 8.
Total Projected Peak Hour Traffic Volumes
at the Completion of the Proposed Project

TABLE 7. TOTAL PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR		
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE	
Waldron Road and Ingram Boulevard / Heil Quaker Boulevard	Eastbound Left Turns	LOS D	2 veh (47 sec/veh)	LOS D	2 veh (38 sec/veh)	
	Eastbound Thrus	LOS D	1 veh (50 sec/veh)	LOS D	3 veh (43 sec/veh)	
	Eastbound Right Turns	LOS E	7 veh (58 sec/veh)	LOS D	12 veh (52 sec/veh)	
	Westbound Left Turns	LOS D	8 veh (54 sec/veh)	LOS D	10 veh (53 sec/veh)	
	Westbound Thrus	LOS D	8 veh (46 sec/veh)	LOS C	2 veh (33 sec/veh)	
	Westbound Right Turns	LOS D	7 veh (41 sec/veh)	LOS C	6 veh (32 sec/veh)	
	Northbound Left Turns	LOS D	7 veh (55 sec/veh)	LOS E	3 veh (57 sec/veh)	
	Northbound Thrus	LOS B	13 veh (18 sec/veh)	LOS D	29 veh (41 sec/veh)	
	Northbound Right Turns	LOS A	5 veh (9 sec/veh)	LOS B	4 veh (13 sec/veh)	
	Southbound Left Turns	LOS E	3 veh (58 sec/veh)	LOS E	3 veh (57 sec/veh)	
	Southbound Thrus	LOS C	14 veh (21 sec/veh)	LOS C	12 veh (24 sec/veh)	
	Southbound Right Turns	LOS C	14 veh (22 sec/veh)	LOS C	12 veh (25 sec/veh)	
	OVERALL INTERSECTION		LOS C (29 sec/veh)		LOS D (37 sec/veh)	
	Ingram Boulevard and Middle Driveway for Project / Industrial Driveway	Eastbound Turning Movements	LOS A	0 veh (9 sec/veh)	LOS A	0 veh (8 sec/veh)
Westbound Turning Movements		LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	
Northbound Turning Movements		LOS B	1 veh (14 sec/veh)	LOS B	1 veh (15 sec/veh)	
Southbound Turning Movements		LOS A	0 veh (0 sec/veh)	LOS A	0 veh (0 sec/veh)	
Ingram Boulevard and Eastern Driveway for Project / Industrial Driveway	Eastbound Turning Movements	LOS A	0 veh (9 sec/veh)	LOS A	0 veh (8 sec/veh)	
	Westbound Turning Movements	LOS A	1 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)	

	Northbound Turning Movements	LOS B	1 veh (12 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Turning Movements	LOS A	0 veh (0 sec/veh)	LOS A	0 veh (0 sec/veh)
Mason Road and Ingram Boulevard / Three Oaks Driveway	Eastbound Left Turns	LOS F	5 veh (265 sec/veh)	LOS E	2 veh (50 sec/veh)
	Eastbound Thrus / Right Turns	LOS E	4 veh (49 sec/veh)	LOS B	2 veh (14 sec/veh)
	Westbound Turning Movements	LOS F	1 veh (80 sec/veh)	LOS E	3 veh (48 sec/veh)
	Northbound Turning Movements	LOS A	2 veh (9 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Turning Movements	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (8 sec/veh)
Ingram Boulevard and Western Project Access	Eastbound Left Turns / Thrus	LOS B	1 veh (10 sec/veh)	LOS A	1 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS E	5 veh (38 sec/veh)	LOS C	2 veh (21 sec/veh)

6. TRAFFIC SIGNAL WARRANT ANALYSES

Based on the results of the capacity analyses, traffic signal warrant analyses were conducted for the intersection of Mason Road and Ingram Boulevard.

The Federal Highway Administration has published the Manual on Uniform Traffic Control Devices (MUTCD 2009), which includes traffic signal warrants that help traffic engineering professionals to identify when a traffic signal installation is justified at a particular location. The warrants include minimum conditions that are compared to existing or projected traffic conditions, and typically, traffic signals should not be installed unless at least one of the MUTCD warrants, as described in [Appendix D](#), is met.

It is important to note that the Manual on Uniform Traffic Control Devices (MUTCD 2009) stipulates that the signal warrant thresholds may be reduced by 30% "...if the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph..." Because the speed limit on Mason Road is 30 mph in the vicinity of Ingram Boulevard, full traffic signal warrant thresholds were considered appropriate for the intersection with Ingram Boulevard.

Based on the daily trip generations for the proposed project, as shown in [Table 6](#), hourly traffic volumes traveling through the intersections within the study area were estimated as shown in [Table 8](#). These hourly volumes were added to the background traffic volumes, which were established by increasing the hourly data collected at the intersections within the study area by 10%.

TABLE 8. HOURLY TRAFFIC VOLUMES (PROPOSED PROJECT)

HOUR	% OF 24-HOUR TRAFFIC		VEHICLES	
	ENTERING	EXITING	ENTERING	EXITING
12:00 - 1:00 AM				
1:00 - 2:00 AM				
2:00 - 3:00 AM				
3:00 - 4:00 AM				
4:00 - 5:00 AM				
5:00 - 6:00 AM				
6:00 - 7:00 AM	5.3%	0.1%	17	0
7:00 - 8:00 AM	41.8%	29.0%	132	91
8:00 - 9:00 AM	9.2%	13.3%	29	42
9:00 - 10:00 AM	1.5%	1.1%	5	3
10:00 - 11:00 AM	1.6%	1.3%	5	4
11:00 - 12:00 N	2.0%	2.3%	6	7
12:00 - 1:00 PM	2.8%	3.2%	9	10
1:00 - 2:00 PM	1.2%	1.3%	4	4
2:00 - 3:00 PM	8.5%	2.8%	27	9
3:00 - 4:00 PM	11.2%	23.9%	35	75
4:00 - 5:00 PM	10.4%	15.9%	33	50
5:00 - 6:00 PM	2.4%	3.2%	8	10
6:00 - 7:00 PM	1.9%	1.7%	6	5
7:00 - 8:00 PM	0.3%	0.4%	1	1
8:00 - 9:00 PM		0.4%		1
9:00 - 10:00 PM				
10:00 - 11:00 PM				
11:00 - 12:00 M				
TOTAL	100.0%	100.0%	315	315

Source: Trip Generation, 11th Edition

The existing, background, and total projected conditions at the intersection of Mason Road and Ingram Boulevard were compared to the full signal warrant thresholds, as shown in [Tables 9A, 9B, and 9C](#). Specifically, these analyses are based on the following parameters:

- a one-lane approach on the main street,
- a two-lane approach on the side street,
- 100% of the eastbound left turns from Mason Road
- 100% of the eastbound thru and right turns from Mason Road

The results of these analyses, which are included in [Tables 9A, 9B, and 9C](#), indicate that the full traffic signal warrants are not satisfied under existing, background, or total projected conditions at the intersection of Mason Road and Ingram Boulevard.

**TABLE 9A. TRAFFIC SIGNAL WARRANT ANALYSIS (EXISTING)
MASON ROAD AND INGRAM BOULEVARD**

EXISTING TRAFFIC VOLUMES

HOUR	TOTAL VEHICLES ON MASON ROAD	EASTBOUND VEHICLES ON INGRAM BOULEVARD	SATISFY FULL WARRANTS?		
			Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2
6:00-7:00 AM	677	98	--	--	--
7:00 - 8:00 AM	635	128	--	--	--
8:00 - 9:00 AM	363	107	--	--	--
9:00 - 10:00 AM	258	128	--	--	--
10:00 - 11:00 AM	316	133	--	--	--
11:00 - 12:00	435	227	--	--	--
12:00 - 1:00 PM	433	208	--	--	--
1:00 - 2:00 PM	326	174	--	--	--
2:00 - 3:00 PM	390	215	--	--	--
3:00 - 4:00 PM	423	251	--	--	--
4:00 - 5:00 PM	557	289	Yes	--	Yes
5:00 - 6:00 PM	373	204	--	--	--
6:00 - 7:00 PM	202	137	--	--	--

**TABLE 9B. TRAFFIC SIGNAL WARRANT ANALYSIS (BACKGROUND)
MASON ROAD AND INGRAM BOULEVARD**

BACKGROUND TRAFFIC VOLUMES

HOUR	TOTAL VEHICLES ON MASON ROAD	EASTBOUND VEHICLES ON INGRAM BOULEVARD	SATISFY FULL WARRANTS?		
			Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2
6:00-7:00 AM	745	108	--	--	--
7:00 - 8:00 AM	699	141	--	--	--
8:00 - 9:00 AM	399	118	--	--	--
9:00 - 10:00 AM	284	141	--	--	--
10:00 - 11:00 AM	348	146	--	--	--
11:00 - 12:00	479	250	--	--	--
12:00 - 1:00 PM	476	229	--	--	--
1:00 - 2:00 PM	359	191	--	--	--
2:00 - 3:00 PM	429	237	--	--	--
3:00 - 4:00 PM	465	276	--	--	Yes
4:00 - 5:00 PM	613	318	Yes	--	Yes
5:00 - 6:00 PM	410	224	--	--	--
6:00 - 7:00 PM	222	151	--	--	--

**TABLE 9C. TRAFFIC SIGNAL WARRANT ANALYSIS (TOTAL)
MASON ROAD AND INGRAM BOULEVARD**

TOTAL PROJECTED TRAFFIC VOLUMES

HOUR	TOTAL VEHICLES ON MASON ROAD	EASTBOUND VEHICLES ON INGRAM BOULEVARD	SATISFY FULL WARRANTS?		
			Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2
6:00-7:00 AM	748	108	--	--	--
7:00 - 8:00 AM	725	159	--	--	--
8:00 - 9:00 AM	405	126	--	--	--
9:00 - 10:00 AM	285	141	--	--	--
10:00 - 11:00 AM	349	147	--	--	--
11:00 - 12:00	480	251	--	--	--
12:00 - 1:00 PM	478	231	--	--	--
1:00 - 2:00 PM	359	192	--	--	--
2:00 - 3:00 PM	434	238	--	--	--
3:00 - 4:00 PM	472	291	--	--	--
4:00 - 5:00 PM	619	328	Yes	--	Yes
5:00 - 6:00 PM	412	226	--	--	Yes
6:00 - 7:00 PM	223	152	--	--	--

7. CONCLUSIONS AND RECOMMENDATIONS

The analyses conducted for the purposes of this study indicate that the proposed project will have the following impacts on the intersections within the study area. Specifically:

Intersection of Waldron Road and Ingram Boulevard / Heil Quaker Boulevard

The analyses conducted for the purposes of this study indicate that this signalized intersection operates at LOS D or better during both peak hours under existing, background, and total projected conditions.

Based on these results, no laneage or traffic control modifications are recommended for this intersection in conjunction with the proposed project.

Intersection of Mason Road and Ingram Boulevard / Three Oaks Driveway

The analyses conducted for the purposes of this study indicate that most of the critical turning movements will operate at LOS B or better during both peak hours. However, the eastbound and westbound turning movements are expected to operate poorly during both peak hours.

Additional analyses indicate that traffic signal warrants are not satisfied by existing, background, or total projected traffic volumes.

Based on these results, no laneage or traffic control modifications are recommended for this intersection in conjunction with the proposed project.

Intersection of Ingram Boulevard and Western Project Access

The analyses conducted for the purposes of this study indicate that the critical turning movements at this intersection will operate with reasonable vehicle queues and delays. However, it is important to note that the inside eastbound lane will likely operate as a default left turn lane, and the outside westbound right turn lane will likely operate as a default right turn lane during the peak 30 minutes at the beginning of the school day and the peak 30 minutes at the end of the school day.

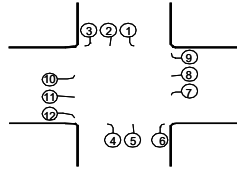
Also, because of the nature of school-related traffic, specifically the intensity of the entering and exiting volumes during the peak 30 minutes at the beginning of the school day and the peak 30 minutes at the end of the school day, consideration should be given to employing a trained traffic control office to facilitate turning movements at the intersection of Ingram Boulevard and the project access during these peak times.

Finally, a school speed zone should be established within the study area. Specifically, on eastbound and westbound Ingram Boulevard, a School Speed Limit Assembly should be

installed approximately 500 feet in advance of the property boundary for the school. This assembly, which should be based on a school zone speed limit of 15 mph, should conform with the signage identified as S4-3P, R2-1, S4-1P and S4-6P within the Manual on Uniform Traffic Control Devices (MUTCD). Also, to mark the end of the school speed zone, a speed limit sign for 45 mph should be installed with an “END SCHOOL ZONE” plaque (S5-2).

**APPENDIX A
EXISTING TRAFFIC COUNTS**

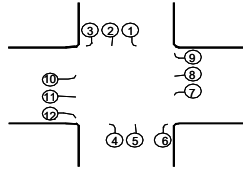
INTERSECTION TRAFFIC VOLUME COUNTS



LOCATION: Waldron Road and Ingram Blvd / Heil Quaker Blvd
 DATE: 7-May-24 Tue
 RECORDER: Burns
 NOTES: signalized

LOCATION TIME	S/B Waldron Road			N/B Waldron Road			W/B Heil Quaker Blvd			E/B Ingram Blvd				
	1	2	3	4	5	6	7	8	9	10	11	12		
6:00-6:15	14	315	14	33	172	17	47	13	18	5	8	19	2,990	675
6:15-6:30	11	350	22	48	187	37	44	25	13	3	4	16	3,042	760
6:30-6:45	13	310	22	78	231	28	44	38	20	3	6	23	2,972	816
6:45-7:00	22	237	33	62	208	34	44	46	18	7	10	18	2,778	739
7:00-7:15	12	236	16	35	226	31	45	28	31	20	4	43	2,758	727
7:15-7:30	19	196	16	57	221	36	51	27	18	16	7	26	2,595	690
7:30-7:45	19	198	14	32	196	31	46	21	20	8	9	28	2,461	622
7:45-8:00	18	223	29	53	257	48	28	19	11	9	4	20	2,388	719
8:00-8:15	17	174	14	40	193	21	27	17	10	14	11	26	2,269	564
8:15-8:30	11	183	17	23	191	36	31	13	15	11	3	22	2,302	556
8:30-8:45	19	185	9	23	189	33	33	14	14	7	9	14	2,340	549
8:45-9:00	12	206	8	26	219	30	43	15	8	9	7	17	2,379	600
9:00-9:15	12	206	10	26	211	28	47	14	9	9	7	18	2,364	597
9:15-9:30	11	207	11	26	204	26	52	12	11	9	6	19	2,349	594
9:30-9:45	11	207	13	25	196	23	56	11	12	8	6	20	2,327	588
9:45-10:00	10	208	14	25	189	21	61	9	14	8	5	21	2,347	585
10:00-10:15	10	208	16	25	181	19	65	8	15	8	5	22	2,355	582
10:15-10:30	10	192	8	20	190	32	42	10	27	13	6	22	2,402	572
10:30-10:45	13	220	14	19	193	23	58	11	9	11	16	21	2,489	608
10:45-11:00	8	249	14	16	183	16	41	10	15	9	13	19	2,563	593
11:00-11:15	17	246	20	14	176	25	39	14	11	16	19	32	2,619	629
11:15-11:30	11	228	13	19	212	24	55	22	13	10	14	38	2,742	659
11:30-11:45	17	251	12	24	202	28	47	23	17	8	19	34	2,747	682
11:45-12:00	14	215	6	33	200	34	57	16	23	7	14	30	2,748	649
12:00-12:15	25	244	11	23	223	19	59	23	27	19	31	48	2,804	752
12:15-12:30	16	208	8	28	210	22	55	19	17	18	30	33	2,778	664
12:30-12:45	15	220	8	28	225	24	52	17	18	16	27	33	2,862	683
12:45-1:00	15	233	7	29	241	26	48	16	19	14	24	33	2,946	705
1:00-1:15	14	245	7	29	256	28	45	14	20	13	22	33	2,921	726
1:15-1:30	14	258	6	30	272	30	41	13	21	11	19	33	2,872	748
1:30-1:45	13	270	6	30	287	32	38	11	22	9	16	33	2,853	767
1:45-2:00	17	187	17	30	285	20	29	21	23	9	5	37	3,044	680
2:00-2:15	14	208	12	25	272	24	41	11	17	16	10	27	3,142	677
2:15-2:30	10	237	13	17	311	25	34	9	21	10	10	32	3,246	729
2:30-2:45	12	267	9	31	287	24	108	17	44	45	33	81	3,291	958
2:45-3:00	21	215	5	16	319	25	49	15	20	22	10	61	3,129	778
3:00-3:15	17	242	10	16	301	28	53	6	21	14	10	63	3,170	781
3:15-3:30	11	210	13	18	319	44	65	7	29	12	15	31	3,230	774
3:30-3:45	14	221	11	21	313	40	66	9	28	10	16	47	3,218	796
3:45-4:00	18	232	10	25	306	36	67	10	27	7	17	64	3,234	819
4:00-4:15	21	243	8	28	300	32	68	12	26	5	18	80	3,238	841
4:15-4:30	9	226	8	20	323	22	50	8	33	12	11	40	3,222	762
4:30-4:45	11	247	15	13	318	18	70	9	22	12	16	61	3,216	812
4:45-5:00	12	215	10	25	354	26	84	14	31	9	10	33	3,106	823
5:00-5:15	6	234	11	21	363	17	47	9	37	16	18	46	2,976	825
5:15-5:30	18	237	1	7	371	21	38	9	24	6	4	20	2,900	756
5:30-5:45	15	167	12	17	353	24	41	9	29	8	6	21	2,829	702
5:45-6:00	9	176	14	15	373	27	19	4	22	4	7	23	2,733	693
6:00-6:15	9	262	4	14	338	21	34	10	14	8	9	26	2,613	749
6:15-6:30	11	232	12	12	288	27	32	8	20	7	8	28	685	
6:30-6:45	11	190	12	15	280	28	30	6	14	1	3	16	606	
6:45-7:00	9	165	9	19	277	16	21	10	12	6	6	23	573	
TOTAL	718	11,741	634	1,384	13,192	1,407	2,487	762	1,030	567	623	1,674		
AM PK HR	58	1,133	93	223	852	130	177	137	82	33	24	100	6:15-7:15	0.93
PM PK HR	53	931	41	86	1,295	98	272	43	112	38	55	214	4:00-5:00	0.96

INTERSECTION TRAFFIC VOLUME COUNTS

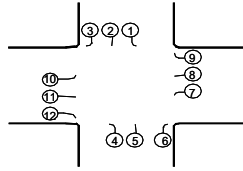


LOCATION: Ingram Blvd and West Driveway
 DATE: 7-May-24 Tue
 RECORDER: Burns
 NOTES: unsignalized

LOCATION	S/B			N/B Driveway (west)			W/B Ingram Boulevard			E/B Ingram Boulevard		
TIME	1	2	3	4	5	6	7	8	9	10	11	12
6:00-6:15												
6:15-6:30												
6:30-6:45				3			6	114			33	9
6:45-7:00				9		2	5	118			29	21
7:00-7:15				19		2	3	95			27	8
7:15-7:30						1		92			33	9
7:30-7:45				1		1	1	79			31	6
7:45-8:00				4			3	71			31	5
8:00-8:15				1				64			37	6
8:15-8:30				1				73			34	6
8:30-8:45				1		1		52			21	14
8:45-9:00				1			3	46			44	5
9:00-9:15				1			2	46			40	4
9:15-9:30				1			2	46			36	3
9:30-9:45				1			1	45			33	3
9:45-10:00				1			1	45			29	2
10:00-10:15				1				45			25	1
10:15-10:30								47			41	2
10:30-10:45				1		1		59			33	1
10:45-11:00				2				57			37	2
11:00-11:15				3				82			52	3
11:15-11:30				2				57			66	2
11:30-11:45				6		1		68			63	2
11:45-12:00				9		1	2	75			58	9
12:00-12:15				8		2		70			64	5
12:15-12:30				2		4		61			67	1
12:30-12:45				2		4		59			61	1
12:45-1:00				3		4		57			54	1
1:00-1:15				3		5		56			48	1
1:15-1:30				4		5		54			41	1
1:30-1:45				4		5		52			35	1
1:45-2:00				5				47			41	2
2:00-2:15				3		1	1	43			35	4
2:15-2:30				21		4		35			43	1
2:30-2:45				18		9	4	86			64	4
2:45-3:00				3				74			50	6
3:00-3:15				8		1	4	69			49	16
3:15-3:30				11		8	9	56			62	24
3:30-3:45				13		6	6	65			69	16
3:45-4:00				9		4	4	75			67	9
4:00-4:15				16		2	1	84			84	1
4:15-4:30				8		1	1	82			67	1
4:30-4:45				12		4		108			61	4
4:45-5:00				9		3		87			67	2
5:00-5:15				12		4		67			59	2
5:15-5:30				6		1		41			45	1
5:30-5:45				6		1		32			48	
5:45-6:00				2				37			43	1
6:00-6:15				3				46			37	
6:15-6:30								39			29	
6:30-6:45				4				27			44	1
6:45-7:00				1				28			37	
TOTAL				264		88	59	3,113			2,304	229
AM PK HR				31		5	14	419			122	47
PM PK HR				45		10	2	361			279	8

349
 503
 638 165
 592 184
 522 154
 476 135
 455 119
 425 114
 410 108
 395 114
 369 89
 363 99
 342 93
 321 88
 323 83
 335 78
 355 72
 423 90
 460 95
 505 98
 561 140
 570 127
 578 140
 565 154
 530 149
 494 135
 464 127
 434 119
 410 113
 384 105
 383 97
 471 95
 509 87
 569 104
 635 185
 625 133
 660 147
 701 170
 691 175
 705 168
 705 188
 661 160
 595 189
 493 168
 408 144
 350 94
 324 87
 313 83
 296 86
 68
 76
 66
 6:30-7:30 0.87
 4:00-5:00 0.93

INTERSECTION TRAFFIC VOLUME COUNTS

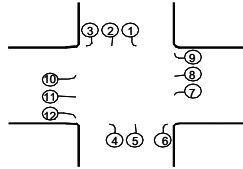


LOCATION: Ingram Blvd and East Driveway
 DATE: 7-May-24 Tue
 RECORDER: Burns
 NOTES: unsignalized

LOCATION TIME	S/B			N/B Driveway (east)			W/B Ingram Boulevard			E/B Ingram Boulevard		
	1	2	3	4	5	6	7	8	9	10	11	12
6:00-6:15												
6:15-6:30												
6:30-6:45							13	114			33	1
6:45-7:00				4		3	14	118			29	2
7:00-7:15							12	95			27	2
7:15-7:30				1			3	92			33	
7:30-7:45							5	79			31	2
7:45-8:00							6	71			31	3
8:00-8:15						2	7	64			37	2
8:15-8:30							7	73			34	2
8:30-8:45							3	52			21	2
8:45-9:00							3	46			44	
9:00-9:15							2	46			40	
9:15-9:30							2	46			36	
9:30-9:45							1	45			33	
9:45-10:00							1	45			29	
10:00-10:15								45			25	
10:15-10:30							1	47			41	1
10:30-10:45								59			33	
10:45-11:00							1	57			37	
11:00-11:15				2				82			52	
11:15-11:30				2		2		57			66	
11:30-11:45				4		3		68			63	
11:45-12:00							1	75			58	
12:00-12:15				4		1	3	70			64	
12:15-12:30				4			1	61			67	3
12:30-12:45				4		1	1	59			61	2
12:45-1:00				4		1	1	57			54	2
1:00-1:15				4		2	1	56			48	1
1:15-1:30				4		2	1	54			41	1
1:30-1:45				4		3	1	52			35	
1:45-2:00							1	4	47		41	
2:00-2:15				2				43			35	
2:15-2:30				8		3	1	35			43	
2:30-2:45				8		3	2	86			64	
2:45-3:00						1	2	74			50	
3:00-3:15				4		1	1	69			49	
3:15-3:30				4		3	1	56			62	
3:30-3:45				3		3	1	65			69	
3:45-4:00				3		3		75			72	
4:00-4:15				2		3		84			84	
4:15-4:30						4	2	82			62	
4:30-4:45				3		4		108			61	
4:45-5:00				2			1	87			67	
5:00-5:15				3				67			59	1
5:15-5:30				5		1		41			45	
5:30-5:45						4		32			48	
5:45-6:00				3			1	37			43	
6:00-6:15								46			37	1
6:15-6:30								39			29	
6:30-6:45								27			44	
6:45-7:00								28			37	
TOTAL				91		54	107	3,113			2,304	28
AM PK HR				5		3	42	419			122	5
PM PK HR				7		11	3	361			274	

331
 467
 596 161
 552 170
 493 136
 469 129
 456 117
 417 111
 399 112
 375 116
 343 78
 344 93
 326 88
 308 84
 314 79
 327 75
 347 70
 413 90
 450 92
 496 95
 535 136
 541 127
 550 138
 540 134
 525 142
 495 136
 462 128
 429 119
 403 112
 371 103
 358 95
 426 93
 460 80
 504 90
 540 163
 518 127
 544 124
 593 126
 617 141
 652 153
 656 173
 613 150
 555 176
 463 157
 390 130
 344 92
 320 84
 307 84
 288 84
 68
 71
 65
 6:30-7:30 0.88
 4:00-5:00 0.93

INTERSECTION TRAFFIC VOLUME COUNTS



LOCATION: Mason Road and Ingram Blvd / Three Oaks Ind Park
 DATE: 14-May-24 Tue
 RECORDER: Burns
 NOTES: unsignalized

LOCATION	S/B Mason Road			N/B Mason Road			W/B Three Oaks Industrial Park			E/B Ingram Blvd		
TIME	1	2	3	4	5	6	7	8	9	10	11	12
6:00-6:15	2	18	14	55	20	8	1	1		10	5	13
6:15-6:30	1	20	23	68	23	10	1	3		7	5	10
6:30-6:45	4	25	30	91	29	14			1	2	8	8
6:45-7:00	3	40	23	108	36	12	1		1	7	9	14
7:00-7:15	5	9	9	83	45	9	1	3		12	4	20
7:15-7:30	2	20	16	85	59	6				10	3	11
7:30-7:45		16	12	63	36	9	1	5	2	6	7	14
7:45-8:00	1	29	9	72	34	6		2		10	10	21
8:00-8:15	1	23	7	51	23	4	1	2		7	4	15
8:15-8:30	1	7	13	53	16	5			1	3	7	13
8:30-8:45		17	7	43	17	4		4	1	6	6	12
8:45-9:00	2	11	17	27	12	2		9		13	5	16
9:00-9:15	2	10	17	26	11	2		8		13	4	16
9:15-9:30	2	9	18	25	11	1		7		13	4	16
9:30-9:45	1	9	18	24	10	1	1	5	1	12	3	16
9:45-10:00	1	8	19	23	10		1	4	1	12	3	16
10:00-10:15	1	7	19	22	9		1	3	1	12	2	16
10:15-10:30		10	42	23	10	1	1	2		6	3	20
10:30-10:45		16	28	16	12	5	2	4	1	14	5	11
10:45-11:00	1	24	33	19	16	2	1	6		26	2	16
11:00-11:15		29	49	21	18	5	5	11	1	8	4	30
11:15-11:30		15	54	27	15	4		1		14	7	37
11:30-11:45	2	27	19	34	17	2	5	10	2	7	2	44
11:45-12:00	2	17	24	28	19	7	5	3	1	18	9	47
12:00-12:15	1	31	32	39	17	1	2	4		13	2	41
12:15-12:30	2	13	14	45	19	3	7	8	1	10	7	41
12:30-12:45		31	11	47	28	2	1	11	1	8	2	40
12:45-1:00		15	14	41	22	5	2	7	2	6	5	33
1:00-1:15		14	13	38	21	4	2	7	2	6	5	33
1:15-1:30		14	12	34	20	3	2	6	1	6	5	33
1:30-1:45	1	13	12	31	20	3	2	6	1	7	4	32
1:45-2:00	1	13	11	27	19	2	2	5		7	4	32
2:00-2:15	1	12	10	24	18	1	2	5		7	4	32
2:15-2:30	1	16	13	33	16	5		7		9	5	39
2:30-2:45	2	25	22	35	30	2	12	30	8	12	9	56
2:45-3:00	2	31	29	34	23	5	6	13		8	5	29
3:00-3:15	2	25	36	28	18	6	4	13		11	4	31
3:15-3:30	9	13	13	38	16	3	3	12	6	10	10	46
3:30-3:45	6	18	18	37	20	2	4	14	6	11	8	50
3:45-4:00	4	24	24	37	24	2	4	15	5	11	6	53
4:00-4:15	1	29	29	36	28	1	5	17	5	12	4	57
4:15-4:30	2	35	27	36	38	1	6	12	5	14	2	57
4:30-4:45		37	37	44	32	1	4	10	2	15	1	74
4:45-5:00	1	33	41	40	28		5	8		12	2	39
5:00-5:15		31	31	45	30		4	3		5		55
5:15-5:30		29	24	22	24			5		5	1	50
5:30-5:45		17	12	29	20		2	1	1	6	2	39
5:45-6:00		11	6	22	20		1	3		7		34
6:00-6:15		11	8	19	18		1			6		32
6:15-6:30		9	8	22	12			1		14		25
6:30-6:45	1	16	12	15	13		1			10		21
6:45-7:00	1	5	5	11	16			1		6		23
TOTAL	72	987	1,044	1,996	1,118	171	112	317	60	502	218	1,579
AM PK HR	14	94	78	367	169	41	2	3	2	31	24	53
PM PK HR	4	134	134	156	126	3	20	47	12	53	9	227

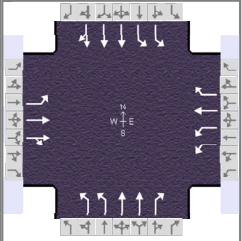
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 878 212
 837 254
 777 200
 715 212
 622 171
 568 194
 488 138
 459 119
 446 117
 430 114
 414 109
 398 106
 410 101
 423 98
 471 93
 559 118
 615 114
 672 146
 706 181
 708 174
 704 171
 715 180
 687 183
 649 170
 615 182
 565 152
 536 145
 507 136
 515 132
 626 123
 688 116
 750 144
 785 243
 736 185
 760 178
 806 179
 862 194
 925 209
 925 224
 905 235
 830 257
 702 209
 597 204
 488 160
 419 129
 379 104
 343 95
 91
 89
 68
 6:30-7:30 0.86
 4:00-5:00 0.90

**APPENDIX B
CAPACITY ANALYSES**

EXISTING CONDITIONS

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	FTG			Duration, h	0.250		
Analyst	FTG			Analysis Date	5/21/2024		
Jurisdiction	LaVergne, TN			Area Type	Other		
Urban Street	Waldron Road			PHF	0.93		
Intersection	Heil Quaker Blvd/Ingram...			Analysis Year	2024 (Existing)		
Project Description	11300			Analysis Period	1 > 7:00		
	File Name			1_exam.xus			



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	33	24	100	177	137	82	223	852	130	58	1133	93

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	5.2	5.3	66.4	4.2	4.4	10.5			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0			
				Red	2.0	0.0	2.0	2.0	0.0	2.0			

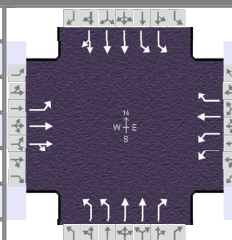
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	2.0	3.0	2.0	3.0	2.0	4.0
Phase Duration, s	10.2	16.5	14.6	20.9	16.5	77.7	11.2	72.4
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.2	3.1	3.2	3.1	0.0	3.1	0.0
Queue Clearance Time (g _s), s	4.1	9.8	8.4	10.8	10.0		4.1	
Green Extension Time (g _e), s	0.0	0.7	0.2	0.7	0.5	0.0	0.1	0.0
Phase Call Probability	0.69	1.00	1.00	1.00	1.00		0.87	
Max Out Probability	0.00	0.00	0.05	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	35	26	108	190	147	88	240	916	140	62	891	428
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900	1610	1757	1900	1610	1757	1809	1610	1757	1900	1823
Queue Service Time (g _s), s	2.1	1.5	7.8	6.4	8.8	5.8	8.0	16.4	3.8	2.1	16.4	16.4
Cycle Queue Clearance Time (g _c), s	2.1	1.5	7.8	6.4	8.8	5.8	8.0	16.4	3.8	2.1	16.4	16.4
Green Ratio (g/C)	0.12	0.09	0.09	0.07	0.12	0.17	0.09	0.60	0.67	0.04	0.55	0.55
Capacity (c), veh/h	166	166	141	251	236	271	309	2161	1077	154	2102	1009
Volume-to-Capacity Ratio (X)	0.214	0.155	0.763	0.759	0.624	0.326	0.777	0.424	0.130	0.406	0.424	0.424
Back of Queue (Q), ft/ln (95 th percentile)	43	32.5	147.2	128.9	190	104.1	161.1	267.7	57.9	41.7	285.1	282.1
Back of Queue (Q), veh/ln (95 th percentile)	1.7	1.3	5.9	5.2	7.6	4.2	6.4	10.7	2.3	1.7	11.4	11.3
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	47.3	50.6	53.5	54.7	49.9	43.9	53.6	13.0	7.2	55.9	15.6	15.6
Incremental Delay (d ₂), s/veh	0.2	0.2	3.2	1.8	1.0	0.3	1.6	0.6	0.2	0.6	0.6	1.3
Initial Queue Delay (d ₃), 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
Control Delay (d), s/veh	47.6	50.8	56.7	56.5	50.9	44.2	55.2	13.6	7.5	56.5	16.3	16.9
Level of Service (LOS)	D	D	E	E	D	D	E	B	A	E	B	B
Approach Delay, s/veh / LOS	53.9		D	52.0		D	20.7		C	18.3		B
Intersection Delay, s/veh / LOS	25.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.74	C	2.60	C	2.40	B	2.26	B
Bicycle LOS Score / LOS	0.63	A	1.19	A	1.56	B	1.25	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	FTG			Duration, h	0.250		
Analyst	FTG		Analysis Date	5/21/2024		Area Type	Other
Jurisdiction	LaVergne, TN		Time Period	PM Peak Hour		PHF	0.96
Urban Street	Waldron Road		Analysis Year	2024 (Existing)		Analysis Period	1 > 7:00
Intersection	Heil Quaker Blvd/Ingram...		File Name	1_expm.xus			
Project Description	11300						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	38	55	214	272	43	112	86	1295	98	53	931	41

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	5.0	0.6	59.3	4.4	1.5	19.1			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	4.0			
				Red	2.0	0.0	2.0	2.0	2.0	2.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	2.0	3.0	2.0	3.0	2.0	4.0
Phase Duration, s	10.4	25.1	17.9	32.6	11.7	66.0	11.0	65.3
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.3	3.1	3.3	3.1	0.0	3.1	0.0
Queue Clearance Time (g _s), s	4.2	18.2	11.5	8.9	5.0		3.8	
Green Extension Time (g _e), s	0.0	0.9	0.4	0.9	0.2	0.0	0.1	0.0
Phase Call Probability	0.73	1.00	1.00	1.00	0.95		0.84	
Max Out Probability	0.00	0.00	0.01	0.00	0.00		0.00	

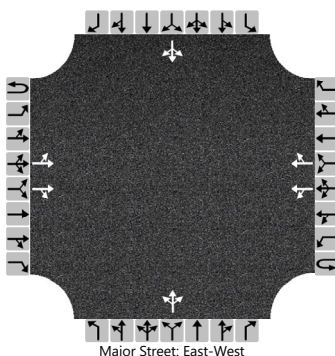
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	40	57	223	283	45	117	90	1349	102	55	680	333
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900	1610	1757	1900	1610	1757	1809	1610	1757	1900	1857
Queue Service Time (g _s), s	2.2	3.1	16.2	9.5	2.3	6.9	3.0	35.7	3.3	1.8	13.2	13.3
Cycle Queue Clearance Time (g _c), s	2.2	3.1	16.2	9.5	2.3	6.9	3.0	35.7	3.3	1.8	13.2	13.3
Green Ratio (g/C)	0.20	0.16	0.16	0.10	0.22	0.26	0.05	0.50	0.60	0.04	0.49	0.49
Capacity (c), veh/h	346	302	256	349	421	425	167	1808	965	148	1878	918
Volume-to-Capacity Ratio (X)	0.114	0.190	0.871	0.812	0.106	0.275	0.537	0.746	0.106	0.373	0.362	0.363
Back of Queue (Q), ft/ln (95 th percentile)	43.4	66.7	273.9	190	47.4	122	60.3	543.2	52.8	36.9	244.5	245.7
Back of Queue (Q), veh/ln (95 th percentile)	1.7	2.7	11.0	7.6	1.9	4.9	2.4	21.7	2.1	1.5	9.8	9.8
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	39.7	43.8	49.3	52.9	37.2	35.1	55.9	23.9	10.3	55.9	18.7	18.7
Incremental Delay (d ₂), s/veh	0.1	0.1	3.6	1.7	0.0	0.1	1.0	2.9	0.2	0.6	0.5	1.1
Initial Queue Delay (d ₃), 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
Control Delay (d), s/veh	39.7	43.9	52.9	54.7	37.3	35.2	56.9	26.8	10.5	56.5	19.2	19.8
Level of Service (LOS)	D	D	D	D	D	D	E	C	B	E	B	B
Approach Delay, s/veh / LOS	49.6		D	47.8		D	27.5		C	21.3		C
Intersection Delay, s/veh / LOS	30.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.73	C	2.60	C	2.42	B	2.27	B
Bicycle LOS Score / LOS	0.75	A	1.22	A	1.76	B	1.07	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / Middle Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2024			North/South Street	Middle Ingram Driveway		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.87		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Existing)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	122	47		14	410	0		31	0	5		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

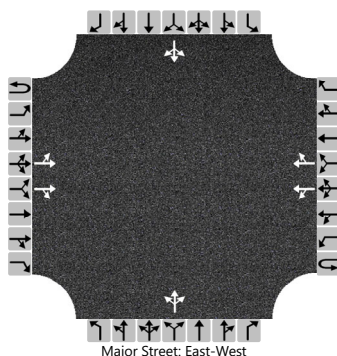
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				16					41					0
Capacity, c (veh/h)		1101				1391					538					0
v/c Ratio		0.00				0.01					0.08					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.2					
Control Delay (s/veh)		8.3	0.0			7.6	0.1				12.3					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.3				12.3						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / Middle Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2024			North/South Street	Middle Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.93		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Existing)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	268	8		2	366	0		45	0	10		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

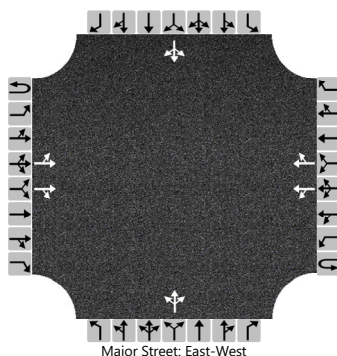
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				2					59				0	
Capacity, c (veh/h)		1176				1276					506				0	
v/c Ratio		0.00				0.00					0.12					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.4					
Control Delay (s/veh)		8.1	0.0			7.8	0.0				13.1					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.1				13.1						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / East Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2024			North/South Street	East Ingram Driveway		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.88		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Existing)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	122	5		42	419	0		5	0	3		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

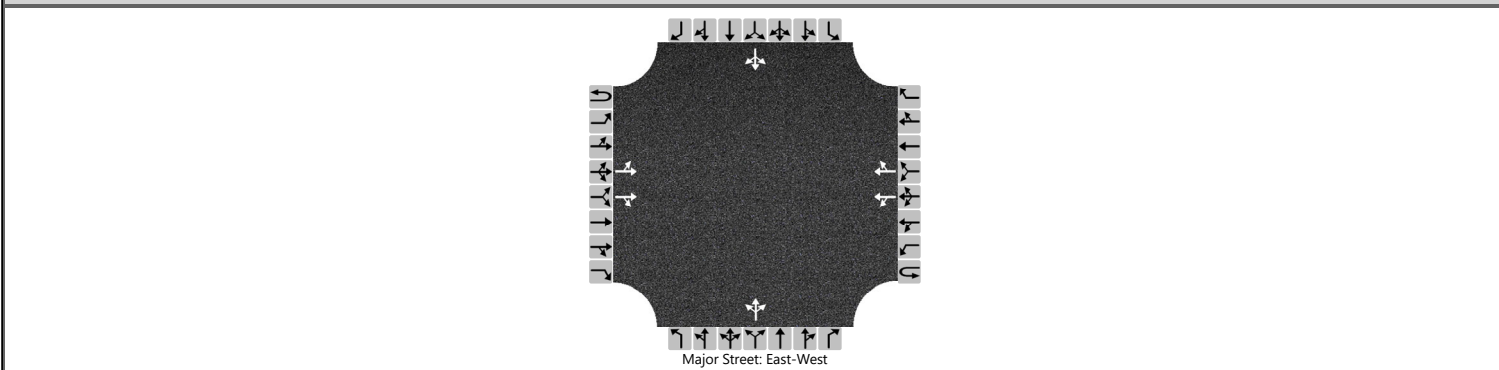
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				48					9					0
Capacity, c (veh/h)		1097				1450					574					0
v/c Ratio		0.00				0.03					0.02					
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.0					
Control Delay (s/veh)		8.3	0.0			7.6	0.2				11.4					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.9				11.4						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / East Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2024			North/South Street	East Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.93		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Existing)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	278	0		3	361	0		7	0	11		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

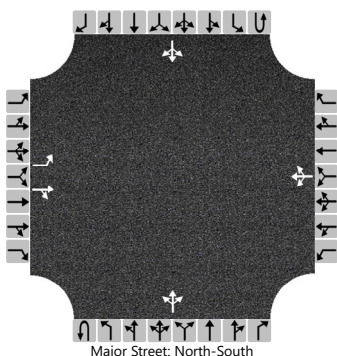
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				3					19					0
Capacity, c (veh/h)		1181				1274					646					0
v/c Ratio		0.00				0.00					0.03					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1					
Control Delay (s/veh)		8.0	0.0			7.8	0.0				10.7					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.1				10.7						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Mason Road/Ingram Blvd		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2024			North/South Street	Mason Road		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.86		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Existing)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	10	11	12		7	8	9		1U	1	2	3	4U	4	5	6
Number of Lanes	1	1	0		0	1	0		0	0	1	0	0	0	1	0
Configuration		L		TR			LTR				LTR				LTR	
Volume (veh/h)	36	28	61		2	3	2		378	169	41		14	94	80	
Percent Heavy Vehicles (%)	0	0	0		0	0	0		0				0			
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

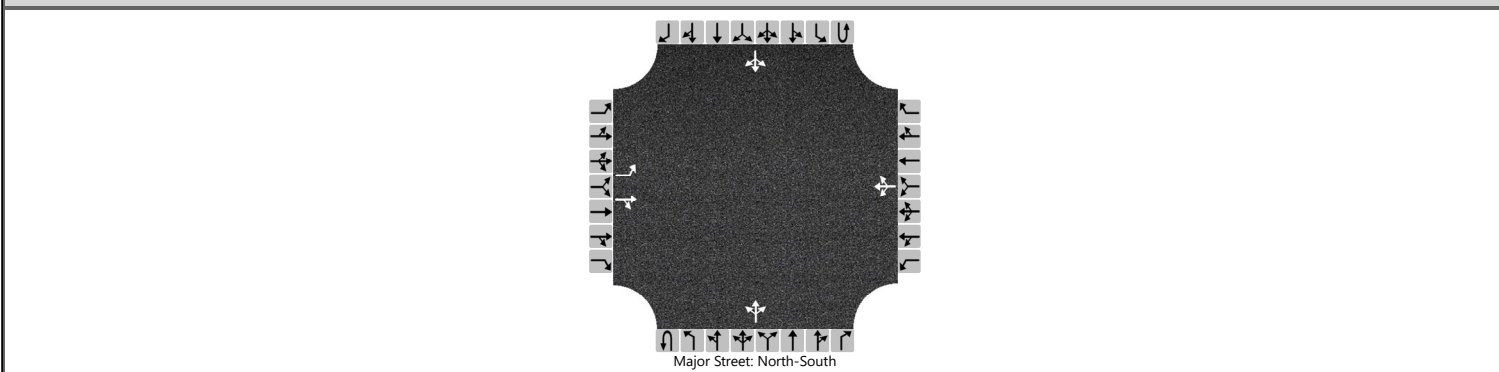
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		42		103			8			440				16			
Capacity, c (veh/h)		86		254			102			1382				1334			
v/c Ratio		0.49		0.41			0.08			0.32				0.01			
95% Queue Length, Q ₉₅ (veh)		2.1		1.9			0.3			1.4				0.0			
Control Delay (s/veh)		81.9		28.5			43.2			8.8	3.3	3.3		7.7	0.1	0.1	
Level of Service (LOS)		F		D			E			A	A	A		A	A	A	
Approach Delay (s/veh)		43.9				43.2				6.8				0.7			
Approach LOS		E				E				A				A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Mason Road/Ingram Blvd		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2024			North/South Street	Mason Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.90		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Existing)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration		L		TR			LTR				LTR				LTR	
Volume (veh/h)		53	9	227		20	51	12		168	126	3		4	134	145
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

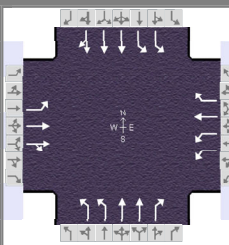
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		59		262			92			187				4		
Capacity, c (veh/h)		207		761			240			1262				1452		
v/c Ratio		0.28		0.34			0.38			0.15				0.00		
95% Queue Length, Q ₉₅ (veh)		1.1		1.5			1.7			0.5				0.0		
Control Delay (s/veh)		29.2		12.2			29.0			8.3	1.3	1.3		7.5	0.0	0.0
Level of Service (LOS)		D		B			D			A	A	A		A	A	A
Approach Delay (s/veh)		15.3				29.0				5.3				0.1		
Approach LOS		C				D				A				A		

BACKGROUND CONDITIONS

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	FTG			Duration, h	0.250		
Analyst	FTG		Analysis Date	5/21/2024		Area Type	Other
Jurisdiction	LaVergne, TN		Time Period	AM Peak Hour		PHF	0.93
Urban Street	Waldron Road		Analysis Year	2026 (Back)		Analysis Period	1 > 7:00
Intersection	Heil Quaker Blvd/Ingram...		File Name	1_bgam.xus			
Project Description	11300						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	36	26	110	195	151	90	245	937	143	64	1246	102

Signal Information				Signal Phases							
Cycle, s	120.0	Reference Phase	2								
Offset, s	0	Reference Point	End	Green	5.4	5.9	64.2	4.3	4.9	11.2	
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	0.0	2.0	

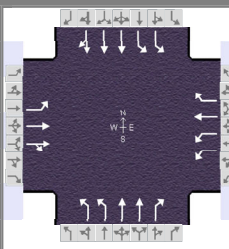
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	2.0	3.0	2.0	3.0	2.0	4.0
Phase Duration, s	10.3	17.2	15.3	22.1	17.3	76.1	11.4	70.2
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.2	3.1	3.2	3.1	0.0	3.1	0.0
Queue Clearance Time (g _s), s	4.3	10.6	9.0	11.7	10.8		4.3	
Green Extension Time (g _e), s	0.0	0.6	0.3	0.7	0.5	0.0	0.1	0.0
Phase Call Probability	0.72	1.00	1.00	1.00	1.00		0.90	
Max Out Probability	0.00	0.04	0.01	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	39	28	118	210	162	97	263	1008	154	69	979	470
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900	1610	1757	1900	1610	1757	1809	1610	1757	1900	1823
Queue Service Time (g _s), s	2.3	1.6	8.6	7.0	9.7	6.3	8.8	19.2	4.3	2.3	19.4	19.4
Cycle Queue Clearance Time (g _c), s	2.3	1.6	8.6	7.0	9.7	6.3	8.8	19.2	4.3	2.3	19.4	19.4
Green Ratio (g/C)	0.13	0.09	0.09	0.08	0.13	0.18	0.09	0.58	0.66	0.04	0.54	0.54
Capacity (c), veh/h	171	177	150	272	255	289	330	2114	1066	158	2034	976
Volume-to-Capacity Ratio (X)	0.226	0.158	0.788	0.772	0.636	0.335	0.797	0.477	0.144	0.436	0.481	0.481
Back of Queue (Q), ft/ln (95 th percentile)	46.6	35	162.3	141.8	204.3	113	177.2	307.2	66.1	46.1	328.6	325.4
Back of Queue (Q), veh/ln (95 th percentile)	1.9	1.4	6.5	5.7	8.2	4.5	7.1	12.3	2.6	1.8	13.1	13.0
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	46.7	50.1	53.2	54.3	49.2	43.0	53.2	14.4	7.6	55.8	17.4	17.4
Incremental Delay (d ₂), s/veh	0.2	0.2	3.4	1.8	1.0	0.3	1.7	0.8	0.3	0.7	0.8	1.7
Initial Queue Delay (d ₃), 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
Control Delay (d), s/veh	46.9	50.2	56.7	56.1	50.1	43.2	54.9	15.1	7.9	56.5	18.3	19.1
Level of Service (LOS)	D	D	E	E	D	D	D	B	A	E	B	B
Approach Delay, s/veh / LOS	53.7		D	51.4		D	21.7		C	20.3		C
Intersection Delay, s/veh / LOS	26.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.74	C	2.60	C	2.40	B	2.26	B
Bicycle LOS Score / LOS	0.64	A	1.26	A	1.66	B	1.32	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	FTG			Duration, h	0.250		
Analyst	FTG			Analysis Date	5/21/2024		
Jurisdiction	LaVergne, TN			Area Type	Other		
Urban Street	Waldron Road			PHF	0.96		
Intersection	Heil Quaker Blvd/Ingram...			Analysis Year	2026 (Back)		
Project Description	11300			Analysis Period	1 > 7:00		
	File Name			1_bgpm.xus			



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	42	61	235	299	47	123	95	1425	108	58	1024	45

Signal Information				Signal Phases									
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	5.2	0.6	56.5	4.6	2.3	20.8			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	4.0	4.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	2.0	2.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	2.0	3.0	2.0	3.0	2.0	4.0
Phase Duration, s	10.6	26.8	18.9	35.1	11.8	63.1	11.2	62.5
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.3	3.1	3.3	3.1	0.0	3.1	0.0
Queue Clearance Time (g _s), s	4.3	19.8	12.4	9.4	5.3		4.0	
Green Extension Time (g _e), s	0.1	1.0	0.5	1.0	0.2	0.0	0.1	0.0
Phase Call Probability	0.77	1.00	1.00	1.00	0.96		0.87	
Max Out Probability	0.00	0.00	0.01	0.00	0.00		0.00	

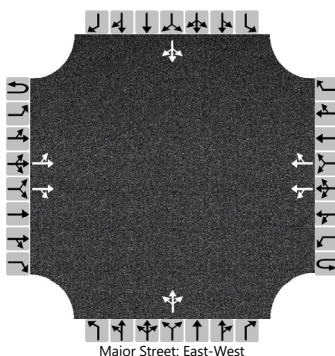
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	44	64	245	311	49	128	99	1484	113	60	748	366
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900	1610	1757	1900	1610	1757	1809	1610	1757	1900	1857
Queue Service Time (g _s), s	2.3	3.4	17.8	10.4	2.4	7.4	3.3	43.8	3.8	2.0	15.5	15.6
Cycle Queue Clearance Time (g _c), s	2.3	3.4	17.8	10.4	2.4	7.4	3.3	43.8	3.8	2.0	15.5	15.6
Green Ratio (g/C)	0.21	0.17	0.17	0.11	0.24	0.29	0.05	0.48	0.58	0.04	0.47	0.47
Capacity (c), veh/h	368	329	279	378	461	460	169	1721	939	152	1790	875
Volume-to-Capacity Ratio (X)	0.119	0.193	0.878	0.824	0.106	0.278	0.585	0.862	0.120	0.397	0.418	0.418
Back of Queue (Q), ft/ln (95 th percentile)	46.9	72.8	294.2	204.9	50.3	130.3	66.8	669.4	61.6	40.4	281.5	282.6
Back of Queue (Q), veh/ln (95 th percentile)	1.9	2.9	11.8	8.2	2.0	5.2	2.7	26.8	2.5	1.6	11.3	11.3
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	38.2	42.4	48.4	52.4	35.3	33.2	55.9	28.0	11.2	55.9	20.9	20.9
Incremental Delay (d ₂), s/veh	0.1	0.1	3.5	2.0	0.0	0.1	1.2	6.0	0.3	0.6	0.7	1.5
Initial Queue Delay (d ₃), 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
Control Delay (d), s/veh	38.3	42.5	51.9	54.4	35.4	33.4	57.1	33.9	11.5	56.5	21.6	22.4
Level of Service (LOS)	D	D	D	D	D	C	E	C	B	E	C	C
Approach Delay, s/veh / LOS	48.5		D	47.0		D	33.8		C	23.7		C
Intersection Delay, s/veh / LOS	33.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.73	C	2.59	C	2.42	B	2.27	B
Bicycle LOS Score / LOS	0.78	A	1.29	A	1.89	B	1.13	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / Middle Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Middle Ingram Driveway		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.87		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Back)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	134	52		15	451	0		34	0	6		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

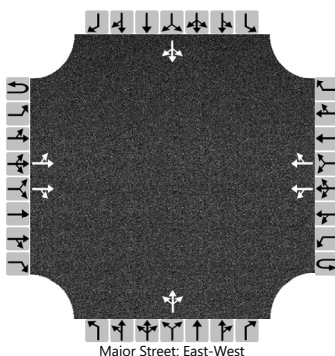
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				17					46				0	
Capacity, c (veh/h)		1058				1368					506				0	
v/c Ratio		0.00				0.01					0.09					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.3					
Control Delay (s/veh)		8.4	0.0			7.7	0.1				12.8					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.3				12.8						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / Middle Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Middle Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.93		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Back)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	295	9		2	403	0		50	0	11		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

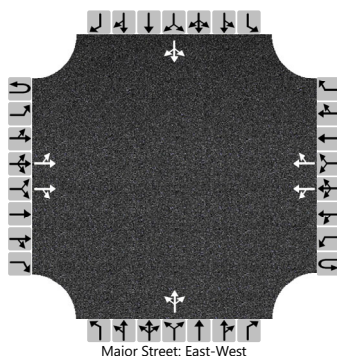
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				2					66					0
Capacity, c (veh/h)		1137				1244					469					0
v/c Ratio		0.00				0.00					0.14					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.5					
Control Delay (s/veh)		8.2	0.0			7.9	0.0				13.9					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.1				13.9						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG	Intersection	Ingram Blvd / East Driveway				
Agency/Co.	FTG	Jurisdiction	LaVergne, TN				
Date Performed	May 2024	East/West Street	Ingram Boulevard				
Analysis Year	2026	North/South Street	East Ingram Driveway				
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.88				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	11300 (Back)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	134	6		46	461	0		5	0	3		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

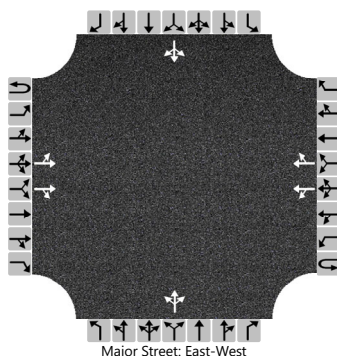
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				52				9				0		
Capacity, c (veh/h)		1053				1433				537				0		
v/c Ratio		0.00				0.04				0.02						
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				0.1						
Control Delay (s/veh)		8.4	0.0			7.6	0.3			11.8						
Level of Service (LOS)		A	A			A	A			B						
Approach Delay (s/veh)	0.0				0.9				11.8							
Approach LOS	A				A				B							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / East Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	East Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.93		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Back)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0	
Configuration		LT		TR		LT		TR			LTR				LTR		
Volume (veh/h)		0	306	0		4	397	0		8	0	12		0	0	0	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

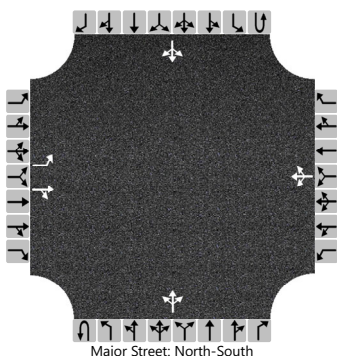
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				4					22					0
Capacity, c (veh/h)		1143				1242					605					0
v/c Ratio		0.00				0.00					0.04					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1					
Control Delay (s/veh)		8.1	0.0			7.9	0.0				11.2					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.1				11.2						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Mason Road/Ingram Blvd		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Mason Road		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.86		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Back)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	10	11	12		7	8	9		1U	1	2	3	4U	4	5	6
Number of Lanes	1	1	0		0	1	0		0	0	1	0	0	0	1	0
Configuration	L		TR			LTR					LTR				LTR	
Volume (veh/h)	40	30	67		2	3	2		416	186	45		15	103	88	
Percent Heavy Vehicles (%)	0	0	0		0	0	0		0				0			
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

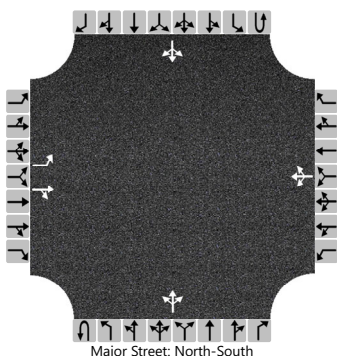
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		47		113			8			484				17		
Capacity, c (veh/h)		64		206			72			1359				1307		
v/c Ratio		0.73		0.55			0.11			0.36				0.01		
95% Queue Length, Q ₉₅ (veh)		3.2		2.9			0.4			1.6				0.0		
Control Delay (s/veh)		149.4		41.7			61.2			9.1	3.8	3.8		7.8	0.1	0.1
Level of Service (LOS)		F		E			F			A	A	A		A	A	A
Approach Delay (s/veh)		73.1				61.2				7.2				0.7		
Approach LOS		F				F				A				A		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Mason Road/Ingram Blvd		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Mason Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.90		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Back)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration		L		TR			LTR				LTR				LTR	
Volume (veh/h)		58	10	250		22	56	13		185	139	3		4	147	160
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

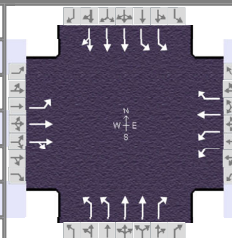
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		64		289			101			206				4		
Capacity, c (veh/h)		168		731			202			1229				1434		
v/c Ratio		0.38		0.40			0.50			0.17				0.00		
95% Queue Length, Q ₉₅ (veh)		1.7		1.9			2.5			0.6				0.0		
Control Delay (s/veh)		39.3		13.1			39.5			8.5	1.6	1.6		7.5	0.0	0.0
Level of Service (LOS)		E		B			E			A	A	A		A	A	A
Approach Delay (s/veh)		17.9				39.5				5.5				0.1		
Approach LOS		C				E				A				A		

TOTAL PROJECTED CONDITIONS

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	FTG			Duration, h	0.250		
Analyst	FTG		Analysis Date	5/21/2024		Area Type	Other
Jurisdiction	LaVergne, TN		Time Period	AM Peak Hour		PHF	0.93
Urban Street	Waldron Road		Analysis Year	2026 (Total)		Analysis Period	1 > 7:00
Intersection	Heil Quaker Blvd/Ingram...		File Name	1_fuam.xus			
Project Description	11300						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	36	26	110	288	151	133	245	937	244	110	1246	102

Signal Information				Signal Phases								
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
Green	6.0	5.4	60.5	4.3	2.5	11.2						
Yellow	4.0	0.0	4.0	4.0	4.0	4.0						
Red	2.0	0.0	2.0	2.0	2.0	2.0						

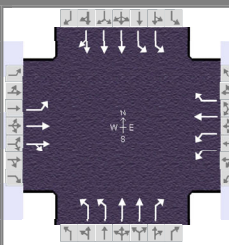
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	2.0	3.0	2.0	3.0	2.0	4.0
Phase Duration, s	10.3	17.2	18.9	25.7	17.4	71.9	12.0	66.5
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.2	3.1	3.2	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s	4.3	10.6	12.4	11.4	10.8		6.0	
Green Extension Time (g_e), s	0.0	0.6	0.5	0.8	0.6	0.0	0.2	0.0
Phase Call Probability	0.72	1.00	1.00	1.00	1.00		0.98	
Max Out Probability	0.00	0.13	0.00	0.00	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	39	28	118	310	162	143	263	1008	262	118	979	470
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900	1610	1757	1900	1610	1757	1809	1610	1757	1900	1823
Queue Service Time (g_s), s	2.3	1.6	8.6	10.4	9.4	9.2	8.8	20.9	8.0	4.0	20.7	20.7
Cycle Queue Clearance Time (g_c), s	2.3	1.6	8.6	10.4	9.4	9.2	8.8	20.9	8.0	4.0	20.7	20.7
Green Ratio (g/C)	0.13	0.09	0.09	0.11	0.16	0.21	0.10	0.55	0.66	0.05	0.50	0.50
Capacity (c), veh/h	212	177	150	377	312	345	335	1987	1057	176	1916	919
Volume-to-Capacity Ratio (X)	0.182	0.158	0.787	0.821	0.520	0.414	0.787	0.507	0.248	0.672	0.511	0.511
Back of Queue (Q), ft/ln (95 th percentile)	46.4	34.9	164.2	203.4	197.3	164	176.5	334.2	124.9	80.4	352.1	349
Back of Queue (Q), veh/ln (95 th percentile)	1.9	1.4	6.6	8.1	7.9	6.6	7.1	13.4	5.0	3.2	14.1	14.0
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	46.5	50.1	53.2	52.4	45.8	40.6	53.1	16.9	8.5	56.0	19.9	19.9
Incremental Delay (d_2), s/veh	0.2	0.2	4.5	1.7	0.5	0.3	1.6	0.9	0.6	1.7	1.0	2.0
Initial Queue Delay (d_3), 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
Control Delay (d), s/veh	46.6	50.2	57.8	54.1	46.3	40.9	54.7	17.8	9.0	57.7	20.9	21.9
Level of Service (LOS)	D	D	E	D	D	D	D	B	A	E	C	C
Approach Delay, s/veh / LOS	54.3		D	49.0		D	22.7		C	24.0		C
Intersection Delay, s/veh / LOS	28.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.74	C	2.60	C	2.41	B	2.27	B
Bicycle LOS Score / LOS	0.64	A	1.50	B	1.75	B	1.35	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	FTG			Duration, h	0.250		
Analyst	FTG		Analysis Date	5/21/2024		Area Type	Other
Jurisdiction	LaVergne, TN		Time Period	PM Peak Hour		PHF	0.96
Urban Street	Waldron Road		Analysis Year	2026 (Total)		Analysis Period	1 > 7:00
Intersection	Heil Quaker Blvd/Ingram...		File Name	1_fupm.xus			
Project Description	11300						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	42	61	235	369	47	155	95	1425	175	89	1024	45

Signal Information				Signal Timing (s)										
Cycle, s	120.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	No	Simult. Gap E/W	On	Green	5.8	53.6	4.6	5.1	20.9	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0				
				Red	2.0	2.0	2.0	2.0	2.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	2.0	3.0	2.0	3.0	2.0	4.0
Phase Duration, s	10.6	26.9	21.7	38.0	11.8	59.7	11.7	59.6
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	3.1	3.3	3.1	3.3	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s	4.3	19.8	14.8	11.2	5.3		5.1	
Green Extension Time (g_e), s	0.1	1.1	0.9	1.1	0.2	0.0	0.2	0.0
Phase Call Probability	0.77	1.00	1.00	1.00	0.96		0.95	
Max Out Probability	0.00	0.00	0.00	0.00	0.00		0.00	

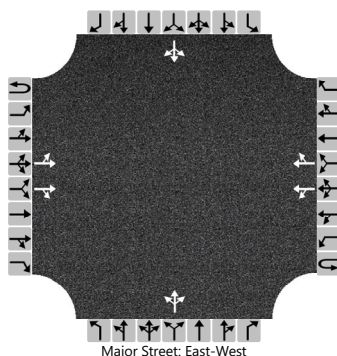
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	44	64	245	384	49	161	99	1484	182	93	748	366
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900	1610	1757	1900	1610	1757	1809	1610	1757	1900	1857
Queue Service Time (g_s), s	2.3	3.4	17.8	12.8	2.3	9.2	3.3	46.1	6.5	3.1	16.3	16.3
Cycle Queue Clearance Time (g_c), s	2.3	3.4	17.8	12.8	2.3	9.2	3.3	46.1	6.5	3.1	16.3	16.3
Green Ratio (g/C)	0.21	0.17	0.17	0.13	0.27	0.31	0.05	0.45	0.58	0.05	0.45	0.45
Capacity (c), veh/h	369	330	280	460	506	506	169	1619	931	168	1699	830
Volume-to-Capacity Ratio (X)	0.119	0.192	0.874	0.836	0.097	0.319	0.585	0.917	0.196	0.553	0.440	0.441
Back of Queue (Q), ft/ln (95 th percentile)	46.8	72.7	293.7	239.7	48.5	160.3	66.8	727.2	106.4	62.4	294.3	295.7
Back of Queue (Q), veh/ln (95 th percentile)	1.9	2.9	11.7	9.6	1.9	6.4	2.7	29.1	4.3	2.5	11.8	11.8
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	38.2	42.4	48.3	50.9	33.1	31.4	55.9	31.1	12.0	55.9	22.8	22.8
Incremental Delay (d_2), s/veh	0.1	0.1	3.4	1.6	0.0	0.1	1.2	9.7	0.5	1.1	0.8	1.7
Initial Queue Delay (d_3), 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
Control Delay (d), s/veh	38.2	42.5	51.7	52.5	33.2	31.5	57.1	40.8	12.5	56.9	23.7	24.5
Level of Service (LOS)	D	D	D	D	C	C	E	D	B	E	C	C
Approach Delay, s/veh / LOS	48.3		D	45.2		D	38.8		D	26.5		C
Intersection Delay, s/veh / LOS	36.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.73	C	2.59	C	2.43	B	2.27	B
Bicycle LOS Score / LOS	0.78	A	1.47	A	1.94	B	1.15	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / Middle Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Middle Ingram Driveway		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.87		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	168	52		15	488	0		34	0	6		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

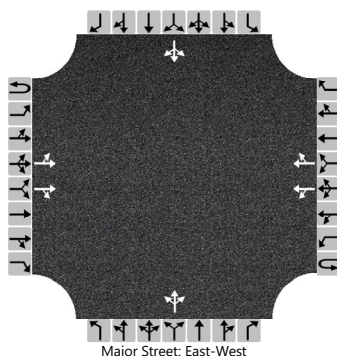
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				17				46				0		
Capacity, c (veh/h)		1020				1324				461				0		
v/c Ratio		0.00				0.01				0.10						
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.3						
Control Delay (s/veh)		8.5	0.0			7.8	0.1			13.7						
Level of Service (LOS)		A	A			A	A			B						
Approach Delay (s/veh)	0.0				0.3				13.7							
Approach LOS	A				A				B							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / Middle Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Middle Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.93		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	321	9		2	428	0		50	0	11		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

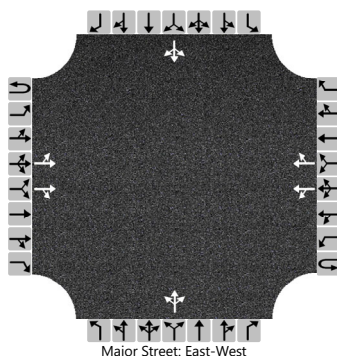
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				2					66					0
Capacity, c (veh/h)		1111				1215					440					0
v/c Ratio		0.00				0.00					0.15					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.5					
Control Delay (s/veh)		8.2	0.0			8.0	0.0				14.6					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.1				14.6						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / East Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	East Ingram Driveway		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.88		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	168	6		46	498	0		5	0	3		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

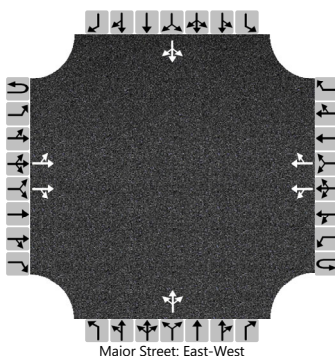
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				52					9					0
Capacity, c (veh/h)		1016				1387					493					0
v/c Ratio		0.00				0.04					0.02					
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.1					
Control Delay (s/veh)		8.5	0.0			7.7	0.3				12.4					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.9				12.4						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / East Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	East Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.93		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		0	332	0		4	422	0		8	0	12		0	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

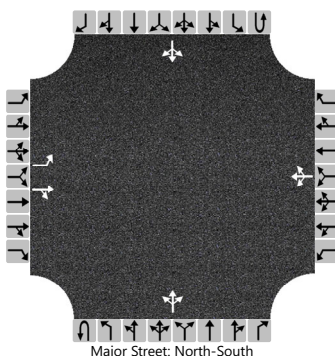
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				4					22					0
Capacity, c (veh/h)		1118				1213					577					0
v/c Ratio		0.00				0.00					0.04					
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1					
Control Delay (s/veh)		8.2	0.0			8.0	0.0				11.5					
Level of Service (LOS)		A	A			A	A				B					
Approach Delay (s/veh)		0.0				0.1				11.5						
Approach LOS		A				A				B						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Mason Road/Ingram Blvd		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Mason Road		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.86		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	10	11	12		7	8	9		1U	1	2	3	4U	4	5	6
Number of Lanes	1	1	0		0	1	0		0	0	1	0	0	0	1	0
Configuration	L		TR				LTR				LTR				LTR	
Volume (veh/h)	49	30	92		2	3	2		444	186	45		15	103	97	
Percent Heavy Vehicles (%)	0	0	0		0	0	0		0				0			
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

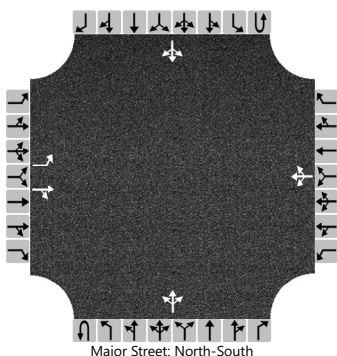
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		57		142			8			516				17		
Capacity, c (veh/h)		54		216			56			1347				1307		
v/c Ratio		1.06		0.66			0.14			0.38				0.01		
95% Queue Length, Q ₉₅ (veh)		4.8		4.0			0.5			1.8				0.0		
Control Delay (s/veh)		265.4		49.0			79.7			9.3	4.2	4.2		7.8	0.1	0.1
Level of Service (LOS)		F		E			F			A	A	A		A	A	A
Approach Delay (s/veh)		111.0				79.7				7.6				0.7		
Approach LOS		F				F				A				A		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Mason Road/Ingram Blvd		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	Mason Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.90		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		1	1	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration		L		TR			LTR				LTR				LTR		
Volume (veh/h)		65	10	269		22	56	13		203	139	3		4	147	167	
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.10		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.20		

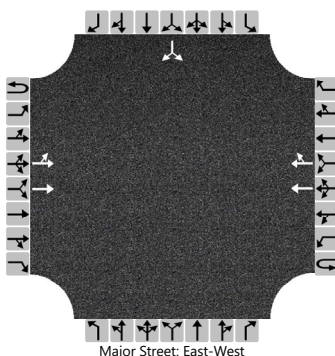
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		72		310				101				226			4		
Capacity, c (veh/h)		149		725				180				1221			1434		
v/c Ratio		0.48		0.43				0.56				0.18			0.00		
95% Queue Length, Q ₉₅ (veh)		2.3		2.2				3.0				0.7			0.0		
Control Delay (s/veh)		49.9		13.6				47.9				8.6	1.7	1.7	7.5	0.0	
Level of Service (LOS)		E		B				E				A	A	A	A	A	
Approach Delay (s/veh)		20.5				47.9				5.8				0.1			
Approach LOS		C				E				A				A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / West Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	West Ingram Driveway		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.70		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		LT	T				T	TR							LR	
Volume (veh/h)		147	186				485	37						34		136
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

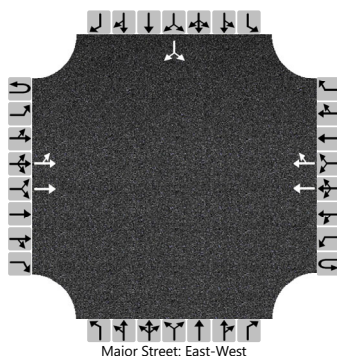
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		210														243
Capacity, c (veh/h)		871														341
v/c Ratio		0.24														0.71
95% Queue Length, Q ₉₅ (veh)		0.9														5.2
Control Delay (s/veh)		10.4	1.1													38.0
Level of Service (LOS)		B	A													E
Approach Delay (s/veh)		5.2												38.0		
Approach LOS		A												E		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	FTG			Intersection	Ingram Blvd / West Driveway		
Agency/Co.	FTG			Jurisdiction	LaVergne, TN		
Date Performed	May 2024			East/West Street	Ingram Boulevard		
Analysis Year	2026			North/South Street	West Ingram Driveway		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.70		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	11300 (Total)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		LT	T				T	TR							LR	
Volume (veh/h)		98	304				453	25						26		102
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		140														183	
Capacity, c (veh/h)		920														401	
v/c Ratio		0.15														0.46	
95% Queue Length, Q ₉₅ (veh)		0.5														2.3	
Control Delay (s/veh)		9.6	1.0													21.3	
Level of Service (LOS)		A	A													C	
Approach Delay (s/veh)		3.1												21.3			
Approach LOS		A												C			

**APPENDIX C
TRIP GENERATION**

TRIP GENERATION CALCULATIONS – Charter School

The following calculations are based on the data compiled for ITE Land Use Code 536.

Average Daily Traffic

$$T = 1.85 (X)$$

$$T = 1.85 (340)$$

$$T = 630 \text{ vehicles}$$

$$\text{Enter} = 0.50 (630) = 315 \text{ vehicles}$$

$$\text{Exit} = 0.50 (630) = 315 \text{ vehicles}$$

AM traffic during peak hour of adjacent street

$$T = 1.05 (X) - 2.46$$

$$T = 1.05 (340) - 2.46$$

$$T = 355 \text{ vehicles}$$

$$\text{Enter} = 0.52 (355) = 184 \text{ vehicles}$$

$$\text{Exit} = 0.48 (355) = 170 \text{ vehicles}$$

PM traffic during peak hour of adjacent street

$$\ln(T) = 0.92 \ln(X) + 0.16$$

$$\ln(T) = 0.92 \ln(340) + 0.16$$

$$T = 251 \text{ vehicles}$$

$$\text{Enter} = 0.49 (251) = 123 \text{ vehicles}$$

$$\text{Exit} = 0.51 (251) = 128 \text{ vehicles}$$

**APPENDIX D
TRAFFIC SIGNAL WARRANTS**

The Federal Highway Administration has published the Manual on Uniform Traffic Control Devices 2009 (MUTCD 2009), which includes eight traffic signal warrants that help traffic engineering professionals to identify when a traffic signal installation is justified at a particular location. These eight warrants include minimum conditions that are compared to existing or projected traffic conditions, and typically, traffic signals should not be installed unless at least one of the MUTCD warrants is met. Of the eight total signal warrants, the following are relevant to the intersection considered as part of this study:

Warrant 1, Eight-Hour Vehicular Volume

The Minimum Vehicular Volume, Condition A, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. The Interruption of Continuous Traffic, Condition B, is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exists for each of any eight hours of an average day:

- A. The vehicles per hour given in both of the 100% columns of Condition A in Table D1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection, or
- B. The vehicles per hour given in both of the 100% columns of Condition B in Table D1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection.

In applying each condition, the major street and minor street volumes shall be for the same eight hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these eight hours.

Option: If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70% columns in Table D1 may be used in place of the 100% columns.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that both of the following conditions exists for each of any eight hours of an average day:

- A. The vehicles per hour given in both of the 80% columns of Condition A in Table D1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection, and
- B. The vehicles per hour given in both of the 80% columns of Condition B in Table D1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection.

These major street and minor street volumes shall be for the same eight hours for each condition; however, the eight hours satisfied in Condition A shall not be required to be the same eight hours satisfied in Condition B. On the minor street, the higher volume shall not be required to be on the same approach during each of these eight hours.

TABLE D1. WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

CONDITION A – MINIMUM VEHICULAR VOLUME							
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor street approach (one direction only)		
Major Street	Minor Street	100%	80%	70%	100%	80%	70%
1 lane	1 lane	500	400	350	150	120	105
2 or more lanes	1 lane	600	480	420	150	120	105
2 or more lanes	2 or more lanes	600	480	420	200	160	140
1 lane	2 or more lanes	500	400	350	200	160	140

CONDITION B – INTERRUPTION OF CONTINUOUS TRAFFIC							
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor street approach (one direction only)		
Major Street	Minor Street	100%	80%	70%	100%	80%	70%
1 lane	1 lane	750	600	525	75	60	53
2 or more lanes	1 lane	900	720	630	75	60	53
2 or more lanes	2 or more lanes	900	720	630	100	80	70
1 lane	2 or more lanes	750	600	525	100	80	70

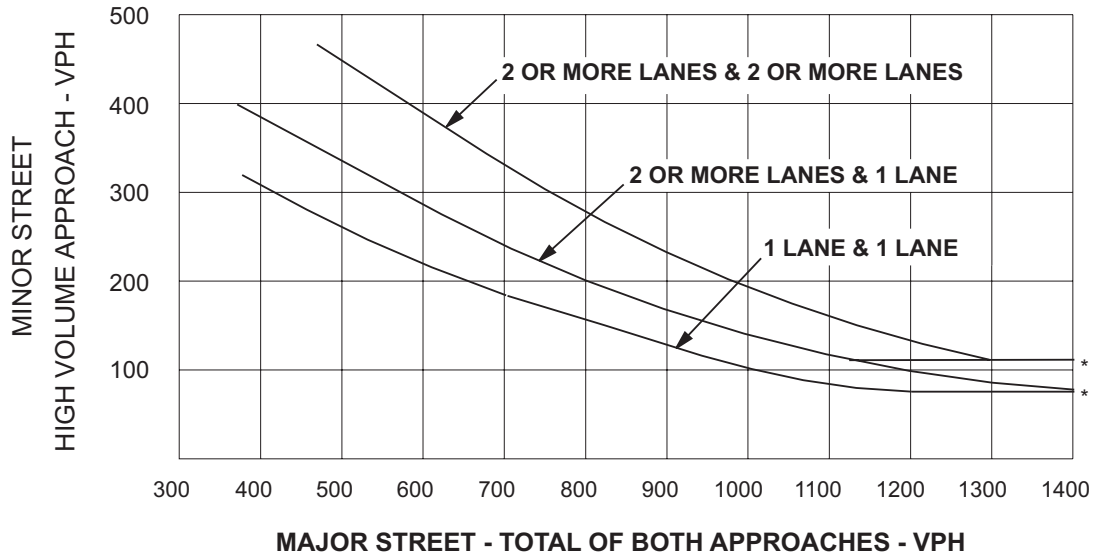
Warrant 2, Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that for each of any four hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the applicable curve in Figure D1-Graph A for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these four hours.

Option: If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure D1-Graph B may be used in place of Figure D1-Graph A.

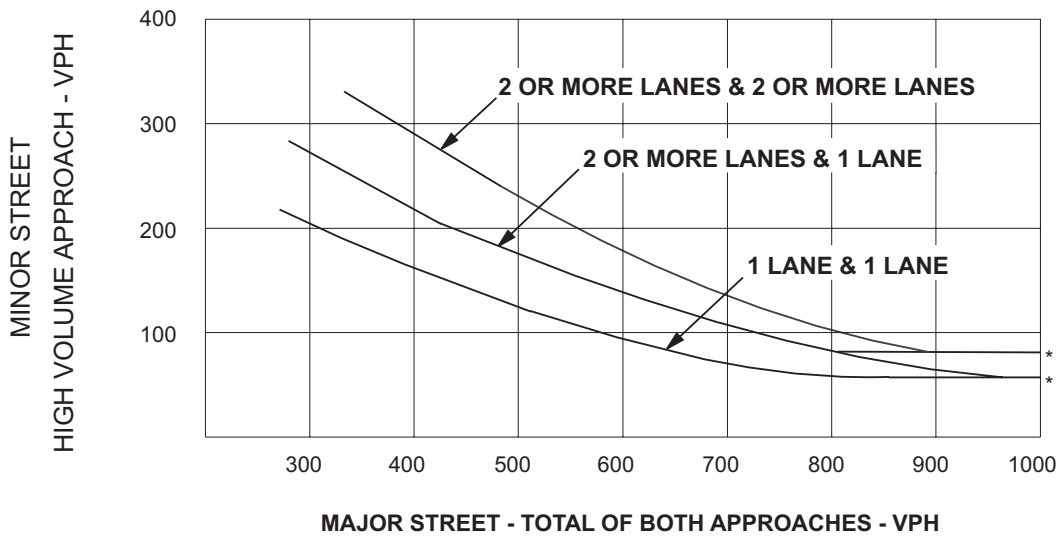
GRAPH A: FOUR HOUR VOLUME WARRANT



*NOTE: 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

GRAPH B: FOUR HOUR VOLUME WARRANT

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Warrant 2 - Four Hour Vehicular Volume