Town of Thompson's Station
Municipal Planning Commission
Meeting Agenda
March 29, 2016

Meeting Called To Order

Pledge Of Allegiance

Minutes-

Consideration Of Minutes Of The February 23, 2016 Meeting

Documents: 02232016 PC MINUTES.PDF

Public Comments-

Old Business:

1. Land Development Ordinance Amendments (File Zone Amend 2016-004).

Documents: ITEM 1 - STAFF REPORT LDO AMENDMENTS.PDF

New Business:

2. Site Plan For The Addition Of A 1,800 Square Foot Building For An Expansion Of The Existing Automotive Facility Located At 4713 Trader's Way (File: SP 2016-001; DR 2016-001).

Documents: ITEM 2 - STAFF REPORT FAST LUBE.PDF, ITEM 2 SITE PLAN PACKET FOR FAST LUBE.PDF

3. Site Plan For The Construction Of A 233,880 Square Foot Elementary And Middle School Located At 2638 And 2640 Clayton Arnold Road (File: SP 2016-002; DR 2016-002).

Documents: ITEM 3 - SCHOOL JUSTIFICATION STATEMENT.PDF, ITEM 3 - SCHOOL TRAFFIC ACCESS REVIEW STUDY.PDF, ITEM 3 - STAFF REPORT WCS SCHOOL.PDF, ITEM 3 SITE PLAN PACKET WCS SCHOOLS.PDF

4. Rezone For Phase 2 Of Two Farms From T2 To Transect Community (TC) (File: Amend 2016- 001).

Documents: ITEM 4 - PHASE TWO CONCEPTUAL HAMLET PLAN.PDF, ITEM 4 - PHASE TWO CONCEPTUAL MASTER PLAN.PDF, ITEM 4 - STAFF REPORT TWO FARMS.PDF, ITEM 4 - PETITION AGAINST TWO FARMS.PDF

5. Concept Plan Revision For Roderick Place For The Development Of 101 Residential Lots And Two Commercial Lots On 79.9 Acres At 4626 And 4624 Columbia Pike (File CP 2016-003).

Documents: ITEM 5 - 2016 RODERICK PATTERN BOOK.PDF, ITEM 5 - REVISED CONCEPT PLAN RODERICK.PDF, ITEM 5 - RODERICK UPDATED TRIP GENERATION MEMO.PDF, ITEM 5 - RODERICK IMPACT STUDY (5.16.15 REV).PDF, ITEM 5 - STAFF REPORT RODERICK.PDF

Adjourn

This meeting will be held at 7:00 p.m. at the Thompson's Station Community Center
1555 Thompson's Station Rd West

Minutes of the Meeting
of the Municipal Planning Commission
of the Town of Thompson 's Station, Tennessee
February 23, 2016

Call to Order:
The meeting of the Municipal Planning Commission of the Town of Thompson's Station was called to order at 7:00 p.m. on the 23rd day of February, 2016 at the Thompson's Station Community Center with the required quorum. Members and staff in attendance were: Chairman Jack Elder; Secretary Don Blair; Commissioner Ben Dilks; Commissioner Sarah Benson; Commissioner Debra Bender; Commissioner Darren Burress; Town Administrator Joe Cosentini; Town Planner Wendy Deats; Town Attorney Todd Moore and Town Clerk Jennifer Jones. Vice Chair Mike Roberts was unable to attend.

Pledge of Allegiance.

Minutes:
The minutes of the January 26th meeting were previously submitted with revisions.

> **Commissioner Bender moved for approval of the January 26th, 2016 meeting minutes. The motion was seconded and carried unanimously.**

Public Comment:

None

Chairman Elder closed public comment.

Town Planner Report:

None

Unfinished Business:

Commissioner Dilks suggested that Items 1 and 2 be heard together.

1. Letter of Credit Reduction for Fields of Canterbury, Section 7B (File: 1-D-14-003)

AND

2. Letter of Credit Reduction for Fields of Canterbury, Section 4C (File: 1-D-14-002).

Mrs. Deats reviewed her staff report for Item 1 and recommended that the Planning Commission reduce the letter of credit from $188,000 to $54,000 for roads, drainage and erosion control and maintain the letter of credit in its current amount of $44,000 for sewer for a year with the option for automatic renewal.

Mrs. Deats reviewed her staff report for Item 2 and recommended that the Planning Commission reduce the letter of credit to $58,000 for roads, drainage and erosion control and $22,000 for sewer for a year with the option for automatic renewal.

Mr. Steve Clifton, Town engineer with Clifton and King came forward to review his report and recommended a reduction of bonds on both sections. Commissioner Dilks voiced concerns over road

replacement and the calculation of risk. Mr. Clifton stated that he is basing his recommendation on the standard level of practice.

Mr. Bucky Ingram with Hood Development then came forward to speak on behalf of the applicant discussing how the maintenance and cleaning of the sewer drains have been and will be maintained.

After discussion, Commissioner Bender made a motion that the Planning Commission reduce the letter of Credit for Fields of Canterbury, Section 7B from $188,000 to $54,000 for roads, drainage and erosion control and maintain the letter of credit in its current amount of $44,000 for sewer for a year with the option for automatic renewal and also reduce the letter of Credit for Fields of Canterbury, Section 4C to $58,000 for roads, drainage and erosion control and $22,000 for sewer for a year with the option for automatic renewal.

The motion was seconded and carried unanimously.

3. Revised preliminary plat for Tollgate Village, Phase 15 (PP 2015-009).

Mrs. Deats reviewed her staff report and recommended that the Planning Commission approve the revised portion of the plat subject to the following contingencies:

1. Prior to the approval of construction plans, the applicant shall enter into a development agreement for Tollgate Village Phase 15.
2. Prior to the approval of construction plans, all applicable codes and regulations shall be addressed to the satisfaction of the Town Engineer.
3. Prior to the approval of construction plans, a drainage study shall be submitted to verify that drainage is managed adequately on site.
4. Prior to the approval of construction plans, a geotechnical report shall be submitted identifying the location of any sinkholes.
5. Prior to the submittal of the final plat for Phase 15, an updated traffic study with a schedule of improvements for traffic mitigation including the secondary access shall be reviewed and approved and a traffic signal shall be installed at the intersection of Highway 31/Tollgate Boulevard.
6. Prior to the submittal of a final plat for Phase 15, a detailed slope analysis shall be prepared showing slopes 15% - 25% and slopes exceeding 25%. Any lots located within areas exceeding 25% slopes shall be located within an open space lot.

Commissioner Burress questioned what would happen to establishing a new road "D."

Mr. Brett Smith and Mr. Bob Nichols, both with Ragan Smith came forward to speak on behalf of the applicant. Mr. Smith explained that the section road "D" would now be modified to the new LDO Standards. Mr. Nichols came with a proposal that eliminated waiting for the traffic study in Contingency number 5. Commissioners Bender and Blair expressed concerns over secondary access roads and time frames for installation.

Brandon Baxter, a traffic engineer with Ragan Smith then came forward to explain the process for traffic light approval.

Brian Rowe, representing the developer Henry & Wallace, came forward to give assurance that they were doing everything possible.

After discussion, Commissioner Burress made a motion to approve the revised preliminary plat for Tollgate Village, Phase 15 (PP 2015-009) with the following contingencies:

1. **Prior to the submittal of the final plat, the applicant shall enter into a development agreement for Tollgate Village Phase 15.**
2. **Prior to the approval of construction plans, all applicable codes and regulations shall be addressed to the satisfaction of the Town Engineer.**
3. **Prior to the approval of construction plans, a drainage study shall be submitted to verify that drainage is managed adequately on site.**
4. **Prior to the approval of construction plans, a geotechnical report shall be submitted identifying the location of any sinkholes.**
5. **Prior to the submittal of the final plat for Phase 15, an updated traffic study with a specific scope being a schedule of improvements for traffic mitigation including secondary access shall be reviewed and approved by the Town.**
6. **A traffic signal shall be installed at the intersection of State Route 6 (Columbia Pike) and Tollgate Boulevard at the expense of the Developer.**
7. **Prior to approval of the final plat for Phase 15, the Developer shall report and update the schedule for the traffic signal installation and a bond will be required to ensure completion of the signal.**
8. **A construction route adjacent to Tollgate Boulevard, north of Phase 14 into Phase 15 shall be utilized by construction traffic.**
9. **Prior to the submittal of a final plat for Phase 15, a detailed slope analysis shall be prepared showing slopes 15% - 25% and slopes exceeding 25%. Any lots located within areas exceeding 25% slopes shall be located within an open space lot.**

The motion was seconded and carried unanimously.

4. Tree replacement plan for Bridgemore Village Phase 5 (PP 2015-004)

Mrs. Deats reviewed her staff report and recommended approval to the Planning Commission on the removal and replacement plan with the following contingencies:

1. Prior to the recordation of any final plats within Phase 5, all trees located within common area shall be planted in accordance with the approved replacement plan.
2. Prior to certificate of occupancy, all lot trees shall be planted in accordance with the approved replacement plan.
3. Prior to Planning Commission approval, a construction access route to Phase 5 be routed through Phase 6.

Commissioner Dilks voiced concern over the pending litigation while Commissioner Burress expressed concern regarding the amount and type of trees being replaced.

Brett Smith with Ragan Smith came forward on behalf of the applicant to review the tree removal plan presented and responded to all questions regarding tree removal and replacement the way it is currently worded within the LDO.

Eugene Bulso, attorney with Leader, Bulso & Nolan PLC, came forward representing the applicant, Mr. Shaw stating that contingency number 3 should be removed because it had nothing to do with the tree removal and replacement plan.

After discussion, Commissioner Bender moved to approve the tree removal and replacement plan for Phase 5 within Bridgemore Village striking out contingency number three.

No one seconded the motion, and the motion failed.

Chairman Jack Elder called a recess at 8:48 for a brief meeting with counsel. The regular Planning Commission meeting resumed at 8:53.

After further discussion, Commissioner Bender made a new motion to approve the tree removal and replacement plan for Phase 5 within Bridgemore Village removing contingency number three.

The motion was seconded.

The motion carried by a vote of 4 to 2 with Commissioners Burress and Dilks casting the opposing votes.

5. Land Development Ordinance Amendments (File: Zone Amend 2016-001)

Mrs. Deats had previously reviewed the land development ordinance agreements with the Planning Commission in a work session on February 17, 2016, and recommends that the Planning Commission recommend to the Board of Mayor and Aldermen these Staff initiated amendments to the Land Development Ordinance. Staff also included an addendum to Item 5, additional revisions to Section 5.1.1 Penalties and Section 5.1.2 Remedies for recommendation to the Board of Mayor and Aldermen.

After discussion, Commissioner Bender made a motion to recommend to the Board of Mayor and Aldermen the Staff initiated amendments to the Land Development Ordinance without the additional revisions to Section 5.1.1 and Section 5.1.2.

The motion was seconded and carried unanimously.

New Business:

6. Zoning Amendment to rezone 4658 Columbia Pike from Specific Plan to D3 (High Intensity Residential) (file: Amend 2015-008)

Mrs. Deats reviewed her report and recommended approval based on the findings for General Plan consistency and the elimination of a Specific Plan zone and is supportive of a Planning Commission recommendation to the Board of Mayor and Aldermen for the rezoning of the subject property from the Specific Plan zone to the D3 zone.

Commissioner Dilks expressed concern over lack of commercial acreage within the Town and loss of sales tax revenue.

Brian Rowe, representing the developer Henry & Wallace, came forward to respond to the concerns.

After discussion, Commissioner Burress made a motion to approve a recommendation to the Board of Mayor and Aldermen, the Zoning Amendment to rezone 4658 Columbia Pike from Specific Plan to D3 (High Intensity Residential) with the following contingencies:

1. **Approval of rezone to D-3, in no way, implies approval of proposed ingress/egress points that were mentioned or shown on a property map, during review by the planning commission.**
2. **Regardless of land use, a 100 foot buffer to Highway 31 will be added to this property.**

The motion was seconded, and passed by a vote of 5 to 1 with Commissioner Dilks casting the opposing vote.

8. Letter of Credit Reduction for Bridgemore Village, Section 2C (1-D-14-011).

Item was withdrawn by applicant

9. Request for Construction Access, Phase 5 Bridgemore Village (PP 2015-004).

Item was withdrawn by applicant

There being no further business, Chairman Elder made a motion to adjourn. The motion was seconded and the meeting was adjourned at 9:32 p.m.

_____
Jack Elder, Chairman

Attest: _____
Don Blair, Secretary

Thompson's Station Planning Commission
Staff Report – Item 1 (Zone Amend 2016-004)
March 29, 2016
Land Development Ordinance Amendments

PROJECT DESCRIPTION

These are Staff and BOMA initiated amendments of the Land Development Ordinance.

PROPOSED REVISIONS

Table 2.3 Community Types, Areas and Civic Space (page 24). Subdivisions require 45% open space, however this limits the ability of property owners to create minor subdivisions in compliance with all development standards in into large lots based on acreage. A minor subdivision is the subdividing of a lot into no more than four lots. Staff recommends a note be incorporated with this table as follows:

(3) Minor subdivisions may be exempt from the requirement for designated open space.

Section 3.6.11 Debris and Waste (page 49). Dumpsters are required to manage trash and debris on construction sites however; the timing for the placement or location of the dumpster on site is not specified or regular care and maintenance addressed within the section. Therefore, Staff recommends the following revisions:

No cut trees, timber, construction debris, junk, rubbish, or other waste materials of any kind shall be buried in any land, left on any lot, or deposited in any natural drainage way (such as sinkholes, underground streams/ channels, ~~or~~ wet weather stream beds or floodways) or public way at the time of the issuance of the certificate of occupancy for the lot, ~~and removal of such waste shall be required prior to issuance of any certificate of occupancy.~~ Waste shall not be left or deposited in any area of the subdivision at any times. Debris dumpsters with lids shall be required for construction debris disposal. A dumpster shall be required for every two adjacent lots at the time any construction activity begins. ~~Such~~ The ~~-~~ dumpsters shall be of adequate size, maintained in a clean manner, the location shall be placed with clear site distance. The dumpsters ~~and~~ shall be removed in a timely manner upon the completion of construction activities. All natural, vegetated material shall be shredded, chipped, or other means to us on site. Burning of materials on site shall be prohibited unless otherwise approved by the Planning Commission.

Table 4.3. T2 Lot Standards (page 78). Revise the table pertaining to access width to setback requirement of 12 feet. The T2 zone is a Rural zone which promotes farm and agricultural uses. Vehicles and equipment found within this zone cannot make the turning radius for a 12 foot wide access drive. Therefore, Staff is recommending either the removal of the access width requirement or an increase of the requirement to a width that is adequate.

Table 4.1 Land Use and Building Type (page 73). Remove group homes from the permitted use table as an allowable use in the T2 district.

Table 4.1 Land Use and Building Type (page 73). Options include:

1. Removal of apartments from the T4 transect district only.
2. Removal of apartments from the T5 transect district only.
3. Maintain the code as it was intended and adopted and recommend rezones to transect community selectively where adjacent land uses and infrastructure support this type of development.

Removal of apartments reduces the effectiveness of the transect zones in providing multiple housing options consisting of a mixture of ownership and rental properties. The transect zoning was intended to create walkable communities with the density to support non-residential uses. Rezones are not permitted by right and therefore, can be denied by the Planning Commission if the Commission determines the transect community zoning is not compatible with the surrounding land uses and would have a negative impact. Therefore, Staff recommends that option 3 be considered as the appropriate means to regulate the intensity and type of development within the Town. Furthermore, it should be noted that if options 1 or 2 are preferred, a more comprehensive review of the LDO will be necessary to ensure that all potential conflicts are addressed related to the elimination of apartments within the transect zones.

Table 4.9 D3 Lot Standards (page 84). Lot width is 50 feet for single family residential; however, townhome lots have a reduced width that is not identified within the table. Therefore, Staff is recommending that a lot width of 20 feet be identified for townhome development to conform to the other districts where townhomes are permitted.

Section 4.11.1 Non-Residential Use Property Development Standards (page 96). Recommendation is to strike the requirement for a masonry wall because it reduces walkability between land uses.

F. ~~Masonry walls shall be required for noise attenuation between non-residential and residential land uses. Masonry walls shall be designed to match the architecture.~~

Section 4.11.1 Non-Residential Use Property Development Standards (page 96). This section regulates development of properties for commercial purposes. This standard references residential buildings, therefore, Staff recommends the following modification to the text:

G. Each development shall include trash areas that will be designed to accommodate two trash bins, one which will be designed for recycling. The trash enclosure shall be enclosed by a masonry wall that matches the architecture of the ~~residential~~ buildings on site.

Section 4.17.3 Prohibited Signs (page 116). Electronic signs are prohibited; however, fuel pricing signs use digital signs to effectively display gas prices. Staff recommends that digital copy be permitted for fuel pricing signs.

Table 4.22 General Sign Restrictions (page 117). Wall signage is permitted for commercial buildings with a maximum height of 18 inches for the text of the sign. However, wall signs are often two or three lines of text including the company logo. The code allows for multiple lines of text in the commercial district, however, does not identify a provision for multiple lines of text within the transect zones. Therefore, Staff recommends the addition of the "36 inches for more than one line of copy.

Section 5.1.1 Penalties (page 125). Modify the text to read as follows:
It shall be unlawful to erect, construct, reconstruct, alter, maintain or use any building or structure, or to use any land in violation of any regulation in this ordinance. Any person violating any of the provisions of this zoning regulations article shall be guilty of a Class C misdemeanor, and conviction shall result in a monetary penalty not to exceed fifty dollars ($50.00) and the repayment of administrative costs incident to the correction of the municipal violation in the amount of two

hundred fifty dollars ($250.00) for each separate offense. Each day any violation of this ordinance shall continue shall constitute a separate offense.

Section 5.1.2 Remedies (page 125). Modify the text to read as follows:
In addition to the penalties reference above ~~and other remedies,~~ upon the recommendation of the Town Planner or Building Official, or upon the request of a property owner who would be specifically damaged by a violation of this ordinance, the Town Administrator may direct the Town Attorney to institute an injunction, mandamus, or other appropriate action or proceeding to prevent such unlawful erection, construction, reconstruction, alteration, repair, conversion, maintenance, or use; or to correct or abate such violation; or to prevent occupancy of such building, structure, or land. Where construction, excavation, demolition, grading or any other activity has begun on any building, dwelling, structure, sign or use in violation of this ordinance or any other Town ordinance, the Town Administrator may, in addition to taking other authorized enforcement action, issue a stop work order pending the responsible party or parties bringing such construction, use or other activity into compliance with the ordinances of the Town. The party or parties may appeal the issuance of a stop work order to the Board of Zoning Appeals and the BZA shall hold a hearing on the order in accordance with § 5.5.4 of this ordinance. The BZA hearing on an appeal of a stop work order shall be heard as soon as possible after publishing the required notice, but not soon than fifteen (15) days after the filing of such appeal with the Town Planner, and not greater than thirty (30) days from the filing of such appeal.

Section 5.2.5 Site Plans (page 127). The administrative section of the code requires site plans be provided for resource conservation developments, planned resource conservation developments and non-residential developments, however, the code does not have a provision for resource conservation developments therefore, the language should be modified as follows:

Site plan review and approval shall be required for ~~resource conservation developments, planned resource conservation developments and~~ all multi-family and nonresidential developments.

Section 5.2.8 Development Agreement Required Prior to Construction (page 131). Modify the section as follows:

No construction or installation of infrastructure, including but not limited to roads, drainage or wastewater infrastructure, may be installed prior to the approval of a development agreement. Applicant may begin preliminary site development and grading work only after:

a. Preliminary plat approval;
b. Construction plan approval by the Town Engineer(s) and Town Planner; and
c. The issuance of a grading permit by the Town Planner.

Following the preliminary plat and construction plan approval, a ~~completed "Development Agreement" shall be prepared and executed prior to the construction of any infrastructure within any development to which these regulations are applicable.~~ A draft development agreement shall be prepared by the Town Planner. The draft development agreement shall substantially conform~~ing~~ to the Development Agreement contained in Appendix "A" and shall ~~be prepared by the Town Planner. The draft agreement shall reference the design~~ incorporate~~d~~ by reference both ~~within~~ the approved plat, including any conditions on said approval, and the approved construction plans. The draft development agreement ~~and~~ shall require ~~be sufficient in form to assure~~ that ~~proposed~~ construction methods and materials meet or exceed minimum standards established by the Town.

The Town Planner shall send t~~T~~he draft development agreement ~~shall be sent~~ to the applicant for approval. Upon acceptance and signature of the agreement by the applicant, the proposed development agreement shall be forwarded to the Board of Mayor and Aldermen for consideration ~~approval~~ at its next regularly scheduled meeting.

Section 5.2.9 ~~Bond~~ Surety Required (page 131).

Prior to recording the final subdivision plat, the ~~application~~ applicant shall provide a ~~bond~~ surety conforming to Section 5.2.10 ~~Bond Standards and Requirements guaranteeing construction or the remaining required improvements.~~ The amount and form of such ~~bond~~ surety shall be sufficient to guarantee to the Town, satisfactory construction, installation, and dedication, free and clear of any encumbrances, of the incomplete portion of the required improvements. If a development agreement has not already been ~~provided~~ approved as specified in Section 5.2.8 ~~Development Agreement Required Prior to Construction,~~ such an agreement shall be provided at this time. The approval of the development agreement shall follow the same procedure as set forth in Section 5.2.8. Such surety instruments shall comply with all statutory requirements and shall be satisfactory to the Town Attorney as to form, sufficiency, and manner of execution, as set forth in these regulations.

Section 5.2.10 ~~Bond~~ Surety Standards and Requirements (page 131).

a. General

All improvements proposed in conjunction with any subdivision must be covered by an adequate ~~bond~~ surety. If such improvements are ~~unless such work is~~ completed prior to filing of any final plat for any portion of the development site, the Town may elect to accept such improvements and require surety for the maintenance as set forth in this ordinance.

b. Amount of ~~bond~~ surety

The developer shall post a good and sufficient ~~bond~~ surety with the Town in the amount of one hundred ten (110%) of the Town Engineers' estimate of cost to assure completion of the work. Good and sufficient surety shall include the types of ~~bond~~ surety specified in Section 5.2.10c. ~~Types of bond.~~ Each ~~bond~~ surety shall reference and secure compliance with the development agreement ~~be accompanied by a "Development Agreement" as per~~ required by Section 5.2.8 ~~Development Agreement Required Prior to Construction, and Appendix "A"~~ where the developer agrees to make and install the improvements in accordance with the approved plans and specifications.

c. Types of ~~bond~~ surety

Subject to the standards and requirement of this Article and acceptance by the Planning Commission and approval by the Town Attorney, the following types of ~~bond~~ surety may be accepted for purposes of guaranteeing completion of improvements required by these regulations: ~~Each bond must remain in effect for at least one (1) year.~~

1. Irrevocable Standby Letter of Credit; or
2. Cash Escrow or bank assignment of certificates of deposit with a federally insured bank having assets of at least $50 million.
3. ~~Cash Builders Bond~~

Notwithstanding the foregoing, any other surety accepted by the Town under prior regulations may remain in effect and may be extended; however any developments approved after the effective date of this ordinance must be secured by the surety types herein.

Irrevocable standby letters of credit

An irrevocable standby letter of credit may be utilized as the means of providing ~~bond~~ surety for improvements required under the various provisions of these regulations provided it meets the following requirements:

a. Any letter of credit shall be drafted so as to represent an obligation of the financial institution to the town and not an obligation to the permittee;
b. ~~All letters of credit, shall be governed and construed in accordance with the Uniform Customs and Practice for Documentary Credit (1983 Revision), International Chamber of Commerce, Publication 400 and Tenn Code Ann Section 47-5-101 through 47-5-118.~~ Such letter shall be valid for one (1) year and shall be automatically renewed for successive one (1) year periods until released by the Town;
c. Said letters may be revoked only after giving the Town 90 days prior written notice with the opportunity to cash the letter and ~~S~~such notice shall be by certified mail, return receipt requested;
d. All letters of credit shall be cashable in Williamson County, or in a County which adjoins Williamson County (within 60 mile radius) and shall be substantially in the form as show in Appendix B;
e. The financial institution issuing the letter of credit or bond must demonstrate its good standing with the State of Tennessee and shall not issue in excess of 10% of its total capital to an applicant; and
f. ~~This~~ The branch of the issuing financial institution shall be located within a 60 mile radius of Thompson's Station, TN. This branch must also be available for contact and for making draws on the letter of credit or ~~bond~~ surety.

The Town Finance Director shall be the accepting authority for all letters of credit and ~~bonds~~ surety and will make a determination on the above referenced items and shall also consider the Thomson Bank Watch or Schushenoff rating of A. If an outside rating system is utilized, a minimum of 2 major rating agencies shall be required of no less than BBB. In addition, the bank must have a passing grade by the FDIC with no deficiencies. All letters of credit, shall be governed and construed in accordance with the Uniform Customs and Practice for Documentary Credit (1983 Revision), International Chamber of Commerce, Publication 400 and Tennessee Code Annotated Section 47-5-101 through 47-5-118.

Upon acceptance and qualification of the letters of credit, the Town Finance Director shall forward said letters to the Town Attorney for final review.

Escrow deposits for improvements

a. No changes
b. Procedures on Escrow Fund

All escrows shall be held by the town, kept in its bank accounts, and be totally under the control of the town. A detailed "escrow agreement" shall be prepared and approved by the Town Attorney and shall be appropriately endorsed by all parties to such agreement at the time of creation of any escrow account. The Town Administrator may execute such escrow agreement on behalf of the Town and designate the Finance Director to administer said account. The developer's tax identification number shall be used for the escrow and the developer shall be responsible for paying tax on any interest credited to the escrow account.

c. Delete performance bond section.
d. Time to post ~~bond~~ surety.

Surety Bond must be posted within 60 days of the Planning Commission action establishing the ~~bond~~ surety amount. Failure to post the ~~bond~~ surety within the allotted time period will require re-approval of the final plat. All review fees will apply.

RECOMMENDATION

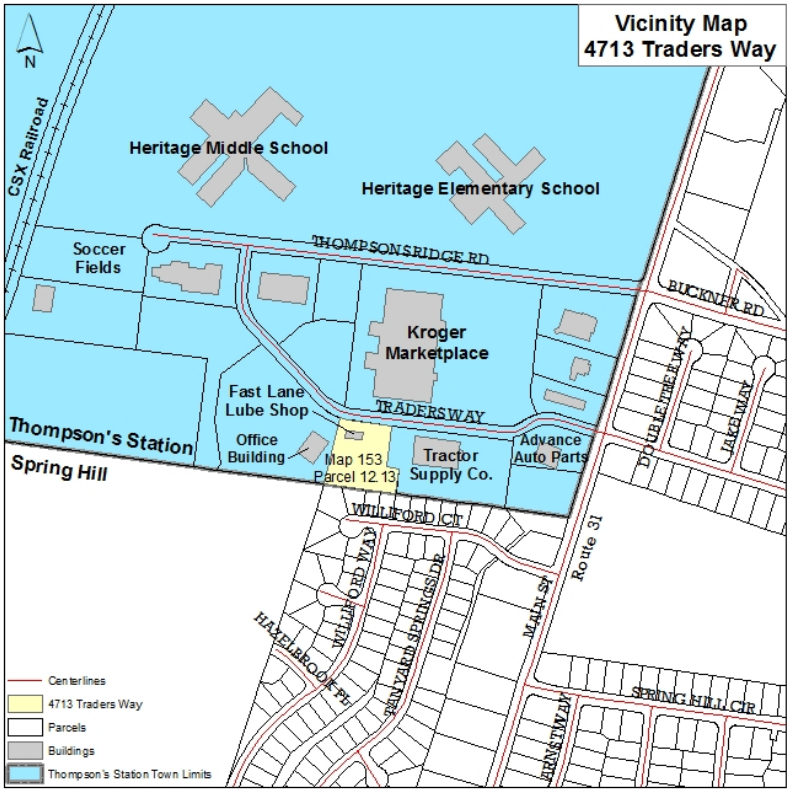
Staff is requesting the Planning Commission recommend to the Board of Mayor and Aldermen these Staff initiated amendments to the Land Development Ordinance.

Thompson's Station Planning Commission
Staff Report – Item 2 (File: SP 2016-001 & DR 2016-001)
March 29, 2016

Site Plan for the addition of a 1,800 square foot building for an expansion of an existing automotive facility.

PROJECT DESCRIPTION

The applicant, Gerald Bucy has submitted a site plan application on behalf of Fast Lane Express Lube Shop, Inc. for the addition of a 1,800 square foot building for automotive repair located at 4713 Traders Way.



BACKGROUND

The project site is 1.61 acres, located within Heritage Commons, zoned Commercial and currently developed with an automotive use. The site is bounded by commercial land (Kroger Marketplace and Tractor Supply) to the north and east, vacant commercial land to the west and a residential neighborhood in the City of Spring Hill to the south.

ANALYSIS

Site Plan

Site plan review by the Planning Commission is required for all non-residential developments to ensure "compliance with the development and design standards" (Section 5.4.4) of the Land Development Ordinance. No grading or building permits will be issued until the site plan has received Planning Commission approval.

Zoning/Land Use

The Commercial zone permits automotive repair facilities. The proposed project is an expansion to the Fast Lube Shop. The existing building a drive through facility and is setback approximately 49

feet to the roadway, Traders Way. The front yard is predominantly landscaped and the proposed building will match the setback with similar landscaping. Other buildings within Heritage Commons have deep setbacks with landscaped front yard areas similar to this site. Access is along Traders Way with a 26 foot wide two-way driveway entrance. All parking is located within the rear of the site along with a pedestrian access from the parking area to the office. Total building square footage with the development of the proposed addition is 3,623 square feet for a total lot coverage of 5%. Total impervious surface with the proposed addition is 32%.

The building will have a maximum height of 20 feet with the front façade oriented toward Traders Way. All automotive bays for the additional building will be rear facing and will have a landscaped front yard. The proposed building is designed to match the architectural style, materials and colors of the existing building. The project will be reviewed by the Design Review Commission on April 6, 2016.

Existing Building

Parking

One parking space is required for every 375 square feet of service bays, thereby requiring 10 parking spaces. The existing parking contains 12, 9 foot long x 18 foot wide parking spaces which are located in the rear of the site behind the existing building. The parking conforms to the original site plan approval and no additional parking is proposed.

Lighting

The project site has lighting within the parking and on the existing building. The proposed building will have wall lighting. The photometric study demonstrates that the lighting on site will not present a significant impact on adjacent properties.

Landscaping

The project site is partially developed and landscaped in accordance with previous plan approval. The proposed facility will be set back with landscaping fronting the building to the roadway. The landscaping materials include grass along with the installation of two Yoshino Cherry trees. The proposed landscaping is substantially compatible with the existing landscaping; however, the plan should also incorporate additional shrub material to match the existing project frontage. The Land Development Ordinance requires that a buffer be installed between commercial uses that include a

broken screen (buffer type 1) along the east property line. This can be achieved through additional tree and shrubs plantings along the north property line. Therefore, Staff recommends a contingency to incorporate additional shrubs along the project frontage and to provide the required buffer along the east property line.

RECOMMENDATION

Based on the project's consistency with the Land Development Ordinance, Staff recommends that the project be approved with the following contingencies:

1. Prior to issuance of grading or building permits, construction plans shall be submitted and approved. Any upgrades to the utility infrastructure necessary for the project shall be incorporated into the construction plans and shall be completed by the applicant.
2. Prior to issuance of grading or building permits, the landscape plan shall be revised to incorporate a buffer along the east property line and incorporate additional shrubs consistent with the existing planting along the project frontage.
3. Prior to installation of the landscaping, the applicant shall meet with staff to confirm location of all landscaping.
4. Any change of use or expansion of the project site shall conform to the requirements set forth within the Land Development Ordinance and shall be approved prior to the implementation of any changes to the project.

ATTACHMENTS

Site Plan Packet

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.

4713 Traders Way

Thompson's Station Tennessee 37179

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON DRAWINGS AT THE JOB SITE AND SHALL NOTIFY DESIGNER OF ANY DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS BEFORE PROCEEDING WITH THE JOB.
2. THE CONTRACTOR SHALL COMPLY WITH ALL RULES AND REGULATIONS OF AGENCIES HAVING JURISDICTION AND SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL CONSTRUCTION, SAFETY AND SANITARY LAWS, CODES, STATUTES, AND ORDINANCES. ALL FEES, TAXES, PERMITS, APPLICATIONS AND CERTIFICATES OF INSPECTION, AND THE FILING OF ALL WORK WITH GOVERNMENTAL AGENCIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. ALL WORK SHALL BE PERFORMED BY SKILLED AND QUALIFIED WORKMEN IN ACCORDANCE WITH THE RECOMMENDED AND BEST PRACTICES OF THE TRADES INVOLVED, AND IN COMPLIANCE WITH BUILDING REGULATIONS AND/OR GOVERNMENTAL LAWS, STATUTES OR ORDINANCES CONCERNING THE USE OF UNION LABOR.
4. EACH TRADE WILL PROCEED IN A FASHION THAT WILL NOT DELAY THE TRADES FOLLOWING THEM.
5. CONTRACTORS SHALL BE RESPONSIBLE FOR THE DISTRIBUTION OF DRAWINGS TO ALL TRADES UNDER HIS JURISDICTION.
6. ALL WORK SHALL BE ERECTED AND INSTALLED PLUMB, LEVEL, SQUARE, TRUE AND IN PROPER ALIGNMENT
7. ALL MATERIALS SHALL BE NEW, UNUSED AND OF THE HIGHEST QUALITY IN EVERY RESPECT, UNLESS OTHERWISE NOTED. MANUFACTURED MATERIALS AND EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
8. THERE SHALL BE NO SUBSTITUTION OF MATERIALS WHERE A MANUFACTURER IS SPECIFIED. WHERE THE TERMS "EQUAL TO" OR "APPROVED EQUAL" ARE USED, THE ARCHITECT SHALL DETERMINE EQUALITY BASED ON INFORMATION SUBMITTED BY THE CONTRACTOR.
9. ALL WORK AND MATERIALS SHALL BE GUARANTEED AGAINST DEFECTS FOR A PERIOD OF AT LEAST ONE (1) YEAR FROM APPROVAL FOR FINAL PAYMENT.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING REQUIRED FOR HIS/HER WORK.
11. CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE OF ACCUMULATION OF WASTE MATERIALS OR RUBBISH. PREMISES TO BE SWEPT CLEAN DAILY OF RELATED CONSTRUCTION DEBRIS. AT THE COMPLETION OF THE WORK, LEAVE THE JOB SITE FREE OF ALL MATERIALS AND BROOM CLEAN.
12. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN. LARGER SCALE DRAWINGS SHALL GOVERN SMALLER SCALE.
13. ANY CHANGE WHICH RESULTS IN EXTRA COST SHALL NOT PROCEED WITHOUT WRITTEN AUTHORIZATION BY THE BUILDING OWNER.
14. TO INSURE PROPER AND ADEQUATE BLOCKING, ALL BLOCKING FOR CABINET WORK WILL BE THE RESPONSIBILITY OF THE CABINET CONTRACTOR.
15. UPON COMPLETION OF WORK THE CONTRACTOR SHALL WALK THROUGH WITH THE ARCHITECT AND COMPILE A "PUNCH LIST" OF CORRECTIONS AND UNSATISFACTORY AND/OR INCOMPLETE WORK. FINAL PAYMENT WILL BE CONTINGENT UPON THE COMPLETION OF THESE ITEMS.

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SITE DATA

SITE SIZE:	1.61 AC (69,918 SF)
ZONE:	CC
USE:	ROAD SERVICE (VEHICLE REPAIR & MAINTENANCE)

SETBACKS
FRONT: 10 FT.
SIDE: 8 FT.
REAR: 15 FT.

LOT COVERAGE:

ALLOWABLE:	0.70
PROVIDED:	0.05

BUILDING SIZE:	1,823 SF : EXISTING
	1,800 SF : PROPOSED
	3,623 SF : TOTAL
PARKING REQUIREMENT:	1 SP/375 SF
PARKING SPACE:	
REQUIRED:	10
PROVIDED:	12 EXISTING
SIDE YARD BUFFER REQUIREMENT:	TYPE "I"

PAVED & CONCRETE AREA:			
	EXISTING -	14,890 S.F.	
	PROPOSED -	3,889 S.F.	
	TOTAL -	18,779 S.F.	

TOTAL IMPERVIOUS AREA:			
	EXISTING -	16,713 S.F.	
	PROPOSED -	5,689 S.F.	
	TOTAL -	22,402 S.F.	32%

TOTAL PROPOSED IMPERVIOUS SURFACE= 32%

BUILDING HEIGHT:	20' (1 STORY)
SQL TYPE:	Mbc2

NOTE:
THIS TRACT IS LOT #12 OF HERITAGE COMMONS SUBDIVISION (REVISION 2)
PLAT BOOK 43, PAGE 13, R.O.W.C.
MAP 153 PARCEL 12.13 : 11TH CIVIL DISTRICT, DEED Bk. 3856 PAGE 648, R.O.W.C.

THOMPSON STATION, TN. ADOPTED BUILDING CODES

The town has adopted the followings Codes effective January 1, 2015:

- 2009 International Building Code including Appendices D and G
- 2009 International Plumbing Code
- 2009 International Mechanical Code
- 2009 International Fire Code including Appendices B, C, and D
- 2009 International Fuel Gas Code

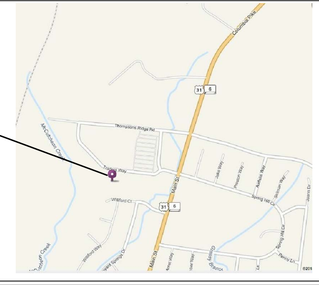
PROJECT DIRECTORY

OWNER/DEVELOPER:	David Cianfaglione 2636 Platt Road Thompson's Station. Tennessee (615) 595-0141 rep. David Cianfaglione
LEAD ENGINEER/APPLICANT:	GERALD G. BUCY, CONSULTING ENGINEER. P.O. BOX 1521 FRANKLIN, TN. 37065 REPRESENTATIVE - GERALD G. BUCY. P.E. 615/794-0323 615/791-6090 (FAX) email: bucycorp@bellsouth.net
Landscape Architect:	Greenspace Design 411 Maplegrove Dr. Franklin, TN 37064 REPRESENTATIVE- JOSHUS B. HENRICK Ph: (615) 591-9606 Fax:(615) 591-1323 email: info@greenspace-design.com

SHEET INDEX

SITE LOCATION

SITE



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Fax: 615.791-6090

GERALD G. BUCY
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 12255
STATE OF TENNESSEE
12/18/15

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REVISIONS
2/25/16 PER TOWN COMMENTS

COVER SHEET

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

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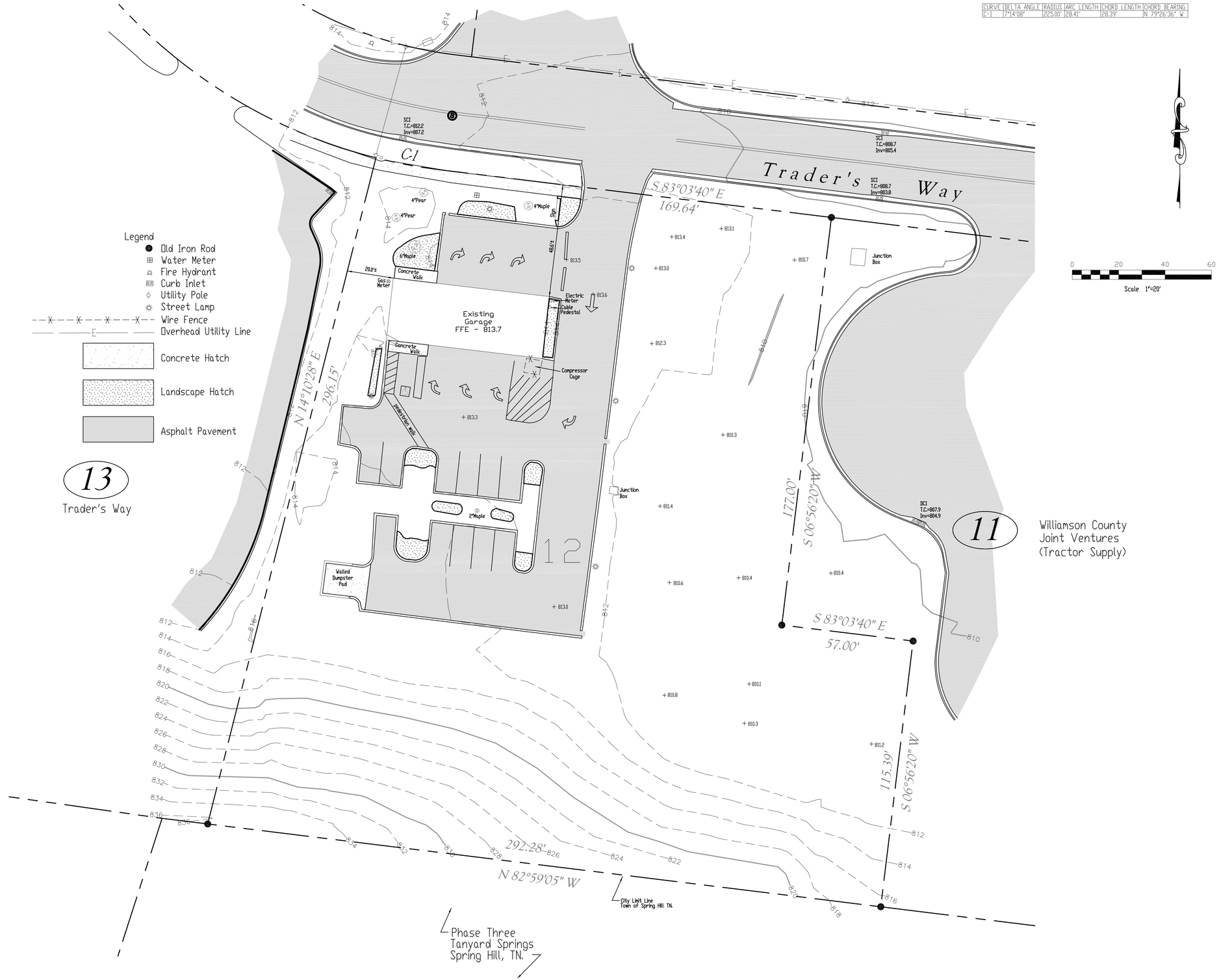
ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : ---

CVR

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C-1	7°14'08"	225.00'	28.41'	28.39'	N 79°26'36" W



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REVISIONS
2/25/16 PER TOWN COMMENTS

Existing Conditions

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

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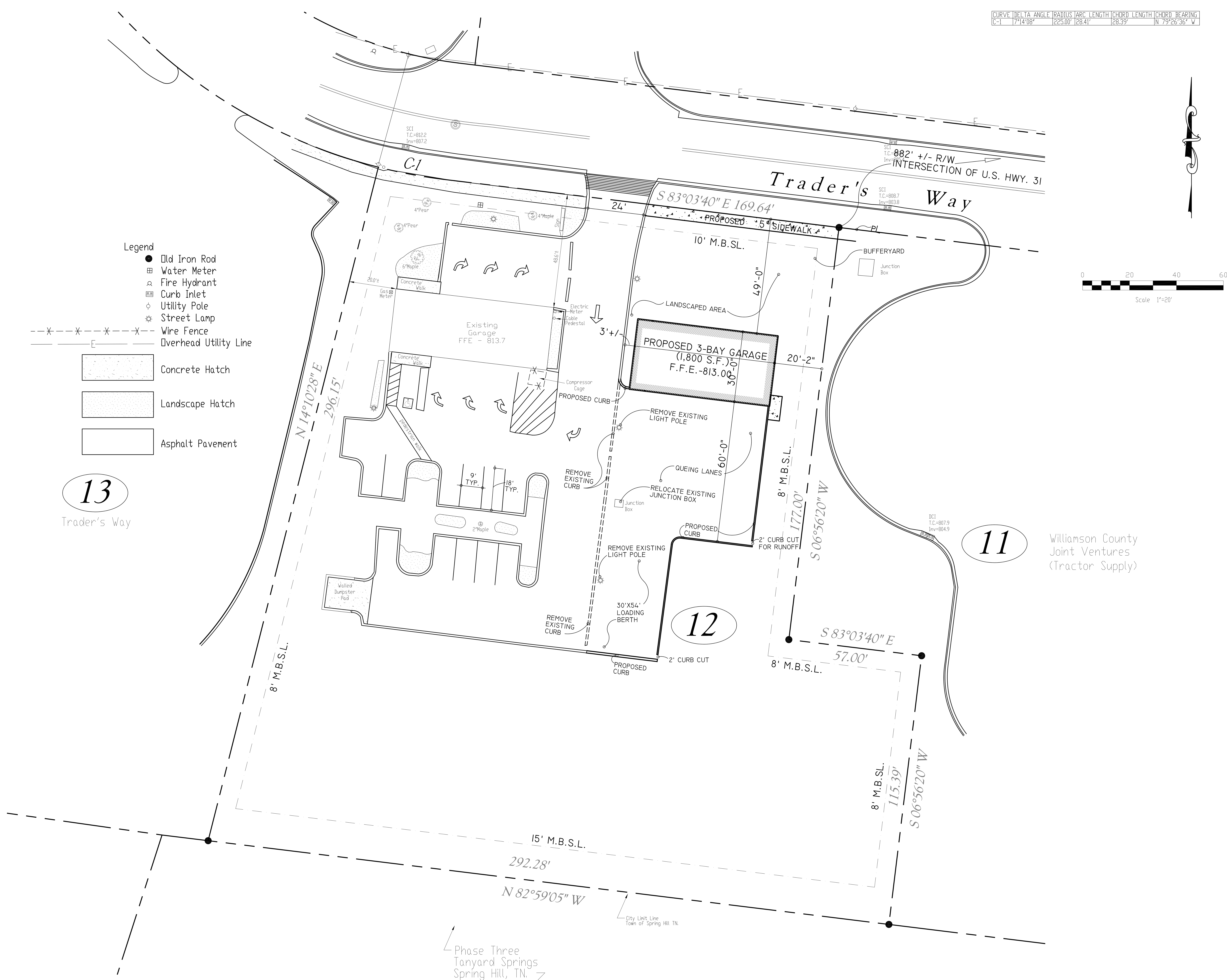
ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : ---

C0



CURVE | DELTA ANGLE | RADIUS | ARC LENGTH | CHORD LENGTH | CHORD BEARING
C-1 | 7°14'08" | 225.00' | 28.41' | 28.39' | N 79°26'36" W
Legend
Old Iron Rod
Water Meter
Fire Hydrant
Curb Inlet
Utility Pole
Street Lamp
Wire Fence
Overhead Utility Line
Concrete Hatch
Landscape Hatch
Asphalt Pavement
13
Trader's Way
C1
Trader's Way
882' +/- R/W
INTERSECTION OF U.S. HWY. 31
S 83°03'40" E 169.64'
24'
PROPOSED 5' SIDEWALK
PL
10' M.B.SL.
BUFFERYARD
Junction Box
LANDSCAPED AREA
49'-0"
Existing Garage
FFE - 813.7
3'+/-
PROPOSED 3-BAY GARAGE
(1,800 S.F.)
F.F.E.-813.00
30'-0"
20'-2"
PROPOSED CURB
REMOVE EXISTING LIGHT POLE
REMOVE EXISTING CURB
QUEING LANES
60'-0"
RELOCATE EXISTING JUNCTION BOX
PROPOSED CURB
2' CURB CUT FOR RUNOFF
8' M.B.SL.
177.00'
S 06°56'20" W
11
Williamson County
Joint Ventures
(Tractor Supply)
REMOVE EXISTING LIGHT POLE
30'X54' LOADING BERTH
REMOVE EXISTING CURB
12
PROPOSED CURB
2' CURB CUT
S 83°03'40" E
57.00'
8' M.B.S.L.
N 14°10'28" E
296.15'
8' M.B.S.L.
9' TYP.
18' TYP.
8' M.B.SL.
115.39'
S 06°56'20" W
15' M.B.S.L.
292.28'
N 82°59'05" W
City Limit Line
Town of Spring Hill TN.
Phase Three
Tanyard Springs
Spring Hill, TN.
0 20 40 60
Scale 1"=20'

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REVISIONS
2/25/16 PER TOWN COMMENTS

Site Layout Plan

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.

4713 Traders Way
Thompson's Station, Tennessee 37179

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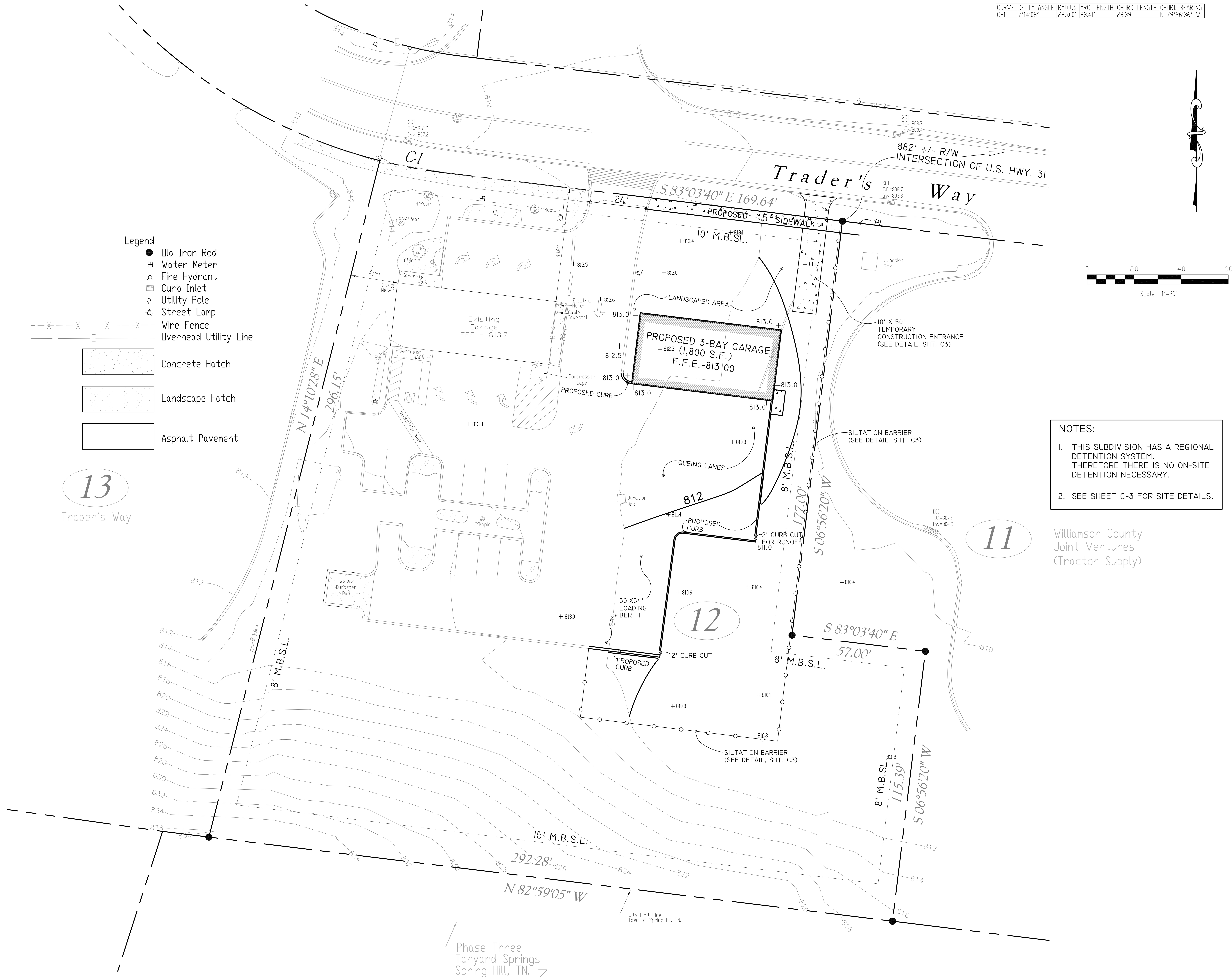
ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : --

C1

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C-1	7°14'08"	225.00'	28.41'	28.39'	N 79°26'36" W



NOTES:

1. THIS SUBDIVISION HAS A REGIONAL DETENTION SYSTEM. THEREFORE THERE IS NO ON-SITE DETENTION NECESSARY.
2. SEE SHEET C-3 FOR SITE DETAILS.

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REVISIONS
2/25/16 PER TOWN COMMENTS

Grading & Drainage Plan

A New Auto Repair Building For Fast Lane Express Lube Shop, Inc.

4713 Traders Way
Thompson's Station, Tennessee 37179

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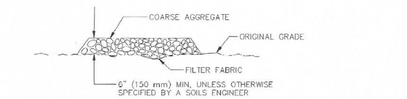
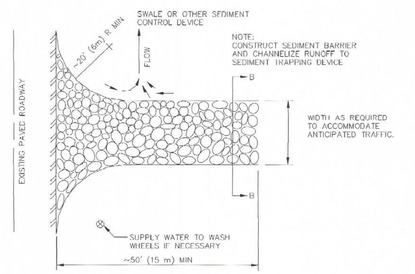
ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : --

C2

ACTIVITY: Stabilized Construction Entrance | TCP – 03



SECTION B–B
N.T.S.



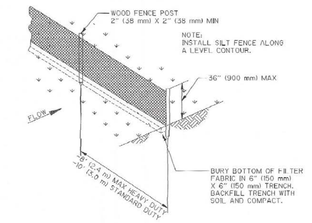
PLAN VIEW
N.T.S.

Figure TCP-03-1
Stabilized Construction Entrance

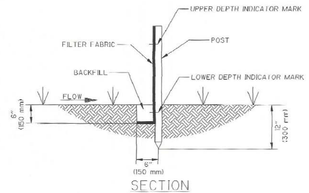
Stormwater Best Management Practices – Temp. Construction Site Management Practices TCP-03-5 November 2008

NOTE:
USE WOVEN WIRE BACKED FENCING

ACTIVITY: Silt Fence | TCP – 13



TYPICAL PREFABRICATED
SILT FENCE INSTALLATION
N.T.S.

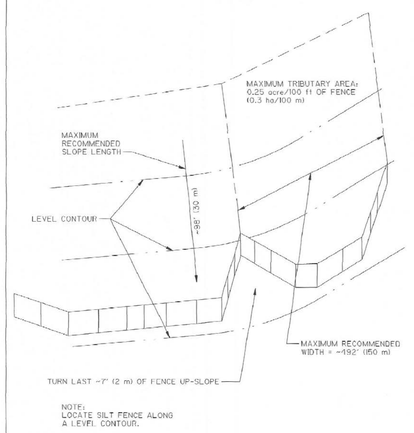


SECTION
N.T.S.

Figure TCP-13-1
Silt Fence Anchoring

Stormwater Best Management Practices – Temp. Construction Management Practices TCP-13-7 November 2008

ACTIVITY: Silt Fence | TCP – 13



PLAN VIEW
N.T.S.

Figure TCP-13-2
Silt Fence End Layout

Stormwater Best Management Practices – Temp. Construction Management Practices TCP-13-8 November 2008

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REVISIONS
2/25/16 PER TOWN COMMENTS

SITE DETAILS

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

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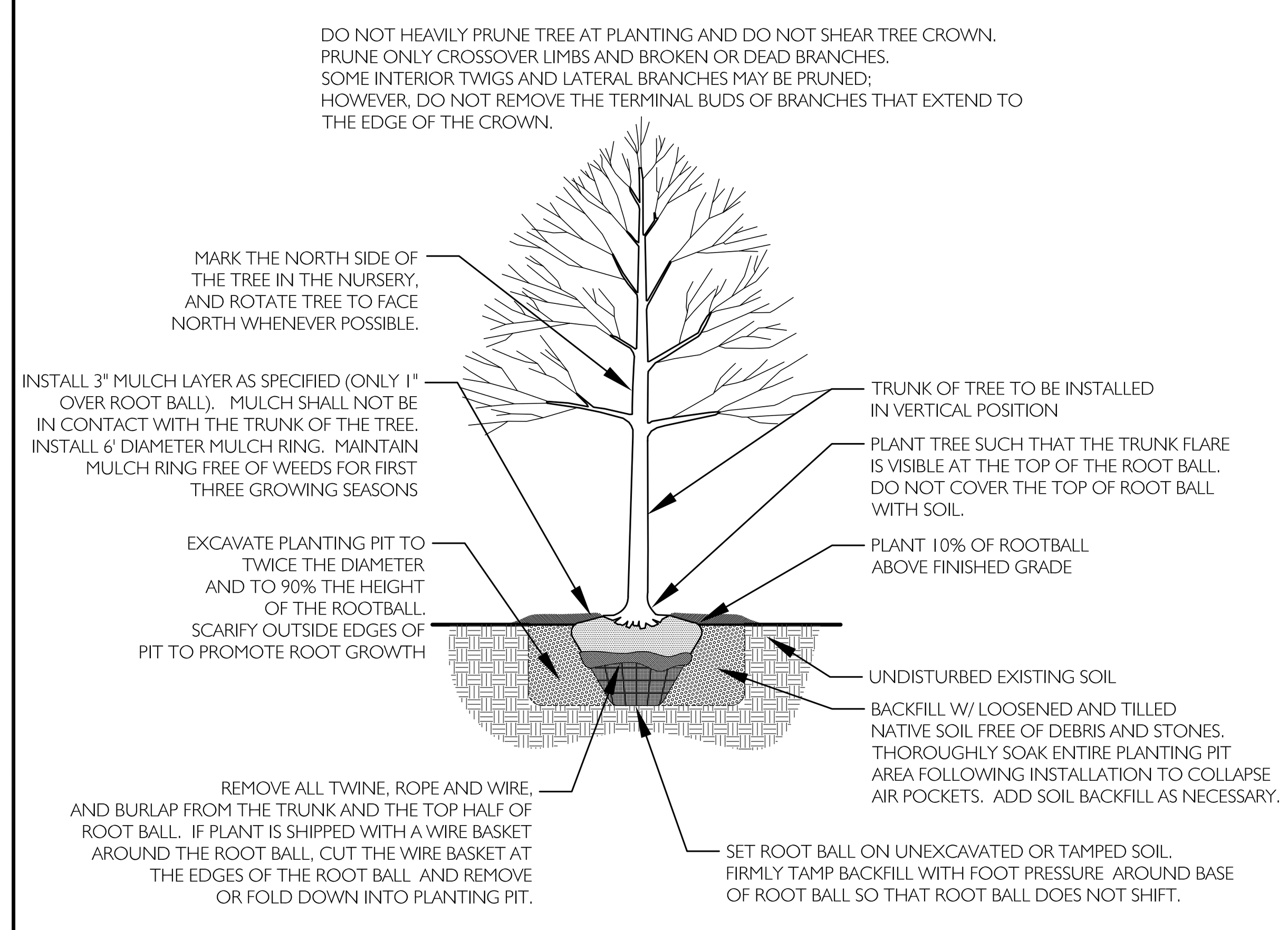
ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : --

C3

Greenspace Design
Landscape Architecture
433 Maplegrove Drive • Franklin, TN 37064 • Office: 615-591-9606 • Fax: 615-591-1323



TREE PLANTING DETAIL

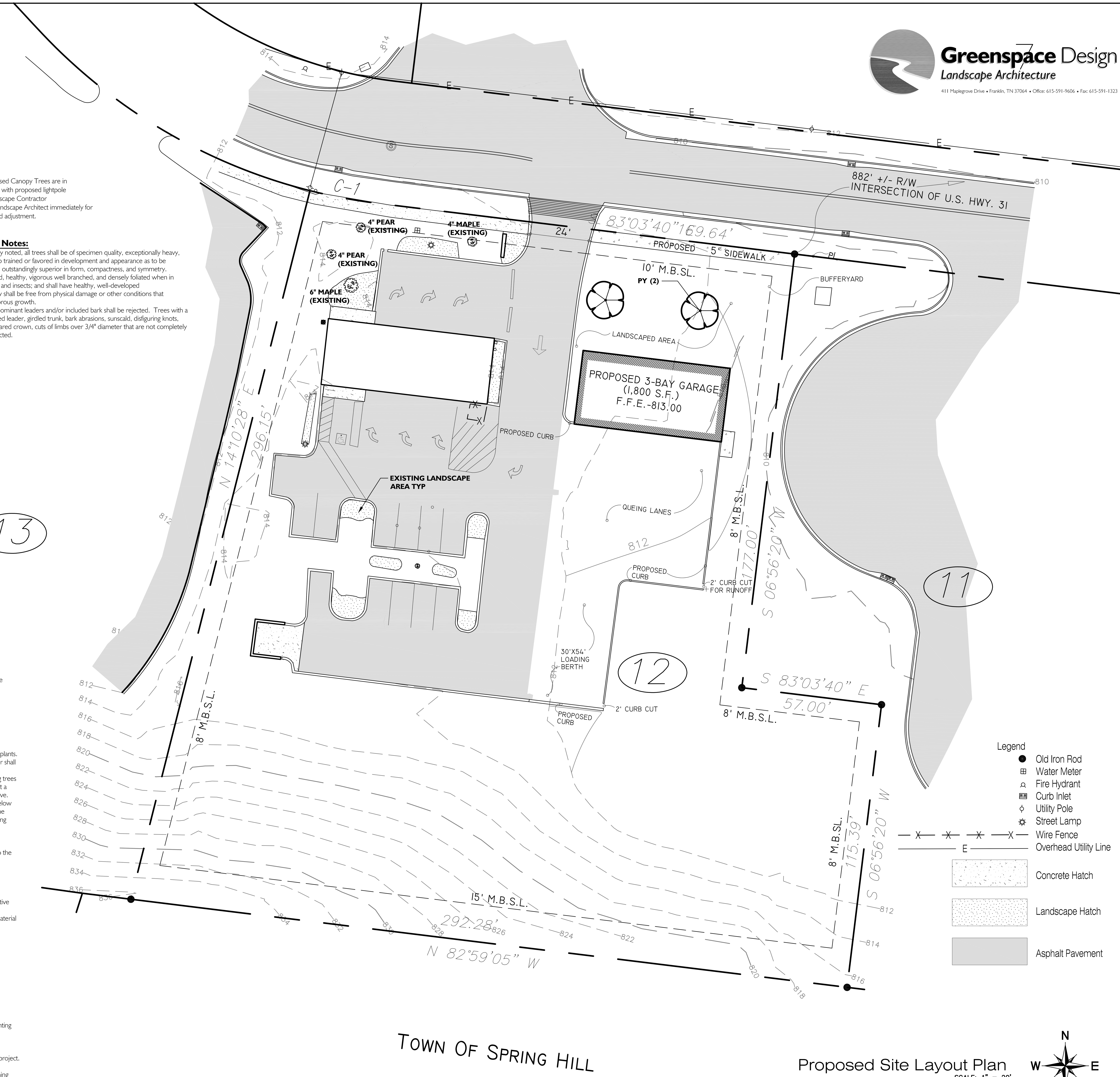
NOT TO SCALE

PLANT SCHEDULE

UNDERSTORY TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	HEIGHT	SPREAD	TRUNK	REMARKS
	PY	2	Prunus x yedoensis	Yoshino Cherry	8'-10'	4'-5'	2"	4' Clear Trunk

NOTE:
In the event proposed Canopy Trees are in conflict (within 15') with proposed lightpole locations, the Landscape Contractor shall contact the Landscape Architect immediately for coordination of field adjustment.

Tree Quality Notes:
1. Unless specifically noted, all trees shall be of specimen quality, exceptionally heavy, symmetrical, and so trained or favored in development and appearance as to be unquestionably and outstandingly superior in form, compactness, and symmetry. They shall be sound, healthy, vigorous well branched, and densely foliated when in leaf; free of disease and insects; and shall have healthy, well-developed root systems. They shall be free from physical damage or other conditions that would prevent vigorous growth.
2. Trees with co-dominant leaders and/or included bark shall be rejected. Trees with a damaged or crooked leader, girdled trunk, bark abrasions, sunscald, disfiguring knots, insect damage, sheared crown, cuts of limbs over 3/4" diameter that are not completely closed shall be rejected.



Proposed Site Layout Plan
SCALE: 1" = 20'

Landscape Notes:

1. All work shall be performed by fully qualified Plantsmen. Use good Horticultural practices to keep all plants and plant material installed in a living, healthy condition up to the date of termination of the contractor's responsibility for care.
2. The Landscape Contractor shall be responsible for examining fully both the site and the bid documents. Discrepancies in the documents or the actual site conditions shall be reported to the Landscape Architect in writing at the time of bidding or discovery. No account shall be made after contract completion for failure to report such condition, or for errors on the part of the Landscape Contractor at the time of bidding.
3. The Landscape Contractor is responsible for locating all underground utilities and shall avoid damage to utilities during the course of the work. The Landscape Contractor is responsible for repairing any damage to utilities, site structures, etc., resulting from landscape construction.
4. The Landscape Contractor shall be responsible for securing all necessary applicable permits and licenses to perform the work set forth on this plan set and the specifications.
5. The Landscape Contractor shall verify all material quantities. In the event of a discrepancy, the quantities shown on the plan will take precedence.
6. No material shall be planted before finish grading has been completed.
7. The plants delivered to the project site shall be planted as soon as site conditions permit. Take care in scheduling plant deliveries and the size of the deliveries so that long periods of storage are avoided. Adequately protect plants placed in temporary storage from the sun and wind; water plants so as to maintain their appearance and health. Plants that have not been properly maintained during temporary storage may be rejected by the Landscape Architect.
8. Should the Contractor encounter unsatisfactory surface or other subsurface drainage conditions, soil depth, latent soils, hard pan, stem of utility lines or other conditions that will jeopardize the health and vigor of the plants, he must advise the Owner's Representative in writing of the conditions prior to installing the plants. Otherwise the Contractor warrants that the planting areas are suitable for proper growth and development of the plant material to be installed and contractor shall take responsibility for the cost of any revision.
9. It is the responsibility of the Contractor to verify that each excavated tree or shrub pit will percolate (drain) prior to adding topsoil of planting mix and installing trees or shrubs.The Contractor shall fill the bottom of selected holes with six inches of water. This water should percolate out within a 24-hour period. If the soil at a given area does not drain properly, a PVC drain or gravel sump shall be installed or the planting relocated to and area approved by the Owner's Representative.
10. Prior to installation of plant materials, the width and length of all parking lot landscape island and median areas are to be excavated to a depth of 24 Inches below the proposed top of pavement elevation. Excavated material is to be removed from the landscape areas and disposed of off site or in an area approved by the Project Engineer. No asphaltic construction trash and/or materials are to be left in the topsoil and planting mix backfill and/or subgrade of any proposed parking area islands and/or planting medians and strips. Parking lot islands and medians are to be backfilled with sifted topsoil as per project specifications and to the elevations indicated on the grading plans.
11. All shrub and ground cover beds not in parking lot islands or median strips are to be excavated to a depth of 12 Inches and disposed of off site or in an area approved by the Project Engineer. Trees in these bed areas shall be installed per the tree planting detail. The bed area is to be backfilled with sifted topsoil to the elevations indicated on the grading plans as per the specifications.
12. The optimum time for planting is from October 1 to April 1. Scheduling for planting at other times must be approved in writing by the Landscape Architect.
13. Existing trees to remain shall be protected from construction damage. Selectively prune dead wood.
14. New tree plantings are to be staked per planting details. Trees that are not staked according to detail will be rejected.
15. All deciduous trees, existing and proposed shall be pruned to provide 4' minimum clear trunk unless otherwise noted.
16. The Landscape Contractor shall stake or mark all plant material locations prior to installation. The Landscape Contractor shall have the Owner's Representative approve all staking prior to installation.
17. All plant material which dies, turns brown, or defoliates (prior to total acceptance of the work) shall be promptly removed from the site and replaced with material of the same species quantity and size and meeting all plant list specifications.
18. The Landscape Contractor shall grade planting beds, as required, to provide positive drainage and promote optimum plant growth.
19. Chemical Weed Control (pre-emergent, i.e. Treflan) shall be applied to all landscape areas prior to any plant installation.
20. All planting areas shall receive a 3" layer of the mulch as specified in the materials schedule, which is to be watered-in after installation.
21. All plants shall be vigorous, healthy material, free of pests and disease.
22. All plants and trees must meet all requirements specified in the plant list, details, and specifications.
23. The standards set forth in "American Standard for Nursery Stock" represent general guideline specifications only and will constitute minimum quality requirements for plant material. All plants must meet minimum size noted at the materials schedule. Trees shall be No. 1 grade specimen and shrubs shall be heavy well shaped specimens as well.
24. All disturbed areas shall be planted with turf as indicated on the materials schedule.
25. Existing sod shall be removed as necessary to accommodate new plantings.
26. Any existing sod areas that are unnecessarily disturbed during the landscape installation shall be resodded to match existing.
27. The Landscape Contractor is responsible for completely maintaining the work (including but not limited to: watering, mulching, spraying, fertilizing, of all planting areas and lawns per project specifications until total acceptance of the work by the owner.
28. The Landscape Contractor shall completely guarantee all work for a period of one year beginning at the date of total acceptance.
29. The Landscape Contractor shall provide the owner with written instructions on the proper care of all specified plant materials prior to final payment.
30. The Landscape Contractor will be responsible for the collection, removal, and proper disposal of any and all debris generated during the installation of this project.
31. ATTENTION OWNER/ INSTALLER:
This landscape plan has been designed to meet the minimum requirements of the City of Thompson Station zoning ordinance, the approval of the planning commission, and planning department policy. Relocating, substituting, resizing, reducing or deleting material may cause the site to no longer conform to the requirements; Thus problems may arise with releasing the performance/ maintenance bond for landscaping. Deviation from the approved landscape plan shall not be made without first consulting Greenspace Design and then obtaining approval from either the planning commission or the planning department.

Revisions

No.	Date	Description
	03/02/2016	City Comments

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Project Number:
Designed By: JBH
Drawn By:
Checked By: JBH

SHEET: Site Landscape Plan

PROJECT: Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

CLIENT: David Cianfaglione
2636 Pratt Road
Thompson's Station, Tn 37179
(615) 595- 0141

CAD FILE NAME: con-c1.dwg

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Phone: 615.794-0323
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JOSHUA B. HENRICK REGISTERED LANDSCAPE ARCHITECT TENNESSEE NO. 743 AGRICULTURE COMMERCE
03/02/2016

Issue Date: 12/14/2015

Sheet Number: L1

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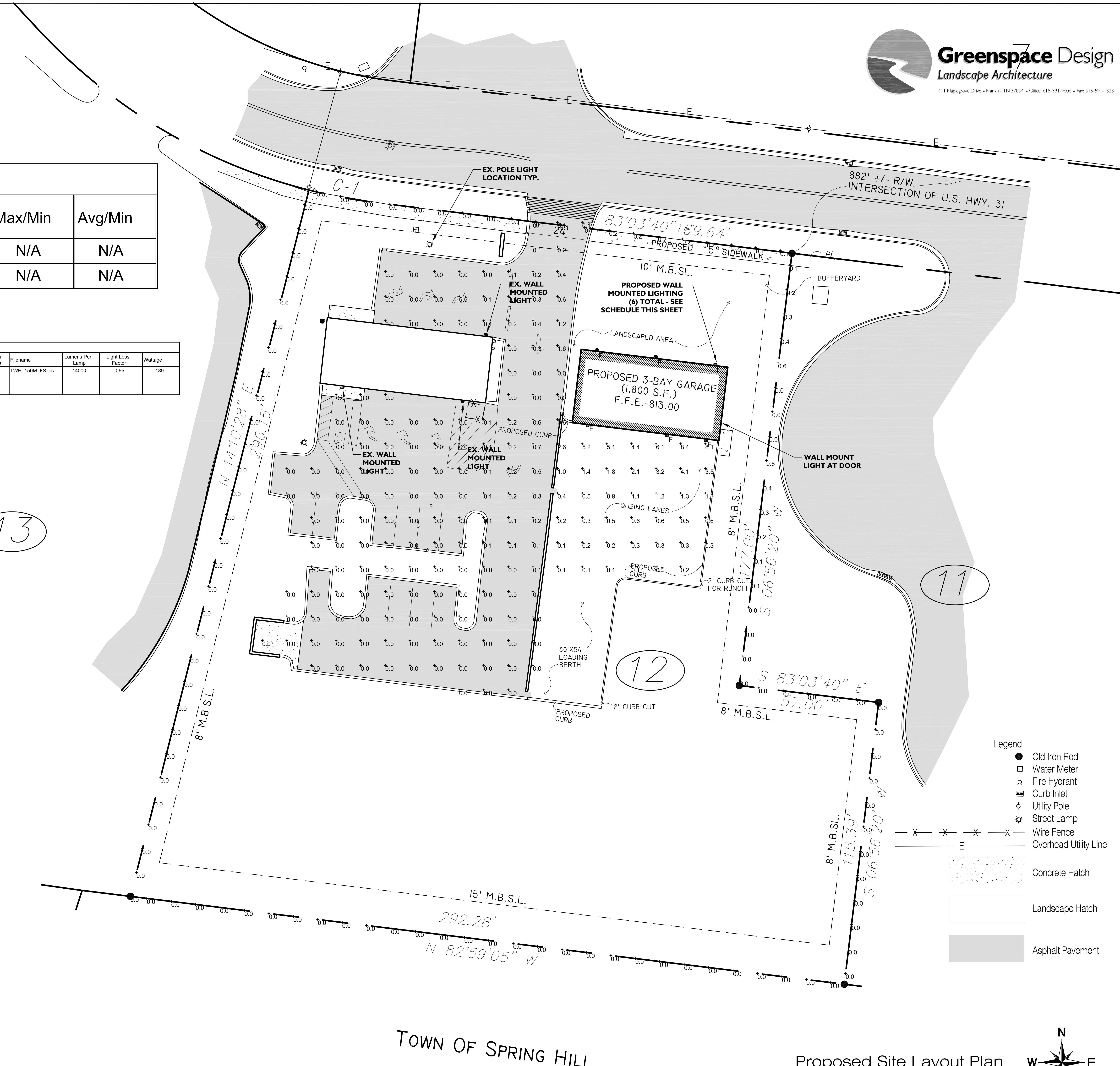
Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
parking lot	+	0.4 fc	8.4 fc	0.0 fc	N/A	N/A
property line	+	0.0 fc	0.6 fc	0.0 fc	N/A	N/A

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	F	6	Lithonia Lighting	TWH 150M FS	DIE-CAST GENERAL PURPOSE WALLPACK WITH GLASS REFRACTOR AND FULL SHIELD	ONE 150-WATT CLEAR ED-28 PULSE START METAL HALIDE, HORIZONTAL POSITION.	1	TWH_150M_FS.ies	14000	0.65	189



Proposed Site Layout Plan
SCALE: 1" = 20'

Revisions		
No.	Date	Description
	03/02/2016	City Comments

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Project Number:
Designed By: JBH
Drawn By:
Checked By: JBH

SHEET: Site Photometric Plan

PROJECT: Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

CLIENT: David Cianfaglione
2636 Pratt Road
Thompson's Station, Tn 37179
(615) 595-0141

CAD FILE NAME: con-c1.dwg

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Consulting Engineer
105 Southeast Parkway / Suite 107
Franklin, Tennessee 37064-3932
Email: bucy@cainbucy.com
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JOSHUA B. HENRICK REGISTERED LANDSCAPE ARCHITECT TENNESSEE NO. 743 03/02/2016

Issue Date: 02/10/2016

Sheet Number: E1

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GENERAL MATERIAL DESCRIPTION KEY

MK	DESCRIPTION
P-1	PAINT - TO BE SELECTED
P-2	PAINT - TO BE SELECTED
P-3	PAINTED BLOCK
FL-1	FLOORING - VINYL COMP. TILE
FL-2	FLOORING - SEALED CONCRETE
FL-3	FLOORING - EXPOSED CONCRETE
RCB	4" RUBBER COVE BASE - TO BE SELECTED
LI	LAMINATE COUNTERTOP - TO BE SELECTED
2x4	2x4 SUSPENDED GRID WITH STANDARD LAY-IN ACOUSTICAL TILE
ES	EXPOSED STRUCTURE
GB	5/8" GYP. BOARD

NOTE:

ROOM FINISH SCHEDULE

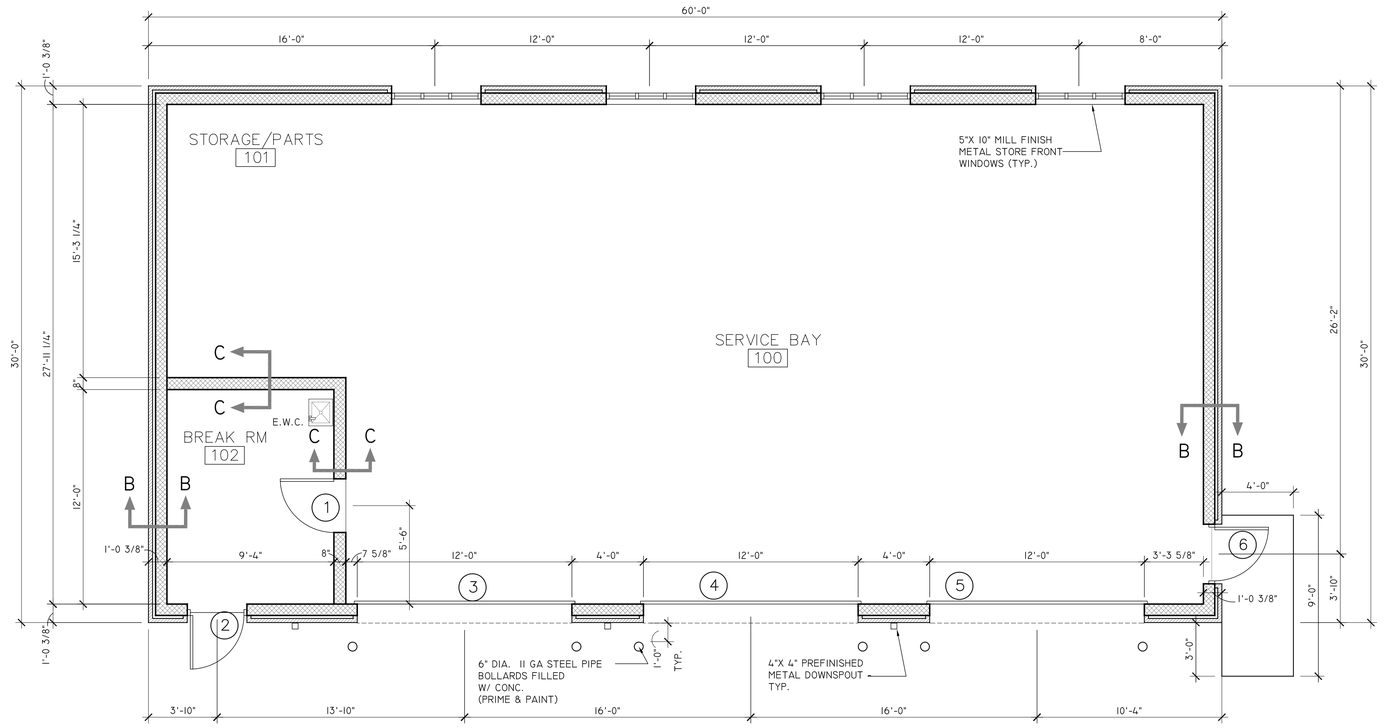
ROOM		WALLS				FLOOR	BASE	CEILING	COMMENTS
NO.	NAME	NORTH	SOUTH	EAST	WEST				
100	SERVICE BAYS	P-1	P-1	P-1	P-1	FL-2	"	ES	
101	STORAGE/PARTS	P-3	P-1	P-1	P-1	FL-2	"	ES	
104	BREAK ROOM	P-1	P-1	P-1	P-1	FL-2	RCB	2x4 (OPT.)	

NOTE:

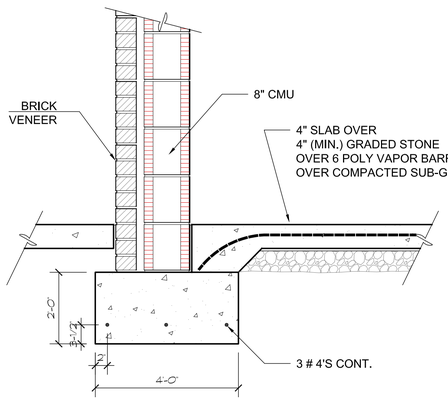
DOOR SCHEDULE

NO.	SIZE	MTL.	TYPE	FRAME	HARDWARE			COMMENTS
◯	WIDTH x HEIGHT x THICK.				LOCK SET	PASSAGE	CLOSER	
1	3'-0" x 7'-0" x 1 3/4"	HM	I	HM	x		x	A
2	3'-0" x 7'-0" x 1 3/4"	HM	I	HM	x		x	A
3	10'-0" x 14'-0"	-	-	-				
4	10'-0" x 14'-0"	-	-	-				
5	10'-0" x 14'-0"	-	-	-				
6	3'-0" x 7'-0" x 1 3/4"	HM	I	HM	x		x	A

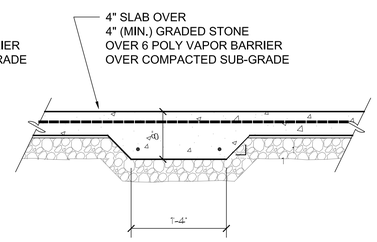
NOTE: A. PROVIDE LEVER HARDWARE



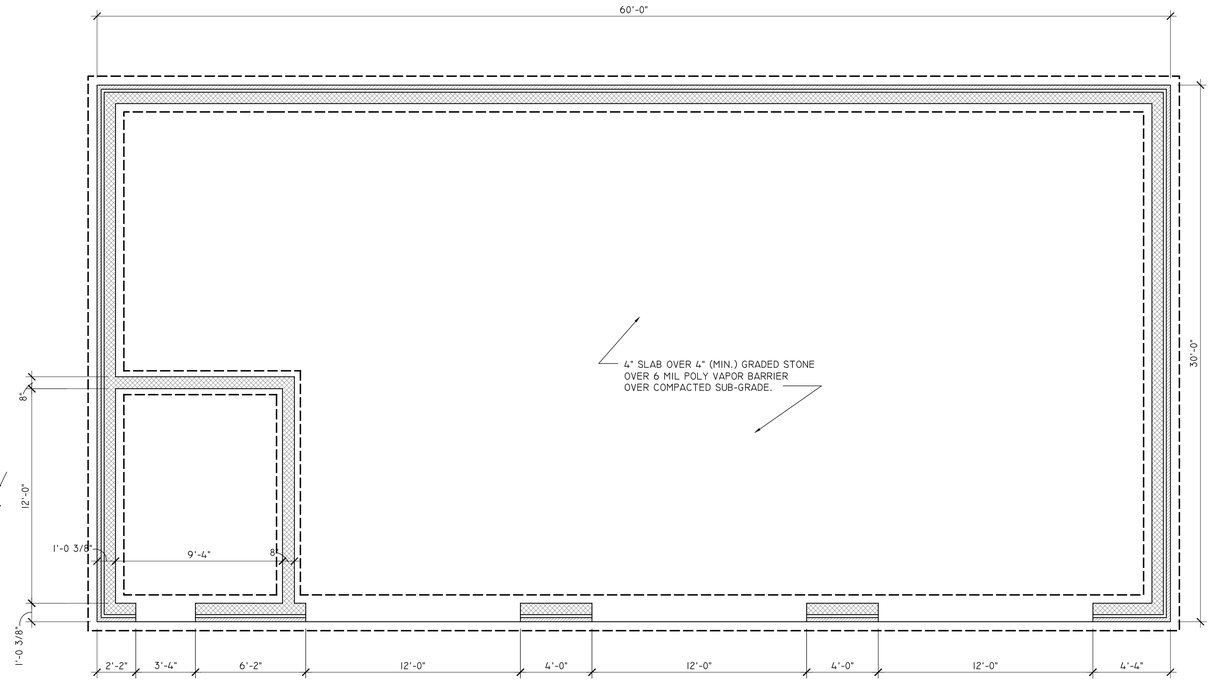
A / A-1 **FLOOR PLAN**
SCALE: 1/4"=1'-0"



AA / A-1 **SECTION B-B**
SCALE: 1/4"=1'-0"



AA / A-1 **SECTION C-C**
SCALE: 1/4"=1'-0"



B / A-1 **FOUNDATION PLAN**
SCALE: 1/4"=1'-0"

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GERALD G. BUCY REGISTERED ENGINEER AGRICULTURE CIVIL COMMERCE No. 12255 STATE OF TENNESSEE
12/18/15

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REVISIONS
2/25/16 PER TOWN COMMENTS

FLOOR PLANS

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

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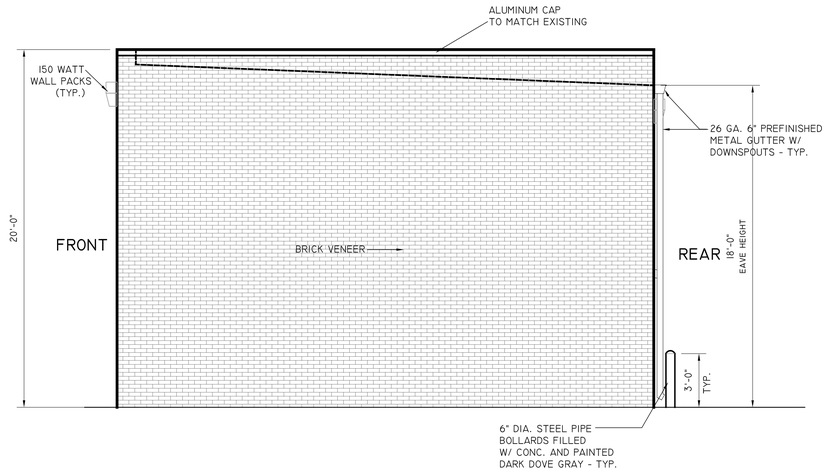
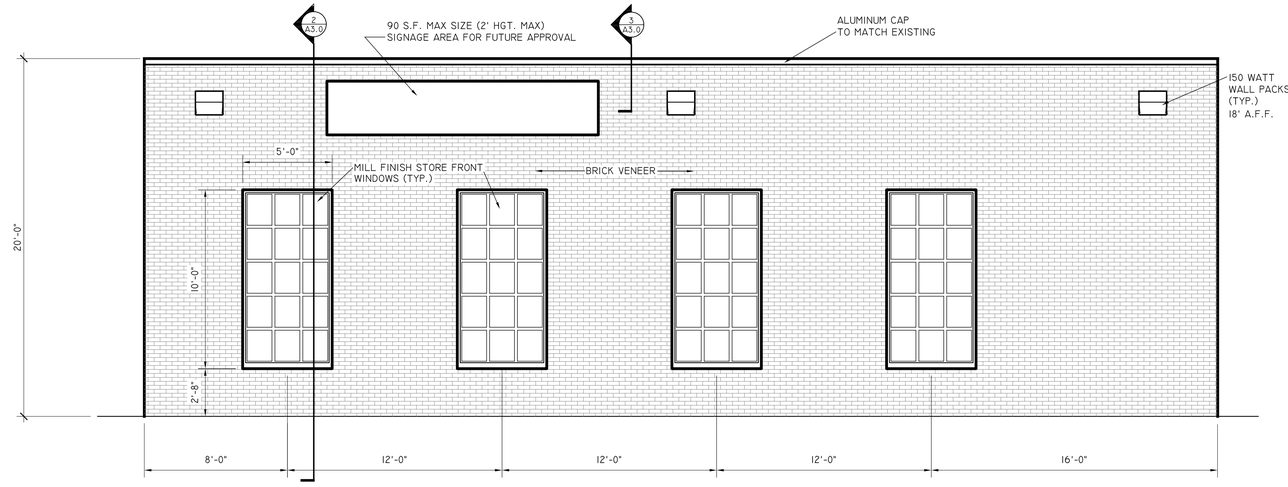
ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : ---

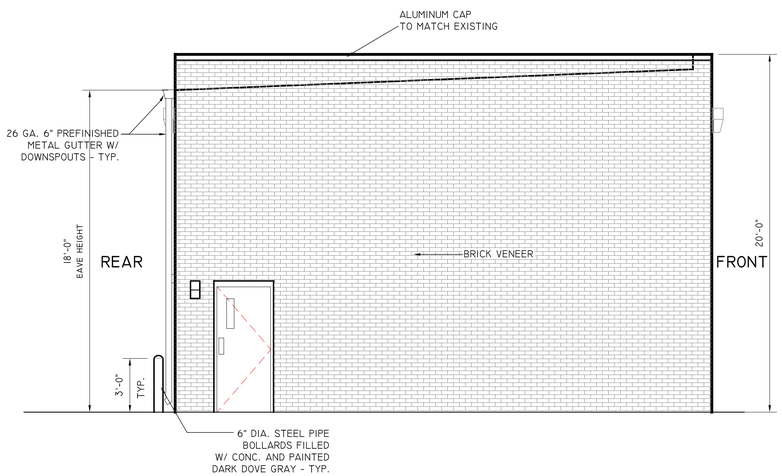
A-1



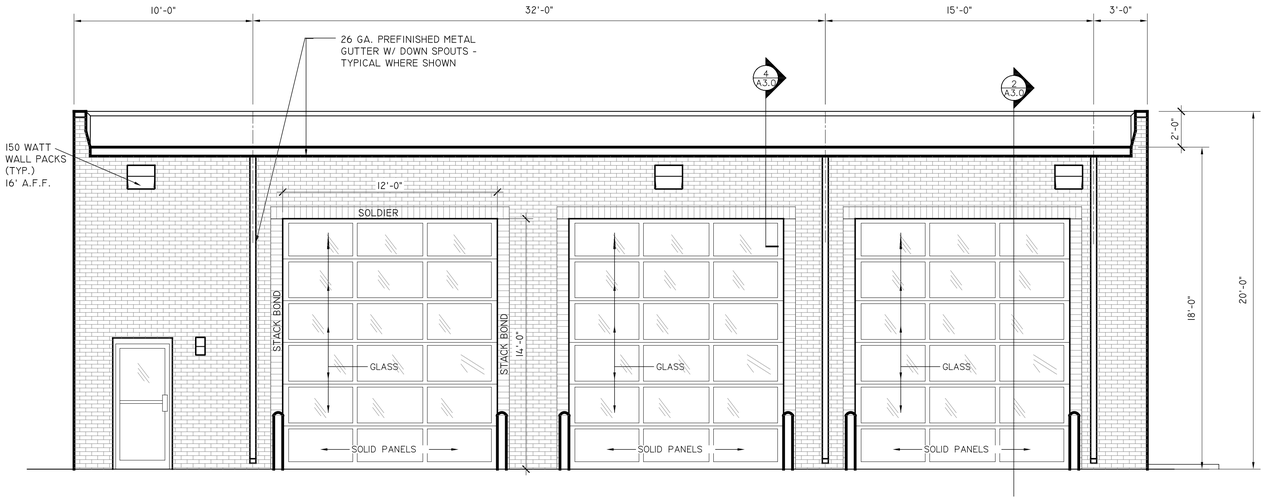
4 A-2 **RIGHT ELEVATION**
SCALE: 1/4"=1'-0"



1 A-2 **FRONT ELEVATION rev-2**
SCALE: 1/4"=1'-0"



3 A-2 **LEFT ELEVATION**
SCALE: 1/4"=1'-0"



2 A-2 **REAR ELEVATION**
SCALE: 1/4"=1'-0"

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REVISIONS
2/25/16 PER TOWN COMMENTS

ELEVATIONS

A New Auto Repair Building For
Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

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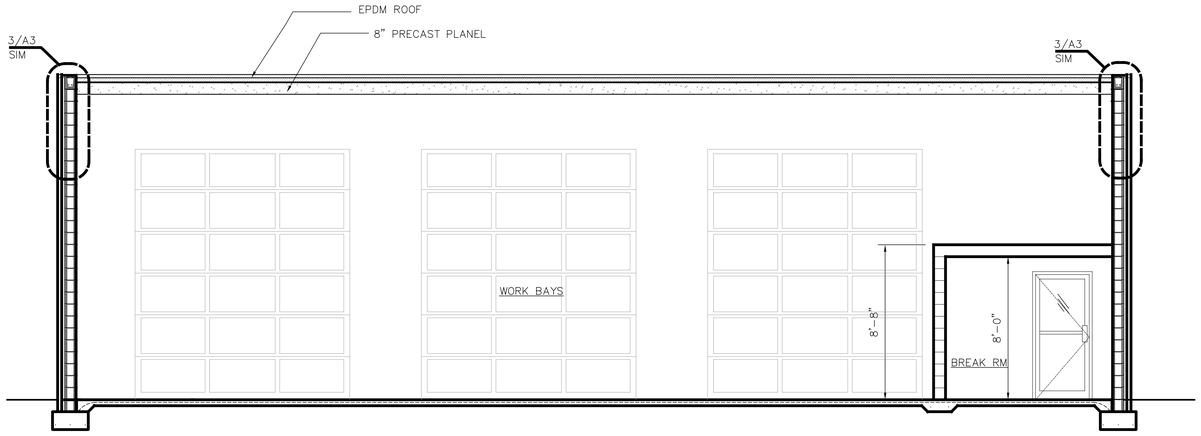
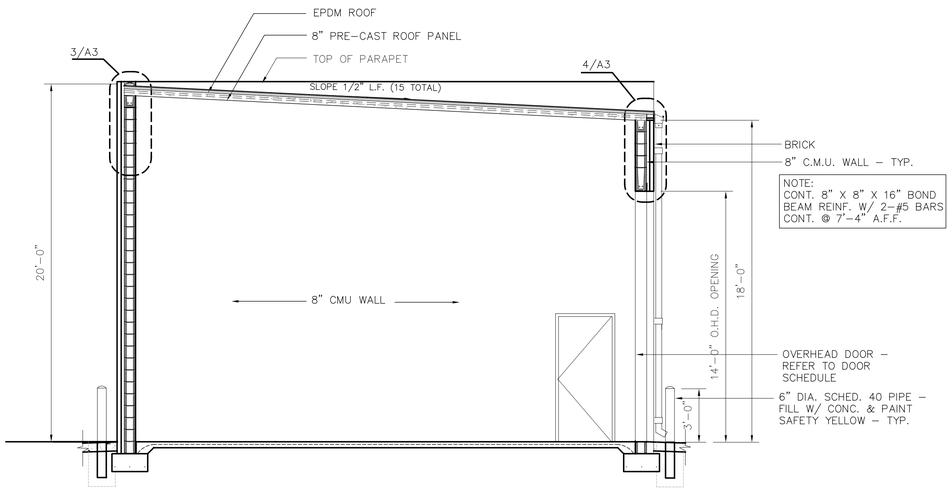
CAD NAME : --

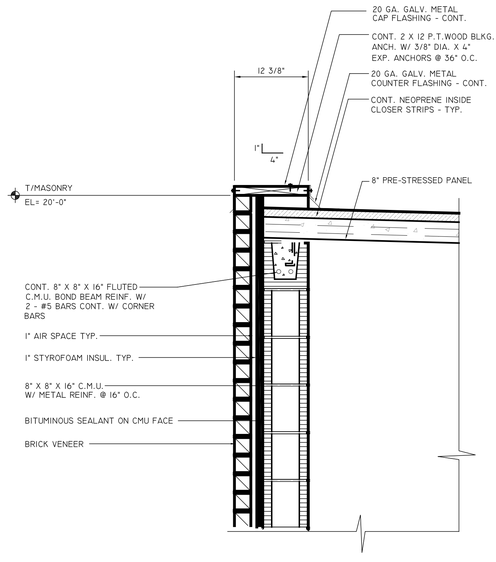
A-2



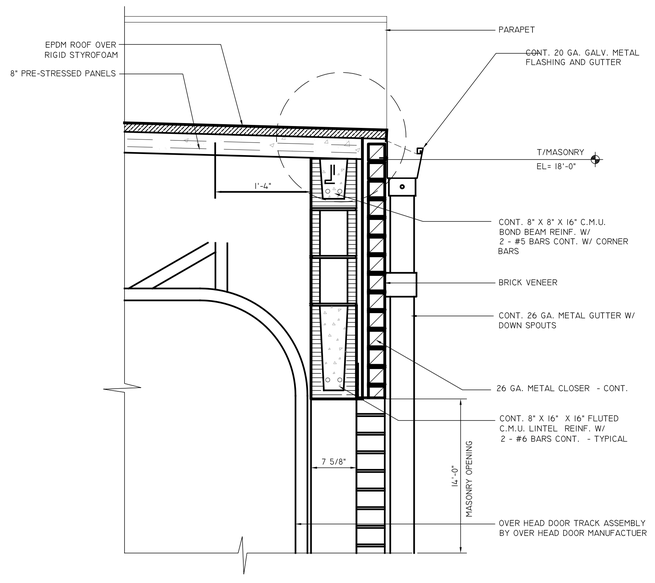
1 BUILDING CROSS SECTION
A-3 SCALE: 1/4"=1'-0"



2 BUILDING SECTION
A-3 SCALE: 1/4"=1'-0"



3 DETAIL @ FRONT WALL
A-3 SCALE: 1"=1'-0"



4 DETAIL @ REAR WALL
A-3 SCALE: 1"=1'-0"

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REVISIONS
2/25/16 PER TOWN COMMENTS

SECTIONS

A New Auto Repair Building For Fast Lane Express Lube Shop, Inc.
4713 Traders Way
Thompson's Station, Tennessee 37179

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ISSUE DATE : 12-18-15
PROJECT#: --
CAD NAME : ---

A-3

RAGAN SMITH

Justification Statement

The proposed school location is based on Williamson County School Board of Education findings that the growth based on current and proposed development patterns in Thompson's Station, and the immediate area, is sufficient to justify a kindergarten through eighth grade public school. The Town of Thompson's Station and those areas of the county surrounding Thompson's Station have grown whereas Williamson County Schools is overcrowded at several of the nearby schools. Williamson County Schools is seeing growth of 1,200 to 1,800 students per year. An elementary and middle school is a permitted use by right (per Table 4.1, LDO) in the D1 (Low Density Residential) Use Zone. This site, which will have sufficient water (per a HBTS main up-size), sufficient sanitary, pedestrian and vehicular connections to immediate neighborhoods, sufficient area for an athletic campus, along with the Town's proposed improvements for Critz Lane, lends itself to being an ideal school site to meet this need.

The rural character along Clayton Arnold has been maintained by pulling the parking over 300' from the right-of-way, maintaining open space along the frontage. The building has also been located to be as far from proposed single-family lots of Bridgemore as can be graded with a proposed buffer. The aforementioned parking, which is set back from Clayton Arnold, is landscaped per Section 4.14.3. The parking and parent drop-off is located in front of the building for student safety and security purposes. The bus drop-off is totally separated from parent drop-off for safety concerns. Also, the children play areas are located behind the building and separated from vehicular and bus traffic for safety concerns.

Further, the Tree Replacement Ordinance has been followed with architecturally located trees, parking lot trees, and landscape buffer (adjacent to prosed and existing single-family of Bridgemore). The other bulk standards of D1 are in compliance and the parking and bus circulation is per County and LDO requirements.

Proposed right and left turn lanes serving this campus have been designed and connectivity with existing Allenwood, across Clayton Arnold, has been accounted for in this design. The overall campus masterplan has significant amount of open space, in both passive and active recreation opportunities, as well as play areas for elementary students.

This proposed institutional use is in keeping with LDO standards, needs of the community, and the character of the immediately adjacent area.

11-052
0471

RAGAN· SMITH

February 24, 2016

Via Electronic Mail: wdeats@thompsons-station.com

Ms. Wendy Deats, AICP
Town of Thompson's Station
1550 Thompson's Station Road West
Thompson's Station, Tennessee 37179

RE: THOMPSON'S STATION PROPOSED K-8 SCHOOL SITE
TRAFFIC ACCESS REVIEW
TOWN OF THOMPSON'S STATION, TENNESSEE

Dear Wendy:

I am writing this letter to address on-site circulation and public roadway access for the proposed K-8 school to be located on Clayton Arnold Road near the Bridgemore Village subdivision in Thompson's Station, Tennessee. The current site plan for this proposed school includes a 233,880 square foot facility with a total capacity of 1,600 students.

Site Access

Access to the proposed school site will be provided at two locations.

- Primary access to the site will be located on Clayton Arnold Road approximately 2,250 feet south of Critz Lane. The primary site access will consist of two driveways with a spacing of approximately 100 feet (center-to-center, 65 feet edge-to-edge). The northern driveway will be restricted to bus use only and will include two lanes with a total pavement width of 28 feet. The southern driveway will align with Allenwood Drive to the west and will be for general use by school staff, visitors, and for student drop-off/pick-up. The southern driveway will include three lanes (one inbound lane, one shared thru-left turn lane, and one right turn lane) with a total width of 36 feet.

- Secondary access to the site will be provided by an extension of Bartrams Bridge Road from the Bridgemore Village subdivision. The extension will connect to an internal circulation route at the rear of the proposed school and will be able to access all portions of the school campus including the drop-off/pick-up area, staff and visitor parking areas, and the athletic fields.

Trip Generation & Assignment

In order to quantify site related impacts within the study area, some estimates of site traffic generation and trip assignment had to be established. Trip generation rates for the development were established using information for the weekday a.m. and p.m. school peak hour as shown in the ***Trip Generation Manual***, *9th Edition* published by the Institute of Transportation Engineers (ITE). The ITE trip generation data includes elementary school and middle school uses, so to estimate the future trip generation of the site the total capacity of the proposed school was divided equally between the two uses for analysis purposes.

The estimated trip generation for the proposed school at full capacity is shown in Table 1 below.

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TABLE 1								
TRIP GENERATION								
Description	# of Students	Daily	A.M. Peak Hour			P.M. Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Elementary School (ITE LUC 520)	800	1,032	198	162	360	101	123	224
Middle School/Junior High School (ITE LUC 522)	800	1,296	238	194	432	108	132	240
TOTAL	**1,600**	**2,328**	**436**	**356**	**792**	**209**	**255**	**464**

The zoning district for the proposed school is not currently known and is not expected to be determined until later in the development and construction process. Due to the lack of school zone data, a reasonable estimate of school traffic distribution was made by assigning 50% of the school traffic to the north on Clayton Arnold Road and 50% of the school traffic to the south on Clayton Arnold Road. While it is reasonable to expect that a portion of the site traffic will use the secondary Bartrams Bridge Road access to reach the school site, the analysis of this review conservatively assigns all proposed site traffic to the Clayton Arnold Road access.

Traffic Analysis

In order to gauge the traffic operations at the site entrance on Clayton Arnold Road when the school reaches the student capacity, analyses were conducted according to the methodology and procedures outlined in the *Highway Capacity Manual*, 2010, published by the Transportation Research Board.

In many locations, a traffic control officer is present during peak ingress/egress periods at schools to assist with the movement of vehicles and people. For the analysis of this review, the following traffic control scenarios have been analyzed.

- Unsignalized, two-way stop control representing that no traffic control officer is present
- Signalized with timing variables calibrated to represent the presence of a traffic control officer

Capacity analysis results for the a.m. and p.m. peak hours are shown below in Table 2.

TABLE 2				
INTERSECTION CAPACITY ANALYSIS RESULTS				
Location	Intersection Control	Condition	Level-of-Service	
			A.M. Peak Hour	P.M. Peak Hour
Clayton Arnold Road at Proposed School Entrance	Two-Way Stop	NB Left Turn	A	A
		SB Left Turn	B	A
		TWSC EB Approach	E	C
		TWSC WB Left/Thru	F	C
		TWSC WB Right	B	A
	Traffic Control Officer	Overall Intersection	C	C

RAGAN SMITH

The capacity analysis results indicate that when at full student capacity, traffic exiting the school site during the a.m. peak hour will experience noticeable delay without a traffic control officer present. The intersection can operate without significant delay when a traffic control officer is present during the a.m. and p.m. peak hours.

Intersection Sight Distance

In order to assess the available sight distance along Clayton Arnold Road, Ragan-Smith staff visited the site to observe the site frontage and available sight distance. The criteria for sight distance is provided in the *Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO). The field observed sight distance at this location, as well as the required sight distances per AASHTO, are shown in the table below.

TABLE 3

INTERSECTION SIGHT DISTANCE

Intersection	Case - Condition [1]	Sight Distance	
		Required [1]	Observed
Proposed School Site Entrance at Clayton Arnold Road	B1 - Left Turn from Minor Road	415 ft.	> 800 ft.
	B2 - Right Turn from Minor Road	365 ft.	> 1,000 ft.

[1] AASHTO Policy on Geometric Design of Highways and Streets, 6th Edition, 2011 p. 9-28 to 9-55

As shown above, adequate sight distance along Clayton Arnold Road is available and can be maintained at the project driveway.

Conclusions and Recommendations

Based on the analysis conducted for the proposed school site, we offer the following recommendations.

- A southbound left turn lane should be constructed on Clayton Arnold Road at the proposed school entrance. Based on the capacity analysis queue length results, the storage length of the southbound left turn lane should be 300 feet. To maintain appropriate design elements on Clayton Arnold Road, a northbound left turn lane into Allenwood Drive should be constructed with 75 feet of storage to align with the southbound left turn lane for the school entrance.

- A northbound right turn lane should be constructed on Clayton Arnold Road at the proposed school entrance. Based on the capacity analysis queue length results, the storage length of the northbound right turn lane should be 350 feet.

- A school zone should be established on Clayton Arnold Road beginning approximately 950 feet south of the school entrance (Allenwood Drive) and ending approximately 650 feet north of the school site entrance (Allenwood Drive). Williamson County school staff have previously indicated that a speed limit of 20 mph will be present in the school zone during arrival and dismissal periods.

- The school administration should monitor traffic operations during the morning and afternoon peak periods as the number of students increase at the school. A traffic control officer should be present to direct traffic during the peak morning and afternoon periods when noticeable delays are incurred by traffic exiting the site.

RAGAN SMITH

If you have any comments or need any additional information about the traffic access review completed for the proposed K-8 school site on Clayton Arnold Road, we would be happy to speak or meet with you at your convenience.

Sincerely,

RAGAN-SMITH ASSOCIATES, INC.

Brandon S. Baxter, P.E., PTOE
Associate

BSB:djb

c: Mr. Kevin Fortney (kevinf@wcs.edu)
Mr. Derek Howard (derek.howard@gmcnetwork.com)

TRAFFIC VOLUME WORKSHEET
CLAYTON ARNOLD RD AT SCHOOL DRIVEWAY
A.M. PEAK HOUR

RAGAN SMITH

Description		Northbound Clayton Arnold Rd			Southbound Clayton Arnold Rd			Eastbound Allenwood Dr			Westbound School Driveway		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2015 EXISTING TRAFFIC VOLUMES			170			58							
2021 BACKGROUND TRAFFIC VOLUMES													
Annual Background Growth													
Growth Rate (%/year)			2.0			2.0							
Growth Factor		1.00	1.13	1.00	1.00	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips		0	21	0	0	7	0	0	0	0	0	0	0
Specific Development Background Growth													
Allenwood	% In	20					80						
	% Out							80		20			
	Trips	0	0	0	0	0	2	6	0	1	0	0	0
Specific Development Background Growth Trips		0	0	0	0	0	2	6	0	1	0	0	0
2021 Background Traffic Volumes		0	191	0	0	65	2	6	0	1	0	0	0
2021 SITE TRAFFIC VOLUMES													
Elementary School	% In			50	50								
	% Out										50		50
	Trips	0	0	99	99	0	0	0	0	0	81	0	81
Middle School/Junior High School	% In			50	50								
	% Out										50		50
	Trips	0	0	119	119	0	0	0	0	0	97	0	97
2021 Site Traffic Volumes		0	0	218	218	0	0	0	0	0	178	0	178
2021 TOTAL TRAFFIC VOLUMES		0	191	218	218	65	2	6	0	1	178	0	178

TRAFFIC VOLUME WORKSHEET
CLAYTON ARNOLD RD AT SCHOOL DRIVEWAY
P.M. PEAK HOUR

RAGAN· SMITH

Description		Northbound Clayton Arnold Rd			Southbound Clayton Arnold Rd			Eastbound Allenwood Dr			Westbound School Driveway		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2015 EXISTING TRAFFIC VOLUMES			54			239							
2021 BACKGROUND TRAFFIC VOLUMES													
Annual Background Growth													
Growth Rate (%/year)			2.0			2.0							
Growth Factor		1.00	1.13	1.00	1.00	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips		0	7	0	0	30	0	0	0	0	0	0	0
Specific Development Background Growth													
Allenwood	% In	20					80						
	% Out							80		20			
	Trips	2	0	0	0	0	6	4	0	1	0	0	0
Specific Development Background Growth Trips		2	0	0	0	0	6	4	0	1	0	0	0
2021 Background Traffic Volumes		2	61	0	0	269	6	4	0	1	0	0	0
2021 SITE TRAFFIC VOLUMES													
Elementary School	% In			50	50								
	% Out										50		50
	Trips	0	0	30	30	0	0	0	0	0	31	0	31
Middle School/Junior High School	% In			50	50								
	% Out										50		50
	Trips	0	0	32	32	0	0	0	0	0	33	0	33
2021 Site Traffic Volumes		0	0	62	62	0	0	0	0	0	64	0	64
2021 TOTAL TRAFFIC VOLUMES		2	61	62	62	269	6	4	0	1	64	0	64

HCS 2010 Two-Way Stop Control Summary Report

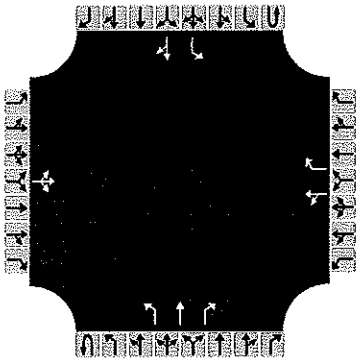
General Information

Analyst	bsb
Agency/Co.	Ragan-Smith Assoc.
Date Performed	2/24/2016
Analysis Year	2021
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Thompson's Station K-8 School

Site Information

Intersection	Clayton Arnold @ Site
Jurisdiction	Thompson's Station, TN
East/West Street	Site Access/Allenwood Dr
North/South Street	Clayton Arnold Rd
Peak Hour Factor	0.70
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	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		0	1	0		0	1	1	0	1	1	1	0	1	1	0
Configuration			LTR			LT		R		L	T	R		L		TR
Volume (veh/h)		6	0	1		178	0	178		0	191	218		218	65	2
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			10			254		254						311		
Capacity			102			169		763		1490				985		
v/c Ratio			0.10			1.50		0.33						0.32		
95% Queue Length			0.3			16.4		1.5						1.4		
Control Delay (s/veh)			44.1			303.3		12.1		7.4				10.3		
Level of Service (LOS)			E			F		B		A				B		
Approach Delay (s/veh)	44.1				157.7								7.9			
Approach LOS	E				F								A			

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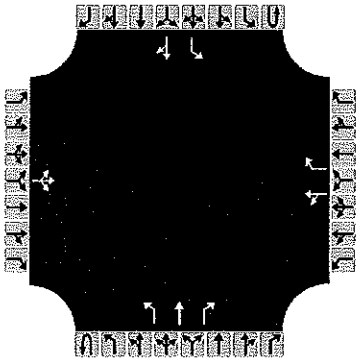
HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	bsb	Intersection	Clayton Arnold @ Site
Agency/Co.	Ragan-Smith Assoc.	Jurisdiction	Thompson's Station, TN
Date Performed	2/24/2016	East/West Street	Site Access/Allenwood Dr
Analysis Year	2021	North/South Street	Clayton Arnold Rd
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.70
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Thompson's Station K-8 School		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	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		0	1	0		0	1	1	0	1	1	1	0	1	1	0
Configuration			LTR			LT		R		L	T	R		L		TR
Volume (veh/h)		4	0	1		64	0	64		2	61	62		62	269	6
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			7			91		91		3				89		
Capacity			326			355		968		1159				1393		
v/c Ratio			0.02			0.26		0.09		0.00				0.06		
95% Queue Length			0.1			1.0		0.3		0.0				0.2		
Control Delay (s/veh)			16.3			18.6		9.1		8.1				7.8		
Level of Service (LOS)			C			C		A		A				A		
Approach Delay (s/veh)	16.3				13.8				0.1				1.4			
Approach LOS	C				B				A				A			

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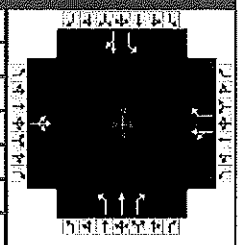
HCS 2010 Signalized Intersection Results Summary

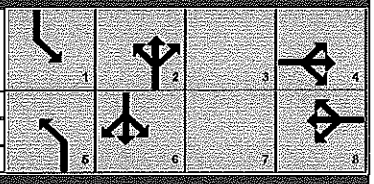
General Information				Intersection Information	
Agency	Ragan-Smith Associates			Duration, h	0.25
Analyst	bsb	Analysis Date	2/23/2016	Area Type	Other
Jurisdiction	Thompson's Station	Time Period	AM Peak Hour	PHF	0.70
Urban Street	Clayton Arnold Rd	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Proposed School	File Name	ClaytonArnold@School_Total_AM_Signal-Officer....		
Project Description	Thompson's Station Proposed K-8 School				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	6	0	1	178	0	178	0	191	218	218	65	2

Signal Information			
Cycle, s	95.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	0.0	14.4	21.3	2.3	17.8	0.0	
Yellow	7.0	7.0	7.0	7.0	7.0	0.0	
Red	3.0	3.0	3.0	3.0	3.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		12.0		11.0	1.1	3.0	1.1	4.0
Phase Duration, s		12.3		27.8	0.0	31.3	24.4	55.7
Change Period, (*Y+Rc*), s		10.0		10.0	10.0	10.0	10.0	10.0
Max Allow Headway (*MAH*), s		3.4		3.5	0.0	3.4	3.3	3.4
Queue Clearance Time (*gs*), s		2.5		16.7		19.9	14.1	4.7
Green Extension Time (*ge*), s		0.0		1.1	0.0	1.4	0.3	0.9
Phase Call Probability		0.23		1.00		1.00	1.00	1.00
Max Out Probability		0.00		0.01		0.00	0.65	0.44

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		10			254	254	0	273	311	311	96	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1778			1810	1610	1810	1900	1610	1810	1890	
Queue Service Time (*gs*), s		0.5			12.8	14.7	0.0	12.5	17.9	12.1	2.7	
Cycle Queue Clearance Time (*gc*), s		0.5			12.8	14.7	0.0	12.5	17.9	12.1	2.7	
Green Ratio (*g/C*)		0.02			0.19	0.19	0.12	0.22	0.22	0.39	0.48	
Capacity (*c*), veh/h		44			336	299	371	423	359	452	902	
Volume-to-Capacity Ratio (*X*)		0.229			0.757	0.851	0.000	0.645	0.868	0.690	0.106	
Available Capacity (*ca*), veh/h		185			566	503	558	1901	1611	519	902	
Back of Queue (*Q*), veh/ln (95 th percentile)		0.4			9.8	10.1	0.0	9.9	11.7	9.3	2.1	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00			0.00	0.00	0.00	0.00	0.77	0.77	0.00	
Uniform Delay (*d1*), s/veh		45.9			37.0	37.8	0.0	33.8	35.9	22.8	13.8	
Incremental Delay (*d2*), s/veh		1.0			1.3	2.9	0.0	0.6	2.5	2.3	0.0	
Initial Queue Delay (*d3*), s/veh		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh		46.9			38.3	40.7	0.0	34.5	38.5	25.1	13.8	
Level of Service (LOS)		D			D	D		C	D	C	B	
Approach Delay, s/veh / LOS	46.9	D		39.5	D		36.6	D		22.5	C	
Intersection Delay, s/veh / LOS	33.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	2.3	B	2.3	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	1.3	A	1.5	A	1.2	A

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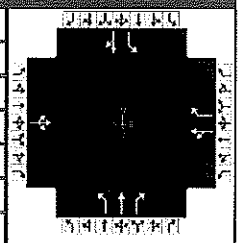
HCS 2010 Signalized Intersection Results Summary

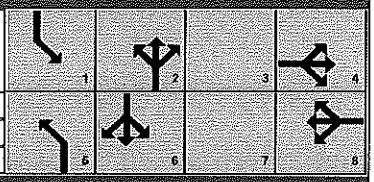
General Information				Intersection Information	
Agency	Ragan-Smith Associates			Duration, h	0.25
Analyst	bsb	Analysis Date	2/23/2016	Area Type	Other
Jurisdiction	Thompson's Station	Time Period	PM Peak Hour	PHF	0.70
Urban Street	Clayton Arnold Rd	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Proposed School	File Name	ClaytonArnold@School_Total_PM_Signal-Officer....		
Project Description	Thompson's Station Proposed K-8 School				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	4	0	1	64	0	64	2	61	62	62	269	6

Signal Information			
Cycle, s	69.2	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	0.5	7.6	10.0	1.3	9.7	0.0
Yellow	7.0	0.0	7.0	7.0	7.0	0.0
Red	3.0	0.0	3.0	3.0	3.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		12.0		11.0	1.1	3.0	1.1	4.0
Phase Duration, s		11.3		19.7	10.5	20.0	18.2	27.6
Change Period, ($Y+R_c$), s		10.0		10.0	10.0	10.0	10.0	10.0
Max Allow Headway (*MAH*), s		3.4		3.5	3.3	3.3	3.3	3.3
Queue Clearance Time (g_s), s		2.3		5.6	2.1	5.4	4.6	15.5
Green Extension Time (g_e), s		0.0		0.2	0.0	0.7	0.1	1.1
Phase Call Probability		0.13		0.97	0.05	1.00	0.82	1.00
Max Out Probability		0.00		0.41	0.00	0.53	0.07	0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		7			91	91	3	87	89	89	393	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1766			1810	1610	1810	1900	1610	1810	1893	
Queue Service Time (g_s), s		0.3			3.2	3.6	0.1	2.8	3.4	2.6	13.5	
Cycle Queue Clearance Time (g_c), s		0.3			3.2	3.6	0.1	2.8	3.4	2.6	13.5	
Green Ratio (*g/C*)		0.02			0.14	0.14	0.15	0.14	0.14	0.26	0.26	
Capacity (*c*), veh/h		33			254	226	149	275	233	456	483	
Volume-to-Capacity Ratio (*X*)		0.218			0.360	0.405	0.019	0.317	0.380	0.194	0.814	
Available Capacity (c_a), veh/h		255			262	233	397	275	233	503	794	
Back of Queue (*Q*), veh/ln (95 th percentile)		0.2			2.5	2.5	0.1	2.3	2.4	2.0	10.1	
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00			0.00	0.00	0.02	0.00	0.16	0.16	0.00	
Uniform Delay (d_1), s/veh		33.4			26.9	27.1	25.3	26.5	26.8	19.8	24.2	
Incremental Delay (d_2), s/veh		1.2			0.3	0.4	0.0	0.2	0.4	0.1	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	
Control Delay (*d*), s/veh		34.7			27.2	27.5	25.4	26.8	27.2	19.9	25.5	
Level of Service (LOS)		C			C	C	C	C	C	B	C	
Approach Delay, s/veh / LOS	34.7	C		27.4	C		26.9	C		24.5	C	
Intersection Delay, s/veh / LOS	25.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	2.3	B	2.3	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.8	A	0.8	A	1.3	A

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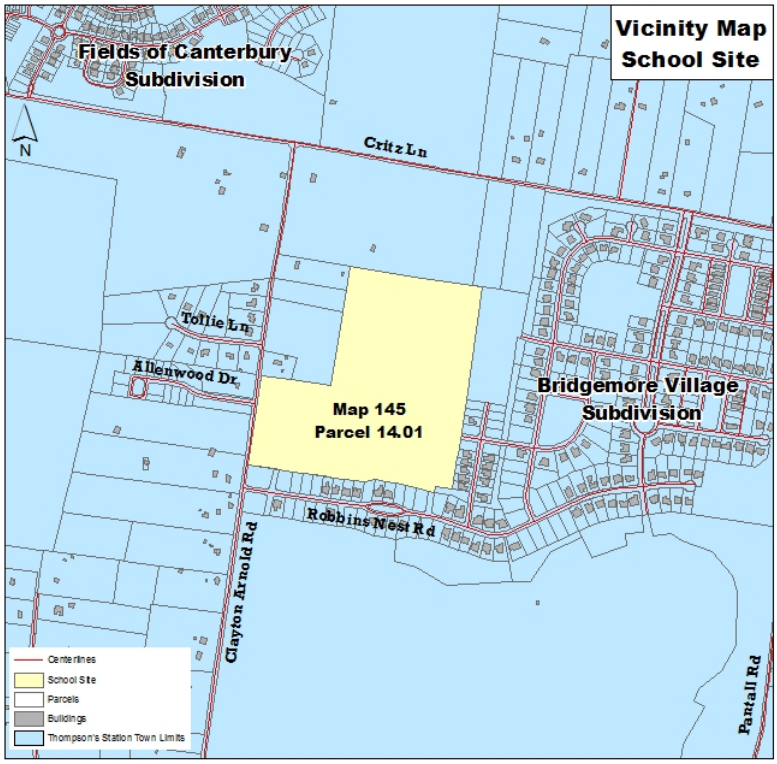
Thompson's Station Planning Commission
Staff Report – Item 3 (File: SP 2016-001 & DR 2016-001)
March 29, 2016
Site Plan for the construction of 233,880 square foot elementary and middle school on 46.87 acre site located at 2638 and 2640 Clayton Arnold Road.

PROJECT DESCRIPTION

The applicant, Williamson County Schools has submitted a site plan for the development of an elementary and middle school located on a 46.87-acre site along the east side of Clayton Arnold Road. The school will be 233,880 square feet and will include grades K – 8 with separate gym facilities, a football fields, multi-sport field, a baseball field and a softball field.



BACKGROUND

The project site was formerly a portion of Bridgemore Village, is zoned D1 and is currently vacant. The site is bounded by residences to the north, east, south and west (across Clayton Arnold Road).

ANALYSIS

Site Plan

Site plan is a plan presenting the general details of the development proposal and review by the Planning Commission is required for all multi-family and non-residential developments to ensure "compliance with the development and design standards" (Section 5.4.4) of the Land Development Ordinance.

Zoning/Land Use

The D1 zone permits the development of an elementary and middle school within this district. The land is currently vacant land and the proposal includes the construction of a 233,880 square foot school building that will consist of two wings, one for an elementary school and one for a

middle school. Lot coverage shall not exceed 55% of the site and the school will have a building footprint of 147,850 square feet for a lot coverage of seven percent. Building height is measured in stories above ground and the code permits three stories. The proposed school will have two stories and a height of 44 feet.

The building will be setback approximately 600 feet from Clayton Arnold Road. The building will be oriented toward Clayton Arnold with a majority of the parking located in front of the school, which is generally discouraged by the Town's codes. The remaining parking is located behind the school with the bus lot on the north side and additional parking in proximity to the ballfields. The front parking lot will have a 267 foot landscaped setback. Sidewalks are not proposed along Clayton Arnold Road, however, the LDO requires a five foot sidewalk be incorporated along the project frontage as part of development. The sidewalk shall be separated from the roadway by a five foot wide landscaped area along the frontage. In addition, pedestrian access ways are required between schools, playgrounds and other public ways. No trails or sidewalks are shown throughout the site demonstrating adequate pedestrian access. Therefore, Staff recommends the inclusion of a sidewalk along Clayton Arnold Road with landscaped area between the road and the sidewalk and additional pedestrian access between the school, fields and neighboring residential uses.

Two driveways are located on Clayton Arnold Road to provide access for general traffic and access for bus traffic. The general traffic drive will provide internal circulation around the perimeter of the school with an additional access to the Bridgemore Village community (Upper Brook Drive). Both entries will be landscaped with a monument sign along Clayton Arnold Road.

Another road, Pleasantville Bridge Road stubs out at the southern property line of the school. The road is currently installed to binder course and is not intended to be an access for the school. Therefore, Staff recommends that this section of roadway be vacated and platted with the open space lot along Clayton Arnold Road.

The service and trash areas are required for non-residential developments and will located on the interior side elevation (north) and be screened by a red brick wall to match the colors and materials of the main building. The HVAC is geothermal and therefore, no mechanical equipment will be located on the roof.

The proposed design and architecture of the school will be reviewed by the Design Review Commission on April 6, 2016.

Parking

The Land Development Code requires one parking space for every classroom and one parking space for every 200 square feet of public gathering areas. The proposed school has 85 classrooms and 38,950 square feet of public gathering areas including the lobbies, gymnasiums, auditorium and cafeteria for a total required parking of 430 spaces. The parking lots include 430 standard 9 foot long by 18 foot wide parking stalls including 43 bike racks located throughout the campus.

Lighting

A photometric plan is required to demonstrate that the lighting on site is designed to minimize trespass and spillover onto adjacent properties. In addition, the code provides an exemption for

ball fields, except that lighting shall be shielded to prevent trespass onto adjacent properties. The school will have wall lighting on the building, parking lot lighting and lighting for the ballfields. The parking lot light standards are 27 feet in height and the ballfield light standards will have heights between 60 and 80 feet. The photometric study submitted for the project demonstrates that the proposed lighting will have approximately one foot candle or less around the perimeter of the site, which indicates that the on-site lighting is located and designed in a manner to minimize light trespass.

Tree Removal

Thirty two trees with a minimum diameter of 24 inches for a total of 890 inches are proposed to be removed for the construction of the school site. All "non-invasive trees of 24 inches in caliper and greater" are subject to the requirements set forth within the LDO for replacement at a ratio of 1.5:1 tree for every removal, thereby requiring the replacement of 1,335 inches of trees be planted on site. The landscape plan includes 521 trees ranging in caliper between two and three inches for replacement of a total of 1,346 inches of trees. These trees include Holly, Red Cedar, Tulip, Magnolia, White Pine, Willow Oak, Red Oak, Cypress, Arborvitae and Elm.

Traffic Access Review Study

A traffic access review was prepared and submitted with the proposed school site. Primary access to the school will be located on Clayton Arnold Road approximately 2,250 feet south of Critz Lane. Two accesses will be provided on Clayton Arnold with approximately 100 feet of spacing distance. The northern driveway, as shown on the site plan, is 28 feet in width, will be restricted to bus access and will include two lanes. The southern driveway, as shown on the site plan, is 36 feet in width with one inbound and two outbound lanes to provide general access.

A secondary access will be located by an extension of Bartram's Bridge Road. This access will provide an entrance into the school from the rear of the site and will connect to the internal circulation through the site including pick up/drop off areas, ball fields and visitor parking.

The Town's Comprehensive traffic impact study (updated September 2015) provides information related to the traffic counts on Clayton Arnold Road along with the need for potential improvements to Clayton Arnold Road. Currently, Clayton Arnold Road has approximately 165 a.m. trips and approximately 211 p.m. trips. District zoning for the school is not established at this time; therefore, traffic distribution is assigned equally from the north and south of Clayton Arnold. However, with the construction of the school, the traffic access review estimates 792 trips entering and exiting the site in the a.m. peak hours and 464 trips entering and exiting the site in the p.m. peak hours. With this analysis, the intersection capacity results indicate that during peak hours, the level of service at the entrance to the school/Clayton Arnold will have a level of service C with the inclusion of a traffic control officer.

Recommendations identified in the traffic access review include the following:

1. A southbound left turn lane should be constructed on Clayton Arnold Road at the entrance with 300 feet of storage length along with a northbound left turn lane into Allenwood with 75 of storage length to align with the southbound left turn lane into the school.
2. A north bound right turn lane should be constructed on Clayton Arnold Road at the entrance with 350 feet of storage length.
3. A school zone should be established on Clayton Arnold Road approximately 950 feet south and 650 feet north of Allenwood Drive.

4. A traffic control officer should be present to direct traffic during the peak morning and afternoon periods when noticeable delays are incurred by traffic exiting the site.

These recommendations are appropriate to manage the traffic volume and flow from the school site. However, due to the lack of analysis related to the trip distribution, Staff does not have information as to what improvements should be made, if any, at Clayton Arnold Road and the north and south intersections (Thompson's Station Road East and Critz Lane). The updated traffic study does suggest improvements for the build out of the projects are that proposed or may be proposed around Town, however, the school was not evaluated within the traffic study and therefore, the potential improvements as a result of the development of the school are not analyzed at this time.

RECOMMENDATION

Based on the project's substantial compliance with the Land Development Ordinance, Staff recommends that the project be approved with the following contingencies:

1. Prior to the issuance of a certificate of occupancy, all traffic mitigation from the traffic access study shall be completed by Williamson County Schools.
2. Once the school zone boundaries have been established, a traffic study shall be prepared and necessary roadway improvements be completed by Williamson County Schools.
3. Prior to the issuance of grading permits, construction plans shall be submitted and approved. Any upgrades to the utility infrastructure necessary for the project shall be completed by the applicant.
4. The project shall be modified to include a five foot sidewalk along Clayton Arnold Road with five foot landscaped area between the road and the sidewalk.
5. The project shall include an additional pedestrian access between the school, fields and neighboring residential uses.
6. Prior to installation of the landscaping, the applicant shall meet with staff for a pre-installation meeting.
7. Prior to the issuance of a certificate of occupancy, all landscaping shall be installed and maintained in a healthy manner.
8. Any change of use or expansion of the project site shall conform to the requirements set forth within the Land Development Ordinance and shall be approved prior to the implementation of any changes to the project.

ATTACHMENTS

Site Plan Packet
Justification Statement
Traffic Access Review (K-8 School Site)

30' M.B.S.L.

10' M.B.S.L.

25' M.B.S.L.

SOFTBALL FIELD

MULTI USE FIELD

CONCESSION STAND

FOOTBALL FIELD

BASEBALL FIELD

CONCRETE PAD FOR BLEACHERS

GATES (TYP.)

48" TALL BLACK VINYL COATED FENCE (TYP.)

OPENSPACE FOR PLAY

PLAY GROUND

SERVICE AREA

15'-4" SCREEN WALL (SEE ARCHITECTURAL PLANS)

PROPOSED K-8 SCHOOL 2 STORY

BUS PARKING

BIKE RACKS (TYP.)

MONUMENT SIGNAGE

16'-8" R.O.W DEDICATION

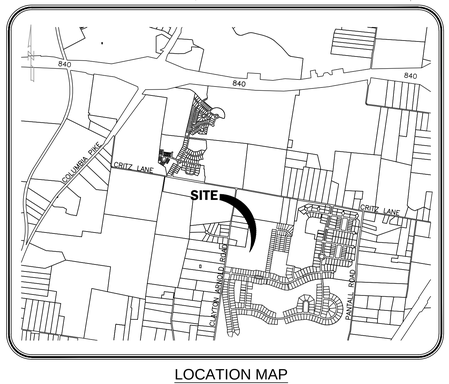
40' M.T.E.M.C.E. EASEMENT

10' ATMOS EASEMENT

20' HB&TS EASEMENT

PROPOSED TURN LANE IMPROVEMENTS

CLAYTON ARNOLD ROAD



LOCATION MAP

N.T.S.

811 Know what's below. Call before you dig.

0 60 120 180

SITE DATA:

PROPERTY INFORMATION:

ADDRESS:	BRIDGEMORE VILLAGE, CLAYTON ARNOLD ROAD
LOCAL JURISDICTION:	TOWN OF THOMPSON'S STATION
COUNTY:	WILLIAMSON
TAX MAP:	145
PARCEL:	14.01
TOTAL SITE AREA:	46.87 ACRES

ZONING INFORMATION:

EXISTING ZONING:	D1 LOW INTENSITY RESIDENTIAL

PROJECT CONTACT INFORMATION:

PROJECT REPRESENTATIVE:	WILLIAMSON COUNTY SCHOOL BOARD KEVIN FORTNEY 1320 WEST MAIN STREET SUITE 202 FRANKLIN, TN 37064 KEVINF@WCS.EDU
ARCHITECT:	GOODWYN, MILLS, CAWOOD MR. DEREK W. HOWARD 3310 WEST END AVENUE, SUITE 420 615-3333-7200 DEREK,HOWARD@GMCNETWORK.COM
CIVIL ENGINEER:	RAGAN-SMITH AND ASSOCIATES, INC MR. JAKE VINCENT, PE. 315 WOODLAND ST, NASHVILLE, TN 37206 615-244-8591 JVINCENT@RAGANSMITH.COM
LANDSCAPE ARCHITECT/ PLANNER:	RAGAN-SMITH AND ASSOCIATES, INC MR.BRETT SMITH, RLA, AICP 315 WOODLAND ST, NASHVILLE, TN 37206 615-244-8591 BSMITH@RAGANSMITH.COM

SPECIFIC PLAN PROJECT INFORMATION:

BUILDING AREA: (K-8 PUBLIC SCHOOL)	233,880 SF. (1,600 STUDENT CAPACITY)

CLASSROOM BREAKDOWN

ELEMENTARY SCHOOL	39 ROOMS
MIDDLE SCHOOL	46 ROOMS
TOTAL ROOMS:	85

PARKING SUMMARY:

PUBLIC GATHERING AREA CALCULATIONS FOR THOMPSON'S STATION ELEM. & MIDDLE SCHOOL:

LOBBY F104: 25 X 24 = 600 SF

MS GYM F107: 120 X 116 = 13920 SF

ELEM. CAFETERIA: 64 X 63 = 4032 SF

24 X 19 = 456

MS. CAFETERIA: 64 X 63 = 4032 SF

24 X 19 = 456

AUDITORIUM: 50 X 65 = 3250

ES GYM G132: 90 X 70 = 6300

ES GYM LOBBY: 26 X 13 = 338

COMMON F101: 46 X 121 = 5566 (INCLUDES F102 & F103)

TOTAL PUBLIC GATHERING AREA = 38950/200 = 195 PARKING SPACES REQUIRED

PARKING SPACES REQUIRED (per table 4.16 for elementary & Jr. High): 195 + 85 = 280 spaces

38950/200 = 195 PARKING SPACES REQUIRED FOR PUBLIC SPACE

85 CR X 1 = 85 PARKING SPACES FOR CLASSROOMS

PARKING SPACES REQUIRED FOR PARKS W/ATHLETIC BALL FIELDS:

1 Parking space per 4 seats; 600 seat bleacher/4 = **150 spaces**

GRAND TOTAL REQUIRED: 150 + 280 = 430 SPACES

GRAND TOTAL PROVIDED: = **430 SPACES** (INC. 13 ACC. SPACE, NOT INCLUDING BUS PARKING)

BIKE PARKING: = **43 SPACES**

LOT COVERAGE: 7.2% (147,850 1ST FLOOR / 2,041,657 TOTAL SITE)

BUILDING HEIGHT:
PROVIDED: 44' MAX

TOTAL IMPERVIOUS: 23%

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3310 West End Avenue, Suite 420 | Nashville, Tel 615.333.7200
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ISSUE	DATE
INITIAL SUBMITTAL	02/24/16
TOWN COMMENTS	03/07/16

drawn by: D.SIEBERG
checked by: B.SMITH

THOMPSON'S STATION K-8

THOMPSON'S STATION, TN 37179

OVERALL LAYOUT PLAN

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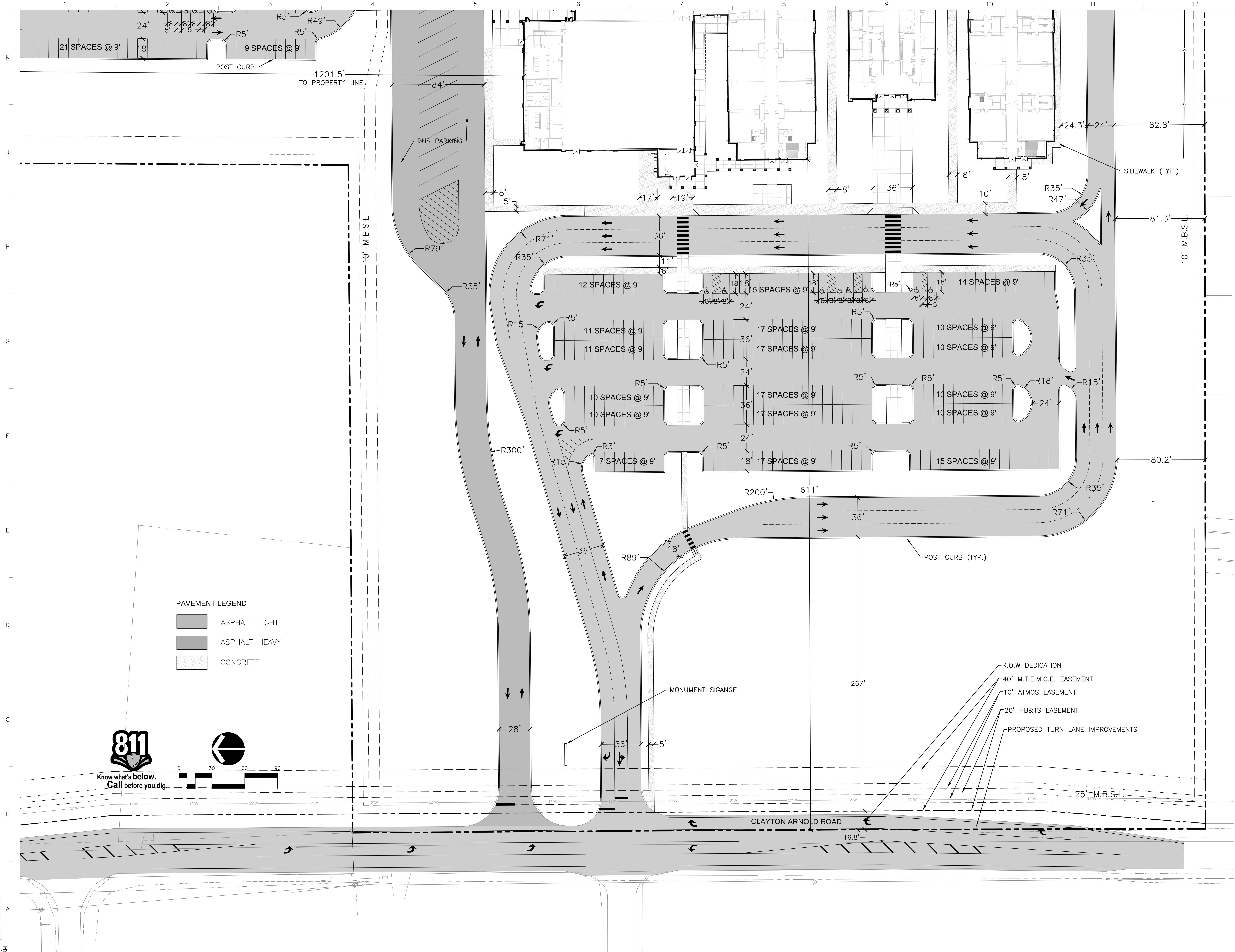

21 SPACES @ 9'
9 SPACES @ 9'
POST CURB
1201.5' TO PROPERTY LINE
84'
BUS PARKING
10' M.B.S.L.
R79'
R35'
R300'
28'
24.3'
24'
82.8'
SIDEWALK (TYP.)
R35'
R47'
81.3'
R71'
36'
11'
6'
12 SPACES @ 9'
15 SPACES @ 9'
14 SPACES @ 9'
11 SPACES @ 9'
17 SPACES @ 9'
10 SPACES @ 9'
10 SPACES @ 9'
7 SPACES @ 9'
15 SPACES @ 9'
R15'
R18'
24'
80.2'
R200'
611'
267'
R89'
18'
POST CURB (TYP.)
PAVEMENT LEGEND
ASPHALT LIGHT
ASPHALT HEAVY
CONCRETE
MONUMENT SIGANGE
R.O.W DEDICATION
40' M.T.E.M.C.E. EASEMENT
10' ATMOS EASEMENT
20' HB&TS EASEMENT
PROPOSED TURN LANE IMPROVEMENTS
811
Know what's below. Call before you dig.
0
30
60
90
25' M.B.S.L.
CLAYTON ARNOLD ROAD
16.8'

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THOMPSON'S STATION K-8

THOMPSON'S STATION, TN 37179

ENLARGED LAYOUT PLAN

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0 30 60 90

FOOTBALL FIELD

MULTI SPORT FIELD

BIKE STAND (TYP.)

POST CURB

7 SPACES @ 9'

9 SPACES @ 9'

R5'

R49'

16 SPACES @ 9'

4 SPACES @ 9'

3 SPACES @ 9'

12 SPACES @ 9'

12 SPACES @ 9'

R60'

R50'

R75'

R15'

R35'

1201.5' TO PROPERTY LINE

BUS PARKING

84'

GATE (TYP.)

15'-4" SCREEN WALL (SEE ARCHITECTURAL PLANS)

SERVICE AREA

PROPOSED 2 STORY K-8 PUBLIC SCHOOL

PLAYGROUND

200.9'

30' M.B.S.L.

365.8'

117.7'

13 SPACES @ 9'

9 SPACES @ 9'

10 SPACES @ 9'

14 SPACES @ 9'

R3'

R149'

R125'

185'

129.1'

10' M.B.S.L.

24.3'

82.8'

SIDEWALK (TYP.)

10'

5'

18'

24'

36'

35'

ENLARGED LAYOUT PLAN

C1.2
sheet of

THOMPSON'S STATION K-8

THOMPSON'S STATION, TN 37179

ISSUE	DATE
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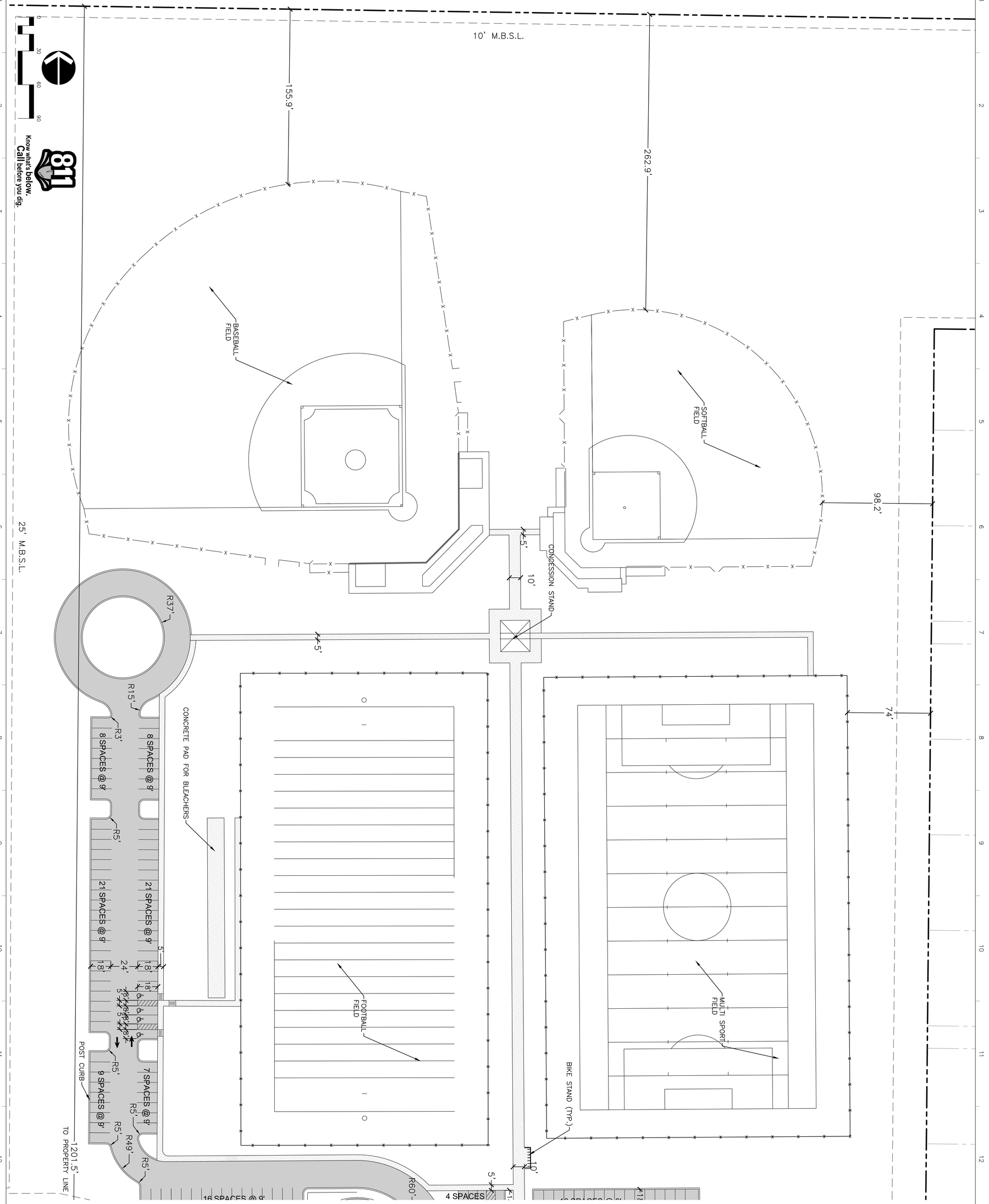

ENLARGED LAYOUT PLAN

THOMPSON'S STATION K-8

THOMPSON'S STATION, TN 37179

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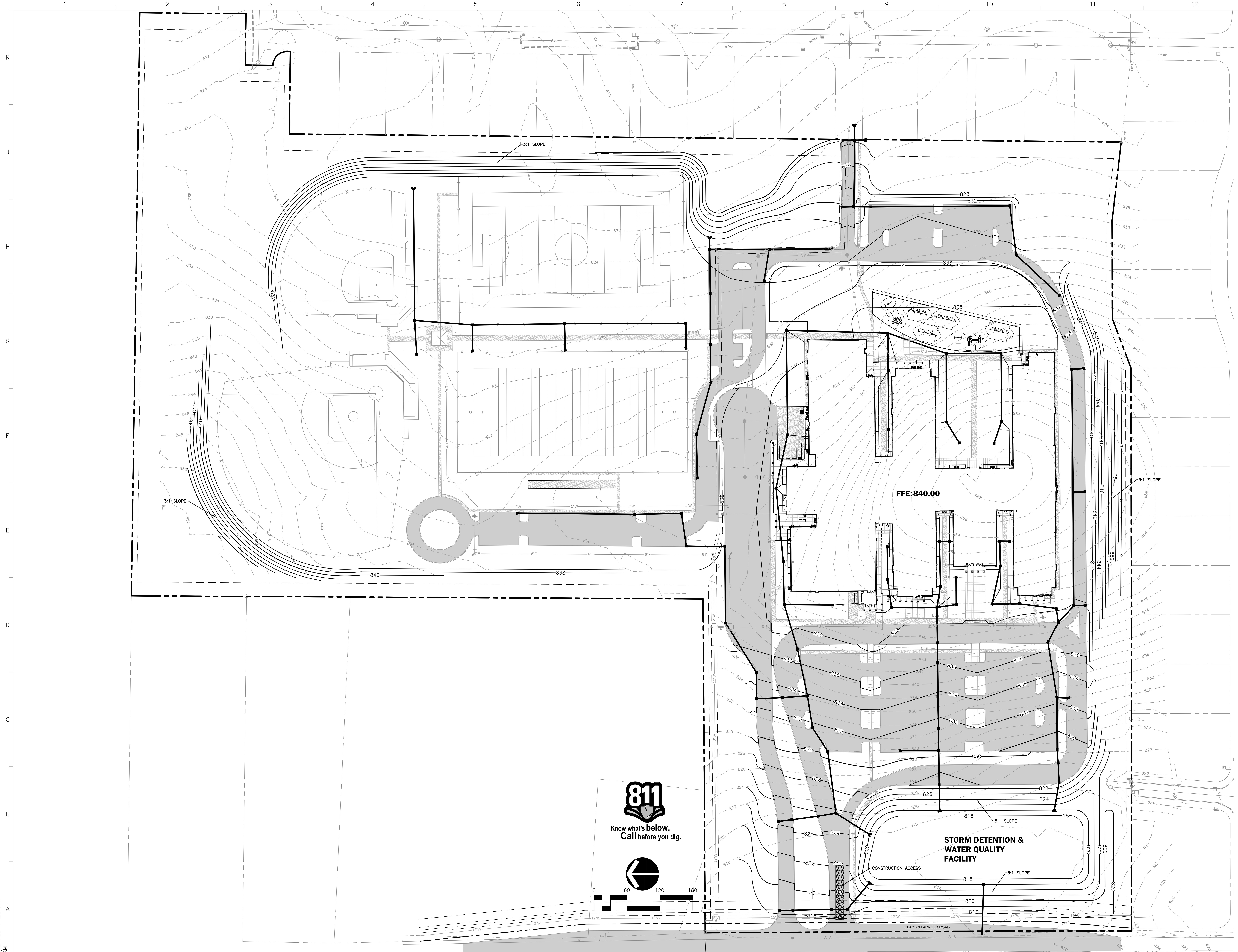

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THOMPSON'S STATION K-8

THOMPSON'S STATION, TN 37179

OVERALL GRADING PLAN

C2.0

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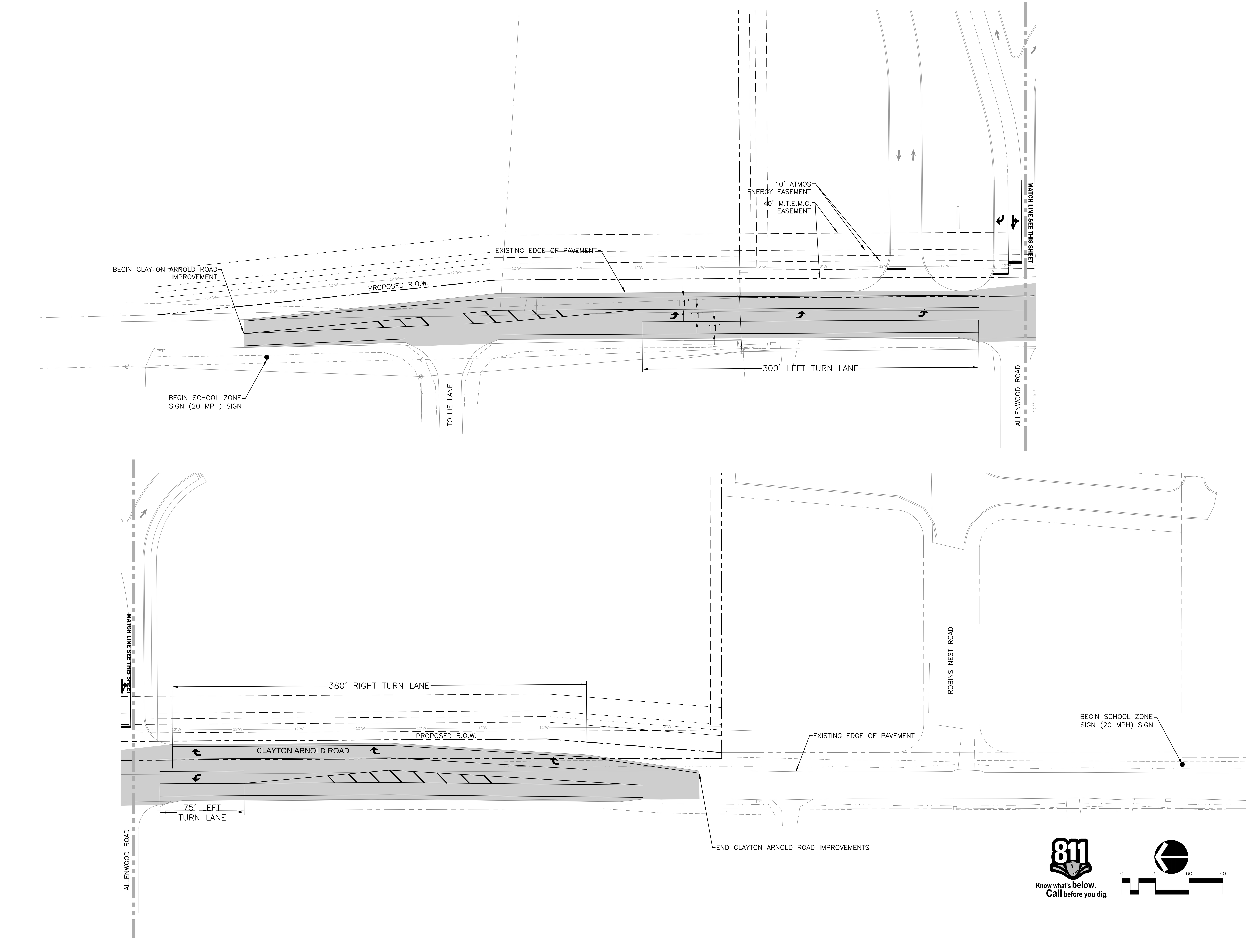

BEGIN CLAYTON ARNOLD ROAD IMPROVEMENT
EXISTING EDGE OF PAVEMENT
PROPOSED R.O.W.
10' ATMOS ENERGY EASEMENT
40' M.T.E.M.C. EASEMENT
11'
11'
11'
300' LEFT TURN LANE
BEGIN SCHOOL ZONE SIGN (20 MPH) SIGN
TOLLIE LANE
ALLENWOOD ROAD
MATCH LINE SEE THIS SHEET
380' RIGHT TURN LANE
PROPOSED R.O.W.
CLAYTON ARNOLD ROAD
EXISTING EDGE OF PAVEMENT
75' LEFT TURN LANE
ROBINS NEST ROAD
BEGIN SCHOOL ZONE SIGN (20 MPH) SIGN
END CLAYTON ARNOLD ROAD IMPROVEMENTS
ALLENWOOD ROAD
MATCH LINE SEE THIS SHEET
811
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30
60
90

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THOMPSON'S STATION K-8
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TURN LANE IMPROVEMENT PLAN

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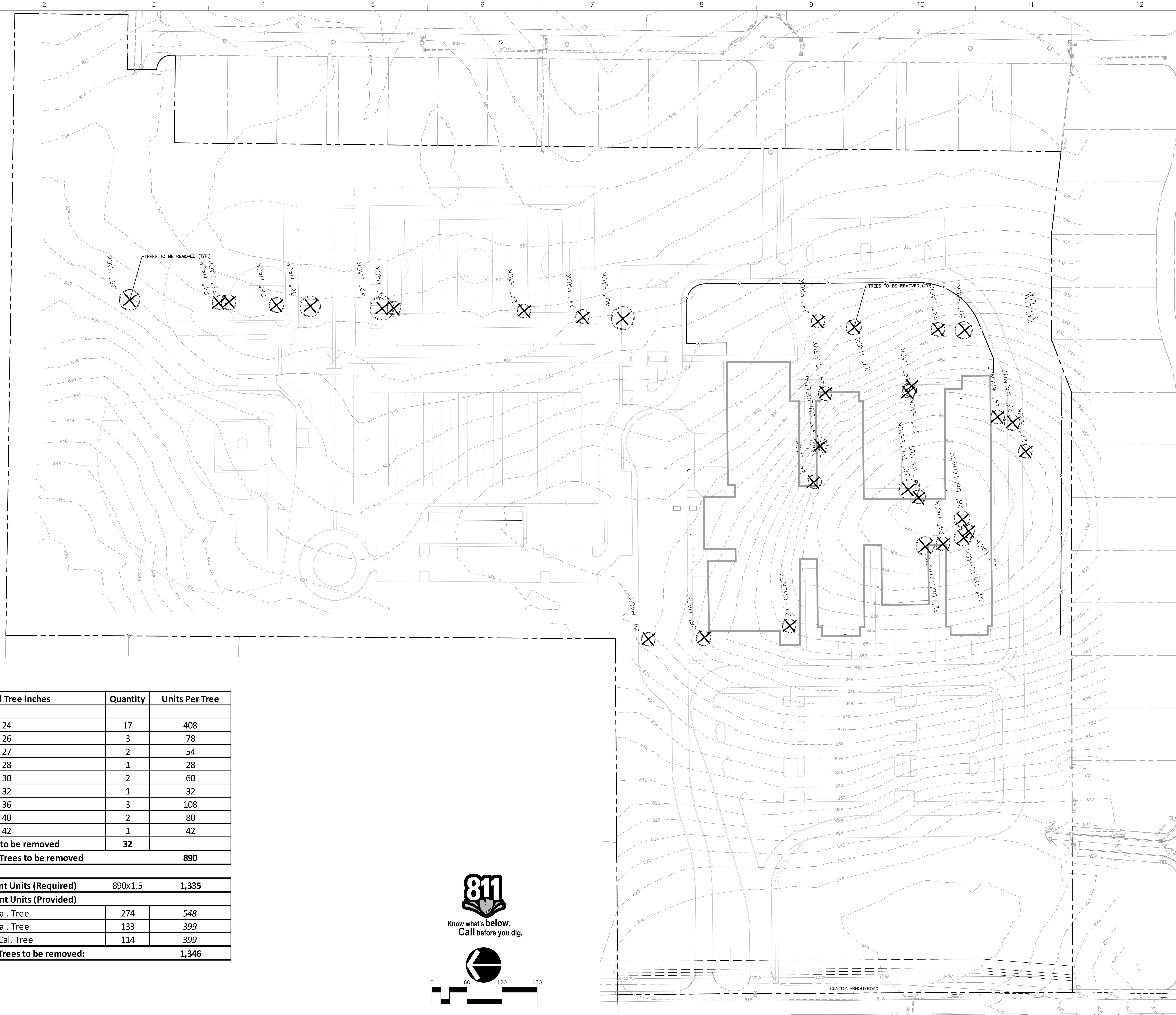

Data Table

Removed Tree inches	Quantity	Units Per Tree
24	17	408
26	3	78
27	2	54
28	1	28
30	2	60
32	1	32
36	3	108
40	2	80
42	1	42
Total Trees to be removed	**32**	
Total Units From Trees to be removed		**890**

Total Replacment Units (Required)	890x1.5	**1,335**
Total Replacment Units (Provided)		
2" Cal. Tree	274	*548*
3" Cal. Tree	133	*399*
3.5" Cal. Tree	114	*399*
Total Units From Trees to be removed:		**1,346**

811
Know what's **below.**
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0 60 120 180

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THOMPSON'S STATION K-8
THOMPSON'S STATION, TN 37179

TREE REMOVAL PLAN

TR1.0
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PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	HEIGHT	SPACING	REMARKS
IN	28	ILEX X 'NELLIE R STEVENS' / NELLIE STEVENS HOLLY	EVERGREEN	2" CAL.	8' HT. MIN.	AS SHOWN	FULL TO BASE
JB	58	JUNIPERUS VIRGINIANA 'BURKII' / BURK RED CEDAR	EVERGREEN	2" CAL.	8' HT. MIN.	AS SHOWN	FULL TO BASE
LT	12	LIRIODENDRON TULIPIFERA / TULIP TREE	DECIDUOUS	3" CAL.	10-12' HT	AS SHOWN	LIMBED UP 6'
MG	18	MAGNOLIA GRANDIFLORA / SOUTHERN MAGNOLIA	EVERGREEN	2" CAL.	8' HT. MIN.	AS SHOWN	FULL TO BASE
PS	32	PINUS STROBUS / WHITE PINE	EVERGREEN	2" CAL.	8' HT. MIN.	AS SHOWN	FULL TO BASE
QW	67	QUERCUS PHELLOS 'WYNSTAR' / WILLOW OAK	DECIDUOUS	3" CAL.	10-12' HT	AS SHOWN	LIMBED UP 6'
QR	32	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	10-12' HT	AS SHOWN	LIMBED UP 6'
TD	114	TAXODIUM DISTICHUM 'AUTUMN GOLD' / AUTUMN GOLD BALD CYPRESS	DECIDUOUS	3.5" CAL.	12-14' HT	AS SHOWN	LIMBED UP 6'
TG	37	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	EVERGREEN	2" CAL.	8' HT. MIN.	AS SHOWN	FULL TO BASE
UE	54	ULMUS PARVIFOLIA 'EMER II' / 'EMER II' ALLEE ELM	DECIDUOUS	3" CAL.	10-12' HT	AS SHOWN	LIMBED UP 6'
CL	69	X CUPRESSOCYPARIS LEYLANDII / LEYLANDI CYPRESS	EVERGREEN	2" CAL.	8' HT. MIN.	AS SHOWN	FULL TO BASE

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CLAYTON ARNOLD ROAD

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THOMPSON'S STATION K-8
THOMPSON'S STATION, TN 37179

OVERALL LANDSCAPE PLAN

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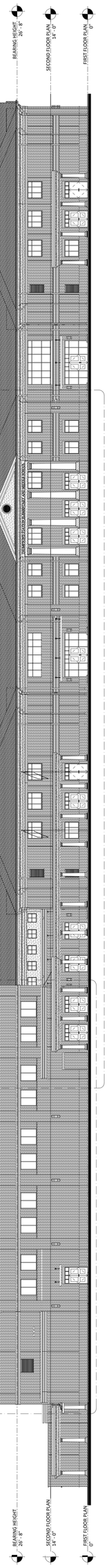
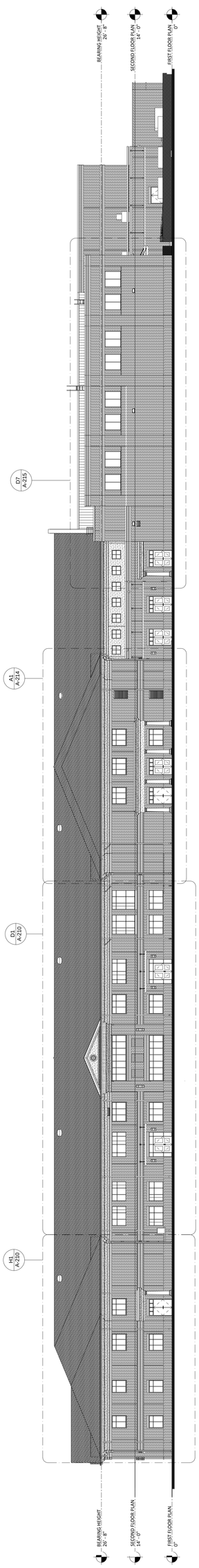


H1
A-201

OVERALL WEST ELEVATION

1/16" = 1'-0"



F1
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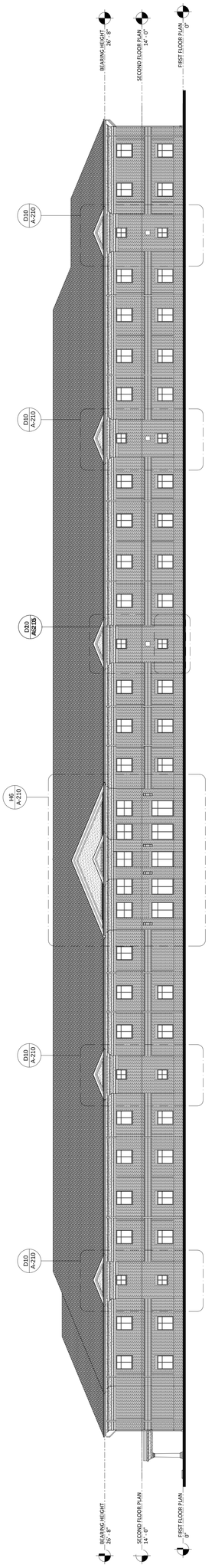
OVERALL EAST ELEVATION

1/16" = 1'-0"



C1
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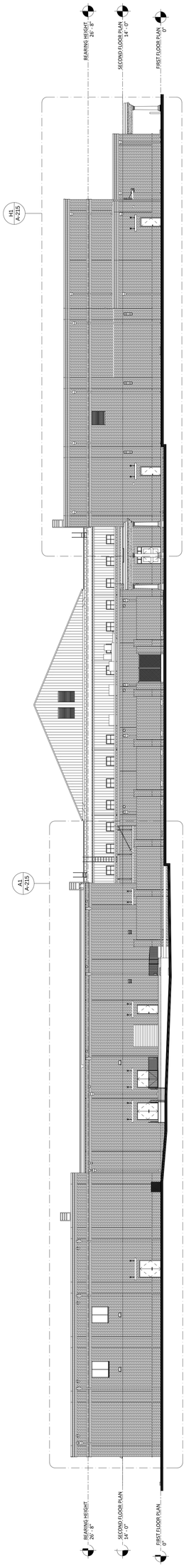
OVERALL SOUTH ELEVATION

1/16" = 1'-0"



A1
A-201

OVERALL NORTH ELEVATION

1/16" = 1'-0"

EXTERIOR ELEVATIONS

THOMSON STATION K-8

THOMSON STATION, TN 37179

GMC # ANAS16003

A-201

sheet of

ISSUE DATE

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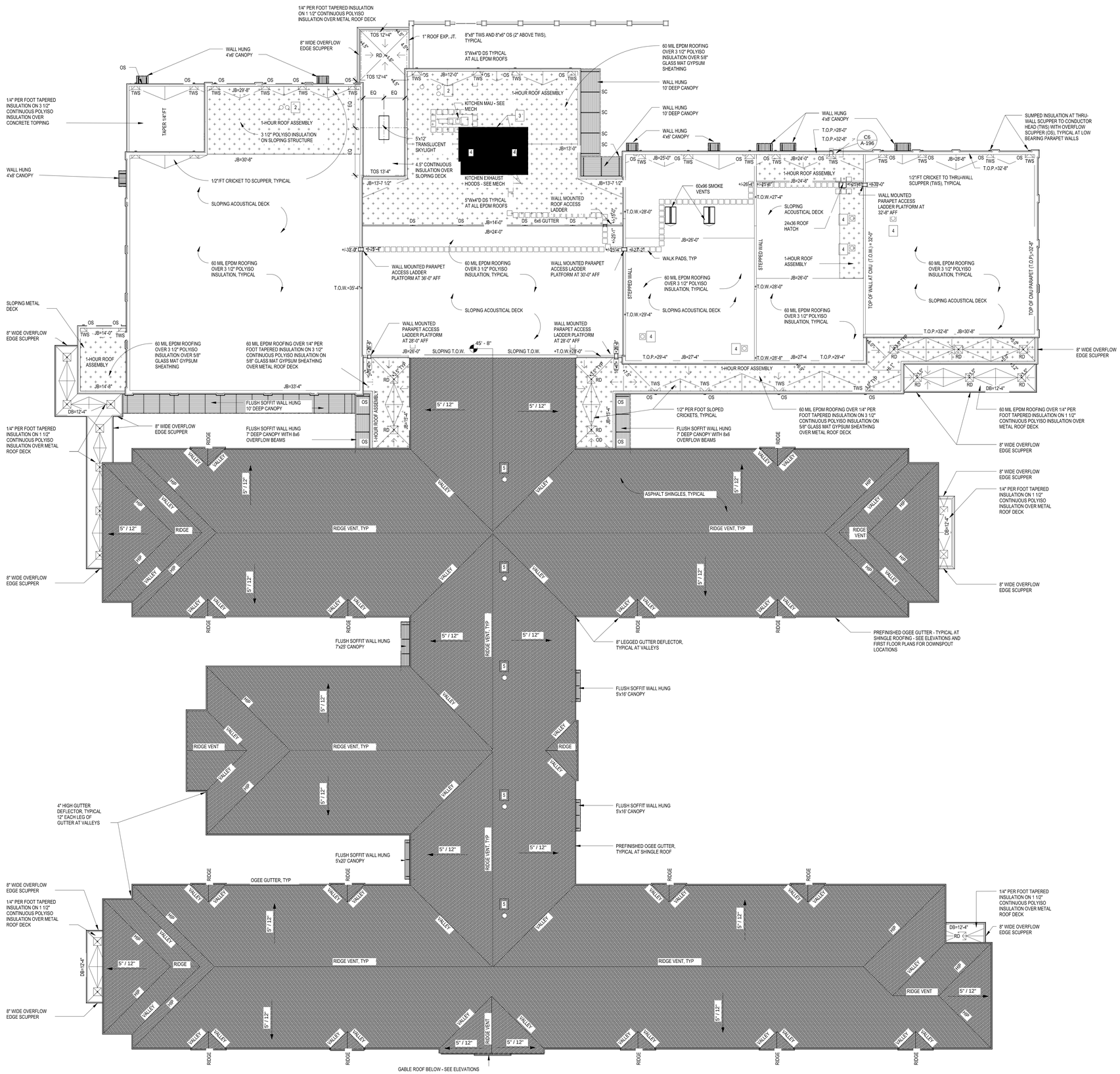

ROOF PLAN NOTES

1. SEE M-230 FOR LOCATIONS OF ROOF TOP MECHANICAL EQUIPMENT
2. AT WATER HEATER FLUES, PROVIDE ROOFING MANUFACTURER'S RECOMMENDED "HOT-STACK" FLASHING DETAILS
3. AT KITCHEN EXHAUST FAN(S), PROVIDE ADDITIONAL PROTECTIVE MEMBRANE 10'-0" MINIMUM BEYOND EXHAUST HOOD FOR PROTECTION OF FIELD MEMBRANE AGAINST GREASE. SEE SPECS.
4. ROOF TOP FAN / HOOD ON CURB. SEE DETAIL A7 / A-196
5. SEE MECHANICAL DRAWINGS FOR ATTIC FANSE. SEE DETAI A7 / A-195

A1 A-191 ROOF PLAN 1" = 20'-0"

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THOMPSON'S STATION MIDDLE & ELEMENTARY SCHOOLS
THOMPSON'S STATION, TN 37179

GMC # ANAS160003

ROOF PLAN

A-191

sheet of

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description	[MANUFAC]
	14	P	SINGLE	N.A.	0.900	ASL-24L-5K-210-2	HUBBELL OUTDOOR
	3	P1	SINGLE	N.A.	0.900	ASL-24L-5K-210-3	HUBBELL OUTDOOR
	4	P2	SINGLE	N.A.	0.900	ASL-24L-5K-210-4	HUBBELL OUTDOOR
	15	P3	BACK-BACK	N.A.	0.900	ASL-24L-5K-210-4	HUBBELL OUTDOOR

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts_1	Illuminance	Fc	1.90	8.6	0.2	9.50	43.00
Property line	Illuminance	Fc	0.01	0.3	0.0	N.A.	N.A.

EQUIPMENT LIST FOR BASEBALL

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	70'	-	70'	1500W MZ	5	5	0
2	B1-B2	80'	-	80'	1500W MZ	9	9	0
2	C1-C2	70'	-	70'	1500W MZ	6	6	0
6	TOTALS					40	40	0

EQUIPMENT LIST FOR SOFTBALL

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A3-A4	60'	-	60'	1500W MZ	3	3	0
2	B3-B4	70'	-	70'	1500W MZ	6	6	0
4	TOTALS					18	18	0

EQUIPMENT LIST FOR SOCCER

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	S1-S2	70'	-	70'	1500W MZ	8	8	0
2	S3-S4	70'	-	70'	1500W MZ	8/7*	8	7
4	TOTALS					46	32	14

* This structure utilizes a back to back mounting configuration

EQUIPMENT LIST FOR FOOTBALL

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	70'	-	70'	1500W MZ	7	7	0
2	S3-S4	70'	-.1'	69.9'	1500W MZ	8/7*	7	8
4	TOTALS					44	28	16

* This structure utilizes a back to back mounting configuration

PHOTOMETRIC SITE PLAN
SCALE: 1" = 80'-0"
PLAN NORTH

ENTECH ENGINEERING INC.
5301 VIRGINIA WAY SUITE 140
BRENTWOOD, TN 37027
v. 615.373.2640 f. 615.373.4837
email@entechtn.com entechtn.com

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checked by: E.E.I.

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THOMPSON'S STATION, TN 37179

GMC # ANAS160003

JONATHAN D. BROWN
REGISTERED ENGINEER
AGRICULTURE COMMERCE
No. 108823
STATE OF TENNESSEE
3/7/16

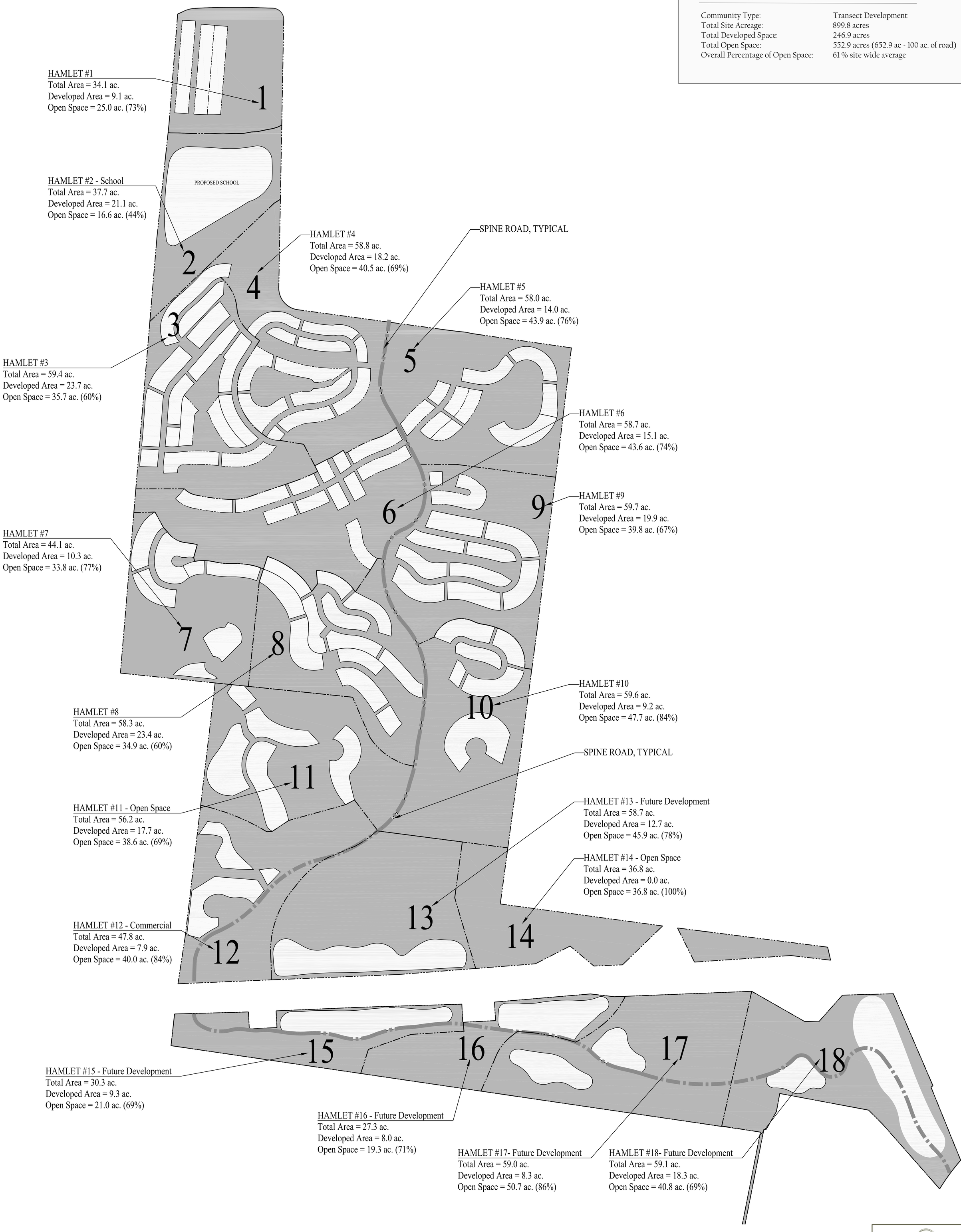
PHOTOMETRIC SITE PLAN

E-001

sheet of

DEVELOPMENT OVERVIEW

Community Type:	Transect Development
Total Site Acreage:	899.8 acres
Total Developed Space:	246.9 acres
Total Open Space:	552.9 acres (652.9 ac - 100 ac. of road)
Overall Percentage of Open Space:	61 % site wide average



CONCEPTUAL HAMLET PLAN - PHASE TWO

FEBRUARY 24, 2016

SCALE: 1" = 300'-0"

300 0 150 300 400

BWD BEAU WELLING DESIGN

TWO FARMS
AT THOMPSON'S STATION

PLAN CONCEPTUAL IN NATURE AND SUBJECT TO SIGNIFICANT CHANGE

Residential Summary

- Small SFD - Alley Access (40'x140')
- Medium SFD - Alley Access (55'x140')
- Large SFD - Front Access (70'x140')
- Estate Lots - .75 to 1.0 ac.

Medium SFD (55' x 140'), Typical

Proposed School Site

Existing Power Line Easement

Existing Gas Line Easement

West Harpeth Road

Large SFD (70' x 140'), Typical

Medium SFD (55' x 140'), Typical

Small SFD (40' x 140'), Typical

Riparian Stream Buffer, Typical

West Harpeth Road

Community Park

Community Park

Community Park

Trail

Existing Lake

Preserve Area (Wetland)

Stream

Existing Lake

Proposed Lake

Property Line, Typical

Estate Lot, Typical

Large SFD (70' x 140'), Typical

Stream

Riparian Stream Buffer, Typical

Preserve Area

Estate Lot, Typical

Preserve Area

Estate Lot, Typical

Preserve Area

Future Development

Possibility

HWY 840

HWY 840

Future Development

Future Development

Future Development

Future Development

Future Development

PLAN CONCEPTUAL IN NATURE AND SUBJECT TO SIGNIFICANT CHANGE

CONCEPTUAL MASTER PLAN - Phase Two

FEBRUARY 24, 2016

Scale: 1" = 300'-0"

300 0 150 300 400

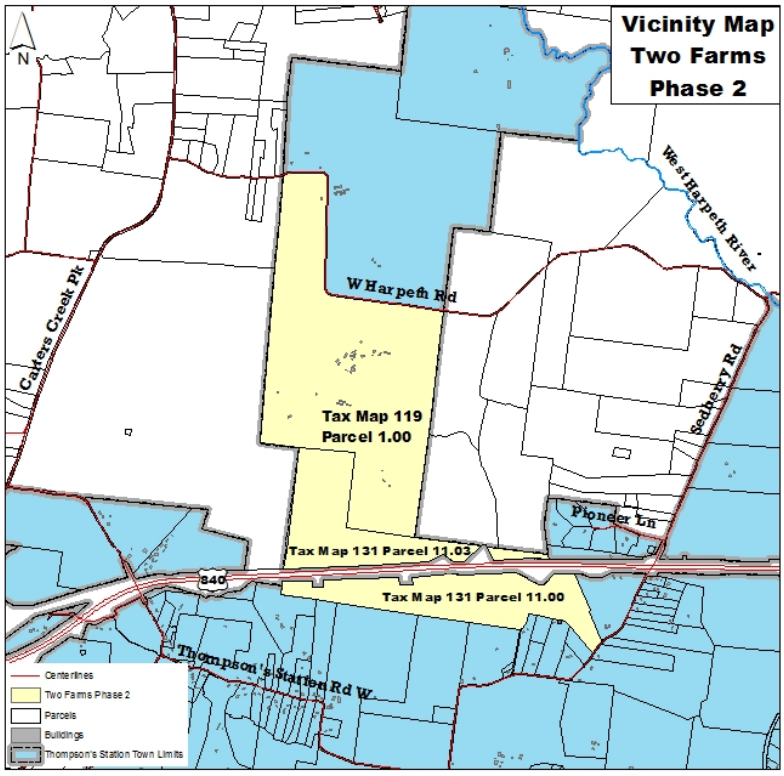
BWD BEAU WELLING DESIGN

TWO FARMS
AT THOMPSON'S STATION

Thompson's Station Planning Commission
Staff Report – Item 4 (Zone Amend 2016-001)
March 29, 2016
Rezone for Phase 2 of Two Farms at Thompson's Station (Map 119 1.00; Map 131 11.00 and Map 131 11.03).

PROJECT DESCRIPTION

A request from Franklin National, LLC to rezone 899.8 acres south of West Harpeth Road, south of State Route 840, west of Sedberry Road to Transect Community (TC) for Phase 2 of the Two Farms at Thompson's Station mixed-use and golf club community.



BACKGROUND

The Board of Mayor and Aldermen adopted the resolution to annex land north of S.R. 840, south of Coleman Road into the Town's municipal boundary.

The Board of Mayor and Aldermen zoned the land south of West Harpeth Road as T2 which is an agricultural zone and zoned the area north of West Harpeth Road (phase 1 of Two Farms) as TC or Transect Community which allows the development of mixed use projects.

A concept plan was submitted for phase 1 of the Two Farms at Thompson's Station which consists of approximately 1,223 acres to be developed into hamlets with a mix of residential types, an 18-hole golf course and other non-residential development. The development of a hamlet requires 60% open space which would include approximately 743 acres of the overall site and include the golf course.

PURPOSE OF A ZONING MAP AMENDMENT OR REZONING REQUEST

Amendments to the zoning ordinance or the zoning map are considered on a case by case basis upon request or petition to the Planning Commission. Proposed map amendments must be "predicated by a finding that the proposed amendment is consistent with the intent of the Town's General Plan and the

proposed amendment will not have a deleterious effect on surrounding properties or the Town as a whole" (LDO 5.3.3).

Changing the zoning of a particular parcel will allow the owner of the parcel to develop or use their property based on the corresponding use table within the Land Development Ordinance (Table 4.1 Land Use and Building Type). The Planning Commission is to evaluate the request based on the General Plan and make a formal recommendation to the Board of Mayor and Aldermen. The recommendation can be one of denial, approval, or approval with conditions.

THE REQUEST BEFORE THE PLANNING COMMISSION

The subject site was rezoned in January 2016 upon annexation to T2 – Rural because at the time, no concept plan was submitted for phase 2 of the Two Farms development. The applicant has begun preparing the concept plan to illustrate the overall development associated with both phases of the project in order to "plan holistically" and plan for the acceptable school site, public works building and trail (see justification statement provided by the applicant attached).

STAFF FINDINGS

The subject property is located south of West Harpeth Road, north and south of State Route 840. Phase 1 of the Two Farms development is zoned Transect Community (TC). The subject properties north of State Route 840 are located within the G1 – Controlled Growth Sector of the General Plan which permits the development of land as a Transect Community. However, the land south of State Route 840 is located within the O2 – Rural Open Space sector. The rezone of the property located north of State Route 840 to TC is consistent with the existing zoning for phase 1 of Two Farms project and given the characteristics of the proposed community including preservation of land, inclusion of civic spaces and development in conjunction with the development standards for each transect district, Staff is supportive of the rezone. However, the land south of State Route 840 is adjacent to T2 – Rural zoning which requires the development of agricultural land uses with single family residential as accessory uses. In addition, access to the southern portion of the property will be located along Sedberry Road with only a pedestrian connection to the properties north of State Route 840. Therefore, Staff recommends that the land south of State Route 840 be maintained as T2 zoning unless vehicular access can be addressed.

Therefore, Staff finds that the TC zoning for the property north of State Route 840 is consistent with the General Plan and will be developed in accordance with the Town's Land Development Ordinance so as to not have a negative effect on the surrounding properties. In addition, technical studies related to traffic and natural resources will be required to evaluate the proposal and be reviewed by the Town prior to any formal approvals.

RECOMMENDATION

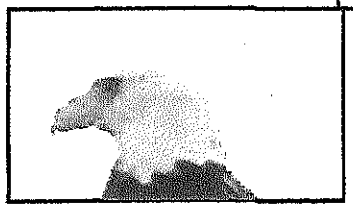
Based on the findings for General Plan consistency, Staff is supportive of a Planning Commission recommendation to the Board of Mayor and Aldermen to zone the land north of State Route 840 (Map 119 1.00 and Map 131 11.03) for phase 2 of the Two Farms at Thompson's Station as Transect Community (TC).

ATTACHMENTS

Application Statement
Draft Conceptual Master Plan
Draft Conceptual Hamlet Plan
Petition (attached via email)

Opposition to the Development of "Two Farms" Property (Thompson Station)

Petition published by West Harpeth Community Alliance on Jan 12, 2016



Target: City of Thompson Station, TN Government

Region: United States of America

Petition Background (Preamble):

A recently annexed property is under review for the proposed development in the area of South of Coleman Road to North of West Harpeth Road. This development, called "Two Farms" will include 900 high density homes, apartments, retail, a golf course and moving the town center of Thompson Station.

This development will add massive amounts of traffic to our already congested roads, require new and widening road projects, a new school, costing between 30-40 million, and higher taxes for all of Williamson County. It will cover approximately 2000 acres- an area as as large as Westhaven with an impact as destructive as Springhill.

Petition:

We, the undersigned, call on the City of Thompson Station, Tennessee, Government to not allow the development of "Two Farms"

Part One - Petitions

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RODERICK PLACE

SPECIFIC PLAN - ZONING REQUEST

January 27, 2016

REVISION SET:

February 29, 2016

TABLE OF CONTENTS

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This document is an update of previous planning efforts including information gathered by and work performed by:

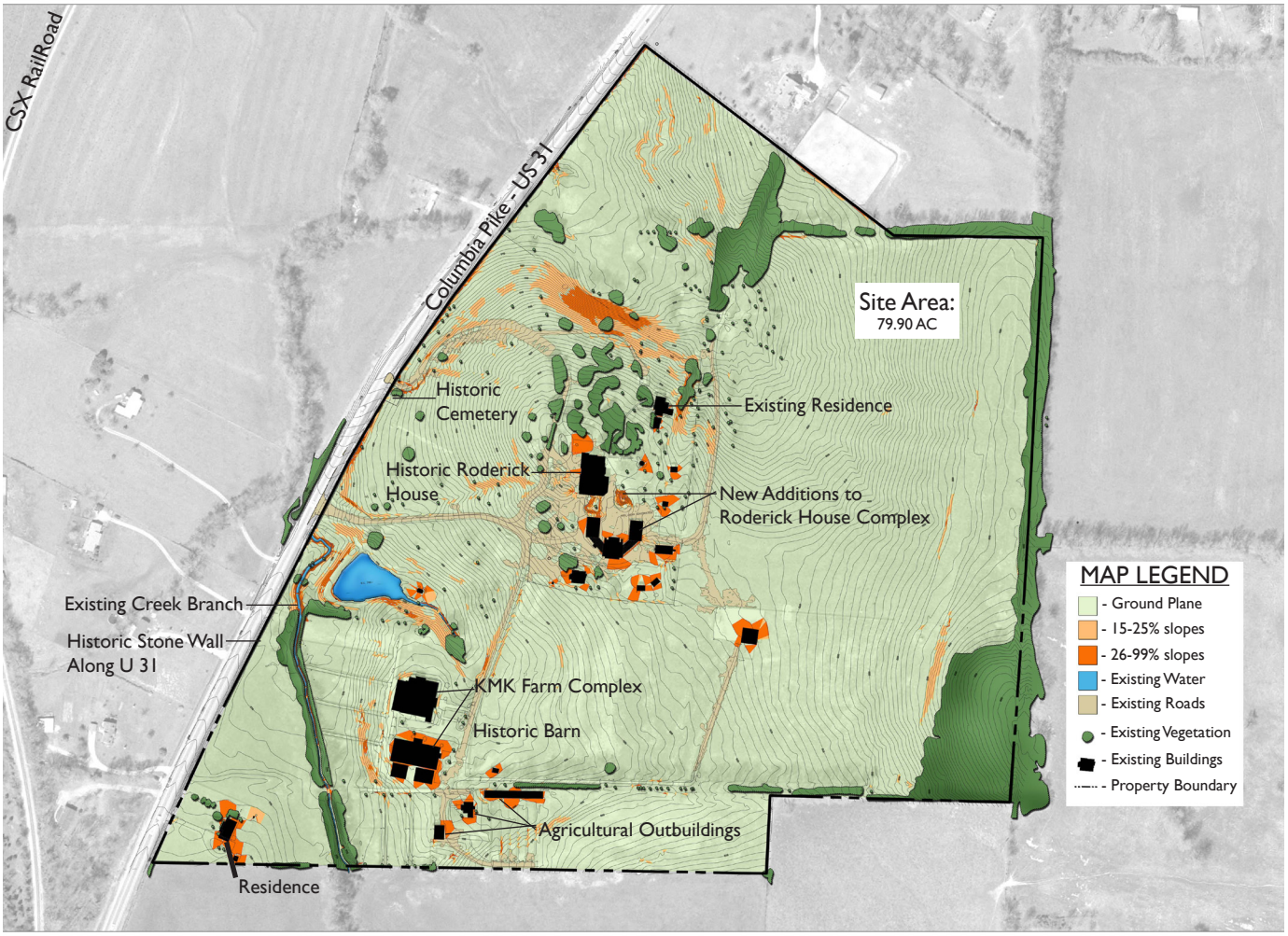
- LandDesign, Inc.
- Suttle Mindlin Architects
- LandDesign Survey
- Paul A Badr

This document is a re-imagining, revision, and re-submittal of The 'Roderick Place' SP Rezoning Plan, approved in October of 2007.

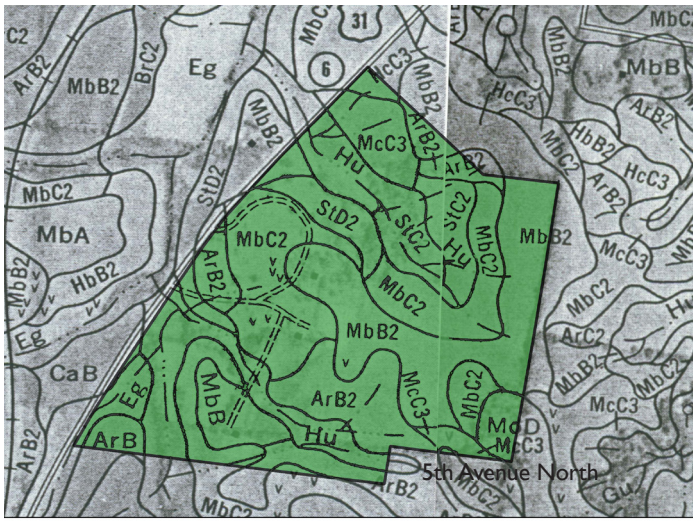
History of Roderick Farm

During the Civil War, at the Battle of Thompson's Station, noted General Nathan Bedford Forrest's horse, Roderick, was killed in effort to stand with the General. Roderick Farm is named for that horse. Roderick Place is located on a small portion of the original Roderick Farm Property which consisted of some three thousand acres belonging to Spencer Buford. A number of the site's historic elements will be retained as Roderick Place develops. Spencer Buford and his wife built the existing Federal Style home in 1801. This house is the focal point of the entire project. Mature tree stands and a cemetery marking the burial places of historic community figures will be preserved. Existing stone walls will be rebuilt and an existing statue of Roderick, who is buried in an unmarked grave at Roderick Farms, will be moved to a more visible location on the site.

In more recent years, Roderick Farms has been used as an Aberdeen Cattle farm known as KMK Acres.



In the rural farmlands of Thompson's Station, the historic Roderick Farm property is situated on gently sloping land crossed by an existing creek and dotted with mature trees. The 79.9 acre site is surrounded by farmland and beautiful existing vegetation and makes an ideal site for a project intending to preserve both cultural and natural features. Roderick Farm is located 7 miles south of Franklin, TN and just north of Spring Hill.



ArB	Armour silt loam, 2-5% slopes
ArB2	Armour silt loam, 2-5% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
MbB	Maury silt loam, 2-5% slopes
MbB2	Maury silt loam, 2-5% slopes, eroded
MbC2	Maury silt loam, 5-12% slopes, eroded
McC3	Maury silt clay loam, 5-12% slopes, severely eroded
MoD	Mimosa and Ashwood very rocky soils, 5-20% slopes
StC2	Stiversville silt loam, 5-12% slopes, eroded
StD2	Stiversville silt loam, 12-20% slopes, eroded

View of the existing structures overlooking the pond.

View of the existing rock wall along Columbia Pike.

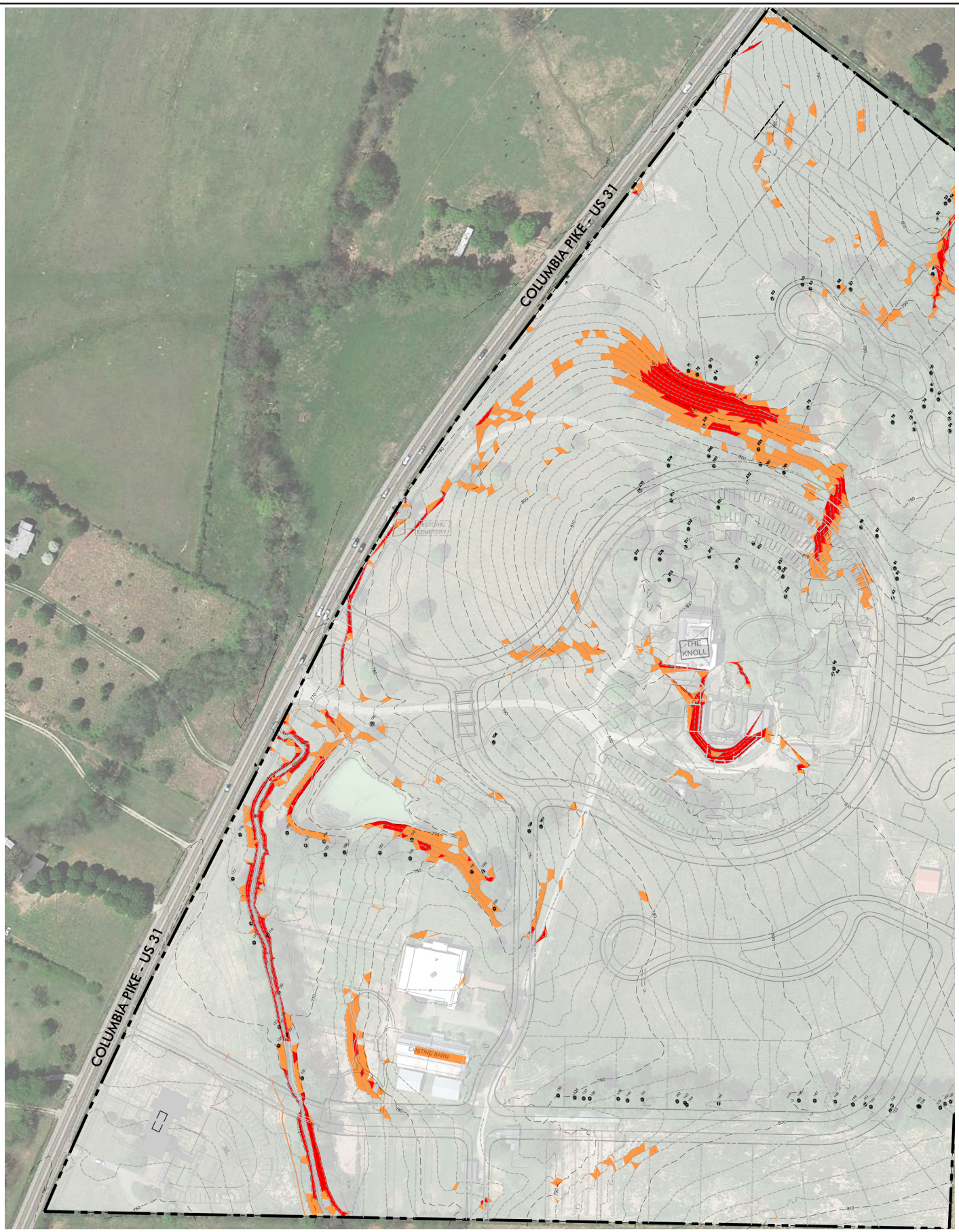
View of the existing stream on site.

View of existing cemetery along Columbia Pike.

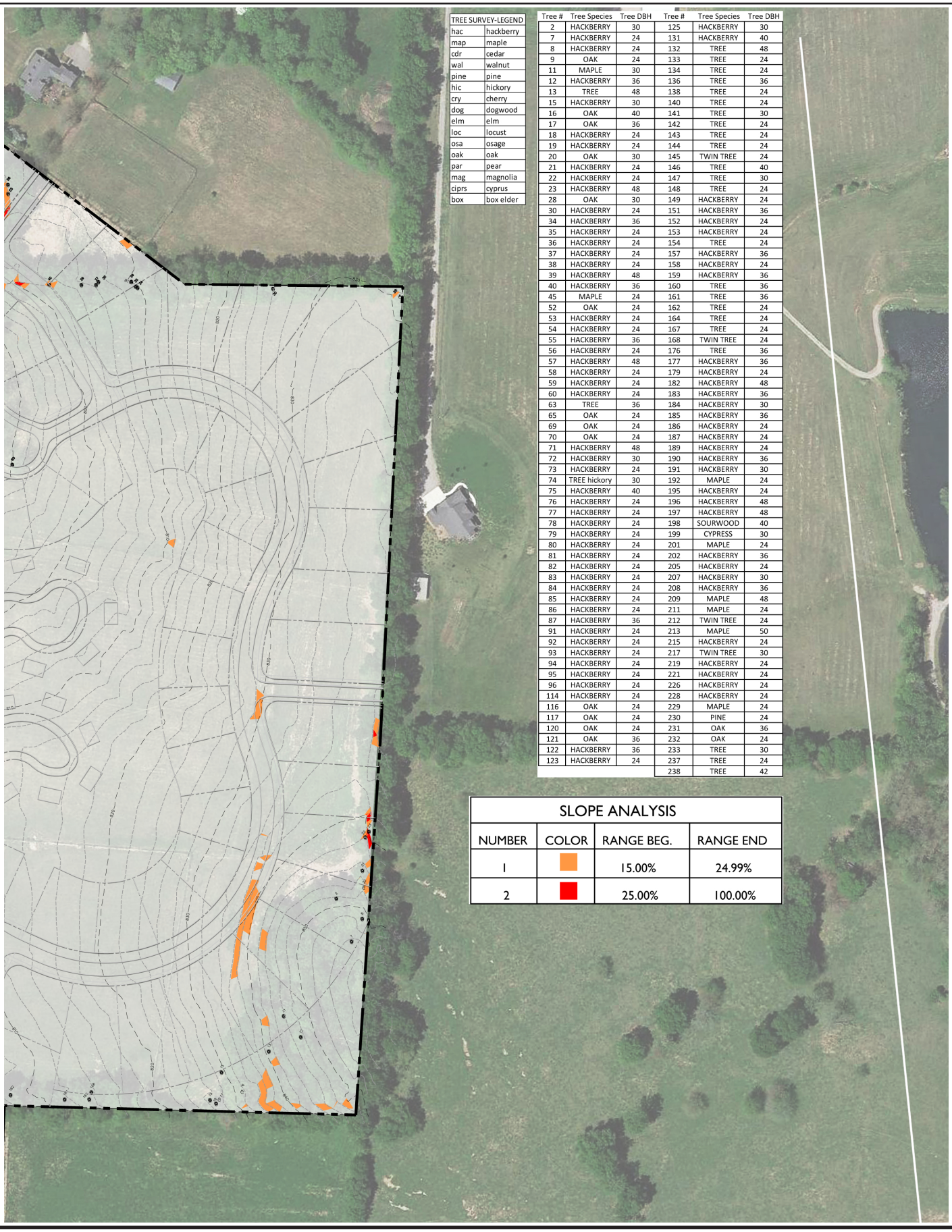
View of existing tree line.

View of the preserved Roderick House.

View of existing barn.



NATURAL RESOURCE INVENTORY



TREE SURVEY-LEGEND	
hac	hackberry
map	maple
cdr	cedar
wal	walnut
pine	pine
hic	hickory
cry	cherry
dog	dogwood
elm	elm
loc	locust
osa	osage
oak	oak
par	pear
mag	magnolia
ciprs	cyprus
box	box elder

Tree #	Tree Species	Tree DBH	Tree #	Tree Species	Tree DBH
2	HACKBERRY	30	125	HACKBERRY	30
7	HACKBERRY	24	131	HACKBERRY	40
8	HACKBERRY	24	132	TREE	48
9	OAK	24	133	TREE	24
11	MAPLE	30	134	TREE	24
12	HACKBERRY	36	136	TREE	36
13	TREE	48	138	TREE	24
15	HACKBERRY	30	140	TREE	24
16	OAK	40	141	TREE	30
17	OAK	36	142	TREE	24
18	HACKBERRY	24	143	TREE	24
19	HACKBERRY	24	144	TREE	24
20	OAK	30	145	TWIN TREE	24
21	HACKBERRY	24	146	TREE	40
22	HACKBERRY	24	147	TREE	30
23	HACKBERRY	48	148	TREE	24
28	OAK	30	149	HACKBERRY	24
30	HACKBERRY	24	151	HACKBERRY	36
34	HACKBERRY	36	152	HACKBERRY	24
35	HACKBERRY	24	153	HACKBERRY	24
36	HACKBERRY	24	154	TREE	24
37	HACKBERRY	24	157	HACKBERRY	36
38	HACKBERRY	24	158	HACKBERRY	24
39	HACKBERRY	48	159	HACKBERRY	36
40	HACKBERRY	36	160	TREE	36
45	MAPLE	24	161	TREE	36
52	OAK	24	162	TREE	24
53	HACKBERRY	24	164	TREE	24
54	HACKBERRY	24	167	TREE	24
55	HACKBERRY	36	168	TWIN TREE	24
56	HACKBERRY	24	176	TREE	36
57	HACKBERRY	48	177	HACKBERRY	36
58	HACKBERRY	24	179	HACKBERRY	24
59	HACKBERRY	24	182	HACKBERRY	48
60	HACKBERRY	24	183	HACKBERRY	36
63	TREE	36	184	HACKBERRY	30
65	OAK	24	185	HACKBERRY	36
69	OAK	24	186	HACKBERRY	24
70	OAK	24	187	HACKBERRY	24
71	HACKBERRY	48	189	HACKBERRY	24
72	HACKBERRY	30	190	HACKBERRY	36
73	HACKBERRY	24	191	HACKBERRY	30
74	TREE hickory	30	192	MAPLE	24
75	HACKBERRY	40	195	HACKBERRY	24
76	HACKBERRY	24	196	HACKBERRY	48
77	HACKBERRY	24	197	HACKBERRY	48
78	HACKBERRY	24	198	SOURWOOD	40
79	HACKBERRY	24	199	CYPRESS	30
80	HACKBERRY	24	201	MAPLE	24
81	HACKBERRY	24	202	HACKBERRY	36
82	HACKBERRY	24	205	HACKBERRY	24
83	HACKBERRY	24	207	HACKBERRY	30
84	HACKBERRY	24	208	HACKBERRY	36
85	HACKBERRY	24	209	MAPLE	48
86	HACKBERRY	24	211	MAPLE	24
87	HACKBERRY	36	212	TWIN TREE	24
91	HACKBERRY	24	213	MAPLE	50
92	HACKBERRY	24	215	HACKBERRY	24
93	HACKBERRY	24	217	TWIN TREE	30
94	HACKBERRY	24	219	HACKBERRY	24
95	HACKBERRY	24	221	HACKBERRY	24
96	HACKBERRY	24	226	HACKBERRY	24
114	HACKBERRY	24	228	HACKBERRY	24
116	OAK	24	229	MAPLE	24
117	OAK	24	230	PINE	24
120	OAK	24	231	OAK	36
121	OAK	36	232	OAK	24
122	HACKBERRY	36	233	TREE	30
123	HACKBERRY	24	237	TREE	24
			238	TREE	42

SLOPE ANALYSIS			
NUMBER	COLOR	RANGE BEG.	RANGE END
1		15.00%	24.99%
2		25.00%	100.00%

Centered around the Civil War era Federal style Roderick House, Roderick Place responds to the importance of this historic land and historic home and enhances the story of this special place. This high quality mixed-use community is home to several distinct planned districts with a traditional Tennessee Federal house at its heart.

The Knoll is the diverse mixed-use core of the development centered around the Roderick Mansion This area features an up-scale restaurant, reception center, and conference space. Landscaped gardens surround and interconnect the expanded house to a new Roderick Spa and Wellness Center and the Inn at Roderick Place. Several residential options radiate from the Knoll including guest cottages, garden homes, and carriage estates. The Knoll Loop encircles the Knoll and connects to the mixed-use core to the cottage lots immediately to the east. Additional residential areas including garden homes, carriage estates, and amenity areas surround the knoll and can be accessed to the south.

Another mixed-use commercial area, The Village Market and Restaurant, is located along highway 31 to the south of the Knoll. The Village Market and Restaurant features a high-end convenience market and restaurant that, together, create a public commercial face of the project. The Barn, amenity area, and bridge are in close proximity and are a part of the public face of the project. Here, recreational amenities and a small, picturesque commercial building are nestled near one another at the south entrance to the project.

Roderick Place weaves planning concepts in a complex and interesting way. Incorporating landscape and historic features with new elements to create a development unlike any other in the Middle-Tennessee region. A rural-chic and rustic style coupled with unexpected informality create new and exciting experiences throughout the site. Each of the neighborhoods has a unique character and sense of place. While the styles are envisioned to be relaxed and informal, everything is designed to be luxurious and inviting. Roderick Place also brings residential forms and patterns, not yet seen in the region, but which fit perfectly within the fabric of the overall development.

An extensive trail network meanders through Roderick Place, linking a sequence of agrarian open spaces as you move through the property. Trails and pathways interconnect all areas of the site providing both recreational opportunities and access to the Knoll. The development offers a complete range of landscape features including open hillside meadows, a re-established boxwood garden, and informal floral gardens. Low stone walls, derived from the existing stone wall along Columbia Pike, will be used in select locations throughout the site as an important visual element and link to the historic character of the property.

MASTER PLAN DESIGN HIGHLIGHTS

The Knoll – Pedestrian-oriented, mixed-use heart of the project features Roderick's (a restaurant, conference and event space), Roderick Manor (a country inn) and a Roderick's Spa and Wellness Center.

The Barn Amenity Area – Existing barns, proposed pool and amenity area set in a creek-side park located at the south entrance to Roderick Place.

Roderick Market – High quality market and restaurant at south entry will provide convenience, retail, and auto fueling for both residents and for the town of Thompson's Station.

Neighborhoods – Unique housing types expand upon the regional availability through the creation of several neighborhoods with distinct character.

Landscape Amenities – An informal landscape style heavily populated with native plants and wildflowers are envisioned to be an integral part of the character of each individual area of the development

History – Preservation of the existing barns, recreation of gardens at the knoll and renovation of the original house recall the Civil War period, while the integration of a new equestrian-themed elements and the Roderick Statue pay tribute to the Roderick story.

Pedestrian Quality – Extensive network of paths, gardens and trails allow residents to enjoy the varied beauty of the


BUILDING KEY:
A = The Mansion at Roderick Place
B = The Inn at Roderick Place
C = The Spa and Wellness Center at Roderick Place
D = The Village Market and Restaurant at Roderick Place
E = Roderick Guest Cottages
RODERICK PLACE
COLUMBIA PIKE
THE KNOLL
BARN AMENITY AREA
A
B
C
D
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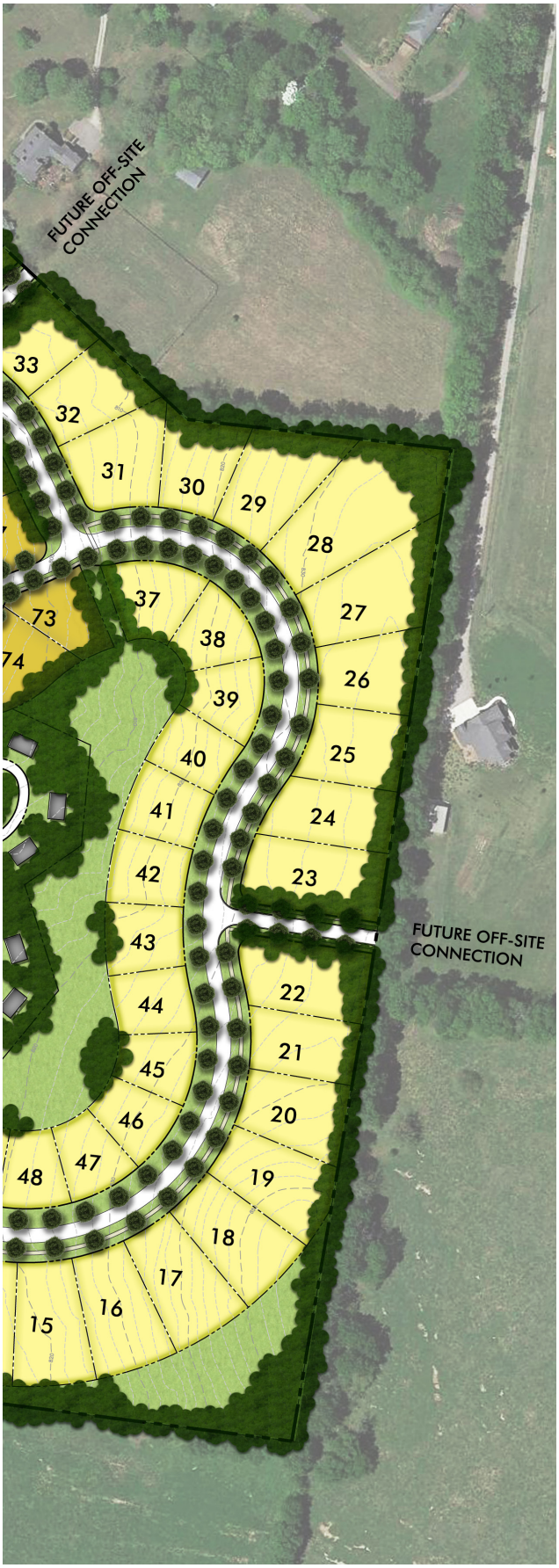
MASTER PLAN



MASTER PLAN TABULAR DATA

EXISTING ZONING:	Specific Plan - High Intensity District
PROPOSED ZONING:	No Change
GROSS SITE AREA:	79.90 AC

OWNER INFO: KMK Acres, LLC

PARCEL INFO:

Parcel A:	4626 Columbia Pike
Deed Book & Page #:	DB 6186, Pg. 657
Tax Map & Parcel #:	Map 146, Par. 15.01
Size:	13.6 AC
Parcel B:	4624 Columbia Pike
Deed Book & Page #:	DB 1500, Pg. 191
Tax Map & Parcel #:	Map 146, Par. 15.01
Size:	66.3 AC

REQUIREMENTS OF PROPOSED ZONING: Specific Plan, High Intensity District (Cluster Option)- General Plan Requirements:

Maximum Density: 3.00 DU/AC
Maximum Height: 3 Stories
Minimum Site Area: 10 Acres
Maximum Site Area: 100 Acres
Area Permitted as Residential: 100%
Area Permitted as Commercial: 100%

COMMERCIAL AREAS: (The Knoll + Roderick Market & Restaurant)

Overall Acreage	
The Knoll	14.28 AC
Roderick Market & Restaurant	2.58 AC
Net Commercial Area:	16.90 AC
Required Commercial O.S.:	8.45 AC (50%)
The Knoll	9.54 AC (66%)
Roderick Market & Restaurant	1.64 AC (64%)
Provided Commercial O.S.:	11.18 AC (66%)
The Knoll	+/- 117,132 SF (Hotel - 76 Keys, Spa, + Mansion) (+/-55,000 sf existing)
Roderick Market & Restaurant:	+/- 5,530 SF
Guest Cottages:	+/- 44,800 SF (56 Units)
Total Square Non-Residential:	**+/- 167,462 SF (56 Units)**
Permitted FAR:	0.23
Net FAR:	0.23

RESIDENTIAL AREAS:

Net Residential Area:	63.00 AC
Required Residential O.S.:	25.20 AC (40%)
Provided Residential O.S.:	28.58 AC (45%)
Total Units:	87 Dwelling Units
Permitted Density:	3.00 DU/AC
Provided Density:	1.38 DU/AC

TRAILS

Proposed Trail Length:	+/- 4520 LF

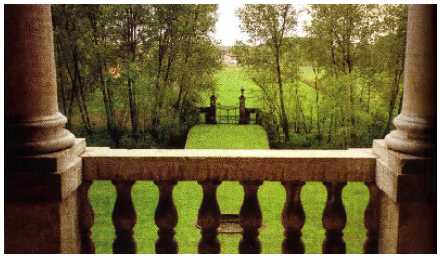
Scenery to be preserved

OPEN SPACE PLAN

Open spaces and amenities are a key driving force in the plan for Roderick Place. The entire master plan celebrates the site's natural features through preservation of a significant amount of open space. The master plan balances mixed-uses and residential homes with exceptional and expansive natural scenery.

The Open Space Plan highlights some of the opportunities inherent in such an approach. Parks and trails will enhance and invite users to enjoy the site's natural features. In addition, it is the intention of the plan to restore natural habitat, where possible, to its original condition as is possible after years of grazing.

This natural habitat will be contrasted with a collection of informal parks, greens, and gardens within the neighborhoods. These areas will attract pedestrians and provide a relaxed settings for outdoor recreation. All of these spaces will be linked by a network of sidewalks, pedestrian footpaths and bikeways, allowing non-motorized traffic to move freely throughout the site.



Conceptual open space images

OPEN SPACE AREAS

"The Front Lawn" - The sloping meadow along Columbia Pike is bordered by an existing stone wall and includes the historic cemetery. The plan proposes preservation of the meadow and a dramatic forest hedgerow flanking and framing views to the Roderick House.

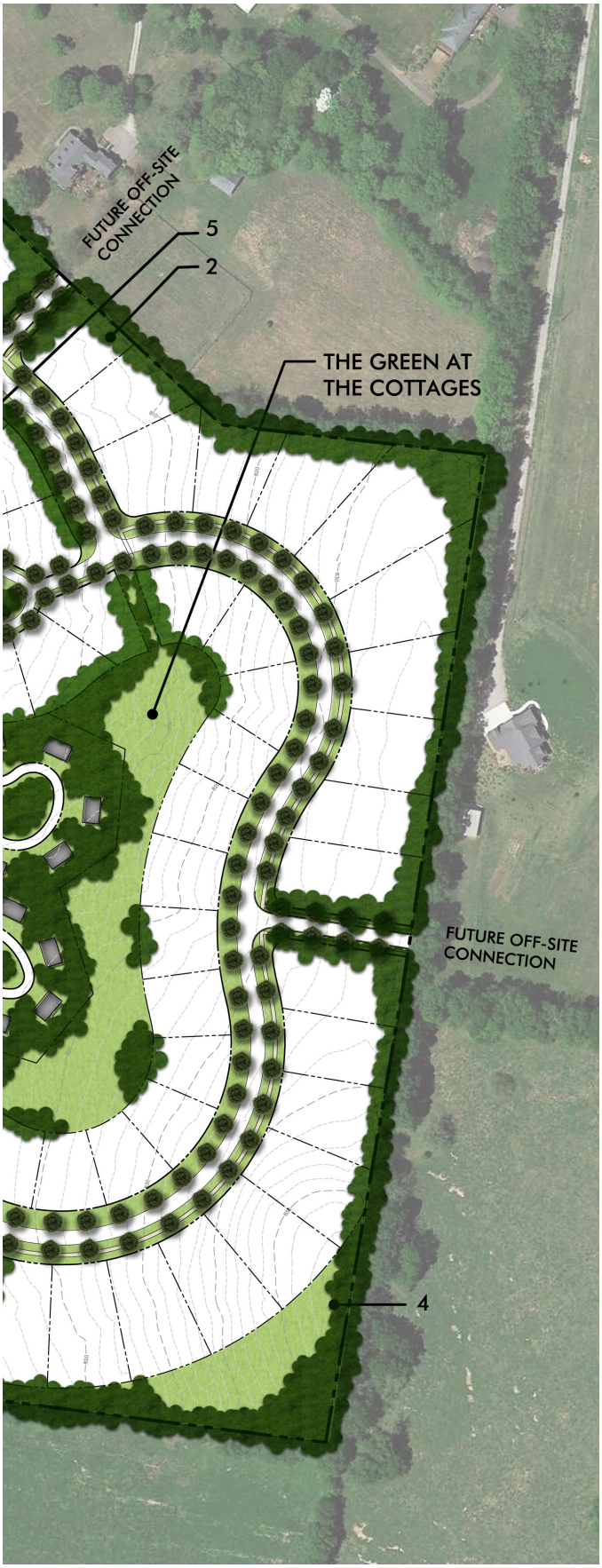
The Barn Amenity Area - Area includes the barn amenity area which features two existing buildings re-purposed to amenity buildings, a pool, and a community gathering space. The amenity buildings are set amidst bridges, waterfalls, a memorial to Roderick the horse, the Roderick Place trail system, and the wooded beauty of the existing creek.

The Gardens of The Knoll - These Gardens are in and around and Roderick Mansion, the Inn at Roderick Place, and the Spa and Wellness Center, . The informal nature of the gardens and the careful selection of plants will create a casual and relaxed environment at the Knoll. The gardens link the elements of the Knoll to the cottages to the east and transition to a natural landscape to be re-forested over time.

Gardens of the Garden Homes - The gardens at the garden homes will be informal gardens and landscape areas that may be used for rain water treatment or may be purely aesthetic in nature. A strong emphasis on deep-rooted, native plants with a succession of blooms through all seasons is preferred.

The Green at the Cottages - The cottages are nestled into an immense open space that will be reforested over time to create a sense of privacy at the knoll and the surrounding residential lots. Outside of the forested area, a series of glades and pastures will be preserved where community spaces such as trails, fire pits, pavilions and other informal gathering spaces as a natural amenity area for guest of the knoll and residents alike.

OPEN SPACE MASTER PLAN



COMMUNITY OPEN SPACE / LANDSCAPE GUIDELINES:

Community Buffers

1. Residential Lot / Columbia Pike Buffer - A buffer of at least 200' is provided between residences and Columbia Pike. Existing trees will be preserved to the greatest extent possible. Where necessary, one canopy tree shall be provided for every 25 feet of Columbia Pike frontage to supplement and enhance preserved existing trees. A continuous evergreen hedge row shall be provided at the residential property line. Evergreen Hedge shall be installed at a height of at least 36 inches and shall be planted a maximum of 48 inches on center. Hedge should have a mature height of six feet.
2. Property Boundary Buffer - A landscape buffer / landscape buffer easement with a minimum width of 20 feet shall be provided at the exterior boundary of this development. Existing trees should be preserved where possible. Where existing trees do not exist or need to be supplemented, 3 canopy trees and 15 shrubs shall be planted for every 100 feet of adjacent boundary. Trees shall be a minimum of 2.5 inch caliper. One out of every three canopy trees installed shall be evergreen. Shrubs shall have a mature height of at least four feet.
3. Barn and Village Buffer - A minimum width of 15 feet of informally planted canopy trees shall be provided with one tree for every 50 feet of adjacent Columbia Pike Right-of-Way. Canopy Trees shall be a minimum of 2.5 inch caliper.
4. Eastern Property Boundary - Large lots are planned through this area to allow existing trees to be preserved to the greatest extent possible. Where existing trees do not exist or need to be supplemented, a combination of existing and proposed trees should achieve 3 canopy trees for every 100 feet of required buffer. Trees shall be a minimum of 2.5" caliper. One out of every 3 canopy trees installed shall be evergreen. Minimum of 30 feet landscape buffer / landscape buffer easement shall be provided and existing trees will be preserved where possible.
5. Garden Lot Buffer - Where Garden Lots back up to public rights-of-way, a 15' landscape buffer easement will be established within the lots adjacent to the right-of-way. Existing trees should be preserved where possible. Where existing trees do not exist or need to be supplemented, a combination of existing and proposed trees should achieve 4 canopy trees and 15 shrubs for every 100 feet of required buffer. Trees shall be a minimum of 2.5" caliper. One out of every 3 canopy trees installed shall be evergreen. Shrubs shall have a mature height of at least 4'.

Street Trees

Street trees to be provided per street sections beginning on page 37.

Parking Lot Landscape Requirements

- All off-street parking should be hidden from view of the public street and located at the rear of all proposed buildings where possible.
- Where off-street parking abuts a public or private road it shall have a minimum 7' buffer.
- Parking should be designed to minimize site impact on existing natural features.
- For every 12 continuous parking spaces there shall be a planting island.

Dumpster Requirement

- Where dumpsters are required, an opaque screen wall / fence shall be provided surrounding its perimeter with a minimum height of 72 inches.
- Dumpster screen / wall shall consist of wood, brick masonry, stone or faux stone
- Access gates shall be a minimum 72 inches in height, opaque and of a style appropriate to tie to surrounding architecture.
- Foundation planting shall be provided with an evergreen hedge with a minimum height of 30 inches at the time of installation.

REGULATING PLAN

The Regulating Plan for Roderick Place graphically articulates the different residential patterns and specifies the building types permitted throughout. This is intended to ensure a project that will, at full build-out, meet or exceed the goals of both the developer and the Town of Thompson's Station, while creating an attractive, appealing, and sustainable community.

In general, the Roderick Place Regulating Plan defines the project's distinctive residential patterns and configurations and provides several housing types and prices. This plan is structured to encourage maximum compatibility with adjoining property uses and zoning. In addition, the Regulating Plan defines opportunities for commercial and civic uses within The Knoll and Roderick Market to reinforce the sense of place and to provide community services.

Building Typologies

A. The Knoll
B. The Barn Amenity Area
C. The Village Market and Restaurant
D. Roderick Guest Cottages
E. Carriage Estate Homes
F. Garden Homes

Notes

1. The regulatory plan is representative of the intended development. Final plan may include minor modifications to lot locations and lot sizes - not exceeding minimums or maximums established as part of this zoning document.
2. For further information, see the following building typologies beginning on page 20.

THE KNOLL (Mixed-Use Commercial)

The Central entrance drive leads visitors by a charming bridge, through open hillside meadow to The Knoll. The carefully expanded Roderick House and series of new buildings and services provide a beautiful setting for dining, receptions, conferences, events and wellness. To the West, the house remains the dominant architectural landmark overlooking preserved open pasture, the existing cemetery and Columbia Pike. Planted forest hedgerows flank Roderick House and cascade down the hillside to frame and enhance the importance of the original structure. Roderick Mansion forms the western terminus of an entry drive and arrival sequence that ties the Mansion, the Inn at Roderick Place, and the Spa and Wellness Center together. Looking east from the Mansion down the entry drive, guests will also see the Roderick Guest Cottages as the project transitions from commercial uses, to guest cottages, to the residences beyond.

Roderick's Spa and Wellness Center will provide state of the art Orthopedic Rehabilitation and Cosmetic Surgery care and service in a beautiful Tennessee Federal style building. Connected to the treatment center, the day spa occupies a courtyard building with private pool and terrace. These buildings are of a similar scale and style to the Roderick House and feature traditional red brick construction with cast stone detailing. The treatment center and spa are nestled in and surrounded by beautiful landscape elements. The Inn at Roderick Place, the boutique inn, reflects the architectural features of the Roderick House but in a more informal garden setting. A range of architectural styles from Federal (matching the existing house), to Colonial, to Country Farm House is envisioned to create a series of buildings that appear to have grown over time to create the proposed Boutique Inn. Each building will have its own style and furnishings appropriate to its historical period. The inn features an automobile arrival courtyard along the primary Knoll axis for guests and visitors. The landscaping and gardens are just as important as the buildings of the Knoll. Landscape features include a canopied entrance to Roderick Mansion at the arrival square, a well-landscaped, parking and arrival area, the entry courtyard to the Inn at Roderick Place, the Wellness Gardens associated with the Spa and Wellness Center and lush landscaping which conceals a new service area next to Roderick Mansion. The gardens interconnect to provide a beautiful setting for gatherings and events at the Knoll and within the Inn courtyard and front yard and serviced by the Inn and the Mansion. The gardens will be built to an exceptional horticultural level, and will be designed to compliment Roderick Mansion with historically rooted garden concepts.

PERMITTED USES:

- Restaurant
- Retail Shop
- Boutique Shop
- Boutique Inn
- Day Spa
- General office
- Medical office
- Conference rooms and event space
- Guest Cottages

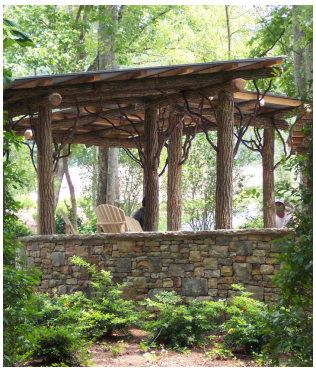
LOT STANDARDS

- Building Coverage: 75% Maximum
- Primary Structure Front Setback: 0 Feet Minimum
- Primary Structure Side Setback: 0 Feet Minimum
- Primary Structure Rear Setback: 0 Feet Minimum
- Distance Between Buildings: 10 Feet Minimum
- Height: 3 Stories Maximum
- Easements
- Parking: Parking to be provided per plan. Valet parking will be available during hours of operation and Overflow Parking will be provided at designated Locations.
- Signage: See Page 26 For Signage Guidelines.

THE BARN AMENITY AREA (Residential Amenity)

The Barn, Bridge, Residential Amenity area, and Roderick Market and Restaurant present a unique "face" of Roderick Place and create a memorable entrance to the residential community. Two existing farm buildings (the Horse Barn and the Farm Office) are retained and given new life as recreational building and are the focal point of this amenity area.

The farm office will be home to a residential club and HOA office building and the hub for pool and outdoor gathering spaces. This could be used for parties or resident events. At the Horse Barn, a soaring second floor loft space provides an outstanding location for events, parties and receptions, and creates a unique experience for the residents of Roderick Place and Thompson's Station. The loft also provides an additional venue for conferences taking place at the Knoll or a stage for summer theater productions. The ground floor of the barn houses the services and amenities associated with the event space and could include a marketplace for antiques and collectibles. A grassy open space next to the Barn provides remote or overflow parking for events on the property and eliminates the need for large paved parking lots. A proposed bridge in this area adds another landmark feature to Roderick Place to connect the many elements of Roderick Place. The historically inspired bridge serves vehicular traffic and offers an attractive and safe pedestrian walkway overlooking the existing stream. The Village Market and Restaurant provides for every-day at a local, retail shop which will offer neccessities like milk and bread and will also be a casual place to go for coffee or ice cream.



PERMITTED USES:

- Residential Club
- Pool and other Recreational Uses
- Cabana and Changing Rooms
- HOA Offices
- Event Space

LOT STANDARDS:

- Building Coverage: 75% maximum
- Primary Structure Front Setback: 0 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Distance Between Buildings: 10 feet minimum
- Height: 2 stories maximum
- Parking: Permitted uses shall satisfy parking requirements per the Town of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel.
- Signage: See page 26 for signage guidelines

THE VILLAGE MARKET AND RESTAURANT (Commercial Use)

The Village Market and Restaurant at Roderick Place is a small convenience-scale market with auto fueling and a +/- 150 seat restaurant. Ample outdoor seating in a partially-covered, fenced dining area is planned as a destination for outdoor dining. A central kitchen will support both the restaurant and will create the high-end on-the-go food at the convenience market. The restaurant and market will be served by parking tucked behind the building and hidden from Columbia Pike.

PERMITTED USES:

- Restaurant
- Retail Shop
- Catering
- Convenience Market
- Auto Fueling

LOT STANDARDS:

- Building Coverage: 75% maximum
- Primary Structure Front Setback: 0 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Distance Between Buildings: 10 feet minimum
- Height: 25 feet maximum
- Parking: Parking Requirements Per The Town Of Thompson's Station Land Development Ordinance. On-Street Parking May Count Toward The Required Parking If Directly Adjacent The Subject Parcel.
- Signage: See page 26 for signage guidelines

RODERICK GUEST COTTAGES (Hopitality Use)

Roderick Guest Cottages are proposed just on the eastern periphery of the Knoll Mixed-Use Commercial area. A maximum of 56 units are permitted comprised of a mix of one, two, and four unit cottage homes. The Guest Cottages will provide a gentle transition from the Mixed-Use Knoll Commercial area to the surrounding for-sale residential uses. A variety of architectural styles and patterns is envisioned in this area to emphasize an informal and rural character. The landscape palette should evoke country garden imagery and should further emphasize the informal nature of this area.

LOT STANDARDS:

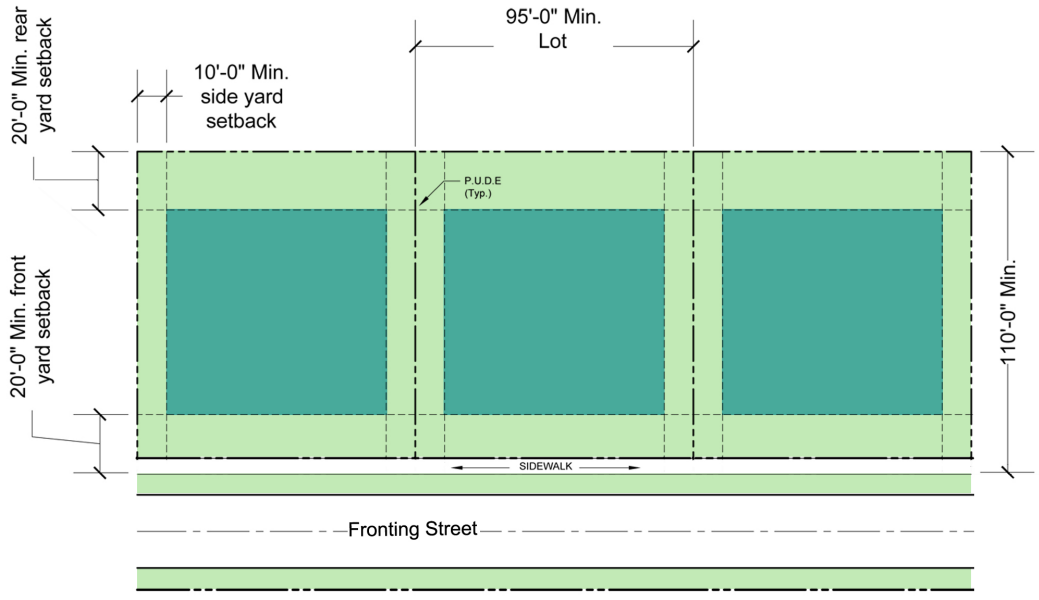
- Primary Structure Front Setback: 15 feet minimum
- Primary Structure Rear Setback: 35 feet minimum
- Primary Structure Side Setback: 5 feet minimum
- Building Height: 3 stories maximum
- Raised Foundation At Front Façade: 18 inches minimum
- Height: 2 stories maximum
- Parking: Permitted uses shall satisfy parking requirements per the Town of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel.
- Distance Between Buildings: 20 feet minimum

RESIDENTIAL USES AND LOT TYPES

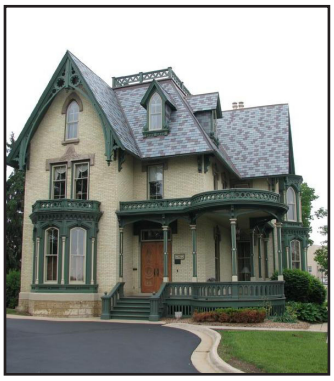
The lots proposed for Roderick Place are designed to accommodate multiple home sizes appropriately scaled and set to create an informal streetscape with a rural country feel. Individual Phases or groups of lots within the development could possess unique architectural character by emphasizing and encouraging specific architectural styles such as: Tennessee Federal (which expands upon the original architecture of the area), Classic American, or Updated Neoclassical style. One group of homes' architectural styles could emphasize large, inviting front porches, while others might emphasize a formal front stoop, but each phase will strive to create significant variations within its architectural style; styles should not be repetitive. Generous landscaping and soft landscape lighting are essential to creating the inviting character of the neighborhood. Cottage Lots are accessed by a shared drive. All lots will have garages accessed from the street (or shared access drive) on which they front.

CARRIAGE ESTATE HOMES (TYP. LOT 95' X 130' | FRONT-LOADED) (RESIDENTIAL

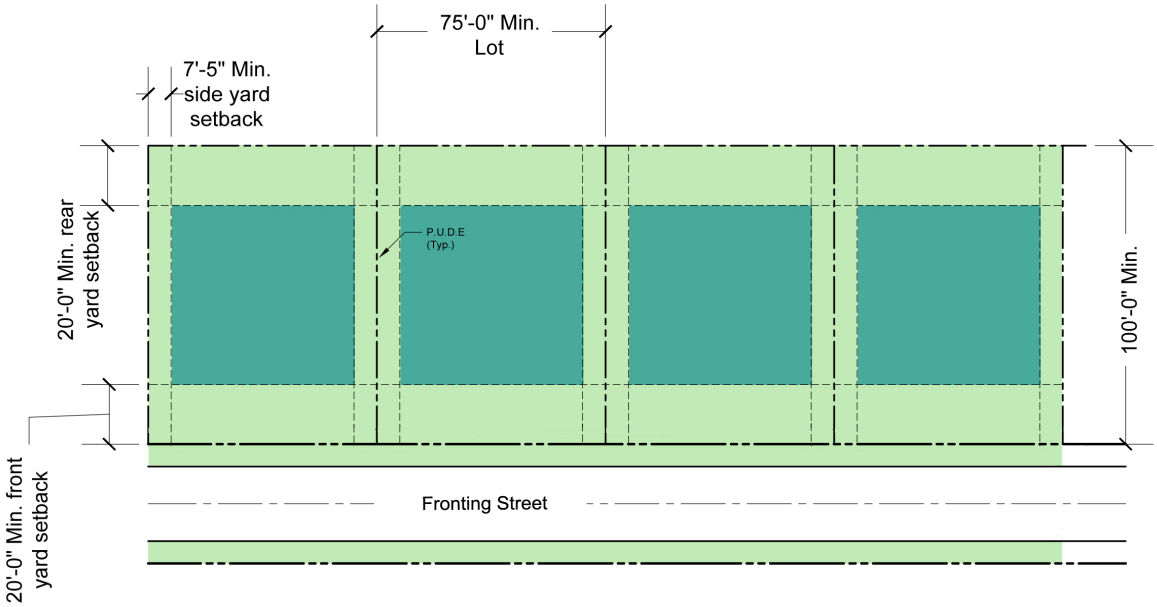
- Lot Area: 11,000 square feet minimum
- Building Coverage: 55% of lot maximum
- Primary Structure Front Setback: 20 feet minimum
- Primary Structure Rear Setback: 20 feet minimum (building envelope may not encroach into landscape easement)
- Primary Structure Side Setback: 10 feet
- Primary Structure Side Street Setback: 20 feet minimum
- Lot Width At Front Setback: 95 feet minimum
- Lot Depth: 110 feet minimum (measured at the central axis of the lot)
- Building Height: 3 Stories Maximum (including walk-out basements where possible)
- Raised Foundation At Front Façade: 18 Inches Minimum
- Required Off-Street Parking: Minimum 2 Cars Per Unit Within An Enclosed Garage.
- Front Facing Garages are discouraged. Where necessary the garage must be set back a minimum of 20 feet from the primary front facade and garage doors shall be improved and articulated to appear as carriage doors.
- Driveways shall be a maximum width of 12' wide from the street to the primary façade of the home. The driveway may expand to accommodate side load garages or extra parking area beyond the primary façade of the home, but shall be set back a minimum of 5' from the property line.



GARDEN HOMES (TYP. LOT 95' X 120' | FRONT-LOADED)



- Lot Area: 7.000 square feet minimum
- Building Coverage: 55% of lot maximum
- Primary Structure Front Setback Zone: 20 - 25 feet
- Primary Structure Rear Setback: 20 feet minimum
- Primary Structure Side Setback: 7.5 feet
- Primary Structure Side Street Setback: 12.5 feet minimum
- Lot Width at Front Setback: 75 feet minimum
- Lot Depth: 100 feet minimum (measured at the central axis of the lot)
- Building Height: 3 stories maximum (including walk-out basements where possible)
- Raised Foundation at Front Façade: 18 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage.
- Where Garden Lots back up to street network, the homes must have strong front and rear elevations and shall be heavily screened from rear streets.
- Front Facing Garages are discouraged. Where necessary the garage must be set back a minimum of 20 feet from the primary front facade and garage doors shall be improved and articulated to appear as carriage doors.
- Driveways shall be a maximum width of 12' wide from the street to the primary façade of the home. The driveway may expand to accommodate side load garages or extra parking area beyond the primary façade of the home, but shall be set back a minimum of 5' from the property line.



ARCHITECTURE & SITE ELEMENTS

ARCHITECTURAL PALETTE & STYLES

Tennessee Federal Style

- This is the most traditional and formal style in the palette.
- The façade is orderly, with windows in symmetrical vertical rows around a central door.
- Brick, stone, or fiber cement siding primary building material with cast stone or painted wood accents
- Windows are double-hung with sashes (upper and lower), typically with six panes per sash.
- Uses a hip or gable roof with brick or stone chimneys and optional gable accents or a flat roof with a detailed parapet and cornice.
- A semicircular or elliptical fanlight over panelized front door is a common feature of this style.
- Palladian and arched windows are common but restrained. These should only be used in a meaningful way.

Updated Neoclassical Style

- This style uses many of the principles of the Tennessee Federal style, but allows a greater range of less predictable details.
- The form of the house is still quite formal, but may include wings, terraces, bay windows, dormers and front porches to increase the architectural palette beyond the Tennessee Federal style.
- Brick and stone are the primary building materials with cast stone or painted wood accents.
- Material changes are acceptable throughout the house. For example, on multi-story houses and buildings, a first story of cast stone, can be used with upper stories of brick or cementitious siding.
- Details like iron work, French doors and appropriately scaled columns are encouraged to add interest to the architecture.

Classic American Style

- This style has roots in the folk Victorian, country farmhouse, bungalow, craftsman, and shingle styles, and is more informal than the above architectural styles.
- It can retain the basic symmetry and simplicity of the Federal style, or it may introduce asymmetrical floor plans of a looser nature.
- Roofs are frequently steeply pitched gable roofs with deep overhangs and are finished with asphalt shingles and/or standing seam metal.
- The primary building materials are cementitious siding, wood, stucco, brick or stone with wood or cast stone detailing.
- Dormers, chimneys, large front and side porches and other details are highly encouraged and the asymmetrical placement of these will "loosen" the appearance of the house.
- Bay windows, columns and French doors are all encouraged to add interest to the house.

Countryside Vernacular (Not for use in residential architecture)

- This style is an elegant version of a picturesque village. Architecture references barns and stables as well as the charm of Main Street America; all in a park-like setting.
- Cementitious Siding, Stone, brick, stucco and wood are the primary façade materials with simple high quality detailing.
- Roofs are hip or gable and may feature weather vanes, spires and cupolas of painted wood, copper or iron.
- Large windows, doors, generous front porches, and gazebos and an inviting attitude with a sense of hospitality.

GENERAL BUILDING REQUIREMENTS

- All buildings will use a level of detail and articulation on all sides of the building appropriate to articulate a complete architectural idea and a well-crafted feeling to each building. A simple farm house character is permitted.
- Avoid large monolithic massing.
- Use natural building materials and / or historically accurate materials where possible.
- Where two or more materials are combined on a façade, the visually heavier of the two materials shall be located below the lighter. Material composition will be in keeping with historical architectural precedents.
- Primary façade materials shall not change at outside corners. Material changes should happen at inside corners and offsets in walls. It is acceptable to change materials where used as trim or accents around windows, doors and cornices.
- Exterior colors shall be compatible and consistent with historical precedents. If bright colors are used, they shall be used in moderation and with respect to neighboring properties.
- The exterior building material of chimneys shall be masonry (stone or brick).
- Windows shall be double hung and shall be inset into walls to create shadow lines and a sense of quality.
- Secondary structures and garages shall generally be constructed of the same materials as the primary building or house, but varied materials may be permitted when attempting to create a sense of being built over time.
- Rooftop and ground-mounted utility units shall be screened from public views. A person standing on the property line of the site should not be able to see the equipment. Architectural screening shall be constructed of materials similar to those used on the building. Landscape screening is also permitted and shall be evergreen with a minimum installed height of 30 inches.
- Where required, all access to commercial building rooftops shall be by internal roof ladders not visible from the public way.
- All trash and service areas, meters, piping, transformers and other ground-installed equipment shall be screened. Architectural screening shall be constructed of materials similar to those used on the building. Landscape screening is also permitted and shall be evergreen with a minimum installed height of 30 inches.

ARCHITECTURAL MATERIALS

General Descriptions

- Natural building materials and / or historic materials where possible. Cementitious siding or faux stone are also permitted.
- Where two or more materials are combined on a façade, the visually heavier of the two materials shall be located below the lighter. Material composition will be in keeping with historical architectural precedents.
- Primary façade materials shall not change at outside corners. Material changes should follow form changes. It is acceptable to change materials where used as trim or accents around windows, doors and cornices.
- Exterior colors shall be compatible and consistent in keeping with historical precedents. If bright colors are used, they shall be used in moderation and with respect to neighboring properties.
- The exterior building material of chimneys shall be brick or stone only. Brick or stone should match primary façade material if primary facade is also brick or stone.
- Translucent or back-lit canopies and awnings must be canvas or metal. Plastic is not permitted.
- Glass shall be clear and non-reflective

Permitted Building Façade Materials

- Brick (standard modular or matching a historical standard)
- Natural Stone
- Cementitious Siding and Trim
- Faux Stone
- Wood
- Stucco

Soffits

- Cementitious Board Soffit
- Vinyl or Aluminum not permitted

Permitted Roof Materials

- 25-year Composition Shingle (or better)
- Standing Seam Metal
- Wood Shingles
- Concrete Roof Tiles
- Slate or Faux Slate
- Flat Roofs (where surrounded by a decorative parapet and cornice, with or without a balustrade, or where consistent with the architectural style of the building.)
- Accents of Copper (used in dormers, gutters, cupolas, spires, and other roof features)

Permitted Windows and Doors

- Wood, CVPC or aluminum clad window with historic inspired profiles are required.
- Clear, insulated, high performance, low-E glazing
- Windows should have appropriate muntins, with true divided lights, or simulated divided lights which place muntins pieces on the inside and outside of the glass. Grid Between Glass (GBG) is prohibited.
- High quality aluminum storefront for commercial use only
- Wood entry doors
- Garage doors, especially those facing public roads or courtyards, shall be of high-quality, carriage style, painted or stained wood or painted metal, well-detailed, and in character with the style of the building. Doors should be diminished and they should be a decorative feature of the elevation, accentuating the style of the building.

Shutters

- Painted or stained wood
- Shutters are to be installed with actual operating hardware or shall have the appearance of operable shutters
- Shutters should be of a style consistent with the style of the house, half the size of the window, and proportioned to be functional with relation to the size of the window it serves

Architectural Trim

- Painted or Stained Wood
- Hardiboard
- Cast Stone
- Azek or similar
- Vinyl or Aluminum Trim not permitted

Columns

- Painted or Stained Wood
- Brick
- Natural Stone
- Cast Stone
- Azek or similar

Trellises and Garden Structures

- Painted, stained, or naturally weathering wood
- Steel with decorative finish
- Wrought Iron
- Cast Stone
- Azek or similar

Awnings

- Commercial quality canvas awning
- Open sides
- Sturdy metal frames
- Plastic or interior glowing awnings are prohibited

SITE SIGNAGE

Signs include any outdoor object, device, or structure used to advertise, identify, display, direct, or attract attention to any person, institution, organization, business, product, service, event or location by any means, including words, letters, figures, designs, symbols, fixtures, colors, illumination or projected images. Signs do not include flags or emblems of any nation, organization of nations, state, city or religious organization.

Categories of Signage

Directional Signage

- Traffic Signs
- Street Signs
- Parking Regulations

Development Signage (at entrances)

- Iron letters mounted to the stone wall
- Soft illumination by discreet lighting placed in the landscape

Neighborhood Identification Signage at neighborhood entries

- Iron letters mounted to masonry walls or pillars
- Soft illumination by discreet lighting placed in the landscaping

Commercial Signage

Individual letters on the buildings

- Individual letter signs will be of white, black, gold, bronze or silver. High quality wood or metal letters individually pin-mounted a minimum of one inch from face of wall or background. No plastic letters.
- Letters shall be prismatic face letterforms with full facets, round face forms, flat faces or layered letterforms with face and liner
- Wall signs shall be mounted through the wall material to the structure behind
- Blade Signs
- Awning Signs
- Letters painted on storefront glass
- When illuminated, signs should use either internal light sources, soft backlighting, decorative light source or concealed architectural light source
- Distinctive type styles is encouraged for all commercial signs

Gas Station

- Changeable electronic text or digital sign panels consistent with Town of Thompson's Station LDO are permitted

Bridges

- Spanning a small swale near the main (center) entry to the knoll, a natural stone bridge sits lightly in the quiet country landscape. Large scale lanterns add ambiance and highlight the craftsmanship of the bridge.
- Another bridge serves as a landmark for Roderick Market and Restaurant as the entry road transitions from the Market to residential amenities and to residential uses and helps to make Roderick Place a unique destination. See the Barn, Bridge, Amenity and Rederick Market and Restaurant section for more information about this area.
- Pedestrian bridges might also be incorporated in several locations including at the streams near the Residential Amenity Area.

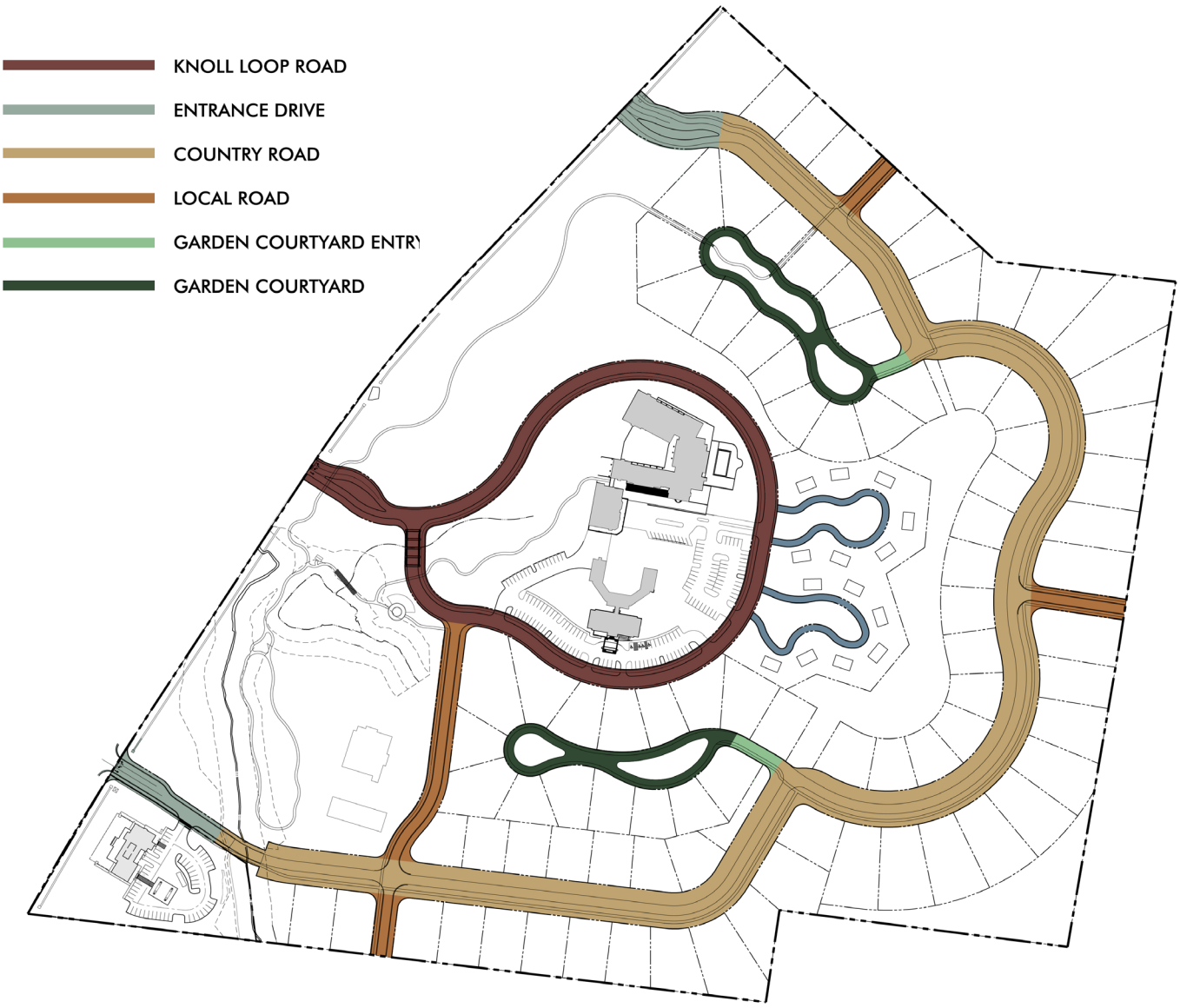
Fences and Walls

- A series of horse fences and stone walls will be utilized as visual accents and reminders of the historic character of the Roderick Place Property.
- Low stone walls (30-36" high), hedgerows, equestrian fences (48" high of dark brown stained wood) and privacy walls will be used where functionally appropriate and when visually necessary.

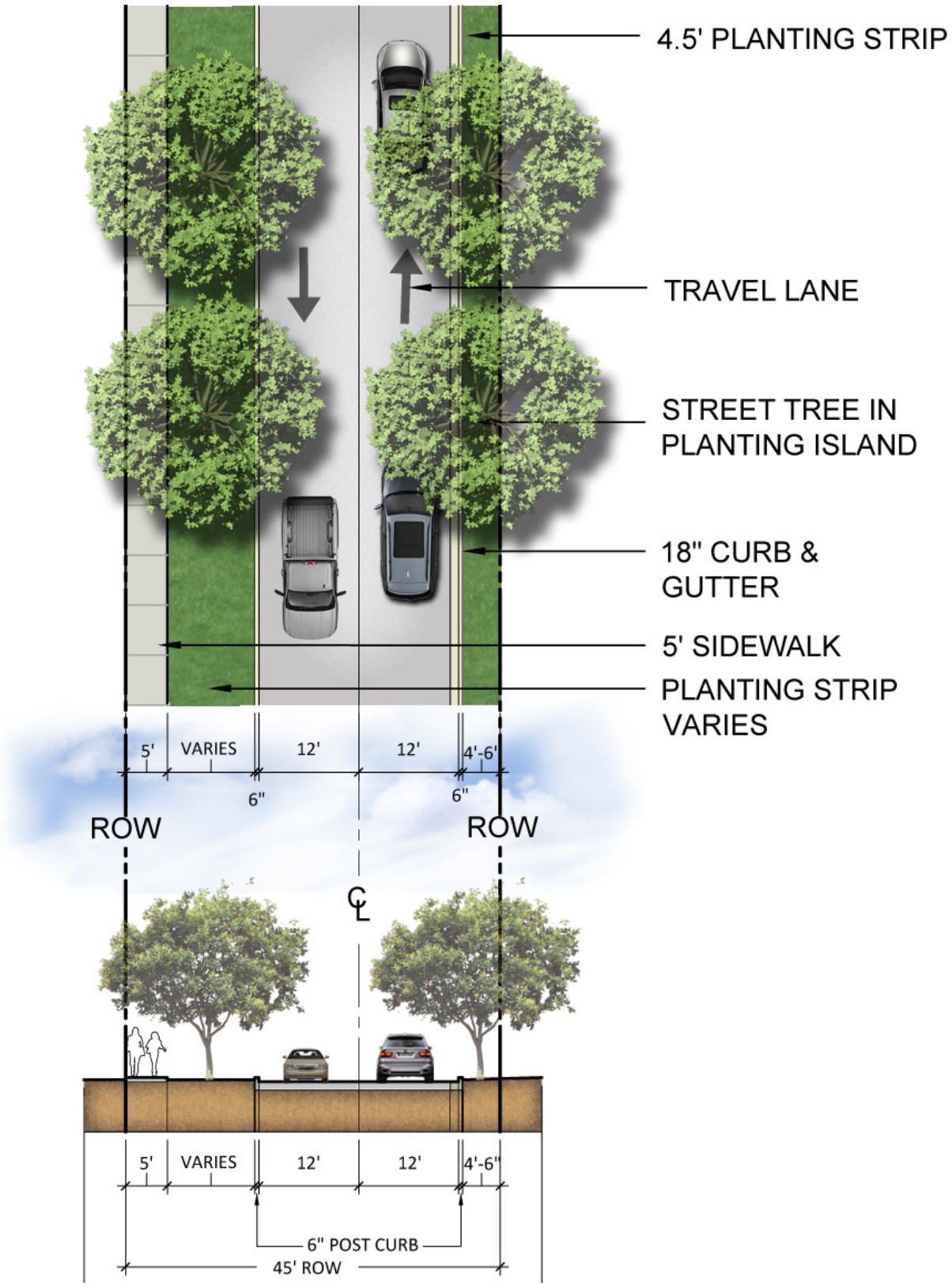
Sidewalks

- Sidewalks to be provided per street sections beginning on page 37.
- Interconnecting primary sidewalks are encouraged. Primary walks shall be a minimum of 5' wide and constructed of concrete or approved alternate.
- Gravel or garden (secondary) walks are permitted in residential clusters, community garden areas, parks and amenity spaces and shall be a minimum of 4' wide.

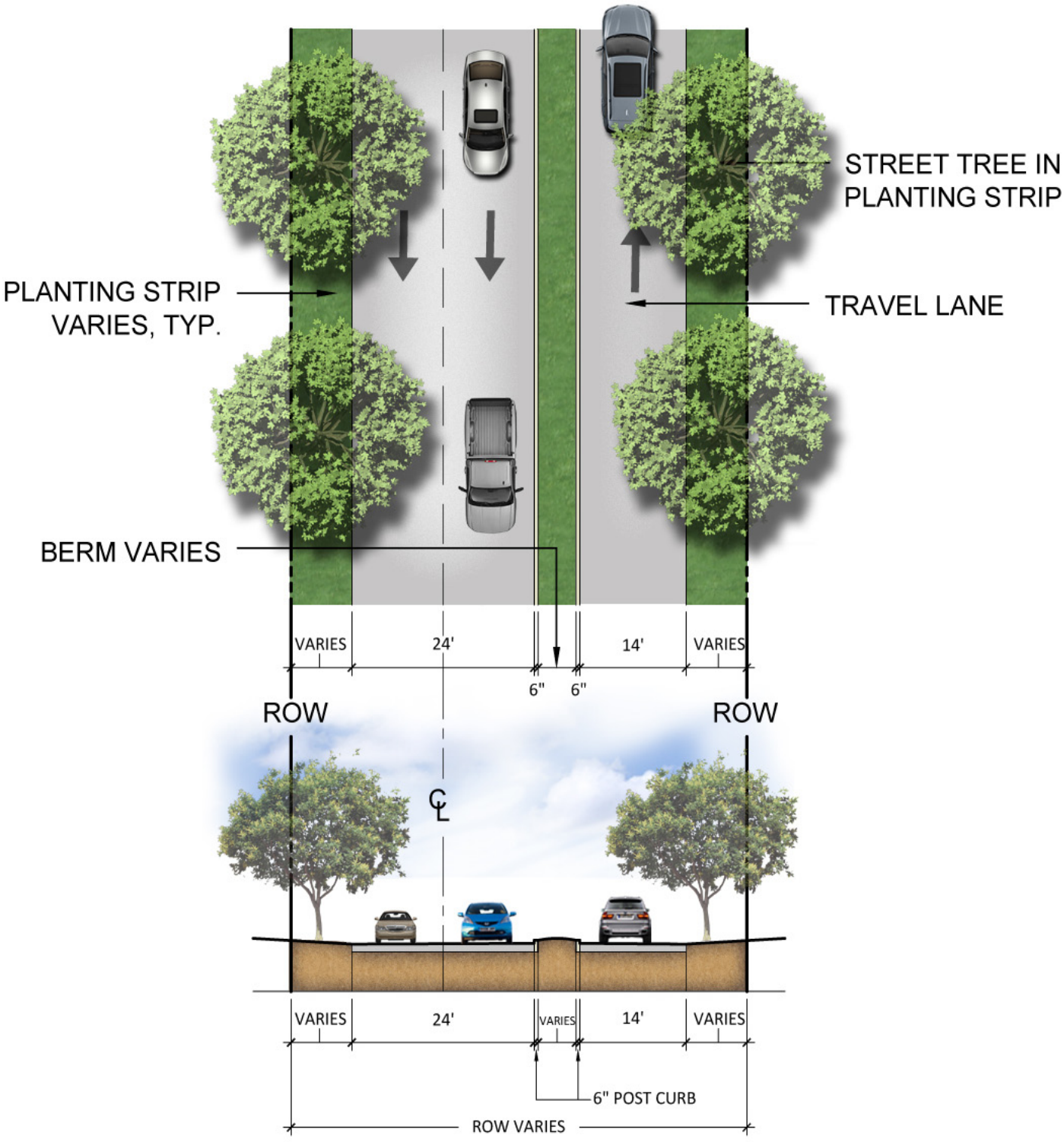
S T R E E T S & W A L K S



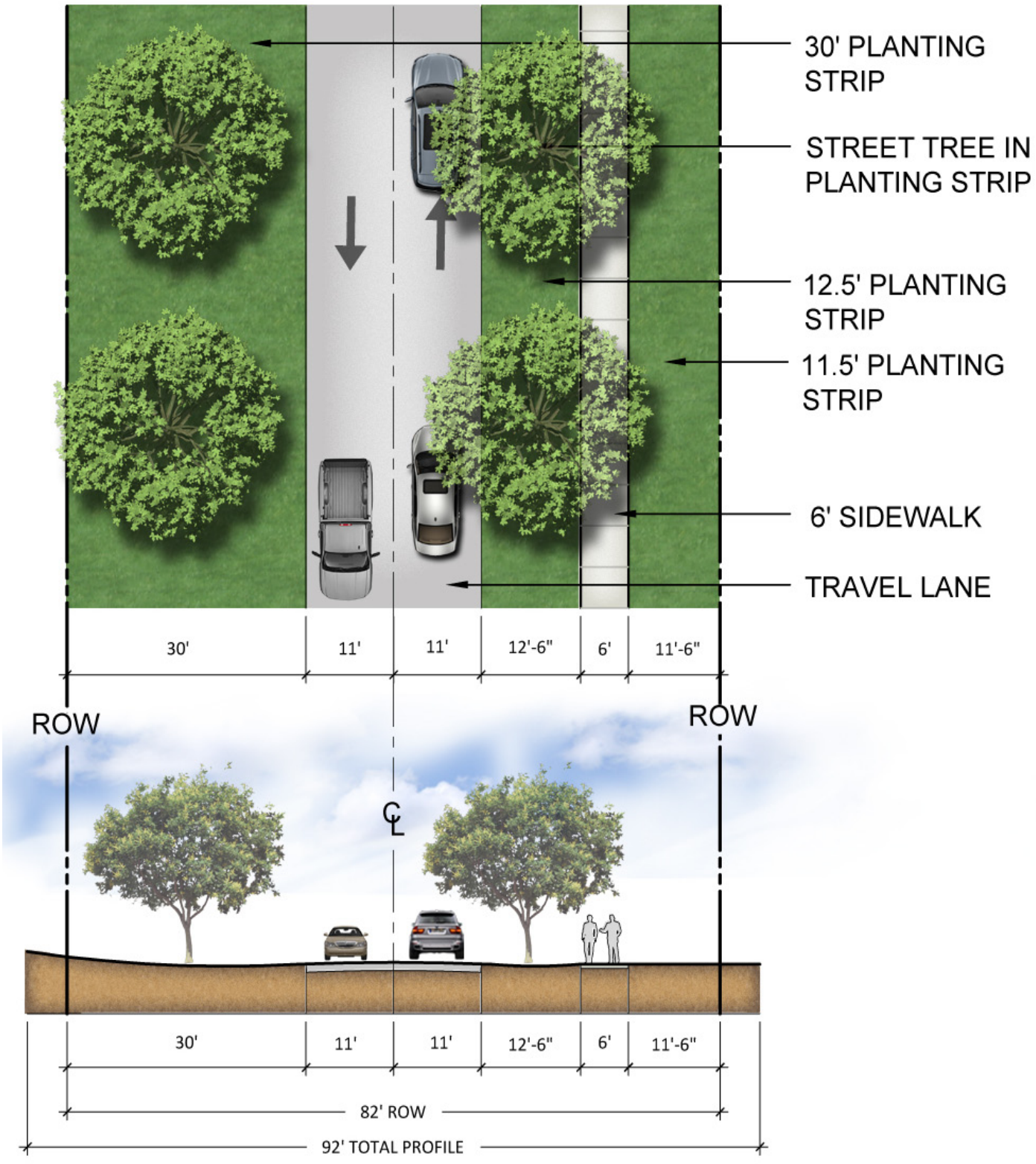
STREET NETWORK



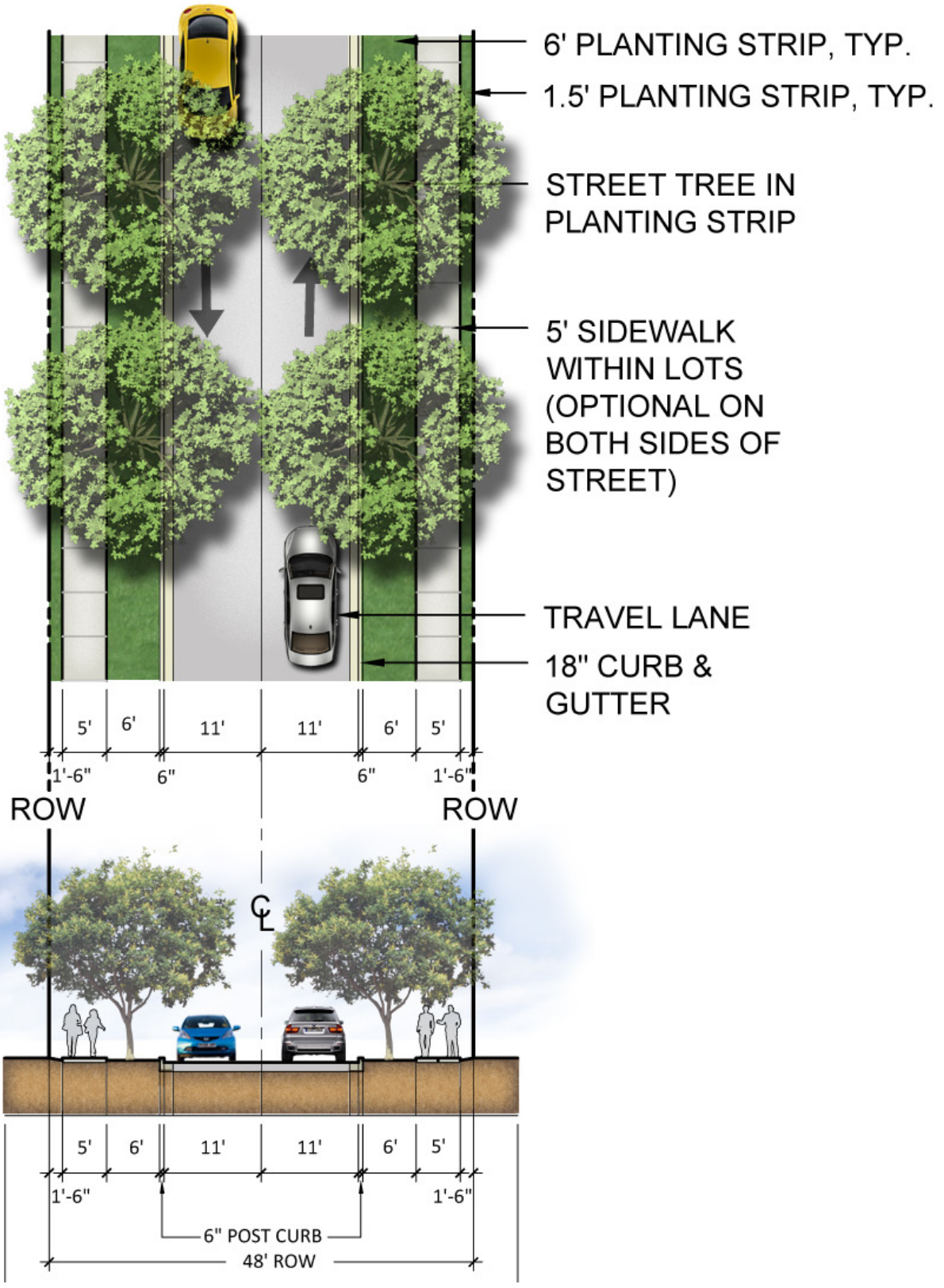
KNOLL LOOP ROAD (45’ ROW)



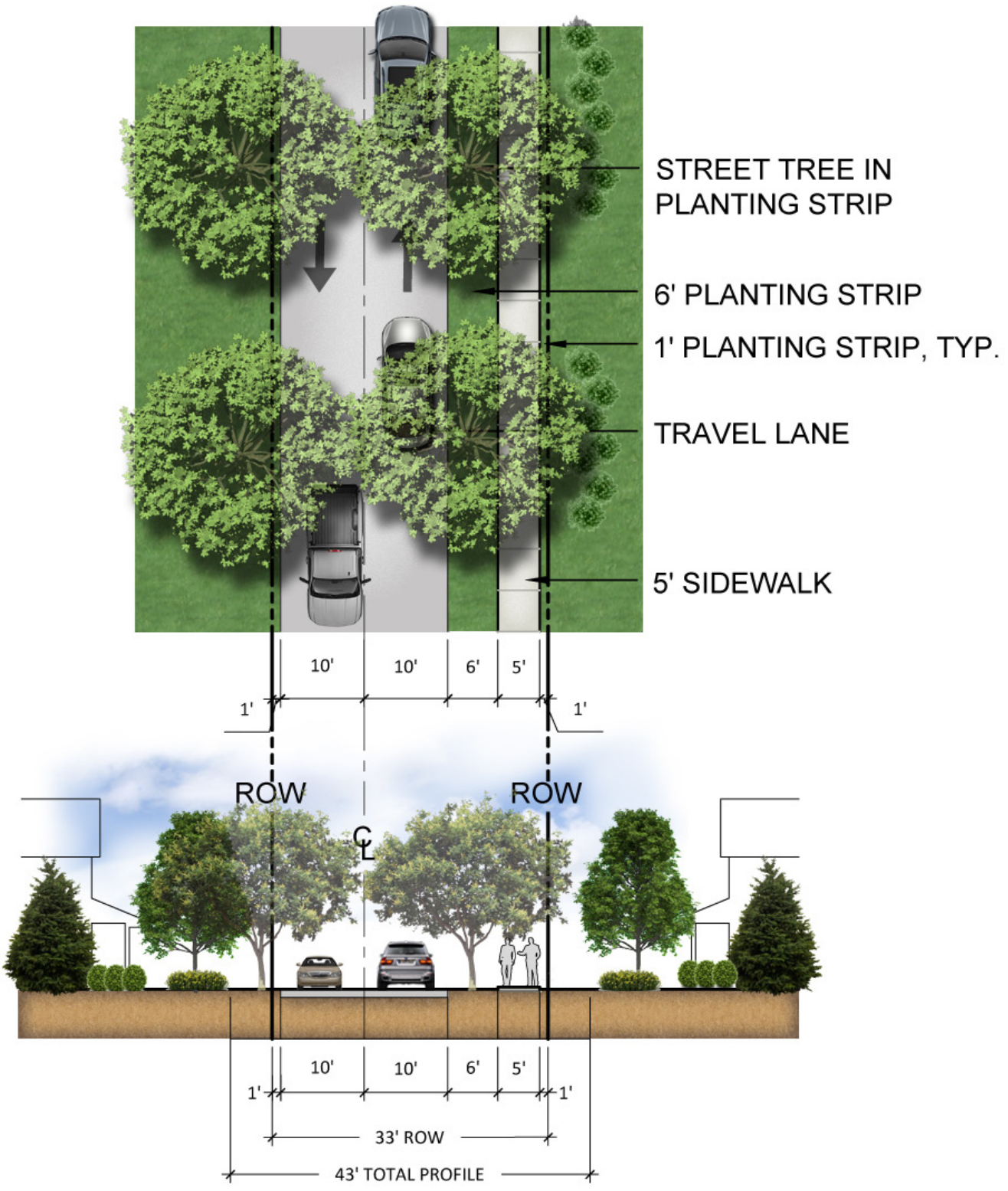
ENTRANCE DRIVE (ROW VARIES)



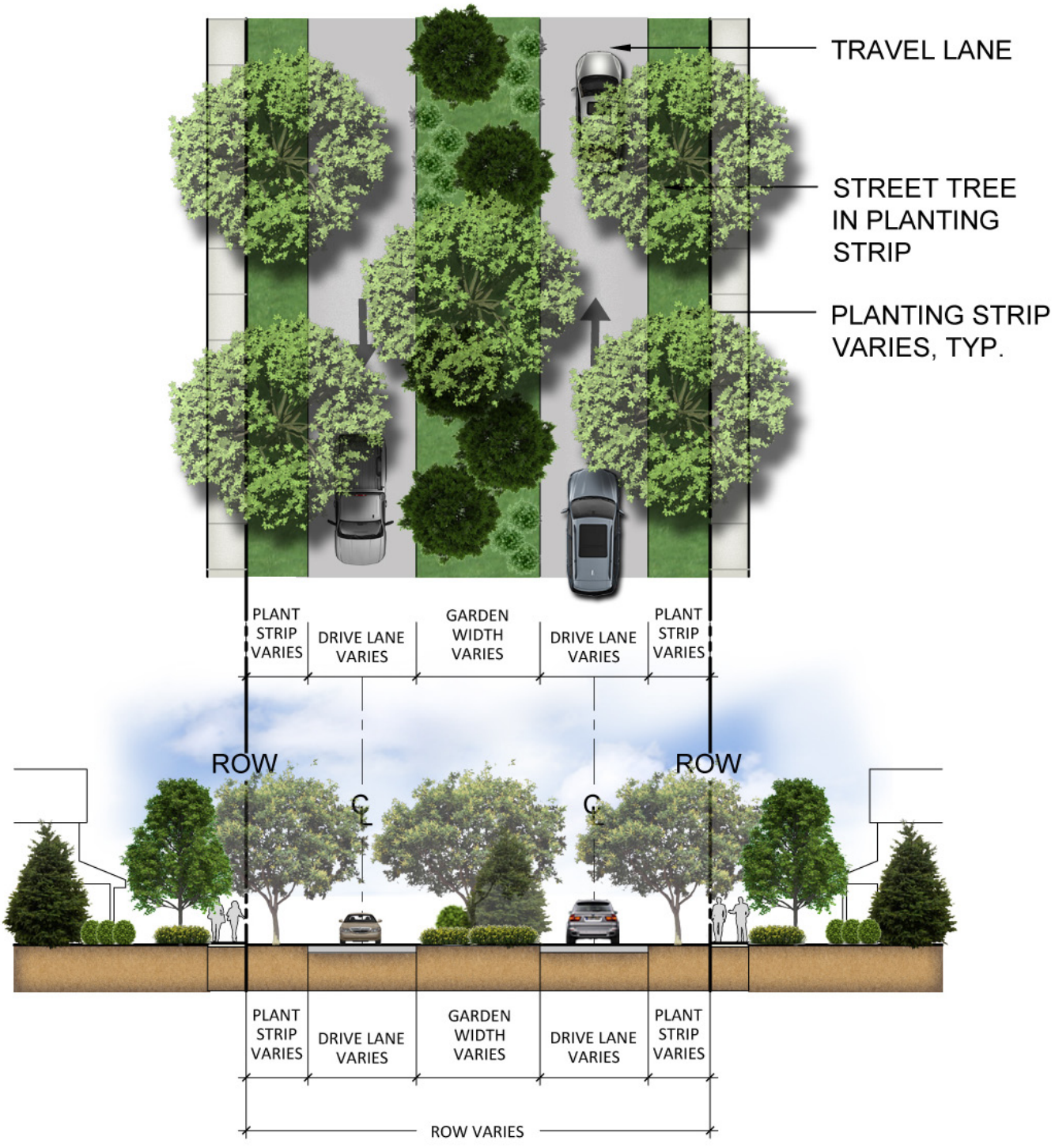
COUNTRY ROAD (82’ ROW)



LOCAL ROAD (48’ ROW)

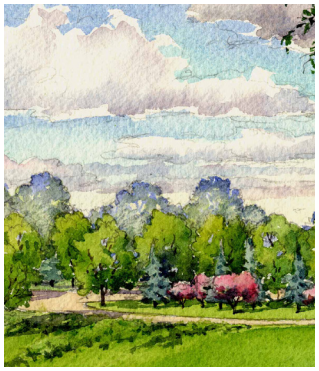


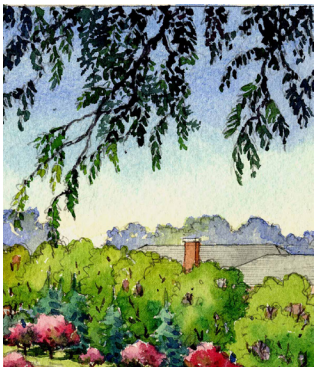
GARDEN COURTYARD ENTRY (33' ROW)



GARDEN COURTYARD (ROW VARIES)

R O D E R I C K P L A C E





BUILDING KEY:
A = The Mansion at Roderick Place
B = The Inn at Roderick Place
C = The Spa and Wellness Center at Roderick Place
D = The Village Market and Restaurant at Roderick Place
E = Roderick Guest Cottages

RODERICK PLACE

COLUMBIA PIKE

FUTURE OFF-SITE CONNECTION

THE KNOLL

BARN AMENITY AREA

FUTURE OFF-SITE CONNECTION

SITE DATA

EXISTING ZONING:	Specific Plan-High Intensity District	
GROSS SITE AREA:	79.90 AC	
COMMERCIAL AREA: (The Knoll & Village)		
COMMERCIAL AREA:		13.59 AC
OPEN SPACE REQUIRED:		6.80 AC (50%)
OPEN SPACE WITHIN COMMERCIAL:		7.18 AC (53%)
RESIDENTIAL		
RESIDENTIAL AREA:		66.31 AC
OPEN SPACE REQUIRED:		26.52 AC (40%)
OPEN SPACE WITHIN RESIDENTIAL:		26.97 AC (41%)
ESTATE LOTS:	56	
GARDEN LOTS:	31	
TOTAL SINGLE FAMILY:	87	
RODERICK GUEST COTTAGES:	56	
TOTAL UNITS:	143	

CONCEPT PLAN

RODERICK PLACE
WILLIAMSON COUNTY, TENNESSEE

KV+D
KISER VOGRIN DESIGN

February 29, 2016
REV March 22, 2016
Project #14046

0 100 200
SCALE: 1"=100'

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning
Ms. Gillian L. Fischbach, P.E., PTOE, President

Date: March 16, 2016

To: Mr. Jeff Rosiak, Kiser Vogrin Design

From: Ms. Gillian L. Fischbach, PE, PTOE, Fischbach Transportation Group (FTG, LLC)

RE: Roderick Farms, Columbia Pike, Thompson's Station, TN

As requested, I have conducted trip generation analyses for the current concept plan for Roderick Farms mixed-use project that is planned for construction on the east side of Columbia Pike, south of Critz Lane, in Thompson's Station, TN. Trip generation data were identified from Trip Generation, 9th Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. The following table presents the daily and peak hour trip generations for the project.

TRIP GENERATION FOR RODERICK FARMS
(MARCH 2016 CONCEPT PLAN)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Single-Family (LUC 210)	87 homes	828	16	49	55	32
Sit-Down Restaurant (LUC 932)	3,768 sq.ft.	480	22	18	22	15
Convenience Store / Gas Station (LUC 852)	8 pumps	4,340	66	66	76	76
Resort (LUC 330)	131 rooms	1,168 *	35	14	28	37
TOTAL ENTERING AND EXITING TRIPS		**6,816**	**139**	**147**	**181**	**160**
NEW TRIPS TO THE COLUMBIA PIKE CORRIDOR **		**3,562**	**90**	**97**	**124**	**103**

* Daily trips identified using LUC 310 (Inn) because no such data is available for LUC 330 *Resort)
** Based on the assumption that 75% of the traffic generated by the convenience store/gas station will be pass-by trips that are already traveling on Columbia Pike during the peak hours.

PO Box 682736 Franklin, TN 37068 (615)771-8022 phone Gillian@FTGtraffic.com

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

Traffic Impact Study

Roderick Place
Columbia Pike
Thompson's Station, TN

Prepared October 2014
(Revised May 2015)

Ms. Gillian L. Fischbach, P.E., PTOE
P.O. Box 682736
Franklin, TN 37068
(615) 771-8022 phone
Gillian@FTGtraffic.com

Traffic Impact Study

Roderick Place
Columbia Pike

Thompson's Station, Tennessee

Prepared October 2014
(Revised May 2015)

PREPARED FOR:
Mr. Leon Heron, Jr.
C&L Development
P.O. Box 241
Thompson's Station, TN 37179

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: 10621

Table of Contents

1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a mixed-use development that is proposed to be constructed on the east side of Columbia Pike, approximately half way between State Route 840 and Thompson's Station Road, in Thompson's Station, Tennessee.

For the purposes of this study, existing traffic volumes were established. 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 existing traffic volumes. The 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. As shown, the project site is located on the east side of Columbia Pike, approximately half way between State Route 840 and Thompson's Station Road, in Thompson's Station, Tennessee.

Currently, the project site includes an historic single-family house that is included on the National register. Also, the site includes several outbuildings and a second single-family home, which is not historic. The developer of the proposed project plans to construct the following land uses:

- 157 single-family homes
- 40 townhomes
- A restaurant with 25,400 sq.ft. of space
- An inn with 75 rooms and a total of 64,100 sq.ft.
- A day spa with 29,000 sq.ft. of space
- A market / restaurant with a total of 4,587 sq.ft. of space

Access to this development is proposed to be provided at three locations on Columbia Pike. The current project site plan is shown in Figure 2.

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 proposed project will be completed in six years.

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

N

No Scale

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

Figure 1.
Location of the Project Site

MASTER PLAN TABULAR DATA:

EXISTING ZONING: Specific Plan-High Intensity District
PROPOSED ZONING: No Change
GROSS SITE AREA: 79.90 AC

PROPOSED ZONING: Specific Plan, High Intensity District (Cluster Option)
GENERAL PLAN REQUIREMENTS
- Maximum Density: 3.0 DU/AC
- Maximum Height: 3 Stories
- Required Open Space: 45%
- Area Permitted as Residential: 100%
- Area Permitted as Commercial: 100%

COMMERCIAL AREA: (The Knoll & The Barn and Village)

Commercial Area:	13 AC
Total Square footage:	127,606 sf
FAR Provided:	0.21
FAR Permitted:	0.23
Open Space within Commercial:	6.9 AC

RESIDENTIAL AREAS:

Residential Area:	66.9 AC
Total Units:	197
Provided Density:	2.94 DU/AC
Permitted Density:	3.0 DU/AC
Open Space within Residential:	29.4 AC

OPEN SPACE:

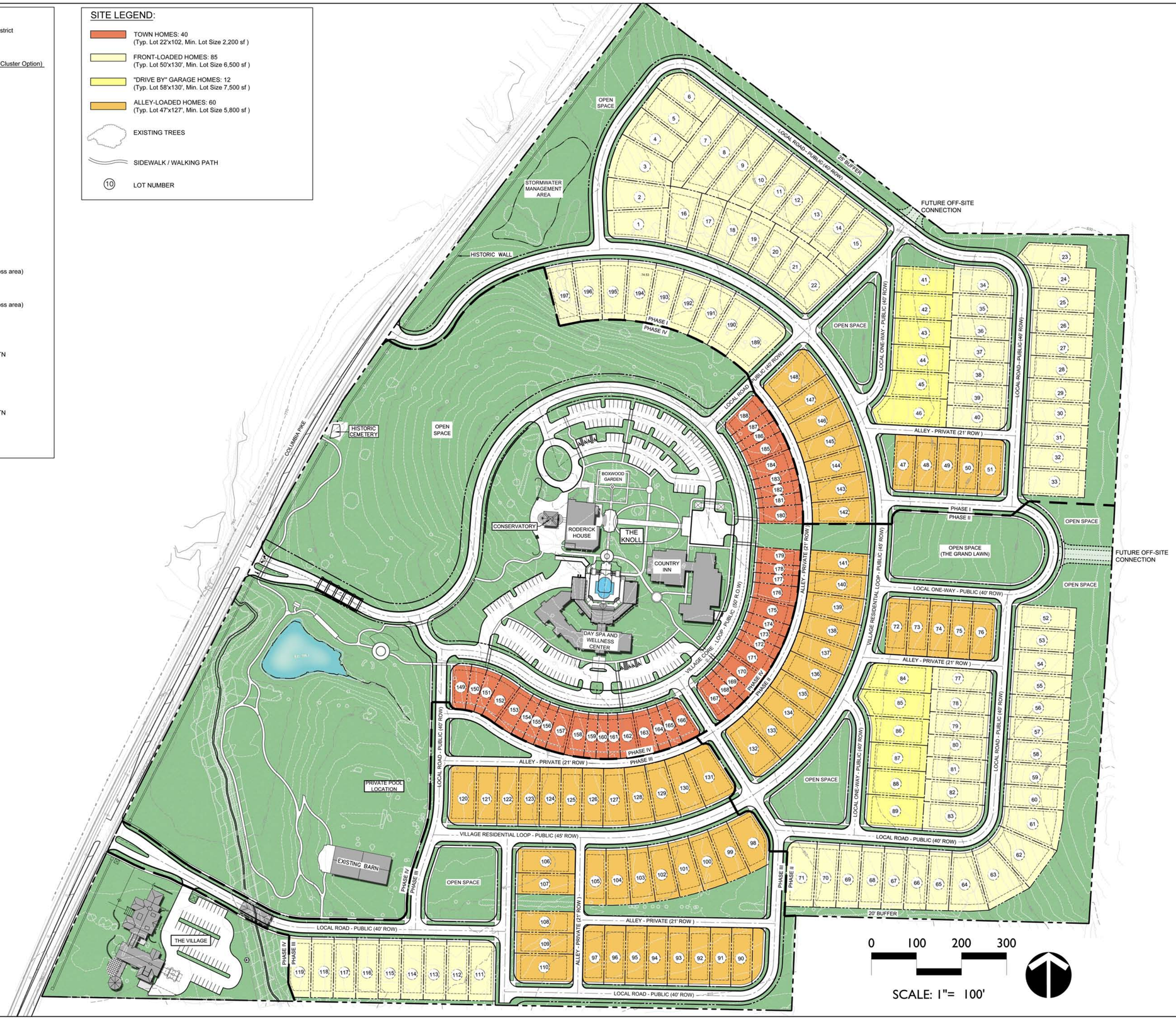
Required:	36.0 AC (45.0% of gross area)
OS Commercial:	6.9 AC
OS Residential:	29.4 AC
Total OS provided:	36.3 AC (45.4% of gross area)

PARCEL INFO:

Parcel A :	4626 Columbia Pike Thompson's Station, TN
Owner:	Leon C. Heron, Jr.
Deed Book & Page #:	DB 6186, Pg. 657
Tax Map & Parcel #:	Map 146, Par. 15.01
Size:	13.6 AC
Parcel B:	4624 Columbia Pike Thompson's Station, TN
Owner:	KMK Acres, LLC
Deed Book & Page #:	DB 1500, Pg. 191
Tax Map & Parcel #:	Map 146, Par. 15.01
Size:	66.3 AC

SITE LEGEND:

- TOWN HOMES: 40 (Typ. Lot 22'x102, Min. Lot Size 2,200 sf)
- FRONT-LOADED HOMES: 85 (Typ. Lot 50'x130', Min. Lot Size 6,500 sf)
- "DRIVE BY" GARAGE HOMES: 12 (Typ. Lot 58'x130', Min. Lot Size 7,500 sf)
- ALLEY-LOADED HOMES: 60 (Typ. Lot 47'x127', Min. Lot Size 5,800 sf)
- EXISTING TREES
- SIDEWALK / WALKING PATH
- (10) LOT NUMBER



KISERVOGRINDESIGN
619 Bradley Court, Franklin, TN 37067 615.620.7171

RODERICK PLACE
THOMPSON'S STATION, TENNESSEE

REVISED DEVELOPMENT SITE PLAN

REVISIONS:
10.15.14 DEVELOPMENT PLAN RE-SUBMITTAL
06.15.15 REVISED OFF-SITE CONNECTIONS

DATE: 10.15.14
DESIGNED BY: DK
DRAWN BY: KL
CHECKED BY: JR
Q.C. BY: JR
SCALE: 1"=100'
PROJECT #: 14046

SHEET NUMBER#:
L1.0

3. EXISTING TRAFFIC VOLUMES

In order to provide data for the traffic impact analysis, current peak hour traffic volumes were identified for Columbia Pike in the vicinity of the project site.

Specifically, hourly, directional data was collected on this roadway segment in March 2014 by the Tennessee Department of Transportation (TDOT). This raw count data is included in Appendix A, and the existing peak hour traffic volumes are shown in Figure 3.

It is important to note that, currently, Columbia Pike includes one travel lane in each direction through the Town of Thompson's Station. However, the Tennessee Department of Transportation (TDOT) is currently developing plans to widen this roadway segment to a five-lane cross-section from south of State Route 840 to Thompson's Station Road. Specifically, TDOT has included this segment of Columbia Pike in its State Industrial Access (SIA) Program, which, according to TDOT's website, "provides funding and technical assistance for highway access to new and expanding industries across the state."

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Transportation Group, LLC
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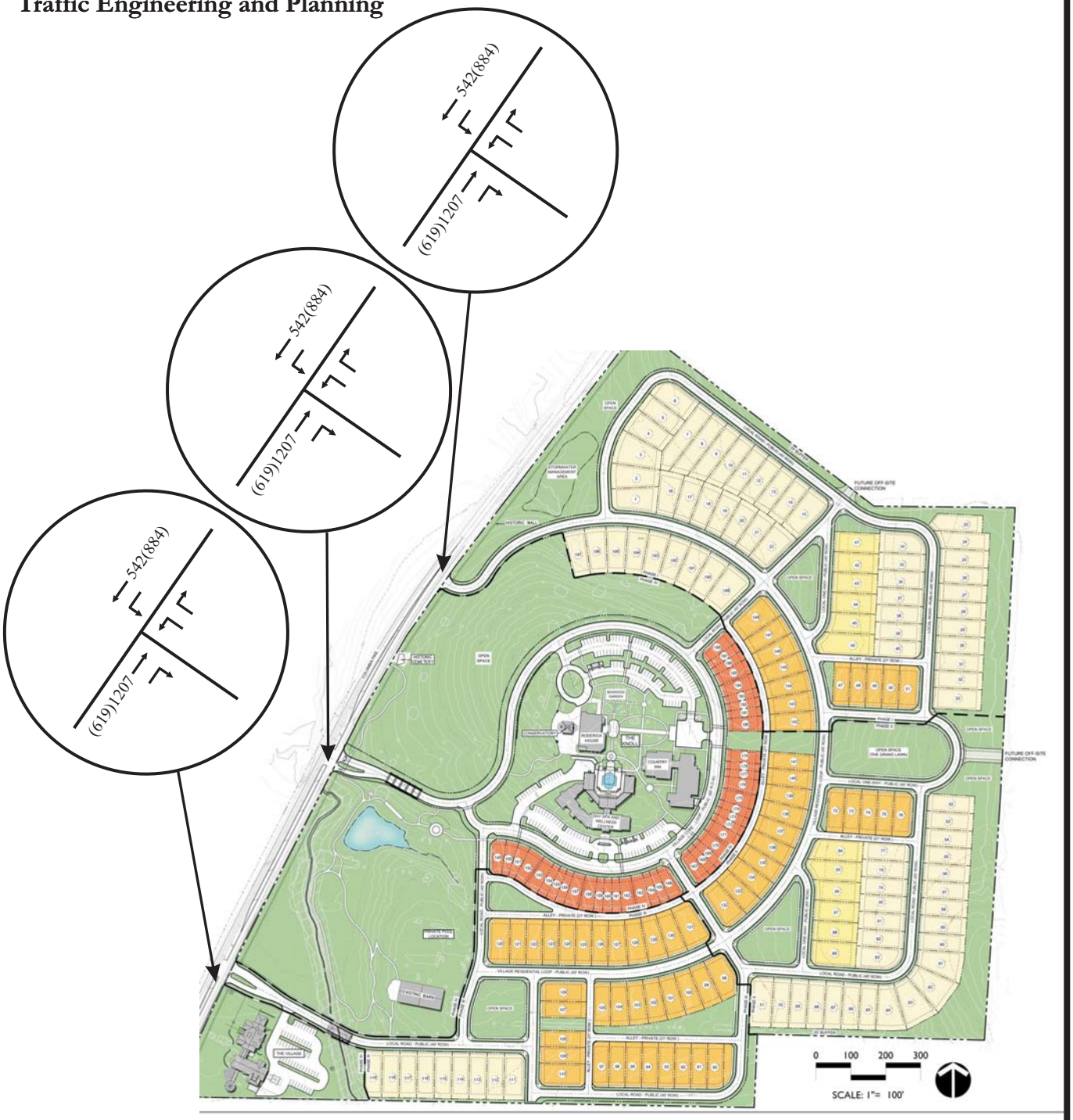

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No Scale

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

Figure 3.
Existing Peak Hour Traffic Volumes

4. PROJECTION OF BACKGROUND TRAFFIC VOLUMES

In order to account for the traffic growth which will occur within the study area because of typical growth, historical volumes within the study area were considered. Specifically, the Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state, and this count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations. As shown in Table 1, the daily traffic volumes on Columbia Pike, between State Route 840 and Thompson's Station Road, has remained relatively stable since State Route 840 opened in 2005. Based on this information, the existing traffic volumes were considered adequate to represent the background conditions in 2020.

TABLE 1. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 67 Columbia Pike ADT	Annual Growth	
2006	21,645		
2007	20,488	-5.35%	
2008	19,891	-2.91%	
2009	18,342	-7.79%	
2010	17,900	-2.41%	
2011	18,685	4.39%	
2012	18,101	-3.13%	
2013	19,666	8.65%	**Overall Growth**
2014	21,013	6.85%	**-0.36%**

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, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Tables 2A and 2B presents the daily and peak hour trip generations for proposed project, and these calculations are included in Appendix B.

TABLE 2A. TRIP GENERATION – RESIDENTIAL DEVELOPMENT

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Single-Family (LUC 210)	157 homes	1,494	29	88	99	58
Townhomes (LUC 230)	40 homes	290	4	21	19	9
TOTAL	**197 homes**	**1,784**	**33**	**109**	**118**	**67**

TABLE 2B. TRIP GENERATION – COMMERCIAL DEVELOPMENT

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Quality Restaurant (LUC 210)	25,400 sq.ft.	2,284	14	7	127	63
Hotel (LUC 310)	75 rooms (64,100 sq.ft.)	670	29	21	26	27
Spa	29,000 sq.ft.	1,460	0	0	82	64
Market / Restaurant (LUC 826)	4,587 sq.ft.	204	15	16	13	10
TOTAL	**123,087**	**4,618**	**58**	**44**	**248**	**164**

For the purposes of this study, it was estimated that none of the traffic generated by the proposed development will be captured, or "pass-by" trips from the adjacent street system. Also, even though studies have shown that it is common for a portion of the trips generated by mixed-use developments will be internal to the site, it was assumed for the purposes of this study that none of the traffic generated by the proposed project will be internal. These assumptions were made because the proposed land use mixed includes relatively small-scale development, and so the potential for diverted trips and/or shared trips is reduced. Also, the conservative approach leads to projected traffic volumes and capacity analyses that will include ample storage for dedicated turn lanes. This is particularly important for intersections on major arterial roadways such as Columbia Pike.

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 distributions shown in Figures 4A and 4B. The development of these distributions 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 distributions were used to add the site-generated trips to the roadway system. Figures 5A and 5B include the peak hour traffic volumes that are expected to be generated by the proposed project. The total entering and exiting traffic volumes shown in Figures 5A and 5B match the totals shown in Tables 2A and 2B.

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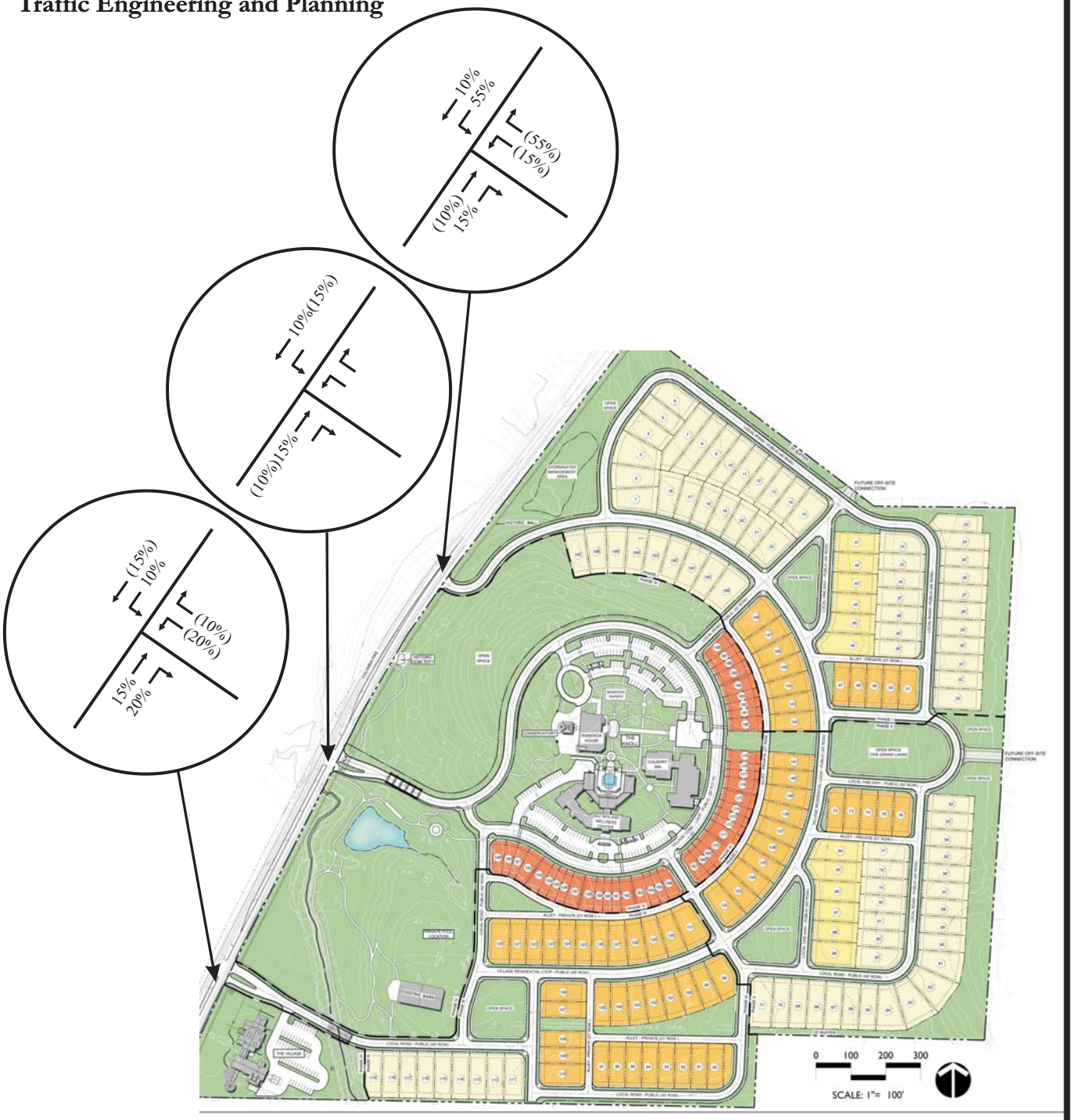
Transportation Group, LLC
Traffic Engineering and Planning



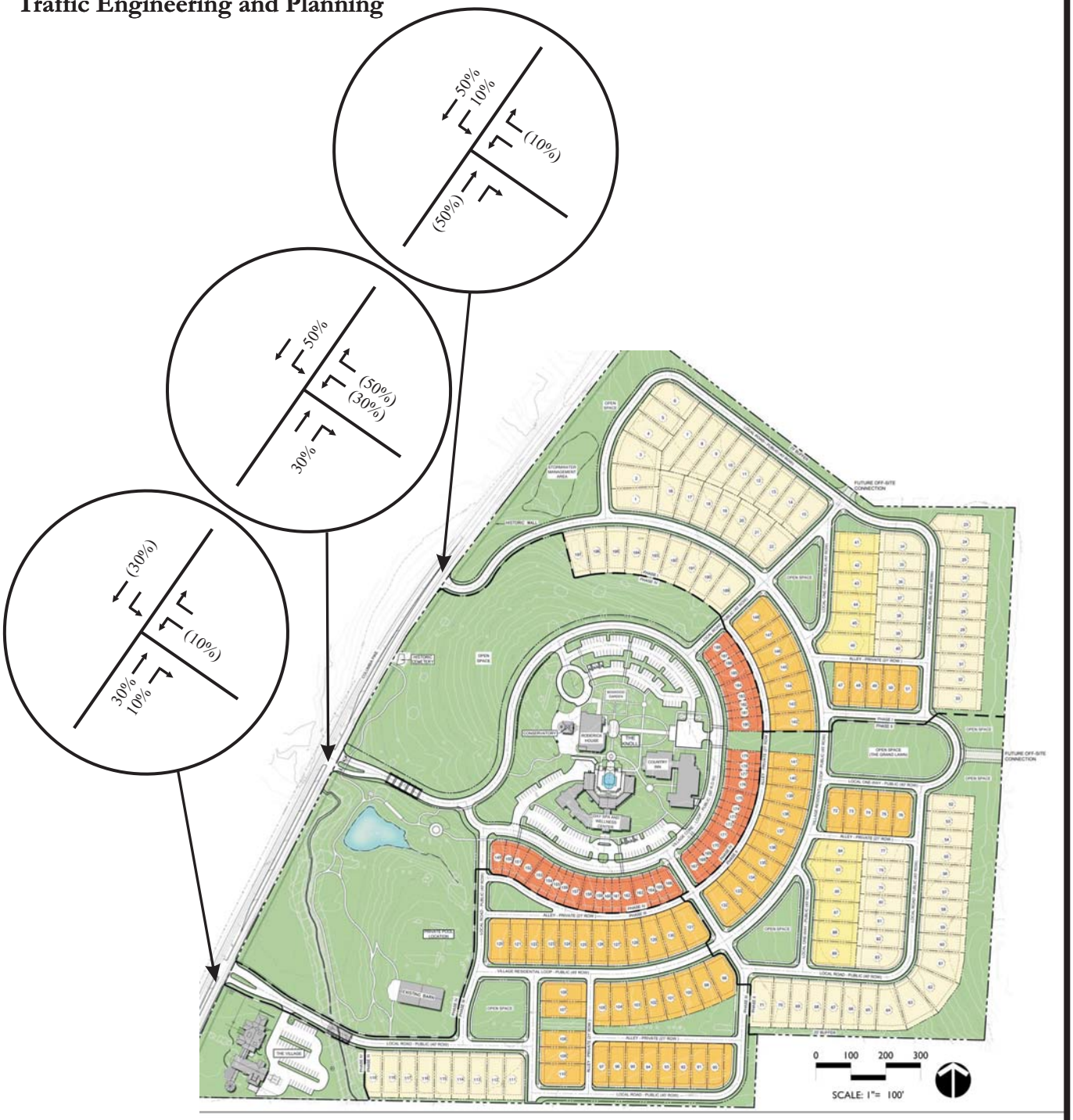
N

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 4A.
Directional Distribution of Traffic Generated by the Residential Portion of the Proposed Project

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



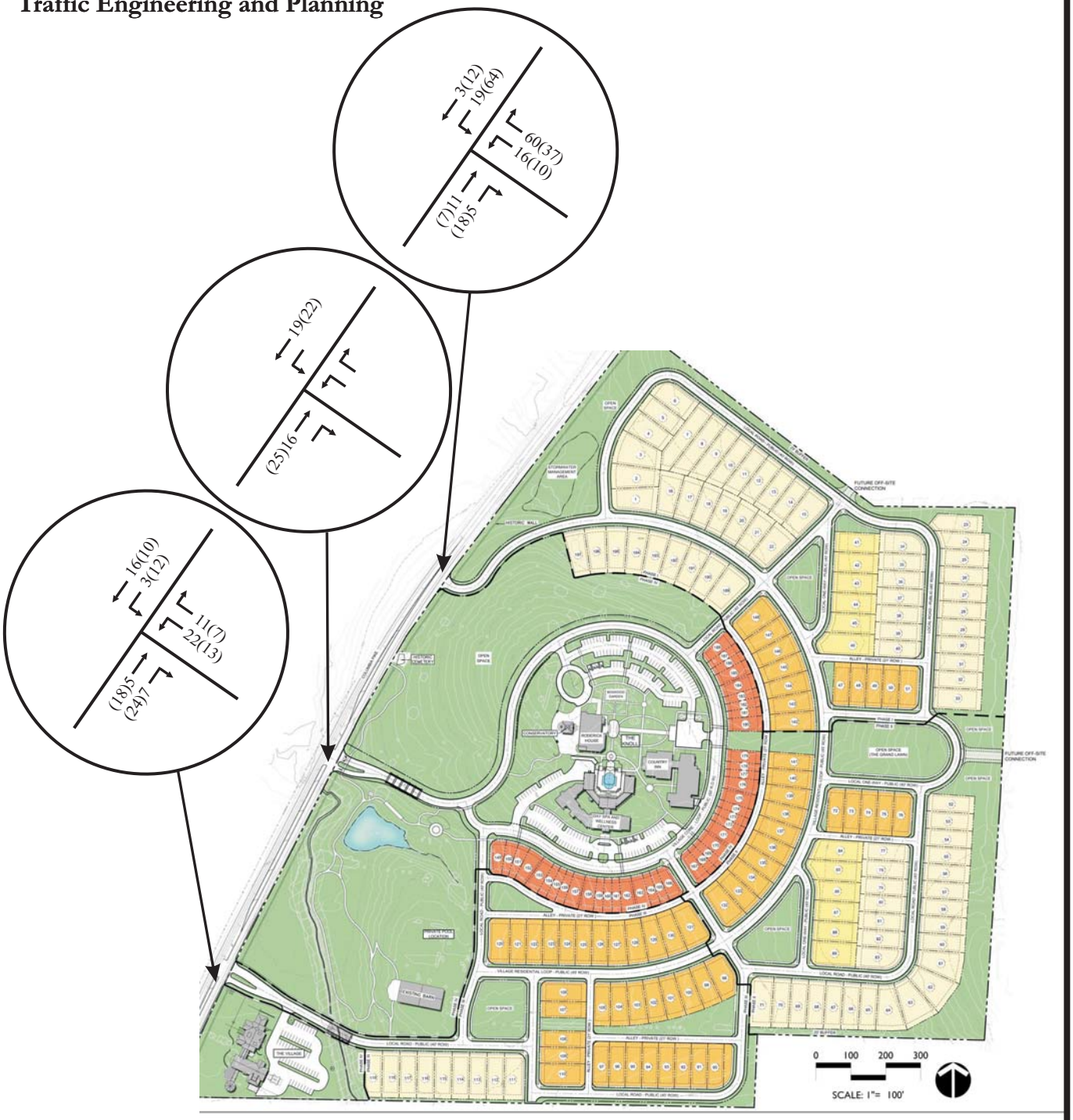
N

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 4B.
Directional Distribution of Traffic Generated by the Commercial Portion of the Proposed Project

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



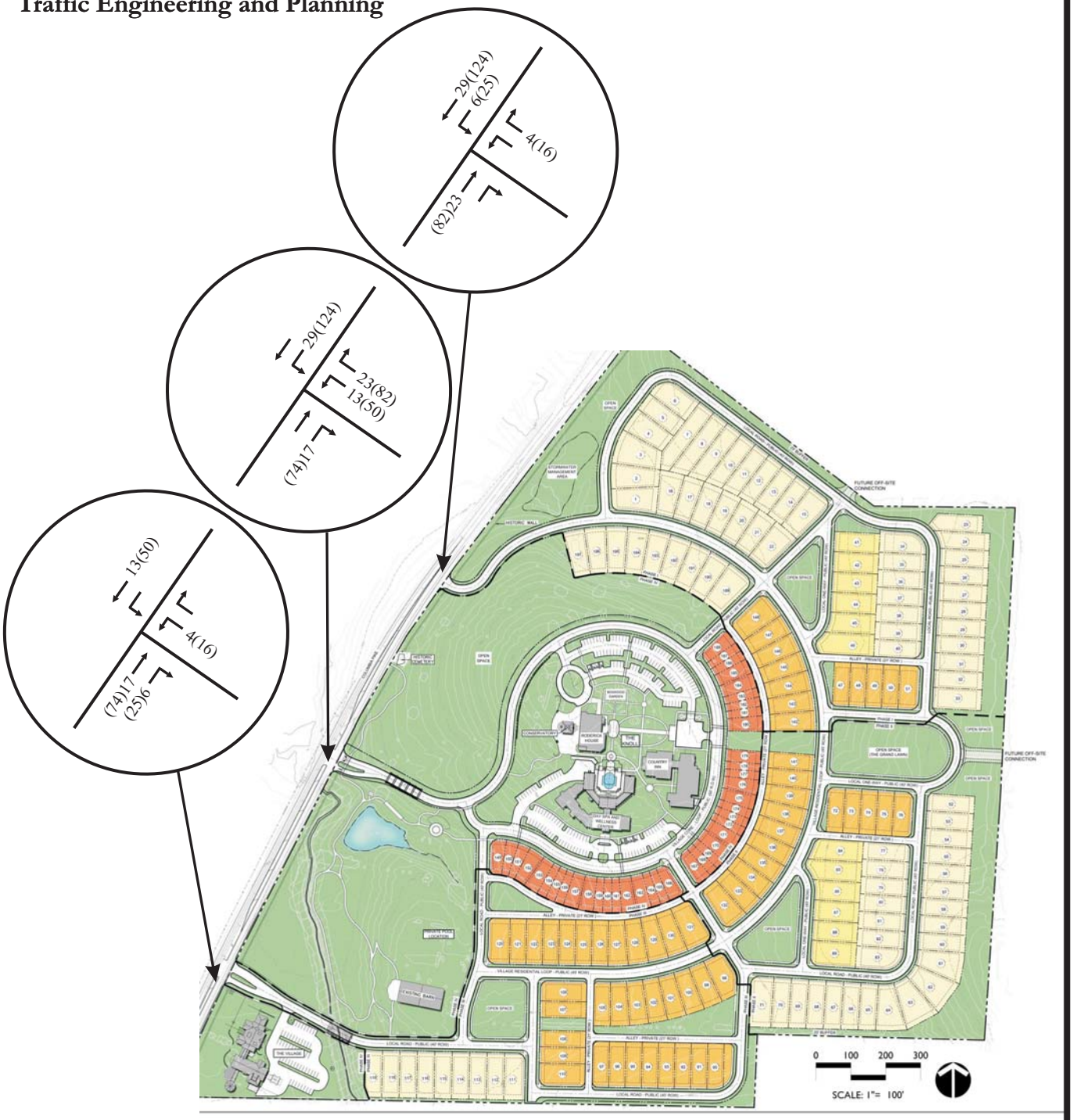
N

No Scale

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

Figure 5A.
Peak Hour Traffic Volumes Generated by the Residential Portion of the Proposed Project

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



N

No Scale

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

Figure 5B.
Peak Hour Traffic Volumes Generated by the Commercial Portion of 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 existing peak hour traffic volumes within the study area. The resulting peak hour volumes are shown in Figure 6.

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, in order to evaluate the need for roadway and traffic control improvements within the study area, capacity calculations were performed for the project accesses, based on the methods outlined in the Highway Capacity Manual 2010 (HCM2010). 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 average vehicle delays are relatively high. Table 3 presents the descriptions of LOS for unsignalized intersections.

For the purposes of these analyses, three laneage scenarios were considered:

1. Initially, it was assumed that all existing laneage on Columbia Pike will be maintained. Specifically, it was assumed that Columbia Pike will continue to include one travel lane in each direction, and no dedicated left and/or right turn lanes will be provided at the project accesses. Also, it was initially assumed that each of the project accesses will be constructed to include one eastbound entering lane and one westbound exiting lane.

2. Additional consideration was given to a laneage scenario that includes dedicated turn lanes at the project accesses. Specifically, it was assumed that Columbia Pike will continue to include one travel lane in each direction but a dedicated southbound left turn lane and a dedicated northbound right turn lane will be provided at each project access. Also, for this scenario, it was assumed that each of the project accesses will be constructed to include one eastbound entering lane and two westbound exiting lanes, striped as separate left and right turn lanes.

3. Final consideration was given to a laneage scenario that includes the future widening of Columbia Pike as well as dedicated turn lanes at the project accesses. Specifically, it was assumed that Columbia Pike will include two travel lanes in each direction. Also, it was assumed that a dedicated southbound left turn lane and a dedicated northbound right turn lane will be provided at each project access. Finally, it was assumed that each of the project accesses will be constructed to include one eastbound entering lane and two westbound exiting lanes, striped as separate left and right turn lanes.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in Table 4, and Appendix C includes the capacity analyses worksheets. These analyses indicate the following:

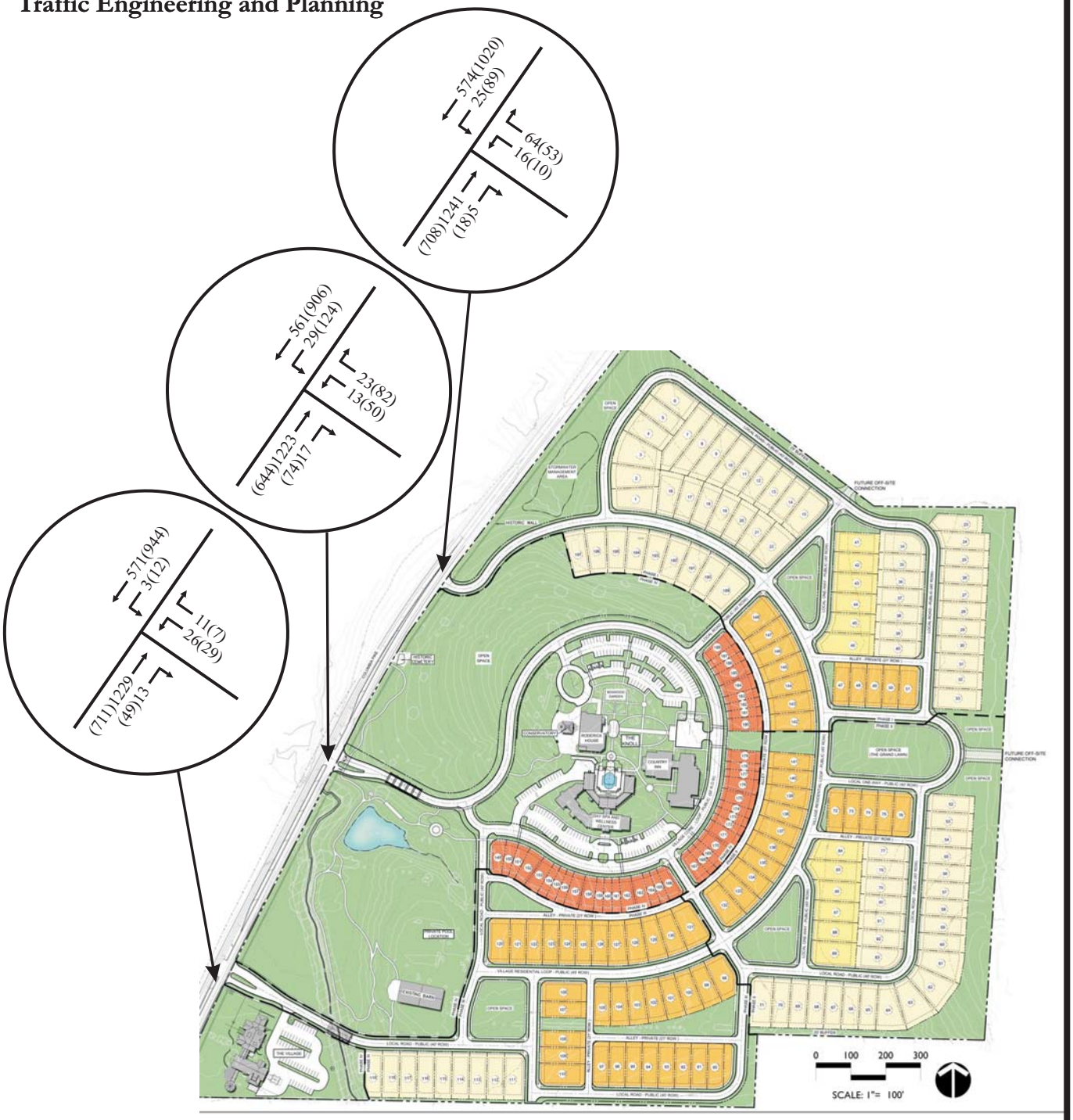
1. With a two-lane cross-section on Columbia Pike and without dedicated turn lanes at the project accesses, the westbound turning movements from the project accesses will operate poorly during the AM and PM peak hours, and significant vehicle queues are likely to occur at the middle project access.

2. With a two-lane cross-section on Columbia Pike, as well as a southbound left turn lane, a northbound right turn lane, and separate westbound left and right turn lanes at each project access, the vehicle delays and queues will be reduced significantly. This is particularly true for the middle project access.

3. With a five-lane cross-section on Columbia Pike, as well as a southbound left turn lane, a northbound right turn lane, and separate westbound left and right turn lanes at each project access, the vehicle delays and queues will be reduced even further. This is particularly true for right turns from the project accesses on to northbound Columbia Pike.

Additional analyses were conducted to determine whether or not dedicated left and/or right turn lanes are warranted for construction on Columbia Pike at one or more of the project accesses. These analyses were based on the method outlined in *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements*. The relevant charts and the results are included in Appendix D. As shown, a southbound left turn lane and a northbound right turn lane are warranted at each of the project accesses on Columbia Pike.

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



N

No Scale

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

Figure 6.
Total Projected Peak Hour Traffic Volumes with the Completion of the Proposed Project

TABLE 3. 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 2010 (HCM 2010)

TABLE 4. TOTAL PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95th %-ILE QUEUE	LEVEL OF SERVICE	95th %-ILE QUEUE
Columbia Pike and the Northern Project Access (with existing laneage and without turn lanes)	Southbound Left Turns / Thrus	LOS B	1 veh	LOS B	1 veh
	Westbound Left and Right Turns	LOS F	5 veh	LOS E	2 veh
Columbia Pike and the Northern Project Access (with existing laneage and without dedicated turn lanes)	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Westbound Left Turns	LOS F	1 veh	LOS F	1 veh
	Westbound Right Turns	LOS E	2 veh	LOS C	1 veh
Columbia Pike and the Northern Project Access (with five-lane cross-section and dedicated turn lanes)	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Westbound Left Turns	LOS F	1 veh	LOS F	1 veh
	Westbound Right Turns	LOS B	1 veh	LOS B	1 veh
Columbia Pike and the Middle Project Access (with existing laneage and without turn lanes)	Southbound Left Turns / Thrus	LOS B	1 veh	LOS B	1 veh
	Westbound Left and Right Turns	LOS F	2 veh	LOS F	12 veh
Columbia Pike and the Middle Project Access (with existing laneage and without dedicated turn lanes)	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Westbound Left Turns	LOS F	1 veh	LOS F	5 veh
	Westbound Right Turns	LOS D	1 veh	LOS C	1 veh
Columbia Pike and the Middle Project Access (with five-lane cross-section and dedicated turn lanes)	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Westbound Left Turns	LOS F	1 veh	LOS F	3 veh
	Westbound Right Turns	LOS B	1 veh	LOS B	1 veh
Columbia Pike and the Southern Project Access (with existing laneage and without turn lanes)	Southbound Left Turns / Thrus	LOS B	1 veh	LOS A	1 veh
	Westbound Left and Right Turns	LOS F	2 veh	LOS F	2 veh

Columbia Pike and the Southern Project Access (with existing laneage and without dedicated turn lanes)	Southbound Left Turns	LOS B	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS F	2 veh	LOS F	2 veh
	Westbound Right Turns	LOS D	1 veh	LOS B	1 veh
Columbia Pike and the Southern Project Access (with five-lane cross-section and dedicated turn lanes)	Southbound Left Turns	LOS B	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS F	1 veh	LOS E	1 veh
	Westbound Right Turns	LOS B	1 veh	LOS B	1 veh

6. CONCLUSIONS AND RECOMMENDATIONS

The analyses presented in this study indicate that the following infrastructure improvements should be provided in order to accommodate the total projected traffic volumes with the completion of the proposed mixed-use project:

1. Each project access should be constructed to include one eastbound entering lane and two westbound exiting lanes. At the northern and southern project accesses, each of the westbound exiting lanes should include at least 100 feet of storage and should be designed and constructed according to AASHTO standards. At the middle project access, the westbound left turn lane should include at least 250 feet of storage, and the westbound right lane should include at least 100 feet of storage. These turn lanes should be designed and constructed according to AASHTO standards.

2. A southbound left turn lane should be constructed on Columbia Pike at each project access. Each of these turn lanes should be 12 feet wide and include at least 100 feet of storage, designed and constructed according to AASHTO standards. It is important to note that these turn lanes are warranted because of the significantly high northbound and southbound peak hour traffic volumes on Columbia Pike. Therefore, these turn lanes should be provided when each project access is constructed in order to facilitate safe and efficient turning movements at these locations.

   Depending on the timing of the planned widening of Columbia Pike to a five-lane cross-section, the southbound left turn lanes at the project accesses could be provided in conjunction with widening project. However, if the improvement of Columbia Pike is uncertain or is scheduled to occur well after the development of the Roderick Place project, the dedicated southbound left turn lane at each project access should be added to the existing two-lane cross-section of Columbia Pike.

3. A northbound right turn lane should be constructed on Columbia Pike at each project access. Each of these turn lanes should be 12 feet wide and include at least 100 feet of storage, designed and constructed according to AASHTO standards. It is important to note that these turn lanes are warranted because of the significantly high northbound and southbound peak hour traffic volumes on Columbia Pike. Therefore, these turn lanes should be provided when each project access is constructed in order to facilitate safe and efficient turning movements at these locations.

   Depending on the timing of the planned widening of Columbia Pike to a five-lane cross-section, the northbound right turn lanes at the project accesses could be provided in conjunction with widening project. However, if the improvement of Columbia Pike is uncertain or is scheduled to occur well after the development of the Roderick Place project, the dedicated northbound right turn lane at each project access should be added to the existing two-lane cross-section of Columbia Pike.

It is important to note that, even with the future laneage on Columbia Pike and the construction of dedicated turn lanes at the project accesses, the westbound left turns from the project accesses onto southbound Columbia Pike are expected to operate at poor LOS during both peak hours. However, these results are typical for unsignalized accesses on major arterial roadways. Also, the low vehicle queues expected for each of these turning movements indicate that the turning movements at these locations will operate acceptably and appropriately. Furthermore, the projected traffic volumes do not approach the thresholds that would indicate that traffic signalization is warranted at one or more of the project accesses. Therefore, the recommended laneage and stop control on the project accesses are the appropriate treatments for these intersections.

APPENDIX A
EXISTING TRAFFIC COUNTS

County: Williamson **Station Number:** 000067

Route: SR006 **Station Type:** Other Rural **Station Out:** NO

Location: NEAR THOMPSON STATION

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
03	1985	9,366	9,834	9,342	0.95	
02	1986	9,238	10,993	10,443	0.95	
02	1987	10,049	11,456	10,883	0.95	
03	1988	10,845		11,127	0.95	
03	1989	11,699	0	7,490	0.95	ACTUAL = 12226
01	1990	7,392		8,427	0.95	
03	1991	6,937	7,492	7,117	0.95	
03	1992	7,747	8,057	7,654	0.95	
04	1993	8,722	8,548	8,121	0.95	
05	1994	11,218	10,881	10,337	0.95	
04	1995	9,852	9,556	9,079	0.95	
04	1996	10,220	9,913	9,418	0.95	
04	1997	10,416	9,999	9,499	0.95	
04	1998	12,078	11,595	11,015	0.95	
03	1999	11,154	11,489	10,915	0.95	
05	2000	14,735	13,998	13,289	0.95	CT LOOKS GOOD
05	2001	16,740	15,903	15,108	0.95	
01	2002	14,346	14,776	14,037	0.95	
03	2003	14,920	15,367	14,599	0.95	
08	2004	0	0	15,037	0.95	EST
05	2005	21,270	20,845	15,488	0.95	ACTUAL - 19802
05	2006	24,766	22,785	21,645	0.95	HIGH LAST 2 YEARS
03	2007	22,465	21,566	20,488	0.95	
03	2008	18,289	17,923	19,891	0.95	ACTUAL= 17027
04	2009	20,761	19,308	18,342	0.95	
11	2010	19,834	18,842	17,900	0.95	
04	2011	21,149	19,669	18,685	0.98	
04	2012	19,240	18,470	18,101	0.98	
03	2013	20,688	20,067	19,666	0.98	
03	2014	21,658	21,441	21,013	0.98	

NORTHBOUND

COVERAGE COUNT DATA WITH 24 HOUR TOTALS

Station Number:	000067	**County:**	94 Williamson
Start Date:	03 / 31 / 2014	**End Date:**	04 / 01 / 2014
Start Time:	12 : 00	**End Time:**	12 : 00
Direction:	1 (Coverage)		

Time	
12:00 - 13:00	597
13:00 - 14:00	608
14:00 - 15:00	666
15:00 - 16:00	654
16:00 - 17:00	616
17:00 - 18:00	619
18:00 - 19:00	581
19:00 - 20:00	446
20:00 - 21:00	247
21:00 - 22:00	167
22:00 - 23:00	104
23:00 - 24:00	56
24:00 - 01:00	29
01:00 - 02:00	18
02:00 - 03:00	17
03:00 - 04:00	25
04:00 - 05:00	89
05:00 - 06:00	333
06:00 - 07:00	1,065
07:00 - 08:00	1,207
08:00 - 09:00	1,110
09:00 - 10:00	879
10:00 - 11:00	674
11:00 - 12:00	644

Total: 11,451

Peak AM	**Peak Total**	**Peak Hour Factor**	**Peak PM**	**Peak Total**	**Peak Hour Factor**
07:15 - 08:15	1789	0.92	17:00 - 18:00	1503	0.94

Peak AM %	**Dir Dist AM %**	**Peak PM %**	**Dir Dist PM %**	**Daily Peak %**	**Daily Dir Dist %**
8	67	7	59	8	67

SOUTHBOUND

COVERAGE COUNT DATA WITH 24 HOUR TOTALS

Station Number: 000067 **County:** 94 Williamson
Start Date: 03 / 31 / 2014 **End Date:** 04 / 01 / 2014
Start Time: 12 : 00 **End Time:** 12 : 00
Direction: 2 (Coverage)

Time	
12:00 - 13:00	589
13:00 - 14:00	589
14:00 - 15:00	636
15:00 - 16:00	807
16:00 - 17:00	875
17:00 - 18:00	884
18:00 - 19:00	885
19:00 - 20:00	673
20:00 - 21:00	552
21:00 - 22:00	379
22:00 - 23:00	229
23:00 - 24:00	132
24:00 - 01:00	136
01:00 - 02:00	29
02:00 - 03:00	27
03:00 - 04:00	21
04:00 - 05:00	26
05:00 - 06:00	101
06:00 - 07:00	184
07:00 - 08:00	542
08:00 - 09:00	477
09:00 - 10:00	491
10:00 - 11:00	460
11:00 - 12:00	483

Total: 10,207

Peak AM	Peak Total	Peak Hour Factor	Peak PM	Peak Total	Peak Hour Factor
07:15 - 08:15	1789	0.92	17:00 - 18:00	1503	0.94

Peak AM %	Dir Dist AM %	Peak PM %	Dir Dist PM %	Daily Peak %	Daily Dir Dist %
8	67	7	59	8	67

TOTAL

COVERAGE COUNT DATA WITH 24 HOUR TOTALS

Station Number: 000067 **County:** 94 Williamson
Start Date: 03 / 31 / 2014 **End Date:** 04 / 01 / 2014
Start Time: 12 : 00 **End Time:** 12 : 00
Direction: 6 (Coverage)

Time	
12:00 - 13:00	1,186
13:00 - 14:00	1,197
14:00 - 15:00	1,302
15:00 - 16:00	1,461
16:00 - 17:00	1,491
17:00 - 18:00	1,503
18:00 - 19:00	1,466
19:00 - 20:00	1,119
20:00 - 21:00	799
21:00 - 22:00	546
22:00 - 23:00	333
23:00 - 24:00	188
24:00 - 01:00	165
01:00 - 02:00	47
02:00 - 03:00	44
03:00 - 04:00	46
04:00 - 05:00	115
05:00 - 06:00	434
06:00 - 07:00	1,249
07:00 - 08:00	1,749
08:00 - 09:00	1,587
09:00 - 10:00	1,370
10:00 - 11:00	1,134
11:00 - 12:00	1,127

Total: 21,658 x Variation Factor: 0.99 = 21,441 x Truck Factor: 0.98 = AADT: 21,012.5

Peak AM	Peak Total	Peak Hour Factor	Peak PM	Peak Total	Peak Hour Factor
07:15 - 08:15	1789	0.92	17:00 - 18:00	1503	0.94

Peak AM %	Dir Dist AM %	Peak PM %	Dir Dist PM %	Daily Peak %	Daily Dir Dist %
8	67	7	59	8	67

APPENDIX B
TRIP GENERATION

TRIP GENERATION CALCULATIONS - Single-family Homes

The following calculations are based on the data compiled for ITE Land Use Code 210.

Average Daily Traffic

T = 9.52 (X)
T = 9.52 (**157**)
T = 1,494 vehicles

Enter = 0.50 (1,494) = 747 vehicles
Exit = 0.50 (1,494) = 747 vehicles

AM traffic during peak hour of adjacent street

T = 0.75 (X)
T = 0.75 (**157**)
T = 118 vehicles

Enter = 0.25 (118) = 30 vehicles
Exit = 0.75 (118) = 88 vehicles

PM traffic during peak hour of adjacent street

T = 1.00 (X)
T = 1.00 (**157**)
T = 157 vehicles

Enter = 0.63 (157) = 99 vehicles
Exit = 0.37 (157) = 58 vehicles

TRIP GENERATION CALCULATIONS – Townhomes

The following calculations are based on the data compiled for ITE Land Use Code 230.

Average Daily Traffic

Ln(T) = 0.87 Ln(X) + 2.46
Ln(T) = 0.87 Ln(**40**) + 2.46
T = 290 vehicle-trips

Enter = 0.50 (290) = 145 vehicles
Exit = 0.50 (290) = 145 vehicles

AM traffic during peak hour of adjacent street

Ln(T) = 0.80 Ln(X) + 0.26
Ln(T) = 0.80 Ln(**40**) + 0.26
T = 25 vehicle-trips

Enter = 0.17 (25) = 4 vehicles
Exit = 0.83 (25) = 21 vehicles

PM traffic during peak hour of adjacent street

Ln(T) = 0.82 Ln(X) + 0.32
Ln(T) = 0.82 Ln(**40**) + 0.32
T = 28 vehicle-trips

Enter = 0.67 (28) = 19 vehicles
Exit = 0.33 (28) = 9 vehicles

TRIP GENERATION CALCULATIONS – Quality Restaurant

The following calculations are based on the data compiled for ITE Land Use Code 931.

Average Daily Traffic

T = 89.95 (X)
T = 89.95 (**25.400**)
T = 2,284 vehicles

Enter = 0.50 (2,284) = 1,142 vehicles
Exit = 0.50 (2,284) = 1,142 vehicles

AM traffic during peak hour of adjacent street

T = 0.81 (X)
T = 0.81 (**25.400**)
T = 21 vehicles

Enter = 0.67 (21) = 14 vehicles
Exit = 0.33 (21) = 7 vehicles

PM traffic during peak hour of adjacent street

T = 7.49 (X)
T = 7.49 (**25.400**)
T = 190 vehicles

Enter = 0.67 (190) = 127 vehicles
Exit = 0.33 (190) = 63 vehicles

TRIP GENERATION CALCULATIONS – Hotel

The following calculations are based on the data compiled for ITE Land Use Code 310.

Average Daily Traffic

T = 8.92 (X)
T = 8.92 (**75**)
T = 670 vehicles

Enter = 0.50 (670) = 335 vehicles
Exit = 0.50 (670) = 335 vehicles

AM traffic during peak hour of adjacent street

T = 0.67 (X)
T = 0.67 (**75**)
T = 50 vehicles

Enter = 0.58 (50) = 29 vehicles
Exit = 0.42 (50) = 21 vehicles

PM traffic during peak hour of adjacent street

T = 0.70 (X)
T = 0.70 (**75**)
T = 53 vehicles

Enter = 0.49 (53) = 26 vehicles
Exit = 0.51 (53) = 27 vehicles

TRIP GENERATION CALCULATIONS – Spa

There is no data available for spas, so for the purposes of this study, it was assumed that the spa will generate a negligible amount of traffic during the AM peak hour. The following calculations are based on the PM peak hour data compiled for ITE Land Use Code 826. Also, it was assumed that the total daily trips will be ten times the total PM peak hour trips and split 50% entering and 50% exiting.

Average Daily Traffic

T = 10 (X)
T = 10 (**146**)
T = 1,460 vehicles

Enter = 0.50 (1,460) = 1,730 vehicles
Exit = 0.50 (1,460) = 1,730 vehicles

PM traffic during peak hour of adjacent street

T = 5.02 (X)
T = 5.02 (**29.000**
T = 146 vehicles

Enter = 0.56 (146) = 82 vehicles
Exit = 0.44 (146) = 64 vehicles

TRIP GENERATION CALCULATIONS - Retail

The following calculations are based on the data compiled for ITE Land Use Code 826.

Average Daily Traffic

T = 44.32 (X)
T = 44.32 (**4.587**)
T = 204 vehicles

Enter = 0.50 (204) = 102 vehicles
Exit = 0.50 (204) = 102 vehicles

AM traffic during peak hour of adjacent street

T = 6.84 (X)
T = 6.84 (**4.587**)
T = 31 vehicles

Enter = 0.48 (31) = 15 vehicles
Exit = 0.52 (31) = 16 vehicles

PM traffic during peak hour of adjacent street

T = 5.02 (X)
T = 5.02 (**4.587**)
T = 23 vehicles

Enter = 0.56 (23) = 13 vehicles
Exit = 0.44 (23) = 10 vehicles

APPENDIX C
CAPACITY ANALYSES

WITH EXISTING CROSS-SECTION AND WITHOUT DEDICATED TURN LANES

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and N. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: N. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1241	5	25	574	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1378	6	31	637	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	16		64			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	19		79			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration	LR					

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		31		98				
C(m) (vph)		501		124				
v/c		0.06		0.79				
95% queue length		0.20		4.65				
Control Delay		12.7		98.9				
LOS		B		F				
Approach Delay				98.9				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: PM Peak Hour
Intersection: Columbia and N. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: N. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		708	18	89	1020	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		786	22	111	1133	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10		53			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	12		66			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration	LR					

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		111		78				
C(m) (vph)		826		184				
v/c		0.13		0.42				
95% queue length		0.46		1.93				
Control Delay		10.0+		38.2				
LOS		B		E				
Approach Delay				38.2				
Approach LOS				E				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and Mid Project Acc
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: Middle Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1223	17	29	561	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1358	21	36	623	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	13		23			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	16		28			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0	0				
Configuration	LR					

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		36		44				
C(m) (vph)		504		101				
v/c		0.07		0.44				
95% queue length		0.23		1.84				
Control Delay		12.7		65.7				
LOS		B		F				
Approach Delay				65.7				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: PM Peak Hour
Intersection: Columbia and Mid Project Acc
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: Middle Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		644	74	124	906	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		715	92	154	1006	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50		82			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	62		102			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration	LR					

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		154		164				
C(m) (vph)		827		108				
v/c		0.19		1.52				
95% queue length		0.68		12.09				
Control Delay		10.3		345.8				
LOS		B		F				
Approach Delay				345.8				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and S. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: S. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1229	13	3	571	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1365	16	3	634	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	26		11			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	32		13			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration	LR					

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		45				
C(m) (vph)		503		80				
v/c		0.01		0.56				
95% queue length		0.02		2.47				
Control Delay		12.2		96.8				
LOS		B		F				
Approach Delay				96.8				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: PM Peak Hour
Intersection: Columbia and S. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: S. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		711	49	12	944	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		790	61	14	1048	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	29		7			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	36		8			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration	LR					

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		14		44				
C(m) (vph)		796		89				
v/c		0.02		0.49				
95% queue length		0.05		2.13				
Control Delay		9.6		79.8				
LOS		A		F				
Approach Delay				79.8				
Approach LOS				F				

WITH EXISTING CROSS-SECTION AND
WITH DEDICATED TURN LANES

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst:	FTG
Date Performed:	May 2015
Analysis Time Period:	AM Peak Hour
Intersection:	Columbia and N. Project Access
Jurisdiction:	Thompson's Station, TN
Analysis Year:	Total with Roderick Place
East/West Street:	N. Project Access
North/South Street:	Columbia Pike
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1241	5	25	574	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1378	6	31	637	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		1	1		1	1
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	16		64			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	19		79			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		31	19		79			
C(m) (vph)		501	56		179			
v/c		0.06	0.34		0.44			
95% queue length		0.20	1.22		2.04			
Control Delay		12.7	99.3		40.1			
LOS		B	F		E			
Approach Delay				51.6				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst:	FTG
Date Performed:	May 2015
Analysis Time Period:	PM Peak Hour
Intersection:	Columbia and N. Project Access
Jurisdiction:	Thompson's Station, TN
Analysis Year:	Total with Roderick Place
East/West Street:	N. Project Access
North/South Street:	Columbia Pike
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		708	18	89	1020	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		786	22	111	1133	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		1	1		1	1
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10		53			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	12		66			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		111	12		66			
C(m) (vph)		826	47		395			
v/c		0.13	0.26		0.17			
95% queue length		0.46	0.86		0.59			
Control Delay		10.0+	106.1		15.9			
LOS		B	F		C			
Approach Delay				29.8				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and Mid Project Acc
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: Middle Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1223	17	29	561	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1358	21	36	623	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		1	1		1	1
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	13		23			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	16		28			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		36	16		28			
C(m) (vph)		504	58		184			
v/c		0.07	0.28		0.15			
95% queue length		0.23	0.97		0.52			
Control Delay		12.7	89.2		28.0			
LOS		B	F		D			
Approach Delay				50.3				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst:	FTG
Date Performed:	May 2015
Analysis Time Period:	PM Peak Hour
Intersection:	Columbia and Mid Project Acc
Jurisdiction:	Thompson's Station, TN
Analysis Year:	Total with Roderick Place
East/West Street:	Middle Project Access
North/South Street:	Columbia Pike
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		644	74	124	906	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		715	92	154	1006	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		1	1		1	1
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50		82			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	62		102			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		154	62		102			
C(m) (vph)		827	52		434			
v/c		0.19	1.19		0.24			
95% queue length		0.68	5.49		0.90			
Control Delay		10.3	315.0		15.8			
LOS		B	F		C			
Approach Delay				128.9				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and S. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: S. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1229	13	3	571	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1365	16	3	634	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		1	1		1	1
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	26		11			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	32		13			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		3	32		13			
C(m) (vph)		503	66		182			
v/c		0.01	0.48		0.07			
95% queue length		0.02	1.94		0.23			
Control Delay		12.2	102.8		26.3			
LOS		B	F		D			
Approach Delay				80.7				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: PM Peak Hour
Intersection: Columbia and S. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: S. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		711	49	12	944	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		790	61	14	1048	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		1	1		1	1
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	29		7			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	36		8			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		14	36		8			
C(m) (vph)		796	80		393			
v/c		0.02	0.45		0.02			
95% queue length		0.05	1.84		0.06			
Control Delay		9.6	82.5		14.4			
LOS		A	F		B			
Approach Delay				70.1				
Approach LOS				F				

WITH FUTURE CROSS-SECTION AND
WITH DEDICATED TURN LANES

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst:	FTG
Date Performed:	May 2015
Analysis Time Period:	AM Peak Hour
Intersection:	Columbia and N. Project Access
Jurisdiction:	Thompson's Station, TN
Analysis Year:	Total with Roderick Place
East/West Street:	N. Project Access
North/South Street:	Columbia Pike
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1241	5	25	574	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1378	6	31	637	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1		1	2
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	16		64			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	19		79			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		31	19		79			
C(m) (vph)		501	73		449			
v/c		0.06	0.26		0.18			
95% queue length		0.20	0.93		0.63			
Control Delay		12.7	70.8		14.7			
LOS		B	F		B			
Approach Delay				25.6				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: PM Peak Hour
Intersection: Columbia and N. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: N. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		708	18	89	1020	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		786	22	111	1133	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1	1	2	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10		53			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	12		66			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		111	12		66			
C(m) (vph)		826	89		660			
v/c		0.13	0.13		0.10			
95% queue length		0.46	0.45		0.33			
Control Delay		10.0+	51.7		11.1			
LOS		B	F		B			
Approach Delay				17.3				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and Mid Project Acc
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: Middle Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1223	17	29	561	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1358	21	36	623	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1		1	2
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	13		23			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	16		28			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		36	16		28			
C(m) (vph)		504	74		455			
v/c		0.07	0.22		0.06			
95% queue length		0.23	0.75		0.20			
Control Delay		12.7	66.6		13.4			
LOS		B	F		B			
Approach Delay				32.8				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst:	FTG
Date Performed:	May 2015
Analysis Time Period:	PM Peak Hour
Intersection:	Columbia and Mid Project Acc
Jurisdiction:	Thompson's Station, TN
Analysis Year:	Total with Roderick Place
East/West Street:	Middle Project Access
North/South Street:	Columbia Pike
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		644	74	124	906	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		715	92	154	1006	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1	1	2	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	50		82			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	62		102			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		154	62		102			
C(m) (vph)		827	90		691			
v/c		0.19	0.69		0.15			
95% queue length		0.68	3.38		0.52			
Control Delay		10.3	106.5		11.1			
LOS		B	F		B			
Approach Delay				47.2				
Approach LOS				E				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: FTG
Date Performed: May 2015
Analysis Time Period: AM Peak Hour
Intersection: Columbia and S. Project Access
Jurisdiction: Thompson's Station, TN
Analysis Year: Total with Roderick Place
East/West Street: S. Project Access
North/South Street: Columbia Pike
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1229	13	3	571	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		1365	16	3	634	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1		1	2
Configuration		T	R		L	T
Upstream Signal?		No				No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	26		11			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	32		13			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		3	32		13			
C(m) (vph)		503	85		453			
v/c		0.01	0.38		0.03			
95% queue length		0.02	1.48		0.09			
Control Delay		12.2	70.9		13.2			
LOS		B	F		B			
Approach Delay				54.3				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst:	FTG
Date Performed:	May 2015
Analysis Time Period:	PM Peak Hour
Intersection:	Columbia and S. Project Access
Jurisdiction:	Thompson's Station, TN
Analysis Year:	Total with Roderick Place
East/West Street:	S. Project Access
North/South Street:	Columbia Pike
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		711	49	12	944	
Peak-Hour Factor, PHF		0.90	0.80	0.80	0.90	
Hourly Flow Rate, HFR		790	61	14	1048	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?			No			
Lanes		2	1	1	2	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	29		7			
Peak Hour Factor, PHF	0.80		0.80			
Hourly Flow Rate, HFR	36		8			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		14	36		8			
C(m) (vph)		796	143		659			
v/c		0.02	0.25		0.01			
95% queue length		0.05	0.94		0.04			
Control Delay		9.6	38.4		10.5			
LOS		A	E		B			
Approach Delay				33.4				
Approach LOS				D				

APPENDIX D
RELEVANT PAGES FROM NCHRP REPORT 457:
ENGINEERING STUDY GUIDE FOR EVALUATING INTERSECTION IMPROVEMENTS

NCHRP
REPORT 457

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Evaluating Intersection Improvements: An Engineering Study Guide

TRANSPORTATION RESEARCH BOARD

NATIONAL RESEARCH COUNCIL

can also indirectly reduce the delay to the left-turn or through movements by lessening their need to compete for service with the right-turn movement.

One disadvantage of adding a lane to the minor-road approach is that it may require reallocating the existing pavement or widening of the approach cross section. Sometimes the pavement width needed for the additional lane is available within the existing roadway cross section. In this instance, the only impact is a reallocation of the paved surface through modification of the pavement markings. However, in downtown settings this reallocation may require the removal of some curb parking stalls and can affect adjacent business significantly. Occasionally, the cross section must be widened to provide for the additional lane. If the needed lane width can be provided within the available right-of-way, the cost may be limited to that of construction. However, if additional right-of-way is needed, the costs of acquiring this property in urban settings can be high.

Guidance. The literature does not offer guidance regarding conditions where a second approach lane would benefit from the operation of a minor-road approach. However, the procedures in Chapter 17 of the *Highway Capacity Manual 2000* (*15*) can be used to identify major- and minor- road volume combinations that would benefit operationally from the provision of a second approach lane or bay. Bonneson and Fontaine (*20*) developed Figure 2-4 using these procedures and an assumed upper limit of 0.7 for the shared-lane, minor-road volume-to-capacity ratio.

Application. Figure 2-4 indicates the conditions that may justify the use of two approach lanes. Use of the information in this figure requires two types of data:

1. Major-road approach volume for the peak hour of the average day and
2. Minor-road turn movement volume for the peak hour of the average day (used to compute right-turn percentage).

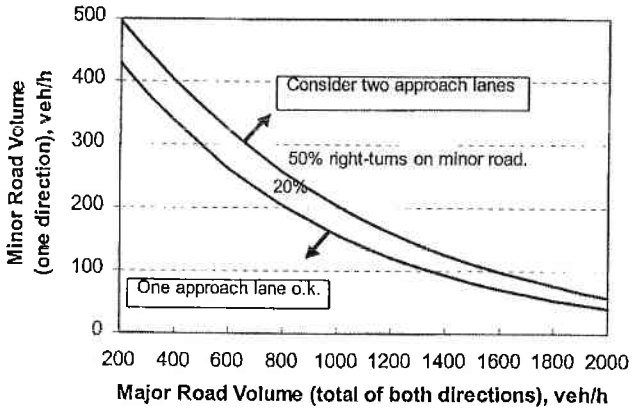


Figure 2-4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

Figure 2-4 would be used once for each minor-road approach to the intersection. The appropriate trend line would be identified on the basis of the percentage of right-turns on the subject minor-road approach. If the volume combination for the major and minor roads intersects above or to the right of this trend line, a second traffic lane should be considered for the subject minor-road approach. If a bay is selected for addition to the intersection, it should be long enough to store vehicles 95 percent of the time (i.e., the bay should not overflow more than 5 percent of the time). Techniques for estimating the 95th percentile storage length are provided in the section, Increase the Length of the Turn Bay.

Add a Left-Turn Bay on the Major Road

Introduction. Provision of a left-turn bay on the major road to a two-way stop-controlled intersection can significantly improve operations and safety at the intersection. A left-turn bay effectively separates those vehicles that are slowing or stopped to turn from those vehicles in through traffic lanes. This separation minimizes turn-related crashes and eliminates unnecessary delay to through vehicles. Data reported by Neuman (*21*) indicate that the crash rate for unsignalized intersections can be reduced by 35 to 75 percent through the provision of a left-turn bay.

One disadvantage of adding a bay to the major-road approach is that it may require reallocating the existing pavement or widening of the approach cross section. Sometimes the pavement width needed for the additional lane is available within the existing roadway cross section. However, in downtown settings this reallocation may require the removal of some curb parking stalls and can affect adjacent business significantly. Occasionally, the cross section must be widened to provide for the turn bay. If the needed width can be provided within the available right-of-way, the cost may be limited to that of construction. However, if additional right-of-way is needed, the costs of acquiring this property in urban settings can be high.

Guidance. Neuman (*21*) suggests that the following guidelines should be used to determine when to provide a left-turn bay on the major road of a two-way stop-controlled intersection:

1. A left-turn lane should be considered at any median crossover on a divided, high-speed road.
2. A left-turn lane should be provided on the unstopped approach of a high-speed rural highway when it intersects with other arterials or collectors.
3. A left-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-5.

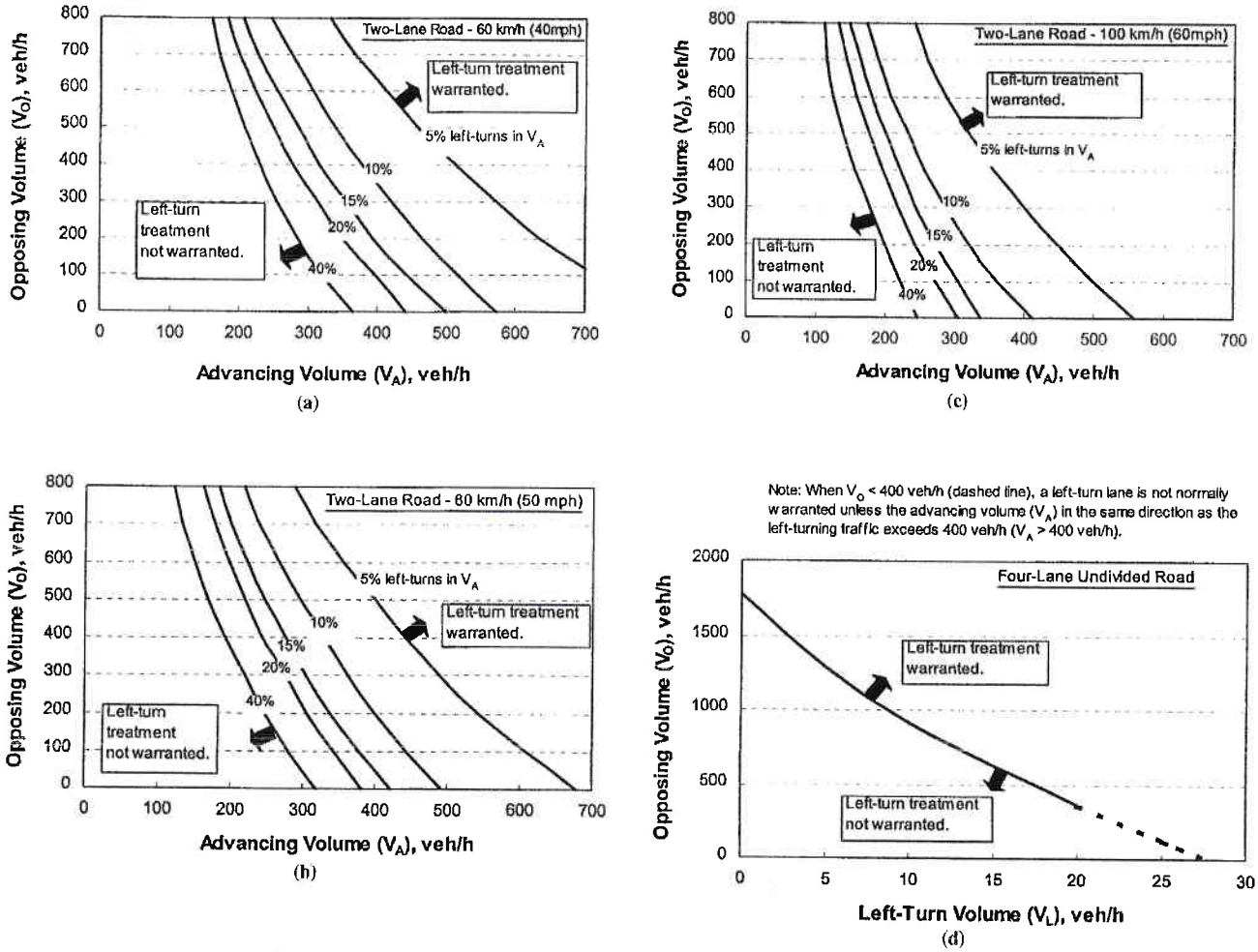


Figure 2-5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

Application. The guidance stated in the preceding section defines the conditions that may justify the provision of a left-turn bay. Application of this guidance requires two types of data:

1. Major-road turn movement volume for the peak hour of the average day and
2. Major-road 85th percentile speed (posted speed can be substituted if data are unavailable).

Use of Figure 2-5 requires determination of the opposing volume, the advancing volume, and the operating speed. The opposing volume should include only the right-turn and through movements on the approach across from (and heading in the opposite direction of) the subject major-road approach. The advancing volume should include the left-turn, right-turn, and through movements on the subject approach. The operating speed can be estimated as the 85th percentile speed. If the operating speed does not coincide with 60, 80, or 100 km/h (i.e., 40, 50, or 60 mph), then interpolation can be used or, as a more conservative approach, the operating speed can be rounded up to the nearest speed for which a figure is provided.

In application, Figure 2-5 is used once for each major-road approach to the intersection. The appropriate trend line is identified on the basis of the percentage of left-turns on the subject major-road approach. If the advancing and opposing volume combination intersects above or to the right of this trend line, a left-turn bay should be considered for the subject approach. If a bay is included at the intersection, it should be long enough to store left-turn vehicles 99.5 percent of the time (i.e., the bay should not overflow more than 0.5 percent of the time). Techniques for estimating this storage length are provided in the section, Increase the Length of the Turn Bay.

Add a Right-Turn Bay on the Major Road

Introduction. Provision of a right-turn bay on the major road to a two-way stop-controlled intersection can signifi-

cantly improve operations and safety at the intersection. A right-turn bay effectively separates those vehicles that are slowing or stopped to turn from those vehicles in the through traffic lanes. This separation minimizes turn-related collisions (e.g., angle, rear-end, and same-direction-sideswipe) and eliminates unnecessary delay to through vehicles.

One disadvantage of adding a bay to the major-road approach is that it may require reallocating the existing pavement or widening of the approach cross section. Sometimes the pavement width needed for the additional lane is available within the existing roadway cross section. However, in downtown settings this reallocation may require the removal of some curb parking stalls and can affect adjacent business significantly. Occasionally, the cross section must be widened to provide for the turn bay. If the needed width can be provided within the available right-of-way, the cost may be limited to that of construction. However, if additional right-of-way is needed, the costs of acquiring this property in urban settings can be high.

Guidance. Hasan and Stokes (*22*) developed guidelines for determining when to provide a right-turn bay on the major road of a two-way stop-controlled intersection. These guidelines were based on an evaluation of the operating and collision costs associated with the right-turn maneuver relative to the cost of constructing a right-turn bay. The operating costs included those of road-user fuel and delay. Separate guidelines were developed for two-lane and four-lane roadways. These guidelines are shown in Figure 2-6.

Application. The guidance described in the preceding section defines conditions that may justify the provision of a right-turn bay. Application of this guidance requires two types of data:

1. Major-road turn movement volume for the peak hour of the average day and
2. Major-road 85th percentile speed (posted speed can be substituted if data are unavailable).

Figure 2-6 should be consulted once for each major-road approach. If the combination of major-road approach volume and right-turn volume intersects above or to the right of the trend line corresponding to the major-road operating speed, then a right-turn bay is a viable alternative.

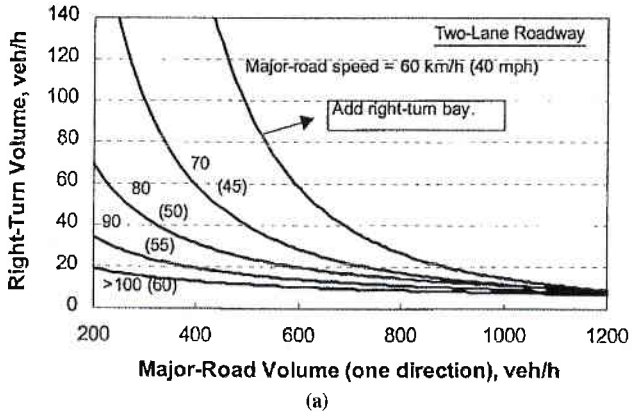


Figure 2-6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

Increase Length of Turn Bay

Introduction. Turn bay length can affect the safety and operation of the intersection approach significantly. This effect becomes more negative as the frequency with which vehicles exceed the available storage increases. Also, for unstopped approaches, this effect becomes more negative as more of the turning vehicle's deceleration occurs in the through lane, prior to the bay. The need to provide adequate storage length, deceleration length, or both is dependent on the type of approach control used and whether the vehicle is turning left or right. Table 2-13 identifies the appropriate bay

TABLE 2-13 Turn-bay length components at unsignalized intersections

Approach Control	Length Components	
	Left-Turn Bay	Right-Turn Bay
Unstopped	Storage Length + Deceleration Length	Deceleration Length
Stopped	Storage Length	Storage Length

Southbound Left Turn Lane on Columbia Pike at the Northern Project Access:

Guidance. The following guidelines should be used to determine when to provide a left-turn bay on the major road of a two-way stop-controlled intersection:

1. **A left-turn lane should be considered at any median crossover on a divided, high-speed road.**

   Since Columbia Pike is not median-divided, this guideline does not apply.

2. **A left-turn lane should be provided on the unstopped approach of a high-speed rural highway when it intersects with other arterials or collectors.**

   The project access is not an arterial or collector roadway, and so this guideline does not apply.

3. **A left-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-5 of *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements*.**

	AM Peak Hour	**PM Peak Hour**
L =	4.2%	8.0%
v =	45 mph (use 50 mph)	45 mph (use 50 mph)
v_a =	599	1,109
v_o =	1,246	726
Result:	turn lane IS warranted	turn lane IS warranted

Northbound Right Turn Lane on Columbia Pike at the Northern Project Access

Guidance. The following guidelines should be used to determine when to provide a right-turn bay on the major road of a two-way stop-controlled intersection:

A right-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-6 of *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements.*

	AM Peak Hour	**PM Peak Hour**
v =	45 mph (use 50 mph)	45 mph (use 50 mph)
Northbound Volume:	1,246	726
Right-Turn Volume:	5	18
Result:	turn lane NOT warranted	turn lane IS warranted

Southbound Left Turn Lane on Columbia Pike at the Middle Project Access:

Guidance. The following guidelines should be used to determine when to provide a left-turn bay on the major road of a two-way stop-controlled intersection:

1. **A left-turn lane should be considered at any median crossover on a divided, high-speed road.**

   Since Columbia Pike is not median-divided, this guideline does not apply.

2. **A left-turn lane should be provided on the unstopped approach of a high-speed rural highway when it intersects with other arterials or collectors.**

   The project access is not an arterial or collector roadway, and so this guideline does not apply.

3. **A left-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-5 of *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements*.**

	AM Peak Hour	**PM Peak Hour**
L =	4.9%	12.0%
v =	45 mph (use 50 mph)	45 mph (use 50 mph)
v_a =	590	1,030
v_o =	1,240	718
Result:	turn lane IS warranted	turn lane IS warranted

Northbound Right Turn Lane on Columbia Pike at the Middle Project Access

Guidance. The following guidelines should be used to determine when to provide a right-turn bay on the major road of a two-way stop-controlled intersection:

A right-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-6 of *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements.*

	AM Peak Hour	**PM Peak Hour**
v =	45 mph (use 50 mph)	45 mph (use 50 mph)
Northbound Volume:	1,240	718
Right-Turn Volume:	17	74
Result:	turn lane IS warranted	turn lane IS warranted

Southbound Left Turn Lane on Columbia Pike at the Southern Project Access:

Guidance. The following guidelines should be used to determine when to provide a left-turn bay on the major road of a two-way stop-controlled intersection:

1. **A left-turn lane should be considered at any median crossover on a divided, high-speed road.**

   Since Columbia Pike is not median-divided, this guideline does not apply.

2. **A left-turn lane should be provided on the unstopped approach of a high-speed rural highway when it intersects with other arterials or collectors.**

   The project access is not an arterial or collector roadway, and so this guideline does not apply.

3. **A left-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-5 of *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements*.**

	AM Peak Hour	**PM Peak Hour**
L =	0.5%	1.3%
v =	45 mph (use 50 mph)	45 mph (use 50 mph)
v_a =	574	956
v_o =	1,242	760
Result:	turn lane IS warranted	turn lane IS warranted

Northbound Right Turn Lane on Columbia Pike at the Southern Project Access

Guidance. The following guidelines should be used to determine when to provide a right-turn bay on the major road of a two-way stop-controlled intersection:

A right-turn lane is recommended on the unstopped approach of any intersection when the combination of intersection volumes intersect above or to the right of the appropriate trend line shown in Figure 2-6 of *NCHRP Report 457: Engineering Study Guide for Evaluating Intersection Improvements.*

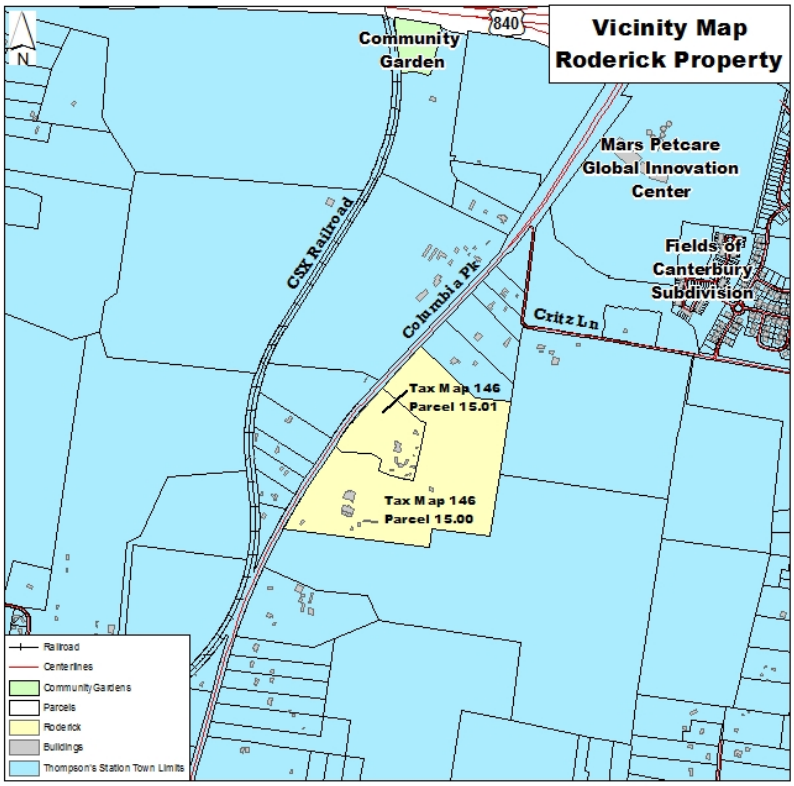
	AM Peak Hour	**PM Peak Hour**
v =	45 mph (use 50 mph)	45 mph (use 50 mph)
Northbound Volume:	1,242	760
Right-Turn Volume:	13	49
Result:	turn lane IS warranted	turn lane IS warranted

Thompson's Station Planning Commission
Staff Report – Item 5 (CP 2016–003)
March 29, 2016

Revised Concept Plan for Roderick Place to develop 87 residential lots, 56 rental units and 127,606 square feet of commercial uses located at 4626 Columbia Pike and 4624 Columbia Pike.

PROJECT DESCRIPTION

The applicant, Kiser/Vogrin Design submitted a revised concept plan on behalf of C & L Development for the development of a 79.9 acre site located along the west side of Columbia Pike, north of Thompson's Station Road, south of Critz Lane.



BACKGROUND

The project site is zoned Specific Plan and currently developed with the Roderick mansion, barn structures and an accessory dwelling unit. The site is bounded by single family residential (commercially zoned) to the north and west (across Columbia Pike), vacant residential land to the east and south.

The project site was rezoned in November 2006 from High Intensity to Specific Plan with approval of a concept plan. Subsequently, a revised concept plan was approved in October 2007 by the Planning Commission. The plan consisted of 174 residential units and 127,606 square feet of commercial uses.

In October 2014, a revision to the concept plan was submitted to permit the development of 157 single-family lots, 40 townhomes, a restaurant, inn and a gas station/market with a restaurant. The Planning Commission reviewed the project and provided comments to the developer

regarding the project however no formal motion was made to the Board of Mayor and Aldermen. All modifications to planned zones must be approved by the Board of Mayor and Aldermen with a recommendation by the Planning Commission.

ANALYSIS

The request is for approval of a revised concept plan that would include 87 single-family residences, 56 rental units and 127,606 square feet of commercial uses.

Zoning

Specific Plan zoning permits a density of three (3) units per acre. As part of the Specific Plan zoning, residential land uses required 40% open space and commercial land uses required 50% open space. The proposed concept plan includes the "Knoll" which includes an inn, 56 guest rental suites (Roderick Guest Cottages), a day spa and wellness center along with additional nonresidential uses; the Barn Amenity Area which will use the existing structures on site as an amenity for the residential portion of the development; the "Roderick Market" will provide convenience and restaurant facilities; and there will be two different housing types: Carriage Estate Homes and Garden Homes for the development of 87 residential lots.

The designated commercial areas are largely consistent in scope and nature to the original approved concept plan with the exception of the addition three acres of guest rental units adjacent to the inn.

The residential component of the development was modified to reduce the number of total residential units and eliminate the variety of housing options.

The Specific Plan zone permitted flexibility in the development of the standards related to the project. Therefore, a revised pattern book was submitted to outline the development standards for the project. The pattern book identifies development standards for each "building typologies" within the development in addition to street sections. The building setbacks, lot widths, lot coverage, building heights, and parking are similar in nature to the allowances within the Town's Land Development Ordinance. The proposed street sections vary and are consistent with the previously approved pattern book from 2007.

Open Space

Open space requirements for the Specific Plan zone were 40% for residential land uses and 50% for non-residential land uses. The applicant is proposing 28.58 acres of open space within the residential area and 11.18 acres within the commercial area. The total open space shown is 39.76 acres which is 50% of the overall site and exceeds the minimum requirements of the SP zone.

Circulation/Roads

The proposed project includes three access points along Columbia Pike along with additional connections for future roadways located to the north, east and south. The north and south entrance drives from Columbia Pike have varying widths, but consist of one 12 foot entry lane and two 12 foot exit lanes. These entrance drives widen to the country road which has an 82 foot right of way and consists of two 11 foot travel lanes with a 30 foot landscaped area on one side of the road and a 12.5 foot landscape strip and sidewalk on the other side of the road. The country road provides access to the single-family lots and the garden courtyard lots. The garden courtyard entry will be a private road with a 33 foot right of way consisting of two 10 foot travel

lanes and a landscaped area with sidewalk on one side of the road. The entry connects a one way private road for the garden courtyard lots with a 15 foot travel lane and a landscape strip on the sides of the road with a landscaped median in between the one way lanes.

The center entrance is the Knoll Loop with a 45 foot right of way including two 12 foot travel lanes with an option for parallel parking or landscaping with a sidewalk on one side of the road and a landscape area on the other side of the road. The Knoll Loop provides a connection to the country road to the southern entrance through a local road that has a 48 foot right of way with two 11 foot travel lanes with a six foot landscape and five foot sidewalk on both sides.

The street sections do not conform to the current LDO which require a minimum of 50 feet with sidewalks on both sides of the road. However, the street sections do closely reflect the previously approved street sections with a few modifications that increase the width of the one way roads, provide turnouts for emergency access and incorporate parallel parking around the Knoll Loop.

A traffic study was prepared for the original project in 2006 and was updated when the 2014 concept plan was reviewed by Planning Commission The traffic study indicated the need for improvements along Columbia Pike at each project entrance. The applicant has received conceptual approval for these traffic improvements and is working with TDOT on final approval. The traffic study was also reviewed by the Town's Consulting Traffic Engineer. The review indicates that the improvements proposed by the traffic study along Columbia Pike are appropriate. However, additional steps are recommended to determine if a signal is warranted.

The applicant has submitted additional information since the current proposal further reduces the number of residential units. A trip generation memo was prepared to identify the new daily traffic impact for Columbia Pike. Within the elimination of residential units, the total trip generation is reduced by 956 trips per day. However, the traffic study should be evaluated, as recommended by the Town's Traffic Engineer, for the current project to address other possible traffic mitigation, such as a traffic signal. Therefore, prior to any approvals of plats, it is recommended that additional analysis related to traffic be submitted and incorporated into the project approval.

RECOMMENDATION

Staff recommends that the Planning Commission recommend to the Board of Mayor and Aldermen approval of the modified plan.

ATTACHMENTS

Concept Plan Packet
Pattern Book
Updated Traffic Study dated May 2015 (via email)
Updated Trip Generation Memo dated March 2016
RPM Roderick TIS Review