Town of Thompson's Station
Municipal Planning Commission
Meeting Agenda
March 28, 2017

Meeting Called To Order

Pledge Of Allegiance

Minutes-

Consideration Of The Minutes Of The February 28, 2017 Meeting

Documents:

02282017 MINUTES.PDF

Public Comments-

Town Planner Report

Unfinished Business:

1. Preliminary Plat For Phase 16 Of Tollgate Village To Create 105 Single Family Lots, Six Open Space Lots And The Removal Of Eight Trees Exceeding 24 Inches In Diameter (PP 2017-003)

Documents:

ITEM 1 - MEMO PHASE 16 TV.PDF
ITEM 1 - FEB STAFF REPORT PHASE 16 TV.PDF
ITEM 1 - PHASE 16 PRELIMINARY PLAT.PDF
ITEM 1 AND 2 - TRAFFIC STUDY FEB 2017.PDF
ITEM 1 AND 2 - TIS REVIEW BY RPM.PDF
ITEM 1 AND 2 RAGAN SMITH TRAFFIC LETTER.PDF

2. Preliminary Plat For Phase 17 Of Tollgate Village To Create 71 Single Family Lots, Five Open Space Lots And The Removal Of Seven Trees Exceeding 24 Inches In Diameter (PP 2017-004)

Documents:

ITEM 2 - MEMO PHASE 17 TV.PDF
ITEM 2 - FEB STAFF REPORT PHASE 17 TV.PDF
ITEM 2 - PHASE 17 PRELIMINARY PLAT.PDF

New Business:

3. Preliminary Plat For Phase 13 Of Fields Of Canterbury To Create 57 Single Family Lots, Four Open Space Lots And The Removal Of 39 Trees Exceeding 24 Inches In Diameter (File PP 2017-005)

Documents:

ITEM 3 - STAFF REPORT PHASE 13 FC.PDF
ITEM 3 - PHASE 13 PRELIMINARY PLAT.PDF
ITEM 3 - PHASE 13 ILLUSTRATIVE PLAN WITH CROSS SECTION.PDF

4. Request For The Planning Commission To Waive The Requirements For A 50-Foot Distance From A Driveway To The Nearest Curvature Of The Corner As Specified In Section 3.7.3 Of The Land Development Ordinance

Documents:

ITEM 4 - MEMO CORNER LOTS.PDF
ITEM 4 - APPLICANT REQUEST.PDF
ITEM 4 - APPLICANT PRESENTATION.PDF

5. Site Plan Approval For An Amenity Center Located On Sporting Hill Bridge Road Within Bridgemore Village (SP 2017-001)

Documents:

ITEM 5 - STAFF REPORT AMENITY BV.PDF
ITEM 5 - SITE PLAN BV AMENITY.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 28 , 2017

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 28th day of February at the Thompson's Station Community Center with the required quorum. Members and staff in attendance were: Chairman Jack Elder; Vice Chairman Mike Roberts; Commissioner Ben Dilks; Commissioner Sarah Benson; Commissioner Trent Harris; Town Planner Wendy Deats; Town Administrator, Joe Cosentini; Town Attorney Todd Moore and Town Clerk, Jennifer Jones. Commissioner Debra Bender and Don Blair were unable to attend.

Pledge of Allegiance.

Minutes:
The minutes of the January 24, 2017 meeting were previously submitted.

> **Commissioner Benson moved for approval of the January 24, 2017 meeting minutes. The motion was seconded and carried unanimously.**

Public Comment:

Brandon Bell - 3045 Millerton Way - Concerns about the Phase 16 contour lines and desires to see hilltops more protected.

Timothy Miller – 2093 Callaway Park Place – Thompson Machinery rezone concerns. Aesthetic issues.

Jordan Bryant – 2016 Bungalow – President of HOA. Tollgate Village paving concerns. Thompson Machinery rezone concerns.

Sherri Elrod – 2631 Westerham Way – Concerns about Thompson Machinery rezone, traffic and lane realignment.

John Souder – 2025 Firtree Way – Concerns regarding Thompson Machinery rezone.

Town Planner Report:

Mrs. Deats updated the Commission the Fields of Canterbury Concept Plan Revision. Mr. Brett Smith, with Ragan Smith came forward to speak on behalf of the Developer

Unfinished Business:

1. **Final Plat for Phase 15 of Tollgate Village to create 83 single family lots and four open space lots (FP 2017-001).**

Mrs. Deats reviewed her report and recommended the planning commission deny Phase 15 within Tollgate Village based on the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The planning commission previously suspended all future plat approvals within Tollgate until this issue was resolved.
2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The traffic study does not adequately address the issue of when a secondary access should be required to be installed.

George Dean and Larry Papel, counsel for MBSC, came forward to speak on behalf of the Developer. Brandon Baxter, a traffic engineer with Ragan Smith, came forward to speak about the traffic study and sureties. Mrs. Deats noted that if the Commission wishes to approve, the contingencies identified in the report should be included.

The Planning Commission requested a brief executive session at 8:21 pm and resumed at 8:32 pm.

After discussion, Commissioner Roberts made a motion to approve final plat for Phase 15 of Tollgate Village to create 83 single family lots and four open space lots (FP-2017-001) with the following contingencies:

1. **Prior to the recordation of the final plat for phase 15, the developer shall obtain approval of the Development Agreement from the Board of Mayor and Aldermen.**
2. **Prior to the recordation of the final plat for phase 15, the traffic study shall be reviewed by the Town's Traffic Engineer and all comments shall be addressed to the satisfaction of the Town's Traffic Engineer.**
3. **Prior to the recordation of the final plat of phase 15, the developer shall obtain the grading permit from TDOT for the turn lane improvements.**
4. **Prior to the recordation of the final plat for phase 15, all sureties for each phase/section in Tollgate Village shall be posted and submitted to the Town in accordance with the requirements with the Land Development Ordinance, including repair work for all the roadways within 90 days**
5. **Prior to the recordation of the final plat for phase 15, a surety will be required in the amount of $380,000 for roads, drainage and erosion control.**
6. **Prior to the recordation of the final plat for phase 15, a surety shall be required in the amount of $285,000 for sewer.**
7. **Prior to the recordation of the final plat for phase 15, a surety in the amount of $126,000 shall be posted for the installation of the traffic signal.**
8. **The construction route adjacent to Tollgate Boulevard, north of Phase 14 into Phase 15 shall be utilized by all construction traffic.**
9. **As builts shall be required for the drainage and sewer system with a letter from the Design Engineer that they are constructed per the approved drawings and functioning as intended.**
10. **Prior to the recordation of the final plat, all recommendations for traffic mitigation shall be satisfied per the timing of the traffic study.**

The motion was seconded and carried by a vote of 4 to 1 with Commissioner Dilks casting the opposing vote.

New Business:

3. **Preliminary Plat for Phase 16 to create 105 single family lots, six open space lots and the removal of eight trees exceeding 24 inches in diameter (PP-2017-001).**

Mrs. Deats reviewed her Staff report and recommended the Planning Commission deny Phase 16 within Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.
2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The traffic study does not adequately address the issue of when a secondary access should be required to be installed.
3. The necessary improvements to the existing wastewater infrastructure in Tollgate have not been identified.

Brett Smith with Ragan Smith, Brian Rowe with MBSC & Larry Papel, attorney for the developer, came forward to speak on behalf of the applicant.

After discussion, Commissioner Roberts made a motion to defer Preliminary Plat for Phase 16 to create 105 single family lots, six open space lots and the removal of eight trees exceeding 24 inches in diameter (PP-2017-001) in order to have more time to consider the information regarding the hilltop development. The motion was seconded and carried by a vote of 4 to 1 with Commissioner Dilks casting the opposing vote.

4. **Preliminary plat for Phase 17 to create 71 single family lots, five open space lots and the removal of seven trees exceeding 24 inches in diameter (PP 2017-002).**

Mrs. Deats reviewed her Staff report and recommended the Planning Commission deny Phase 16 within Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.
2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The traffic study does not adequately address the issue of when a secondary access should be required to be installed.
3. The necessary improvements to the existing wastewater infrastructure in Tollgate have not been identified.

Brett Smith with Ragan Smith, and George Dean, attorney for the developer, came forward to speak on behalf of the applicant.

After discussion, Commissioner Dilks made a motion to defer Preliminary Plat for Phase 17 to create 71 single family lots, five open space lots and the removal of seven trees exceeding 24 inches in diameter (PP-2017-002). The motion was seconded and carried by all.

2. **Rezone of 12.71 acres of land located at 4545 Columbia Pike from (CC) Community Commercial to (IL) Industrial Low (RZ 2017-002; CP 2017-002).**

Mrs. Deats reviewed her staff report and recommended that the Planning Commission recommend to the Board of Mayor and Aldermen to approve the rezone for 4541 Columbia Pike as Industrial Low (IL) with the following contingency:

1. All sales and rental equipment shall be stored and maintained in the rear of the site behind appropriate and architecturally compatible screening.

Mr. Jeff Rosiak with KVD came forward to speak on behalf of the developer of the project.

Mrs. Deats presented two alternatives:

1. To permit equipment rental by right, however expressed concern with allowing a use of this nature by right, or
2. To permit equipment rental as special exception which would be discretionary review by the BZA.

After discussion, Commissioner Dilks recommended that the Planning Commission recommend to the Board of Mayor and Aldermen approve this use as a special exception in the Community Commercial zone rather than approve a full rezone. The motion was seconded and carried unanimously.

There being no further business, Commissioner Benson made a motion to adjourn. The motion was seconded and the meeting was adjourned at 9:35 p.m.

_____
Jack Elder, Chairman

Attest: _____
Don Blair, Secretary

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1550 Thompson's Station Road W.
P.O. Box 100
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DATE: March 17, 2017

TO: The Planning Commission

FROM: Wendy Deats, Town Planner

SUBJECT: Item 1 – PP 2017-003 – Deferral from February 28, 2017 Planning Commission meeting

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On February 28, 2017, the Planning Commission deferred the request to the March meeting to provide time to better review options for development on the hillside. In addition, the deferral provided time for Staff to review the traffic study and sewer information, and for the developer to submit the sureties for Tollgate Village.

Hillside Development

Section 3.3.7 states that "disturbance, grading and development on natural slopes exceeding 15% including hilltops areas shall be discouraged. Any lot exceeding 15% shall be designated as a critical lot." The regulations further state that "Disturbance, grading and development on natural slopes exceeding 25% shall be prohibited." The proposed plat provides an analysis across the phase showing the slopes between 15-25% and exceeding 25% along with identifying which areas are natural. All lots containing 15 – 25% slope are designated as critical lots and all areas exceeding 25% are within permanent open space in accordance with the code. However, given the concern that the residential lots have shifted to the hillside, Staff has requested that the developer provide information as to the purpose for the modification from the original site development plan. The developer has provided the following response to developing on the hillside:

"The "latest approved development plan", as we understand it, was April 2014. (Since then, there were several revisions to the previous zoning ordinance and quite a few amendments to the current Land Development Ordinance.) As Concept Plans are no longer voted upon, we have endeavored to meet the L.D.O. - while generally keeping with the overall single-family development pattern of the earlier Concept Plans.

To that end, subsequent changes in zoning/regulations have necessitated the "shift" of this section of single-family homes. These changes include accommodation of stormwater quality, decrease block lengths (more streets/intersections), 50' minimum lot widths, pedestrian alleys, and Planning Commissioners' statements desiring to see more alley-loaded lots (where feasible with contours). This layout adjustment (shift) still does not compensate for all the impacts of the L.D.O. as these changes have resulted in over 30 lots being "lost" in this area.

Additionally, this site does not meet the definition of a ridge line, as defined in Section 1.3 definitions (ridge line: the crest or line of the hill that connects the two highest points). This topographical feature is a standalone highpoint; it is not part of a series of other highpoints with an associated ridge line that would qualify as such.

In keeping with the previous ordinance and the current L.D.O requirements, there are no lots or improvements proposed in areas of existing, natural 25% slopes or greater. That intent has continued to be met throughout the project.

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The current plan is considered, by the collective developer/design/consulting team, to comply with recent L.D.O. updates, while reducing the overall lot count, while meeting stormwater regulations, while providing additional alley products requested, while responding to the natural features – while keeping with the intent of an almost 3 year old "approved development plan" (that did not accommodate these subsequent requirements)."

Traffic Study

The revised traffic study was submitted on February 28, 2017. The traffic study proposes the following conclusions and recommendations for traffic improvements:

General Recommendations

1. *One route of secondary access to Tollgate Village should be constructed and open to traffic prior to the final plat approval for Tollgate Village Section 16 or Section 17, whichever occurs first. If development in Tollgate Village occurs outside of Sections 15, 16, and 17, a route of secondary access should be constructed as part of that development.*
2. *Additional routes of access or roadway/intersection improvements should be constructed and open to traffic based upon the estimated total trip generation for the existing and proposed development. Table 9 provides a summary of access scenarios and corresponding trip generation thresholds for each access scenario. A trip generation report, established using appropriate methodologies for internal trip capture and estimated based upon the current edition of the ITE Trip Generation Manual, should be provided with each proposed development in Tollgate Village. The total peak hour trip generation should not exceed the maximum trip generation for the applicable access scenario.*

Columbia Pike at Tollgate Boulevard

3. *A traffic signal at Columbia Pike and Tollgate Boulevard should be installed concurrently with Tollgate Village Section 15. The existing northbound lanes that merge from two to one at Tollgate Boulevard should be extended approximately 300 feet north of Tollgate Boulevard to provide merging area downstream of the new traffic signal. The Tollgate Village developer has already completed design plans for a traffic signal including the extended northbound merge area at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.*
4. *A southbound right turn lane on Columbia Pike with a turn lane length of 275 feet and a taper length of 100 feet should be installed concurrently with Tollgate Village Section 15. The Tollgate Village developer has already completed design plans for a southbound right turn lane at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.*

Columbia Pike at North Access

5. *The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should be constructed as a three-lane roadway to support efficient future access.*
6. *The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should operate as a right-in/right-out only access if Columbia Pike consists of a two-lane roadway to the north of Tollgate Village and across the West Harpeth River.*
7. *The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should provide full turning movement access if Columbia*

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Pike has been widened to consist of a five-lane roadway to the north of Tollgate Village and across the West Harpeth River.

8. *Future widening of Columbia Pike, presumably by TDOT, should provide the extension of the existing five-lane section north of Tollgate Village and across the West Harpeth River. The extension of this roadway section will provide a northbound left turn lane for the North Access to Tollgate Village.*
9. *When the North Access to Tollgate Village is converted to provide full turning movement access, a southbound right turn lane should be constructed on Columbia Pike. The final design of the Columbia Pike widening, the West Harpeth River crossing, and impacts to adjacent utilities and floodways/floodplains should be considered when determining the feasibility and final design of this right turn lane.*
10. *A TDOT highway entrance permit will be required in order to construct this access.*
11. *A TDOT grading permit will be required for any turn lane or grading work completed in the right-of-way on Columbia Pike.*

Columbia Pike at Declaration Way

12. *The existing southbound right turn lane on Columbia Pike should be extended to have a length of 500 feet with a taper length of 100 feet.*
13. *Williamson County Schools should continue to utilize a traffic control officer to direct traffic at this intersection during peak arrival and dismissal periods. Based upon the high volume and peaking characteristics of the school traffic, a permanent traffic signal installation could be considered as an alternative to the continued use of a traffic control officer.*

Declaration Way at South Access

14. *New pavement markings consistent with the MUTCD and public roadway standards should be installed on Declaration Way between Columbia Pike and the South Access.*
15. *The intersection of Declaration Way and the South Access should operate as a two-way stop control intersection. The South Access should be the minor street with stop control and Declaration Way should be the major street without stop control.*

The study was reviewed by the Town's Traffic Consultant, RPM and comments were submitted to Ragan Smith on March 13, 2017. The developer is working with Staff to address the comments.

Traffic Signal Update

TDOT has issued the grading permit for the turn lane improvements at Columbia Pike/Tollgate Boulevard. The Town has not received the surety for the traffic signal, however, a contingency was placed on the final plat for phase 15 to require the $126,000 surety prior to plat recordation.

Sewer

The developer submitted a conceptual plan for re-routing the gravity line which is found to be acceptable and therefore, submitted construction drawings which are found to be acceptable with conditions. The developer is still working on the plans for how the upgrade to the sewer line will be completed from the manhole on Wareham to the pump station.

Sureties

The sureties have not been submitted to the Town.

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Recommendation

Plats are suspended within Tollgate Village; therefore, Staff recommends that the Planning Commission deny Phase 16 within Tollgate Village for the following reason:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.

Once plat suspension is lifted, the following are recommended to be incorporated as contingencies to project approval:

1. Prior to the approval of construction plans, a development agreement shall be approved and executed between the Town and the Developer
2. Prior to the approval of construction plans, all sureties for each phase/section in Tollgate Village and for the installation of the traffic signal shall be posted and submitted to the Town in accordance with the requirements with the Land Development Ordinance.
3. All recommendations for traffic mitigation shall be completed in accordance with the phasing/timing set forth within the traffic study dated February 28, 2017.
4. Prior to the submittal of the final plat for phase 16, all sewer improvements must be completed to the satisfaction of the Town.
5. The construction route adjacent to Tollgate Boulevard, north of Phase 14 shall be utilized by all construction traffic.
6. All tree replacement requirements as approved by the Planning Commission shall be completed the satisfaction of the Town.

Attachments

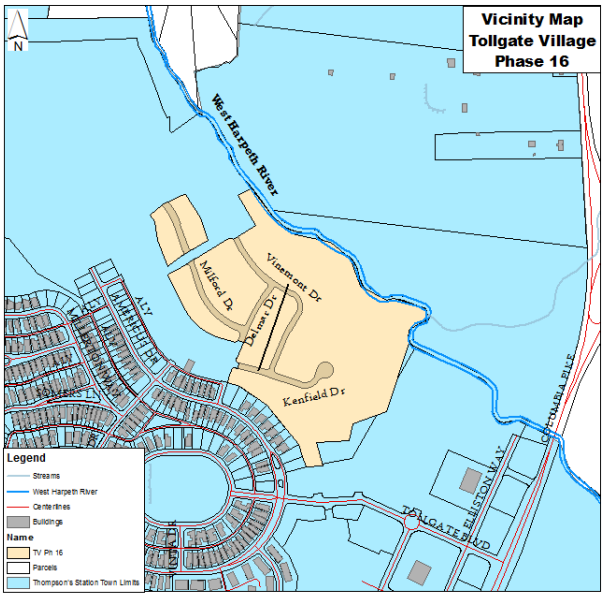
February 28, 2017 staff report
Traffic Study dated February 28, 2017
RPM letter dated March 13, 2017
Preliminary Plat

Thompson's Station Planning Commission
Staff Report –Item 3 (PP 2017-003)
February 28, 2017

Preliminary plat for Phase 16 to create 105 single family lots, six open space lots and approval for the removal of eight trees exceeding 24 inches in diameter.

PROJECT DESCRIPTION

A request to approve the preliminary plat for Phase 16 of Tollgate Village to create 105 single family lots, six open space lots and removal of eight trees exceeding 24 inches in diameter.



BACKGROUND

On September 27, 2016, the Planning Commission suspended all plats within Tollgate Village due to issues related to infrastructure in several sections of the Tollgate Village which have not been completed by the developer and no sureties in place to ensure completion of the improvements.

At this time, Tollgate Village still does not have completed public roads to access this phase of the development and no sureties are in place to guarantee completion of such infrastructure.

On October 25, 2016, the Planning Commission denied the request for the preliminary plat approval for phase 16 of Tollgate Village for the following reason:

> Based on the lack of completed public roads and other infrastructure necessary to serve this phase of Tollgate Village, and the absence of adequate surety to complete such roads and infrastructure which has resulted in the suspensions of plats within Tollgate Village, and based upon (1) the lack of traffic signal installation or surety (2) lack of an updated traffic study addressing secondary access and traffic mitigation (3) lack of evaluation of the main pump station to determine necessary upgrades the Planning Commission has denied the final plat for Phase 17 of Tollgate Village.

On January 24, 2017, the Planning Commission denied the request for a preliminary plat approval for phase 16 of Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.

2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The proposed traffic study does not adequately address the issue of when a secondary access should be required to be installed. Based on the most recently approved traffic study, a secondary access should be installed prior to final plat approval for Phase 16.
3. It has not been determined whether the existing wastewater infrastructure in Tollgate can support this phase of the development.

ANALYSIS

Preliminary Plat

The preliminary plat provides an analysis of the site's special features and the response to those features (LDO Section 5.4.3). This preliminary plat for phase 16 includes the creation of 105 single family lots and six open space lots totaling approximately 21 acres of open space. However, the layout of this phase is not consistent with the approved development plan (dated 4-15-14). Changes include a revision to the layout of the roads, including roads not identified on the development plan, removal of two open space areas, the addition of another open space lot and the phase is shifted eastward up the hill previously identified as open space. The applicant has submitted an open space exhibit showing that the shift is due to storm water infrastructure and that 120 acres (35%) of the land will still be platted as open space.

Roadways

The standard for local roadways is 50 feet. The Planning Commission approved 46 foot roadways with a five-foot grass strip for other roadways within this subdivision. The applicant is requesting the Planning Commission approve the 46-foot width for the roadways within this phase to be consistent with these approved right-of-way widths to continue/maintain the existing streetscape that has been established.

Critical Lots

Lots 1601-1602, 1607-1608, 1610-1613, 1617-1620, 1631-1639, 1646-1658, 1670-1674, 1679-1681, 1683-1686, 1688-1695, 1700 and 1704 are designated as critical lots on the plat. The slope identified on the plan indicates that these lots have slopes between 15 and 25%. The plan illustrates that areas exceeding 25% slope are within the proposed open space. All critical lots will require engineered site plans to address all site specific issues.

Lot Standards

The single family lots will vary in size from .16 acres to .38 acres with a minimum of 50 feet for lot widths. Proposed setbacks are 10 feet for the front yard, 7.5 feet for the side yard and 20 feet for the rear yard with a minimum of a 20-foot driveway. Block lengths do not exceed 800 feet, except where adjacent to open space as permitted within the ordinance. Blocks that exceed 500 feet in length will have a 16-foot pedestrian access provided.

Traffic Improvements

In 2015, a revised concept plan was submitted along with an updated traffic study (See attached study). The plan was not approved and the traffic study was not accepted or approved. In 2016, an updated traffic study, as required for approval of the phase 15 preliminary plat, was submitted in December. A "preferred" secondary access was noted in the report as a connection to Declaration Way. The schedule for the incorporating this secondary access is recommended after 248 additional units are constructed. The Town's Consulting Traffic Engineer reviewed the traffic study and

submitted comments to Staff. Staff provided the traffic engineer's comments along concerns/comments from Staff review.

On January 17, 2017, the applicant submitted responses to these comments which were submitted to and commented on by the Town's Traffic Engineer. In addition, Staff has met with the developer's traffic engineer and TDOT to discuss the secondary access along Columbia Pike, north of Tollgate Boulevard. After receiving comments from Staff and TDOT, the developer's traffic engineer is working on the revised traffic study in order to provide a study with "a specific scope being a schedule of improvements for traffic mitigation including a secondary access shall be reviewed and approved by the Town" as required by the contingency for the preliminary plat approval of phase 15.

Traffic Signal

The traffic signal at Tollgate Boulevard/Columbia Pike was approved by the Planning Commission in November 2015. The Planning Commission approved the signal with the following contingencies:

1. Prior to the approval of installation of the traffic improvements, the Town Engineer shall approve the construction plans.
2. Prior to the approval of construction plans, the applicant shall post a surety in the amount of $126,000 for the traffic signal.
3. Prior to the approval of the construction plans, the applicant shall post a surety in the amount of $95,000 which could be waived if TDOT requires a surety that meets or exceeds this amount for the turn lane improvements.
4. The signalization shall include a controller compatible with signal synchronization within Thompson's' Station.

TDOT has received all necessary information including a letter of credit in the amount of $150,000 for the turn lane improvements and anticipates issuing the grading permit. Since TDOT will be requiring a $150,000 surety, contingency #3 will be satisfied. Staff recommends that prior to any future final plat approvals, a contingency for installation and operation of the signal be incorporated.

<u>Sewer</u>

During the construction drawing approval phase, it was noted that an analysis of the wastewater system was needed for Tollgate Village. The development team tested the pump station and an evaluation of the collection system is ongoing to identify the necessary improvements. Prior to any plat approvals, all necessary upgrades should be identified with a contingency for completion of the improvements prior to final plat approvals.

<u>Tree Removal</u>

Development of phase 16 requires the removal of eight trees for a total of 218 inches. The Land Development Ordinance requires the replacement of trees exceeding 24 inches at a ratio of one and a half inches for every inch removed. Therefore, 327 inches of trees is required to be replaced on the site. The replacement plan includes 164 trees to be planted within the open space on the eastern edge of phase 16. The replacement trees will be 2-inch caliper in size and are a variety of deciduous and evergreen trees such as American Sycamore, Southern Magnolia, Leylandi Cypress, Red Oak, White Pine, American Sweet Gum, and Eastern Red Bud. Total tree replacement will be 328 inches.

RECOMMENDATION

Plats are suspended within Tollgate Village, therefore, Staff recommends that the Planning Commission deny Phase 16 within Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.
2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The traffic study does not adequately address the issue of when a secondary access should be required to be installed.
3. The necessary improvements to the existing wastewater infrastructure in Tollgate have not been identified.

Once plat suspension is lifted, the following are recommended to be incorporated as contingencies to project approval:

1. Prior to the approval of construction plans, a development agreement shall be approved and executed between the Town and the Developer
2. Prior to the recordation of the final plat for phase 16, the traffic signal be installed and operational in accordance with the approved intersection improvement plans.
3. Prior to the recordation of the final plat for phase 16, the secondary access onto Columbia Pike shall be constructed.
4. Prior to the recordation of the final plat for phase 16, all sewer improvements must be installed.
5. The construction route adjacent to Tollgate Boulevard, north of Phase 14 shall be utilized by all construction traffic.
6. All tree replacement requirements as approved by the Planning Commission shall be satisfied to the satisfaction of the Town.

ATTACHMENTS

Preliminary Plat
Site Development Plan (4/15/2014)

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO CREATE 105 RESIDENTIAL SINGLE-FAMILY LOTS AND SIX OPEN SPACE TRACTS.

2. BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE COORDINATE SYSTEM OF 1983. GPS EQUIPMENT WAS USED DURING THE COURSE OF THE SURVEY ON THE SITE TO DETERMINE THE POSITION OF TWO CONTROL POINTS FOR ESTABLISHING THE BEARING BASE. THE EQUIPMENT USED: LEICA, MODEL GX 1230, DUAL FREQUENCY RECEIVER. THE TYPE OF SURVEY: NETWORK ADJUSTED REAL TIME KINEMATIC. CONTROL POINTS FOR BEARING BASE FOR PROJECT AND ROAD LOCATION IMPROVEMENTS

3. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES, PUBLIC RECORDS, AND/OR MAPS PREPARED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THEREFORE, RELIANCE UPON THE TYPE, SIZE AND LOCATION OF UTILITIES SHOWN SHOULD BE DONE SO WITH THIS CIRCUMSTANCE CONSIDERED. DETAILED VERIFICATION OF EXISTENCE, LOCATION AND DEPTH SHOULD ALSO BE MADE PRIOR TO ANY DECISION RELATIVE THERETO IS MADE. AVAILABILITY AND COST OF SERVICE SHOULD BE CONFIRMED WITH THE APPROPRIATE UTILITY COMPANY. IN TENNESSEE, IT IS A REQUIREMENT, PER "THE UNDERGROUND UTILITY DAMAGE PREVENTION ACT", THAT ANYONE WHO ENGAGES IN EXCAVATION MUST NOTIFY ALL KNOWN UNDERGROUND UTILITY OWNERS NO LESS THAN THREE (3) NOR MORE THAN TEN (10) WORKING DAYS PRIOR TO THE DATE OF THEIR INTENT TO EXCAVATE AND ALSO TO AVOID ANY POSSIBLE HAZARD OR CONFLICT. TENNESSEE ONE CALL, DIAL 811.

4. THIS PROPERTY IS CURRENTLY ZONED D3 (HIGH DENSITY RESIDENTIAL). MAXIMUM LOT COVERAGE – 55%.
   MINIMUM BUILDING SETBACKS PER TOWN OF THOMPSON'S STATION LAND DEVELOPMENT ORDINANCE DATED AUGUST 9, 2015:
   FRONT: 10'*
   REAR: 20'
   SIDE: 7.5'
   *20' MINIMUM DRIVEWAY LENGTH, EXCLUSIVE OF SIDEWALKS

5. ELEVATIONS SHOWN HEREON ARE BASED ON NAVD 88. CONTOURS ARE AT TWO FOOT INTERVALS AND ARE BASED ON A FIELD RUN SURVEY BY RAGAN-SMITH ASSOCIATES ON JULY 12, 2016 USING RANDOM SPOT ELEVATIONS. CONTOURS WERE DERIVED USING SURFACE MODELING TECHNIQUES.

6. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THIS PROPERTY LIES WITHIN FLOOD ZONES "AE", "X" (OTHER FLOOD AREAS) AND "X" (OTHER AREAS), AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 47187C0335F, WITH AN EFFECTIVE DATE OF SEPTEMBER 29, 2006, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 470424, PANEL NO. 0335, SUFFIX F, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "AE" UNDER "SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD" AS BASE FLOOD ELEVATIONS DETERMINED. SAID MAP DEFINES ZONE "X" (OTHER FLOOD AREAS) UNDER "OTHER FLOOD AREAS" AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. SAID MAP DEFINES ZONE "X" (OTHER AREAS) UNDER "OTHER AREAS" AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

7. ALL STREETS ARE DESIGNATED PUBLIC AND AS SUCH ARE PUBLIC UTILITY, ACCESS AND DRAINAGE EASEMENTS.

8. ALL PUBLIC STREETS AND DRAINAGE STRUCTURES WITHIN THE RIGHTS-OF-WAY WILL BE MAINTAINED BY THE TOWN OF THOMPSON'S STATION.

9. OPEN SPACE AREAS, PUBLIC UTILITY AND DRAINAGE EASEMENTS (INCLUDING DRAINAGE AND DETENTION STRUCTURES), ALLEYS AND ALL LANDSCAPING WITHIN ROADWAY MEDIANS WILL BE MAINTAINED BY THE HOMEOWNERS' ASSOCIATION.

10. SANITARY SEWER LINES AND STORM LINES SHOWN HEREON WERE TAKEN FROM A PRELIMINARY DESIGN FOR THIS SECTION. FINAL PLACEMENT OF UTILITIES WILL BE DEPICTED ON THE FINAL PLAT.

11. DOMESTIC WATER SUPPLY INFORMATION SHOWN HEREON IS BASED ON A PRELIMINARY DESIGN FOR THIS SECTION. FINAL PLACEMENT TO BE DESIGNED BY OTHERS AND INCLUDED ON THE FINAL PLAT. WATER TO BE PROVIDED BY H.B.&T.S.

12. LOTS SHOWN THUS (*) ARE DESIGNATED AS CRITICAL LOTS AND HAVE MANMADE SLOPES (LOTS 1601, 1602, 1607, 1608, 1610–1613, 1617–1620, 1631, 1639, 1688–1695, 1699, 1700 AND 1704) AND NATURAL SLOPES (LOTS 11645–1658 AND 1670–1674) IN EXCESS OF 15%. PER SECTION 3.3.7 OF THE SUBDIVISION REGULATIONS, PRIOR TO THE ISSUANCE OF A BUILDING PERMIT, A SITE GRADING PLAN FOR DEVELOPMENT OF THE LOT SHALL BE SUBMITTED ADDRESSING SITE SPECIFIC NATURAL RESOURCE ISSUES TO THE TOWN OF THOMPSON'S STATION FOR REVIEW AND APPROVAL. NO BUILDING PERMIT WILL BE ISSUED ON SAID LOTS UNTIL AND UNLESS THE TOWN ENGINEER HAS RECEIVED AND REVIEWED THE SITE PLAN.

13. THE BLOCK LENGTHS IN THIS SECTION DO NOT EXCEED THE MAXIMUM LENGTH (800') FOR THE D3 ZONING DISTRICT.

14. I HEREBY STATE THAT THIS SURVEY WAS DONE IN COMPLIANCE WITH THE CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE AND THIS IS A CATEGORY I SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS 1:43,595.

BY: [signature] DATE: 2-17-17
JOHN T. DARNALL, TN RLS #1571

PHASE 16
LOTS 1601–1705
OPEN SPACE 1794–1799

SITE DATA TABLE (PHASE 16)

TOTAL LOT AREA	– 23.28 AC.±
TOTAL R.O.W. AREA	– 4.21 AC.±
OPEN SPACE AREA	– 20.76 AC.±
TOTAL SITE AREA	– 48.25 AC.±
TOTAL LINEAR FEET OF ROAD	– 3,827 FT.

SURVEYOR:
RAGAN-SMITH ASSOCIATES, INC.
TOM DARNALL, RLS
315 WOODLAND STREET
NASHVILLE, TENNESSEE 37206
(615) 244-8591

OWNER / DEVELOPER
MBSC TN HOMEBUILDER, LLC
C/O BRIAN ROWE
312 S. GAY STREET, SUITE 200
KNOXVILLE, TENNESSEE 37902
(865) 408-8322

LEGEND

OS	OPEN SPACE
R.O.W.	R.O.W.
R.O.W.C.T.	REGISTER'S OFFICE WILLIAMSON COUNTY, TENNESSEE
*	CRITICAL LOT (SEE NOTE 12)

DEED REFERENCE

BEING A PORTION OF THE SAME PROPERTY CONVEYED TO MBSC TN HOMEBUILDER, LLC, FROM TGF 2010, LLC OF RECORD IN BOOK 5264, PAGE 242, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

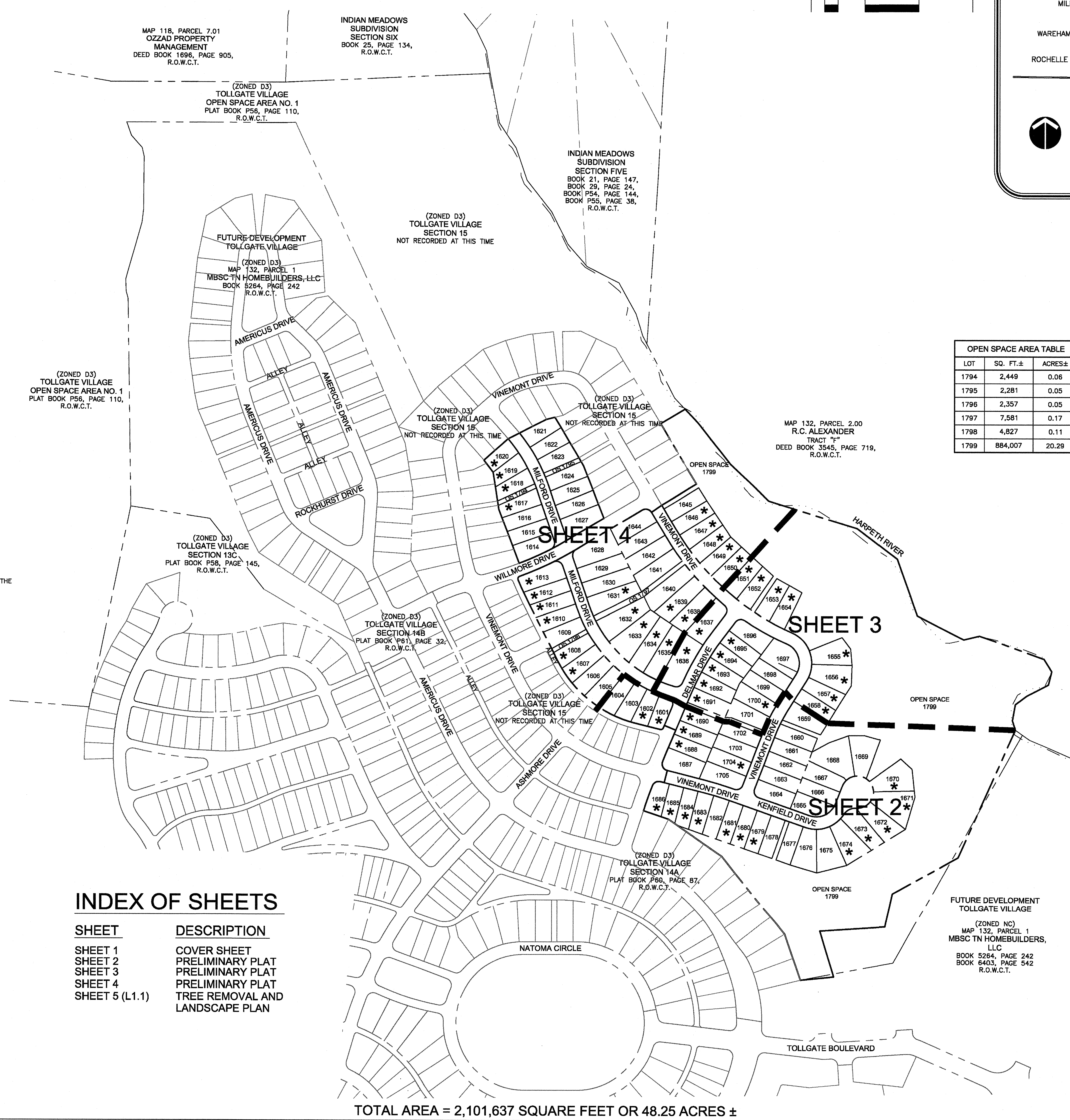
BEING THE SAME PROPERTY CONVEYED TO MBSC TN HOMEBUILDER, LLC FROM MBSC TN HOMEBUILDER, LLC BY CORRECTIVE QUITCLAIM DEED OF RECORD IN BOOK 6403, PAGE 542, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

PROPERTY MAP REFERENCE

BEING A PORTION OF PARCEL 1 AS SHOWN ON WILLIAMSON COUNTY PROPERTY MAP 132.

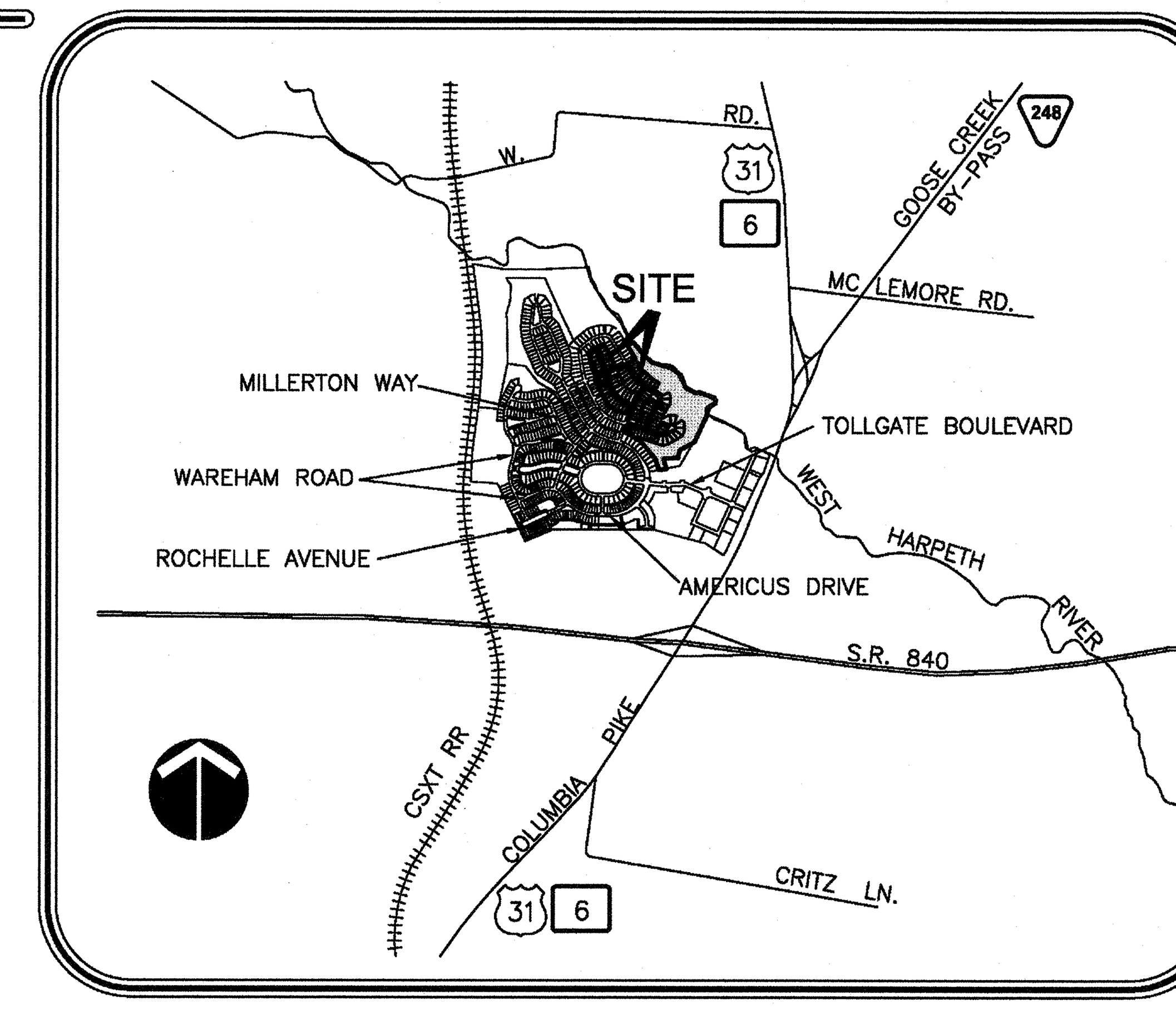
(SEE NOTE 2)

0 200 400 600



OPEN SPACE AREA TABLE

LOT	SQ. FT.±	ACRES±
1794	2,449	0.06
1795	2,281	0.05
1796	2,357	0.05
1797	7,581	0.17
1798	4,827	0.11
1799	884,007	20.29



LOCATION MAP

NOT TO SCALE

LOT AREA TABLE

LOT	SQ. FT.±	ACRES±
1601	7,000	0.16
1602	7,442	0.17
1603	8,174	0.19
1604	8,753	0.20
1605	9,108	0.21
1606	9,229	0.21
1607	9,111	0.21
1608	8,775	0.20
1609	8,894	0.20
1610	8,442	0.19
1611	8,103	0.19
1612	8,456	0.19
1613	11,220	0.26
1614	9,579	0.22
1615	8,412	0.19
1616	8,514	0.20
1617	8,585	0.20
1618	8,197	0.19
1619	7,517	0.17
1620	7,237	0.17
1621	8,015	0.18
1622	7,884	0.18
1623	8,420	0.19
1624	8,450	0.19
1625	8,240	0.19
1626	8,374	0.19
1627	10,378	0.24
1628	13,972	0.32
1629	10,415	0.24
1630	10,854	0.25
1631	11,619	0.27
1632	14,407	0.33
1633	15,098	0.35
1634	12,531	0.29
1635	12,224	0.28
1636	15,348	0.35
1637	12,250	0.28
1638	11,160	0.26
1639	12,075	0.28
1640	12,322	0.28
1641	11,428	0.26
1642	10,841	0.25
1643	9,998	0.23
1644	10,626	0.24
1645	8,324	0.19
1646	8,702	0.20
1647	9,069	0.21
1648	8,935	0.21
1649	8,964	0.21
1650	9,155	0.21
1651	9,155	0.21
1652	8,964	0.21
1653	8,868	0.20

LOT AREA TABLE

LOT	SQ. FT.±	ACRES±
1654	8,868	0.20
1655	11,596	0.27
1656	12,600	0.29
1657	8,951	0.21
1658	8,250	0.19
1659	9,824	0.23
1660	8,217	0.19
1661	8,250	0.19
1662	8,250	0.19
1663	8,250	0.19
1664	9,153	0.21
1665	8,938	0.21
1666	8,248	0.19
1667	9,078	0.21
1668	15,977	0.37
1669	12,275	0.28
1670	13,261	0.30
1671	14,266	0.33
1672	11,299	0.26
1673	10,500	0.24
1674	12,397	0.28
1675	12,728	0.29
1676	11,587	0.27
1677	8,250	0.19
1678	8,250	0.19
1679	8,250	0.19
1680	8,250	0.19
1681	8,250	0.19
1682	8,602	0.20
1683	8,438	0.19
1684	7,839	0.18
1685	7,108	0.16
1686	7,712	0.18
1687	10,857	0.25
1688	8,254	0.19
1689	8,254	0.19
1690	8,254	0.19
1691	8,668	0.20
1692	8,723	0.20
1693	8,555	0.20
1694	8,724	0.20
1695	8,404	0.19
1696	10,232	0.23
1697	12,883	0.30
1698	8,336	0.19
1699	8,584	0.20
1700	9,556	0.22
1701	9,443	0.22
1702	8,318	0.19
1703	8,497	0.20
1704	8,593	0.20
1705	10,031	0.23

INDEX OF SHEETS

TOTAL AREA = 2,101,637 SQUARE FEET OR 48.25 ACRES ±

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CHATTANOOGA
www.ragansmith.com

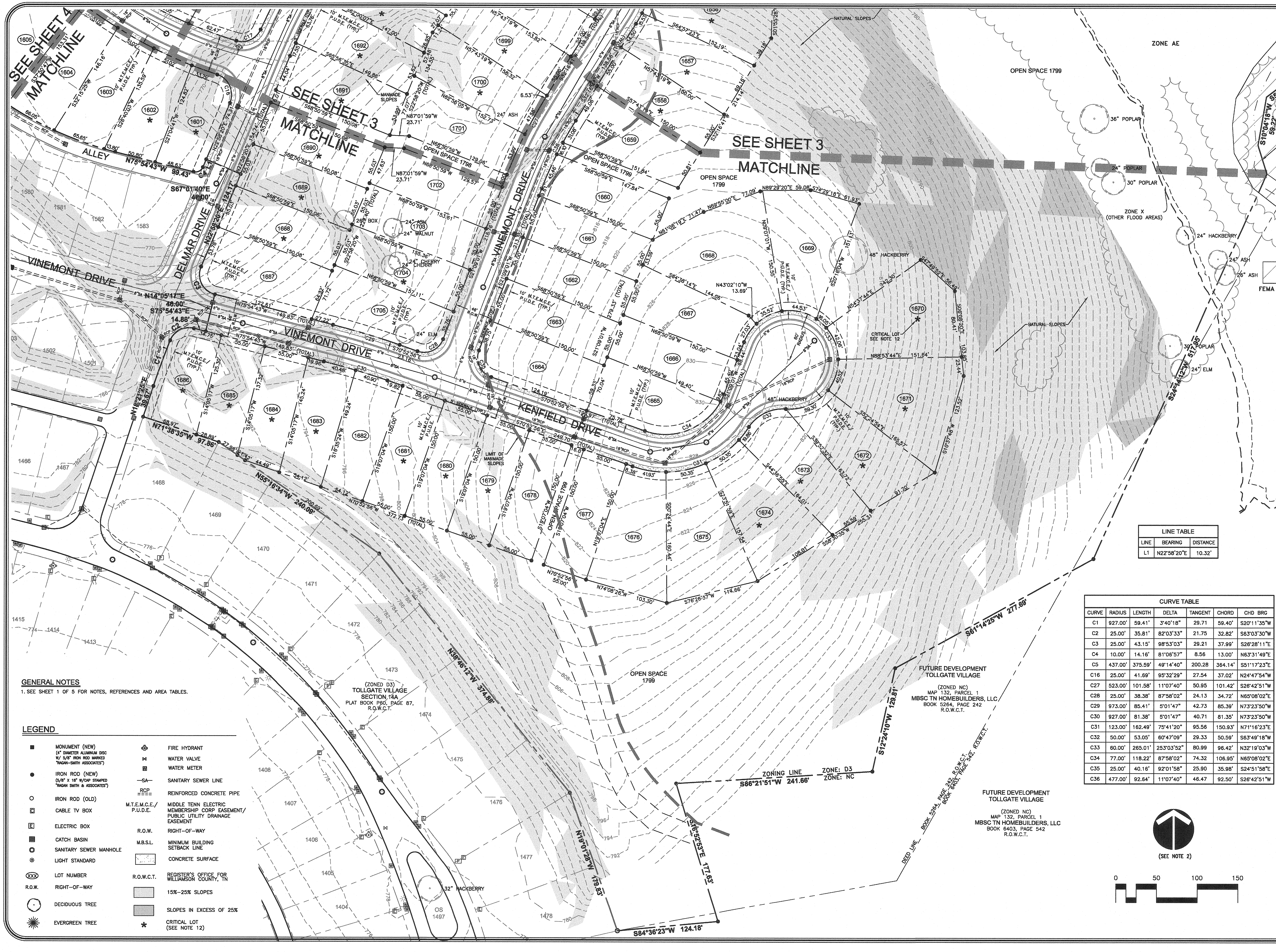
JOHN T. DARNALL
TENNESSEE NO. 1571

TOLLGATE VILLAGE - PHASE 16
FOR
MBSC TN HOMEBUILDER, LLC
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

JOB NO. 10-081	WK. ORDER 9260
APPROVED:	JTD
DRAWN:	AMR
SCALE:	1" = 200'
DATE:	AUGUST 23, 2016

REVISIONS

PRELIMINARY PLAT



LINE TABLE		
LINE	BEARING	DISTANCE
L1	N22°58'20"E	10.32'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	927.00'	59.41'	3°40'18"	29.71	59.40'	S20°11'35"W
C2	25.00'	35.81'	82°03'33"	21.75	32.82'	S63°03'30"W
C3	25.00'	43.15'	98°53'03"	29.21	37.99'	S26°28'11"E
C4	10.00'	14.16'	81°06'57"	8.56	13.00'	N63°31'49"E
C5	437.00'	375.59'	49°14'40"	200.28	364.14'	S51°17'23"E
C16	25.00'	41.69'	95°32'29"	27.54	37.02'	N24°47'54"W
C27	523.00'	101.58'	11°07'40"	50.95	101.42'	S26°42'51"W
C28	25.00'	38.38'	87°58'02"	24.13	34.72'	N65°08'02"E
C29	973.00'	85.41'	5°01'47"	42.73	85.39'	N73°23'50"W
C30	927.00'	81.38'	5°01'47"	40.71	81.35'	N73°23'50"W
C31	123.00'	162.49'	75°41'20"	95.56	150.93'	N71°16'23"E
C32	50.00'	53.05'	60°47'09"	29.33	50.59'	S63°49'18"W
C33	60.00'	265.01'	253°03'52"	80.99	96.42'	N32°19'03"W
C34	77.00'	118.22'	87°58'02"	74.32	106.95'	N65°08'02"E
C35	25.00'	40.16'	92°01'58"	25.90	35.98'	S24°51'58"E
C36	477.00'	92.64'	11°07'40"	46.47	92.50'	S26°42'51"W

GENERAL NOTES

1. SEE SHEET 1 OF 5 FOR NOTES, REFERENCES AND AREA TABLES.

LEGEND

MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")	FIRE HYDRANT
IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")	WATER VALVE
IRON ROD (OLD)	WATER METER
CABLE TV BOX	—SA— SANITARY SEWER LINE
ELECTRIC BOX	RCP REINFORCED CONCRETE PIPE
CATCH BASIN	M.T.E.M.C.E./P.U.D.E. MIDDLE TENN ELECTRIC MEMBERSHIP CORP EASEMENT/ PUBLIC UTILITY DRAINAGE EASEMENT
SANITARY SEWER MANHOLE	R.O.W. RIGHT-OF-WAY
LIGHT STANDARD	M.B.S.L. MINIMUM BUILDING SETBACK LINE
(XXX) LOT NUMBER	CONCRETE SURFACE
R.O.W. RIGHT-OF-WAY	R.O.W.C.T. REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN
DECIDUOUS TREE	15%-25% SLOPES
EVERGREEN TREE	SLOPES IN EXCESS OF 25%
	* CRITICAL LOT (SEE NOTE 12)

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JOHN T. DARNALL · TENNESSEE NO. 1571

TOLLGATE VILLAGE - PHASE 16

FOR

MBSC TN HOMEBUILDER, LLC

TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

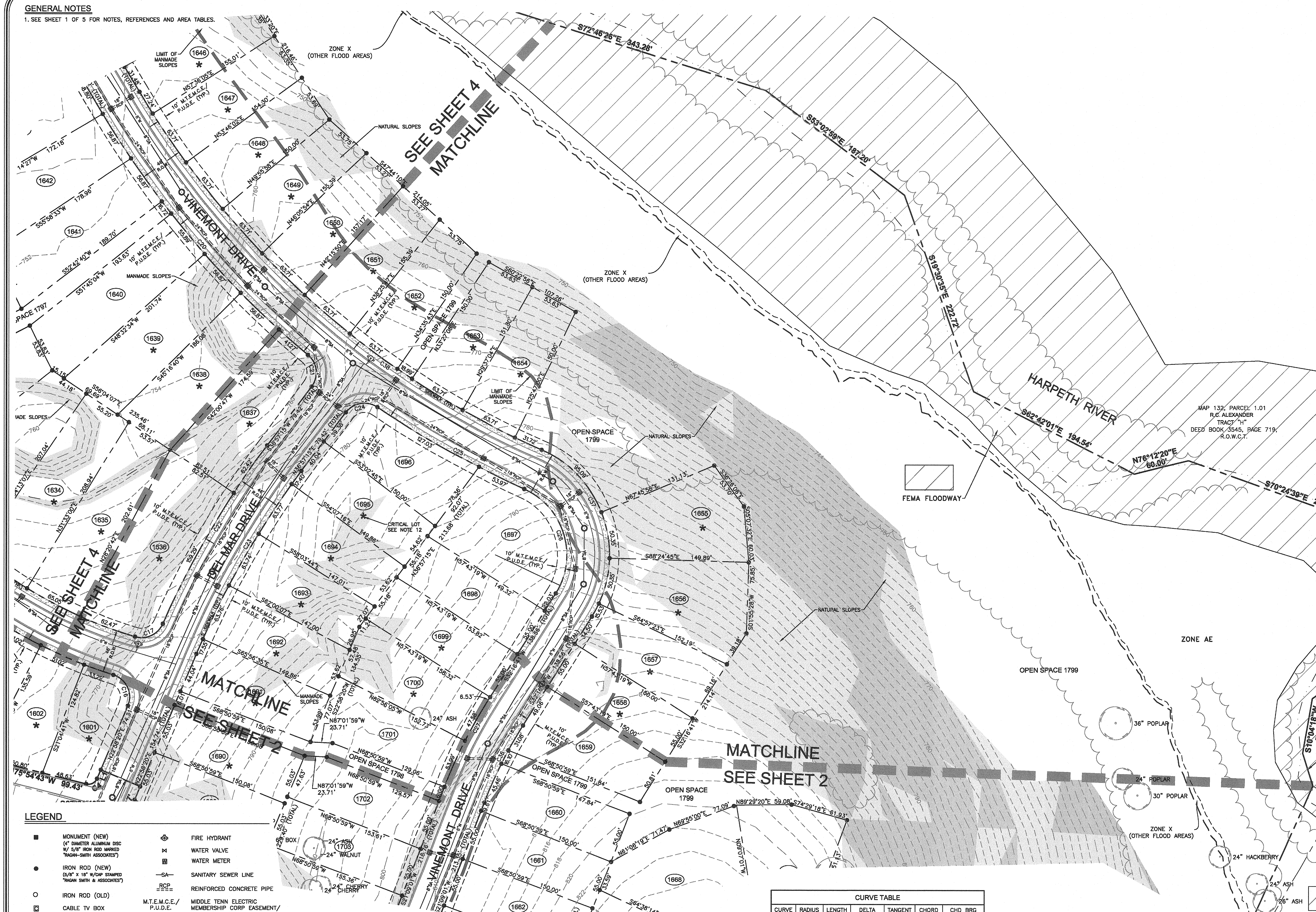
REVISIONS	
3	02-17-2017 (AMR) REV. PER LOTS 1657, 1667, 1674-1676
2	01-16-2017 (DDB) REV. PER STAFF COMMENTS
1	09-14-2016 (AMR) REV. PER STAFF COMMENTS

JOB NO. 10-081 WK. ORDER 9260
APPROVED: JTD
DRAWN: AMR
SCALE: 1" = 50'
DATE: AUGUST 23, 2016

PRELIMINARY PLAT

GENERAL NOTES

1. SEE SHEET 1 OF 5 FOR NOTES, REFERENCES AND AREA TABLES.



LEGEND

Symbol	Description	Symbol	Description
■	MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")		FIRE HYDRANT
●	IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")		WATER VALVE
○	IRON ROD (OLD)	W	WATER METER
C	CABLE TV BOX	—SA—	SANITARY SEWER LINE
E	ELECTRIC BOX	RCP	REINFORCED CONCRETE PIPE
	CATCH BASIN	M.T.E.M.C.E./ P.U.D.E.	MIDDLE TENN ELECTRIC MEMBERSHIP CORP EASEMENT/ PUBLIC UTILITY DRAINAGE EASEMENT
	SANITARY SEWER MANHOLE	R.O.W.	RIGHT-OF-WAY
	LIGHT STANDARD	M.B.S.L.	MINIMUM BUILDING SETBACK LINE
XXX	LOT NUMBER		CONCRETE SURFACE
R.O.W.	RIGHT-OF-WAY	R.O.W.C.T.	REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN
	DECIDUOUS TREE		15%-25% SLOPES
	EVERGREEN TREE		SLOPES IN EXCESS OF 25%
		*	CRITICAL LOT (SEE NOTE 12)

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

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C16	25.00'	41.69'	95°32'29"	27.54	37.02'	N24°47'54"W
C17	25.00'	35.92'	82°20'02"	21.86	32.91'	N65°03'56"E
C21	25.00'	38.10'	87°18'38"	23.85	34.52'	N06°42'04"W
C22	973.00'	221.71'	13°03'21"	111.34	221.23'	S30°25'35"W
C23	927.00'	226.22'	13°58'55"	113.67	225.66'	S29°57'48"W
C24	25.00'	38.10'	87°18'38"	23.85	34.52'	S80°36'35"W
C25	998.00'	180.99'	10°23'26"	90.74	180.74'	S60°55'49"E
C26	77.00'	132.25'	98°24'13"	89.21	116.58'	N16°55'25"W
C37	123.00'	211.25'	98°24'13"	142.51	186.23'	N16°55'25"W
C38	952.00'	587.63'	35°21'59"	303.51	578.35'	S48°26'33"E

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JOHN T. DARNALL
REGISTERED LAND SURVEYOR
AGRICULTURE COMMERCE
TENNESSEE NO. 1571
2-17-17

TOLLGATE VILLAGE - PHASE 16

FOR

MBSC TN HOMEBUILDER, LLC

TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

REVISIONS
3. 02-17-2017 (AMR) REV. PER LOTS 1657, 1667, 1674-1676
2. 01-16-2017 (DDB) REV. PER STAFF COMMENTS
1. 09-14-2016 (AMR) REV. PER STAFF COMMENTS

JOB NO. 10-081
WK. ORDER 9260
APPROVED: JTD
DRAWN: AMR
SCALE: 1" = 50'
DATE: AUGUST 23, 2016

PRELIMINARY PLAT

GENERAL NOTES

1. SEE SHEET 1 OF 5 FOR NOTES, REFERENCES AND AREA TABLES.

LEGEND

■	MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")		FIRE HYDRANT
●	IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")		WATER VALVE
○	IRON ROD (OLD)		WATER METER
	CABLE TV BOX	—SA—	SANITARY SEWER LINE
E	ELECTRIC BOX	RCP	REINFORCED CONCRETE PIPE
	CATCH BASIN	M.T.E.M.C.E./ P.U.D.E.	MIDDLE TENN ELECTRIC MEMBERSHIP CORP EASEMENT/ PUBLIC UTILITY DRAINAGE EASEMENT
	SANITARY SEWER MANHOLE	R.O.W.	RIGHT-OF-WAY
	LIGHT STANDARD	M.B.S.L.	MINIMUM BUILDING SETBACK LINE
(XXX)	LOT NUMBER		CONCRETE SURFACE
R.O.W.	RIGHT-OF-WAY	R.O.W.C.T.	REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN
	DECIDUOUS TREE		15%-25% SLOPES
	EVERGREEN TREE		SLOPES IN EXCESS OF 25%
		*	CRITICAL LOT (SEE NOTE 12)

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

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	437.00'	375.59'	49°14'40"	200.28	364.14'	S51°17'23"E
C6	10.00'	16.02'	91°47'07"	10.32	14.36'	S23°58'55"W
C7	1223.00'	226.98'	10°38'02"	113.82	226.66'	N64°33'28"E
C8	25.00'	39.27'	90°00'00"	25.00	35.36'	N75°45'33"W
C9	1177.00'	203.44'	9°54'13"	101.98	203.19'	N64°11'33"E
C10	25.00'	35.69'	81°47'40"	21.65	32.74'	N21°58'39"E
C11	577.00'	217.20'	21°34'05"	109.90	215.92'	N29°42'14"W
C12	623.00'	222.99'	20°30'29"	112.70	221.81'	N29°10'26"W
C13	25.00'	44.44'	101°50'22"	30.78	38.81'	S69°50'22"E
C14	25.00'	42.57'	97°34'14"	28.54	37.61'	N67°42'18"W
C15	523.00'	489.72'	53°38'58"	264.47	472.02'	S45°44'40"E
C18	477.00'	456.62'	54°50'52"	247.51	439.38'	S46°20'37"E
C19	25.00'	34.10'	78°09'38"	20.30	31.52'	S20°09'38"W
C20	998.00'	341.35'	19°35'50"	172.36	339.69'	S40°33'28"E

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• www.ragansmith.com •

JOHN T. DARNALL REGISTERED LAND SURVEYOR TENNESSEE NO. 1571

TOLLGATE VILLAGE - PHASE 16
FOR
MBSC TN HOMEBUILDER, LLC
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

JOB NO. 10-081	WK. ORDER 9260
APPROVED:	JTD
DRAWN:	AMR
SCALE:	1" = 50'
DATE:	AUGUST 23, 2016

REVISIONS
3. 02-17-2017 (AMR) REV. PER LOTS 1657, 1667, 1674-1676
2. 01-16-2017 (DDB) REV. PER STAFF COMMENTS
1. 09-14-2016 (AMR) REV. PER STAFF COMMENTS

PRELIMINARY PLAT

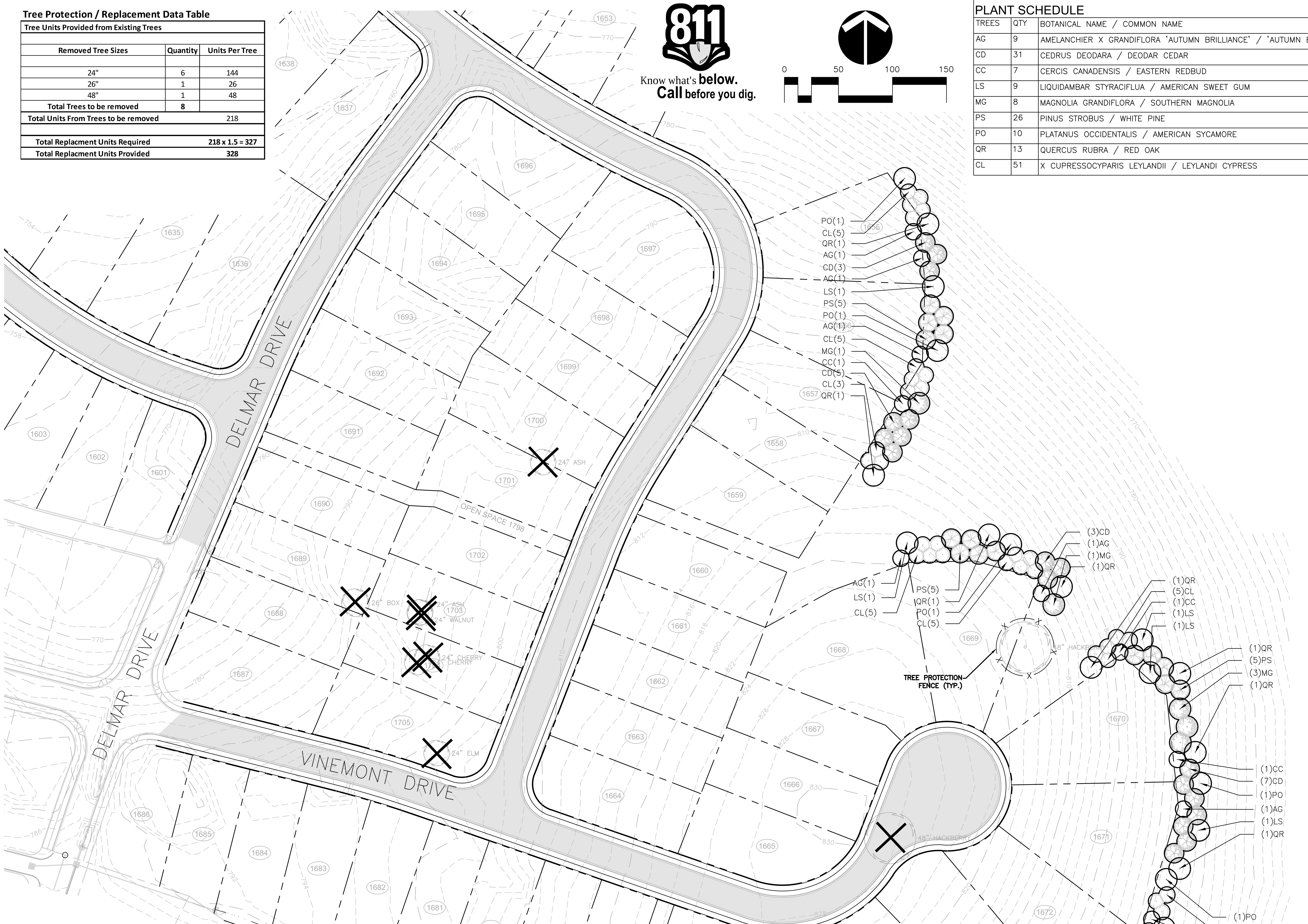
Tree Protection / Replacement Data Table

Tree Units Provided from Existing Trees		
Removed Tree Sizes	Quantity	Units Per Tree
24"	6	144
26"	1	26
48"	1	48
Total Trees to be removed	8	
Total Units From Trees to be removed		218
Total Replacment Units Required		218 x 1.5 = 327
Total Replacment Units Provided		328

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

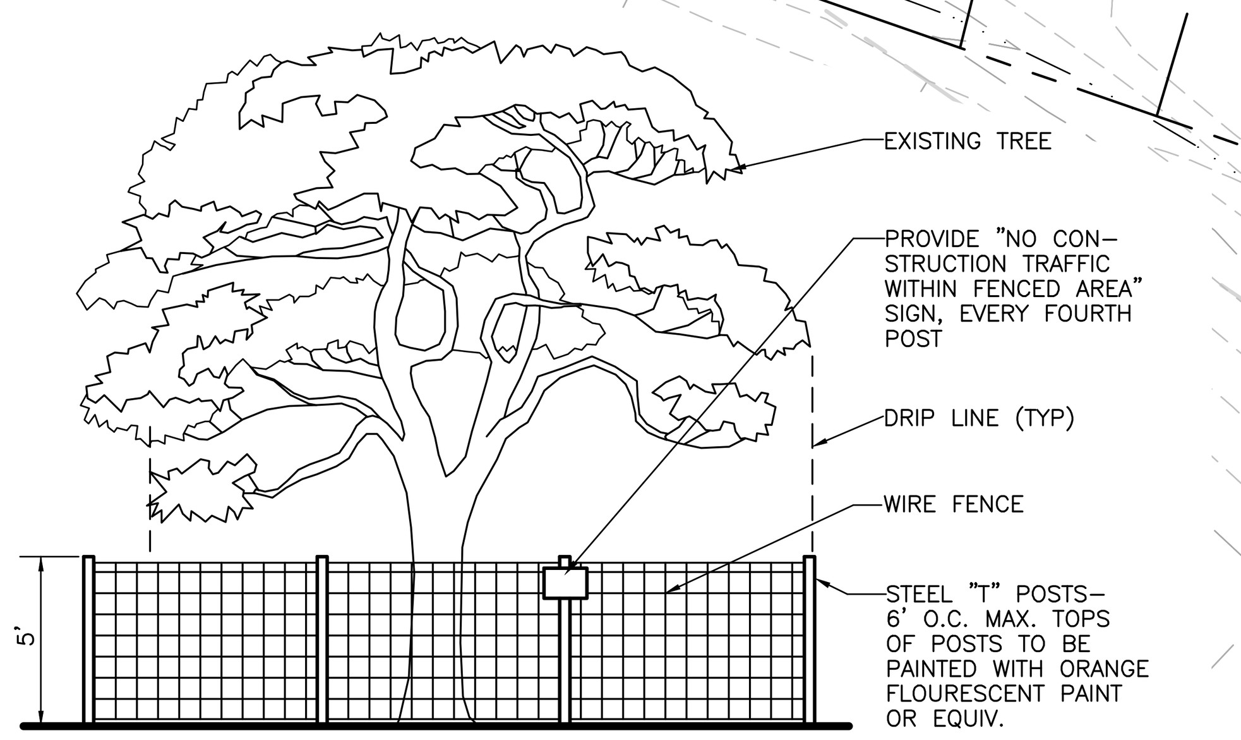
PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
AG	9	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' / 'AUTUMN BRILLIANCE' SERVICEBERRY	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CD	31	CEDRUS DEODARA / DEODAR CEDAR	EVERGREEN	2" CAL.	AS SHOWN	FULL TO BASE
CC	7	CERCIS CANADENSIS / EASTERN REDBUD	DECIDUOUS	2" CAL.	AS SHOWN	B&B
LS	9	LIQUIDAMBAR STYRACIFLUA / AMERICAN SWEET GUM	DECIDUOUS	2" CAL.	AS SHOWN	B&B
MG	8	MAGNOLIA GRANDIFLORA / SOUTHERN MAGNOLIA	EVERGREEN	2" CAL.	AS SHOWN	FULL TO BASE
PS	26	PINUS STROBUS / WHITE PINE	EVERGREEN	2" CAL.	AS SHOWN	FULL TO BASE
PO	10	PLATANUS OCCIDENTALIS / AMERICAN SYCAMORE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
QR	13	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CL	51	X CUPRESSOCYPARIS LEYLANDII / LEYLANDI CYPRESS	EVERGREEN	2" CAL.	AS SHOWN	FULL TO BASE



PLANTING NOTES

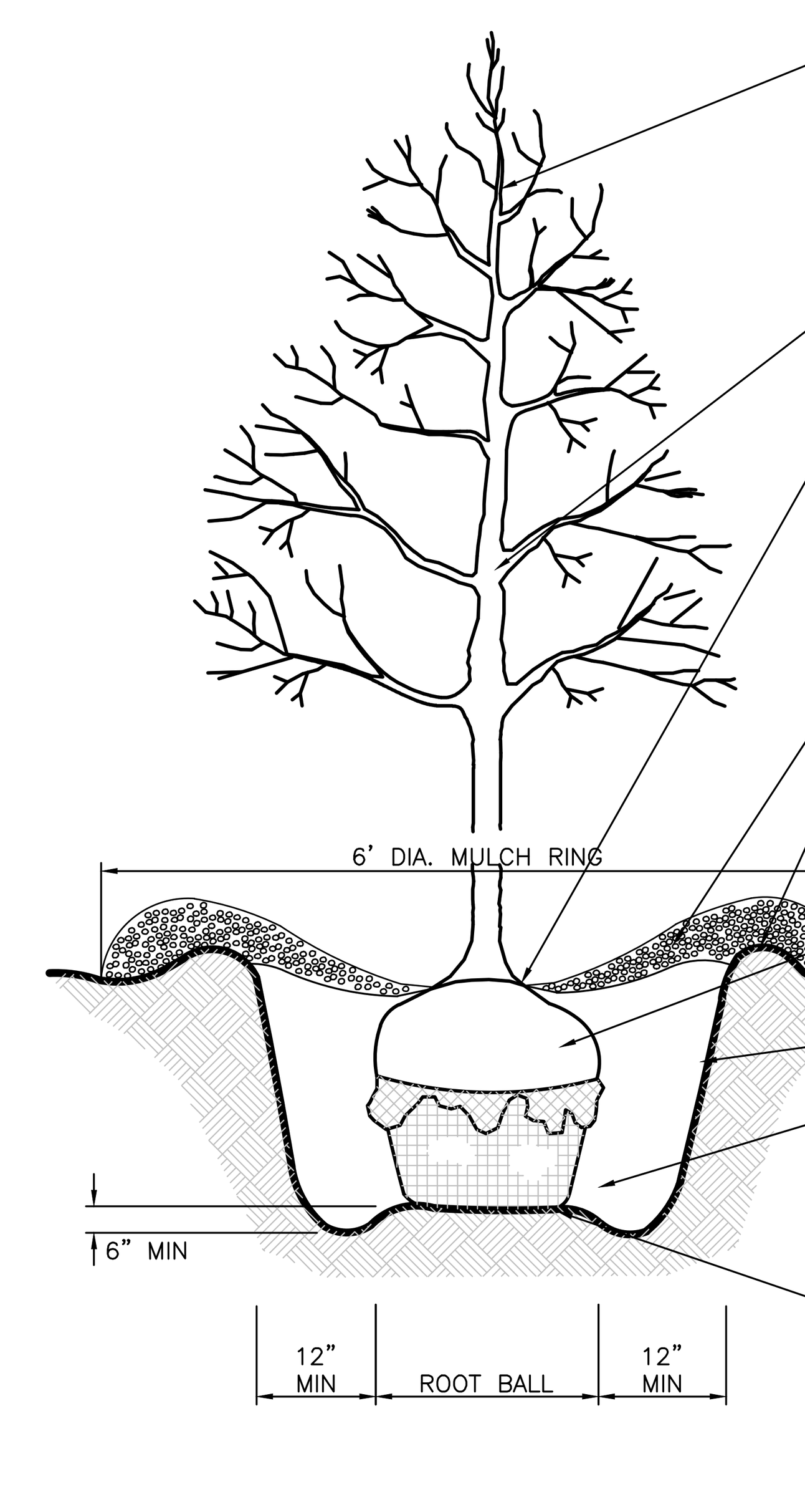
1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10–10–10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5–10–5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE–INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON–BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON–BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.



TREE PROTECTION DETAIL
NOT TO SCALE

NOTE:
POSTS TO BE PLACED AT 1.5 x DRIP LINE– SEE PLANS FOR FENCE LOCATION.

NOTE:
ALL TREE PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING PERMIT.



- DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO–DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.
- MARK THE NORTH SIDE OF THE TREE IN THE NURSERY, AND ROTATE TREE TO FACE NORTH AT THE SITE WHEN EVER POSSIBLE.
- EACH TREE MUST BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. NO MULCH SHALL BE WITHIN A MINIMUM OF 3" FROM THE TRUNK OF THE TREE. DO NOT COVER THE TOP OF ROOT BALL WITH SOIL. SET TOP OF ROOT BALL FLUSH TO GRADE OR 1–2" HIGHER IN SLOWLY DRAINING SOILS.
- 4" PINE STRAW MULCH, DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK.
- 3" RAISED EARTH RING
- REMOVE ALL TWINE, ROPE, WIRE, AND BURLAP FROM TOP ⅓ OF ROOT BALL.
- SCARIFY SIDES BEFORE PLANTING.
- TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE SO THAT ROOT BALL DOES NOT SHIFT. BACKFILL WITH TOPSOIL IN 9" LAYERS. WATER EACH LAYER UNTIL SETTLED. DO NOT TAMP AFTER WATERING.
- PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.

NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON–BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING
NOT TO SCALE

RAGAN • SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
NASHVILLE
315 WOODLAND STREET
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SECTION 16
CONSTRUCTION PLANS
THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

TOLLGATE Village

JOB NO.	WK. ORDER
10081	9260
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	1"=50'
DATE:	AUGUST 24, 2016

REVISIONS

TREE REMOVAL & LANDSCAPE PLAN

L1.1

TRAFFIC IMPACT STUDY

for

TOLLGATE VILLAGE

Thompson's Station, Tennessee

February 28, 2017

Prepared for:

MBSC TN HOMEBUILDERS, LLC
402 S. Gay Street, Suite 202
Knoxville, Tennessee 37902

Prepared by:

RAGAN-SMITH ASSOCIATES, INC.
315 Woodland Street, P.O. Box 60070
Nashville, Tennessee 37206-0070
(615) 244-8591

10-081 / 9260

TOLLGATE VILLAGE
TRAFFIC IMPACT STUDY

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EXECUTIVE SUMMARY

INTRODUCTION

Tollgate Village is located on the west side of Columbia Pike (US Highway 31 / State Route 6) between Independence High School and the West Harpeth River in the Town of Thompson's Station, Tennessee. The purpose of this traffic impact study is to review the access needs and roadway improvements for traffic mitigation at Tollgate Village.

BACKGROUND TRAFFIC

Based upon the proposed development schedule, the years 2020 and 2027 will be used to analyze the impact of Tollgate Village.

To establish background traffic growth, TDOT historical traffic data was obtained in the project vicinity. Traffic growth due to outside developments and general population growth was based upon linear regression analysis of the historical traffic count data. Background traffic growth was established by increasing existing traffic by ***3 percent annually*** for the period from 2016 to 2027.

SITE TRAFFIC

The traffic impact of Tollgate Village is based upon a calculation of the number of vehicle trips that will enter and/or exit the site. The analysis periods of this report are the a.m. and p.m. peak hours of a typical weekday. Therefore, trips were generated according to the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition*. The total estimated trip generation for Tollgate Village is shown in the table below.

TOTAL TRIP GENERATION: TOLLGATE VILLAGE

Land Use	Total Units	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Existing Development	-	4,258	82	228	310	161	150	311
Single Family Homes	277 homes	2,681	51	153	204	166	97	263
General Office	95,650 sf	1,269	163	22	185	28	137	165
Medical Office	19,000 sf	562	36	9	45	18	47	65
Retail	57,950 sf	2,517	--	--	--	71	90	161
Drug Store	12,900 sf	1,143	36	20	56	53	55	108
Sit-Down Restaurant	7,000 sf	890	42	34	76	41	28	69
Fast-Food Restaurant	3,900 sf	--	103	68	171	52	50	102
Assisted Living	120 beds	315	11	6	17	11	15	26
Hair Salon	1,400 sf	--	2	0	2	0	2	2
Veterinarian	2,140 sf	--	6	3	9	4	6	10
Bank	3,500 sf	--	--	--	--	19	23	42
Day Care Center	50 students	206	22	19	41	19	22	41
TOTAL		**13,841**	**554**	**562**	**1,116**	**643**	**722**	**1,365**

TRAFFIC ANALYSIS

The following public intersections were analyzed for capacity deficiencies and improvement needs:

- Columbia Pike at Tollgate Boulevard
- Columbia Pike at North Access
- Columbia Pike at Declaration Way
- Declaration Way at Branford Place

For these intersections, the following traffic scenarios were analyzed, where applicable:

- 2016 Existing Traffic
- 2020 Background Traffic
- 2020 Total Traffic that contains all traffic projected in the study area, including the completion of residential development at Tollgate Village
- 2027 Background Traffic
- 2027 Total Traffic that contains all traffic projected in the study area, including the full build-out of Tollgate Village

CONCLUSIONS AND RECOMMENDATIONS

General Recommendations

- One route of secondary access to Tollgate Village should be constructed and open to traffic prior to the final plat approval for Tollgate Village Section 16 or Section 17, whichever occurs first. If development in Tollgate Village occurs outside of Sections 15, 16, and 17, a route of secondary access should be constructed as part of that development.

- Additional routes of access or roadway/intersection improvements should be constructed and open to traffic based upon the estimated total trip generation for the existing and proposed development. Table 9 provides a summary of access scenarios and corresponding trip generation thresholds for each access scenario. A trip generation report, established using appropriate methodologies for internal trip capture and estimated based upon the current edition of the ITE Trip Generation Manual, should be provided with each proposed development in Tollgate Village. The total peak hour trip generation should not exceed the maximum trip generation for the applicable access scenario.

Columbia Pike at Tollgate Boulevard

- A traffic signal at Columbia Pike and Tollgate Boulevard should be installed concurrently with Tollgate Village Section 15. The existing northbound lanes that merge from two to one at Tollgate Boulevard should be extended approximately 300 feet north of Tollgate Boulevard to provide merging area downstream of the new traffic signal. The Tollgate Village developer has already completed design plans for a traffic signal including the extended northbound merge area at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.

- A southbound right turn lane on Columbia Pike with a turn lane length of 275 feet and a taper length of 100 feet should be installed concurrently with Tollgate Village Section 15. The Tollgate Village developer has already completed design plans for a southbound right turn lane at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.

Columbia Pike at North Access

- The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should be constructed as a three-lane roadway to support efficient future access.

- The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should operate as a right-in/right-out only access if Columbia Pike consists of a two-lane roadway to the north of Tollgate Village and across the West Harpeth River.

- The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should provide full turning movement access if Columbia Pike has been widened to consist of a five-lane roadway to the north of Tollgate Village and across the West Harpeth River.

- Future widening of Columbia Pike, presumably by TDOT, should provide the extension of the existing five-lane section north of Tollgate Village and across the West Harpeth River. The extension of this roadway section will provide a northbound left turn lane for the North Access to Tollgate Village.

- When the North Access to Tollgate Village is converted to provide full turning movement access, a southbound right turn lane should be constructed on Columbia Pike. The final design of the Columbia Pike widening, the West Harpeth River crossing, and impacts to adjacent utilities and floodways/floodplains should be considered when determining the feasibility and final design of this right turn lane.

- A TDOT highway entrance permit will be required in order to construct this access.

- A TDOT grading permit will be required for any turn lane or grading work completed in the right-of-way on Columbia Pike.

Columbia Pike at Declaration Way

- The existing southbound right turn lane on Columbia Pike should be extended to have a length of 500 feet with a taper length of 100 feet.

- Williamson County Schools should continue to utilize a traffic control officer to direct traffic at this intersection during peak arrival and dismissal periods. Based upon the high volume and peaking characteristics of the school traffic, a permanent traffic signal installation could be considered as an alternative to the continued use of a traffic control officer.

Declaration Way at South Access

- New pavement markings consistent with the MUTCD and public roadway standards should be installed on Declaration Way between Columbia Pike and the South Access.

- The intersection of Declaration Way and the South Access should operate as a two-way stop control intersection. The South Access should be the minor street with stop control and Declaration Way should be the major street without stop control.

I. INTRODUCTION

The purpose of this study is to assess the access needs and analyze the transportation related impacts due to the future development at the Tollgate Village community in the Town of Thompson's Station, Tennessee. Tollgate Village will include a mix of residential, retail, and office land uses at full build-out. This report has been requested by Town of Thompson's Station staff in order to address transportation impacts as part of preliminary and final plat reviews for residential sections of Tollgate Village.

In order to evaluate the Tollgate Village future development, an inventory of the existing transportation system was carried out, along with an assessment of its adequacy. Based on the project schedule, interim and final build-out horizon years were established and future traffic growth was added to existing traffic volumes. Transportation analyses were performed in order to evaluate project access alternatives and to assess any site or non-site related impacts on the system. Finally, recommendations for project access and roadway improvements were offered.

II. PROJECT DESCRIPTION

A. Existing Development

As shown in Figure 1, Tollgate Village is located on the west side of Columbia Pike (US Highway 31 / State Route 6) between Independence High School and the West Harpeth River in the Town of Thompson's Station, Tennessee. The Tollgate Village Concept Plan includes a total area of 345.9 acres. At the time that this traffic study was initiated and traffic counts were conducted, Tollgate Village consisted of the following land uses and units.

- 370 Single Family Homes
- 81 Condominiums/Townhomes
- 201 Apartment Units
- 30,000 sf General Office
- 46,800 sf Medical Office

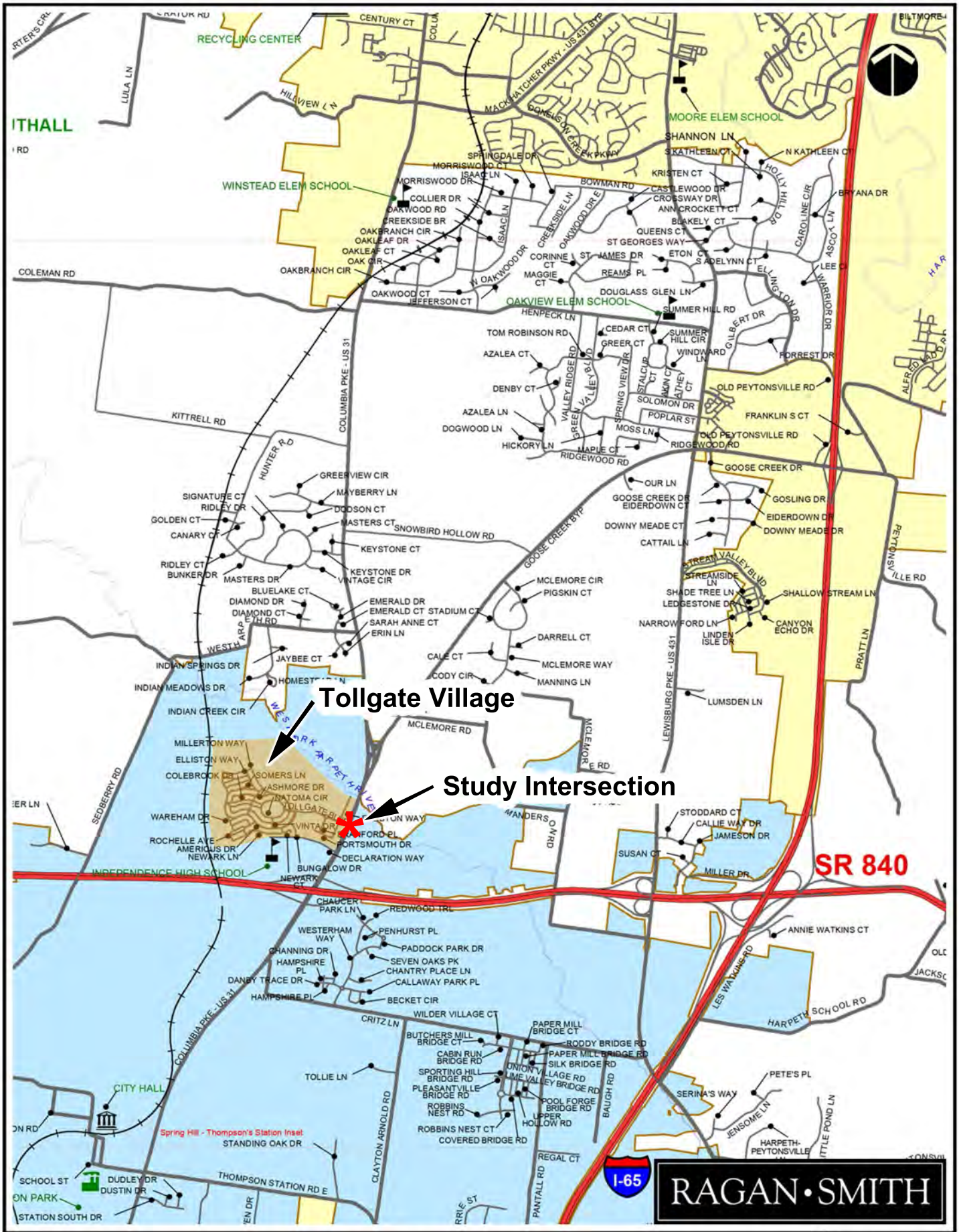
Figure 2 shows an aerial layout of Tollgate Village including a summary of the existing development.

B. Proposed Development

The sections of Tollgate Village that have not been developed include residential and commercial areas with the High Intensity Residential (D3) and Neighborhood Commercial (NC) zoning designations. These zoning districts are intended for higher density residential development and neighborhood commercial activities, small-scale businesses, and high intensity residential.

The remaining single-family residential areas at Tollgate Village consist of Sections 15, 16 and 17 that will include a total of 259 homes. Additionally, eighteen (18) homes in other completed sections of Tollgate Village were not complete at the time of this study and will be considered as part of the proposed development. Therefore, the remaining proposed single family residential development at Tollgate Village will consist of 277 homes.

For the purpose of assessing the future traffic impact of the commercial area at Tollgate Village, the Town of Thompson's Station Land Development Ordinance was used to identify potential allowable uses in order to establish a feasible development scenario for the commercial area. This scenario was established in order to estimate future traffic for analysis purposes only. It is not binding and does not restrict the uses and sizes of development in the commercial area. Development in the commercial area will be subject to the allowable uses and standards of the Town's Land Development Ordinance. An illustration of the possible development scenario is included in the appendix of this report.



Tollgate Village Location Map

Figure 1

VICINITY MAP
NOT TO SCALE

TOLLGATE VILLAGE
EXISTING UNIT COUNT - NOVEMBER 2016

	RECORDED	CONSTRUCTED
SINGLE FAMILY:	388	370
TOWNHOMES:	51	51
CONDOMINIUMS:	30	30
APARTMENTS:	201	201
TOTAL:	670	652
COMMERCIAL:	76,800 S.F.	76,800 S.F.

TOLLGATE Village

Town of Thompson's Station,
Williamson County, Tennessee

N

SCALE:1"=200'
January 20, 2017

RAGAN•SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
JOB NO: 10-081/9260

C. Project Access

Access to Tollgate Village includes an existing primary access and future, proposed secondary access as described below.

- Primary Access – Primary access to Tollgate Village is provided by Tollgate Boulevard. Tollgate Boulevard intersects Columbia Pike approximately 1,875 feet north of the State Route 840 interchange and approximately 1,900 feet south of the Goose Creek Bypass (State Route 248). Tollgate Boulevard consists of one (1) lane for traffic entering Tollgate Village and two (2) lanes for traffic exiting Tollgate Village. The exiting lane assignment on Tollgate Boulevard includes one (1) right turn lane and one (1) left turn lane with storage lengths of approximately 200 feet. This access is currently unsignalized and two-way stop control is in place at Columbia Pike.

- Secondary Access (North) – The Tollgate Village Concept Plan indicates that a secondary access to Columbia Pike will be located approximately 640 feet north of Tollgate Boulevard.

- Secondary Access (South) – The Tollgate Village Concept Plan includes a proposed connection to Declaration Way, the existing access drive to Independence High School. Access at this location will require an agreement with Williamson County Schools.

D. Phasing and Timing

The build-out of Tollgate Village is occurring in multiple phases with the development schedule largely influenced by market conditions. For the future traffic analysis in this report, it will be assumed that the residential sections are complete in the year 2020 and that full build-out of Tollgate Village occurs in the year 2027.

III. EXISTING CONDITIONS

A. Transportation System

The existing transportation system in the area that provides access to Tollgate Village consists of arterial, collector, and private roadways. The following roadways will comprise the study area for consideration of traffic mitigation measures at Tollgate Village.

- **Columbia Pike (US Highway 31 / State Route 6)** in the study area is classified as a minor arterial on the Tennessee Department of Transportation (TDOT) functional classification system and is listed as an arterial in the General Plan for Thompson's Station. The current Thompson's Station Road Map does not indicate a classification for Columbia Pike. The Columbia Pike corridor connects the Cities of Franklin and Columbia and passes through the Town of Thompson's Station and the City of Spring Hill. Within the vicinity of Tollgate Village, Columbia Pike transitions from a two-lane to a five-lane roadway between the West Harpeth River and Tollgate Boulevard. The five-lane section of Columbia Pike continues to the south beyond State Route 840. The posted speed limit on Columbia Pike is 45 mph.

- **Tollgate Boulevard** is listed as a collector roadway in the General Plan for Thompson's Station. The current Thompson's Station Road Map does not indicate a classification for Tollgate Boulevard. Tollgate Boulevard is two-lane roadway and provides primary access to Tollgate Village. Tollgate Boulevard ends within the Tollgate Village development and does not provide access to any area adjacent to or beyond the area included on the Tollgate Village concept plan. The posted speed limit on Tollgate Boulevard is 30 mph.

- **Independence High School Access** is a private drive providing access from Columbia Pike to Independence High School. This private drive generally consists of a three-lane section with one travel lane in each direction and a two-way continuous left turn lane. At Columbia Pike, a median and exclusive left and right turn lanes are provided.

Figure 1 shows the location of Tollgate Village and the intersection of Columbia Pike at Tollgate Boulevard. Figure 2 shows an aerial layout of the Tollgate Village community.

B. Traffic Volumes

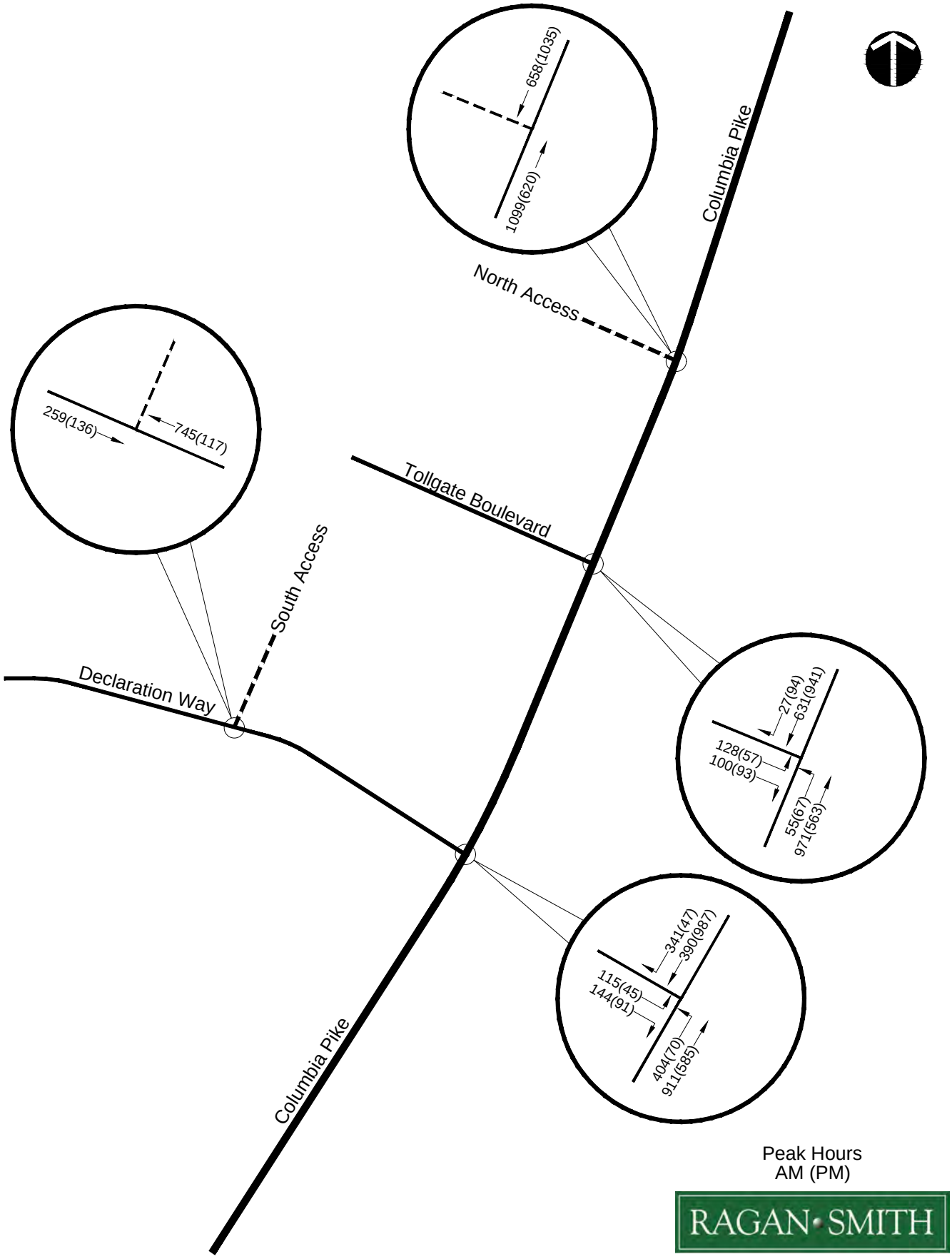
In order to assess the adequacy of the local transportation system, an evaluation of the current operational quality of intersections within the study area was required.

The peak hour of the adjacent street traffic was used to evaluate the traffic operations for access at Tollgate Village. In order to identify the peak periods for analysis, traffic counts were conducted in November 2016 and January 2017 at the following intersections:

- Columbia Pike at Tollgate Boulevard (November 2016)
- Columbia Pike at Declaration Way (January 2017)

The traffic counts at Columbia Pike and Tollgate Boulevard were conducted from 6:00 a.m. to 7:00 p.m. to identify the peak hour of traffic for analysis and to assess the need for a traffic signal based upon peak and non-peak traffic conditions. According to the traffic counts conducted on Columbia Pike at Tollgate Boulevard, the a.m. and p.m. peak hours for intersection analysis are ***6:45 a.m. – 7:45 a.m.***, and ***4:45 p.m. – 5:45 p.m.***, respectively.

Figure 3 shows the existing peak hour traffic volumes for the intersections in the study area.



Tollgate Village
Existing Traffic Volumes

Figure
3

IV. FORECASTED BACKGROUND TRAFFIC

A. Introduction

Based on the proposed development schedule, the years 2020 and 2027 will be used to analyze the traffic impact of Tollgate Village.

Before any impacts to the study area can be addressed, some estimate of background traffic volumes for the horizon years 2020 and 2027 must be established. Background traffic volumes were established by estimating potential growth due to small scale development and/or general population growth in the area.

B. Specific Development Growth

No specific, approved developments are located within the immediate study area on Columbia Pike.

C. Annual Growth

To establish traffic growth due to population growth or small scale development, Tennessee Department of Transportation (TDOT) historical traffic count data was obtained at locations within the general project vicinity. The TDOT historical traffic count data includes traffic volume counts conducted annually on Columbia Pike and the Goose Creek Bypass beginning in 1985. The available historical count data was tabulated for each location and analyzed to identify patterns or growth trends.

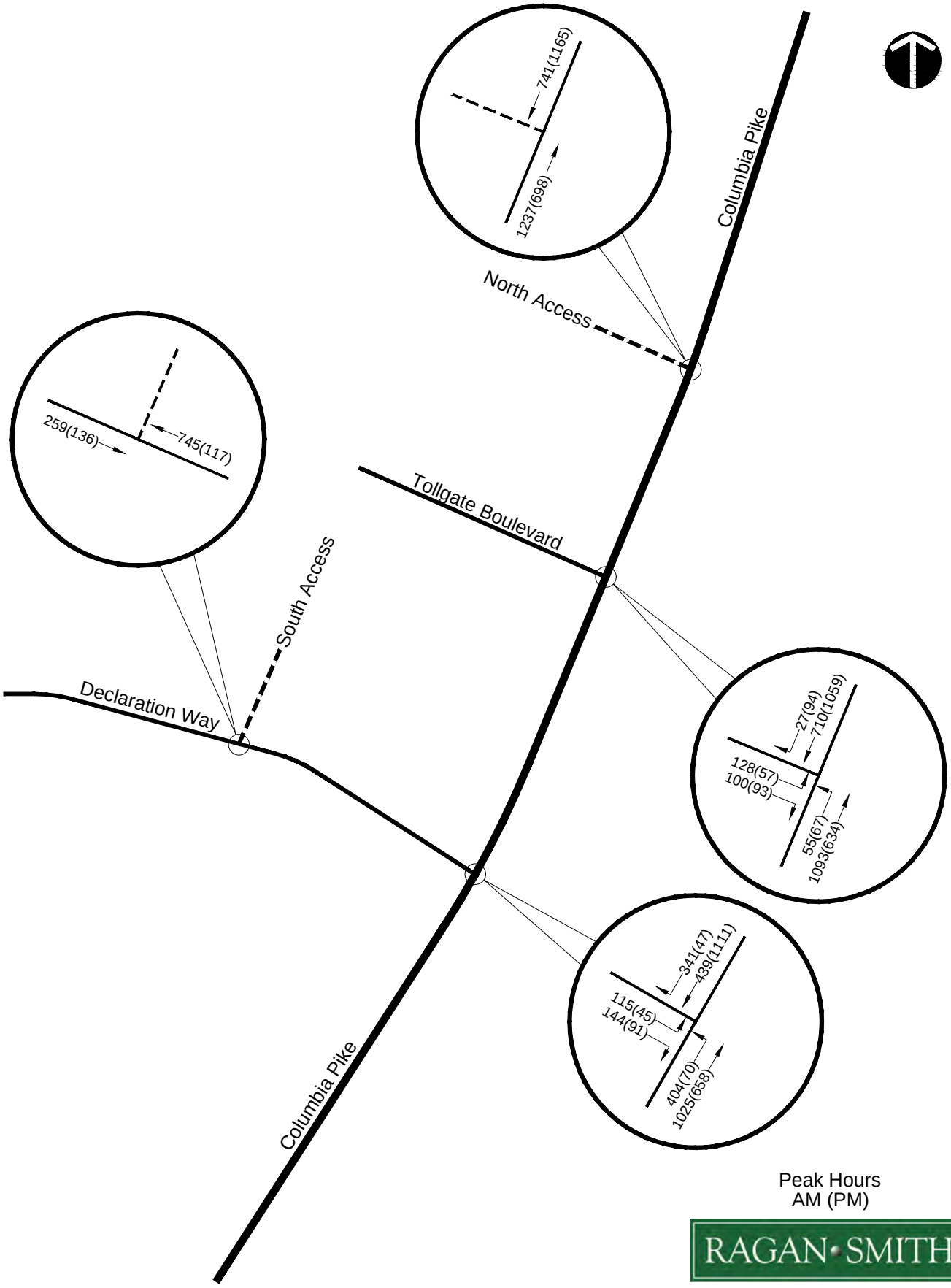
Based upon linear regression analysis of this data, we will use a ***3 percent annual growth rate*** as the base growth for the existing traffic volumes.

D. Background Traffic

Background traffic for the future traffic forecasts was compiled based on the following:

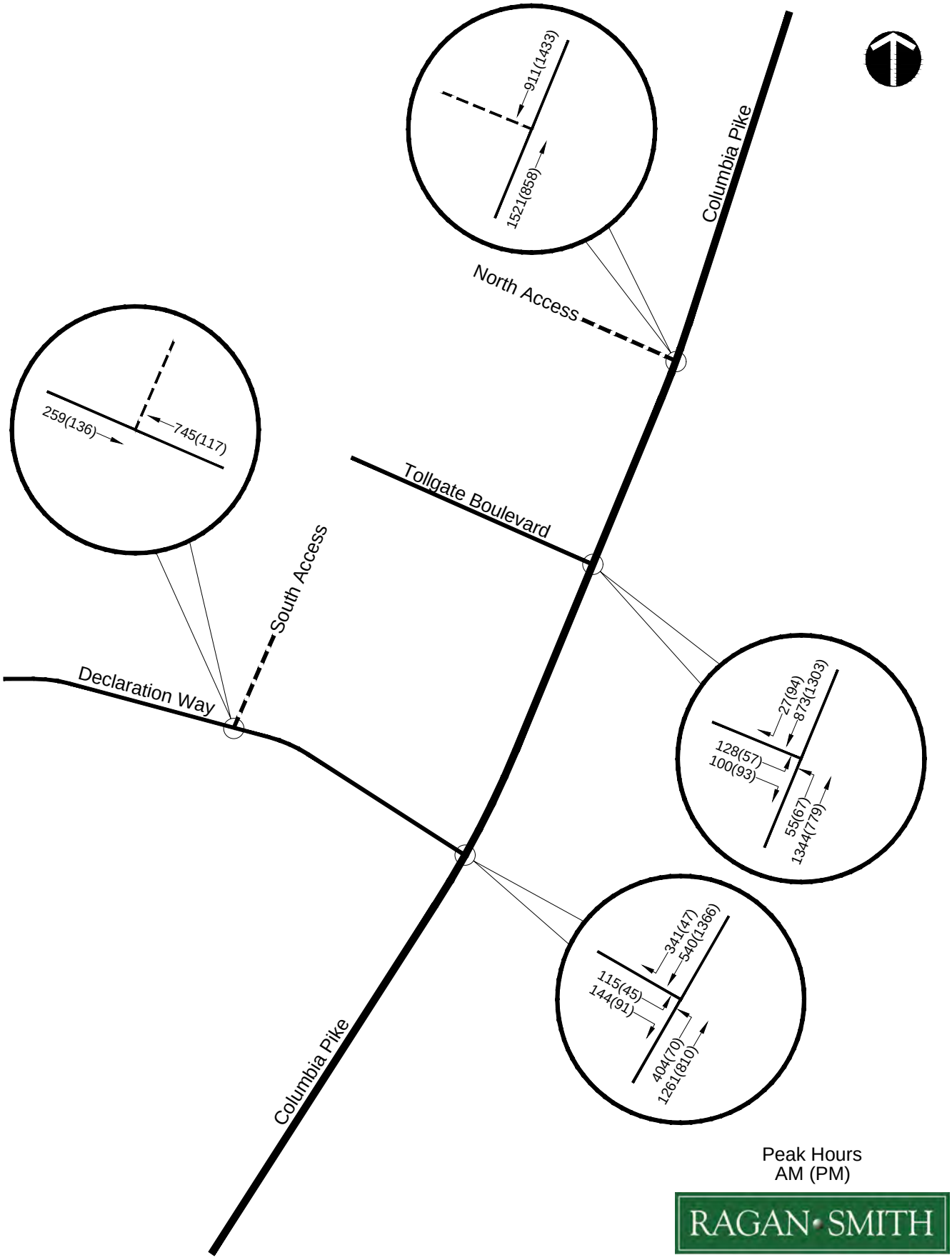
- 2016 existing traffic data
- 3% annual increase of traffic volumes for the period from 2016 to 2020
- 3% annual increase of traffic volumes for the period from 2016 to 2027

Background traffic volumes on the future roadway, representing existing traffic volumes plus background growth, for the year 2020 are shown in Figure 4. Background traffic volumes on the future roadway, representing existing traffic volumes plus background growth, for the year 2027 are shown in Figure 5.



Tollgate Village
2020 Background Traffic Volumes

Figure
4



Tollgate Village
2027 Background Traffic Volumes

Figure
5

V. PROPOSED SITE TRAFFIC

A. Site Trip Generation

In order to quantify site-related impacts within the study area, some estimates of site trip generation and traffic assignment had to be established. Trip generation rates for the development were established using information for the weekday a.m. and p.m. peak hour of the adjacent street as shown in the ITE *Trip Generation Manual, 9th Edition*. For this study, horizon year 2020 will include the completion of single family residential sections at Tollgate Village. Trip generation for the remaining single family homes at Tollgate Village is shown in Table 1.

TABLE 1

TRIP GENERATION: TOLLGATE VILLAGE 2020 HORIZON YEAR

Land Use	Total Units	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Single Family Homes	277 homes	2,681	51	153	204	166	97	263

As previously discussed, potential development in the commercial area at Tollgate Village was identified using the Town of Thompson's Station Land Development Ordinance to establish a feasible development scenario for the commercial area. This scenario was established in order to estimate future traffic for analysis purposes only. It is not binding and does not restrict the uses and sizes of development in the commercial area. Development in the commercial area will be subject to the allowable uses and standards of the Town's Land Development Ordinance. An estimate of trip generation for the remaining sections of Tollgate Village to reach full build-out, including the commercial area scenario based on the Town's Land Development Ordinance, is shown in Table 2.

TABLE 2

NEW TRIP GENERATION: TOLLGATE VILLAGE 2027 HORIZON YEAR

Land Use	Total Units	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Single Family Homes	277 homes	2,681	51	153	204	166	97	263
General Office	95,650 sf	1,269	163	22	185	28	137	165
Medical Office	19,000 sf	562	36	9	45	18	47	65
Retail	57,950 sf	2,517	--	--	--	71	90	161
Drug Store	12,900 sf	1,143	36	20	56	53	55	108
Sit-Down Restaurant	7,000 sf	890	42	34	76	41	28	69
Fast-Food Restaurant	3,900 sf	--	103	68	171	52	50	102
Assisted Living	120 beds	315	11	6	17	11	15	26
Hair Salon	1,400 sf	--	2	0	2	0	2	2
Veterinarian	2,140 sf	--	6	3	9	4	6	10
Bank	3,500 sf	--	--	--	--	19	23	42
Day Care Center	50 students	206	22	19	41	19	22	41
TOTAL		**9,583**	**472**	**334**	**806**	**482**	**572**	**1,054**

Table 3 below shows the trips generated by the existing sections of Tollgate Village and the total trip generation estimates for the remaining undeveloped sections of Tollgate Village.

TABLE 3

TOTAL TRIP GENERATION: TOLLGATE VILLAGE

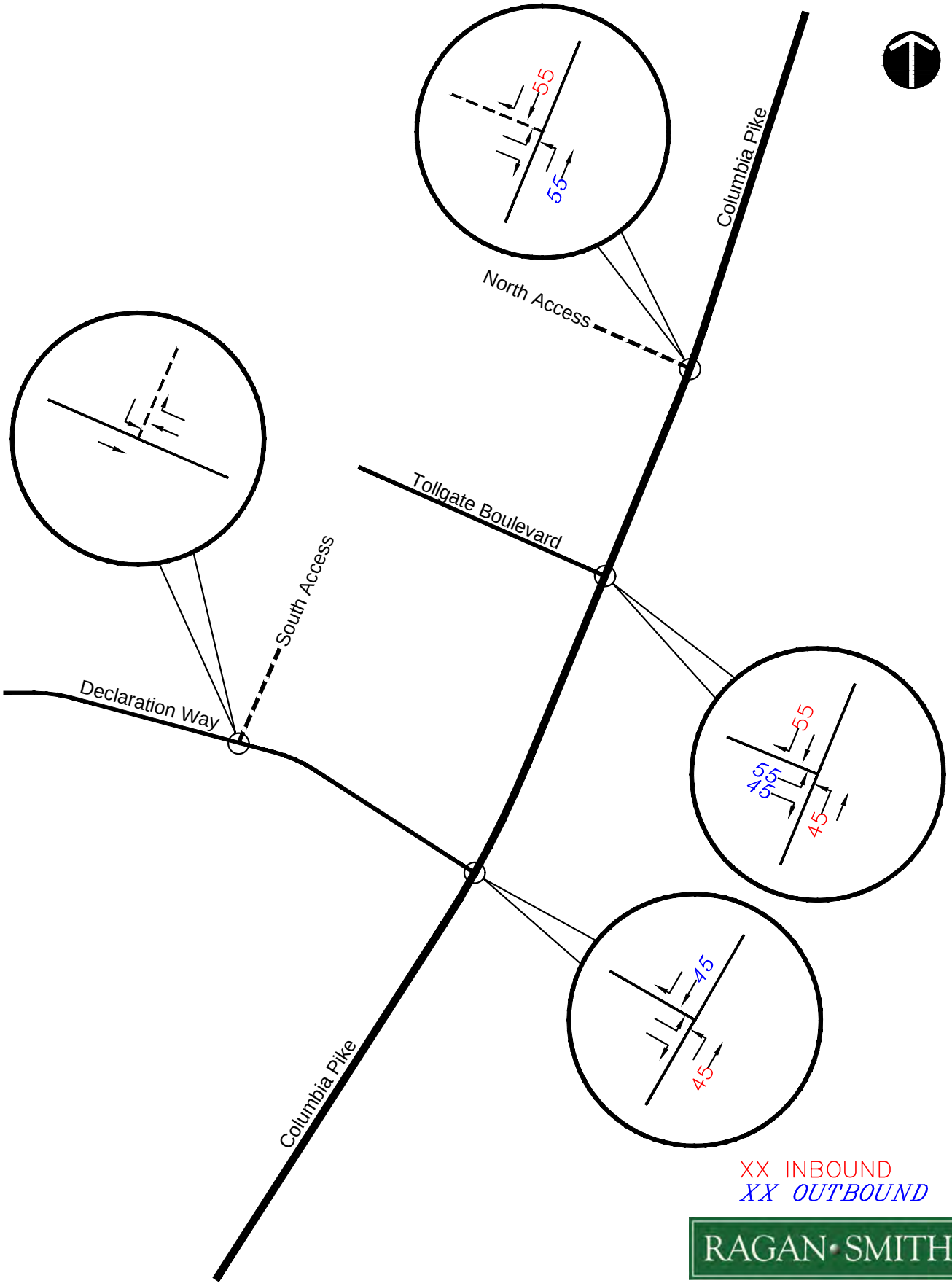
Land Use	Total Units	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Existing Development	-	4,258	82	228	310	161	150	311
Single Family Homes	277 homes	2,681	51	153	204	166	97	263
General Office	95,650 sf	1,269	163	22	185	28	137	165
Medical Office	19,000 sf	562	36	9	45	18	47	65
Retail	57,950 sf	2,517	--	--	--	71	90	161
Drug Store	12,900 sf	1,143	36	20	56	53	55	108
Sit-Down Restaurant	7,000 sf	890	42	34	76	41	28	69
Fast-Food Restaurant	3,900 sf	--	103	68	171	52	50	102
Assisted Living	120 beds	315	11	6	17	11	15	26
Hair Salon	1,400 sf	--	2	0	2	0	2	2
Veterinarian	2,140 sf	--	6	3	9	4	6	10
Bank	3,500 sf	--	--	--	--	19	23	42
Day Care Center	50 students	206	22	19	41	19	22	41
TOTAL		**13,841**	**554**	**562**	**1,116**	**643**	**722**	**1,365**

B. Site Trip Distribution and Assignment

Site trips were distributed based primarily upon the prevalent commuter patterns in the area and the proximity and routes to major transportation facilities. Figures 6 and 7 show the distribution of residential and commercial site trips, respectively, for Tollgate Village.

Site traffic volumes generated by future sections of Tollgate Village in the horizon year 2020 are shown in Figure 8. The accumulation of existing, background growth, and site-generated traffic for the horizon year 2020 is shown in Figure 9.

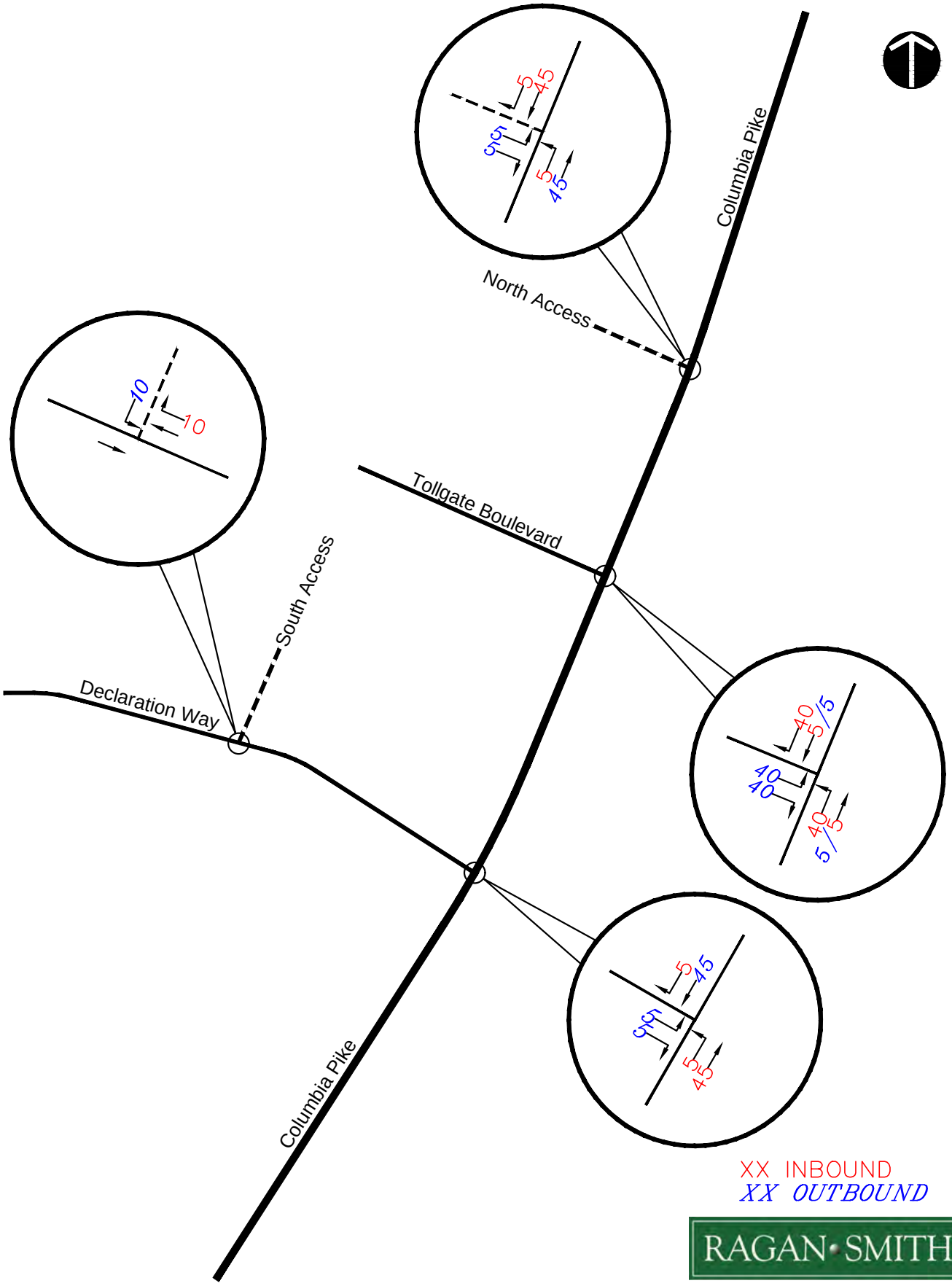
Site traffic volumes generated by future sections of Tollgate Village in the horizon year 2027 are shown in Figure 10. The accumulation of existing, background growth, and site-generated traffic for the horizon year 2027 is shown in Figure 11.



RAGAN·SMITH

Tollgate Village
Site Trip Distribution - Residential

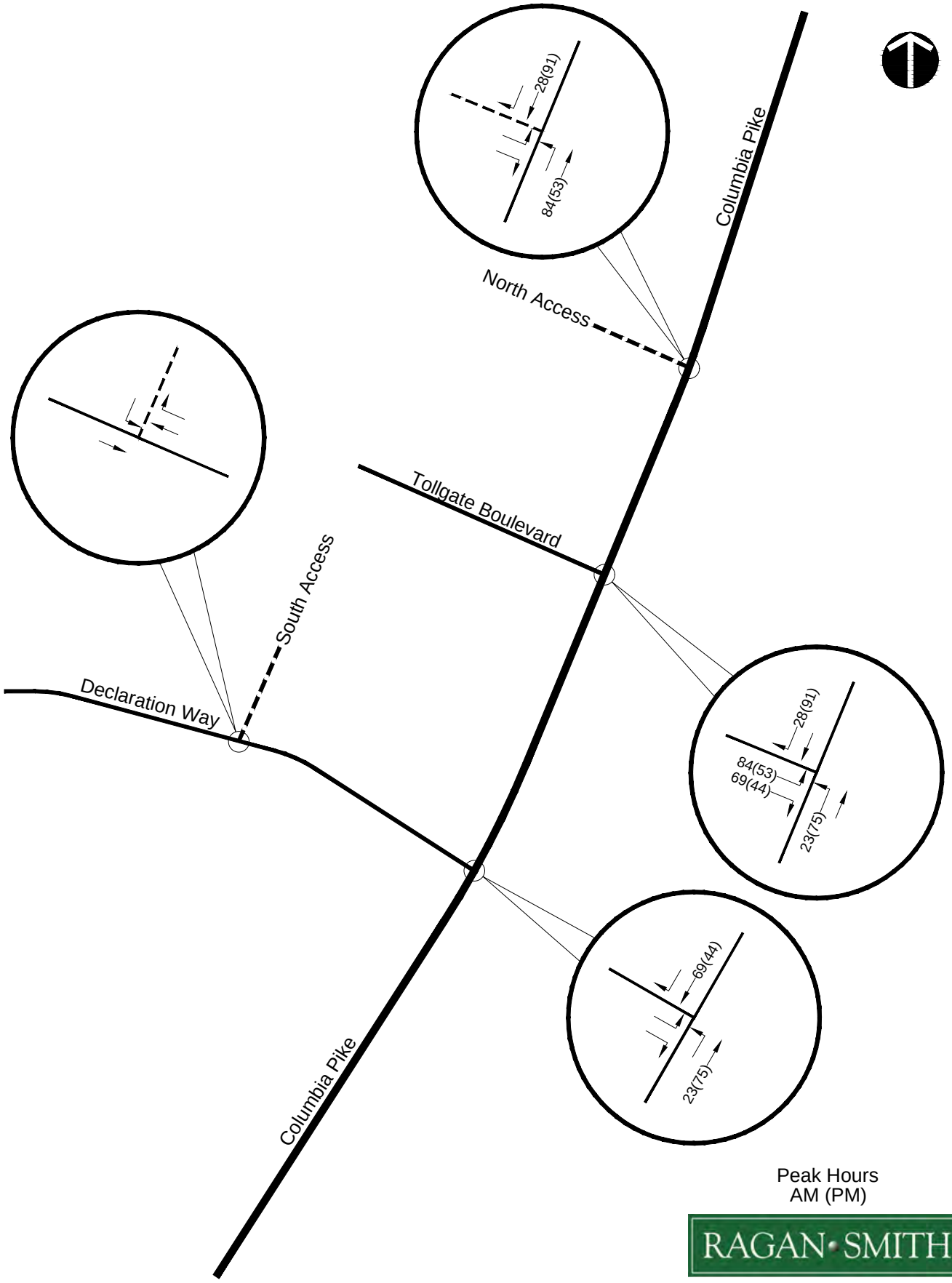
Figure
6



RAGAN·SMITH

Tollgate Village
Site Trip Distribution - Commercial

Figure
7

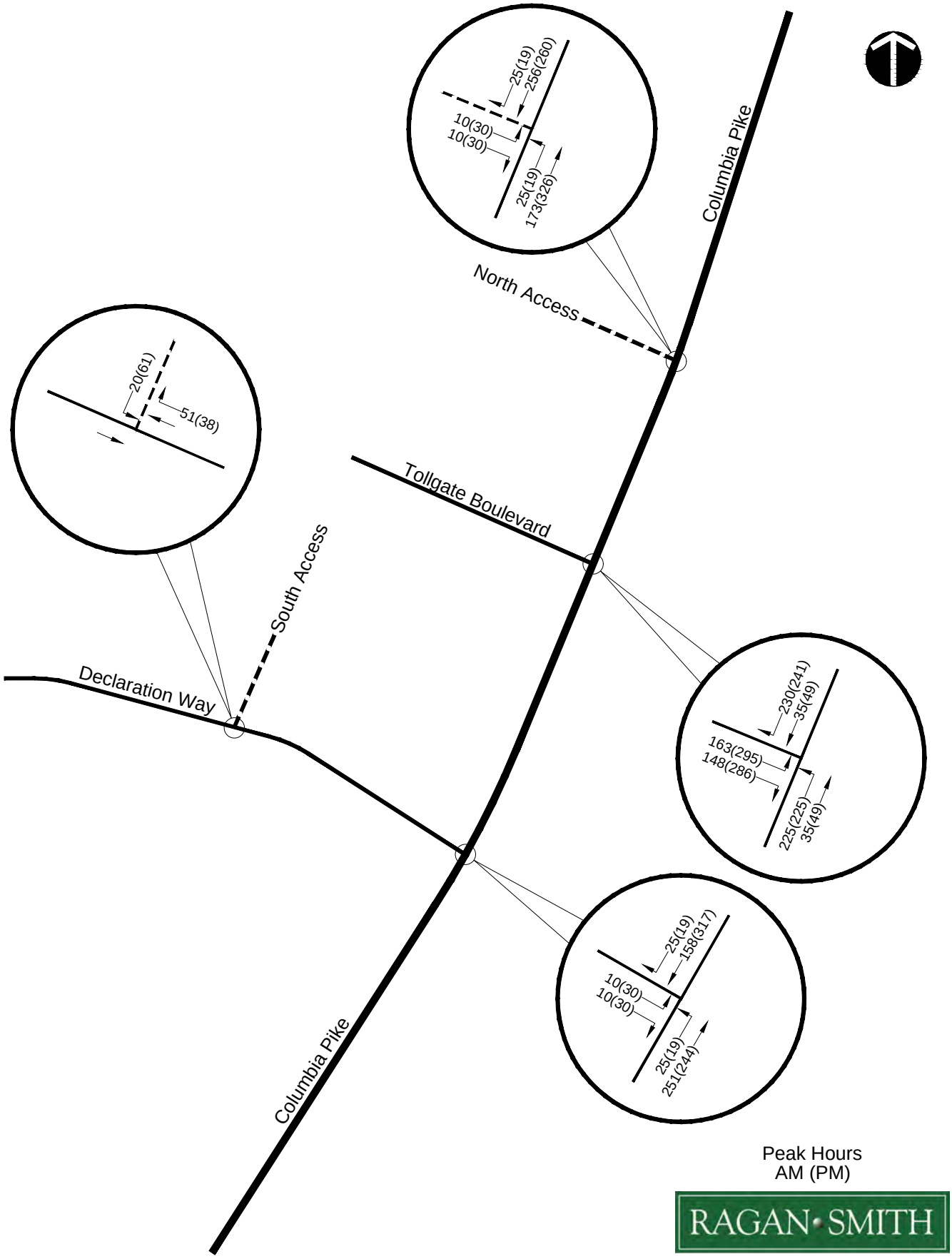


Peak Hours
AM (PM)

RAGAN·SMITH

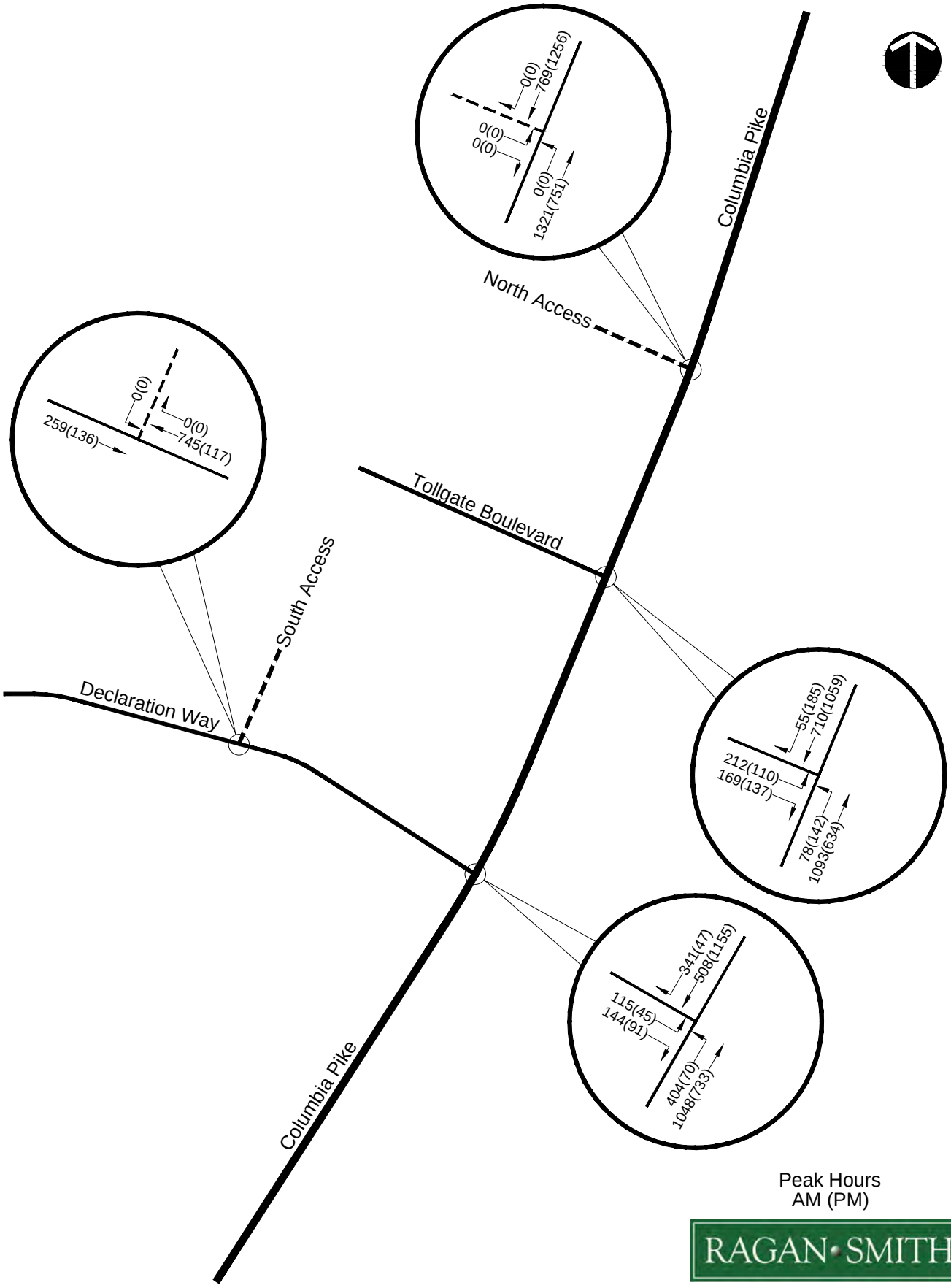
Tollgate Village
2020 Site Traffic Volumes

Figure
8



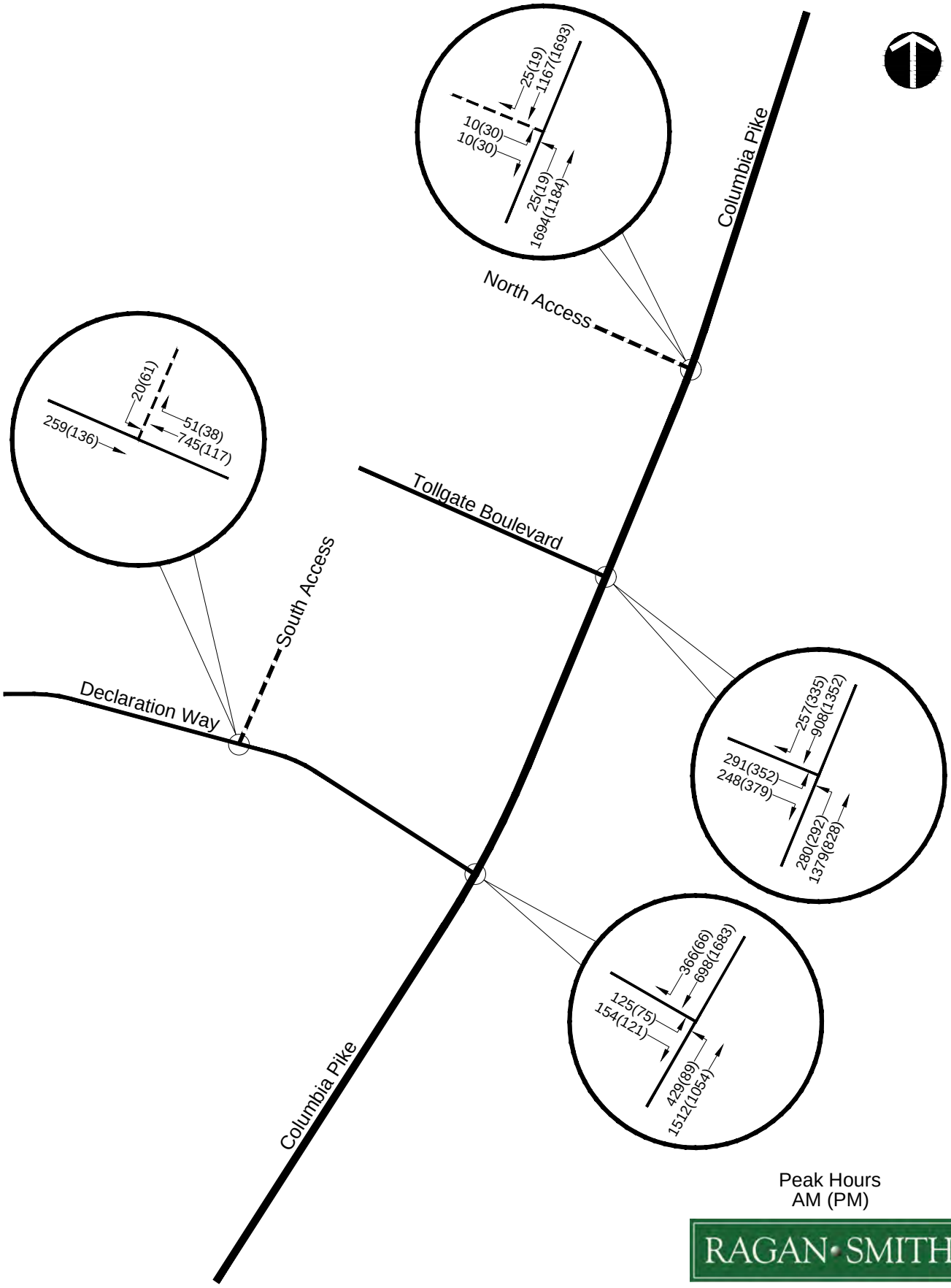
Tollgate Village
2027 Site Traffic Volumes

Figure
9



Tollgate Village
2020 Total Traffic Volumes

Figure
10



Tollgate Village
2027 Total Traffic Volumes

Figure
11

VI. TRANSPORTATION ANALYSIS

A. Intersection Capacity Analysis

In order to determine the quality of existing traffic operations and identify capacity deficiencies, intersection capacity analyses were conducted at the following intersections.

- Columbia Pike at Tollgate Boulevard
- Columbia Pike at North Access
- Columbia Pike at Declaration Way
- Declaration Way at Branford Place

Capacity analyses were conducted according to the methodology and procedures outlined in the *Highway Capacity Manual*, HCM 2010, published by Transportation Research Board. Capacity analysis results for the a.m. peak hour are shown in Table 4.

TABLE 4

INTERSECTION CAPACITY ANALYSIS RESULTS – A.M. PEAK HOUR

Intersection	Condition[(1)]	Level of Service (avg. delay/vehicle – sec.)					
		Existing		2020 Horizon		2027 Horizon	
		TWSC [(1)]	Signal	Back-ground	Total	Back-ground	Total
Columbia Pike at Tollgate Boulevard	NB Left	A(9.6)	A(6.5)	A(6.1)	A(8.9)	A(6.4)	D(54.2)
	NB Thru	-	A(4.9)	A(8.2)	B(10.6)	A(9.0)	B(15.3)
	SB Thru	-	A(9.4)	B(18.9)	C(22.4)	B(19.0)	D(44.5)
	SB Right	-	A(3.6)	A(1.0)	A(0.8)	A(0.8)	A(4.6)
	EB Left	F(131.2)	C(26.7)	C(30.7)	C(34.7)	D(36.9)	E(69.4)
	EB Right	B(12.1)	C(22.1)	A(7.8)	B(11.0)	B(11.9O)	C(24.7)
	Overall Intersection	-	A(8.9)	B(13.5)	B(16.7)	B(14.4)	C(31.6)
Columbia Pike at North Access	NB Left	-	-	-	-	-	B(12.1)
	TWSC EB Left	-	-	-	-	-	D(34.5)
	TWSC EB Right	-	-	-	-	-	B(14.0)
	NB Left	F(232.1)	-	F(232.1)	F(232.1)	F(232.1)	F(267.9)
	TWSC EB Left	F(93.4)	-	F(93.4)	F(93.4)	F(93.4)	F(105.7)
	TWSC EB Right	F(180.5)	-	F(180.5)	F(180.5)	F(180.5)	F(208.8)
Declaration Way at Branford Place	EB Left	-	-	-	-	-	A(0.0)
	TWSC SB Left	-	-	-	-	-	C(16.3)
	TWSC SB Right	-	-	-	-	-	A(0.0)

[(1)] TWSC = Two-way Stop Control (Existing Control)

Capacity analysis results for the p.m. peak hour are shown in Table 5.

TABLE 5

INTERSECTION CAPACITY ANALYSIS RESULTS – P.M. PEAK HOUR

Intersection	Condition[1]	Level of Service (avg. delay/vehicle – sec.)					
		Existing		2020 Horizon		2027 Horizon	
		TWSC [1]	Signal	Back-ground	Total	Back-ground	Total
Columbia Pike at Tollgate Boulevard	NB Left	B(11.5)	A(7.1)	A(4.7)	A(8.7)	A(4.7)	E(64.3)
	NB Thru	-	A(3.8)	A(4.5)	A(5.0)	A(4.3)	B(11.4)
	SB Thru	-	B(10.0)	B(18.2)	C(22.6)	B(18.1)	D(48.7)
	SB Right	-	A(4.2)	A(1.1)	A(1.2)	A(0.9)	A(4.5)
	EB Left	E(37.3)	C(21.8)	C(28.9)	D(35.9)	C(34.7)	E(76.7)
	EB Right	B(14.5)	C(20.2)	A(7.5)	A(9.7)	A(8.7)	C(30.1)
	Overall Intersection	-	A(8.6)	B(12.2)	B(14.7)	B(12.4)	D(37.7)
Columbia Pike at North Access	NB Left	-	-	-	-	-	C(16.6)
	TWSC EB Left	-	-	-	-	-	F(67.2)
	TWSC EB Right	-	-	-	-	-	C(19.7)
Columbia Pike at Declaration Way	NB Left	B(11.5)	-	B(12.5)	B(12.8)	C(15.1)	C(22.1)
	TWSC EB Left	E(41.2)	-	F(54.6)	F(63.9)	F(111.8)	F(724.3)
	TWSC EB Right	C(17.2)	-	C(19.9)	C(20.9)	D(27.5)	F(90.8)
Declaration Way at Branford Place	EB Left	-	-	-	-	-	A(0.0)
	TWSC SB Left	-	-	-	-	-	B(10.5)
	TWSC SB Right	-	-	-	-	-	A(0.0)

[1] TWSC = Two-way Stop Control (Existing Control)

Level of service (LOS) criteria for unsignalized intersections is shown in Table 6.

TABLE 6		
LEVEL OF SERVICE DESCRIPTIONS FOR UNSIGNALIZED INTERSECTIONS		
Level of Service	**Description**	**Control Delay (sec. /veh.)**
A	Usually no conflicting traffic	0 - 10
B	Occasionally some delay due to conflicting traffic	> 10 - 15
C	Delay is noticeable but not inconveniencing	> 15 - 25
D	Delay is noticeable and irritating, increased risk taking	> 25 - 35
E	Delay approaches tolerance level, risk taking likely	> 35 - 50
F	Delay exceeds tolerance level, high likelihood of risk taking	> 50
Source: Highway Capacity Manual, HCM 2010		

Level of service (LOS) criteria for signalized intersections is shown in Table 7.

TABLE 7		
LEVEL OF SERVICE DESCRIPTIONS FOR SIGNALIZED INTERSECTIONS		
Level of Service	**Description**	**Control Delay (sec. /veh.)**
A	Volume-to-capacity ratio is low, progression is extremely favorable, most vehicles travel through intersection without stopping.	0 - 10
B	Volume-to-capacity ratio is low, progression is good and/or short cycle lengths is present, more vehicles stop than for LOS A.	> 10 – 20
C	Progression is favorable and/or cycle length is moderate, number of vehicles stopping is significant although many still pass through intersection without stopping.	> 20 – 35
D	Volume-to-capacity ratio is high, progression is ineffective, cycle length is long, many vehicles stop.	> 35 – 55
E	Volume-to-capacity ratio is high, progression is unfavorable, cycle length is long, many vehicles stop.	> 55 – 80
F	Volume-to-capacity ratio is very high, progression is very poor, cycle length is long, most cycles fail to clear the queue.	> 80
Source: Highway Capacity Manual, HCM 2010		

B. Traffic Signal Warrants

In order to assess the need for a traffic signal at the intersection of Columbia Pike at Tollgate Boulevard, existing intersection conditions were checked against specific warrants found in the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD). The purpose of the signal warrants is to consider factors related to the operation and safety of the intersection and the potential to improve these conditions. The MUTCD provides guidance that a traffic signal should not be installed unless one or more of the signal warrants are satisfied. The nine (9) MUTCD traffic signal warrants are listed below.

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

Warrant 1 (Eight-Hour Vehicular Volume) and Warrant 2 (Four-Hour Vehicular Volume) were specifically considered in this study as they are applicable to the study area and Tollgate Village development. Additionally, the availability of the traffic volume data allows an evaluation of Warrant 3 (Peak Hour) to be completed. The traffic data checked against the signal warrants includes 2016 existing counted traffic volumes. A description of each of the MUTCD traffic signal warrants and statement of its applicability to this study is shown below.

- **Warrant 1, Eight-Hour Vehicular Volume**
  The intended application of this warrant is at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal or where the traffic volume on a major street is so heavy that traffic on a minor intersecting street experiences significant delay or conflict when entering or crossing the major street.

  This warrant is applicable to the evaluation of the subject intersection and will be reviewed further in this study.

- **Warrant 2, Four-Hour Vehicular Volume**
  This warrant is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

  This warrant is applicable to the evaluation of the subject intersection and will be reviewed further in this study.

- **Warrant 3, Peak Hour**
  This warrant is intended for use at a location where traffic conditions cause minor-street traffic to suffer undue delay when entering or crossing the major street for a minimum of 1 hour of an average day. This signal warrant is generally applied only in specific locations that attract or discharge large numbers of vehicles over a short time.

  This warrant may not be applicable due to the trip generation characteristics of the residential land uses. However, since traffic volumes are available at the subject intersection this warrant will be reviewed further in this study.

- **Warrant 4, Pedestrian Volume**
  This warrant is intended to be used where a high traffic volume on the major street causes pedestrians excessive delay when crossing the major street.

  This warrant is not applicable at the subject intersection because there are no pedestrian facilities located on Columbia Pike and no pedestrians were observed crossing Columbia Pike during the traffic count collection. This warrant will not be reviewed further in this study.

- **Warrant 5, School Crossing**
  The School Crossing signal warrant should be evaluated where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

  The nearest school to the study area is located 0.2 miles away but there is no crossing for school children on Columbia Pike at the subject intersection or at the school access. Therefore, this warrant is not applicable at the subject intersection and will not be reviewed further in this study.

- **Warrant 6, Coordinated Signal System**
  This warrant is intended to be used where a coordinated signal system is in place and sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

  The Town of Thompson's Station and the City of Spring Hill have a coordinated signal system that begins approximately 2.5 miles south of the subject intersection. Two existing traffic signals and one planned traffic signal are located between the coordinated signal system and the subject intersection. This warrant is not applicable at the subject intersection and will not be reviewed further in this study.

- **Warrant 7, Crash Experience**
  The Crash Experience signal warrant is intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

  Based upon a Road Safety Audit Report prepared by TDOT in 2015, the crash experience data for the subject intersection does not meet the minimum criteria for application of this warrant. Therefore, this warrant will not be reviewed further in this study.

- **Warrant 8, Roadway Network**
  This warrant is intended for use when installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network.

  This warrant is not applicable at the project intersection and will not be reviewed further in this study.

- **Warrant 9, Intersection Near a Grade Crossing**
  The Intersection Near a Grade Crossing signal warrant is intended for use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal.

  This warrant is not applicable at the project intersection and will not be reviewed further in this study.

The existing laneage and traffic volumes at the intersection of Columbia Pike and Tollgate Boulevard were compared to the traffic signal criteria shown in the MUTCD. As provided for in the MUTCD, the right-turn traffic on the minor street (Tollgate Boulevard) at this intersection was reduced since right-turn movements can experience less delay than left-turn or through movements when a separate right turn lane is provided. The right turn volume reduction was determined based upon the method presented in the National Cooperative Highway Research Program (NCHRP) Report 457, *Evaluating Intersection Improvements: An Engineering Study Guide*, which considers the major street traffic that conflicts with the right-turn movement, the number of lanes serving the conflicting volume, and the geometry of the minor street approach. The NCHRP Report 457 analysis indicated that all right turn movements on Tollgate Boulevard should be subtracted for each hour evaluated.

The existing traffic data and a summary of the signal warrant evaluation results for the intersection of Columbia Pike at Tollgate Boulevard are shown below in Table 8.

TABLE 8

TRAFFIC SIGNAL WARRANT SUMMARY

COLUMBIA PIKE AT TOLLGATE BOULEVARD

Time Period	Major Street Volume (Existing)	Minor Street Volume (Existing)	Traffic Signal Warrant				
			#1			#2	#3B
			Cond. A (70%)	Cond. B (70%)	Combination (56%)	70%	70%
6 a.m. – 7 a.m.	1,282	101		X	X	X	X
7 a.m. - 8 a.m.	1,597	125	X	X	X	X	X
8 a.m. - 9 a.m.	1,285	106	X	X	X	X	X
9 a.m. - 10 a.m.	994	77		X		X	
10 a.m. - 11 a.m.	961	57		X			
11 a.m. - 12 p.m.	931	75		X		X	
12 p.m. - 1 p.m.	968	48					
1 p.m. - 2 p.m.	1,067	32					
2 p.m. - 3 p.m.	1,312	54		X			
3 p.m. - 4 p.m.	1,435	46					
4 p.m. - 5 p.m.	1,624	48					
5 p.m. - 6 p.m.	1,580	53		X			
No. of Hours that Warrant is Satisfied			2	8	3	5	3
Minimum Hours to Satisfy Warrant			8	8	8	4	1
Is Warrant Met?			**YES**			**YES**	**YES**

As shown by the data presented in Table 8, the MUTCD traffic signal warrants at the intersection of Columbia Pike and Tollgate Boulevard are satisfied. This is an indication that traffic signal control is justified based upon the traffic volumes at the intersection.

C. Interim Analysis Thresholds

The development of Tollgate Village will occur in phases and the connections to Columbia Pike to the north of Tollgate Boulevard and to the south via Declaration Way will occur as this development activity progresses. An evaluation of different access scenarios was completed

to determine logical thresholds, or triggers, for when additional access or improvements should be provided. The triggers were established based upon the total peak hour trip generation that can be served by the evaluated access scenario. Table 9 below summarizes the access and improvement scenarios and corresponding total peak hour trip generation triggers.

TABLE 9

TRIP GENERATION AND SITE ACCESS/IMPROVEMENT TRIGGERS

Access Status			Maximum Total Trip Generation	
Tollgate Blvd Access	**North Access**	**South Access**	**A.M. Peak Hour**	**P.M. Peak Hour**
Signalized	RI/RO Only	No	1,111	1,380
Signalized	RI/RO Only	Open	1,182	1,418
Signalized	No	Open	1,147	1,369
Signalized	Full Access	No	1,146	1,399
Signalized	Full Access	Open	1,217	1,437

VII. CONCLUSIONS AND RECOMMENDATIONS

A. Introduction

Based upon a review of the existing and future proposed conditions within the study area, we offer the recommendations shown below. Figure 12 illustrates a summary of these recommendations.

B. General Recommendations

- One route of secondary access to Tollgate Village should be constructed and open to traffic prior to the final plat approval for Tollgate Village Section 16 or Section 17, whichever occurs first. If development in Tollgate Village occurs outside of Sections 15, 16, and 17, a route of secondary access should be constructed as part of that development.

- Additional routes of access or roadway/intersection improvements should be constructed and open to traffic based upon the estimated total trip generation for the existing and proposed development. Table 9 provides a summary of access scenarios and corresponding trip generation thresholds for each access scenario. A trip generation report, established using appropriate methodologies for internal trip capture and estimated based upon the current edition of the ITE Trip Generation Manual, should be provided with each proposed development in Tollgate Village. The total peak hour trip generation should not exceed the maximum trip generation for the applicable access scenario.

C. Columbia Pike at Tollgate Boulevard

- A traffic signal at Columbia Pike and Tollgate Boulevard should be installed concurrently with Tollgate Village Section 15. The existing northbound lanes that merge from two to one at Tollgate Boulevard should be extended approximately 300 feet north of Tollgate Boulevard to provide merging area downstream of the new traffic signal. The Tollgate Village developer has already completed design plans for a traffic signal including the extended northbound merge area at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.

- A southbound right turn lane on Columbia Pike with a turn lane length of 275 feet and a taper length of 100 feet should be installed concurrently with Tollgate Village Section 15. The Tollgate Village developer has already completed design plans for a southbound right turn lane at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.

D. Columbia Pike at North Access

- The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should be constructed as a three-lane roadway to support efficient future access.

- The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should operate as a right-in/right-out only access if Columbia Pike consists of a two-lane roadway to the north of Tollgate Village and across the West Harpeth River.

- The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should provide full turning movement access if Columbia Pike has been widened to consist of a five-lane roadway to the north of Tollgate Village and across the West Harpeth River.\

- Future widening of Columbia Pike, presumably by TDOT, should provide the extension of the existing five-lane section north of Tollgate Village and across the West Harpeth River. The extension of this roadway section will provide a northbound left turn lane for the North Access to Tollgate Village.

- When the North Access to Tollgate Village is converted to provide full turning movement access, a southbound right turn lane should be constructed on Columbia Pike. The final design of the Columbia Pike widening, the West Harpeth River crossing, and impacts to adjacent utilities and floodways/floodplains should be considered when determining the feasibility and final design of this right turn lane.

- A TDOT highway entrance permit will be required in order to construct this access.

- A TDOT grading permit will be required for any turn lane or grading work completed in the right-of-way on Columbia Pike.

E. Columbia Pike at Declaration Way

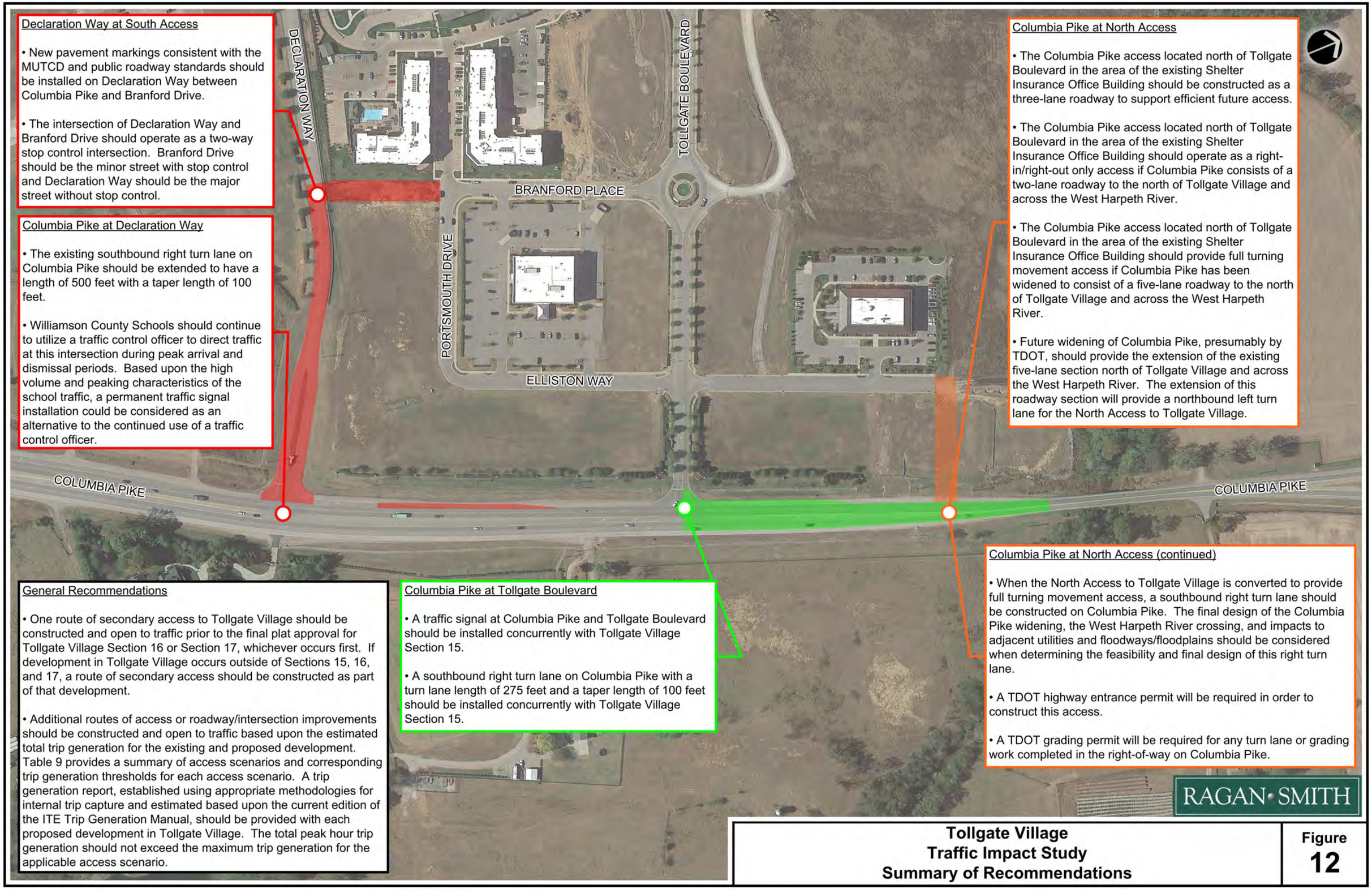
- The existing southbound right turn lane on Columbia Pike should be extended to have a length of 500 feet with a taper length of 100 feet.

- Williamson County Schools should continue to utilize a traffic control officer to direct traffic at this intersection during peak arrival and dismissal periods. Based upon the high volume and peaking characteristics of the school traffic, a permanent traffic signal installation could be considered as an alternative to the continued use of a traffic control officer.

F. Declaration Way at South Access

- New pavement markings consistent with the MUTCD and public roadway standards should be installed on Declaration Way between Columbia Pike and the South Access.

- The intersection of Declaration Way and the South Access should operate as a two-way stop control intersection. The South Access should be the minor street with stop control and Declaration Way should be the major street without stop control.



Declaration Way at South Access

• New pavement markings consistent with the MUTCD and public roadway standards should be installed on Declaration Way between Columbia Pike and Branford Drive.

• The intersection of Declaration Way and Branford Drive should operate as a two-way stop control intersection. Branford Drive should be the minor street with stop control and Declaration Way should be the major street without stop control.

Columbia Pike at Declaration Way

• The existing southbound right turn lane on Columbia Pike should be extended to have a length of 500 feet with a taper length of 100 feet.

• Williamson County Schools should continue to utilize a traffic control officer to direct traffic at this intersection during peak arrival and dismissal periods. Based upon the high volume and peaking characteristics of the school traffic, a permanent traffic signal installation could be considered as an alternative to the continued use of a traffic control officer.

Columbia Pike at North Access

• The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should be constructed as a three-lane roadway to support efficient future access.

• The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should operate as a right-in/right-out only access if Columbia Pike consists of a two-lane roadway to the north of Tollgate Village and across the West Harpeth River.

• The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should provide full turning movement access if Columbia Pike has been widened to consist of a five-lane roadway to the north of Tollgate Village and across the West Harpeth River.

• Future widening of Columbia Pike, presumably by TDOT, should provide the extension of the existing five-lane section north of Tollgate Village and across the West Harpeth River. The extension of this roadway section will provide a northbound left turn lane for the North Access to Tollgate Village.

General Recommendations

• One route of secondary access to Tollgate Village should be constructed and open to traffic prior to the final plat approval for Tollgate Village Section 16 or Section 17, whichever occurs first. If development in Tollgate Village occurs outside of Sections 15, 16, and 17, a route of secondary access should be constructed as part of that development.

• Additional routes of access or roadway/intersection improvements should be constructed and open to traffic based upon the estimated total trip generation for the existing and proposed development. Table 9 provides a summary of access scenarios and corresponding trip generation thresholds for each access scenario. A trip generation report, established using appropriate methodologies for internal trip capture and estimated based upon the current edition of the ITE Trip Generation Manual, should be provided with each proposed development in Tollgate Village. The total peak hour trip generation should not exceed the maximum trip generation for the applicable access scenario.

Columbia Pike at Tollgate Boulevard

• A traffic signal at Columbia Pike and Tollgate Boulevard should be installed concurrently with Tollgate Village Section 15.

• A southbound right turn lane on Columbia Pike with a turn lane length of 275 feet and a taper length of 100 feet should be installed concurrently with Tollgate Village Section 15.

Columbia Pike at North Access (continued)

• When the North Access to Tollgate Village is converted to provide full turning movement access, a southbound right turn lane should be constructed on Columbia Pike. The final design of the Columbia Pike widening, the West Harpeth River crossing, and impacts to adjacent utilities and floodways/floodplains should be considered when determining the feasibility and final design of this right turn lane.

• A TDOT highway entrance permit will be required in order to construct this access.

• A TDOT grading permit will be required for any turn lane or grading work completed in the right-of-way on Columbia Pike.

RAGAN • SMITH

Tollgate Village
Traffic Impact Study
Summary of Recommendations

Figure 12

APPENDIX

A. TRAFFIC COUNTS

B. TRAFFIC ASSIGNMENT WORKSHEETS

C. CAPACITY ANALYSIS WORKSHEETS - EXISTING

D. CAPACITY ANALYSIS WORKSHEETS - 2020 BACKGROUND

E. CAPACITY ANALYSIS WORKSHEETS - 2020 TOTAL

F. CAPACITY ANALYSIS WORKSHEETS - 2027 BACKGROUND

G. CAPACITY ANALYSIS WORKSHEETS - 2027 TOTAL

APPENDIX A

TRAFFIC COUNTS

RAGAN-SMITH-ASSOCIATES
315 Woodland Street
Nashville, Tennessee 37206-0070
P:(615)244-8591 bbaxter@ragansmith.com

File Name : Columbia@Tollgate
Site Code : 10-081 / 9260
Start Date : 11/17/2016
Page No : 1

Groups Printed- Group 1

	Columbia Pike Northbound			Columbia Pike Southbound			Tollgate Blvd Eastbound					
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Exclu. Total	Inclu. Total	Int. Total
06:00	8	168	0	0	58	2	10	0	6	0	252	252
06:15	4	208	0	0	51	2	22	0	10	0	297	297
06:30	9	224	0	0	106	3	34	0	18	0	394	394
06:45	10	229	0	0	196	3	35	0	30	0	503	503
Total	31	829	0	0	411	10	101	0	64	0	1446	1446
07:00	21	204	0	0	241	9	30	0	40	0	545	545
07:15	11	289	0	0	111	7	29	0	17	0	464	464
07:30	13	249	0	0	83	8	34	0	13	0	400	400
07:45	26	228	0	0	89	8	32	0	21	0	404	404
Total	71	970	0	0	524	32	125	0	91	0	1813	1813
08:00	26	200	0	0	103	19	40	0	12	0	400	400
08:15	16	204	0	0	89	14	20	0	15	0	358	358
08:30	17	202	0	0	102	7	27	0	12	0	367	367
08:45	11	165	0	0	106	4	19	0	16	0	321	321
Total	70	771	0	0	400	44	106	0	55	0	1446	1446
09:00	20	142	0	0	98	12	25	0	20	0	317	317
09:15	13	123	0	0	92	10	16	0	25	0	279	279
09:30	15	128	0	0	97	8	18	0	21	0	287	287
09:45	20	117	0	0	89	10	18	0	25	0	279	279
Total	68	510	0	0	376	40	77	0	91	0	1162	1162
10:00	24	119	0	0	96	2	16	0	13	0	270	270
10:15	21	112	0	0	93	12	15	0	19	0	272	272
10:30	15	114	0	0	95	9	12	0	17	0	262	262
10:45	25	107	0	0	104	12	14	0	17	0	279	279
Total	85	452	0	0	388	35	57	0	66	0	1083	1083
11:00	10	108	0	0	106	8	21	0	18	0	271	271
11:15	20	132	0	0	85	10	17	0	25	0	289	289
11:30	15	101	0	0	104	18	17	0	21	0	276	276
11:45	14	97	0	0	92	10	20	0	11	0	244	244
Total	59	438	0	0	387	46	75	0	75	0	1080	1080
12:00	14	108	0	0	110	9	12	0	25	0	278	278
12:15	22	93	0	0	109	12	14	0	11	0	261	261
12:30	21	103	0	0	103	15	11	0	19	0	272	272
12:45	29	95	0	0	106	19	11	0	14	0	274	274
Total	86	399	0	0	428	55	48	0	69	0	1085	1085
13:00	13	113	0	0	111	15	8	0	17	0	277	277
13:15	18	132	0	0	104	13	8	0	22	0	297	297
13:30	19	102	0	0	132	16	12	0	13	0	294	294
13:45	18	108	0	0	136	16	3	0	16	0	297	297
Total	68	455	0	0	483	60	31	0	68	0	1165	1165
14:00	20	107	0	0	154	15	10	0	20	0	326	326
14:15	12	107	0	0	151	15	9	0	14	0	308	308
14:30	27	186	0	0	129	13	20	0	20	0	395	395
14:45	23	207	0	0	135	11	15	0	32	0	423	423
Total	82	607	0	0	569	54	54	0	86	0	1452	1452
15:00	22	137	0	0	158	24	18	0	24	0	383	383
15:15	25	155	0	0	162	21	9	0	20	0	392	392
15:30	22	131	0	0	204	30	10	0	18	0	415	415
15:45	25	117	0	0	177	24	9	0	26	0	378	378
Total	94	540	0	0	701	99	46	0	88	0	1568	1568

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Start Date : 11/17/2016

Groups Printed- Group 1

	Columbia Pike Northbound			Columbia Pike Southbound			Tollgate Blvd Eastbound					
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Exclu. Total	Inclu. Total	Int. Total
16:00	18	133	0	0	239	29	5	0	29	0	453	453
16:15	19	142	0	0	211	26	11	0	21	0	430	430
16:30	14	126	0	0	197	25	18	0	26	0	406	406
16:45	13	157	0	0	255	20	14	0	25	0	484	484
Total	64	558	0	0	902	100	48	0	101	0	1773	1773
17:00	24	160	0	0	231	25	13	0	29	0	482	482
17:15	18	118	0	0	228	23	13	0	16	0	416	416
17:30	12	128	0	0	227	26	17	0	23	0	433	433
17:45	16	111	0	0	199	34	10	0	15	0	385	385
Total	70	517	0	0	885	108	53	0	83	0	1716	1716
18:00	19	120	0	0	207	31	10	0	11	0	398	398
18:15	22	103	0	0	176	25	17	0	9	0	352	352
18:30	22	74	0	0	129	34	7	0	9	0	275	275
18:45	17	57	0	0	142	21	9	0	8	0	254	254
Total	80	354	0	0	654	111	43	0	37	0	1279	1279
Grand Total	928	7400	0	0	7108	794	864	0	974	0	18068	18068
Apprch %	11.1	88.9			90.0	10.0	47.0		53.0			
Total %	5.1	41.0			39.3	4.4	4.8		5.4	0.0	100.0	

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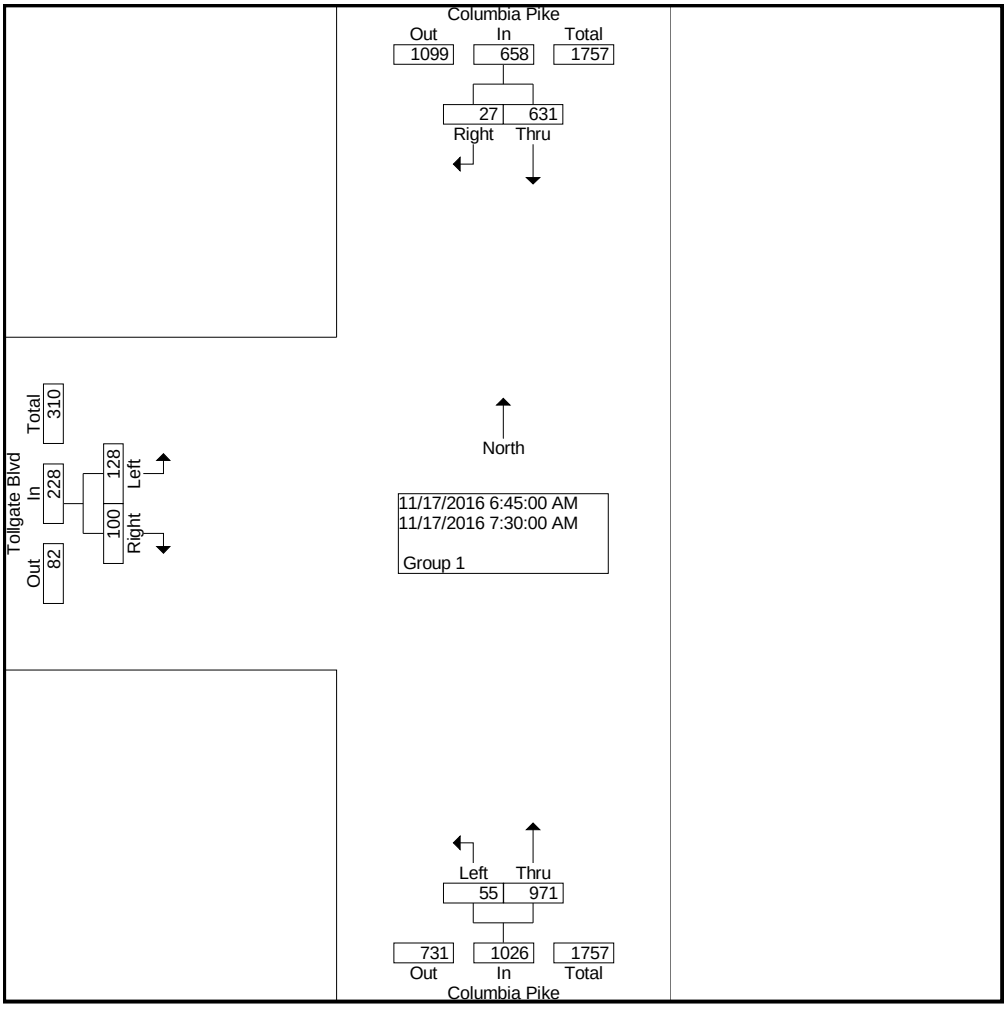
	Columbia Pike Northbound			Columbia Pike Southbound			Tollgate Blvd Eastbound				
Start Time	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	App. Total	Int. Total
Peak Hour From 06:00 to 09:45 - Peak 1 of 1											
Intersection	06:45										
Volume	55	971	1026	631	27	658	128	100	228	0	1912
Percent	5.4	94.6		95.9	4.1		56.1	43.9			
07:00 Volume	21	204	225	241	9	250	30	40	70	0	545
Peak Factor											0.877
High Int.	07:15			07:00			07:00			5:45:00 AM	
Volume	11	289	300	241	9	250	30	40	70		
Peak Factor			0.855			0.658			0.814		



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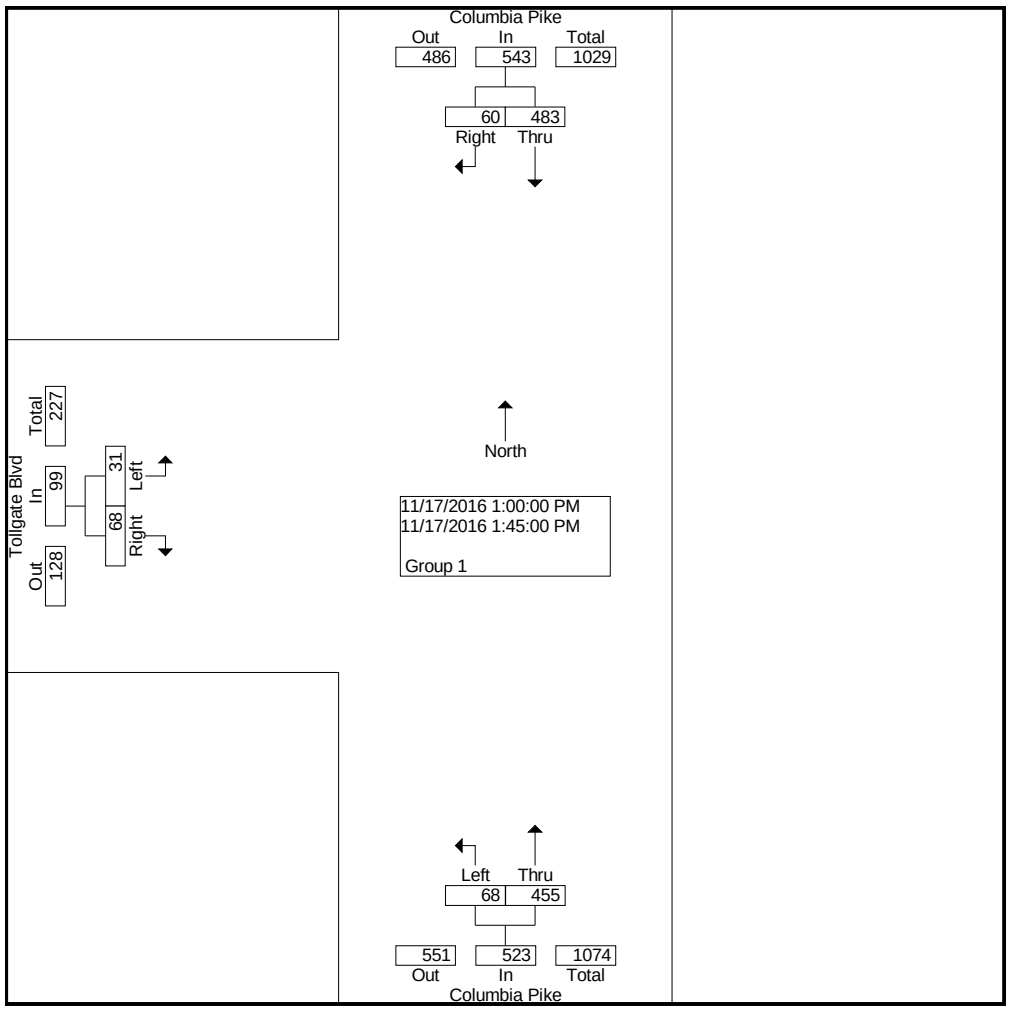
Start Date : 11/17/2016

	Columbia Pike Northbound			Columbia Pike Southbound			Tollgate Blvd Eastbound				
Start Time	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	App. Total	Int. Total
Peak Hour From 10:00 to 13:45 - Peak 1 of 1											
Intersection	13:00										
Volume	68	455	523	483	60	543	31	68	99	0	1165
Percent	13.0	87.0		89.0	11.0		31.3	68.7			
13:45 Volume	18	108	126	136	16	152	3	16	19	0	297
Peak Factor											0.981
High Int.	13:15			13:45			13:15				
Volume	18	132	150	136	16	152	8	22	30		
Peak Factor			0.872			0.893			0.825		



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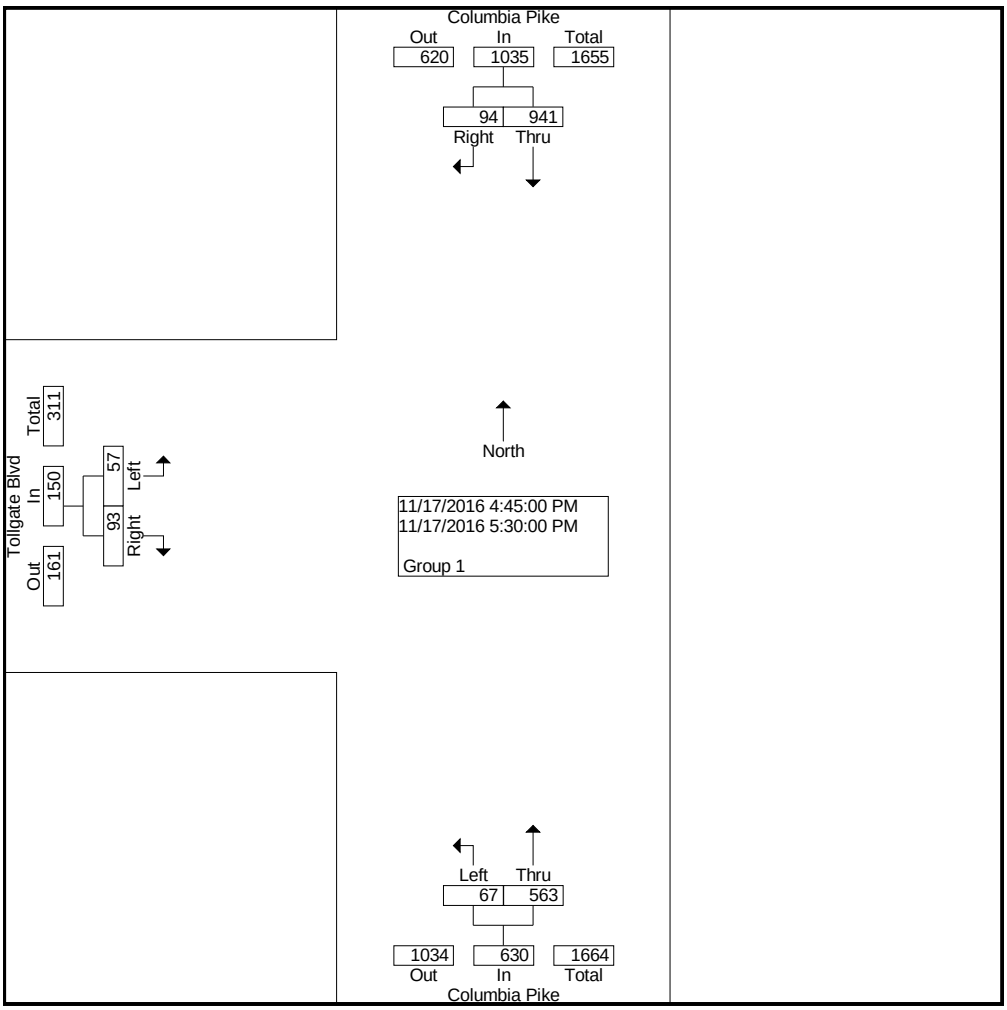
Start Date : 11/17/2016

	Columbia Pike Northbound			Columbia Pike Southbound			Tollgate Blvd Eastbound				
Start Time	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	App. Total	Int. Total
Peak Hour From 14:00 to 18:45 - Peak 1 of 1											
Intersection	16:45										
Volume	67	563	630	941	94	1035	57	93	150	0	1815
Percent	10.6	89.4		90.9	9.1		38.0	62.0			
16:45 Volume	13	157	170	255	20	275	14	25	39	0	484
Peak Factor											0.938
High Int.	17:00			16:45			17:00				
Volume	24	160	184	255	20	275	13	29	42		
Peak Factor			0.856			0.941			0.893		



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File Name : Columbia@Declaration
Site Code : 10-081 / 9260
Start Date : 1/31/2017

Groups Printed- Group 1

	Columbia Pike Southbound			Westbound			Columbia Pike Northbound			Declaration Way Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
06:45 AM	0	0	141	0	0	0	192	0	0	35	0	43	411
Total	0	0	141	0	0	0	192	0	0	35	0	43	411
07:00 AM	0	0	178	0	0	0	174	0	0	58	0	63	473
07:15 AM	0	0	21	0	0	0	33	0	0	20	0	35	109
07:30 AM	0	0	1	0	0	0	5	0	0	2	0	3	11
*** BREAK ***													
Total	0	0	200	0	0	0	212	0	0	80	0	101	593
*** BREAK ***													
04:45 PM	0	0	8	0	0	0	14	0	0	10	0	16	48
Total	0	0	8	0	0	0	14	0	0	10	0	16	48
05:00 PM	0	0	9	0	0	0	13	0	0	7	0	17	46
05:15 PM	0	0	14	0	0	0	26	0	0	1	0	6	47
05:30 PM	0	0	16	0	0	0	17	0	0	27	0	52	112
Grand Total	0	0	388	0	0	0	474	0	0	160	0	235	1257
Apprch %	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	40.5	0.0	59.5	
Total %	0.0	0.0	30.9	0.0	0.0	0.0	37.7	0.0	0.0	12.7	0.0	18.7	

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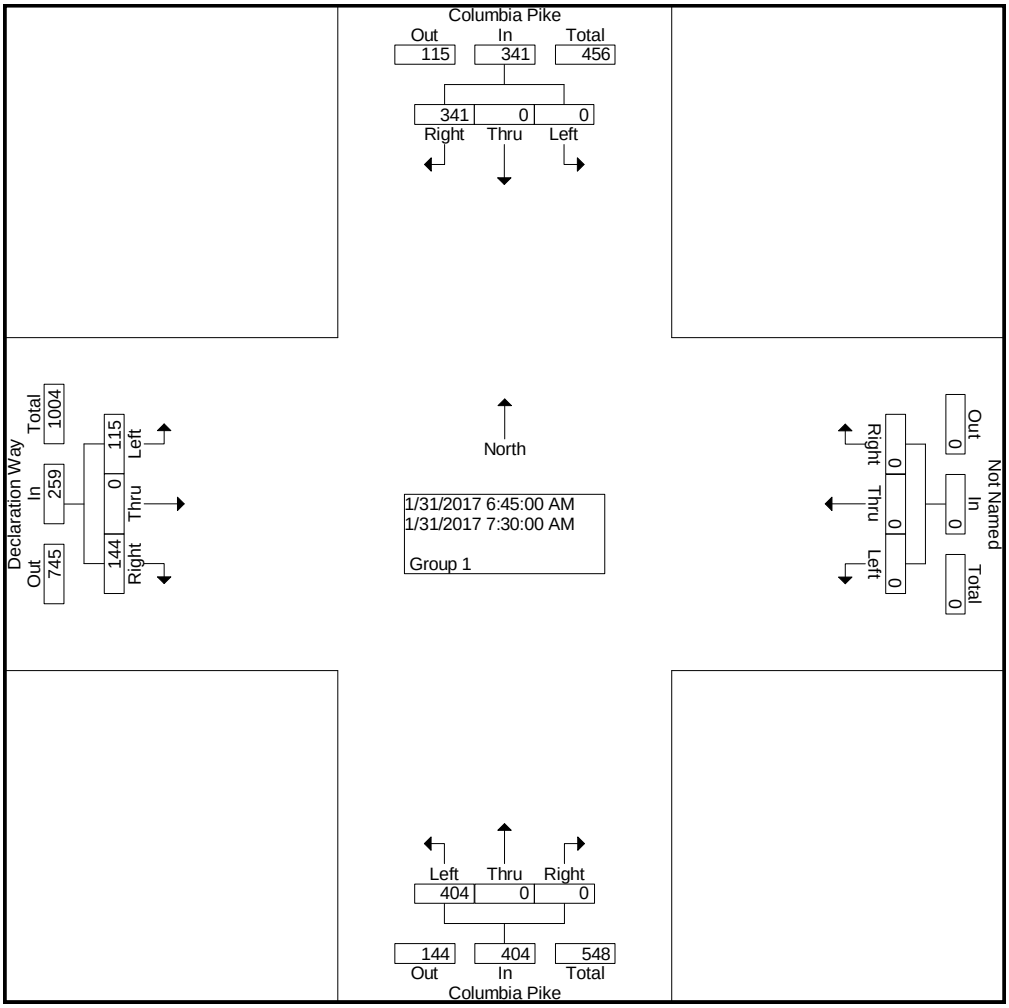
File Name : Columbia@Declaration
Site Code : 10-081 / 9260
Start Date : 1/31/2017

	Columbia Pike Southbound				Westbound				Columbia Pike Northbound				Declaration Way Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 06:45 AM to 11:45 AM - Peak 1 of 1																	
Intersection 06:45 AM																	
Volume	0	0	341	341	0	0	0	0	404	0	0	404	115	0	144	259	1004
Percent	0.0	0.0	100.0		0.0	0.0	0.0		100.0	0.0	0.0		44.4	0.0	55.6		
07:00 Volume	0	0	178	178	0	0	0	0	174	0	0	174	58	0	63	121	473
Peak Factor																	0.531
High Int.	07:00 AM				6:30:00 AM				06:45 AM				07:00 AM				
Volume	0	0	178	178	0	0	0	0	192	0	0	192	58	0	63	121	
Peak Factor				0.479								0.526				0.535	



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File Name : Columbia@Declaration
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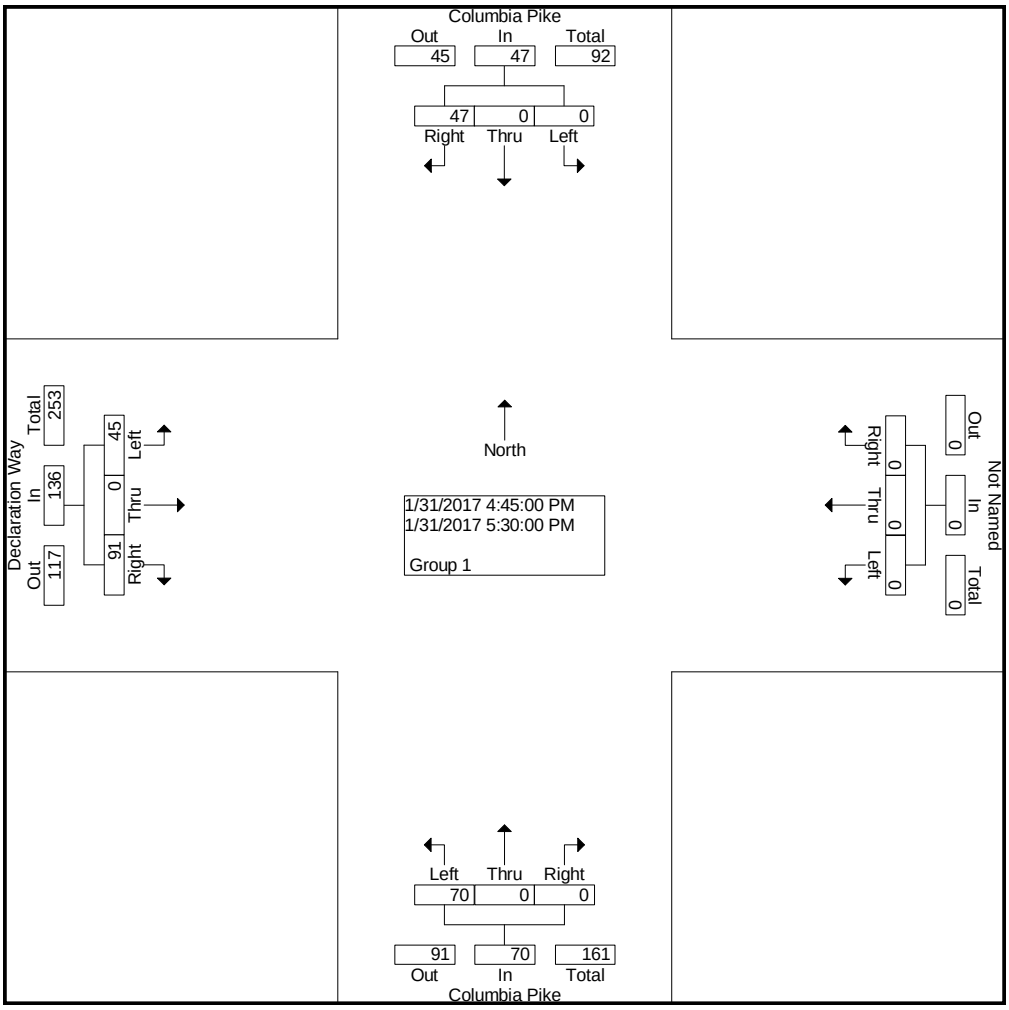
Start Date : 1/31/2017

	Columbia Pike Southbound				Westbound				Columbia Pike Northbound				Declaration Way Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:30 PM - Peak 1 of 1																	
Intersection	04:45 PM																
Volume	0	0	47	47	0	0	0	0	70	0	0	70	45	0	91	136	253
Percent	0.0	0.0	100.0		0.0	0.0	0.0		100.0	0.0	0.0		33.1	0.0	66.9		
05:30 Volume	0	0	16	16	0	0	0	0	17	0	0	17	27	0	52	79	112
Peak Factor																	0.565
High Int.	05:30 PM								05:15 PM				05:30 PM				
Volume	0	0	16	16	0	0	0	0	26	0	0	26	27	0	52	79	
Peak Factor				0.734								0.673				0.430	



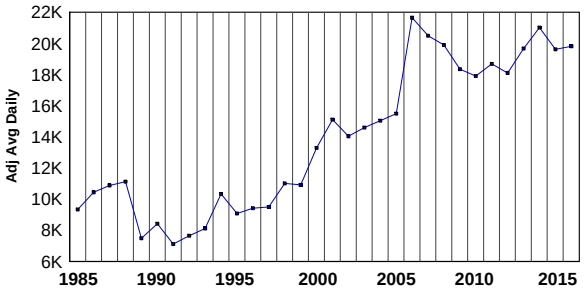
County: Williamson **Station Number:** 000067

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

Location: NEAR THOMPSON STATION (Coverage)

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	
03	2015	20,640	20,021	19,620	0.98	
03	2016	0	0	19,816	0.98	EST

Adjusted Average Daily Value Plot

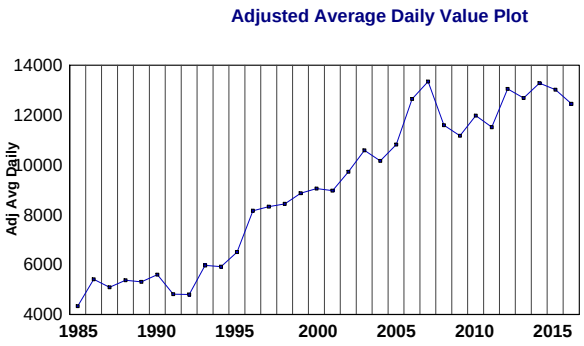


County: Williamson **Station Number:** 000094

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

Location: COLUMBIA PIKE NORTH OF GOOSE CREEK BYPASS

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
03	1985	4,172	4,422	4,334	0.98	
02	1986	4,642	5,524	5,414	0.98	
02	1987	4,367	5,197	5,093	0.98	
03	1988	5,080		5,376	0.98	
03	1989	5,157	0	5,310	0.98	ACTUAL = 5459
01	1990	5,487	0	5,600	0.98	ACTUAL = 6721
03	1991	4,509	4,915	4,817	0.98	
03	1992	4,684	4,918	4,800	0.98	
04	1993	6,214	6,090	5,968	0.98	
05	1994	6,225	6,038	5,917	0.98	
04	1995	6,916	6,639	6,506	0.98	
03	1996	8,165	8,328	8,162	0.98	
04	1997	8,850	8,496	8,326	0.98	
04	1998	8,969	8,610	8,438	0.98	
03	1999	8,781	9,044	8,863	0.98	
05	2000	9,826	9,236	9,051	0.98	DIFF MONTH
05	2001	12,271	11,657	8,968	0.98	ACTUAL = 11424
01	2002	9,633	9,922	9,724	0.98	
03	2003	14,458	14,602	10,583	0.98	ACTUAL = 14310
03	2004	9,972	10,370	10,163	0.98	
03	2005	10,927	11,036	10,816	0.98	
05	2006	14,026	12,904	12,646	0.98	UP & DOWN
03	2007	14,185	13,618	13,345	0.98	
03	2008	12,071	11,830	11,593	0.98	
06	2009	0	0	11,170	0.98	TAKEN FROM CLASS
11	2010	12,864	12,221	11,976	0.98	
04	2011	13,200	11,748	11,513	0.98	
05	2012	13,450	13,316	13,049	0.98	
01	2013	12,325	12,941	12,682	0.98	
01	2014	0	0	13,281	0.98	EST
03	2015	13,695	13,284	13,018	0.98	
08	2016	13,660	12,704	12,450	0.98	



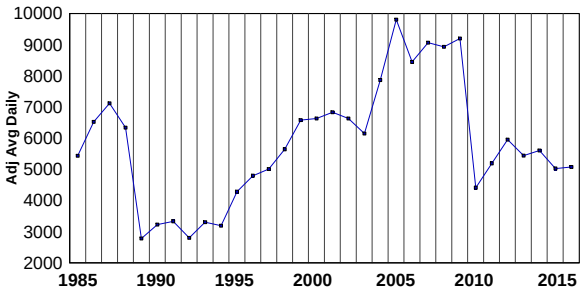
County: Williamson **Station Number:** 000095

Route: SR248 **Station Type:** Other Rural **Station Out:** NO

Location: GOOSE CREEK BYPASS NORTH OF COLUMBIA PIKE

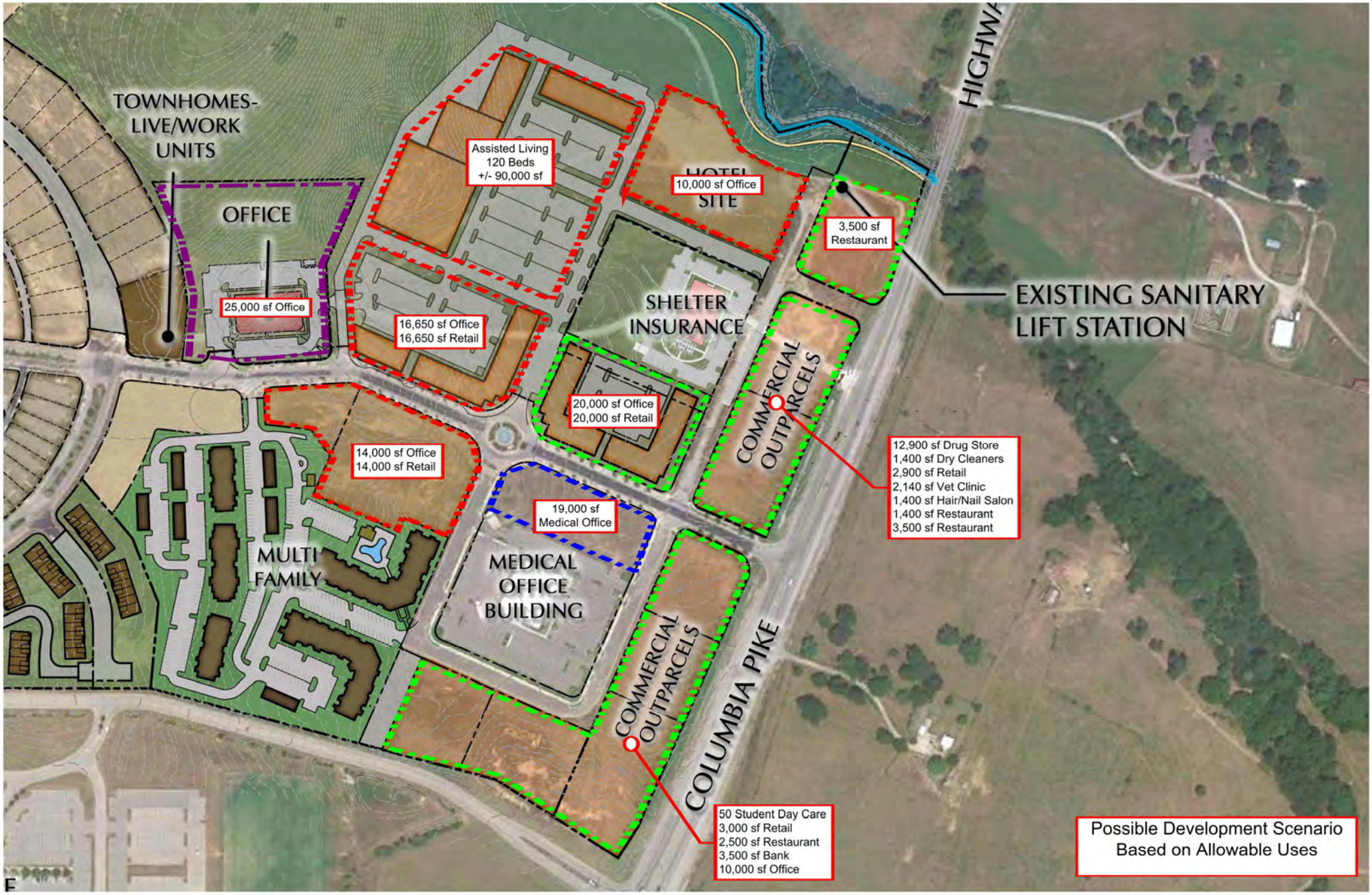
Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
03	1985	5,514	5,845	5,436	0.93	
02	1986	5,894	7,014	6,523	0.93	
02	1987	6,433	7,655	7,119	0.93	
03	1988	6,311		6,339	0.93	
03	1989	7,072	0	2,780	0.93	ACTUAL = 7103
01	1990	2,777		3,228	0.93	SATURN PKWY OPEN
03	1991	3,287	3,583	3,332	0.93	
03	1992	2,895	3,011	2,800	0.93	
04	1993	3,625	3,553	3,304	0.93	
04	1994	3,392	3,290	3,191	0.97	
04	1995	4,600	4,416	4,283	0.97	
03	1996	4,947	4,944	4,796	0.97	
04	1997	5,380	5,165	5,010	0.97	
04	1998	6,061	5,819	5,644	0.97	
03	1999	6,584	6,782	6,579	0.97	
05	2000	7,273	6,837	6,632	0.97	DIFF MONTH
05	2001	11,536	10,959	6,831	0.97	ACTUAL = 10630
02	2002	6,637	6,836	6,631	0.97	
03	2003	8,424	8,508	6,149	0.97	ACTUAL = 8253
03	2004	7,874	8,110	7,866	0.97	HIGH 2 YRS - KEEP
03	2005	10,007	10,107	9,804	0.97	GOING UP
05	2006	9,466	8,709	8,447	0.97	SEE 2004
11	2007	0	0	9,065	0.97	EST
03	2008	5,373	5,266	8,932	0.97	ACTUAL = 5108
06	2009	0	0	9,199	0.97	EST
11	2010	4,787	4,548	4,411	0.99	LOW LAST 2 YRS COUNTED
04	2011	5,892	5,244	5,191	0.99	SEE 2008 ACTUAL
05	2012	6,074	6,013	5,953	0.99	
01	2013	5,234	5,496	5,441	0.99	
01	2014	0	0	5,604	0.99	EST
03	2015	5,235	5,078	5,027	0.99	
03	2016	0	0	5,077	0.99	EST

Adjusted Average Daily Value Plot



APPENDIX B

TRAFFIC ASSIGNMENT WORKSHEETS


TOWNHOMES-
LIVE/WORK
UNITS
OFFICE
25,000 sf Office
Assisted Living
120 Beds
+/- 90,000 sf
16,650 sf Office
16,650 sf Retail
HOTEL
SITE
10,000 sf Office
3,500 sf
Restaurant
SHELTER
INSURANCE
EXISTING SANITARY
LIFT STATION
20,000 sf Office
20,000 sf Retail
COMMERCIAL
OUTPARCELS
12,900 sf Drug Store
1,400 sf Dry Cleaners
2,900 sf Retail
2,140 sf Vet Clinic
1,400 sf Hair/Nail Salon
1,400 sf Restaurant
3,500 sf Restaurant
14,000 sf Office
14,000 sf Retail
19,000 sf
Medical Office
MULTI
FAMILY
MEDICAL
OFFICE
BUILDING
COMMERCIAL
OUTPARCELS
COLUMBIA PIKE
50 Student Day Care
3,000 sf Retail
2,500 sf Restaurant
3,500 sf Bank
10,000 sf Office
Possible Development Scenario
Based on Allowable Uses

TRAFFIC VOLUME WORKSHEET
SPECIFIC NON-SITE TRIP GENERATION &
PROPOSED DEVELOPMENT TRIP GENERATION

RAGAN·SMITH

2020 SPECIFIC NON-SITE DEVELOPMENT TRIP GENERATION							
Development	Daily	A.M. Peak Hour			P.M. Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
				0			0
				0			0
				0			0
				0			0
TOTAL	0	0	0	0	0	0	0

TOLLGATE VILLAGE TRIP GENERATION 2020 HORIZON YEAR							
Development	Daily	A.M. Peak Hour			P.M. Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Tollgate Village (Unbuilt + Sections 15, 16, & 17)	2,681	51	153	204	166	97	263
				0			0
				0			0
				0			0
				0			0
				0			0
TOTAL	2,681	51	153	204	166	97	263

2030 SPECIFIC NON-SITE DEVELOPMENT TRIP GENERATION							
Development	Daily	A.M. Peak Hour			P.M. Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
				0			0
				0			0
				0			0
				0			0
				0			0
TOTAL	0	0	0	0	0	0	0

TOLLGATE VILLAGE 2030 HORIZON YEAR (FULL BUILD-OUT)							
Development	Daily	A.M. Peak Hour			P.M. Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Tollgate Village (Unbuilt + Sections 15, 16, & 17)	2,681	51	153	204	166	97	263
Tollgate Village (Commercial Section)	10,782	506	197	703	376	606	982
				0			0
				0			0
				0			0
				0			0
TOTAL	13,463	557	350	907	542	703	1,245

TRAFFIC VOLUME WORKSHEET
COLUMBIA PIKE AT TOLLGATE BOULEVARD
A.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound Columbia Pike			Southbound Columbia Pike			Eastbound Tollgate Boulevard			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES	55	971			631	27	128		100			
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)		3.0			3.0							
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	122	0	0	79	0	0	0	0	0	0	0
2020 Background Traffic Volumes	55	1093	0	0	710	27	128	0	100	0	0	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In	45					55						
% Out							55		45			
Trips	23	0	0	0	0	28	84	0	69	0	0	0
2020 Site Traffic Volumes	23	0	0	0	0	28	84	0	69	0	0	0
2020 TOTAL TRAFFIC VOLUMES	78	1093	0	0	710	55	212	0	169	0	0	0
2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)		3.0			3.0							
Growth Factor	1.00	1.38	1.00	1.00	1.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	373	0	0	242	0	0	0	0	0	0	0
2027 Background Traffic Volumes	55	1344	0	0	873	27	128	0	100	0	0	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In	45					55						
% Out							55		45			
Trips	23	0	0	0	0	28	84	0	69	0	0	0
Tollgate Village (Commercial Section) % In	40	5			5	40						
% Out		5			5		40		40			
Trips	202	35	0	0	35	202	79	0	79	0	0	0
2027 Site Traffic Volumes	225	35	0	0	35	230	163	0	148	0	0	0
2027 TOTAL TRAFFIC VOLUMES	280	1379	0	0	908	257	291	0	248	0	0	0

TRAFFIC VOLUME WORKSHEET
COLUMBIA PIKE AT TOLLGATE BOULEVARD
P.M. PEAK HOUR

RAGAN·SMITH

Description		Northbound Columbia Pike			Southbound Columbia Pike			Eastbound Tollgate Boulevard			Westbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES		67	563			941	94	57		93			
2020 BACKGROUND TRAFFIC VOLUMES													
Annual Background Growth													
Growth Rate (%/year)			3.0			3.0							
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	71	0	0	118	0	0	0	0	0	0	0
2020 Background Traffic Volumes		67	634	0	0	1059	94	57	0	93	0	0	0
2020 SITE TRAFFIC VOLUMES													
Tollgate Village (Unbuilt + Sections 15, 16, & 17)	% In	45					55						
	% Out							55		45			
	Trips	75	0	0	0	0	91	53	0	44	0	0	0
2020 Site Traffic Volumes		75	0	0	0	0	91	53	0	44	0	0	0
2020 TOTAL TRAFFIC VOLUMES		142	634	0	0	1059	185	110	0	137	0	0	0
2027 BACKGROUND TRAFFIC VOLUMES													
Annual Background Growth													
Growth Rate (%)			3.0			3.0							
Growth Factor		1.00	1.38	1.00	1.00	1.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips		0	216	0	0	362	0	0	0	0	0	0	0
2027 Background Traffic Volumes		67	779	0	0	1303	94	57	0	93	0	0	0
2027 TOTAL TRAFFIC VOLUMES													
Tollgate Village (Unbuilt + Sections 15, 16, & 17)	% In	45					55						
	% Out							55		45			
	Trips	75	0	0	0	0	91	53	0	44	0	0	0
	% In	40	5			5	40						
Tollgate Village (Commercial Section)	% Out		5			5		40		40			
	Trips	150	49	0	0	49	150	242	0	242	0	0	0
2027 Site Traffic Volumes		225	49	0	0	49	241	295	0	286	0	0	0
2027 TOTAL TRAFFIC VOLUMES		292	828	0	0	1352	335	352	0	379	0	0	0

TRAFFIC VOLUME WORKSHEET
COLUMBIA PIKE AT NORTH ACCESS
A.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound Columbia Pike			Southbound Columbia Pike			Eastbound North Access			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES		1099			658							
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)		3.0			3.0							
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	138	0	0	83	0	0	0	0	0	0	0
2020 Background Traffic Volumes	0	1237	0	0	741	0	0	0	0	0	0	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In					55							
% Out		55										
Trips	0	84	0	0	28	0	0	0	0	0	0	0
2020 Site Traffic Volumes	0	84	0	0	28	0	0	0	0	0	0	0
2020 TOTAL TRAFFIC VOLUMES	0	1321	0	0	769	0	0	0	0	0	0	0
2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)		3.0			3.0							
Growth Factor	1.00	1.38	1.00	1.00	1.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	422	0	0	253	0	0	0	0	0	0	0
2027 Background Traffic Volumes	0	1521	0	0	911	0	0	0	0	0	0	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In					55							
% Out		55										
Trips	0	84	0	0	28	0	0	0	0	0	0	0
Tollgate Village (Commercial Section) % In	5				45	5						
% Out		45					5		5			
Trips	25	89	0	0	228	25	10	0	10	0	0	0
2027 Site Traffic Volumes	25	173	0	0	256	25	10	0	10	0	0	0
2027 TOTAL TRAFFIC VOLUMES	25	1694	0	0	1167	25	10	0	10	0	0	0

TRAFFIC VOLUME WORKSHEET
COLUMBIA PIKE AT NORTH ACCESS
P.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound Columbia Pike			Southbound Columbia Pike			Eastbound North Access			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES		620			1035							
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)		3.0			3.0							
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	78	0	0	130	0	0	0	0	0	0	0
2020 Background Traffic Volumes	0	698	0	0	1165	0	0	0	0	0	0	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In					55							
% Out		55										
Trips	0	53	0	0	91	0	0	0	0	0	0	0
2020 Site Traffic Volumes	0	53	0	0	91	0	0	0	0	0	0	0
2020 TOTAL TRAFFIC VOLUMES	0	751	0	0	1256	0	0	0	0	0	0	0

2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)		3.0			3.0							
Growth Factor	1.00	1.38	1.00	1.00	1.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	238	0	0	398	0	0	0	0	0	0	0
2027 Background Traffic Volumes	0	858	0	0	1433	0	0	0	0	0	0	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In					55							
% Out		55										
Trips	0	53	0	0	91	0	0	0	0	0	0	0
Tollgate Village (Commercial Section) % In	5				45	5						
% Out		45					5		5			
Trips	19	273	0	0	169	19	30	0	30	0	0	0
2027 Site Traffic Volumes	19	326	0	0	260	19	30	0	30	0	0	0
2027 TOTAL TRAFFIC VOLUMES	19	1184	0	0	1693	19	30	0	30	0	0	0

TRAFFIC VOLUME WORKSHEET
COLUMBIA PIKE AT DECLARATION WAY
A.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound Columbia Pike			Southbound Columbia Pike			Eastbound Declaration Way			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES	404	911			390	341	115		144			
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)		3.0			3.0							
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	114	0	0	49	0	0	0	0	0	0	0
2020 Background Traffic Volumes	404	1025	0	0	439	341	115	0	144	0	0	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In		45										
% Out					45							
Trips	0	23	0	0	69	0	0	0	0	0	0	0
2020 Site Traffic Volumes	0	23	0	0	69	0	0	0	0	0	0	0
2020 TOTAL TRAFFIC VOLUMES	404	1048	0	0	508	341	115	0	144	0	0	0

2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)		3.0			3.0							
Growth Factor	1.00	1.38	1.00	1.00	1.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	350	0	0	150	0	0	0	0	0	0	0
2027 Background Traffic Volumes	404	1261	0	0	540	341	115	0	144	0	0	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In		45										
% Out					45							
Trips	0	23	0	0	69	0	0	0	0	0	0	0
Tollgate Village (Commercial Section) % In	5	45				5						
% Out					45		5		5			
Trips	25	228	0	0	89	25	10	0	10	0	0	0
2027 Site Traffic Volumes	25	251	0	0	158	25	10	0	10	0	0	0
2027 TOTAL TRAFFIC VOLUMES	429	1512	0	0	698	366	125	0	154	0	0	0

TRAFFIC VOLUME WORKSHEET
COLUMBIA PIKE AT DECLARATION WAY
P.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound Columbia Pike			Southbound Columbia Pike			Eastbound Declaration Way			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES	70	585			987	47	45		91			
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)		3.0			3.0							
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	73	0	0	124	0	0	0	0	0	0	0
2020 Background Traffic Volumes	70	658	0	0	1111	47	45	0	91	0	0	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In		45										
% Out					45							
Trips	0	75	0	0	44	0	0	0	0	0	0	0
2020 Site Traffic Volumes	0	75	0	0	44	0	0	0	0	0	0	0
2020 TOTAL TRAFFIC VOLUMES	70	733	0	0	1155	47	45	0	91	0	0	0

2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)		3.0			3.0							
Growth Factor	1.00	1.38	1.00	1.00	1.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	225	0	0	379	0	0	0	0	0	0	0
2027 Background Traffic Volumes	70	810	0	0	1366	47	45	0	91	0	0	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In		45										
% Out					45							
Trips	0	75	0	0	44	0	0	0	0	0	0	0
Tollgate Village (Commercial Section) % In	5	45				5						
% Out					45		5		5			
Trips	19	169	0	0	273	19	30	0	30	0	0	0
2027 Site Traffic Volumes	19	244	0	0	317	19	30	0	30	0	0	0
2027 TOTAL TRAFFIC VOLUMES	89	1054	0	0	1683	66	75	0	121	0	0	0

TRAFFIC VOLUME WORKSHEET
DECLARATION WAY AT SOUTH ACCESS
A.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound			Southbound South Access			Eastbound Declaration Way			Westbound Declaration Way		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES								259			745	
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)												
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	0	0	0	0	0	0	0	0	0	0	0
2020 Background Traffic Volumes	0	0	0	0	0	0	0	259	0	0	745	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In / % Out / Trips	0	0	0	0	0	0	0	0	0	0	0	0
2020 Site Traffic Volumes	0	0	0	0	0	0	0	0	0	0	0	0
2020 TOTAL TRAFFIC VOLUMES	0	0	0	0	0	0	0	259	0	0	745	0
2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)												
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	0	0	0	0	0	0	0	0	0	0	0
2027 Background Traffic Volumes	0	0	0	0	0	0	0	259	0	0	745	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In / % Out / Trips	0	0	0	0	0	0	0	0	0	0	0	0
Tollgate Village (Commercial Section) % In												10
% Out				10								
Trips	0	0	0	20	0	0	0	0	0	0	0	51
2027 Site Traffic Volumes	0	0	0	20	0	0	0	0	0	0	0	51
2027 TOTAL TRAFFIC VOLUMES	0	0	0	20	0	0	0	259	0	0	745	51

TRAFFIC VOLUME WORKSHEET
DECLARATION WAY AT SOUTH ACCESS
P.M. PEAK HOUR

RAGAN·SMITH

Description	Northbound			Southbound South Access			Eastbound Declaration Way			Westbound Declaration Way		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2016 EXISTING TRAFFIC VOLUMES								136			117	
2020 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%/year)												
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	0	0	0	0	0	0	0	0	0	0	0
2020 Background Traffic Volumes	0	0	0	0	0	0	0	136	0	0	117	0
2020 SITE TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In / % Out / Trips	0	0	0	0	0	0	0	0	0	0	0	0
2020 Site Traffic Volumes	0	0	0	0	0	0	0	0	0	0	0	0
2020 TOTAL TRAFFIC VOLUMES	0	0	0	0	0	0	0	136	0	0	117	0
2027 BACKGROUND TRAFFIC VOLUMES												
Annual Background Growth												
Growth Rate (%)												
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual Background Growth Trips	0	0	0	0	0	0	0	0	0	0	0	0
2027 Background Traffic Volumes	0	0	0	0	0	0	0	136	0	0	117	0
2027 TOTAL TRAFFIC VOLUMES												
Tollgate Village (Unbuilt + Sections 15, 16, & 17) % In / % Out / Trips	0	0	0	0	0	0	0	0	0	0	0	0
Tollgate Village (Commercial Section) % In												10
% Out				10								
Trips	0	0	0	61	0	0	0	0	0	0	0	38
2027 Site Traffic Volumes	0	0	0	61	0	0	0	0	0	0	0	38
2027 TOTAL TRAFFIC VOLUMES	0	0	0	61	0	0	0	136	0	0	117	38

APPENDIX C

CAPACITY ANALYSIS WORKSHEETS EXISTING CONDITIONS

HCS 2010 Two-Way Stop Control Summary Report

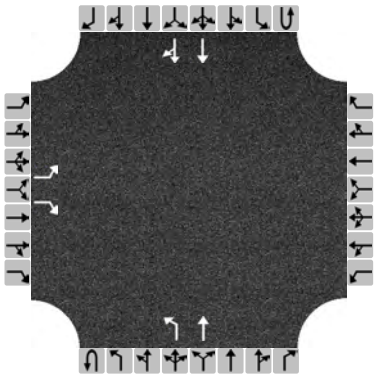
General Information

Analyst	bsb
Agency/Co.	Ragan-Smith Associates
Date Performed	12/19/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Tollgate Village

Site Information

Intersection	Columbia Pk/Tollgate Blvd
Jurisdiction	Thompson's Station, TN
East/West Street	Tollgate Blvd
North/South Street	Columbia Pk
Peak Hour Factor	0.88
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		1	0	1		0	0	0	0	1	1	0	0	0	2	0
Configuration		L		R						L	T				T	TR
Volume (veh/h)		128		100						55	971				631	27
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		145		114						62						
Capacity		147		621						850						
v/c Ratio		0.99		0.18						0.07						
95% Queue Length		7.3		0.7						0.2						
Control Delay (s/veh)		131.2		12.1						9.6						
Level of Service (LOS)		F		B						A						
Approach Delay (s/veh)	78.8								0.5							
Approach LOS	F															

HCS 2010 Two-Way Stop Control Summary Report

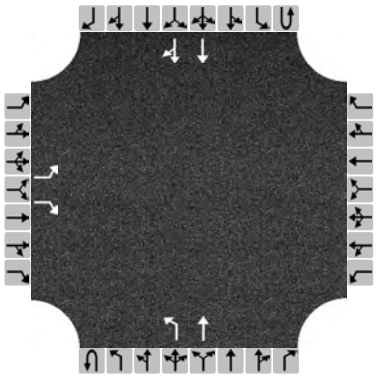
General Information

Analyst	bsb
Agency/Co.	Ragan-Smith Associates
Date Performed	12/19/2016
Analysis Year	2016
Time Analyzed	Midday Peak Hour
Intersection Orientation	North-South
Project Description	Tollgate Village

Site Information

Intersection	Columbia Pk/Tollgate Blvd
Jurisdiction	Thompson's Station, TN
East/West Street	Tollgate Blvd
North/South Street	Columbia Pk
Peak Hour Factor	0.98
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		1	0	1		0	0	0	0	1	1	0	0	0	2	0
Configuration		L		R						L	T				T	TR
Volume (veh/h)		31		68						68	455				483	60
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		32		69						69						
Capacity		309		717						1006						
v/c Ratio		0.10		0.10						0.07						
95% Queue Length		0.3		0.3						0.2						
Control Delay (s/veh)		18.0		10.6						8.8						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	12.9								1.1							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

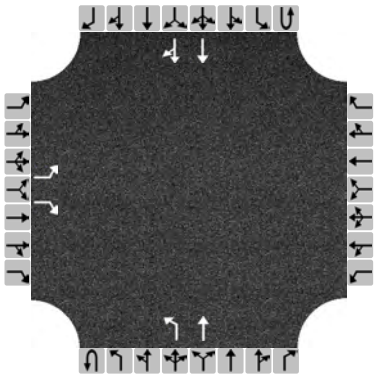
General Information

Analyst	bsb
Agency/Co.	Ragan-Smith Associates
Date Performed	12/19/2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Tollgate Village

Site Information

Intersection	Columbia Pk/Tollgate Blvd
Jurisdiction	Thompson's Station, TN
East/West Street	Tollgate Blvd
North/South Street	Columbia Pk
Peak Hour Factor	0.94
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		1	0	1		0	0	0	0	1	1	0	0	0	2	0
Configuration		L		R						L	T				T	TR
Volume (veh/h)		57		93						67	563				941	94
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

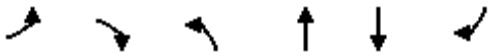
Flow Rate (veh/h)		61		99						71						
Capacity		171		476						624						
v/c Ratio		0.36		0.21						0.11						
95% Queue Length		1.5		0.8						0.4						
Control Delay (s/veh)		37.3		14.5						11.5						
Level of Service (LOS)		E		B						B						
Approach Delay (s/veh)	23.2								1.2							
Approach LOS	C															

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	128	100	55	971	631	27
Future Volume (veh/h)	128	100	55	971	631	27
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900
Adj Flow Rate, veh/h	158	123	64	1129	956	41
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.81	0.81	0.86	0.86	0.66	0.66
Percent Heavy Veh, %	0	0	0	2	2	0
Cap, veh/h	244	290	400	2360	1837	1056
Arrive On Green	0.13	0.13	0.04	0.67	0.52	0.52
Sat Flow, veh/h	1810	1615	1810	3632	3632	1615
Grp Volume(v), veh/h	158	123	64	1129	956	41
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1770	1770	1615
Q Serve(g_s), s	4.8	3.9	0.9	9.1	10.3	0.5
Cycle Q Clear(g_c), s	4.8	3.9	0.9	9.1	10.3	0.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	244	290	400	2360	1837	1056
V/C Ratio(X)	0.65	0.42	0.16	0.48	0.52	0.04
Avail Cap(c_a), veh/h	920	893	1068	6953	5123	2556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	21.2	6.3	4.7	9.2	3.6
Incr Delay (d2), s/veh	2.9	1.0	0.2	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.4	4.4	5.0	0.3
LnGrp Delay(d),s/veh	26.7	22.1	6.5	4.9	9.4	3.6
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	281			1193	997	
Approach Delay, s/veh	24.7			5.0	9.2	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		44.7		13.3	8.6	36.1		
Change Period (Y+Rc), s		* 6		5.5	* 6	* 6		
Max Green Setting (Gmax), s		* 1.1E2		29.5	* 24	* 84		
Max Q Clear Time (g_c+I1), s		11.1		6.8	2.9	12.3		
Green Ext Time (p_c), s		18.3		1.1	0.2	17.8		

Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Notes



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	128	100	55	971	631	27
Future Volume (vph)	128	100	55	971	631	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.159			
Satd. Flow (perm)	1805	1615	302	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		105				41
Link Speed (mph)	30			25	45	
Link Distance (ft)	275			925	685	
Travel Time (s)	6.3			25.2	10.4	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.66	0.66
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	158	123	64	1129	956	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	123	64	1129	956	41
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	11.5	24.7	37.8	37.8	24.1	41.8
Actuated g/C Ratio	0.19	0.40	0.62	0.62	0.39	0.68
v/c Ratio	0.46	0.17	0.17	0.52	0.69	0.04
Control Delay	28.6	5.0	6.0	7.6	18.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	5.0	6.0	7.6	18.4	1.1
LOS	C	A	A	A	B	A
Approach Delay	18.3			7.5	17.7	
Approach LOS	B			A	B	
Queue Length 50th (ft)	52	4	8	102	145	0
Queue Length 95th (ft)	106	28	22	163	154	4
Internal Link Dist (ft)	195			845	605	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	895	1138	793	3539	3539	1563
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.11	0.08	0.32	0.27	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 61.1			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 43.5%		ICU Level of Service A	
Analysis Period (min) 15			

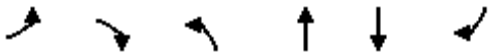
Splits and Phases: 1: Columbia Pk & Tollgate Blvd

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	68	68	455	483	60
Future Volume (veh/h)	31	68	68	455	483	60
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900
Adj Flow Rate, veh/h	37	82	78	523	543	67
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.83	0.83	0.87	0.87	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	0
Cap, veh/h	241	311	480	1976	1195	760
Arrive On Green	0.13	0.13	0.06	0.56	0.34	0.34
Sat Flow, veh/h	1810	1615	1810	3632	3632	1615
Grp Volume(v), veh/h	37	82	78	523	543	67
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1770	1770	1615
Q Serve(g_s), s	0.7	1.6	0.9	2.9	4.5	0.9
Cycle Q Clear(g_c), s	0.7	1.6	0.9	2.9	4.5	0.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	241	311	480	1976	1195	760
V/C Ratio(X)	0.15	0.26	0.16	0.26	0.45	0.09
Avail Cap(c_a), veh/h	1433	1375	1539	10832	7981	3857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	12.8	6.5	4.3	9.7	5.4
Incr Delay (d2), s/veh	0.3	0.4	0.2	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.6	0.5	1.4	2.2	0.5
LnGrp Delay(d),s/veh	14.6	13.2	6.6	4.3	9.9	5.5
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	119			601	610	
Approach Delay, s/veh	13.7			4.6	9.4	
Approach LOS	B			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		26.8		10.5	8.2	18.6		
Change Period (Y+Rc), s		* 6		5.5	* 6	* 6		
Max Green Setting (Gmax), s		* 1.1E2		29.5	* 24	* 84		
Max Q Clear Time (g_c+I1), s		4.9		3.6	2.9	6.5		
Green Ext Time (p_c), s		6.1		0.4	0.2	6.1		

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Notes



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	31	68	68	455	483	60
Future Volume (vph)	31	68	68	455	483	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.330			
Satd. Flow (perm)	1805	1615	627	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		82				67
Link Speed (mph)	30			25	45	
Link Distance (ft)	275			925	685	
Travel Time (s)	6.3			25.2	10.4	
Peak Hour Factor	0.83	0.83	0.87	0.87	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	37	82	78	523	543	67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	82	78	523	543	67
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	7.3	17.0	26.9	28.6	18.2	28.1
Actuated g/C Ratio	0.17	0.40	0.63	0.67	0.43	0.66
v/c Ratio	0.12	0.12	0.13	0.22	0.36	0.06
Control Delay	18.5	3.0	4.5	4.4	13.5	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	3.0	4.5	4.4	13.5	1.7
LOS	B	A	A	A	B	A
Approach Delay	7.8			4.4	12.2	
Approach LOS	A			A	B	
Queue Length 50th (ft)	8	0	7	28	60	0
Queue Length 95th (ft)	27	15	18	44	103	10
Internal Link Dist (ft)	195			845	605	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	1284	1312	1079	3539	3539	1600
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.06	0.07	0.15	0.15	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 42.6			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 37.5%		ICU Level of Service A	
Analysis Period (min) 15			

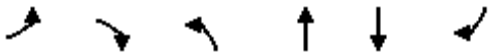
Splits and Phases: 1: Columbia Pk & Tollgate Blvd

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	93	67	563	941	94
Future Volume (veh/h)	57	93	67	563	941	94
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900
Adj Flow Rate, veh/h	69	112	77	647	1057	106
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.83	0.83	0.87	0.87	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	0
Cap, veh/h	224	282	365	2329	1744	995
Arrive On Green	0.12	0.12	0.05	0.66	0.49	0.49
Sat Flow, veh/h	1810	1615	1810	3632	3632	1615
Grp Volume(v), veh/h	69	112	77	647	1057	106
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1770	1770	1615
Q Serve(g_s), s	1.8	3.2	1.0	4.0	11.4	1.4
Cycle Q Clear(g_c), s	1.8	3.2	1.0	4.0	11.4	1.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	224	282	365	2329	1744	995
V/C Ratio(X)	0.31	0.40	0.21	0.28	0.61	0.11
Avail Cap(c_a), veh/h	1014	988	1098	7665	5648	2777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	19.3	6.8	3.8	9.7	4.1
Incr Delay (d2), s/veh	0.8	0.9	0.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.0	0.5	1.9	5.5	0.8
LnGrp Delay(d),s/veh	21.8	20.2	7.1	3.8	10.0	4.2
LnGrp LOS	C	C	A	A	B	A
Approach Vol, veh/h	181			724	1163	
Approach Delay, s/veh	20.8			4.2	9.5	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		40.6		12.0	8.7	31.9		
Change Period (Y+Rc), s		* 6		5.5	* 6	* 6		
Max Green Setting (Gmax), s		* 1.1E2		29.5	* 24	* 84		
Max Q Clear Time (g_c+I1), s		6.0		5.2	3.0	13.4		
Green Ext Time (p_c), s		12.7		0.7	0.2	12.6		

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Notes

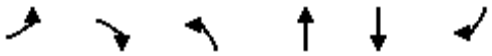


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	57	93	67	563	941	94
Future Volume (vph)	57	93	67	563	941	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.133			
Satd. Flow (perm)	1805	1615	253	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		81				106
Link Speed (mph)	30			25	45	
Link Distance (ft)	275			925	685	
Travel Time (s)	6.3			25.2	10.4	
Peak Hour Factor	0.83	0.83	0.87	0.87	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	69	112	77	647	1057	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	112	77	647	1057	106
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	8.5	22.4	38.5	38.5	24.0	38.6
Actuated g/C Ratio	0.14	0.38	0.66	0.66	0.41	0.66
v/c Ratio	0.27	0.17	0.20	0.28	0.73	0.10
Control Delay	27.6	6.4	4.8	4.5	18.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	6.4	4.8	4.5	18.2	1.1
LOS	C	A	A	A	B	A
Approach Delay	14.5			4.6	16.6	
Approach LOS	B			A	B	
Queue Length 50th (ft)	22	7	8	39	153	0
Queue Length 95th (ft)	57	33	20	64	246	12
Internal Link Dist (ft)	195			845	605	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	926	1089	814	3539	3539	1594
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.10	0.09	0.18	0.30	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 58.7			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



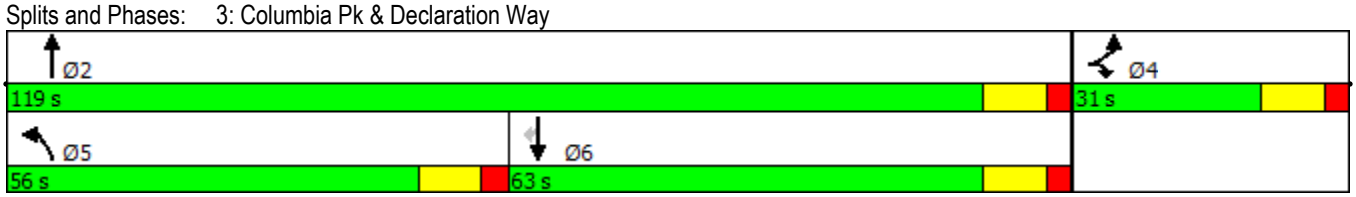
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	115	144	404	911	390	341
Future Volume (vph)	115	144	404	911	390	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	560			150
Storage Lanes	1	1	1			1
Taper Length (ft)	25		175			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	20			20	20	
Link Distance (ft)	758			935	925	
Travel Time (s)	25.8			31.9	31.5	
Peak Hour Factor	0.54	0.54	0.53	0.86	0.66	0.48
Adj. Flow (vph)	213	267	762	1059	591	710
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	267	762	1059	591	710
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	30			20	20	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	Prot	NA	NA	Perm
Protected Phases	4	4	5	2	6	
Permitted Phases						6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	28.0	15.0	28.0	28.0	28.0
Total Split (s)	31.0	31.0	56.0	119.0	63.0	63.0
Total Split (%)	20.7%	20.7%	37.3%	79.3%	42.0%	42.0%
Maximum Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Yellow Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	10.0	10.0	10.0	10.0	10.0	10.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Actuated g/C Ratio	0.14	0.14	0.31	0.73	0.35	0.35
v/c Ratio	0.86	1.21	1.41	0.41	0.47	1.27
Control Delay	93.4	180.5	232.1	8.6	39.2	175.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	180.5	232.1	8.6	39.2	175.2
LOS	F	F	F	A	D	F
Approach Delay	141.9			102.1	113.4	
Approach LOS	F			F	F	
Queue Length 50th (ft)	207	~317	~995	193	235	~873
Queue Length 95th (ft)	170	213	504	214	202	390
Internal Link Dist (ft)	678			855	845	
Turn Bay Length (ft)		250	560			150
Base Capacity (vph)	247	221	542	2571	1250	559
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.21	1.41	0.41	0.47	1.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.41			
Intersection Signal Delay: 111.5		Intersection LOS: F	
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Columbia Pk & Declaration Way



Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	91	70	585	987	47
Future Vol, veh/h	45	91	70	585	987	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	250	560	-	-	150
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	43	43	67	86	94	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	212	104	680	1050	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1599	525	1050	0	-	0
Stage 1	1050	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 97	497	659	-	-	-
Stage 1	298	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 82	497	659	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	298	-	-	-	-	-
Stage 2	456	-	-	-	-	-

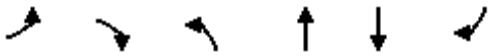
Approach	EB	NB	SB
HCM Control Delay, s	25.3	1.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	659	-	200	497	-	-
HCM Lane V/C Ratio	0.159	-	0.523	0.426	-	-
HCM Control Delay (s)	11.5	-	41.2	17.5	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.6	-	2.7	2.1	-	-

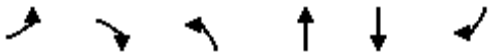
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX D

CAPACITY ANALYSIS WORKSHEETS
2020 BACKGROUND



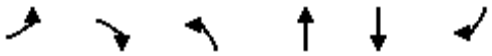
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	128	100	55	1093	710	27
Future Volume (vph)	128	100	55	1093	710	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.132			
Satd. Flow (perm)	1805	1615	251	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		77				41
Link Speed (mph)	30			20	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			31.5	9.5	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.66	0.66
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	158	123	64	1271	1076	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	123	64	1271	1076	41
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	12.0	25.2	41.2	41.2	27.5	45.8
Actuated g/C Ratio	0.18	0.39	0.63	0.63	0.42	0.70
v/c Ratio	0.47	0.18	0.19	0.57	0.72	0.04
Control Delay	30.7	7.8	6.1	8.1	18.9	1.0
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	30.7	7.8	6.1	8.2	18.9	1.0
LOS	C	A	A	A	B	A
Approach Delay	20.7			8.1	18.2	
Approach LOS	C			A	B	
Queue Length 50th (ft)	55	11	8	125	173	0
Queue Length 95th (ft)	113	40	22	198	179	3
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	842	1079	748	3539	3539	1558
Starvation Cap Reductn	0	0	0	878	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.11	0.09	0.48	0.30	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 65.1			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 46.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd

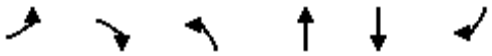


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	57	93	67	634	1059	94
Future Volume (vph)	57	93	67	634	1059	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.124			
Satd. Flow (perm)	1805	1615	236	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		68				100
Link Speed (mph)	30			45	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			14.0	9.5	
Peak Hour Factor	0.89	0.89	0.86	0.86	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	64	104	78	737	1127	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	104	78	737	1127	100
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	8.4	22.5	40.7	40.7	26.0	40.6
Actuated g/C Ratio	0.14	0.37	0.67	0.67	0.43	0.67
v/c Ratio	0.26	0.16	0.21	0.31	0.74	0.09
Control Delay	28.9	7.5	4.7	4.5	18.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	7.5	4.7	4.5	18.2	1.1
LOS	C	A	A	A	B	A
Approach Delay	15.7			4.6	16.8	
Approach LOS	B			A	B	
Queue Length 50th (ft)	21	8	8	46	168	0
Queue Length 95th (ft)	61	40	19	72	274	12
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	893	1047	789	3539	3539	1594
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.10	0.10	0.21	0.32	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 60.8			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 53.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



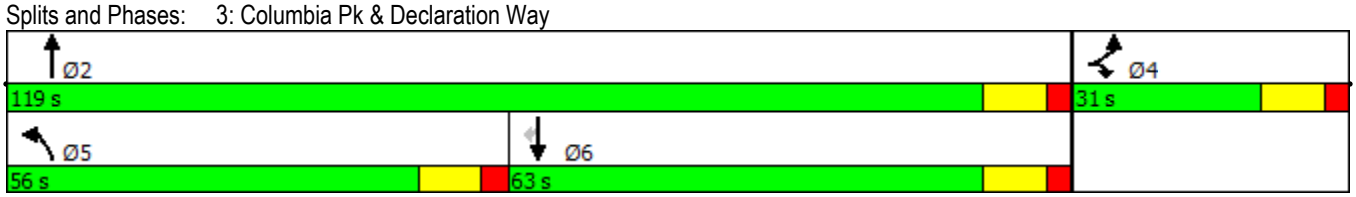
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	115	144	404	1025	439	341
Future Volume (vph)	115	144	404	1025	439	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	560			150
Storage Lanes	1	1	1			1
Taper Length (ft)	25		175			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	20			20	20	
Link Distance (ft)	758			935	925	
Travel Time (s)	25.8			31.9	31.5	
Peak Hour Factor	0.54	0.54	0.53	0.86	0.66	0.48
Adj. Flow (vph)	213	267	762	1192	665	710
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	267	762	1192	665	710
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	30			20	20	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	Prot	NA	NA	Perm
Protected Phases	4	4	5	2	6	
Permitted Phases						6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	28.0	15.0	28.0	28.0	28.0
Total Split (s)	31.0	31.0	56.0	119.0	63.0	63.0
Total Split (%)	20.7%	20.7%	37.3%	79.3%	42.0%	42.0%
Maximum Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Yellow Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	10.0	10.0	10.0	10.0	10.0	10.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Actuated g/C Ratio	0.14	0.14	0.31	0.73	0.35	0.35
v/c Ratio	0.86	1.21	1.41	0.46	0.53	1.27
Control Delay	93.4	180.5	232.1	9.1	40.5	175.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	180.5	232.1	9.1	40.5	175.2
LOS	F	F	F	A	D	F
Approach Delay	141.9			96.1	110.1	
Approach LOS	F			F	F	
Queue Length 50th (ft)	207	~317	~995	230	272	~873
Queue Length 95th (ft)	170	213	504	251	228	390
Internal Link Dist (ft)	678			855	845	
Turn Bay Length (ft)		250	560			150
Base Capacity (vph)	247	221	542	2571	1250	559
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.21	1.41	0.46	0.53	1.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.41			
Intersection Signal Delay: 106.9		Intersection LOS: F	
Intersection Capacity Utilization 65.9%		ICU Level of Service C	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Columbia Pk & Declaration Way



Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	91	70	658	1111	47
Future Vol, veh/h	45	91	70	658	1111	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	250	560	-	-	150
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	43	43	67	86	94	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	212	104	765	1182	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1774	591	1182	0	-	0
Stage 1	1182	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 74	450	587	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 61	450	587	-	-	-
Mov Cap-2 Maneuver	171	-	-	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	425	-	-	-	-	-

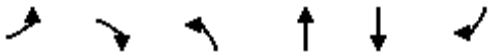
Approach	EB	NB	SB
HCM Control Delay, s	31.4	1.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	587	-	171	450	-	-
HCM Lane V/C Ratio	0.178	-	0.612	0.47	-	-
HCM Control Delay (s)	12.5	-	54.6	19.9	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.6	-	3.4	2.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX E

CAPACITY ANALYSIS WORKSHEETS
2020 TOTAL

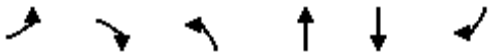


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	212	169	78	1093	710	55
Future Volume (vph)	212	169	78	1093	710	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.124			
Satd. Flow (perm)	1805	1615	236	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		77				83
Link Speed (mph)	30			20	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			31.5	9.5	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.66	0.66
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	262	209	91	1271	1076	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	262	209	91	1271	1076	83
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5

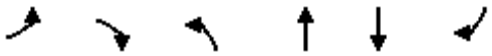
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	17.6	31.8	46.1	46.1	31.4	55.2
Actuated g/C Ratio	0.23	0.42	0.61	0.61	0.42	0.73
v/c Ratio	0.63	0.29	0.28	0.59	0.73	0.07
Control Delay	34.7	11.0	8.9	10.6	22.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	11.0	8.9	10.6	22.4	0.8
LOS	C	B	A	B	C	A
Approach Delay	24.2			10.5	20.9	
Approach LOS	C			B	C	
Queue Length 50th (ft)	110	38	15	165	211	0
Queue Length 95th (ft)	190	81	38	261	220	4
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	728	1055	659	3539	3454	1461
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.14	0.36	0.31	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 75.6			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 51.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



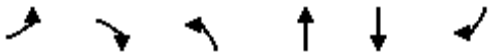
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	137	142	634	1059	185
Future Volume (vph)	110	137	142	634	1059	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.112			
Satd. Flow (perm)	1805	1615	213	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		68				197
Link Speed (mph)	30			45	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			14.0	9.5	
Peak Hour Factor	0.89	0.89	0.86	0.86	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	124	154	165	737	1127	197
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	154	165	737	1127	197
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	35.0	30.0	30.0	120.0	90.0	35.0
Total Split (%)	22.6%	19.4%	19.4%	77.4%	58.1%	22.6%
Maximum Green (s)	29.5	24.0	24.0	114.0	84.0	29.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	11.0	29.5	48.5	48.5	29.5	46.7
Actuated g/C Ratio	0.15	0.41	0.68	0.68	0.41	0.65
v/c Ratio	0.45	0.22	0.38	0.31	0.77	0.18
Control Delay	35.9	9.7	8.7	5.0	22.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	9.7	8.7	5.0	22.6	1.2
LOS	D	A	A	A	C	A
Approach Delay	21.4			5.7	19.5	
Approach LOS	C			A	B	
Queue Length 50th (ft)	49	22	21	55	211	0
Queue Length 95th (ft)	119	67	60	90	354	20
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	773	968	699	3539	3469	1501
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.24	0.21	0.32	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 71.4			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



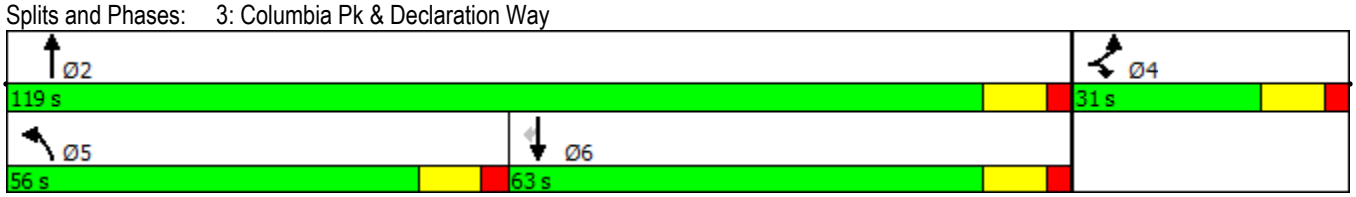
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	115	144	404	1048	508	341
Future Volume (vph)	115	144	404	1048	508	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	560			150
Storage Lanes	1	1	1			1
Taper Length (ft)	25		175			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	20			20	20	
Link Distance (ft)	758			935	925	
Travel Time (s)	25.8			31.9	31.5	
Peak Hour Factor	0.54	0.54	0.53	0.86	0.66	0.48
Adj. Flow (vph)	213	267	762	1219	770	710
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	267	762	1219	770	710
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	30			20	20	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	Prot	NA	NA	Perm
Protected Phases	4	4	5	2	6	
Permitted Phases						6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	28.0	15.0	28.0	28.0	28.0
Total Split (s)	31.0	31.0	56.0	119.0	63.0	63.0
Total Split (%)	20.7%	20.7%	37.3%	79.3%	42.0%	42.0%
Maximum Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Yellow Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	10.0	10.0	10.0	10.0	10.0	10.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Actuated g/C Ratio	0.14	0.14	0.31	0.73	0.35	0.35
v/c Ratio	0.86	1.21	1.41	0.47	0.62	1.27
Control Delay	93.4	180.5	232.1	9.3	42.7	175.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	180.5	232.1	9.3	42.7	175.2
LOS	F	F	F	A	D	F
Approach Delay	141.9			95.0	106.3	
Approach LOS	F			F	F	
Queue Length 50th (ft)	207	~317	~995	237	327	~873
Queue Length 95th (ft)	170	213	504	260	267	390
Internal Link Dist (ft)	678			855	845	
Turn Bay Length (ft)		250	560			150
Base Capacity (vph)	247	221	542	2571	1250	559
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.21	1.41	0.47	0.62	1.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.41			
Intersection Signal Delay: 104.9		Intersection LOS: F	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Columbia Pk & Declaration Way



Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	91	70	733	1155	47
Future Vol, veh/h	45	91	70	733	1155	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	250	560	-	-	150
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	43	43	67	86	94	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	212	104	852	1229	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1864	614	1229	0	-	0
Stage 1	1229	-	-	-	-	-
Stage 2	635	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 64	435	563	-	-	-
Stage 1	239	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 52	435	563	-	-	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	239	-	-	-	-	-
Stage 2	399	-	-	-	-	-

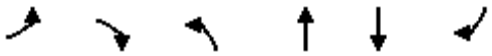
Approach	EB	NB	SB
HCM Control Delay, s	35.1	1.4	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	563	-	158	435	-	-
HCM Lane V/C Ratio	0.186	-	0.662	0.487	-	-
HCM Control Delay (s)	12.8	-	63.9	20.9	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.7	-	3.8	2.6	-	-

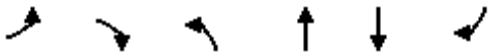
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX F

CAPACITY ANALYSIS WORKSHEETS
2027 BACKGROUND



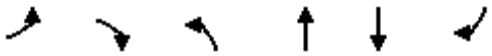
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	128	100	55	1344	873	27
Future Volume (vph)	128	100	55	1344	873	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.094			
Satd. Flow (perm)	1805	1615	179	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		63				41
Link Speed (mph)	30			20	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			31.5	9.5	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.66	0.66
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	158	123	64	1563	1323	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	123	64	1563	1323	41
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5



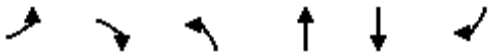
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	36.0	17.0	17.0	119.0	102.0	36.0
Total Split (%)	23.2%	11.0%	11.0%	76.8%	65.8%	23.2%
Maximum Green (s)	30.5	11.0	11.0	113.0	96.0	30.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	12.7	25.7	49.8	49.8	36.3	55.2
Actuated g/C Ratio	0.17	0.35	0.67	0.67	0.49	0.74
v/c Ratio	0.51	0.21	0.23	0.66	0.77	0.03
Control Delay	36.9	11.9	6.4	9.0	19.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	11.9	6.4	9.0	19.0	0.8
LOS	D	B	A	A	B	A
Approach Delay	25.9			8.9	18.5	
Approach LOS	C			A	B	
Queue Length 50th (ft)	66	18	8	184	241	0
Queue Length 95th (ft)	131	55	22	282	230	3
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	766	684	368	3539	3537	1572
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.18	0.17	0.44	0.37	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 74.4			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



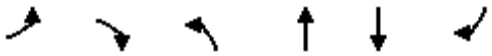
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	57	93	67	779	1303	94
Future Volume (vph)	57	93	67	779	1303	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.099			
Satd. Flow (perm)	1805	1615	188	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		77				100
Link Speed (mph)	30			45	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			14.0	9.5	
Peak Hour Factor	0.89	0.89	0.86	0.86	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	64	104	78	906	1386	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	104	78	906	1386	100
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	23.0	18.0	18.0	132.0	114.0	23.0
Total Split (%)	14.8%	11.6%	11.6%	85.2%	73.5%	14.8%
Maximum Green (s)	17.5	12.0	12.0	126.0	108.0	17.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	8.4	22.4	48.8	48.8	34.3	48.9
Actuated g/C Ratio	0.12	0.32	0.71	0.71	0.50	0.71
v/c Ratio	0.29	0.18	0.24	0.36	0.79	0.09
Control Delay	34.7	8.7	4.7	4.3	18.1	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	8.7	4.7	4.3	18.1	0.9
LOS	C	A	A	A	B	A
Approach Delay	18.6			4.3	16.9	
Approach LOS	B			A	B	
Queue Length 50th (ft)	25	8	8	60	230	0
Queue Length 95th (ft)	70	45	18	89	359	10
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	469	663	421	3539	3539	1382
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.16	0.19	0.26	0.39	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 69			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



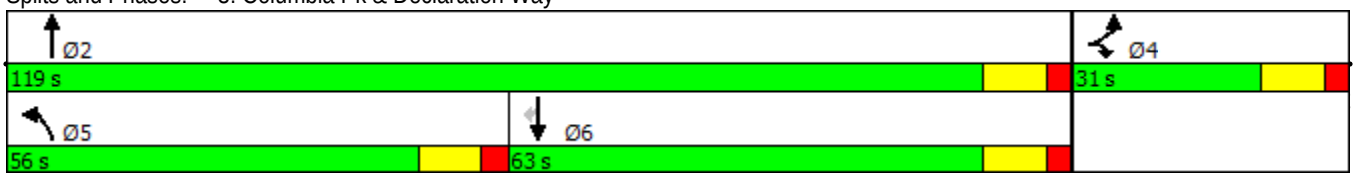
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	115	144	404	1261	540	341
Future Volume (vph)	115	144	404	1261	540	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	560			150
Storage Lanes	1	1	1			1
Taper Length (ft)	25		175			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	20			20	20	
Link Distance (ft)	758			935	925	
Travel Time (s)	25.8			31.9	31.5	
Peak Hour Factor	0.54	0.54	0.53	0.86	0.66	0.48
Adj. Flow (vph)	213	267	762	1466	818	710
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	267	762	1466	818	710
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	30			20	20	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	Prot	NA	NA	Perm
Protected Phases	4	4	5	2	6	
Permitted Phases						6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	28.0	15.0	28.0	28.0	28.0
Total Split (s)	31.0	31.0	56.0	119.0	63.0	63.0
Total Split (%)	20.7%	20.7%	37.3%	79.3%	42.0%	42.0%
Maximum Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Yellow Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	10.0	10.0	10.0	10.0	10.0	10.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Actuated g/C Ratio	0.14	0.14	0.31	0.73	0.35	0.35
v/c Ratio	0.86	1.21	1.41	0.57	0.65	1.27
Control Delay	93.4	180.5	232.1	10.6	43.8	175.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	180.5	232.1	10.6	43.8	175.2
LOS	F	F	F	B	D	F
Approach Delay	141.9			86.4	104.9	
Approach LOS	F			F	F	
Queue Length 50th (ft)	207	~317	~995	320	353	~873
Queue Length 95th (ft)	170	213	504	344	286	390
Internal Link Dist (ft)	678			855	845	
Turn Bay Length (ft)		250	560			150
Base Capacity (vph)	247	221	542	2571	1250	559
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.21	1.41	0.57	0.65	1.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.41			
Intersection Signal Delay: 99.3		Intersection LOS: F	
Intersection Capacity Utilization 68.7%		ICU Level of Service C	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Columbia Pk & Declaration Way



Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	91	70	810	1366	47
Future Vol, veh/h	45	91	70	810	1366	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	250	560	-	-	150
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	43	43	67	86	94	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	212	104	942	1453	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2133	727	1453	0	-	0
Stage 1	1453	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 42	366	462	-	-	-
Stage 1	181	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 33	366	462	-	-	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	181	-	-	-	-	-
Stage 2	360	-	-	-	-	-

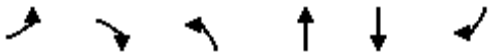
Approach	EB	NB	SB
HCM Control Delay, s	55.4	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	462	-	123	366	-	-
HCM Lane V/C Ratio	0.226	-	0.851	0.578	-	-
HCM Control Delay (s)	15.1	-	111.8	27.5	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	0.9	-	5.2	3.5	-	-

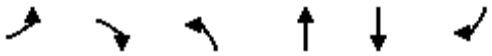
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX G

CAPACITY ANALYSIS WORKSHEETS
2027 TOTAL



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	291	248	280	1379	908	257
Future Volume (vph)	291	248	280	1379	908	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.062			
Satd. Flow (perm)	1805	1615	118	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		17				154
Link Speed (mph)	30			20	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			31.5	9.5	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.66	0.66
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	359	306	326	1603	1376	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	359	306	326	1603	1376	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5

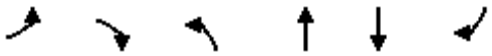


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	44.0	35.0	35.0	111.0	76.0	44.0
Total Split (%)	28.4%	22.6%	22.6%	71.6%	49.0%	28.4%
Maximum Green (s)	38.5	29.0	29.0	105.0	70.0	38.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	32.0	64.0	91.4	91.4	58.9	97.0
Actuated g/C Ratio	0.24	0.47	0.68	0.68	0.44	0.72
v/c Ratio	0.84	0.40	0.80	0.67	0.89	0.32
Control Delay	69.4	24.7	54.2	15.0	44.5	4.6
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	69.4	24.7	54.2	15.3	44.5	4.6
LOS	E	C	D	B	D	A
Approach Delay	48.8			21.8	35.7	
Approach LOS	D			C	D	
Queue Length 50th (ft)	325	173	237	440	626	66
Queue Length 95th (ft)	410	232	#368	498	462	57
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	531	816	453	2766	1895	1287
Starvation Cap Reductn	0	0	0	420	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.38	0.72	0.68	0.73	0.30

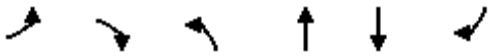
Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 135.3			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 31.6		Intersection LOS: C	
Intersection Capacity Utilization 71.3%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbia Pk & Tollgate Blvd



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	352	379	292	828	1352	335
Future Volume (vph)	352	379	292	828	1352	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	160			275
Storage Lanes	1	1	1			1
Taper Length (ft)	110		70			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3539	3539	1615
Flt Permitted	0.950		0.058			
Satd. Flow (perm)	1805	1615	110	3539	3539	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		14				130
Link Speed (mph)	30			45	45	
Link Distance (ft)	275			925	629	
Travel Time (s)	6.3			14.0	9.5	
Peak Hour Factor	0.89	0.89	0.86	0.86	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Adj. Flow (vph)	396	426	340	963	1438	356
Shared Lane Traffic (%)						
Lane Group Flow (vph)	396	426	340	963	1438	356
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes	Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	4.0	4.0	10.0	10.0	7.0
Minimum Split (s)	12.5	10.0	10.0	16.0	16.0	12.5



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (s)	45.0	34.0	34.0	110.0	76.0	45.0
Total Split (%)	29.0%	21.9%	21.9%	71.0%	49.0%	29.0%
Maximum Green (s)	39.5	28.0	28.0	104.0	70.0	39.5
Yellow Time (s)	3.2	4.3	4.3	4.3	4.3	3.2
All-Red Time (s)	2.3	1.7	1.7	1.7	1.7	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.0	5.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	35.3	68.1	96.6	96.6	63.3	104.7
Actuated g/C Ratio	0.25	0.47	0.67	0.67	0.44	0.73
v/c Ratio	0.90	0.55	0.86	0.40	0.92	0.29
Control Delay	76.7	30.1	64.3	11.4	48.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	30.1	64.3	11.4	48.7	4.5
LOS	E	C	E	B	D	A
Approach Delay	52.5			25.2	40.0	
Approach LOS	D			C	D	
Queue Length 50th (ft)	386	295	280	217	699	61
Queue Length 95th (ft)	#552	399	#421	242	810	98
Internal Link Dist (ft)	195			845	549	
Turn Bay Length (ft)		200	160			275
Base Capacity (vph)	504	787	410	2606	1754	1263
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.54	0.83	0.37	0.82	0.28

Intersection Summary			
Area Type:	Other		
Cycle Length: 155			
Actuated Cycle Length: 143.6			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 37.7		Intersection LOS: D	
Intersection Capacity Utilization 87.6%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbia Pk & Tollgate Blvd

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	25	1694	1167	25
Future Vol, veh/h	10	10	25	1694	1167	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	27	1841	1268	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2257	648	1296	0	-	0
Stage 1	1282	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	35	413	531	-	-	-
Stage 1	224	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	33	413	531	-	-	-
Mov Cap-2 Maneuver	133	-	-	-	-	-
Stage 1	224	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	531	-	133	413	-	-
HCM Lane V/C Ratio	0.051	-	0.082	0.026	-	-
HCM Control Delay (s)	12.1	-	34.5	14	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

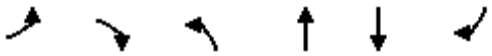
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	30	19	1184	1693	19
Future Vol, veh/h	30	30	19	1184	1693	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	86	94	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	33	21	1377	1801	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2541	911	1822	0	-	0
Stage 1	1811	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 22	277	332	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 21	277	332	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	410	-	-	-	-	-

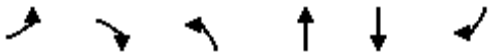
Approach	EB	NB	SB
HCM Control Delay, s	43.4	0.2	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	332	-	89	277	-	-
HCM Lane V/C Ratio	0.062	-	0.366	0.118	-	-
HCM Control Delay (s)	16.6	-	67.2	19.7	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	125	154	429	1512	698	366
Future Volume (vph)	125	154	429	1512	698	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	560			150
Storage Lanes	1	1	1			1
Taper Length (ft)	25		175			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	20			20	20	
Link Distance (ft)	758			935	925	
Travel Time (s)	25.8			31.9	31.5	
Peak Hour Factor	0.54	0.54	0.53	0.86	0.66	0.48
Adj. Flow (vph)	231	285	809	1758	1058	763
Shared Lane Traffic (%)						
Lane Group Flow (vph)	231	285	809	1758	1058	763
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	30			20	20	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Prot	Prot	NA	NA	Perm
Protected Phases	4	4	5	2	6	
Permitted Phases						6



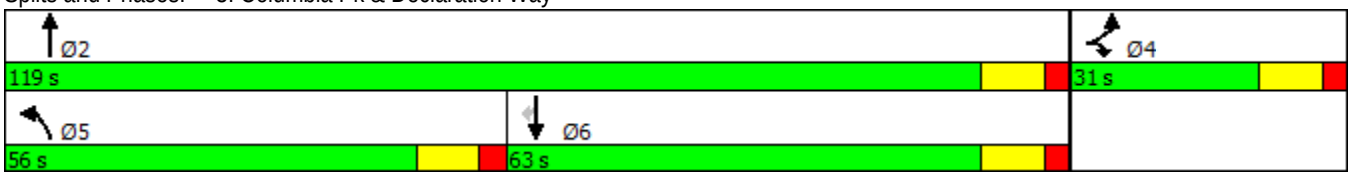
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.0	28.0	15.0	28.0	28.0	28.0
Total Split (s)	31.0	31.0	56.0	119.0	63.0	63.0
Total Split (%)	20.7%	20.7%	37.3%	79.3%	42.0%	42.0%
Maximum Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Yellow Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	10.0	10.0	10.0	10.0	10.0	10.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	21.0	21.0	46.0	109.0	53.0	53.0
Actuated g/C Ratio	0.14	0.14	0.31	0.73	0.35	0.35
v/c Ratio	0.94	1.29	1.49	0.68	0.85	1.36
Control Delay	105.7	208.8	267.9	12.9	52.4	213.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.7	208.8	267.9	12.9	52.4	213.3
LOS	F	F	F	B	D	F
Approach Delay	162.7			93.2	119.8	
Approach LOS	F			F	F	
Queue Length 50th (ft)	227	~353	~1091	446	502	~980
Queue Length 95th (ft)	183	#236	#554	470	384	427
Internal Link Dist (ft)	678			855	845	
Turn Bay Length (ft)		250	560			150
Base Capacity (vph)	247	221	542	2571	1250	559
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.29	1.49	0.68	0.85	1.36

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.49			
Intersection Signal Delay: 110.4		Intersection LOS: F	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Columbia Pk & Declaration Way



Intersection	
Int Delay, s/veh	41.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	75	121	89	1054	1683	66
Future Vol, veh/h	75	121	89	1054	1683	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	250	560	-	-	150
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	43	43	67	86	94	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	174	281	133	1226	1790	90

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2668	895	1790	0	-	0
Stage 1	1790	-	-	-	-	-
Stage 2	878	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 18	284	342	-	-	-
Stage 1	~ 119	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 11	284	342	-	-	-
Mov Cap-2 Maneuver	~ 75	-	-	-	-	-
Stage 1	~ 119	-	-	-	-	-
Stage 2	224	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 333.2	2.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	342	-	75	284	-	-
HCM Lane V/C Ratio	0.388	-	2.326	0.991	-	-
HCM Control Delay (s)	22.1	-	$ 724.3	90.8	-	-
HCM Lane LOS	C	-	F	F	-	-
HCM 95th %tile Q(veh)	1.8	-	16.4	10.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	259	745	51	20	0
Future Vol, veh/h	0	259	745	51	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	282	810	55	22	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	865	0	-	0	1120	838
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	282	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	778	-	-	-	228	366
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	766	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	778	-	-	-	228	366
Mov Cap-2 Maneuver	-	-	-	-	339	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	766	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	778	-	-	-	339
HCM Lane V/C Ratio	-	-	-	-	0.064
HCM Control Delay (s)	0	-	-	-	16.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	136	117	38	61	0
Future Vol, veh/h	0	136	117	38	61	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	148	127	41	66	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	296	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	148	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1410	-	-	-	695	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1410	-	-	-	695	899
Mov Cap-2 Maneuver	-	-	-	-	719	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1410	-	-	-	719
HCM Lane V/C Ratio	-	-	-	-	0.092
HCM Control Delay (s)	0	-	-	-	10.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

RPM Transportation Consultants, LLC
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March 13, 2017

Ms. Wendy Deats
Town Planner
Town of Thompsons Station
1550 Thompsons Station Road West
Thompsons Station, TN 37179

Re: Tollgate Village – Traffic Impact Study Review
Thompson's Station, Tennessee

Dear Wendy:

I am writing this letter to summarize our review of the Traffic Impact Study (TIS) for the Tollgate Village development on Tollgate Boulevard. On March 1st, 2017, RPM received a copy of the TIS for the development prepared by Ragan-Smith Associates, Inc. This report is dated February 28, 2017. It should be noted that recommendations from a previous study for this development conducted by Ragan-Smith in December 2016 were incorporated into this traffic study. RPM reviewed the previous study in January 2017.

The Tollgate Village residential development is located on Tollgate Boulevard on the west side of Columbia Pike, approximately 0.5 miles north of the State Route 840 interchange. Based on information included in the TIS, the purpose of the study is to evaluate the need for roadway improvements based on the impacts of the development, as well as establishing a schedule of improvements for traffic mitigation as the development progresses. The traffic mitigation measures recommended in the TIS are, (1) a secondary access on Columbia Pike to the north of Tollgate Boulevard (right in/right out only), (2) a secondary access on Declaration Way, (3) the addition of a right turn lane and the installation of a traffic signal on Columbia Pike at the intersection with Tollgate Boulevard, and (4) an extension of the existing southbound right turn lane on Columbia Pike at the intersection with Declaration Way. Improvements to the intersection of Columbia Pike and the northern secondary access were also recommended based on the expected widening of Columbia Pike. These improvements include (1) the addition of a southbound right turn lane on Columbia Pike and (2) the addition of a northbound left turn lane on Columbia Pike. These improvements will allow the intersection of Columbia Pike and the northern secondary access to provide full turning movement access.

I have divided my comments into two different sections. The first includes comments related to technical aspects of the study and its methodologies. The second includes comments related to the interpretation of the results of the analyses and the study's recommendations.

Technical Aspects of the TIS

In order to perform the analyses involved in this study, a traffic count was conducted at the intersection of Columbia Pike and Tollgate Boulevard on November 17, 2016 and at the intersection of Columbia Pike and Declaration Way on January 31, 2017. According to the Town of Thompson's Station, construction of a separate project was underway at the intersection of Columbia Pike and Critz Lane, south of the project site during November 2016, which might have affected traffic volumes at the intersection of Columbia Pike and Tollgate Boulevard. The study intersection was previously counted by Ragan-Smith in 2014 as part of a 2015 traffic study for the same residential development. The 2016 through movement volumes along Columbia Pike were found to be within approximately 5% of the 2014 through movement volumes during both the A.M. and P.M. peak hours, with one exception. The traffic volume for the northbound through movement at the study intersection during the A.M. peak hour decreased by approximately 28% from 2014 to 2016. However, according to the Town of Thompson's Station, the previously mentioned construction site should not affect traffic coming from Critz Lane turning north onto Columbia Pike. Therefore, these counts remain valid for use and were collected during a typical weekday when school was in session.

In evaluating the need for a traffic signal at the intersection of Columbia Pike and Tollgate Boulevard, standard methodologies were used. This analysis was conducted in accordance with procedures outlined in the Manual on Uniform Traffic Control Devices (MUTCD) and the National Cooperative Highway Research Program (NCHRP) Report 457, *Evaluating Intersection Improvements: An Engineering Study Guide*. It was found that multiple traffic signal warrants were satisfied based on existing traffic volumes at the study intersection.

The capacity analyses for the existing, background, and future traffic conditions were prepared according to standard traffic engineering methodologies as outlined in the *Highway Capacity Manual 2010*. Therefore, the methodology used in this traffic study sufficiently provides a logical trigger point for the necessity of a secondary access.

Recommendations of the TIS

We agree with the findings of the assessment and its recommendations at the intersection of Columbia Pike and Tollgate Boulevard. These recommendations include the installation of a traffic signal, the extension of the northbound merge area approximately 300 feet north of the intersection, and the construction of a southbound right turn lane with a storage length of 275 feet and 100 feet of taper length. The TIS also recommends the removal of the two-way left turn lane pavement markings along Columbia Pike north of the Tollgate Boulevard intersection. These recommended improvements are consistent with the previous study conducted by Ragan-Smith in December 2016. According to the study, no westbound approach exists at the study intersection; however, we did not conduct a site visit to confirm this assessment.

The traffic study also includes recommendations for a schedule of traffic mitigation measures, including two secondary access locations. The conclusion drawn in the traffic study is that a secondary access will need to be constructed before the final

plat approval of Section 16 or 17, whichever comes first. We agree with the assessment that this is a logical trigger point for the necessity of a secondary access, based on capacity considerations.

The traffic study provided thresholds for the maximum amount of trips that could be served by the various secondary access scenarios. It is recommended that trip generation analysis be conducted for each commercial land use as the development progresses. There are no specific recommendations for which secondary access point should be opened first, but the study recommends that no commercial land use trip generation should exceed the maximum trip generation for the applicable access scenario at the time of the analysis.

It was noted that the configuration of the secondary access(es) apparently makes very little difference on the maximum allowable trip generation from the development. Whether the north access is restricted movements, unrestricted movements, or not there at all makes little impact on the total capacity (~5% during the PM peak) of the street network. This is because very little traffic was assigned to these secondary access points. The locations of these connections in relation to the rest of the development makes it unlikely that they will receive significant utilization, and therefore the volume estimates appear to be reasonable.

It was recommended in the study that the northern secondary access location should only provide right in/right out turning movement access until the widening of Columbia Pike by TDOT is completed. With the widening project, the addition of a northbound left turn lane and a southbound right turn lane is recommended on Columbia Pike at the northern access point to provide full turning movement access.

The recommendation to limit the north access to right-in, right-out operation was never explained. In fact, it would be more typical to restrict turning movements in this way on a wider 4-5 lane cross-section than a narrower 2 lane cross-section. Figure 12 of the study also indicates that the access will be located at a point along Columbia Pike immediately south of the development of a second southbound lane. Having a driveway located in such close proximity to a change in lanes is undesirable.

In summary, we agree with the following recommendations included in the Tollgate Village TIS, dated February 28, 2017:

- A traffic signal is warranted at the intersection of Columbia Pike and Tollgate Boulevard under the current traffic conditions. Because Columbia Pike is a state route, the proposed traffic signal will also need approval from TDOT.

- A right turn lane along Columbia Pike at the Tollgate Boulevard intersection is warranted based on the current traffic conditions. The recommended 275 feet of storage length and 100 feet of taper is sufficient to serve the existing traffic volumes.

- It is recommended that the northbound merge area along Columbia Pike be extended approximately 300 feet north of the Tollgate Boulevard intersection. Additionally, the two-way left turn lane pavement markings along Columbia Pike north of the Tollgate Boulevard intersection should be removed.

- It is recommended that the existing southbound right turn lane on Columbia Pike at Declaration Way should be extended to have a storage length of 500 feet with 100 feet of taper.

- The continued use of a traffic control officer by Williamson County Schools during peak arrival and dismissal periods at the intersection of Columbia Pike and Declaration Way is recommended.

- It is recommended that one route of secondary access should be opened prior to the final plat approval of Section 16 or 17, whichever comes first. Note that this is based only on capacity constraints. Access redundancy requirements for safety/security considerations may require construction of a second access sooner.

Other considerations at the secondary access locations are as follow:

- The traffic impact study conclusions include a significant level of variability due to the possibility of five (5) different access configurations. As mentioned earlier, the difference in performance between any one of these various configurations is slight (5%-10%). This slight difference indicates that the secondary access configuration is related more to convenience and safety/security than actual traffic impacts. It is recommended that the development team and other stakeholders (Town officials, Williamson County Schools, and TDOT) work to develop an acceptable master plan based on these non-traffic considerations. Knowing what type of access is possible and where will make it easier to condition certain known improvements at different construction thresholds.

- Unless a larger plan for access control on Columbia Pike exists, it is not recommended to plan for a restricted movement on the northern access, only to switch to full access once the road is widened. Instead, construction of this driveway should include widening Columbia Pike to include a full northbound left turn lane. Additional widening north of the access may be required to prevent the driveway from being located in the middle of a change in lane configuration along Columbia Pike. This will be accomplished by the TDOT widening project, but the development should construct these improvements if not already done by TDOT. A southbound right turn lane is recommended by the study as well.

- Whether or not a secondary access to Declaration Way is allowed, one or more pedestrian connections to allow student access from Tollgate Village to the school campus is desirable. If a connection is made, pedestrian accommodations should be included.

Please contact me if you have any questions regarding this review or if you need any additional information.

Sincerely,
RPM TRANSPORTATION CONSULTANTS

Jeff Hammond, P.E

10-081
9260

RAGAN•SMITH

March 27, 2017

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: TOLLGATE VILLAGE TRAFFIC IMPACT STUDY
RESPONSE TO TRAFFIC STUDY REVIEW COMMENTS
TOWN OF THOMPSON'S STATION, TENNESSEE

Dear Wendy:

The purpose of this letter is to respond and provide additional information to the Town's review of the Tollgate Village traffic impact study completed by Ragan-Smith on February 28, 2017. Comments were received from the Town on March 13, 2017. A listing of the staff report recommendations, other pertinent comments and our response or acknowledgement is provided below.

Staff Report Recommendations from the Traffic Study:

1. *"One route of secondary access to Tollgate Village should be constructed and open to traffic prior to the final plat approval for Tollgate Village Section 16 or Section 17, whichever occurs first. If development in Tollgate Village occurs outside of Sections 15, 16, and 17, a route of secondary access should be constructed as part of that development."*
   Town Traffic Study Review Comments: *"We agree with the assessment that this is a logical trigger point for the necessity of a secondary access, based on capacity considerations."*
   RESPONSE: Acknowledge and agree.

2. *"Additional routes of access or roadway/intersection improvements should be constructed and open to traffic based upon the estimated total trip generation for the existing and proposed development. Table 9 provides a summary of access scenarios and corresponding trip generation thresholds for each access scenario. A trip generation report, established using appropriate methodologies for internal trip capture and estimated based upon the current edition of the ITE Trip Generation Manual, should be provided with each proposed development in Tollgate Village. The total peak hour trip generation should not exceed the maximum trip generation for the applicable access scenario."*
   Town Traffic Study Review Comments: *"It is recommended that trip generation analysis be conducted for each commercial land use as the development progresses. There are no specific recommendations for which secondary access point should be opened first, but the study recommends that no commercial land use trip generation should exceed the maximum trip generation for the applicable access scenario at the time of the analysis.*
   RESPONSE: Acknowledge and agree.

3. *"A traffic signal at Columbia Pike and Tollgate Boulevard should be installed concurrently with Tollgate Village Section 15. The existing northbound lanes that merge from two to one at Tollgate Boulevard should be extended approximately 300 feet north of Tollgate Boulevard to provide merging area downstream of the new traffic signal. The Tollgate Village developer has already completed design plans for a traffic signal including the extended northbound merge area at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application,"*
   Town Traffic Study Review Comments: The review completed by the Town's consultant agrees with this recommendation.
   RESPONSE: Acknowledge and agree.

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4. *"A southbound right turn lane on Columbia Pike with a turn lane length of 275 feet and a taper length of 100 feet should be installed concurrently with Tollgate Village Section 15. The Tollgate Village developer has already completed design plans for a southbound right turn lane at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application."*
   Town Traffic Study Review Comments: The review completed by the Town's consultant agrees with this recommendation.
   RESPONSE: Acknowledge and agree.

5. *"The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should be constructed as a three-lane roadway to support efficient future access."*
   Town Traffic Study Review Comments: The review completed by the Town's consultant does not address this recommendation.
   RESPONSE: Acknowledge and agree.

6. *"The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should operate as a right-in/right-out only access if Columbia Pike consists of a two-lane roadway to the north of Tollgate Village and across the West Harpeth River."*
   Town Traffic Study Review Comments: *"Unless a larger plan for access control on Columbia Pike exists, it is not recommended to plan for a restricted movement on the northern access, only to switch to full access once the road is widened. Instead, Construction of this driveway should include widening Columbia Pike to include a full northbound left turn lane. Additional widening north of the access may be required to prevent the driveway from being located in the middle of a change in lane configuration along Columbia Pike. This will be accomplished by the TDOT widening project, but the development should construct these improvements if not already done by TDOT. A southbound right turn lane is recommended by the study as well."*
   RESPONSE: Based upon discussions with Town staff, an explanation of the need for the right-in/right-out access configuration will assist in addressing/mitigating this review comment. The proximity of the bridge over the West Harpeth River on Columbia Pike north of Tollgate Village restricts the ability to widen Columbia Pike beyond what is currently built without incurring costly bridge improvements. In order to maintain the feasibility of implementing access and offsite improvements for Tollgate Village, the right-in/right-out restricted access configuration was developed as an initial means of operation with full access being provided after TDOT completes the necessary bridge widening as part of future roadway projects. A meeting was held in early February 2017 with Ragan-Smith staff, Town of Thompson's Station staff, and TDOT staff where discussion of this access configuration indicated that it would be acceptable and that the necessary entrance permit could be approved after appropriate construction documents are prepared.

7. *"The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should provide full turning movement access if Columbia Pike has been widened to consist of a five-lane roadway to the north of Tollgate Village and across the West Harpeth River."*
   Town Traffic Study Review Comments: The review completed by the Town's consultant indicates that full turning movement access for this location is appropriate.
   RESPONSE: Acknowledge and agree.

8. *"Future widening of Columbia Pike, presumably by TDOT, should provide the extension of the existing five-lane section north of Tollgate Village and across the West Harpeth River. The*

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extension of this roadway section will provide a northbound left turn lane for the North Access to Tollgate Village."
Town Traffic Study Review Comments: The review completed by the Town's consultant indicates that the recommendation for a future a northbound left turn lane at this location is appropriate.
RESPONSE: Acknowledge and agree.

9. *"When the North Access to Tollgate Village is converted to provide full turning movement access, a southbound right turn lane should be constructed on Columbia Pike. The final design of the Columbia Pike widening, the West Harpeth River crossing, and impacts to adjacent utilities and floodways/floodplains should be considered when determining the feasibility and final design of this right turn lane."*
Town Traffic Study Review Comments: The review completed by the Town's consultant indicates that the recommendation for a future a southbound right turn lane at this location is appropriate.
RESPONSE: Acknowledge and agree.

10. *"A TDOT highway entrance permit will be required in order to construct this access."*
Town Traffic Study Review Comments: The review completed by the Town's consultant does not address this recommendation.
RESPONSE: Acknowledge and agree.

11. *"A TDOT grading permit will be required for any turn lane or grading work completed in the right-of-way on Columbia Pike."*
Town Traffic Study Review Comments: The review completed by the Town's consultant does not address this recommendation.
RESPONSE: Acknowledge and agree.

12. *"The existing southbound right turn lane on Columbia Pike should be extended to have a length of 500 feet with a taper length of 100 feet."*
Town Traffic Study Review Comments: The review completed by the Town's consultant agrees with this recommendation.
RESPONSE: Acknowledge and agree.

13. *"Williamson County Schools should continue to utilize a traffic control officer to direct traffic at this intersection during peak arrival and dismissal periods. Based upon the high volume and peaking characteristics of the school traffic, a permanent traffic signal installation could be considered as an alternative to the continued use of a traffic control officer."*
Town Traffic Study Review Comments: The review completed by the Town's consultant agrees with this recommendation.
RESPONSE: Acknowledge and agree.

14. *"New pavement markings consistent with the MUTCD and public roadway standards should be installed on Declaration Way between Columbia Pike and the South Access."*
Town Traffic Study Review Comments: The review completed by the Town's consultant does not address this recommendation.
RESPONSE: Acknowledge and agree.

15. *"The intersection of Declaration Way and the South Access should operate as a two-way stop control intersection. The South Access should be the minor street with stop control and Declaration Way should be the major street without stop control."*
Town Traffic Study Review Comments: The review completed by the Town's consultant does not address this recommendation.
RESPONSE: Acknowledge and agree.

RAGAN•SMITH

If you have any comments or if you need any additional information related to this project, we would be happy to discuss or review them with you at your convenience.

Sincerely,

RAGAN-SMITH ASSOCIATES, INC.

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

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c: Mr. Brian Rowe (brian.rowe@henryandwallace.com)
Mr. George Dean (gdean@tewlawfirm.com)
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1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

DATE: March 17, 2017

TO: The Planning Commission

FROM: Wendy Deats, Town Planner

SUBJECT: Item 2 – PP 2017-004 – Deferral from February 28, 2017 Planning Commission meeting

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On February 28, 2017, the Planning Commission deferred the request to the March meeting to provide time to review the traffic study and sewer information, and for the developer to submit the sureties for Tollgate Village.

Traffic Study

The revised traffic study was submitted on February 28, 2017. The traffic study proposes the following conclusions and recommendations for traffic improvements:

General Recommendations

1. *One route of secondary access to Tollgate Village should be constructed and open to traffic prior to the final plat approval for Tollgate Village Section 16 or Section 17, whichever occurs first. If development in Tollgate Village occurs outside of Sections 15, 16, and 17, a route of secondary access should be constructed as part of that development.*
2. *Additional routes of access or roadway/intersection improvements should be constructed and open to traffic based upon the estimated total trip generation for the existing and proposed development. Table 9 provides a summary of access scenarios and corresponding trip generation thresholds for each access scenario. A trip generation report, established using appropriate methodologies for internal trip capture and estimated based upon the current edition of the ITE Trip Generation Manual, should be provided with each proposed development in Tollgate Village. The total peak hour trip generation should not exceed the maximum trip generation for the applicable access scenario.*

Columbia Pike at Tollgate Boulevard

3. *A traffic signal at Columbia Pike and Tollgate Boulevard should be installed concurrently with Tollgate Village Section 15. The existing northbound lanes that merge from two to one at Tollgate Boulevard should be extended approximately 300 feet north of Tollgate Boulevard to provide merging area downstream of the new traffic signal. The Tollgate Village developer has already completed design plans for a traffic signal including the extended northbound merge area at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.*
4. *A southbound right turn lane on Columbia Pike with a turn lane length of 275 feet and a taper length of 100 feet should be installed concurrently with Tollgate Village Section 15. The Tollgate Village developer has already completed design plans for a southbound right turn lane at this intersection and has submitted the plans to the Town of Thompson's Station for approval and to TDOT as part of a grading permit application.*

Columbia Pike at North Access

5. *The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should be constructed as a three-lane roadway to support efficient future access.*

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6. *The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should operate as a right-in/right-out only access if Columbia Pike consists of a two-lane roadway to the north of Tollgate Village and across the West Harpeth River.*
7. *The Columbia Pike access located north of Tollgate Boulevard in the area of the existing Shelter Insurance Office Building should provide full turning movement access if Columbia Pike has been widened to consist of a five-lane roadway to the north of Tollgate Village and across the West Harpeth River.*
8. *Future widening of Columbia Pike, presumably by TDOT, should provide the extension of the existing five-lane section north of Tollgate Village and across the West Harpeth River. The extension of this roadway section will provide a northbound left turn lane for the North Access to Tollgate Village.*
9. *When the North Access to Tollgate Village is converted to provide full turning movement access, a southbound right turn lane should be constructed on Columbia Pike. The final design of the Columbia Pike widening, the West Harpeth River crossing, and impacts to adjacent utilities and floodways/floodplains should be considered when determining the feasibility and final design of this right turn lane.*
10. *A TDOT highway entrance permit will be required in order to construct this access.*
11. *A TDOT grading permit will be required for any turn lane or grading work completed in the right-of-way on Columbia Pike.*

Columbia Pike at Declaration Way

12. *The existing southbound right turn lane on Columbia Pike should be extended to have a length of 500 feet with a taper length of 100 feet.*
13. *Williamson County Schools should continue to utilize a traffic control officer to direct traffic at this intersection during peak arrival and dismissal periods. Based upon the high volume and peaking characteristics of the school traffic, a permanent traffic signal installation could be considered as an alternative to the continued use of a traffic control officer.*

Declaration Way at South Access

14. *New pavement markings consistent with the MUTCD and public roadway standards should be installed on Declaration Way between Columbia Pike and the South Access.*
15. *The intersection of Declaration Way and the South Access should operate as a two-way stop control intersection. The South Access should be the minor street with stop control and Declaration Way should be the major street without stop control.*

The study was reviewed by the Town's Traffic Consultant, RPM and comments were submitted to Ragan Smith on March 13, 2017. The developer is working with Staff to address the comments.

Traffic Signal Update

TDOT has issued the grading permit for the turn lane improvements at Columbia Pike/Tollgate Boulevard. The Town has not received the surety for the traffic signal, however, a contingency was placed on the final plat for phase 15 to require the $126,000 surety prior to plat recordation.

Sewer

The developer submitted a conceptual plan for re-routing the gravity line which is found to be acceptable and therefore, submitted construction drawings which are found to be acceptable with

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conditions. The developer is still working on the plans for how the upgrade to the sewer line will be completed from the manhole on Wareham to the pump station.

Sureties
The sureties have not been submitted to the Town.

Recommendation
Plats are suspended within Tollgate Village; therefore, Staff recommends that the Planning Commission deny Phase 17 within Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.

Once plat suspension is lifted, the following are recommended to be incorporated as contingencies to project approval:

1. Prior to the approval of construction plans, a development agreement shall be approved and executed between the Town and the Developer
2. Prior to the approval of construction plans, all sureties for each phase/section in Tollgate Village and for the installation of the traffic signal shall be posted and submitted to the Town in accordance with the requirements with the Land Development Ordinance.
3. All recommendations for traffic mitigation shall be completed in accordance with the phasing/timing set forth within the traffic study dated February 28, 2017.
4. Prior to the submittal of the final plat for phase 17, all sewer improvements must be completed to the satisfaction of the Town.
5. The construction route adjacent to Tollgate Boulevard, north of Phase 14 shall be utilized by all construction traffic.
6. All tree replacement requirements as approved by the Planning Commission shall be completed the satisfaction of the Town.

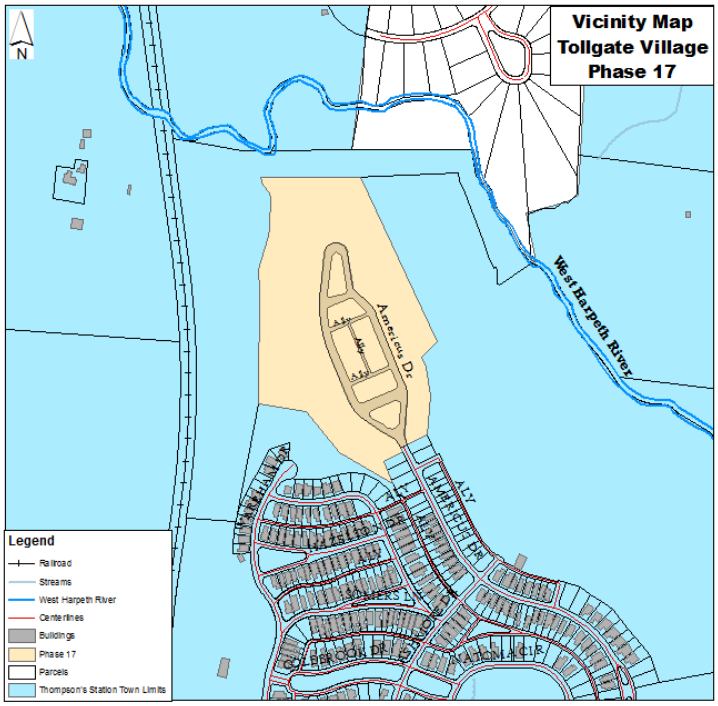
Attachments
February 28, 2017 staff report
Traffic Study dated February 28, 2017
RPM letter dated March 13, 2017
Preliminary Plat

Thompson's Station Planning Commission
Staff Report –Item 4 (PP 2017-004)
February 28, 2017

Preliminary plat for Phase 17 to create 71 single family lots, five open space lots and approval for the removal of seven trees exceeding 24 inches in diameter.

PROJECT DESCRIPTION

A request to approve the preliminary plat for Phase 17 of Tollgate Village to create 71 single family lots, five open space lots and removal of seven trees exceeding 24 inches in diameter.



BACKGROUND

On September 27, 2016, the Planning Commission suspended all plats within Tollgate Village due to issues related to infrastructure in several sections of the Tollgate Village which have not been completed by the developer and no sureties in place to ensure completion of the improvements.

At this time, Tollgate Village still does not have completed public roads to access this phase of the development and no sureties are in place to guarantee completion of such infrastructure.

On October 25, 2016, the Planning Commission denied the request for the preliminary plat approval for phase 17 of Tollgate Village for the following reason:

> Based on the lack of completed public roads and other infrastructure necessary to serve this phase of Tollgate Village, and the absence of adequate surety to complete such roads and infrastructure which has resulted in the suspensions of plats within Tollgate Village, and based upon (1) the lack of traffic signal installation or surety (2) lack of an updated traffic study addressing secondary access and traffic mitigation (3) lack of evaluation of the main pump station to determine necessary upgrades the Planning Commission has denied the final plat for Phase 17 of Tollgate Village.

On January 24, 2017, the Planning Commission denied the request for a preliminary plat approval for phase 17 of Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.
2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The proposed traffic study does not adequately address the issue of when a secondary access should be required to be installed. Based on the most recently approved traffic study, a secondary access should be installed prior to final plat approval for Phase 16.
3. It has not been determined whether the existing wastewater infrastructure in Tollgate can support this phase of the development.

ANALYSIS

Preliminary Plat

The preliminary plat provides an analysis of the site's special features and the response to those features (LDO Section 5.4.3). This preliminary plat for phase 17 includes the creation of 71 single family lots and five open space lots totaling 16.8 acres of open space. However, the layout of this phase is modified from the approved development plan (dated 4-15-14). Changes include a revision to the layout of the roads and alleys and the addition of another open space lot.

Roadways

The standard for local roadways is 50 feet. The Planning Commission approved 46 foot roadways with a five-foot grass strip for other roadways within this subdivision. The applicant is requesting the Planning Commission approve the 46-foot width for the roadways within this phase to be consistent with these approved right-of-way widths to continue/maintain the existing streetscape that has been established.

Critical Lots

Lots 1709-1710, 1716-1731, 1734-1738, 1745-1750, 1755-1756, 1759, and 1764-1776 are designated as critical lots on the plat. The slope identified on the plan indicates that these lots have slopes between 15 and 25%. The plan illustrates that areas exceeding 25% slope are within the proposed open space. All critical lots will require engineered site plans to address all site specific issues.

Lot Standards

The single family lots will vary in size from .14 acres to .34 acres with a minimum of 50 feet for lot widths. Proposed setbacks are 10 feet for the front yard, 7.5 feet for the side yard and 20 feet for the rear yard with a minimum of a 20-foot driveway. Block lengths do not exceed 800 feet, except where adjacent to open space or where a preexisting block occurs as permitted within the ordinance. Blocks that exceed 500 feet in length will have a 16-foot pedestrian access provided.

Traffic Improvements

In 2015, a revised concept plan was submitted along with an updated traffic study (See attached study). The plan was not approved and the traffic study was not accepted or approved. In 2016, an updated traffic study, as required for approval of the phase 15 preliminary plat, was submitted in December. A "preferred" secondary access was noted in the report as a connection to Declaration Way. The schedule for the incorporating this secondary access is recommended after 248 additional units are constructed. The Town's Consulting Traffic Engineer reviewed the traffic study and

submitted comments to Staff. Staff provided the traffic engineer's comments along concerns/comments from Staff review.

On January 17, 2017, the applicant submitted responses to these comments which were submitted to and commented on by the Town's Traffic Engineer. In addition, Staff has met with the developer's traffic engineer and TDOT to discuss the secondary access along Columbia Pike, north of Tollgate Boulevard. After receiving comments from Staff and TDOT, the developer's traffic engineer is working on the revised traffic study in order to provide a study with "a specific scope being a schedule of improvements for traffic mitigation including a secondary access shall be reviewed and approved by the Town" as required by the contingency for the preliminary plat approval of phase 15.

Traffic Signal

The traffic signal at Tollgate Boulevard/Columbia Pike was approved by the Planning Commission in November 2015. The Planning Commission approved the signal with the following contingencies:

1. Prior to the approval of installation of the traffic improvements, the Town Engineer shall approve the construction plans.
2. Prior to the approval of construction plans, the applicant shall post a surety in the amount of $126,000 for the traffic signal.
3. Prior to the approval of the construction plans, the applicant shall post a surety in the amount of $95,000 which could be waived if TDOT requires a surety that meets or exceeds this amount for the turn lane improvements.
4. The signalization shall include a controller compatible with signal synchronization within Thompson's' Station.

TDOT has received all necessary information including a letter of credit in the amount of $150,000 for the turn lane improvements and anticipates issuing the grading permit. Since TDOT will be requiring a $150,000 surety, contingency #3 will be satisfied. Staff recommends that prior to any future final plat approvals, a contingency for installation and operation of the signal be incorporated.

Sewer

During the construction drawing approval phase, it was noted that an analysis of the wastewater system was needed for Tollgate Village. The development team tested the pump station and an evaluation of the collection system is ongoing to identify the necessary improvements. Prior to any plat approvals, all necessary upgrades should be identified with a contingency for completion of the improvements prior to final plat approvals.

Tree Removal

Development of phase 17 requires the removal of seven trees for a total of 264 inches. The Land Development Ordinance requires the replacement of trees exceeding 24 inches at a ratio of one and a half inches for every inch removed. Therefore, 396 inches of trees is required to be replaced on the site. The replacement plan includes 105 trees to be planted within the two open space lots of phase 17. The replacement trees will be either 2 or 3-inch caliper in size and are a variety of deciduous and evergreen trees such as American Sycamore, Southern Magnolia, Leylandi Cypress, Red Oak, White Pine, American Sweet Gum, and Eastern Red Bud. Total tree replacement from these 105 trees is 290 inches within phase 17. The developer is requesting that the 61 inches of trees to satisfy tree replacement be planted within the open space for Section 7. These trees will be

between 2, 3 or 4-inch caliper in size with one 6-inch caliper tree as a specimen tree. The variety will consist of an Allee Elm as the six-inch specimen tree, Shumard Oak, Zelkova and Nuttall Oak. And lastly, the remaining 45 inches will be planted in the open space along Americus Drive and in the alley open space lot of Section 12. Total tree replacement will be 396 inches.

RECOMMENDATION

Plats are suspended within Tollgate Village, therefore, Staff recommends that the Planning Commission deny Phase 17 within Tollgate Village for the following reasons:

1. There are no completed public roads to access this phase of the development and no sureties in place to guarantee that such infrastructure will be completed. The Planning Commission previously suspended all future plat approvals within Tollgate until this issue was resolved.
2. The plat does not provide for the construction of a secondary access as shown on the approved site development plan and the developer does not have the ability to access Declaration Way at this time. The traffic study does not adequately address the issue of when a secondary access should be required to be installed.
3. The necessary improvements to the existing wastewater infrastructure in Tollgate have not been identified.

Once plat suspension is lifted, the following are recommended to be incorporated as contingencies to project approval:

1. Prior to the approval of construction plans, a development agreement shall be approved and executed between the Town and the Developer.
2. Prior to the recordation of the final plat for phase 17, the traffic signal be installed and operational in accordance with the approved intersection improvement plans.
3. Prior to the recordation of the final plat for phase 17, the secondary access onto Columbia Pike shall be constructed.
4. Prior to the recordation of the final plat for phase 17, all sewer improvements must be installed.
5. The construction route adjacent to Tollgate Boulevard, north of Phase 14 shall be utilized by all construction traffic.
6. All tree replacement requirements as approved by the Planning Commission shall be satisfied to the satisfaction of the Town.

ATTACHMENT

Preliminary Plat
Site Development Plan (4/15/2014)

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO CREATE 70 RESIDENTIAL SINGLE–FAMILY LOTS AND FIVE OPEN SPACE TRACTS.

2. BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE COORDINATE SYSTEM OF 1983, GPS EQUIPMENT WAS USED DURING THE COURSE OF THE SURVEY ON THE SITE TO DETERMINE THE POSITION OF TWO CONTROL POINTS FOR ESTABLISHING THE BEARING BASE. THE EQUIPMENT USED: LEICA, MODEL GX 1230, DUAL FREQUENCY RECEIVER. THE TYPE OF SURVEY: NETWORK ADJUSTED REAL TIME KINEMATIC. CONTROL POINTS FOR BEARING BASE FOR PROJECT AND ROAD LOCATION IMPROVEMENTS

3. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES, PUBLIC RECORDS, AND/OR MAPS PREPARED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THEREFORE, RELIANCE UPON THE TYPE, SIZE AND LOCATION OF UTILITIES SHOWN SHOULD BE DONE SO WITH THIS CIRCUMSTANCE CONSIDERED. DETAILED VERIFICATION OF EXISTENCE, LOCATION AND DEPTH SHOULD ALSO BE MADE PRIOR TO ANY DECISION RELATIVE THERETO IS MADE. AVAILABILITY AND COST OF SERVICE SHOULD BE CONFIRMED WITH THE APPROPRIATE UTILITY COMPANY. IN TENNESSEE, IT IS A REQUIREMENT, PER "THE UNDERGROUND UTILITY DAMAGE PREVENTION ACT", THAT ANYONE WHO ENGAGES IN EXCAVATION MUST NOTIFY ALL KNOWN UNDERGROUND UTILITY OWNERS NO LESS THAN THREE (3) NOR MORE THAN TEN (10) WORKING DAYS PRIOR TO THE DATE OF THEIR INTENT TO EXCAVATE AND ALSO TO AVOID ANY POSSIBLE HAZARD OR CONFLICT. TENNESSEE ONE CALL, DIAL 811.

4. THIS PROPERTY IS CURRENTLY ZONED D3 (HIGH DENSITY RESIDENTIAL). MAXIMUM LOT COVERAGE – 55%.
MINIMUM BUILDING SETBACKS PER TOWN OF THOMPSON'S STATION LAND DEVELOPMENT ORDINANCE DATED AUGUST 9, 2015:
FRONT: 10'*
REAR: 20'
SIDE: 7.5'
*20' MINIMUM DRIVEWAY LENGTH, EXCLUSIVE OF SIDEWALKS

5. ELEVATIONS SHOWN HEREON ARE BASED ON NAVD 88. CONTOURS ARE AT TWO FOOT INTERVALS AND ARE BASED ON A FIELD RUN SURVEY BY RAGAN–SMITH ASSOCIATES ON JANUARY 26, 2015 USING RANDOM SPOT ELEVATIONS. CONTOURS WERE DERIVED USING SURFACE MODELING TECHNIQUES.

6. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THIS PROPERTY LIES WITHIN FLOOD ZONES "AE", AND "X" (OTHER AREAS), AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 47187C0335F, WITH AN EFFECTIVE DATE OF SEPTEMBER 29, 2006, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 470424, PANEL NO. 0335, SUFFIX F, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "AE" UNDER "SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD" AS BASE FLOOD ELEVATIONS DETERMINED. SAID MAP DEFINES ZONE "X" (OTHER AREAS) UNDER "OTHER AREAS" AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

7. ALL STREETS ARE DESIGNATED PUBLIC AND AS SUCH ARE PUBLIC UTILITY, ACCESS AND DRAINAGE EASEMENTS.

8. ALL PUBLIC STREETS AND DRAINAGE STRUCTURES WITHIN THE RIGHTS–OF–WAY WILL BE MAINTAINED BY THE TOWN OF THOMPSON'S STATION.

9. OPEN SPACE AREAS, PUBLIC UTILITY AND DRAINAGE EASEMENTS (INCLUDING DRAINAGE AND DETENTION STRUCTURES), ALLEYS AND ALL LANDSCAPING WITHIN ROADWAY MEDIANS WILL BE MAINTAINED BY THE HOMEOWNERS' ASSOCIATION.

10. SANITARY SEWER LINES AND STORM LINES SHOWN HEREON WERE TAKEN FROM A PRELIMINARY DESIGN FOR THIS SECTION. FINAL PLACEMENT OF UTILITIES WILL BE DEPICTED ON THE FINAL PLAT.

11. DOMESTIC WATER SUPPLY INFORMATION SHOWN HEREON IS BASED ON A PRELIMINARY DESIGN FOR THIS SECTION. FINAL PLACEMENT TO BE DESIGNED BY OTHERS AND INCLUDED ON THE FINAL PLAT. WATER TO BE PROVIDED BY H.B.&T.S.

12. LOTS SHOWN THUS (★) ARE DESIGNATED AS CRITICAL LOTS AND HAVE MANMADE SLOPES IN EXCESS OF 15%. PER SECTION 3.3.7 OF THE SUBDIVISION REGULATIONS, PRIOR TO THE ISSUANCE OF A BUILDING PERMIT, A SITE GRADING PLAN FOR DEVELOPMENT OF THE LOT SHALL BE SUBMITTED ADDRESSING SITE SPECIFIC NATURAL RESOURCE ISSUES TO THE TOWN OF THOMPSON'S STATION FOR REVIEW AND APPROVAL. NO BUILDING PERMIT WILL BE ISSUED ON SAID LOTS UNTIL AND UNLESS THE TOWN ENGINEER HAS RECEIVED AND REVIEWED THE SITE PLAN.

13. THE BLOCK LENGTHS IN THIS SECTION DO NOT EXCEED THE MAXIMUM LENGTH (800') FOR THE D3 ZONING DISTRICT.

14. I HEREBY STATE THAT THIS SURVEY WAS DONE IN COMPLIANCE WITH THE CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE AND THIS IS A CATEGORY I SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS 1:43,595.

BY: _____ DATE: 3-15-17
JOHN T. DARNALL, TN RLS #1571

PHASE 17
LOTS 1706–1775
OPEN SPACE 1789–1793

SITE DATA TABLE (PHASE 17)

TOTAL LOT AREA	–	13.76 ACRES±
TOTAL R.O.W. AREA	–	3.73 ACRES±
OPEN SPACE AREA	–	16.80 ACRES±
TOTAL SITE AREA	–	34.29 ACRES±
TOTAL LINEAR FEET OF ROAD	–	4322 FEET

SURVEYOR:
RAGAN–SMITH ASSOCIATES, INC.
TOM DARNALL, RLS
315 WOODLAND STREET
NASHVILLE, TENNESSEE 37206
(615) 244–8591

OWNER / DEVELOPER
MBSC TN HOMEBUILDER, LLC
C/O BRIAN ROWE
312 S. GAY STREET, SUITE 200
KNOXVILLE, TENNESSEE 37902
(865) 408–8322

LEGEND

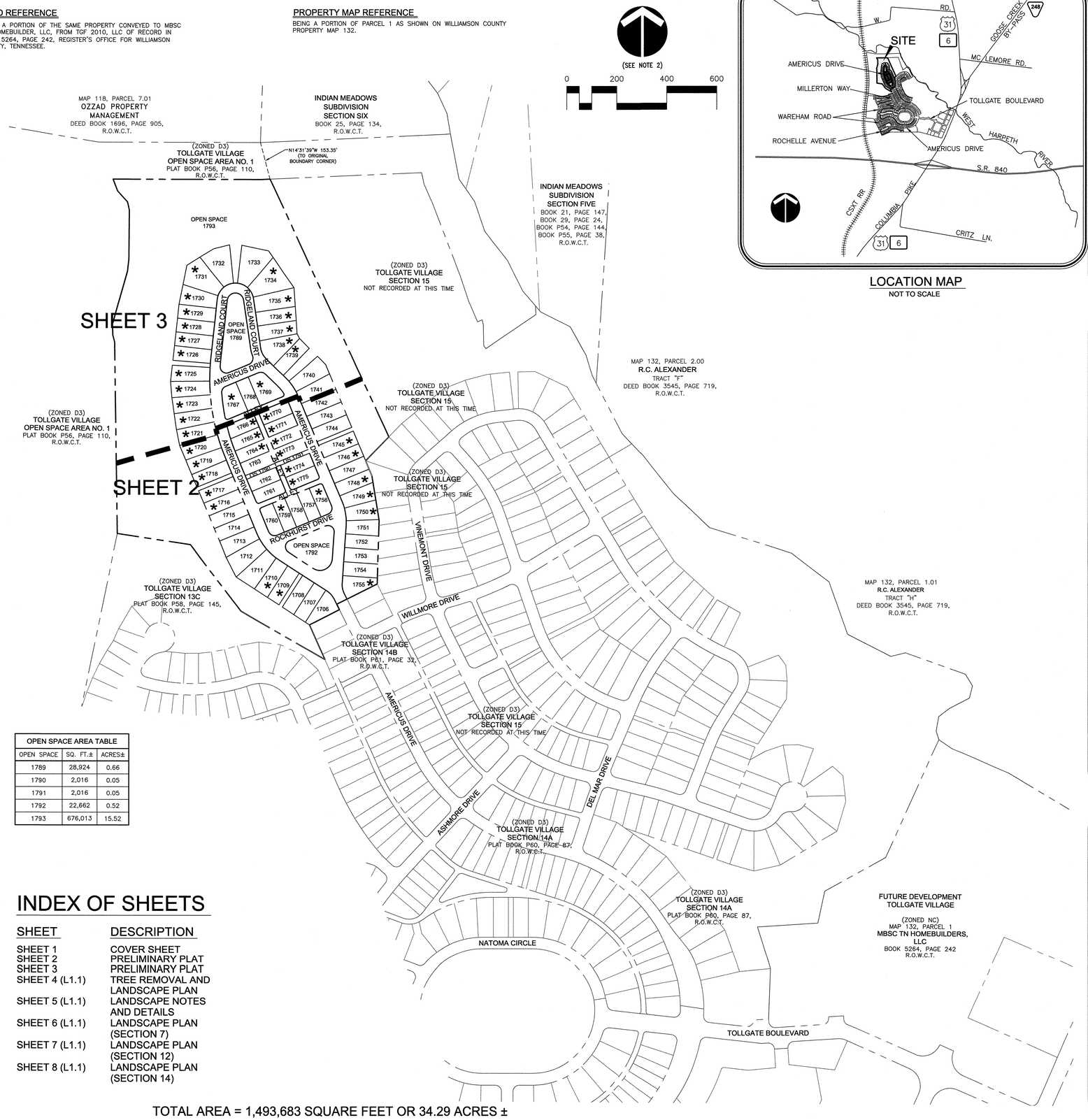
OS	OPEN SPACE
R.O.W.	R.O.W.
R.O.W.C.T.	REGISTER'S OFFICE WILLIAMSON COUNTY, TENNESSEE
*	CRITICAL LOT (SEE NOTE 12)

LOT AREA TABLE

LOT	SQ. FT.±	ACRES±
1706	8,261	0.19
1707	8,316	0.19
1708	8,298	0.19
1709	8,274	0.19
1710	8,804	0.20
1711	10,603	0.24
1712	10,679	0.25
1713	9,148	0.21
1714	8,250	0.19
1715	8,250	0.19
1716	8,250	0.19
1717	8,250	0.19
1718	8,250	0.19
1719	8,716	0.20
1720	9,031	0.21
1721	9,132	0.21
1722	9,202	0.21
1723	9,197	0.21
1724	9,345	0.21
1725	9,243	0.21
1726	8,614	0.20
1727	8,250	0.19
1728	8,250	0.19
1729	8,250	0.19
1730	9,841	0.23
1731	13,716	0.31
1732	12,940	0.30
1733	14,161	0.33
1734	14,599	0.34
1735	11,258	0.26
1736	8,739	0.20
1737	8,784	0.20
1738	10,803	0.25
1739	8,274	0.19
1740	10,478	0.24
1741	9,041	0.21
1742	8,250	0.19
1743	8,250	0.19
1744	8,250	0.19
1745	8,250	0.19
1746	8,250	0.19
1747	8,250	0.19
1748	8,172	0.19
1749	8,541	0.20
1750	8,412	0.19
1751	7,866	0.18
1752	7,341	0.17
1753	7,458	0.17
1754	7,575	0.17
1755	8,429	0.19
1756	6,837	0.16
1757	6,678	0.15
1758	6,678	0.15
1759	6,678	0.15
1760	7,077	0.16
1761	7,013	0.16
1762	6,678	0.15
1763	6,678	0.15
1764	6,678	0.15
1765	6,624	0.15
1766	6,710	0.15
1767	10,118	0.23
1768	6,804	0.16
1769	10,912	0.25
1770	7,013	0.16
1771	6,678	0.15
1772	6,678	0.15
1773	6,678	0.15
1774	6,678	0.15
1775	7,013	0.16

DEED REFERENCE
BEING A PORTION OF THE SAME PROPERTY CONVEYED TO MBSC TN HOMEBUILDER, LLC, FROM TGF 2010, LLC OF RECORD IN BOOK 5264, PAGE 242, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

PROPERTY MAP REFERENCE
BEING A PORTION OF PARCEL 1 AS SHOWN ON WILLIAMSON COUNTY PROPERTY MAP 132.



OPEN SPACE AREA TABLE

OPEN SPACE	SQ. FT.±	ACRES±
1789	28,924	0.66
1790	2,016	0.05
1791	2,016	0.05
1792	22,662	0.52
1793	676,013	15.52

INDEX OF SHEETS

TOTAL AREA = 1,493,683 SQUARE FEET OR 34.29 ACRES ±

LOCATION MAP
NOT TO SCALE

RAGAN•SMITH
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LANDSCAPE ARCHITECTS • SURVEYORS
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CHATTANOOGA
1420 DOMINION TOWER
SUITE 200
37421
(423) 490-9400
• www.ragansmith.com •

JOHN T. DARNALL 1571 REGISTERED LAND SURVEYOR AGRICULTURE TENNESSEE NO. 1571

TOLLGATE VILLAGE - PHASE 17
FOR
MBSC TN HOMEBUILDER, LLC
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

NO.	REVISIONS	DATE
3	REV. PER LOT REVISIONS (AMR)	03-15-2017
2	REV. PER STAFF COMMENTS (DDB)	01-16-2017
1	REV. PER STAFF COMMENTS (AMR)	09-14-2016

JOB NO. 10-081 | WK. ORDER 9260
APPROVED: JTD
DRAWN: SLN/AMR
SCALE: 1" = 200'
DATE: AUGUST 23, 2016

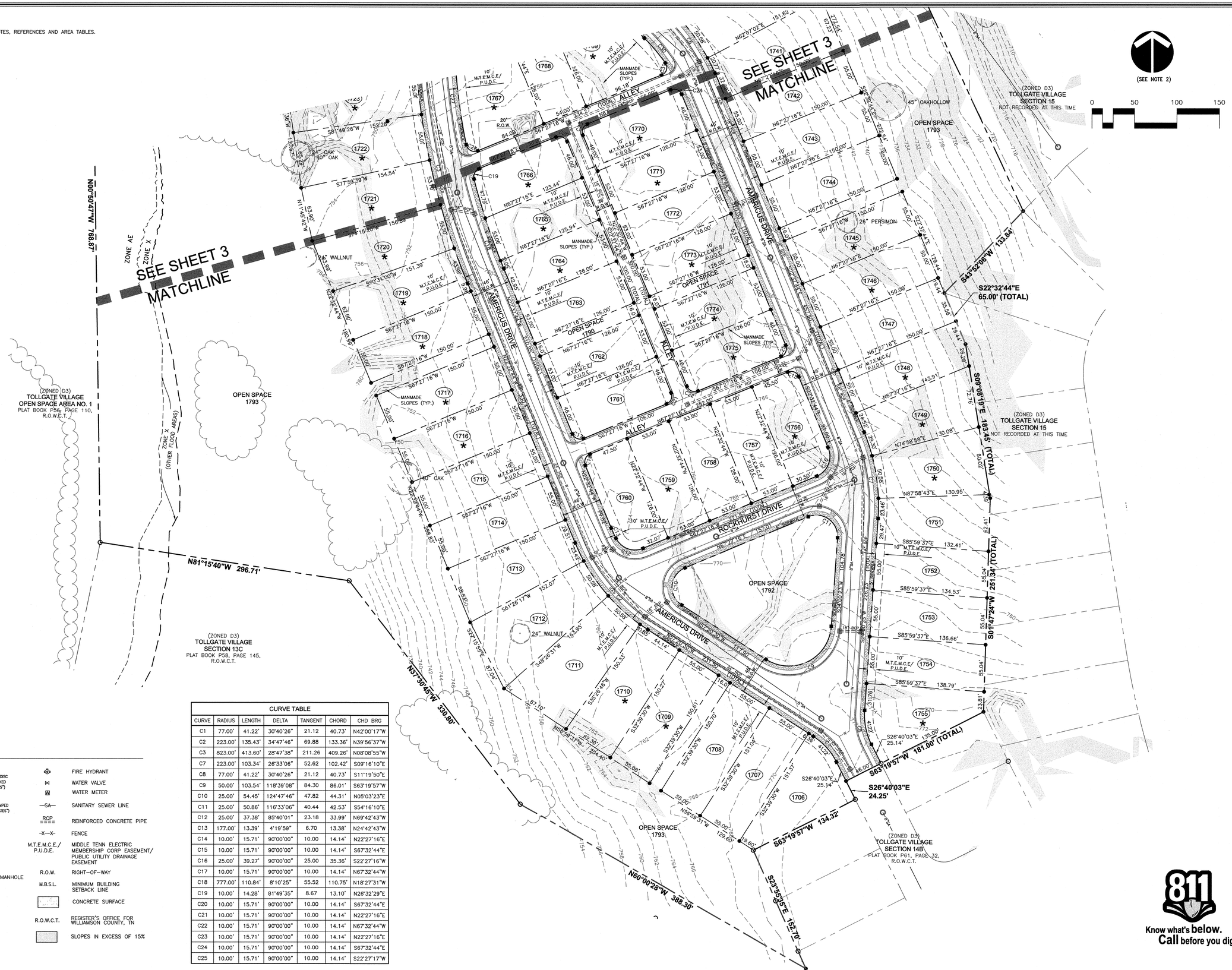
PRELIMINARY PLAT

1 OF 8

G:\10081-00001\SURVEY\PLATS\SECTION 17\PRELIMINARY PLAT\SEC 17 PRELIM PLAT.DWG
LAST UPDATED BY AMR ON: 3/15/2017 12:29 PM
PLOTTED BY AMANDA REED ON: 3/15/2017 12:29 PM

GENERAL NOTES

1. SEE SHEET 1 OF 6 FOR NOTES, REFERENCES AND AREA TABLES.



CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	77.00'	41.22'	30°40'26"	21.12	40.73'	N42°00'17"W
C2	223.00'	135.43'	34°47'46"	69.88	133.36'	N39°56'37"W
C3	823.00'	413.60'	28°47'38"	211.26	409.26'	N08°08'55"W
C7	223.00'	103.34'	26°33'06"	52.62	102.42'	S09°16'10"E
C8	77.00'	41.22'	30°40'26"	21.12	40.73'	S11°19'50"E
C9	50.00'	103.54'	118°39'08"	84.30	86.01'	S63°19'57"W
C10	25.00'	54.45'	124°47'46"	47.82	44.31'	N05°03'23"E
C11	25.00'	50.86'	116°33'06"	40.44	42.53'	S54°16'10"E
C12	25.00'	37.38'	85°40'01"	23.18	33.99'	N69°42'43"W
C13	177.00'	13.39'	4°19'59"	6.70	13.38'	N24°42'43"W
C14	10.00'	15.71'	90°00'00"	10.00	14.14'	N22°27'16"E
C15	10.00'	15.71'	90°00'00"	10.00	14.14'	S67°32'44"E
C16	25.00'	39.27'	90°00'00"	25.00	35.36'	S22°27'16"W
C17	10.00'	15.71'	90°00'00"	10.00	14.14'	N67°32'44"W
C18	777.00'	110.84'	8°10'25"	55.52	110.75'	N18°27'31"W
C19	10.00'	14.28'	81°49'35"	8.67	13.10'	N26°32'29"E
C20	10.00'	15.71'	90°00'00"	10.00	14.14'	S67°32'44"E
C21	10.00'	15.71'	90°00'00"	10.00	14.14'	N22°27'16"E
C22	10.00'	15.71'	90°00'00"	10.00	14.14'	N67°32'44"W
C23	10.00'	15.71'	90°00'00"	10.00	14.14'	N22°27'16"E
C24	10.00'	15.71'	90°00'00"	10.00	14.14'	S67°32'44"E
C25	10.00'	15.71'	90°00'00"	10.00	14.14'	S22°27'17"W

LEGEND

- ■ MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")
- ● IRON ROD (NEW) (5/8" x 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
- ○ IRON ROD (OLD)
- CABLE TV BOX
- E ELECTRIC BOX
- CATCH BASIN
- SANITARY SEWER MANHOLE
- LIGHT STANDARD
- XXX LOT NUMBER
- R.O.W. RIGHT-OF-WAY
- DECIDUOUS TREE
- * CRITICAL LOT (SEE NOTE 12)
- FIRE HYDRANT
- WATER VALVE
- WM WATER METER
- —SA— SANITARY SEWER LINE
- RCP REINFORCED CONCRETE PIPE
- —X—X— FENCE
- M.T.E.M.C.E./ P.U.D.E. MIDDLE TENN ELECTRIC MEMBERSHIP CORP EASEMENT/ PUBLIC UTILITY DRAINAGE EASEMENT
- R.O.W. RIGHT-OF-WAY
- M.B.S.L. MINIMUM BUILDING SETBACK LINE
- CONCRETE SURFACE
- R.O.W.C.T. REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN
- SLOPES IN EXCESS OF 15%

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CHATTANOOGA, TN 37405
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• www.ragansmith.com •

JOHN T. DARNALL
REGISTERED
LAND SURVEYOR
TENNESSEE
TENNESSEE NO. 1571

TOLLGATE VILLAGE - PHASE 17

FOR

MBSC TN HOMEBUILDER, LLC

TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

REVISIONS	DATE
03-15-2017 (AMR) REV. PER LOT REVISIONS	
01-16-2017 (DSB) REV. PER STAFF COMMENTS	
09-14-2016 (AMR) REV. PER STAFF COMMENTS	

JOB NO.	10-081
WK. ORDER	9260
APPROVED:	JTD
DRAWN:	AMR/SLN
SCALE:	1" = 50'
DATE:	AUGUST 23, 2016

PRELIMINARY PLAT

2 OF 8

G:\10081-00800\SURVEY\PLAT\SECTION 17\PRELIM\PLAT 17 PRELIM PLAT.DWG
PLOTTED BY AMANDA REED ON 3/15/2017 12:28 PM
LAST UPDATED BY AMR ON 3/15/2017 12:28 PM

GENERAL NOTES

1. SEE SHEET 1 OF 6 FOR NOTES, REFERENCES AND AREA TABLES.

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C3	823.00'	413.60'	28°47'38"	211.26	409.26'	N08°08'55"W
C4	73.00'	210.80'	165°26'54"	571.76	144.82'	N88°58'21"E
C5	77.00'	50.89'	37°51'59"	26.41	49.97'	S27°14'12"E
C6	223.00'	91.95'	23°37'27"	46.64	91.30'	S34°21'27"E
C28	25.00'	31.15'	71°23'05"	17.96	29.17'	N31°45'44"E
C29	25.00'	28.96'	66°22'33"	16.35	27.37'	S79°21'27"E
C30	177.00'	38.77'	12°33'06"	19.47	38.70'	S39°53'38"E
C31	10.00'	17.64'	101°04'22"	12.15	15.44'	S16°55'05"W
C32	25.00'	50.75'	116°19'01"	40.26	42.48'	N54°23'13"W
C33	783.00'	33.85'	2°28'37"	16.93	33.85'	N05°00'35"E
C34	33.00'	95.29'	165°26'54"	258.47	65.47'	N88°58'21"E
C35	117.00'	27.40'	13°25'10"	13.76	27.34'	S15°00'47"E
C36	25.00'	38.91'	89°10'39"	24.64	35.10'	S22°51'57"W

LEGEND

- MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")
- IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
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- CONCRETE SURFACE
- R.O.W.C.T. — REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN
- SLOPES IN EXCESS OF 15%

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

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www.ragansmith.com

JOHN T. DARNALL — TENNESSEE — NO. 1571

TOLLGATE VILLAGE - PHASE 17

FOR

MBSC TN HOMEBUILDER, LLC

TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

REVISIONS	
3	03-15-2017 (AMR) REV. PER LOT REVISIONS
2	01-16-2017 (DDB) REV. PER STAFF COMMENTS
1	09-14-2016 (AMR) REV. PER STAFF COMMENTS

JOB NO. 10-081	WK. ORDER 9260
APPROVED:	JTD
DRAWN:	AMR/SLN
SCALE:	1" = 50'
DATE:	AUGUST 23, 2016

PRELIMINARY PLAT

Tree Protection / Replacement Data Table

Tree Units Provided from Existing Trees		
Removed Tree Sizes	Quantity	Units Per Tree
24 "	1	24
26 "	1	26
30 "	1	30
34 "	1	34
36 "	1	36
42 "	1	42
72 "	1	72
Total Trees to be removed	7	
Total Units From Trees to be		264
Total Replacment Units		264 x 1.5 = 396
Total Replacment Units		396*

* 290 CAL. IN. PROVIDED PER THIS LANDSCAPE PLAN. THE REMAINING REPLACEMENT TREES ARE PLANTED AS FOLLOWS:

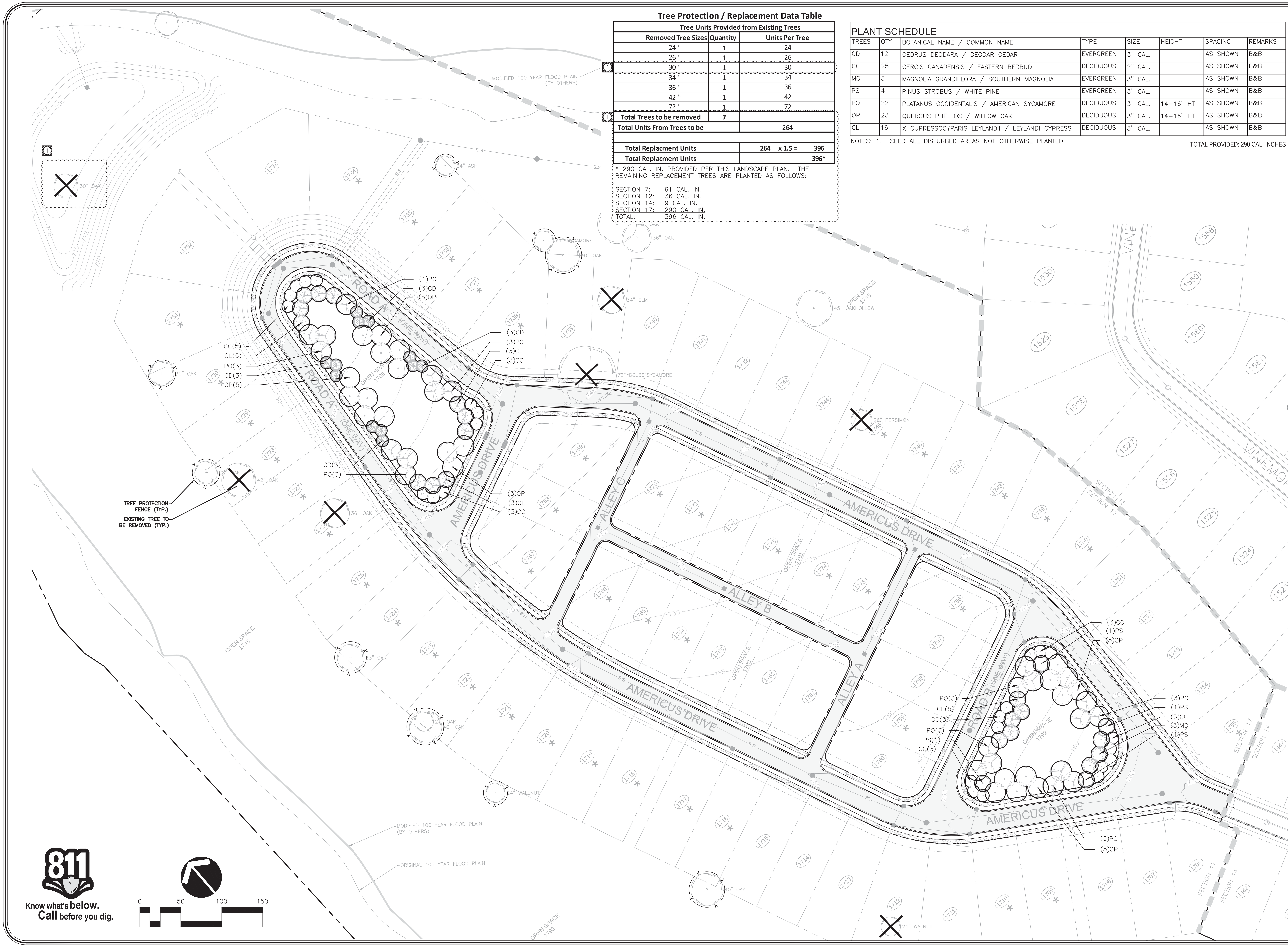
SECTION 7: 61 CAL. IN.
SECTION 12: 36 CAL. IN.
SECTION 14: 9 CAL. IN.
SECTION 17: 290 CAL. IN.
TOTAL: 396 CAL. IN.

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	HEIGHT	SPACING	REMARKS
CD	12	CEDRUS DEODARA / DEODAR CEDAR	EVERGREEN	3" CAL.		AS SHOWN	B&B
CC	25	CERCIS CANADENSIS / EASTERN REDBUD	DECIDUOUS	2" CAL.		AS SHOWN	B&B
MG	3	MAGNOLIA GRANDIFLORA / SOUTHERN MAGNOLIA	EVERGREEN	3" CAL.		AS SHOWN	B&B
PS	4	PINUS STROBUS / WHITE PINE	EVERGREEN	3" CAL.		AS SHOWN	B&B
PO	22	PLATANUS OCCIDENTALIS / AMERICAN SYCAMORE	DECIDUOUS	3" CAL.	14–16' HT	AS SHOWN	B&B
QP	23	QUERCUS PHELLOS / WILLOW OAK	DECIDUOUS	3" CAL.	14–16' HT	AS SHOWN	B&B
CL	16	X CUPRESSOCYPARIS LEYLANDII / LEYLANDI CYPRESS	DECIDUOUS	3" CAL.		AS SHOWN	B&B

NOTES: 1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.

TOTAL PROVIDED: 290 CAL. INCHES



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BRETT ALAN SMITH REGISTERED LANDSCAPE ARCHITECT TENNESSEE
03/15/17

SECTION 17 FOR CONSTRUCTION PLANS

THOMPSON'S STATION, WILLIAMSON COUNTY, TN

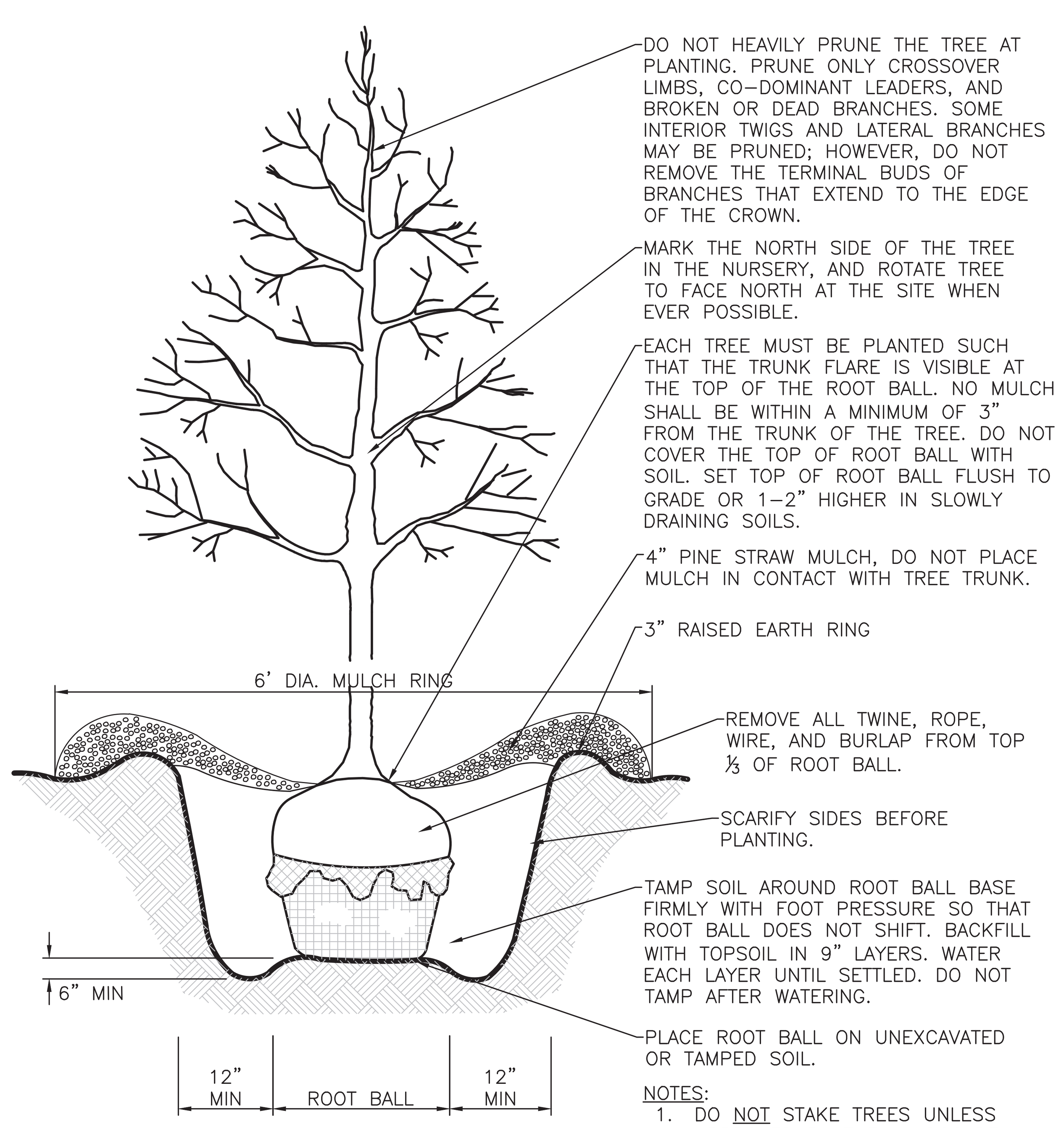
TOLLGATE Village

JOB NO.	10081
WK. ORDER	9260
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	1"=50'
DATE:	SEPTEMBER 1, 2016

REVISIONS
1 09–23–16 T. GARDNER ADD. TREE REMOVE/REPLACE

TREE REMOVAL & LANDSCAPE PLAN

L1.1

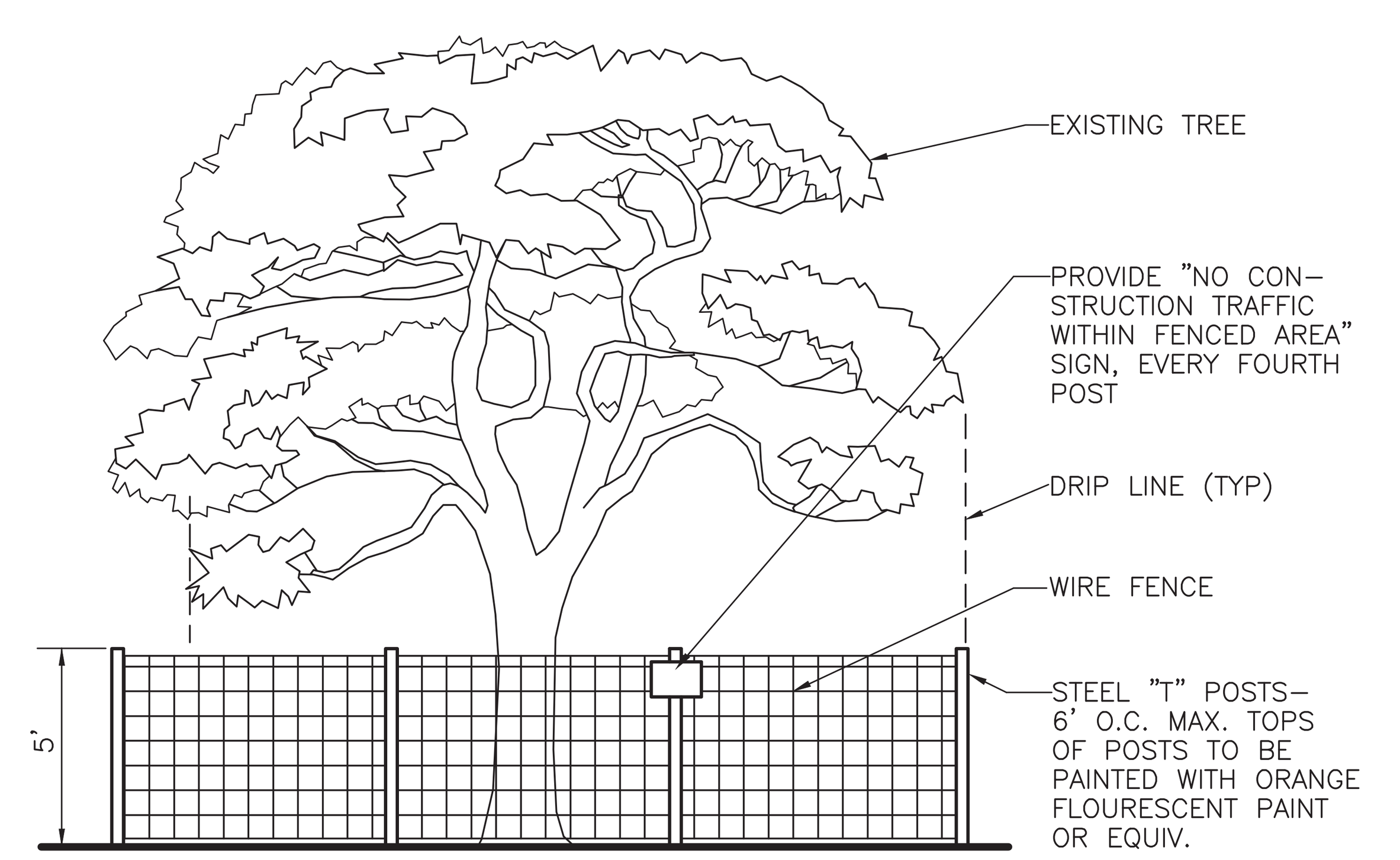


NOTES:

1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON-BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING

NOT TO SCALE



TREE PROTECTION DETAIL

NOT TO SCALE

NOTE:
POSTS TO BE PLACED AT 1.5 x DRIP LINE- SEE PLANS FOR FENCE LOCATION.

NOTE:

ALL TREE PROTECTION FENCING SHALL BE IN PLACE PRIOR TO THE ISSUANCE OF A GRADING PERMIT.

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10-10-10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON-BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY-31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6-12-12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
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6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR IS RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.

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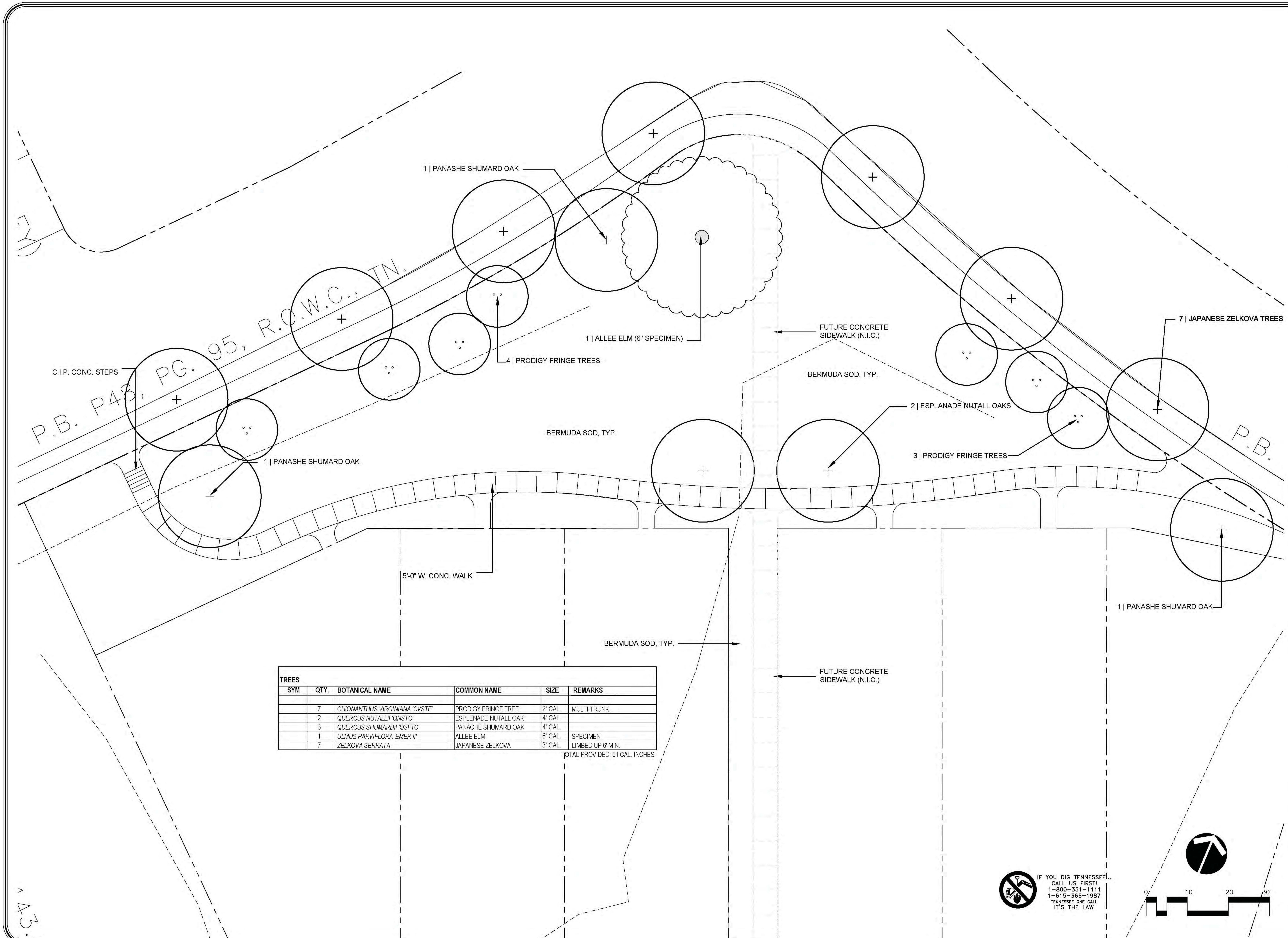
SECTION 17
FOR
CONSTRUCTION PLANS
THOMPSON'S STATION, WILLIAMSON COUNTY, TN

TOLLGATE Village

JOB NO. 10081	WK. ORDER 9260
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	N.T.S.
DATE:	SEPTEMBER 1, 2016
REVISIONS	

LANDSCAPE NOTES AND DETAILS

L1.2



TREES

SYM	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
	7	*CHIONANTHUS VIRGINIANA 'CVSTF'*	PRODIGY FRINGE TREE	2" CAL.	MULTI-TRUNK
	2	*QUERCUS NUTALLII 'QNSTC'*	ESPLENADE NUTALL OAK	4" CAL.	
	3	*QUERCUS SHUMARDII 'QSFTC'*	PANACHE SHUMARD OAK	4" CAL.	
	1	*ULMUS PARVIFLORA 'EMER II'*	ALLEE ELM	6" CAL.	SPECIMEN
	7	*ZELKOVA SERRATA*	JAPANESE ZELKOVA	3" CAL.	LIMBED UP 6' MIN.

TOTAL PROVIDED: 61 CAL. INCHES

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TENNESSEE ONE CALL
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SECTION 7 FOR CONSTRUCTION PLANS

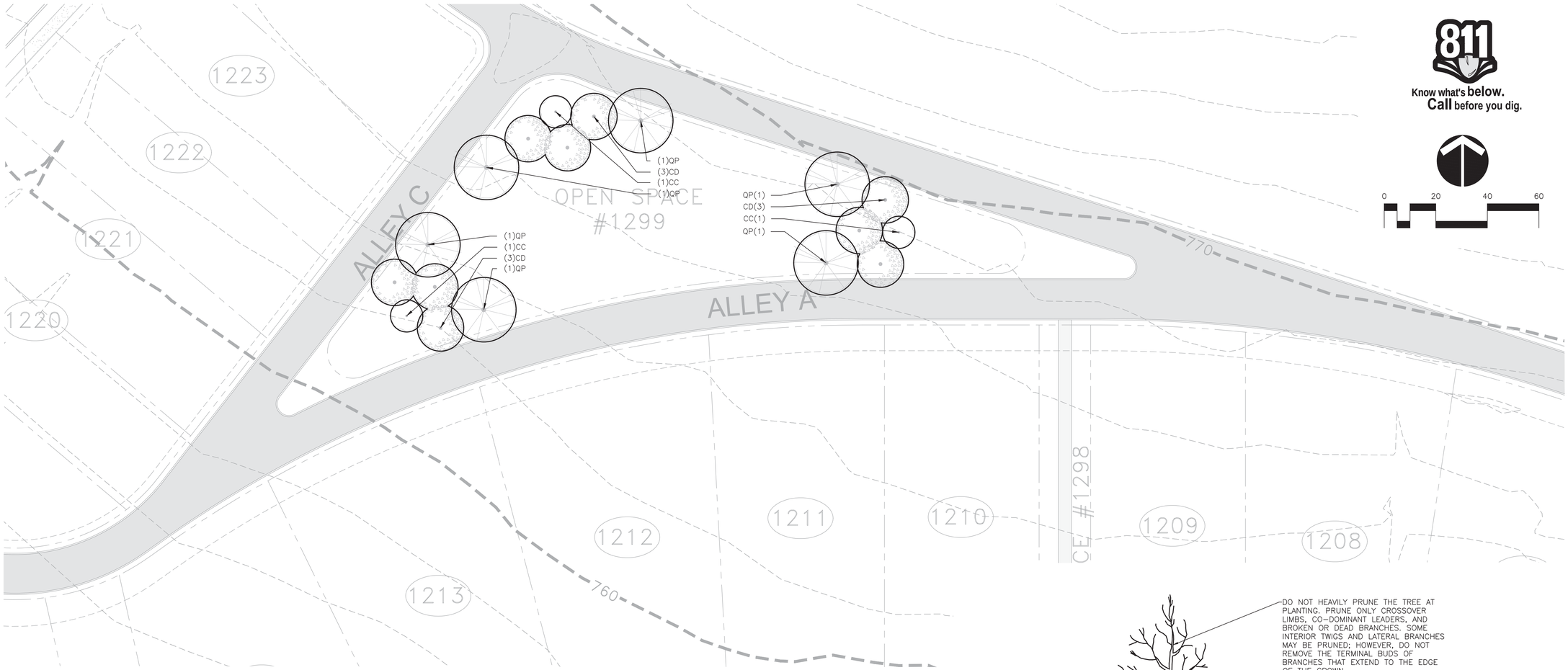
THOMPSON'S STATION, WILLIAMSON COUNTY, TN

TOLLGATE Village

JOB NO.	WK ORDER
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	1"=10'
DATE:	SEPTEMBER 2, 2016
REVISIONS	

LANDSCAPE PLAN

L1.1



Know what's **below.**
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0 20 40 60

PLANT SCHEDULE							
TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	HEIGHT	SPACING	REMARKS
CD	9	CEDRUS DEODARA / DEODAR CEDAR	EVERGREEN	2" CAL.		AS SHOWN	B&B
CC	3	CERCIS CANADENSIS / EASTERN REDBUD	DECIDUOUS	2" CAL.		AS SHOWN	B&B
QP	6	QUERCUS SHUMARDII 'PANACHE' / PANACHE SHUMARD OAK	DECIDUOUS	2" CAL.	12–14' HT	AS SHOWN	B&B

NOTES: 1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED. TOTAL PROVIDED: 36 CAL. INCHES

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY–31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6–12–12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. APPLY SEED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKE IN LIGHTLY. WATER TOPSOIL LIGHTLY PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
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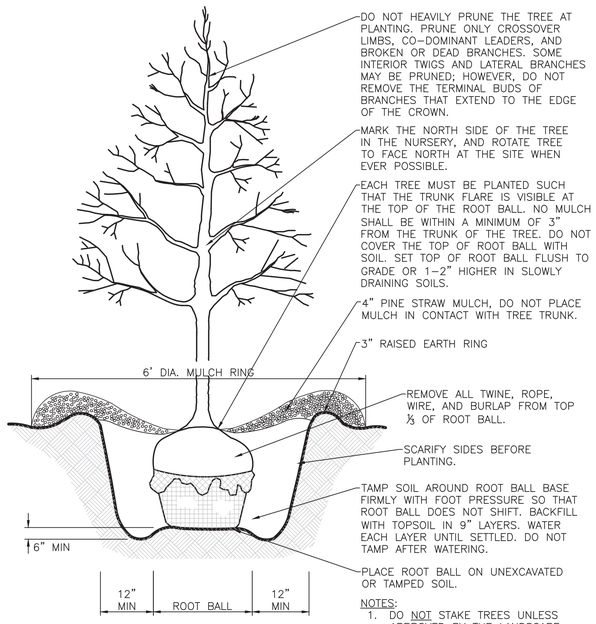
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10–10–10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5–10–5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE–INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON–BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON–BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.



TREE PLANTING
NOT TO SCALE

NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON–BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

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SECTION 12
FOR
CONSTRUCTION PLANS
THOMPSON'S STATION, WILLIAMSON COUNTY, TN

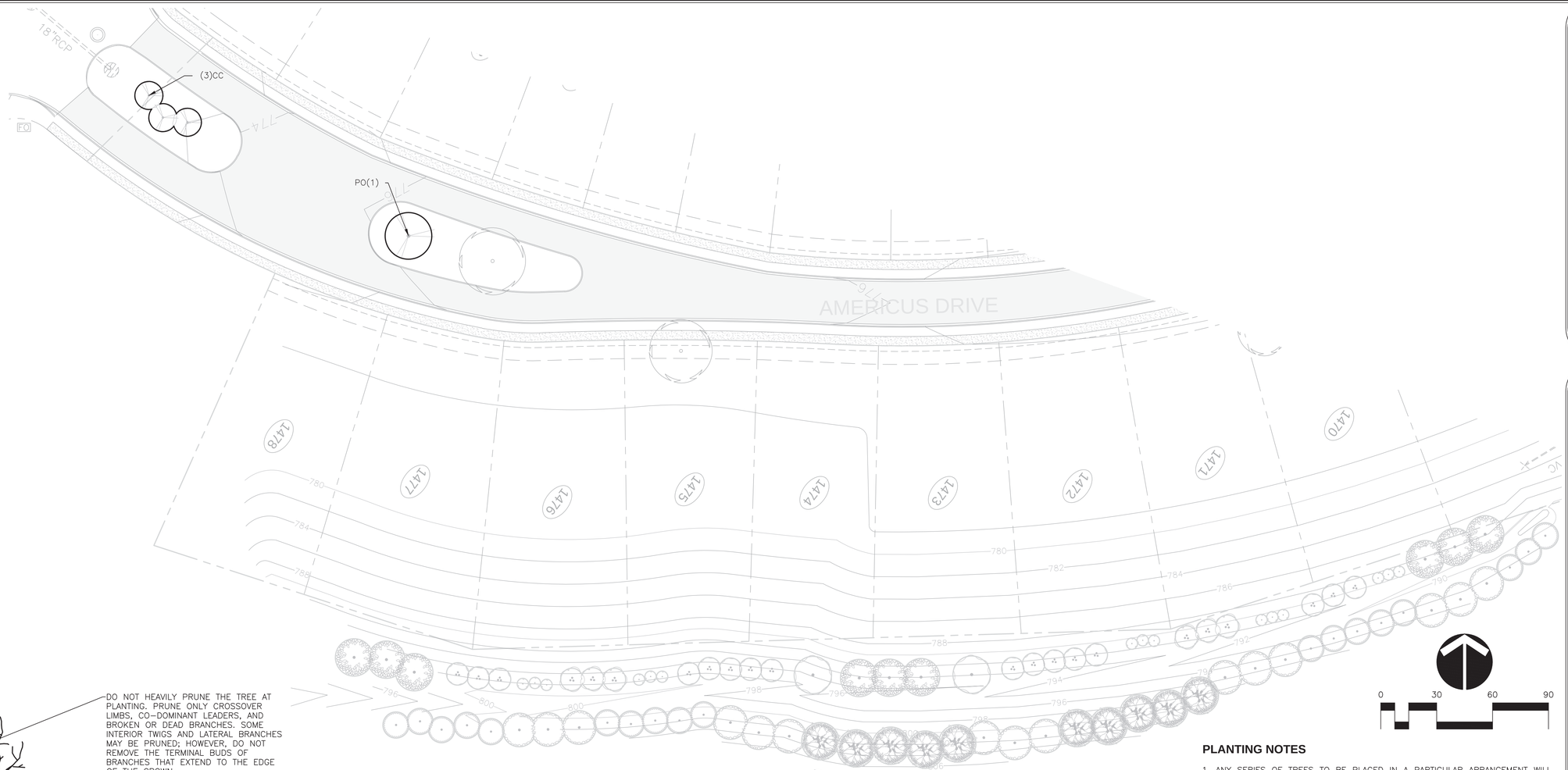
TOLLGATE Village

JOB NO.	WK. ORDER
10081	9260
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	1"=20'
DATE:	SEPTEMBER 23, 2016

REVISIONS

LANDSCAPE PLAN

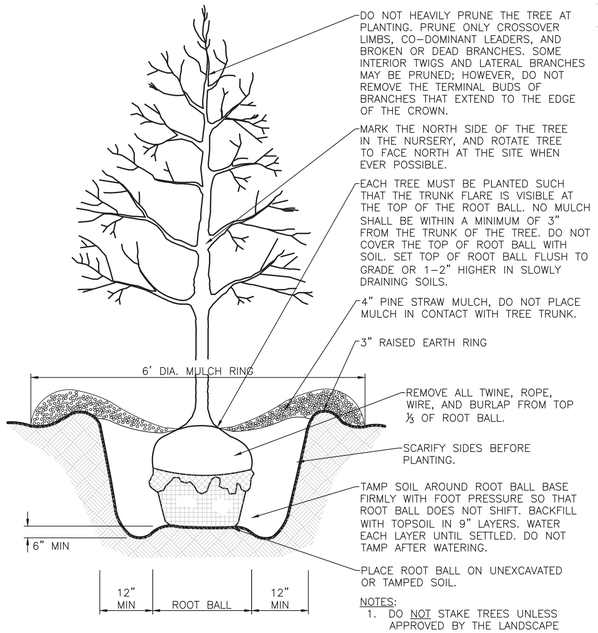
L1.1



0 30 60 90

PLANT SCHEDULE							
TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	HEIGHT	SPACING	REMARKS
CC	3	CERCIS CANADENSIS / EASTERN REDBUD	DECIDUOUS	2" CAL.		AS SHOWN	
PO	1	PLATANUS OCCIDENTALIS / AMERICAN SYCAMORE	DECIDUOUS	3" CAL.	14–16' HT	AS SHOWN	B&B

NOTES: 1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED. TOTAL PROVIDED: 9 CAL. INCHES



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TREE PLANTING
NOT TO SCALE

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

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TOLLGATE Village

SECTION 14
FOR
CONSTRUCTION PLANS

JOB NO.	WK. ORDER
10081	9260
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	1"=30'
DATE:	SEPTEMBER 23, 2016

REVISIONS

LANDSCAPE PLAN

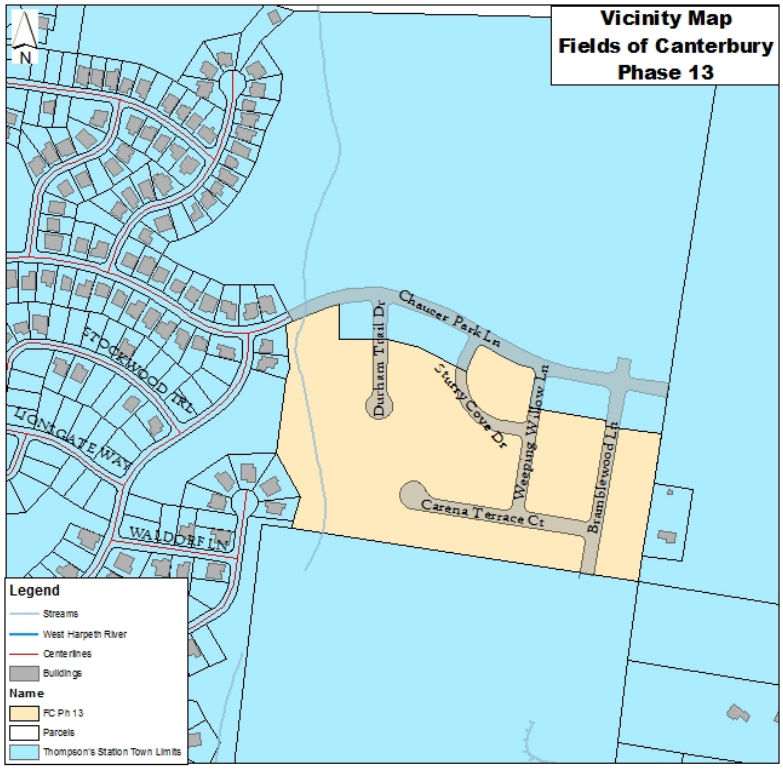
L1.2

Thompson's Station Planning Commission
Staff Report – Item 3 (PP 2017-005)
March 28, 2017

The Fields of Canterbury Preliminary Plat - Phase 13 for the creation of 57 single family lots and four (4) open space lots and the removal of 39 trees totaling 1,086 inches of trees.

PROJECT DESCRIPTION

Ragan Smith & Associates, on behalf of Hood Development submitted a request for a preliminary plat to create 57 single family lots, four (4) open space lots and the removal of 39 trees within the Fields of Canterbury neighborhood.



ANALYSIS

Land Use/Density

The development is located within the D3 – High Intensity zoning district which permits three units an acre and permits housing options that include single-family and townhomes. The overall development is 270.5 acres and was approved to include 204 townhomes and 612 single-family dwellings for a total of 816 residential units. Phase 13 is the final phase and includes the remaining 57 single-family lots.

Lot Width and Setbacks

The single family lots will vary in size from .17 acres to .28 acres with widths greater than 50 feet. The proposed setbacks are 20 feet for the front yard setback, 7.5 feet for the side yard setbacks and 20 feet for the rear yard setback. Therefore, the preliminary plat conforms to lot widths and setback standards within Land Development Ordinance.

Roadways

The standard for local roadways is 50 feet. Bramblewood Lane, Durham Trail Drive and Carena Terrace Court will have a right-of-way width of 50 feet. Sturry Cove and Weeping Willow Lane

are proposed to have a width of 40 feet. This is due to some reconfiguration of the roadways through this phase. During phase 11, lots were eliminated to create an open space area with a one-way loop (Sturry Cove) starting and ending at Chaucer Park Lane. Sturry Cove was permitted as a 40 foot right-of-way providing one way access around Open Space Lot 1396. However, due to the reconfiguration of the roadways, another road, Weeping Willow will now intersect with Sturry Cove and provide access to Chaucer Park Lane, both roads having two-way access. With the approval of 40 feet under the previous code, both ends of Sturry Cove were stubbed out with a 40 foot right-of-way width during the construction of phase 11. Therefore, the developer is requesting that the Planning Commission approve a 40-foot right-of-way for these two roadways. In addition, 13 parallel parking spaces are provided along Sturry Cove, adjacent the open space (Lot 1396).

Other layout changes include the replacement of a through road with two cul de sacs to comply with block length requirements; a cul de sac was eliminated; and a Bramblewood Lane will be extended to the southern boundary for a connection to the south.

Critical Lots
No development will occur on slopes exceeding 25%; however, several lots contain slopes between 15 and 25% and are critical lots due to these slopes. Lots 1306, 1326 – 1327, 1340 – 1342, 1348, 1350, 1355 – 1357 are designated as critical lots on the plat. A grading plan will be reviewed with the construction plans for the overall phase. Prior to the issuance of building permits, all critical lots require engineered site plans and site specific grading plans to address any issues.

Open Space
The original development plan was approved with a 25% requirement for open space. In May 2015, the applicant submitted a revised plan increasing the open space to 31% for a total of 85 acres. The development currently has 66.22 acres of open space which is approximately 78% of the total for the project. The preliminary plat creates four open space lots, totaling 13.08 acres. The remaining 5.7 acres will be platted as phase 12 final plats are recorded. Therefore, the project is consistent with the open space requirement approved for the development.

Trees
Development of phase 13 will result in the removal of 39 trees for a total of 1,086 inches. The Land Development Ordinance requires the replacement of trees 24 inches and greater at a ratio of one and a half inches for every inch removed. Therefore, 1,629 inches of trees is required to be replaced within the development. The replacement plan includes one tree per each single-family lot for a total of 57 trees, 89 street trees, and 103 trees within phase 13 open space. These 249 trees total 587 inches of the necessary replacement trees. The replacement plan also includes replacement trees located in the amenity center and other phases for an additional 1,043 inches. The replacement trees include, but are not limited to several deciduous and evergreen varieties such as Maple, Cedar, Crape Myrtle, Magnolia, Oak, Red Bud, Cypress and Elm.

<u>Construction Plans</u>
While the preliminary plat provides an entitlement to move forward with the phase, construction plans are submitted, but review is not complete at this time. The construction documents provide all the necessary engineering for the development. During the review of the construction drawings, any engineering issues that are identified, including but not limited to grading, drainage, etc. will be required to be addressed adequately prior to approval. Therefore, should any issues arise during the construction plan review, it will be incumbent on the applicant to revise the preliminary plat accordingly to meet all engineering related standards.

In addition, revisions are required to the geotechnical report. The entire area within this phase does not appear to be fully evaluated within the report. Staff has requested an addendum be submitted from the engineer addressing the entire phase. Therefore, prior to approval of construction plans, the geotechnical report shall be amended and the developer shall be responsible for adhering to all recommendations.

Construction Route
On March 24, 2015, the Planning Commission approved the construction route which provided temporary construction access from Critz Lane to Callaway Park Place to access all other necessary roads into the different phases. This temporary access was permitted until Paddock Park Place was completed at which time would become the construction access. Paddock Park Place is complete and open to traffic. Therefore, the construction traffic for phase 13 shall be Paddock Park to Callaway Park Place and onto Chaucer Park Lane providing access to phases 11, 12 and 13.

RECOMMENDATION
Based on the project's compliance with the Land Development Ordinance, Staff recommends that the Planning Commission approve the preliminary plat and tree removals and replacement plan with the contingencies provided. In addition, a reduction of roadway with for Sturry Cove and Weeping Willow will not create an unsafe condition, therefore, Staff recommends the Planning Commission permit the 40-foot right-of-way.

1. Prior to the approval of construction plans, the applicant shall enter into a development agreement for the project.
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 approval of construction plans, the geotechnical report shall be amended to incorporate the entire area for phase 13. During construction, the developer shall comply with all recommendations of the geotechnical report.

ATTACHMENT
Preliminary Plat
Illustrative Plan
Construction Route Map

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO CREATE 57 SINGLE FAMILY LOTS AND FOUR OPEN SPACE TRACTS.
2. BEARINGS SHOWN HEREON ARE BASED ON SURVEYS BY CRAWFORD LAND SURVEYORS, P.C. DATED AUGUST 10, 2004 AND MARCH 25, 2005.
3. THE PROPERTY IS ZONED D3 (HIGH DENSITY RESIDENTIAL).
   MAXIMUM LOT COVERAGE (SINGLE FAMILY) – 55%.
   MINIMUM BUILDING SETBACKS:
   FRONT – 20'
   SIDE – 7.5'
   REAR – 20'
4. WITHIN ALL NEW DEVELOPMENTS AND FOR OFF–SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL (EXCLUDING TRANSFORMERS AND THE MTEMC FEEDER LINE RUNNING NORTH/SOUTH ALONG THE DISTANCE OF THE TVA TRANSMISSION LINE EASEMENT), GAS, SEWER, TELEPHONE, AND WATERLINES SHALL BE PLACED UNDERGROUND. SEE VARIANCE GRANTED BY THE TOWN OF THOMPSON'S STATION M.P.C. APRIL 16, 2007 FOR THE FIELDS OF CANTERBURY REGARDING M.T.E.M.C. OVERHEAD POWER LINES.
5. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THE PROPERTY LIES WITHIN FLOOD ZONE "X", AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAPS NO. 47187C0335F AND 47187C0355F, WITH AN EFFECTIVE DATE OF SEPTEMBER 29, 2006, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 470424, PANEL NOS. 0335 AND 0355, SUFFIX F, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "X" UNDER "OTHER AREAS" AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."
6. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES, PUBLIC RECORDS, AND/OR MAPS PREPARED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THEREFORE, RELIANCE UPON THE TYPE, SIZE AND LOCATION OF UTILITIES SHOWN SHOULD BE DONE SO WITH THIS CIRCUMSTANCE CONSIDERED. DETAILED VERIFICATION OF EXISTENCE, LOCATION AND DEPTH SHOULD ALSO BE MADE PRIOR TO ANY DECISION RELATIVE THERETO IS MADE. AVAILABILITY AND COST OF SERVICE SHOULD BE CONFIRMED WITH THE APPROPRIATE UTILITY COMPANY. IN TENNESSEE, IT IS A REQUIREMENT, PER "THE UNDERGROUND UTILITY DAMAGE PREVENTION ACT", THAT ANYONE WHO ENGAGES IN EXCAVATION MUST NOTIFY ALL KNOWN UNDERGROUND UTILITY OWNERS NO LESS THAN THREE (3) NOR MORE THAN TEN (10) WORKING DAYS PRIOR TO THE DATE OF THEIR INTENT TO EXCAVATE AND ALSO TO AVOID ANY POSSIBLE HAZARD OR CONFLICT. TENNESSEE ONE CALL, DIAL 811.
7. SANITARY SEWER LINES AND STORM LINES SHOWN HEREON WERE TAKEN FROM A PRELIMINARY DESIGN FOR THIS SECTION. FINAL PLACEMENT OF UTILITIES WILL BE DEPICTED ON THE FINAL PLAT.
8. DOMESTIC WATER SUPPLY INFORMATION SHOWN HEREON IS BASED ON A PRELIMINARY DESIGN ALL PUBLIC STREETS AND DRAINAGE STRUCTURES WITHIN THE RIGHTS–OF–WAY WILL BE MAINTAINED BY THE TOWN OF THOMPSON'S STATION.
9. OPEN SPACE AREAS AND PUBLIC UTILITY AND DRAINAGE EASEMENTS, INCLUDING DRAINAGE AND DETENTION STRUCTURES, WILL BE MAINTAINED BY THE HOMEOWNER'S ASSOCIATION
10. TOPOGRAPHIC INFORMATION SHOWN HEREON WAS TAKEN FROM AN AERIAL SURVEY FURNISHED BY L.I. SMITH & ASSOCIATES, INC., DATED APRIL 6, 2005. CONTOURS SHOWN ARE AT 2 FOOT INTERVALS.
11. LOTS SHOWN THUS (*) ARE DESIGNATED AS CRITICAL LOTS AND HAVE NATURAL SLOPES IN EXCESS OF 15%. PER SECTION 3–102.104 OF THE SUBDIVISION REGULATIONS, PRIOR TO THE ISSUANCE OF A BUILDING PERMIT, A SITE GRADING PLAN FOR DEVELOPMENT OF THE LOT SHALL BE SUBMITTED ADDRESSING SITE SPECIFIC NATURAL RESOURCE ISSUES TO THE TOWN OF THOMPSON'S STATION FOR REVIEW AND APPROVAL. NO BUILDING PERMIT WILL BE ISSUED ON SAID LOTS UNTIL AND UNLESS THE TOWN ENGINEER HAS RECEIVED AND APPROVED THE SITE PLAN.
12. 100 YEAR DETENTION WATER SURFACE ELEVATION BASED ON DETENTION STUDY PREPARED BY RAGAN–SMITH ASSOCIATES, INC. DATED APRIL 27, 2012.
13. I HEREBY STATE THAT THIS SURVEY WAS DONE IN COMPLIANCE WITH THE CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE AND THIS IS A CATEGORY I SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS 1:15,000.

   BY: [signature] DATE: 3-15-17
   JOHN T. DARNALL, TN RLS #1571

14. **A WAIVER/MODIFICATION OF STANDARD IS REQUESTED FOR DRIVEWAY LOCATIONS DISTANCES TO POINT OF CURVATURE (LDO 3.7.3). PROPOSED SITE PLANS WILL REFLECT PREVIOUS SECTIONS ARCHITECTURE, STREETSCAPE, AND DRIVEWAY LOCATIONS FOR CONTINUITY.**

DEED REFERENCE

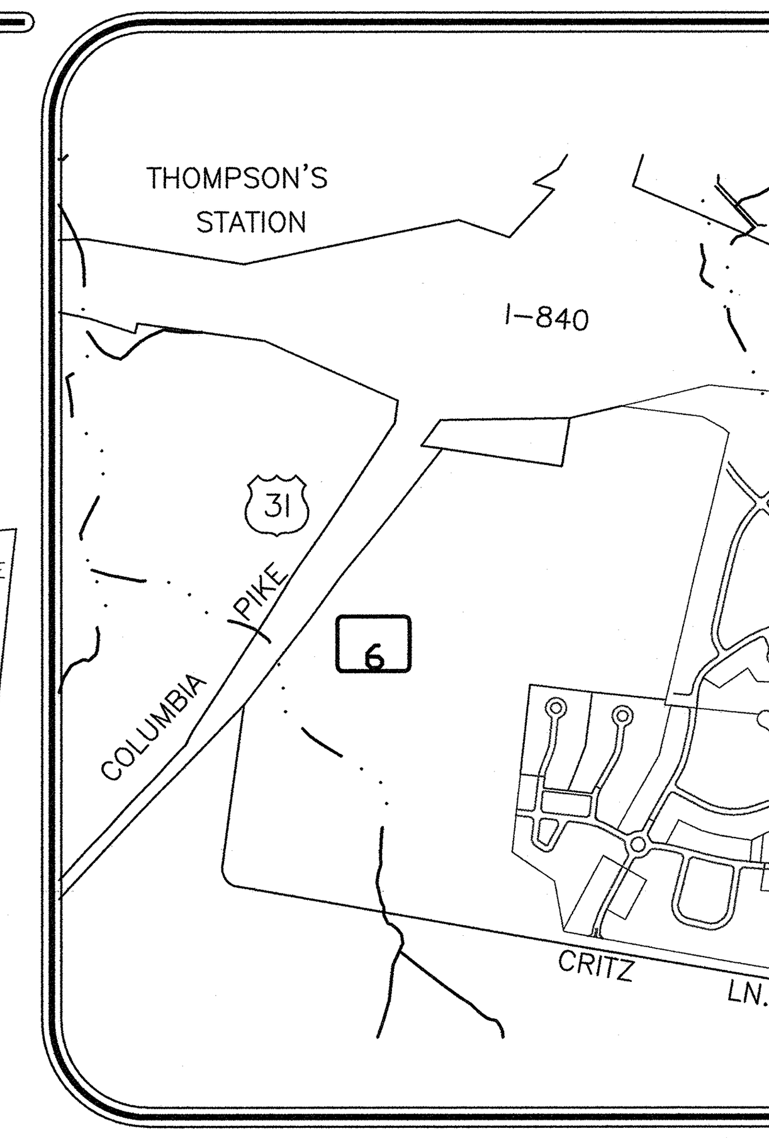
BEING A PORTION OF THE SAME PROPERTY CONVEYED TO HOOD DEVELOPMENT, LLC (HOOD SINGLE DEVELOPMENT, LLC HAVING SINCE MERGED INTO HOOD DEVELOPMENT, LLC BY MERGER OF RECORD IN BOOK 5481, PAGE 558) BY DEED OF RECORD IN BOOK 4239, PAGE 639, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

PROPERTY MAP REFERENCE

BEING A PORTION OF PARCEL NUMBER 40.01 AS SHOWN ON WILLIAMSON COUNTY PROPERTY MAP NUMBER 132.

(SEE NOTE 2)

0 200 400 600



LOCATION MAP
NOT TO SCALE

LOT AREA TABLE		
LOT	SQ. FT.±	ACRES±
1301	7,812	0.18
1302	7,812	0.18
1303	7,500	0.17
1304	9,062	0.21
1305	10,982	0.25
1306	11,528	0.26
1307	10,442	0.24
1308	9,269	0.21
1309	7,397	0.17
1310	7,500	0.17
1311	9,568	0.22
1312	11,036	0.25
1313	9,852	0.23
1314	10,581	0.24
1315	9,528	0.22
1316	9,609	0.22
1317	9,405	0.22
1318	11,074	0.25
1319	9,866	0.23
1320	7,500	0.17
1321	7,500	0.17
1322	7,650	0.18
1323	10,463	0.24
1324	10,228	0.23
1325	12,087	0.28
1326	11,394	0.26
1327	12,697	0.29
1328	8,125	0.19
1329	7,500	0.17

LOT AREA TABLE		
LOT	SQ. FT.±	ACRES±
1330	7,500	0.17
1331	7,500	0.17
1332	7,500	0.17
1333	7,500	0.17
1334	7,500	0.17
1335	7,500	0.17
1336	7,500	0.17
1337	8,616	0.20
1338	7,500	0.17
1339	7,500	0.17
1340	7,500	0.17
1341	7,500	0.17
1342	7,500	0.17
1343	7,500	0.17
1344	7,500	0.17
1345	7,558	0.17
1346	7,501	0.17
1347	7,500	0.17
1348	7,500	0.17
1349	7,500	0.17
1350	8,086	0.19
1351	7,588	0.17
1352	7,588	0.17
1353	8,086	0.19
1354	7,500	0.17
1355	7,500	0.17
1356	7,500	0.17
1357	7,504	0.17

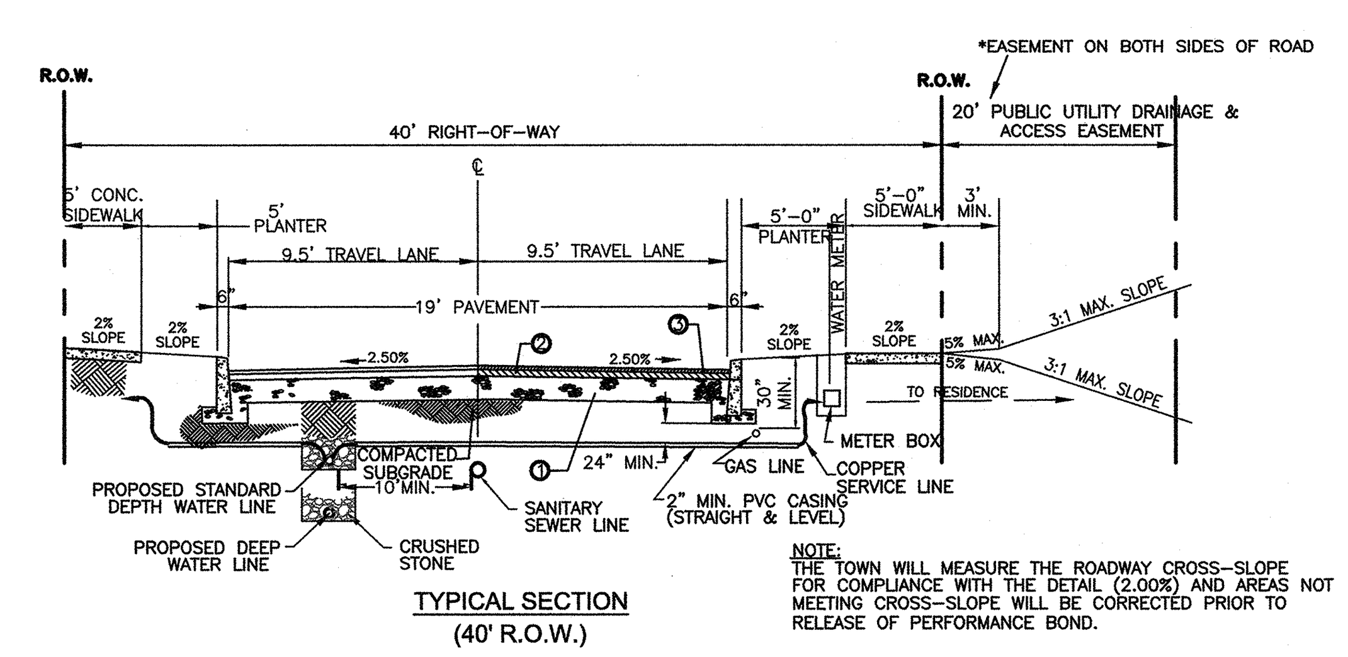
OPEN SPACE LOT AREA TABLE		
OS LOT	SQ. FT.±	ACRES±
1396	51,460	1.18
1397	258,067	5.92
1398	4,000	0.09
1399	26,894	0.62

PHASE 13
LOTS 1301–1357
OPEN SPACE 1396–1399

SITE DATA TABLE (PHASE 13)	
TOTAL LOT AREA	– 11.19 ACRES±
TOTAL R.O.W. AREA	– 2.69 ACRES±
OPEN SPACE AREA	– 7.81 ACRES±
TOTAL SITE AREA	– 21.69 ACRES±
TOTAL LINEAR FEET OF ROAD	– 2,293 FEET

SURVEYOR:
RAGAN–SMITH ASSOCIATES, INC.
TOM DARNALL, RLS
315 WOODLAND STREET
NASHVILLE, TENNESSEE 37206
(615) 244–8591

OWNER / DEVELOPER
HOOD DEVELOPMENT, LLC
C/O PRESTON INGRAM
121 FIRST AVENUE SOUTH, SUITE 210
FRANKLIN, TENNESSEE 37064
(615) 794–6401



LEGEND

OS	OPEN SPACE
R.O.W.	R.O.W.
R.O.W.C.T.	REGISTER'S OFFICE WILLIAMSON COUNTY, TENNESSEE
*	CRITICAL LOT (SEE NOTE 11)

TOTAL AREA = 944,960 SQUARE FEET OR 21.69 ACRES ±

RAGAN•SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS

THE FIELDS OF CANTERBURY
PHASE 13
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

JOB NO. 05-043	WK. ORDER 7878
APPROVED:	JTD
DRAWN:	AMR
SCALE:	1" = 200'
DATE:	MARCH 1, 2017

REVISIONS
1 03–15–2017 (AMR) REV. PER STAFF COMMENTS

PRELIMINARY PLAT

GENERAL NOTES

1. SEE SHEET 1 OF 2 FOR NOTES, REFERENCES AND AREA TABLES.

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	425.00'	97.13'	13°05'38"	48.78	96.91'	N69°24'28"E
C2	185.00'	66.35'	20°33'00"	33.54	66.00'	N21°12'19"E
C3	25.00'	39.27'	90°00'00"	25.00	35.36'	N76°28'49"E
C4	950.00'	173.84'	10°29'05"	87.17	173.60'	S63°45'44"E
C5	25.00'	34.13'	78°12'58"	20.32	31.54'	S29°53'48"E
C6	50.00'	36.14'	41°24'35"	18.90	35.36'	S20°46'16"W
C7	50.00'	3.48'	3°58'57"	1.74	3.47'	S02°03'27"W
C8	50.00'	32.66'	37°25'38"	16.94	32.08'	S22°45'45"W
C9	50.00'	229.35'	262°49'09"	56.69	75.00'	S89°56'01"E
C10	50.00'	39.99'	45°49'15"	21.13	38.93'	S18°33'56"W
C11	50.00'	38.99'	44°40'48"	20.55	38.01'	S26°41'06"E
C12	50.00'	40.24'	46°06'55"	21.28	39.17'	S72°04'58"E
C13	50.00'	16.65'	19°04'26"	8.40	16.57'	N75°19'22"E
C14	50.00'	38.73'	44°22'51"	20.39	37.77'	N43°35'43"E
C15	50.00'	54.76'	62°44'54"	30.49	52.06'	N09°58'09"W
C16	50.00'	36.14'	41°24'35"	18.90	35.36'	N20°38'18"W
C17	50.00'	3.03'	3°28'20"	1.52	3.03'	N39°36'26"W
C18	50.00'	33.11'	37°56'14"	17.19	32.51'	N18°54'08"W
C19	225.00'	14.83'	3°46'35"	7.42	14.83'	S11°53'00"W
C20	165.00'	94.71'	32°53'15"	48.70	93.41'	S06°26'55"E

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C21	165.00'	34.54'	11°59'44"	17.34	34.48'	S03°59'50"W
C22	165.00'	54.47'	18°54'47"	27.48	54.22'	S11°27'25"E
C23	165.00'	5.70'	1°58'44"	2.85	5.70'	S21°54'11"E
C24	230.00'	115.90'	28°52'20"	59.21	114.68'	S37°19'42"E
C25	230.00'	49.46'	12°19'14"	24.82	49.36'	S29°03'10"E
C26	230.00'	55.44'	13°48'39"	27.86	55.31'	S42°07'06"E
C27	230.00'	11.00'	2°44'26"	5.50	11.00'	S50°23'39"E
C28	205.00'	103.85'	29°01'27"	53.06	102.74'	S66°16'35"E
C29	205.00'	43.83'	12°14'56"	22.00	43.74'	S57°53'20"E
C30	205.00'	54.83'	15°19'28"	27.58	54.67'	S71°40'32"E
C31	205.00'	5.19'	1°27'03"	2.60	5.19'	S80°03'47"E
C32	25.00'	39.27'	90°00'00"	25.00	35.36'	S35°47'19"E
C33	25.00'	39.27'	90°00'00"	25.00	35.36'	S54°12'41"W
C34	50.00'	52.36'	60°00'00"	28.87	50.00'	N50°47'19"W
C35	50.00'	209.44'	240°00'00"	86.60	86.60'	S39°12'41"W
C36	50.00'	36.72'	42°04'28"	19.23	35.90'	N41°49'33"W
C37	50.00'	38.06'	43°36'55"	20.01	37.15'	N84°40'14"W
C38	50.00'	16.06'	18°24'21"	8.10	15.99'	S64°19'08"W
C39	50.00'	41.92'	48°02'32"	22.28	40.71'	S31°05'42"W
C40	50.00'	41.94'	48°03'47"	22.29	40.72'	S16°57'27"E

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C41	50.00'	34.73'	39°47'59"	18.10	34.04'	S60°53'20"E
C42	25.00'	39.27'	90°00'00"	25.00	35.36'	S35°47'19"E
C43	25.00'	39.27'	90°00'00"	25.00	35.36'	S54°12'41"W
C44	25.00'	39.27'	90°00'00"	25.00	35.36'	N35°47'19"W
C45	22.50'	35.34'	90°00'00"	22.50	31.82'	N54°12'41"E
C46	162.50'	82.32'	29°01'27"	42.06	81.44'	N66°16'35"W
C47	187.50'	94.48'	28°52'20"	48.27	93.49'	N37°19'42"W
C48	122.50'	70.31'	32°53'15"	36.16	69.35'	N06°26'55"W
C49	182.50'	2.98'	0°56'06"	1.49	2.98'	N10°27'45"E

LEGEND

- MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")
- IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
- IRON ROD (OLD)
- CABLE TV BOX
- ELECTRIC BOX
- CATCH BASIN
- SANITARY SEWER MANHOLE
- LIGHT STANDARD
- XXX — LOT NUMBER
- R.O.W. — RIGHT-OF-WAY
- DECIDUOUS TREE
- EVERGREEN TREE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- —SA— SANITARY SEWER LINE
- RCP — REINFORCED CONCRETE PIPE
- —X—X— FENCE
- P.U.D.E. — PUBLIC UTILITY DRAINAGE EASEMENT
- R.O.W. — RIGHT-OF-WAY
- M.B.S.L. — MINIMUM BUILDING SETBACK LINE
- CONCRETE SURFACE
- R.O.W.C.T. — REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TN
- SLOPES IN EXCESS OF 15%
- * CRITICAL LOT (SEE NOTE 11)

RAGAN·SMITH

LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS

THE FIELDS OF CANTERBURY
PHASE 13

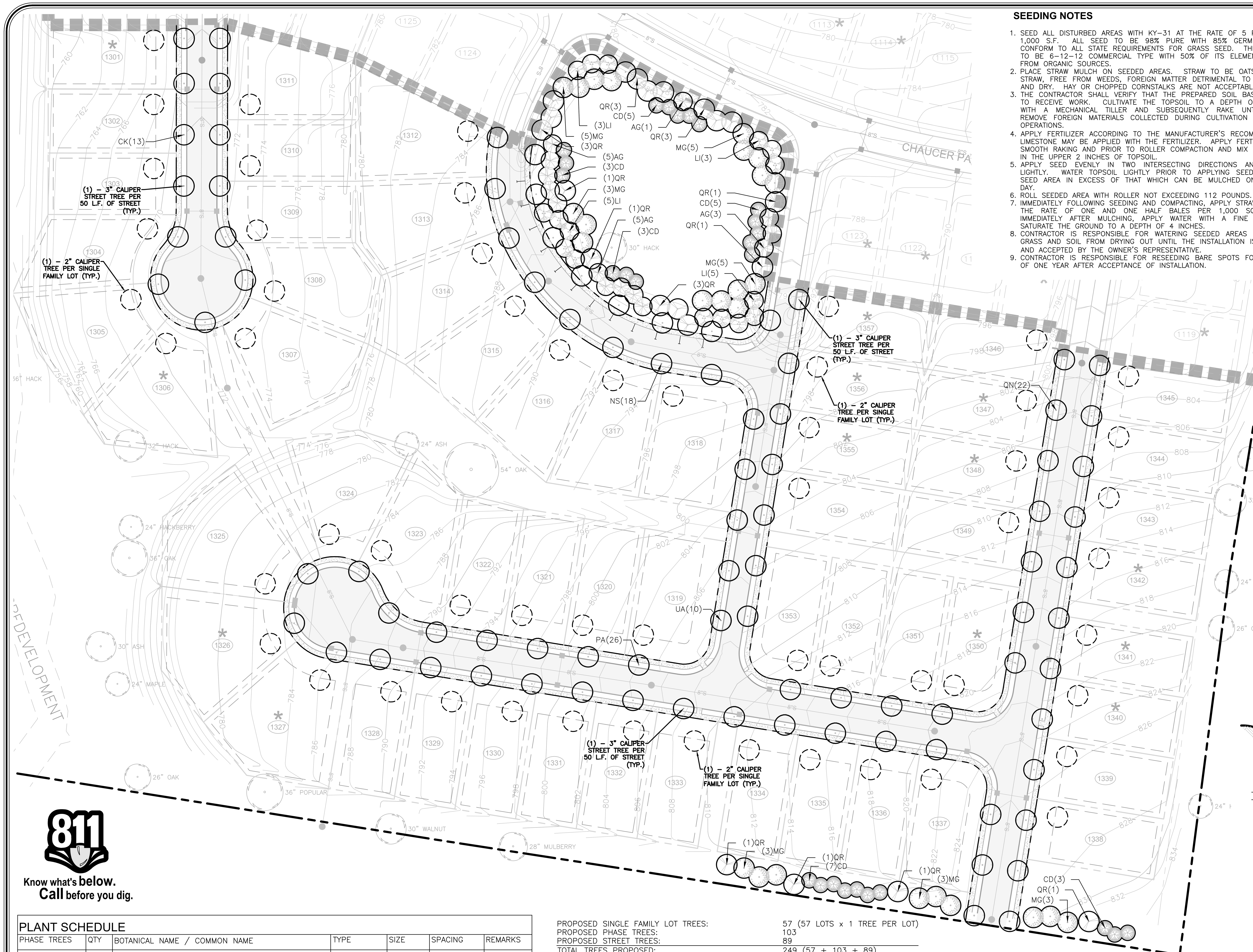
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

1 03-15-2017 (AMR) REV. PER STAFF COMMENTS

REVISIONS

JOB NO. 05-043	WK. ORDER 7878
APPROVED:	JTD
DRAWN:	AMR
SCALE:	1" = 50'
DATE:	MARCH 1, 2017

PRELIMINARY PLAT



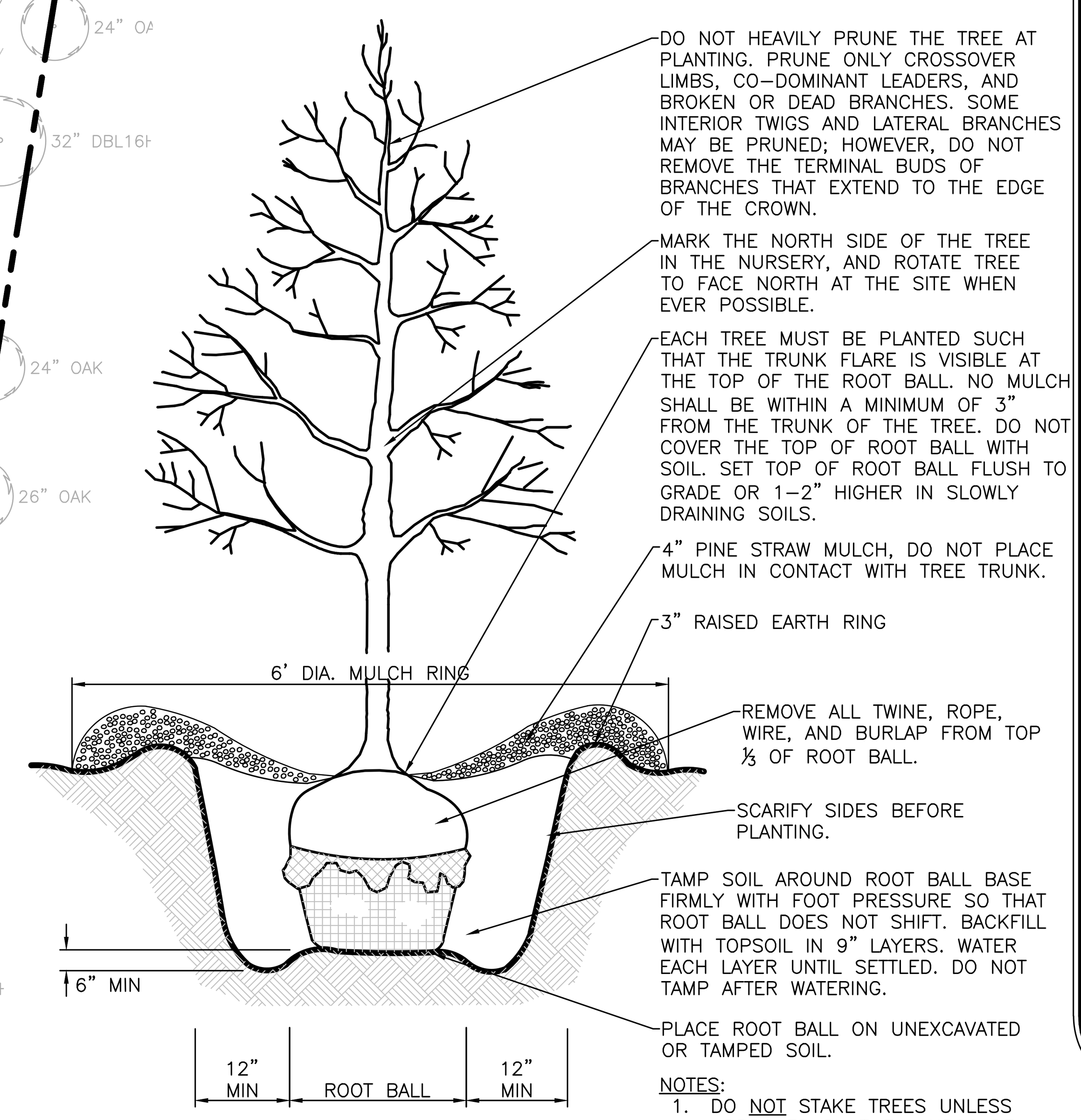
811
Know what's below.
Call before you dig.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY-31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6-12-12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. APPLY SEED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKE IN LIGHTLY. WATER TOPSOIL LIGHTLY PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR IS RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10-10-10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND SHAPE.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON-BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.



NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON-BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING
NOT TO SCALE

PLANT SCHEDULE

PHASE TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
AG	14	ACER GRISEUM / PAPERBARK MAPLE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CD	26	CEDRUS DEODARA / DEODAR CEDAR	EVERGREEN	2" CAL.	AS SHOWN	B&B
LI	16	LAGERSTROEMIA INDICA / CRAPE MYRTLE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
MG	27	MAGNOLIA GRANDIFLORA / SOUTHERN MAGNOLIA	EVERGREEN	2" CAL.	AS SHOWN	B&B
QR	20	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	AS SHOWN	B&B

STREET TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
CK	13	CLADRASTIS KENTUKEA / AMERICAN YELLOWWOOD	DECIDUOUS	3" CAL.	AS SHOWN	B&B
NS	18	NYSSA SYLVATICA / SOUR GUM	DECIDUOUS	3" CAL.	AS SHOWN	B&B
PA	26	PLATANUS X ACERIFOLIA / LONDON PLANE TREE	DECIDUOUS	3" CAL.	AS SHOWN	B&B
QN	22	QUERCUS NUTTALLII / NUTTALL OAK	DECIDUOUS	3" CAL.	AS SHOWN	B&B
UA	10	ULMUS PARVIFOLIA 'ALLEE' / ALLEE LACEBARK ELM	DECIDUOUS	3" CAL.	AS SHOWN	B&B

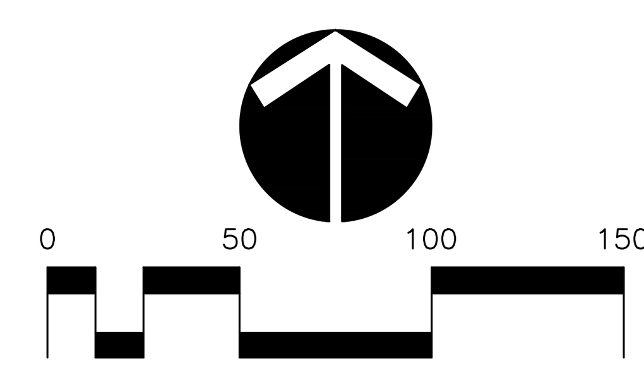
NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.
3. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.

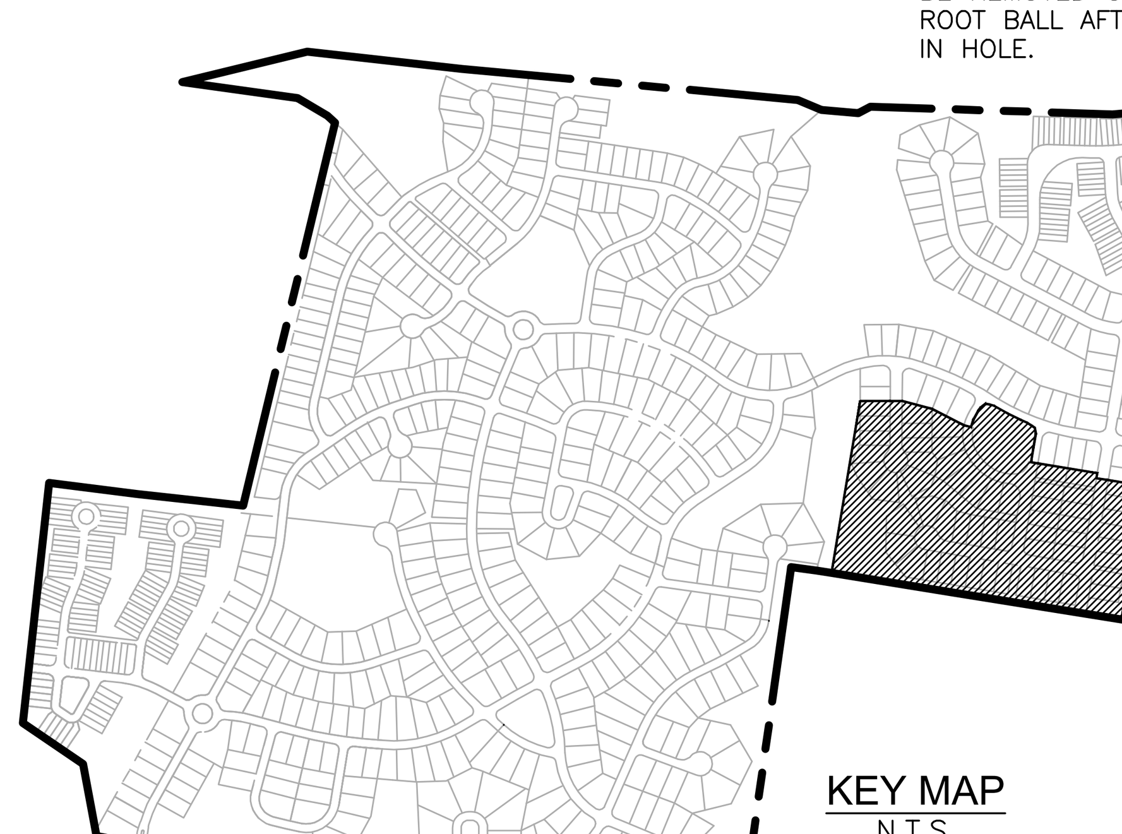
PROPOSED SINGLE FAMILY LOT TREES:	57 (57 LOTS x 1 TREE PER LOT)
PROPOSED PHASE TREES:	103
PROPOSED STREET TREES:	89
TOTAL TREES PROPOSED:	249 (57 + 103 + 89)

PROPOSED SINGLE FAMILY LOT TREES (CAL. IN.):	114" (57 x 2 CAL. IN.)
PROPOSED PHASE TREES (CAL. IN.):	206" (103 X 2 CAL. IN.)
PROPOSED STREET TREES (CAL. IN.):	267" (89 X 3 CAL. IN.)
TOTAL CALIPER INCHES PROPOSED:	587" (114" + 206" + 267")

AMENITY CENTER (CAL. IN.):	165"	(55 @ 3 CAL. IN.) 1
PHASE 1B (CAL. IN.):	94"	(47 @ 2 CAL. IN.)
PHASE 2 ALONG WESTERHAM WAY (CAL. IN.):	16"	(8 @ 2 CAL. IN.)
PHASE 4E OPEN SPACE (CAL. IN.):	44"	(22 @ 2 CAL. IN.)
PHASE 8A ALONG CALLAWAY PARK PLACE (CAL. IN.):	82"	(41 @ 2 CAL. IN.)
PHASE 9 BERM (CAL. IN.):	112"	(47 @ 2 CAL. IN.)
PHASE 10 BERM ALONG CRITZ (CAL. IN.):	422"	(211 @ 2 CAL. IN.)
PHASE 10B BERM (CAL. IN.):	108"	(54 @ 2 CAL. IN.)
TOTAL CALIPER INCHES PROPOSED:	1,043"	(47 @ 2 CAL. IN.)

TOTAL CALIPER INCHES PROPOSED:	1,630" (587" + 1,043")
TOTAL CALIPER INCHES REQUIRED:	1,629" (SEE EXISTING TREE REMOVAL PLAN)





KEY MAP
N.T.S.

RAGAN • SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
NASHVILLE
315 WOODLAND STREET
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(615) 244-8591
CHATTANOOGA
1410 COWART STREET
SUITE 200
CHATTANOOGA, TN 37408
(423) 490-9400
• www.ragansmith.com •

BRETT ALAN SMITH REGISTERED LANDSCAPE ARCHITECT TENNESSEE NO. 03/15/17

THE FIELDS OF CANTERBURY-PH13

FOR

HOOD DEVELOPMENT, LLC

WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

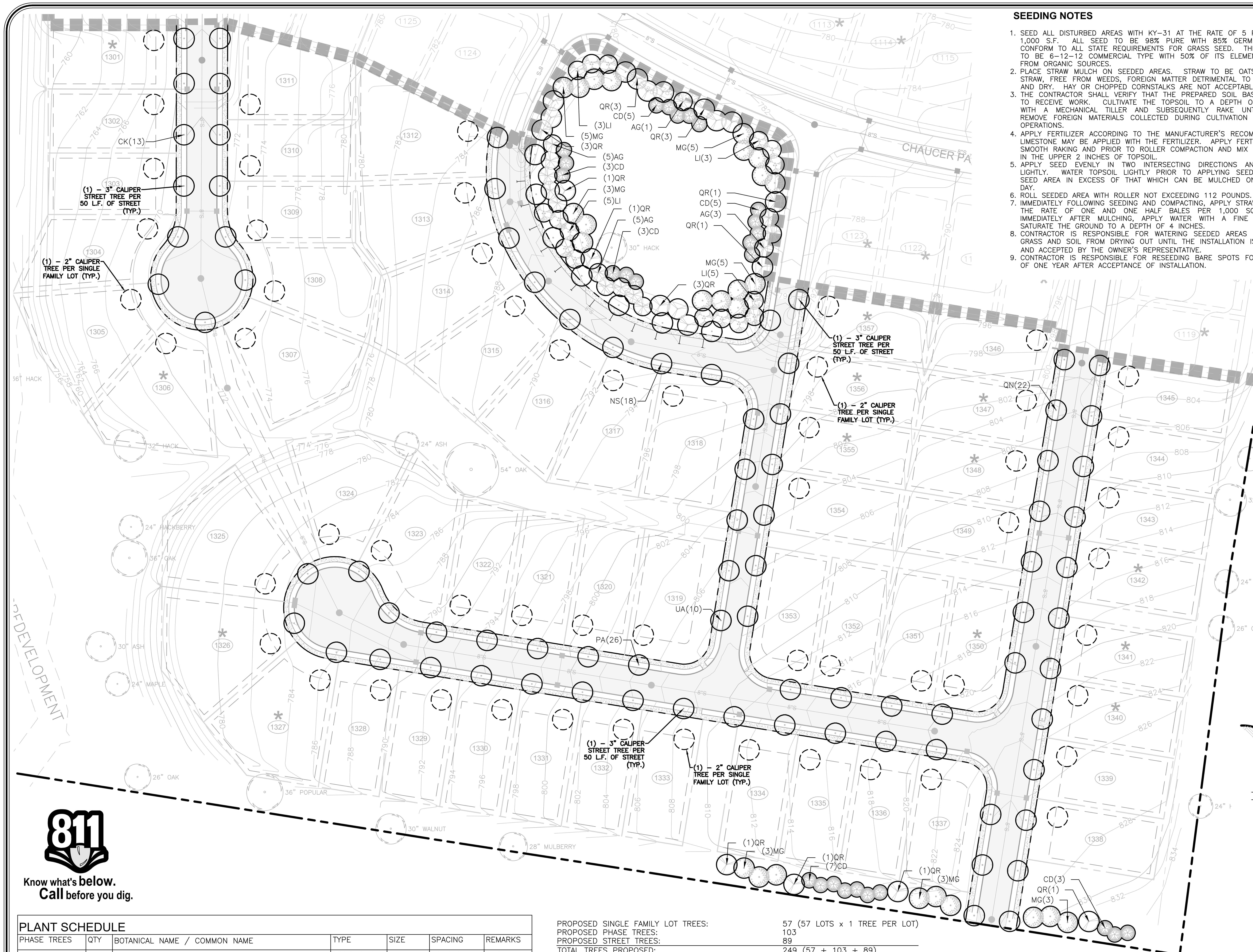
1 03-15-17 T. GARDNER PER TOWN COMMENTS

REVISIONS

JOB NO. 05043	WK. ORDER 7878
DESIGNED:	B. SMITH
DRAWN:	T.GARDNER
SCALE:	1"=50'
DATE:	MARCH 1, 2017

LANDSCAPE PLAN

L1.1

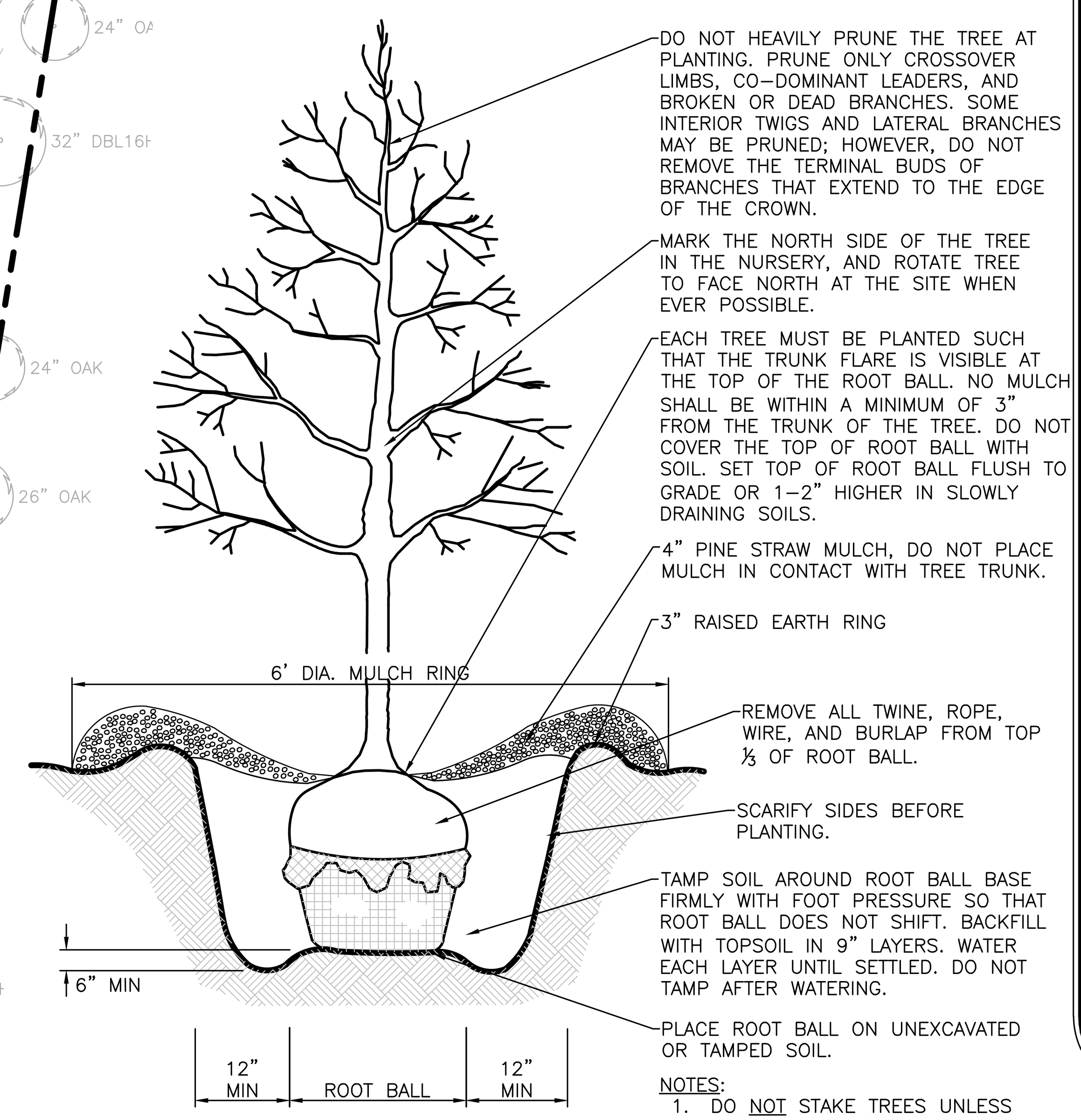


SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY–31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6–12–12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. APPLY SEED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKE IN LIGHTLY. WATER TOPSOIL LIGHTLY PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR IS RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10–10–10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5–10–5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE–INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON–BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON–BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.



TREE PLANTING
NOT TO SCALE

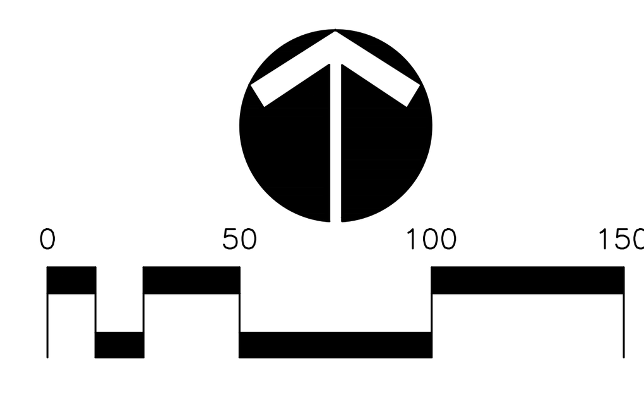
NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON–BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

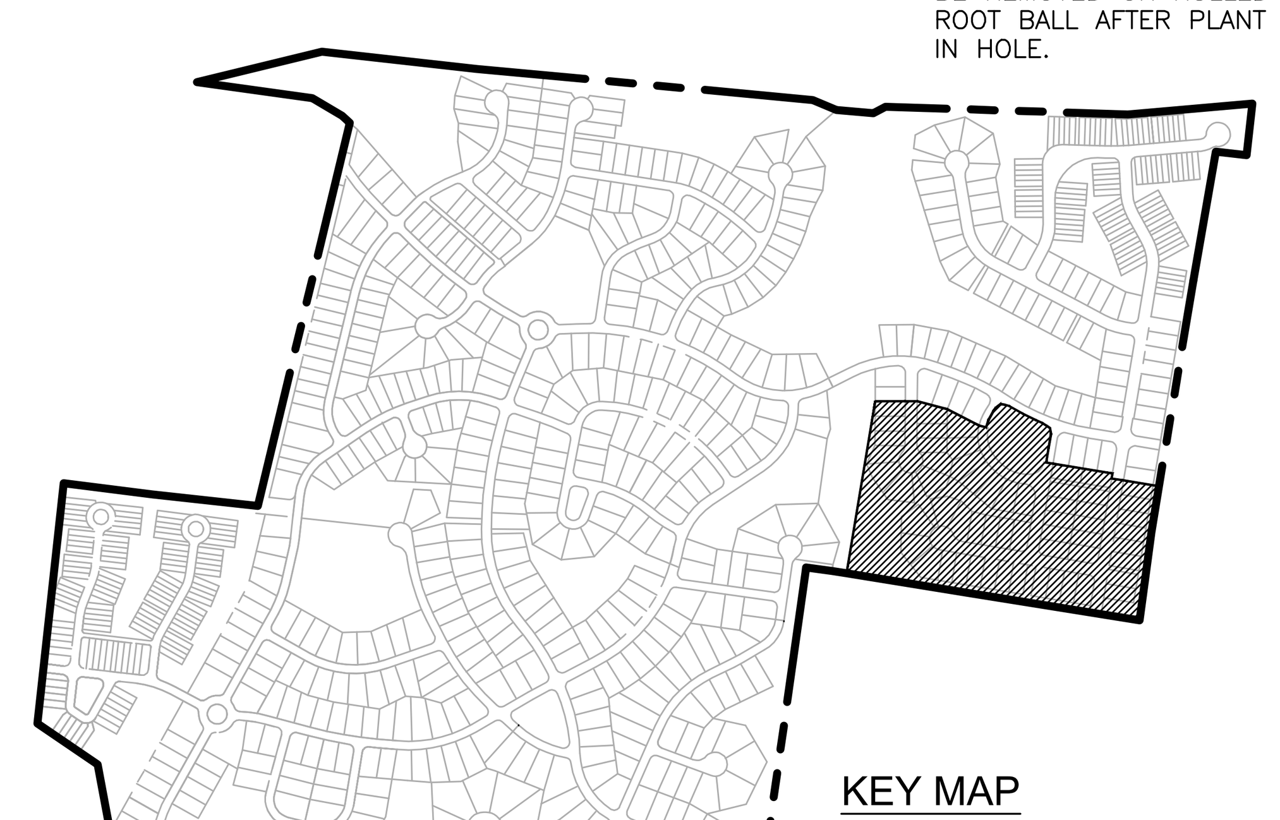
PLANT SCHEDULE

PHASE TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
AG	14	ACER GRISEUM / PAPERBARK MAPLE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CD	26	CEDRUS DEODARA / DEODAR CEDAR	EVERGREEN	2" CAL.	AS SHOWN	B&B
LI	16	LAGERSTROEMIA INDICA / CRAPE MYRTLE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
MG	27	MAGNOLIA GRANDIFLORA / SOUTHERN MAGNOLIA	EVERGREEN	2" CAL.	AS SHOWN	B&B
QR	20	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	AS SHOWN	B&B
STREET TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
CK	13	CLADRASTIS KENTUKEA / AMERICAN YELLOWWOOD	DECIDUOUS	3" CAL.	AS SHOWN	B&B
NS	18	NYSSA SYLVATICA / SOUR GUM	DECIDUOUS	3" CAL.	AS SHOWN	B&B
PA	26	PLATANUS X ACERIFOLIA / LONDON PLANE TREE	DECIDUOUS	3" CAL.	AS SHOWN	B&B
QN	22	QUERCUS NUTTALLII / NUTTALL OAK	DECIDUOUS	3" CAL.	AS SHOWN	B&B
UA	10	ULMUS PARVIFOLIA 'ALLEE' / ALLEE LACEBARK ELM	DECIDUOUS	3" CAL.	AS SHOWN	B&B

NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.
3. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.

PROPOSED SINGLE FAMILY LOT TREES:	57 (57 LOTS x 1 TREE PER LOT)	
PROPOSED PHASE TREES:	103	
PROPOSED STREET TREES:	89	
TOTAL TREES PROPOSED:	249 (57 + 103 + 89)	
PROPOSED SINGLE FAMILY LOT TREES (CAL. IN.):	114" (57 x 2 CAL. IN.)	
PROPOSED PHASE TREES (CAL. IN.):	206" (103 X 2 CAL. IN.)	
PROPOSED STREET TREES (CAL. IN.):	267" (89 X 3 CAL. IN.)	
TOTAL CALIPER INCHES PROPOSED:	587" (114" + 206" + 267")	
AMENITY CENTER (CAL. IN.):	165"	(55 @ 3 CAL. IN.) ①
PHASE 1B (CAL. IN.):	94"	(47 @ 2 CAL. IN.)
PHASE 2 ALONG WESTERHAM WAY (CAL. IN.):	16"	(8 @ 2 CAL. IN.)
PHASE 4E OPEN SPACE (CAL. IN.):	44"	(22 @ 2 CAL. IN.)
PHASE 8A ALONG CALLAWAY PARK PLACE (CAL. IN.):	82"	(41 @ 2 CAL. IN.)
PHASE 9 BERM (CAL. IN.):	112"	(47 @ 2 CAL. IN.)
PHASE 10 BERM ALONG CRITZ (CAL. IN.):	422"	(211 @ 2 CAL. IN.)
PHASE 10B BERM (CAL. IN.):	108"	(54 @ 2 CAL. IN.)
TOTAL CALIPER INCHES PROPOSED:	1,043"	(47 @ 2 CAL. IN.)
TOTAL CALIPER INCHES PROPOSED:	1,630" (587" + 1,043")	
TOTAL CALIPER INCHES REQUIRED:	1,629" (SEE EXISTING TREE REMOVAL PLAN)	





KEY MAP
N.T.S.

RAGAN • SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
NASHVILLE
315 WOODLAND STREET
P.O. BOX 60070
NASHVILLE, TN. 37206
(615) 244-8591
CHATTANOOGA
1410 COWART STREET
SUITE 200
CHATTANOOGA, TN 37408
(423) 490-9400
• www.ragansmith.com •

BRETT ALAN SMITH REGISTERED AGRICULTURE COMMERCE TENNESSEE NO. LANDSCAPE ARCHITECT 03/15/17

THE FIELDS OF CANTERBURY-PH13

FOR

HOOD DEVELOPMENT, LLC

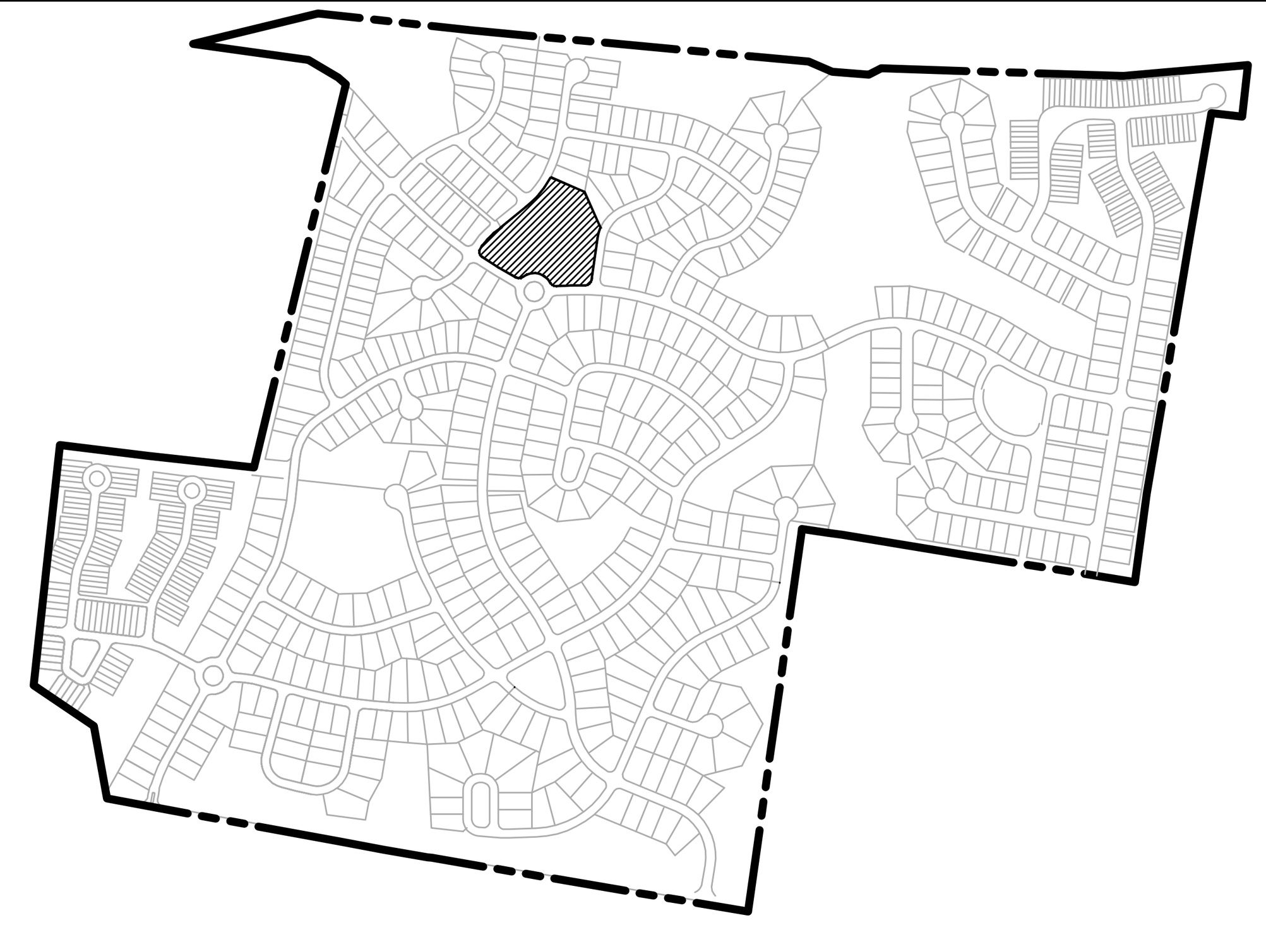
WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

①	03–15–17 T. GARDNER PER TOWN COMMENTS
REVISIONS	

JOB NO. 05043	WK. ORDER 7878
DESIGNED:	B. SMITH
DRAWN:	T.GARDNER
SCALE:	1"=50'
DATE:	MARCH 1, 2017

LANDSCAPE PLAN

L1.1

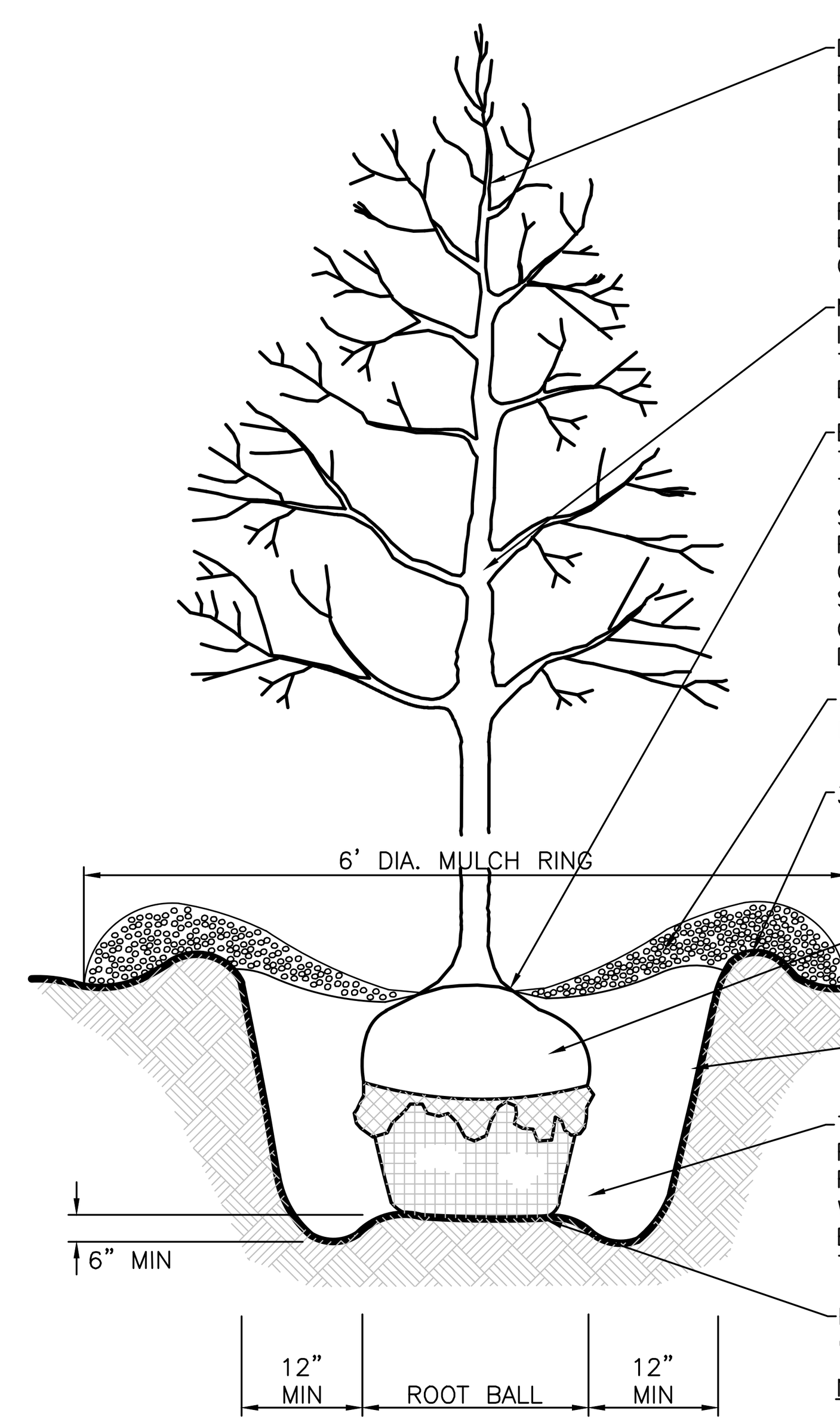


KEY MAP
N.T.S.

PLANT SCHEDULE						
TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
CJ	10	CRYPTOMERIA JAPONICA / JAPANESE CEDAR	EVERGREEN	3" CAL.	AS SHOWN	B&B
MB	8	MAGNOLIA GRANDIFLORA 'D.D. BLANCHARD' TM / SOUTHERN MAGNOLIA	EVERGREEN	3" CAL.	AS SHOWN	B&B
QP	37	QUERCUS PHELLOS / WILLOW OAK	DECIDUOUS	3" CAL.	AS SHOWN	B&B

NOTES:
1. SOD ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.

CALIPER INCHES PROVIDED: 165 CAL. IN. (55 x 3")



- DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.
- MARK THE NORTH SIDE OF THE TREE IN THE NURSERY, AND ROTATE TREE TO FACE NORTH AT THE SITE WHEN EVER POSSIBLE.
- EACH TREE MUST BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. NO MULCH SHALL BE WITHIN A MINIMUM OF 3" FROM THE TRUNK OF THE TREE. DO NOT COVER THE TOP OF ROOT BALL WITH SOIL. SET TOP OF ROOT BALL FLUSH TO GRADE OR 1-2" HIGHER IN SLOWLY DRAINING SOILS.
- 4" PINE STRAW MULCH, DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK.
- 3" RAISED EARTH RING
- REMOVE ALL TWINE, ROPE, WIRE, AND BURLAP FROM TOP ⅓ OF ROOT BALL.
- SCARIFY SIDES BEFORE PLANTING.
- TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE SO THAT ROOT BALL DOES NOT SHIFT. BACKFILL WITH TOPSOIL IN 9" LAYERS. WATER EACH LAYER UNTIL SETTLED. DO NOT TAMP AFTER WATERING.
- PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.

NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON-BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING
NOT TO SCALE

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10-10-10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON-BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SODDING NOTES

1. AREAS INDICATED FOR SOD SHALL BE 419 BERMUDA. MINIMUM AGE SHALL BE 18 MONTHS, WITH ROOT DEVELOPMENT THAT WILL SUPPORT ITS OWN WEIGHT WITHOUT TEARING WHEN SUSPENDED VERTICALLY BY HOLDING THE UPPER TWO CORNERS.
2. SUBMIT SOD CERTIFICATION FOR GRASS SPECIES AND LOCATION OF SOD SOURCE. INCLUDE CERTIFICATION THAT SOD IS FREE OF DISEASE, NEMATODES, UNDESIRABLE INSECTS, AND QUARANTINE RESTRICTIONS.
3. SOD SHALL BE DELIVERED ON PALLETS. STORE SOD AT A LOCATION PROTECTED FROM DAMAGING WINDS.
4. APPLY 6-12-12 COMMERCIAL TYPE FERTILIZER, WITH 50% OF THE ELEMENT DERIVED FROM ORGANIC SOURCES AT A RATE RECOMMENDED BY THE MANUFACTURER. APPLY AFTER SMOOTH RAKING OF TOPSOIL AND NO MORE THAN 48 HOURS BEFORE LAYING SOD. MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL AND LIGHTLY WATER TO AID BREAKDOWN.
5. LIGHTLY MOISTEN AREA TO RECEIVE SOD IMMEDIATELY PRIOR TO LAYING SOD.
6. LAY SOD TIGHTLY WITH NO OPEN JOINTS VISIBLE AND NOT OVERLAPPING. STAGGER END JOINTS A MINIMUM OF 12 INCHES AND DO NOT STRETCH SOD PIECES.
7. ON SLOPES 6 INCHES PER FOOT AND STEEPER, LAY SOD PERPENDICULAR TO SLOPE AND SECURE EVERY ROW WITH WOODEN PEGS AT AN MAXIMUM 2 FEET O.C. DRIVE PEGS FLUSH WITH SOD PORTION OF SOD.
8. PRIOR TO PLACING SOD ON SLOPES OF 8 INCHES PER FOOT AND STEEPER, PLACE JUTE EROSION CONTROL MESH OVER TOPSOIL. SECURELY ANCHOR IN PLACE WITH PEGS SUNK FIRMLY INTO THE GROUND. CONTRACTOR SHALL SUBMIT 12" X 12" SAMPLES OF JUTE MESH FOR REVIEW TO LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
9. IMMEDIATELY AFTER INSTALLATION, WATER SODDED AREAS TO A DEPTH OF 4 INCHES.
10. AFTER SOD AND SOIL HAVE DRIED, ROLL SODDED AREAS TO ENSURE A GOOD BOND BETWEEN SOIL AND SOD. ROLLER SHALL NOT EXCEED 150 POUNDS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING (MOWING, TRIMMING, WATERING) THE SOD UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
12. THE CONTRACTOR SHALL REPLACE SOD AREAS THAT SHOW DETERIORATION FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF THE INSTALLATION. REPLACE DETERIORATED MATERIAL WITH SOD OF EQUAL QUALITY ORIGINALLY SPECIFIED.

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

RAGAN • SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
NASHVILLE
315 WOODLAND STREET
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CHATTANOOGA, TN 37408
(423) 490-9400
• www.ragansmith.com •

BRETT ALAN SMITH
REGISTERED
AGRICULTURE
TENNESSEE NO.
LANDSCAPE ARCHITECT
03/15/17

THE FIELDS OF CANTERBURY-PH13

FOR

HOOD DEVELOPMENT, LLC

WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

REVISIONS

JOB NO. 05043	WK. ORDER 7878
DESIGNED:	B. SMITH
DRAWN:	T.GARDNER
SCALE:	1"=30'
DATE:	MARCH 1, 2017

AMENITY CENTER
LANDSCAPE PLAN

L1.2

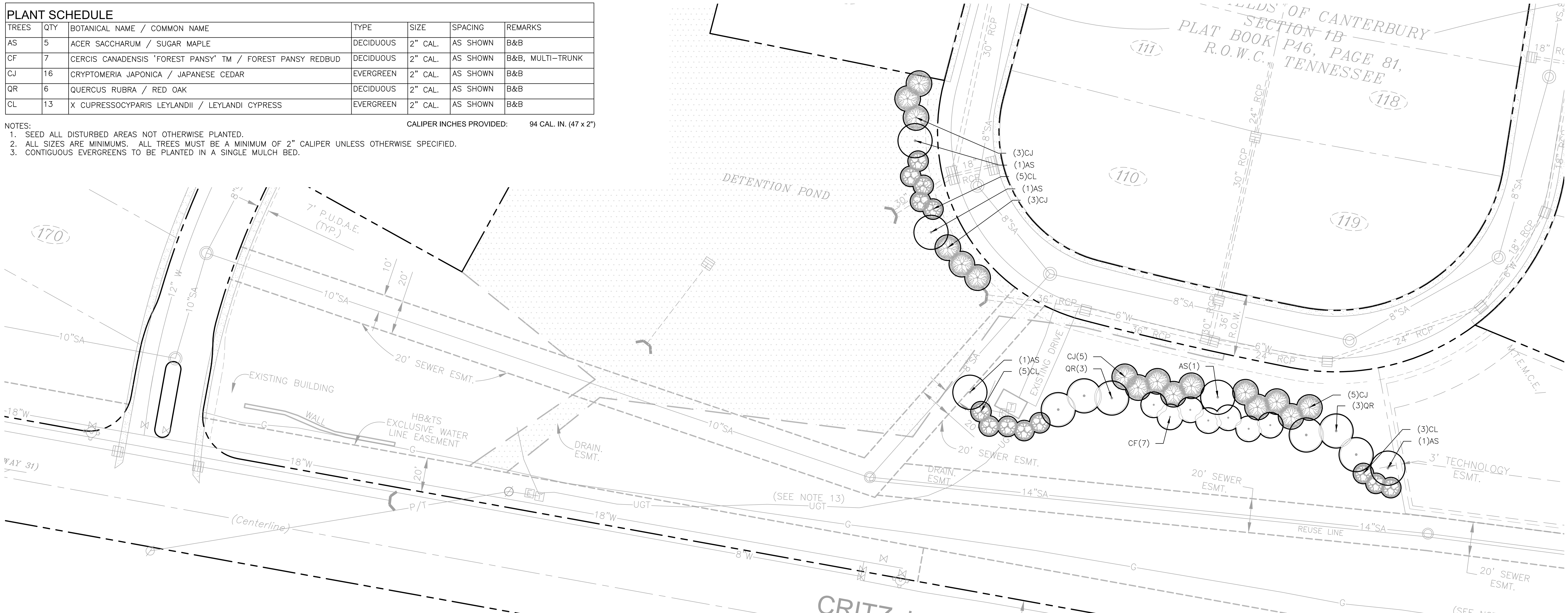
PLANT SCHEDULE

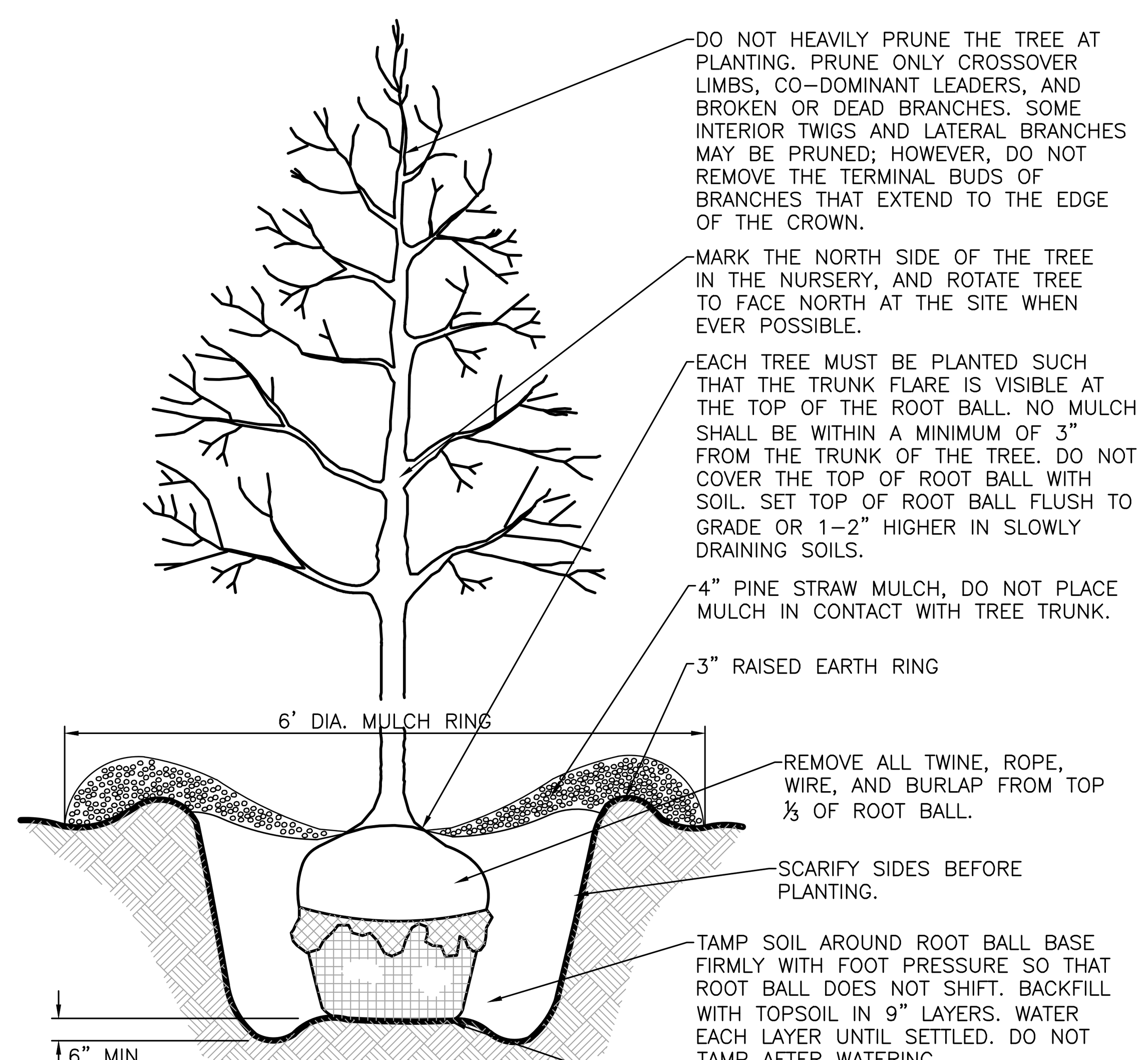
TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
AS	5	ACER SACCHARUM / SUGAR MAPLE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CF	7	CERCIS CANADENSIS 'FOREST PANSY' TM / FOREST PANSY REDBUD	DECIDUOUS	2" CAL.	AS SHOWN	B&B, MULTI-TRUNK
CJ	16	CRYPTOMERIA JAPONICA / JAPANESE CEDAR	EVERGREEN	2" CAL.	AS SHOWN	B&B
QR	6	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CL	13	X CUPRESSOCYPARIS LEYLANDII / LEYLANDI CYPRESS	EVERGREEN	2" CAL.	AS SHOWN	B&B

NOTES:

CALIPER INCHES PROVIDED: 94 CAL. IN. (47 x 2")

1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.
3. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.





NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON-BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING
NOT TO SCALE

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10-10-10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON-BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
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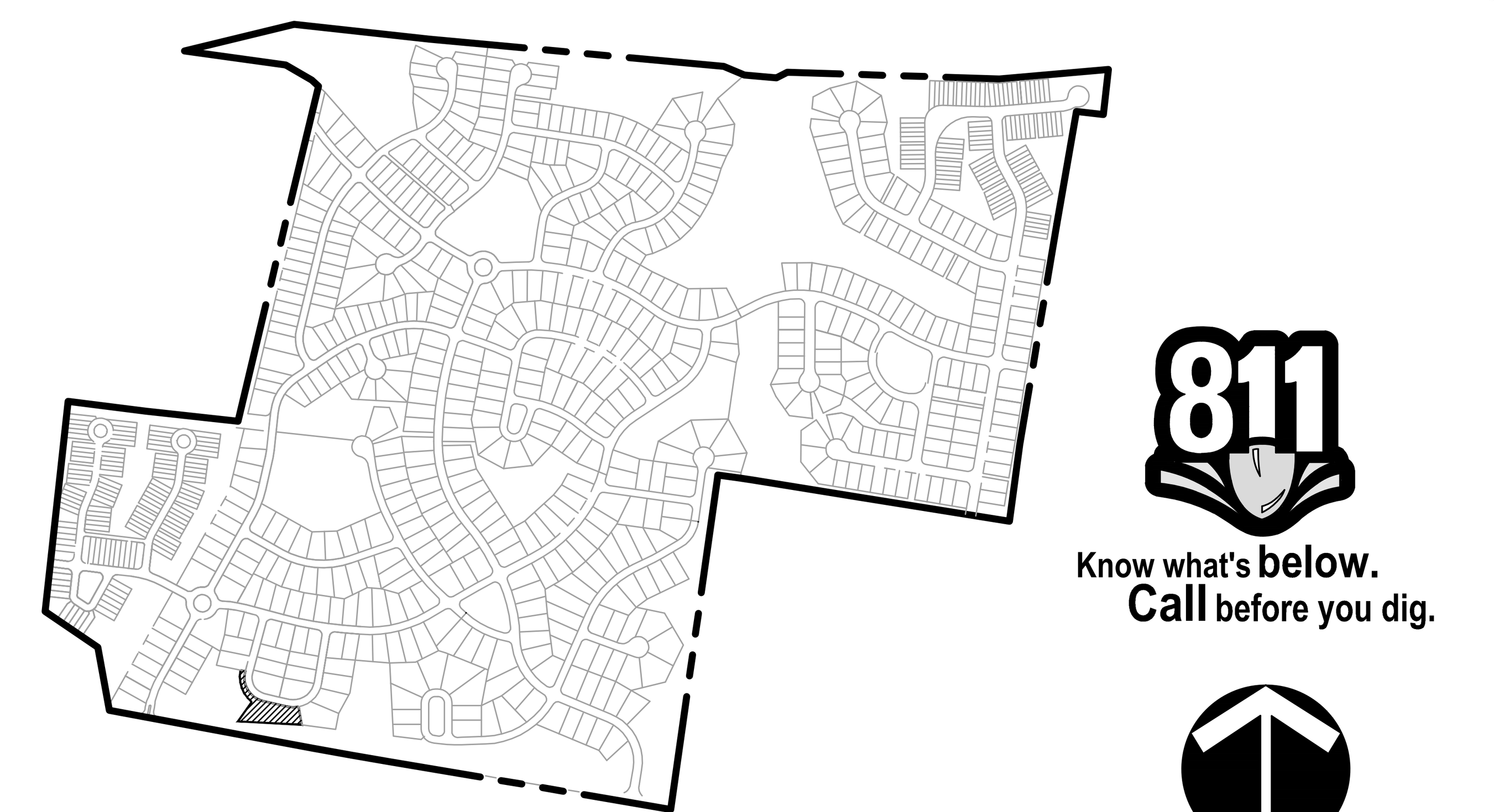
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY-31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6-12-12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. APPLY SEED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKE IN LIGHTLY. WATER TOPSOIL LIGHTLY PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR IS RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.



KEY MAP
N.T.S.

811
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FOR

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WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

REVISIONS

JOB NO. 05043	WK. ORDER 7878
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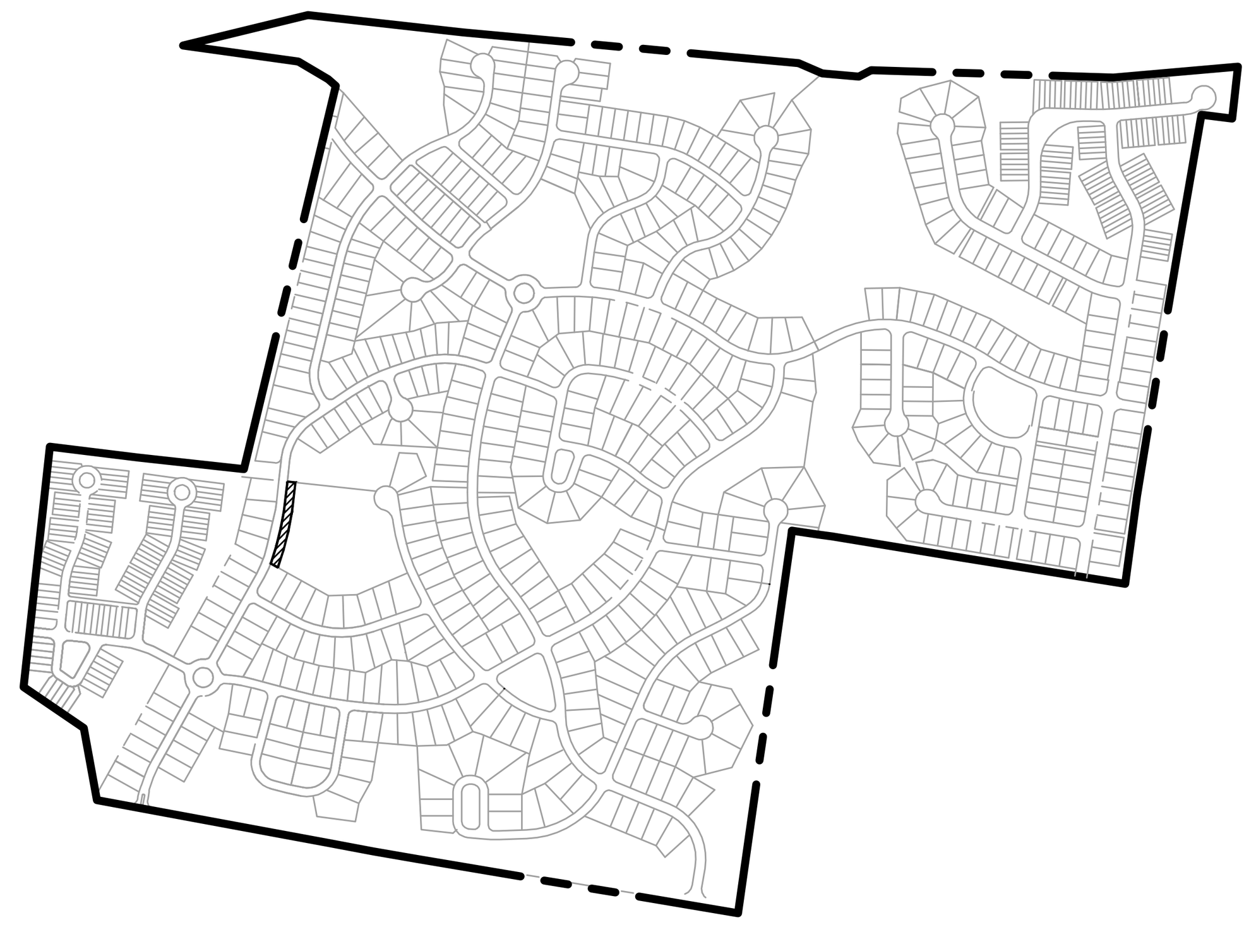
DRAWN:	T. GARDNER
SCALE:	1"=30'
DATE:	MARCH 1, 2017

PHASE 1B
LANDSCAPE PLAN

L1.3



KEY MAP

N.T.S.

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
CF	8	CERCIS CANADENSIS 'FOREST PANSY' TM / FOREST PANSY REDBUD	DECIDUOUS	2" CAL.	AS SHOWN	B&B, MULTI-TRUNK

CALIPER INCHES PROVIDED: 16 CAL. IN. (8 x 2")

NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.

SEEDING NOTES

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2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
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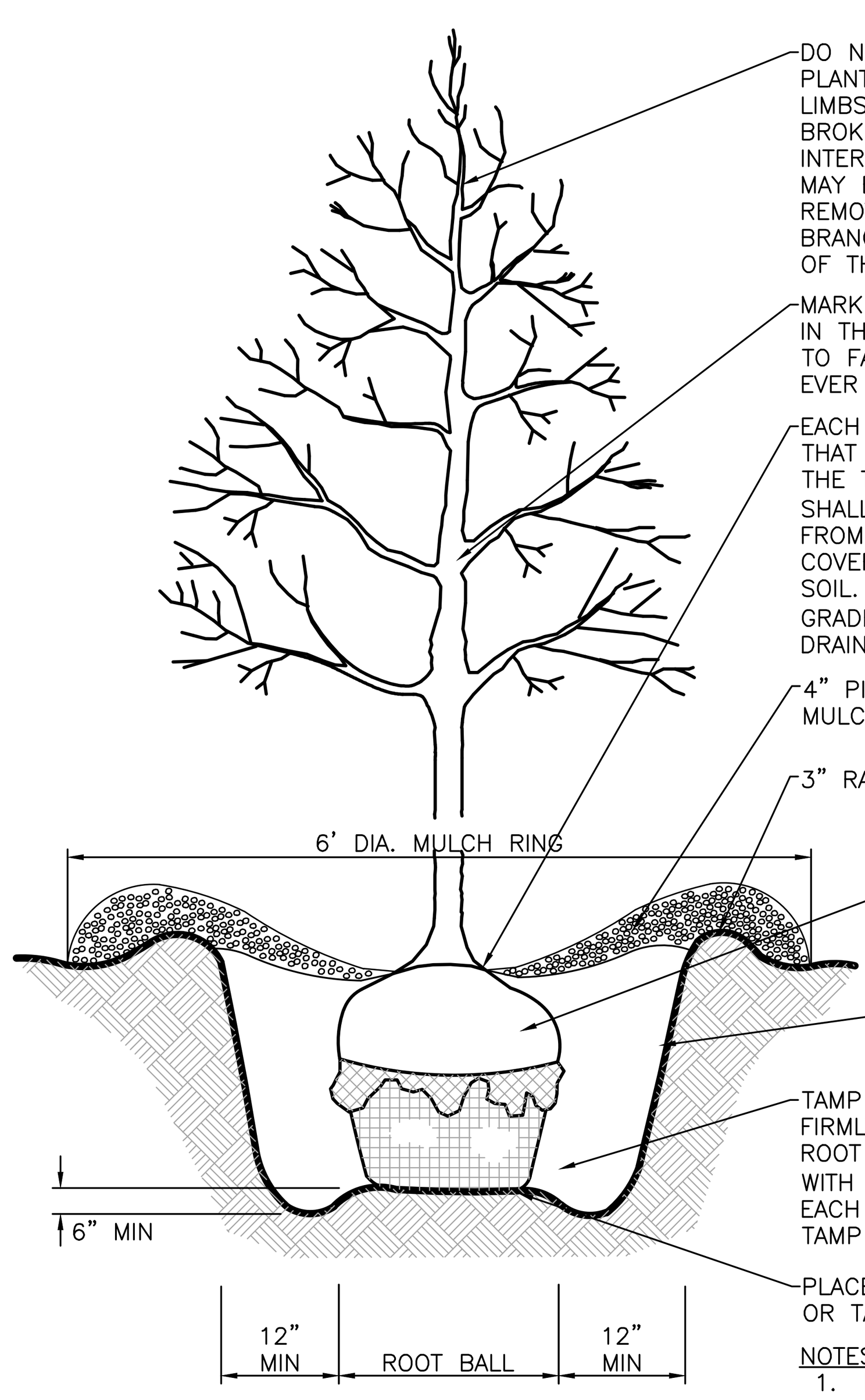

DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.

MARK THE NORTH SIDE OF THE TREE IN THE NURSERY, AND ROTATE TREE TO FACE NORTH AT THE SITE WHEN EVER POSSIBLE.

EACH TREE MUST BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. NO MULCH SHALL BE WITHIN A MINIMUM OF 3" FROM THE TRUNK OF THE TREE. DO NOT COVER THE TOP OF ROOT BALL WITH SOIL. SET TOP OF ROOT BALL FLUSH TO GRADE OR 1-2" HIGHER IN SLOWLY DRAINING SOILS.

4" PINE STRAW MULCH, DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK.

3" RAISED EARTH RING

REMOVE ALL TWINE, ROPE, WIRE, AND BURLAP FROM TOP ⅓ OF ROOT BALL.

SCARIFY SIDES BEFORE PLANTING.

TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE SO THAT ROOT BALL DOES NOT SHIFT. BACKFILL WITH TOPSOIL IN 9" LAYERS. WATER EACH LAYER UNTIL SETTLED. DO NOT TAMP AFTER WATERING.

PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.

NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON-BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING

NOT TO SCALE

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FOR

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TENNESSEE NO.
03/15/17

REVISIONS

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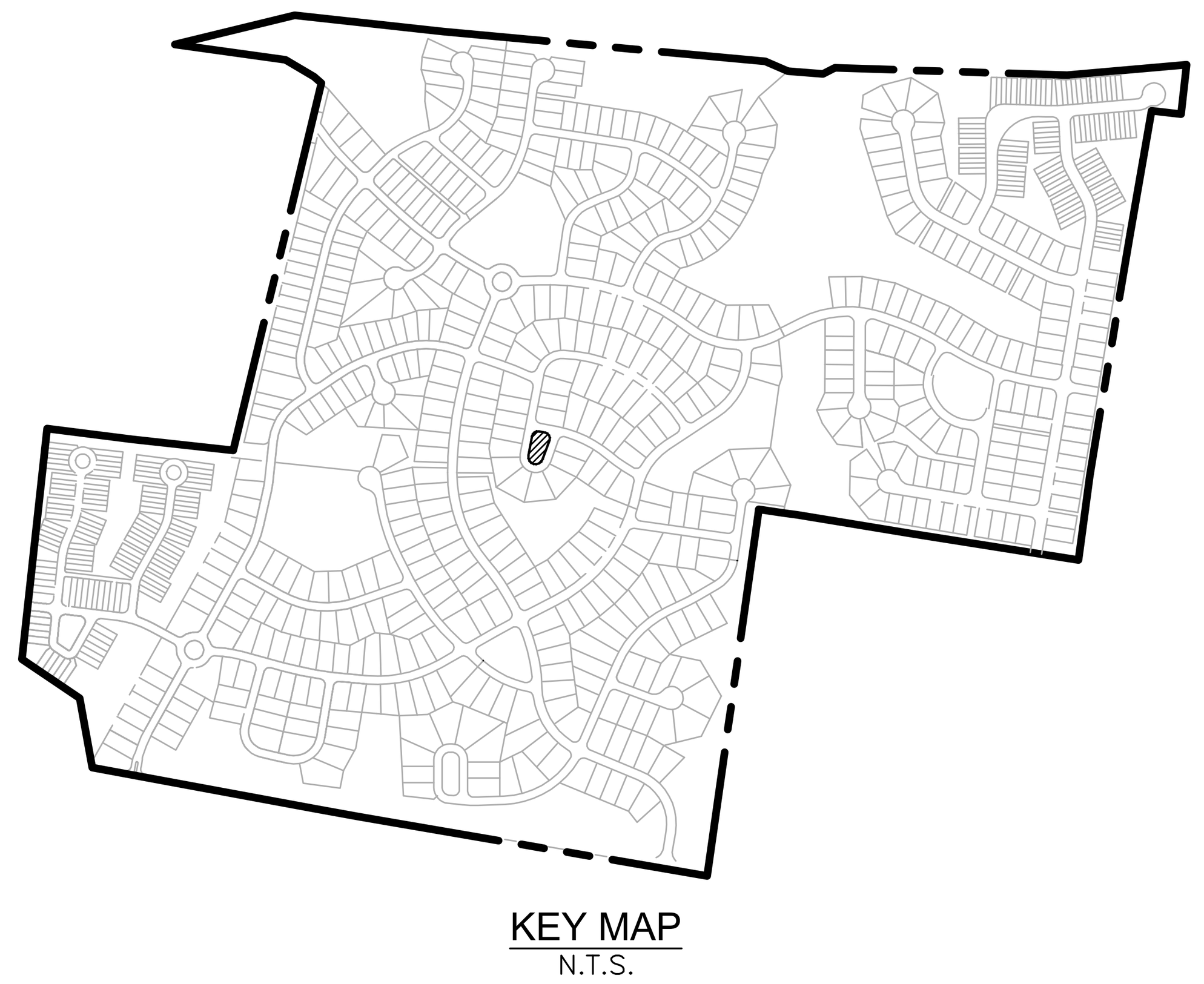
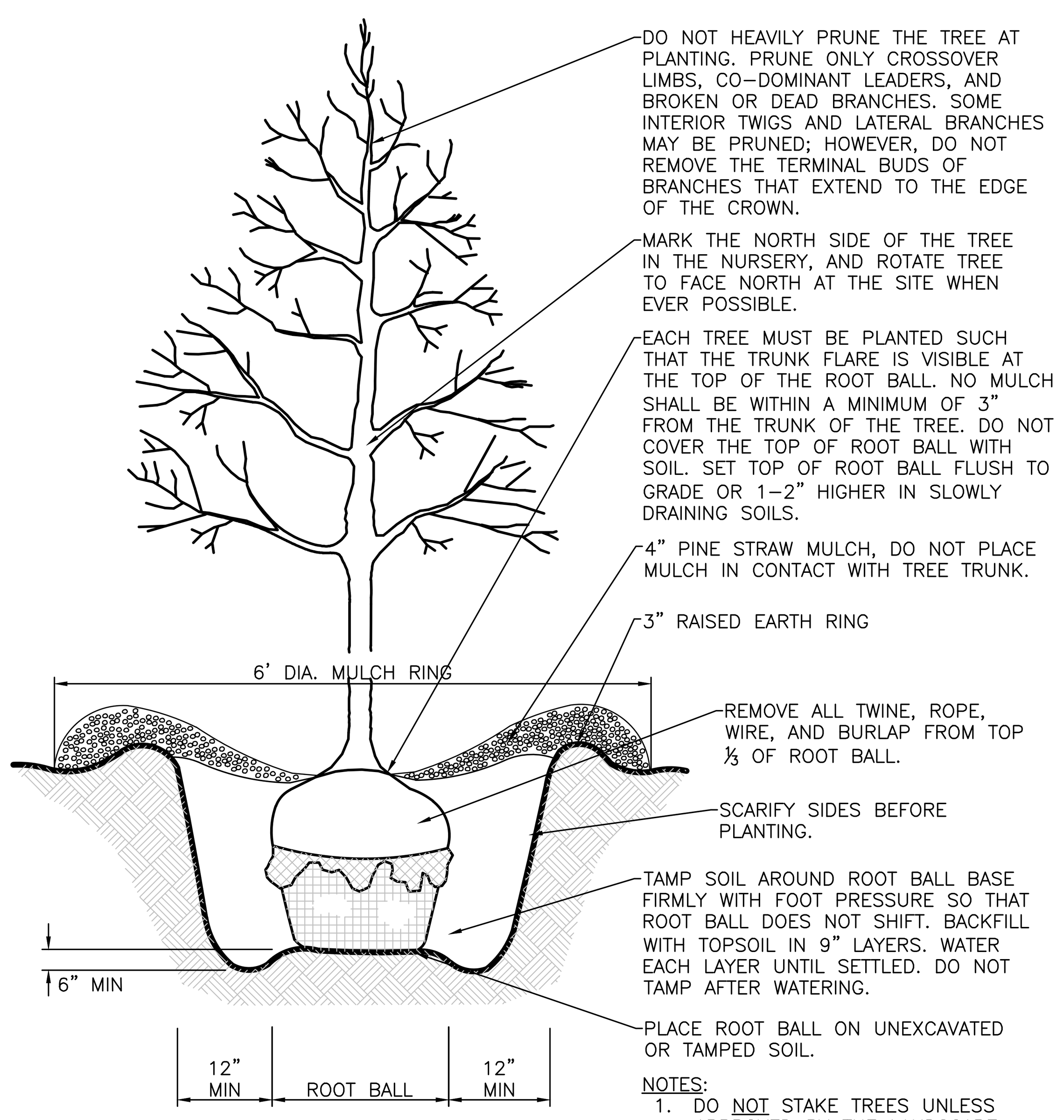
DRAWN:	T. GARDNER
SCALE:	1"=30'
DATE:	MARCH 1, 2017

PHASE 2
LANDSCAPE PLAN

L1.4





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NOT TO SCALE

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3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
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14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY-31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6-12-12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
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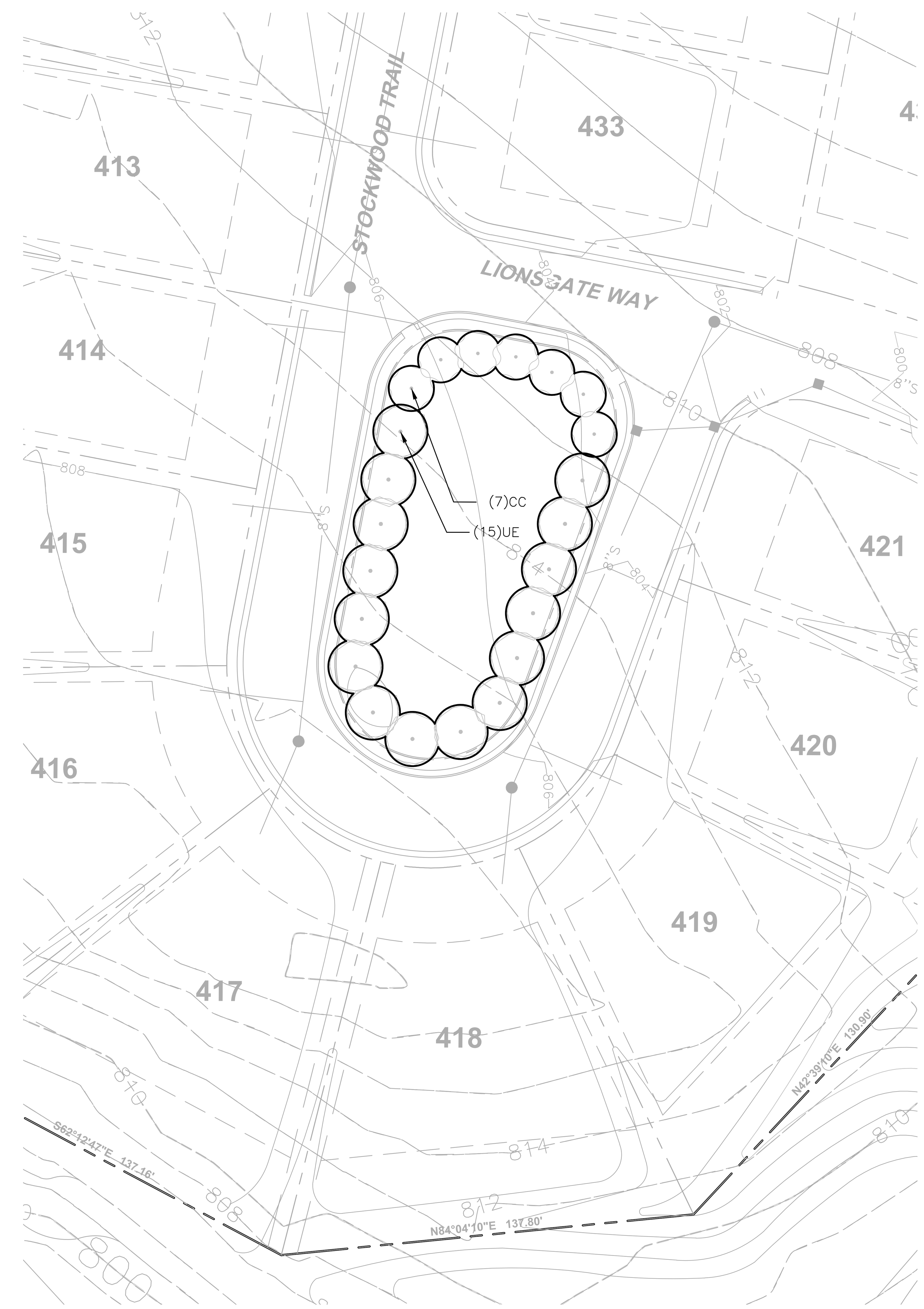
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR IS RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.



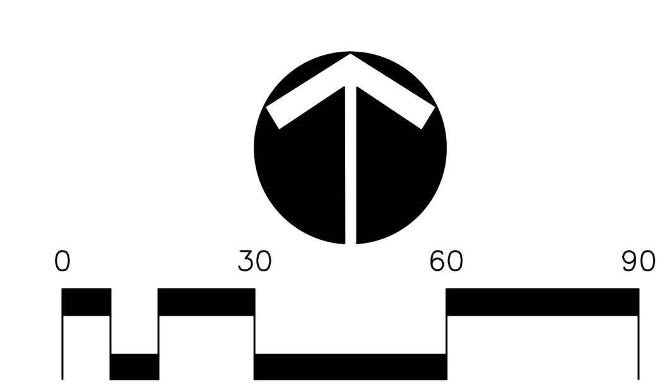
PLANT SCHEDULE 4E OPEN SPACE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
CC	7	CERCIS CANADENSIS / EASTERN REDBUD	DECIDUOUS	2" CAL.	AS SHOWN	B&B, MULTI-TRUNK
UE	15	ULMUS PARVIFOLIA 'EMER II' / 'EMER II' ALLEE ELM	DECIDUOUS	2" CAL.	AS SHOWN	B&B

CALIPER INCHES PROVIDED: 44 CAL. IN. (22 x 2")

NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.

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



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CHATTANOOGA, TN 37408
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BRETT ALAN SMITH REGISTERED AGRICULTURE LANDSCAPE ARCHITECT TENNESSEE 03/15/17

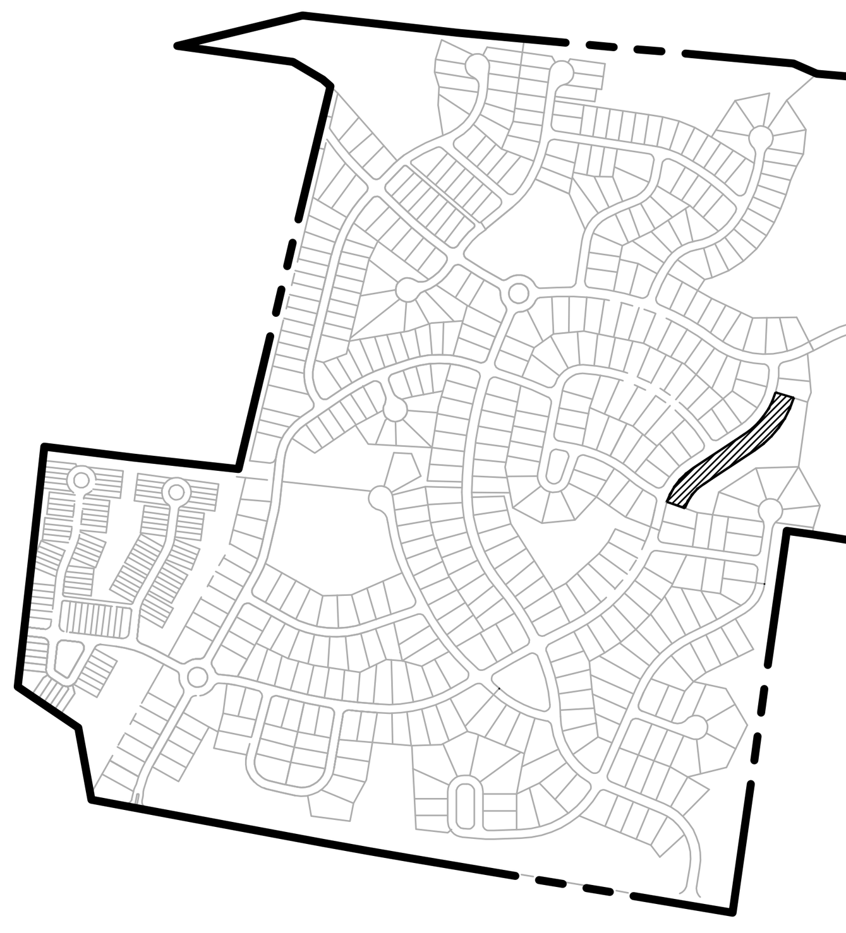
THE FIELDS OF CANTERBURY-PH13
FOR
HOOD DEVELOPMENT, LLC
WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

JOB NO. 05043	WK. ORDER 7878
DESIGNED:	B. SMITH
DRAWN:	T. GARDNER
SCALE:	1"=30'
DATE:	MARCH 1, 2017

REVISIONS

PHASE 4E
LANDSCAPE PLAN

L1.5



KEY MAP
N.T.S.

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10–10–10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5–10–5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE–INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON–BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON–BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY–31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6–12–12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. APPLY SEED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKE IN LIGHTLY. WATER TOPSOIL LIGHTLY PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
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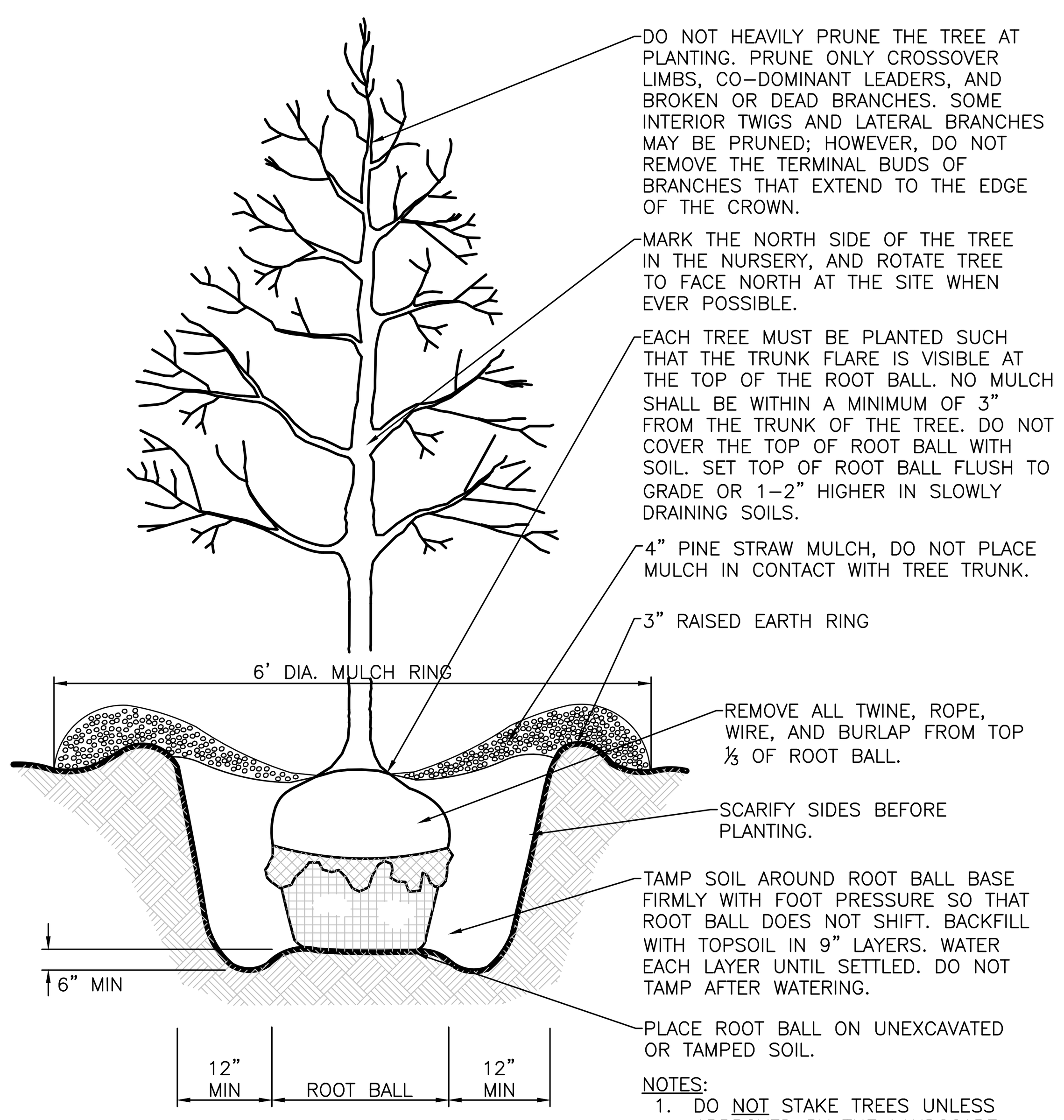
PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
BN	8	BETULA NIGRA / RIVER BIRCH MULTI–TRUNK	DECIDUOUS	2" CAL.	AS SHOWN	B&B
MS	12	MAGNOLIA VIRGINIANA / SWEET BAY	EVERGREEN	2" CAL.	AS SHOWN	B&B, MULTI–TRUNK
SB	9	SALIX BABYLONICA / WEEPING WILLOW	DECIDUOUS	2" CAL.	AS SHOWN	B&B
TD	12	TAXODIUM DISTICHUM / BALD CYPRESS	DECIDUOUS	2" CAL.	AS SHOWN	B&B

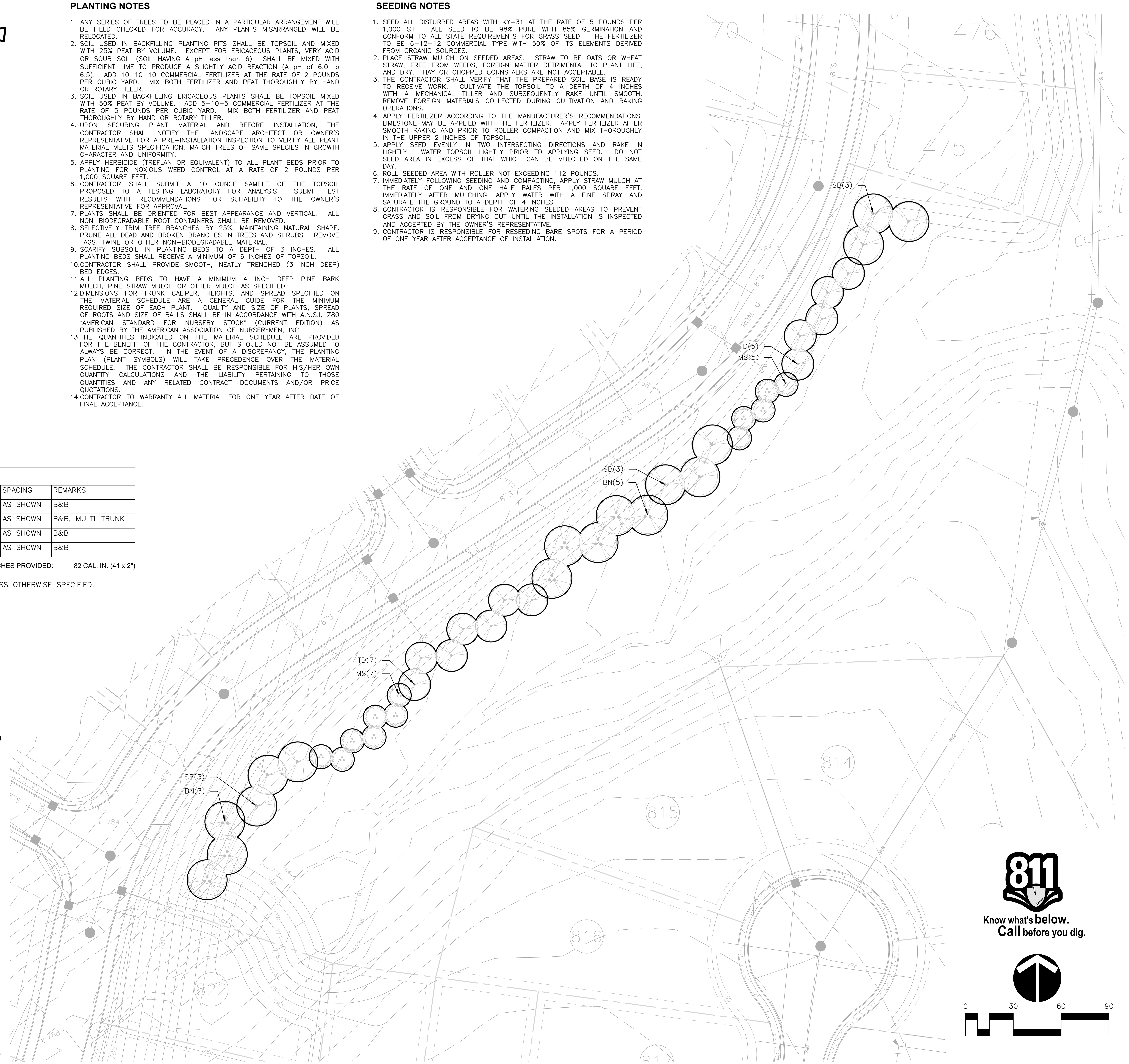
CALIPER INCHES PROVIDED: 82 CAL. IN. (41 x 2")

NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.
3. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.



NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON–BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING
NOT TO SCALE



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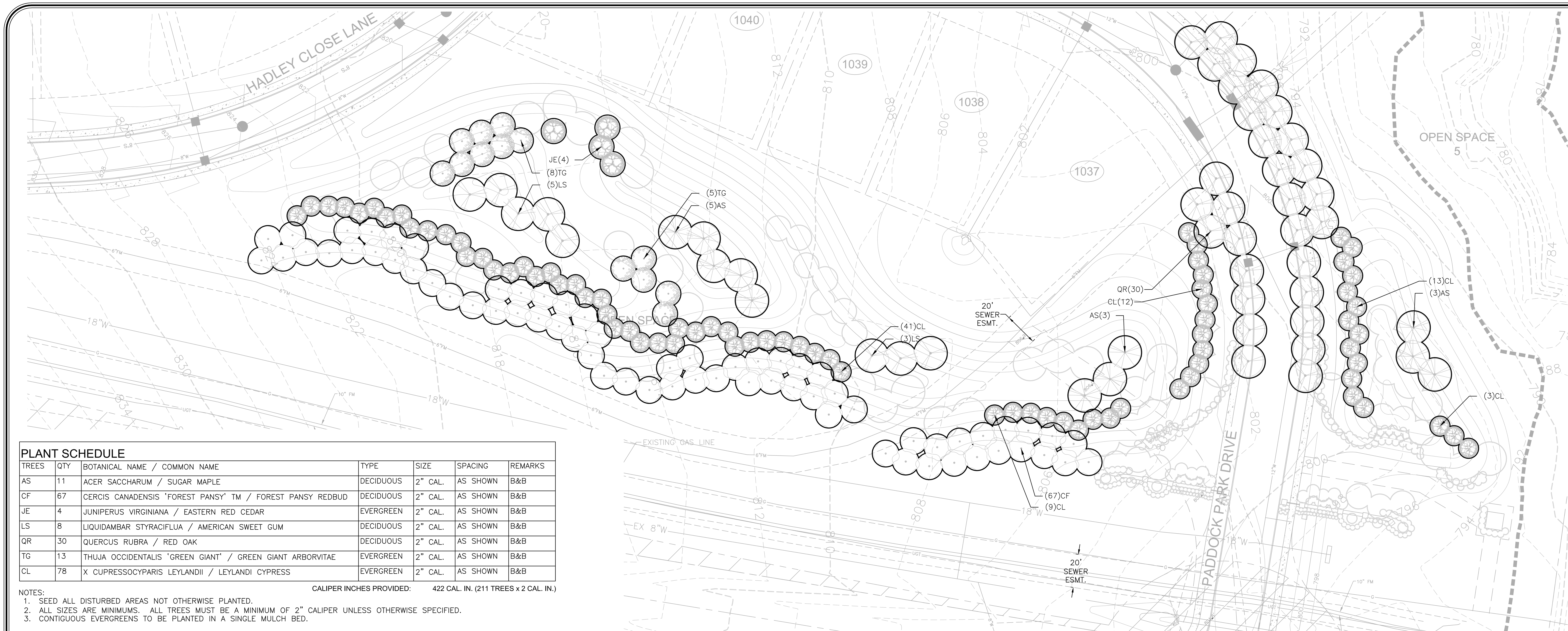
FOR
HOOD DEVELOPMENT, LLC
WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

REVISIONS

JOB NO.	05043	WK. ORDER	7878
DESIGNED:	B. SMITH		
DRAWN:	T. GARDNER		
SCALE:	1"=30'		
DATE:	MARCH 1, 2017		

PHASE 8A
LANDSCAPE PLAN

L1.6



PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
AS	11	ACER SACCHARUM / SUGAR MAPLE	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CF	67	CERCIS CANADENSIS 'FOREST PANSY' TM / FOREST PANSY REDBUD	DECIDUOUS	2" CAL.	AS SHOWN	B&B
JE	4	JUNIPERUS VIRGINIANA / EASTERN RED CEDAR	EVERGREEN	2" CAL.	AS SHOWN	B&B
LS	8	LIQUIDAMBAR STYRACIFLUA / AMERICAN SWEET GUM	DECIDUOUS	2" CAL.	AS SHOWN	B&B
QR	30	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	AS SHOWN	B&B
TG	13	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	EVERGREEN	2" CAL.	AS SHOWN	B&B
CL	78	X CUPRESSOCYPARIS LEYLANDII / LEYLANDI CYPRESS	EVERGREEN	2" CAL.	AS SHOWN	B&B

CALIPER INCHES PROVIDED: 422 CAL. IN. (211 TREES x 2 CAL. IN.)

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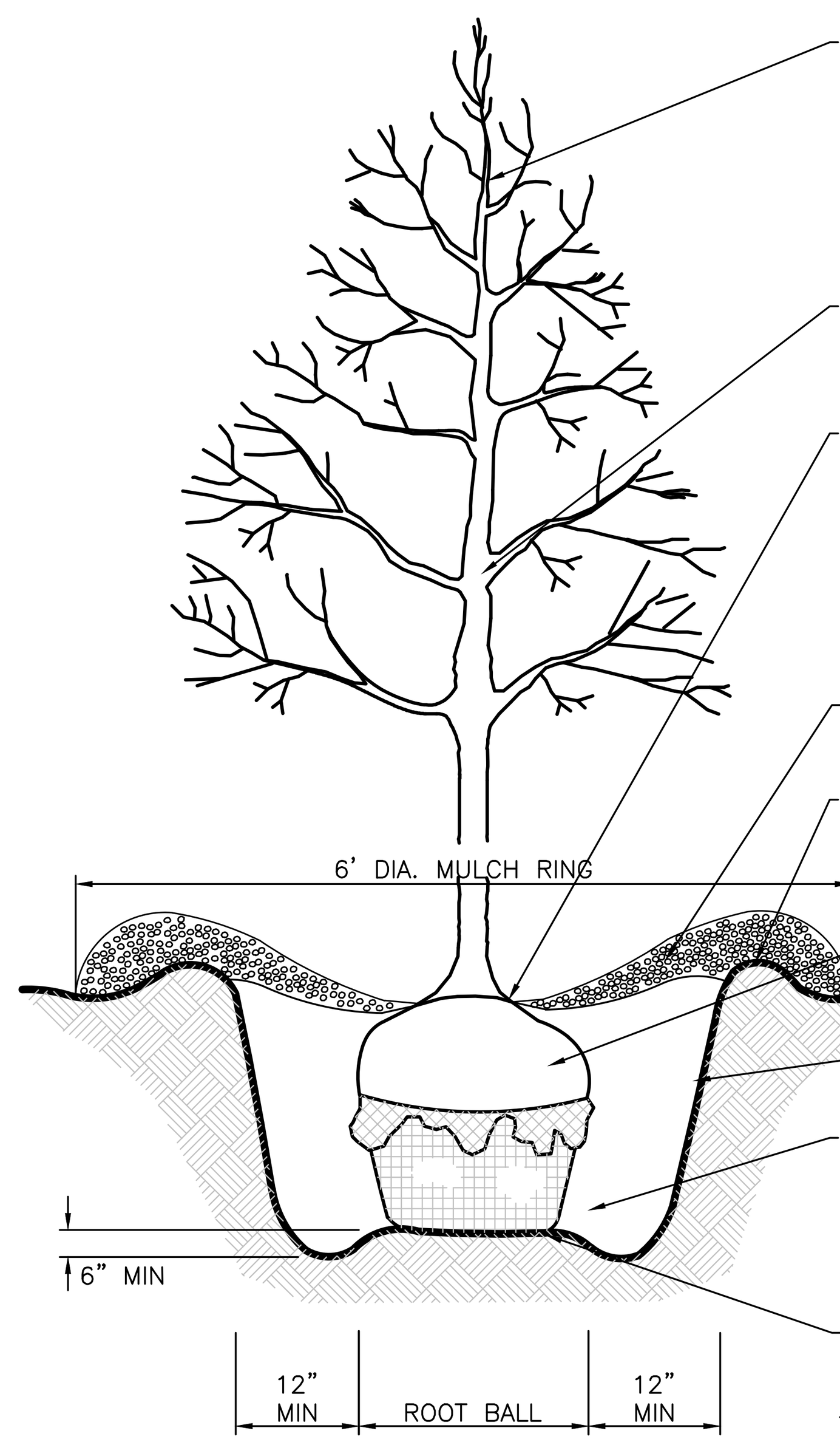

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TREE PLANTING
NOT TO SCALE

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14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY-31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6-12-12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
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6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
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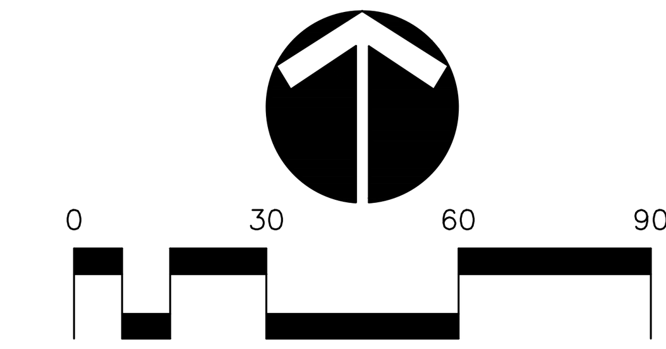
KEY MAP
N.T.S.

Know what's below.
Call before you dig.



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BRETT ALAN SMITH
REGISTERED LANDSCAPE ARCHITECT
03/15/17

THE FIELDS OF CANTERBURY-PH13
FOR
HOOD DEVELOPMENT, LLC

WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

JOB NO.	05043
WK. ORDER	7878
DESIGNED:	T. GARDNER
DRAWN:	T. GARDNER
SCALE:	1"=30'
DATE:	MARCH 1, 2017

REVISIONS

PHASE 10 BERM LANDSCAPE PLAN

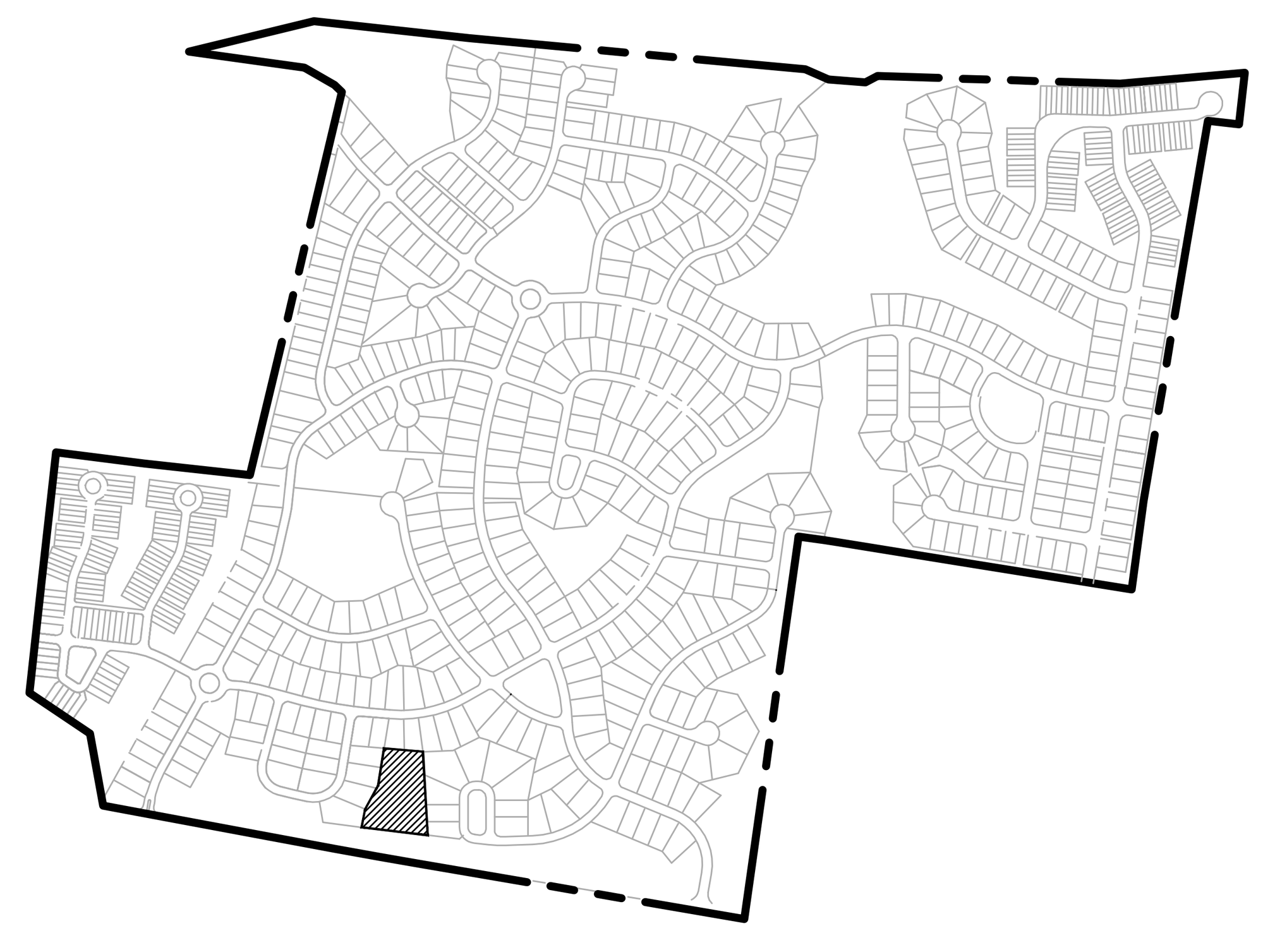
L1.7

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
AG	9	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' / 'AUTUMN BRILLIANCE' SERVICEBERRY	DECIDUOUS	2" CAL.	AS SHOWN	B&B
CF	27	CERCIS CANADENSIS 'FOREST PANSY' TM / FOREST PANSY REDBUD	DECIDUOUS	2" CAL.	AS SHOWN	B&B, MULTI-TRUNK
CL	18	X CUPRESSOCYPARIS LEYLANDII / LEYLANDI CYPRESS	EVERGREEN	2" CAL.	AS SHOWN	B&B

CALIPER INCHES PROVIDED: 108 CAL. IN. (54 TREES x 2 CAL. IN.)

NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.
3. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.



KEY MAP
N.T.S.

SEEDING NOTES

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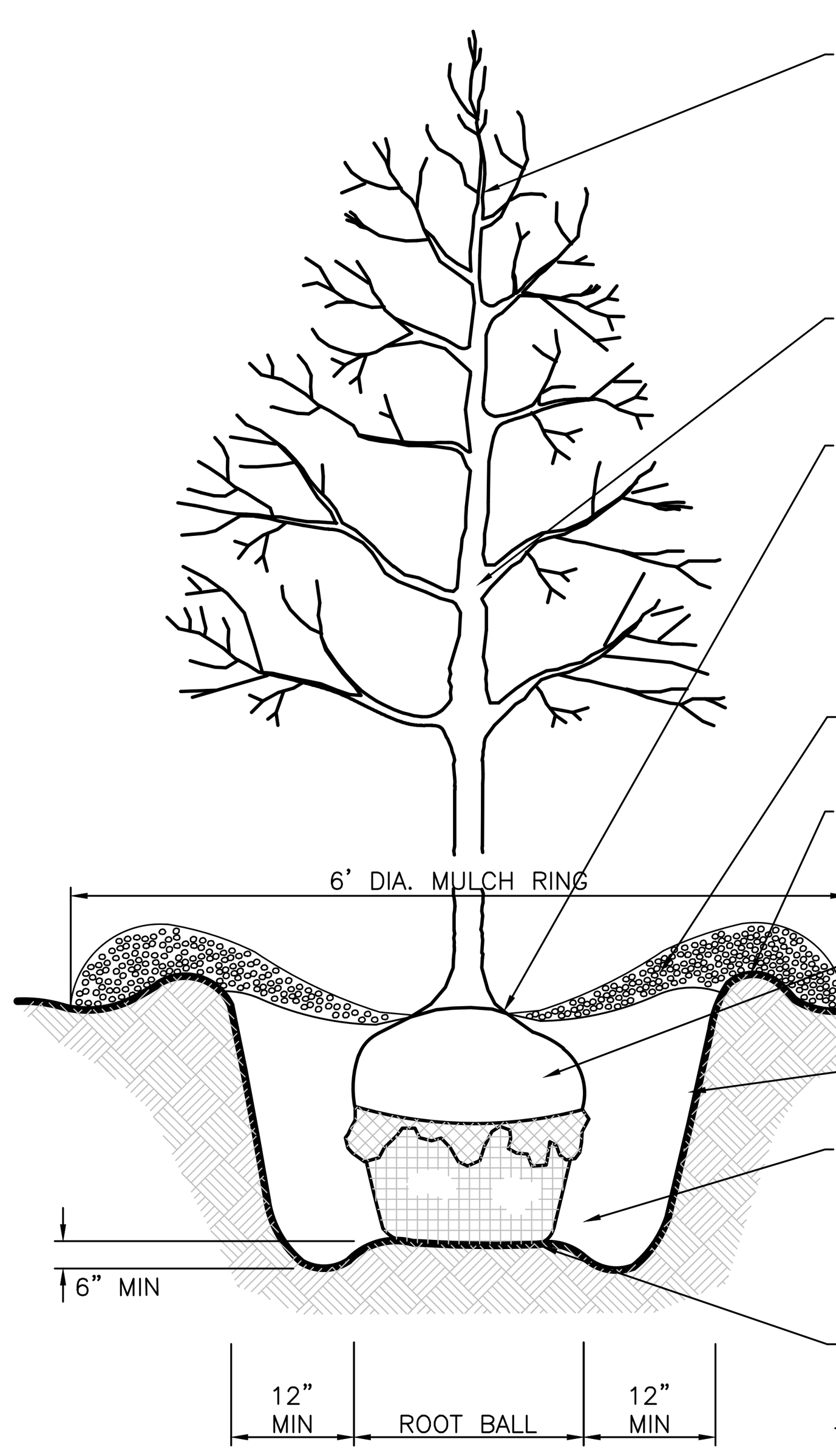

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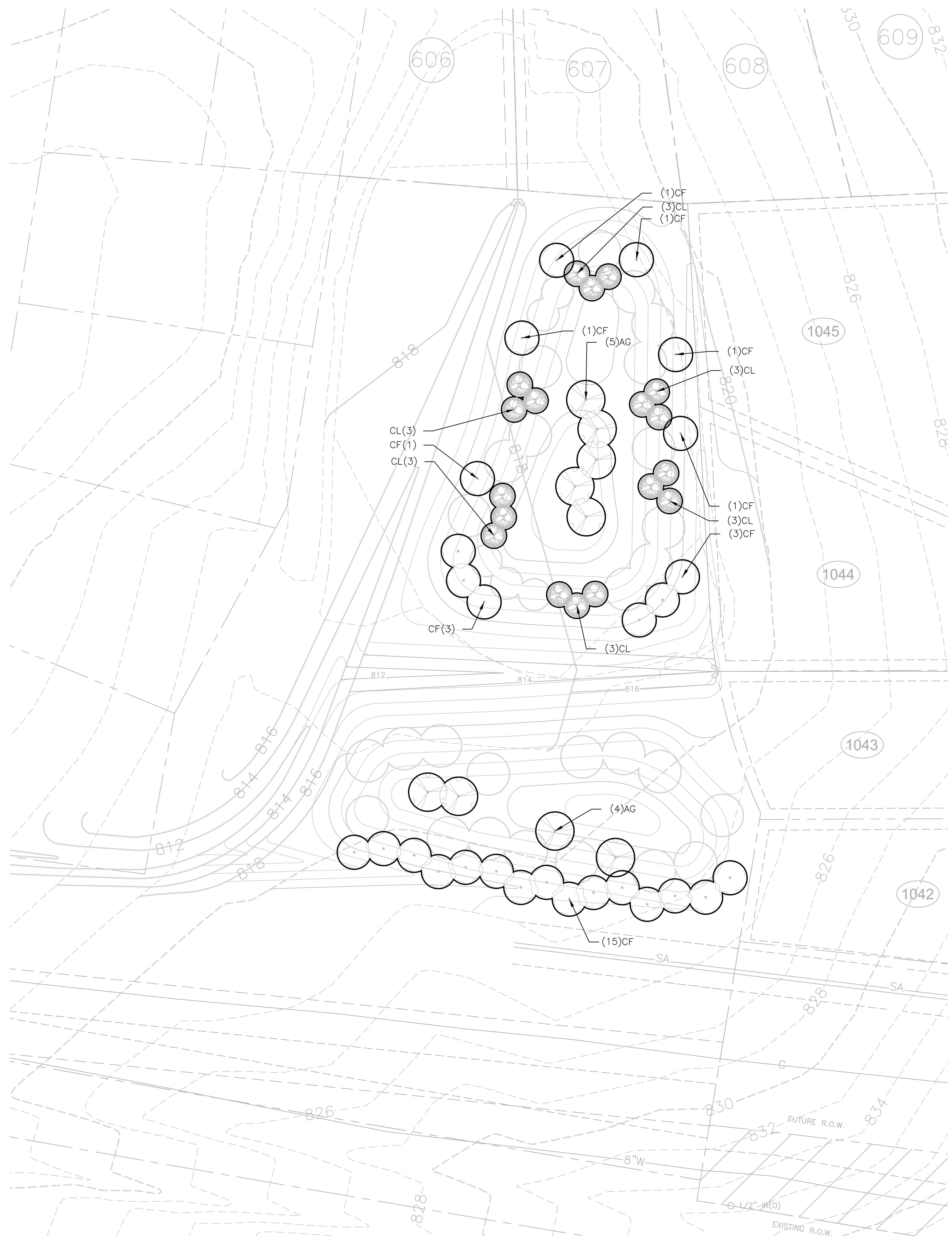
TREE PLANTING
NOT TO SCALE

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10-10-10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON-BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.



Know what's **below.**
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0 30 60 90

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THE FIELDS OF CANTERBURY-PH13
FOR
HOOD DEVELOPMENT, LLC
WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

REVISIONS

JOB NO. 05043	WK. ORDER 7878
DESIGNED:	T. GARDNER
DRAWN:	T. GARDNER
SCALE:	1"=30'
DATE:	MARCH 1, 2017

PHASE 10B BERM
LANDSCAPE PLAN

L1.8

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	SPACING	REMARKS
CJ	15	CRYPTOMERIA JAPONICA / JAPANESE CEDAR	EVERGREEN	2" CAL.	AS SHOWN	B&B
JE	16	JUNIPERUS VIRGINIANA / EASTERN RED CEDAR	EVERGREEN	2" CAL.	AS SHOWN	B&B
QR	12	QUERCUS RUBRA / RED OAK	DECIDUOUS	2" CAL.	AS SHOWN	B&B
TG	13	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	EVERGREEN	2" CAL.	AS SHOWN	B&B

CALIPER INCHES PROVIDED: 112 CAL. IN. (56 TREES x 2 CAL. IN.)

NOTES:
1. SEED ALL DISTURBED AREAS NOT OTHERWISE PLANTED.
2. ALL SIZES ARE MINIMUMS. ALL TREES MUST BE A MINIMUM OF 2" CALIPER UNLESS OTHERWISE SPECIFIED.
3. CONTIGUOUS EVERGREENS TO BE PLANTED IN A SINGLE MULCH BED.

PLANTING NOTES:

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3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. 5–10–5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD SHALL BE ADDED. BOTH FERTILIZER AND PEAT SHALL BE THOROUGHLY MIXED BY HAND OR ROTARY TILLER.
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6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. TEST RESULTS, WITH RECOMMENDATIONS FOR SUITABILITY, SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON–BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS SHALL ALSO BE PRUNED. REMOVE TAGS, TWINE OR OTHER NON–BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
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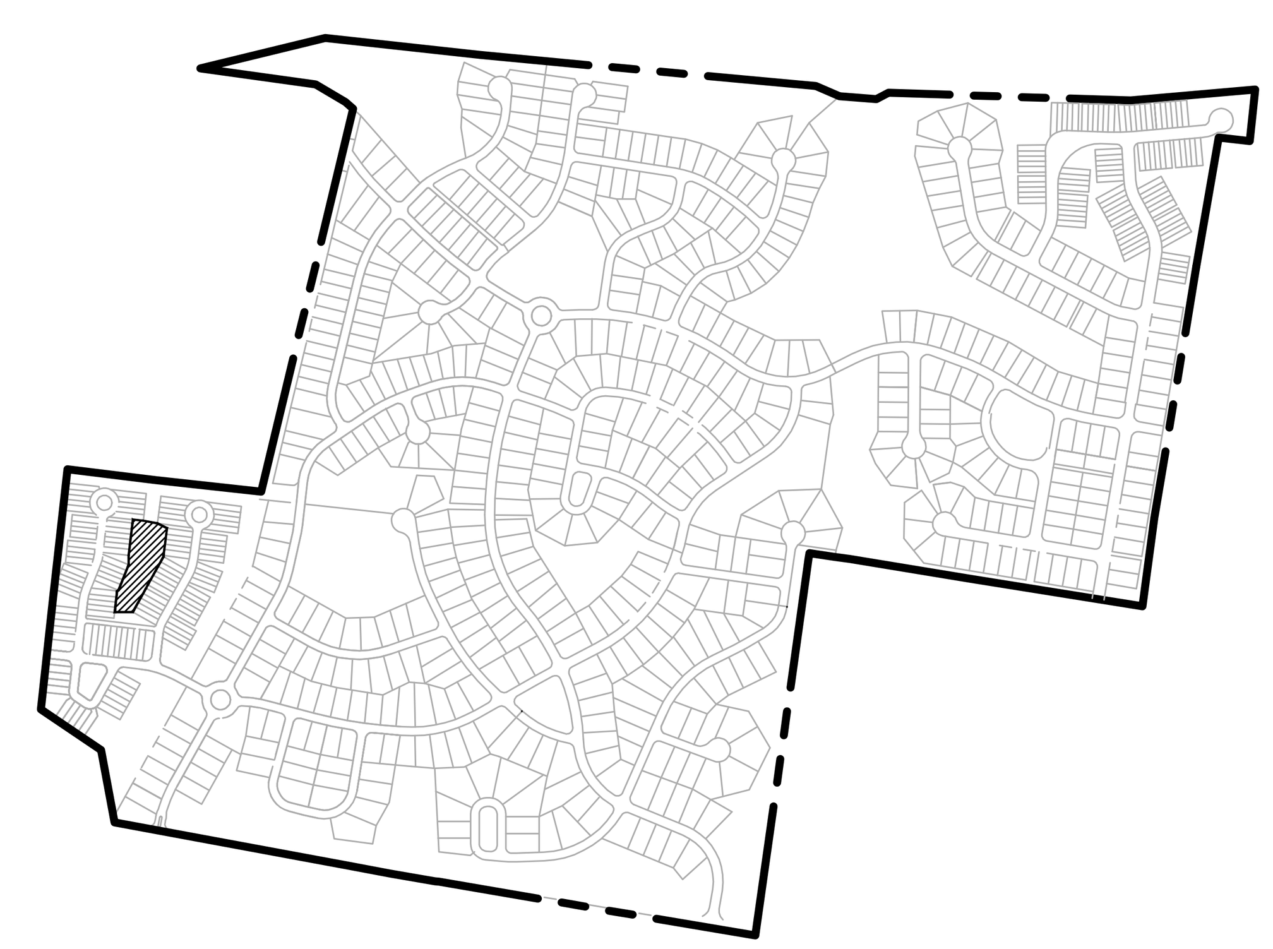
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES:

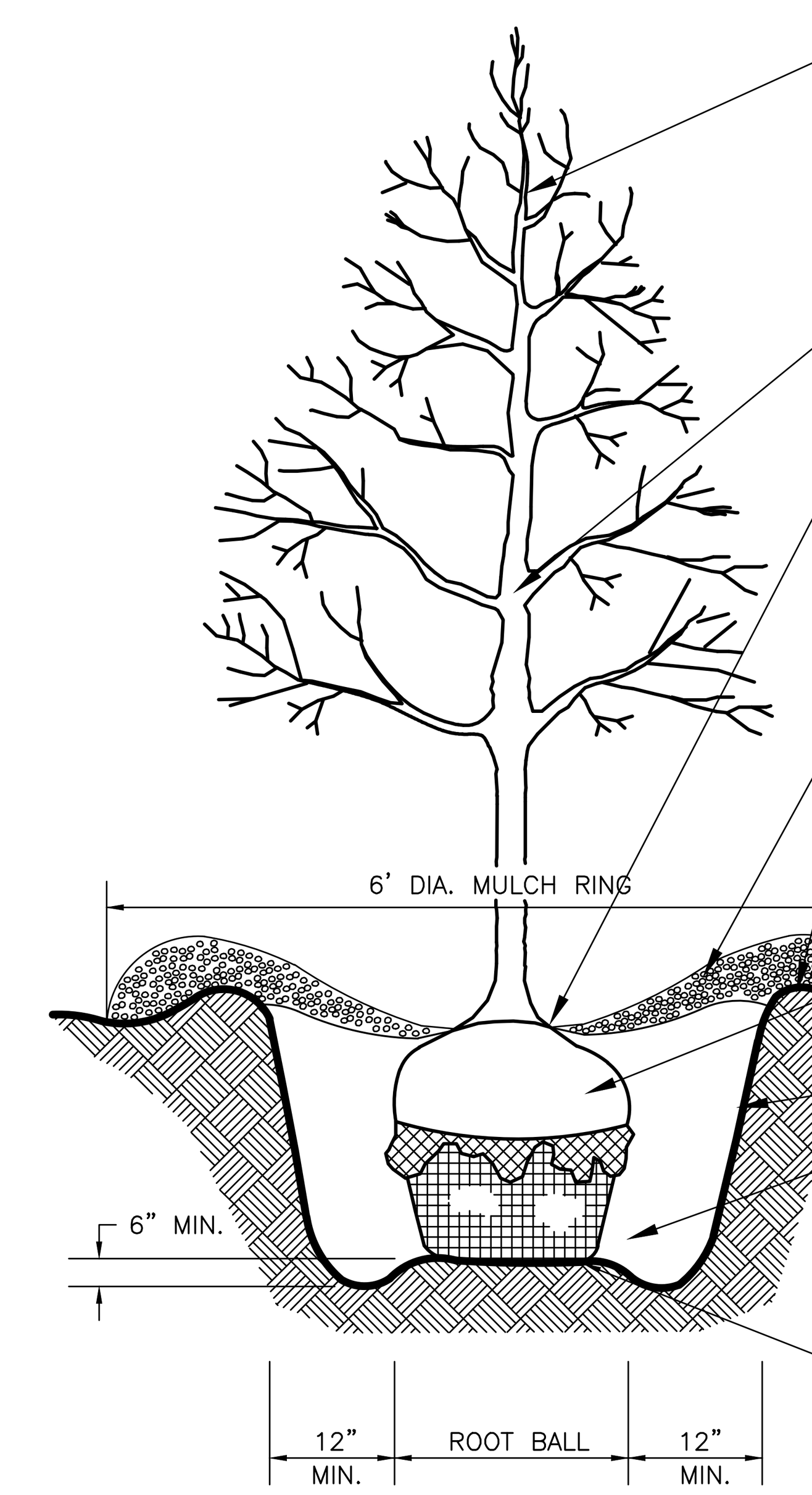
1. ALL DISTURBED AREAS TO BE SEEDED WITH KY–31 FESCUE AT THE RATE OF 5 LBS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER SHALL BE 6–12–12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. STRAW MULCH SHALL BE PLACED UPON SEEDED AREAS. STRAW SHALL BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. THE TOPSOIL SHALL BE CULTIVATED TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKED UNTIL SMOOTH. FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS SHALL BE REMOVED FROM PROJECT SITE.
4. FERTILIZER SHALL BE APPLIED PER THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. FERTILIZER SHALL BE APPLIED AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND IT SHALL BE MIXED THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. SEED SHALL BE APPLIED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKED IN LIGHTLY. THE TOPSOIL SHALL BE LIGHTLY WATERED PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALE PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.



KEY MAP
N.T.S.

0 30 60 90

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



- DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO–DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.
- MARK THE NORTH SIDE OF THE TREE IN THE NURSERY, AND ROTATE TREE TO FACE NORTH AT THE SITE WHEN EVER POSSIBLE.
- EACH TREE MUST BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. NO MULCH SHALL BE WITHIN A MININUM OF 3" FROM THE TRUNK OF THE TREE. DO NOT COVER THE TOP OF THE ROOT BALL WITH SOIL. SET TOP OF ROOT BALL FLUSH TO GRADE OR 1–2" HIGHER IN SLOWLY DRAINING SOILS.
- 4" PINE STRAW MULCH, DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK.
- 3" RAISED EARTH RING
- REMOVE ALL TWINE, ROPE, WIRE, AND BURLAP FROM TOP 1/3 OF ROOTBALL
- SCARIFY SIDES BEFORE PLANTING
- TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE SO THAT ROOT BALL DOES NOT SHIFT. BACKFILL WITH TOPSOIL IN 9" LAYERS. WATER EACH LAYER UNTIL SETTLED. DO NOT TAMP AFTER WATERING
- PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.

NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON–BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING
NOT TO SCALE

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BRETT ALAN SMITH — REGISTERED LANDSCAPE ARCHITECT

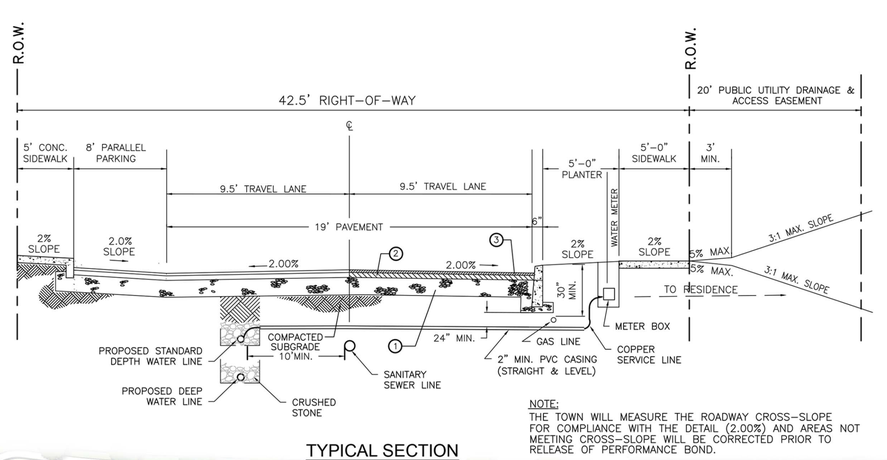
THE FIELDS OF CANTERBURY-PH13
FOR
HOOD DEVELOPMENT, LLC
WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

1	03–01–17 T. GARDNER REVISED PLANT MATERIAL
REVISIONS	

JOB NO.	05043
WK. ORDER	7878
DESIGNED:	B. Smith
DRAWN:	T. Gardner
SCALE:	1"=30'
DATE:	APRIL 1, 2014

LANDSCAPE PLAN
PHASE 9 - BERM

L1.9



TYPICAL SECTION
(42.5' R.O.W.)

NOTE:
THE TOWN WILL MEASURE THE ROADWAY CROSS-SLOPE FOR COMPLIANCE WITH THE DETAIL (2.00%) AND AREAS NOT MEETING CROSS-SLOPE WILL BE CORRECTED PRIOR TO RELEASE OF PERFORMANCE BOND.

RAGAN•SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
315 WOODLAND ST. P.O. BOX 60070
NASHVILLE, TN 37206 PH (615) 244-8591
FAX (615) 244-6739 WWW.RAGANSMITH.COM

Canterbury

Phase 13 - Illustrative Plan

0 50 100 150

JOB NO: 05-043 / 7878
DATE: 03-15-2017

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

MEMO

DATE: March 17, 2017

TO: Planning Commission

FROM: Wendy Deats, AICP
Town Planner

SUBJECT: Item 4 - Request to waive the requirement for a 50-foot distance from a driveway to the nearest curvature of the corner as specified in Section 3.7.3. of the Land Development Ordinance.

Request

Willow Branch Partners, LLC is requesting that the Planning Commission waive the standard in Section 3.7.3 of Article 3 which requires a 50-foot separation between the driveway and the corner.

Analysis

Section 3.7.3 states "all residential driveways shall be a minimum of 50 feet from the nearest point of curvature." The lots within the Fields of Canterbury vary, however, the minimum requirement is 50 feet. Application of a 50-foot separation between driveway and corner on lots with a width of 50 feet creates a practical difficulty given the lack of width to comply with the standard. Therefore, Staff supports the request for waiving the requirement.

Furthermore, driveway corner clearance is a valid concern for driveways on arterials and collectors due to queing lengths and the potential to block intersections. However, on local roads with low speeds and relatively minor traffic volumes, driveway spacing is not an issue. This along with stop conditions result in driveway location not being an operational concern for local roadways. Requirements appropriate to driveway spacing should include site distance and location outside of the radius return. Therefore, Staff recommends a revision to require driveways be located outside of the radius return on local roadways.

Administration of Land Development Ordinance

Article 5, Section 5.5.2 permits the Planning Commission to grant a deviation from a subdivision regulation if the Commission finds that "extraordinary hardships or practical difficulties may result from strict compliance with the subdivision regulations." The deviation should not have the "effect of mollifying the general intent and purpose of these regulations" and the Commission concludes that "the purposed of these regulations may be specifically served to an equal or greater extent by an alternative proposal, condition or circumstance." Approval of the deviation may be subject to conditions as the Planning Commission determines appropriate.

Recommendation

Based on the practical difficulty of applying the standard to lots with a width requirement of 50 feet, Staff recommends that Planning Commission waive Section 3.7.3 as it relates to the distance requirement of 50 feet between a residential driveway and the corner of a local roadway and direct Staff to prepare an amendment to the LDO.

Attachments

Applicant Statement
Applicant Presentation

It has come to our attention that a land development ordinance is now being enforced in Canterbury concerning driveway setbacks on corner lots. The code in reference LDO 3.7.3, which states the driveway must be 50 feet away from the nearest point of curvature on corner lots, has caused two of our most recent building permit submittals to be denied. We understand the importance of the ordinances and we are eager to comply with the LDO from development to construction of individual residences. Our immediate concern is that two of our lots are being held up in permit stage due to this issue. We would like for the Commission to consider granting a variance approval to issue permits for these particular lots as all of the other prior submitted applications have been. The two potential residents have paid deposits, had pre-construction meetings and design meetings with our company. They are excited, committed and very much looking forward to living in Thompson's Station. It would be unfair to these residents and to the other residence surrounding the lots in question to make a change that is not consistent with the streetscape, architecture, and usability that remains consistent throughout the entire development of Canterbury. We were unaware of this ordinance and never received a notice that this issue would go into effect to give us time to make the proper adjustments to the product we construct to give the homeowners and the community the proper consistency with the rest of the community. As stated previously we have never had this ordinance cause a permit to be denied throughout the construction of residences in 8 phases totaling 53 prior approved and constructed corner lot products.

We would like to ask the commission for a variance for the two lots recently denied which include lot 1124 in phase 11 and 1032 in phase 10. We would also appreciate consideration from the commission to grant the variance for the remaining developed corner lots in phases 10 and 11 as the remaining lots are permit ready. We have prepared a short presentation to give a visual understanding of our request explaining the issues the ordinance creates for the community.

1. This page shows a plot plan submitted for permit approval on 2-28-17 along with others that are ready to begin construction throughout Canterbury. We received approval for 1041 shown here on 3-2-17, although the lot does need meet the standard listed under 3.7.3 as you can see pointed out.
2. Here is a copy of the permit for lot 1041 issued 3-2-17 which is now ready and approved to begin construction
3. Again, we have another example of a lot in phase 10 shown here, lot 1056 which was submitted prior to the previous lot and approved on 2-21-17.
4. The permit shown here for lot 1056 which is now ready to be constructed, although the driveway does not meet the ordinance in question.
5. The map shown here on page 5 of this document shows corner lots highlighted throughout the bulk of the neighborhood which has nearly 53 corner lots that have been approved and constructed the same as lots 1041 and 1056 shown previously with the driveways within 50’ of the nearest point of curvature from the corner intersections.

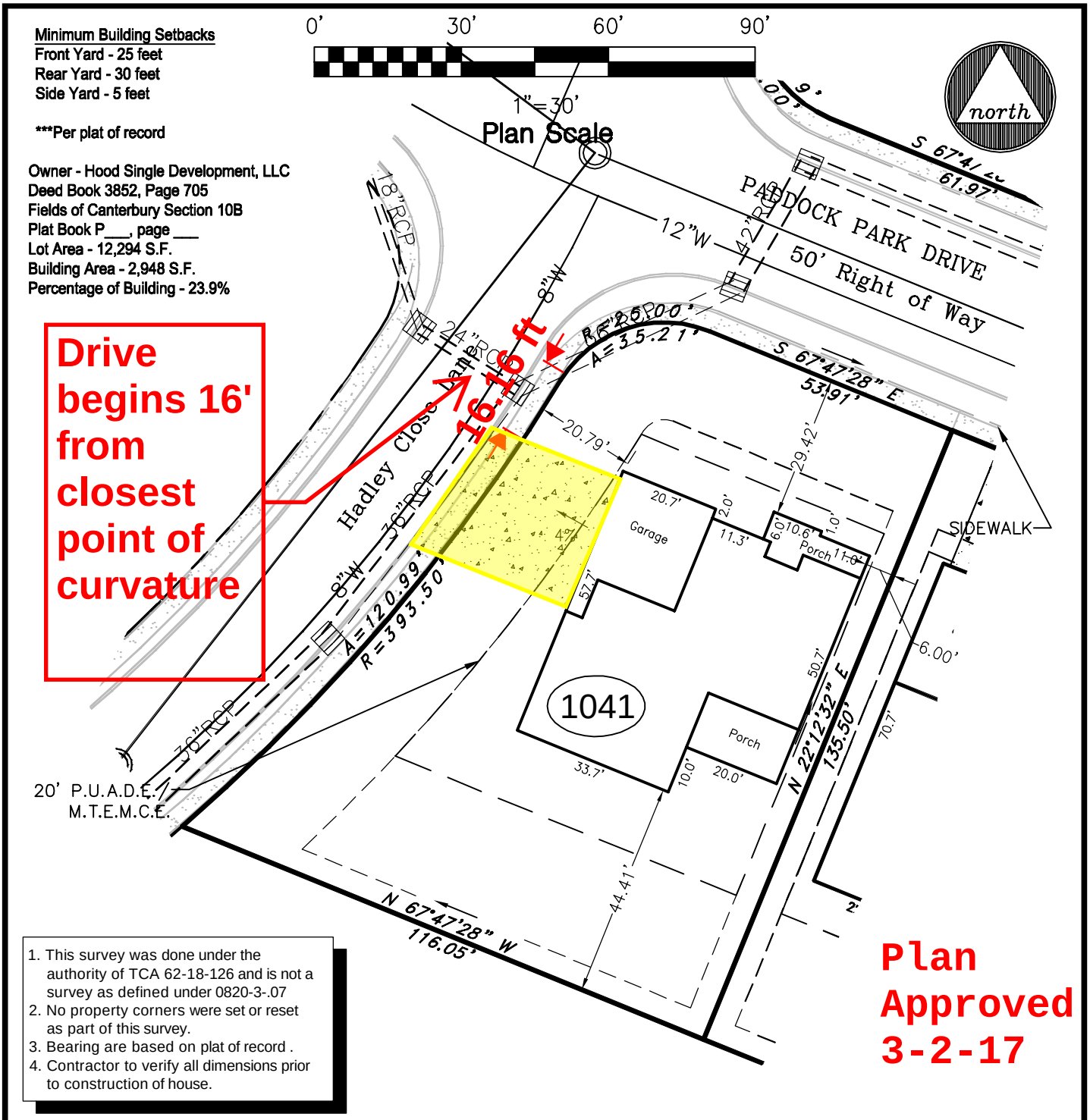
6. Shown here is lot 1032 which was submitted for permit approval on 2-28-17 with lot 1041 yet this lot was not approved due to the ordinance in question. This again was the first time the ordinance caused a denied application for permit and the first time we became aware that the ordinance existed. We have a buyer who has gone through all the preconstruction steps with our staff and is eager to be resident of Thompson's Station. We feel this ordinance being the cause of denial for permit is unfair to our customer considering the site plan is consistent with every other corner lot previously and recently constructed throughout Canterbury. The text in the highlighted boxes on the plan explain why this plan cannot be adjusted to meet the ordinance and how another product designed to do so would adversely affect the street scape, adjacent lots, and community consistency as a whole.

7. This plot plan for lot 1124 which was submitted the same date as the previous lot was also denied due to the same reason. It also has a buyer who has spent time and money to purchase a plan that there are many examples of throughout the community.

8. The aerial view shown here is in Phase 4 & 8 of Canterbury and the text referencing the highlighted areas explain how changing what has been approved throughout the development would alter the look of the community, hinder usability of the lots in question, and affect the surrounding adjacent residence.

9. The following are examples pictures of existing homes on corner lots that do not meet the ordinance standard but over the years have helped create the streetscape that has become Canterbury.

10. The final two pages show Phase 11 and Phase 10 with highlighted corner lots that have not been approved. These lots are permit ready and have been developed with the product constructed in the previous 8 single family phases in mind. Please consider approval of variance for the remaining lots shown to keep the community consistent and the ability to give the homeowners the best possible usability for these lots.



1. This survey was done under the authority of TCA 62-18-126 and is not a survey as defined under 0820-3-.07
2. No property corners were set or reset as part of this survey.
3. Bearing are based on plat of record .
4. Contractor to verify all dimensions prior to construction of house.

Plan Approved 3-2-17

WES ENGINEERS-SURVEYORS

CIVIL ENGINEERING SURVEYING PLANNING
2486 Nashville Hwy
COLUMBIA, TN 38401
PHONE: (931) 388-2329

SEAL

ALLEN B. O'LEARY
REGISTERED LAND SURVEYOR
XVI
AGRICULTURE
COMMERCE
TENNESSEE NO. 1987

CLIENT:
Willowbranch Partners, LLC
121 First Avenue South Suite 200
Franklin, Tennessee 37064

PROJECT:
Plot Plan - Lot 1041
The Fields of Canterbury
2723 Paddock Park Drive
Thompson Station, TN 37179

REVISION:	DATE:

DRAWN BY: ABO	SCALE: 1" = 30'
	SHEET: 1 OF 1
PROJECT NO: 16502	DATE: 2-11-2017

FILE: J:\WES_Engineers_Surveyors 2016\16507 - Canterbury - Thompson Station\dwg\Oleary\125003\Survey\125003-Survey_2011 Section 10.dwg

Town of Thompson's Station
BUILDING PERMIT
No. 1589

Location: 2901 Hadley Close Ln

Lot: 1041 Canterbury Type of Building: Residential

TERMS: It shall be unlawful to commence the excavation for the construction of any structure, including accessory units; or to commence the moving or alteration of any building until the Building Official has issued a Building Permit for such work. Any violation is subject to a fine of up to $50.00 for each day without a Building Permit. **This permit must be posted securely in a permit box at a height of 5 feet, protected from weather, and visible from the street when excavation or work begins. Place permit number and lot number on front of box.**

Do not copy or laminate this permit.

REMOVAL, ALTERATION OR MUTILATION OF THIS PERMIT IS PROHIBITED.

Builder: Willow Branch Partners

Issued By: Richard King, Building Codes Official

Date: 03/02/2017

For inspections, call (615) 794-4333 Monday—Friday.

Inspection Log	Initial	Date
Footing Inspection:		
Foundation Inspect:		
1st Floor Load Points:		
Slab & Radon Insp:		
Plumbing Rough-In:		
Water & Sewer:		
Electric Inspection:	(State)	
HVAC Inspection:		
Natural Gas Inspection:		
Brick (Lintel) Inspection:		
Framing Inspection:		
Insulation Inspection:		
Final Inspection:		

NOTE:

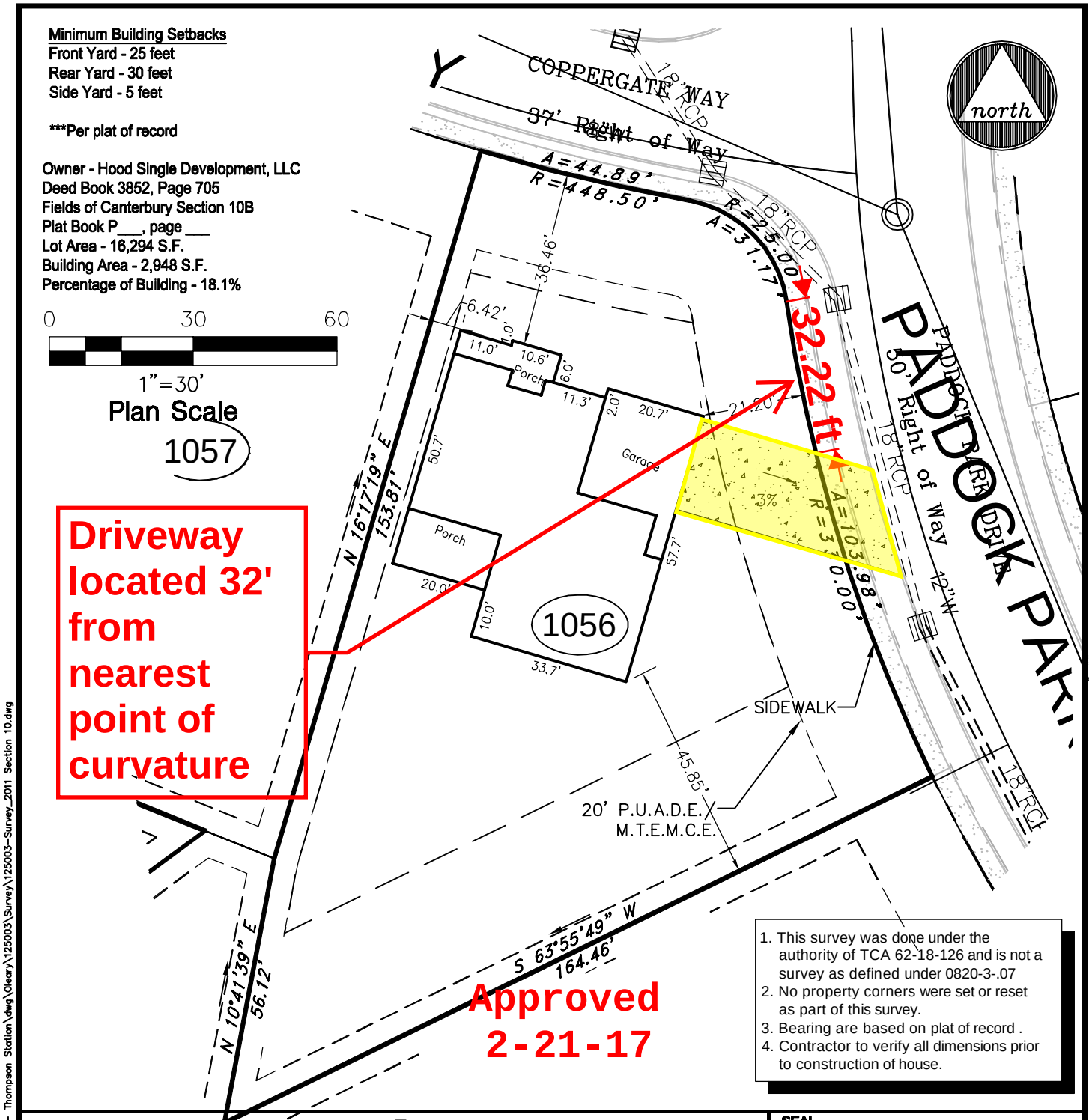
CONSTRUCTION HOURS ARE BETWEEN 7AM-6PM MON-SAT

STAMPED, APPROVED PLANS MUST BE POSTED AT JOB SITE IN ORDER FOR INSPECTIONS TO BE PERFORMED.

ALL NECESSARY FEES MUST BE PAID IN FULL PRIOR TO INSPECTIONS.

FAILURE TO COMPLY WITH TOWN'S REQUIREMENTS MAY RESULT IN CANCELLATION OF INSPECTIONS.

International Plumbing Code Section 311 states that toilet facilities for construction workers shall be provided and kept in sanitary condition. One portable toilet shall be provided for every 10 workers.



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WES ENGINEERS-SURVEYORS

CIVIL ENGINEERING SURVEYING PLANNING
2486 Nashville Hwy
COLUMBIA, TN 38401
PHONE: (931) 388-2329

SEAL

ALLEN B. O'LEARY
REGISTERED LAND SURVEYOR
XVI
AGRICULTURE
COMMERCE
TENNESSEE NO. 1987
2-21-17

CLIENT:
Willowbranch Partners, LLC
121 First Avenue South Suite 200
Franklin, Tennessee 37064

PROJECT:
Plot Plan - Lot 1056
The Fields of Canterbury
2281 Coppergate Way
Thompson Station, TN 37179

REVISION:	DATE:

DRAWN BY: ABO	SCALE: 1" = 30'
	SHEET: 1 OF 1
PROJECT NO: 16502	DATE: 1-21-2017

FILE: J:\WES_Engineers_Surveyors 2016\16507 - Canterbury - Thompson Station\dwg\Oleary\125003\Survey\125003-Survey_2011 Section 10.dwg

Town of Thompson's Station

BUILDING PERMIT

No. 1570

Location: 2703 Paddock Park Dr.

Lot: 1056 Canterbury **Type of Building: Residential**

TERMS: It shall be unlawful to commence the excavation for the construction of any structure, including accessory units; or to commence the moving or alteration of any building until the Building Official has issued a Building Permit for such work. Any violation is subject to a fine of up to $50.00 for each day without a Building Permit. **This permit must be posted securely in a permit box at a height of 5 feet, protected from weather, and visible from the street when excavation or work begins. Place permit number and lot number on front of box.**

Do not copy or laminate this permit.

REMOVAL, ALTERATION OR MUTILATION OF THIS PERMIT IS PROHIBITED.

Builder: Willow Branch Partners

Issued By: Richard King, Building Codes Official **Date: 02/21/2017**

For inspections, call (615) 794-4333 Monday—Friday.

Inspection Log	Initial	Date
Footing Inspection:		
Foundation Inspect:		
1st Floor Load Points:		
Slab & Radon Insp:		
Plumbing Rough-In:		
Water & Sewer:		
Electric Inspection:	(State)_____	
HVAC Inspection:		
Natural Gas Inspection:		
Brick (Lintel) Inspection:		
Framing Inspection:		
Insulation Inspection:		
Final Inspection:		

NOTE:

CONSTRUCTION HOURS ARE BETWEEN 7AM-6PM MON-SAT

STAMPED, APPROVED PLANS MUST BE POSTED AT JOB SITE IN ORDER FOR INSPECTIONS TO BE PERFORMED.

ALL NECESSARY FEES MUST BE PAID IN FULL PRIOR TO INSPECTIONS.

FAILURE TO COMPLY WITH TOWN'S REQUIREMENTS MAY RESULT IN CANCELLATION OF INSPECTIONS.

International Plumbing Code Section 311 states that toilet facilities for construction workers shall be provided and kept in sanitary condition. One portable toilet shall be provided for every 10 workers.

53 Corner Lots Previously Built or Approved Throughout 8 Phases of Development

0 200 400 600

The Fields of Canterbury

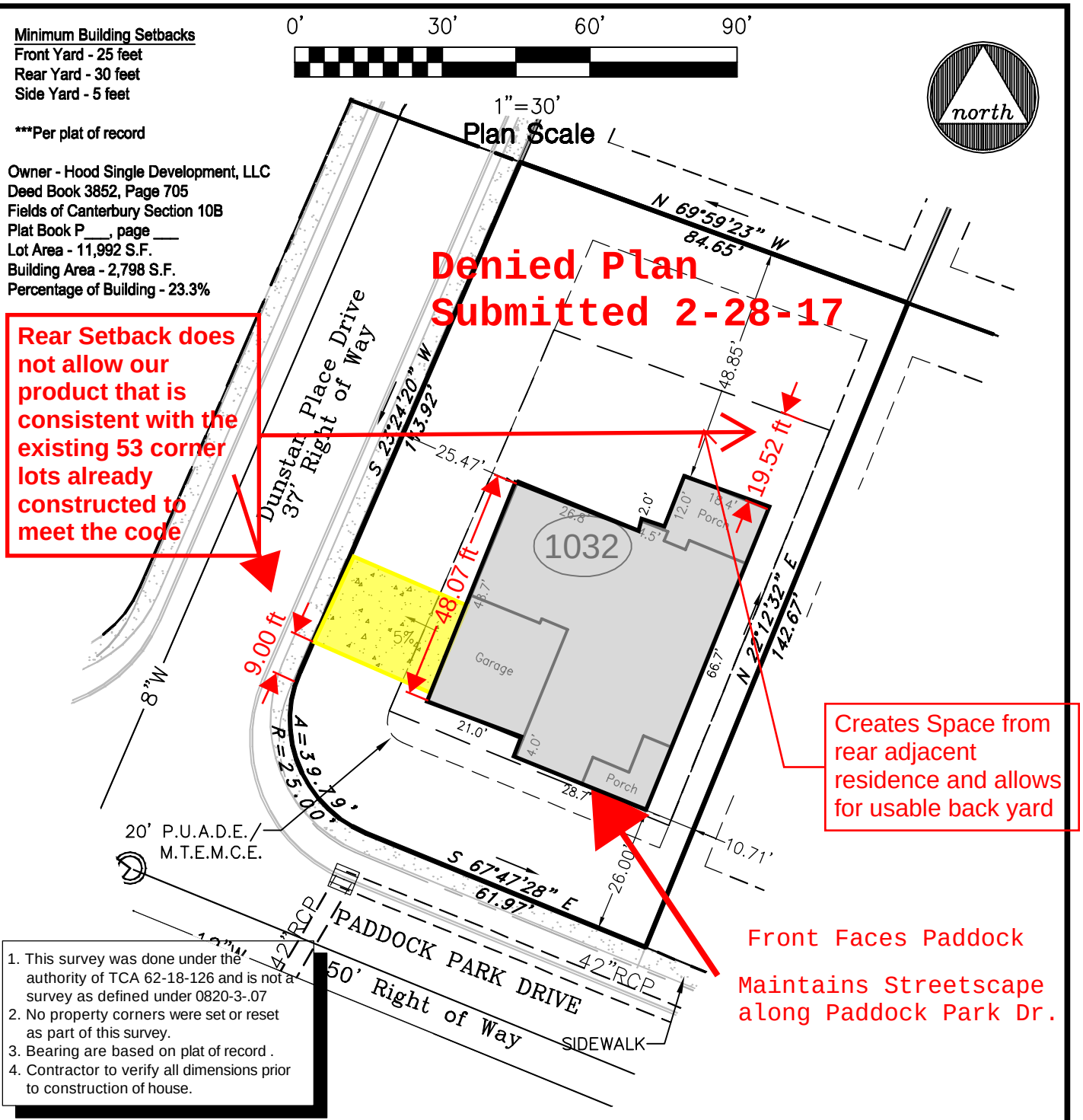
February 18, 2015

G:\05043-7878\1-Survey\MASTER PLAN\PHASE EXHIBIT

Minimum Building Setbacks
Front Yard - 25 feet
Rear Yard - 30 feet
Side Yard - 5 feet

***Per plat of record

Owner - Hood Single Development, LLC
Deed Book 3852, Page 705
Fields of Canterbury Section 10B
Plat Book P___, page ___
Lot Area - 11,992 S.F.
Building Area - 2,798 S.F.
Percentage of Building - 23.3%



1. This survey was done under the authority of TCA 62-18-126 and is not a survey as defined under 0820-3-.07
2. No property corners were set or reset as part of this survey.
3. Bearing are based on plat of record .
4. Contractor to verify all dimensions prior to construction of house.

WES ENGINEERS-SURVEYORS
CIVIL ENGINEERING SURVEYING PLANNING
2486 Nashville Hwy
COLUMBIA, TN 38401
PHONE: (931) 388-2329

SEAL

ALLEN B. O'LEARY
REGISTERED LAND SURVEYOR
XVI
AGRICULTURE
COMMERCE
TENNESSEE NO. 1987

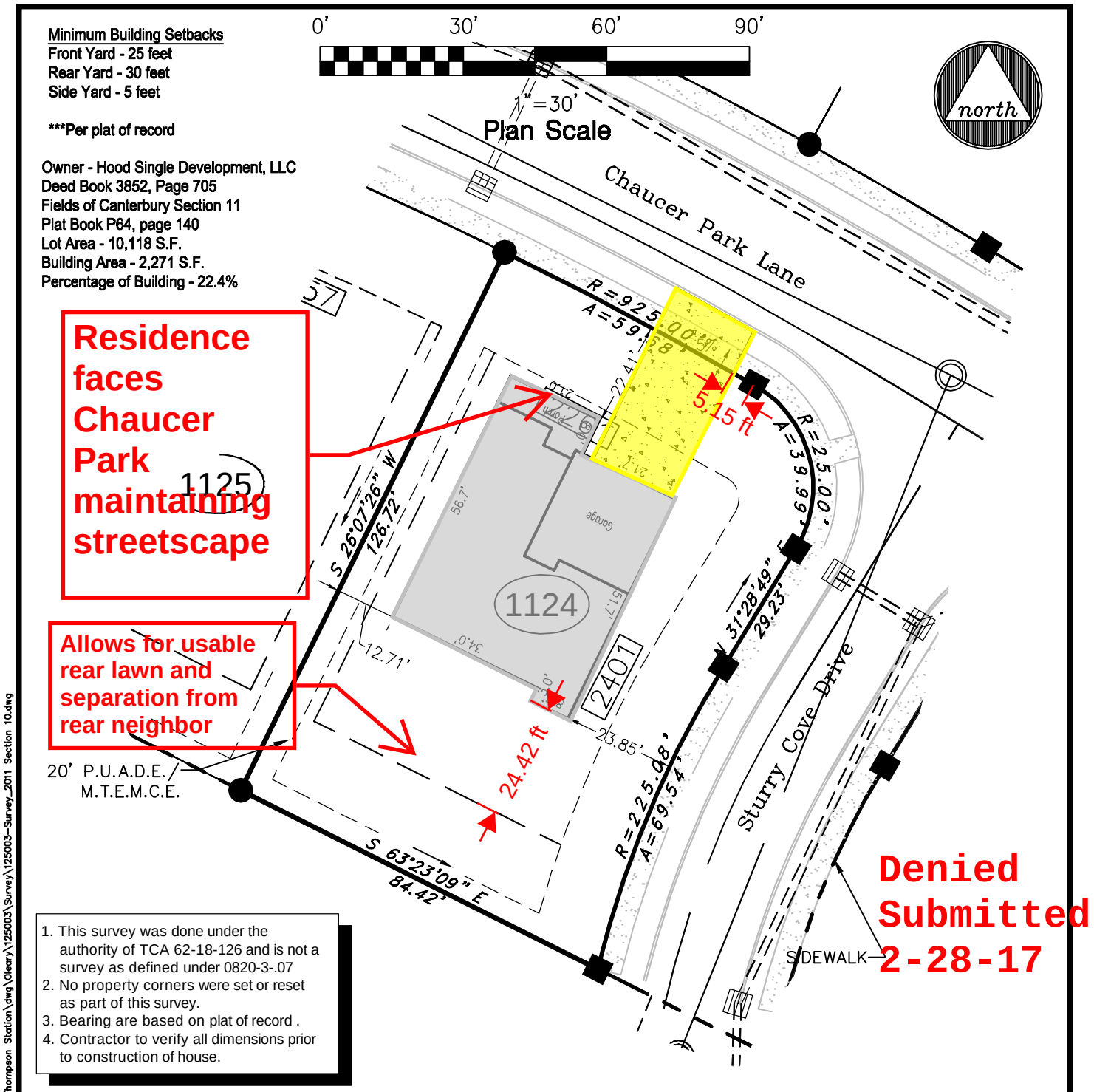
CLIENT:
Willowbranch Partners, LLC
121 First Avenue South Suite 200
Franklin, Tennessee 37064

PROJECT:
Plot Plan - Lot 1032
The Fields of Canterbury
2650 Dunstan Place Drive
Thompson Station, TN 37179

REVISION:	DATE:

DRAWN BY: ABO	SCALE: 1" = 30'
	SHEET: 1 OF 1
PROJECT NO: 16502	DATE: 1-21-2017

FILE: J:\WES_Engineers_Surveyors 2016\16507 - Canterbury - Thompson Station\dwg\Oleary\125003\Survey\125003-Survey_2011 Section 10.dwg



WES ENGINEERS-SURVEYORS
CIVIL ENGINEERING SURVEYING PLANNING
2486 Nashville Hwy
COLUMBIA, TN 38401
PHONE: (931) 388-2329

SEAL

ALLEN B. O'LEARY
REGISTERED LAND SURVEYOR
XVI
AGRICULTURE
COMMERCE
TENNESSEE NO. 1987

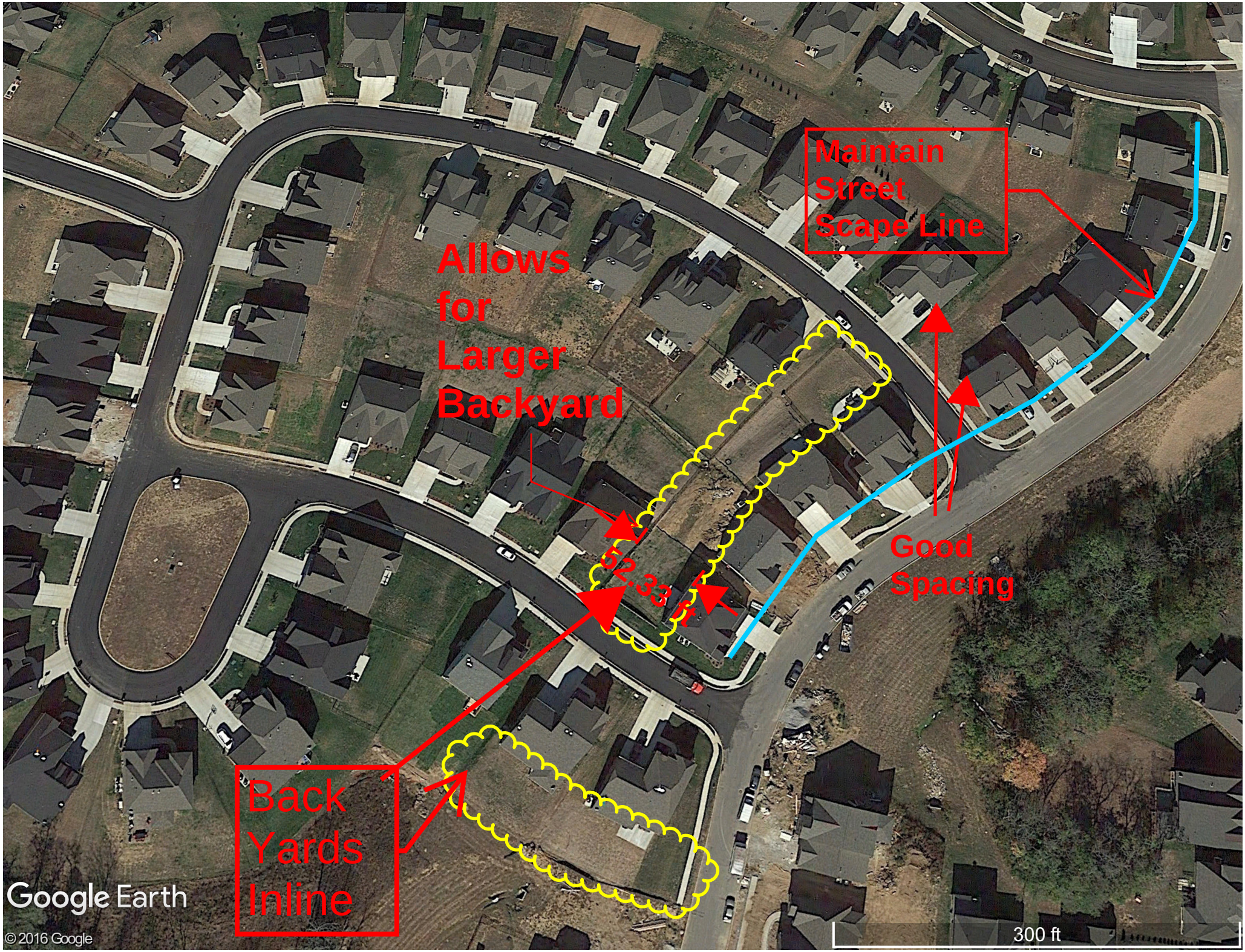
CLIENT:
Willowbranch Partners, LLC
121 First Avenue South Suite 200
Franklin, Tennessee 37064

PROJECT:
Plot Plan - Lot 1124
The Fields of Canterbury
2401 Sturry Cove Lane
Thompson Station, TN 37179

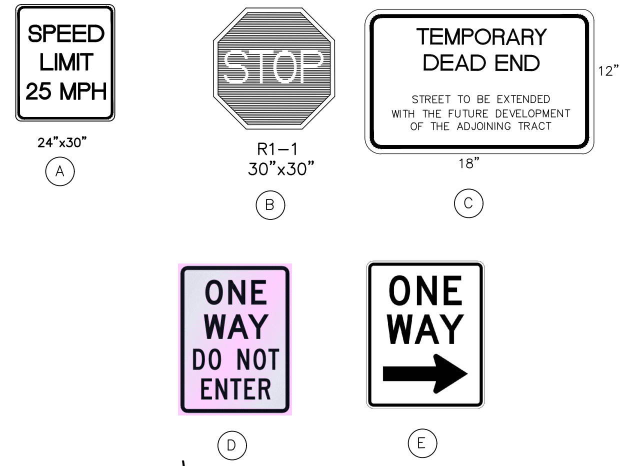
REVISION:	DATE:

DRAWN BY: ABO	SCALE: 1" = 30'
	SHEET: 1 OF 1
PROJECT NO: 16502	DATE: 2-20-2017

FILE: I:\WES_Engineers_Surveyors 2016\16507 - Canterbury - Thompson Station\dwg\Oleary\125003\Survey\125003-Survey_2011 Section 10.dwg


Maintain
Street
Scape Line
Allows
for
Larger
Backyard
52.33 ft
Good
Spacing
Back
Yards
Inline
Google Earth
© 2016 Google
300 ft


STOP



PAVEMENT LEGEND

ASPHALT PAVEMENT

CONCRETE WALK

*RADIUS MEASUREMENTS TAKEN FROM BACK OF CURB

✱ DENOTES CRITICAL LOT

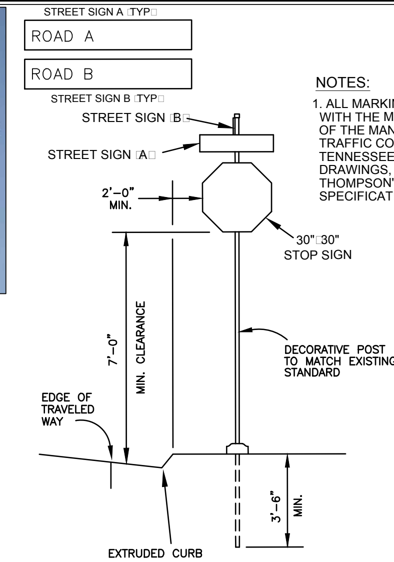
811 Know what's below. Call before you dig.

DECORATIVE SIGN / POST DETAILS

NOT TO SCALE

NOTES:

SIZE:	9" X 30" STREET SIGNS
MARKINGS:	3ml GOLD & WHITE REFLECTIVE
MATERIAL:	BLACK POLYMETAL
POST:	COMPLETE SYSTEM PINEAPPLE TOP, 888 FLUTED BASE, WITH SCROLL WORK



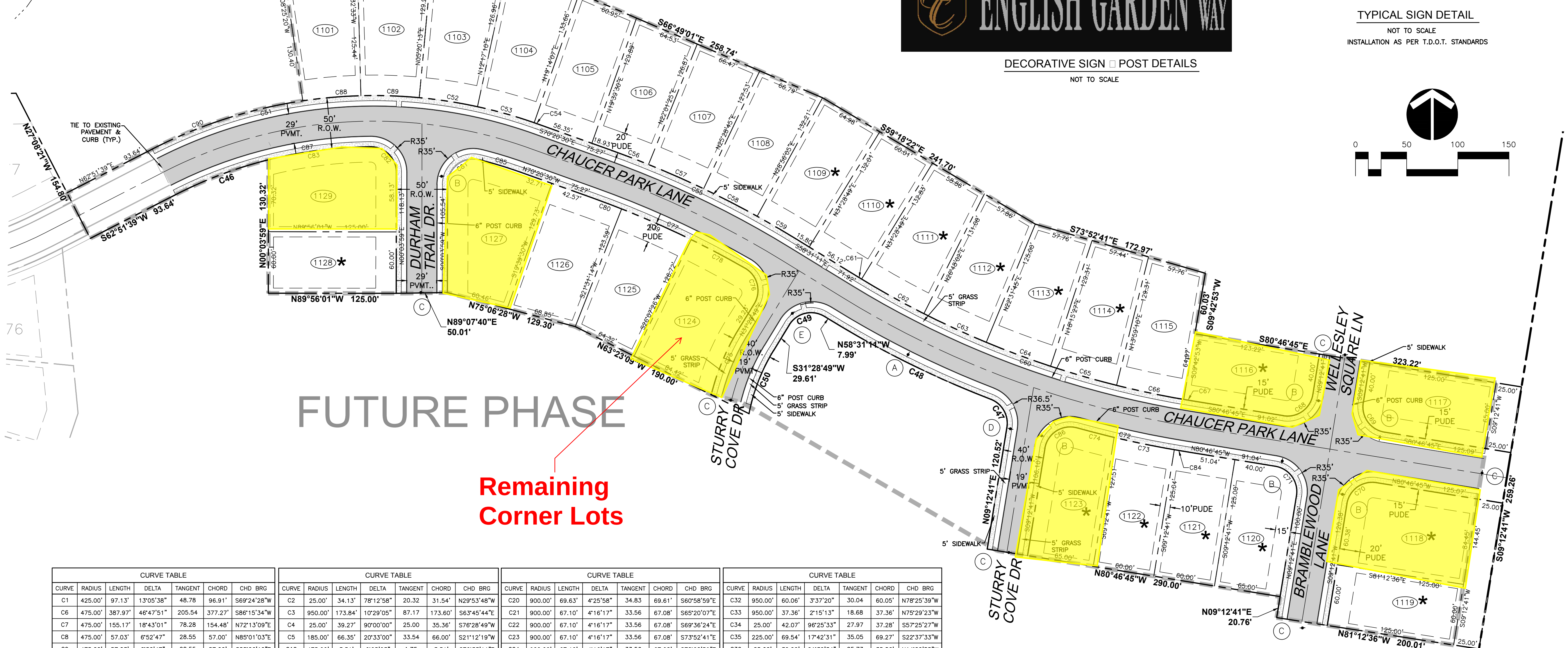
NOTES:

1. ALL MARKINGS SHALL COMPLY WITH THE MILLENIUM EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, TENNESSEE D.O.T. STANDARD DRAWINGS, AND THE TOWN OF THOMPSON'S STATION SPECIFICATIONS.

TYPICAL SIGN DETAIL

NOT TO SCALE

INSTALLATION AS PER T.D.O.T. STANDARDS



CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	425.00'	97.13'	13°05'38"	48.78	96.91'	S69°24'28"W
C6	475.00'	387.97'	46°47'51"	205.54	377.27'	S86°15'34"W
C7	475.00'	155.17'	18°43'01"	78.28	154.48'	N72°13'09"E
C8	475.00'	57.03'	6°52'47"	28.55	57.00'	N85°01'03"E
C9	475.00'	57.03'	6°52'47"	28.55	57.00'	S88°06'10"E
C10	475.00'	57.61'	6°56'57"	28.84	57.58'	S81°11'18"E
C11	475.00'	57.61'	6°56'57"	28.84	57.58'	S74°14'21"E
C12	475.00'	3.51'	0°25'23"	1.75	3.51'	S70°33'11"E
C14	975.00'	40.25'	2°21'55"	20.13	40.25'	S69°09'32"E
C40	925.00'	30.06'	1°51'44"	15.03	30.06'	N69°24'38"W
C41	425.00'	41.91'	5°38'58"	20.97	41.89'	S73°09'59"E
C42	25.00'	45.35'	103°56'33"	31.97	39.39'	S52°02'16"W
C43	25.00'	39.50'	90°31'07"	25.23	35.51'	N45°11'35"W
C44	425.00'	100.83'	13°35'35"	50.65	100.59'	S82°45'04"W
C45	425.00'	197.95'	26°41'13"	100.81	196.17'	S76°12'15"W

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C2	25.00'	34.13'	78°12'58"	20.32	31.54'	N29°53'48"W
C3	950.00'	173.84'	10°29'05"	87.17	173.60'	S63°45'44"E
C4	25.00'	39.27'	90°00'00"	25.00	35.36'	S76°28'49"W
C5	185.00'	66.35'	20°33'00"	33.54	66.00'	S21°12'19"W
C12	475.00'	3.51'	0°25'23"	1.75	3.51'	S70°33'11"E
C13	975.00'	201.17'	11°49'19"	100.94	200.82'	N64°25'51"W
C14	975.00'	40.25'	2°21'55"	20.13	40.25'	S69°09'32"E
C15	975.00'	58.80'	3°27'20"	29.41	58.79'	S66°14'55"E
C16	975.00'	58.80'	3°27'20"	29.41	58.79'	S62°47'35"E
C17	975.00'	43.31'	2°32'43"	21.66	43.31'	S59°47'33"E
C18	900.00'	349.65'	22°15'34"	177.06	347.46'	N69°38'58"W
C19	900.00'	3.88'	0°14'49"	1.94	3.88'	S58°38'36"E

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C20	900.00'	69.63'	4°25'58"	34.83	69.61'	S60°58'59"E
C21	900.00'	67.10'	4°16'17"	33.56	67.08'	S65°20'07"E
C22	900.00'	67.10'	4°16'17"	33.56	67.08'	S69°36'24"E
C23	900.00'	67.10'	4°16'17"	33.56	67.08'	S73°52'41"E
C24	900.00'	67.10'	4°16'17"	33.56	67.08'	S78°08'59"E
C25	900.00'	7.76'	0°29'38"	3.88	7.76'	S80°31'56"E
C26	25.00'	39.27'	90°00'33"	25.00	35.36'	N54°12'58"E
C27	25.00'	39.27'	89°59'27"	25.00	35.35'	S35°47'02"E
C28	25.00'	39.27'	90°00'33"	25.00	35.36'	S54°12'58"W
C29	25.00'	39.27'	89°59'27"	25.00	35.35'	N35°47'02"W
C30	950.00'	106.39'	6°24'59"	53.25	106.33'	S77°34'16"E
C31	950.00'	8.96'	0°32'26"	4.48	8.96'	N80°30'32"W

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C32	950.00'	60.06'	3°37'20"	30.04	60.05'	N78°25'39"W
C33	950.00'	37.36'	2°15'13"	18.68	37.36'	N75°29'23"W
C34	25.00'	42.07'	96°25'33"	27.97	37.28'	S57°25'27"W
C35	225.00'	69.54'	17°42'31"	35.05	69.27'	S22°37'33"W
C36	25.00'	39.99'	91°39'34"	25.73	35.86'	N14°20'58"W
C37	925.00'	164.06'	10°09'44"	82.25	163.85'	S65°15'38"E
C38	925.00'	59.68'	3°41'49"	29.85	59.67'	N62°01'40"W
C39	925.00'	74.31'	4°36'11"	37.18	74.29'	N66°10'40"W
C40	925.00'	30.06'	1°51'44"	15.03	30.06'	N69°24'38"W

Lots 1116,1117,1118,1123,1124,1127,1129 not currently approved

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LANDSCAPE ARCHITECTS • SURVEYORS

THE FIELDS OF CANTERBURY

FOR

HOOD DEVELOPMENT, LLC

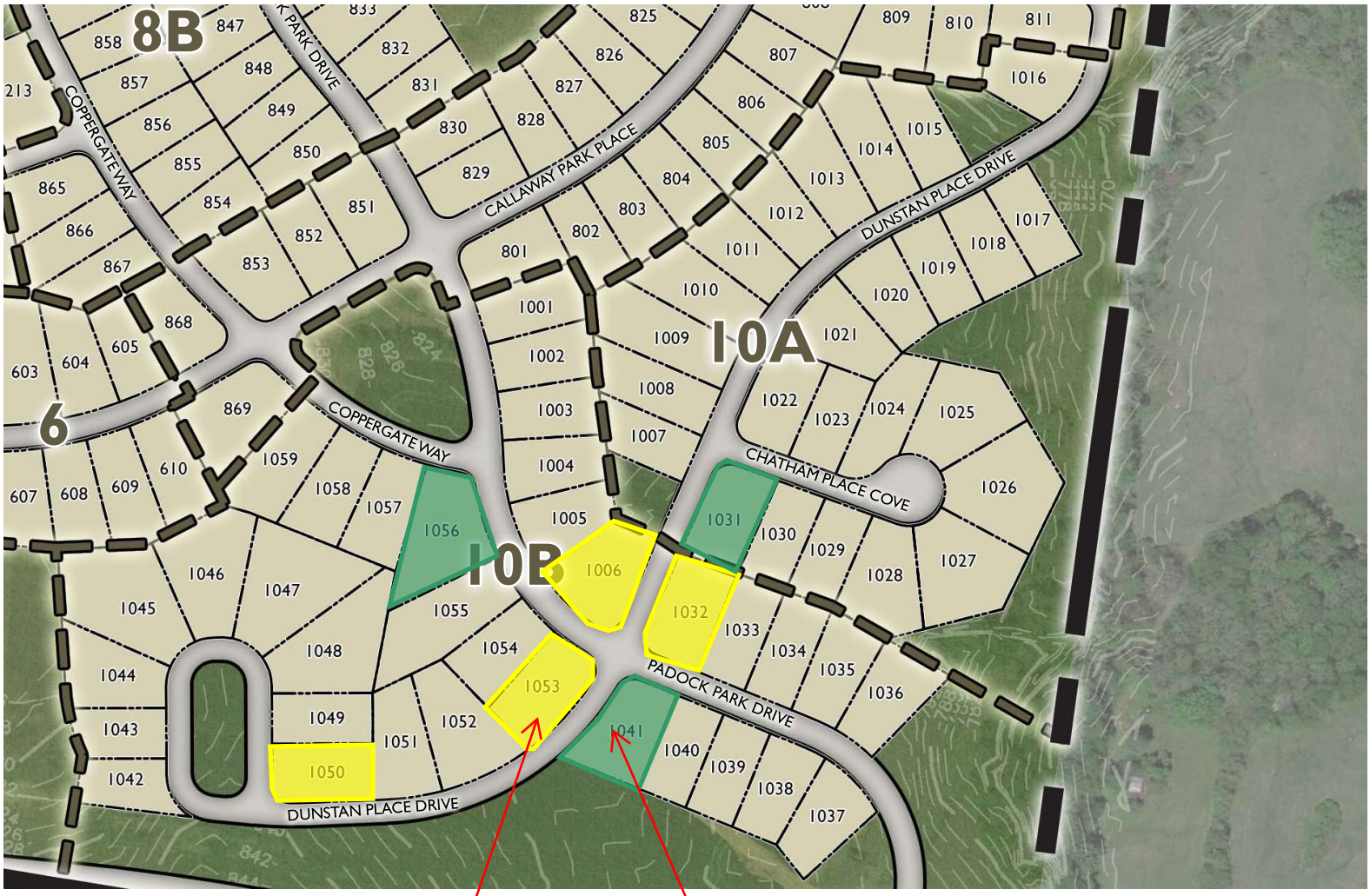
WILLIAMSON COUNTY, TOWN OF THOMPSON'S STATION, TENNESSEE

REVISIONS

JOB NO.	05-043
WK. ORDER	7878
DESIGNED:	MAM
DRAWN:	DRS
SCALE:	1"=50'
DATE:	JULY 29, 2015

OVERALL SITE LAYOUT

C1.0



Corner Lots without approval

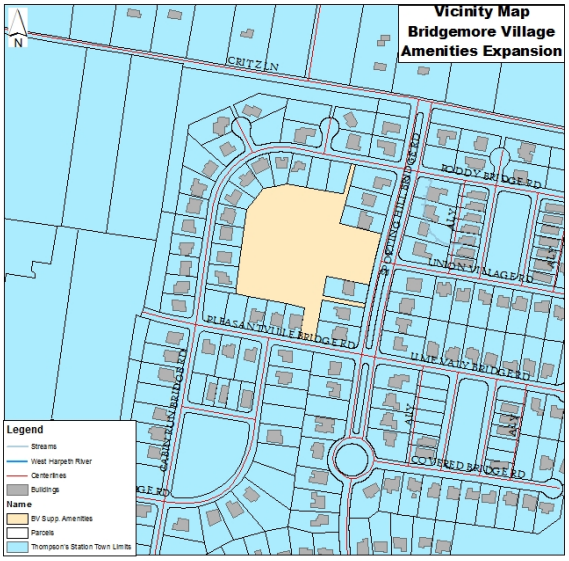
Corner Lots currently approved

Lots 1050, 1053, 1006, 1032 not currently approved

Thompson's Station Planning Commission
Staff Report – Item 5 (File: SP 2017-001)
March 28, 2017
Site Plan for the expansion of the amenity center within Bridgemore Village.

PROJECT DESCRIPTION

The applicant, Ragan-Smith has submitted a site plan application on behalf of MBSC, Bridgemore, LLC for the expansion of the amenity center within Phase 1 of Bridgemore Village.



ANALYSIS

Site Plan

Site plan review by the Planning Commission is required 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 Land Development Ordinance requires residential developments provide amenities for neighborhoods. Bridgemore Village has a pool and is proposing to expand the amenity to include a fire pit, 25-meter lap pool with a sun shelf, playground, pavilion and covered outdoor kitchen/grilling area, and a trellis enclosed by an aluminum fence with additional landscaping around the perimeter. A parking lot with 24 spaces is provided on site and access to the site is from a public roadway within the development, Sporting Hill Bridge Road. All structures conform to the minimum setback requirements within the D1 zone and will meet the requirements for the provision of amenities within neighborhoods. Therefore, the proposed expansion conforms to the standards within the Land Development Ordinance.

Landscaping

The proposed landscaping includes Sugar Maple, Arborvitae, Crape Myrtle and Schip Laurel in addition to the existing natural vegetation on site. Therefore, the landscaping meets the requirements within the Land Development Ordinance.

RECOMMENDATION

Based on the project's consistency with the Land Development Ordinance, Staff recommends that the project be approved as proposed.

ATTACHMENTS

Site Plan Packet

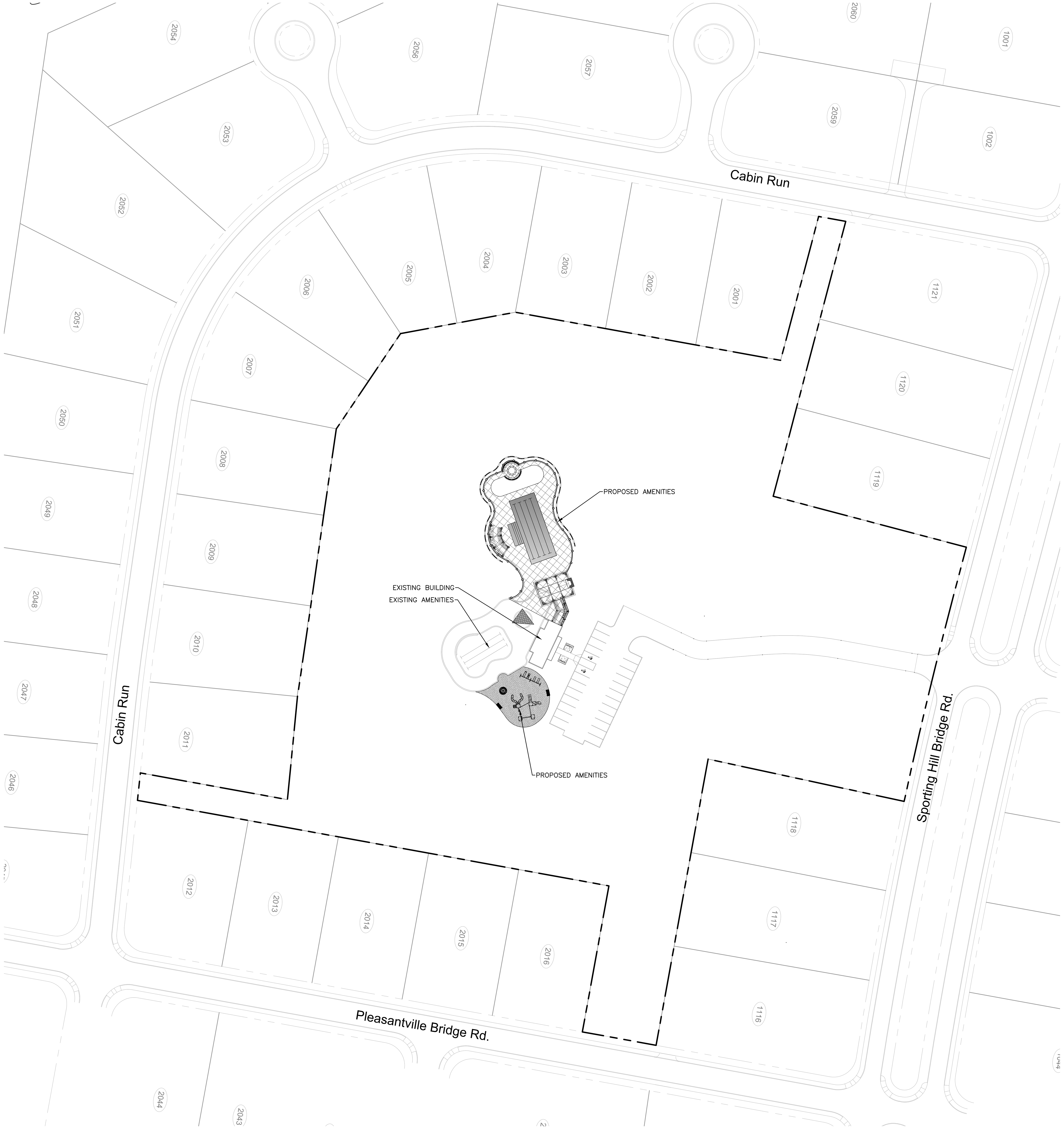
C3 Studio LLC
312 Gay Street · #200
Knoxville · TN 37902
865-200-4065
www. C3StudioLLC.com

Bridgemore Village

Nashville, TN

A	Fire Pit
B	25 Meter Lap Pool
C	Sun Shelf
D	Trellis
E	Landscape Buffer
F	Remove Mushroom Add New Sun Shade
G	Existing Pool
H	New Pool Edging
I	Playground
J	New 3-season Pavillion - 26' x 36'
K	Covered Grilling Area

Not For Construction



LOCATION MAP

N.T.S.

LOT SIZE: 8.10AC

A: MAP AND PARCEL: MAP 145, PORTION OF PARCELS 14.00 & 16.00 D1-LOW INTENSITY RESIDENTIAL

811

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NASHVILLE, TN. 37206
(615) 244-8591
CHATTANOOGA
1410 COWART STREET
SUITE 200
CHATTANOOGA, TN 37408
(423) 490-9400
• www.ragansmith.com •

BRETT ALAN SMITH
REGISTERED
LANDSCAPE ARCHITECT
TENNESSEE NO. 500

SUPPLEMENTAL AMENITIES
FOR
BRIDGEMORE VILLAGE

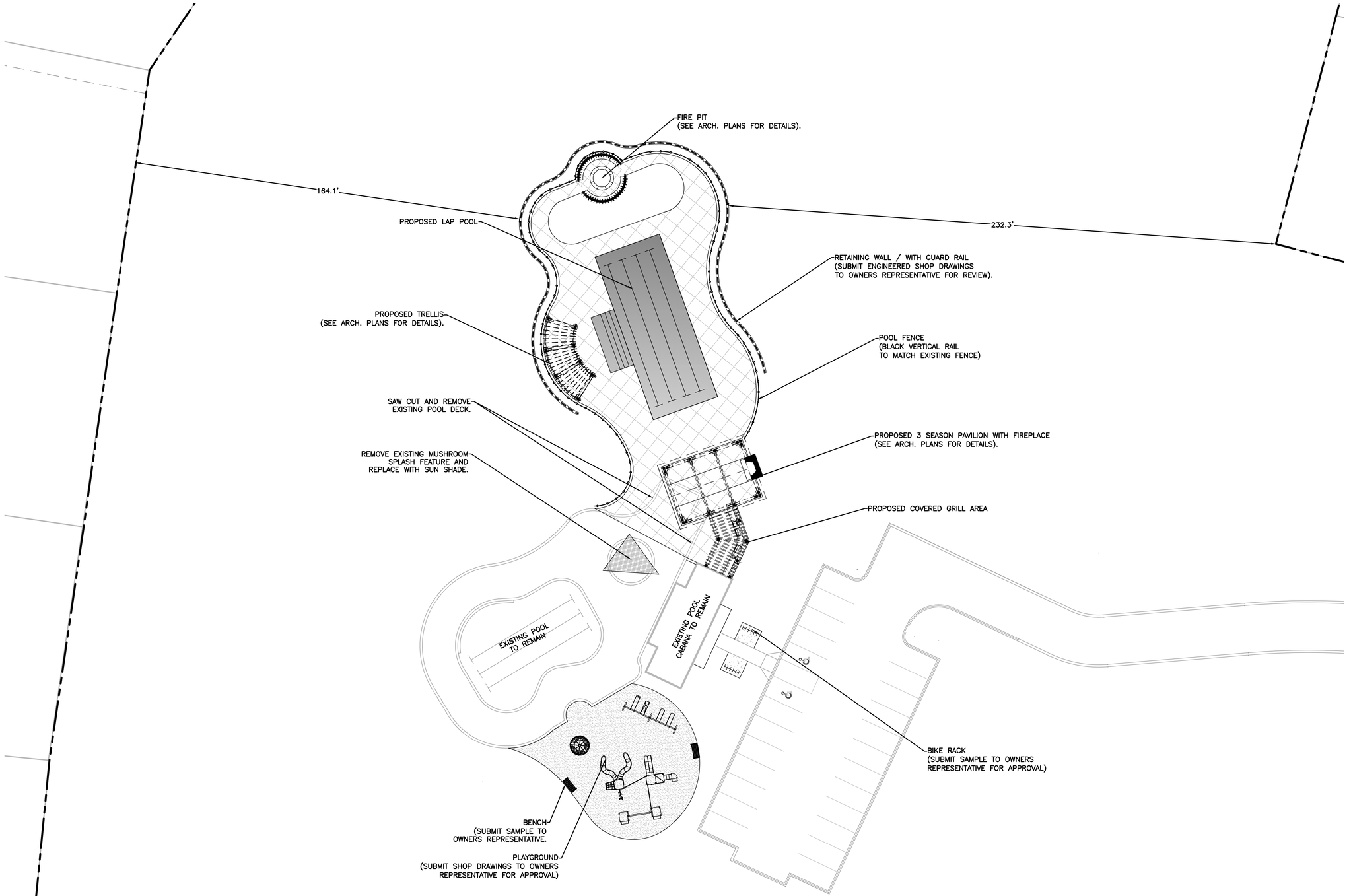
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

REVISIONS

JOB NO. 11052	WK. ORDER 9396
DESIGNED:	B. SMITH
DRAWN:	D. SIEBERG
SCALE:	1"=60'
DATE:	MARCH 01, 2017

OVERALL LAYOUT

C1.0



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CHATTANOOGA, TENNESSEE 37402
(423) 490-3400
NASHVILLE
P.O. BOX 55070, 211 STREET
NASHVILLE, TENNESSEE 37206
(615) 244-8591
www.ragansmith.com

BRETT ALAN SMITH
REGISTERED
LANDSCAPE ARCHITECT
TENNESSEE NO. 300

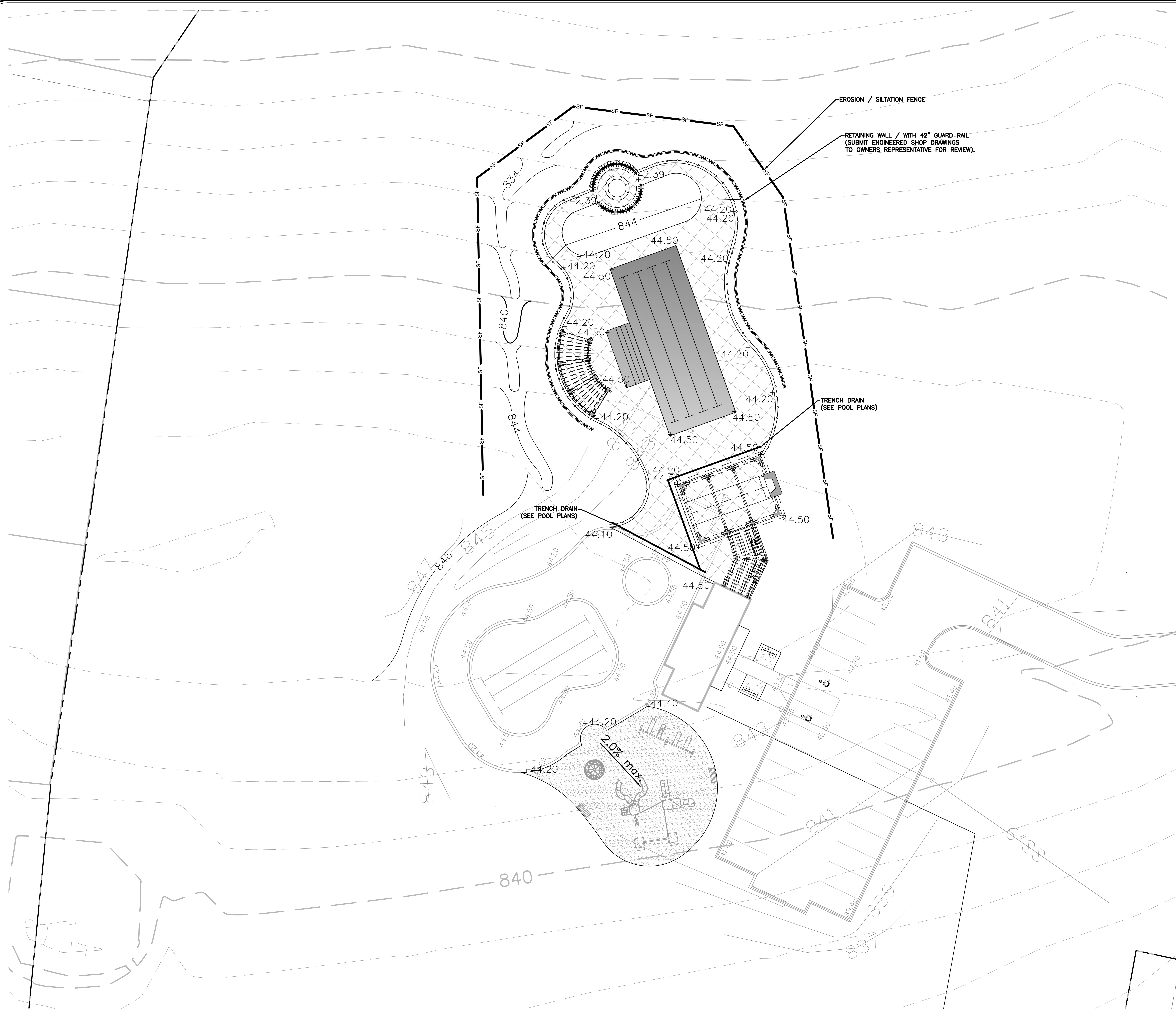
SUPPLEMENTAL AMENITIES
FOR
BRIDGEMORE VILLAGE
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

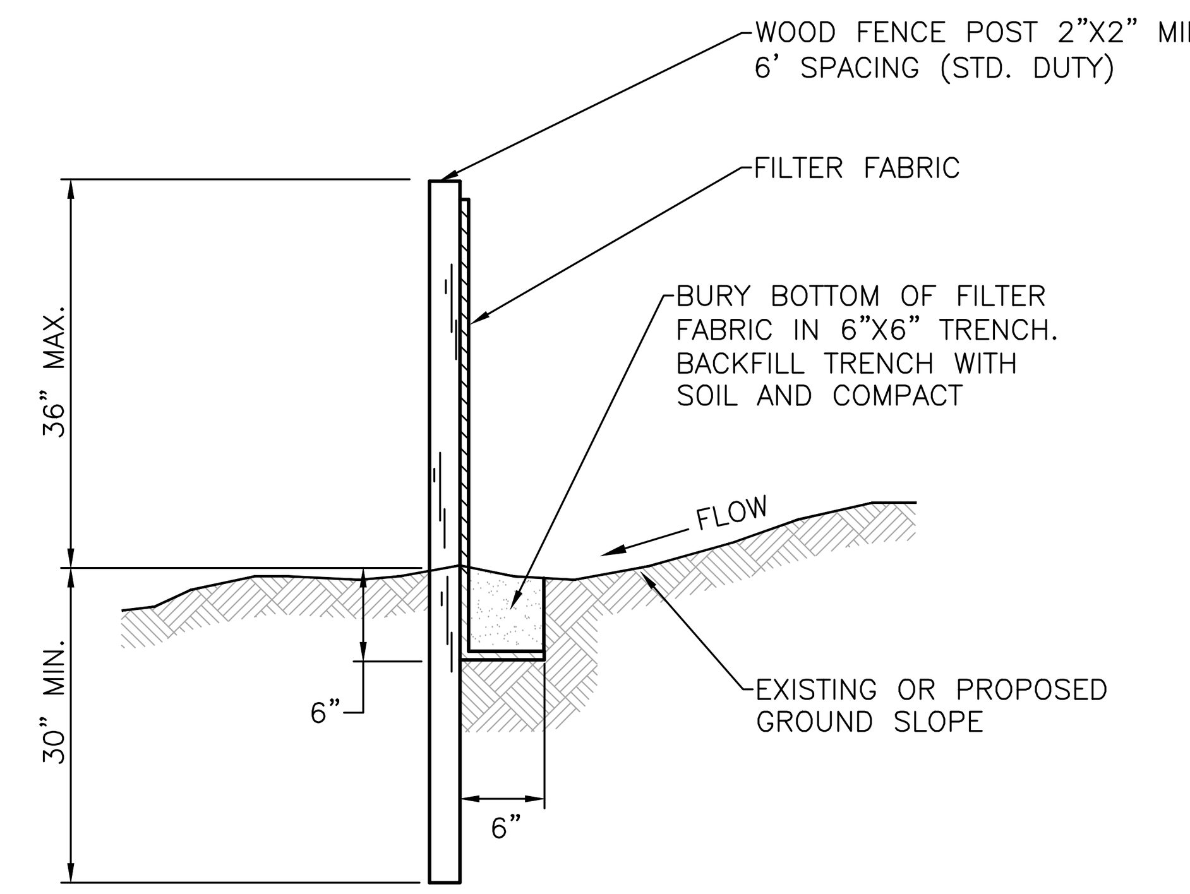
REVISIONS	DATE:	SCALE:	DRAWN:	DESIGNED:	JOB NO.	WK. ORDER
	MARCH 01, 2017	1"=20'	D. SIEBERG	B. SMITH	11052	9396

ENLARGED LAYOUT

C1.1

G:\11052-SSWH-CIVIL ENGINEERING\SECTION-AMENITIES\PLAN SHEETS\RA-ARGEU-LAYOUT-LAYOUT.DWG
PLOTTED BY: DENNIS SIEBERG ON: 3/1/2017 9:57 AM
LAST UPDATED BY: DRS ON: 3/1/2017 9:54 AM





TO BE INSTALLED AS NOTED ON PLAN BEFORE COMMENCING GRADING OPERATION AND LEFT IN PLACE UNTIL A GOOD STAND OF GRASS IS ESTABLISHED OVER ALL DISTURBED AREAS. PRIOR TO INSTALLATION, CONTRACTOR SHOULD CONFIRM WITH THE PUBLIC WORKS DEPT. THAT THIS DETAIL IS THE CURRENT AND APPROVED EROSION/SILTATION BARRIER.

EROSION/SILTATION FENCE
NOT TO SCALE

NOTES:
1. CONTOURS & BASE INFORMATION ARE FROM JAMES CARBINE PROVIDED CADD FILES FOR THE ORIGINAL AMENITY AREA.
2. CONTRACTOR TO FIELD VERIFY EXISTING TOPOGRAPHY AND EXISTING SPOT ELEVATIONS.

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LANDSCAPE ARCHITECTS • SURVEYORS
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(615) 244-8591
CHATTANOOGA
1410 COWART STREET
SUITE 200
CHATTANOOGA, TN 37408
(423) 490-9400
• www.ragansmith.com •

BRETT ALAN SMITH REGISTERED LANDSCAPE ARCHITECT TENNESSEE NO. 500

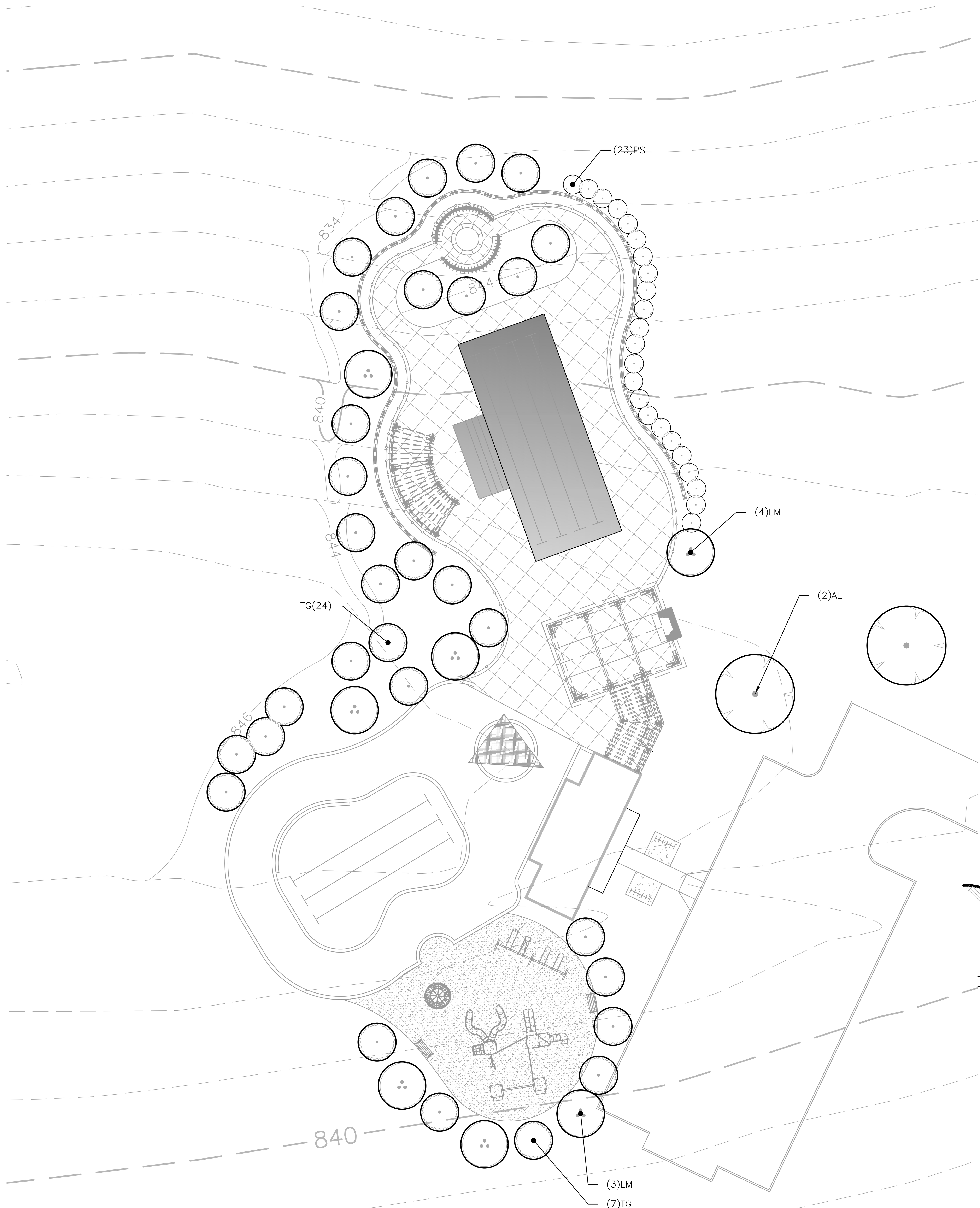
SUPPLEMENTAL AMENITIES
FOR
BRIDGEMORE VILLAGE
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

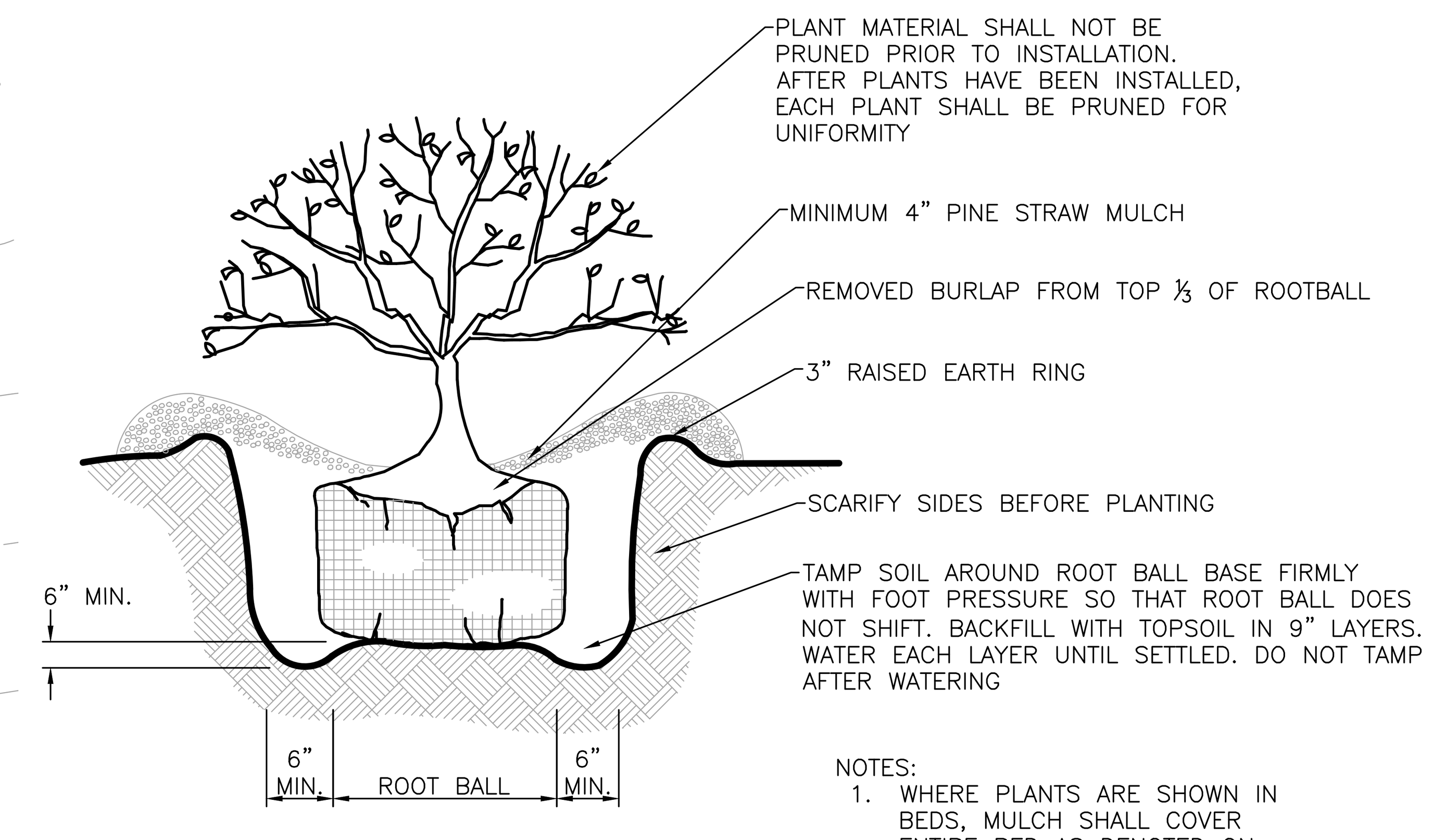
REVISIONS

JOB NO. 11052	WK. ORDER 9396
DESIGNED:	B. SMITH
DRAWN:	D. SIEBERG
SCALE:	1"=20'
DATE:	MARCH 01, 2017

GRADING PLAN

C2.0

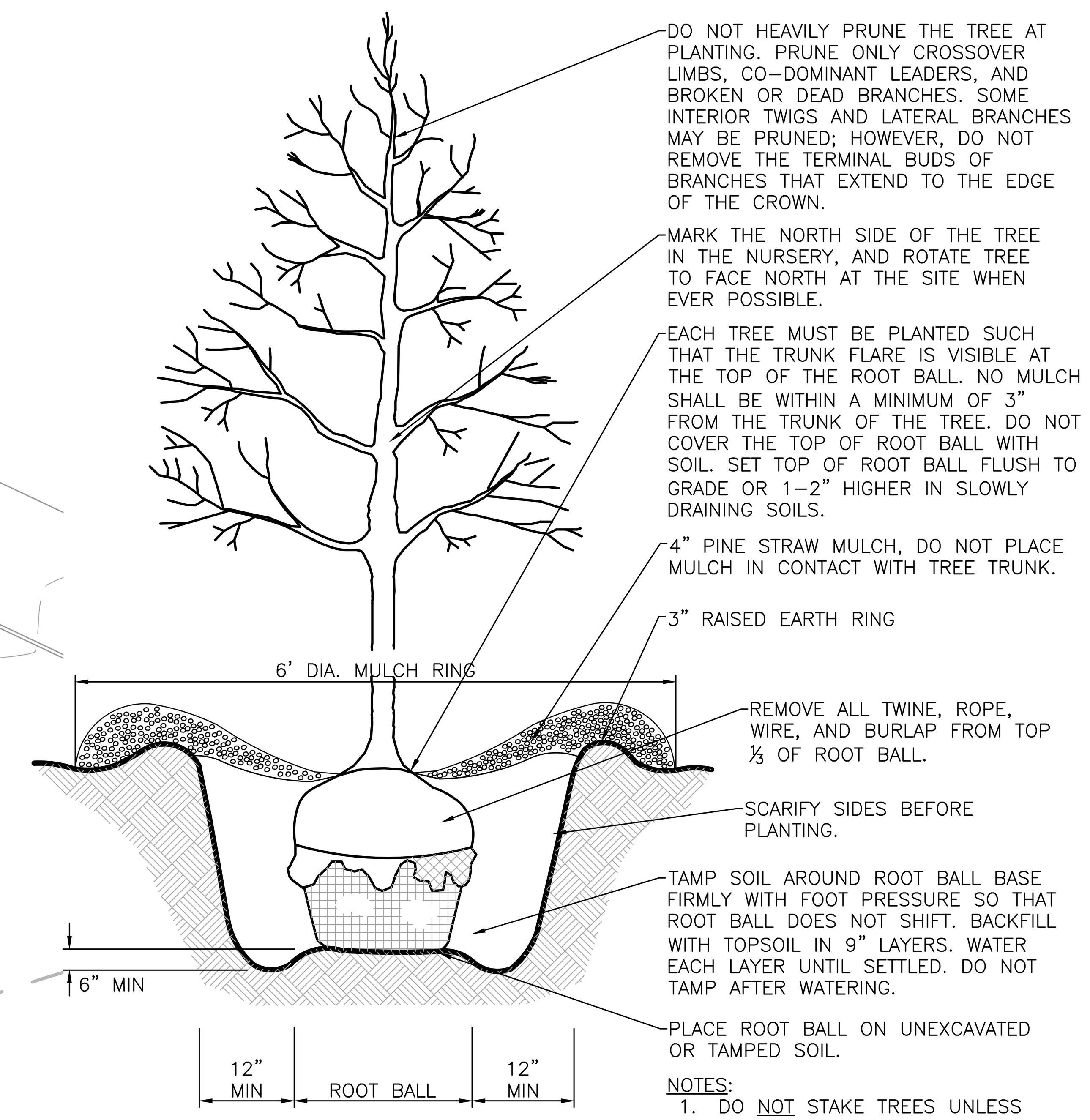




NOTES:
1. WHERE PLANTS ARE SHOWN IN BEDS, MULCH SHALL COVER ENTIRE BED AS DENOTED ON THE PLANS.
2. CONTAINER GROWN PLANT MATERIAL MAY BE SUBSTITUTED FOR BURLAP MATERIAL

SHRUB PLANTING

NOT TO SCALE



NOTES:
1. DO NOT STAKE TREES UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. IF STAKED, REMOVE AFTER ONE GROWING SEASON.
2. DO NOT WRAP TREE TRUNKS UNLESS APPROVED BY THE LANDSCAPE ARCHITECT. REMOVE WRAP AFTER PLANTING.
3. NON-BIODEGRADABLE BURLAP TO BE REMOVED OR ROLLED UNDER ROOT BALL AFTER PLANT IS PLACED IN HOLE.

TREE PLANTING

NOT TO SCALE

PLANTING NOTES

1. ANY SERIES OF TREES TO BE PLACED IN A PARTICULAR ARRANGEMENT WILL BE FIELD CHECKED FOR ACCURACY. ANY PLANTS MISARRANGED WILL BE RELOCATED.
2. SOIL USED IN BACKFILLING PLANTING PITS SHALL BE TOPSOIL AND MIXED WITH 25% PEAT BY VOLUME. EXCEPT FOR ERICACEOUS PLANTS, VERY ACID OR SOUR SOIL (SOIL HAVING A pH less than 6) SHALL BE MIXED WITH SUFFICIENT LIME TO PRODUCE A SLIGHTLY ACID REACTION (A pH of 6.0 to 6.5). ADD 10-10-10 COMMERCIAL FERTILIZER AT THE RATE OF 2 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
3. SOIL USED IN BACKFILLING ERICACEOUS PLANTS SHALL BE TOPSOIL MIXED WITH 50% PEAT BY VOLUME. ADD 5-10-5 COMMERCIAL FERTILIZER AT THE RATE OF 5 POUNDS PER CUBIC YARD. MIX BOTH FERTILIZER AND PEAT THOROUGHLY BY HAND OR ROTARY TILLER.
4. UPON SECURING PLANT MATERIAL AND BEFORE INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR A PRE-INSTALLATION INSPECTION TO VERIFY ALL PLANT MATERIAL MEETS SPECIFICATION. MATCH TREES OF SAME SPECIES IN GROWTH CHARACTER AND UNIFORMITY.
5. APPLY HERBICIDE (TREFLAN OR EQUIVALENT) TO ALL PLANT BEDS PRIOR TO PLANTING FOR NOXIOUS WEED CONTROL AT A RATE OF 2 POUNDS PER 1,000 SQUARE FEET.
6. CONTRACTOR SHALL SUBMIT A 10 OUNCE SAMPLE OF THE TOPSOIL PROPOSED TO A TESTING LABORATORY FOR ANALYSIS. SUBMIT TEST RESULTS WITH RECOMMENDATIONS FOR SUITABILITY TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.
7. PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE AND VERTICAL. ALL NON-BIODEGRADABLE ROOT CONTAINERS SHALL BE REMOVED.
8. SELECTIVELY TRIM TREE BRANCHES BY 25%, MAINTAINING NATURAL SHAPE. PRUNE ALL DEAD AND BROKEN BRANCHES IN TREES AND SHRUBS. REMOVE TAGS, TWINE OR OTHER NON-BIODEGRADABLE MATERIAL.
9. SCARIFY SUBSOIL IN PLANTING BEDS TO A DEPTH OF 3 INCHES. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 6 INCHES OF TOPSOIL.
10. CONTRACTOR SHALL PROVIDE SMOOTH, NEATLY TRENCHED (3 INCH DEEP) BED EDGES.
11. ALL PLANTING BEDS TO HAVE A MINIMUM 4 INCH DEEP PINE BARK MULCH, PINE STRAW MULCH OR OTHER MULCH AS SPECIFIED.
12. DIMENSIONS FOR TRUNK CALIPER, HEIGHTS, AND SPREAD SPECIFIED ON THE MATERIAL SCHEDULE ARE A GENERAL GUIDE FOR THE MINIMUM REQUIRED SIZE OF EACH PLANT. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH A.N.S.I. Z80 "AMERICAN STANDARD FOR NURSERY STOCK" (CURRENT EDITION) AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
13. THE QUANTITIES INDICATED ON THE MATERIAL SCHEDULE ARE PROVIDED FOR THE BENEFIT OF THE CONTRACTOR, BUT SHOULD NOT BE ASSUMED TO ALWAYS BE CORRECT. IN THE EVENT OF A DISCREPANCY, THE PLANTING PLAN (PLANT SYMBOLS) WILL TAKE PRECEDENCE OVER THE MATERIAL SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS AND THE LIABILITY PERTAINING TO THOSE QUANTITIES AND ANY RELATED CONTRACT DOCUMENTS AND/OR PRICE QUOTATIONS.
14. CONTRACTOR TO WARRANTY ALL MATERIAL FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE.

SEEDING NOTES

1. SEED ALL DISTURBED AREAS WITH KY-31 AT THE RATE OF 5 POUNDS PER 1,000 S.F. ALL SEED TO BE 98% PURE WITH 85% GERMINATION AND CONFORM TO ALL STATE REQUIREMENTS FOR GRASS SEED. THE FERTILIZER TO BE 6-12-12 COMMERCIAL TYPE WITH 50% OF ITS ELEMENTS DERIVED FROM ORGANIC SOURCES.
2. PLACE STRAW MULCH ON SEEDED AREAS. STRAW TO BE OATS OR WHEAT STRAW, FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND DRY. HAY OR CHOPPED CORNSTALKS ARE NOT ACCEPTABLE.
3. THE CONTRACTOR SHALL VERIFY THAT THE PREPARED SOIL BASE IS READY TO RECEIVE WORK. CULTIVATE THE TOPSOIL TO A DEPTH OF 4 INCHES WITH A MECHANICAL TILLER AND SUBSEQUENTLY RAKE UNTIL SMOOTH. REMOVE FOREIGN MATERIALS COLLECTED DURING CULTIVATION AND RAKING OPERATIONS.
4. APPLY FERTILIZER ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. LIMESTONE MAY BE APPLIED WITH THE FERTILIZER. APPLY FERTILIZER AFTER SMOOTH RAKING AND PRIOR TO ROLLER COMPACTION AND MIX THOROUGHLY IN THE UPPER 2 INCHES OF TOPSOIL.
5. APPLY SEED EVENLY IN TWO INTERSECTING DIRECTIONS AND RAKE IN LIGHTLY. WATER TOPSOIL LIGHTLY PRIOR TO APPLYING SEED. DO NOT SEED AREA IN EXCESS OF THAT WHICH CAN BE MULCHED ON THE SAME DAY.
6. ROLL SEEDED AREA WITH ROLLER NOT EXCEEDING 112 POUNDS.
7. IMMEDIATELY FOLLOWING SEEDING AND COMPACTING, APPLY STRAW MULCH AT THE RATE OF ONE AND ONE HALF BALES PER 1,000 SQUARE FEET. IMMEDIATELY AFTER MULCHING, APPLY WATER WITH A FINE SPRAY AND SATURATE THE GROUND TO A DEPTH OF 4 INCHES.
8. CONTRACTOR IS RESPONSIBLE FOR WATERING SEEDED AREAS TO PREVENT GRASS AND SOIL FROM DRYING OUT UNTIL THE INSTALLATION IS INSPECTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR IS RESPONSIBLE FOR RESEEDING BARE SPOTS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF INSTALLATION.

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE	HEIGHT	SPACING	REMARKS
AL	2	ACER SACCHARUM 'LEGACY' / LEGACY SUGAR MAPLE	DECIDUOUS	2" CAL.		AS SHOWN	LIMED UP 6'
LM	7	LAGERSTROEMIA X 'MUSKOGEE' / LAVENDER CRAPE MYRTLE MULTI-TRUNK	DECIDUOUS	1.5" CAL.	8-10' HT	AS SHOWN	MULTI TRUNK- 3-5 CANES MAX.
TG	31	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	EVERGREEN		8-10' HT	AS SHOWN	B&B, MATCHED

SHRUBS	QTY	BOTANICAL NAME / COMMON NAME	TYPE	SIZE/HT	SPREAD	SPACING	REMARKS
PS	23	PRUNUS LAUROCERASUS 'SCHIPKAENSIS' / SCHIPKA LAUREL	EVERGREEN	4' HT.		AS SHOWN	MATCHED

811
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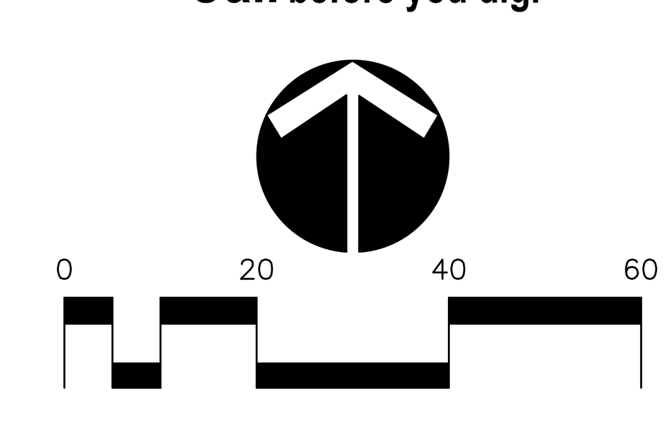

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FOR
BRIDGEMORE VILLAGE
TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

REVISIONS

JOB NO.	11052
WK. ORDER	9396
DESIGNED:	B. SMITH
DRAWN:	D. SIEBERG
SCALE:	1"=20'
DATE:	MARCH 01, 2017

LANDSCAPE PLAN

L1.0

RSA STANDARD NOTES

SITE GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES IN THE PROXIMITY OF THE CONSTRUCTION AREA AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.
2. THE CONTRACTOR SHALL CONFORM TO ALL LOCAL, STATE AND FEDERAL CODES AND OBTAIN ALL PERMITS PRIOR TO BEGINNING WORK.
3. THE CONTRACTOR SHALL CHECK ALL FINISHED GRADES AND DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.
4. DIMENSIONS ARE TO THE FACE OF CURB, EDGE OF CONCRETE AND FACE OF BUILDING UNLESS NOTED OTHERWISE.
5. PROPOSED BUILDING FOOTPRINT IS FOR GRAPHIC PURPOSES ONLY. CONTRACTOR SHALL USE THE CURRENT ARCHITECTURAL DRAWINGS FOR BUILDING STAKEOUT AND VERIFY THAT THERE ARE NO DISCREPANCIES WITH THESE PLANS.
6. ALL TRAFFIC MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICE (MUTCD). ALL PAVEMENT MARKING SHALL BE THERMOPLASTIC UNLESS DIRECTED OTHERWISE BY THE OWNER'S REPRESENTATIVE.
7. ALL HANDICAP RAMPS, PARKING SPACES AND ACCESSIBLE ROUTES SHALL COMPLY WITH THE CURRENT ADA REQUIREMENTS.
8. EXTERIOR DOOR LANDINGS SHALL BE PROVIDED PER THE LOCAL BUILDING CODE. CONTRACTOR SHALL COORDINATE DOOR LOCATIONS AND ADJACENT SIDEWALK/LANDING GRADES WITH THESE PLANS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE.

SITE CONSTRUCTION NOTES

1. THE NECESSARY PERMITS FOR THE WORK SHOWN ON THESE SITE DEVELOPMENT PLANS WILL BE OBTAINED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON THIS PROJECT. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND OBTAIN ALL PERMITS AND PAY ALL FEES INVOLVED IN SECURING SAID PERMITS. HE SHALL ALSO COMPLY WITH ALL CITY, COUNTY AND STATE BUILDING LAWS, ORDINANCES OR REGULATIONS RELATING TO THE CONSTRUCTION OF THE PROJECT.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL BEAR ALL EXPENSES OF FIELD STAKING NECESSARY FOR SITE AND BUILDING LAYOUT. ALL LAYOUT SHALL BE PERFORMED IN ACCORDANCE WITH THE SITE LAYOUT PLAN.
3. THE LOCATION OF EXISTING PIPING AND UNDERGROUND UTILITIES, SUCH AS WATER AND GAS LINES, ELECTRICAL AND TELEPHONE CONDUITS, ETC., AS SHOWN ON THIS PORTION OF THE PLANS HAVE BEEN DETERMINED FROM THE BEST AVAILABLE INFORMATION BY ACTUAL SURVEYS, OR TAKEN FROM THE RECORDS AND DRAWINGS OF THE EXISTING UTILITIES. HOWEVER, THE CIVIL ENGINEER DOES NOT ASSUME RESPONSIBILITY THAT, DURING CONSTRUCTION, THE POSSIBILITY OF UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED OR THAT ACTUAL LOCATION OF THOSE SHOWN MAY VARY SOMEWHAT FROM THE LOCATION DESIGNATED ON THIS PORTION OF THE PLANS. IN AREAS WHERE IT IS NECESSARY THAT THE EXACT LOCATIONS OF UNDERGROUND LINES BE KNOWN, THE CONTRACTOR SHALL, AT THIS OWN EXPENSE, FURNISH ALL LABOR AND TOOLS TO EITHER VERIFY AND SUBSTANTIATE OR DEFINITIVELY ESTABLISH THE LOCATION OF THE LINES.
4. THE CONTRACTOR MUST UNDERSTAND THAT THE WORK IS ENTIRELY AT HIS RISK UNTIL SAME IS ACCEPTED AND HE WILL BE HELD RESPONSIBLE FOR ITS SAFETY BY THE OWNER. THEREFORE, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY TEMPORARY WORKS FOR THE PROTECTION OF THE WORK, INCLUDING BARRICADES, WARNING SIGNS, AND LIGHTS.
5. THE SITE DEVELOPMENT PORTION OF THIS PROJECT WILL BE SUBJECT TO THE INSPECTION AND FINAL APPROVAL OF THE LOCAL PLANNING, CODES, WATER AND SEWER DEPARTMENTS (AND/OR UTILITY DISTRICTS), ENGINEERING/PUBLIC WORKS DEPARTMENTS AND FIRE MARSHAL'S OFFICE.
6. IF, DURING THE CONSTRUCTION OF THE SITE DEVELOPMENT PORTION OF THIS PROJECT, A QUESTION OF INTENT OR CLARITY ARISES FROM EITHER THE PLANS OR SPECIFICATIONS, THE CONTRACTOR WILL IMMEDIATELY BRING THE MATTER TO THE ATTENTION OF THE CIVIL ENGINEER OR OWNER'S REPRESENTATIVE FOR RESOLUTION BEFORE THE AFFECTED WORK ITEMS ARE INITIATED OR PURSUED FURTHER.
7. THE CONTRACTOR WILL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD AND/OR UNDERGROUND POWER LINES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK THE CONTRACTOR MUST WORK IN CLOSE PROXIMITY OF THE ABOVE-NOTED LINES, THE ELECTRIC AND/OR TELEPHONE COMPANIES SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN. THE CONTRACTOR SHOULD MAKE A THOROUGH EXAMINATION OF THE OVERHEAD LINES IN THE PROJECT AREA PRIOR TO THE INITIATION OF CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE PREMISES OR ADJACENT PREMISES, OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION OF THE WORK, CAUSED BY HIMSELF, HIS SUBCONTRACTORS, OR THE CARELESSNESS OF ANY OF HIS EMPLOYEES.

DEMOLITION NOTES

1. THE CONTRACTOR WILL BE REQUIRED TO REMOVE ALL EXCAVATED MATERIALS AND SUCH ITEMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ALL ITEMS SHALL BE PROPERLY DISPOSED OF AT AN OFF-SITE LOCATION. THE CONTRACTOR SHALL OUTLINE ANY AND ALL POSSIBLE HAUL ROUTES AND SHALL BE PREPARED TO SUBMIT SUCH TO THE LOCAL JURISDICTION PUBLIC WORKS DEPARTMENT, THE CIVIL ENGINEER AND OTHER AUTHORITIES FOR APPROVAL.
2. IF, AT ANY TIME, PRIOR TO OR DURING THE DEMOLITION WORK, HAZARDOUS MATERIAL IS ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE AND APPROPRIATE GOVERNMENTAL AGENCY.
3. THE CONTRACTOR SHALL NOTIFY ADJACENT OWNERS OF WORK THAT MAY AFFECT THEIR PROPERTY, POTENTIAL NOISE, UTILITY OUTAGE OR DISRUPTION. SUCH OPERATIONS SHALL BE CONDUCTED BY THE CONTRACTOR WITH MINIMUM INTERFERENCE TO ADJACENT OWNERS. ADJACENT EGRESS AND ACCESS SHALL BE PROPERLY MAINTAINED AT ALL TIMES. DO NOT CLOSE OR OBSTRUCT ANY ROADWAYS, PARKING OR SIDEWALKS WITHOUT PERMISSION FROM THE ADJACENT OWNERS OR THE LOCAL JURISDICTION PUBLIC WORKS DEPARTMENT.
4. PRIOR TO THE COMMENCEMENT OF DEMOLITION/GRADING OPERATIONS, ALL OVERHEAD AND UNDERGROUND UTILITIES SHALL BE LOCATED. ALL REMOVAL AND/OR RELOCATION OF UTILITIES SHALL BE COORDINATED WITH THE RESPECTIVE UTILITY COMPANIES.
5. THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER OR AROUND THE UTILITIES, THE CONTRACTOR WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT AT NO ADDITIONAL COST TO OWNER.
6. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR CONTACTING ALL AFFECTED UTILITIES PRIOR TO SUBMITTING HIS BID TO DETERMINE THE EXTENT TO WHICH UTILITY DISCONNECTIONS AND/OR ADJUSTMENTS WILL HAVE UPON THE SCHEDULE OF THE WORK FOR THE PROJECT. SOME UTILITY FACILITIES MAY NEED TO BE ADJUSTED CONCURRENTLY WITH THE CONTRACTOR'S OPERATIONS, WHILE SOME WORK MAY BE REQUIRED 'AROUND' UTILITY FACILITIES THAT WILL REMAIN IN PLACE. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACTOR WILL RECEIVE NO ADDITIONAL COMPENSATION FOR DELAYS OR INCONVENIENCE CAUSED BY THE UTILITY ADJUSTMENT.

EROSION PREVENTION AND SEDIMENT CONTROLS

DESIGN, INSPECTION, AND MAINTENANCE OF BMPS DESCRIBED AND SHOWN ON THESE PLANS SHALL BE CONSISTENT OR EXCEED RECOMMENDATIONS CONTAINED IN THE CURRENT EDITION OF TDEC'S TENNESSEE EROSION CONTROL HANDBOOK.

1. ALL CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, TDEC AND LOCAL STANDARDS.
2. BMP CAPACITY [SEDIMENT TRAPS, SILT FENCES, SEDIMENTATION PONDS, AND OTHER SEDIMENT CONTROL] SHALL NOT BE REDUCED BY MORE THAN 50% AT ANY GIVEN TIME. IF PERIODIC INSPECTIONS OR OTHER INFORMATION INDICATES A CONTROL HAS BEEN USED INAPPROPRIATELY OR INCORRECTLY, THE CONTRACTOR MUST REPLACE OR MODIFY THE CONTROL FOR RELEVANT SITE SITUATIONS.
3. WHERE PERMANENT OR TEMPORARY VEGETATION COVER IS USED AS A CONTROL MEASURE, THE TIMING OF THE PLANTING IS CRITICAL. PLANNING FOR PLANTING OF VEGETATION COVER DURING WINTER OR DRY MONTHS SHOULD BE AVOIDED.
4. IF SEDIMENT ESCAPES THE PERMITTED AREA, OFF-SITE ACCUMULATIONS OF SEDIMENT THAT HAVE NOT REACHED A STREAM MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFFSITE IMPACTS. THE CONTRACTOR SHALL NOT INITIATE REMEDIATION/RESTORATION OF A STREAM WITHOUT CONSULTING THE DIVISION FIRST. THE NOI GENERAL PERMIT DOES NOT AUTHORIZE ACCESS TO PRIVATE PROPERTY. ARRANGEMENTS CONCERNING REMOVAL OF SEDIMENT ON ADJOINING PROPERTY MUST BE SETTLED BY THE CONTRACTOR AND ADJOINING LANDOWNER.
5. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORM WATER SHALL BE PICKED UP PRIOR TO ANTICIPATED STORM EVENTS OR BEFORE BEING CARRIED OFF OF THE SITE BY WIND OR OTHERWISE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORM WATER DISCHARGES. AFTER USE, MATERIALS USED FOR EPSC SHOULD BE REMOVED OR OTHERWISE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORM WATER DISCHARGE.
6. ERODIBLE MATERIAL STORAGE AREAS (INCLUDING OVERBURDEN AND STOCKPILES OF SOIL) AND BORROW PITS ARE CONSIDERED PART OF THE SITE AND SHOULD BE ADDRESSED WITH APPROPRIATE BMP'S ACCORDINGLY.
7. PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED, OR DISTURBED MORE THAN 15 DAYS PRIOR TO GRADING OR EARTH MOVING UNLESS THE AREA IS STABILIZED. CONTRACTOR SHALL SEQUENCE EVENTS TO MINIMIZE THE EXPOSURE TIME OF GRADED OR DENUDED AREAS. CLEARING AND GRUBBING SHALL BE HELD TO THE MINIMUM NECESSARY FOR GRADING AND EQUIPMENT OPERATION. EXISTING VEGETATION AT THE SITE SHOULD BE PRESERVED TO THE MAXIMUM EXTENT PRACTICABLE.
8. EPSC MEASURES MUST BE IN PLACE AND FUNCTIONAL BEFORE MOVING OPERATIONS BEGIN AND MUST BE CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. TEMPORARY MEASURES MAY BE REMOVED AT THE BEGINNING OF THE WORKDAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.
9. THE FOLLOWING RECORDS SHALL BE MAINTAINED ON OR NEAR SITE: THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR; THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE OR A PORTION OF THE SITE; THE DATES WHEN STABILIZATION MEASURES ARE INITIATED; INSPECTION RECORDS AND RAINFALL RECORDS. CONTRACTOR SHALL MAINTAIN A RAIN GAUGE AND DAILY RAINFALL RECORDS AT THE SITE, OR USE A REFERENCE SITE FOR A RECORD OF DAILY AMOUNT OF PRECIPITATION.
10. A COPY OF THE SWPPP SHALL BE RETAINED ON-SITE AND SHOULD BE ACCESSIBLE TO THE DIRECTOR AND THE PUBLIC. ONCE SITE IS INACTIVE OR DOES NOT HAVE AN ONSITE LOCATION ADEQUATE TO STORE THE SWPPP, THE LOCATION OF THE SWPPP, ALONG WITH A CONTACT PHONE NUMBER, SHALL BE POSTED ON-SITE. IF THE SWPPP IS LOCATED OFF-SITE, REASONABLE LOCAL ACCESS TO THE PLAN, DURING NORMAL WORKING HOURS, MUST BE PROVIDED.
11. OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION ACCESS (A POINT OF ENTRANCE/EXIT TO A CONSTRUCTION SITE) SHALL BE CONSTRUCTED AS NEEDED TO REDUCE THE TRACKING OF MUD AND DIRT ONTO PUBLIC ROADS BY CONSTRUCTION VEHICLES.
12. INSPECTIONS MUST BE PERFORMED AT LEAST TWICE EVERY CALENDAR WEEK. INSPECTIONS SHALL BE PERFORMED AT LEAST 72 HOURS APART. WHERE SITES OR PORTIONS OF CONSTRUCTION SITES HAVE BEEN TEMPORARILY STABILIZED, OR RUNOFF IS UNLIKELY DUE TO WINTER CONDITIONS OR DUE TO EXTREME DROUGHT, SUCH INSPECTION HAS TO BE CONDUCTED ONCE PER MONTH UNTIL THAWING OR PRECIPITATION RESULTS IN RUNOFF OR CONSTRUCTION ACTIVITIES RESUMES. INSPECTION REQUIREMENT DO NOT APPLY TO DEFINABLE AREAS THAT HAVE BEEN FINALLY STABILIZED, AS DESIGNED BY THE ENGINEER. WRITTEN NOTIFICATION OF THE INTENT TO CHANGE THE INSPECTION FREQUENCY AND THE JUSTIFICATION FOR SUCH REQUEST MUST BE SUBMITTED TO THE LOCAL ENVIRONMENTAL FIELD OFFICE, OR THE DIVISION'S NASHVILLE CENTRAL OFFICE FOR PROJECTS OF TDOT OR TVA. SHOULD THE DIVISION DISCOVER THAT MONTHLY INSPECTION OF THE DIVISION DISCOVER THAT MONTHLY INSPECTIONS OF THE SITE ARE NOT APPROPRIATE DUE TO INSUFFICIENT STABILIZATION MEASURES OR OTHERWISE, TWICE WEEKLY INSPECTIONS SHALL RESUME. THE DIVISION MAY INSPECT THE SITE TO CONFIRM OR DENY THE NOTIFICATION TO CONDUCT MONTHLY INSPECTIONS.
13. INSPECTORS PERFORMING THE REQUIRED TWICE WEEKLY INSPECTIONS MUST HAVE AN ACTIVE CERTIFICATION AND A RECORD OF CERTIFICATION MUST BE KEPT ON SITE. BASED ON THE RESULTS OF THE INSPECTION, ANY INADEQUATE CONTROL MEASURES OR CONTROL MEASURES IN DISREPAIR SHALL BE REPLACED OR MODIFIED, OR REPAIRED AS NECESSARY, BEFORE THE NEXT RAIN EVENT, BUT IN NO CASE MORE THAN 7 DAYS AFTER THE NEED IDENTIFIED.
14. OUTFALL POINTS SHALL BE INSPECTED TO DETERMINE WHETHER EPSC MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS. WHERE DISCHARGE LOCATIONS ARE INACCESSIBLE, NEARBY DOWNSTREAM LOCATIONS SHALL BE INSPECTED. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING.

TREE PROTECTION NOTES

1. ANY REQUIRED EXCAVATION IN OR AROUND THE PROTECTION ZONE TO ACCOMMODATE UNDERGROUND SERVICES, FOOTINGS, ETC., SHALL BE INDICATED ON THE PLAN, AND SHALL BE EXCAVATED BY HAND. IN ADDITION, RELATED ROOT PRUNING SHALL BE ACCOMPLISHED BY A CERTIFIED ARBORIST VIA ANSI A-300-95 STANDARD SO AS TO MINIMIZE IMPACT OF THE GENERAL ROOT SYSTEM.
2. THE STORAGE OF BUILDING MATERIALS OR STOCKPILING SHALL NOT BE PERMITTED WITHIN THE LIMITS OF OR AGAINST THE PROTECTION BARRIERS.
3. TREES WITHIN THE PROTECTION BARRIERS MUST BE ADEQUATELY CARED FOR THROUGHOUT THE CONSTRUCTION PROCESS (I.E., THEY MUST BE WATERED SUFFICIENTLY, PARTICULARLY IF THE TREE'S ROOT SYSTEM HAS BEEN DISTURBED BY EXCAVATION). FILL SHALL NOT BE PLACED UPON THE ROOT SYSTEM IN SUCH A MANNER AS TO ENDANGER THE HEALTH OR LIFE OF THE AFFECTED TREE.
4. TREE PROTECTION BARRIER SHALL BE CONSTRUCTED PRIOR TO THE ISSUANCE OF ANY PERMITS AND SHALL REMAIN INTACT THROUGHOUT THE ENTIRE PERIOD OF CONSTRUCTION.

SITE GRADING & STORM DRAINAGE NOTES

EROSION CONTROL SEDIMENT BARRIERS AND TREE PROTECTION BARRIER SHALL BE INSTALLED PRIOR BEGINNING SITE WORK.

1. NO HEAVY EQUIPMENT SHALL CROSS OR BE STORED OUTSIDE THE LIMITS OF CONSTRUCTION, WITHIN TREE PROTECTIONS ZONES, OR UNDER THE DRIP LINE OF EXISTING TREES TO REMAIN.
2. TOPSOIL STRIPPED FROM AREAS TO BE GRADED SHALL BE STOCKPILED ON SITE IN A LOCATION APPROVED BY THE OWNER'S REPRESENTATIVE. DRAINAGE SHALL BE ROUTED AROUND STOCKPILE LOCATIONS FOR THE DURATION OF GRADING OPERATIONS. EROSION CONTROL MEASURES SHALL BE INSTALLED TO PREVENT LOSS OF TOPSOIL MATERIAL.
3. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL REVIEW GEOTECHNICAL REPORT.
4. ALL CUT AND FILL SHALL BE PERFORMED UNDER THE DIRECTION/OBSERVATION OF THE GEOTECHNICAL ENGINEER.
5. THE SUITABILITY OF SOILS FOR FILL MATERIAL SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
6. UNLESS DIRECTED OTHERWISE BY GEOTECHNICAL ENGINEER, ALL FILL AREAS SHALL BE RAISED IN LIFTS NOT EXCEEDING 8" IN THICKNESS. THE RELATIVE COMPACTION OF EACH LAYER SHALL NOT BE LESS THAN 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698) IN ALL AREAS OF FILL WITHIN OPEN AREAS AND 98% OF SAME SPECIFICATION FOR AREAS UNDER ROADS, PARKING, SIDEWALKS, BUILDING SLABS, AND FOUNDATIONS.
7. ALL GRADING SHALL BE COMPLETED TO THE GRADES INDICATED WITHIN THESE PLANS. FINAL GRADES SHALL PROVIDE PROPER DRAINAGE AND PREVENT STANDING WATER.
8. ALL STORM DRAINAGE CASTINGS TO BE JOHN BOUCHARD & SONS CO. OR APPROVED EQUAL, UNLESS OTHERWISE NOTED.
9. ALL STORM DRAINAGE PIPES TO BE RCP, CLASS III, UNLESS OTHERWISE NOTED.
10. INSTALLATION OF PIPE MATERIAL SHALL BE PLACED WITH A SCREEN STONE ENVELOPE AND WHEN UNDER PAVEMENT ENTIRE TRENCH TO BE BACKFILLED WITH SCREEN STONE TO SUBGRADE. SIZE OF STONE, ENVELOPES, AND TRENCHES TO BE SPECIFIED BY MUNICIPALITIES FOR PUBLIC LINES AND PRIVATE LINES TO ADHERE TO COMMON PRACTICES FOR INSTALLATION REQUIREMENTS.

SITE UTILITY NOTES

1. ALL MATERIALS AND WORKMANSHIP FOR UTILITY LINES AND APPURTENANCES SHALL BE IN STRICT COMPLIANCE WITH THE GOVERNING UTILITY COMPANY AND LOCAL CODES. PRIOR TO CONSTRUCTION CONTRACTOR SHALL NOTIFY UTILITY COMPANY. (SEE UTILITY CONTACT INFORMATION)
2. CONTRACTOR SHALL COORDINATE SITE ELECTRICAL, GAS, TELEPHONE, AND CABLE WITH THE RESPECTIVE UTILITY COMPANY FOR SERVICE LAYOUT AND DESIGN INFORMATION. ANY PROPOSED LAYOUT OF THESE UTILITIES DEPICTED ON THESE DRAWINGS IS GRAPHICAL ONLY AND NOT INTENDED TO REPRESENT DESIGN OF THESE UTILITIES.
3. PRIOR TO COMMENCEMENT OF CONSTRUCTION, CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ANY REQUIRED TAP AND CONNECTION FEES.
4. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
5. SITE CONTRACTOR SHALL CONSTRUCT ALL UTILITY SERVICES TO WITHIN 5' OF BUILDING.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES TO AVOID CONFLICTS.
7. CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF WATER, SEWER AND STORMWATER CONNECTIONS TO THE BUILDING AS DEPICTED ON THE BUILDING MECHANICAL PLANS AND THE SITE UTILITY PLAN AND NOTIFY THE ENGINEER OR OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
8. WATER SERVICES LINES ¾" - 3" SHALL BE TYPE-K COPPER AND 4" OR LARGER SHALL BE DUCTILE IRON PIPE - CLASS 52 UNLESS OTHERWISE REQUIRED BY UTILITY COMPANY.
9. FIRE LINE INSTALLATION AND THRUST BLOCKING LOCATION AND SIZING SHALL BE PER N.F.P.A. AND LOCAL FIRE DEPARTMENT REQUIREMENTS.
10. WATER METER MANUFACTURER/MODEL NUMBER AND VAULT SPECIFICATIONS SHALL BE PER THE WATER UTILITY COMPANY.
11. BACKFLOW DEVICE (RPBP/DDCVA) MANUFACTURER/MODEL NUMBER SHALL BE PER THE WATER UTILITY COMPANY.
12. CONTRACTOR SHALL INSTALL HOT BOX ENCLOSURE (PRE-FINISHED DARK GREEN) ON ALL EXTERIOR ABOVE-GROUND BACKFLOW DEVICES. DOMESTIC AND FIRE BACKFLOW DEVICES SHALL BE HEATED. CONTRACTOR SHALL COORDINATE PROVIDING APPROPRIATE ELECTRICAL SERVICE TO BACKFLOW DEVICE.
13. CONTRACTOR SHALL COORDINATE LOCATION OF BACKFLOW DEVICE WITH THE BUILDING MECHANICAL DRAWINGS.
14. SANITARY SEWER SERVICE LINES SHALL BE SDR 35 PVC UNLESS SPECIFIED OTHERWISE.
15. MAINTAIN A 10' HORIZONTAL AND 18" VERTICAL SEPARATION BETWEEN SANITARY SEWER AND WATER LINES.
16. ALL FIRE LINE MAINS TO BE INSTALLED BY LICENSED FIRE PROTECTION CONTRACTOR.
17. INSTALLATION OF PIPE MATERIAL SHALL BE PLACED WITH A SCREEN STONE ENVELOPE AND WHEN UNDER PAVEMENT ENTIRE TRENCH TO BE BACKFILLED WITH SCREEN STONE TO SUBGRADE. SIZE OF STONE, ENVELOPES, AND TRENCHES TO BE SPECIFIED BY MUNICIPALITIES FOR PUBLIC LINES AND PRIVATE LINES TO ADHERE TO COMMON PRACTICES FOR INSTALLATION REQUIREMENTS.

GEOTECHNICAL NOTE

1. NO GEOTECHNICAL STUDY HAS BEEN CONDUCTED ON THIS SITE. HOWEVER, THE DESIGN FOR THE SITE IMPROVEMENTS SHOWN ON THIS PLAN HAS RELIED ON EXPERIENCE WITH SIMILAR PROJECTS AND SIMILAR SOIL/SITE CONDITIONS. IF, IN THE PURSUIT OF THIS WORK BY THE CONTRACTOR, CONDITIONS OR CIRCUMSTANCES ARE ENCOUNTERED THAT ARE DIFFERENT THAN REFLECTED IN THESE PLANS OR THAT APPEAR TO IMPACT THE SCOPE OF THE WORK, THE CONTRACTOR WILL IMMEDIATELY NOTIFY THE CIVIL ENGINEER, AND THE OWNER/DEVELOPER BEFORE ANY REMEDIAL COURSE OF ACTION OR DESIGN CHANGE IS INITIATED. ALL PARTIES (OWNER, CIVIL ENGINEER, PROPER GOVERNMENTAL AGENCIES, AND CONTRACTOR) MUST BE IN AGREEMENT AND THE MAGNITUDE OF THE COST/TIME REQUIRED FOR THE MEASURES ESTABLISHED.

RSA SPECIAL NOTES

PROJECT SPECIFIC NOTES

THIS PROJECT WILL BE SUBJECT TO THE INSPECTION AND FINAL APPROVAL OF THE TOWN OF THOMPSON'S STATION

RAGAN·SMITH
LAND PLANNERS • CIVIL ENGINEERS
LANDSCAPE ARCHITECTS • SURVEYORS
NASHVILLE
315 WOODLAND STREET
P.O. BOX 60070
NASHVILLE, TN 37206
(615) 244-8591
CHATTANOOGA
1413 COWART STREET
SUITE 200
CHATTANOOGA, TN 37408
(423) 490-9400
• www.ragansmith.com •

BRETT ALAN
REGISTERED
LANDSCAPE ARCHITECT
TENNESSEE NO. 500

SUPPLEMENTAL AMENITIES
FOR
BRIDGEMORE VILLAGE

TOWN OF THOMPSON'S STATION, WILLIAMSON COUNTY, TENNESSEE

JOB NO. 11052	WK. ORDER 9396
DESIGNED:	B. SMITH
DRAWN:	D. SIEBERG
SCALE:	N/A
DATE:	MARCH 01, 2017

REVISIONS

CIVILL NOTES

N1.0

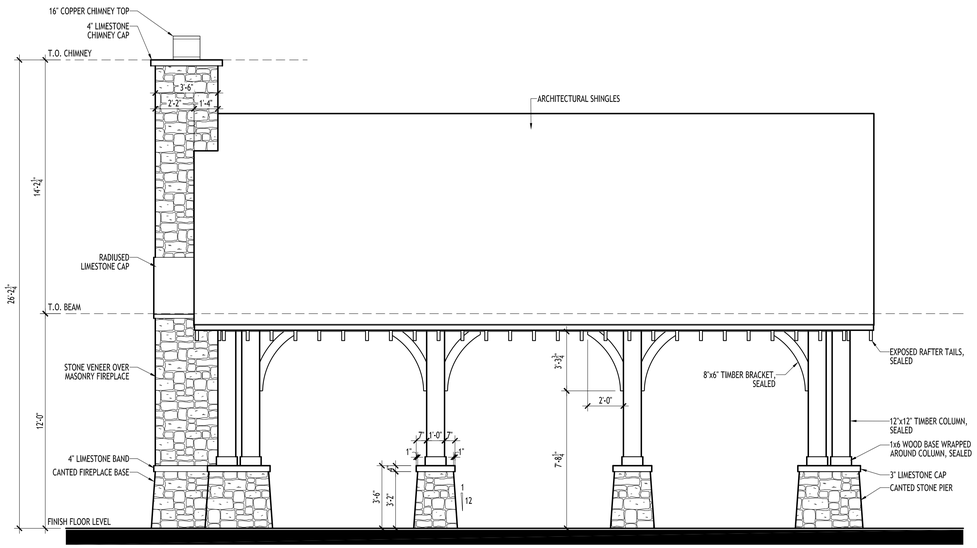
SEAL:

C3 Studio LLC
312 Gay Street · #200
Knoxville · TN 37902
843-309-4461
www. C3StudioLLC.com

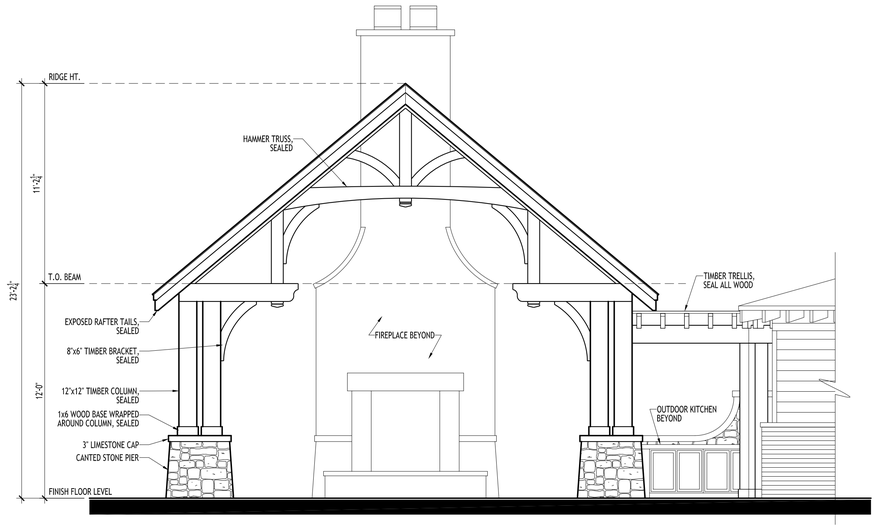
NOT FOR CONSTRUCTION

AMENITY PAVILION

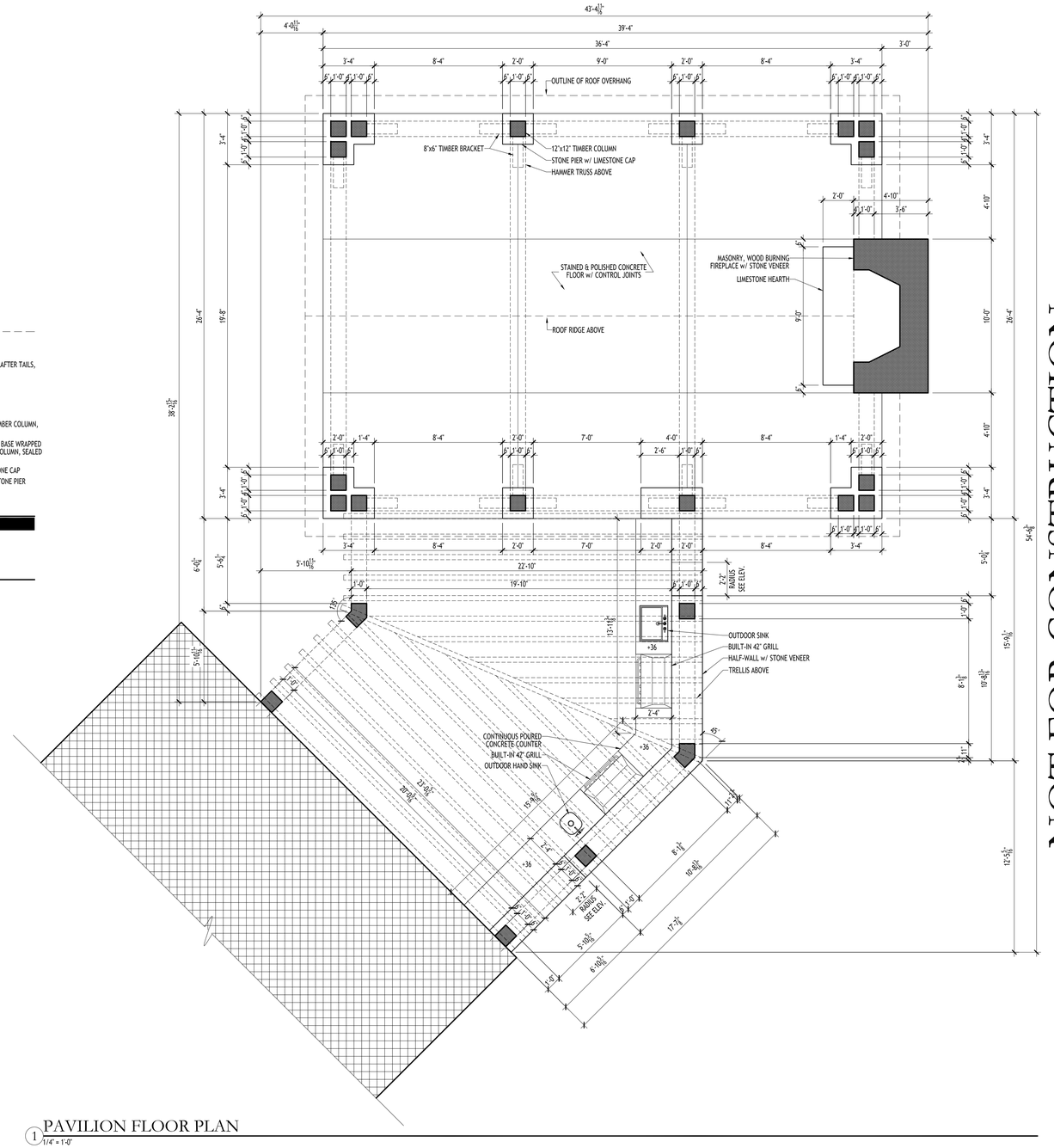
BRIDGEMORE VILLAGE, THOMPSON'S STATION, TN



3 PAVILION NORTH ELEVATION
1/4" = 1'-0"



2 PAVILION WEST ELEVATION
1/4" = 1'-0"



1 PAVILION FLOOR PLAN
1/4" = 1'-0"

REVISIONS
#1: --

DATE
December 8, 2016

PROJECT
160304

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DLG	DLG

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AMENITY PAVILION

BRIDGEMORE VILLAGE, THOMPSON'S STATION, TN

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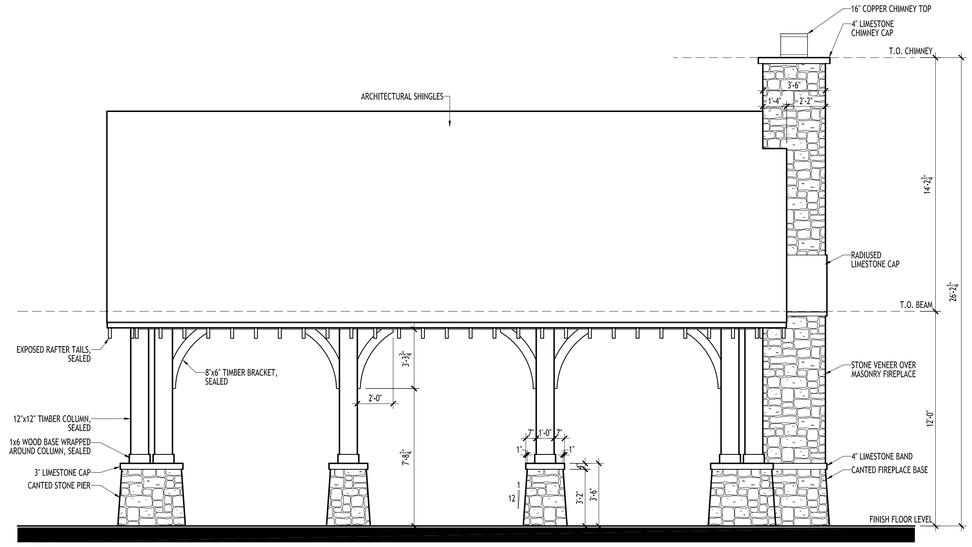
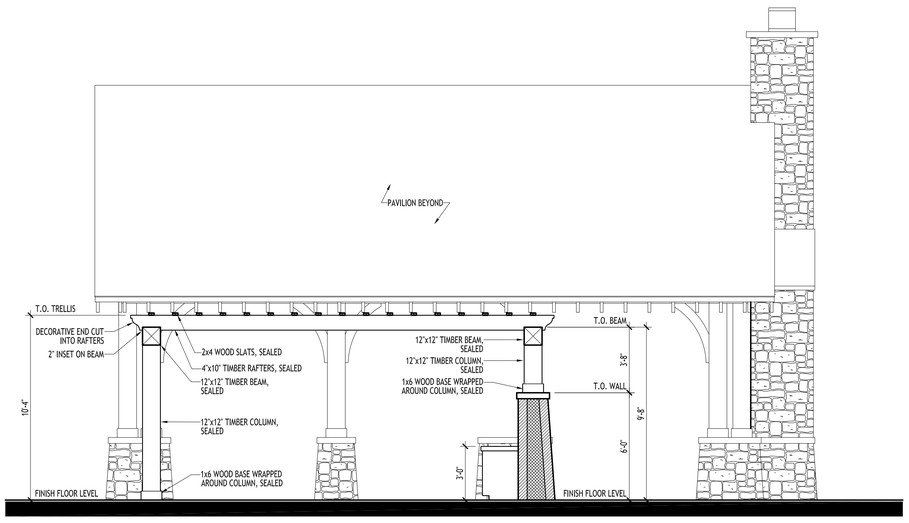
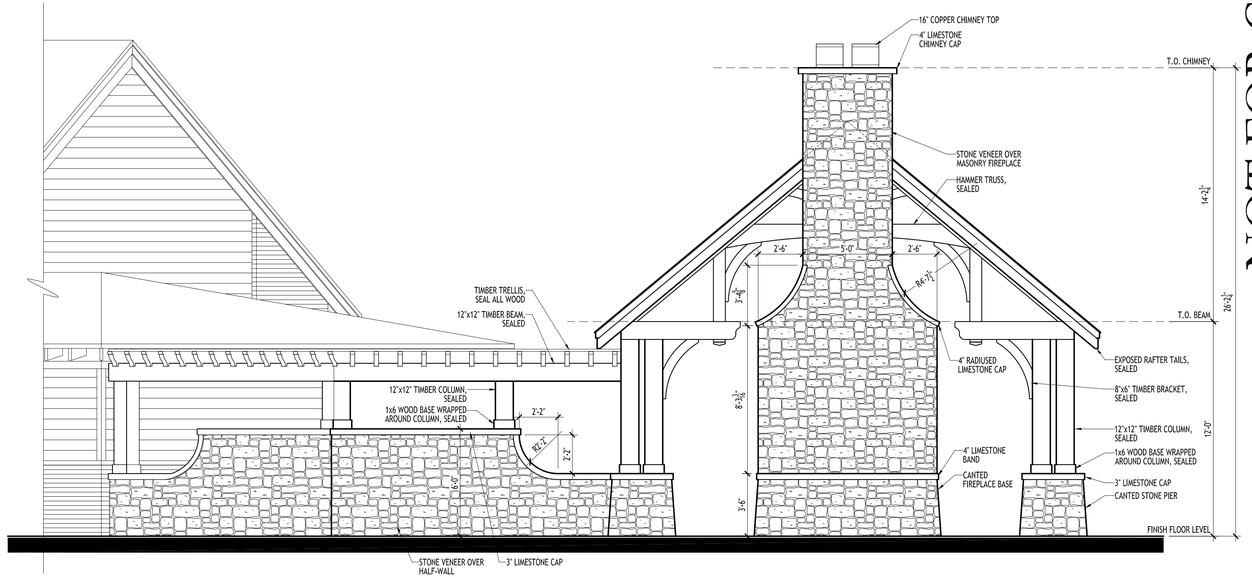


2 PAVILION SOUTH ELEVATION
1/4" = 1'-0"



3 PAVILION TRELLIS SECTION
1/4" = 1'-0"



1 PAVILION EAST ELEVATION
1/4" = 1'-0"

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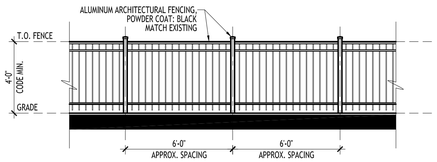
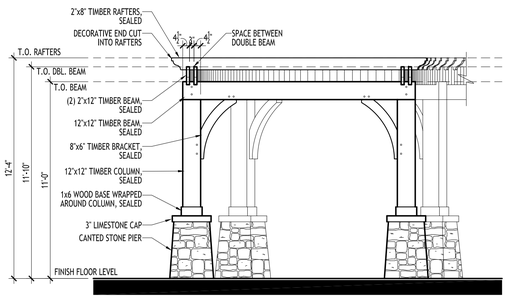
AMENITY PAVILION

BRIDGEMORE VILLAGE, THOMPSON'S STATION, TN

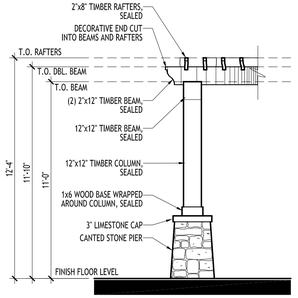


NOTE: FENCING MATERIALS, FINISH, SPACING, AND CONSTRUCTION MUST MEET ALL LOCAL AND STATE CODE REQUIREMENTS FOR COMMERCIAL POOL FENCING

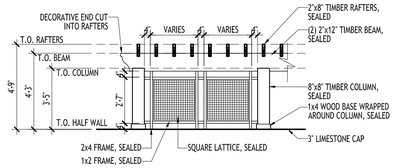
9 FENCE ELEVATION
1/4" = 1'-0"



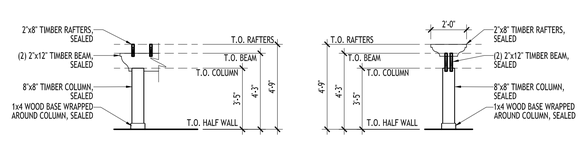
4 PERGOLA SIDE ELEVATION
1/4" = 1'-0"



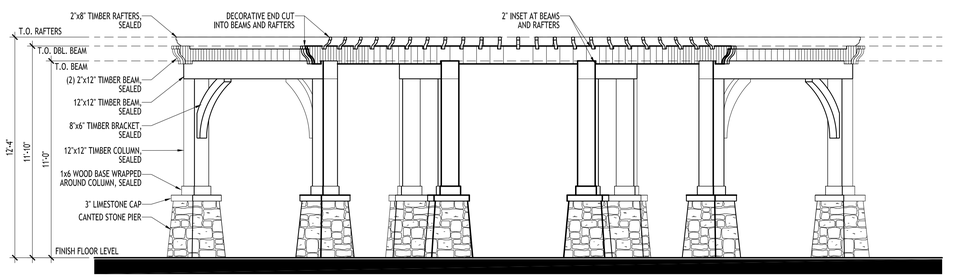
3 PERGOLA COLUMN ELEVATION
1/4" = 1'-0"



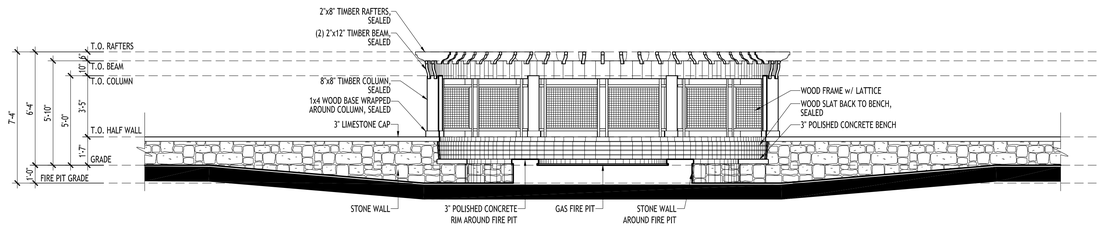
8 FIRE PIT LATTICE ELEVATION
1/4" = 1'-0"



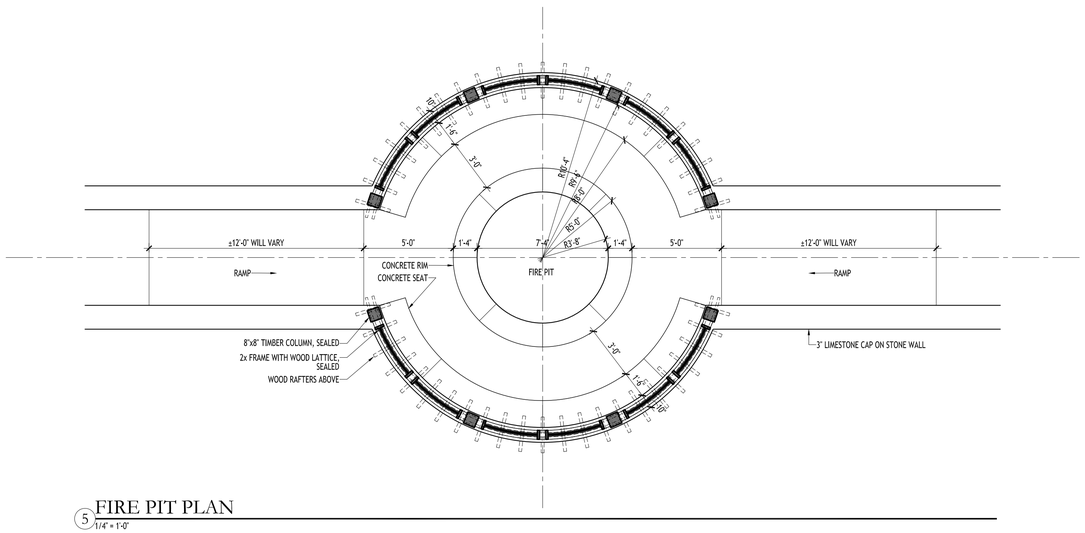
7 FIRE PIT COLUMN ELEVATIONS
1/4" = 1'-0"



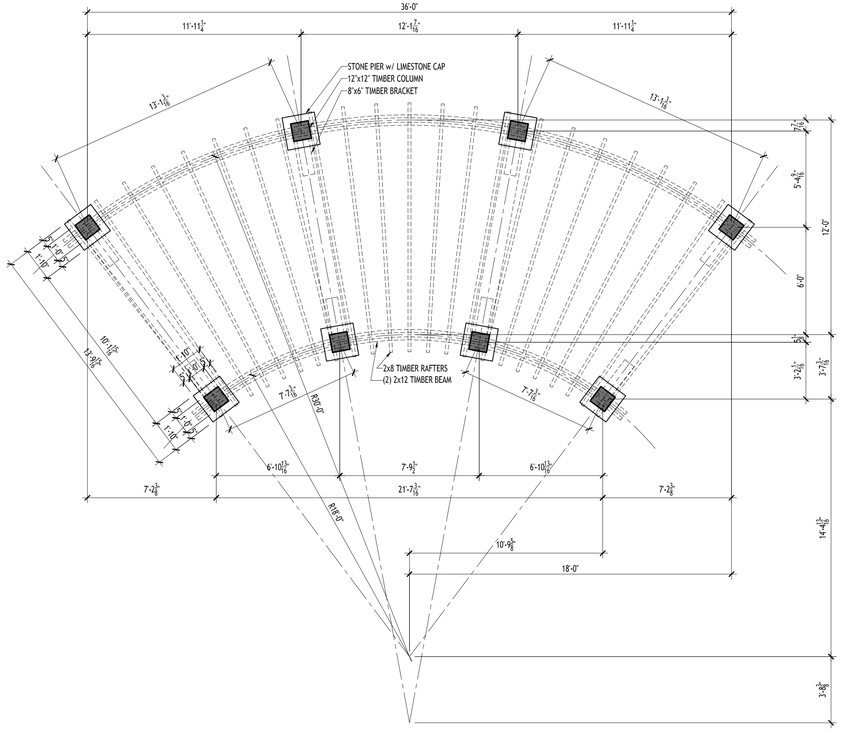
2 PERGOLA FRONT ELEVATION
1/4" = 1'-0"



6 FIRE PIT ELEVATION/SECTION
1/4" = 1'-0"



5 FIRE PIT PLAN
1/4" = 1'-0"



1 PERGOLA PLAN
1/4" = 1'-0"

REVISIONS
#1: --

DATE
December 8, 2016

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