CITY OF CHARLES TOWN
PLANNING COMMISSION
AGENDA • JANUARY 22, 2024

Commission/Board Meeting | **CITY HALL** | **7:00 PM**

101 E Washington Street, Charles Town, WV 25414

1. CALL TO ORDER

2. WORK SESSION
Postponed to later date

3. CALL TO ORDER

4. APPROVAL OF MINUTES

: Draft September 25, 2023 Minutes
9.25.23 PC MINUTES_DRAFT.pdf

: Draft October 24, 2023 minutes
10.24.23 PC MINUTES_DRAFT.pdf

: Draft November 27, 2023 minutes
11.27.23 PC MINUTES_DRAFT.pdf

5. UNFINISHED BUSINESS

6. NEW BUSINESS

41. : **Election of Officers:**
-President
-Vice-President
-Secretary (per by-laws, shall be a Planning Staff member)

42. : **Public Hearing:** SLD2023-04: Fairview - Sketch Plan
1. Staff Report.pdf
2. Application.pdf
3. Plans.pdf
4. Traffic Study.pdf
5. 2023 Revised and signed COA.pdf
6. 2005 Original CoA.pdf

43. : **Public Hearing**: ZMA2023-03: Vinton Hayes - Rezoning to Urban Reserve
1. Staff Report.pdf
2. Application.pdf
3._Site.pdf
4._Original_Conditions_of_Annexation.pdf
5._Original_hayes_concept-drawing.pdf
6._COA_Revised.pdf

44. : **Public Hearing:** WV 2023-08: Happy Retreat - Waiver from lighting standards
   1. Staff Report.pdf
   2. Application.pdf
   3. Lighting Plan and Details.pdf
   4. Lighting Specs.pdf

45. : **Public Hearing**: WV2023-09: Mark Letenzi - Waiver from lighting standards
   1. Staff Report.pdf
   2._Application.pdf
   3._2024-01-12_Public_Comment.pdf
   4._2024-01-08_Public_Comment.pdf
   5. Public Comment.pdf
   6._Installed_Lighting_Specifications.pdf
   7._2024-01-17_Staff_Pictures.pdf
   8._Approved_Plans.pdf

46. : **Public Hearing**: BR2023-10 - Norborne Glebe Phase Candlewood Drive Extension - Bond Release
   1. Staff Report.pdf
   2._Application.pdf
   3._KH_Review.pdf
   4._Applicant_Consultant_Review.pdf
   5._As-Built_Diagrams.pdf

47. : **Public Hearing**: BR2023-11: Norborn Glebe Phase 14A- Bond Release
   1. Staff Report.pdf
   2._Application.pdf
   3._KH_Review.pdf
   4._Applicant_Consultant_Review.pdf
   5._As-Built_Diagrams.pdf

48 : Commission Review: SLD2023-02: Westover Dental - Preliminary Plan
   1. Staff Report.pdf
   2. Application.pdf
   3. Revised Plans.pdf
   4. KH Review.pdf
   5. 2024-01-18 Comment response.pdf
   6. CTUB.pdf

49. : *Commission Review:*SLD2023-04: Hillside - Preliminary Plan
POSTPONED TO FEBRUARY 26 MEETING

50. : *Commission Review:* SLD2023-07 : Happy Retreat - Preliminary Plan
POSTPONED TO FEBRUARY 26 MEETING

51. : *Commission Review*: 2024 Meeting Calendar
   2024-Planning-Commission DRAFT.docx

7. ADJOURNMENT

8. NOTICE: The Public May View the Meeting Live by Clicking on the Event Link at:

https://www.charlestownwv.us/government/agendas-and-minutes/

Planning Commission
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

AGENDA ITEM (ID #)

Draft September 25, 2023 Minutes

ATTACHMENTS:

- 9.25.23 PC MINUTES_DRAFT.pdf

CITY OF CHARLES TOWN
PLANNING COMMISSION MEETING
MINUTES • SEPTEMBER 25, 2023

Committee Meeting **CITY HALL** **6:00 PM**
101 E Washington Street, Charles Town, WV 25414

1. CALL TO ORDER – Work Session

Present: Ann Paonessa - Chair
Angie Cummings - Secretary
Kevin Long
Jeff Hynes
Jessica Derr – Attended Virtually
James Newman, City Staff: Zoning Administrator

2. NEW BUSINESS – Work Session

2.1 : Text Amendment – Open Space Requirements

Staff gave presentation.

Commission discussion. Desire to see a pro-rata share of open space when there are different uses. Additionally, add language that states "To the fullest extent possible open space for townhomes must be located near the townhomes." The Commission requested
Staff bring a text amendment to the next available public hearing.

2.2 : Text Amendment – Commercial Pad Site Preparation

Staff gave presentation.

Commission discussion. Commissioners generally in favor. Change percentage requirement to 30%. Use similar language adopted by City of Frederick MD.

Work Session Adjourned at 6:46

3. CALL TO ORDER – Regular Session at 7pm.

4. APRROVAL OF MINUTES

No minutes to approve.

5. UNFINISHED BUSINESS

5.1 : SLD2023-08 – Huntfield Phase 3B

Staff gave presentation.

Applicant not present.

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Item was tabled at prior meeting.

Motion to remove item from table.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Long, Derr, Hynes, Cummings, Paonessa

Motion to deny request for plan changes.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Long, Derr, Hynes, Cummings, Paonessa

6. NEW BUSINESS

6.1 : ZMA2023-01 – Vinton-Hayes Property Rezoning

Staff gave presentation.

Commission: Is Neighborhood Commercial not a viable zoning district for this site because of the nature of the site or because of the applicant's development plans?

Staff: Because of the applicant's plans.

Applicant: Revised COA for site because the proposed development around a commercial/hospital core did not come to fruition over 17 years. Existing zoning is not working for the site, and the property owners have worked with the City to make this property developable. The Commercial zoning aspect holds the site back. Aware of the requirement for Urban Reserve rezoning to come first but operated with the understanding that if a viable project came along then the Urban Reserve zoning would not be needed.

Applicant gave presentation.

Commission: Did the developer reach out to anyone in the City?

Applicant: Spoke with ward members and the City CoA Committee.

Commission: Considered Neighborhood Commercial zoning as an alternative zoning district?

Applicant: No, as we have no desire for commercial development.

No further questions for the applicant.

Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Long, Derr, Hynes, Cummings, Paonessa

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Robin Thomas: Expressed concern about floodplain, access, traffic, infrastructure, stormwater and wildlife. Keep current zoning or lower the impact of development.

Karen Furr: Expressed concerned about impact on well water. Concerned about potential impacts to archaeological remains. Concern about environmental impact and traffic.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Long, Derr, Hynes, Cummings, Paonessa

Commission: Concern about UR nullification requirements not being met and the need to follow process.

Motion to recommend Urban Reserve Zoning.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Long, Derr, Hynes, Cummings, Paonessa

6.2 : SLD2023-03 – Alla Willa Dr. Casino – Preliminary Plan Review

Staff gave presentation.

No questions or comments.

Motion to approve preliminary plan.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Long, Derr, Hynes, Cummings, Paonessa

6.3 : WV2023-07: Waiver Request by Joan and Joe's Coffee

Staff gave presentation.

Commission: Questioned requirement regarding sidewalks, concerns with issues of safety and sidewalk requirements.

Staff: The goal is to plug in gaps where there are missing sidewalks. The waiver would keep gaps in place.

Joe Hague, Engineer: Wants commission to entertain an option for Joan and Joe’s Coffee to provide a sidewalk easement in the future when the full street sidewalk can be built. Property ends at telephone pole and discusses gap in continuance of sidewalk due to property lines.

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Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Hynes
AYES:	Long, Derr, Hynes, Cummings, Paonessa

No comments.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Hynes
AYES:	Long, Derr, Hynes, Cummings, Paonessa

Motion to deny sidewalk waiver request. {Cummings against motion}

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Long, Derr, Hynes, Paonessa

Motion to approve waiver from curb and gutter.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Cummings
AYES:	Long, Derr, Hynes, Cummings, Paonessa

6.4: SLD2023-09 – Joan and Joe's Coffee – Sketch Plan Completeness

Staff gave presentation.

Motion to deem application complete.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Cummings
AYES:	Long, Derr, Hynes, Cummings, Paonessa

6.5: SLD2023-02 – Westover Dental – Sketch Plan Completeness Review

Staff gave presentation.

Motion to deem application complete.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Cummings
AYES:	Long, Derr, Hynes, Cummings, Paonessa

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7. ADJOURNMENT

Adjourned at 8:54 pm.

DRAFT

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Draft October 24, 2023 minutes

ATTACHMENTS:

- 10.24.23 PC MINUTES_DRAFT.pdf

CITY OF CHARLES TOWN
PLANNING COMMISSION
AGENDA ● OCTOBER 23, 2023

Committee Meeting **CITY HALL** **6:00 PM**
101 E Washington Street, Charles Town, WV 25414

1. CALL TO ORDER

Present: Ann Paonessa, Chair – Attended Virtually
Jessica Derr – Acting Chair
Angie Cummings - Secretary
Jeff Hynes

Kevin Long – Absent

City Staff: James Newman - Zoning Administrator

2. WORK SESSION

2.1: TXA2023-06 - Minor Subdivision requirements

Staff presentation.

Commission discussion: Remove lot width language. Investigate easement requirements and ability to enforce, confirm any potential negative impacts of allowing mergers by multiple owners and research into zoning boundary adjustments when boundary lines are moved.

2.2: TXA2023-09 - Neighborhood-Residential Use Changes

Staff Presentation.

Commission discussion: Update item 3 to clarify that Neighborhood Commercial uses must be commercial in nature. Tennis/racquet club to be Special Exception Use not Permitted Use. Animal clinic to be Permitted Use.

Work Session Adjourned at 6:53 pm

3. CALL TO ORDER - Regular Session at 7pm.

4. APPROVAL OF MINUTES

Motion by Commissioner Derr to approve August 28, 2023 Minutes with the following change: Add explanation to item 4 explaining why it was tabled.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Paonessa
AYES:	Derr, Hynes, Cummings, Paonessa

5. UNFINISHED BUSINESS

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5.1: SLD2023-04 - Fairview Subdivision: Completeness Review

Staff gave presentation.

Commission: Would like to see Jefferson County parcels that include neighboring development be included on the plan in order to view how this plan fits into the overall area. Concerned about traffic in the area with the new housing and interested in a potential traffic study.

Motion to deem application complete.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Paonessa
AYES:	Derr, Hynes, Cummings, Paonessa

6. NEW BUSINESS

6.1: SLD2023-02 Westover Dental Sketch Plan

Staff gave presentation.

Commission: Why did the plan change so dramatically?

Applicant: Due to requirements of the covenants. Restrictions more severe than City setbacks and not all property owners signed off on allowing waiver from covenants.

Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa

James Bright: Concerned about construction noise and the longevity of the building in this location.

Caroline Bright: Concerned about noise, light and what landscaping will be provided.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Derr
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa

Motion to approve sketch plan.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Paonessa
AYES:	Derr, Hynes, Cummings, Paonessa

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6.2: SLD2023-09 Joan and Joe's Coffee Sketch Plan

Staff gave presentation.

Commission: Access easement needed?

Staff: Would be good to have but there is no Code Requirement.

Commission: Where is the exit in reference to the residential property.

Applicant: Entrance and exit are separated. Exit access road is adjacent to residential property.

Commission: How does the resident next door feel about this?

Staff: We have received no public comment.

Commission: If in the future the property gets sold, how would the entrance and exit access roads be handled.

Staff: An access easement would be needed if property is split and there is no road frontage. If they both properties have road frontage, the matter of if there is enough road width to safely accommodate two-way traffic.

Commission: Bio-retention ponds to be landscaped?

Applicant: Yes.

Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Cummings
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa

Commissioner Paonessa left at 7:48 pm

6.3: TXA2023-07 Commercial Pad Site requirements

Staff gave presentation.

Commission: Do we need to specify what qualifies as 'utility' installation?

Staff: Will change to "utilities" and add a definition to define utilities.

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Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings

No comments

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings

Commission discussion: Council should provide guidance on what % of residential units can completed prior to grading and utility installation.

Motion to table by Hynes.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings

6.4: TXA 2023-10 Open Space requirements

Staff gave presentation.

Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings

No comments.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Cummings
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings

Commission: Discussion of adding an example for clarification.

Motion to approve with the following exception: add example for clarification

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings

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7. ADJOURNMENT

Motion to adjourn.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings

Meeting adjourned at 8:01 pm

DRAFT

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Draft November 27, 2023 minutes

ATTACHMENTS:

- 11.27.23 PC MINUTES_DRAFT.pdf

CITY OF CHARLES TOWN
PLANNING COMMISSION AGENDA
● NOVEMBER 27,2023

Committee Meeting **CITY HALL** **6:00 PM**
101 E Washington Street, Charles Town, WV 25414

1. CALL TO ORDER

Present: Ann Paonessa, Chair
Jessica Derr
Angie Cummings - Secretary
Jeff Hynes
Kevin Long

James Newman, City Staff: Zoning Administrator
Kim Crosson, City Staff: Permit Tech

2. WORK SESSION

2.1: TXA2023-06 - Minor Subdivision requirements

Staff presentation.

PC Discussion. In agreement to proceed with public hearing.

2.2: TXA2023-09 - Neighborhood-Residential Use Changes

Staff presentation.

PC Discussion. Asked Staff to remove reference to Neighborhood Commercial and replace with "non-residential uses". Requested comparison of R15, NR, and NC Districts.

Work Session Adjourned at 6:44 pm

3. CALL TO ORDER - Regular Session at 7pm.

4. APPROVAL OF MINUTES

No minutes available.

5. UNFINISHED BUSINESS

No unfinished business.

6. NEW BUSINESS

6.1: ZMA2023-02 Prospect Place- Partial rezoning from General Commercial to Neighborhood Residential.

Staff gave presentation.

Planning Commission: When was Comp Plan adopted? Staff: 2018

DRAFT

Planning Commission: Does the topography prevent all development?

Staff: Sketch shows commercial development in area deemed topographically challenging.

Applicant: Peter - Their request is to revert back to 2007 zoning. Was previously rezoned to General Commercial to accommodate a deal with Lowes to come to site, but it fell through in 2001. Had additional conversations with Great Wolfe Lodge post-Lowes withdrawing. Additionally, had a plan for regional stormwater facility on a nearby property, but that deal also fell through. WVDoH doesn't want to approve a light on the highway, which limits our commercial access options. Will be performing a traffic study once US Rte. 340 reopens. We'll combine this property with a smaller commercial property adjacent to it as part of the development plan. The site has a 77ft. rise from road to back of property. Slopes make development difficult. There is already excess commercial zoning over 200 acres. We'll have 12 ½ acres of commercial uses, but stormwater will occupy some of that land. Current economic reality does not allow previous plans to come to fruition.

Applicant: Tom – currently have 2 parcels under contract, which will be combined into one. The site is very topographically challenged for commercial use. The grade of the property, rocks, and sink holes does not make it feasible to develop site. With it being residential – will have to do some mild grading in comparison for residential. There is an abundance of other land that is zoned commercial that could accommodate commercial development.

Planning Commission: Has there been any effort with the City regarding discussion to revise the Conditions of Annexation?

Guest: We had a preapplication meeting with the City and explained the need for change approximately 2 months ago.

Planning Commission: How is grading different for commercial verses residential?

Guest: Housing can weave its way through the topography whereas commercial cannot.

Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Derr
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Sanadra Sokol - Concerned about wildlife and natural landscape. Experienced negative impacts with previous development. Requesting that during the grading, dirt be placed between neighboring development as a barrier. Suggesting a middle school as an alternative possibility, community center, wants other options considered. Wants strict guideline for blasting and a buffer in between their housing and any new development.

Charles Pepper – Currently being impacted by blasting at Stone Springs development. Requesting direction regarding recourse existing house may have in order to collect for damages caused to housing from blasting. Concerned about the impact of developing this site.

Micheal George – Opposed to rezoning and the purposed development. Commercial demand exists. This is the most northern piece of commercial property that exists.

Alissa Meeks – Previously met with developers. Was initially excited about the proposal until found out it was residential. Topography has not changed since Lowes almost came to the site. This area is buildable, and it takes the right commercial interest to come in and build here. The builder's stance is not representative of the City's position. Market study

DRAFT

done in 2001 showed we need restaurants and retail. Wants to start from scratch and come up with a plan, but what has been suggested is not the right course of action.

Applicant: Peter- Willing to work with conditions on blasting, buffering issues. Commercial development has not shown interest in this site in over 15 years.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Motion to discuss rezoning.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Derr
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Planning Commission: COA is a contract with the City. If COA is revised, it should go to a public hearing, but is not required.

Motion recommend denial, subject to the condition that the applicant work with City Staff on revising the conditions of annexation.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa, Long

6.2: BR2023-06 Alla Willa Drive Casino – Bond Establishment

Staff gave presentation.

Motion to approve Bond Establishment.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa, Long

6.3: TXA2023-07 Commercial Pad Sites – Commercial Pad Site Preparation Requirements

Staff gave presentation.

Planning Commission: Where did 25% completion requirement come from?
Staff: Council discussed this on November 6th and was interested in reducing the number from 40%.

Motion to open public hearing.

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RESULT:	**Approved**
MOVER:	Long
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa, Long

No Comment.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Derr
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Motion to approve the Text Amendment: Commercial Pad Site Preparation Requirements.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Long
AYES:	Derr, Hynes, Cummings, Paonessa, Long

6.4: TXA2023-10 Open Space – Clarifying Open Space Calculations.

Staff gave presentation.

Motion to open public hearing.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa, Long

No Comment.

Motion to close public hearing.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Hynes
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Motion to approve the Text Amendment: Clarification of Open Space Calculations.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Planning Commission: Language clarification and modification regarding "Must, Should, Shall".

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Motion to amend approval and change "must" to "shall" by Kevin Long.

Planning Commission: Discussion regarding specific verbiage.

Kevin Long withdrawals amendment.

Motion to approve original recommendation as presented.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa, Long

6.5: SLD2023-09 Joan and Joe's Coffee – Preliminary Plan

Staff gave presentation.

Planning Commission: Verification that easement covers entrance and exit and that they will stay that way.
Staff: Easement language calls for separate entrance and exit access lanes.

Motion to approve Preliminary Plan.

RESULT:	**Approved**
MOVER:	Derr
SECONDER:	Long
AYES:	Derr, Hynes, Cummings, Paonessa, Long

6.6: BR2023-04 Huntfield Phase 2B2 – Bond Reduction

Staff gave presentation.

Motion to approve Bond Reduction.

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Cummings
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Planning Commission: Discussion regarding placement of signs and missing signage.

Applicant: Acknowledges to check on sign locations.

Long: Motion to approve the bond.

Motion to amend approval subject to placement of missing signage, specifically at Lord Fairfax and Silverleaf and Lord Fairfax and Holly Springs by Jessica Derr.

Kevin Long withdrawals original motion so as to approve amended motion

DRAFT

Amended motion to approve subject to condition:

1. The appropriate missing signage be installed, specifically at Lord Fairfax and Silverleaf, and Lord Fairfax and Holly Springs

RESULT:	**Approved**
MOVER:	Long
SECONDER:	Derr
AYES:	Derr, Hynes, Cummings, Paonessa, Long

Commissioner Cummings left meeting at 8:31 pm

6.7: BR2023-05 Huntfield Phase 3A – Bond Reduction

Staff gave presentation.

Motion to approve Bond Reduction subject to condition:

1. The appropriate missing signage be installed, specifically at Lord Fairfax and Silverleaf, and Lord Fairfax and Deerbrook.

RESULT:	**Approved**
MOVER:	Derr
SECONDER:	Hynes
AYES:	Derr, Hynes, Paonessa, Long

7. ADJOURNMENT

Motion to adjourn.

RESULT:	**Approved**
MOVER:	Hynes
SECONDER:	Derr
AYES:	Derr, Hynes, Paonessa, Long

Meeting adjourned at 8:34 pm

DRAFT

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Election of Officers:
-President
-Vice-President
-Secretary (per by-laws, shall be a Planning Staff member)

ATTACHMENTS:

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Public Hearing: SLD2023-04: Fairview - Sketch Plan

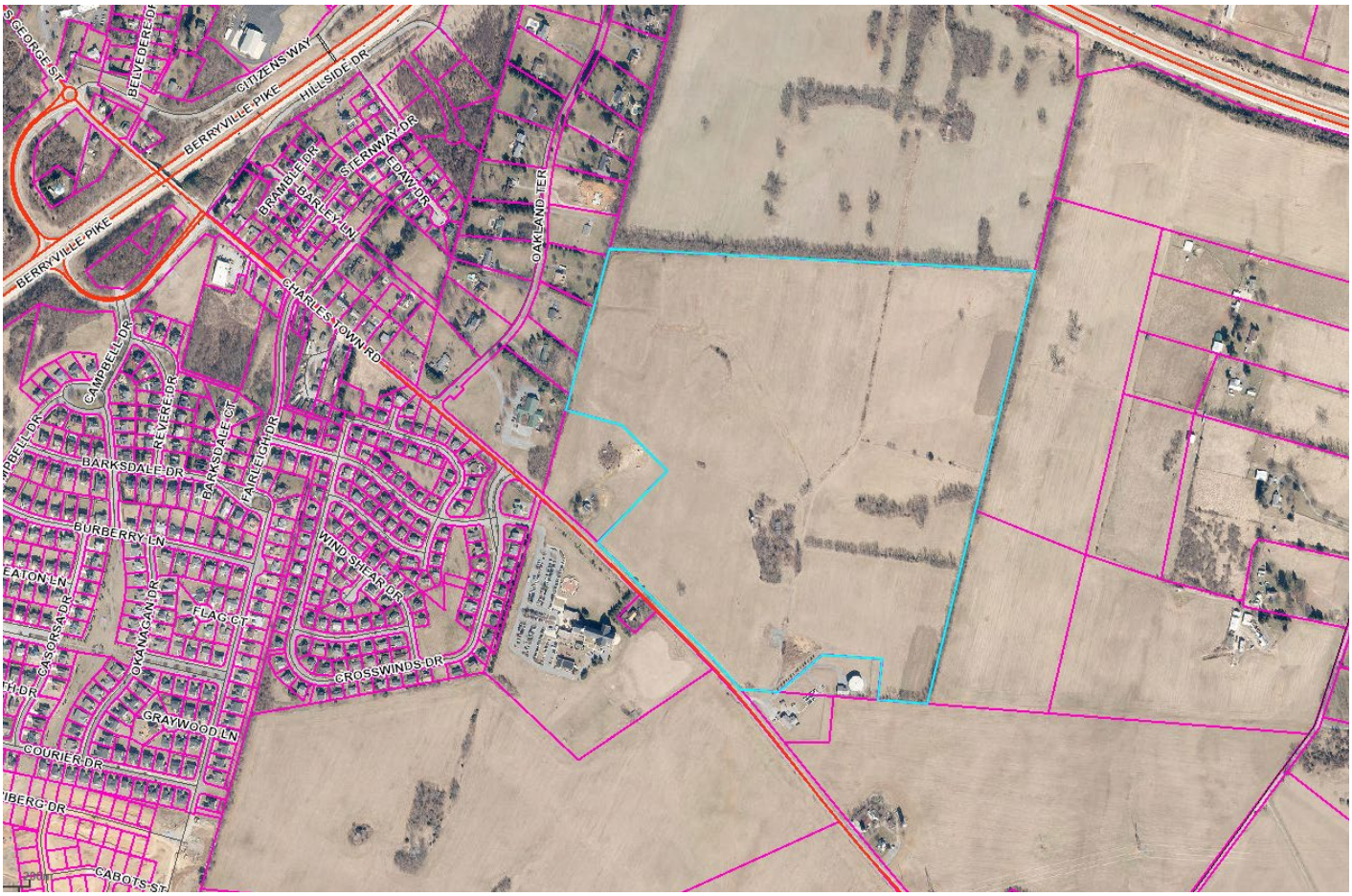
ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Plans.pdf
- 4. Traffic Study.pdf
- 5. 2023 Revised and signed COA.pdf
- 6. 2005 Original CoA.pdf

Sketch Plan - Fairview

SLD2023-04

Date: For the January 22, 2024 Planning Commission meeting
Applicant: LGI Homes-West Virginia LLC
Property Owner: Jaguar IV LC
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Major Subdivision and Land Development.
Property Location: Located on Charles Town Road
Current Zoning: Neighborhood Residential



PROJECT OVERVIEW

The development of 113.65 acres for 184 townhomes, 266 single-family detached dwelling units, and two commercial site pads.

ZONING REVIEW

The property is zoned Neighborhood Residential (NR). Per the Zoning Ordinance:

The purpose of the NR District is to provide for a mix of housing types and related services and Uses, including Commercial Uses and office services.

…

The intent is to create a cohesive pattern of primarily residential development that allows a mix of Uses, including neighborhood servicing Commercial and office Uses and/or Commercial and office Uses that complement the primarily residential character of the neighborhood.

USE MIXTURE

Total usable land area requirements:

TYPE	REQUIRED	PROVIDED
Residential	50%	50% - 56.82 acres
Commercial	10%	10.10% - 11.48 acres
Open Space	10%	11.18% - 12.49 acres

The commercial use aspect is required to be comprised of Neighborhood Commercial Uses. As Neighborhood Commercial refers to a particular zoning district which allows both commercial and residential uses, the Planning Commission is currently working on a text amendment to clarify that the commercial uses shall be non-residential in nature.

DENSITY

Maximum permitted density is 10 units/acre; proposed density is 4 units/acre.

Net Buildable Land Area is 78.37 acres. Total development acreage is approximately:
Residential -townhomes -----10.49 acres
Residential – Single Family----46.33 acres
Commercial area----------9.06 acres
Common Open Space----------12.49 acres

SIDEWALKS

Sidewalks will be provided on both sides of all roads within the development. Additional details are required at the Preliminary Plan stage. Sidewalks must be between 5-6 ft. in width.

TRAILS

Plan states "*No trails are proposed at this time, trails may be added at a later time in conjunction with project amenity design".* Trails are required per the Conditions of Annexation, and shall be included along the major roadway. This level of detail is required at the Preliminary Plan stage. Trails are required to be between 6-8 ft. in width.

BUFFERS

Buffers between non-residential and residential uses will be provided at time of site plan submission for non-residential development components of this subdivision. An adjacent property is a working farm, which is a non-residential use. Buffers between this development and the farm are appropriate.

There is an existing tree line that can be used as buffering. Additional evergreen plantings would be appropriate as a visual buffer and to partially mitigate dust from farming operations.

OPEN SPACE/RECREATION

The Conditions of Annexation require a variety of recreational and open space options. This level of detail is generally provided at the Preliminary Plan stage. The plans state that the site will contain passive open space throughout the development.

The Conditions of Annexation require that at least 10% of the parcel be designated for open space, with a pro-rated 20% open space based on the percentage of the property that is developed for townhomes. The applicant has provided adequate open-space to meet both requirements.

STORMWATER

Detailed stormwater management plans are not required at the sketch plan phase. Those details will be required at the Preliminary Plan stage. The City's 3rd party engineering firm, Kimley-Horn, has reviewed the plans and has no comments about storm water management at this stage. Additional review will occur for the Preliminary Plan stage.

ROAD DESIGN

The main thoroughfare is designated on the Comprehensive Plan. The applicant is required by the Conditions of Annexation to build a minimum two-lane road designed to *minor collector* road standards. Those details are required at the Preliminary Plan stage. The right-of-way for that road shall be at least 80 feet wide, which is shown on the sketch plan.

TRAFFIC IMPACT STUDY

Per the Conditions of Annexation, a traffic impact study is required if the sketch plan is approved. The applicant has completed the traffic study, and it was approved by the WV Division of Highways on October 4, 2023. A final version was provided to the City on December 20, 2023.

The study was based on 267 single-family homes, 200 townhomes, and 99,000 sq. ft. of self-storage space. The sketch plan shows 266 single-family homes, 184 townhomes, and two commercial pads with no designated use. Self-storage is not a permitted use in the Neighborhood Residential zoning district.

The total number of daily trips is estimated at 4,133, with a morning peak of 335 trips per hour and an evening peak of 421 trips per hour. To adequately handle the increased traffic, multiple improvements are required:

1. Construction of a right-turn slip lane on the US 340 Southbound Ramp to WV 115,
2. Construction of a right-turn slip lane on the WV 115 eastbound approach to US 340 Northbound Ramp/Hillside Drive,
3. Construction of an exclusive left-turn lane on WV 115 eastbound approach to Site Drive #1,
4. Construction of an exclusive left-turn lane on WV 115 eastbound approach to Site Drive #2.
5. Traffic Signal at WV 115 and Jefferson Avenue
6. Widening Rt 115 to include a eastbound left-turn lane
7. WV 115 and Citizens Way – NB US 340 right-turn slip lane
8. Roundabout at WV 115 and Hillside Drive

The results of the 2030 Build Improved Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2030 Build Conditions will be mostly mitigated following implementation of proposed improvements. Traffic movements that are expected to operate worse than LOS D include the following:

1. Farleigh Drive northbound approach to WV 115 LOS F during the evening peak hour
2. Crosswinds Drive northbound left-turn movement to WV 115 LOS E during evening peak hour.

Additional off-site improvements that will improve traffic levels of service include:

1. The WVDoH traffic circle to be located at the intersection of Charles Town Road and Hillside Drive, with a planned construction date of 2025.
2. A traffic signal and exclusive left-turn lane at the intersection of Charles Town Road and Jefferson Avenue. Per the study, that improvement is part of a planned project by WVDoH.

Kimley-Horn reviewed the traffic study and provided the following comments:

"The Applicant should provide mitigation for Intersections 4, and 5 which as shown in Table 4 on Page 34 are shown to have failing LOS in the future 2030 Build Improved condition. The Applicant should commit to making the necessary improvements to conform with providing a minimum LOS D for all approaches."

Level of Service	SIGNALIZED Intersection Control Delay (sec/veh)	UNSIGNALIZED Intersection Control Delay (sec/veh)	Intersection LOS Description
A	≤ 10.0	≤ 10.0	Free flow, insignificant delays.
B	10.1-20.0	10.1-15.0	Stable operation, minimal delays.
C	20.1-35.0	15.1-25.0	Stable operation, acceptable delays.
D	35.1-55.0	25.1-35.0	Restricted flow, common delays.
E	55.1-80.0	35.1-50.0	Maximum capacity, extended delays. Volumes at or near capacity. Long queues form upstream from intersection.
F	> 80.0	> 50.0	Forced flow, excessive delays. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

VIEW OF NEARBY ROADS



CONDITIONS OF ANNEXATION

On September 18, 2023 City Council approved a set of revised conditions of annexation for the parcel. To summarize, the conditions include:

Economic Impact:

1. A fee of $3,494 per residential unit.
2. A fee of $2,958 per thousand sq. ft. of commercial space.

Zoning:

1. At least 10% of the property shall be open space.
2. Open space standards for townhomes shall be pro-rated at 20% based on the percentage of the property developed for townhomes.

Recreation:

1. Land owner shall create recreation areas, walking path, small parks (1 to 2 acres in size).
2. Outdoor community center consisting of a pavilion with electricity, picnic tables, and BBQ grills.
3. Playground using commercial grade equipment that serves 6-23 month old toddlers, children 2-5 years old, and children 5-12 years old.
4. A multi-purpose play field.

Affordable Housing:

1. 10% of the residential units shall meet the Dept. of Housing and Urban Development's HOME Homeownership value limit.

Note: For a new one-unit dwelling, that limit is currently $337,000 based on 2023 data.

Transportation:

1. Land owner shall coordinate with the Jefferson County Board of Education to provide an adequate number of bus stop shelters.
2. Land owner shall coordinate with the Eastern Panhandle Transit Authority to provide an adequate number of bus stop shelters.
3. The Land owner shall construct a major roadway and trail consistent with the Comprehensive Plan.
4. A traffic impact study will be performed
5. If a traffic light is required per the traffic impact study the applicant shall be responsible for any portion deemed appropriate by the State Department of Highways.

Site Improvement:

1. All commercial lots shall be prepared, to include grading and utility installation. This shall be done during Phase 1 of the project.

COMPREHENSIVE PLAN

Both the 10 and 25 year future land use plans for this parcel designate the area as *Professional Office and Institutional District*, which were based on planned investments by West Virgina University Healthcare Systems. *Professional Office and Institutional District* is defined in the Comp Plan as:

Professional Office/Institutional Future Land Uses are included to enhance the work place environment by providing for the establishment of offices, medical and other institutional uses, limited accessory services for workers' convenience and public space. It is intended to promote attractive office development projects which are compatible with one another, as well as with adjoining residential areas.

A medium to high density residential option is available when such can be achieved through innovative design and include significant natural resource protection. This future land use district is specifically designated to incentivize economic development opportunities and diversify the City's economy and strengthen its tax base to support its critical infrastructure and public service needs.

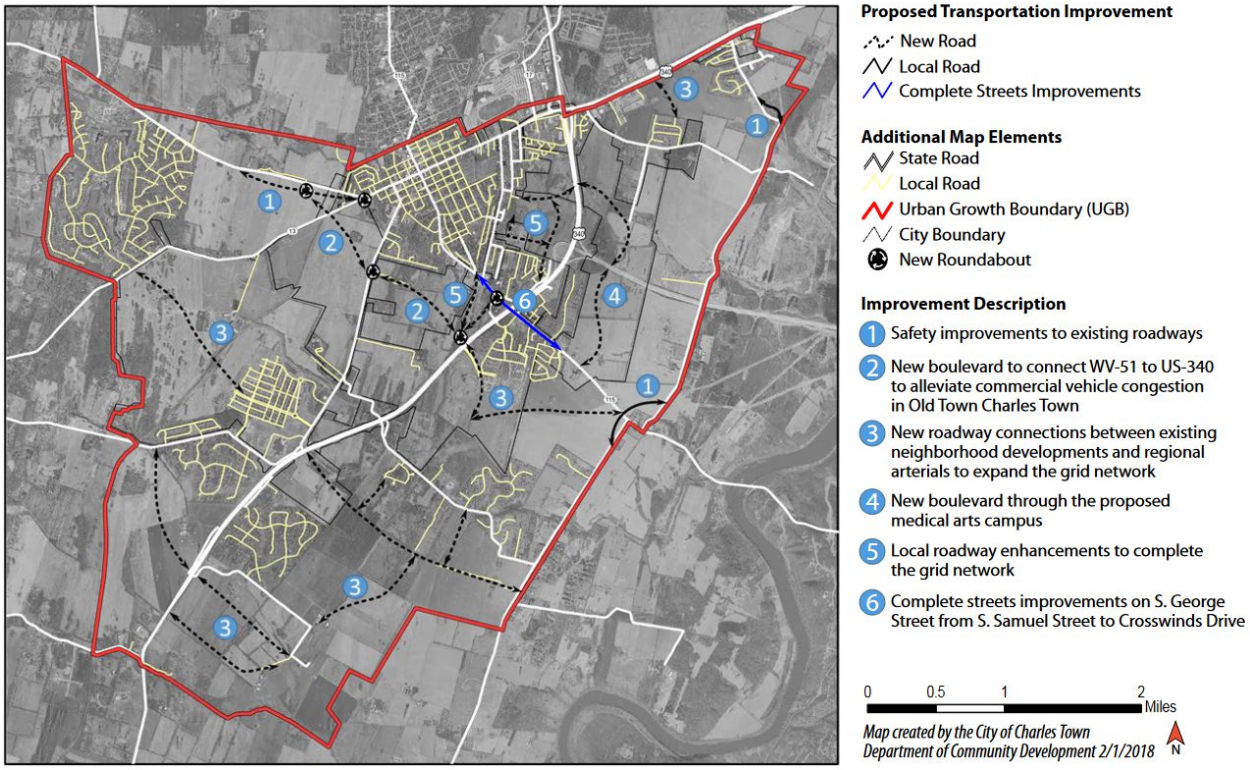
-Comprehensive Plan pg. 75

This property is designated on the *Future Roadway Network Improvements Plan* as being part of the location for a new boulevard trough a proposed medical arts campus (see item #4 on the map below). The applicant is proposing an eighty-foot wide right of way to account for the Comprehensive Plan required road and trail connection.

City Council approved changes to the Conditions of Annexation. Among the whereas clauses supporting the revisions was a statement that the property has sat vacant for 18 years since the original Conditions were adopted. The Comprehensive Plan future land use designation as Professional Office and Institutional District is no longer appropriate for this site and should be changed. The proposed development provides a medium-density residential development option. While not in compliance with the future land use designation of professional office and institutional uses, the development does include a major thoroughfare envisioned in the Comprehensive Plan.

CITY OF CHARLES TOWN COMPREHENSIVE PLAN

Future Roadway Network Improvements



CONCLUSION

The applicant is seeking to build a development of 184 townhomes, 266 single-family detached homes, and two commercial lots. The proposed development is predominantly residential. While not in compliance with the future land use designation of professional office and institutional uses, the development does include a major thoroughfare envisioned in the Comprehensive Plan. Council, through the revised Conditions of Annexation, requested the Commission to review this site for residential development. Additional details of landscaping and stormwater management are required to be provided at the Preliminary Plan phase.

RECOMMENDATION

Approval subject to conditions:

1. The trail required by the Conditions of Annexation shall be shown on the Preliminary Plan.
2. All recreation amenities required by the Conditions of Annexation shall be shown on the Preliminary Plan.
3. A minimum 10-ft wide evergreen vegetated landscape buffer shall be planted along the eastern and northern property lines. The buffer shall conform to the requirements of Subdivision and Land Development Ordinance Section 1333.15. The buffer shall be shown on the Preliminary Plan.

4. The Applicant shall provide mitigation for Intersections 4, and 5 which as shown in Table 4 on Page 34 of the Traffic Impact Study which are shown to have failing LOS in the future 2030 Build Improved condition. The Applicant shall make the necessary improvements to conform with providing a minimum LOS D for all approaches. The improvements shall be made prior to the issuance of any Certificate of Occupancy.

Sketch Plan Application No._____

SKETCH PLAN APPLICATION

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
ARTICLE 1332, SUBDIVISION AND LAND DEVELOPMENT APPLICATION & APPROVAL REQUIREMENTS

To assist the Subdivision Administrator in the review of a Sketch Plan Application, the Applicant must utilize this form to supply the City with the information prescribed under Section 1332.03 of the Charles Town S/LD Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as a Sketch Plan Application as required by Ordinance Section 1332.03. Applicant is responsible to ensure the standards of Ordinance Section 1332.04, Sketch Plan Requirements, are met and provided herein is a checklist of the Sketch Plan requirements.

1. DATE March 14, 20 23

2. APPLICATION TYPE*

Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance

- x Submit three (3) copies of the Sketch Plan submitted and in Adobe PDF format

x Major S/LD Development

- x Submit three (3) copies of the Sketch Plan submitted and in Adobe PDF format

*There are two types of Sketch Plan submissions:

1. For Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance. Submission standards are found in Section 1332.04(D).
2. For a Sketch Plan for a Major S/LD application, submission standards are found in Section 1332.04(E)

3. $ 3 3 / , & $ 1 7 1 0 ME* LGI Homes - West Virginia, LLC

Address: 1450 Lake Robbins Drive #430, The Woodlands, TX 77380

Telephone Number (301) 3556-5970 Fax Number (___)

Email Address mike.dropik@lgihomes.com

4. 3 5 2 3 (5 7 < 2 : 1 (5 ¶ 6 Jaguar IV LC

Address: 2755 Mews Lane; Charlottesville, VA 22901

Telephone Number (703) 209-0111 Fax Number (___)

Email Address ccocke@cst-cpa.com

5. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address: Charles Town Road

Tax Map # and Parcel: TM 10, Parcel 218.1

Deed Book and Page #: 1089 / 144

Property Area in Square Feet or Acres: 4,950,477 SQ. FT. and 113.65 Acres

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

Mixed use residential and commercial community.

7. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

Existing Use: Agricultural

Current Zoning: Neighborhood Residential (NR)

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

8. ARE THERE ANY ANTICIPATED WAIVERS OR VARIANCES? IF YES, PROVIDE DETAILS.

No

9. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

None known

x No

10. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

Application No.	Project Name and Phase	Status	Approval Date
Conditions of Annexation Resolution 2005-15	Annexation Agreement	Approved	12-05-2005

11. INTERESTED PARTY ADDRESSES, FOR PUBLIC NOTICE (including across street)
(Interested parties are defined as adjacent properties within 100 feet).

Owner	# and Street	City, State, Zip
See attached graphic & list.		

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1332.02 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant

_____ Date 3-14-2023

Signature of Property Owner (If different than Applicant)

Charles P Cocke Date 3/14/2023

Jaguar IV, LC, Mgr

Please submit an original completed Application and specified number of Site Plan copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments:_____

_____

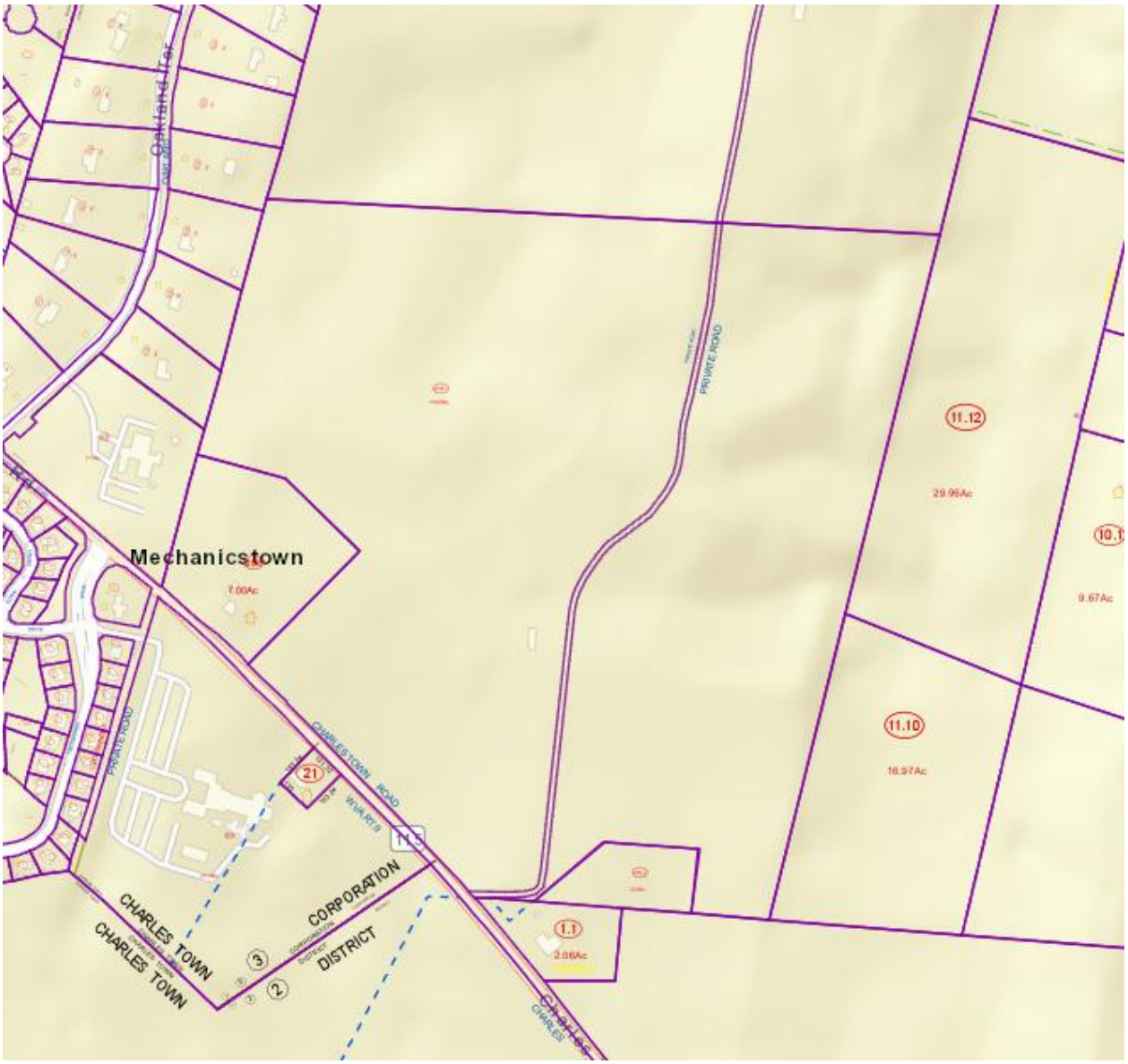
_____

_____

_____

_____

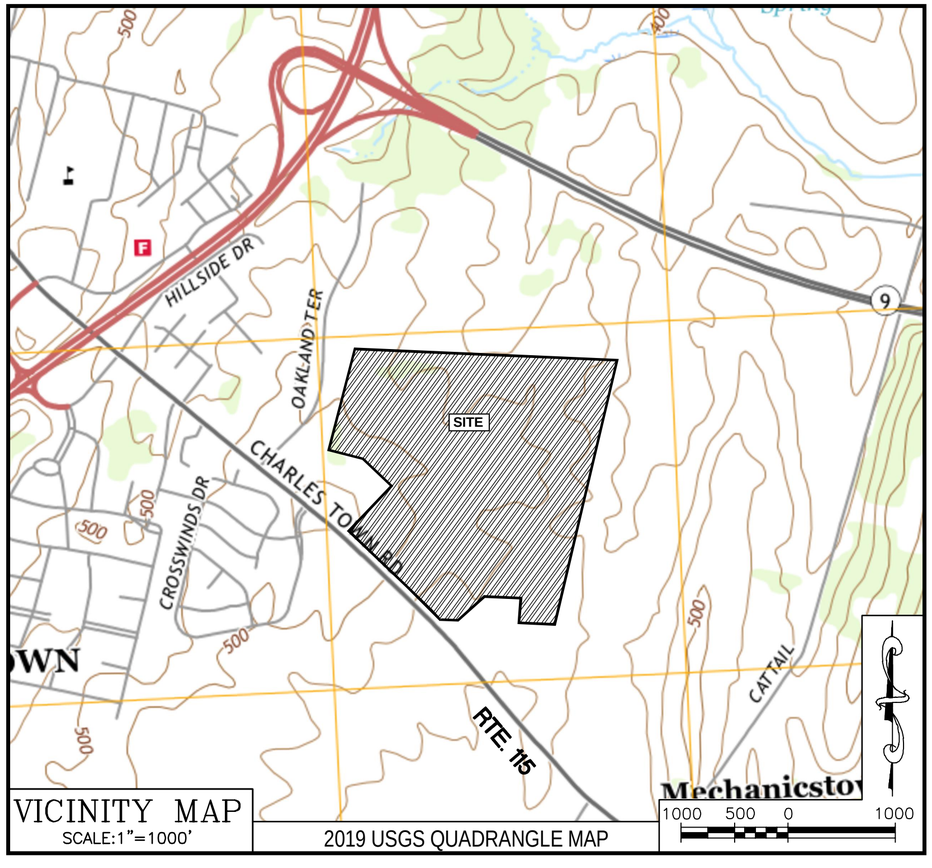
ADJACENT PROPERTY OWNER INFORM		
Reference #	Owner Name	Owner Address
1	OAKLAND COMMUNITY CHU	104 OAKLAND DRIVE, CHARLES TOWN, W
2	OAKLAND U. M. CHURCH TRU	70 OAKLAND TERRACE, CHARLES TOWN, V
3	KENT H TICE ET	104 OAKLAND TERRACE, CHARLES TOWN, V
4	MARK & CHARIS HEN	150 OAKLAND TERRACE, CHARLES TOWN, V
5	NORA SUE PAIN	188 OAKLAND TERRACE, CHARLES TOWN, V
6	DARAL A KIDWELL ES	254 OAKLAND TERRACE, CHARLES TOWN, V
7	MARK F. LANGLET	544 LEGO DRIVE, CHARLOTTESVILLE, \
8	CAROLYN & RONALD WIDM	1434 CATTAIL RUN RD, CHARLES TOWN, W
9	RONALD WIDMY	1434 CATTAIL RUN RD, CHARLES TOWN, W
10	HIGH HORIZONZ FARM	336 ROSEMONT WAY, CHARLES TOWN, W
11	CITY OF CHARLES T	PO BOX 14, CHARLES TOWN, WV
12	CITY OF CHARLES T	PO BOX 14, CHARLES TOWN, WV
13	DR ACQUISITIONS	60 THOMAS JOHNSON DR, FREDERICK, M
14	ROMAN CATHOLIC DIO	1300 BYRON ST, WHEELING, WV
15	HARRY D L	15376 CHARLES TOWN RD, CHARLES TOWN, V


Mechanicstown
PRIVATE ROAD
CHARLES TOWN ROAD
PRIVATE ROAD
CHARLES TOWN
CHARLES TOWN
CORPORATION
DISTRICT
11.12
29.96Ac
11.10
16.97Ac
1.1
2.08Ac
21
7.00Ac
9.67Ac

SKETCH PLAN FOR
FAIRVIEW
CITY OF CHARLES TOWN, WV
TAX MAP 10, PARCEL 218.1
DEED BOOK 1089, PAGE 144

OWNER
JAGUAR IV, LC
2755 MEWS LANE
CHARLOTTESVILLE, VA 22901

APPLICANT
LGI HOMES – WEST VIRGINIA, LLC
1450 LAKE ROBBINS DRIVE #430
THE WOODLANDS, TX 77380



VICINITY MAP
SCALE: 1"=1000'
2019 USGS QUADRANGLE MAP

SKETCH PLAN CHECKLIST NOTES PER SECTION 1332.04, SKETCH PLAN REQUIREMENTS

E.2.a. Existing conditions obtained from aerial survey. Perimeter boundary information shown hereon is based on a survey performed by GORDON.

E.2.b. See Sheets 3-13 for arrangement of land uses. Proposed land uses include single-family detached, single family attached, commercial, parks/open space and associated improvements.

E.2.c. See this sheet for a Vicinity Map. Map is 2019 USGS Quadrangle Map.

E.2.d. See Sheet 2 for all abutting owners; see Sheets 3-13 for adjoining lot lines, and structures within 100'. Owner information obtained from the Jefferson County Assessors Tax Map Viewer website.

E.2.e. See title block for for date, creator of plan and address. See this Sheet for Owner / Applicant information.

E.2.f. The property is zoned Neighborhood Residential (NR) and consists of 113.65+/- acres.

E.2.g. See Net Buildable Land Area Calculation Table Sheet 2 for maximum and proposed densities based on the net buildable land area.

E.2.h. Public water and sanitary sewer services are available through the Charles Town Utility Board (CTUB). Electric service is available from Potomac Edison.

E.2.i. A sanitary sewer pump station is located on Bailey Brooks Way approximately 2,200' north of Fairview.

E.2.j. Residential units will be provided water and sanitary sewer through proposed lines running within the right-of-ways and/or open spaces which will connect to existing within Charles Town Road. Electric will be provided from power lines along Charles Town Road.

E.2.k. There are no existing covenants for the subject property. The development is subject to the Conditions of Annexation (COA) approved in Resolution 2023-12.

E.2.l.
- See Sheets 3-13 for lot layout.
- 184 townhouse units are proposed as part of this application.
  - Average lots are 20'x100' and are 2,000 sf.
  - Townhomes may be up to 3-stories with an approximate height not to exceed 35'.
- 266 single-family detached units are proposed as part of this application.
  - Average lots are 60'x110' and are 6,600 sf.
  - Single-family homes may be up to 3-stories with an approximate height of 35'.
- 2 commercial lots consisting of 9.06 acres in the aggregate are proposed. 2.42 acres were conveyed to the City of Charles Town for expansion of the existing water treatment plant. Pursuant to COA Resolution 2023-12, these 2.42 acres contribute to the 10% commercial requirement.
- Parking for residential units will be provided on-lot and offsite through on-street parking. Commercial parking will be determined at site plan for the specific commercial lot and future uses.

E.2.m. The total acreage of the tract being subdivided is 113.65+/- acres.
- The developments Net Build Land Area is 3,413,925+/- square feet (78.37+/- acres).

E.2.n. See Approximate Acreages Table on Sheet 2.

E.2.o. The development will consist of 184 townhomes and 266 single-family detached units.

E.2.p. See Sheets 3-13 for proposed street layout. Access will be provided through Charles Town Road. Road A extends to the adjacent property to the north as identified in the Comprehensive Plan. Road A will have an 80' right-of-way as identified in the annexation agreement.

E.2.q.
- Sidewalks will be provided on both sides of all proposed streets within the subject property.
- No trails are proposed at this time, trails may be added at a later time in conjunction with project amenity design.

E.2.r. The development will provide passive open space throughout the property. See Approximate Acreages Table on Sheet 2 for additional information.

E.2.s. There are no environmental sensitive areas within the Common Open Space.

E.2.t. No Modifications, Waivers, Variances, Special Exceptions and/or Conditional Uses have been requested.

E.2.u. No buffers are required/proposed within the residential portion of this development. A buffer will be provided for the commercial development as required by City of Charles Town Ordinances based on the specific commercial use at time of site plan.

E.2.v. See Sheets 3-13 for road and right-of-way widths. All roads will be curb & gutter and will be in accordance with the the City's typical roadway section requirements (SDLO Appendix A). Driveways will be provided for each residential unit. Parking for commercial areas will be determined for the specific commercial uses at site plan. All proposed right-of-ways will be 50' (Neighborhood Street), 56' (Neighborhood Center Street), 61' (Minor Collector) or 80' (Road A).

E.2.u. This development will not include any bonus factors.

SHEET INDEX

1. COVER SHEET AND NOTES
2. OVERALL PLAN AND CALCULATIONS
3-13. CONCEPTUAL PLAN
14. CONDITIONS OF ANNEXATION
15. AERIAL OVERLAY

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SEAL:

REVISIONS
4-18-2023: REVISED PER CITY COMMENTS
10-11-2023: REVISED PER CITY COMMENTS & REVISED COA

COVER SHEET AND NOTES

FAIRVIEW
SKETCH PLAN
CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

SCALE:	HORIZ.: 1"=1,000' VERT.:
DATE:	MARCH, 2023
JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	1 OF 15

FILE PATH: J:\PROJECTS\SKETCH PLANS\2023 FAIRVIEW_ARCH\CT-CONCEPT PLAN\FAIRVIEW_SKETCH PLAN.DWG
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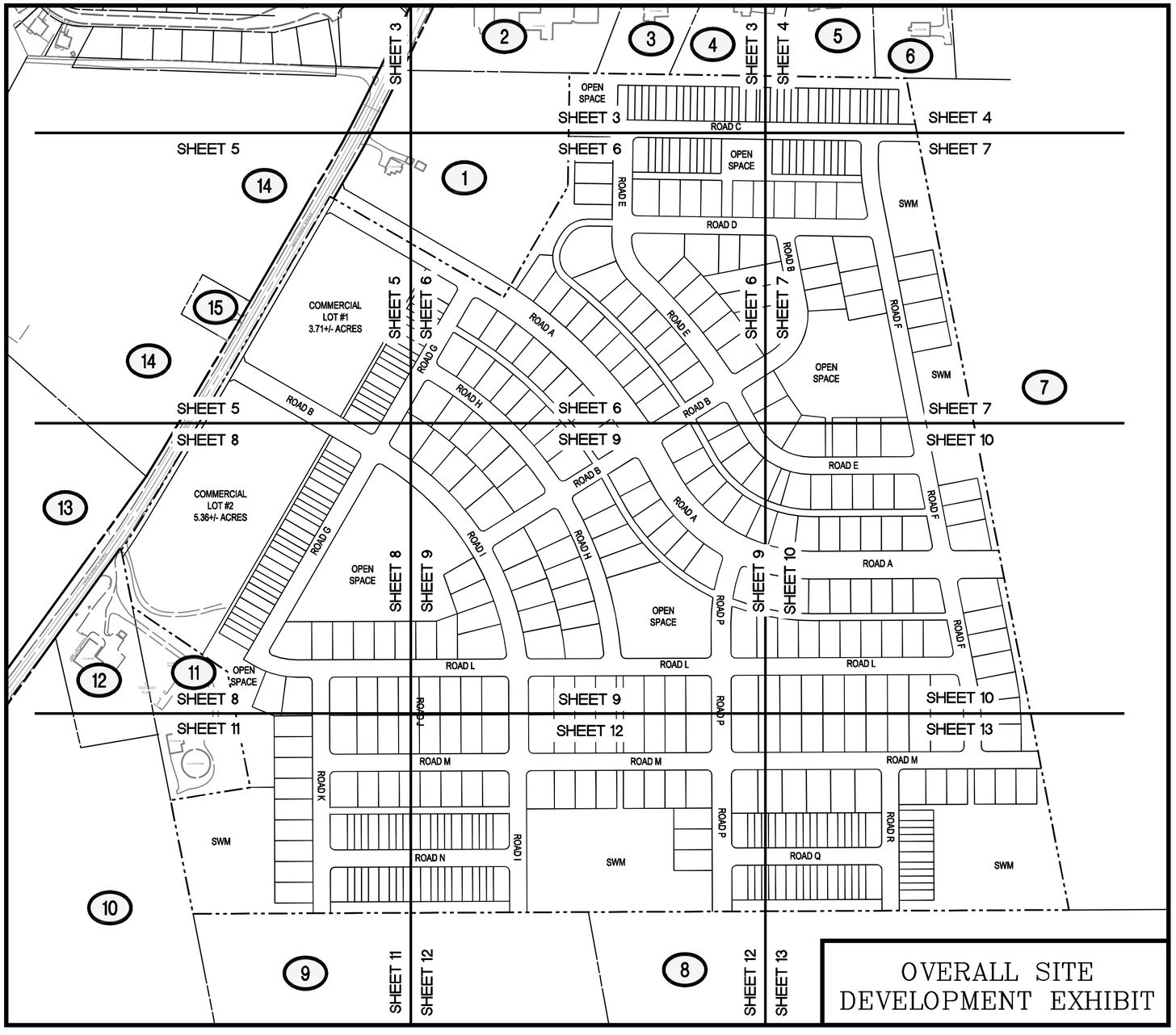

Density Checklist Section - 1332.04(E).2.g.	
Section 1322.08.(B).4.b.	
Maximum Based on NBLA	3,413,925 / 1,750 = 1,950 Units
Proposed	450 Units
Table 1322.08	
Maximum (10 Units Per Acre)	1,136 Units
Proposed	450 Units

Net Buildable Land Area Calculation - Checklist Section 1332.04(E).2.g.		
Area / Use	**Square Feet**	**Acres**
Gross Land Area	4,950,477	113.65
Right-of-Ways	1,124,480	25.81
Charles Town Road Right-of-Way Reservation	17,885	0.41
Stormwater Management Area	394,187	9.05
Sensitive Natural Areas (wetlands & floodplain)	0	0.00
Net Buildable Land Area (NBLA)	3,413,925	78.37

Approximate Acreages - Checklist Section 1332.04(E).2.n.		
Area / Use	**Square Feet**	**Acres**
Common Open Space	544,000	12.49
Residential Lot Area (Townhouse)	456,900	10.49
Residential Lot Area (Single-Family Detached)	2,018,200	46.33
Commercial Lot Area	394,825	9.06
Right-of-Ways	1,124,480	25.81
Charles Town Road Right-of-Way Reservation	17,885	0.41
Stormwater Management Area	394,187	9.05
Total	4,950,477	113.65
*Will vary with final engineering design.		

Common Open Space Calculations - Checklist Section 1332.04(E).2.x.	
ZO Table 1322.07 - 10% Required Open Space (Excludes Townhome Area)	
4,519,577 sf x 0.10	451,958 sf
COA Res. #2023-012 - 20% Required Open Space (Townhome Area Only)	
456,900 sf x 0.20	91,380 sf
Combined Open Space Calculations	
Total Required	543,338 sf
Total Proposed	544,000 sf

Neighborhood Residential Land Use Mix Requirements				
	Requirement		**Provided**	
Use	**%**	**Acres**	**%**	**Acres**
Residential	50	56.82	50.00	56.82
Commercial	10	11.36	10.10	11.48*
Open Space	10	11.36	11.18	12.49

*Per COA Resolution #2023-012 , Commercial includes 2.42 acres conveyed to the City of Charles Town for water treatment plant (PB 1135, Page 420).

ADJACENT PROPERTY OWNER INFORMATION						
Reference #	**Owner Name**	**Owner Address**	**District**	**Tax Map**	**Parcel**	**Zoning District**
1	OAKLAND COMMUNITY CHURCH	104 OAKLAND DRIVE, CHARLES TOWN, WV 25414	3	10	208	GENERAL COMMERCIAL
2	OAKLAND U. M. CHURCH TRUSTEES	70 OAKLAND TERRACE, CHARLES TOWN, WV 25414	3	10	219	GENERAL COMMERCIAL
3	KENT H TICE ET UX	104 OAKLAND TERRACE, CHARLES TOWN, WV 25414	2	18	6.26	RESIDENTIAL GROWTH (COUNTY)
4	MARK & CHARIS HENSON	150 OAKLAND TERRACE, CHARLES TOWN, WV 25414	2	18	6.25	RESIDENTIAL GROWTH (COUNTY)
5	NORA SUE PAINTER	188 OAKLAND TERRACE, CHARLES TOWN, WV 25414	2	18	6.24	RESIDENTIAL GROWTH (COUNTY)
6	DARAL A KIDWELL ESTATE	254 OAKLAND TERRACE, CHARLES TOWN, WV 25414	2	18	6.23	RESIDENTIAL GROWTH (COUNTY)
7	MARK F. LANGLET - TR	544 LEGO DRIVE, CHARLOTTESVILLE, VA 22911	3	15	17	NEIGHBORHOOD RESIDENTIAL
8	CAROLYN & RONALD WIDMYER	1434 CATTAIL RUN RD, CHARLES TOWN, WV 25414	2	18	11.12	RURAL (COUNTY)
9	RONALD WIDMYER	1434 CATTAIL RUN RD, CHARLES TOWN, WV 25414	2	18	11.10	RURAL (COUNTY)
10	HIGH HORIZONZ FARM INC	336 ROSEMONT WAY, CHARLES TOWN, WV 25414	2	19	1	RURAL (COUNTY)
11	CITY OF CHARLES TOWN	PO BOX 14, CHARLES TOWN, WV 25414	3	10	218.2	NEIGHBORHOOD RESIDENTIAL
12	CITY OF CHARLES TOWN	PO BOX 14, CHARLES TOWN, WV 25414	2	19	1.1	RURAL (COUNTY)
13	DR ACQUISITIONS LLC	60 THOMAS JOHNSON DR, FREDERICK, MD 21702	2	17	22	RESIDENTIAL GROWTH (COUNTY)
14	ROMAN CATHOLIC DIOCESE	1300 BYRON ST, WHEELING, WV 26003	3	10	213	NEIGHBORHOOD COMMERCIAL
15	HARRY D LEE	15376 CHARLES TOWN RD, CHARLES TOWN, WV 25414	2	17	21	RES-LIGHT INDUSTRIAL-COMM (COUNTY)

(1) – ADJACENT PROPERTY OWNER REFERENCE NUMBER

250 125 0 250

GRAPHICAL SCALE: 1" = 250'

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SEAL:

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4-18-2023: REVISED PER CITY COMMENTS
10-11-2023: REVISED PER CITY COMMENTS & REVISED COA

OVERALL PLAN AND CALCULATIONS

FAIRVIEW SKETCH PLAN

CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

SCALE:	HORIZ.: 1"=250' VERT.:
DATE:	MARCH, 2023
JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	2 OF 15

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LEGEND:

EXISTING		PROPOSED
	BOUNDARY/RIGHT-OF-WAY LINE	
	ADJACENT BOUNDARY LINE	
	EDGE OF PAVEMENT	
	BUILDINGS	
	UTILITY POLE	
OHE	OVERHEAD UTILITY LINE	
590	INDEX CONTOUR LINE (10')	
592	INTERMEDIATE CONTOUR LINE (2')	
	DRIP LINE OF TREES	
	5'-0" SIDEWALK	

(1) – ADJACENT PROPERTY OWNER REFERENCE NUMBER

50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

MATCH LINE - SEE SHEET 4

CHARLES TOWN ROAD , WV ROUTE 115

EX. BUILDING

EX. BUILDING

EX. BUILDING

OPEN SPACE

ROAD C (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 6

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4-18-2023: REVISED PER CITY COMMENTS
10-11-2023: REVISED PER CITY COMMENTS & REVISED COA

CONCEPTUAL PLAN

FAIRVIEW SKETCH PLAN

CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

SCALE:	HORIZ.: 1"=50' VERT.:
DATE:	MARCH, 2023
JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	3 OF 15

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MATCH LINE - SEE SHEET 3

50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

OAKLAND TERRACE

EX. BUILDING

EX. BUILDING

4

5

6

7

ROAD C (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 7

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FAIRVIEW
SKETCH PLAN

CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

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DATE:	MARCH, 2023
JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	4 OF 15

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50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

EX. BUILDING

ROAD A (80' RIGHT-OF-WAY)

CHARLES TOWN ROAD - WV ROUTE 115

EX. 16" WATER MAIN (TYP.)

COMMERCIAL
LOT #1
3.71+/- ACRES

EX. BUILDING

EX. 16" WATER MAIN (TYP.)

ROAD B (61' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 8

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FAIRVIEW
SKETCH PLAN

CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

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DRAWN: DC	CHECK: CW
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NCS:	
SHEET:	5 OF 15

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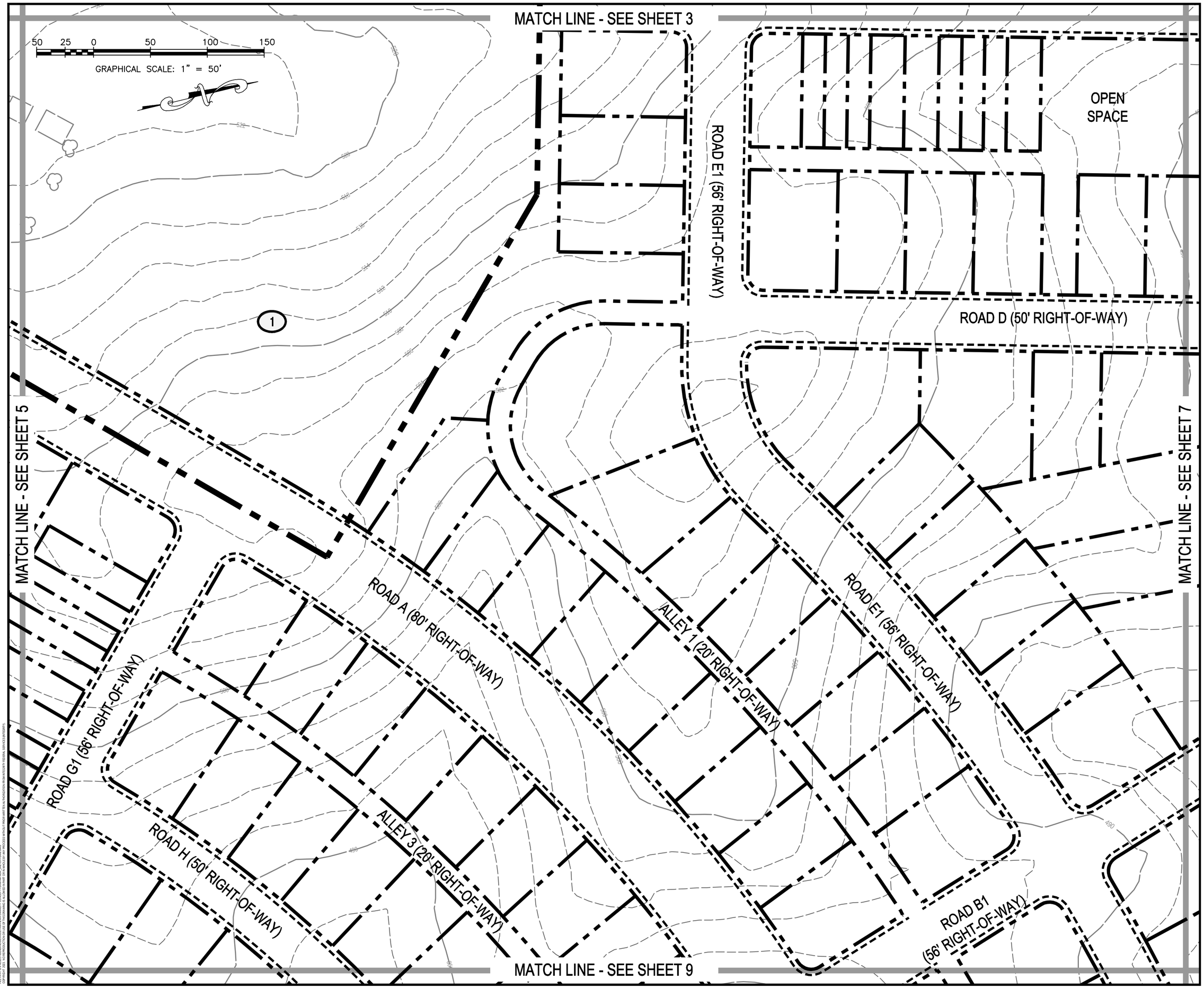

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TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

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NCS:	
SHEET:	6 OF 15

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MATCH LINE - SEE SHEET 4

50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

STORM WATER MANAGEMENT (SWM)

MATCH LINE - SEE SHEET 6

ROAD B2 (50' RIGHT-OF-WAY)

ROAD F2 (50' RIGHT-OF-WAY)

7

OPEN SPACE

STORM WATER MANAGEMENT (SWM)

MATCH LINE - SEE SHEET 10

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TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

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JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	7 OF 15

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MATCH LINE - SEE SHEET 5

50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

CHARLES TOWN ROAD - WV ROUTE 115

ROAD G (50' RIGHT-OF-WAY)

COMMERCIAL
LOT #2
5.36+/- ACRES

EX. 16" WATER MAIN (TYP.)

EX. FIRE HYDRANTS

EX. BUILDING

EX. GRAVEL DRIVE (TYP.)

EX. TREATMENT PLANT

OPEN SPACE

ROAD G (50' RIGHT-OF-WAY)

ROAD K (50' RIGH

MATCH LINE - SEE SHEET 9

MATCH LINE - SEE SHEET 11

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TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

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DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	8 OF 15

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MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 8

MATCH LINE - SEE SHEET 10

MATCH LINE - SEE SHEET 12

ROAD B 3 (50' RIGHT-OF-WAY)

ALLEY 2 (20' RIGHT-OF-WAY)

ROAD A (80' RIGHT-OF-WAY)

ROAD I 1 (56' RIGHT-OF-WAY)

ROAD H (50' RIGHT-OF-WAY)

ROAD P1 (56' RIGHT-OF-WAY)

ROAD L (50' RIGHT-OF-WAY)

ROAD L (50' RIGHT-OF-WAY)

OPEN SPACE

OHE

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CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

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DATE:	MARCH, 2023
JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	9 OF 15

MATCH LINE - SEE SHEET 7

STORM WATER MANAGEMENT (SWM)

ROAD E2 (50' RIGHT-OF-WAY)

ROAD F2 (50' RIGHT-OF-WAY)

ALLEY 2 (20' RIGHT-OF-WAY)

ROAD A (80' RIGHT-OF-WAY)

7

MATCH LINE - SEE SHEET 9

ALLEY 4 (20' RIGHT-OF-WAY)

ROAD L (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 13

50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

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TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

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CADD:	
NCS:	
SHEET:	10 OF 15

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MATCH LINE - SEE SHEET 8

12

11

10

9

EX. BUILDING

EX. WATER TOWER

STORM WATER MANAGEMENT (SWM)

RIGHT-OF-WAY)

ROAD K (50' RIGHT-OF-WAY)

ROAD M (50' RIGHT-OF-WAY)

ALLEY 5 (20' RIGHT-OF-WAY)

ROAD N (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 12

GRAPHICAL SCALE: 1" = 50'

50 25 0 50 100 150

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DRAWN: DC	CHECK: CW
CADD:	
NCS:	
SHEET:	11 OF 15

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FAIRVIEW
SKETCH PLAN

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TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

SCALE: HORIZ.: 1"=50'
VERT.:
DATE: MARCH, 2023
JOB: FAIRVIEW
DRAWN: DC | CHECK: CW
CADD:
NCS:
SHEET: 12 OF 15

MATCH LINE - SEE SHEET 13

ROAD P1
(56' RIGHT-OF-WAY)

ROAD P2 (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 9

ROAD M (50' RIGHT-OF-WAY)

STORM WATER MANAGEMENT (SWM)

8

9

ROAD I2 (50' RIGHT-OF-WAY)

ALLEY 5 (20' RIGHT-OF-WAY)

ROAD N (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 11

GRAPHICAL SCALE: 1" = 50'
50 25 0 50 100 150

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MATCH LINE - SEE SHEET 10

ROAD F (50' RIGHT-OF-WAY)

ROAD M (50' RIGHT-OF-WAY)

ROAD R (50' RIGHT-OF-WAY)

MATCH LINE - SEE SHEET 12

ROAD Q (50' RIGHT-OF-WAY)

STORM WATER MANAGEMENT (SWM)

7

8

50 25 0 50 100 150

GRAPHICAL SCALE: 1" = 50'

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JOB:	FAIRVIEW
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CADD:	
NCS:	
SHEET:	13 OF 15

Resolution #2023-012

City of Charles Town

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 725-2311 ♦ Web: www.charlestownwv.us

Resolution to Repeal and Replace the Conditions of Annexation for Fairview Property

WHEREAS, Oakland United Methodist Church and the Estate of Margaret Z. Dailey, by Bank of Charles Town as executor, presented their petition to annex property into the City of Charles Town (City) at a regular council meeting on the 19th day of September 2005 that was subsequently referred to the Finance Committee (Committee) and the Planning Commission (Commission) for review, analysis, and recommendation; and

WHEREAS, the Committee and Commission recommended, and the Charles Town City Council (Council) received and approved acceptance via Resolution 2005-15 on 5th day of December 2005 for annexation of Oakland United Methodist Church and the Estate of Margaret Z. Dailey, by Bank of Charles, her Executor, to incorporate such land into the City with several conditions including certain parcels with a zoning designation of Neighborhood Residential and General Commercial; and

WHEREAS, the petitioners agree that any conditions of annexation imposed by Council at that time would bind the owners of the property, their successors, and assigns; and

WHEREAS, nearly eighteen years after that initial agreement was made, the subject property remains undeveloped and the current property owners, working with the developer, have requested Council consider amendments to the original agreement that reflect the City's current growth plans and existing economic conditions; and

WHEREAS, the Mayor appointed a Select Committee on the 22nd day of June 2023, including representatives from the City's Community Development Division, Planning Commission, and Council, to work with the current owners to determine if amendments should be recommended to the full Council for further consideration; and

WHEREAS, after several productive discussions with the current property owner and prospective developer of the Fairview Property that was annexed with conditions into the City pursuant to Resolution 2005-15 (Resolution), the special committee recommends repealing the conditions of annexation imposed by the Resolution and replacing with new terms and conditions.

NOW, THEREFORE BE IT RESOLVED Council agrees to the following new terms and conditions with respect to the development of the Fairview Property: See Attached Exhibit 1

NOW, THEREFORE BE IT FURTHER RESOLVED, the Planning Commission shall review the owner/developers' sketch plan dated March 2023 for development during the 24th day of April, 2023 Planning Commission for consistency with the Neighborhood Residential Zoning District standards and other conditions outlined in this resolution, make adjustments with the owner/developer as agreed, and perform all other routine duties as outlined in the City's Subdivision and Land Development Ordinance related to this project; and

NOW, THEREFORE BE IT FUTHER RESOLVED, Council and the property owner agree that the terms and conditions contained in this resolution shall bind the current owner, their successor, and assigns.

Adopted the 18th day of September 2023.

Robert M. Trainor
Mayor

John Nissel
City Manager/Clerk

Exhibit 1 of Resolution 2023-012: City of Charles Town - Conditions of Annexation offered by Jaguar IV, LC, and any future assigns and/or buyers, for the annexation of approximately 113.8 acres into the City of Charles Town.

"Jaguar IV, LC", herein also referred to as "Land Owner", and any future assigns and/or buyers, agrees to the following conditions of annexation for "The Property" identified as Parcel 218.1, Tax Map 10, Charles Town District, for annexation into the City of Charles Town, herein also referred to as "The City":

Economic Impact:

1. In lieu of paying capital improvement fees, and fee in-lieu requirements for Park Dedication under Section 1333.17 of the Subdivision and Land Development Ordinance, the Land Owner proffers to pay a flat fee of $3,494.00 per residential unit at the time of building permit issuance. The Land Owner shall be exempt from any future capital improvement fees implemented by The City.
2. In lieu of paying capital improvement fees, the Land Owner proffers to pay a flat fee of $2,958.00 per thousand square feet of commercial space at the time of building permit issuance. The Land Owner shall be exempt from any future capital improvement fees implemented by The City.

Urban Zoning:

3. The Property is to be zoned (NR) Neighborhood Residential District. At least 10% of the total land area of Parcel 218.1 shall be created as "for-profit" commercial uses. All proposed land uses shall be so designated on the Sketch Plan. The 2.42-acre Parcel 218.2, deeded to the City of Charles Town in 2013 for a water treatment facility, is to be included in the calculation of commercial use.
4. The City agrees to the following clarifications of the Zoning Ordinance:
   a. Townhomes may be constructed on individual lots and do not need to be located on a 5 acre cluster.
   b. For all residential structures, street front set backs shall be measured from the street curb.
5. The Land Owner agrees to provide landscaped buffers between commercial uses and adjoining residential uses. Such buffers shall be as prescribed in the City's Zoning Ordinance or may be landscaped parks or trails.
6. In accordance with the NR Zone regulations, at least 10% of Parcel 218.1 shall be open space. As a mixed-use community, Section 1333.20(O) of the Subdivision and Land Development Ordinance of the City of Charles Town, open space standards for townhouse developments shall be pro-rated at 20% based on the percentage of the property that is developed for townhomes.

Municipal Infrastructure and Services:

7. As part of the development, the Land Owner agrees to create recreation areas, walking paths and a small community park(s) (1 to 2 acres) to be built for use of the residents and users of the planned development. These areas shall be maintained by the HOA created for the development.
8. The following amenities shall be included in the community park(s):
   a. Outdoor community center consisting of a pavilion with electricity, picnic tables and BBQ grills.
   b. Playground: Construct commercial grade playground equipment that serves the following age groups (6-23 months, 2-5 years, and 5-12 years). The playground should meet ADA compliance standards that features ramps and transfer stations with accessible access to the playground area. Playground surfacing should consist of ADA accessible engineered wood fiber, rubber mulch, or pour-in-place rubber surfacing with the goal of facilitating inclusive play opportunities.
   c. Multi-purpose play field.

Affordable Housing:

9. 10% of the residential units in the development shall meet HUD's HOME Homeownership Value Limits for Jefferson County.

Transportation:

10. The Landowner shall co-ordinate with the Jefferson County Board of Education to provide an adequate number of bus stop shelters within the development to be used for school transportation, subject to acceptance by the Jefferson County Board of Education.
11. The Landowner shall co-ordinate with the Eastern Panhandle Transit Authority to provide an adequate number of bus stop shelters for public transportation subject to acceptance by EPTA.
12. The Land Owner shall include the construction of a major roadway and trail consistent with the transportation plan of the City's Comprehensive Plan. The trail shall be fully constructed by the Land Owner to Subdivision and Land Development Ordinance standards under Section 1333.18(A) and Standard Detail ST1. The trail is to be located within the proposed major road right of way, and it shall be accessible by the general public. The road shall be designed as a continuous limited access roadway designed to serve the traffic generated by the subdivision, but not limiting the use of traffic calming features such as roundabouts, narrow travel lanes and raised crosswalks to make the road more compatible for a residential area. The Land Owner shall build this road not more than 2 lanes wide (minor collector road design standards), excluding required turning lanes, and this road shall be located within an eighty-foot wide right of way. The road shall be located to serve the various parts of the subdivision. An eighty foot wide right of way will be reserved and platted to allow completion through the Property of the major road to the property line [adjoining the approximately 92 acre Langlet property (currently Tax District 3/Map 15/Parcel 7)] of the parcel.
13. The City agrees to work with the Land Owner and the WVDOT to create the best main entrances into the development.
14. The Land Owner shall conduct a traffic impact analysis (TIA) once the Sketch Plan for the Development has been developed and actual uses and transportation patterns have been delineated. This TIA will be done in accordance with the guidelines as set by the WVDOH. It will be submitted with the Preliminary Subdivision / Land Development Plat.
15. The Land Owner agrees that if it is determined by the traffic study that traffic lights are required at build out of the development at any of the intersections with Route 115 that it will be responsible for any portion of the light the State Department of Highways deems appropriate.

Other:

16. The Land Owner shall ensure that the above conditions of annexation are binding to the property and upon any assigns and/or buyers of any, or all, portions of the property, excluding land given to the City or WVDOT.
17. To incentivize and attract commercial development within the City, all commercial lots associated with the land shall be prepared in a way that includes grading and utility installation. All commercial lots shall have all pad sites graded with utility installation (stubbed to the property line) completed during the initial start-up of Project Phase 1. Specifically, if Phase 1 includes more than 100 residential units, to include both townhomes and single-family homes, all commercial pad site preparation shall run concurrently with the construction of the first (10) ten residential units. No more than (10) ten residential units shall be constructed until all commercial lots are completed with the above requirements.

City of Charles Town

Robert M. Trainor
Mayor

Attest:

John Nissel
City Clerk

STATE OF WEST VIRGINIA
COUNTY OF Jefferson, to wit:

The foregoing instrument was acknowledged before me this 11 day of October, 2023, by Robert M. Trainor, in his capacity as Mayor of the City of Charles Town, a West Virginia municipal corporation.

(Affix Notarial Seal)

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
Carolyn M. Vezzosi
City of Charles Town
101 E. Washington Street
PO Box 14
Charles Town, WV 25414
My Commission Expires June 12, 2029

Carolyn Vezzosi
NOTORY PUBLIC

My commission expires: 6/12/2025

Charles Cocke, Mgr.
Charles Cocke
Charles Cocke, Manager
Jaguar IV LC

STATE OF Maryland
County of Montgomery

The foregoing instrument was acknowledged before me this 5TH day of October, 2023,
By Charles Cocke, Manager of Jaguar IV LC
(Affix Notarial Seal)

Michael Dropik
NOTARY PUBLIC
Montgomery County
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4-18-2023: REVISED PER CITY COMMENTS
10-11-2023: REVISED PER CITY COMMENTS & REVISED COA

CONDITIONS OF ANNEXATION

FAIRVIEW
SKETCH PLAN
CITY OF CHARLES TOWN, WEST VIRGINIA
TAX MAP 10, PARCEL 218.1 (D.B. 1089, PG 144)

CT FILE # 2023-04

SCALE:	HORIZ.: 1"=50' VERT.:
DATE:	MARCH, 2023
JOB:	FAIRVIEW
DRAWN: DC	CHECK: CW
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SHEET:	14 OF 15

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AERIAL OVERLAY

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CITY OF CHARLES TOWN, WEST VIRGINIA
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Fairview Farms Traffic Impact Study - REVISION
Charles Town, Jefferson County, WV

AMT Project File 22-0255.001 | August 4, 2023

PREPARED FOR:
LG Homes – Mid Atlantic
1450 Lake Robbins Drive, Suite 430
The Woodlands, TX 77380

A. MORTON THOMAS AND ASSOCIATES, INC.



PREPARED BY:
Caleb Glaser, P.E., PTOE
A. Morton Thomas and Associates, Inc.
417 Grand Park Drive, Suite 104
Parkersburg, WV 26105
(304) 400-4952

Signature: Date: 08/04/2023

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EXECUTIVE SUMMARY

This report summarizes existing and future traffic analyses conducted in support of the proposed Fairview Farms Mixed-Use Development. The proposed development is to be located north of WV 115 (Charles Town Road) and east of US 340 (Berryville Pike) in Charles Town, Jefferson County. The proposed site plan includes 267 single-family homes, 200 townhomes, and 99,000 square feet (sf) of self-storage. Fairview Farms is expected to be built and completed by the year 2030.

The proposed mixed-use development is anticipated to be served by two site driveways intersecting directly with WV 115. Site Drive #1 is proposed to be located approximately 630 feet east of Crosswinds Drive approaching WV 115 from the north and will operate as a full movement approach utilizing two-way stop-control (TWSC). Site Drive #2 will approach WV 115 from the north approximately 1,270 feet east of Crosswinds Drive and will operate as a full movement approach utilizing TWSC.

Traffic analyses will consider future conditions at the anticipated build-out year of 2030. This report summarizes the analyses of 2022 Existing conditions, 2030 No-Build conditions (without proposed development in place), 2030 Build conditions (with the proposed development in place), and 2030 Build Improved conditions (with the proposed development and improvements in place) during weekday AM and PM peak hours. An annual growth rate of 1.20% was obtained from the WVDOH Performance Management Division.

Three approved traffic impact studies have been included in the future peak hour forecasts as pending developments that will be complete by the Build Year of 2030. These developments are the Tate Manor, Magnolia Springs, and Kings Crossing residential developments. The Tate Manor and Magnolia Springs developments are located north of Crescent Drive/High Street and east of Jefferson Avenue in Charles Town and are anticipated to be completed by the year 2024. The Kings Crossing development is located along the south side of WV 115 opposite the proposed development and is anticipated to be complete by 2025. Estimated traffic generated by the three developments are included in the background traffic volumes beginning in the 2030 No-Build conditions.

AMT (A. Morton Thomas and Associates, Inc.) was retained to determine the projected traffic impacts of the proposed development in accordance with the guidelines set forth by WVDOH in Traffic Engineering Directive (TED) 106-2. The intent of the study is to fully examine the impacts of the traffic generated by the development on the existing transportation system and identify potential mitigation measures. This report presents trip generation, trip distribution, intersection on capacity analysis, queuing analysis, auxiliary lane analysis, and recommendations for transportation improvements necessary to meet the anticipated traffic demands.

Based upon a review of the site plan and adjacent transportation network and following scope of work coordination with WVDOH, the following eight existing and two proposed intersections are included within the scope of the Traffic Impact Study (TIS) for the proposed Fairview Farms residential development:

1) WV 115 (Charles Town Road) with Jefferson Avenue (CR 34) (*TWSC "T" type intersection)*
2) WV 115 with Citizens Way (CR 115/4)/US 340 SB (*Single-lane Roundabout Plus intersection)*
3) WV 115 with Hillside Drive (CR 9/69)/US 340 NB (*TWSC Plus type intersection)*
4) WV 115 with Fairleigh Drive/Bailey Brooks Way *(TWSC Plus type intersection)*

5) WV 115 with Crosswinds Drive *(TWSC "T" type intersection)*
6) WV 115 with Kabletown Road (CR 25) *(TWSC "T" type intersection)*
7) WV 115 with Cattail Run Road (CR 9/3) *(TWSC "T" type intersection)*
8) WV 9 (Veterans Memorial Highway) with Cattail Run Road *(TWSC Plus type intersection)*
9) WV 115 with Site Drive #1 *(Proposed TWSC "T" type intersection)*
10) WV 115 with Site Drive #2 *(Proposed TWSC "T" type intersection)*

Peak Hour Traffic Volumes

Peak hour turning movement counts were collected for the eight existing intersections within the study area by AMT on Friday April 23, 2022 between the hours of 7-9 AM and 3-6 PM. On this date, Jefferson County Schools were fully operational with in-classroom instruction for all students.

The proposed development is expected to be complete by the year 2030. The 2030 No-Build peak hour traffic volumes include the existing 2022 traffic volume, the anticipated traffic generated by the pending Tate Manor development, the anticipated traffic generated by the Magnolia Springs development, the anticipated traffic generated by the Kings Crossing development, and an annual traffic growth prior to the year 2030. The growth rate of 1.20% was applied to the existing peak hour traffic counts and compounded annually.

The 2030 Build Conditions include the existing 2022 traffic volume, the anticipated traffic generated by the pending Tate Manor development, the anticipated traffic generated by the Magnolia Springs development, the anticipated traffic generated by the Kings Crossing development, an annual traffic growth prior to the year 2030, and the traffic generated by build-out of the Fairview Farms development. Site generated traffic was distributed onto the transportation network based upon existing traffic patterns and anticipated origin and destination of the newly generated site trips.

Site Trip Generation and Distribution

The proposed Fairview Farms mixed-use development includes 267 single-family homes, 200 townhomes, and 99,000 sf of self-storage. Trip generation "Peak Hour of Generator" rates from ITE Trip Generation Manual, 11th Edition, were utilized for Self-Storage (LUC 151), Single-Family Detached Housing (LUC 210), and Multifamily Housing (LUC 220). Trip generation analysis indicates that a total of 4,133 new daily trips will be generated including 335 AM peak hour trips and 421 PM peak hour trips.

The AM and PM peak hour trips to/from the proposed site were distributed based upon interpolation from current traffic patterns with all trips entering the development via WV 115. Distribution of the new external trips are as follows:

- 25% to/from the north on US 340
- 25% to/from the south on US 340
- 15% to/from the east on WV 9
    - 10% to/from north via Cattail Run Road
    - 5% to/from north via US 340
- 30% to/from the west on WV 115
- 5% to/from the east on WV 115

2022 Existing Conditions Analysis

The results of the 2022 Existing Conditions capacity analyses indicate that one traffic movement currently operates worse than LOS D, which is considered the minimum tolerable level. Traffic movements that are expected to operate worse than LOS D include the following (movements shown in bold type indicate they first appear in the milestone analysis being discussed):

- ***US 340 NB Ramp northbound shared left/thru lane to WV 115 LOS F during PM peak hour***

2030 No-Build Conditions Analysis

Improvements included in the 2030 No-Build Conditions include installation of a traffic signal at WV 115 with Jefferson Avenue and construction of an exclusive left-turn lane on WV 115 eastbound at Jefferson Avenue. These improvements were included in the Tate Manor TIS. In addition, construction of a single-lane roundabout at the WV 115 with US 340 NB Ramp/Hillside Drive is included in the 2030 No-Build conditions. This improvement is currently a planned project by WVDOH and requested to be included beginning in this scenario.

The results of the 2030 No-Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2022 Existing Conditions are anticipated to be mitigated following implementation of proposed improvements. One additional movement is anticipated to operate worse than LOS D during the 2030 No-Build conditions (shown in bold). Traffic movements that are expected to operate worse than LOS D include the following:

- ***Farleigh Drive northbound approach to WV 115 LOS E during PM peak hour***

2030 Build Conditions Analysis

Improvements included in the 2030 Build Conditions include construction of the two site driveways intersecting with WV 115.

The results of the 2030 Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2030 No-Build Conditions are anticipated to continue. Three additional movements are anticipated to operate worse than LOS D during the 2030 Build conditions (shown in bold). Traffic movements that are expected to operate worse than LOS D include the following:

- ***US 340 SB Ramp northbound shared left/thru/right lane to WV 115 LOS E during PM peak hour***
- ***WV 115 eastbound approach to US 340 NB Ramp/Hillside Drive LOS E during PM peak hour***
- *Farleigh Drive northbound approach to WV 115 LOS F during PM peak hour*
- ***Crosswinds Drive northbound left-turn movement to WV 115 LOS E during PM peak hour***

2030 Build Improved Conditions Analysis

Improvements included in the 2030 Build Improved Conditions comprise construction of a right-turn slip lane on the US 340 Southbound Ramp to WV 115, construction of a right-turn slip lane on the WV 115 eastbound approach to US 340 Northbound Ramp/Hillside Drive, construction of an exclusive left-turn lane on WV 115 eastbound approach to Site Drive #1, and construction of an exclusive left-turn lane on WV 115 eastbound approach to Site Drive #2.

The results of the 2030 Build Improved Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2030 Build Conditions will be mostly mitigated following implementation of proposed improvements. Traffic movements that are expected to operate worse than LOS D include the following:

- *Farleigh Drive northbound approach to WV 115 LOS F during the PM peak hour*
- *Crosswinds Drive northbound left-turn movement to WV 115 LOS E during PM peak hour*

Conclusions/Recommendations

Based on the findings of the Tate Manor TIS, the following infrastructure improvements are recommended to address existing capacity issues and accommodate the Tate Manor residential development in order to maintain operation of the existing transportation network:

WV 115 with Jefferson Avenue

- As part of the Tate Manor TIS, it was recommended that a traffic signal be installed at the intersection of WV 115 and Jefferson Avenue. Intersection conditions previously met the MUTCD warranting criteria. Additionally, the 2022 Existing Conditions and 2030 No-Build analysis indicates that the intersection LOS will currently operates at LOS E during the PM peak hour under TWSC.

- In conjunction with installation of a traffic signal identified in previous studies, widening WV 115 to construct an exclusive left-turn lane on the eastbound approach is recommended. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with an appropriate taper.

Based on the findings of the Kings Crossing TIS, the following infrastructure improvements are recommended to address existing capacity issues and accommodate the Kings Crossing residential development in order to maintain operation of the existing transportation network:

WV 115 with Citizen Way/US 340 Southbound Ramps

- Construct a low angle right-turn slip lane on for the US 340 northbound ramp approach to WV 115 eastbound. The 2030 Build analysis indicates that the ramp approach will deteriorate to LOS E during the PM peak hour with the overall intersection operating LOS C. The addition of the right-turn slip lane improves the ramp to LOS A during the PM peak hour and the overall intersection to LOS B. This measure is needed at the conclusion of Phase 2 and prior to beginning Phase 3.

Based on the findings of the Magnolia Springs TIS, the following infrastructure improvements are recommended to address existing capacity issues in order to maintain operation of the existing transportation network:

WV 115 with Hillside Drive/US 340 Northbound Ramps

- Proceed with the WVDOH planned conversion of the intersection to a single lane roundabout. This project is currently programmed by WVDOH and is expected to be constructed in 2025. For the purpose of this study, the installation of a single lane roundabout is included beginning in 2030 No-Build conditions.

Based on the findings of this study, the following capacity infrastructure improvements are recommended to mitigate future transportation issues prior to construction of the Fairview Farms Development:

WV 115 with Hillside Drive/US 340 Northbound Ramps

- Construct an exclusive right-turn slip lane on the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive. The WV 115 eastbound approach is anticipated to experience lengthy queues beginning in the 2030 No-Build conditions. This improvement increases capacity and reduces queue lengths on the approach.

Based on the finding of this study, the following geometric improvements are recommended to mitigate the impacts of the Fairview Farms development and maintain acceptable traffic operations along the existing transportation network in 2030:

WV 115 with Site Drive #1

- Construct Site Drive #1 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 630 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and one egress lane. Site Drive #1 will operate under stop-control, while WV 115 operates as free-flow.

- Construct an exclusive left-turn lane on the WV 115 eastbound approach to Site Drive #1. Peak hour volumes are projected to meet the AASHTO guidelines during 2030 Build Conditions AM and PM peak hours. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with appropriate taper.

WV 115 with Site Drive #2

- Construct Site Drive #2 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 1,270 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and one egress lane. Site Drive #2 will operate under stop-control, while WV 115 operates as free-flow.

- Construct an exclusive left-turn lane on the WV 115 eastbound approach to Site Drive #2. Peak hour volumes are projected to meet the AASHTO guidelines during 2030 Build Conditions PM peak hour. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with appropriate taper.

INTRODUCTION

This report summarizes existing and future traffic analyses conducted in support of the proposed Fairview Farms Mixed-Use Development. The proposed development is to be located north of WV 115 (Charles Town Road) and east of US 340 (Berryville Pike) in Charles Town, Jefferson County. The proposed site plan includes 267 single-family homes, 200 townhomes, and 99,000 sf of self-storage. Fairview Farms is expected to be built and completed by the year 2030.

The proposed mixed-use development is anticipated to be served by two site driveways intersecting directly with WV 115. Site Drive #1 is proposed to be located approximately 630 feet east of Crosswinds Drive approaching WV 115 from the north and will operate as a full movement approach utilizing TWSC. Site Drive #2 will approach WV 115 from the north approximately 1,270 feet east of Crosswinds Drive and will operate as a full movement approach utilizing TWSC.

Traffic analyses will consider future conditions at the anticipated build-out year of 2030. This report summarizes the analyses of 2022 Existing conditions, 2030 No-Build conditions (without proposed development in place), 2030 Build conditions (with the proposed development in place), and 2030 Build Improved conditions (with the proposed development and improvements in place) during weekday AM and PM peak hours. An annual growth rate of 1.20% was obtained from the WVDOH Performance Management Division.

Three approved traffic impact studies have been included in the future peak hour forecasts as pending developments that will be complete by the Build Year of 2030. These developments are the Tate Manor, Magnolia Springs, and Kings Crossing residential developments. The Tate Manor and Magnolia Springs developments are located north of Crescent Drive/High Street and east of Jefferson Avenue in Charles Town and are anticipated to be completed by the year 2024. The Kings Crossing development is located along the south side of WV 115 opposite the proposed development and is anticipated to be complete by 2025. Estimated traffic generated by the three developments are included in the background traffic volumes beginning in the 2030 No-Build conditions. Information regarding both developments is located in **Appendix F**.

AMT was retained to determine the projected traffic impacts of the proposed development in accordance with the guidelines set forth by WVDOH in TED 106-2. The intent of the study is to fully examine the impacts of the traffic generated by the development on the existing transportation system and identify potential mitigation measures. This report presents trip generation, trip distribution, intersection on capacity analysis, queuing analysis, auxiliary lane analysis, and recommendations for transportation improvements necessary to meet the anticipated traffic demands.

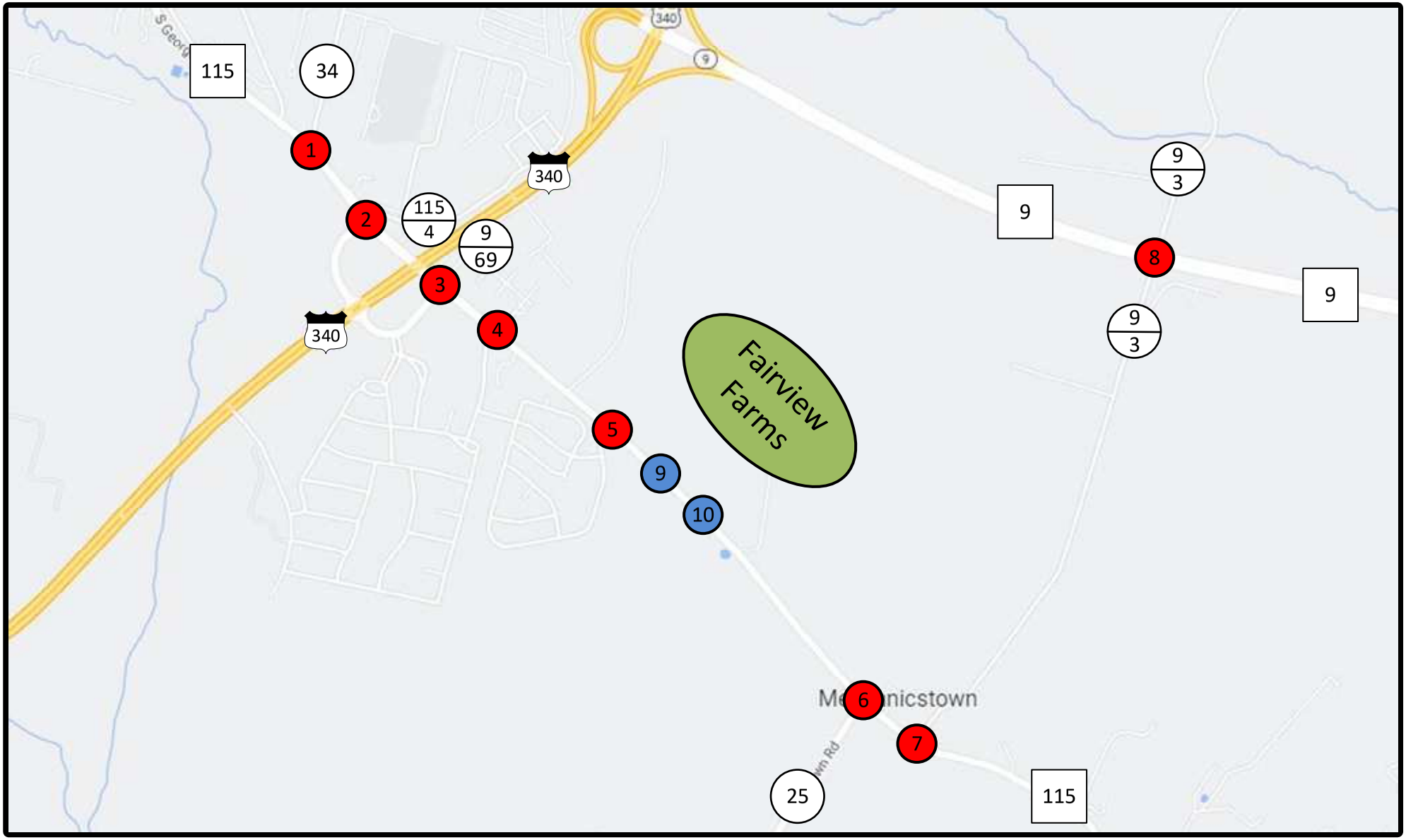
AMT coordinated with WVDOH to determine the intersections to be studied within the scope of work, preliminary trip generation, distribution, and study methodology for this TIS. A copy of the approved Scope of Work (SOW) is included in **Appendix G**.

STUDY AREA DESCRIPTION

Based upon a review of the site plan and adjacent transportation network and following SOW coordination with WVDOH, the following eight existing and two proposed intersections are included within the scope of the TIS for the proposed Fairview Farms mixed-use development:

1) WV 115 (Charles Town Road) with Jefferson Avenue (CR 34) (*TWSC "T" type intersection)*
2) WV 115 with Citizens Way (CR 115/4)/US 340 SB (*Single-lane Roundabout Plus intersection)*
3) WV 115 with Hillside Drive (CR 9/69)/US 340 NB (*TWSC Plus type intersection)*
4) WV 115 with Fairleigh Drive/Bailey Brooks Way *(TWSC Plus type intersection)*
5) WV 115 with Crosswinds Drive *(TWSC "T" type intersection)*
6) WV 115 with Kabletown Road (CR 25) *(TWSC "T" type intersection)*
7) WV 115 with Cattail Run Road (CR 9/3) *(TWSC "T" type intersection)*
8) WV 9 (Veterans Memorial Highway) with Cattail Run Road *(TWSC Plus type intersection)*
9) WV 115 with Site Drive #1 *(Proposed TWSC "T" type intersection)*
10) WV 115 with Site Drive #2 *(Proposed TWSC "T" type intersection)*

The study area and key intersections are shown on **Figure 1**. The proposed site plan overview is shown on **Figure 2** and the proposed commercial lot site plan is shown on **Figure 3**.



LEGEND

- = Development
- = Existing Intersection
- = Proposed Intersection

AMT

N

NOT TO SCALE

Fairview Farms TIS

Site Location Map

DATE: August 2023

FIGURE 1

267 SINGLE FAMILY LOTS

200 TOWNHOUSE LOTS

Neighborhood Residential Land Use Mix Requirements				
	Requirement*		Provided	
Use	%	Acres	%	Acres
Residential	50	58.08	0.50	58.09
Commercial	10	11.62	0.10	11.62
Open Space*	10	7.75	0.13	10.17

*Per Ordinance, 10% of "usable land (Net Builldabal Land Area)" required for open space.

150 75 0 150 300 450

GRAPHICAL SCALE: 1" = 150'

NORTH

COMPREHENSIVE PLAN ROAD
LIMITED ACCESS
(80' RIGHT-OF-WAY)

SWM

SWM

SWM

CENTRAL
OPEN SPACE
(3.42 ACRES)

SWM

Intersection #5 – WV 115 & Crosswinds Dr (Full Access)

Intersection #9 – WV 115 & Site Drive #1 (Full Access)

COMMERCIAL LOT #1
(3.76 ACRES)

15' WIDE ROAD RIGHT-OF-WAY
RESERVATION (ROUTE 115)

COMMERCIAL LOT #2
(5.44 ACRES)

Intersection #10 – WV 115 & Site Drive #2 (Full Access)

WATER PLANT DEDICATION
(2.42 ACRES)

SWM

SINGLE FAMILY LOT (110' DEPTH)

TOWNHOUSE LOT (100' DEPTH)

COMMON OPEN SPACE

STORMWATER MANAGEMENT

COMMERCIAL LOT

Fairview Farms TIS

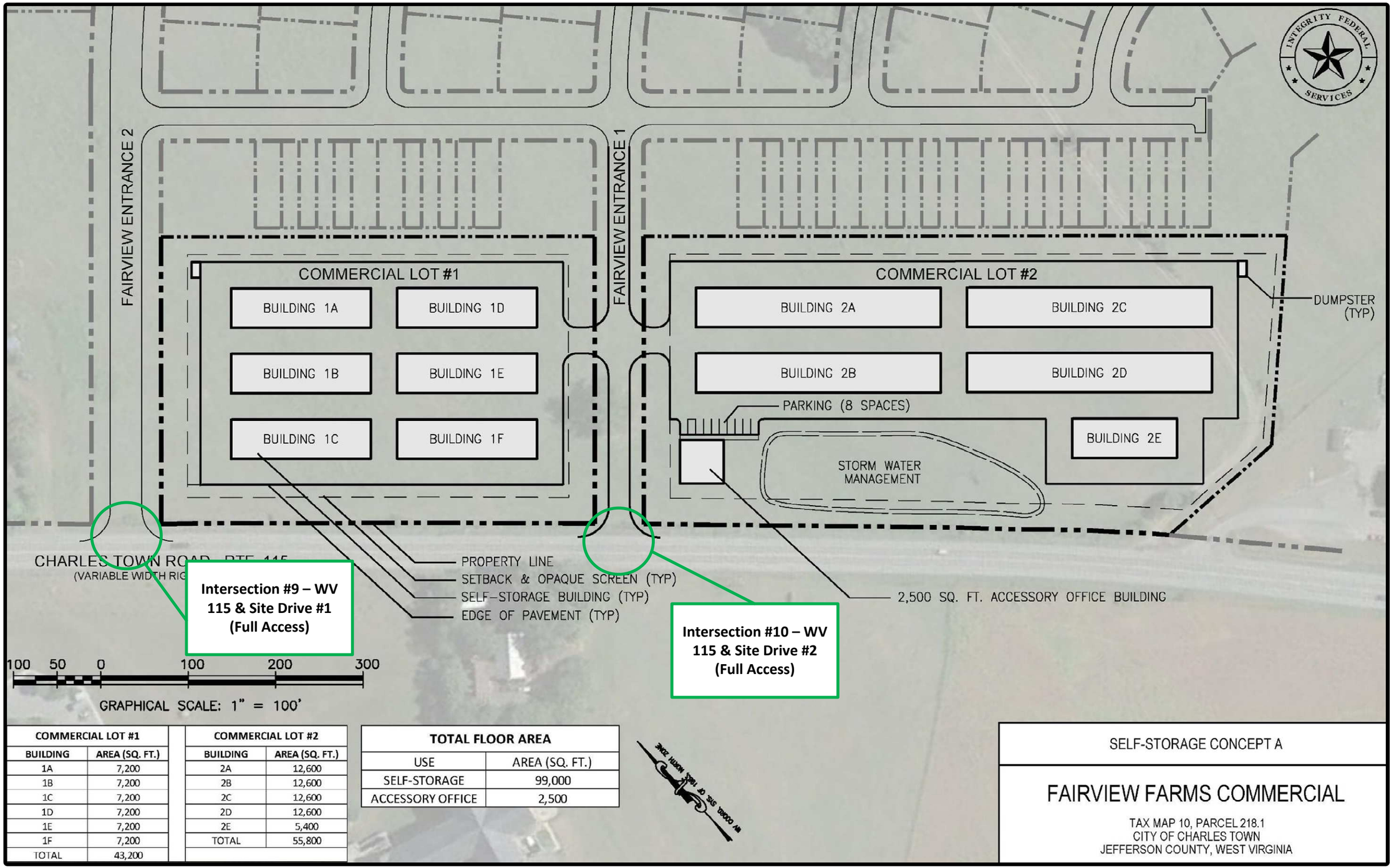
Site Plan - Overview

DATE: August 2023

FIGURE 2

N

NOT TO SCALE



COMMERCIAL LOT #1	
BUILDING	AREA (SQ. FT.)
1A	7,200
1B	7,200
1C	7,200
1D	7,200
1E	7,200
1F	7,200
TOTAL	43,200

COMMERCIAL LOT #2	
BUILDING	AREA (SQ. FT.)
2A	12,600
2B	12,600
2C	12,600
2D	12,600
2E	5,400
TOTAL	55,800

TOTAL FLOOR AREA	
USE	AREA (SQ. FT.)
SELF-STORAGE	99,000
ACCESSORY OFFICE	2,500

SELF-STORAGE CONCEPT A

FAIRVIEW FARMS COMMERCIAL

TAX MAP 10, PARCEL 218.1
CITY OF CHARLES TOWN
JEFFERSON COUNTY, WEST VIRGINIA

Fairview Farms TIS
Site Plan – Commercial Lots
DATE: August 2023
FIGURE 3
NOT TO SCALE

EXISTING ROADWAY CONDITIONS

A detailed description of the existing study area roadway network is provided in this section of the report. AADT (Annual Average Daily Traffic) volume information was obtained from the WVDOH GIS website.

US 340 (Berryville Pike) is a north-south four-lane two way-controlled access divided highway within the project area. US 340 is part of the National Highway System (NHS). US 340 forms a grade separated modified trumpet interchange with WV 115 south of the project site, with the ramps intersecting with surface streets to the north. The posted speed limit on this section of US 340 is 60 miles per hour (mph). The AADT along US 340 is 16,115 vehicles per day (vpd) just north of the US 340 interchange with WV 115.

WV 115 (Charles Town Road) is a north-south two-lane urban major collector within the project area. The posted speed limit on this section of WV 115 is 45 mph east of Kabletown Road before increasing to 55 mph just before Kabletown Road. The AADT along WV 115 in the project area is 4,542 vpd. WV 115 provides a direct connection to Downtown Charles Town, located approximately one-mile northwest of Citizens Way.

WV 9 (Veterans Memorial Highway) is a four-lane divided highway classified as an expressway within the study area. WV 9 overlaps with US 340 in the south of the Charles Town Interchange before splitting from US 340 and continuing east to Hillsboro VA, serving as a primary east/west facility through Jefferson, Berkeley, and Morgan Counties. The speed limit on this section of WV 9 is 60 mph and the AADT is 26,776 vpd.

Jefferson Avenue (CR 34) is a two-lane two-way essential arterial state and local service (SLS) route within the project area. Jefferson Avenue provides access to mostly residential properties and is the only means of access to High Street. High Street connects directly to Charles Town Middle School. The posted speed limit on the section of Jefferson Avenue being analyzed is 35 mph. The AADT in the project area is 4,230.

Kabletown Road (CR 25) is a two-lane two-way collector, state and local service roadway within the project area. Kabletown Road provides access to residential properties while providing a direct connection to WV 115. The posted speed limit on this section of Kabletown Road is 40 mph and the AADT is 1,630 vpd.

Cattail Run Road (CR 9/3) is a two-lane two-way essential arterial within the study area. Cattail Run Road intersects with Keyes Ferry Road to the north and WV 9 to the south serving residential properties and provides access to a rural area. The speed limit on Cattail Run Road is 35 mph and the AADT is 553 vpd.

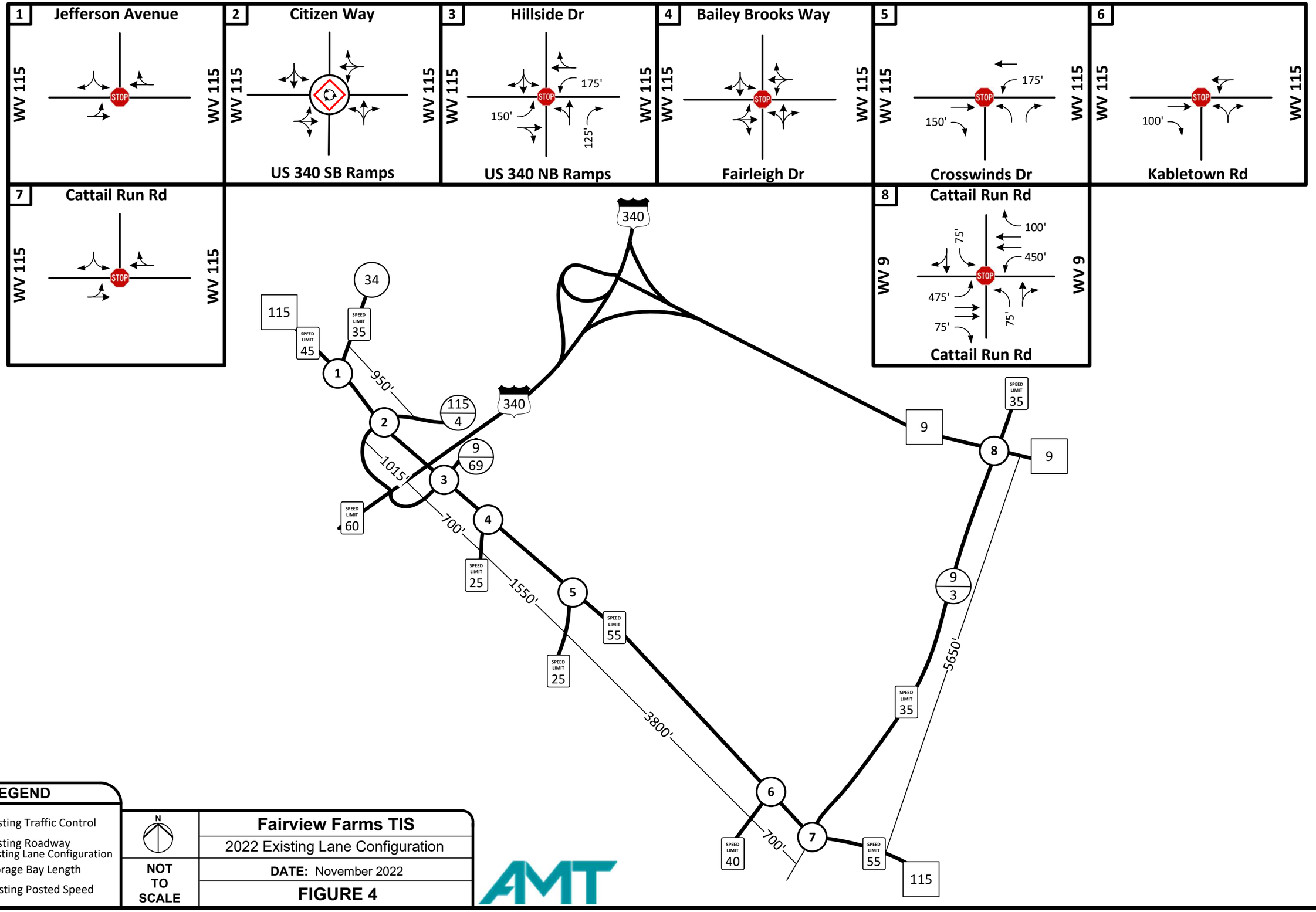
Hillside Drive (CR 9/69) is a two-lane two-way state and local service roadway within the project area. Hillside Drive provides access to residential properties while providing a direct connection to WV 115 opposite US 340 Northbound Ramps. The posted speed limit on this section of Hillside Drive is 35 mph and the AADT is 150 vpd. The AADT for Hillside Drive was not available on WVDOH GIS website, therefore, was calculated based on collected turning movement counts.

Citizens Way (CR 115/4) is a two-lane two-way state and local service roadway within the project area. Citizens Way provides access to the residential neighborhood north of WV 115 and east of Jefferson Avenue. Citizens Way intersects with WV 115 opposite US 340 Southbound Ramps at a four-leg roundabout intersection. The posted speed limit on this section of Citizens Way is 35 mph and the AADT along Citizens Way in the project area is 750 vpd. The AADT for Citizens Way was not available on WVDOH GIS website, therefore, was calculated based on collected turning movement counts.

Table 1 provides a detailed description of the existing study area roadway network. In addition, Estimated Build Year AADT is included in the table which contains Existing volume, Fairview Farms trips, approved background trips (Tate Manor, Magnolia Springs, and Kings Crossing developments), and traffic inflation to 2030. The 2022 existing intersection lane configurations and intersections control are shown on **Figure 4.**

Table 1: Roadway Facility Summary

Name	Code	State Functional Classification	Area	Direction	Speed Limit	Typical Roadway Paved Width (ft)	AADT (Year)	**Estimated Build AADT (2030)**	Description
Berryville Pike	US 340	Trunkline	Jefferson County	N-S	60	72	16,115 (2017)	18,813	N-S Trunkline that forms and interchange with WV 115 west of the proposed development
Veterans Memorial Highway	WV 9	Expressway	Jefferson County	E-W	60	72	26,776 (2017)	31,259	E-W Expressway that runs parallel with CR 17 through study area and connects with US 340
Charles Town Road	WV 115	Trunkline	Jefferson County	N-S	45/55	38	4,542 (2017)	15,730	E-W Trunkline that runs perpendicular with US 340 through study area & is main access to development
Jefferson Avenue	CR 34	Essential Arterial	Jefferson County	N-S	35	28	4,373 (2017)	4,440	N-S SLS Route that intersect with WV 115
Kabletown Road	CR 25	Collector (SLS)	Jefferson County	N-S	40	22	1,630 (2017)	1,820	N-S SLS Route that intersects with WV 115
Citizens Way	CR 115/4	Collector (SLS)	Jefferson County	N-S	35	24	1,990 (2022)	5,120	N-S SLS Route that intersects with WV 115 directly opposite US 340 SB Ramps
Cattail Run Road	CR 9/3	Essential Arterial	Jefferson County	N-S	35	20	553 (2017)	1,340	N-S Essential Arterial that intersects with WV 9 in southern end of study area
Hillside Drive	CR 9/69	Collector (SLS)	Jefferson County	N-S	35	30	150 (2022)	160	N-S SLS Route that intersects with WV 115 directly opposite US 340 NB Ramps


1
Jefferson Avenue
WV 115
WV 115
STOP
2
Citizen Way
WV 115
WV 115
US 340 SB Ramps
3
Hillside Dr
WV 115
WV 115
175'
150'
125'
US 340 NB Ramps
4
Bailey Brooks Way
WV 115
WV 115
STOP
Fairleigh Dr
5
WV 115
WV 115
175'
150'
STOP
Crosswinds Dr
6
WV 115
WV 115
100'
STOP
Kabletown Rd
7
Cattail Run Rd
WV 115
WV 115
STOP
8
Cattail Run Rd
WV 9
WV 9
100'
75'
450'
475'
75'
75'
STOP
Cattail Run Rd
340
34
115
SPEED LIMIT 45
SPEED LIMIT 35
1
950'
115
4
2
340
9
69
3
1015'
SPEED LIMIT 60
700'
4
SPEED LIMIT 25
1550'
5
SPEED LIMIT 55
SPEED LIMIT 25
3800'
6
SPEED LIMIT 40
700'
7
SPEED LIMIT 55
9
8
SPEED LIMIT 35
9
9
3
5650'
SPEED LIMIT 35
115
LEGEND
Existing Traffic Control
Existing Roadway
Existing Lane Configuration
XXX' Storage Bay Length
SPEED LIMIT XX Existing Posted Speed
N
NOT TO SCALE
Fairview Farms TIS
2022 Existing Lane Configuration
DATE: November 2022
FIGURE 4
AMT

EXISTING & NO-BUILD PROJECT TRAFFIC VOLUMES

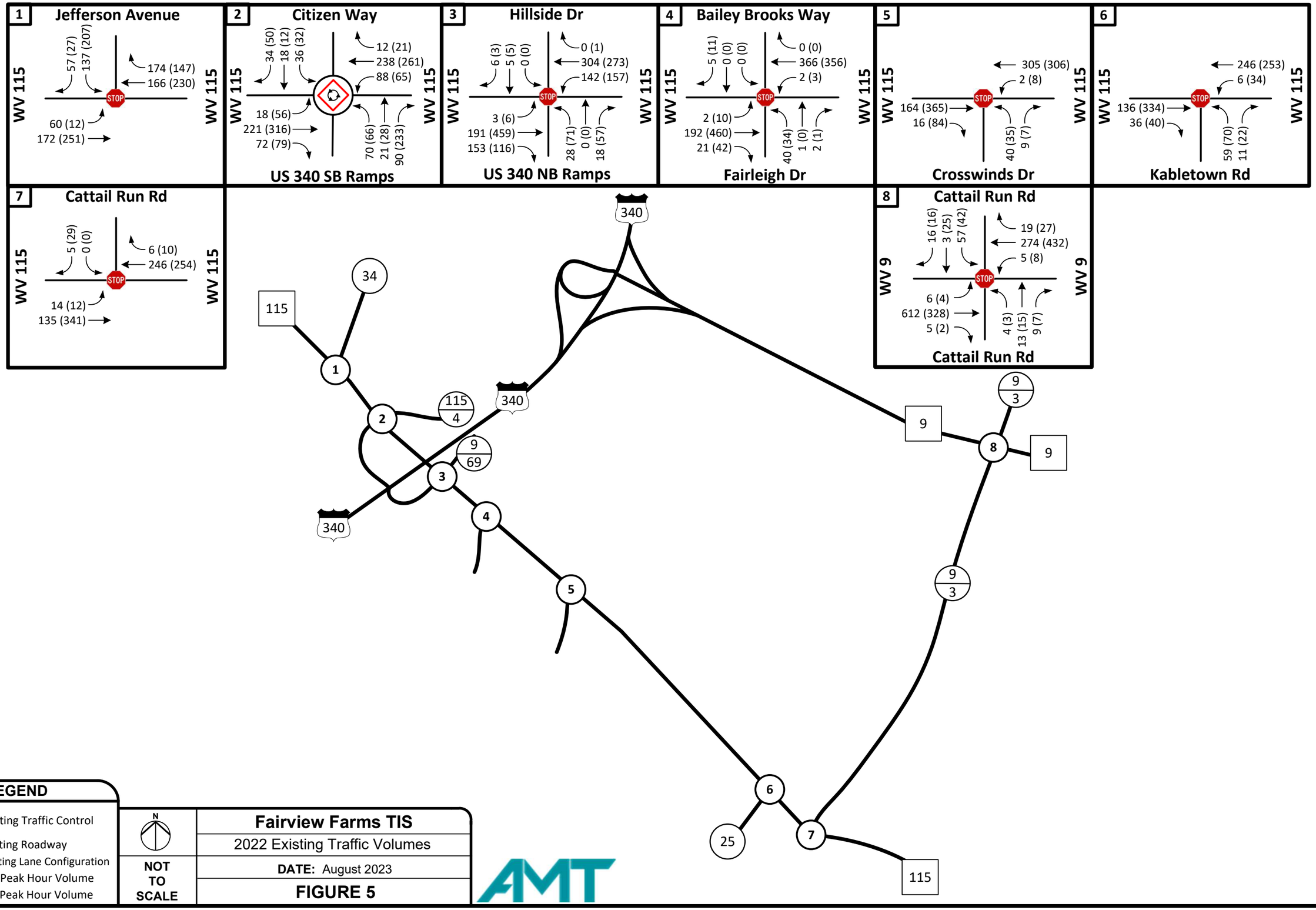
2022 Existing Conditions

Peak hour turning movement counts were collected for the eight existing intersections within the study area by AMT on Friday April 23, 2022 between the hours of 7-9 AM and 3-6 PM. On this date, Jefferson County Schools were fully operational with in-classroom instruction for all students. The traffic count data is located in **Appendix B** and the 2022 Existing Traffic Volumes for the weekday AM and PM peak hour volumes are shown on **Figure 5**.

2030 No-Build Conditions

The proposed development is expected to be complete by the year 2030. The 2030 No-Build peak hour traffic volumes include the existing 2022 traffic volume, the anticipated traffic generated by the pending Tate Manor development, the anticipated traffic generated by the Magnolia Springs development, the anticipated traffic generated by the Kings Crossing development, and annual traffic growth prior to the year 2030. The growth rate of 1.20% was applied to the existing peak hour traffic counts and compounded annually.

The total background development trips for the weekday AM and PM peak hours are shown on **Figure 6** to illustrate the increase in traffic volume resulting from adjacent projects included within this study. The 2030 No-Build peak hour volumes for the weekday AM and PM peak hour volumes are shown on **Figure 7**.



LEGEND

- Existing Traffic Control
- Existing Roadway
- Existing Lane Configuration
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

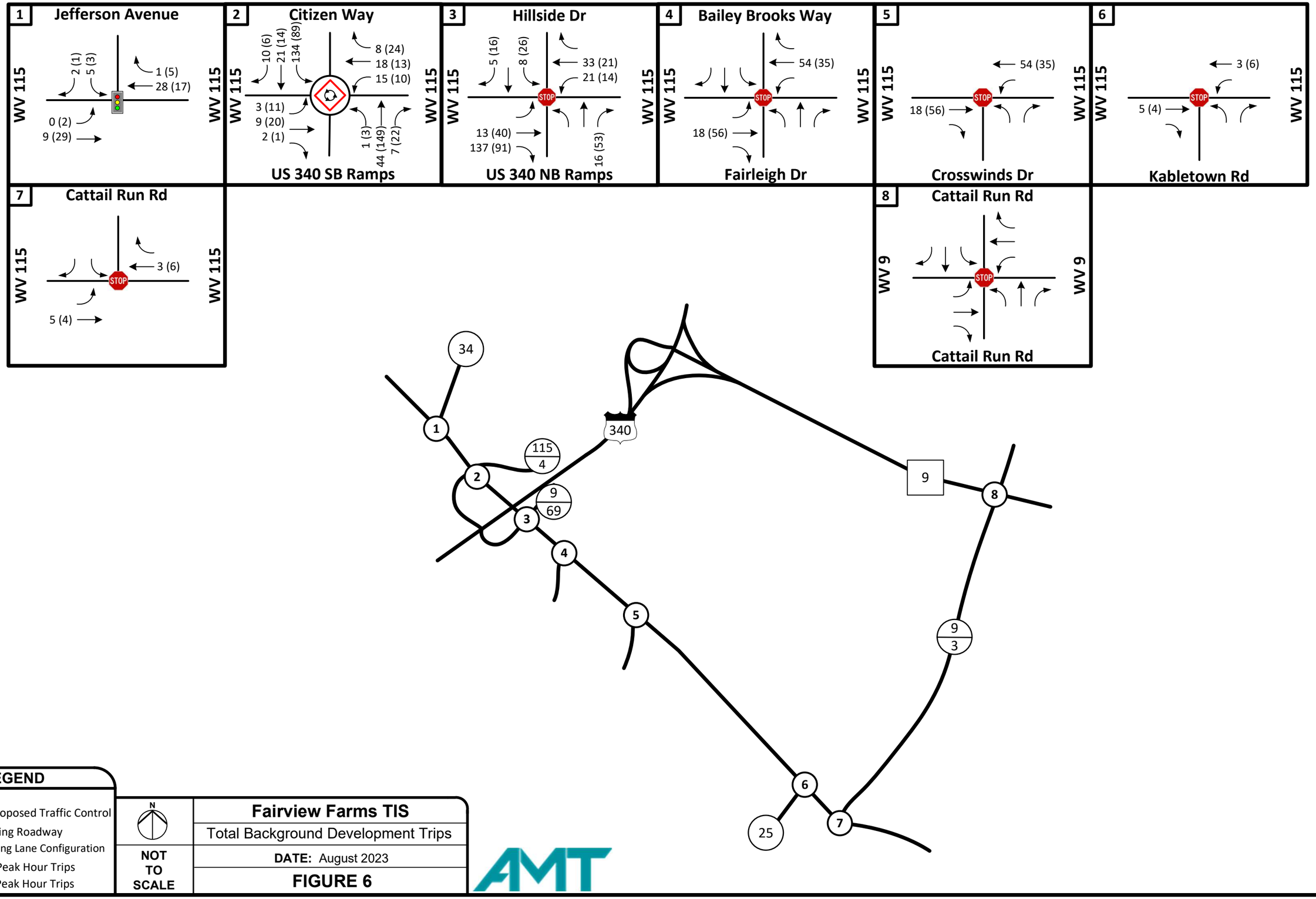
NOT TO SCALE

Fairview Farms TIS

2022 Existing Traffic Volumes

DATE: August 2023

FIGURE 5



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- XX AM Peak Hour Trips
- (XX) PM Peak Hour Trips

N

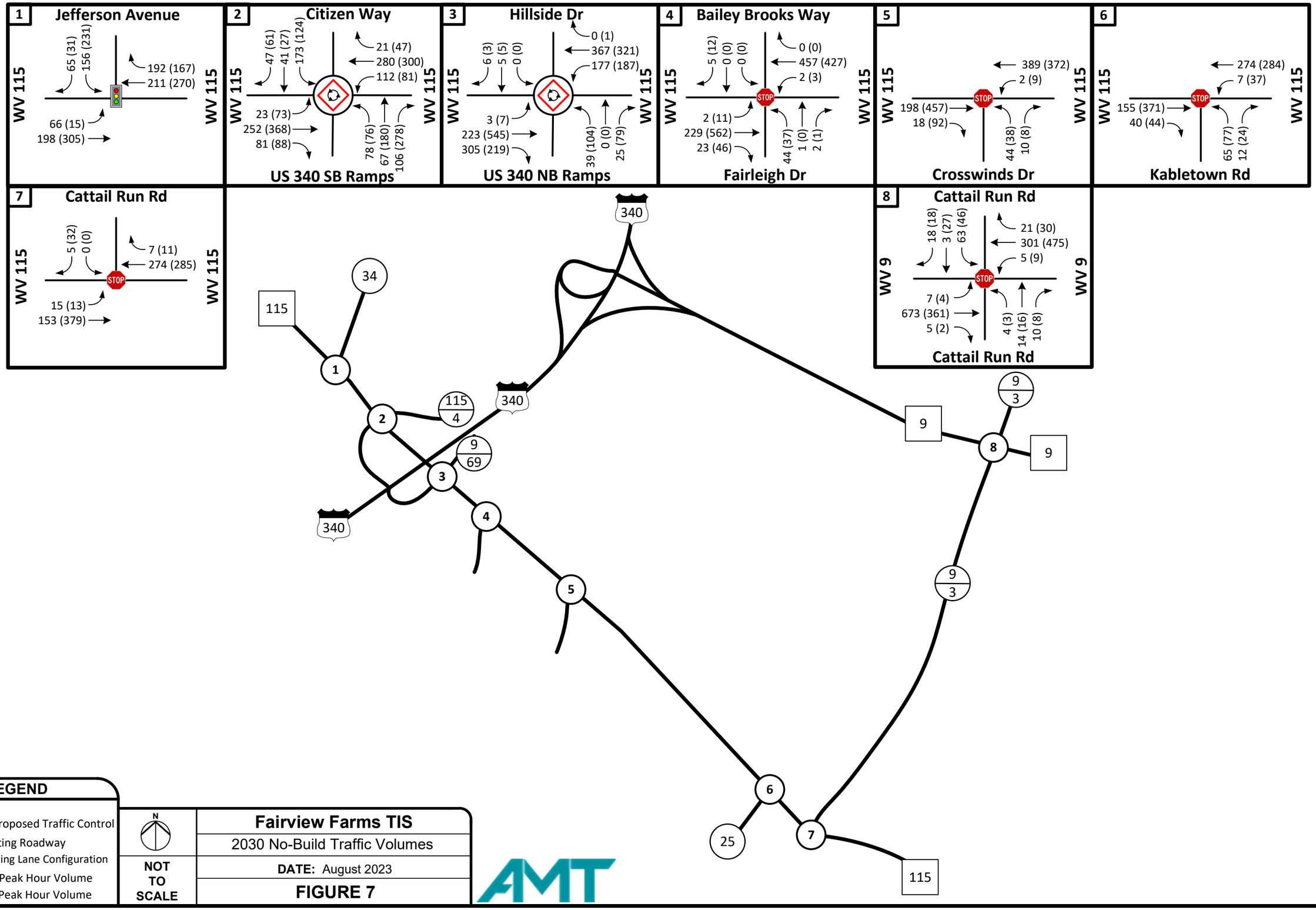
NOT TO SCALE

Fairview Farms TIS

Total Background Development Trips

DATE: August 2023

FIGURE 6


1
Jefferson Avenue
WV 115
WV 115
65 (31)
156 (231)
192 (167)
211 (270)
66 (15)
198 (305)
2
Citizen Way
47 (61)
41 (27)
173 (124)
21 (47)
280 (300)
112 (81)
23 (73)
252 (368)
81 (88)
78 (76)
67 (180)
106 (278)
US 340 SB Ramps
3
Hillside Dr
0 (1)
367 (321)
177 (187)
6 (3)
5 (5)
0 (0)
3 (7)
223 (545)
305 (219)
39 (104)
0 (0)
25 (79)
US 340 NB Ramps
4
Bailey Brooks Way
5 (12)
0 (0)
0 (0)
0 (0)
457 (427)
2 (3)
2 (11)
229 (562)
23 (46)
44 (37)
1 (0)
2 (1)
Fairleigh Dr
5
389 (372)
2 (9)
198 (457)
18 (92)
44 (38)
10 (8)
Crosswinds Dr
6
274 (284)
7 (37)
155 (371)
40 (44)
65 (77)
12 (24)
Kabletown Rd
7
Cattail Run Rd
5 (32)
0 (0)
7 (11)
274 (285)
15 (13)
153 (379)
8
Cattail Run Rd
WV 9
WV 9
18 (18)
3 (27)
63 (46)
21 (30)
301 (475)
5 (9)
7 (4)
673 (361)
5 (2)
4 (3)
14 (16)
10 (8)
Cattail Run Rd
340
34
115
1
2
115
4
340
9
69
3
4
5
6
25
7
115
9
3
8
9
9
3
LEGEND
Proposed Traffic Control
Existing Roadway
Existing Lane Configuration
XX AM Peak Hour Volume
(XX) PM Peak Hour Volume
N
NOT TO SCALE
Fairview Farms TIS
2030 No-Build Traffic Volumes
DATE: August 2023
FIGURE 7
AMT

TRIP GENERATION

The proposed Fairview Farms mixed-use development includes 267 single-family homes, 200 townhomes, and 99,000 sf of self-storage. Trip generation "Peak Hour of Generator" rates from ITE Trip Generation Manual, 11th Edition, were utilized for Self-Storage (LUC 151), Single-Family Detached Housing (LUC 210), and Multifamily Housing (LUC 220). As shown in **Table 2** below, the proposed development will generate a total of 4,133 new daily trips including 335 AM peak hour trips and 421 PM peak hour trips.

Table 2: Trip Generation Summary

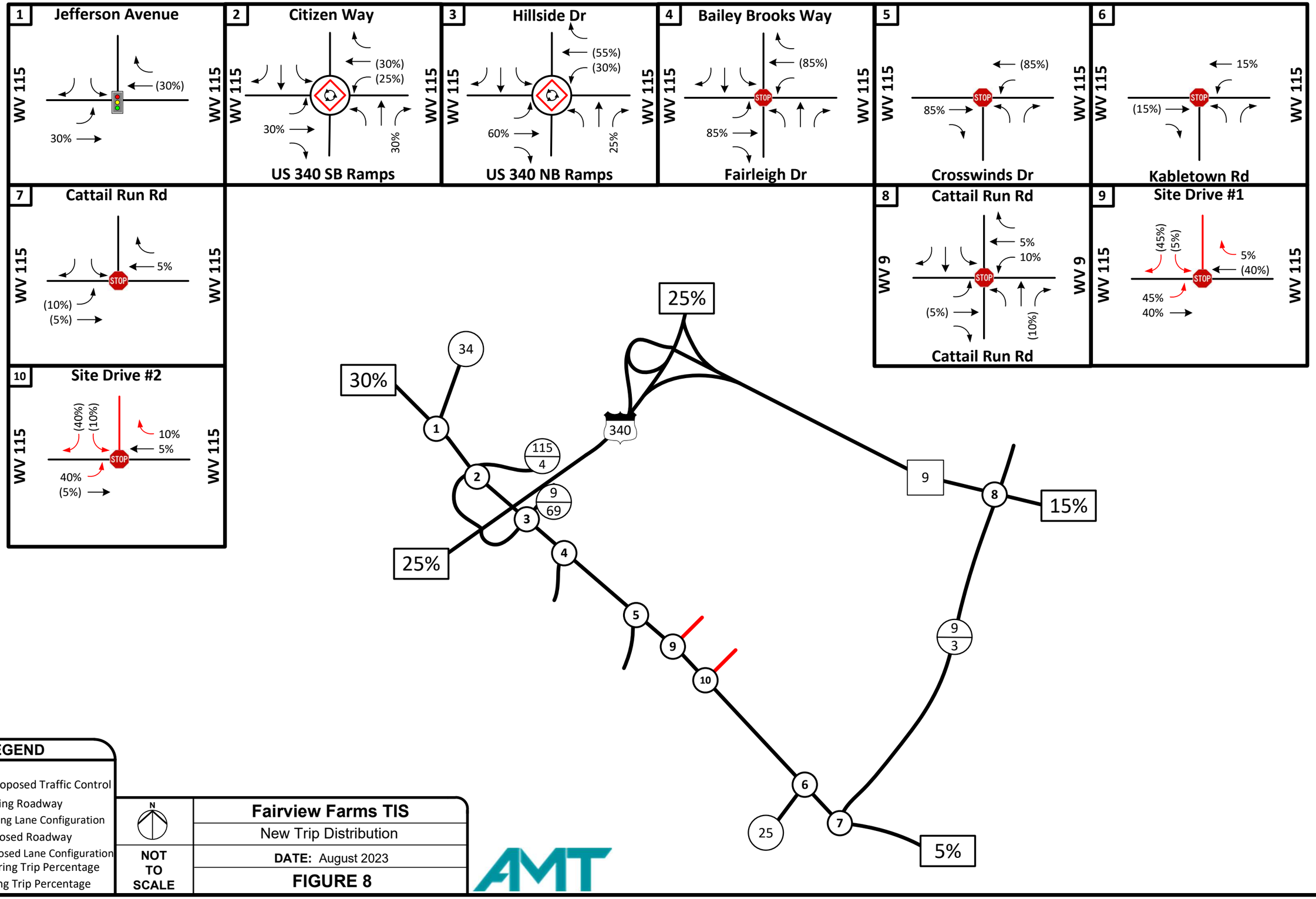
Description	LUC	Density		Daily Trips	AM Peak			PM Peak		
					Enter	Exit	Total	Enter	Exit	Total
Self Storage Facility	151	99,000	S.F.	149	10	10	20	10	10	20
Single-Family Homes	210	267	Units	2,520	53	150	203	171	96	267
Townhomes	220	200	Units	1,464	31	81	112	79	55	134
Net New External Trips				**4,133**	**94**	**241**	**335**	**260**	**161**	**421**

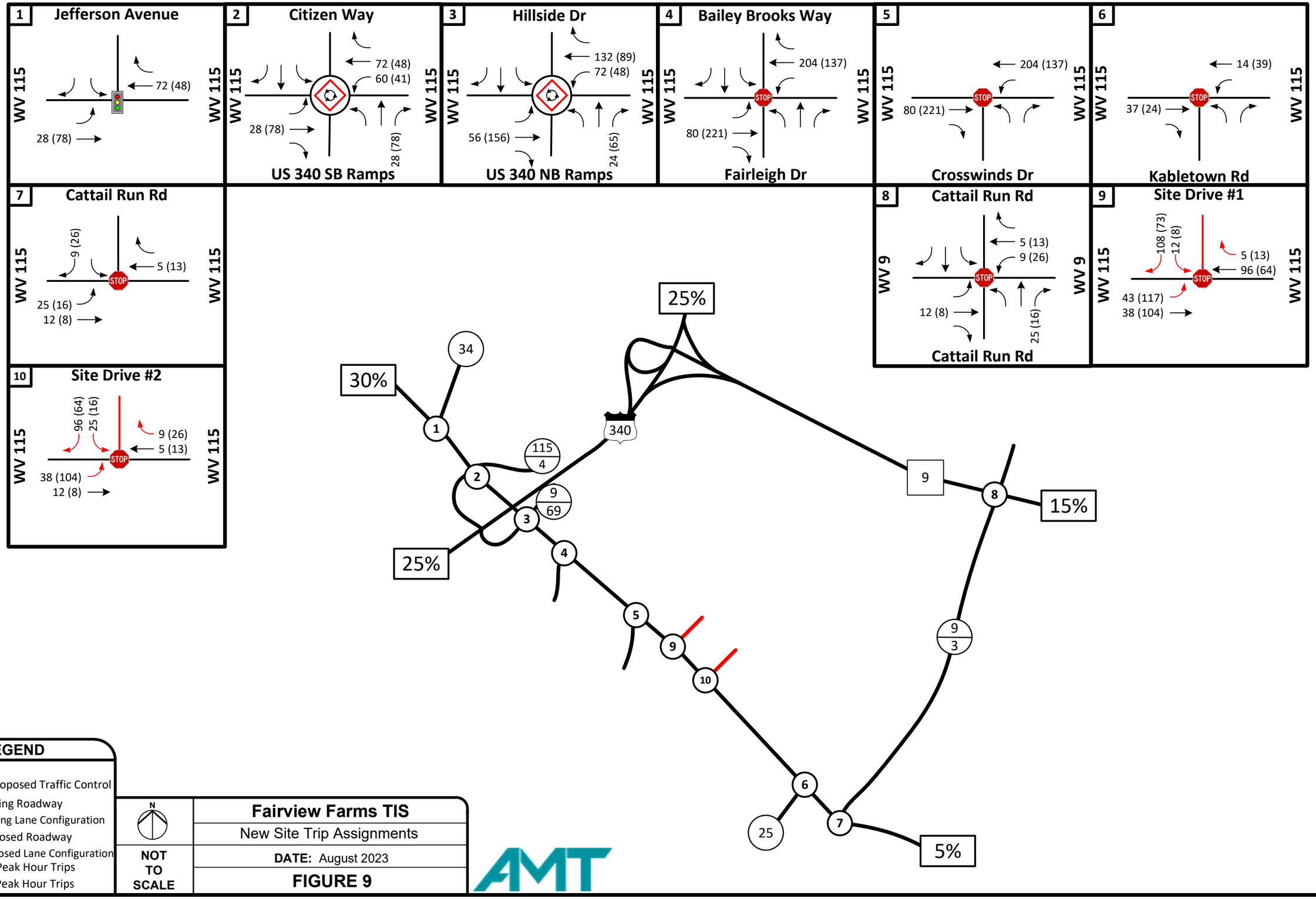
TRIP DISTRIBUTION

The AM and PM peak hour trips to/from the proposed site were distributed based upon interpolation from current traffic patterns with all trips entering the development via WV 115. Distribution of the new external trips are as follows:

- 25% to/from the north on US 340
- 25% to/from the south on US 340
- 15% to/from the east on WV 9
  - 10% to/from north via Cattail Run Road
  - 5% to/from north via US 340
- 30% to/from the west on WV 115
- 5% to/from the east on WV 115

The external trip distribution percentages are shown on **Figure 8** and the AM and PM peak hour new site trip assignments are shown on **Figure 9**.


1
Jefferson Avenue
WV 115
WV 115
(30%)
30%
2
Citizen Way
(30%)
(25%)
30%
30%
US 340 SB Ramps
3
Hillside Dr
(55%)
(30%)
60%
25%
US 340 NB Ramps
4
Bailey Brooks Way
(85%)
STOP
85%
Fairleigh Dr
5
(85%)
STOP
85%
Crosswinds Dr
6
15%
STOP
(15%)
Kabletown Rd
7
Cattail Run Rd
5%
STOP
(10%)
(5%)
8
Cattail Run Rd
WV 9
WV 9
5%
10%
STOP
(5%)
(10%)
Cattail Run Rd
9
Site Drive #1
(45%)
(5%)
5%
(40%)
STOP
45%
40%
10
Site Drive #2
(40%)
(10%)
10%
5%
STOP
40%
(5%)
25%
34
30%
1
340
115
4
2
9
69
3
4
25%
5
9
10
9
3
9
8
15%
6
25
7
5%
LEGEND
Proposed Traffic Control
Existing Roadway
Existing Lane Configuration
Proposed Roadway
Proposed Lane Configuration
XX% Entering Trip Percentage
XX%) Exiting Trip Percentage
N
NOT TO SCALE
Fairview Farms TIS
New Trip Distribution
DATE: August 2023
FIGURE 8
AMT



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX AM Peak Hour Trips
- (XX) PM Peak Hour Trips

N

NOT TO SCALE

Fairview Farms TIS

New Site Trip Assignments

DATE: August 2023

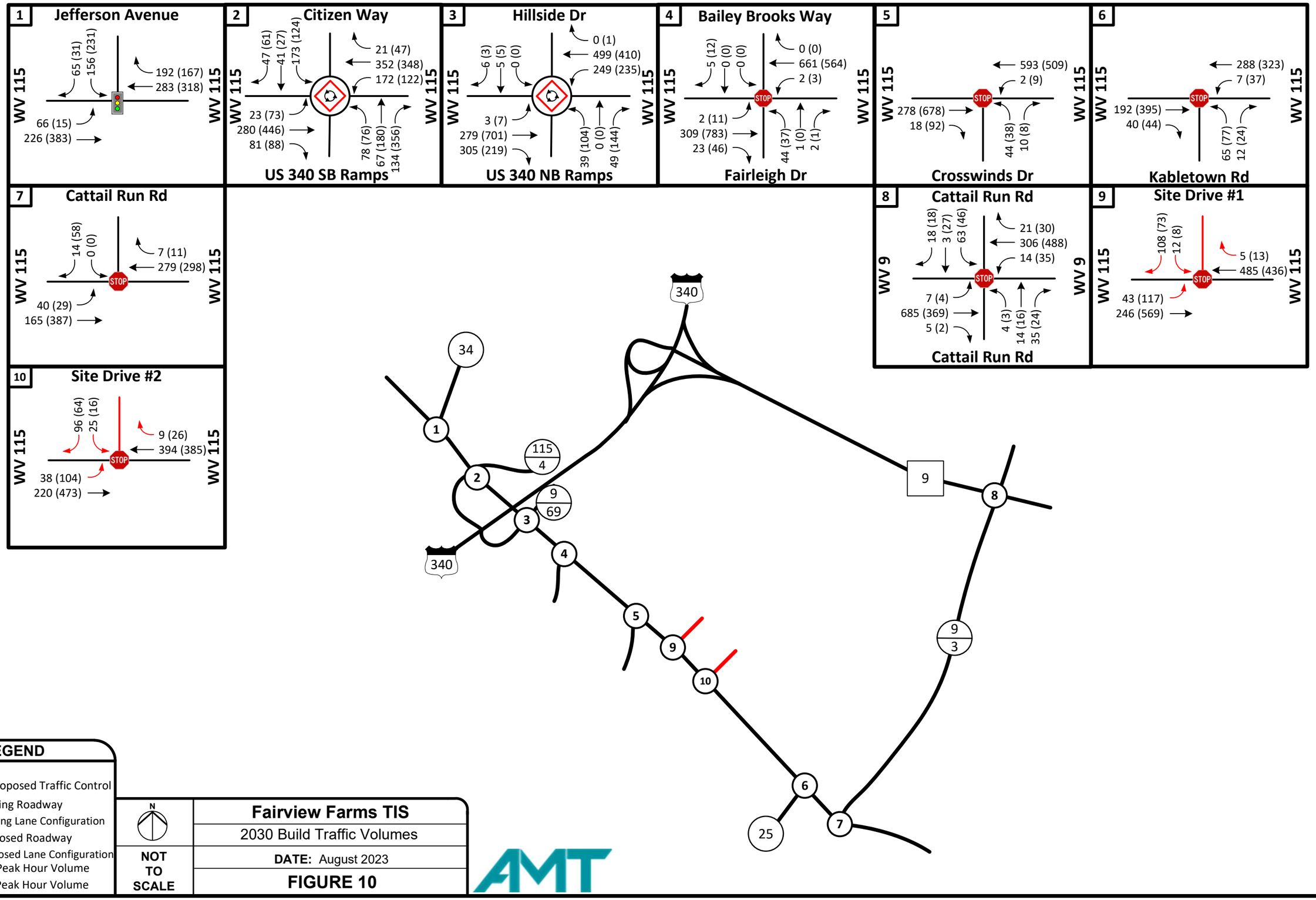
FIGURE 9

BUILD PROJECT TRAFFIC VOLUMES

2030 Build Conditions

The 2030 Build peak hour traffic volumes include existing 2022 traffic volumes, anticipated traffic generated by the Tate Manor development, anticipated traffic generated by the Magnolia Springs development, anticipated traffic generated by the Kings Crossing development, annual traffic growth prior to the year 2030, and traffic generated by build-out of the Fairview Farms development. Site generated traffic was distributed onto the transportation network based upon existing traffic patterns and anticipated origin and destination of the newly generated site trips (see **Figure 8** and **9**). The 2030 Build Traffic Volumes for the weekday AM and PM peak hour are shown on **Figure 10**.

The peak hour traffic forecast calculations spreadsheet is included in **Appendix B**.


1
Jefferson Avenue
WV 115
WV 115
65 (31)
156 (231)
192 (167)
283 (318)
66 (15)
226 (383)
2
Citizen Way
47 (61)
41 (27)
173 (124)
21 (47)
352 (348)
172 (122)
23 (73)
280 (446)
81 (88)
78 (76)
67 (180)
134 (356)
US 340 SB Ramps
3
Hillside Dr
6 (3)
5 (5)
0 (0)
0 (1)
499 (410)
249 (235)
3 (7)
279 (701)
305 (219)
39 (104)
0 (0)
49 (144)
US 340 NB Ramps
4
Bailey Brooks Way
5 (12)
0 (0)
0 (0)
0 (0)
661 (564)
2 (3)
2 (11)
309 (783)
23 (46)
44 (37)
1 (0)
2 (1)
Fairleigh Dr
5
593 (509)
2 (9)
278 (678)
18 (92)
44 (38)
10 (8)
Crosswinds Dr
6
288 (323)
7 (37)
192 (395)
40 (44)
65 (77)
12 (24)
Kabletown Rd
7
Cattail Run Rd
14 (58)
0 (0)
7 (11)
279 (298)
40 (29)
165 (387)
8
Cattail Run Rd
WV 9
WV 9
18 (18)
3 (27)
63 (46)
21 (30)
306 (488)
14 (35)
7 (4)
685 (369)
5 (2)
4 (3)
14 (16)
35 (24)
9
Site Drive #1
108 (73)
12 (8)
5 (13)
485 (436)
43 (117)
246 (569)
10
Site Drive #2
96 (64)
25 (16)
9 (26)
394 (385)
38 (104)
220 (473)
340
34
1
2
115
4
9
69
3
4
5
9
10
9
8
9
3
6
7
25
LEGEND
Proposed Traffic Control
Existing Roadway
Existing Lane Configuration
Proposed Roadway
Proposed Lane Configuration
XX AM Peak Hour Volume
(XX) PM Peak Hour Volume
N
NOT TO SCALE
Fairview Farms TIS
2030 Build Traffic Volumes
DATE: August 2023
FIGURE 10

CAPACITY ANALYSIS

The Highway Capacity Manual defines capacity as the maximum suitable flow rate at which vehicles reasonably can be expected to traverse a point during a specified time period. Capacity uses the measure of efficiency, Level-of-Service (LOS), to describe the traffic performance at intersections. LOS is defined for the overall intersection delay for signalized intersections. An acceptable LOS for a signalized intersection is considered to be LOS D or better (i.e. A, B, C or D).

At unsignalized intersections, the LOS is defined by the control delay for the movement that must yield right-of-way. It may be typical for stop-controlled minor streets to experience long delays during peak periods, while the majority of the traffic flows through the intersection on the major street travel unimpeded.

The procedures outlined in the Highway Capacity Manual; 6th Edition were used as guidelines for the analysis of the study area intersections. This manual provides procedures for the analysis of both signalized and unsignalized intersections. LOS categories range from LOS "A" (best) to "F" (worst) as shown in **Table 3**.

Table 3: Level of Service Criteria

Level of Service	SIGNALIZED Intersection Control Delay (sec/veh)	UNSIGNALIZED Intersection Control Delay (sec/veh)	Intersection LOS Description
A	≤ 10.0	≤ 10.0	Free flow, insignificant delays.
B	10.1-20.0	10.1-15.0	Stable operation, minimal delays.
C	20.1-35.0	15.1-25.0	Stable operation, acceptable delays.
D	35.1-55.0	25.1-35.0	Restricted flow, common delays.
E	55.1-80.0	35.1-50.0	Maximum capacity, extended delays. Volumes at or near capacity. Long queues form upstream from intersection.
F	> 80.0	> 50.0	Forced flow, excessive delays. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

LOS analysis was completed through the use of Synchro, version 11.1 and Sidra, version 9.0. The software package categorizes the LOS based on HCM methodology and criteria. According to industry standards, any signalized intersection or any approach of an unsignalized intersection is considered acceptable if the average delay is at LOS D or better with LOS A representing little or no delay. Any signalized intersection or approach with a LOS of E or F is considered substandard and may need solutions to improve the operational performance. Copies of the Synchro analyses outputs for each analysis year/scenario are shown in **Appendix C**. Copies of the Sidra analyses outputs for each analysis year/scenario are shown in **Appendix E.**

2022 Existing Conditions Analysis

Since WV 115 and US 340 are both designated as N-S routes, establishment of approach directions utilized throughout the capacity analysis are based on WVDOH cardinal route direction of US 340. While maintaining US 340 as the north-south route through the study area, WV 115 was established as east-west. The bearing direction for WV 115 is east-west through the project area with WV 115 Northbound running west and WV 115 southbound running east.

WV 115 with Jefferson Avenue

Capacity analysis indicates the WV 115 eastbound left-turn movement to Jefferson Avenue currently operates at LOS A during both the AM and PM peak hours. The WV 115 westbound approach to Jefferson Avenue currently operates as free flow traveling unimpeded through the intersection. The Jefferson Avenue southbound approach operates at LOS C during both the AM and PM peak hours under stop control.

WV 115 with US 340 Southbound and Citizens Way

Analysis indicates that the WV 115 eastbound approach to US 340 Southbound/Citizen Way currently operates at LOS A during both the AM and PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Southbound/Citizen Way currently operates at LOS A during both the AM and PM peak hours. The US 340 Southbound Ramp northbound approach to WV 115 currently operates at LOS A during both the AM and PM peak hours. The Citizens Way southbound approach to WV 115 currently operates at LOS A during both AM and PM peak hours. The roundabout is anticipated to operate at an overall LOS A during both the AM and PM peak hours.

WV 115 with US 340 Northbound and Hillside Drive

Analysis indicates the WV 115 eastbound left-turn movement to Hillside Drive currently operates at LOS A both the AM and PM peak hours, while the thru/right movement currently operates as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to US 340 Northbound currently operates at LOS A during both the AM and PM peak hours, while the thru/right movement operates as free flow moving unimpeded through the intersection. The US 340 Northbound Ramp shared left/thru movement to WV 115 currently operates at LOS D during the AM peak hour and LOS F during the PM peak hour, while the right-turn movement currently operates at LOS B during both the AM and PM peak hours under stop control. The Hillside Drive southbound approach to WV 115 currently operates at LOS C during both the AM and PM peak hours under stop control.

WV 115 with Fairleigh Drive and Bailey Brooks Way

Analysis indicates the WV 115 eastbound left-turn movement to Bailey Brooks Way currently operates at LOS A during both the AM and PM peak hours. The WV 115 westbound left-turn movement to Fairleigh Drive currently operates at LOS A during both the AM and PM peak hours. The Fairleigh Drive northbound approach to WV 115 currently operates at LOS C during both the AM and PM peak hours under stop control. The Bailey Brooks Way southbound approach to WV 115 currently operates at LOS B during both the AM and PM peak hours under stop control.

WV 115 with Crosswinds Drive

Analysis indicates the WV 115 eastbound thru and exclusive right-turn movements to Crosswinds Drive currently operates as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to Crosswinds Drive currently operates at LOS A during both the AM and PM peak hours, while the thru movement currently operates as free-flow traveling unimpeded through the intersection. The Crosswinds Drive northbound left-turn movement to WV 115 currently operates at LOS B during the AM peak hour and LOS C during PM peak hour, while the right-turn movement currently operates at LOS A during the AM peak hour and LOS B during the PM peak hour under stop control.

WV 115 with Kabletown Road

Analysis indicates the WV 115 eastbound approach to Kabletown Road currently operates as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to Kabletown Road currently operates at LOS A during both the AM and PM peak hours. The Kabletown Road northbound approach to WV 115 currently operates at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

WV 115 with Cattail Run Road

Analysis indicates the WV 115 eastbound left-turn movement to Cattail Run Road currently operates at LOS A during both the AM and PM peak hours. The WV 115 westbound approach currently operates as free-flow traveling unimpeded through the intersection. The Cattail Run Road southbound approach to WV 115 currently operates at LOS B during both the AM and PM peak hours under stop control.

WV 9 with Cattail Run Road

Analysis indicates the WV 9 eastbound left-turn movement to Cattail Run Road currently operates at LOS A during both the AM and PM peak hours while the exclusive thru and right-turn movements operate as free-flow traveling unimpeded through the intersection. The WV 9 westbound left-turn movement to Cattail Run Road currently operates at LOS A during both the AM and PM peak hours while the exclusive thru and right-turn movements operate as free-flow traveling unimpeded through the intersection. The Cattail Run Road northbound approach to WV 9 currently operates at LOS C during both the AM and PM peak hours under stop control. The Cattail Run Road southbound approach to WV 9 currently operates at LOS C during both the AM and PM peak hours under stop control.

Figure 11 shows the LOS during the weekday AM and PM peak hours for the 2022 Existing Conditions for each lane group movement at each study intersection.

2030 No-Build Conditions Analysis

The 2030 No-Build peak hour traffic volumes include the existing 2022 traffic volume, the anticipated traffic generated by the pending Tate Manor development, the anticipated traffic generated by the Magnolia Springs development, the anticipated traffic generated by the Kings Crossing development, and an annual traffic growth prior to the year 2030.

Improvements included in the 2030 No-Build Conditions Analysis comprise installation of a traffic signal at WV 115 with Jefferson Avenue and construction of an exclusive left turn lane on WV 115 eastbound at

Jefferson Avenue. Both of these improvements were included in the Tate Manor TIS and expected to be implemented by 2030. In addition, construction of a single-lane roundabout at the WV 115 with US 340 NB Ramp/Hillside Drive is included in the 2030 No-Build conditions. This improvement is currently a planned project by WVDOH and requested to be included beginning in this scenario.

WV 115 with Jefferson Avenue

Following installation of a traffic signal, capacity analysis indicates the WV 115 eastbound approach is expected to operate at LOS A during both the AM and PM peak hours under signal control. The WV 115 westbound approach to Jefferson Avenue is expected to operate at LOS A during both the AM and PM peak hours. The Jefferson Avenue southbound approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours. The overall signalized intersection is expected to operate at LOS A during both AM and PM peak hours.

WV 115 with US 340 Southbound and Citizens Way

Analysis indicates that the WV 115 eastbound approach to US 340 Southbound/Citizen Way will continue to operate at a LOS A during both the AM and PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Southbound/Citizen Way will continue to operate at LOS A during both the AM and PM peak hours. The US 340 Southbound Ramp northbound approach to WV 115 is expected to operate at LOS A during the AM peak hour and LOS C during the PM peak hour. The Citizens Way southbound approach to WV 115 will continue to operate at LOS A during both AM and PM peak hours. The overall roundabout intersection is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour.

WV 115 with US 340 Northbound and Hillside Drive

Following construction of a single-lane roundabout, analysis indicates the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive is expected to operate at LOS A during the AM peak hour and LOS C during the PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Northbound Ramps/Hillside Drive is expected to operate at LOS A during both the AM and PM peak hours. The US 340 Northbound Ramp approach to WV 115 is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The Hillside Drive southbound approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours. The overall roundabout intersection is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour.

WV 115 with Fairleigh Drive and Bailey Brooks Way

Analysis indicates the WV 115 eastbound left-turn movement to Bailey Brooks Way will continue to operate at LOS A during both the AM and PM peak hours. The WV 115 westbound left-turn movement to Fairleigh Drive will continue to operate at LOS A during both the AM and PM peak hours. The Fairleigh Drive northbound approach to WV 115 is expected to operate at LOS C during the AM peak hour and LOS E during the PM peak hour under stop control. The Bailey Brooks Way southbound approach to WV 115 will continue to operate at LOS B during both the AM and PM peak hours under stop control.

WV 115 with Crosswinds Drive

Analysis indicates the WV 115 eastbound thru and exclusive right-turn movements to Crosswinds Drive will continue to operate as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to Crosswinds Drive will continue to operate at LOS A during both the AM and PM peak hours, while the through movement will continue to operate as free-flow traveling unimpeded through the intersection. The Crosswinds Drive northbound left-turn movement to WV 115 will continue to operate at LOS B during the AM peak hour and at LOS C during the PM peak hour, while the right-turn movement will continue to operate at LOS A during the AM peak hour and LOS B during the PM peak hour under stop control.

WV 115 with Kabletown Road

Analysis indicates the WV 115 eastbound approach to Kabletown Road will continue to operate as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to Kabletown Road will continue to operate at LOS A during both the AM and PM peak hours. The Kabletown Road northbound approach to WV 115 will continue to operate at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

WV 115 with Cattail Run Road

Analysis indicates the WV 115 eastbound left-turn movement to Cattail Run Road will continue to operate at LOS A during both the AM and PM peak hours. The WV 115 westbound approach will continue to operate as free-flow traveling unimpeded through the intersection. The Cattail Run Road southbound approach to WV 115 will continue to operate at LOS B during both the AM and PM peak hours under stop control.

WV 9 with Cattail Run Road

Analysis indicates the WV 9 eastbound left-turn movement to Cattail Run Road will continue to operate at LOS A during both the AM and PM peak hours while the exclusive thru and right-turn movements will continue to operate as free-flow traveling unimpeded through the intersection. The WV 9 westbound left-turn movement to Cattail Run Road will continue to operate at LOS A during both the AM and PM peak hours while the exclusive thru and right-turn movements operate as free-flow traveling unimpeded through the intersection. The Cattail Run Road northbound approach to WV 9 will continue to operate at LOS C during both the AM and PM weekday peak hours under stop control. The Cattail Run Road southbound approach to WV 9 will continue to operate at LOS C during both the AM and PM peak hours under stop control.

Figure 12 shows the LOS during the weekday AM and PM peak hours for the 2030 No-Build Conditions for each lane group movement at each study intersection.

2030 Build Conditions Analysis

The 2030 Build Conditions include the existing 2022 traffic volume, the anticipated traffic generated by the pending Tate Manor development, the anticipated traffic generated by the Magnolia Springs development, the anticipated traffic generated by the Kings Crossing development, an annual traffic growth prior to the year 2030, and the traffic generated by build-out of the Fairview Farms development.

Improvements included in the 2030 Build Conditions comprise construction of the two site driveways intersecting with WV 115.

WV 115 with Jefferson Avenue

Capacity analysis indicates the WV 115 eastbound approach to Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours under signal control. The WV 115 westbound approach to Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The Jefferson Avenue southbound approach to WV 115 will continue to operate at LOS A during both the AM and PM peak hours. The overall signalized intersection will continue to operate at LOS A during both AM and PM peak hours.

WV 115 with US 340 Southbound and Citizens Way

Analysis indicates that the WV 115 eastbound approach to US 340 Southbound/Citizen Way is expected to operate at LOS B during both the AM and PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Southbound/Citizen Way approach is expected to operate at LOS B during both the AM and PM peak hours. The US 340 Southbound Ramp northbound approach to WV 115 is expected to operate at LOS B during the AM peak hour and LOS E during the PM peak hour. The Citizens Way southbound approach to WV 115 is expected to operate at LOS B during the AM peak hour and LOS A during the PM peak hour. The overall roundabout intersection is expected to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

WV 115 with US 340 Northbound and Hillside Drive

Analysis indicates the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive is expected to operate at LOS B during the AM peak hour and LOS E during the PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Northbound Ramps/Hillside Drive is expected to operate at LOS B during both the AM and PM peak hours. The US 340 Northbound Ramp approach to WV 115 is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The Hillside Drive southbound approach to WV 115 will continue to operate at LOS A during both the AM and PM peak hours. The overall roundabout intersection is expected to operate at LOS B during the AM peak hour and LOS D during the PM peak hour.

WV 115 with Fairleigh Drive and Bailey Brooks Way

Capacity analysis indicates the WV 115 eastbound left-turn movement to Bailey Brooks Way will continue to operate at LOS A during both the AM and PM peak hours. The WV 115 westbound left-turn movement to Fairleigh Drive will continue to operate at LOS A during both the AM and PM peak hours. The Fairleigh Drive northbound approach to WV 115 is expected to operate at LOS D during the AM peak hour and LOS F during the PM peak hour under stop control. The Bailey Brooks Way southbound approach to WV 115 will continue to operate at LOS B during both the AM and PM peak hours under stop control.

WV 115 with Crosswinds Drive

Analysis indicates the WV 115 eastbound thru and exclusive right-turn movements to Crosswinds Drive will continue to operate as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to Crosswinds Drive will continue to operate at LOS A during both the AM

and PM peak hours, while the thru movement will continue to operate as free-flow traveling unimpeded through the intersection. The Crosswinds Drive northbound left-turn movement to WV 115 is expected to operate at LOS C during the AM peak hour and LOS E during the PM peak hour, while the right-turn movement is expected to operate at LOS B during both the AM and PM peak hours under stop control.

WV 115 with Kabletown Road

Analysis indicates the WV 115 eastbound approach to Kabletown Road will continue to operate as free-flow traveling unimpeded through the intersection. The WV 115 westbound left-turn movement to Kabletown Road will continue to operate at LOS A during both the AM and PM peak hours. The Kabletown Road northbound approach to WV 115 will continue to operate at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

WV 115 with Cattail Run Road

Analysis indicates the WV 115 eastbound left-turn movement to Cattail Run Road will continue to operate at LOS A during both the AM and PM peak hours. The WV 115 westbound approach will continue to operate as free-flow traveling unimpeded through the intersection. The Cattail Run Road southbound approach to WV 115 will continue to operate at LOS B during both the AM and PM peak hours under stop control.

WV 9 with Cattail Run Road

Analysis indicates the WV 9 eastbound left-turn movement to Cattail Run Road will continue to operate at LOS A during both the AM and PM peak hours while the exclusive thru and right-turn movements will continue to operate as free-flow traveling unimpeded through the intersection. The WV 9 westbound left-turn movement to Cattail Run Road will continue to operate at LOS A during both the AM and PM peak hours while the exclusive thru and right-turn movements operate as free-flow traveling unimpeded through the intersection. The Cattail Run Road northbound approach to WV 9 will continue to operate at LOS C during both the AM and PM peak hours under stop control. The Cattail Run Road southbound approach to WV 9 is expected to operate at LOS C during the AM peak hour and LOS D during the PM peak hour under stop control.

WV 115 with Site Drive #1

Analysis indicates that the WV 115 eastbound left-turn movement to Site Drive #1 is expected operate at LOS A during both the AM and PM peak hours. The WV 115 westbound approach to Site Drive #1 is expected to operate as free-flow traveling unimpeded through the intersection. The Site Drive #1 southbound approach to WV 115 is expected to operate at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

WV 115 with Site Drive #2

Analysis indicates that the WV 115 eastbound left-turn movement to Site Drive #2 is expected to operate at LOS A during both the AM and PM peak hours. The WV 115 westbound approach to Site Drive #2 is expected to operate as free-flow traveling unimpeded through the intersection. The Site Drive #2 southbound approach to WV 115 is expected to operate at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

Figure 13 shows the LOS during the weekday AM and PM peak hours for the 2030 Build Conditions for each lane group movement at each study intersection.

2030 Build Improved Conditions Analysis

Improvements included in the 2030 Build Improved Conditions comprise construction of a right-turn slip lane on the US 340 Southbound Ramp to WV 115, construction of a right-turn slip lane on the WV 115 eastbound approach to US 340 Northbound Ramp/Hillside Drive, construction of an exclusive left-turn lane on WV 115 eastbound approach to Site Drive #1, and construction of an exclusive left-turn lane on WV 115 eastbound approach to Site Drive #2.

Additional analysis is provided for the intersections with proposed improvements implemented. Remaining intersections will operate as described in 2030 Build Conditions and do not necessitate physical improvements.

WV 115 with US 340 Southbound and Citizens Way

Following construction of a northbound exclusive right-turn lane, capacity analysis indicates that the WV 115 eastbound approach to US 340 Southbound/Citizen Way will continue to operate at LOS B during both the AM and PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Southbound/Citizens Way will continue to operate at LOS B during both the AM and PM peak hours. The US 340 Southbound Ramps northbound left/thru movement to WV 115 is expected to operate at LOS A during the both AM and PM peak hours, while the right-turn movement is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The Citizens Way southbound approach to WV 115 will continue to operate at LOS B during the AM peak hour and LOS A during the PM peak hour. The roundabout is anticipated to operate at an overall LOS B during both the AM and PM peak hours.

WV 115 with US 340 Northbound and Hillside Drive

Following construction of an exclusive right-turn lane on the WV 115 eastbound approach, analysis indicates the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hours under roundabout yield control. The WV 115 westbound approach to US 340 Northbound Ramps/Hillside Drive will continue to operate at LOS B during both the AM and PM peak hours. The US 340 Northbound Ramp approach to WV 115 will continue to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The Hillside Drive southbound approach to WV 115 will continue to operate at LOS A during both the AM and PM peak hours. The overall roundabout intersection is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour.

WV 115 with Site Drive #1

Following construction of an eastbound exclusive left-turn lane, capacity analysis indicates that the WV 115 eastbound left-turn movement to Site Drive #1 is expected to operate at LOS A during both the AM and PM peak hours, while the thru movement will operate as free-flow traveling unimpeded through the intersection. The WV 115 westbound approach to Site Drive #1 will continue to operate as free-flow traveling unimpeded through the intersection. The Site Drive #1 southbound approach to WV 115 will continue to operate at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

WV 115 with Site Drive #2

Following construction of an eastbound exclusive left-turn lane, capacity analysis indicates that the WV 115 eastbound left-turn movement to Site Drive #2 is expected to operate at LOS A during both the AM and PM peak hours, while the thru movement will operate as free-flow traveling unimpeded through the intersection. The WV 115 westbound approach to Site Drive #2 will continue to operate as free-flow traveling unimpeded through the intersection. The Site Drive #2 southbound approach to WV 115 will continue to operate at LOS B during the AM peak hour and LOS C during the PM peak hour under stop control.

Figure 14 shows the LOS during the weekday AM and PM peak hours for the 2030 Build Improved Conditions for each lane group movement at each study intersection.

Table 4 shows the LOS results for the intersections within the study area during the weekday AM and PM peak hours for the 2022 Existing Conditions, 2030 No-Build Conditions, 2030 Build Conditions, and 2030 Build Improved Conditions.

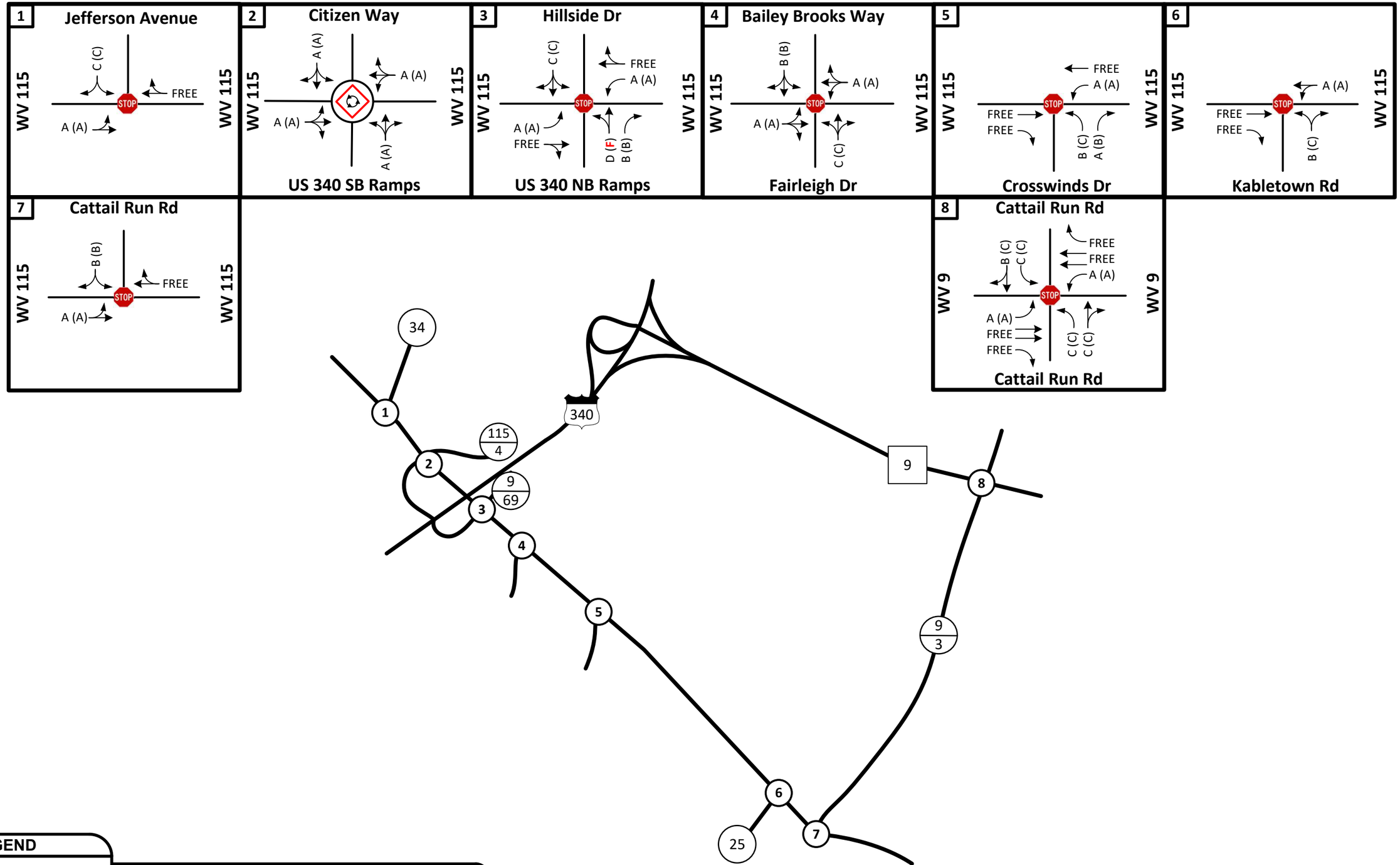
Table 4: Level of Service Analysis Summary

Intersection	Movement	2022 Existing Conditions				2030 No-Build Conditions				2030 Build Conditions				2030 Build Improved Conditions			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Intersection 1 - WV 115 (Charles Town Road) with Jefferson Avenue	EB Left-Turn	A	8.3	A	8.1	A	7.9	A	7.1	A	8.5	A	7.3	A	8.5	A	7.3
	EB Thru	N/A	N/A	N/A	N/A	A	4.3	A	4.8	A	4.1	A	5.0	A	4.1	A	5.0
	EB Approach	N/A	2.2	N/A	0.4	A	5.2	A	4.9	A	5.1	A	5.0	A	5.1	A	5.0
	WB Thru/Right	N/A	FREE	N/A	FREE	A	6.0	A	6.0	A	6.0	A	6.0	A	6.0	A	6.0
Proposed Three-Leg Signalized Intersection	WB Approach	N/A	0.0	N/A	0.0	A	6.0	A	6.0	A	6.0	A	6.0	A	6.0	A	6.0
	SB Left/Right	C	20.6	C	19.5	A	8.1	A	7.0	A	9.3	A	7.7	A	9.3	A	7.7
	SB Approach	C	20.6	C	19.5	A	8.1	A	7.0	A	9.3	A	7.7	A	9.3	A	7.7
Existing Three-Leg Unsignalized Intersection (TWSC)	Overall	N/A	N/A	N/A	N/A	A	6.3	A	5.9	A	6.5	A	6.1	A	6.5	A	6.1
Intersection 2 - WV 115 (Charles Town Road) with US 340 Southbound/Citizens Way	EB Left/Thru/Right	A	6.2	A	6.7	A	9.5	A	9.4	B	11.5	B	12.0	B	11.5	B	12.0
	EB Approach	A	6.2	A	6.7	A	9.5	A	9.4	B	11.5	B	12.0	B	11.5	B	12.0
	WB Left/Thru/Right	A	6.2	A	6.0	A	7.9	A	9.2	B	10.4	B	11.1	B	10.4	B	11.1
	WB Approach	A	6.2	A	6.0	A	7.9	A	9.2	B	10.4	B	11.1	B	10.4	B	11.1
	NB Left/Thru/Right	A	5.8	A	8.4	A	9.1	C	20.6	B	10.3	**E**	**40.8**	N/A	N/A	N/A	N/A
	NB Left/Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	6.4	A	9.0
	NB Right-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	6.1	B	10.2
	NB Approach	A	5.8	A	8.4	A	9.1	C	20.6	B	10.3	**E**	**40.8**	A	6.3	A	9.7
	SB Left/Thru/Right	A	5.5	A	5.1	A	9.5	A	7.1	B	12.5	A	8.1	B	12.5	A	8.1
	SB Approach	A	5.5	A	5.1	A	9.5	A	7.1	B	12.5	A	8.1	B	12.5	A	8.1
Existing Four-Leg Roundabout Intersection	Overall	A	6.1	A	6.9	A	8.9	B	12.6	B	11.1	C	20.4	B	10.3	B	10.6
Intersection 3 - WV 115 (Charles Town Road) with US 340 Northbound/Hillside Drive	EB Left-Turn	A	7.9	A	7.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	EB Thru/Right	N/A	FREE	N/A	FREE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	EB Left/Thru/Right	N/A	N/A	N/A	N/A	A	9.6	C	17.3	B	12.8	**E**	**43.0**	N/A	N/A	N/A	N/A
	EB Left/Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	6.2	B	14.3
	EB Right-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	6.4	A	5.3
	EB Approach	N/A	0.1	N/A	0.1	A	9.6	C	17.3	B	12.8	**E**	**43.0**	A	6.3	B	12.2
	WB Left-Turn	A	8.5	A	9.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	WB Thru/Right	N/A	FREE	N/A	FREE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	WB Left/Thru/Right	N/A	N/A	N/A	N/A	A	7.5	A	7.9	B	10.8	B	10.2	B	10.8	B	10.2
	WB Approach	N/A	2.7	N/A	3.5	A	7.5	A	7.9	B	10.8	B	10.2	B	10.8	B	10.2
	NB Left/Thru	D	25.3	**F**	**66.8**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NB Right-Turn	B	10.0	B	12.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Proposed Four-Leg Roundabout Intersection in 2030 No-Build Conditions	NB Left/Thru/Right	N/A	N/A	N/A	N/A	A	4.0	A	8.2	A	4.6	B	12.9	A	4.6	B	12.9
	NB Approach	C	19.3	**E**	**42.8**	A	4.0	A	8.2	A	4.6	B	12.9	A	4.6	B	12.9
	SB Left/Thru/Right	C	16.3	C	24.3	A	5.4	A	5.5	A	6.8	A	6.4	A	6.8	A	6.4
	SB Approach	C	16.3	C	24.3	A	5.4	A	5.5	A	6.8	A	6.4	A	6.8	A	6.4
Existing Four-Leg Unsignalized Intersection (TWSC)	Overall	N/A	N/A	N/A	N/A	A	8.3	B	12.8	B	11.2	D	27.1	A	8.5	B	11.5
Intersection 4 - WV 115 (Charles Town Road) with Fairleigh Drive/Bailey Brooks Way	EB Left-Turn	A	8.2	A	8.2	A	8.4	A	8.4	A	9.2	A	8.9	A	9.2.	A	8.9
	EB Approach	N/A	0.1	N/A	0.2	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1
	WB Left-Turn	A	7.7	A	8.6	A	7.8	A	9.0	A	8.1	A	10.0	A	8.1	A	10.0
	WB Approach	N/A	0.0	N/A	0.1	N/A	0.0	N/A	0.1	N/A	0.0	N/A	0.1	N/A	0.0	N/A	0.1
	NB Left/Thru/Right	C	15.8	C	24.6	C	19.2	**E**	**35.4**	D	32.2	**F**	**88.1**	D	32.2	**F**	**88.1**
	NB Approach	C	15.8	C	24.6	C	19.2	**E**	**35.4**	D	32.2	**F**	**88.1**	D	32.2	**F**	**88.1**
	SB Left/Thru/Right	B	10.7	B	10.7	B	11.5	B	11.3	B	13.9	B	12.8	B	13.9	B	12.8
Existing Four-Leg Unsignalized Intersection (TWSC)	SB Approach	B	10.7	B	10.7	B	11.5	B	11.3	B	13.9	B	12.8	B	13.9	B	12.8
Intersection 5 - WV 115 (Charles Town Road) with Crosswinds Drive	EB Thru	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	EB Right-Turn	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	EB Approach	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0
	WB Left-Turn	A	7.6	A	8.4	A	7.7	A	8.8	A	7.9	A	9.7	A	7.9	A	9.7
	WB Thru	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	WB Approach	N/A	0.0	N/A	0.2	N/A	0.0	N/A	0.2	N/A	0.0	N/A	0.2	N/A	0.0	N/A	0.2
	NB Left-Turn	B	12.6	C	16.2	B	14.4	C	20.1	C	20.3	**E**	**35.6**	C	20.3	**E**	**35.6**
	NB Right-Turn	A	9.2	B	10.7	A	9.4	B	11.6	B	10.0	B	14.2	B	10.0	B	14.2
Existing Three-Leg Unsignalized Intersection (TWSC)	NB Approach	B	12.0	C	15.3	B	13.5	C	18.6	C	18.4	D	31.9	C	18.4	D	31.9

Table 4 Continued

Intersection	Movement	2022 Existing Conditions				2030 No-Build Conditions				2030 Build Conditions				2030 Build Improved Conditions			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Intersection 6 - WV 115 (Charles Town Road) with Kabletown Road (CR 25)	EB Thru	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	EB Right-Turn	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	EB Approach	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0
	WB Left-Turn	A	7.6	A	8.2	A	7.7	A	8.3	A	7.8	A	8.4	A	7.8	A	8.4
	WB Approach	N/A	0.2	N/A	1.0	N/A	0.2	N/A	1.0	N/A	0.2	N/A	0.9	N/A	0.2	N/A	0.9
	NB Left/Right	B	11.8	C	15.6	B	13.8	C	17.5	B	13.2	C	19.1	B	13.2	C	19.1
Existing Three-Leg Unsignalized Intersection (TWSC)	NB Approach	B	11.8	C	15.6	B	13.8	C	17.5	B	13.2	C	19.1	B	13.2	C	19.1
Intersection 7 - WV 115 (Charles Town Road) with Cattail Run Road (CR 9/3)	EB Left-Turn	A	7.9	A	7.9	A	8.0	A	7.9	A	8.1	A	8.0	A	8.1	A	8.0
	EB Approach	N/A	0.0	N/A	0.3	N/A	0.7	N/A	0.3	N/A	1.6	N/A	0.6	N/A	1.6	N/A	0.6
	WB Thru/Right	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	WB Approach	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0
	SB Left/Right	B	10.0	B	10.0	B	10.2	B	10.2	B	10.4	B	10.5	B	10.4	B	10.5
Existing Three-Leg Unsignalized Intersection (TWSC)	SB Approach	B	10.0	B	10.0	B	10.2	B	10.2	B	10.4	B	10.5	B	10.4	B	10.5
Intersection 8 - WV 9 with Cattail Run Road (CR 9/3)	EB Left-Turn	A	7.9	A	8.6	A	8.0	A	8.8	A	8.0	A	8.9	A	8.0	A	8.9
	EB Thru	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	EB Right-Turn	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	EB Approach	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1
	WB Left-Turn	A	8.9	A	8.2	A	9.1	A	8.3	A	9.2	A	8.4	A	9.2	A	8.4
	WB Thru	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	WB Right-Turn	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	WB Approach	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.1	N/A	0.4	N/A	0.5	N/A	0.4	N/A	0.5
	NB Left-Turn	C	19.2	C	18.5	C	21.5	C	20.7	C	22.7	C	24.0	C	22.7	C	24.0
	NB Thru/Right	C	16.7	C	18.1	C	18.4	C	20.0	C	15.6	C	18.1	C	15.6	C	18.1
	NB Approach	C	17.1	C	18.1	C	18.8	C	20.1	C	16.1	C	18.5	C	16.1	C	18.5
	SB Left-Turn	C	18.2	C	22.3	C	20.7	D	26.4	C	23.1	D	33.7	C	23.1	D	33.7
	SB Thru/Right	B	10.9	C	18.0	B	11.2	C	20.0	B	11.4	C	22.8	B	11.4	C	22.8
Existing Four-Leg Unsignalized Intersection (TWSC)	SB Approach	C	16.4	C	20.2	C	18.3	C	23.2	C	20.2	D	28.3	C	20.2	D	28.3
Intersection 9 - WV 115 (Charles Town Road) with Site Drive #1	EB Left-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	8.7	A	8.8	A	8.7	A	8.8
	EB Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FREE	N/A	FREE
	EB Approach	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.3	N/A	1.5	N/A	1.3	N/A	1.5
	WB Thru/Right	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	WB Approach	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0
	SB Left/Right	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	14.9	C	15.6	B	14.9	C	15.2
Proposed Three-Leg Unsignalized Intersection (TWSC)	SB Approach	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	14.9	C	15.6	B	14.9	C	15.2
Intersection 10 - WV 115 (Charles Town Road) with Site Drive #2	EB Left-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	8.4	A	8.6	A	8.4	A	8.6
	EB Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FREE	N/A	FREE
	EB Approach	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.2	N/A	1.6	N/A	1.2	N/A	1.6
	WB Thru/Right	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FREE	N/A	FREE	N/A	FREE	N/A	FREE
	WB Approach	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0	N/A	0.0	N/A	0.0	N/A	0.0
	SB Left/Right	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	14.0	C	16.3	B	14.0	C	15.9
Proposed Three-Leg Unsignalized Intersection (TWSC)	SB Approach	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	14.0	C	16.3	B	14.0	C	15.9

** = Delay exceeding 200 sec/veh



LEGEND

- Existing Traffic Control
- Existing Roadway
- Existing Lane Configuration
- A — AM Level of Service
- (A) — PM Level of Service

N

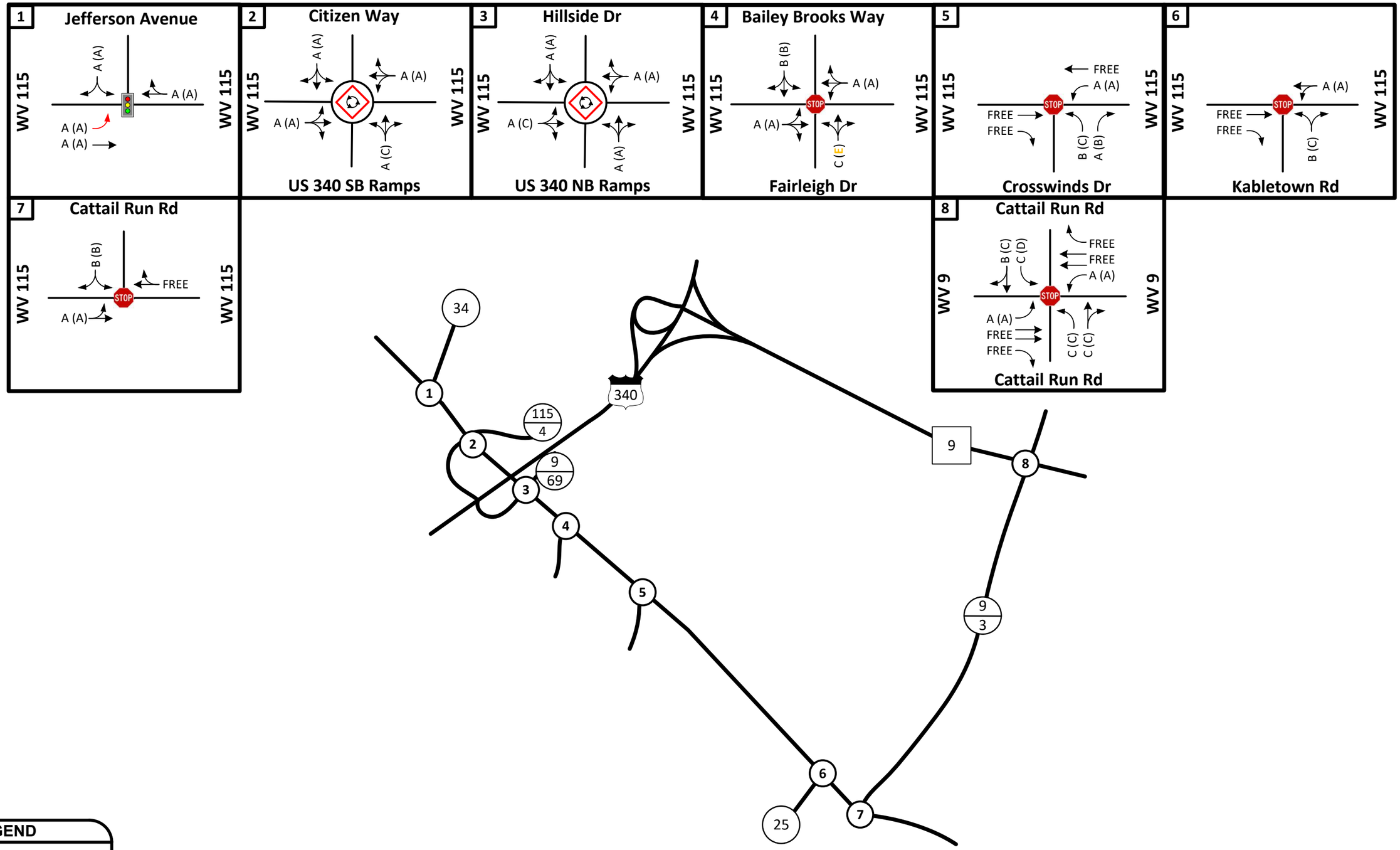
NOT TO SCALE

Fairview Farms TIS

2022 Existing Level of Service

DATE: August 2023

FIGURE 11



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Lane Configuration
- X AM Level of Service
- (X) PM Level of Service

N

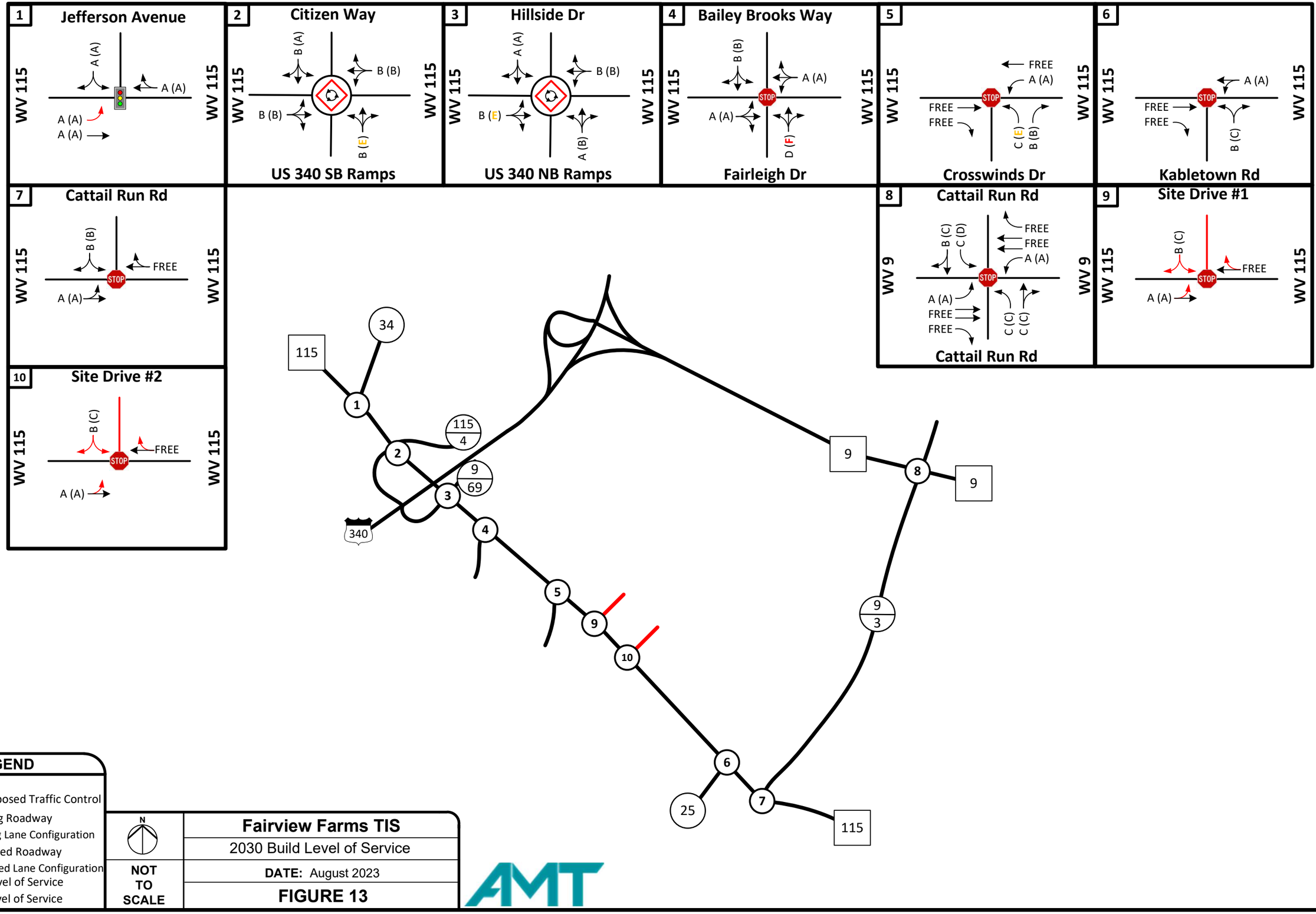
NOT TO SCALE

Fairview Farms TIS

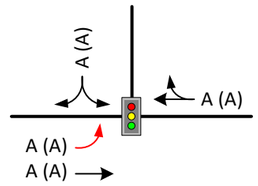
2030 No-Build Level of Service

DATE: August 2023

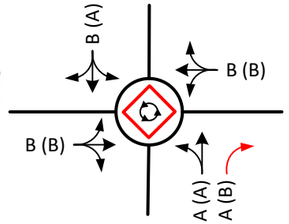
FIGURE 12


1
Jefferson Avenue
WV 115
WV 115
A (A)
A (A)
A (A)
2
Citizen Way
B (A)
B (B)
B (B)
B (E)
US 340 SB Ramps
3
Hillside Dr
A (A)
B (B)
B (E)
A (B)
US 340 NB Ramps
4
Bailey Brooks Way
B (B)
A (A)
STOP
A (A)
D (F)
Fairleigh Dr
5
FREE
A (A)
FREE
FREE
C (E)
B (B)
Crosswinds Dr
6
A (A)
FREE
FREE
B (C)
Kabletown Rd
7
Cattail Run Rd
B (B)
FREE
STOP
A (A)
8
Cattail Run Rd
WV 9
WV 9
B (C)
C (D)
FREE
FREE
A (A)
A (A)
FREE
FREE
C (C)
C (C)
Cattail Run Rd
9
Site Drive #1
B (C)
FREE
A (A)
10
Site Drive #2
B (C)
FREE
A (A)
34
115
1
115
4
2
9
69
3
340
4
5
9
10
6
25
7
115
9
8
9
9
3
LEGEND
Proposed Traffic Control
Existing Roadway
Existing Lane Configuration
Proposed Roadway
Proposed Lane Configuration
A AM Level of Service
(A) PM Level of Service
N
NOT TO SCALE
Fairview Farms TIS
2030 Build Level of Service
DATE: August 2023
FIGURE 13
AMT

1 **Jefferson Avenue**

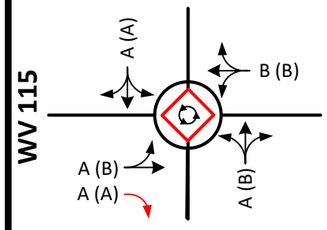


2 **Citizen Way**



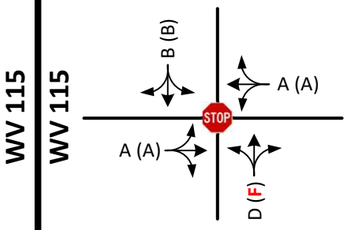
US 340 SB Ramps

3 **Hillside Dr**



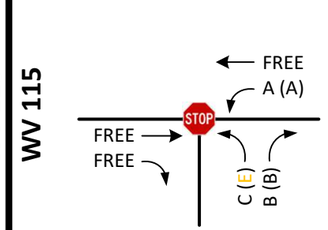
US 340 NB Ramps

4 **Bailey Brooks Way**



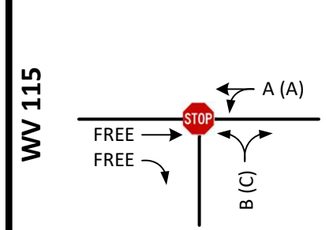
Fairleigh Dr

5



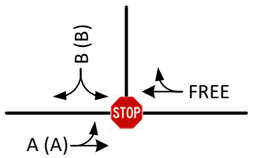
Crosswinds Dr

6

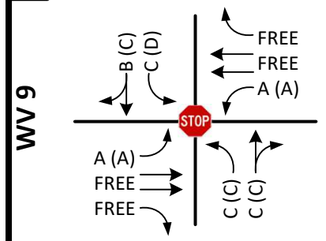


Kabletown Rd

7 **Cattail Run Rd**

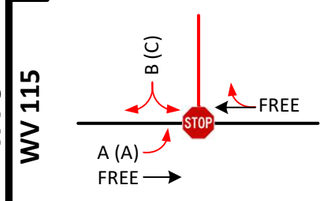


8 **Cattail Run Rd**

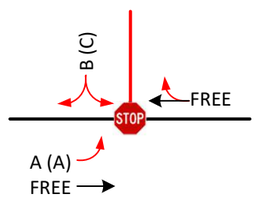


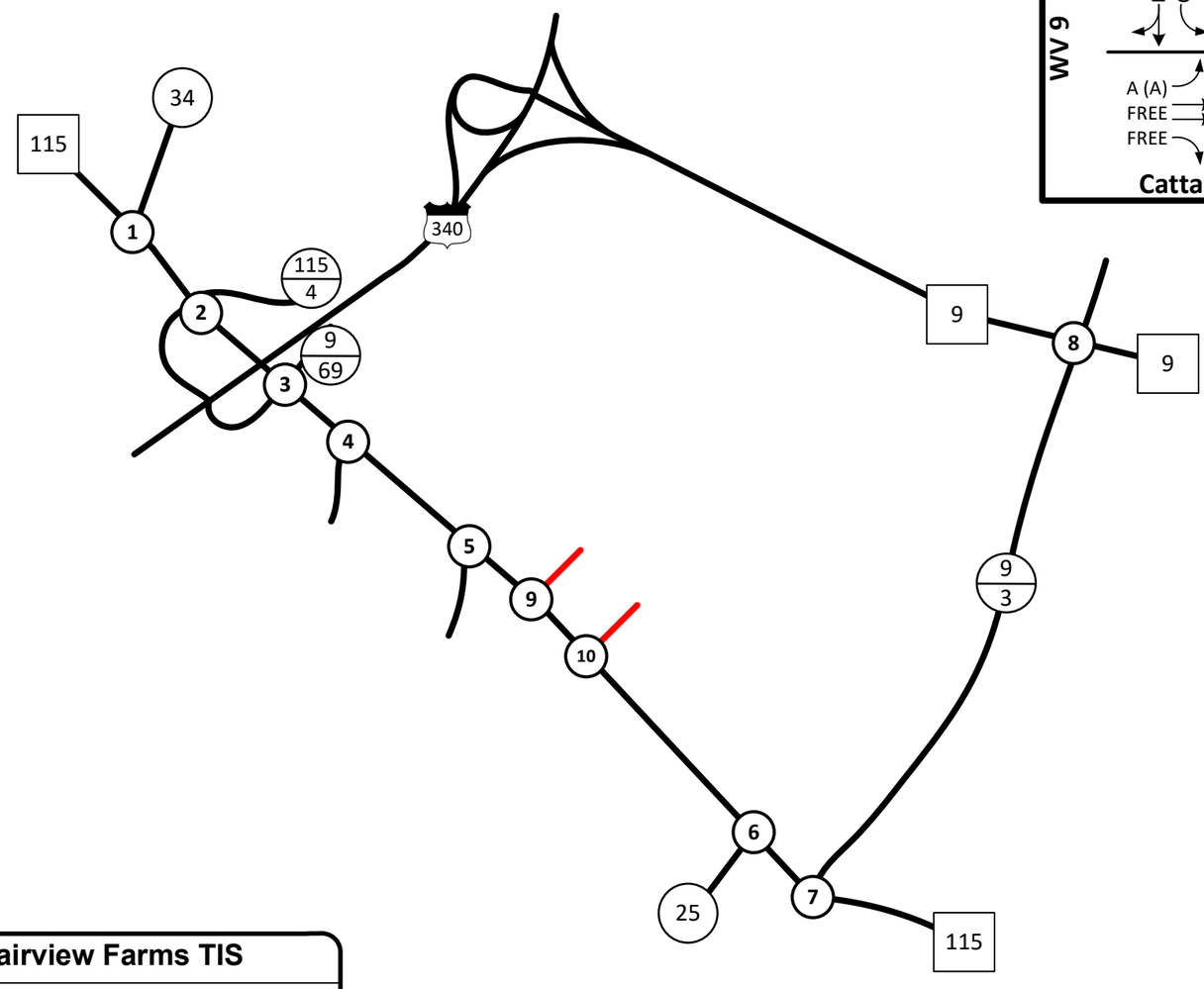
Cattail Run Rd

9 **Site Drive #1**



10 **Site Drive #2**





LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- A — AM Level of Service
- (A) — PM Level of Service

N

NOT TO SCALE

Fairview Farms TIS

2030 Build Improved Level of Service

DATE: August 2023

FIGURE 14

QUEUING ANALYSIS

2022 Existing Conditions Analysis

Queuing analysis was performed for all study intersections during the weekday AM and PM peak hours using the SimTraffic micro-simulation model, which is a simulation complement to the Synchro traffic analysis models utilized for the capacity analysis. The queuing calculations produced by SimTraffic are acknowledged within the industry to be a realistic replication of actual conditions. Each simulation model was seeded for 10 minutes and recorded for 60 minutes. The simulation was run five times and then averaged to estimate the 95th percentile queuing for all scenarios. The queuing analysis for roundabout intersections were performed using Sidra, version 9.0.

The queuing analysis indicates that there are no existing turning movements currently exceeding storage length during the peak periods analyzed.

Figure 15 shows the 2022 Existing Conditions Queuing Analysis for the weekday AM and PM peak hours.

2030 No-Build Conditions Analysis

Queuing analysis indicates that all conditions described in the 2022 Existing Conditions are expected to continue with similar queues with the increase in traffic due to regional growth in the study area. No additional turning movements are expected to exceed storage length during the peak periods analyzed. However, an excessive queue length is expected on the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive following construction of a single-lane roundabout.

Figure 16 shows the 2030 No-Build Queuing Analysis for the weekday AM and PM peak hours.

2030 Build Conditions Analysis

Queuing analysis indicates that all conditions described in the 2030 No-Build Conditions are expected to continue with similar queueing following build-out of the Fairview Farms development. Analysis indicates that no additional lane groups are expected to exceed storage length during peak periods analyzed.

Figure 17 shows the 2030 Build Queuing Analysis for the weekday AM and PM peak hours.

2030 Build Improved Conditions Analysis

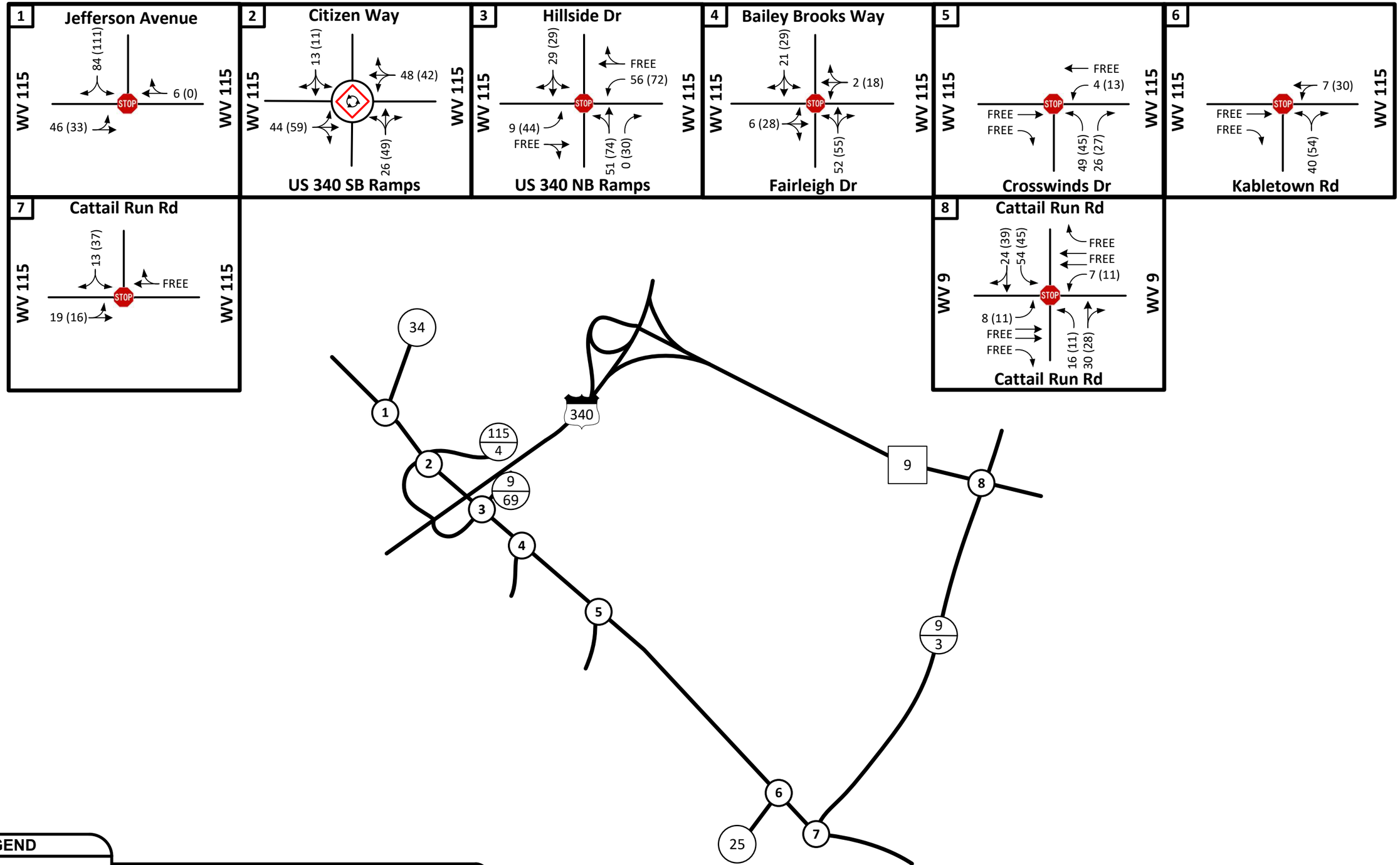
Queuing analysis indicates that all conditions described in the 2030 Build Conditions are expected to be mitigated following implementation of proposed improvements. Analysis indicates that no additional movements are expected to exceed storage length.

Figure 18 shows the 2030 Build Improved Queuing Analysis for the weekday AM and PM peak hours.

Table 5 presents the 95% queuing results for the intersections within the study during the AM and PM peak hours for the 2022 Existing Conditions, 2030 No-Build Conditions, 2030 Build Conditions, and 2030 Build Improved Conditions. Copies of the SimTraffic analyses outputs are included in **Appendix D**.

Table 5: Queueing Analysis Summary

Intersection	Movement	Existing Storage Length (ft)	2022 Existing		Proposed Storage Length (ft)	2030 No-Build		Proposed Storage Length (ft)	2030 Build		Proposed Storage Length (ft)	2030 Build Improved	
			AM	PM		AM	PM		AM	PM		AM	PM
Intersection 1 - WV 115 (Charles Town Road) with Jefferson Avenue	EB Left/Thru	--	46	33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	EB Left-Turn	N/A	N/A	N/A	125	63	33	125	62	35	125	64	57
	EB Thru	N/A	N/A	N/A	--	66	101	--	80	103	--	81	301
	WB Thru/Right	--	6	0	--	103	114	--	109	119	--	115	138
	SB Left/Right	--	84	111	--	106	139	--	116	135	--	115	176
Intersection 2 - WV 115 (Charles Town Road) with US 340 Southbound/Citizens Way	EB Left/Thru/Right	--	44	59	--	71	85	--	104	169	--	104	169
	WB Left/Thru/Right	--	48	42	--	68	69	--	108	123	--	108	123
	NB Left/Thru/Right	--	26	49	--	47	221	--	63	449	N/A	N/A	N/A
	NB Left/Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	21	39
	NB Right-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	19	67
	SB Left/Thru/Right	--	13	11	--	54	30	--	70	32	--	68	32
Intersection 3 - WV 115 (Charles Town Road) with US 340 Northbound/Hillside Drive	EB Left-Turn	150	9	44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	EB Thru/Right	--	FREE	FREE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	EB Left/Thru/Right	N/A	N/A	N/A	--	93	435	--	197	1260	N/A	N/A	N/A
	EB Left/Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	34	283
	EB Right-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100	38	24
	WB Left-Turn	175	56	72	--	N/A	N/A	--	N/A	N/A	--	N/A	N/A
	WB Thru/Right	--	FREE	FREE	--	N/A	N/A	--	N/A	N/A	--	N/A	N/A
	WB Left/Thru/Right	--	N/A	N/A	--	85	80	--	164	123	--	164	123
	NB Left/Thru	--	51	74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NB Right-Turn	115	0	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NB Left/Thru/Right	N/A	N/A	N/A	--	7	31	--	11	63	--	11	63
	SB Left/Thru/Right	--	29	29	--	2	2	--	2	2	--	2	2
Intersection 4 - WV 115 (Charles Town Road) with Fairleigh Drive/Bailey Brooks Way	EB Left/Thru/Right	--	6	28	--	15	73	--	17	61	--	8	69
	WB Left/Thru/Right	--	2	18	--	7	40	--	6	134	--	7	46
	NB Left/Thru/Right	--	52	55	--	58	56	--	53	66	--	57	64
	SB Left/Thru/Right	--	21	29	--	24	35	--	23	34	--	23	34
Intersection 5 - WV 115 (Charles Town Road) with Crosswinds Drive	EB Thru	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE
	EB Right-Turn	150	FREE	FREE	150	FREE	FREE	150	FREE	FREE	150	FREE	FREE
	WB Left-Turn	175	4	13	175	8	18	175	5	20	175	4	21
	WB Thru	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE
	NB Left-Turn	--	49	45	--	48	51	--	52	54	--	50	53
	NB Right-Turn	--	26	27	--	27	25	--	29	25	--	31	28
Intersection 6 - WV 115 (Charles Town Road) with Kabletown Road (CR 25)	EB Thru	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE
	EB Right-Turn	100	FREE	FREE	100	FREE	FREE	100	FREE	FREE	100	FREE	FREE
	WB Left/Thru	--	7	30	--	14	27	--	10	39	--	3	38
	NB Left/Right	--	40	54	--	48	58	--	46	66	--	52	64
Intersection 7 - WV 115 (Charles Town Road)	EB Left/Thru	--	19	16	--	16	17	--	23	29	--	27	28
	WB Thru/Right	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE
	SB Left/Right	--	13	37	--	13	39	--	21	43	--	24	42
Intersection 8 - WV 9 with Cattail Run Road (CR 9/3)	EB Left-Turn	475	8	11	475	13	9	475	12	10	475	12	8
	EB Thru	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE
	EB Right-Turn	75	FREE	FREE	75	FREE	FREE	75	FREE	FREE	75	FREE	FREE
	WB Left-Turn	450	7	11	450	11	15	450	23	27	450	25	28
	WB Thru	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE	--	FREE	FREE
	WB Right-Turn	100	FREE	FREE	100	FREE	FREE	100	FREE	FREE	100	FREE	FREE
	NB Left-Turn	75	16	11	75	15	10	75	18	15	75	31	11
	NB Thru/Right	--	30	28	--	29	30	--	41	34	--	39	37
	SB Left-Turn	75	54	45	75	49	44	75	58	48	125	61	50
	SB Thru/Right	--	24	39	--	23	42	--	24	40	--	24	43
Intersection 9 - WV 115 (Charles Town Road) with Site Drive #1	EB Left/Thru	N/A	N/A	N/A	N/A	N/A	N/A	--	47	83	N/A	N/A	N/A
	EB Left-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	125	35	54
	EB Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	FREE	FREE
	WB Thru/Right	N/A	N/A	N/A	N/A	N/A	N/A	--	FREE	FREE	--	FREE	FREE
	SB Left/Right	N/A	N/A	N/A	N/A	N/A	N/A	--	68	58	--	76	54
Intersection 10 - WV 115 (Charles Town Road) with Site Drive #2	EB Left/Thru	N/A	N/A	N/A	N/A	N/A	N/A	--	39	81	N/A	N/A	N/A
	EB Left-Turn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	125	32	48
	EB Thru	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	FREE	FREE
	WB Thru/Right	N/A	N/A	N/A	N/A	N/A	N/A	--	FREE	FREE	--	FREE	FREE
	SB Left/Right	N/A	N/A	N/A	N/A	N/A	N/A	--	78	57	--	75	59



LEGEND

- Existing Traffic Control
- Existing Roadway
- Existing Lane Configuration
- XX AM Queue (FT)
- (XX) PM Queue (FT)

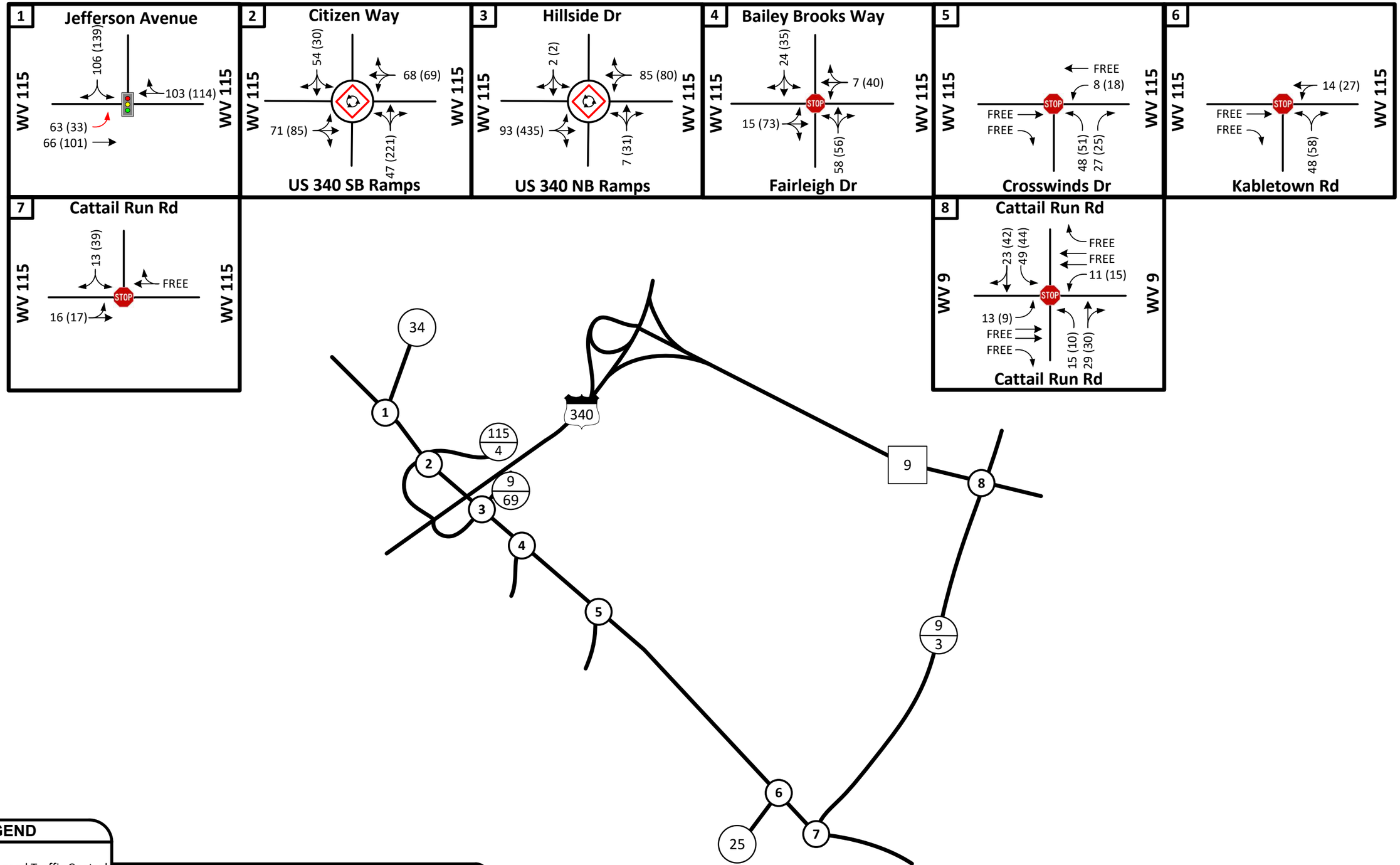
NOT TO SCALE

Fairview Farms TIS

2022 Existing Queuing Analysis

DATE: August 2023

FIGURE 15



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Lane Configuration
- XX AM Queue (FT)
- (XX) PM Queue (FT)

N

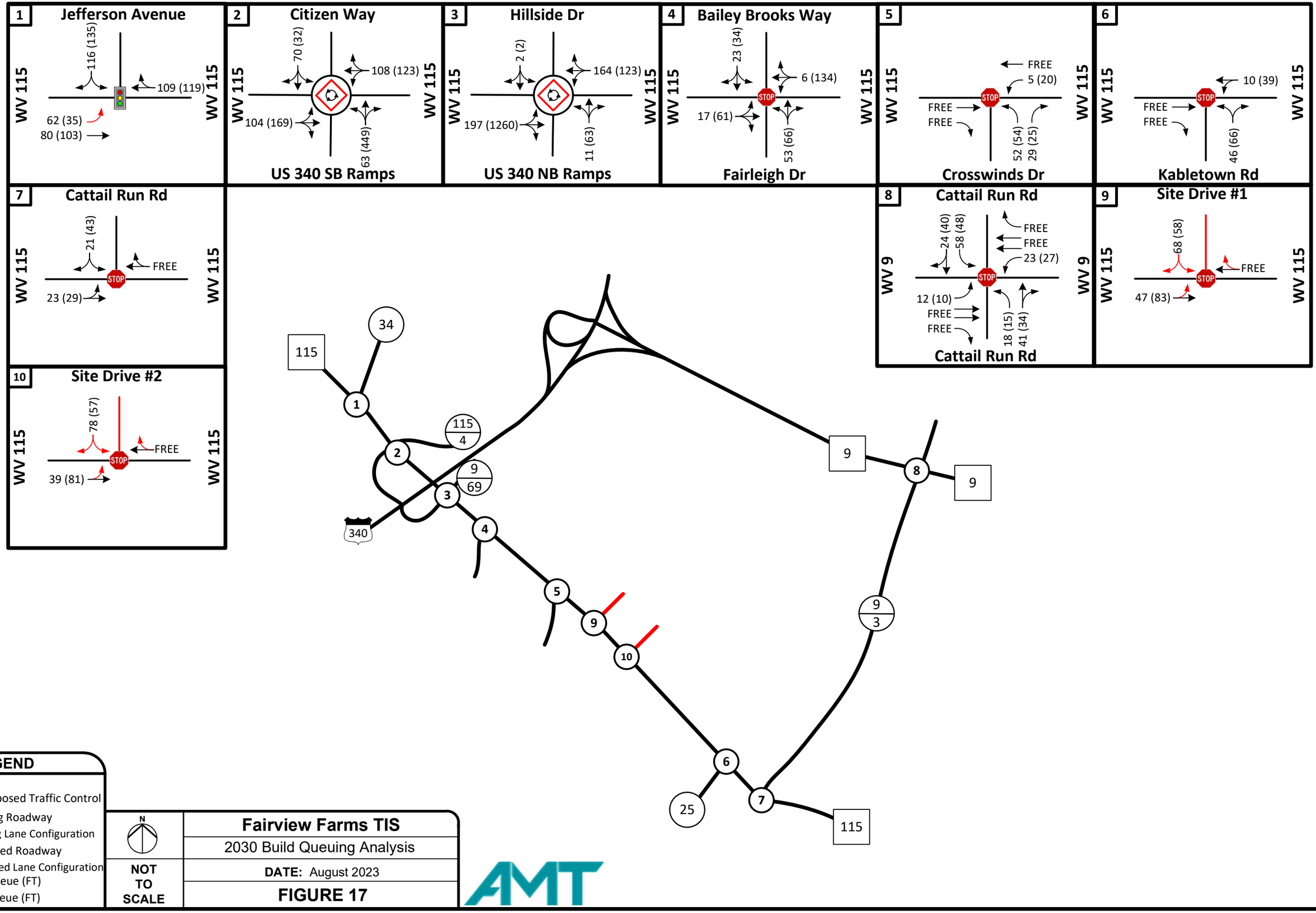
NOT TO SCALE

Fairview Farms TIS

2030 No-Build Queuing Analysis

DATE: August 2023

FIGURE 16



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX AM Queue (FT)
- (XX) PM Queue (FT)

N

NOT TO SCALE

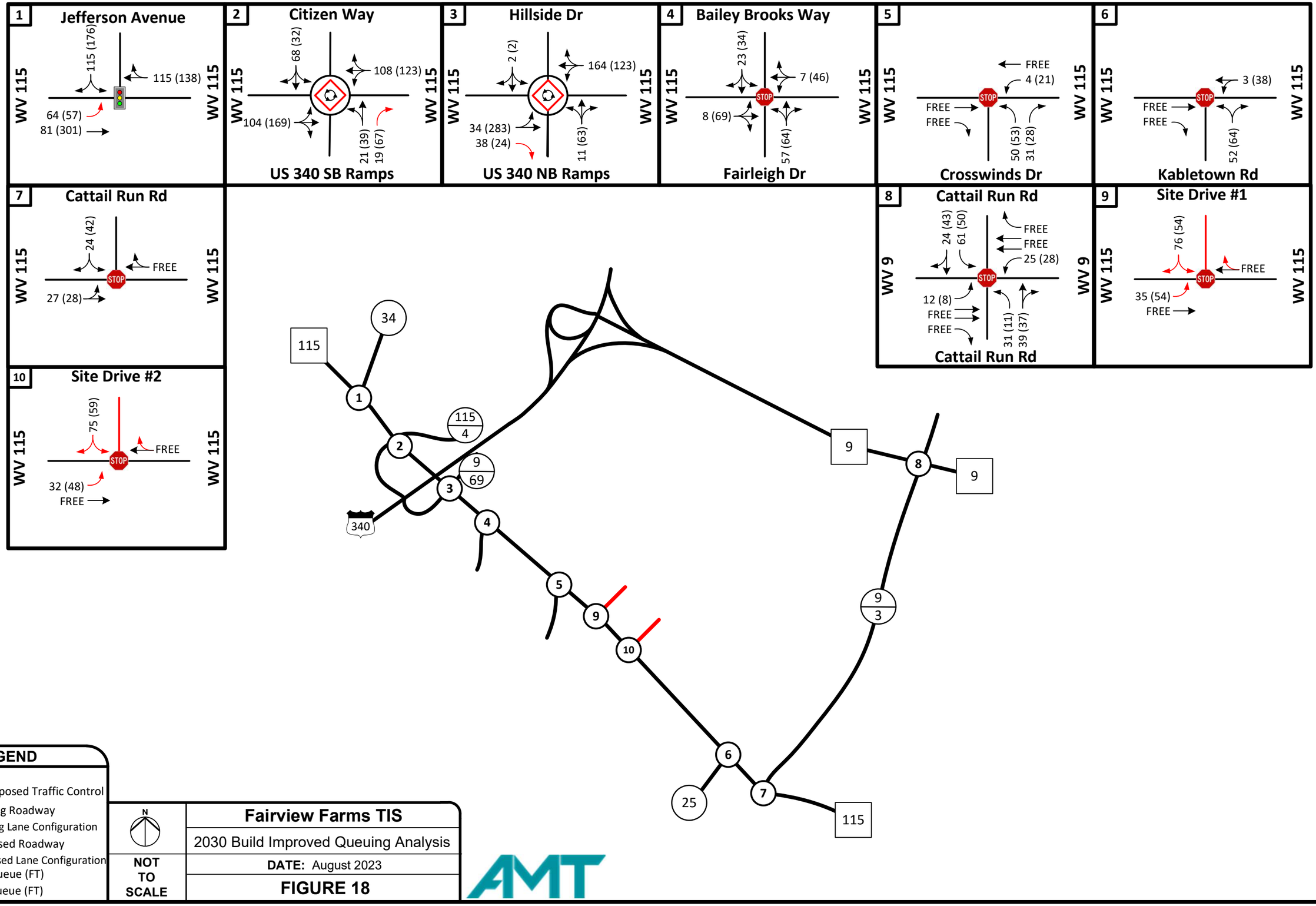
Fairview Farms TIS

2030 Build Queuing Analysis

DATE: August 2023

FIGURE 17

AMT



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX AM Queue (FT)
- (XX) PM Queue (FT)

N

NOT TO SCALE

Fairview Farms TIS

2030 Build Improved Queuing Analysis

DATE: August 2023

FIGURE 18

AASHTO LEFT TURN LANE ANALYSIS

In accordance with WVDOH procedures outlined in TED 106-2, analysis comparing intersection volumes with the AASHTO (American Association of State Highway Transportation Officials) guidelines for left turn lanes on two lane highways is provided as guide to identify potential need for left turn lanes. The guideline is outlined in Table 9-23 of the 2011 AASHTO Green Book and is intended for comparison of rural two-lane roadways where the subject approach is free flow. The need for auxiliary lanes on signalized approaches or low speed stop control approaches is typically based upon capacity analysis. Comparison with the AASHTO criteria is provided for the WV 115 eastbound approaches to Site Drive #1 and Site Drive #2.

Comparison of the AASHTO guideline shows that the guideline criteria is are met for both the WV 115 eastbound approaches to Site Drive #1 and Site Drive #2 during the 2030 Build Conditions PM peak hour as shown in **Table 6**.

Table 6: AASHTO Analysis Summary

AASHTO Left-Turn Analysis			
WV 115 with Site Drive #1		WV 115 with Site Drive #2	
2030 Build Conditions		2030 Build Conditions	
AM Peak	PM Peak	AM Peak	PM Peak
Guideline Met	**Guideline Met**	**Guideline Not Met**	**Guideline Met**

Copies of the review of AASHTO Table 9-23 for each approach are contained in **Appendix B**.

CONCLUSIONS/RECOMMENDATIONS

This report summarizes existing and future traffic analyses conducted in support of the proposed Fairview Farms Mixed-Use Development. The proposed development is to be located north of WV 115 (Charles Town Road) and east of US 340 (Berryville Pike) in Charles Town, Jefferson County. The proposed site plan includes 267 single-family homes, 200 townhomes, and 99,000 sf of self-storage. Fairview Farms is expected to be built and completed by the year 2030.

The proposed mixed-use development is anticipated to be served by two site driveways intersecting directly with WV 115. Site Drive #1 is proposed to be located approximately 630 feet east of Crosswinds Drive approaching WV 115 from the north and will operate as a full movement approach utilizing TWSC. Site Drive #2 will approach WV 115 from the north approximately 1,270 feet east of Crosswinds Drive and will operate as a full movement approach utilizing TWSC.

Based on the findings of the Tate Manor TIS, the following infrastructure improvements are recommended to address existing capacity issues and accommodate the Tate Manor residential development in order to maintain operation of the existing transportation network:

WV 115 with Jefferson Avenue

- As part of the Tate Manor TIS, it was recommended that a traffic signal be installed at the intersection of WV 115 and Jefferson Avenue. Intersection conditions previously met the MUTCD warranting criteria. Additionally, the 2022 Existing Conditions and 2030 No-Build analysis indicates that the intersection LOS will currently operates at LOS E during the PM peak hour under TWSC.

- In conjunction with installation of a traffic signal identified in previous studies, widening WV 115 to construct an exclusive left-turn lane on the eastbound approach is recommended. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with an appropriate taper.

Based on the findings of the Kings Crossing TIS, the following infrastructure improvements are recommended to address existing capacity issues and accommodate the Kings Crossing residential development in order to maintain operation of the existing transportation network:

WV 115 with Citizen Way/US 340 Southbound Ramps

- Construct a low angle right-turn slip lane on for the US 340 northbound ramp approach to WV 115 eastbound. The 2030 Build analysis indicates that the ramp approach will deteriorate to LOS E during the PM peak hour with the overall intersection operating LOS C. The addition of the right-turn slip lane improves the ramp to LOS A during the PM peak hour and the overall intersection to LOS B. This measure is needed at the conclusion of Phase 2 and prior to beginning Phase 3.

Based on the findings of the Magnolia Springs TIS, the following infrastructure improvements are recommended to address existing capacity issues in order to maintain operation of the existing transportation network:

WV 115 with Hillside Drive/US 340 Northbound Ramps

- Proceed with the WVDOH planned conversion of the intersection to a single lane roundabout. This project is currently programmed by WVDOH and is expected to be constructed in 2025. For the purpose of this study, the installation of a single lane roundabout is included beginning in 2030 No-Build conditions.

Based on the findings of this study, the following capacity infrastructure improvements are recommended to mitigate future transportation issues prior to construction of the Fairview Farms Development:

WV 115 with Hillside Drive/US 340 Northbound Ramps

- Construct an exclusive right-turn slip lane on the WV 115 eastbound approach to US 340 Northbound Ramps/Hillside Drive. The WV 115 eastbound approach is anticipated to experience lengthy queues beginning in the 2030 No-Build conditions. This improvement increases capacity and reduces queue lengths on the approach.

Based on the finding of this study, the following geometric improvements are recommended to mitigate the impacts of the Fairview Farms development and maintain acceptable traffic operations along the existing transportation network in 2030:

WV 115 with Site Drive #1

- Construct Site Drive #1 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 630 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and one egress lane. Site Drive #1 will operate under stop-control, while WV 115 operates as free-flow.

- Construct an exclusive left-turn lane on the WV 115 eastbound approach to Site Drive #1. Peak hour volumes are projected to meet the AASHTO guidelines during 2030 Build Conditions AM and PM peak hours. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with appropriate taper.

WV 115 with Site Drive #2

- Construct Site Drive #2 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 1,270 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and one egress lane. Site Drive #2 will operate under stop-control, while WV 115 operates as free-flow.

- Construct an exclusive left-turn lane on the WV 115 eastbound approach to Site Drive #2. Peak hour volumes are projected to meet the AASHTO guidelines during 2030 Build Conditions PM peak hour. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with appropriate taper.

APPENDIX A: STUDY AREA PHOTOS



WV 115 Eastbound Approach to Jefferson Avenue



WV 115 Westbound Approach to Jefferson Avenue



Jefferson Avenue Southbound Approach to WV 115



WV 115 Eastbound Approach to US 340 SB Ramps/Citizen Way



WV 115 Westbound Approach to US 340 SB Ramps/Citizen Way



US 340 SB Off Ramp Northbound Approach to WV 115



Citizen Way Southbound Approach to WV 115



WV 115 Eastbound Approach to US 340 NB Ramp/Hillside Dr



WV 115 Westbound Approach to US 340 NB Ramp/Hillside Dr



US 340 NB Off Ramp Northbound Approach to WV 115



Hillside Dr Southbound Approach to WV 115



WV 115 Eastbound Approach to Fairleigh Dr/Bailey Brooks Way



WV 115 Westbound Approach to Fairleigh Dr/Bailey Brooks Way



Fairleigh Dr Northbound Approach to WV 115



Bailey Brooks Way Southbound Approach to WV 115



WV 115 Eastbound Approach to Crosswinds Dr



WV 115 Westbound Approach to Crosswinds Dr



Crosswinds Dr Northbound Approach to WV 115



WV 115 Eastbound Approach to Kabletown Rd



WV 115 Westbound Approach to Kabletown Rd



Kabletown Rd Northbound Approach to WV 115



WV 115 Eastbound Approach to Cattail Run Road



WV 115 Westbound Approach to Cattail Run Road



Cattail Run Road Southbound Approach to WV 115



WV 9 Eastbound Approach to Cattail Run Road



WV 9 Westbound Approach to Cattail Run Road



Cattail Run Road Northbound Approach to WV 9



Cattail Run Road Southbound Approach to WV 9

APPENDIX B: TRAFFIC VOLUMES & CALCULATIONS

APPENDIX B-1: VOLUME CALCULATIONS

22-0255.001 - Fairview Farms Residential Development TIS - Traffic Volume Calculations

	Balanced Existing Traffic (2022)		Future w/o Adj Devs (2030)		Historical Growth (2022-2030)		Magnolia Springs Site Trips (2024)		Tate Manor Site Trips (2024)		Kings Crossing Site Trips (2025)		No Build Volumes (2030)		Site Trip Distribution		Site Trip Assignment		Build Volumes (2030)		Site Impact	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	Enter	Exit	AM	PM	AM	PM	AM	PM
Intersection 1 - WV 115 (Charlestown Road) with Jefferson Avenue (CR 34)																						
EBL	60	12	66	13	6	1			0	2			66	15			0	0	66	15		
EBT	172	251	189	276	17	25	3	11			6	18	198	305	30%		28	78	226	383	9.6%	19.6%
EBR	0	0	0	0	0	0							0	0			0	0	0	0		
WBL	0	0	0	0	0	0							0	0			0	0	0	0		
WBT	166	230	183	253	17	23	10	6			18	11	211	270		30%	72	48	283	318	15.2%	9.9%
WBR	174	147	191	162	17	15			1	5			192	167			0	0	192	167		
NBL	0	0	0	0	0	0							0	0			0	0	0	0		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
NBR	0	0	0	0	0	0							0	0			0	0	0	0		
SBL	137	207	151	228	14	21			5	3			156	231			0	0	156	231		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
SBR	57	27	63	30	6	3			2	1			65	31			0	0	65	31		
Intersection 2 - WV 115 (Charles Town Road) with US 340 Southbound/Citizens Way (CR 115/4)																						
EBL	18	56	20	62	2	6	3	11					23	73			0	0	23	73		
EBT	221	316	243	348	22	32			3	2	6	18	252	368	30%		28	78	280	446	7.3%	12.9%
EBR	72	79	79	87	7	8			2	1			81	88			0	0	81	88		
WBL	88	65	97	71	9	6					15	10	112	81		25%	60	41	172	122		
WBT	238	261	262	287	24	26			0	2	18	11	280	300		30%	72	48	352	348	24.2%	17.2%
WBR	12	21	13	23	1	2	7	22	1	2			21	47			0	0	21	47		
NBL	70	66	77	73	7	7			1	3			78	76			0	0	78	76		
NBT	21	28	23	31	2	3	42	141	2	8			67	180			0	0	67	180	10.0%	12.7%
NBR	90	233	99	256	9	23					7	22	106	278	30%		28	78	134	356		
SBL	36	32	39	35	3	3	126	84	8	5			173	124			0	0	173	124		
SBT	18	12	20	13	2	1	19	13	2	1			41	27			0	0	41	27	0.0%	0.0%
SBR	34	50	37	55	3	5	10	6					47	61			0	0	47	61		
Intersection 3 - WV 115 (Charles Town Road) with US 340 Northbound/Hillside Drive (CR 9/69)																						
EBL	3	6	3	7	0	1							3	7			0	0	3	7		
EBT	191	459	210	505	83	98					13	40	223	545	60%		56	156	279	701	9.5%	16.8%
EBR	153	116	168	128	15	12	126	84	11	7			305	219			0	0	305	219		
WBL	142	157	156	173	14	16					21	14	177	187		30%	72	48	249	235		
WBT	304	273	334	300	144	58					33	21	367	321		55%	132	89	499	410	27.3%	21.2%
WBR	0	1	0	1	0	0							0	1			0	0	0	1		
NBL	28	71	31	78	3	7	7	22	1	4			39	104			0	0	39	104		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	27.3%	26.2%
NBR	18	57	20	63	2	6					5	16	25	79	25%		24	65	49	144		
SBL	0	0	0	0	0	0							0	0			0	0	0	0		
SBT	5	5	5	5	0	0							5	5			0	0	5	5	0.0%	0.0%
SBR	6	3	6	3	0	0							6	3			0	0	6	3		
Intersection 4 - WV 115 (Charles Town Road) with Fairleigh Drive/Bailey Brooks Way																						
EBL	2	10	2	11	0	1							2	11			0	0	2	11		
EBT	192	460	211	506	19	46					18	56	229	562	85%		80	221	309	783	24.0%	26.3%
EBR	21	42	23	46	2	4							23	46			0	0	23	46		
WBL	2	3	2	3	0	0							2	3			0	0	2	3		
WBT	366	356	403	392	37	36					54	35	457	427		85%	204	137	661	564	30.8%	24.2%
WBR	0	0	0	0	0	0							0	0			0	0	0	0		
NBL	40	34	44	37	4	3							44	37			0	0	44	37		
NBT	1	0	1	0	0	0							1	0			0	0	1	0	0.0%	0.0%
NBR	2	1	2	1	0	0							2	1			0	0	2	1		
SBL	0	0	0	0	0	0							0	0			0	0	0	0		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
SBR	5	11	5	12	0	1							5	12			0	0	5	12		

Annual Growth Rate 1.20%

Existing Year 2022

Build Year 2030

	AM		PM	
	Enter	Exit	Enter	Exit
Net New Trips	94	241	260	161
Pass-By Trips	0	0	0	0

	Balanced Existing Traffic (2022)		Future w/o Adj Devs (2030)		Historical Growth (2022-2030)		Magnolia Springs Site Trips (2024)		Tate Manor Site Trips (2024)		Kings Crossing Site Trips (2025)		No Build Volumes (2030)		Site Trip Distribution		Site Trip Assignment		Build Volumes (2030)		Site Impact	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	Enter	Exit	AM	PM	AM	PM	AM	PM
Intersection 5 - WV 115 (Charles Town Road) with Crosswinds Drive																						
EBL	0	0	0	0	0	0							0	0			0	0	0	0		
EBT	164	365	180	401	16	36					18	56	198	457	85%		80	221	278	678	27.0%	28.7%
EBR	16	84	18	92	2	8							18	92			0	0	18	92		
WBL	2	8	2	9	0	1							2	9			0	0	2	9		
WBT	305	306	335	337	30	31					54	35	389	372		85%	204	137	593	509	34.3%	26.4%
WBR	0	0	0	0	0	0							0	0			0	0	0	0		
NBL	40	35	44	38	4	3							44	38			0	0	44	38		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
NBR	9	7	10	8	1	1							10	8			0	0	10	8		
SBL	0	0	0	0	0	0							0	0			0	0	0	0		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
SBR	0	0	0	0	0	0							0	0			0	0	0	0		
Intersection 6 - WV 115 (Charles Town Road) with Kabletown Road (CR 25)																						
EBL	0	0	0	0	0	0							0	0			0	0	0	0		
EBT	136	334	150	367	14	33					5	4	155	371		15%	37	24	192	395	15.9%	5.5%
EBR	36	40	40	44	4	4							40	44			0	0	40	44		
WBL	6	34	7	37	1	3							7	37			0	0	7	37		
WBT	246	253	271	278	25	25					3	6	274	284	15%		14	39	288	323	4.7%	10.8%
WBR	0	0	0	0	0	0							0	0			0	0	0	0		
NBL	59	70	65	77	6	7							65	77			0	0	65	77		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
NBR	11	22	12	24	1	2							12	24			0	0	12	24		
SBL	0	0	0	0	0	0							0	0			0	0	0	0		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
SBR	0	0	0	0	0	0							0	0			0	0	0	0		
Intersection 7 - WV 115 (Charles Town Road) with Cattail Run Road (CR 9/3)																						
EBL	14	12	15	13	1	1							15	13		10%	25	16	40	29		
EBT	135	341	148	375	13	34					5	4	153	379		5%	12	8	165	387	18.0%	5.8%
EBR	0	0	0	0	0	0							0	0			0	0	0	0		
WBL	0	0	0	0	0	0							0	0			0	0	0	0		
WBT	246	254	271	279	25	25					3	6	274	285	5%		5	13	279	298	1.7%	4.2%
WBR	6	10	7	11	1	1							7	11			0	0	7	11		
NBL	0	0	0	0	0	0							0	0			0	0	0	0		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	#DIV/0!	#DIV/0!
NBR	0	0	0	0	0	0							0	0			0	0	0	0		
SBL	0	0	0	0	0	0							0	0			0	0	0	0		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	64.3%	44.8%
SBR	5	29	5	32	0	3							5	32	10%		9	26	14	58		
Intersection 8 - WV 9 (Veterans Memorial Highway) with Cattail Run Road (CR 9/3)																						
EBL	6	4	7	4	1	0							7	4			0	0	7	4		
EBT	612	328	673	361	61	33							673	361		5%	12	8	685	369	1.7%	2.1%
EBR	5	2	5	2	0	0							5	2			0	0	5	2		
WBL	5	8	5	9	0	1							5	9	10%		9	26	14	35		
WBT	274	432	301	475	27	43							301	475	5%		5	13	306	488	4.1%	7.1%
WBR	19	27	21	30	2	3							21	30			0	0	21	30		
NBL	4	3	4	3	0	0							4	3			0	0	4	3		
NBT	13	15	14	16	1	1							14	16			0	0	14	16	47.2%	37.2%
NBR	9	7	10	8	1	1							10	8		10%	25	16	35	24		
SBL	57	42	63	46	6	4							63	46			0	0	63	46		
SBT	3	25	3	27	0	2							3	27			0	0	3	27	0.0%	0.0%
SBR	16	16	18	18	2	2							18	18			0	0	18	18		

	Balanced Existing Traffic (2022)		Future w/o Adj Devs (2030)		Historical Growth (2022-2030)		Magnolia Springs Site Trips (2024)		Tate Manor Site Trips (2024)		Kings Crossing Site Trips (2025)		No Build Volumes (2030)		Site Trip Distribution		Site Trip Assignment		Build Volumes (2030)		Site Impact	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	Enter	Exit	AM	PM	AM	PM	AM	PM
Intersection 9 - WV 115 (Charles Town Road) with Site Drive #1																						
EBL	0	0	0	0	0	0							0	0	45%		43	117	43	117		
EBT	173	372	190	409	17	37					18	56	208	465	40%		38	104	246	569	28.0%	32.2%
EBR	0	0	0	0	0	0							0	0			0	0	0	0		
WBL	0	0	0	0	0	0							0	0			0	0	0	0		
WBT	305	306	335	337	30	31					54	35	389	372		40%	96	64	485	436	20.6%	17.1%
WBR	0	0	0	0	0	0							0	0	5%		5	13	5	13		
NBL	0	0	0	0	0	0							0	0			0	0	0	0		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
NBR	0	0	0	0	0	0							0	0			0	0	0	0		
SBL	0	0	0	0	0	0							0	0		5%	12	8	12	8		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	100.0%	100.0%
SBR	0	0	0	0	0	0							0	0		45%	108	73	108	73		
Intersection 10 - WV 115 (Charles Town Road) with Site Drive #2																						
EBL	0	0	0	0	0	0							0	0	40%		38	104	38	104		
EBT	173	372	190	409	17	37					18	56	208	465		5%	12	8	220	473	19.4%	19.4%
EBR	0	0	0	0	0	0							0	0			0	0	0	0		
WBL	0	0	0	0	0	0							0	0			0	0	0	0		
WBT	305	306	335	337	30	31					54	35	389	372	5%		5	13	394	385	3.5%	9.5%
WBR	0	0	0	0	0	0							0	0	10%		9	26	9	26		
NBL	0	0	0	0	0	0							0	0			0	0	0	0		
NBT	0	0	0	0	0	0							0	0			0	0	0	0	0.0%	0.0%
NBR	0	0	0	0	0	0							0	0			0	0	0	0		
SBL	0	0	0	0	0	0							0	0		10%	25	16	25	16		
SBT	0	0	0	0	0	0							0	0			0	0	0	0	100.0%	100.0%
SBR	0	0	0	0	0	0							0	0		40%	96	64	96	64		

APPENDIX B-2: TURNING MOVEMENT COUNTS

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 1: WV 115 @ Jefferson Avenue
COUNT BY	AMT

Friday

STREET	Jefferson Ave								WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	12	0	4	16	0	0	0	0	0	29	25	54	5	27	0	32	16	86	102	102
0715 - 0730	**17**	**0**	**9**	**26**	**0**	**0**	**0**	**0**	**0**	**39**	**44**	**83**	**12**	**47**	**0**	**59**	**26**	**142**	**168**	270
0730 - 0745	**41**	**0**	**17**	**58**	**0**	**0**	**0**	**0**	**0**	**39**	**62**	**101**	**25**	**46**	**0**	**71**	**58**	**172**	**230**	500
0745 - 0800	**55**	**0**	**24**	**79**	**0**	**0**	**0**	**0**	**0**	**46**	**44**	**90**	**13**	**38**	**0**	**51**	**79**	**141**	**220**	720
0800 - 0815	**24**	**0**	**7**	**31**	**0**	**0**	**0**	**0**	**0**	**42**	**24**	**66**	**10**	**41**	**0**	**51**	**31**	**117**	**148**	***766***
0815 - 0830	23	0	5	28	0	0	0	0	0	34	23	57	4	42	0	46	28	103	131	729
0830 - 0845	15	0	8	23	0	0	0	0	0	64	32	96	5	52	0	57	23	153	176	675
0845 - 0900	21	0	8	29	0	0	0	0	0	67	27	94	6	51	0	57	29	151	180	635
1500 - 1515	59	0	19	78	0	0	0	0	0	68	38	106	12	58	0	70	78	176	254	254
1515 - 1530	54	0	16	70	0	0	0	0	0	71	23	94	11	58	0	69	70	163	233	487
1530 - 1545	42	0	5	47	0	0	0	0	0	69	32	101	12	64	0	76	47	177	224	711
1545 - 1600	37	0	8	45	0	0	0	0	0	78	40	118	6	71	0	77	45	195	240	951
1600 - 1615	38	0	11	49	0	0	0	0	0	63	36	99	4	55	0	59	49	158	207	904
1615 - 1630	53	0	9	62	0	0	0	0	0	71	38	109	3	69	0	72	62	181	243	914
1630 - 1645	40	0	10	50	0	0	0	0	0	62	46	108	8	65	0	73	50	181	231	921
1645 - 1700	49	0	14	63	0	0	0	0	0	59	38	97	4	71	0	75	63	172	235	916
1700 - 1715	**49**	**0**	**7**	**56**	**0**	**0**	**0**	**0**	**0**	**61**	**32**	**93**	**2**	**69**	**0**	**71**	**56**	**164**	**220**	929
1715 - 1730	**56**	**0**	**7**	**63**	**0**	**0**	**0**	**0**	**0**	**54**	**38**	**92**	**3**	**65**	**0**	**68**	**63**	**160**	**223**	909
1730 - 1745	**45**	**0**	**7**	**52**	**0**	**0**	**0**	**0**	**0**	**66**	**38**	**104**	**4**	**59**	**0**	**63**	**52**	**167**	**219**	897
1745 - 1800	**57**	**0**	**6**	**63**	**0**	**0**	**0**	**0**	**0**	**49**	**39**	**88**	**3**	**58**	**0**	**61**	**63**	**149**	**212**	***874***
Peak HR AM																				
0715 - 0815	***137***	***0***	***57***	***194***	***0***	***0***	***0***	***0***	***0***	***166***	***174***	***340***	***60***	***172***	***0***	***232***	***194***	***572***	***766***	
Peak HR PM																				
1700 - 1800	***207***	***0***	***27***	***234***	***0***	***0***	***0***	***0***	***0***	***230***	***147***	***377***	***12***	***251***	***0***	***263***	***234***	***640***	***874***	
AM PHF	**0.614**				**0.000**				**0.842**				**0.817**				**0.833**			
PM PHF	**0.929**				**0.000**				**0.906**				**0.926**				**0.980**			

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 2: WV 115 @ US 340 Southbound Ramps/Citizens Way
COUNT BY	AMT

Friday

STREET	Citizens Way				US 340 SB Ramps				WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	14	3	8	25	8	2	14	24	9	31	2	42	4	30	6	40	49	82	131	131
0715 - 0730	**15**	**5**	**10**	**30**	**16**	**6**	**26**	**48**	**28**	**58**	**4**	**90**	**3**	**46**	**17**	**66**	**78**	**156**	**234**	365
0730 - 0745	**8**	**6**	**9**	**23**	**24**	**8**	**17**	**49**	**33**	**74**	**1**	**108**	**7**	**56**	**25**	**88**	**72**	**196**	**268**	633
0745 - 0800	**7**	**3**	**9**	**19**	**15**	**5**	**28**	**48**	**16**	**63**	**4**	**83**	**7**	**66**	**21**	**94**	**67**	**177**	**244**	877
0800 - 0815	**6**	**4**	**6**	**16**	**15**	**2**	**19**	**36**	**11**	**43**	**3**	**57**	**1**	**53**	**9**	**63**	**52**	**120**	**172**	***918***
0815 - 0830	7	2	8	17	10	4	26	40	11	45	3	59	6	53	6	65	57	124	181	865
0830 - 0845	5	4	6	15	10	2	21	33	13	78	1	92	3	55	9	67	48	159	207	804
0845 - 0900	9	2	13	24	12	4	22	38	9	78	2	89	5	55	9	69	62	158	220	780
1500 - 1515	14	2	17	33	29	7	36	72	12	63	11	86	18	82	21	121	105	207	312	312
1515 - 1530	6	2	7	15	24	6	40	70	9	58	4	71	16	84	13	113	85	184	269	581
1530 - 1545	7	2	7	16	28	8	39	75	8	64	6	78	6	87	17	110	91	188	279	860
1545 - 1600	12	0	11	23	30	10	49	89	10	76	4	90	11	82	15	108	112	198	310	1170
1600 - 1615	6	1	9	16	18	6	40	64	12	71	4	87	8	73	12	93	80	180	260	1118
1615 - 1630	7	1	12	20	32	7	58	97	5	65	4	74	10	90	24	124	117	198	315	1164
1630 - 1645	8	2	14	24	20	14	43	77	10	74	5	89	11	82	12	105	101	194	295	1180
1645 - 1700	2	2	9	13	13	10	46	69	7	74	3	84	11	95	15	121	82	205	287	1157
1700 - 1715	**11**	**2**	**11**	**24**	**20**	**8**	**52**	**80**	**19**	**64**	**6**	**89**	**15**	**86**	**16**	**117**	**104**	**206**	**310**	1207
1715 - 1730	**6**	**4**	**18**	**28**	**14**	**5**	**54**	**73**	**8**	**61**	**5**	**74**	**18**	**78**	**26**	**122**	**101**	**196**	**297**	1189
1730 - 1745	**5**	**2**	**16**	**23**	**18**	**11**	**61**	**90**	**19**	**66**	**5**	**90**	**11**	**71**	**21**	**103**	**113**	**193**	**306**	1200
1745 - 1800	**10**	**4**	**5**	**19**	**14**	**4**	**66**	**84**	**19**	**70**	**5**	**94**	**12**	**81**	**16**	**109**	**103**	**203**	**306**	***1219***
Peak HR AM																				
0715 - 0815	***36***	***18***	***34***	***88***	***70***	***21***	***90***	***181***	***88***	***238***	***12***	***338***	***18***	***221***	***72***	***311***	***269***	***649***	***918***	
Peak HR PM																				
1700 - 1800	***32***	***12***	***50***	***94***	***66***	***28***	***233***	***327***	***65***	***261***	***21***	***347***	***56***	***316***	***79***	***451***	***421***	***798***	***1219***	

AM PHF	**0.733**	**0.923**	**0.782**	**0.827**	**0.856**
PM PHF	**0.839**	**0.908**	**0.923**	**0.924**	**0.983**

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 3: WV 115 @ US 340 Northbound Ramps/Hillside Drive
COUNT BY	AMT

Friday

STREET	Hillside Dr				US 340 NB Ramps				WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	0	3	0	3	3	0	2	5	28	31	0	59	1	35	39	75	8	134	142	142
0715 - 0730	**0**	**2**	**0**	**2**	**10**	**0**	**3**	**13**	**28**	**41**	**0**	**69**	**1**	**15**	**48**	**64**	**15**	**133**	**148**	290
0730 - 0745	**0**	**0**	**3**	**3**	**4**	**0**	**4**	**8**	**37**	**40**	**0**	**77**	**1**	**43**	**41**	**85**	**11**	**162**	**173**	463
0745 - 0800	**0**	**1**	**2**	**3**	**7**	**0**	**5**	**12**	**42**	**63**	**0**	**105**	**1**	**32**	**32**	**65**	**15**	**170**	**185**	648
0800 - 0815	**0**	**2**	**1**	**3**	**7**	**0**	**6**	**13**	**35**	**46**	**0**	**81**	**0**	**37**	**32**	**69**	**16**	**150**	**166**	***672***
0815 - 0830	0	1	1	2	8	0	5	13	27	46	0	73	1	53	42	96	15	169	184	708
0830 - 0845	0	0	0	0	7	0	4	11	35	49	0	84	1	52	32	85	11	169	180	715
0845 - 0900	0	1	0	1	8	0	4	12	33	54	0	87	0	48	34	82	13	169	182	712
1500 - 1515	0	0	0	0	11	0	7	18	32	60	0	92	0	82	27	109	18	201	219	219
1515 - 1530	0	1	0	1	14	0	21	35	37	53	0	90	2	74	24	100	36	190	226	445
1530 - 1545	0	1	1	2	19	1	17	37	31	44	0	75	0	98	29	127	39	202	241	686
1545 - 1600	0	1	2	3	20	1	12	33	31	44	0	75	4	104	31	139	36	214	250	936
1600 - 1615	0	0	1	1	11	0	14	25	25	50	0	75	2	118	30	150	26	225	251	968
1615 - 1630	0	0	0	0	21	0	8	29	33	54	0	87	3	95	22	120	29	207	236	978
1630 - 1645	0	1	0	1	23	0	13	36	33	70	0	103	1	97	29	127	37	230	267	1004
1645 - 1700	0	1	1	2	18	0	10	28	33	43	1	77	3	98	25	126	30	203	233	987
1700 - 1715	**0**	**1**	**1**	**2**	**20**	**0**	**14**	**34**	**32**	**63**	**0**	**95**	**5**	**95**	**34**	**134**	**36**	**229**	**265**	1001
1715 - 1730	**0**	**0**	**1**	**1**	**15**	**0**	**14**	**29**	**37**	**50**	**0**	**87**	**1**	**104**	**40**	**145**	**30**	**232**	**262**	1027
1730 - 1745	**0**	**2**	**0**	**2**	**17**	**0**	**12**	**29**	**38**	**73**	**0**	**111**	**0**	**88**	**18**	**106**	**31**	**217**	**248**	1008
1745 - 1800	**0**	**2**	**1**	**3**	**19**	**0**	**17**	**36**	**50**	**56**	**1**	**107**	**0**	**120**	**24**	**144**	**39**	**251**	**290**	***1065***
Peak HR AM																				
0715 - 0815	***0***	***5***	***6***	***11***	***28***	***0***	***18***	***46***	***142***	***190***	***0***	***332***	***3***	***127***	***153***	***283***	***57***	***615***	***672***	
Peak HR PM																				
1700 - 1800	***0***	***5***	***3***	***8***	***71***	***0***	***57***	***128***	***157***	***242***	***1***	***400***	***6***	***407***	***116***	***529***	***136***	***929***	***1065***	
AM PHF	**0.917**				**0.885**				**0.790**				**0.832**				**0.908**			
PM PHF	**0.667**				**0.889**				**0.901**				**0.912**				**0.918**			

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 4: WV 115 @ Fairleigh Drive/Baily Brooks Way
COUNT BY	AMT

Friday

STREET	Bailey Brooks Way				Fairleigh Dr				WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	0	0	3	3	2	0	0	2	0	68	0	68	0	20	2	22	5	90	95	95
0715 - 0730	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**10**	**1**	**96**	**0**	**97**	**1**	**46**	**2**	**49**	**10**	**146**	**156**	251
0730 - 0745	**0**	**0**	**2**	**2**	**13**	**0**	**0**	**13**	**0**	**110**	**0**	**110**	**0**	**49**	**6**	**55**	**15**	**165**	**180**	431
0745 - 0800	**0**	**0**	**3**	**3**	**10**	**0**	**1**	**11**	**0**	**86**	**0**	**86**	**0**	**51**	**9**	**60**	**14**	**146**	**160**	591
0800 - 0815	**0**	**0**	**0**	**0**	**7**	**1**	**1**	**9**	**1**	**74**	**0**	**75**	**1**	**46**	**4**	**51**	**9**	**126**	**135**	***631***
0815 - 0830	0	0	4	4	5	0	0	5	0	68	0	68	1	56	4	61	9	129	138	613
0830 - 0845	0	0	2	2	14	0	1	15	1	103	0	104	1	50	4	55	17	159	176	609
0845 - 0900	0	0	5	5	5	0	0	5	0	111	0	111	3	54	5	62	10	173	183	632
1500 - 1515	0	0	0	0	6	0	1	7	0	65	0	65	2	93	9	104	7	169	176	176
1515 - 1530	0	0	1	1	11	0	0	11	0	75	0	75	1	104	9	114	12	189	201	377
1530 - 1545	0	0	1	1	3	0	0	3	1	77	0	78	1	91	12	104	4	182	186	563
1545 - 1600	0	0	2	2	9	0	0	9	1	98	0	99	1	93	15	109	11	208	219	782
1600 - 1615	0	0	0	0	7	0	2	9	0	113	0	113	1	101	20	122	9	235	244	850
1615 - 1630	0	0	1	1	7	0	0	7	0	91	0	91	8	115	7	130	8	221	229	878
1630 - 1645	0	0	3	3	8	0	1	9	1	98	0	99	2	107	10	119	12	218	230	922
1645 - 1700	0	0	2	2	4	0	0	4	2	77	0	79	2	125	4	131	6	210	216	919
1700 - 1715	**0**	**0**	**1**	**1**	**12**	**0**	**0**	**12**	**0**	**84**	**0**	**84**	**1**	**106**	**8**	**115**	**13**	**199**	**212**	887
1715 - 1730	**0**	**0**	**2**	**2**	**5**	**0**	**0**	**5**	**1**	**85**	**0**	**86**	**1**	**110**	**11**	**122**	**7**	**208**	**215**	873
1730 - 1745	**0**	**0**	**6**	**6**	**9**	**0**	**0**	**9**	**1**	**88**	**0**	**89**	**4**	**109**	**11**	**124**	**15**	**213**	**228**	871
1745 - 1800	**0**	**0**	**2**	**2**	**8**	**0**	**1**	**9**	**1**	**99**	**0**	**100**	**4**	**135**	**12**	**151**	**11**	**251**	**262**	***917***
Peak HR AM																				
0715 - 0815	***0***	***0***	***5***	***5***	***40***	***1***	***2***	***43***	***2***	***366***	***0***	***368***	***2***	***192***	***21***	***215***	***48***	***583***	***631***	
Peak HR PM																				
1700 - 1800	***0***	***0***	***11***	***11***	***34***	***0***	***1***	***35***	***3***	***356***	***0***	***359***	***10***	***460***	***42***	***512***	***46***	***871***	***917***	

AM PHF	**0.417**	**0.827**	**0.836**	**0.896**	**0.876**
PM PHF	**0.458**	**0.729**	**0.898**	**0.848**	**0.875**

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 5: WV 115 @ Crosswinds Drive
COUNT BY	AMT

Friday

STREET					Crosswinds Dr				WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	0	0	0	0	4	0	3	7	0	60	0	60	0	13	4	17	7	77	84	84
0715 - 0730	**0**	**0**	**0**	**0**	**5**	**0**	**4**	**9**	**1**	**93**	**0**	**94**	**0**	**43**	**1**	**44**	**9**	**138**	**147**	231
0730 - 0745	**0**	**0**	**0**	**0**	**23**	**0**	**1**	**24**	**0**	**79**	**0**	**79**	**0**	**36**	**5**	**41**	**24**	**120**	**144**	375
0745 - 0800	**0**	**0**	**0**	**0**	**11**	**0**	**2**	**13**	**1**	**68**	**0**	**69**	**0**	**45**	**7**	**52**	**13**	**121**	**134**	509
0800 - 0815	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**3**	**0**	**65**	**0**	**65**	**0**	**40**	**3**	**43**	**3**	**108**	**111**	***536***
0815 - 0830	0	0	0	0	11	0	2	13	2	54	0	56	0	52	6	58	13	114	127	516
0830 - 0845	0	0	0	0	13	0	2	15	3	98	0	101	0	41	6	47	15	148	163	535
0845 - 0900	0	0	0	0	8	0	1	9	1	85	0	86	0	48	4	52	9	138	147	548
1500 - 1515	0	0	0	0	4	0	2	6	1	63	0	64	0	80	12	92	6	156	162	162
1515 - 1530	0	0	0	0	5	0	1	6	0	67	0	67	0	90	8	98	6	165	171	333
1530 - 1545	0	0	0	0	6	0	3	9	4	68	0	72	0	75	9	84	9	156	165	498
1545 - 1600	0	0	0	0	10	0	0	10	1	82	0	83	0	75	12	87	10	170	180	678
1600 - 1615	0	0	0	0	8	0	2	10	4	95	0	99	0	80	16	96	10	195	205	721
1615 - 1630	0	0	0	0	5	0	1	6	0	82	0	82	0	103	7	110	6	192	198	748
1630 - 1645	0	0	0	0	9	0	1	10	1	85	0	86	0	91	7	98	10	184	194	777
1645 - 1700	0	0	0	0	5	0	0	5	5	68	0	73	0	102	17	119	5	192	197	794
1700 - 1715	**0**	**0**	**0**	**0**	**10**	**0**	**1**	**11**	**2**	**67**	**0**	**69**	**0**	**86**	**17**	**103**	**11**	**172**	**183**	772
1715 - 1730	**0**	**0**	**0**	**0**	**10**	**0**	**1**	**11**	**1**	**77**	**0**	**78**	**0**	**95**	**11**	**106**	**11**	**184**	**195**	769
1730 - 1745	**0**	**0**	**0**	**0**	**6**	**0**	**5**	**11**	**2**	**75**	**0**	**77**	**0**	**91**	**18**	**109**	**11**	**186**	**197**	772
1745 - 1800	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**9**	**3**	**87**	**0**	**90**	**0**	**93**	**38**	**131**	**9**	**221**	**230**	***805***
Peak HR AM																				
0715 - 0815	***0***	***0***	***0***	***0***	***40***	***0***	***9***	***49***	***2***	***305***	***0***	***307***	***0***	***164***	***16***	***180***	***49***	***487***	***536***	
Peak HR PM																				
1700 - 1800	***0***	***0***	***0***	***0***	***35***	***0***	***7***	***42***	***8***	***306***	***0***	***314***	***0***	***365***	***84***	***449***	***42***	***763***	***805***	
AM PHF	**0.000**				**0.510**				**0.816**				**0.865**				**0.912**			
PM PHF	**0.000**				**0.955**				**0.872**				**0.857**				**0.875**			

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 6: WV 115 @ Kabletown Road
COUNT BY	AMT

Friday

STREET					Kabletown Rd				WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	0	0	0	0	7	0	7	14	2	55	0	57	0	13	3	16	14	73	87	87
0715 - 0730	**0**	**0**	**0**	**0**	**13**	**0**	**5**	**18**	**0**	**76**	**0**	**76**	**0**	**38**	**6**	**44**	**18**	**120**	**138**	225
0730 - 0745	**0**	**0**	**0**	**0**	**17**	**0**	**1**	**18**	**4**	**64**	**0**	**68**	**0**	**36**	**5**	**41**	**18**	**109**	**127**	352
0745 - 0800	**0**	**0**	**0**	**0**	**13**	**0**	**2**	**15**	**0**	**56**	**0**	**56**	**0**	**26**	**17**	**43**	**15**	**99**	**114**	466
0800 - 0815	**0**	**0**	**0**	**0**	**16**	**0**	**3**	**19**	**2**	**50**	**0**	**52**	**0**	**36**	**8**	**44**	**19**	**96**	**115**	***494***
0815 - 0830	0	0	0	0	6	0	8	14	3	56	0	59	0	43	11	54	14	113	127	483
0830 - 0845	0	0	0	0	19	0	6	25	5	85	0	90	0	39	5	44	25	134	159	515
0845 - 0900	0	0	0	0	11	0	6	17	1	73	0	74	0	36	14	50	17	124	141	542
1500 - 1515	0	0	0	0	4	0	4	8	2	56	0	58	0	66	14	80	8	138	146	146
1515 - 1530	0	0	0	0	11	0	3	14	7	57	0	64	0	74	17	91	14	155	169	315
1530 - 1545	0	0	0	0	8	0	4	12	4	67	0	71	0	66	17	83	12	154	166	481
1545 - 1600	0	0	0	0	16	0	3	19	5	74	0	79	0	59	16	75	19	154	173	654
1600 - 1615	0	0	0	0	16	0	4	20	11	82	0	93	0	71	9	80	20	173	193	701
1615 - 1630	0	0	0	0	14	0	1	15	7	65	0	72	0	88	19	107	15	179	194	726
1630 - 1645	0	0	0	0	19	0	5	24	16	72	0	88	0	86	9	95	24	183	207	767
1645 - 1700	0	0	0	0	12	0	5	17	4	63	0	67	0	77	22	99	17	166	183	777
1700 - 1715	**0**	**0**	**0**	**0**	**15**	**0**	**9**	**24**	**7**	**52**	**0**	**59**	**0**	**78**	**10**	**88**	**24**	**147**	**171**	755
1715 - 1730	**0**	**0**	**0**	**0**	**13**	**0**	**6**	**19**	**11**	**69**	**0**	**80**	**0**	**90**	**11**	**101**	**19**	**181**	**200**	761
1730 - 1745	**0**	**0**	**0**	**0**	**21**	**0**	**6**	**27**	**9**	**63**	**0**	**72**	**0**	**89**	**7**	**96**	**27**	**168**	**195**	749
1745 - 1800	**0**	**0**	**0**	**0**	**21**	**0**	**1**	**22**	**7**	**69**	**0**	**76**	**0**	**77**	**12**	**89**	**22**	**165**	**187**	***753***
Peak HR AM																				
0715 - 0815	***0***	***0***	***0***	***0***	***59***	***0***	***11***	***70***	***6***	***246***	***0***	***252***	***0***	***136***	***36***	***172***	***70***	***424***	***494***	
Peak HR PM																				
1700 - 1800	***0***	***0***	***0***	***0***	***70***	***0***	***22***	***92***	***34***	***253***	***0***	***287***	***0***	***334***	***40***	***374***	***92***	***661***	***753***	
AM PHF	**0.000**				**0.921**				**0.829**				**0.977**				**0.895**			
PM PHF	**0.000**				**0.852**				**0.897**				**0.926**				**0.941**			

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 7: WV 115 @ Cattail Run Road
COUNT BY	AMT

Friday

STREET	Cattail Run Rd								WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	0	0	2	2	0	0	0	0	0	54	2	56	6	15	0	21	2	77	79	79
0715 - 0730	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**76**	**2**	**78**	**8**	**38**	**0**	**46**	**2**	**124**	**126**	205
0730 - 0745	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**66**	**1**	**67**	**3**	**31**	**0**	**34**	**2**	**101**	**103**	308
0745 - 0800	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**57**	**3**	**60**	**2**	**26**	**0**	**28**	**0**	**88**	**88**	396
0800 - 0815	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**47**	**0**	**47**	**1**	**40**	**0**	**41**	**1**	**88**	**89**	***406***
0815 - 0830	0	0	0	0	0	0	0	0	0	59	1	60	11	42	0	53	0	113	113	393
0830 - 0845	0	0	2	2	0	0	0	0	0	83	1	84	4	34	0	38	2	122	124	414
0845 - 0900	0	0	3	3	0	0	0	0	0	75	5	80	3	41	0	44	3	124	127	453
1500 - 1515	1	0	3	4	0	0	0	0	0	55	7	62	0	69	0	69	4	131	135	135
1515 - 1530	1	0	9	10	0	0	0	0	0	57	4	61	2	74	0	76	10	137	147	282
1530 - 1545	0	0	5	5	0	0	0	0	0	65	6	71	3	68	0	71	5	142	147	429
1545 - 1600	0	0	2	2	0	0	0	0	0	72	8	80	1	64	0	65	2	145	147	576
1600 - 1615	0	0	13	13	0	0	0	0	0	80	8	88	1	70	0	71	13	159	172	613
1615 - 1630	0	0	4	4	0	0	0	0	0	69	2	71	1	84	0	85	4	156	160	626
1630 - 1645	1	0	12	13	0	0	0	0	0	66	1	67	4	85	0	89	13	156	169	648
1645 - 1700	0	0	4	4	0	0	0	0	0	66	5	71	4	77	0	81	4	152	156	657
1700 - 1715	**0**	**0**	**7**	**7**	**0**	**0**	**0**	**0**	**0**	**53**	**3**	**56**	**4**	**81**	**0**	**85**	**7**	**141**	**148**	633
1715 - 1730	**0**	**0**	**12**	**12**	**0**	**0**	**0**	**0**	**0**	**65**	**3**	**68**	**3**	**93**	**0**	**96**	**12**	**164**	**176**	649
1730 - 1745	**0**	**0**	**5**	**5**	**0**	**0**	**0**	**0**	**0**	**67**	**2**	**69**	**4**	**91**	**0**	**95**	**5**	**164**	**169**	649
1745 - 1800	**0**	**0**	**5**	**5**	**0**	**0**	**0**	**0**	**0**	**69**	**2**	**71**	**1**	**76**	**0**	**77**	**5**	**148**	**153**	***646***
Peak HR AM																				
0715 - 0815	***0***	***0***	***5***	***5***	***0***	***0***	***0***	***0***	***0***	***246***	***6***	***252***	***14***	***135***	***0***	***149***	***5***	***401***	***406***	
Peak HR PM																				
1700 - 1800	***0***	***0***	***29***	***29***	***0***	***0***	***0***	***0***	***0***	***254***	***10***	***264***	***12***	***341***	***0***	***353***	***29***	***617***	***646***	
AM PHF	**0.625**				**0.000**				**0.808**				**0.810**				**0.806**			
PM PHF	**0.604**				**0.000**				**0.930**				**0.919**				**0.918**			

VEHICLE AND PEDESTRIAN VOLUME SUMMARY

COUNT LOCATION	
CITY	Charles Town
STATE	WV
DATE	5/13/2022
INTERSECTION	Int 8: WV 9 @ Cattail Run Road
COUNT BY	AMT

Friday

STREET	Cattail Run Rd				Cattail Run Rd				WV 115				WV 115				Total			PEAK HR
	From North				From South				From East				From West							
TIME	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	N-S	E-W	ALL	
0700 - 0715	14	0	1	15	0	5	3	8	2	60	3	65	0	197	0	197	23	262	285	285
0715 - 0730	**13**	**2**	**4**	**19**	**1**	**6**	**4**	**11**	**1**	**74**	**5**	**80**	**2**	**159**	**0**	**161**	**30**	**241**	**271**	556
0730 - 0745	**12**	**0**	**3**	**15**	**1**	**3**	**1**	**5**	**1**	**72**	**7**	**80**	**0**	**145**	**2**	**147**	**20**	**227**	**247**	803
0745 - 0800	**14**	**1**	**7**	**22**	**1**	**2**	**4**	**7**	**0**	**69**	**2**	**71**	**3**	**149**	**2**	**154**	**29**	**225**	**254**	1057
0800 - 0815	**18**	**0**	**2**	**20**	**1**	**2**	**0**	**3**	**3**	**59**	**5**	**67**	**1**	**159**	**1**	**161**	**23**	**228**	**251**	***1023***
0815 - 0830	7	0	0	7	1	6	3	10	0	70	5	75	0	125	0	125	17	200	217	969
0830 - 0845	12	1	3	16	1	4	4	9	2	74	4	80	0	116	0	116	25	196	221	943
0845 - 0900	11	2	2	15	1	7	0	8	0	65	5	70	0	96	0	96	23	166	189	878
1500 - 1515	8	5	4	17	3	3	0	6	1	183	14	198	2	94	1	97	23	295	318	318
1515 - 1530	15	4	5	24	1	5	1	7	4	164	18	186	1	85	0	86	31	272	303	621
1530 - 1545	7	1	3	11	0	8	1	9	3	191	19	213	1	91	1	93	20	306	326	947
1545 - 1600	6	3	4	13	2	4	2	8	1	181	15	197	0	93	1	94	21	291	312	1259
1600 - 1615	7	3	2	12	1	12	2	15	7	193	19	219	3	83	2	88	27	307	334	1275
1615 - 1630	15	4	5	24	3	0	1	4	0	200	15	215	3	100	0	103	28	318	346	1318
1630 - 1645	8	12	4	24	0	4	1	5	2	110	10	122	2	94	0	96	29	218	247	1239
1645 - 1700	13	3	8	24	5	3	1	9	0	63	9	72	2	96	0	98	33	170	203	1130
1700 - 1715	**7**	**7**	**8**	**22**	**1**	**4**	**4**	**9**	**2**	**99**	**8**	**109**	**2**	**78**	**0**	**80**	**31**	**189**	**220**	1016
1715 - 1730	**7**	**10**	**3**	**20**	**0**	**4**	**0**	**4**	**2**	**101**	**5**	**108**	**0**	**93**	**2**	**95**	**24**	**203**	**227**	897
1730 - 1745	**12**	**6**	**1**	**19**	**1**	**6**	**2**	**9**	**2**	**162**	**8**	**172**	**1**	**84**	**0**	**85**	**28**	**257**	**285**	935
1745 - 1800	**16**	**2**	**4**	**22**	**1**	**1**	**1**	**3**	**2**	**70**	**6**	**78**	**1**	**73**	**0**	**74**	**25**	**152**	**177**	***909***
Peak HR AM																				
0715 - 0815	***57***	***3***	***16***	***76***	***4***	***13***	***9***	***26***	***5***	***274***	***19***	***298***	***6***	***612***	***5***	***623***	***102***	***921***	***1023***	
Peak HR PM																				
1700 - 1800	***42***	***25***	***16***	***83***	***3***	***15***	***7***	***25***	***8***	***432***	***27***	***467***	***4***	***328***	***2***	***334***	***108***	***801***	***909***	
AM PHF	**0.864**				**0.591**				**0.931**				**0.967**				**0.944**			
PM PHF	**0.943**				**0.694**				**0.679**				**0.879**				**0.797**			

APPENDIX B-3: AASHTO LEFT-TURN LANE ANALYSIS

AM Peak 2030 Condition (WV 115 with Site Drive #1)

% LT	Operating Speed
10 % Left Turns	55 mph
Opposing Volume (veh/h)	Advancing Volume (veh/h)
490	289
Required Advancing	AASHTO Analysis
268	Guideline Met

PM Peak 2030 Condition (WV 115 with Site Drive #1)

% LT	Operating Speed
20 % Left Turns	55 mph
Opposing Volume (veh/h)	Advancing Volume (veh/h)
449	686
Required Advancing	AASHTO Analysis
210	Guideline Met

AM Peak 2030 Condition (WV 115 with Site Drive #2)

% LT	Operating Speed
10 % Left Turns	55 mph
Opposing Volume (veh/h)	Advancing Volume (veh/h)
403	258
Required Advancing	AASHTO Analysis
294	Guideline Not Met

PM Peak 2030 Condition (WV 115 with Site Drive #2)

% LT	Operating Speed
20 % Left Turns	55 mph
Opposing Volume (veh/h)	Advancing Volume (veh/h)
411	577
Required Advancing	AASHTO Analysis
218	Guideline Met

APPENDIX C: SYNCHRO OUTPUTS

APPENDIX C-1: 2022 EXISTING CONDITIONS AM PEAK HOUR

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	172	166	174	137	57
Future Vol, veh/h	60	172	166	174	137	57
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	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	207	200	210	165	69

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	410	0	-	0	656	305
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	351	-
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	1149	-	-	-	430	735
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1149	-	-	-	399	735
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1149	-	-	-	461
HCM Lane V/C Ratio	0.063	-	-	-	0.507
HCM Control Delay (s)	8.3	0	-	-	20.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.8

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	191	153	142	304	0	28	0	18	0	5	6
Future Vol, veh/h	3	191	153	142	304	0	28	0	18	0	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	150	-	-	175	-	-	-	-	125	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	210	168	156	334	0	31	0	20	0	5	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	334	0	0	378	0	0	952	946	294	946	1030	334
Stage 1	-	-	-	-	-	-	300	300	-	646	646	-
Stage 2	-	-	-	-	-	-	652	646	-	300	384	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1225	-	-	1180	-	-	239	262	745	241	233	708
Stage 1	-	-	-	-	-	-	709	666	-	460	467	-
Stage 2	-	-	-	-	-	-	457	467	-	709	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1225	-	-	1180	-	-	208	227	745	210	202	708
Mov Cap-2 Maneuver	-	-	-	-	-	-	208	227	-	210	202	-
Stage 1	-	-	-	-	-	-	708	665	-	459	405	-
Stage 2	-	-	-	-	-	-	388	405	-	688	610	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.7	19.3	16.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	208	745	1225	-	-	1180	-	-	331
HCM Lane V/C Ratio	0.148	0.027	0.003	-	-	0.132	-	-	0.037
HCM Control Delay (s)	25.3	10	7.9	-	-	8.5	-	-	16.3
HCM Lane LOS	D	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0.1	0	-	-	0.5	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	192	21	2	366	0	40	1	2	0	0	5
Future Vol, veh/h	2	192	21	2	366	0	40	1	2	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	218	24	2	416	0	45	1	2	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	416	0	0	242	0	0	657	654	230	656	666	416
Stage 1	-	-	-	-	-	-	234	234	-	420	420	-
Stage 2	-	-	-	-	-	-	423	420	-	236	246	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1143	-	-	1324	-	-	378	386	809	379	380	637
Stage 1	-	-	-	-	-	-	769	711	-	611	589	-
Stage 2	-	-	-	-	-	-	609	589	-	767	703	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1143	-	-	1324	-	-	373	384	809	376	378	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	373	384	-	376	378	-
Stage 1	-	-	-	-	-	-	767	710	-	610	588	-
Stage 2	-	-	-	-	-	-	602	588	-	762	702	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	15.8	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	383	1143	-	-	1324	-	-	637
HCM Lane V/C Ratio	0.128	0.002	-	-	0.002	-	-	0.009
HCM Control Delay (s)	15.8	8.2	0	-	7.7	0	-	10.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	164	16	2	305	40	9
Future Vol, veh/h	164	16	2	305	40	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	180	18	2	335	44	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	198	0	519	180
Stage 1	-	-	-	-	180	-
Stage 2	-	-	-	-	339	-
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	-	-	1375	-	517	863
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	722	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1375	-	516	863
Mov Cap-2 Maneuver	-	-	-	-	516	-
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	721	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	516	863	-	-	1375	-
HCM Lane V/C Ratio	0.085	0.011	-	-	0.002	-
HCM Control Delay (s)	12.6	9.2	-	-	7.6	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	136	36	6	246	59	11
Future Vol, veh/h	136	36	6	246	59	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	151	40	7	273	66	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	191	0	438	151
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	287	-
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	-	-	1383	-	576	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1383	-	573	895
Mov Cap-2 Maneuver	-	-	-	-	573	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	757	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	607	-	-	1383	-
HCM Lane V/C Ratio	0.128	-	-	0.005	-
HCM Control Delay (s)	11.8	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	135	246	6	0	5
Future Vol, veh/h	14	135	246	6	0	5
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	169	308	8	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	316	0	-	0	517	312
Stage 1	-	-	-	-	312	-
Stage 2	-	-	-	-	205	-
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	1244	-	-	-	518	728
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1244	-	-	-	510	728
Mov Cap-2 Maneuver	-	-	-	-	510	-
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	829	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1244	-	-	-	728
HCM Lane V/C Ratio	0.014	-	-	-	0.009
HCM Control Delay (s)	7.9	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	612	5	5	274	19	4	13	9	57	3	16
Future Vol, veh/h	6	612	5	5	274	19	4	13	9	57	3	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	651	5	5	291	20	4	14	10	61	3	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	311	0	0	656	0	0	820	984	326	646	969	146
Stage 1	-	-	-	-	-	-	663	663	-	301	301	-
Stage 2	-	-	-	-	-	-	157	321	-	345	668	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1246	-	-	927	-	-	267	247	670	357	252	875
Stage 1	-	-	-	-	-	-	417	457	-	683	664	-
Stage 2	-	-	-	-	-	-	829	650	-	644	455	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1246	-	-	927	-	-	257	245	670	334	249	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	245	-	334	249	-
Stage 1	-	-	-	-	-	-	415	455	-	680	661	-
Stage 2	-	-	-	-	-	-	805	647	-	613	453	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	17.1	16.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	257	331	1246	-	-	927	-	-	334	626
HCM Lane V/C Ratio	0.017	0.071	0.005	-	-	0.006	-	-	0.182	0.032
HCM Control Delay (s)	19.2	16.7	7.9	-	-	8.9	-	-	18.2	10.9
HCM Lane LOS	C	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	0.2	0	-	-	0	-	-	0.7	0.1

APPENDIX C-2: 2022 EXISTING CONDITIONS PM PEAK HOUR

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	251	230	147	207	27
Future Vol, veh/h	12	251	230	147	207	27
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	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	256	235	150	211	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	385	0	-	0	590	310
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	280	-
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	1173	-	-	-	470	730
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1173	-	-	-	464	730
Mov Cap-2 Maneuver	-	-	-	-	464	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	19.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1173	-	-	-	484
HCM Lane V/C Ratio	0.01	-	-	-	0.493
HCM Control Delay (s)	8.1	0	-	-	19.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	2.7

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	459	116	157	273	1	71	0	57	0	5	3
Future Vol, veh/h	6	459	116	157	273	1	71	0	57	0	5	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	150	-	-	175	-	-	-	-	125	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	499	126	171	297	1	77	0	62	0	5	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	298	0	0	625	0	0	1220	1216	562	1216	1279	298
Stage 1	-	-	-	-	-	-	576	576	-	640	640	-
Stage 2	-	-	-	-	-	-	644	640	-	576	639	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1263	-	-	956	-	-	157	181	526	158	166	741
Stage 1	-	-	-	-	-	-	503	502	-	464	470	-
Stage 2	-	-	-	-	-	-	461	470	-	503	470	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1263	-	-	956	-	-	130	148	526	120	135	741
Mov Cap-2 Maneuver	-	-	-	-	-	-	130	148	-	120	135	-
Stage 1	-	-	-	-	-	-	500	499	-	461	386	-
Stage 2	-	-	-	-	-	-	372	386	-	441	467	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.5	42.8	24.3
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	130	526	1263	-	-	956	-	-	195
HCM Lane V/C Ratio	0.594	0.118	0.005	-	-	0.179	-	-	0.045
HCM Control Delay (s)	66.8	12.8	7.9	-	-	9.6	-	-	24.3
HCM Lane LOS	F	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	3	0.4	0	-	-	0.6	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	460	42	3	356	0	34	0	1	0	0	11
Future Vol, veh/h	10	460	42	3	356	0	34	0	1	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	523	48	3	405	0	39	0	1	0	0	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	405	0	0	571	0	0	987	980	547	981	1004	405
Stage 1	-	-	-	-	-	-	569	569	-	411	411	-
Stage 2	-	-	-	-	-	-	418	411	-	570	593	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1154	-	-	1002	-	-	226	250	537	229	242	646
Stage 1	-	-	-	-	-	-	507	506	-	618	595	-
Stage 2	-	-	-	-	-	-	612	595	-	506	493	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1002	-	-	219	246	537	225	238	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	246	-	225	238	-
Stage 1	-	-	-	-	-	-	500	499	-	609	593	-
Stage 2	-	-	-	-	-	-	598	593	-	498	486	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	24.6	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	223	1154	-	-	1002	-	-	646
HCM Lane V/C Ratio	0.178	0.01	-	-	0.003	-	-	0.019
HCM Control Delay (s)	24.6	8.2	0	-	8.6	0	-	10.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	365	84	8	306	35	7
Future Vol, veh/h	365	84	8	306	35	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	415	95	9	348	40	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	781	415
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	366	-
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	-	-	1055	-	363	637
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1055	-	360	637
Mov Cap-2 Maneuver	-	-	-	-	360	-
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	360	637	-	-	1055	-
HCM Lane V/C Ratio	0.11	0.012	-	-	0.009	-
HCM Control Delay (s)	16.2	10.7	-	-	8.4	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	334	40	34	253	70	22
Future Vol, veh/h	334	40	34	253	70	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	355	43	36	269	74	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	398	0	696	355
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	341	-
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	-	-	1161	-	408	689
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	720	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1161	-	393	689
Mov Cap-2 Maneuver	-	-	-	-	393	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	694	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	15.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	438	-	-	1161	-
HCM Lane V/C Ratio	0.223	-	-	0.031	-
HCM Control Delay (s)	15.6	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	341	254	10	0	29
Future Vol, veh/h	12	341	254	10	0	29
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	13	371	276	11	0	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	287	0	-	0	679	282
Stage 1	-	-	-	-	282	-
Stage 2	-	-	-	-	397	-
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	1275	-	-	-	417	757
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1275	-	-	-	412	757
Mov Cap-2 Maneuver	-	-	-	-	412	-
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	679	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1275	-	-	-	757
HCM Lane V/C Ratio	0.01	-	-	-	0.042
HCM Control Delay (s)	7.9	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

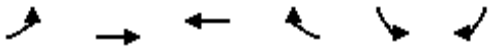
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	328	2	8	432	27	3	15	7	42	25	16
Future Vol, veh/h	4	328	2	8	432	27	3	15	7	42	25	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	410	3	10	540	34	4	19	9	53	31	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	413	0	0	726	1014	205	785	983	270
Stage 1	-	-	-	-	-	-	420	420	-	560	560	-
Stage 2	-	-	-	-	-	-	306	594	-	225	423	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	995	-	-	1142	-	-	312	237	802	283	247	728
Stage 1	-	-	-	-	-	-	581	588	-	480	509	-
Stage 2	-	-	-	-	-	-	679	491	-	757	586	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	995	-	-	1142	-	-	271	234	802	260	244	728
Mov Cap-2 Maneuver	-	-	-	-	-	-	271	234	-	260	244	-
Stage 1	-	-	-	-	-	-	578	585	-	478	504	-
Stage 2	-	-	-	-	-	-	614	487	-	721	583	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	18.1	20.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	271	302	995	-	-	1142	-	-	260	329
HCM Lane V/C Ratio	0.014	0.091	0.005	-	-	0.009	-	-	0.202	0.156
HCM Control Delay (s)	18.5	18.1	8.6	-	-	8.2	-	-	22.3	18
HCM Lane LOS	C	C	A	-	-	A	-	-	C	C
HCM 95th %tile Q(veh)	0	0.3	0	-	-	0	-	-	0.7	0.5

APPENDIX C-3: 2030 NO-BUILD AM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	66	198	211	192	156	65
Future Volume (veh/h)	66	198	211	192	156	65
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
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	239	254	231	188	78
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	518	913	440	400	399	165
Arrive On Green	0.49	0.49	0.49	0.41	0.33	0.26
Sat Flow, veh/h	911	1870	902	820	1211	502
Grp Volume(v), veh/h	80	239	0	485	267	0
Grp Sat Flow(s),veh/h/ln	911	1870	0	1723	1719	0
Q Serve(g_s), s	1.9	2.1	0.0	5.7	3.4	0.0
Cycle Q Clear(g_c), s	7.6	2.1	0.0	5.7	3.4	0.0
Prop In Lane	1.00			0.48	0.70	0.29
Lane Grp Cap(c), veh/h	518	913	0	841	566	0
V/C Ratio(X)	0.15	0.26	0.00	0.58	0.47	0.00
Avail Cap(c_a), veh/h	1855	3660	0	3371	1981	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.8	4.1	0.0	5.4	7.5	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.6	0.6	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	0.2	0.1	0.0	0.4	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.9	4.3	0.0	6.0	8.1	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		319	485		267	
Approach Delay, s/veh		5.2	6.0		8.1	
Approach LOS		A	A		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			15.8		11.5	15.8
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			51.5		29.5	51.5
Max Q Clear Time (g_c+I1), s			9.6		5.4	7.7
Green Ext Time (p_c), s			1.8		0.8	3.3

Intersection Summary		
HCM 6th Ctrl Delay	6.3	
HCM 6th LOS	A	

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	229	23	2	457	0	44	1	2	0	0	5
Future Vol, veh/h	2	229	23	2	457	0	44	1	2	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	260	26	2	519	0	50	1	2	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	519	0	0	286	0	0	803	800	273	802	813	519
Stage 1	-	-	-	-	-	-	277	277	-	523	523	-
Stage 2	-	-	-	-	-	-	526	523	-	279	290	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1047	-	-	1276	-	-	302	318	766	302	313	557
Stage 1	-	-	-	-	-	-	729	681	-	537	530	-
Stage 2	-	-	-	-	-	-	535	530	-	728	672	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1047	-	-	1276	-	-	298	317	766	299	312	557
Mov Cap-2 Maneuver	-	-	-	-	-	-	298	317	-	299	312	-
Stage 1	-	-	-	-	-	-	728	680	-	536	529	-
Stage 2	-	-	-	-	-	-	528	529	-	723	671	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	19.2	11.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	306	1047	-	-	1276	-	-	557
HCM Lane V/C Ratio	0.175	0.002	-	-	0.002	-	-	0.01
HCM Control Delay (s)	19.2	8.4	0	-	7.8	0	-	11.5
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	198	18	2	389	44	10
Future Vol, veh/h	198	18	2	389	44	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	218	20	2	427	48	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	238	0	649	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	431	-
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	-	-	1329	-	434	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1329	-	433	822
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	654	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	433	822	-	-	1329	-
HCM Lane V/C Ratio	0.112	0.013	-	-	0.002	-
HCM Control Delay (s)	14.4	9.4	-	-	7.7	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	40	7	374	65	12
Future Vol, veh/h	155	40	7	374	65	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	172	44	8	416	72	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	216	0	604	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	432	-
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	-	-	1354	-	461	872
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1354	-	457	872
Mov Cap-2 Maneuver	-	-	-	-	457	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	494	-	-	1354	-
HCM Lane V/C Ratio	0.173	-	-	0.006	-
HCM Control Delay (s)	13.8	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	163	274	7	0	5
Future Vol, veh/h	15	163	274	7	0	5
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	204	343	9	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	352	0	-	0	590	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	242	-
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	1207	-	-	-	470	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	798	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1207	-	-	-	462	695
Mov Cap-2 Maneuver	-	-	-	-	462	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	798	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1207	-	-	-	695
HCM Lane V/C Ratio	0.016	-	-	-	0.009
HCM Control Delay (s)	8	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.9

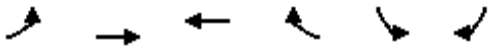
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	673	5	5	301	21	4	14	10	63	3	18
Future Vol, veh/h	7	673	5	5	301	21	4	14	10	63	3	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	716	5	5	320	22	4	15	11	67	3	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	342	0	0	721	0	0	902	1082	358	710	1065	160
Stage 1	-	-	-	-	-	-	730	730	-	330	330	-
Stage 2	-	-	-	-	-	-	172	352	-	380	735	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1214	-	-	877	-	-	233	216	638	321	221	857
Stage 1	-	-	-	-	-	-	380	426	-	657	644	-
Stage 2	-	-	-	-	-	-	813	630	-	614	424	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1214	-	-	877	-	-	223	213	638	296	218	857
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	213	-	296	218	-
Stage 1	-	-	-	-	-	-	378	423	-	653	640	-
Stage 2	-	-	-	-	-	-	786	626	-	579	421	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	18.8	18.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	223	295	1214	-	-	877	-	-	296	604
HCM Lane V/C Ratio	0.019	0.087	0.006	-	-	0.006	-	-	0.226	0.037
HCM Control Delay (s)	21.5	18.4	8	-	-	9.1	-	-	20.7	11.2
HCM Lane LOS	C	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	0.3	0	-	-	0	-	-	0.9	0.1

APPENDIX C-4: 2030 NO-BUILD PM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	305	270	167	231	31
Future Volume (veh/h)	15	305	270	167	231	31
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
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	311	276	170	236	32
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	530	854	495	305	538	73
Arrive On Green	0.46	0.46	0.46	0.38	0.35	0.27
Sat Flow, veh/h	944	1870	1083	667	1540	209
Grp Volume(v), veh/h	15	311	0	446	269	0
Grp Sat Flow(s),veh/h/ln	944	1870	0	1750	1756	0
Q Serve(g_s), s	0.3	2.8	0.0	4.9	3.1	0.0
Cycle Q Clear(g_c), s	5.2	2.8	0.0	4.9	3.1	0.0
Prop In Lane	1.00			0.38	0.88	0.12
Lane Grp Cap(c), veh/h	530	854	0	800	613	0
V/C Ratio(X)	0.03	0.36	0.00	0.56	0.44	0.00
Avail Cap(c_a), veh/h	1985	3737	0	3497	2282	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.1	4.6	0.0	5.4	6.5	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.6	0.5	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	0.0	0.2	0.0	0.3	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.1	4.8	0.0	6.0	7.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		326	446		269	
Approach Delay, s/veh		4.9	6.0		7.0	
Approach LOS		A	A		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			14.3		11.5	14.3
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			49.5		31.5	49.5
Max Q Clear Time (g_c+I1), s			7.2		5.1	6.9
Green Ext Time (p_c), s			1.8		0.8	2.9

Intersection Summary	
HCM 6th Ctrl Delay	5.9
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	562	46	3	427	0	37	0	1	0	0	12
Future Vol, veh/h	11	562	46	3	427	0	37	0	1	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	639	52	3	485	0	42	0	1	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	485	0	0	691	0	0	1189	1182	665	1183	1208	485
Stage 1	-	-	-	-	-	-	691	691	-	491	491	-
Stage 2	-	-	-	-	-	-	498	491	-	692	717	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1078	-	-	904	-	-	165	190	460	166	183	582
Stage 1	-	-	-	-	-	-	435	446	-	559	548	-
Stage 2	-	-	-	-	-	-	554	548	-	434	434	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1078	-	-	904	-	-	158	185	460	163	178	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	185	-	163	178	-
Stage 1	-	-	-	-	-	-	426	437	-	548	545	-
Stage 2	-	-	-	-	-	-	538	545	-	424	425	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	35.4	11.3
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	161	1078	-	-	904	-	-	582
HCM Lane V/C Ratio	0.268	0.012	-	-	0.004	-	-	0.023
HCM Control Delay (s)	35.4	8.4	0	-	9	0	-	11.3
HCM Lane LOS	E	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	457	92	9	372	38	8
Future Vol, veh/h	457	92	9	372	38	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	519	105	10	423	43	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	624	0	962	519
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	443	-
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	-	-	957	-	284	557
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	957	-	281	557
Mov Cap-2 Maneuver	-	-	-	-	281	-
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	281	557	-	-	957	-
HCM Lane V/C Ratio	0.154	0.016	-	-	0.011	-
HCM Control Delay (s)	20.1	11.6	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	371	44	37	284	77	24
Future Vol, veh/h	371	44	37	284	77	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	395	47	39	302	82	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	442	0	775	395
Stage 1	-	-	-	-	395	-
Stage 2	-	-	-	-	380	-
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	-	-	1118	-	366	654
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1118	-	351	654
Mov Cap-2 Maneuver	-	-	-	-	351	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	-	-	1118	-
HCM Lane V/C Ratio	0.273	-	-	0.035	-
HCM Control Delay (s)	17.5	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	379	285	11	0	32
Future Vol, veh/h	13	379	285	11	0	32
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	14	412	310	12	0	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	322	0	-	0	756	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	440	-
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	1238	-	-	-	376	724
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	649	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1238	-	-	-	370	724
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	649	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1238	-	-	-	724
HCM Lane V/C Ratio	0.011	-	-	-	0.048
HCM Control Delay (s)	7.9	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.7

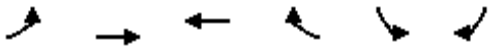
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	361	2	9	475	30	3	16	8	46	27	18
Future Vol, veh/h	4	361	2	9	475	30	3	16	8	46	27	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	451	3	11	594	38	4	20	10	58	34	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	632	0	0	454	0	0	797	1115	226	862	1080	297
Stage 1	-	-	-	-	-	-	461	461	-	616	616	-
Stage 2	-	-	-	-	-	-	336	654	-	246	464	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	947	-	-	1103	-	-	277	207	777	249	217	699
Stage 1	-	-	-	-	-	-	550	564	-	445	480	-
Stage 2	-	-	-	-	-	-	652	461	-	736	562	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	1103	-	-	233	204	777	225	214	699
Mov Cap-2 Maneuver	-	-	-	-	-	-	233	204	-	225	214	-
Stage 1	-	-	-	-	-	-	547	561	-	443	475	-
Stage 2	-	-	-	-	-	-	580	456	-	697	559	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	20.1	23.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	233	270	947	-	-	1103	-	-	225	296
HCM Lane V/C Ratio	0.016	0.111	0.005	-	-	0.01	-	-	0.256	0.19
HCM Control Delay (s)	20.7	20	8.8	-	-	8.3	-	-	26.4	20
HCM Lane LOS	C	C	A	-	-	A	-	-	D	C
HCM 95th %tile Q(veh)	0	0.4	0	-	-	0	-	-	1	0.7

APPENDIX C-5: 2030 BUILD AM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	66	226	283	192	156	65
Future Volume (veh/h)	66	226	283	192	156	65
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
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	272	341	231	188	78
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	482	976	543	368	372	154
Arrive On Green	0.52	0.52	0.52	0.45	0.31	0.24
Sat Flow, veh/h	840	1870	1039	704	1211	502
Grp Volume(v), veh/h	80	272	0	572	267	0
Grp Sat Flow(s),veh/h/ln	840	1870	0	1744	1719	0
Q Serve(g_s), s	2.2	2.4	0.0	7.0	3.8	0.0
Cycle Q Clear(g_c), s	9.3	2.4	0.0	7.0	3.8	0.0
Prop In Lane	1.00			0.40	0.70	0.29
Lane Grp Cap(c), veh/h	482	976	0	910	528	0
V/C Ratio(X)	0.17	0.28	0.00	0.63	0.51	0.00
Avail Cap(c_a), veh/h	1578	3416	0	3185	1849	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	3.9	0.0	5.3	8.6	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.7	0.7	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	0.2	0.1	0.0	0.5	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	4.1	0.0	6.0	9.3	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		352	572		267	
Approach Delay, s/veh		5.1	6.0		9.3	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		17.8		11.5	17.8
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		51.5		29.5	51.5
Max Q Clear Time (g_c+I1), s		11.3		5.8	9.0
Green Ext Time (p_c), s		2.0		0.8	4.0

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	309	23	2	661	0	44	1	2	0	0	5
Future Vol, veh/h	2	309	23	2	661	0	44	1	2	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	351	26	2	751	0	50	1	2	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	751	0	0	377	0	0	1126	1123	364	1125	1136	751
Stage 1	-	-	-	-	-	-	368	368	-	755	755	-
Stage 2	-	-	-	-	-	-	758	755	-	370	381	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	858	-	-	1181	-	-	182	206	681	182	202	411
Stage 1	-	-	-	-	-	-	652	621	-	401	417	-
Stage 2	-	-	-	-	-	-	399	417	-	650	613	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	858	-	-	1181	-	-	179	205	681	180	201	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	179	205	-	180	201	-
Stage 1	-	-	-	-	-	-	650	619	-	400	416	-
Stage 2	-	-	-	-	-	-	392	416	-	645	611	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	32.2	13.9
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	185	858	-	-	1181	-	-	411
HCM Lane V/C Ratio	0.289	0.003	-	-	0.002	-	-	0.014
HCM Control Delay (s)	32.2	9.2	0	-	8.1	0	-	13.9
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	278	18	2	593	44	10
Future Vol, veh/h	278	18	2	593	44	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	305	20	2	652	48	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	325	0	961	305
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	656	-
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	-	-	1235	-	284	735
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	283	735
Mov Cap-2 Maneuver	-	-	-	-	283	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	515	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	735	-	-	1235	-
HCM Lane V/C Ratio	0.171	0.015	-	-	0.002	-
HCM Control Delay (s)	20.3	10	-	-	7.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	192	40	7	288	65	12
Future Vol, veh/h	192	40	7	288	65	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	44	8	320	72	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	257	0	549	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	336	-
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	-	-	1308	-	497	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	724	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1308	-	494	827
Mov Cap-2 Maneuver	-	-	-	-	494	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	527	-	-	1308	-
HCM Lane V/C Ratio	0.162	-	-	0.006	-
HCM Control Delay (s)	13.2	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	165	279	7	0	14
Future Vol, veh/h	40	165	279	7	0	14
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	206	349	9	0	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	358	0	-	0	660	354
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	306	-
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	1201	-	-	-	428	690
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1201	-	-	-	408	690
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1201	-	-	-	690
HCM Lane V/C Ratio	0.042	-	-	-	0.025
HCM Control Delay (s)	8.1	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	685	5	14	306	21	4	14	35	63	3	18
Future Vol, veh/h	7	685	5	14	306	21	4	14	35	63	3	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	729	5	15	326	22	4	15	37	67	3	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	348	0	0	734	0	0	938	1121	365	742	1104	163
Stage 1	-	-	-	-	-	-	743	743	-	356	356	-
Stage 2	-	-	-	-	-	-	195	378	-	386	748	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1208	-	-	867	-	-	219	205	632	304	210	853
Stage 1	-	-	-	-	-	-	373	420	-	634	628	-
Stage 2	-	-	-	-	-	-	788	614	-	609	418	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1208	-	-	867	-	-	208	200	632	265	205	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	208	200	-	265	205	-
Stage 1	-	-	-	-	-	-	371	417	-	630	617	-
Stage 2	-	-	-	-	-	-	753	604	-	549	415	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	16.1	20.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	208	391	1208	-	-	867	-	-	265	588
HCM Lane V/C Ratio	0.02	0.133	0.006	-	-	0.017	-	-	0.253	0.038
HCM Control Delay (s)	22.7	15.6	8	-	-	9.2	-	-	23.1	11.4
HCM Lane LOS	C	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	0.5	0	-	-	0.1	-	-	1	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	246	485	5	12	108
Future Vol, veh/h	43	246	485	5	12	108
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	273	539	6	13	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	545	0	-	0	911	542
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	369	-
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	1024	-	-	-	304	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1024	-	-	-	287	540
Mov Cap-2 Maneuver	-	-	-	-	287	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	699	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1024	-	-	-	496
HCM Lane V/C Ratio	0.047	-	-	-	0.269
HCM Control Delay (s)	8.7	0	-	-	14.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Intersection	
Int Delay, s/veh	2.6

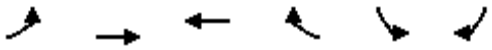
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	220	394	9	25	96
Future Vol, veh/h	38	220	394	9	25	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	244	438	10	28	107

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	448	0	-	0	771	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	328	-
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	1112	-	-	-	368	615
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	730	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1112	-	-	-	352	615
Mov Cap-2 Maneuver	-	-	-	-	352	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	730	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1112	-	-	-	533
HCM Lane V/C Ratio	0.038	-	-	-	0.252
HCM Control Delay (s)	8.4	0	-	-	14
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

APPENDIX C-6: 2030 BUILD PM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	383	318	167	231	31
Future Volume (veh/h)	15	383	318	167	231	31
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
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	391	324	170	236	32
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	512	895	553	290	516	70
Arrive On Green	0.48	0.48	0.48	0.40	0.34	0.26
Sat Flow, veh/h	903	1870	1155	606	1540	209
Grp Volume(v), veh/h	15	391	0	494	269	0
Grp Sat Flow(s),veh/h/ln	903	1870	0	1761	1756	0
Q Serve(g_s), s	0.3	3.7	0.0	5.6	3.3	0.0
Cycle Q Clear(g_c), s	5.9	3.7	0.0	5.6	3.3	0.0
Prop In Lane	1.00			0.34	0.88	0.12
Lane Grp Cap(c), veh/h	512	895	0	843	589	0
V/C Ratio(X)	0.03	0.44	0.00	0.59	0.46	0.00
Avail Cap(c_a), veh/h	1812	3588	0	3379	2191	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.3	4.6	0.0	5.4	7.1	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.7	0.6	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	0.0	0.2	0.0	0.4	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.3	5.0	0.0	6.0	7.7	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		406	494		269	
Approach Delay, s/veh		5.0	6.0		7.7	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		15.3		11.5	15.3
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		49.5		31.5	49.5
Max Q Clear Time (g_c+I1), s		7.9		5.3	7.6
Green Ext Time (p_c), s		2.4		0.8	3.3

Intersection Summary	
HCM 6th Ctrl Delay	6.1
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	783	46	3	564	0	37	0	1	0	0	12
Future Vol, veh/h	11	783	46	3	564	0	37	0	1	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	890	52	3	641	0	42	0	1	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	641	0	0	942	0	0	1596	1589	916	1590	1615	641
Stage 1	-	-	-	-	-	-	942	942	-	647	647	-
Stage 2	-	-	-	-	-	-	654	647	-	943	968	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	943	-	-	728	-	-	86	108	330	87	104	475
Stage 1	-	-	-	-	-	-	316	342	-	460	467	-
Stage 2	-	-	-	-	-	-	456	467	-	315	332	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	943	-	-	728	-	-	81	104	330	84	100	475
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	104	-	84	100	-
Stage 1	-	-	-	-	-	-	307	332	-	447	464	-
Stage 2	-	-	-	-	-	-	440	464	-	305	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	88.1	12.8
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	83	943	-	-	728	-	-	475
HCM Lane V/C Ratio	0.52	0.013	-	-	0.005	-	-	0.029
HCM Control Delay (s)	88.1	8.9	0	-	10	0	-	12.8
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	678	92	9	509	38	8
Future Vol, veh/h	678	92	9	509	38	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	770	105	10	578	43	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	875	0	1368	770
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	598	-
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	-	-	771	-	162	401
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	771	-	160	401
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	542	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	31.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	160	401	-	-	771	-
HCM Lane V/C Ratio	0.27	0.023	-	-	0.013	-
HCM Control Delay (s)	35.6	14.2	-	-	9.7	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	395	44	37	323	77	24
Future Vol, veh/h	395	44	37	323	77	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	420	47	39	344	82	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	467	0	842	420
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	422	-
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	-	-	1094	-	334	633
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1094	-	319	633
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	633	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	362	-	-	1094	-
HCM Lane V/C Ratio	0.297	-	-	0.036	-
HCM Control Delay (s)	19.1	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	387	298	11	0	58
Future Vol, veh/h	29	387	298	11	0	58
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	32	421	324	12	0	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	336	0	-	0	815	330
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	485	-
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	1223	-	-	-	347	712
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1223	-	-	-	335	712
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	619	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1223	-	-	-	712
HCM Lane V/C Ratio	0.026	-	-	-	0.089
HCM Control Delay (s)	8	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	369	2	35	488	30	3	16	24	46	27	18
Future Vol, veh/h	4	369	2	35	488	30	3	16	24	46	27	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	461	3	44	610	38	4	20	30	58	34	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	648	0	0	464	0	0	881	1207	231	949	1172	305
Stage 1	-	-	-	-	-	-	471	471	-	698	698	-
Stage 2	-	-	-	-	-	-	410	736	-	251	474	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	934	-	-	1094	-	-	241	182	771	215	191	691
Stage 1	-	-	-	-	-	-	542	558	-	397	440	-
Stage 2	-	-	-	-	-	-	589	423	-	731	556	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	1094	-	-	193	174	771	182	182	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	174	-	182	182	-
Stage 1	-	-	-	-	-	-	539	555	-	395	422	-
Stage 2	-	-	-	-	-	-	503	406	-	674	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	18.5	28.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	193	325	934	-	-	1094	-	-	182	258
HCM Lane V/C Ratio	0.019	0.154	0.005	-	-	0.04	-	-	0.316	0.218
HCM Control Delay (s)	24	18.1	8.9	-	-	8.4	-	-	33.7	22.8
HCM Lane LOS	C	C	A	-	-	A	-	-	D	C
HCM 95th %tile Q(veh)	0.1	0.5	0	-	-	0.1	-	-	1.3	0.8

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	117	569	436	13	8	73
Future Vol, veh/h	117	569	436	13	8	73
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	632	484	14	9	81

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	498	0	-	0	1383	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	892	-
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	1066	-	-	-	158	578
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	400	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1066	-	-	-	128	578
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	400	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1066	-	-	-	429
HCM Lane V/C Ratio	0.122	-	-	-	0.21
HCM Control Delay (s)	8.8	0	-	-	15.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0.8

Intersection	
Int Delay, s/veh	2.1

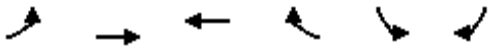
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	104	473	385	26	16	64
Future Vol, veh/h	104	473	385	26	16	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	526	428	29	18	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	457	0	-	0	1201	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	758	-
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	1104	-	-	-	204	615
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	174	615
Mov Cap-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1104	-	-	-	408
HCM Lane V/C Ratio	0.105	-	-	-	0.218
HCM Control Delay (s)	8.6	0	-	-	16.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.8

APPENDIX C-7: 2030 BUILD IMPROVED AM PEAK



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	66	226	283	192	156	65
Future Volume (veh/h)	66	226	283	192	156	65
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
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	272	341	231	188	78
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	482	976	543	368	372	154
Arrive On Green	0.52	0.52	0.52	0.45	0.31	0.24
Sat Flow, veh/h	840	1870	1039	704	1211	502
Grp Volume(v), veh/h	80	272	0	572	267	0
Grp Sat Flow(s),veh/h/ln	840	1870	0	1744	1719	0
Q Serve(g_s), s	2.2	2.4	0.0	7.0	3.8	0.0
Cycle Q Clear(g_c), s	9.3	2.4	0.0	7.0	3.8	0.0
Prop In Lane	1.00			0.40	0.70	0.29
Lane Grp Cap(c), veh/h	482	976	0	910	528	0
V/C Ratio(X)	0.17	0.28	0.00	0.63	0.51	0.00
Avail Cap(c_a), veh/h	1578	3416	0	3185	1849	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	3.9	0.0	5.3	8.6	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.7	0.7	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	0.2	0.1	0.0	0.5	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	4.1	0.0	6.0	9.3	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		352	572		267	
Approach Delay, s/veh		5.1	6.0		9.3	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		17.8		11.5	17.8
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		51.5		29.5	51.5
Max Q Clear Time (g_c+I1), s		11.3		5.8	9.0
Green Ext Time (p_c), s		2.0		0.8	4.0

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	309	23	2	661	0	44	1	2	0	0	5
Future Vol, veh/h	2	309	23	2	661	0	44	1	2	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	351	26	2	751	0	50	1	2	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	751	0	0	377	0	0	1126	1123	364	1125	1136	751
Stage 1	-	-	-	-	-	-	368	368	-	755	755	-
Stage 2	-	-	-	-	-	-	758	755	-	370	381	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	858	-	-	1181	-	-	182	206	681	182	202	411
Stage 1	-	-	-	-	-	-	652	621	-	401	417	-
Stage 2	-	-	-	-	-	-	399	417	-	650	613	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	858	-	-	1181	-	-	179	205	681	180	201	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	179	205	-	180	201	-
Stage 1	-	-	-	-	-	-	650	619	-	400	416	-
Stage 2	-	-	-	-	-	-	392	416	-	645	611	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	32.2	13.9
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	185	858	-	-	1181	-	-	411
HCM Lane V/C Ratio	0.289	0.003	-	-	0.002	-	-	0.014
HCM Control Delay (s)	32.2	9.2	0	-	8.1	0	-	13.9
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	278	18	2	593	44	10
Future Vol, veh/h	278	18	2	593	44	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	305	20	2	652	48	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	325	0	961	305
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	656	-
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	-	-	1235	-	284	735
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	283	735
Mov Cap-2 Maneuver	-	-	-	-	283	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	515	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	735	-	-	1235	-
HCM Lane V/C Ratio	0.171	0.015	-	-	0.002	-
HCM Control Delay (s)	20.3	10	-	-	7.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	192	40	7	288	65	12
Future Vol, veh/h	192	40	7	288	65	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	44	8	320	72	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	257	0	549	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	336	-
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	-	-	1308	-	497	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	724	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1308	-	494	827
Mov Cap-2 Maneuver	-	-	-	-	494	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	527	-	-	1308	-
HCM Lane V/C Ratio	0.162	-	-	0.006	-
HCM Control Delay (s)	13.2	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	165	279	7	0	14
Future Vol, veh/h	40	165	279	7	0	14
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	206	349	9	0	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	358	0	-	0	660	354
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	306	-
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	1201	-	-	-	428	690
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1201	-	-	-	408	690
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1201	-	-	-	690
HCM Lane V/C Ratio	0.042	-	-	-	0.025
HCM Control Delay (s)	8.1	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	685	5	14	306	21	4	14	35	63	3	18
Future Vol, veh/h	7	685	5	14	306	21	4	14	35	63	3	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	729	5	15	326	22	4	15	37	67	3	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	348	0	0	734	0	0	938	1121	365	742	1104	163
Stage 1	-	-	-	-	-	-	743	743	-	356	356	-
Stage 2	-	-	-	-	-	-	195	378	-	386	748	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1208	-	-	867	-	-	219	205	632	304	210	853
Stage 1	-	-	-	-	-	-	373	420	-	634	628	-
Stage 2	-	-	-	-	-	-	788	614	-	609	418	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1208	-	-	867	-	-	208	200	632	265	205	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	208	200	-	265	205	-
Stage 1	-	-	-	-	-	-	371	417	-	630	617	-
Stage 2	-	-	-	-	-	-	753	604	-	549	415	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	16.1	20.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	208	391	1208	-	-	867	-	-	265	588
HCM Lane V/C Ratio	0.02	0.133	0.006	-	-	0.017	-	-	0.253	0.038
HCM Control Delay (s)	22.7	15.6	8	-	-	9.2	-	-	23.1	11.4
HCM Lane LOS	C	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	0.5	0	-	-	0.1	-	-	1	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	246	485	5	12	108
Future Vol, veh/h	43	246	485	5	12	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	273	539	6	13	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	545	0	-	0	911	542
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	369	-
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	1024	-	-	-	304	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1024	-	-	-	290	540
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	556	-
Stage 2	-	-	-	-	699	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1024	-	-	-	497
HCM Lane V/C Ratio	0.047	-	-	-	0.268
HCM Control Delay (s)	8.7	-	-	-	14.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Intersection	
Int Delay, s/veh	2.6

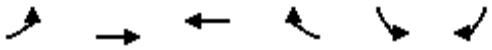
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	220	394	9	25	96
Future Vol, veh/h	38	220	394	9	25	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	244	438	10	28	107

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	448	0	-	0	771	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	328	-
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	1112	-	-	-	368	615
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	730	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1112	-	-	-	354	615
Mov Cap-2 Maneuver	-	-	-	-	354	-
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	730	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1112	-	-	-	534
HCM Lane V/C Ratio	0.038	-	-	-	0.252
HCM Control Delay (s)	8.4	-	-	-	14
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

APPENDIX C-8: 2030 BUILD IMPROVED PM PEAK



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	383	318	167	231	31
Future Volume (veh/h)	15	383	318	167	231	31
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
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	391	324	170	236	32
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	512	895	553	290	516	70
Arrive On Green	0.48	0.48	0.48	0.40	0.34	0.26
Sat Flow, veh/h	903	1870	1155	606	1540	209
Grp Volume(v), veh/h	15	391	0	494	269	0
Grp Sat Flow(s),veh/h/ln	903	1870	0	1761	1756	0
Q Serve(g_s), s	0.3	3.7	0.0	5.6	3.3	0.0
Cycle Q Clear(g_c), s	5.9	3.7	0.0	5.6	3.3	0.0
Prop In Lane	1.00			0.34	0.88	0.12
Lane Grp Cap(c), veh/h	512	895	0	843	589	0
V/C Ratio(X)	0.03	0.44	0.00	0.59	0.46	0.00
Avail Cap(c_a), veh/h	1812	3588	0	3379	2191	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.3	4.6	0.0	5.4	7.1	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.7	0.6	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	0.0	0.2	0.0	0.4	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.3	5.0	0.0	6.0	7.7	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		406	494		269	
Approach Delay, s/veh		5.0	6.0		7.7	
Approach LOS		A	A		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			15.3		11.5	15.3
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			49.5		31.5	49.5
Max Q Clear Time (g_c+I1), s			7.9		5.3	7.6
Green Ext Time (p_c), s			2.4		0.8	3.3

Intersection Summary	
HCM 6th Ctrl Delay	6.1
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	783	46	3	564	0	37	0	1	0	0	12
Future Vol, veh/h	11	783	46	3	564	0	37	0	1	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	890	52	3	641	0	42	0	1	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	641	0	0	942	0	0	1596	1589	916	1590	1615	641
Stage 1	-	-	-	-	-	-	942	942	-	647	647	-
Stage 2	-	-	-	-	-	-	654	647	-	943	968	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	943	-	-	728	-	-	86	108	330	87	104	475
Stage 1	-	-	-	-	-	-	316	342	-	460	467	-
Stage 2	-	-	-	-	-	-	456	467	-	315	332	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	943	-	-	728	-	-	81	104	330	84	100	475
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	104	-	84	100	-
Stage 1	-	-	-	-	-	-	307	332	-	447	464	-
Stage 2	-	-	-	-	-	-	440	464	-	305	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	88.1	12.8
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	83	943	-	-	728	-	-	475
HCM Lane V/C Ratio	0.52	0.013	-	-	0.005	-	-	0.029
HCM Control Delay (s)	88.1	8.9	0	-	10	0	-	12.8
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	678	92	9	509	38	8
Future Vol, veh/h	678	92	9	509	38	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	175	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	770	105	10	578	43	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	875	0	1368	770
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	598	-
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	-	-	771	-	162	401
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	771	-	160	401
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	542	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	31.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	160	401	-	-	771	-
HCM Lane V/C Ratio	0.27	0.023	-	-	0.013	-
HCM Control Delay (s)	35.6	14.2	-	-	9.7	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	395	44	37	323	77	24
Future Vol, veh/h	395	44	37	323	77	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	420	47	39	344	82	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	467	0	842	420
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	422	-
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	-	-	1094	-	334	633
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1094	-	319	633
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	633	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	362	-	-	1094	-
HCM Lane V/C Ratio	0.297	-	-	0.036	-
HCM Control Delay (s)	19.1	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	387	298	11	0	58
Future Vol, veh/h	29	387	298	11	0	58
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	32	421	324	12	0	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	336	0	-	0	815	330
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	485	-
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	1223	-	-	-	347	712
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1223	-	-	-	335	712
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	619	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1223	-	-	-	712
HCM Lane V/C Ratio	0.026	-	-	-	0.089
HCM Control Delay (s)	8	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	369	2	35	488	30	3	16	24	46	27	18
Future Vol, veh/h	4	369	2	35	488	30	3	16	24	46	27	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	475	-	75	450	-	100	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	461	3	44	610	38	4	20	30	58	34	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	648	0	0	464	0	0	881	1207	231	949	1172	305
Stage 1	-	-	-	-	-	-	471	471	-	698	698	-
Stage 2	-	-	-	-	-	-	410	736	-	251	474	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	934	-	-	1094	-	-	241	182	771	215	191	691
Stage 1	-	-	-	-	-	-	542	558	-	397	440	-
Stage 2	-	-	-	-	-	-	589	423	-	731	556	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	1094	-	-	193	174	771	182	182	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	174	-	182	182	-
Stage 1	-	-	-	-	-	-	539	555	-	395	422	-
Stage 2	-	-	-	-	-	-	503	406	-	674	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	18.5	28.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	193	325	934	-	-	1094	-	-	182	258
HCM Lane V/C Ratio	0.019	0.154	0.005	-	-	0.04	-	-	0.316	0.218
HCM Control Delay (s)	24	18.1	8.9	-	-	8.4	-	-	33.7	22.8
HCM Lane LOS	C	C	A	-	-	A	-	-	D	C
HCM 95th %tile Q(veh)	0.1	0.5	0	-	-	0.1	-	-	1.3	0.8

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	117	569	436	13	8	73
Future Vol, veh/h	117	569	436	13	8	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	632	484	14	9	81

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	498	0	-	0	1383	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	892	-
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	1066	-	-	-	158	578
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	400	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1066	-	-	-	139	578
Mov Cap-2 Maneuver	-	-	-	-	139	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	400	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1066	-	-	-	441
HCM Lane V/C Ratio	0.122	-	-	-	0.204
HCM Control Delay (s)	8.8	-	-	-	15.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0.8

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	104	473	385	26	16	64
Future Vol, veh/h	104	473	385	26	16	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	526	428	29	18	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	457	0	-	0	1201	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	758	-
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	1104	-	-	-	204	615
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1104	-	-	-	183	615
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1104	-	-	-	418
HCM Lane V/C Ratio	0.105	-	-	-	0.213
HCM Control Delay (s)	8.6	-	-	-	15.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.8

APPENDIX D: SIMTRAFFIC OUTPUTS

APPENDIX D-1: 2022 EXISTING AM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	68	9	98
Average Queue (ft)	16	0	52
95th Queue (ft)	46	6	84
Link Distance (ft)	1662	891	2162
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: US 340 NB Ramps/Hillside Dr & WV 115

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LT	LTR
Maximum Queue (ft)	21	19	68	64	40
Average Queue (ft)	1	1	27	19	7
95th Queue (ft)	9	9	56	51	29
Link Distance (ft)		923		1075	1179
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150		175		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	6	4	60	35
Average Queue (ft)	0	0	25	4
95th Queue (ft)	6	2	52	21
Link Distance (ft)	640	1404	816	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	5	56	26
Average Queue (ft)	0	24	7
95th Queue (ft)	4	49	26
Link Distance (ft)		265	265
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	16	48
Average Queue (ft)	1	24
95th Queue (ft)	7	40
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	33	20
Average Queue (ft)	3	2
95th Queue (ft)	19	13
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	L	TR	L	TR
Maximum Queue (ft)	19	16	24	34	63	28
Average Queue (ft)	1	1	3	12	26	9
95th Queue (ft)	8	7	16	30	54	24
Link Distance (ft)				5539		2235
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	475	450	75		75	
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D-2: 2022 EXISTING PM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	52	136
Average Queue (ft)	8	66
95th Queue (ft)	33	111
Link Distance (ft)	1662	2162
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: US 340 NB Ramps/Hillside Dr & WV 115

Movement	EB	EB	WB	NB	NB	SB
Directions Served	L	TR	L	LT	R	LTR
Maximum Queue (ft)	22	36	81	84	53	35
Average Queue (ft)	1	3	39	40	5	7
95th Queue (ft)	11	20	72	74	30	29
Link Distance (ft)		923		1075		1179
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	150		175		125	
Storage Blk Time (%)				0		
Queuing Penalty (veh)				0		

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	59	40	69	35
Average Queue (ft)	4	2	26	7
95th Queue (ft)	28	18	55	29
Link Distance (ft)	640	1404	816	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	27	50	26
Average Queue (ft)	2	22	7
95th Queue (ft)	13	45	27
Link Distance (ft)		265	265
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	46	65
Average Queue (ft)	8	31
95th Queue (ft)	30	54
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	30	51
Average Queue (ft)	3	14
95th Queue (ft)	16	37
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	R	L	TR	L	TR
Maximum Queue (ft)	20	22	4	24	33	56	61
Average Queue (ft)	1	2	0	2	11	21	16
95th Queue (ft)	11	11	3	11	28	45	39
Link Distance (ft)					5539		2235
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	475	450	100	75		75	
Storage Blk Time (%)						0	0
Queuing Penalty (veh)						0	0

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D-3: 2030 NO-BUILD AM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	70	70	132	130
Average Queue (ft)	34	34	59	61
95th Queue (ft)	63	66	103	106
Link Distance (ft)		1662	893	2156
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	30	11	68	35
Average Queue (ft)	1	0	29	5
95th Queue (ft)	15	7	58	24
Link Distance (ft)	640	1404	816	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	16	53	31
Average Queue (ft)	1	24	7
95th Queue (ft)	8	48	27
Link Distance (ft)		265	265
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	37	59
Average Queue (ft)	2	27
95th Queue (ft)	14	48
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	30	19
Average Queue (ft)	3	2
95th Queue (ft)	16	13
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	R	L	TR	L	TR
Maximum Queue (ft)	25	22	6	24	32	56	24
Average Queue (ft)	2	2	0	3	11	27	8
95th Queue (ft)	13	11	4	15	29	49	23
Link Distance (ft)					5539		2235
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	475	450	100	75		75	
Storage Blk Time (%)						0	
Queuing Penalty (veh)						0	

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement	WB
Directions Served	R
Maximum Queue (ft)	40
Average Queue (ft)	1
95th Queue (ft)	28
Link Distance (ft)	1075
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D-4: 2030 NO-BUILD PM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	39	124	145	175
Average Queue (ft)	10	54	67	80
95th Queue (ft)	33	101	114	139
Link Distance (ft)		1662	893	2156
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	134	85	70	40
Average Queue (ft)	13	5	24	11
95th Queue (ft)	73	40	56	35
Link Distance (ft)	640	1404	816	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	27	62	26
Average Queue (ft)	3	24	7
95th Queue (ft)	18	51	25
Link Distance (ft)		265	265
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	39	71
Average Queue (ft)	7	33
95th Queue (ft)	27	58
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	37	49
Average Queue (ft)	3	18
95th Queue (ft)	17	39
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	L	R	L	TR	L	TR
Maximum Queue (ft)	20	4	23	4	15	35	56	60
Average Queue (ft)	1	0	3	0	1	10	21	19
95th Queue (ft)	9	3	15	3	10	30	44	42
Link Distance (ft)		4218				5539		2235
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	475		450	100	75		75	
Storage Blk Time (%)							0	0
Queuing Penalty (veh)							0	0

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 6

APPENDIX D-5: 2030 BUILD AM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	70	109	136	138
Average Queue (ft)	33	40	66	66
95th Queue (ft)	62	80	109	116
Link Distance (ft)		1662	893	2156
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	35	8	60	30
Average Queue (ft)	2	0	27	5
95th Queue (ft)	17	6	53	23
Link Distance (ft)	640	1404	816	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	6	62	31
Average Queue (ft)	0	26	8
95th Queue (ft)	5	52	29
Link Distance (ft)		265	265
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	16	66
Average Queue (ft)	1	26
95th Queue (ft)	10	46
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	27	26
Average Queue (ft)	6	6
95th Queue (ft)	23	21
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	R	L	TR	L	TR
Maximum Queue (ft)	20	34	10	28	51	75	28
Average Queue (ft)	2	6	0	4	18	28	8
95th Queue (ft)	12	23	7	18	41	58	24
Link Distance (ft)					5539		2235
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	475	450	100	75		75	
Storage Blk Time (%)					0	0	
Queuing Penalty (veh)					0	0	

Intersection: 9: WV 115 & Site Drive #1

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	65	80
Average Queue (ft)	15	41
95th Queue (ft)	47	68
Link Distance (ft)	519	206
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: WV 115 & Site Drive #2

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	56	114
Average Queue (ft)	12	43
95th Queue (ft)	39	78
Link Distance (ft)	712	232
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement	WB
Directions Served	R
Maximum Queue (ft)	84
Average Queue (ft)	6
95th Queue (ft)	61
Link Distance (ft)	1075
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D-6: 2030 BUILD PM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	43	130	158	162
Average Queue (ft)	11	58	68	79
95th Queue (ft)	35	103	119	135
Link Distance (ft)		1662	893	2156
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	117	207	83	39
Average Queue (ft)	10	17	32	10
95th Queue (ft)	61	134	66	34
Link Distance (ft)	640	1404	816	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	4	29	64	27
Average Queue (ft)	0	4	25	7
95th Queue (ft)	3	20	54	25
Link Distance (ft)			265	265
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	175		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Kabletown Rd & WV 115

Movement	EB	WB	NB
Directions Served	R	LT	LR
Maximum Queue (ft)	4	64	91
Average Queue (ft)	0	11	35
95th Queue (ft)	3	39	66
Link Distance (ft)		627	1818
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	49	58
Average Queue (ft)	6	21
95th Queue (ft)	29	43
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	R	L	R	L	TR	L	TR
Maximum Queue (ft)	19	8	30	9	24	38	57	55
Average Queue (ft)	1	0	8	0	3	15	22	17
95th Queue (ft)	10	5	27	6	15	34	48	40
Link Distance (ft)						5539		2235
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	475	75	450	100	75		75	
Storage Blk Time (%)						0	0	0
Queuing Penalty (veh)						0	0	0

Intersection: 9: WV 115 & Site Drive #1

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	100	78
Average Queue (ft)	37	33
95th Queue (ft)	83	58
Link Distance (ft)	519	206
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: WV 115 & Site Drive #2

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	106	67
Average Queue (ft)	33	33
95th Queue (ft)	81	57
Link Distance (ft)	712	232
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement	SB
Directions Served	R
Maximum Queue (ft)	94
Average Queue (ft)	17
95th Queue (ft)	147
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	575
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 180

APPENDIX D-7: 2030 BUILD IMPROVED AM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	78	92	134	140
Average Queue (ft)	33	42	68	66
95th Queue (ft)	64	81	115	115
Link Distance (ft)		1662	890	2156
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	16	11	60	30
Average Queue (ft)	1	0	28	5
95th Queue (ft)	8	7	57	23
Link Distance (ft)	622	1404	816	397
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	6	58	27
Average Queue (ft)	0	24	10
95th Queue (ft)	4	50	31
Link Distance (ft)		265	265
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	5	71
Average Queue (ft)	0	28
95th Queue (ft)	3	52
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	43	26
Average Queue (ft)	6	8
95th Queue (ft)	27	24
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	R	L	TR	L	TR
Maximum Queue (ft)	19	34	7	24	51	82	24
Average Queue (ft)	2	7	0	2	17	29	9
95th Queue (ft)	12	25	5	13	39	61	24
Link Distance (ft)					5539		2235
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	475	450	100	75		75	
Storage Blk Time (%)					0	0	
Queuing Penalty (veh)					0	0	

Intersection: 9: WV 115 & Site Drive #1

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	39	4	110
Average Queue (ft)	13	0	41
95th Queue (ft)	35	3	76
Link Distance (ft)		712	204
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: WV 115 & Site Drive #2

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	39	102
Average Queue (ft)	10	43
95th Queue (ft)	32	75
Link Distance (ft)		226
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement	WB
Directions Served	R
Maximum Queue (ft)	144
Average Queue (ft)	6
95th Queue (ft)	68
Link Distance (ft)	1056
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

APPENDIX D-8: 2030 BUILD IMPROVED PM PEAK HOUR

Intersection: 1: WV 115 & Jefferson Ave

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	108	309	155	208
Average Queue (ft)	11	116	80	98
95th Queue (ft)	57	301	138	176
Link Distance (ft)		1662	890	2156
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125			
Storage Blk Time (%)		15		
Queuing Penalty (veh)		2		

Intersection: 4: Fairleigh Dr/Bailey Brooks Way & WV 115

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	108	97	72	42
Average Queue (ft)	13	6	30	10
95th Queue (ft)	69	46	64	34
Link Distance (ft)	622	1404	816	397
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Crosswinds Dr & WV 115

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	4	28	66	31
Average Queue (ft)	0	5	24	8
95th Queue (ft)	3	21	53	28
Link Distance (ft)			265	265
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	175		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Kabletown Rd & WV 115

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	54	74
Average Queue (ft)	11	35
95th Queue (ft)	38	64
Link Distance (ft)	627	1818
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: WV 115 & Cattail Run Rd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	48	58
Average Queue (ft)	6	20
95th Queue (ft)	28	42
Link Distance (ft)	627	5539
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Cattail Run Rd & WV 9

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	L	TR	L	TR
Maximum Queue (ft)	15	42	19	46	65	64
Average Queue (ft)	1	8	2	16	23	19
95th Queue (ft)	8	28	11	37	50	43
Link Distance (ft)				5539		2235
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	475	450	75		75	
Storage Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0

Intersection: 9: WV 115 & Site Drive #1

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	58	61
Average Queue (ft)	26	32
95th Queue (ft)	54	54
Link Distance (ft)		204
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: WV 115 & Site Drive #2

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	57	68
Average Queue (ft)	20	35
95th Queue (ft)	48	59
Link Distance (ft)		226
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: US 340 & US 340 SB Ramps/US 340 NB Ramps

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	1912	1918	745
Average Queue (ft)	816	908	466
95th Queue (ft)	2459	2555	1106
Link Distance (ft)	2371	2371	
Upstream Blk Time (%)	8	16	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			575
Storage Blk Time (%)		0	51
Queuing Penalty (veh)		0	135

Network Summary

Network wide Queuing Penalty: 1330

APPENDIX E: SIDRA OUTPUTS

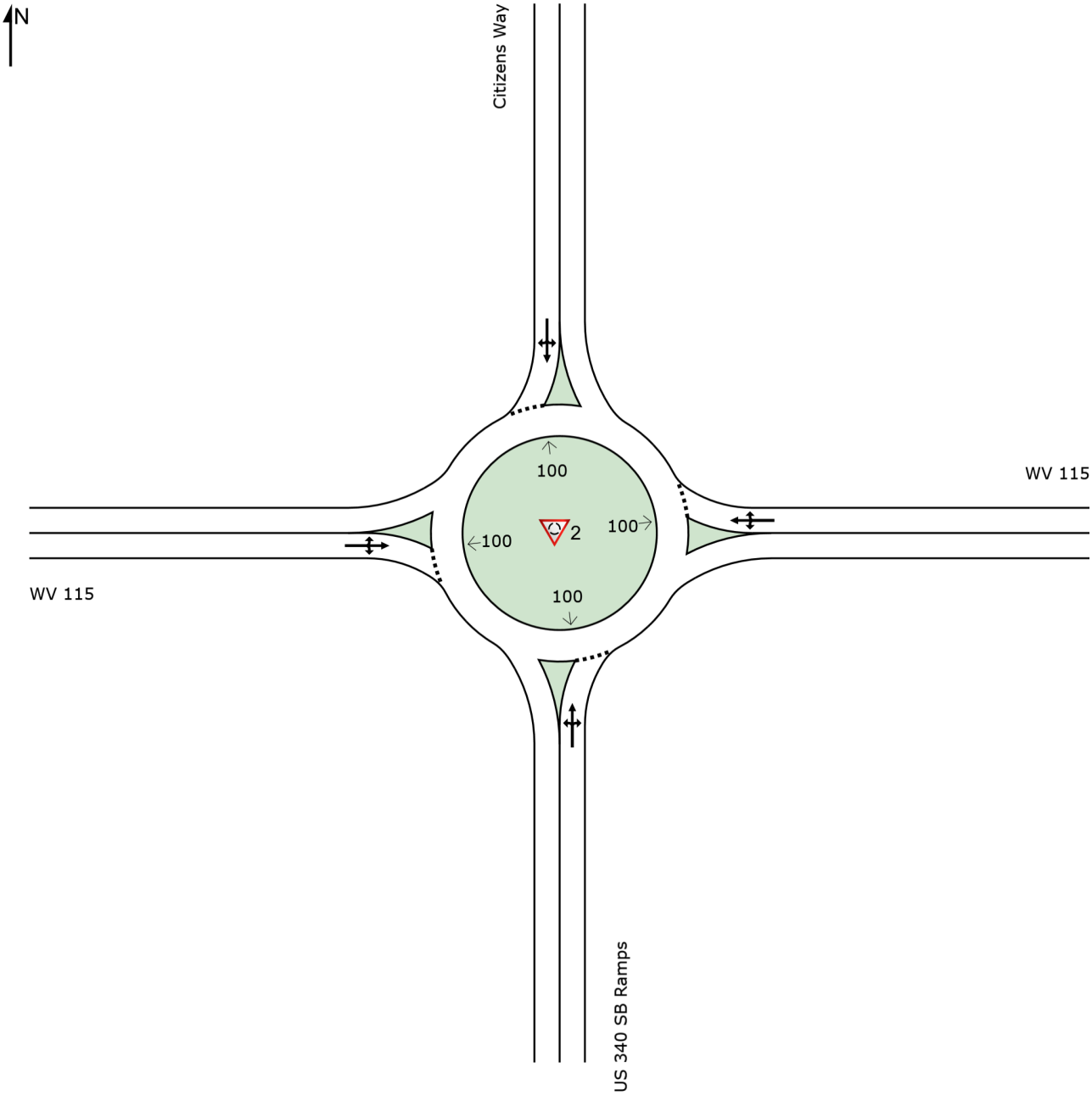
APPENDIX E-1: 2022 EXISTING AM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2022 Existing Conditions)]

2022 Existing AM Peak
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2022 Existing Conditions)]

2022 Existing AM Peak
Site Category: Existing Design
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	32.9	mph	32.9	mph
Travel Distance (Total)	584.3	veh-mi/h	701.1	pers-mi/h
Travel Time (Total)	17.7	veh-h/h	21.3	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.82			
Travel Time Index	8.04			
Congestion Coefficient	1.21			
Demand Flows (Total)	1067	veh/h	1281	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.331			
Practical Spare Capacity	156.5	%		
Effective Intersection Capacity	3221	veh/h		
Control Delay (Total)	1.80	veh-h/h	2.16	pers-h/h
Control Delay (Average)	6.1	sec	6.1	sec
Control Delay (Worst Lane)	6.2	sec		
Control Delay (Worst Movement)	6.2	sec	6.2	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	6.1	sec		
Idling Time (Average)	4.0	sec		
Intersection Level of Service (LOS)	LOS A			
95% Back of Queue - Vehicles (Worst Lane)	1.9	veh		
95% Back of Queue - Distance (Worst Lane)	47.5	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.02			
Total Effective Stops	301	veh/h	361	pers/h
Effective Stop Rate	0.28		0.28	
Proportion Queued	0.41		0.41	
Performance Index	30.4		30.4	
Cost (Total)	372.14	$/h	372.14	$/h
Fuel Consumption (Total)	23.9	gal/h		
Carbon Dioxide (Total)	213.3	kg/h		
Hydrocarbons (Total)	0.019	kg/h		
Carbon Monoxide (Total)	0.265	kg/h		
NOx (Total)	0.256	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 91.6% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	512,372	veh/y	614,847	pers/y
Delay	862	veh-h/y	1,035	pers-h/y
Effective Stops	144,356	veh/y	173,227	pers/y
Travel Distance	280,450	veh-mi/y	336,540	pers-mi/y
Travel Time	8,513	veh-h/y	10,216	pers-h/y
Cost	178,627	$/y	178,627	$/y
Fuel Consumption	11,452	gal/y		
Carbon Dioxide	102,395	kg/y		
Hydrocarbons	9	kg/y		

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2022 Existing Conditions)]

2022 Existing AM Peak
Site Category: Existing Design
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	210	2.0	970	0.217	100	5.8	LOS A	1.0	25.5	Full	1600	0.0	0.0
Approach	210	2.0		0.217		5.8	LOS A	1.0	25.5				
East: WV 115													
Lane 1[d]	393	2.0	1186	0.331	100	6.2	LOS A	1.9	47.5	Full	1000	0.0	0.0
Approach	393	2.0		0.331		6.2	LOS A	1.9	47.5				
North: Citizens Way													
Lane 1[d]	102	2.0	838	0.122	100	5.5	LOS A	0.5	12.8	Full	1600	0.0	0.0
Approach	102	2.0		0.122		5.5	LOS A	0.5	12.8				
West: WV 115													
Lane 1[d]	362	2.0	1139	0.317	100	6.2	LOS A	1.7	43.8	Full	1600	0.0	0.0
Approach	362	2.0		0.317		6.2	LOS A	1.7	43.8				
Intersection	1067	2.0		0.331		6.1	LOS A	1.9	47.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	81	24	105	210	2.0	970	0.217	100	NA	NA
Approach	81	24	105	210	2.0		0.217			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	102	277	14	393	2.0	1186	0.331	100	NA	NA
Approach	102	277	14	393	2.0		0.331			

North: Citizens Way

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	42	21	40	102	2.0	838	0.122	100	NA	NA
Approach	42	21	40	102	2.0		0.122			

West: WV 115

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	21	257	84	362	2.0	1139	0.317	100	NA	NA
Approach	21	257	84	362	2.0		0.317			

	Total	%HV	Deg.Satn (v/c)
Intersection	1067	2.0	0.331

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

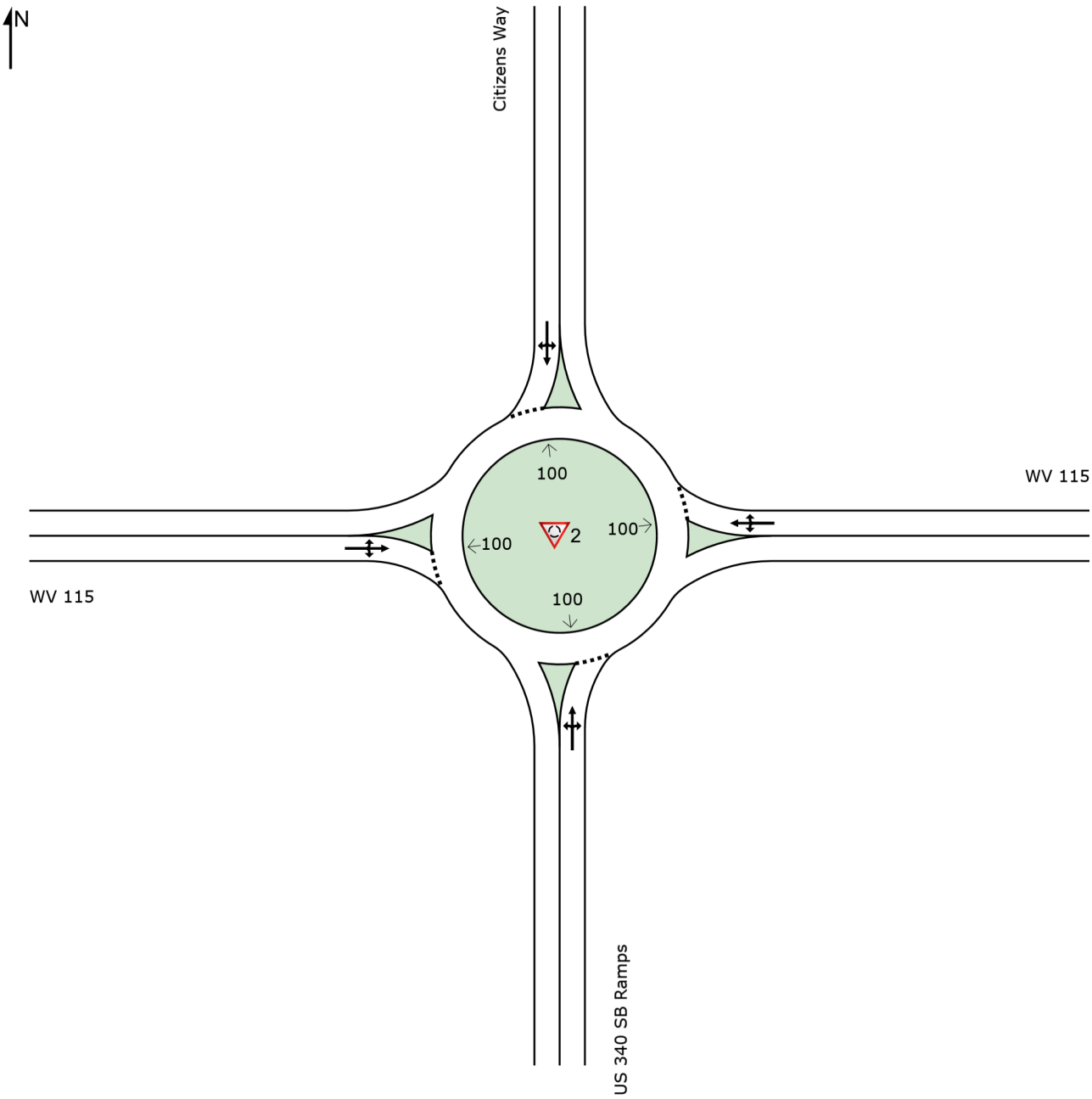
APPENDIX E-2: 2022 EXISTING PM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2022 Existing Conditions)]

2022 Existing PM Peak
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2022 Existing Conditions)]

2022 Existing PM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: US 340 SB Ramps														
3	L2	66	2.0	67	2.0	0.379	8.4	LOS A	1.9	48.9	0.61	0.56	0.61	32.9
8	T1	28	2.0	29	2.0	0.379	8.4	LOS A	1.9	48.9	0.61	0.56	0.61	32.8
18	R2	233	2.0	238	2.0	0.379	8.4	LOS A	1.9	48.9	0.61	0.56	0.61	30.4
Approach		327	2.0	334	2.0	0.379	8.4	LOS A	1.9	48.9	0.61	0.56	0.61	31.2
East: WV 115														
1	L2	65	2.0	66	2.0	0.307	6.0	LOS A	1.7	42.2	0.38	0.24	0.38	33.2
6	T1	261	2.0	266	2.0	0.307	6.0	LOS A	1.7	42.2	0.38	0.24	0.38	33.1
16	R2	21	2.0	21	2.0	0.307	6.0	LOS A	1.7	42.2	0.38	0.24	0.38	32.0
Approach		347	2.0	354	2.0	0.307	6.0	LOS A	1.7	42.2	0.38	0.24	0.38	33.0
North: Citizens Way														
7	L2	32	2.0	33	2.0	0.107	5.1	LOS A	0.4	11.3	0.49	0.39	0.49	33.0
4	T1	12	2.0	12	2.0	0.107	5.1	LOS A	0.4	11.3	0.49	0.39	0.49	34.1
14	R2	50	2.0	51	2.0	0.107	5.1	LOS A	0.4	11.3	0.49	0.39	0.49	33.2
Approach		94	2.0	96	2.0	0.107	5.1	LOS A	0.4	11.3	0.49	0.39	0.49	33.3
West: WV 115														
5	L2	56	2.0	57	2.0	0.382	6.7	LOS A	2.3	58.9	0.35	0.20	0.35	34.0
2	T1	316	2.0	322	2.0	0.382	6.7	LOS A	2.3	58.9	0.35	0.20	0.35	32.7
12	R2	79	2.0	81	2.0	0.382	6.7	LOS A	2.3	58.9	0.35	0.20	0.35	33.0
Approach		451	2.0	460	2.0	0.382	6.7	LOS A	2.3	58.9	0.35	0.20	0.35	33.0
All Vehicles		1219	2.0	1244	2.0	0.382	6.9	LOS A	2.3	58.9	0.44	0.32	0.44	32.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2022 Existing Conditions)]

2022 Existing PM Peak
Site Category: Existing Design
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	32.5	mph	32.5	mph
Travel Distance (Total)	675.9	veh-mi/h	811.1	pers-mi/h
Travel Time (Total)	20.8	veh-h/h	24.9	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.81			
Travel Time Index	7.92			
Congestion Coefficient	1.23			
Demand Flows (Total)	1244	veh/h	1493	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.382			
Practical Spare Capacity	122.6	%		
Effective Intersection Capacity	3257	veh/h		
Control Delay (Total)	2.37	veh-h/h	2.85	pers-h/h
Control Delay (Average)	6.9	sec	6.9	sec
Control Delay (Worst Lane)	8.4	sec		
Control Delay (Worst Movement)	8.4	sec	8.4	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	6.9	sec		
Idling Time (Average)	4.7	sec		
Intersection Level of Service (LOS)	LOS A			
95% Back of Queue - Vehicles (Worst Lane)	2.3	veh		
95% Back of Queue - Distance (Worst Lane)	58.9	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.02			
Total Effective Stops	400	veh/h	480	pers/h
Effective Stop Rate	0.32		0.32	
Proportion Queued	0.44		0.44	
Performance Index	36.8		36.8	
Cost (Total)	434.79	$/h	434.79	$/h
Fuel Consumption (Total)	27.7	gal/h		
Carbon Dioxide (Total)	247.6	kg/h		
Hydrocarbons (Total)	0.022	kg/h		
Carbon Monoxide (Total)	0.308	kg/h		
NOx (Total)	0.297	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 91.2% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	597,061	veh/y	716,474	pers/y
Delay	1,138	veh-h/y	1,366	pers-h/y
Effective Stops	192,026	veh/y	230,431	pers/y
Travel Distance	324,443	veh-mi/y	389,332	pers-mi/y
Travel Time	9,978	veh-h/y	11,974	pers-h/y
Cost	208,701	$/y	208,701	$/y
Fuel Consumption	13,296	gal/y		
Carbon Dioxide	118,867	kg/y		
Hydrocarbons	11	kg/y		

Carbon Monoxide	148	kg/y
NOx	142	kg/y

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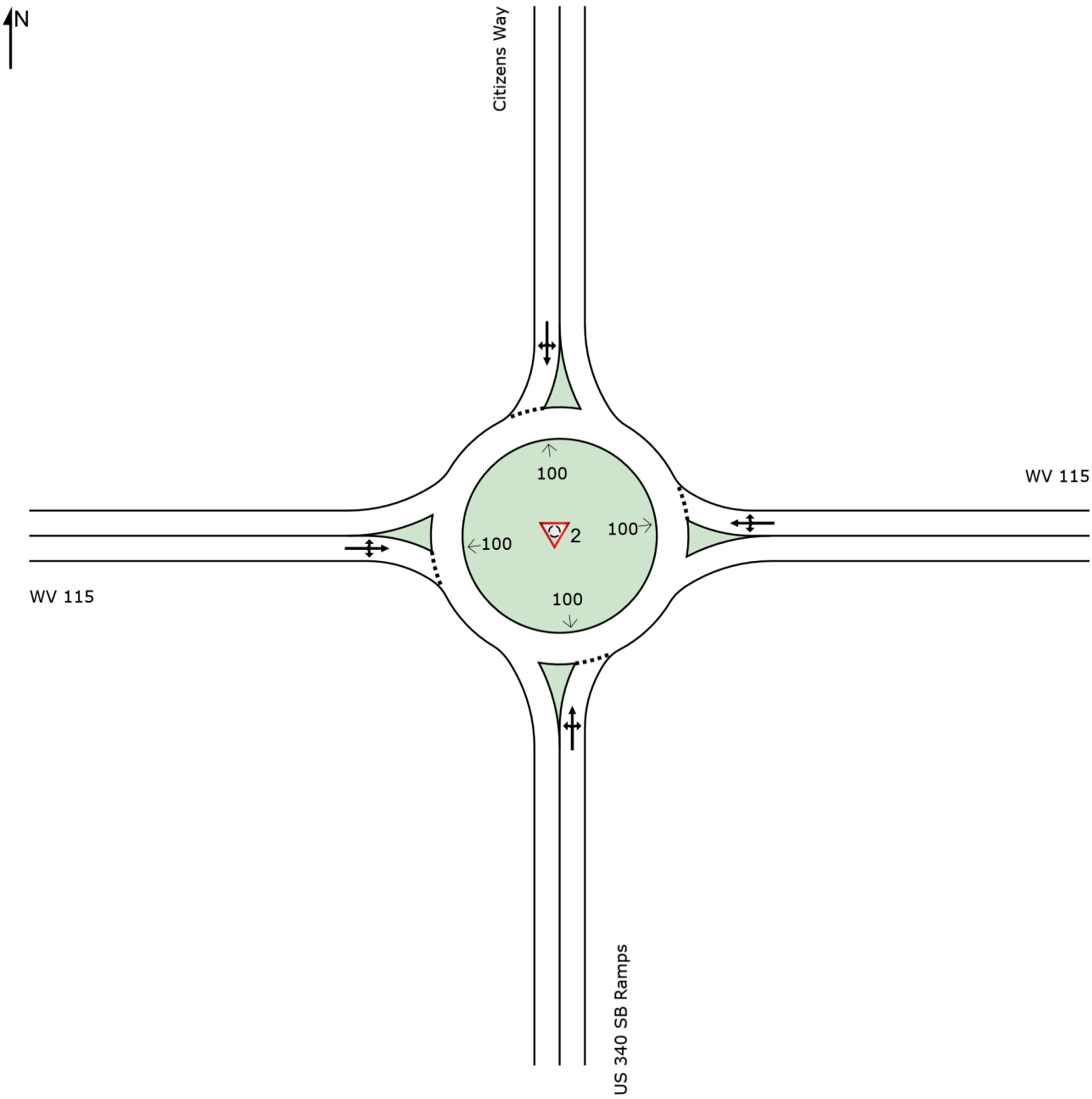
APPENDIX E-3: 2030 NO-BUILD AM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 No-Build Conditions)]

2030 No-Build AM Peak
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 No-Build Conditions)]

2030 No-Build AM Peak
Site Category: Existing Design
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	31.3	mph	31.3	mph
Travel Distance (Total)	819.4	veh-mi/h	983.2	pers-mi/h
Travel Time (Total)	26.2	veh-h/h	31.4	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.78			
Travel Time Index	7.58			
Congestion Coefficient	1.28			
Demand Flows (Total)	1490	veh/h	1787	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.454			
Practical Spare Capacity	87.3	%		
Effective Intersection Capacity	3282	veh/h		
Control Delay (Total)	3.70	veh-h/h	4.44	pers-h/h
Control Delay (Average)	8.9	sec	8.9	sec
Control Delay (Worst Lane)	9.7	sec		
Control Delay (Worst Movement)	9.7	sec	9.7	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	8.9	sec		
Idling Time (Average)	5.6	sec		
Intersection Level of Service (LOS)	LOS A			
95% Back of Queue - Vehicles (Worst Lane)	2.8	veh		
95% Back of Queue - Distance (Worst Lane)	71.2	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.03			
Total Effective Stops	825	veh/h	990	pers/h
Effective Stop Rate	0.55		0.55	
Proportion Queued	0.60		0.60	
Performance Index	51.6		51.6	
Cost (Total)	548.51	$/h	548.51	$/h
Fuel Consumption (Total)	35.0	gal/h		
Carbon Dioxide (Total)	313.1	kg/h		
Hydrocarbons (Total)	0.028	kg/h		
Carbon Monoxide (Total)	0.384	kg/h		
NOx (Total)	0.375	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 92.3% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	714,977	veh/y	857,972	pers/y
Delay	1,777	veh-h/y	2,132	pers-h/y
Effective Stops	395,918	veh/y	475,101	pers/y
Travel Distance	393,289	veh-mi/y	471,947	pers-mi/y
Travel Time	12,573	veh-h/y	15,088	pers-h/y
Cost	263,286	$/y	263,286	$/y
Fuel Consumption	16,813	gal/y		
Carbon Dioxide	150,297	kg/y		
Hydrocarbons	14	kg/y		

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 No-Build Conditions)]

2030 No-Build AM Peak
Site Category: Existing Design
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	292	2.0	787	0.371	100	9.1	LOS A	1.8	47.0	Full	1600	0.0	0.0
Approach	292	2.0		0.371		9.1	LOS A	1.8	47.0				
East: WV 115													
Lane 1[d]	480	2.0	1104	0.435	100	7.9	LOS A	2.7	67.7	Full	1000	0.0	0.0
Approach	480	2.0		0.435		7.9	LOS A	2.7	67.7				
North: Citizens Way													
Lane 1[d]	303	2.0	766	0.396	100	9.7	LOS A	2.1	53.9	Full	1600	0.0	0.0
Approach	303	2.0		0.396		9.7	LOS A	2.1	53.9				
West: WV 115													
Lane 1[d]	414	2.0	912	0.454	100	9.5	LOS A	2.8	71.2	Full	1600	0.0	0.0
Approach	414	2.0		0.454		9.5	LOS A	2.8	71.2				
Intersection	1490	2.0		0.454		8.9	LOS A	2.8	71.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	91	78	123	292	2.0	787	0.371	100	NA	NA
Approach	91	78	123	292	2.0		0.371			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	130	326	24	480	2.0	1104	0.435	100	NA	NA
Approach	130	326	24	480	2.0		0.435			

North: Citizens Way

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	201	48	55	303	2.0	766	0.396	100	NA	NA
Approach	201	48	55	303	2.0		0.396			

West: WV 115

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	27	293	94	414	2.0	912	0.454	100	NA	NA
Approach	27	293	94	414	2.0		0.454			

	Total	%HV	Deg.Satn (v/c)
Intersection	1490	2.0	0.454

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

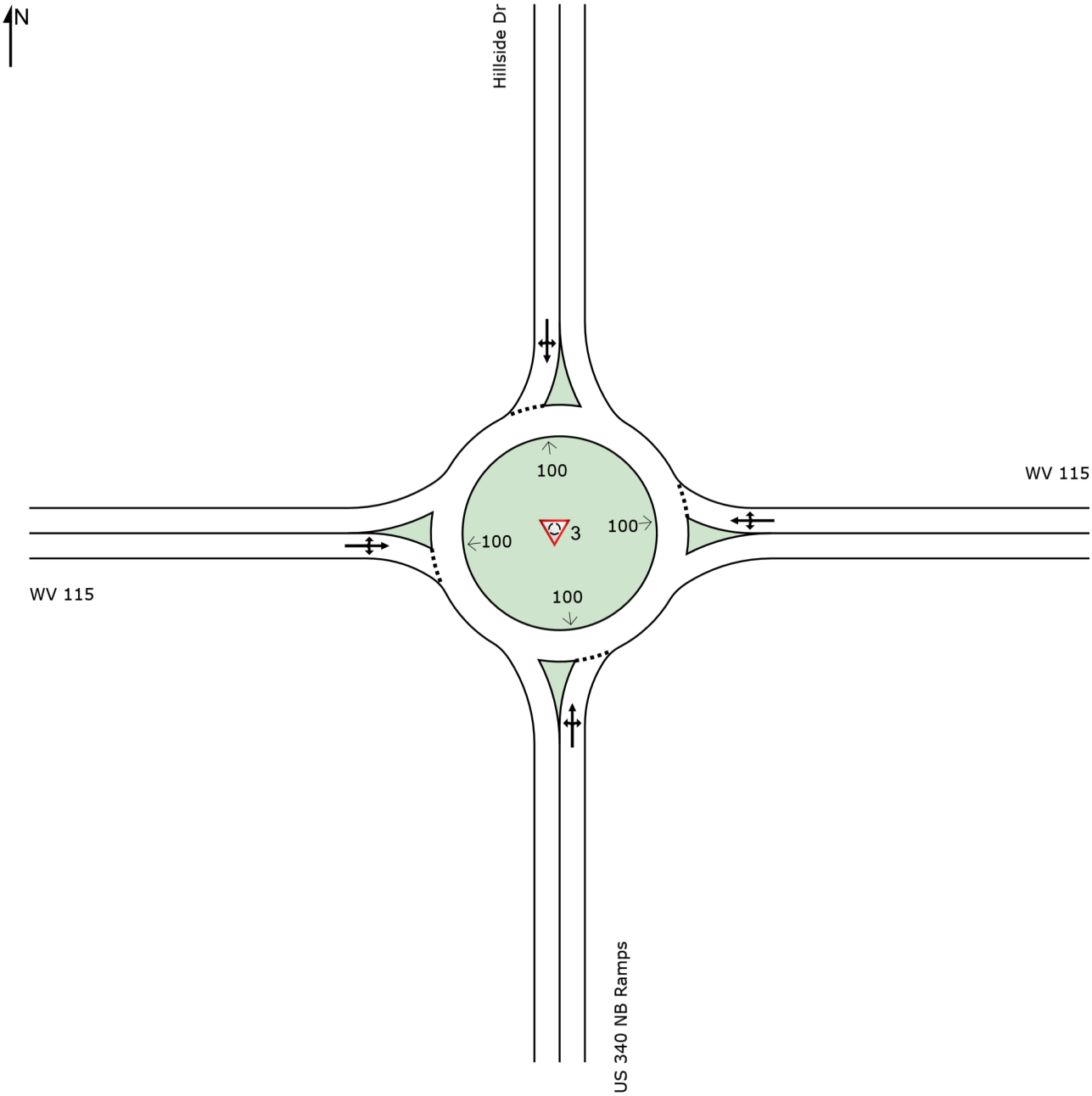
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 No-Build Conditions)]

2030 No-Build AM Peak
Site Category: Proposed Design 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 No-Build Conditions)]

2030 No-Build AM Peak
Site Category: Proposed Design 1
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	31.9	mph	31.9	mph
Travel Distance (Total)	699.6	veh-mi/h	839.6	pers-mi/h
Travel Time (Total)	21.9	veh-h/h	26.3	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.80			
Travel Time Index	7.75			
Congestion Coefficient	1.25			
Demand Flows (Total)	1267	veh/h	1520	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.532			
Practical Spare Capacity	59.9	%		
Effective Intersection Capacity	2383	veh/h		
Control Delay (Total)	2.91	veh-h/h	3.49	pers-h/h
Control Delay (Average)	8.3	sec	8.3	sec
Control Delay (Worst Lane)	9.6	sec		
Control Delay (Worst Movement)	9.6	sec	9.6	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	8.3	sec		
Idling Time (Average)	6.2	sec		
Intersection Level of Service (LOS)	LOS A			
95% Back of Queue - Vehicles (Worst Lane)	3.7	veh		
95% Back of Queue - Distance (Worst Lane)	93.4	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.03			
Total Effective Stops	327	veh/h	392	pers/h
Effective Stop Rate	0.26		0.26	
Proportion Queued	0.41		0.41	
Performance Index	40.1		40.1	
Cost (Total)	455.41	$/h	455.41	$/h
Fuel Consumption (Total)	28.6	gal/h		
Carbon Dioxide (Total)	255.7	kg/h		
Hydrocarbons (Total)	0.023	kg/h		
Carbon Monoxide (Total)	0.317	kg/h		
NOx (Total)	0.306	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 93.1% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	608,176	veh/y	729,811	pers/y
Delay	1,396	veh-h/y	1,675	pers-h/y
Effective Stops	156,951	veh/y	188,341	pers/y
Travel Distance	335,826	veh-mi/y	402,991	pers-mi/y
Travel Time	10,527	veh-h/y	12,632	pers-h/y
Cost	218,596	$/y	218,596	$/y
Fuel Consumption	13,727	gal/y		
Carbon Dioxide	122,747	kg/y		
Hydrocarbons	11	kg/y		

LANE SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 No-Build Conditions)]

2030 No-Build AM Peak
Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 NB Ramps													
Lane 1[d]	71	2.0	1044	0.068	100	4.0	LOS A	0.3	7.3	Full	1600	0.0	0.0
Approach	71	2.0		0.068		4.0	LOS A	0.3	7.3				
East: WV 115													
Lane 1[d]	599	2.0	1288	0.465	100	7.5	LOS A	3.4	85.3	Full	1000	0.0	0.0
Approach	599	2.0		0.465		7.5	LOS A	3.4	85.3				
North: Hillside Dr													
Lane 1[d]	13	2.0	695	0.019	100	5.4	LOS A	0.1	1.8	Full	1600	0.0	0.0
Approach	13	2.0		0.019		5.4	LOS A	0.1	1.8				
West: WV 115													
Lane 1[d]	584	2.0	1098	0.532	100	9.6	LOS A	3.7	93.3	Full	1600	0.0	0.0
Approach	584	2.0		0.532		9.6	LOS A	3.7	93.4				
Intersection	1267	2.0		0.532		8.3	LOS A	3.7	93.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	1	27	71	2.0	1044	0.068	100	NA	NA
Approach	43	1	27	71	2.0		0.068			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	195	403	1	599	2.0	1288	0.465	100	NA	NA
Approach	195	403	1	599	2.0		0.465			

North: Hillside Dr

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	1	5	7	13	2.0	695	0.019	100	NA	NA
Approach	1	5	7	13	2.0		0.019			

West: WV 115

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	3	245	335	584	2.0	1098	0.532	100	NA	NA
Approach	3	245	335	584	2.0		0.532			

	Total	%HV	Deg.Satn (v/c)
Intersection	1267	2.0	0.532

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 NB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Hillside Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

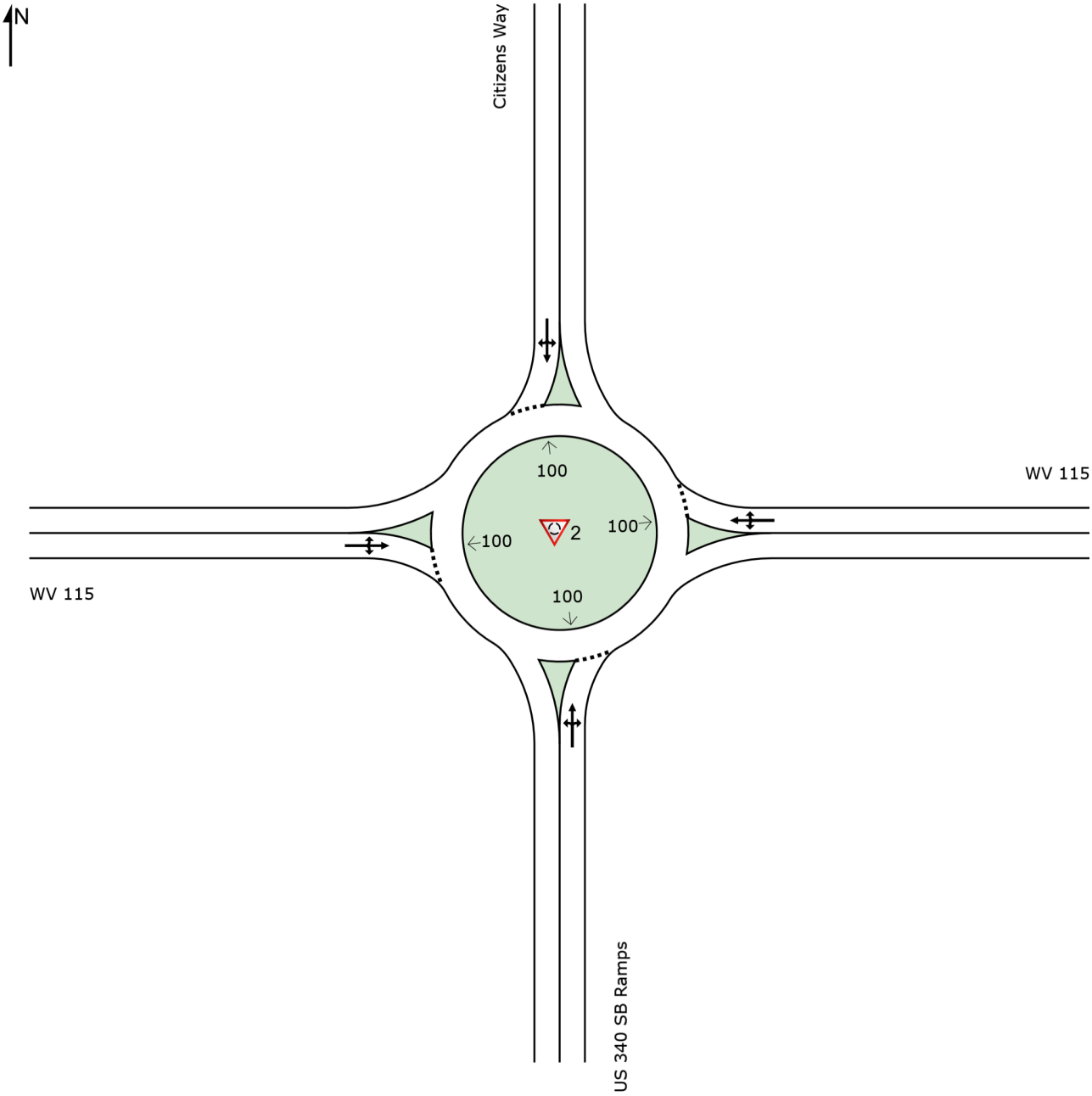
APPENDIX E-4: 2030 NO-BUILD PM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 No-Build Conditions)]

2030 No-Build PM Peak
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 No-Build Conditions)]

2030 No-Build PM Peak
Site Category: Existing Design
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	29.7	mph	29.7	mph
Travel Distance (Total)	957.5	veh-mi/h	1149.0	pers-mi/h
Travel Time (Total)	32.2	veh-h/h	38.6	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.74			
Travel Time Index	7.15			
Congestion Coefficient	1.34			
Demand Flows (Total)	1738	veh/h	2085	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.734			
Practical Spare Capacity	15.8	%		
Effective Intersection Capacity	2368	veh/h		
Control Delay (Total)	6.09	veh-h/h	7.30	pers-h/h
Control Delay (Average)	12.6	sec	12.6	sec
Control Delay (Worst Lane)	20.6	sec		
Control Delay (Worst Movement)	20.6	sec	20.6	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	12.6	sec		
Idling Time (Average)	7.3	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	8.7	veh		
95% Back of Queue - Distance (Worst Lane)	220.7	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.06			
Total Effective Stops	1252	veh/h	1502	pers/h
Effective Stop Rate	0.72		0.72	
Proportion Queued	0.68		0.68	
Performance Index	75.4		75.4	
Cost (Total)	665.97	$/h	665.97	$/h
Fuel Consumption (Total)	41.5	gal/h		
Carbon Dioxide (Total)	371.0	kg/h		
Hydrocarbons (Total)	0.034	kg/h		
Carbon Monoxide (Total)	0.453	kg/h		
NOx (Total)	0.445	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 92.6% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	834,122	veh/y	1,000,947	pers/y
Delay	2,922	veh-h/y	3,506	pers-h/y
Effective Stops	600,917	veh/y	721,100	pers/y
Travel Distance	459,614	veh-mi/y	551,537	pers-mi/y
Travel Time	15,450	veh-h/y	18,540	pers-h/y
Cost	319,668	$/y	319,668	$/y
Fuel Consumption	19,924	gal/y		
Carbon Dioxide	178,092	kg/y		
Hydrocarbons	16	kg/y		

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 No-Build Conditions)]

2030 No-Build PM Peak
Site Category: Existing Design
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	545	2.0	743	0.734	100	20.6	LOS C	8.7	220.7	Full	1600	0.0	0.0
Approach	545	2.0		0.734		20.6	LOS C	8.7	220.7				
East: WV 115													
Lane 1[d]	437	2.0	954	0.458	100	9.2	LOS A	2.7	69.4	Full	1000	0.0	0.0
Approach	437	2.0		0.458		9.2	LOS A	2.7	69.4				
North: Citizens Way													
Lane 1[d]	216	2.0	833	0.260	100	7.1	LOS A	1.2	29.9	Full	1600	0.0	0.0
Approach	216	2.0		0.260		7.1	LOS A	1.2	29.9				
West: WV 115													
Lane 1[d]	540	2.0	1058	0.510	100	9.4	LOS A	3.3	84.5	Full	1600	0.0	0.0
Approach	540	2.0		0.510		9.4	LOS A	3.3	84.5				
Intersection	1738	2.0		0.734		12.6	LOS B	8.7	220.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	78	184	284	545	2.0	743	0.734	100	NA	NA
Approach	78	184	284	545	2.0		0.734			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	83	306	48	437	2.0	954	0.458	100	NA	NA
Approach	83	306	48	437	2.0		0.458			

North: Citizens Way

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	127	28	62	216	2.0	833	0.260	100	NA	NA
Approach	127	28	62	216	2.0		0.260			

West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	74	376	90	540	2.0	1058	0.510	100	NA	NA
Approach	74	376	90	540	2.0		0.510			

	Total	%HV	Deg.Satn (v/c)
Intersection	1738	2.0	0.734

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

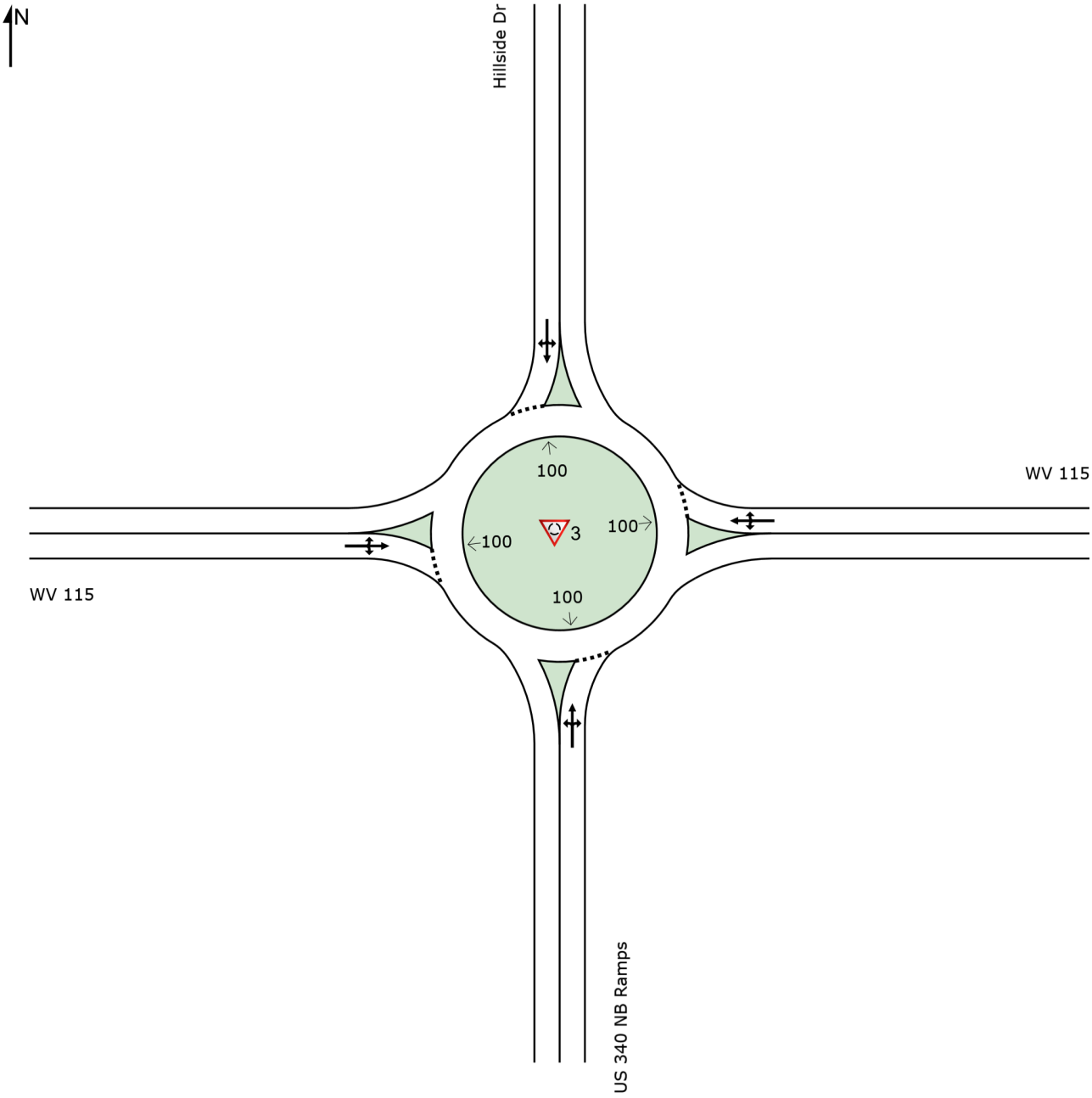
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 No-Build Conditions)]

2030 No-Build PM Peak
Site Category: Proposed Design 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 No-Build Conditions)]

2030 No-Build PM Peak
Site Category: Proposed Design 1
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	29.6	mph	29.6	mph
Travel Distance (Total)	871.8	veh-mi/h	1046.2	pers-mi/h
Travel Time (Total)	29.4	veh-h/h	35.3	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.74			
Travel Time Index	7.12			
Congestion Coefficient	1.35			
Demand Flows (Total)	1601	veh/h	1921	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.771			
Practical Spare Capacity	10.3	%		
Effective Intersection Capacity	2078	veh/h		
Control Delay (Total)	5.71	veh-h/h	6.86	pers-h/h
Control Delay (Average)	12.8	sec	12.8	sec
Control Delay (Worst Lane)	17.3	sec		
Control Delay (Worst Movement)	17.3	sec	17.3	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	12.8	sec		
Idling Time (Average)	6.9	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	17.1	veh		
95% Back of Queue - Distance (Worst Lane)	434.8	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.11			
Total Effective Stops	1052	veh/h	1263	pers/h
Effective Stop Rate	0.66		0.66	
Proportion Queued	0.67		0.67	
Performance Index	85.3		85.3	
Cost (Total)	609.44	$/h	609.44	$/h
Fuel Consumption (Total)	38.1	gal/h		
Carbon Dioxide (Total)	340.3	kg/h		
Hydrocarbons (Total)	0.031	kg/h		
Carbon Monoxide (Total)	0.413	kg/h		
NOx (Total)	0.414	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 93.2% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	768,522	veh/y	922,226	pers/y
Delay	2,743	veh-h/y	3,292	pers-h/y
Effective Stops	505,051	veh/y	606,061	pers/y
Travel Distance	418,460	veh-mi/y	502,152	pers-mi/y
Travel Time	14,123	veh-h/y	16,948	pers-h/y
Cost	292,530	$/y	292,530	$/y
Fuel Consumption	18,274	gal/y		
Carbon Dioxide	163,349	kg/y		
Hydrocarbons	15	kg/y		

LANE SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 No-Build Conditions)]

2030 No-Build PM Peak
Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 NB Ramps													
Lane 1[d]	200	2.0	724	0.276	100	8.2	LOS A	1.2	30.7	Full	1600	0.0	0.0
Approach	200	2.0		0.276		8.2	LOS A	1.2	30.7				
East: WV 115													
Lane 1[d]	553	2.0	1192	0.464	100	7.9	LOS A	3.1	79.5	Full	1000	0.0	0.0
Approach	553	2.0		0.464		7.9	LOS A	3.1	79.5				
North: Hillside Dr													
Lane 1[d]	10	2.0	677	0.014	100	5.5	LOS A	0.1	1.4	Full	1600	0.0	0.0
Approach	10	2.0		0.014		5.5	LOS A	0.1	1.4				
West: WV 115													
Lane 1[d]	838	2.0	1088	0.771	100	17.3	LOS C	17.1	434.8	Full	1600	0.0	0.0
Approach	838	2.0		0.771		17.3	LOS C	17.1	434.8				
Intersection	1601	2.0		0.771		12.8	LOS B	17.1	434.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	113	1	86	200	2.0	724	0.276	100	NA	NA
Approach	113	1	86	200	2.0		0.276			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	203	349	1	553	2.0	1192	0.464	100	NA	NA
Approach	203	349	1	553	2.0		0.464			

North: Hillside Dr

Mov. From N	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	1	5	3	10	2.0	677	0.014	100	NA	NA
Approach	1	5	3	10	2.0		0.014			

West: WV 115

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	592	238	838	2.0	1088	0.771	100	NA	NA
Approach	8	592	238	838	2.0		0.771			

	Total	%HV	Deg.Satn (v/c)
Intersection	1601	2.0	0.771

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 NB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Hillside Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

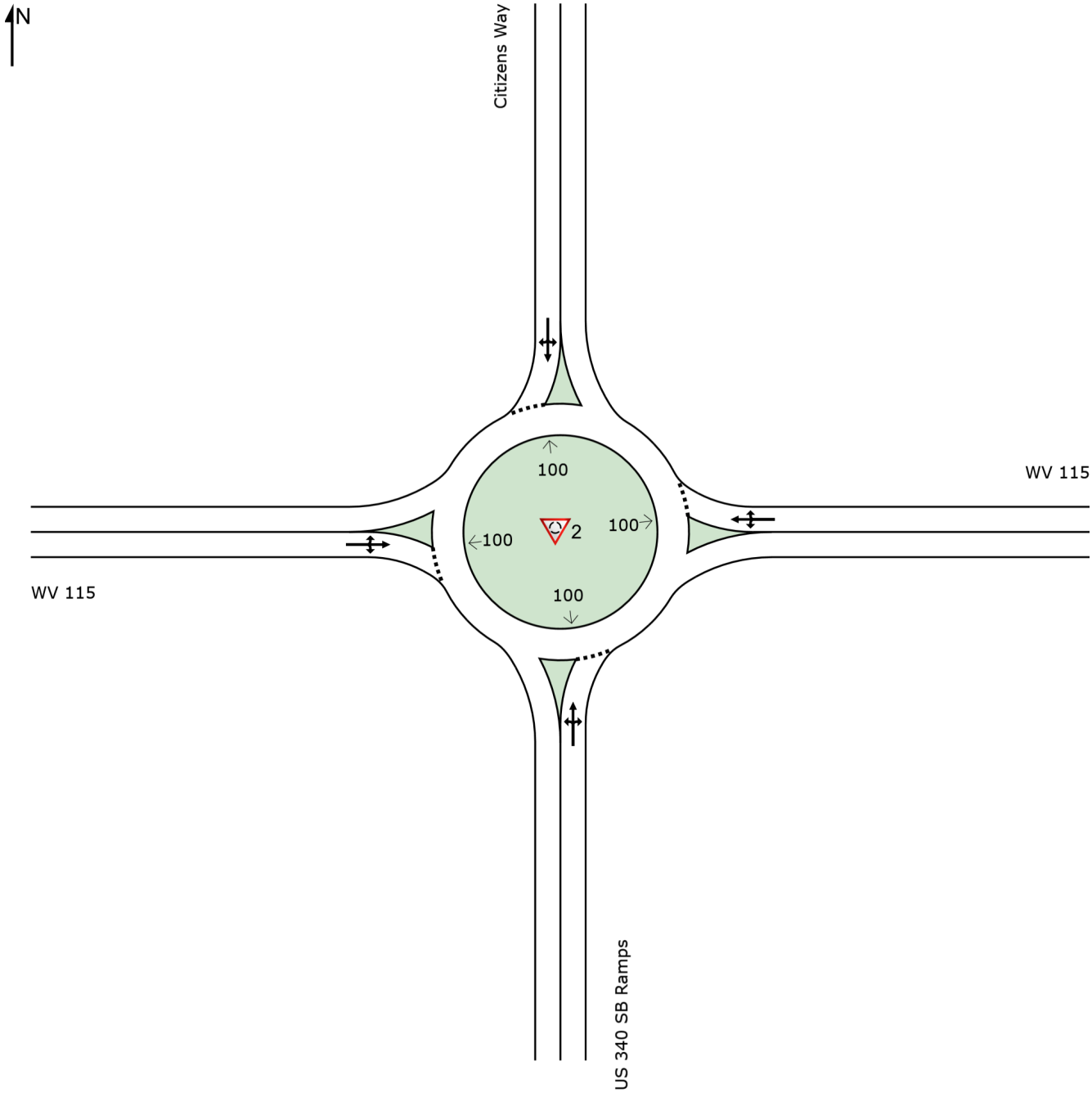
APPENDIX E-5: 2030 BUILD AM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Conditions)]

2030 Build AM Peak
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Conditions)]

2030 Build AM Peak
Site Category: Existing Design
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	30.2	mph	30.2	mph
Travel Distance (Total)	933.3	veh-mi/h	1120.0	pers-mi/h
Travel Time (Total)	30.9	veh-h/h	37.1	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.76			
Travel Time Index	7.28			
Congestion Coefficient	1.32			
Demand Flows (Total)	1708	veh/h	2050	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.574			
Practical Spare Capacity	48.1	%		
Effective Intersection Capacity	2976	veh/h		
Control Delay (Total)	5.25	veh-h/h	6.30	pers-h/h
Control Delay (Average)	11.1	sec	11.1	sec
Control Delay (Worst Lane)	12.5	sec		
Control Delay (Worst Movement)	12.5	sec	12.5	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	11.1	sec		
Idling Time (Average)	6.7	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	4.2	veh		
95% Back of Queue - Distance (Worst Lane)	107.7	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.04			
Total Effective Stops	1127	veh/h	1353	pers/h
Effective Stop Rate	0.66		0.66	
Proportion Queued	0.67		0.67	
Performance Index	67.5		67.5	
Cost (Total)	643.91	$/h	643.91	$/h
Fuel Consumption (Total)	40.8	gal/h		
Carbon Dioxide (Total)	364.4	kg/h		
Hydrocarbons (Total)	0.033	kg/h		
Carbon Monoxide (Total)	0.443	kg/h		
NOx (Total)	0.437	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 93.5% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	819,907	veh/y	983,888	pers/y
Delay	2,520	veh-h/y	3,023	pers-h/y
Effective Stops	541,077	veh/y	649,292	pers/y
Travel Distance	447,984	veh-mi/y	537,581	pers-mi/y

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Conditions)]

2030 Build AM Peak
Site Category: Existing Design
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	324	2.0	761	0.426	100	10.3	LOS B	2.5	62.6	Full	1600	0.0	0.0
Approach	324	2.0		0.426		10.3	LOS B	2.5	62.6				
East: WV 115													
Lane 1[d]	634	2.0	1104	0.574	100	10.4	LOS B	4.2	107.7	Full	1000	0.0	0.0
Approach	634	2.0		0.574		10.4	LOS B	4.2	107.7				
North: Citizens Way													
Lane 1[d]	303	2.0	653	0.465	100	12.5	LOS B	2.7	69.7	Full	1600	0.0	0.0
Approach	303	2.0		0.465		12.5	LOS B	2.7	69.7				
West: WV 115													
Lane 1[d]	447	2.0	848	0.526	100	11.5	LOS B	4.1	103.9	Full	1600	0.0	0.0
Approach	447	2.0		0.526		11.5	LOS B	4.1	103.9				
Intersection	1708	2.0		0.574		11.1	LOS B	4.2	107.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	91	78	156	324	2.0	761	0.426	100	NA	NA
Approach	91	78	156	324	2.0		0.426			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	200	409	24	634	2.0	1104	0.574	100	NA	NA

Approach	200	409	24	634	2.0		0.574			
North: Citizens Way										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	201	48	55	303	2.0	653	0.465	100	NA	NA
Approach	201	48	55	303	2.0		0.465			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	27	326	94	447	2.0	848	0.526	100	NA	NA
Approach	27	326	94	447	2.0		0.526			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1708	2.0		0.574						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

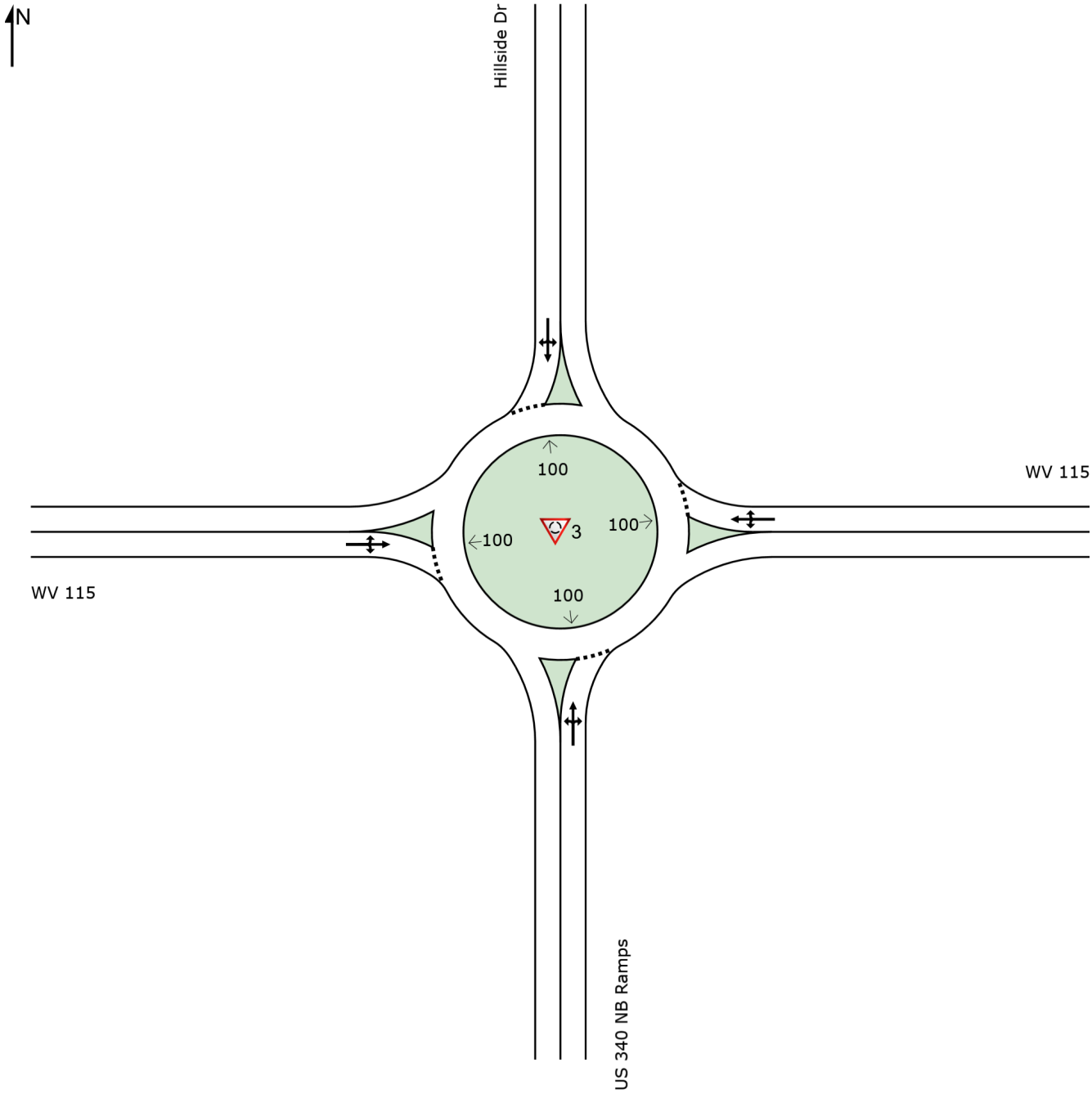
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Conditions)]

2030 Build AM Peak
Site Category: Proposed Design 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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INTERSECTION SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Conditions)]

2030 Build AM Peak
Site Category: Proposed Design 1
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	30.4	mph	30.4	mph
Travel Distance (Total)	862.3	veh-mi/h	1034.7	pers-mi/h
Travel Time (Total)	28.4	veh-h/h	34.1	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.76			
Travel Time Index	7.33			
Congestion Coefficient	1.32			
Demand Flows (Total)	1579	veh/h	1895	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.639			
Practical Spare Capacity	33.0	%		
Effective Intersection Capacity	2471	veh/h		
Control Delay (Total)	4.91	veh-h/h	5.90	pers-h/h
Control Delay (Average)	11.2	sec	11.2	sec
Control Delay (Worst Lane)	12.8	sec		
Control Delay (Worst Movement)	12.8	sec	12.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	11.2	sec		
Idling Time (Average)	7.5	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	7.7	veh		
95% Back of Queue - Distance (Worst Lane)	196.6	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.07			
Total Effective Stops	654	veh/h	784	pers/h
Effective Stop Rate	0.41		0.41	
Proportion Queued	0.51		0.51	
Performance Index	65.6		65.6	
Cost (Total)	586.36	$/h	586.36	$/h
Fuel Consumption (Total)	36.5	gal/h		
Carbon Dioxide (Total)	325.9	kg/h		
Hydrocarbons (Total)	0.029	kg/h		
Carbon Monoxide (Total)	0.400	kg/h		
NOx (Total)	0.392	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 94.5% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	757,978	veh/y	909,574	pers/y
Delay	2,358	veh-h/y	2,830	pers-h/y
Effective Stops	313,779	veh/y	376,535	pers/y
Travel Distance	413,884	veh-mi/y	496,661	pers-mi/y

LANE SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Conditions)]

2030 Build AM Peak
Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 NB Ramps													
Lane 1[d]	98	2.0	979	0.100	100	4.6	LOS A	0.4	10.7	Full	1600	0.0	0.0
Approach	98	2.0		0.100		4.6	LOS A	0.4	10.7				
East: WV 115													
Lane 1[d]	823	2.0	1288	0.639	100	10.8	LOS B	6.5	164.3	Full	1000	0.0	0.0
Approach	823	2.0		0.639		10.8	LOS B	6.5	164.3				
North: Hillside Dr													
Lane 1[d]	13	2.0	550	0.024	100	6.8	LOS A	0.1	2.2	Full	1600	0.0	0.0
Approach	13	2.0		0.024		6.8	LOS A	0.1	2.2				
West: WV 115													
Lane 1[d]	645	2.0	1011	0.638	100	12.8	LOS B	7.7	196.6	Full	1600	0.0	0.0
Approach	645	2.0		0.638		12.8	LOS B	7.7	196.6				
Intersection	1579	2.0		0.639		11.2	LOS B	7.7	196.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	1	54	98	2.0	979	0.100	100	NA	NA
Approach	43	1	54	98	2.0		0.100			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	274	548	1	823	2.0	1288	0.639	100	NA	NA

Approach	274	548	1	823	2.0		0.639			
North: Hillside Dr										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	5	7	13	2.0	550	0.024	100	NA	NA
Approach	1	5	7	13	2.0		0.024			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	3	307	335	645	2.0	1011	0.638	100	NA	NA
Approach	3	307	335	645	2.0		0.638			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1579	2.0		0.639						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 NB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Hillside Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

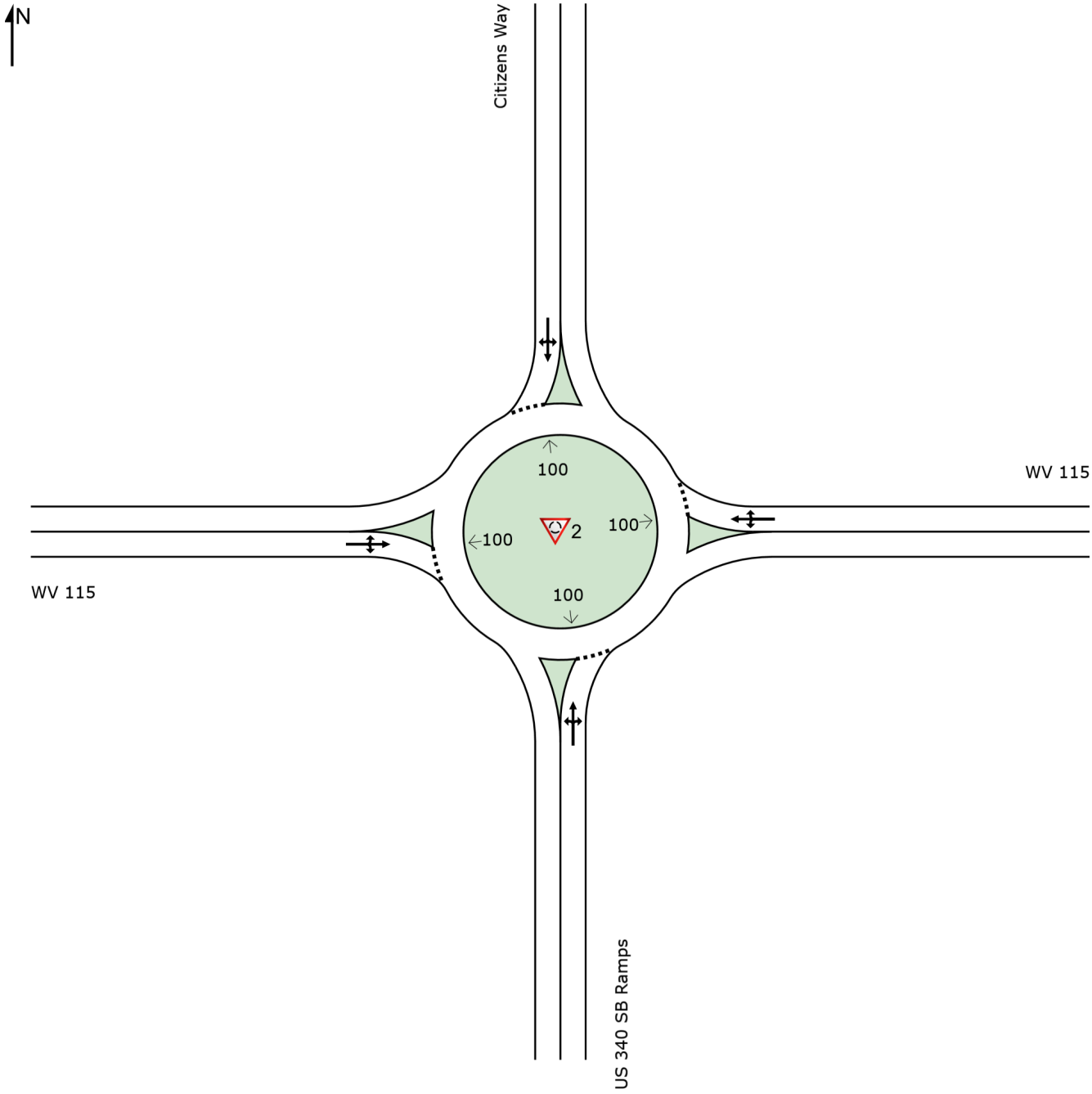
APPENDIX E-6: 2030 BUILD PM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Conditions)]

2030 Build PM Peak
Site Category: Existing Design
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Conditions)]

2030 Build PM Peak
Site Category: Existing Design
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	26.6	mph	26.6	mph
Travel Distance (Total)	1086.5	veh-mi/h	1303.8	pers-mi/h
Travel Time (Total)	40.9	veh-h/h	49.1	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.66			
Travel Time Index	6.27			
Congestion Coefficient	1.51			
Demand Flows (Total)	1988	veh/h	2385	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.914			
Practical Spare Capacity	-7.0	%		
Effective Intersection Capacity	2176	veh/h		
Control Delay (Total)	11.26	veh-h/h	13.51	pers-h/h
Control Delay (Average)	20.4	sec	20.4	sec
Control Delay (Worst Lane)	40.8	sec		
Control Delay (Worst Movement)	40.8	sec	40.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	20.4	sec		
Idling Time (Average)	11.3	sec		
Intersection Level of Service (LOS)	LOS C			
95% Back of Queue - Vehicles (Worst Lane)	17.7	veh		
95% Back of Queue - Distance (Worst Lane)	448.6	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.11			
Total Effective Stops	2012	veh/h	2414	pers/h
Effective Stop Rate	1.01		1.01	
Proportion Queued	0.78		0.78	
Performance Index	123.0		123.0	
Cost (Total)	829.90	$/h	829.90	$/h
Fuel Consumption (Total)	49.7	gal/h		
Carbon Dioxide (Total)	443.8	kg/h		
Hydrocarbons (Total)	0.041	kg/h		
Carbon Monoxide (Total)	0.531	kg/h		
NOx (Total)	0.531	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 93.2% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	954,122	veh/y	1,144,947	pers/y
Delay	5,406	veh-h/y	6,487	pers-h/y
Effective Stops	965,759	veh/y	1,158,911	pers/y
Travel Distance	521,533	veh-mi/y	625,840	pers-mi/y

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Conditions)]

2030 Build PM Peak
Site Category: Existing Design
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	624	2.0	684	0.914	100	40.8	LOS E	17.7	448.6	Full	1600	0.0	0.0
Approach	624	2.0		0.914		40.8	LOS E	17.7	448.6				
East: WV 115													
Lane 1[d]	528	2.0	954	0.553	100	11.1	LOS B	4.8	122.7	Full	1000	0.0	0.0
Approach	528	2.0		0.553		11.1	LOS B	4.8	122.7				
North: Citizens Way													
Lane 1[d]	216	2.0	758	0.285	100	8.1	LOS A	1.3	32.4	Full	1600	0.0	0.0
Approach	216	2.0		0.285		8.1	LOS A	1.3	32.4				
West: WV 115													
Lane 1[d]	619	2.0	1013	0.612	100	12.0	LOS B	6.6	168.9	Full	1600	0.0	0.0
Approach	619	2.0		0.612		12.0	LOS B	6.6	168.9				
Intersection	1988	2.0		0.914		20.4	LOS C	17.7	448.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	78	184	363	624	2.0	684	0.914	100	NA	NA
Approach	78	184	363	624	2.0		0.914			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	124	355	48	528	2.0	954	0.553	100	NA	NA

Approach	124	355	48	528	2.0		0.553				
North: Citizens Way											
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	127	28	62	216	2.0	758	0.285	100	NA	NA	
Approach	127	28	62	216	2.0		0.285				
West: WV 115											
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	74	455	90	619	2.0	1013	0.612	100	NA	NA	
Approach	74	455	90	619	2.0		0.612				
	Total	%HV	Deg.Satn (v/c)								
Intersection	1988	2.0		0.914							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

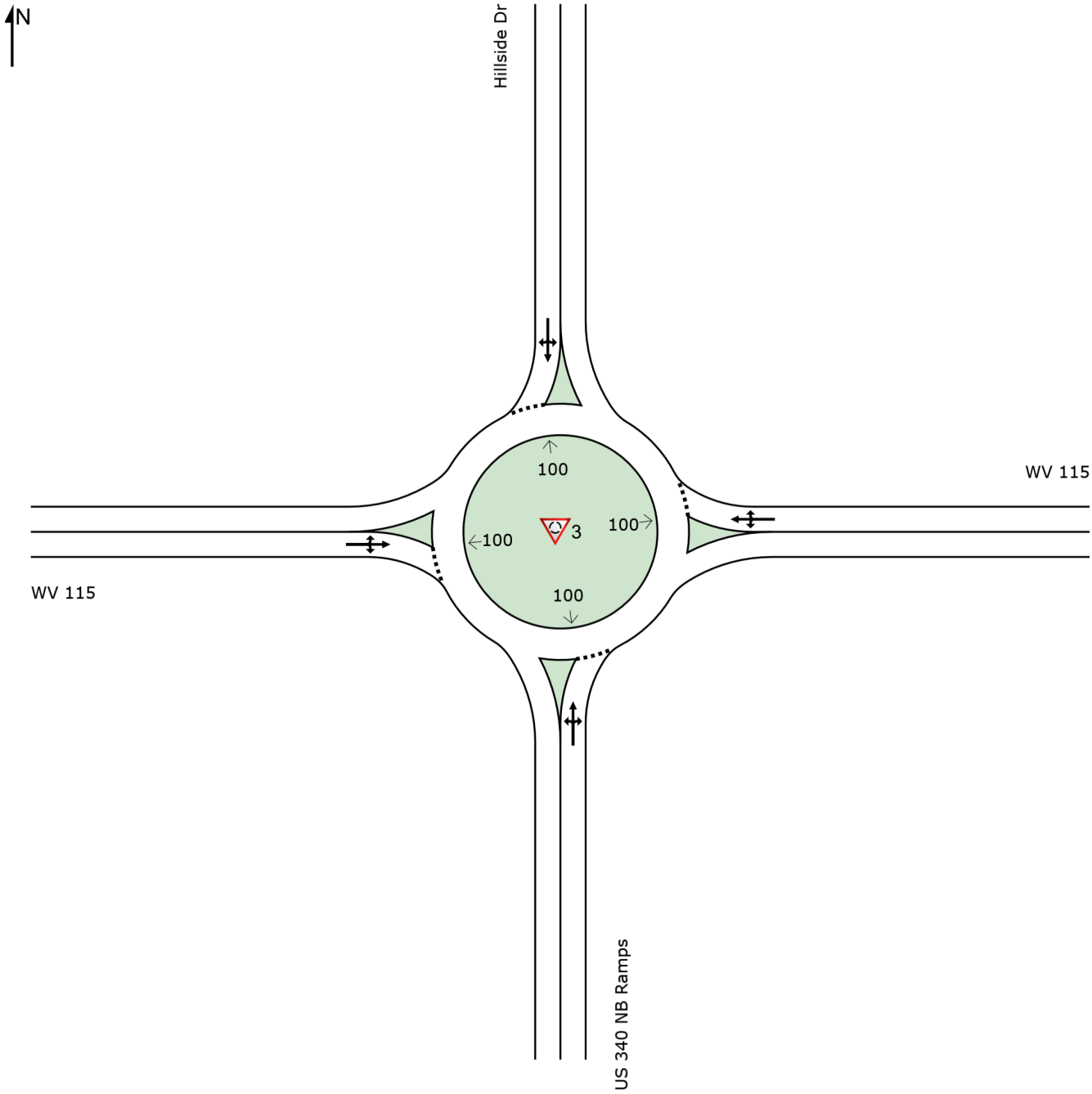
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Conditions)]

2030 Build PM Peak
Site Category: Proposed Design 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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INTERSECTION SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Conditions)]

2030 Build PM Peak
Site Category: Proposed Design 1
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	24.3	mph	24.3	mph
Travel Distance (Total)	1073.2	veh-mi/h	1287.8	pers-mi/h
Travel Time (Total)	44.2	veh-h/h	53.0	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.61			
Travel Time Index	5.64			
Congestion Coefficient	1.65			
Demand Flows (Total)	1990	veh/h	2388	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.978			
Practical Spare Capacity	-13.1	%		
Effective Intersection Capacity	2035	veh/h		
Control Delay (Total)	15.00	veh-h/h	18.00	pers-h/h
Control Delay (Average)	27.1	sec	27.1	sec
Control Delay (Worst Lane)	43.0	sec		
Control Delay (Worst Movement)	43.0	sec	43.0	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	27.1	sec		
Idling Time (Average)	14.1	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	49.6	veh		
95% Back of Queue - Distance (Worst Lane)	1259.2	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.32			
Total Effective Stops	2362	veh/h	2835	pers/h
Effective Stop Rate	1.19		1.19	
Proportion Queued	0.79		0.79	
Performance Index	192.4		192.4	
Cost (Total)	885.99	$/h	885.99	$/h
Fuel Consumption (Total)	51.7	gal/h		
Carbon Dioxide (Total)	461.6	kg/h		
Hydrocarbons (Total)	0.044	kg/h		
Carbon Monoxide (Total)	0.537	kg/h		
NOx (Total)	0.563	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 94.2% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	955,304	veh/y	1,146,365	pers/y
Delay	7,201	veh-h/y	8,641	pers-h/y
Effective Stops	1,133,807	veh/y	1,360,568	pers/y
Travel Distance	515,118	veh-mi/y	618,141	pers-mi/y

LANE SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Conditions)]

2030 Build PM Peak
Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 NB Ramps													
Lane 1[d]	271	2.0	607	0.446	100	12.9	LOS B	2.5	62.5	Full	1600	0.0	0.0
Approach	271	2.0		0.446		12.9	LOS B	2.5	62.5				
East: WV 115													
Lane 1[d]	702	2.0	1192	0.589	100	10.2	LOS B	4.8	123.1	Full	1000	0.0	0.0
Approach	702	2.0		0.589		10.2	LOS B	4.8	123.1				
North: Hillside Dr													
Lane 1[d]	10	2.0	580	0.017	100	6.4	LOS A	0.1	1.6	Full	1600	0.0	0.0
Approach	10	2.0		0.017		6.4	LOS A	0.1	1.6				
West: WV 115													
Lane 1[d]	1008	2.0	1030	0.978	100	43.0	LOS E	49.6	1259.2	Full	1600	0.0	0.0
Approach	1008	2.0		0.978		43.0	LOS E	49.6	1259.2				
Intersection	1990	2.0		0.978		27.1	LOS D	49.6	1259.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	113	1	157	271	2.0	607	0.446	100	NA	NA
Approach	113	1	157	271	2.0		0.446			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	255	446	1	702	2.0	1192	0.589	100	NA	NA

Approach	255	446	1	702	2.0		0.589			
North: Hillside Dr										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	5	3	10	2.0	580	0.017	100	NA	NA
Approach	1	5	3	10	2.0		0.017			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	762	238	1008	2.0	1030	0.978	100	NA	NA
Approach	8	762	238	1008	2.0		0.978			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1990	2.0		0.978						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 NB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Hillside Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

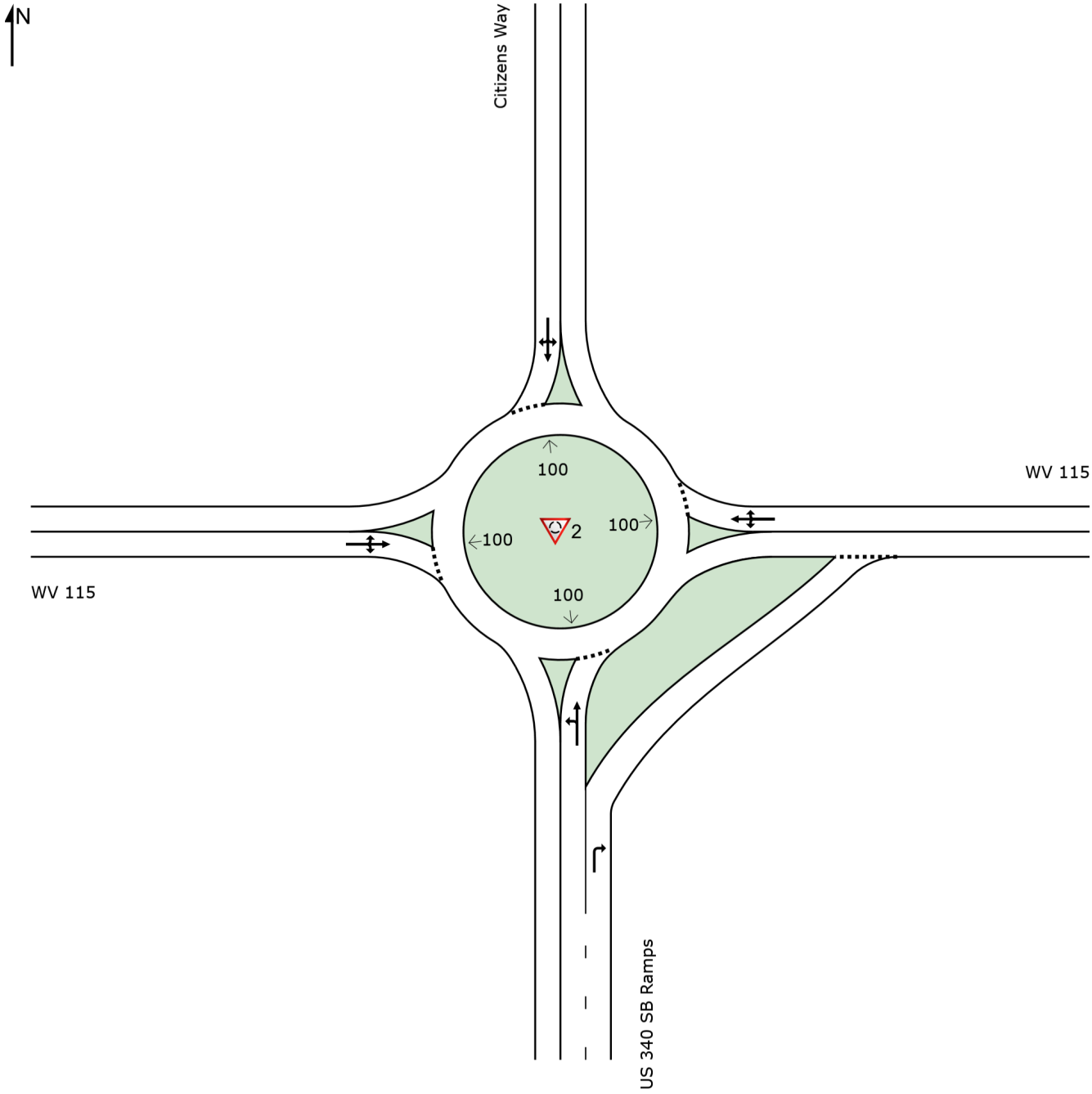
APPENDIX E-7: 2030 BUILD IMPROVED AM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved AM Peak
Site Category: Proposed Design 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved AM Peak
Site Category: Proposed Design 1
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	30.6	mph	30.6	mph
Travel Distance (Total)	933.3	veh-mi/h	1120.0	pers-mi/h
Travel Time (Total)	30.5	veh-h/h	36.6	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.76			
Travel Time Index	7.39			
Congestion Coefficient	1.31			
Demand Flows (Total)	1708	veh/h	2050	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.574			
Practical Spare Capacity	48.1	%		
Effective Intersection Capacity	2976	veh/h		
Control Delay (Total)	4.88	veh-h/h	5.86	pers-h/h
Control Delay (Average)	10.3	sec	10.3	sec
Control Delay (Worst Lane)	12.5	sec		
Control Delay (Worst Movement)	12.5	sec	12.5	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	10.3	sec		
Idling Time (Average)	6.3	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	4.2	veh		
95% Back of Queue - Distance (Worst Lane)	107.7	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.04			
Total Effective Stops	1050	veh/h	1260	pers/h
Effective Stop Rate	0.61		0.61	
Proportion Queued	0.64		0.64	
Performance Index	62.7		62.7	
Cost (Total)	637.32	$/h	637.32	$/h
Fuel Consumption (Total)	40.5	gal/h		
Carbon Dioxide (Total)	362.0	kg/h		
Hydrocarbons (Total)	0.033	kg/h		
Carbon Monoxide (Total)	0.441	kg/h		
NOx (Total)	0.434	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 93.5% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	819,907	veh/y	983,888	pers/y
Delay	2,343	veh-h/y	2,812	pers-h/y
Effective Stops	503,969	veh/y	604,763	pers/y
Travel Distance	447,984	veh-mi/y	537,581	pers-mi/y

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved AM Peak
Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	169	2.0	833	0.202	100	6.4	LOS A	0.8	20.7	Full	1600	0.0	0.0
Lane 2	156	2.0	854	0.182	100	6.1	LOS A	0.7	18.5	Full	1600	0.0	0.0
Approach	324	2.0		0.202		6.3	LOS A	0.8	20.7				
East: WV 115													
Lane 1[d]	634	2.0	1104	0.574	100	10.4	LOS B	4.2	107.7	Full	1000	0.0	0.0
Approach	634	2.0		0.574		10.4	LOS B	4.2	107.7				
North: Citizens Way													
Lane 1[d]	303	2.0	653	0.465	100	12.5	LOS B	2.7	69.7	Full	1600	0.0	0.0
Approach	303	2.0		0.465		12.5	LOS B	2.7	69.7				
West: WV 115													
Lane 1[d]	447	2.0	848	0.526	100	11.5	LOS B	4.1	103.9	Full	1600	0.0	0.0
Approach	447	2.0		0.526		11.5	LOS B	4.1	103.9				
Intersection	1708	2.0		0.574		10.3	LOS B	4.2	107.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	91	78	-	169	2.0	833	0.202	100	NA	NA
Lane 2	-	-	156	156	2.0	854	0.182	100	NA	NA
Approach	91	78	156	324	2.0		0.202			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	200	409	24	634	2.0	1104	0.574	100	NA	NA
Approach	200	409	24	634	2.0		0.574			
North: Citizens Way										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	201	48	55	303	2.0	653	0.465	100	NA	NA
Approach	201	48	55	303	2.0		0.465			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	27	326	94	447	2.0	848	0.526	100	NA	NA
Approach	27	326	94	447	2.0		0.526			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1708	2.0	0.574							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

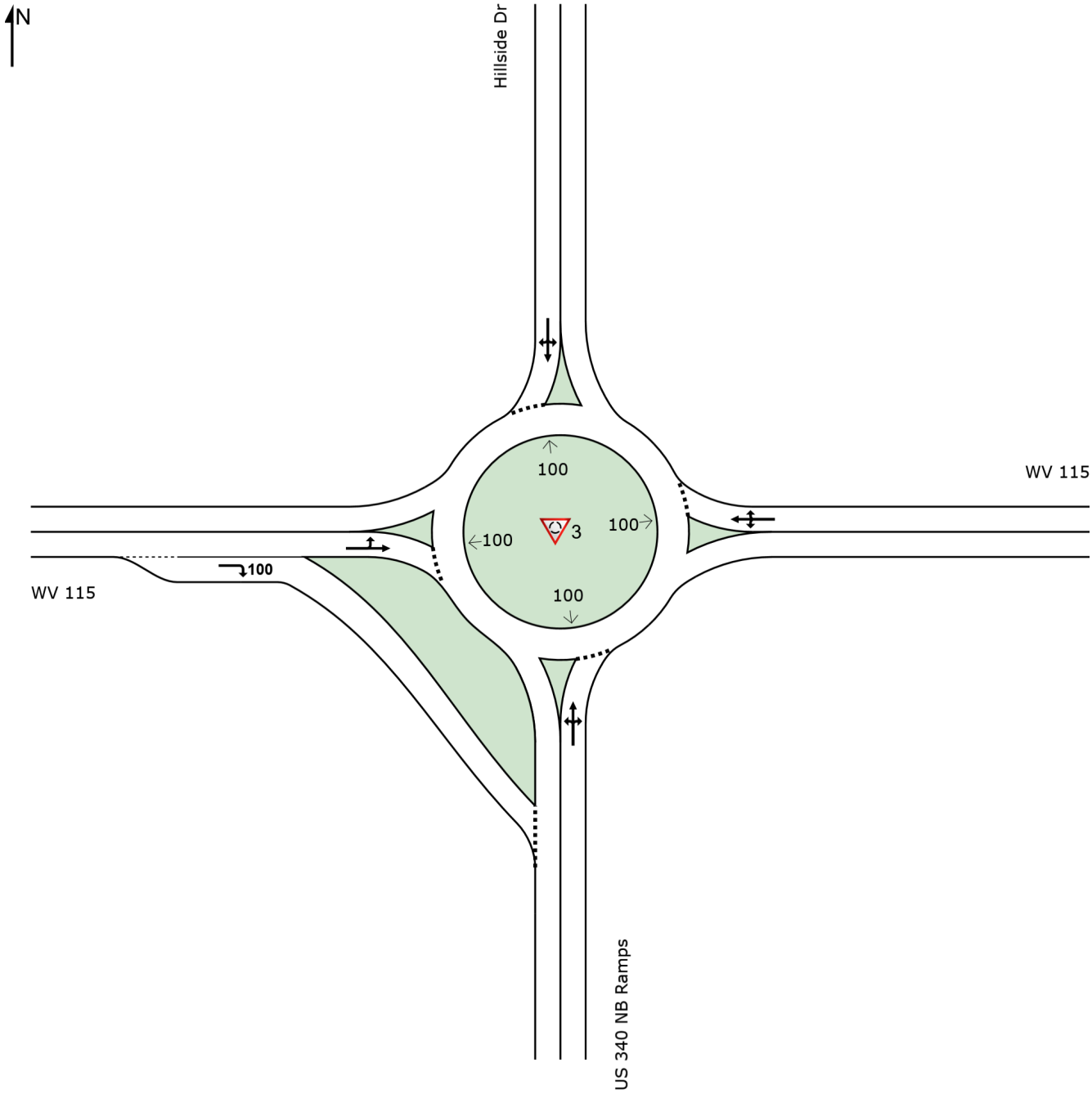
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved AM Peak
Site Category: Proposed Design 2
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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INTERSECTION SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved AM Peak
Site Category: Proposed Design 2
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	31.7	mph	31.7	mph
Travel Distance (Total)	862.3	veh-mi/h	1034.7	pers-mi/h
Travel Time (Total)	27.2	veh-h/h	32.6	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.79			
Travel Time Index	7.69			
Congestion Coefficient	1.26			
Demand Flows (Total)	1579	veh/h	1895	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.639			
Practical Spare Capacity	33.0	%		
Effective Intersection Capacity	2471	veh/h		
Control Delay (Total)	3.75	veh-h/h	4.49	pers-h/h
Control Delay (Average)	8.5	sec	8.5	sec
Control Delay (Worst Lane)	10.8	sec		
Control Delay (Worst Movement)	10.8	sec	10.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	8.5	sec		
Idling Time (Average)	6.5	sec		
Intersection Level of Service (LOS)	LOS A			
95% Back of Queue - Vehicles (Worst Lane)	6.5	veh		
95% Back of Queue - Distance (Worst Lane)	164.3	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.07			
Total Effective Stops	391	veh/h	469	pers/h
Effective Stop Rate	0.25		0.25	
Proportion Queued	0.40		0.40	
Performance Index	47.7		47.7	
Cost (Total)	564.68	$/h	564.68	$/h
Fuel Consumption (Total)	35.4	gal/h		
Carbon Dioxide (Total)	316.9	kg/h		
Hydrocarbons (Total)	0.028	kg/h		
Carbon Monoxide (Total)	0.392	kg/h		
NOx (Total)	0.379	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 94.5% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	757,978	veh/y	909,574	pers/y
Delay	1,798	veh-h/y	2,157	pers-h/y
Effective Stops	187,657	veh/y	225,188	pers/y
Travel Distance	413,884	veh-mi/y	496,660	pers-mi/y

LANE SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved AM Peak
Site Category: Proposed Design 2
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 NB Ramps													
Lane 1[d]	98	2.0	979	0.100	100	4.6	LOS A	0.4	10.7	Full	1600	0.0	0.0
Approach	98	2.0		0.100		4.6	LOS A	0.4	10.7				
East: WV 115													
Lane 1[d]	823	2.0	1288	0.639	100	10.8	LOS B	6.5	164.3	Full	1000	0.0	0.0
Approach	823	2.0		0.639		10.8	LOS B	6.5	164.3				
North: Hillside Dr													
Lane 1[d]	13	2.0	550	0.024	100	6.8	LOS A	0.1	2.2	Full	1600	0.0	0.0
Approach	13	2.0		0.024		6.8	LOS A	0.1	2.2				
West: WV 115													
Lane 1[d]	310	2.0	1073	0.289	100	6.2	LOS A	1.4	34.3	Full	1600	0.0	0.0
Lane 2	335	2.0	1074	0.312	100	6.4	LOS A	1.5	38.0	Short	100	0.0	NA
Approach	645	2.0		0.312		6.3	LOS A	1.5	38.0				
Intersection	1579	2.0		0.639		8.5	LOS A	6.5	164.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	1	54	98	2.0	979	0.100	100	NA	NA
Approach	43	1	54	98	2.0		0.100			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	274	548	1	823	2.0	1288	0.639	100	NA	NA

Approach	274	548	1	823	2.0		0.639			
North: Hillside Dr										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	5	7	13	2.0	550	0.024	100	NA	NA
Approach	1	5	7	13	2.0		0.024			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	3	307	-	310	2.0	1073	0.289	100	NA	NA
Lane 2	-	-	335	335	2.0	1074	0.312	100	0.0	1
Approach	3	307	335	645	2.0		0.312			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1579	2.0		0.639						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 NB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Hillside Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

APPENDIX E-8: 2030 BUILD IMPROVED PM PEAK HOUR

SITE LAYOUT

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved PM Peak
Site Category: Proposed Design 1
Roundabout

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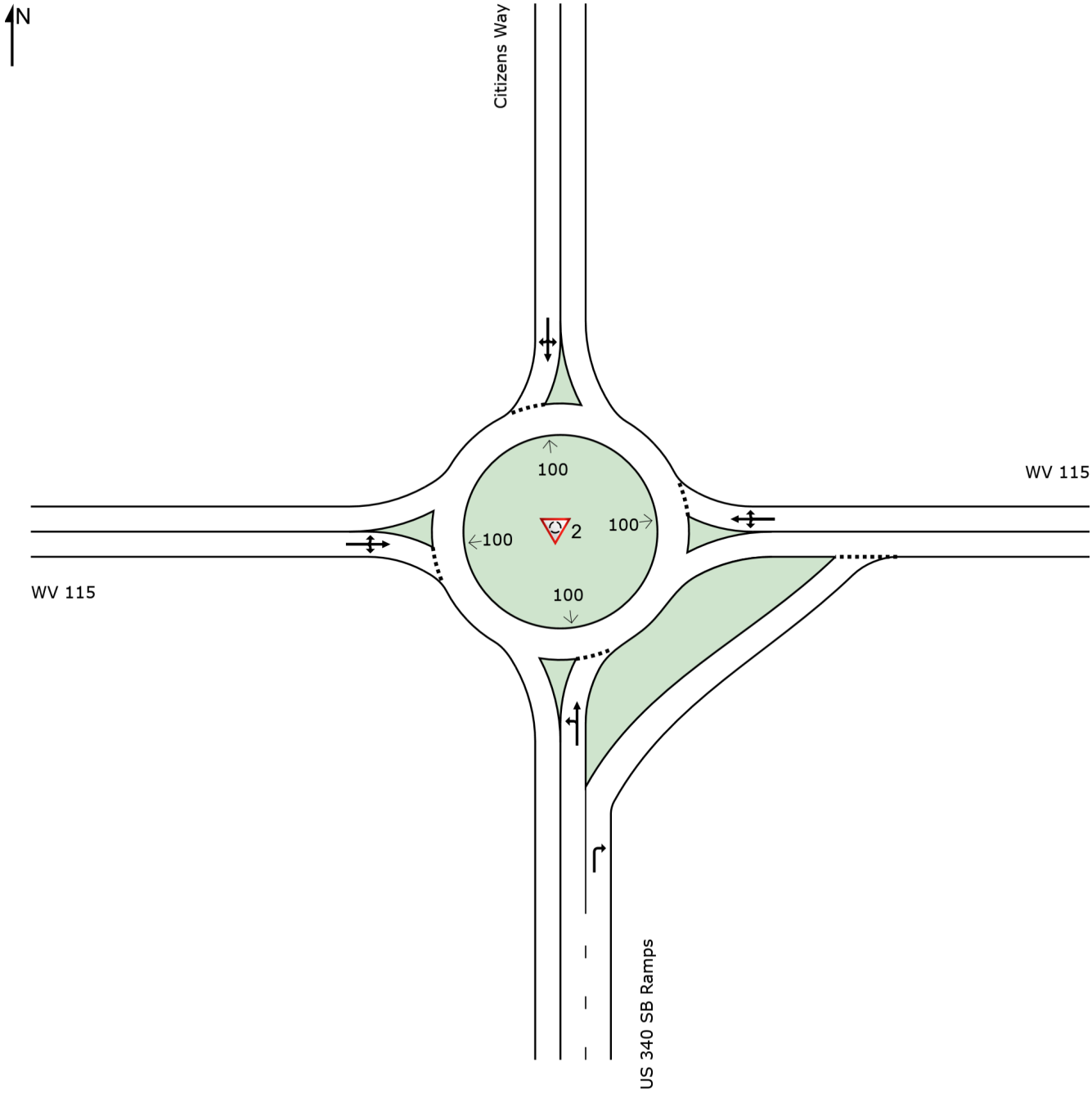

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INTERSECTION SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved PM Peak
Site Category: Proposed Design 1
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	30.6	mph	30.6	mph
Travel Distance (Total)	1086.5	veh-mi/h	1303.8	pers-mi/h
Travel Time (Total)	35.5	veh-h/h	42.6	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.77			
Travel Time Index	7.39			
Congestion Coefficient	1.31			
Demand Flows (Total)	1988	veh/h	2385	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.612			
Practical Spare Capacity	39.0	%		
Effective Intersection Capacity	3249	veh/h		
Control Delay (Total)	5.87	veh-h/h	7.04	pers-h/h
Control Delay (Average)	10.6	sec	10.6	sec
Control Delay (Worst Lane)	12.0	sec		
Control Delay (Worst Movement)	12.0	sec	12.0	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	10.6	sec		
Idling Time (Average)	5.9	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	6.6	veh		
95% Back of Queue - Distance (Worst Lane)	168.9	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.05			
Total Effective Stops	1379	veh/h	1654	pers/h
Effective Stop Rate	0.69		0.69	
Proportion Queued	0.67		0.67	
Performance Index	76.1		76.1	
Cost (Total)	739.44	$/h	739.44	$/h
Fuel Consumption (Total)	46.8	gal/h		
Carbon Dioxide (Total)	417.9	kg/h		
Hydrocarbons (Total)	0.038	kg/h		
Carbon Monoxide (Total)	0.512	kg/h		
NOx (Total)	0.504	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 92.4% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	954,122	veh/y	1,144,947	pers/y
Delay	2,816	veh-h/y	3,379	pers-h/y
Effective Stops	661,748	veh/y	794,098	pers/y
Travel Distance	521,532	veh-mi/y	625,839	pers-mi/y

LANE SUMMARY

Site: 2 [WV 115 w US 340 SB/Citizens Way (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved PM Peak
Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 SB Ramps													
Lane 1[d]	261	2.0	757	0.345	100	9.0	LOS A	1.5	39.4	Full	1600	0.0	0.0
Lane 2	363	2.0	811	0.448	100	10.2	LOS B	2.6	66.5	Full	1600	0.0	0.0
Approach	624	2.0		0.448		9.7	LOS A	2.6	66.5				
East: WV 115													
Lane 1[d]	528	2.0	954	0.553	100	11.1	LOS B	4.8	122.7	Full	1000	0.0	0.0
Approach	528	2.0		0.553		11.1	LOS B	4.8	122.7				
North: Citizens Way													
Lane 1[d]	216	2.0	758	0.285	100	8.1	LOS A	1.3	32.4	Full	1600	0.0	0.0
Approach	216	2.0		0.285		8.1	LOS A	1.3	32.4				
West: WV 115													
Lane 1[d]	619	2.0	1013	0.612	100	12.0	LOS B	6.6	168.9	Full	1600	0.0	0.0
Approach	619	2.0		0.612		12.0	LOS B	6.6	168.9				
Intersection	1988	2.0		0.612		10.6	LOS B	6.6	168.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 SB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	78	184	-	261	2.0	757	0.345	100	NA	NA
Lane 2	-	-	363	363	2.0	811	0.448	100	NA	NA
Approach	78	184	363	624	2.0		0.448			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	124	355	48	528	2.0	954	0.553	100	NA	NA
Approach	124	355	48	528	2.0		0.553			
North: Citizens Way										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	127	28	62	216	2.0	758	0.285	100	NA	NA
Approach	127	28	62	216	2.0		0.285			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	74	455	90	619	2.0	1013	0.612	100	NA	NA
Approach	74	455	90	619	2.0		0.612			

	Total	%HV	Deg.Satn (v/c)
Intersection	1988	2.0	0.612

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

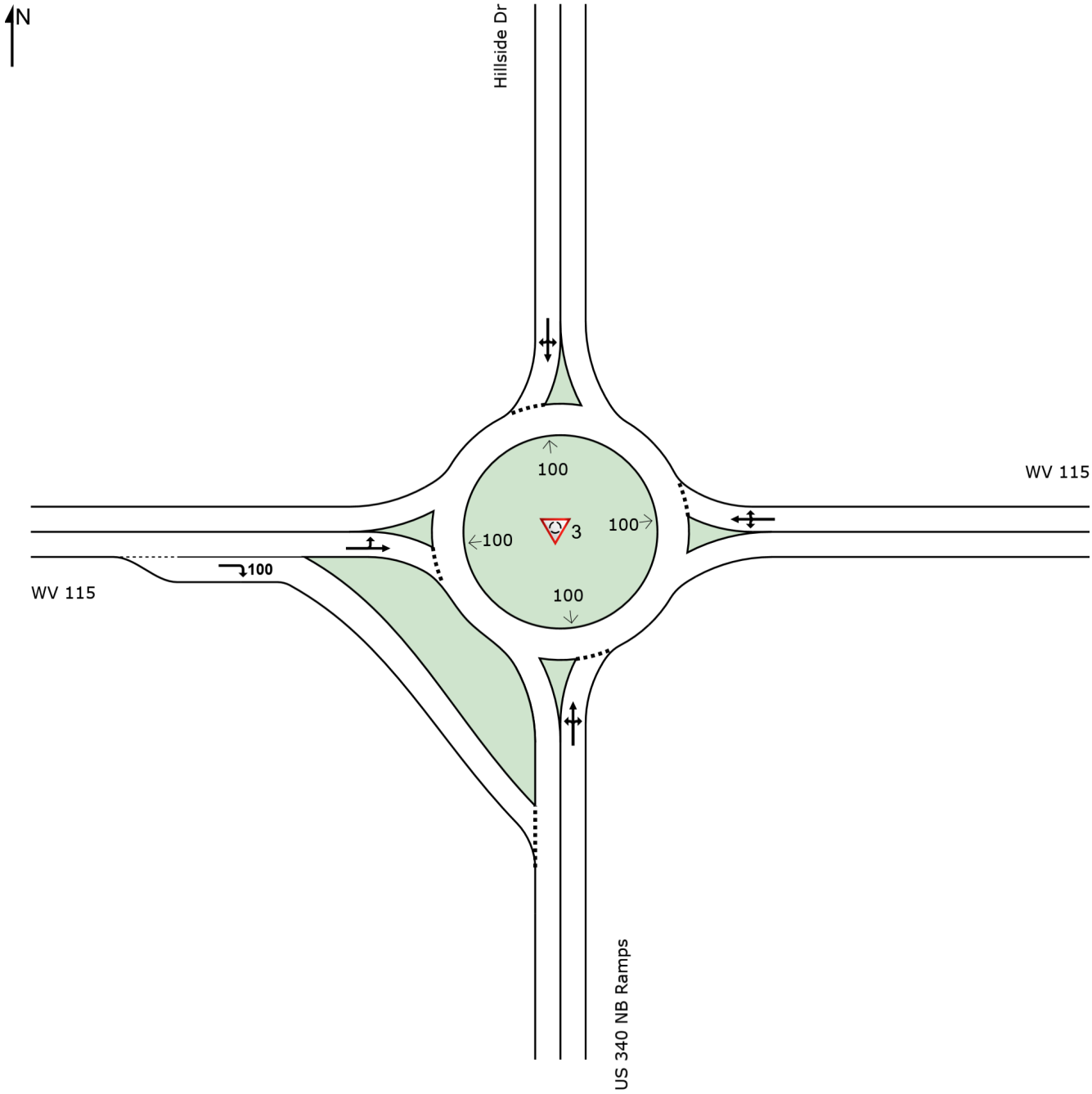
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 SB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Citizens Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved PM Peak
Site Category: Proposed Design 2
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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INTERSECTION SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved PM Peak
Site Category: Proposed Design 2
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Travel Speed (Average)	30.2	mph	30.2	mph
Travel Distance (Total)	1073.2	veh-mi/h	1287.8	pers-mi/h
Travel Time (Total)	35.5	veh-h/h	42.6	pers-h/h
Desired Speed (Program)	40.0	mph		
Speed Efficiency	0.75			
Travel Time Index	7.28			
Congestion Coefficient	1.32			
Demand Flows (Total)	1990	veh/h	2388	pers/h
Percent Heavy Vehicles (Demand)	2.0	%		
Degree of Saturation	0.705			
Practical Spare Capacity	20.6	%		
Effective Intersection Capacity	2823	veh/h		
Control Delay (Total)	6.38	veh-h/h	7.65	pers-h/h
Control Delay (Average)	11.5	sec	11.5	sec
Control Delay (Worst Lane)	14.3	sec		
Control Delay (Worst Movement)	14.3	sec	14.3	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	11.5	sec		
Idling Time (Average)	6.6	sec		
Intersection Level of Service (LOS)	LOS B			
95% Back of Queue - Vehicles (Worst Lane)	11.2	veh		
95% Back of Queue - Distance (Worst Lane)	283.3	ft		
Ave. Queue Storage Ratio (Worst Lane)	0.07			
Total Effective Stops	1156	veh/h	1387	pers/h
Effective Stop Rate	0.58		0.58	
Proportion Queued	0.62		0.62	
Performance Index	76.1		76.1	
Cost (Total)	737.37	$/h	737.37	$/h
Fuel Consumption (Total)	46.2	gal/h		
Carbon Dioxide (Total)	413.3	kg/h		
Hydrocarbons (Total)	0.038	kg/h		
Carbon Monoxide (Total)	0.504	kg/h		
NOx (Total)	0.501	kg/h		

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Site Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 94.2% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	955,304	veh/y	1,146,365	pers/y
Delay	3,061	veh-h/y	3,673	pers-h/y
Effective Stops	554,680	veh/y	665,616	pers/y
Travel Distance	515,117	veh-mi/y	618,141	pers-mi/y

LANE SUMMARY

Site: 3 [WV 115 w US 340 NB/Hillside Drive (Site Folder: 2030 Build Improved Conditions)]

2030 Build Improved PM Peak
Site Category: Proposed Design 2
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: US 340 NB Ramps													
Lane 1[d]	271	2.0	607	0.446	100	12.9	LOS B	2.5	62.5	Full	1600	0.0	0.0
Approach	271	2.0		0.446		12.9	LOS B	2.5	62.5				
East: WV 115													
Lane 1[d]	702	2.0	1192	0.589	100	10.2	LOS B	4.8	123.1	Full	1000	0.0	0.0
Approach	702	2.0		0.589		10.2	LOS B	4.8	123.1				
North: Hillside Dr													
Lane 1[d]	10	2.0	580	0.017	100	6.4	LOS A	0.1	1.6	Full	1600	0.0	0.0
Approach	10	2.0		0.017		6.4	LOS A	0.1	1.6				
West: WV 115													
Lane 1[d]	770	2.0	1092	0.705	100	14.3	LOS B	11.2	283.3	Full	1600	0.0	0.0
Lane 2	238	2.0	1093	0.218	100	5.3	LOS A	1.0	24.4	Short	100	0.0	NA
Approach	1008	2.0		0.705		12.2	LOS B	11.2	283.3				
Intersection	1990	2.0		0.705		11.5	LOS B	11.2	283.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: US 340 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	113	1	157	271	2.0	607	0.446	100	NA	NA
Approach	113	1	157	271	2.0		0.446			

East: WV 115

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	255	446	1	702	2.0	1192	0.589	100	NA	NA

Approach	255	446	1	702	2.0		0.589			
North: Hillside Dr										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	5	3	10	2.0	580	0.017	100	NA	NA
Approach	1	5	3	10	2.0		0.017			
West: WV 115										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	762	-	770	2.0	1092	0.705	100	NA	NA
Lane 2	-	-	238	238	2.0	1093	0.218	100	0.0	1
Approach	8	762	238	1008	2.0		0.705			
	Total	%HV	Deg.Satn (v/c)							
Intersection	1990	2.0		0.705						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: US 340 NB Ramps Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Hillside Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: WV 115 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

APPENDIX F: APPROVED ADJACENT DEVELOPMENTS

APPENDIX F-1: TATE MANOR TIS

Tate Manor Traffic Impact Study
Jefferson County, WV

AMT Project File 19-0073.001 | December 19, 2019 **REVISED**

PREPARED FOR:

Dan Ryan Builders
10212 Governor Lane Blvd, Suite 1006
Williamsport, MD 21795

A. MORTON THOMAS AND ASSOCIATES, INC.



PREPARED BY:

Timothy Kirk, PE, PTOE
A. Morton Thomas and Associates, Inc.
417 Grand Park Drive, Suite 104
Parkersburg, WV 26105
(304) 400-4952

Signature: Timothy Kirk Date: 12/19/19

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EXECUTIVE SUMMARY

This report summarizes the existing and future traffic analyses conducted in support of the proposed Tate Manor residential development. The proposed residential development will be located along the east side of Jefferson Avenue (CR 34) and north of Crescent Drive/High Street in Charles Town, Jefferson County. Site access is proposed to Jefferson Avenue, Belvedere Farm Lane, and an extension of Belvedere Drive from Crescent Drive. The proposed site includes 80 townhomes and is expected to be completed by 2024.

The site is proposed to be served by three site driveways – one full-movement connection to Jefferson Avenue, one full-movement connection to Belvedere Farm Lane, and one full-movement connection via extension of Belvedere Drive via Crescent Drive. The proposed site driveways are assumed to operate under stop-control.

The traffic analysis will consider future conditions at the anticipated build-out year of 2024. This report summarizes the analyses of 2019 Existing conditions, 2024 No-Build conditions (without the proposed development in place), and 2024 Build conditions (with the proposed development in place) during the weekday AM and PM peak hours. Traffic generated by the pending Magnolia Springs development is included in the No Build and Build Conditions analysis. The annual growth rate was provided by WVDOH at a compounded rate of 1.31% per year.

AMT (A. Morton Thomas and Associates, Inc.) was retained to determine the potential traffic impacts of the proposed residential development in accordance with the guidelines set forth by the WVDOH (Division of Highways) in Traffic Engineering Directive (TED) 106-2. The intention of the study is to fully examine the impacts of the traffic generated by the residential development on the existing transportation system and identify potential mitigation measures. This report presents trip generation, trip distribution, intersection capacity analysis, queuing analysis, auxiliary lane analysis, signal warrant analysis, and recommendations for transportation improvements required to meet anticipated traffic demands.

Based upon a review of the site plan and adjacent transportation network, the following seven (7) existing and one (1) proposed site driveway intersections are included within the scope of the Traffic Impact Study (TIS) for the proposed Tate Manor residential development:

1) Jefferson Avenue (CR 34) with Euclid Avenue *(Two-way Stop-Control Three-legged intersection)*
2) Euclid Avenue with Belvedere Farm Lane *(Two-way Stop-Control Three-legged intersection)*
3) Jefferson Avenue (CR 34) with High Street *(Two-way Stop-Control Three-legged intersection)*
4) Crescent Drive with Belvedere Drive *(Two-way Stop-Control Three-legged intersection)*
5) WV 115 with Jefferson Avenue (CR 34) *(Two-way Stop-Control Three-legged intersection)*
6) WV 115 with Citizens Way/US 340 *(Single-lane Roundabout Four-legged intersection)*
7) WV 115 with Hillside Drive/US 340 *(Two-way Stop-Control Four-legged intersection)*
8) Jefferson Avenue (CR 34) with Site Driveway #1 *(Proposed Two-way Stop-Control Three-legged intersection)*

The existing Two-way Stop-Control Three-legged intersection of Belvedere Drive with Crescent Drive will be the location of one of the three proposed site driveways. This site driveway will be located in line with Belvedere Drive on the north side of Crescent Drive and will create a fourth leg to the intersection. The

site driveway will be an extension of Belvedere Drive and will operate under stop control. Additional site access will be provided via direct access to Jefferson Avenue and extension of Belvedere Farm Lane, which connects to Euclid Avenue.

Hale Road currently dead ends prior to connection with Crescent Drive just west of Belvedere Drive, and there are no plans to connect these two streets. No traffic from Tate Manor will enter Jefferson Avenue via Hale Road and High Street, which avoids conflict with traffic from Charles Town Middle School.

Site Trip Generation and Distribution

The proposed Tate Manor residential development will include 80 townhomes. The trip generation "Peak Hour of Generator" rates from the ITE Trip Generation Manual, 10th Edition, were utilized for Multifamily Housing (LUC 220). The trip generation analysis indicates that a total of 564 new daily trips will be generated, which includes 39 new AM peak hour trips, and 48 new PM peak hour trips.

The AM and PM peak hour site generated trips to/from the proposed site were distributed based upon interpolation from current traffic patterns. The distribution of the new external trips are as follows:

- 35% to/from the north on US 340
- 10% to/from the south on US 340
- 5% to/from the west on WV 115
- 35% to/from the north on Jefferson Avenue (CR 34)
- 15% to/from the north on Euclid Avenue

2019 Existing Conditions Analysis

The capacity analysis indicates the westbound approach of Euclid Avenue to Jefferson Avenue (CR 34) currently operates at Level of Service (LOS) B during both the AM and PM peak hours with stop control. The southbound approach of Jefferson Avenue currently operates at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue operates as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the northbound Belvedere Farm Lane approach to Euclid Avenue currently operates at LOS A during both the AM and PM peak hour with stop control. The westbound Euclid Avenue approach to Belvedere Farm Lane currently operates at LOS A during both the AM and PM peak hours. The eastbound approach of Euclid Avenue operates as free-flow traveling unimpeded through the intersection.

Analysis indicates that the westbound approach of High Street to Jefferson Avenue currently operates at LOS C during the AM peak hour and LOS B during the PM peak hour with stop control. The southbound approach of Jefferson Avenue currently operates at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue operates as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the northbound Belvedere Drive approach to Crescent Drive currently operates at LOS A during both the AM and PM peak hours with stop control. The westbound Crescent Drive approach to Belvedere Drive currently operates at LOS A during both the AM and PM peak hours. The eastbound approach of Crescent Drive operates as free-flow traveling unimpeded through the

intersection. Hale Road currently dead ends prior to connection with Crescent Drive just west of Belvedere Drive, and there are no plans to connect these two streets.

Additional analysis indicates that the southbound Jefferson Avenue approach to WV 115 currently operates at LOS C during the AM peak hour and LOS E during the PM peak hour with stop control. The eastbound WV 115 approach to Jefferson Avenue currently operates at LOS A during both the AM and PM peak hours. The westbound approach of WV 115 operates as free-flow traveling unimpeded through the intersection.

The intersection of WV 115 with Citizens Way and the US 340 Southbound Ramps was recently modified to a four-legged roundabout. Analysis indicates that the eastbound WV 115 approach to Citizens Way currently operates at LOS A during both the AM and PM peak hours. The westbound WV 115 approach to Citizens Way currently operates at LOS A during both the AM and PM peak hours. The northbound US 340 ramps approach to WV 115 currently operates at LOS A during the AM peak hour and LOS B during the PM peak hour. The southbound Citizens Way approach to WV 115 currently operates at LOS A during both the AM and PM peak hours.

Further analysis indicates that the left turn movement on the eastbound WV 115 approach to Hillside Drive and the US 340 Northbound ramps currently operates at LOS A during both the AM and PM peak hours. The eastbound through movement travels uninhibited through the intersection. The left turn movement on the westbound WV 115 approach to Hillside Drive and the US 340 Northbound ramps currently operates at LOS A during both the AM and PM peak hours. The westbound through movement travels uninhibited through the intersection. The US 340 Northbound Ramps approach currently operates at LOS D during the AM peak hour and LOS F during the PM peak hour. The southbound Hillside Drive approach currently operates at LOS C during the AM peak hour and LOS D during the PM peak hour.

2024 No-Build Conditions Analysis

The 2024 No Build Conditions include the existing 2019 traffic volume, anticipated annual traffic growth to 2024, and the traffic anticipated to be generated by the Magnolia Springs development.

The capacity analysis indicates the westbound approach of Euclid Avenue to Jefferson Avenue (CR 34) will continue to operate at LOS B during both the AM and PM peak hours with stop control. The southbound approach of Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue will continue to operate as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the northbound Belvedere Farm Lane approach to Euclid Avenue will continue to operate at LOS A during both the AM and PM peak hour with stop control. The westbound Euclid Avenue approach to Belvedere Farm Lane will continue to operate at LOS A during both the AM and PM peak hours. The eastbound approach of Euclid Avenue will continue to operate as free-flow traveling unimpeded through the intersection.

Analysis indicates that the westbound approach of High Street to Jefferson Avenue is expected to operate at LOS D during the AM peak hour and LOS B during the PM peak hour with stop control. The southbound approach of Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue will continue to operate as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the northbound Belvedere Drive approach to Crescent Drive will continue to operate at LOS A during both the AM and PM peak hours with stop control. The westbound Crescent Drive approach to Belvedere Drive will continue to operate at LOS A during both the AM and PM peak hours. The eastbound approach of Crescent Drive will continue to operate as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the southbound Jefferson Avenue approach to WV 115 is expected to operate at LOS C during the AM peak hour and LOS F during the PM peak hour with stop control in the No Build Condition. The eastbound WV 115 approach to Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The westbound approach of WV 115 will continue to operate as free-flow traveling unimpeded through the intersection. The intersection can be improved to LOS A during the AM and PM peak hours considering No Build conditions if a traffic signal is installed prior to 2024.

The intersection of WV 115 with Citizens Way and the US 340 Southbound Ramps was recently modified to a four-legged single lane roundabout. Analysis indicates that the eastbound WV 115 approach to Citizens Way is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The westbound WV 115 approach to Citizens Way is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The northbound US 340 ramps approach to WV 115 is expected to operate at LOS A during the AM peak hour and LOS D during the PM peak hour. The southbound Citizens Way approach to WV 115 will continue to operate at LOS A during both the AM and PM peak hours. The LOS of the US 340 southbound ramp approach can be improved to LOS B in the PM peak hour considering Build conditions if a right turn slip is constructed.

The intersection of WV 115 with Hillside Drive and the US 340 Northbound Ramps is anticipated to be modified to a four-legged single lane roundabout to mirror the newly constructed roundabout at WV 115 with Citizens Drive by 2024. For this traffic study, it was assumed the roundabout would be constructed by 2024 and thus included in the No-Build and Build Conditions. Analysis indicates that the eastbound WV 115 approach to Hillside Drive is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The westbound WV 115 approach to Hillside Drive is expected to operate at LOS A during both the AM and PM peak hours. The northbound US 340 ramps approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours. The southbound Hillside Drive approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours.

2024 Build Conditions Analysis

The 2024 Build Conditions include the existing 2019 traffic volume, anticipated annual traffic growth to 2024, traffic anticipated to be generated by the Magnolia Springs development, and the traffic generated by the Tate Manor development.

The capacity analysis indicates the westbound approach of Euclid Avenue to Jefferson Avenue will continue to operate at LOS B during both the AM and PM peak hours with stop control. The southbound approach of Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue will continue to operate as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the northbound Belvedere Farm Lane approach to Euclid Avenue will continue to operate at LOS A during both the AM and PM peak hour with stop control. The westbound

Euclid Avenue approach to Belvedere Farm Lane will continue to operate at LOS A during both the AM and PM peak hours. The eastbound approach of Euclid Avenue will continue to operate as free-flow traveling unimpeded through the intersection.

Analysis indicates that the westbound approach of High Street to Jefferson Avenue will continue to operate at LOS D during the AM peak hour and LOS B during the PM peak hour with stop control. The southbound approach of Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue will continue to operate as free-flow traveling unimpeded through the intersection. Hale Road currently dead ends prior to connection with Crescent Drive just west of Belvedere Drive, and there are no plans to connect these two streets. No traffic from Tate Manor will enter Jefferson Avenue via Hale Road and High Street, which avoids conflict with traffic from Charles Town Middle School.

Additional analysis indicates that the northbound Belvedere Drive approach to Crescent Drive will continue to operate at LOS A during both the AM and PM peak hours with stop control. The proposed southbound Belvedere Drive approach to Crescent Drive is expected to operate at LOS A during both the AM and PM peak hours with stop control. The westbound Crescent Drive approach to Belvedere Drive will continue to operate at LOS A during both the AM and PM peak hours. The eastbound approach of Crescent Drive will continue to operate as free-flow traveling unimpeded through the intersection. Crescent Drive dead ends immediately west of Belvedere Drive.

Additional analysis indicates that the southbound Jefferson Avenue approach to WV 115 is expected to operate at LOS D during the AM peak hour and LOS F during the PM peak hour with stop control. The eastbound WV 115 approach to Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The westbound approach of WV 115 will continue to operate as free-flow traveling unimpeded through the intersection. The intersection can be improved to LOS A during the AM and PM peak hours considering Build conditions if a traffic signal is installed prior to 2024.

The intersection of WV 115 with Citizens Way and the US 340 Southbound Ramps was recently modified to a four-legged single lane roundabout. Analysis indicates that the eastbound WV 115 approach to Citizens Way will continue to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The westbound WV 115 approach to Citizens Way will continue to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The northbound US 340 ramps approach to WV 115 will continue to operate at LOS A during the AM peak hour and LOS D during the PM peak hour. The southbound Citizens Way approach to WV 115 will continue to operate at LOS A during both the AM and PM peak hours. The LOS of the US 340 southbound ramp approach can be improved to LOS B in the PM peak hour considering No Build conditions if a right turn slip lane is constructed.

The intersection of WV 115 with Hillside Drive and the US 340 Northbound Ramps is anticipated to be modified to a four-legged single lane roundabout to mirror the newly constructed roundabout at WV 115 with Citizens Drive. For this traffic study, it was assumed the roundabout would be constructed by 2024 and thus included in the No-Build and Build Conditions. Analysis indicates that the eastbound WV 115 approach to Hillside Drive is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The westbound WV 115 approach to Hillside Drive is expected to operate at LOS A during both the AM and PM peak hours. The northbound US 340 ramps approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours. The southbound Hillside Drive approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours.

Further analysis indicates that the westbound Site Drive #1 approach is expected to operate at LOS B during both the AM and PM peak hours with stop control. The southbound Jefferson Avenue approach is expected to operate at LOS A during both the AM and PM peak hours. The northbound Jefferson Avenue approach is expected to operate as free-flow traveling unimpeded through the intersection.

2024 Build Conditions Analysis

The 2024 Build Conditions include the existing 2019 traffic volume, anticipated annual traffic growth to 2024, traffic anticipated to be generated by the Magnolia Springs development, and the traffic generated by the Tate Manor development.

The 2024 Build Improved Conditions also includes a number of proposed roadway improvements that are to mitigate capacity issues along the existing transportation network. These are proposed to mitigate existing issues and not as a result of the proposed Tate Manor residential development. These improvements include, installing a traffic signal at the WV 115 with Jefferson Avenue intersection, constructing an exclusive left-turn lane on the eastbound WV 115 approach to Jefferson Avenue, and constructing an exclusive right-turn slip lane on the US 340 southbound exit ramp approach to WV 115.

The capacity analysis indicates the westbound approach of Euclid Avenue to Jefferson Avenue will continue to operate at LOS B during both the AM and PM peak hours with stop control. The southbound approach of Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue will continue to operate as free-flow traveling unimpeded through the intersection.

Additional analysis indicates that the northbound Belvedere Farm Lane approach to Euclid Avenue will continue to operate at LOS A during both the AM and PM peak hour with stop control. The westbound Euclid Avenue approach to Belvedere Farm Lane will continue to operate at LOS A during both the AM and PM peak hours with stop control. The eastbound approach of Euclid Avenue will continue to operate at LOS A during both the AM and PM peak hours with stop control. This intersection is proposed to be modified to an All-Way Stop-Control intersection with the completion of the proposed Magnolia Springs development.

Analysis indicates that the westbound approach of High Street to Jefferson Avenue will continue to operate at LOS D during the AM peak hour and LOS B during the PM peak hour with stop control. The southbound approach of Jefferson Avenue will continue to operate at LOS A during both the AM and PM peak hours. The northbound approach of Jefferson Avenue will continue to operate as free-flow traveling unimpeded through the intersection. Hale Road currently dead ends prior to connection with Crescent Drive just west of Belvedere Drive, and there are no plans to connect these two streets. No traffic from Tate Manor will enter Jefferson Avenue via Hale Road and High Street, which avoids conflict with traffic from Charles Town Middle School.

Additional analysis indicates that the northbound Belvedere Drive approach to Crescent Drive will continue to operate at LOS A during both the AM and PM peak hours with stop control. The proposed southbound Belvedere Drive approach to Crescent Drive is expected to operate at LOS A during both the AM and PM peak hours with stop control. The westbound Crescent Drive approach to Belvedere Drive will continue to operate at LOS A during both the AM and PM peak hours. The eastbound approach of Crescent Drive will continue to operate as free-flow traveling unimpeded through the intersection. Crescent Drive dead ends immediately west of Belvedere Drive.

The intersection is proposed to be modified to a signalized intersection with the addition of an exclusive left-turn lane on the eastbound WV 115 approach. Analysis indicates that the southbound Jefferson Avenue approach to WV 115 is expected to operate at LOS B during both the AM and PM peak hours with traffic-signal control. The eastbound WV 115 approach to Jefferson Avenue is expected to operate at LOS A during both the AM and PM peak hours with traffic-signal control. The westbound approach of WV 115 is expected to operate at LOS A during both the AM and PM peak hours with traffic-signal control. The overall intersection is expected to operate at LOS A during both the AM and PM peak hours.

The intersection of WV 115 with Citizens Way and the US 340 Southbound Ramps was recently modified to a four-legged single lane roundabout. Analysis indicates that the eastbound WV 115 approach to Citizens Way will continue to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The westbound WV 115 approach to Citizens Way will continue to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The northbound US 340 ramps approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours with the addition of a right-turn slip lane. The southbound Citizens Way approach to WV 115 will continue to operate at LOS A during both the AM and PM peak hours.

The intersection of WV 115 with Hillside Drive and the US 340 Northbound Ramps is anticipated to be modified to a four-legged single lane roundabout to mirror the newly constructed roundabout at WV 115 with Citizens Drive. For this traffic study, it was assumed the roundabout would be constructed by 2024 and thus included in the No-Build and Build Conditions. Analysis indicates that the eastbound WV 115 approach to Hillside Drive is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. The westbound WV 115 approach to Hillside Drive is expected to operate at LOS A during both the AM and PM peak hours. The northbound US 340 ramps approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours. The southbound Hillside Drive approach to WV 115 is expected to operate at LOS A during both the AM and PM peak hours.

Further analysis indicates that the westbound Site Drive #1 approach is expected to operate at LOS B during both the AM and PM peak hours with stop control. The southbound Jefferson Avenue approach is expected to operate at LOS A during both the AM and PM peak hours. The northbound Jefferson Avenue approach is expected to operate as free-flow traveling unimpeded through the intersection.

Conclusions/Recommendations

The proposed Tate Manor residential development will be located along the east side of Jefferson Avenue and north of Crescent Drive/High Street in Charles Town, Jefferson County, West Virginia. Site access is proposed to Jefferson Avenue, Belvedere Farm Lane, and an extension of Belvedere Drive from Crescent Drive. The proposed site includes 80 townhomes. The residential development is expected to be completed by 2024.

The site is proposed to be served by three site driveways – one full-movement connection to Jefferson Avenue, one full-movement connection to Belvedere Farm Lane, and one full-movement connection via extension of Belvedere Drive via Crescent Drive. The proposed site driveways are assumed to operate under stop-control.

The results of the capacity analyses and the queueing analyses indicate that the trips generated by the proposed site can be accommodated within the existing transportation network.

Based on the findings of this study, the following infrastructure improvements are recommended from evaluation of the Tate Manor Residential Traffic Impact Study maintain adequate operation of the existing transportation network:

Jefferson Avenue with Proposed Site Driveway #1

- Construct Site Driveway #1 as a full movement approach located approximately 250 feet north of the Jefferson Avenue and High Street intersection. The driveway should be constructed to provide one ingress lane and two egress lanes. The proposed driveway will operate under stop-control while Jefferson Avenue operates as free-flow.

Crescent Drive with Belvedere Drive (Proposed Site Driveway #2)

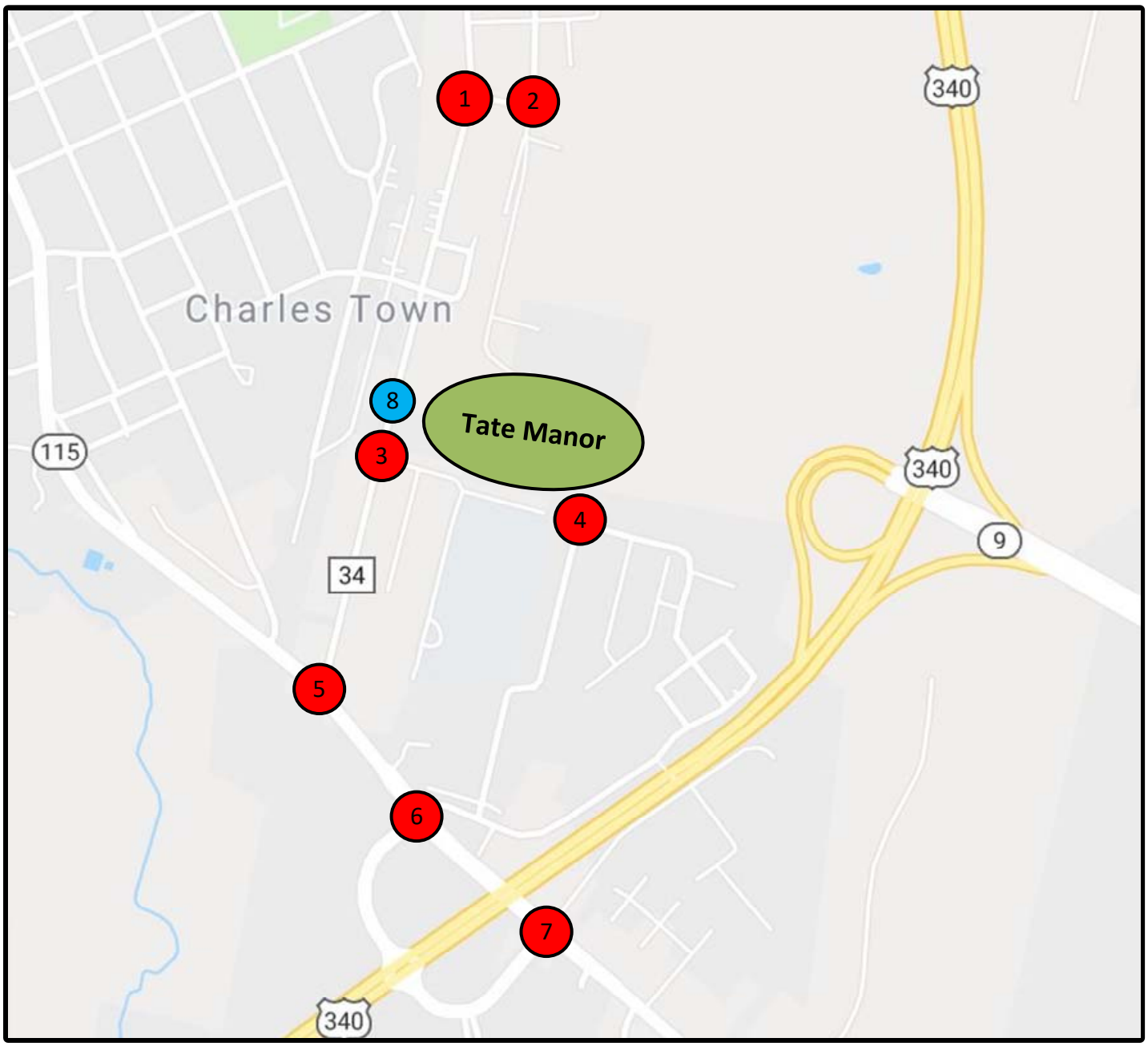
- Construct Site Driveway #2 as a full movement approach as an extension of Belvedere Drive, which will intersect with Crescent Drive opposite existing Belvedere Drive creating a plus type intersection. The driveway should be constructed to provide one ingress lane and one egress lanes. The proposed driveway will operate under stop-control while Crescent Drive operates as free-flow.

WV 115 with Jefferson Avenue

- It is recommended that the WVDOH further evaluate the need for a traffic signal at the intersection of WV 115 with Jefferson Avenue. Evaluation of existing peak hour conditions indicate that the MUTCD Peak Hour Warrant is met for the intersection. In addition, the No Build analysis indicates that LOS will deteriorate to LOS F during the PM peak hour by 2024 with Two Way Stop Control.

WV 115 with Citizens Way and the US 340 Southbound Ramps

- Ideally, consideration should be given to add a right turn slip lane on the US 340 southbound ramp approach to WV 115. The No Build analysis indicates that LOS will deteriorate to LOS D for the ramp approach during the PM peak hour by 2024 with the current configuration. Creating the right turn slip lane improves the ramp approach to LOS B.



LEGEND

= Proposed Site

= Existing Intersection

= Proposed Intersection

N

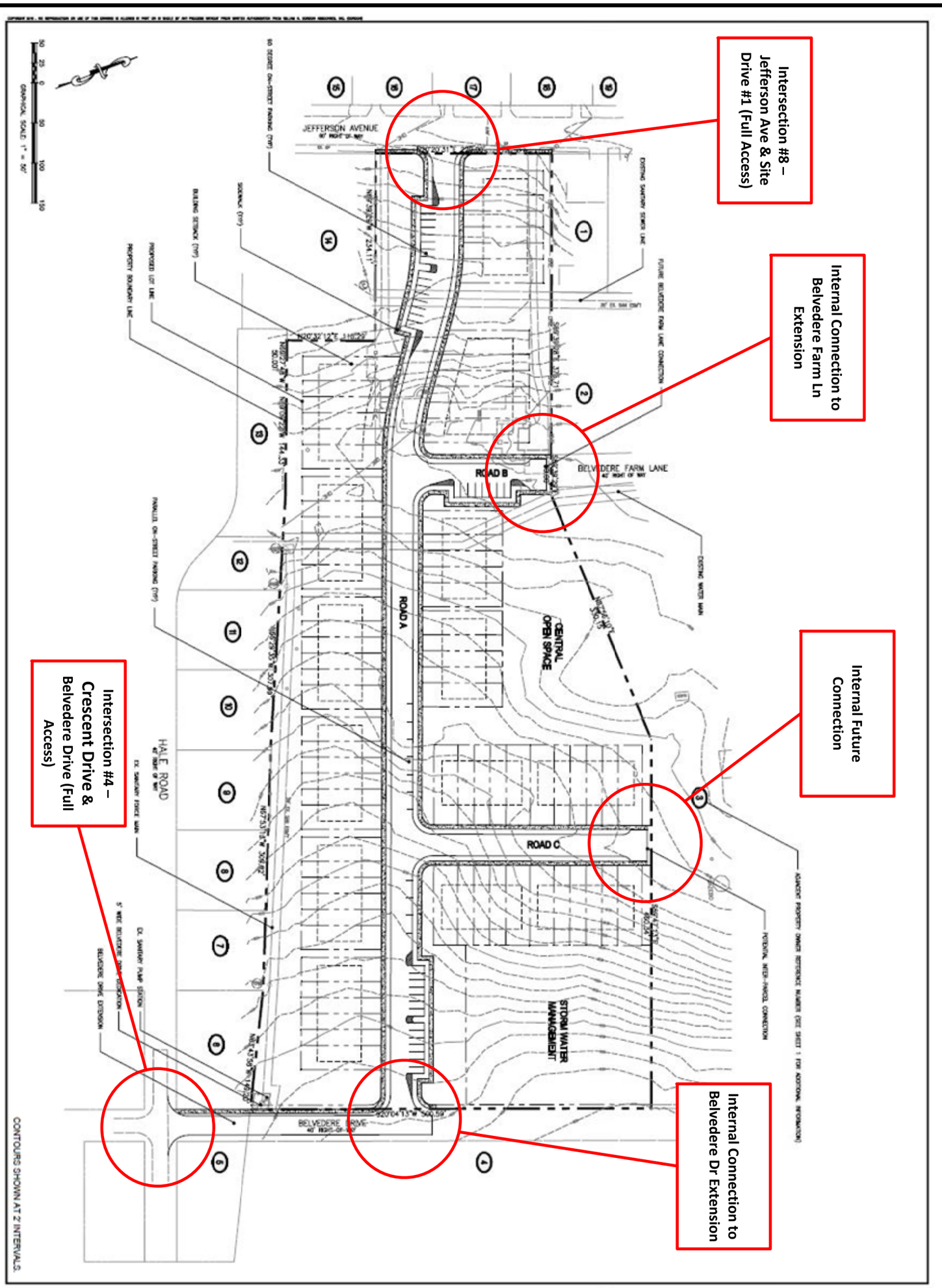
NOT TO SCALE

Tate Manor
Residential Development TIS

Site Location Map

DATE: December 2019

FIGURE 1



CONCEPTUAL PLAN

JEFFERSON HEIGHTS SOUTH SKETCH PLAN

City of CHARLES TOWN, WEST VIRGINIA

2019-02-12: REVISED PURSUANT TO CITY COMMENTS.

SCALE: HORIZ. 1" = 50' VERT.
DATE: February 4, 2019
JOB: 2280-0163
DRAWN:
CHKD: 2280 Sketch Plan.DWG
SHEET NO'S: 02 OF 02

Gordon
148 S. Queen Street, Suite 201
Martinsburg, WV 25401
Phone: 304-725-8456
www.gordonusa.com
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SECURITY CONSULTING

Tate Manor
Residential Development TIS

Site Plan

NOT TO SCALE

DATE: December 2019

FIGURE 2

TRIP GENERATION

The proposed residential development will be located along the east side of Jefferson Avenue and north of Crescent Drive/High Street in Charles Town, Jefferson County. Site access is proposed to Jefferson Avenue, Belvedere Farm Lane, and an extension of Belvedere Drive from Crescent Drive. The proposed site includes 80 townhomes and is expected to be completed by 2024. The trip generation "Peak Hour of Generator" rates from the ITE Trip Generation Manual, 10th Edition, were utilized for Multifamily Housing (LUC 220).

As shown in **Table 2** below, the proposed residential development will generate a total of 564 new daily trips, including 39 new AM peak hour, and 48 new PM peak hour trips.

Table 2: Trip Generation Summary

Description	LUC	Density		Daily Trips	AM Peak			PM Peak		
					Enter	Exit	Total	Enter	Exit	Total
Multifamily Housing	220	80	Units	564	9	30	39	30	18	48
Total				**564**	**9**	**30**	**39**	**30**	**18**	**48**

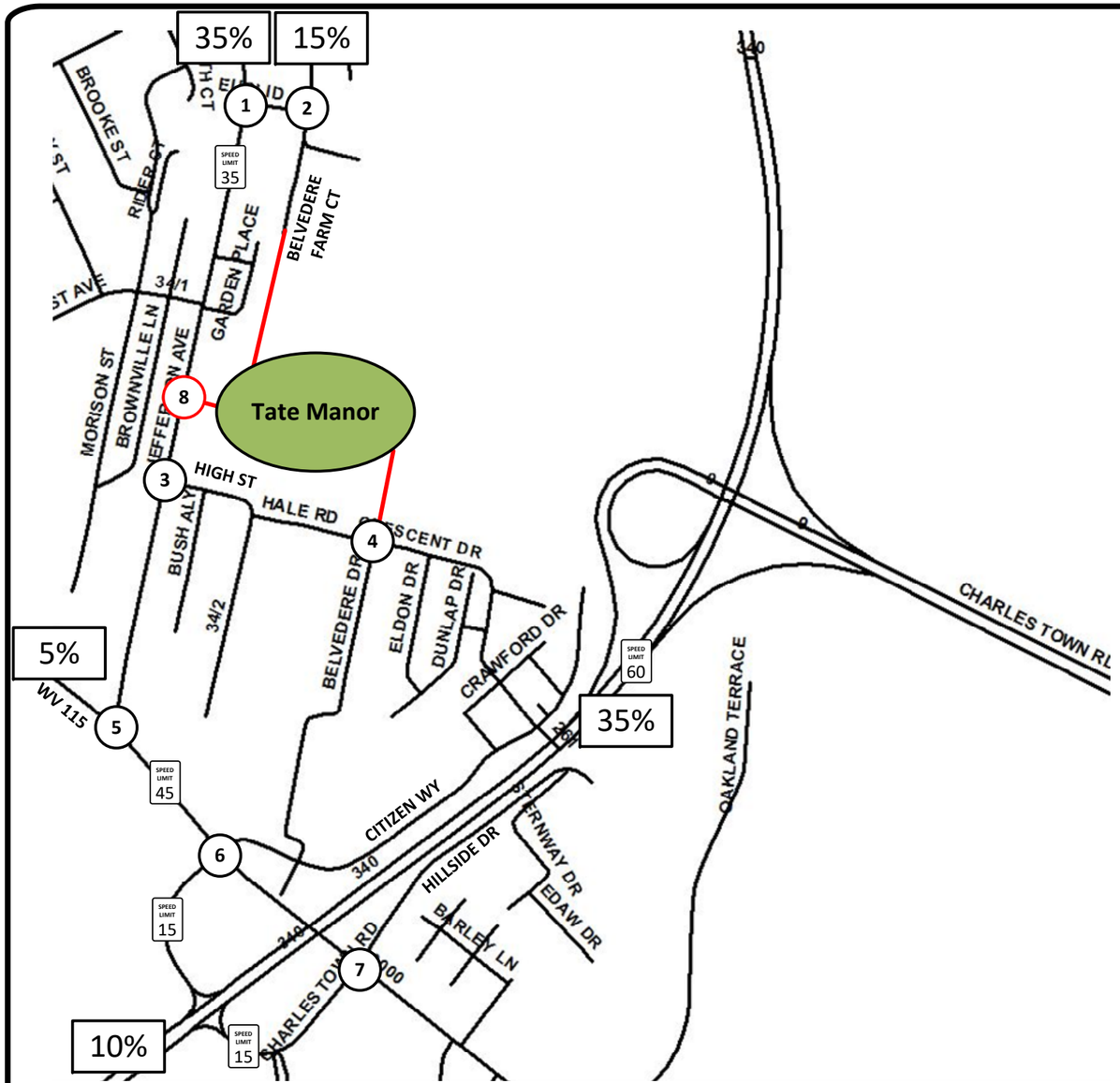
TRIP DISTRIBUTION

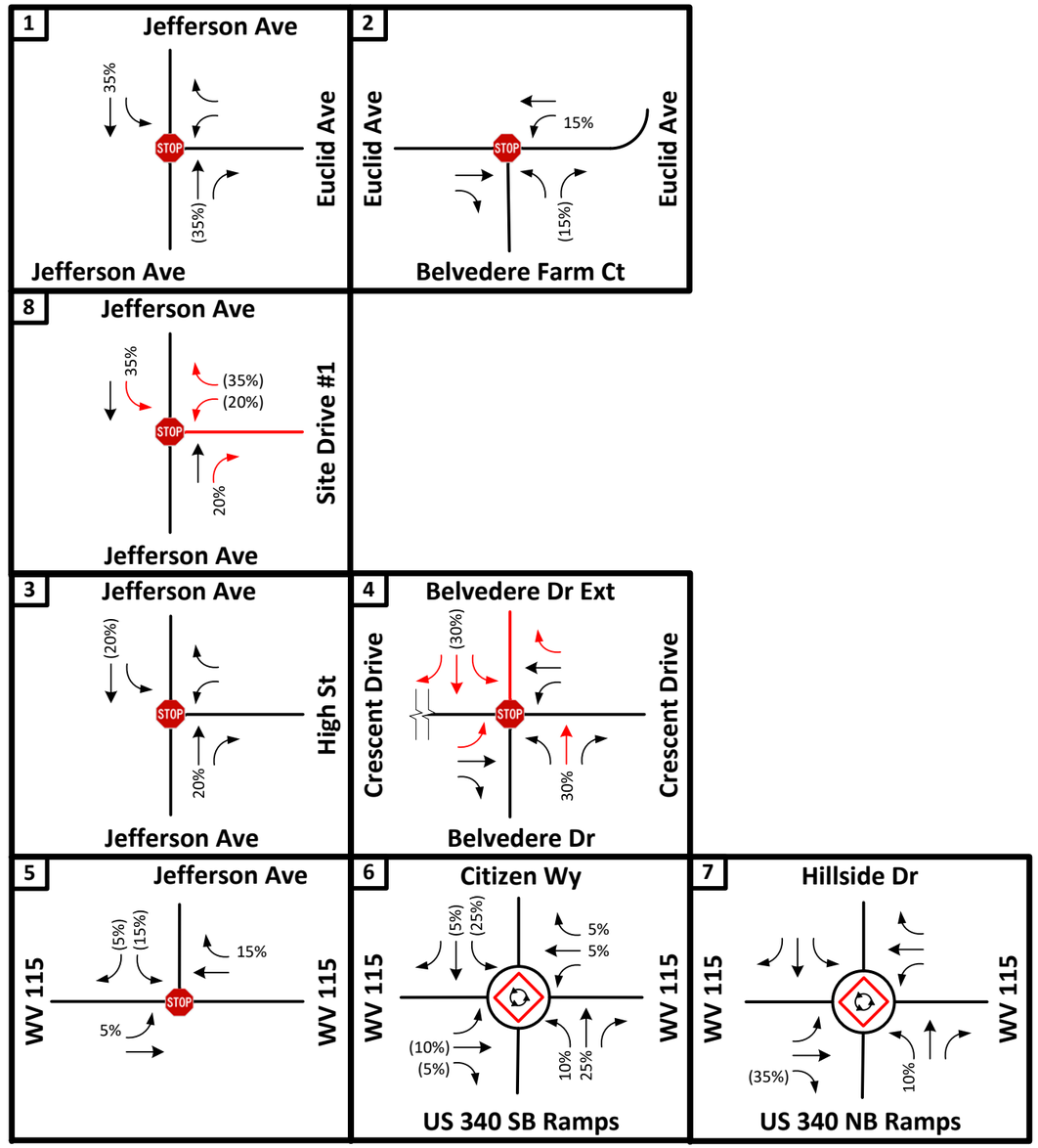
The new AM and PM peak hour site generated trips to/from the proposed site were distributed based upon interpolation from current traffic patterns. The distribution of the new external trips are as follows:

- 35% to/from the north on US 340
- 10% to/from the south on US 340
- 5% to/from the west on WV 115
- 35% to/from the north on Jefferson Avenue
- 15% to/from the north on Euclid Avenue

Traffic generated by the impending Magnolia Springs development located north of the Tate Manor residential development is included as a pending development accounted for in No Build and Build conditions. Magnolia Springs is proposed to have site driveways which intersect with Euclid Avenue and with Citizens Way. An approved Traffic Impact Study by Kittelson & Associates was obtained for this project and future traffic volumes were accounted for in the No Build and Build volume calculations, as directed by the WVDOH.

The external trip distribution percentages are shown in **Figure 4**, and the AM and PM peak hour new site trip assignments are shown on **Figure 5**.





LEGEND

- Existing Traffic Control
- Roundabout
- Existing Roadway
- Proposed Roadway
- XX% Entering Trip Percentage
- (XX%) Exiting Trip Percentage

N

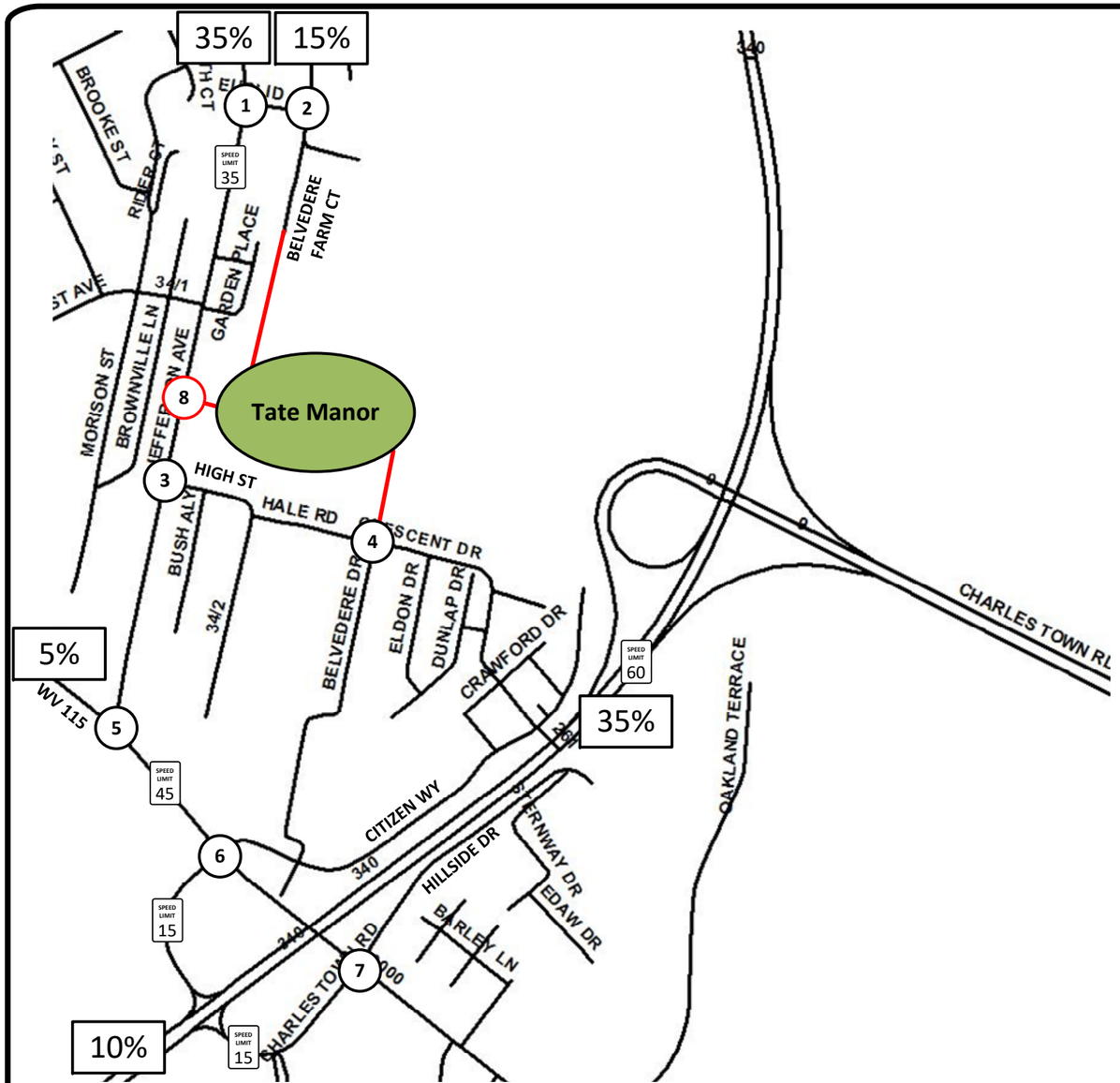
NOT TO SCALE

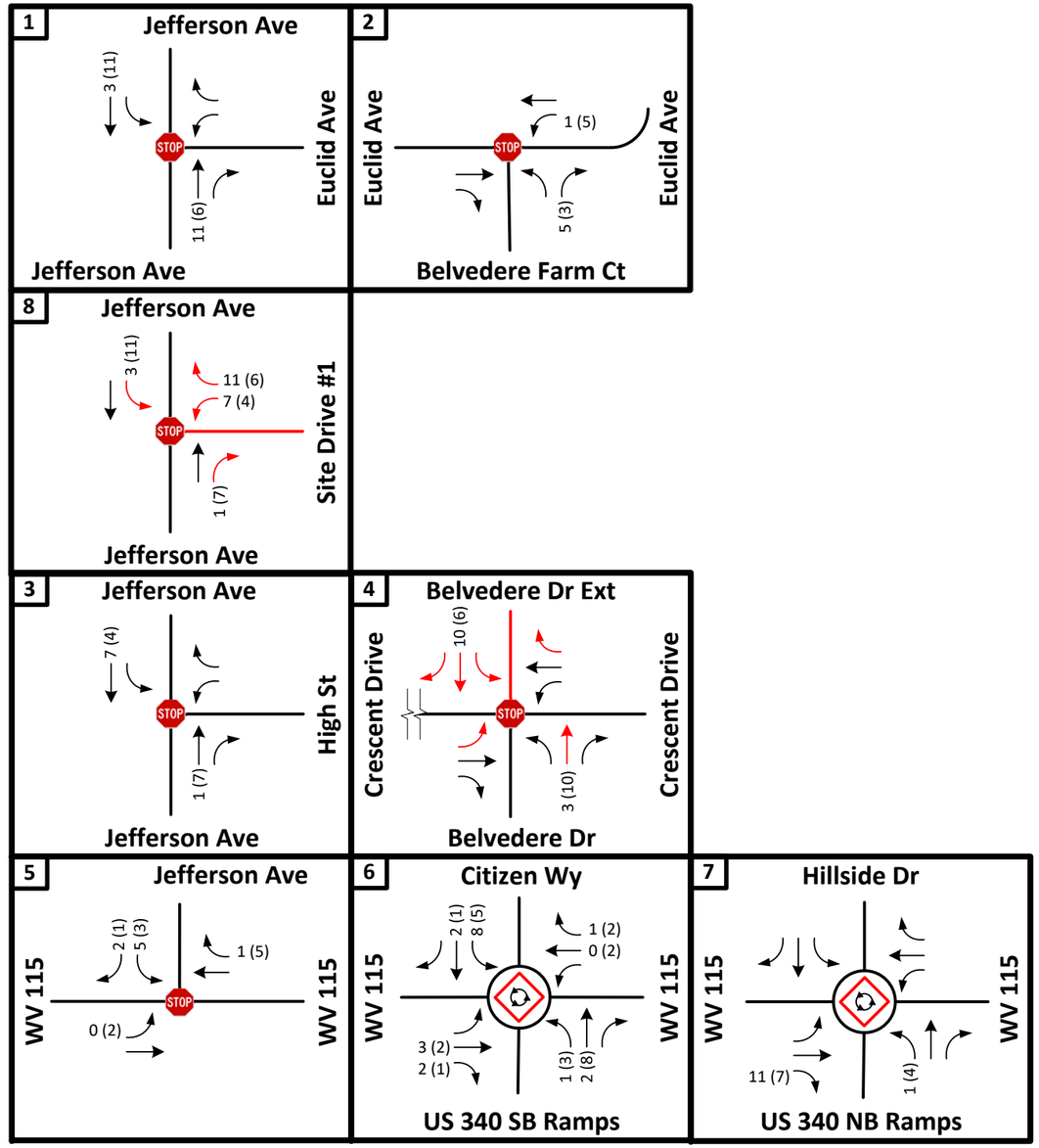
Tate Manor Residential Development TIS

Site Trip Distribution

DATE: December 2019

FIGURE 4





LEGEND

- Existing Traffic Control
- Roundabout
- Existing Roadway
- Proposed Roadway
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

N

NOT TO SCALE

Tate Manor
Residential Development TIS

Site Trip Assignment

DATE: December 2019

FIGURE 5

APPENDIX F-2: MAGNOLIA SPRINGS TIS

Transportation Impact Study

Magnolia Springs

Jefferson County, West Virginia

June 2018
(Revised September 2018)

Transportation Impact Study

Magnolia Springs

Jefferson County, West Virginia

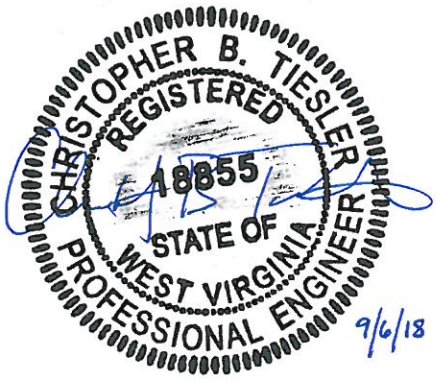
Prepared For:
Chandler's Glen, LLC
PO Box 1875
Martinsburg, West Virginia
(304) 901-4931

Prepared By:
Kittelson & Associates, Inc.
11480 Commerce Park Drive, Suite 450
Reston, Virginia 20191
(703) 885-8970

Project Manager: Amelia Martin
Project Principal: Chris Tiesler, P.E.

Project No. 22481

September 2018



Section 1
Executive Summary

EXECUTIVE SUMMARY

Chandlers Glen, LLC proposes to develop the Magnolia Springs development, located west of US-340 near Charles Town in Jefferson County, West Virginia.

A traffic operations analysis has been conducted to confirm that the transportation system can adequately support the proposed Magnolia Springs, in fulfillment of West Virginia Division of Highways (WVDOH) requirements. The scope of the project analysis was developed through collaboration with WVDOH staff in accordance with WVDOH's Traffic Engineering Directive (TED) 106-2.

Specifically, this analysis includes:

- Year 2018 existing land use and transportation system conditions within the site vicinity;
- Planned development improvements in the study area;
- Forecast year 2022 background traffic conditions during the Friday a.m. and Friday p.m. peak periods, including regional growth;
- Trip generation and distribution estimates for the proposed development;
- Forecast year 2022 total traffic conditions with full build-out of the site during the Friday a.m. and Friday p.m. peak periods;
- Conclusions and recommendations.

TRANSPORTATION IMPACT ANALYSIS FINDINGS

The results of the traffic impact analysis indicate that the proposed development can be constructed while not impacting operations on the surrounding transportation system assuming provision of mitigations specified in this report. The findings of this analysis and our recommendations are discussed below.

Existing Conditions

- The study intersections operate at acceptable levels of service during the Friday a.m. and Friday p.m. peak hours, with the exception of the Route 115 & Hillside Drive & US-340 NB Ramps intersection.
    - During the Friday a.m. peak hour, the northbound approach operates at LOS E.
    - During the Friday p.m. peak hour, the northbound approach operates at LOS F.

Year 2022 Background Traffic Conditions

- A 0.625 percent growth rate (compounded annually) was used to account for regional growth in development of year 2022 background traffic volumes.
- In-process traffic from the Jefferson Heights North development was added to background traffic to project year 2022 background traffic volumes.

- The Euclid Avenue & Belvedere Farm Court intersection will also be realigned and changed to All-Way Stop Control with the Jefferson Heights North development.
- The study intersections operate at acceptable levels of service during the Friday a.m. and Friday p.m. peak hours, with the exception of the Route 115 & Hillside Drive & US-340 NB Ramps intersection.
    - During both peak hours, the northbound approach is expected to experience an increase in delay but maintain levels of service consistent with existing conditions.
        - To help mitigate increased delay at the intersection, MUTCD traffic signal warrants were evaluated. Only Warrant 3 (Peak Hour) will be met under year 2022 background conditions, which is generally a warrant reserved for special cases.
        - A single-lane roundabout was also evaluated to help mitigate the northbound approach delays. Based on these analyses, the intersection would operate acceptably with a roundabout during the Friday a.m. and p.m. peak hours.
- All forecast queues are anticipated to be accommodated with existing storage lengths.

Proposed Development Plan

- The Magnolia Springs development is anticipated to be fully built-out in year 2022.
- The current development plan consists of up to 350 single-family homes.
- Access to the site is proposed via an extension of Citizens Way to the south and a driveway off Belvedere Farm Court to the north. The following driveway distributions were assumed and confirmed during the scoping process:
    - Citizens Way (south): 80 percent
    - Belvedere Farm Court (north): 20 percent
- The proposed development would be estimated to generate approximately 259 Friday a.m. (65 in; 194 out), and 347 Friday p.m. (218 in; 129 out) net new peak hour trips. These estimates are based on data available from the *Trip Generation Manual, 10th Edition* and the number of dwelling units (Single-family Detached Housing: ITE Land Use Code 210).

Year 2022 Total Traffic Conditions

- All of the study intersections are forecast to operate at the same level-of-service during both the Friday a.m. and Friday p.m. peak periods relative to year 2022 background traffic conditions with the following exceptions:
    - Route 115 & Citizens Way & US-340 SB Ramps: The critical movements are anticipated to operate at LOS "B" during the Friday a.m. peak hour and LOS "D" during the Friday p.m. peak hour with v/c ratios of 0.45 and 0.80, respectively. Under year 2022 background conditions, the critical movements are anticipated to operate at LOS "A" during the Friday a.m. peak hour and LOS "B" during the Friday p.m. peak hour.

- Note the intersection is still forecast to operate acceptably, so adding roadway capacity does not appear warranted as part of the development.

- Route 115 & Hillside Drive & US-340 NB Ramps: The critical northbound movement is anticipated to operate at LOS "F" during the Friday a.m. and p.m. peak hours with a v/c ratio of 0.78 and over 1.0, respectively. Under year 2022 background conditions, this approach is anticipated to operate at LOS "E" during the Friday a.m. peak hour and LOS "F" during the Friday p.m. peak hour.

  - To help mitigate increased delay at the intersection, MUTCD traffic signal warrants were evaluated. Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour) are expected to be met under year 2022 total traffic conditions at the 70 and 100 percent volume thresholds.

    - With the installation of a traffic signal, the westbound left-turn 95th percentile queue is anticipated to exceed the available storage capacity during the Friday p.m. peak hour. If this improvement is implemented, the westbound left-turn lane could be extended to 250 feet of storage to accommodate queues.

  - A single-lane roundabout was also evaluated to help mitigate the northbound approach delays. Based on these analyses, the intersection would operate acceptably with a roundabout during the Friday a.m. and p.m. peak hours.

- Increases to queueing is typically less than the assumed length of one vehicle and is anticipated to have only minor impacts operations beyond conditions already noted under year 2022 background conditions. The largest disparity in queuing between year 2022 background and year 2022 total conditions is projected to occur on the northbound approach of the Route 115 & Citizens Way & US-340 SB Ramps intersection (approximately five vehicles); however, this increase can be accommodated by the existing roadway geometry and the level of service is expected to be acceptable.

RECOMMENDATIONS

Both the City of Charles Town and Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) prefer the installation of a roundabout at the Route 115 & Hillside Drive & US-340 NB ramps intersection, which operates with deficiencies under existing and background conditions. A preliminary cost estimate provided by WVDOH indicates the cost of a roundabout at this location would be approximately $950,000.

Per discussions with WVDOH, the applicant is willing to make a one-time contribution of $50,000 to a future intersection improvement at the Route 115 & Hillside Drive & US-340 NB ramps intersection once a project is formally programmed. No other improvements to the roadway network are recommended with the Magnolia Springs development.

Section 2
Introduction

Trip Generation

Trip generation estimates for the proposed development were developed using the standard reference *Trip Generation, 10th Edition* (Reference 4) published by the Institute of Transportation Engineers (ITE). **Table 6** shows the estimated trip generation potential of the site when completed.

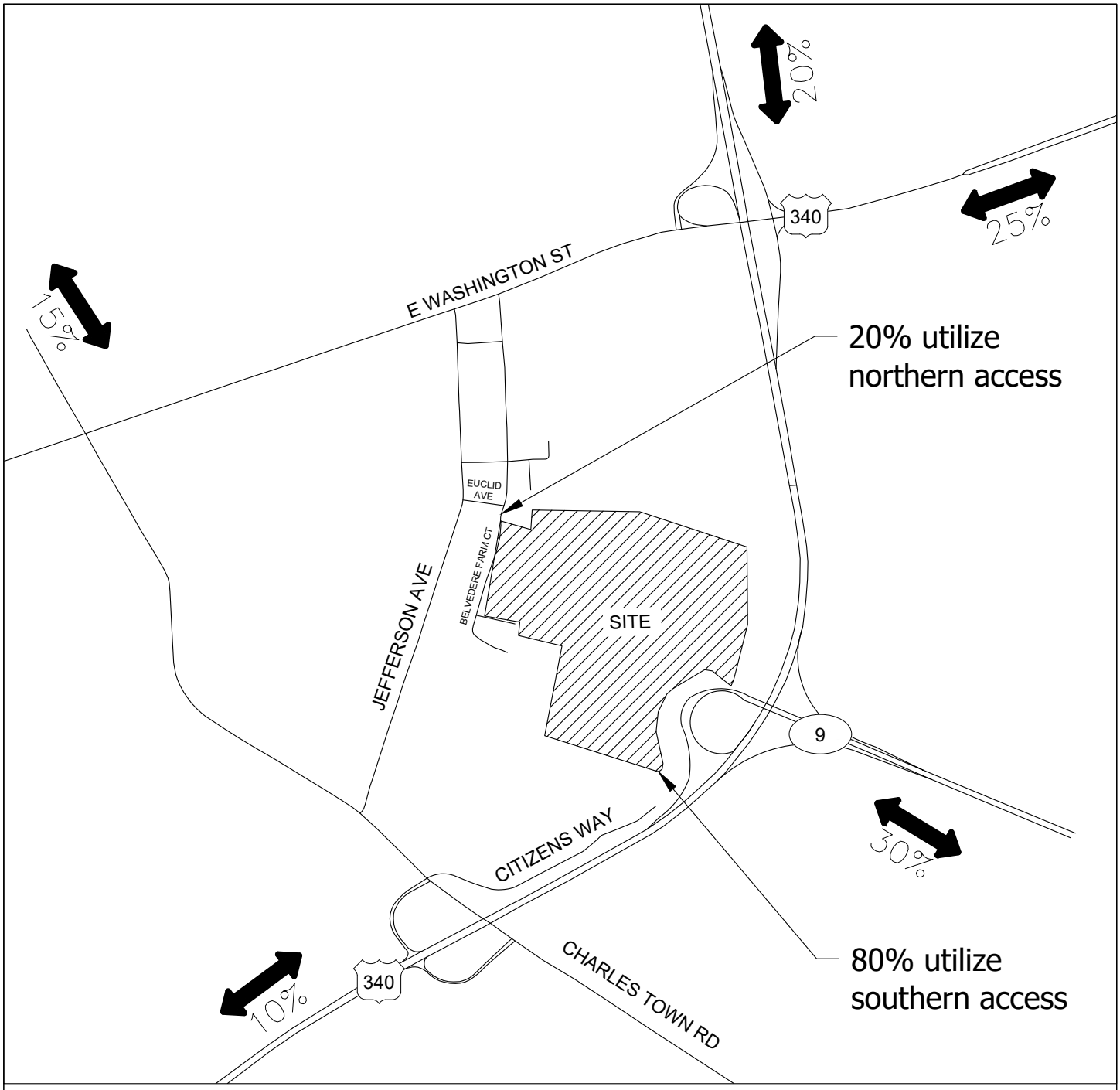
Table 6. Estimated Trip Generation

Land Use	ITE Code	Units		Peak Hour of Adjacent Street						
				Weekday Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Single-family Detached Housing	210	350	Dwelling Units	3,304	259	65	194	347	218	129

As shown in **Table 6**, the proposed development would be estimated to generate approximately 259 Friday a.m. (65 in; 194 out), and 347 Friday p.m. (218 in; 129 out) net new peak hour trips.

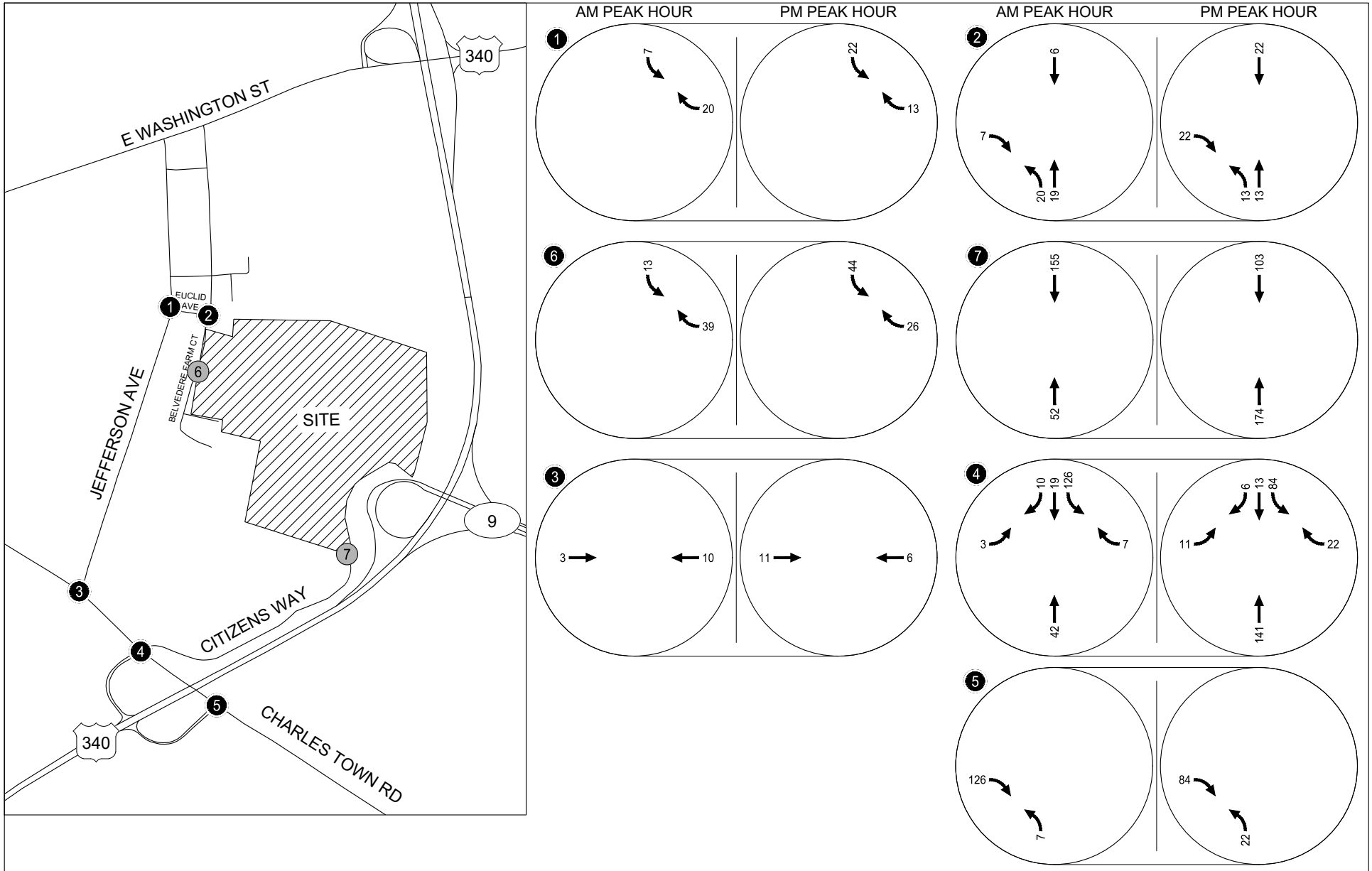
Site Trip Distribution/Trip Assignment

The estimated trip distribution pattern was confirmed by WVDOH through scoping correspondence. **Figure 10** illustrates the estimated trip distribution pattern. **Figure 11** shows the assignment of net new site-generated trips to the roadway network during the Friday a.m. and Friday p.m. peak hours.



Trip Distribution
Jefferson County, West Virginia

Figure
10



Site-Generated Trips
Friday AM and PM Peak Hours
Jefferson County, West Virginia

Figure
11

KITTELSON & ASSOCIATES

Section 5
Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

The results of the traffic impact analysis indicate that the proposed development can be constructed while not impacting operations on the surrounding transportation system assuming provision of mitigations specified in this report. The findings of this analysis and our recommendations are discussed below.

FINDINGS

Existing Conditions

- The study intersections operate at acceptable levels of service during the Friday a.m. and Friday p.m. peak hours, with the exception of the Route 115 & Hillside Drive & US-340 NB Ramps intersection.
    - During the Friday a.m. peak hour, the northbound approach operates at LOS E.
    - During the Friday p.m. peak hour, the northbound approach operates at LOS F.

Year 2022 Background Traffic Conditions

- A 0.625 percent growth rate (compounded annually) was used to account for regional growth in development of year 2022 background traffic volumes.
- In-process traffic from the Jefferson Heights North development was added to background traffic to project year 2022 background traffic volumes.
- The Euclid Avenue & Belvedere Farm Court intersection will also be realigned and changed to All-Way Stop Control with the Jefferson Heights North development.
- The study intersections operate at acceptable levels of service during the Friday a.m. and Friday p.m. peak hours, with the exception of the Route 115 & Hillside Drive & US-340 NB Ramps intersection.
    - During both peak hours, the northbound approach is expected to experience an increase in delay but maintain levels of service consistent with existing conditions.
        - To help mitigate increased delay at the intersection, MUTCD traffic signal warrants were evaluated. Only Warrant 3 (Peak Hour) will be met under year 2022 background conditions, which is generally a warrant reserved for special cases.
        - A single-lane roundabout was also evaluated to help mitigate the northbound approach delays. Based on these analyses, the intersection would operate acceptably with a roundabout during the Friday a.m. and p.m. peak hours.
- All forecast queues are anticipated to be accommodated with existing storage lengths.

Proposed Development Plan

- The Magnolia Springs development is anticipated to be fully built-out in year 2022.
- The current development plan consists of up to 350 single-family homes.
- Access to the site is proposed via an extension of Citizens Way to the south and a driveway off Belvedere Farm Court to the north. The following driveway distributions were assumed and confirmed during the scoping process:
    - Citizens Way (south): 80 percent
    - Belvedere Farm Court (north): 20 percent
- The proposed development would be estimated to generate approximately 259 Friday a.m. (65 in; 194 out), and 347 Friday p.m. (218 in; 129 out) net new peak hour trips. These estimates are based on data available from the *Trip Generation Manual, 10th Edition* and the number of dwelling units (Single-family Detached Housing: ITE Land Use Code 210).

Year 2022 Total Traffic Conditions

- All of the study intersections are forecast to operate at the same level-of-service during both the Friday a.m. and Friday p.m. peak periods relative to year 2022 background traffic conditions with the following exceptions:
    - Route 115 & Citizens Way & US-340 SB Ramps: The critical movements are anticipated to operate at LOS "B" during the Friday a.m. peak hour and LOS "D" during the Friday p.m. peak hour with v/c ratios of 0.45 and 0.80, respectively. Under year 2022 background conditions, the critical movements are anticipated to operate at LOS "A" during the Friday a.m. peak hour and LOS "B" during the Friday p.m. peak hour.
        - Note the intersection is still forecast to operate acceptably, so adding roadway capacity does not appear warranted as part of the development.
    - Route 115 & Hillside Drive & US-340 NB Ramps: The critical northbound movement is anticipated to operate at LOS "F" during the Friday a.m. and p.m. peak hours with a v/c ratio of 0.78 and over 1.0, respectively. Under year 2022 background conditions, this approach is anticipated to operate at LOS "E" during the Friday a.m. peak hour and LOS "F" during the Friday p.m. peak hour.
        - To help mitigate increased delay at the intersection, MUTCD traffic signal warrants were evaluated. Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour) are expected to be met under year 2022 total traffic conditions at the 70 and 100 percent volume thresholds.
            - With the installation of a traffic signal, the westbound left-turn 95th percentile queue is anticipated to exceed the available storage capacity during the Friday p.m. peak hour. If this improvement is implemented, the westbound left-turn lane could be extended to 250 feet of storage to accommodate queues.

- A single-lane roundabout was also evaluated to help mitigate the northbound approach delays. Based on these analyses, the intersection would operate acceptably with a roundabout during the Friday a.m. and p.m. peak hours.

- Increases to queueing is typically less than the assumed length of one vehicle and is anticipated to have only minor impacts operations beyond conditions already noted under year 2022 background conditions. The largest disparity in queuing between year 2022 background and year 2022 total conditions is projected to occur on the northbound approach of the Route 115 & Citizens Way & US-340 SB Ramps intersection (approximately five vehicles); however, this increase can be accommodated by the existing roadway geometry and the level of service is expected to be acceptable.

RECOMMENDATIONS

Both the City of Charles Town and Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) prefer the installation of a roundabout at the Route 115 & Hillside Drive & US-340 NB ramps intersection, which operates with deficiencies under existing and background conditions. A preliminary cost estimate provided by WVDOH indicates the cost of a roundabout at this location would be approximately $950,000.

Per discussions with WVDOH, the applicant is willing to make a one-time contribution of $50,000 to a future intersection improvement at the Route 115 & Hillside Drive & US-340 NB ramps intersection once a project is formally programmed. No other improvements to the roadway network are recommended with the Magnolia Springs development.

APPENDIX F-3: KINGS CROSSING TIS

Kings Crossing Residential Traffic Impact Study
Charles Town, Jefferson County, WV

AMT Project File 21-0261.001 | May 4, 2022 **REVISED**

PREPARED FOR:

Mr. Matt Stare
Land Acquisition & Developer Manager
DR Acquisitions
10212 Governor Lane Blvd, Suite 1006
Williamsport, MD 21795

A. MORTON THOMAS AND ASSOCIATES, INC.

PREPARED BY:

Timothy Kirk, PE, PTOE
A. Morton Thomas and Associates, Inc.
417 Grand Park Drive, Suite 104
Parkersburg, WV 26105
(304) 400-4952

TIMOTHY S. KIRK
REGISTERED
14169
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

Signature: Date:

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EXECUTIVE SUMMARY

This report summarizes existing and future traffic analyses conducted in support of the proposed Kings Crossing Residential Development. The proposed residential development is to be located south of WV 115 (Charles Town Road) and east of US 340 (Berryville Pike) near Charles Town, Jefferson County, West Virginia. The proposed site plan includes 177 single-family homes and 227 townhomes and is expected to be built and completed by the year 2025. The development will be constructed in three phases. Phase 1 will include 43 single-family homes and 72 townhomes and is planned to be completed in 2022. Phase 2 includes an additional 81 single-family homes and 83 townhomes and is planned to be completed in 2024. Phase 3 includes an additional 53 single-family homes and 72 townhomes and is planned to be completed in 2025.

The proposed residential development is anticipated to be served by two site driveways intersecting directly with WV 115. Site Drive #1 and Site Drive #2 intersect with WV 115. Site Drive #1 (addressed as Road 1 on the site plan) is proposed to be located approximately 2,000 feet east of Crosswinds Drive approaching WV 115 from the south and will operate as a full movement approach utilizing two-way stop-control (TWSC). Site Drive #2 (addressed as Road 12 on the site plan) will approach WV 115 from the south approximately 2,600 feet east of Crosswinds Drive and will operate as a full movement approach utilizing TWSC.

Traffic analyses will consider future conditions at the anticipated milestone years of 2022, 2024, and 2025. This report summarizes the analyses of 2021 Existing conditions, 2022 No-Build conditions (without proposed development in place), 2022 Phase 1 Build conditions (with phase 1 of proposed development in place), 2024 Partial Build, 2024 Phase 2 Build (with phase 1 and 2 of the proposed development in place), 2025 Partial Build, 2025 Full Build (with complete development in place), and 2025 Build Improved conditions (with the proposed development and proposed improvements in place) during weekday AM and PM peak hours. An annual growth rate of 1.20% was obtained from the WVDOH.

Two approved traffic impact studies have been included in the future peak hour forecasts as pending developments that will be complete by the Full Build Year of 2025. These developments are the Tate Manor and Magnolia Springs residential developments. Both developments are located north of Crescent Drive/High Street and east of Jefferson Avenue in Charles Town and are anticipated to be completed by the year 2024. Estimated traffic generated by the two developments are included in the background traffic volumes beginning in the 2024 Partial Build conditions. Information regarding both developments is located in **Appendix F**.

AMT (A. Morton Thomas and Associates, Inc.) was retained to determine the projected traffic impacts of the proposed development in accordance with the guidelines set forth by WVDOH in Traffic Engineering Directive (TED) 106-2. The intent of the study is to fully examine the impacts of the traffic generated by the development on the existing transportation system and identify potential mitigation measures. This report presents trip generation, trip distribution, intersection on capacity analysis, queuing analysis, signal warrant analysis, auxiliary lane analysis, and recommendations for transportation improvements necessary to meet the anticipated traffic demands.

Based upon a review of the site plan and adjacent transportation network and following scope of work coordination with WVDOH, the following seven (7) existing and two (2) proposed intersections are

included within the scope of the Traffic Impact Study (TIS) for the proposed Kings Crossing residential development:

1) US 340 (Berryville Pike) with Candlewood Drive *(TWSC "T" type intersection)*
2) WV 115 (S. George Street) with Jefferson Avenue (CR 34) (*TWSC "T" type intersection)*
3) WV 115 with Citizens Way (CR 115/4)/US 340 SB (*Single-lane Roundabout Plus intersection)*
4) WV 115 with Hillside Drive (CR 9/69)/US 340 NB (*TWSC Plus type intersection)*
5) WV 115 with Fairleigh Drive/Bailey Brooks Way *(TWSC Plus type intersection)*
6) WV 115 with Crosswinds Drive *(TWSC "T" type intersection)*
7) WV 115 with Kabletown Road (CR 25) *(TWSC "T" type intersection)*
8) WV 115 with Site Drive #1 *(Proposed TWSC "T" type intersection)*
9) WV 115 with Site Drive #2 *(Proposed TWSC "T" type intersection)*

Peak Hour Traffic Volumes

Peak hour turning movement counts were collected for six (6) of the seven (7) existing intersections within the study area by AMT on Friday April 23, 2021 between the hours of 7-9 AM and 3-6 PM. Following submission of the Scope of Work document, WVDOH requested that the intersection of WV 115 with Jefferson Avenue intersection be included as part of the study area. Peak hour turning movement counts were collected for the additional intersection on May 4, 2018 by Quality Counts, in support of the Magnolia Springs TIS prepared by Kittelson & Associates Inc. The peak hour turning movement counts conducted by Quality Counts were balanced into the existing system. It was assumed that the additional trips produced from balancing the counts would proceed to enter and exit the system via US 340. On both May 4, 2018 and April 23, 2021, Jefferson County Schools were fully operational with in-classroom instruction for all students. The turning movement counts were compared with existing AADT and determined to be reasonable as a check and calibration for COVID-19 impacts.

The first phase of the proposed development is expected to be complete by the year 2022. The 2022 No-Build peak hour traffic volumes include: existing 2021 peak hour traffic and an annual traffic growth prior to the year 2022. The growth rate of 1.20% was applied to the existing peak hour traffic counts and compounded annually.

The 2022 Phase 1 Build traffic volumes include: the existing peak hour traffic volume, annual traffic growth until 2022, and new trips generated by phase 1 of the proposed development.

The 2024 Partial Build volumes include: the existing peak hour traffic volumes, annual traffic growth until 2024, anticipated traffic generated by the Tate Manor development, anticipated traffic generated by the Magnolia Springs development, and new trips generated by phase 1 of the proposed development.

The 2024 Phase 2 Build Volumes include: the existing peak hour traffic volumes, annual traffic growth until 2024, anticipated traffic generated by the Tate Manor development, anticipated traffic generated by the Magnolia Springs development, and new trips generated by phase 1 and phase 2 of the proposed development.

The 2025 Partial Build Volumes include: the existing peak hour traffic volumes, annual traffic growth until 2025, anticipated traffic generated by the Tate Manor development, anticipated traffic generated by the Magnolia Springs development, and new trips generated by phase 1 and phase 2 of the proposed development.

The 2025 Full Build Conditions include: existing 2021 peak hour traffic volume, anticipated traffic generated by the Tate Manor development, anticipated traffic generated by the Magnolia Springs development, an annual traffic growth prior to the year 2025, and the new peak hour trips to be generated by the full build out of Kings Crossing development. Site generated traffic was distributed onto the transportation network based upon existing traffic patterns and anticipated origin and destination of the newly generated site trips.

Site Trip Generation and Distribution

The proposed Kings Crossing residential development includes 177 single-family homes and 227 townhomes. The development will be constructed in three phases. Trip generation "Peak Hour of Generator" rates from ITE Trip Generation Manual, 10th Edition, were utilized for Single-Family Detached Housing (LUC 210) and Multifamily Housing (LUC 220). Phase 1 will include 43 single-family homes and 72 townhomes. Trip generation analysis indicates that Phase 1 will generate a total of 933 trips which includes 73 AM peak hour trips and 91 PM peak hour trips. Phase 2 includes an additional 81 single-family homes and 83 townhomes. Phase 2 will generate a total of 1,373 additional trips which includes 108 AM peak hour trips and 137 PM peak hour trips. Phase 3 will include 53 single-family homes and 72 townhomes. Phase 3 will generate a total of 1,027 additional trips which includes 80 AM peak hour trips and 101 PM peak hour trips. Trip generation analysis indicates that a total of 3,333 new daily trips will be generated including 261 AM peak hour trips and 329 PM peak hour trips at full build out in 2025.

The AM and PM peak hour trips to/from the proposed site were distributed based upon interpolation from current traffic patterns with all trips entering the development via WV 115. Distribution of the new external trips are as follows:

- 35% to/from the north on US 340
- 25% to/from the south on US 340
- 30% to/from the west on WV 115
- 10% to/from the east on WV 115

2021 Existing Conditions Analysis

The results of the 2021 existing conditions capacity analyses indicate that three (3) traffic movements currently operate worse than LOS D, which is considered the minimum tolerable level. Traffic movements that are expected to operate worse than LOS D include the following:

- ***Candlewood Drive westbound shared left-turn to US 340 LOS E during the PM peak hour***
- ***Jefferson Avenue southbound shared left/right lane to WV 115 LOS E during the PM peak hour***
- ***US 340 NB Ramp northbound shared left/through lane to WV 115 LOS F during the PM peak hour***

2022 No-Build Conditions Analysis

The results of the 2028 No-Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2021 Existing Conditions are anticipated to continue. Traffic movements that are expected to operate worse than LOS D include the following:

- *Candlewood Drive westbound shared left/through lane to US 340 LOS E during the PM peak hour*

- *Jefferson Avenue southbound shared left/right lane to WV 115 LOS F during the PM peak hour*
- *US 340 NB Ramp northbound shared left/through lane to WV 115 LOS F during both the AM and PM peak hours*

2022 Phase 1 Build Conditions Analysis

Geometric improvements included in the Phase 1 2022 Build Conditions include the construction of Site Drive #1 and Site Drive #2. Site Drive #1 is a full movement approach connecting to WV 115 creating a "T" type intersection approximately 2,000 feet east of Crosswinds Drive and will operate under stop control. Site Drive #2 is a full movement approach connecting to WV 115 creating a "T" type intersection approximately 2,600 feet east of Crosswinds Drive and will operate under stop control.

The results of the Phase 1 2022 Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2022 No-Build Conditions are anticipated to continue with no additional movements expected to operate worse than LOS D. Traffic movements that are expected to operate worse than LOS D include the following:

- *Candlewood Drive westbound shared left/through lane to US 340 LOS E during PM peak hour*
- *Jefferson Avenue southbound shared left/right lane to WV 115 LOS F during PM peak hour*
- *US 340 NB Ramp northbound shared left/through lane to WV 115 LOS E during the AM peak hour and LOS F during the PM peak hour*

2024 Partial Build Conditions Analysis

The results of the 2022 Phase 1 Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2021 Existing Conditions are anticipated to continue with no additional traffic movements operating worse than LOS D. Traffic movements that are expected to operate worse than LOS D include the following:

- *Candlewood Drive westbound shared left/through lane to US 340 LOS E during the PM peak hour*
- *Jefferson Avenue southbound shared left/right lane to WV 115 LOS F during the PM peak hour*
- *US 340 NB Ramp northbound shared left/through lane to WV 115 LOS F during both the AM and PM peak hours*

2024 Phase 2 Build Conditions Analysis

The results of the Phase 2 2024 Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2024 Partial Build Conditions are anticipated to continue with no additional movements expected to operate worse than LOS D. Traffic movements that are expected to operate worse than LOS D include the following:

- *Candlewood Drive westbound shared left/through lane to US 340 LOS E during PM peak hour*
- *Jefferson Avenue southbound shared left/right lane to WV 115 LOS F during PM peak hour*
- *US 340 NB Ramp northbound shared left/through lane to WV 115 LOS F during both the AM and PM peak hours*

2025 Partial Build Conditions Analysis

The results of the 2024 Phase 2 Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2021 Existing Conditions are anticipated to continue with no additional movements operating at LOS worse than D. Traffic movements that are expected to operate worse than LOS D include the following:

- *Candlewood Drive westbound shared left/through lane to US 340 LOS E during the PM peak hour*
- *Jefferson Avenue southbound shared left/right lane to WV 115 LOS F during the PM peak hour*
- *US 340 NB Ramp northbound shared left/through lane to WV 115 LOS F during both the AM and PM peak hours*

2025 Full Build Conditions Analysis

The results of the Phase 3 2025 Full Build Conditions capacity analyses indicate that traffic movements that operate worse than LOS D during 2025 Partial Build Conditions are anticipated to continue with two additional movements expected to operate worse than LOS D. Traffic movements that are expected to operate worse than LOS D include the following:

- *Candlewood Drive westbound shared left/through lane to US 340 LOS E during PM peak hour*
- *Jefferson Avenue southbound shared left/right lane to WV 115 LOS F during PM peak hour*
- ***US 340 SB Ramp northbound shared left/through/right lane to WV 115 LOS E during the PM peak hour***
- *US 340 NB Ramp northbound shared left/through lane to WV 115 LOS F during both the AM and PM peak hours*
- ***Hillside Drive southbound shared left/through/right lane to WV 115 LOS E during the PM peak hour***

2025 Full Build Improved Conditions Analysis

Geometric improvements included in the Phase 3 2028 Build Improved Conditions include:

1. Construction of an exclusive left-turn lane on WV 115 westbound approach to Site Drive #1.
2. Construction of a roundabout at the WV 115 with US 340 Northbound Ramp/Hillside Drive intersection.
3. Construction of a right turn slip lane at WV 115 with US 340 Southbound Ramp/Citizen Way.
4. Installation of a traffic signal at WV 115 with Jefferson Avenue.
5. Construction of an exclusive left turn lane on WV 115 eastbound at Jefferson Avenue identified in the Tate Manor TIS.

The results of the Phase 3 2025 Full Build Improved Conditions capacity analyses indicate that no traffic movements will operate worse than LOS D, which is considered the minimum tolerable level, except for Candlewood Drive to US 340 and US 340 SB Ramp to WV 115.

- *Candlewood Drive westbound shared left-turn movement to US 340 LOS E during the PM peak hour.*

Conclusions/Recommendations

Based on the findings of this study, the following infrastructure improvements are recommended to address existing capacity issues and maintain operation of the existing transportation network:

US 340 with Candlewood Drive

- Install pavement markings on the Candlewood Drive approach to US 340. Previous pavement markings are no longer visible and need to be reinstalled to delineate separate left and right turn lanes.

WV 115 with Jefferson Avenue

- As part of the Tate Manor TIS, it was recommended that a traffic signal be installed at the intersection of WV 115 and Jefferson Avenue. Intersection conditions previously met the MUTCD warranting criteria. Additionally, the 2021 Existing Conditions and 2022 No-Build analysis indicates that the intersection LOS will currently operates at LOS E during the PM peak hour under Two Way Stop Control. The previously completed signal warrant is located in **Appendix G**.

- In conjunction with installation of a traffic signal identified in previous studies, widening WV 115 to construct an exclusive left-turn lane on the eastbound approach is recommended. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with an appropriate taper.

WV 115 with Hillside Drive/ US 340 Northbound Ramps

- Proceed with the DOH planned conversion of the intersection to a single lane roundabout. The 2021 Existing Conditions analysis indicates that the northbound movement currently operates at LOS E during the PM peak hour. Under roundabout yield control, this intersection would operate at an overall LOS C during the PM peak hour for 2025 Full Build Conditions, with the northbound movement operating at LOS A.

Based on the finding of this study, the following improvements are recommended for Phase 1 of the Kings Crossing Residential Development:

WV 115 with Site Drive #1

- Construct Site Drive #1 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 2,000 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and two egress lanes to provide separate left and right turn lanes exiting the development. Site Drive #1 will operate under stop-control, while WV 115 operates as free-flow.

WV 115 with Site Drive #2

- Construct Site Drive #2 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 2,600 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and two egress lanes to provide separate left and right turn

lanes exiting the development. Site Drive #2 will operate under stop-control, while WV 115 operates as free-flow.

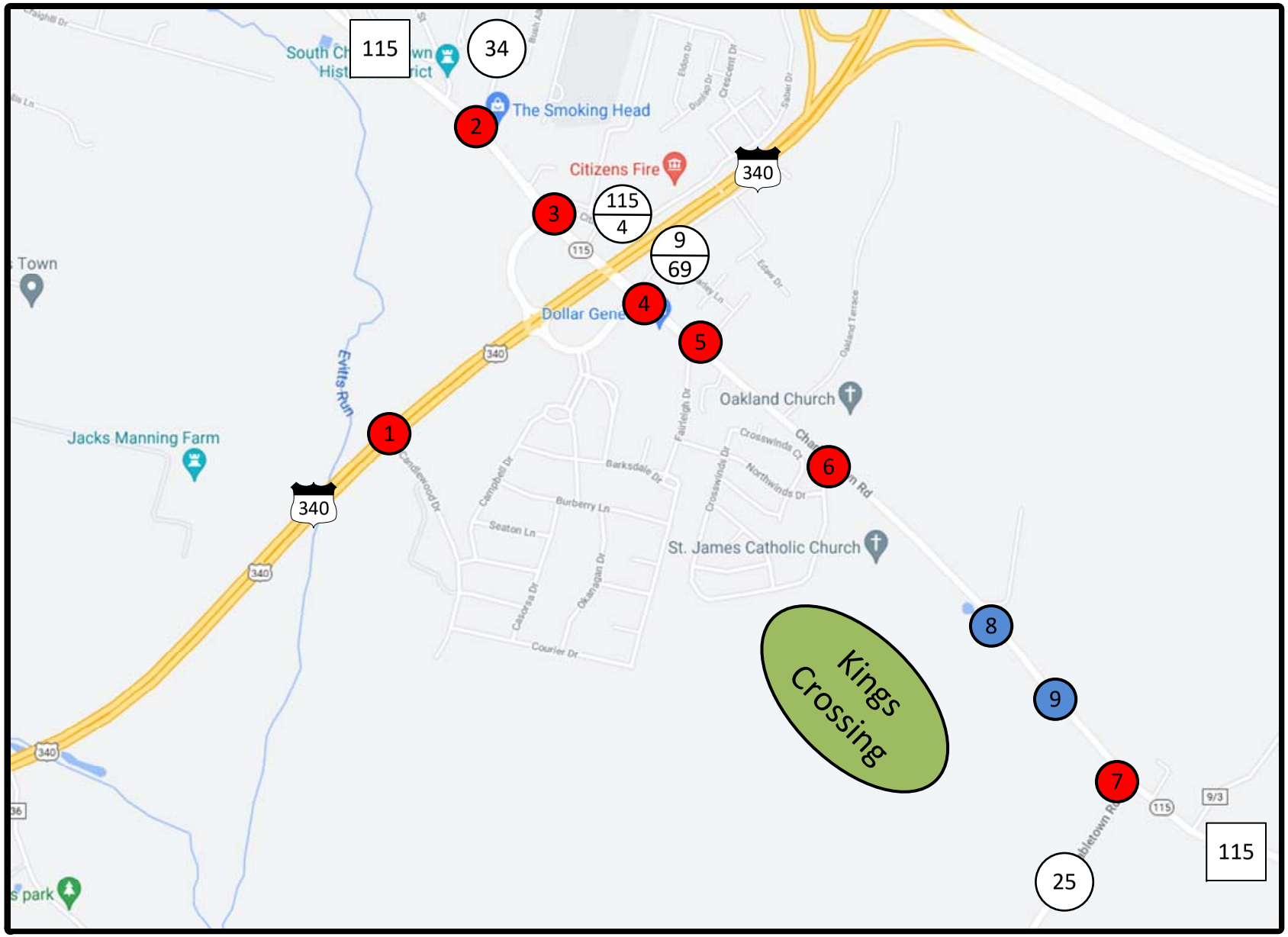
Based on the finding of this study, the following geometric improvements are recommended to mitigate the impacts of the Kings Crossing residential development and maintain acceptable traffic operations along the existing transportation network after the full build out of Kings Crossing Residential development in 2025:

WV 115 with Citizen Way/US 340 Southbound Ramps

- Construct a low angle right turn slip lane on for the US 340 northbound ramp approach to WV 115 eastbound. The 2025 Partial Build analysis indicates that the ramp approach will deteriorate to LOS C during the PM peak hour with the overall intersection operating LOS B. The 2025 Build analysis indicates that the US 340 southbound ramp approach will deteriorate to LOS E during the PM peak hour with the overall intersection operating at LOS C. The addition of the right turn slip lane improves the ramp to LOS B during the PM peak hour and the overall intersection to LOS B. This measure is needed at the conclusion of Phase 2 and prior to beginning Phase 3.

WV 115 with Site Drive #1

- Construct an exclusive left-turn lane on the WV 115 westbound approach to Site Drive #2. Peak hour volumes are projected to meet the AASHTO guidelines following 2025 Build Conditions PM peak hour. The left-turn should be constructed to provide a minimum of 125 feet of full-width storage with appropriate taper. This measure is needed at the conclusion of Phase 2 and prior to beginning Phase 3.



LEGEND

= Development

= Existing Intersection

= Proposed Intersection

AMT

N

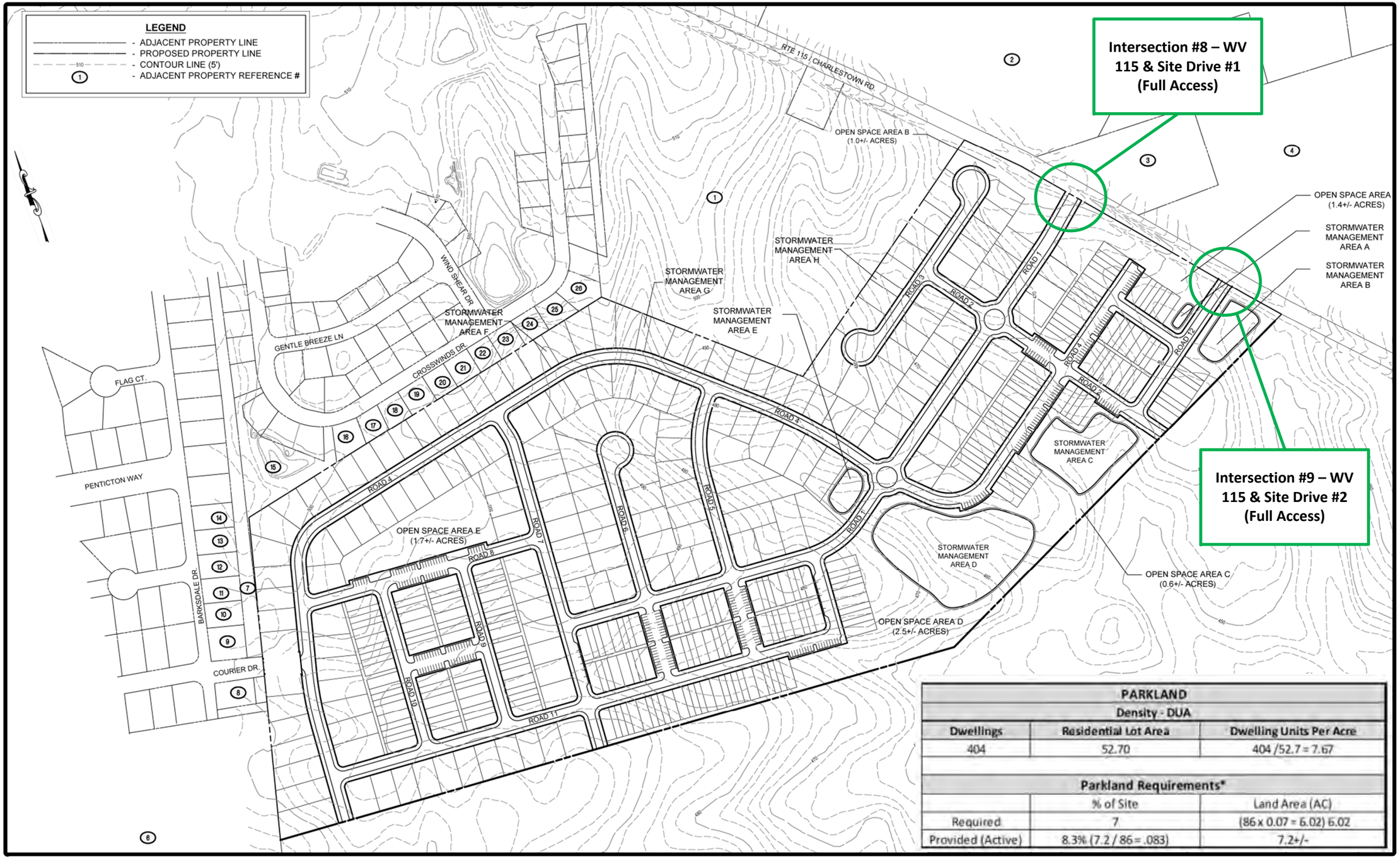
NOT TO SCALE

Kings Crossing Residential TIS

Site Location Map

DATE: May 2022

FIGURE 1



PARKLAND		
Density - DUA		
Dwellings	Residential Lot Area	Dwelling Units Per Acre
404	52.70	404 /52.7 = 7.67
Parkland Requirements*		
	% of Site	Land Area (AC)
Required	7	(86 x 0.07 = 6.02) 6.02
Provided (Active)	8.3% (7.2 / 86 = .083)	7.2+/-

AMT

Kings Crossing Residential TIS

Site Plan

NOT TO SCALE

DATE: May 2022

FIGURE 2

TRIP GENERATION

The proposed Kings Crossing residential development includes 177 single-family homes and 227 townhomes. The development will be constructed in three phases. Trip generation "Peak Hour of Generator" rates from ITE Trip Generation Manual, 10th Edition, were utilized for Single-Family Detached Housing (LUC 210) and Multifamily Housing (LUC 220). Phase 1 will include 43 single-family homes and 72 townhomes. Trip generation analysis indicates that Phase 1 will generate a total of 933 trips which includes 73 AM peak hour trips and 91 PM peak hour trips. Phase 2 includes an additional 81 single-family homes and 83 townhomes. Phase 2 will generate a total of 1,373 additional trips which includes 108 AM peak hour trips and 137 PM peak hour trips. Phase 3 will include 53 single-family homes and 72 townhomes. Phase 3 will generate a total of 1,027 additional trips which includes 80 AM peak hour trips and 101 PM peak hour trips. Trip generation analysis indicates that a total of 3,333 new daily trips will be generated including 261 AM peak hour trips and 329 PM peak hour trips at full build out in 2025.

Table 2 shows the summary of the Trip Generation for all three phases of Kings Crossing.

Table 2: Trip Generation Summary

Phase 1

Description	LUC	Density	Daily Trips	AM Peak			PM Peak		
				Enter	Exit	Total	Enter	Exit	Total
Single-Family Homes	210	43 Units	406	9	24	33	28	15	43
Townhomes	220	72 Units	527	11	29	40	28	20	48
Total Net New External Trips			**933**	**20**	**53**	**73**	**56**	**35**	**91**

Phase 2

Description	LUC	Density	Daily Trips	AM Peak			PM Peak		
				Enter	Exit	Total	Enter	Exit	Total
Single-Family Homes	210	81 Units	765	16	46	62	52	29	81
Townhomes	220	83 Units	608	13	33	46	33	23	56
Total Net New External Trips			**1,373**	**29**	**79**	**108**	**85**	**52**	**137**

Phase 3

Description	LUC	Density	Daily Trips	AM Peak			PM Peak		
				Enter	Exit	Total	Enter	Exit	Total
Single-Family Homes	210	53 Units	500	10	30	40	34	19	53
Townhomes	220	72 Units	527	11	29	40	28	20	48
Total Net New External Trips			**1,027**	**21**	**59**	**80**	**62**	**39**	**101**

Full Build (Summary)

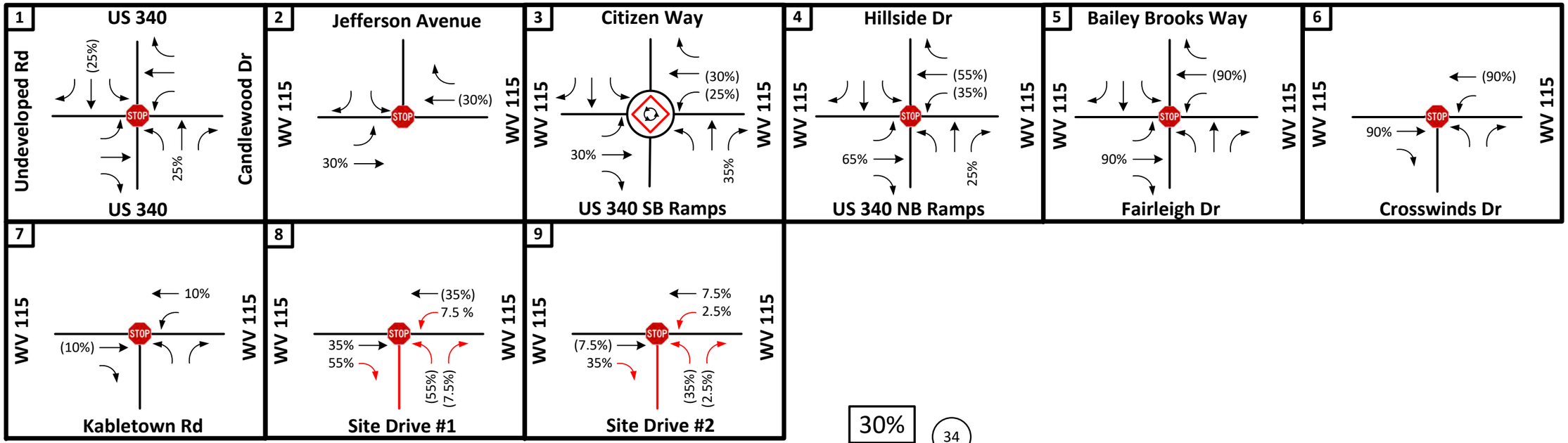
Description	LUC	Density	Daily Trips	AM Peak			PM Peak		
				Enter	Exit	Total	Enter	Exit	Total
Single-Family Homes	210	177 Units	1,671	35	100	135	114	63	177
Townhomes	220	227 Units	1,662	35	91	126	89	63	152
Total Net New External Trips			**3,333**	**70**	**191**	**261**	**203**	**126**	**329**

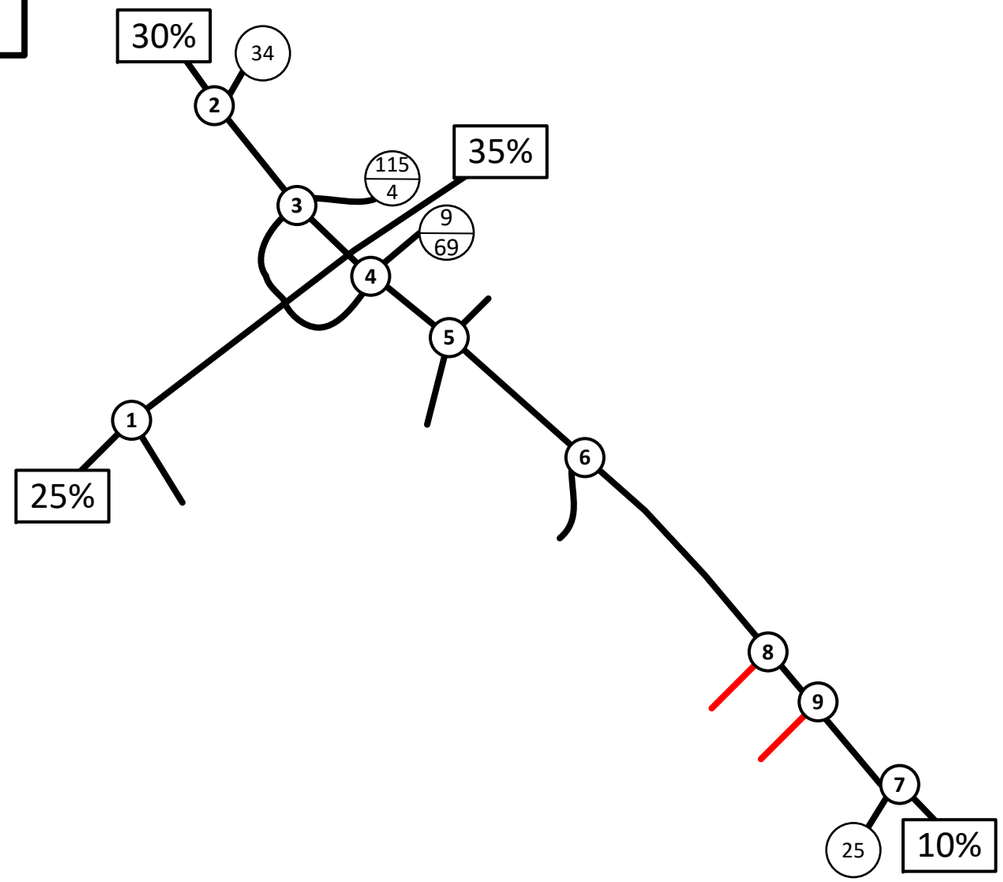
TRIP DISTRIBUTION

The AM and PM peak hour trips to/from the proposed site were distributed based upon interpolation from current traffic patterns with all trips entering the development via WV 115. Distribution of the new external trips are as follows:

- 35% to/from the north on US 340
- 25% to/from the south on US 340
- 30% to/from the west on WV 115
- 10% to/from the east on WV 115

The external trip distribution percentages are shown on **Figure 6** and the AM and PM peak hour new site trip assignments are shown on **Figure 7** through **9**.





LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX% Entering Trip Percentage
- (X%) Exiting Trip Percentage

N

NOT TO SCALE

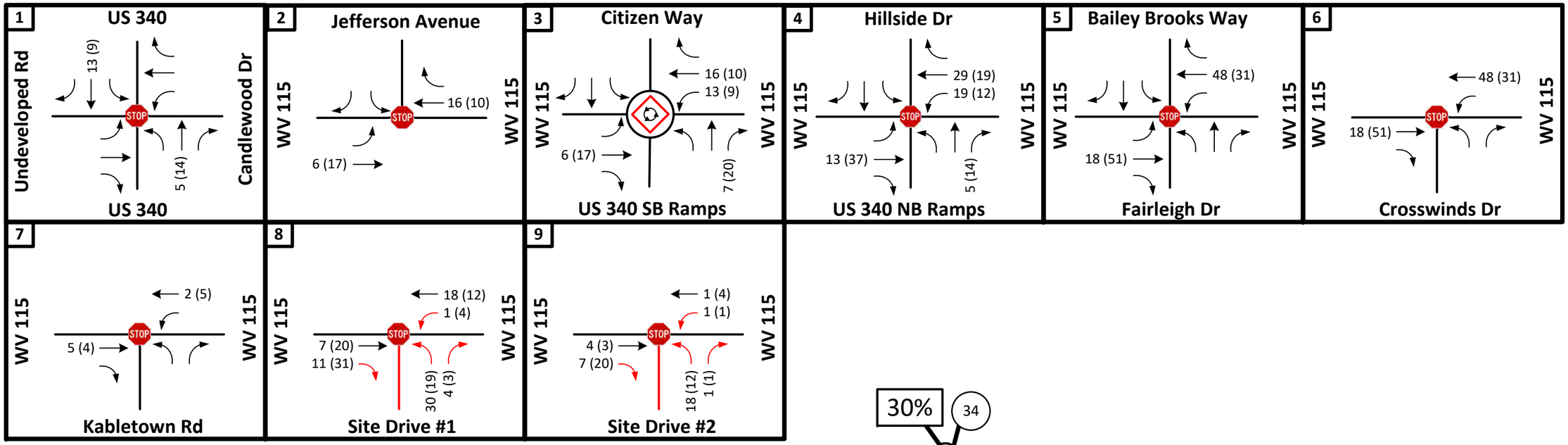
Kings Crossing Residential TIS

New Trip Distribution

DATE: May 2022

FIGURE 6

AMT



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX AM Peak Hour Trips
- (XX) PM Peak Hour Trips

N

NOT TO SCALE

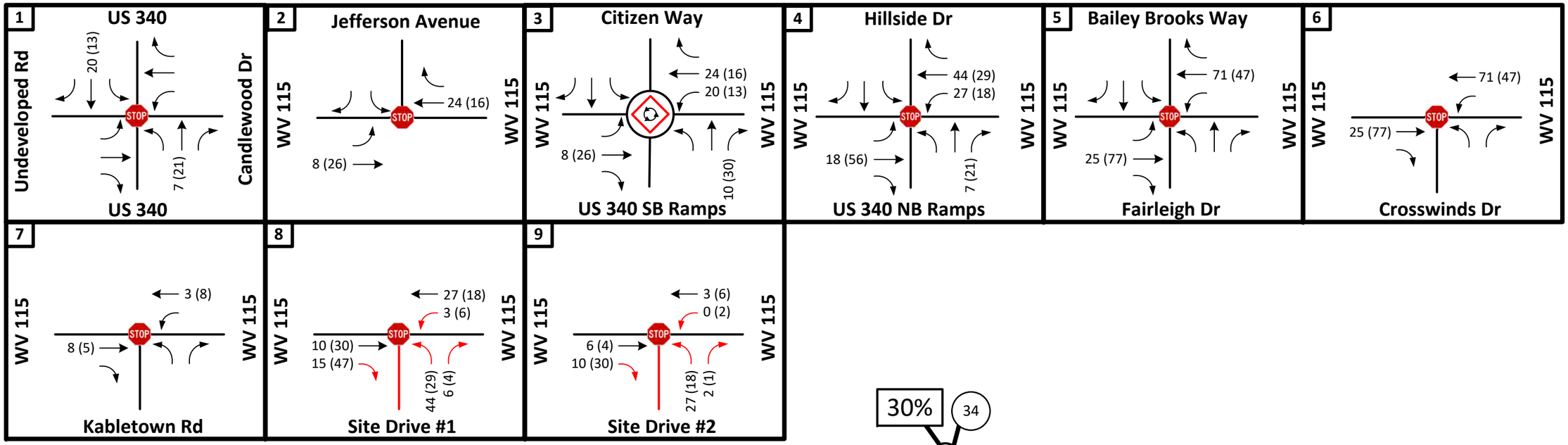
Kings Crossing Residential TIS

Phase 1 Site Trip Assignments

DATE: May 2022

FIGURE 7

AMT



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX AM Peak Hour Trips
- (XX) PM Peak Hour Trips

N

NOT TO SCALE

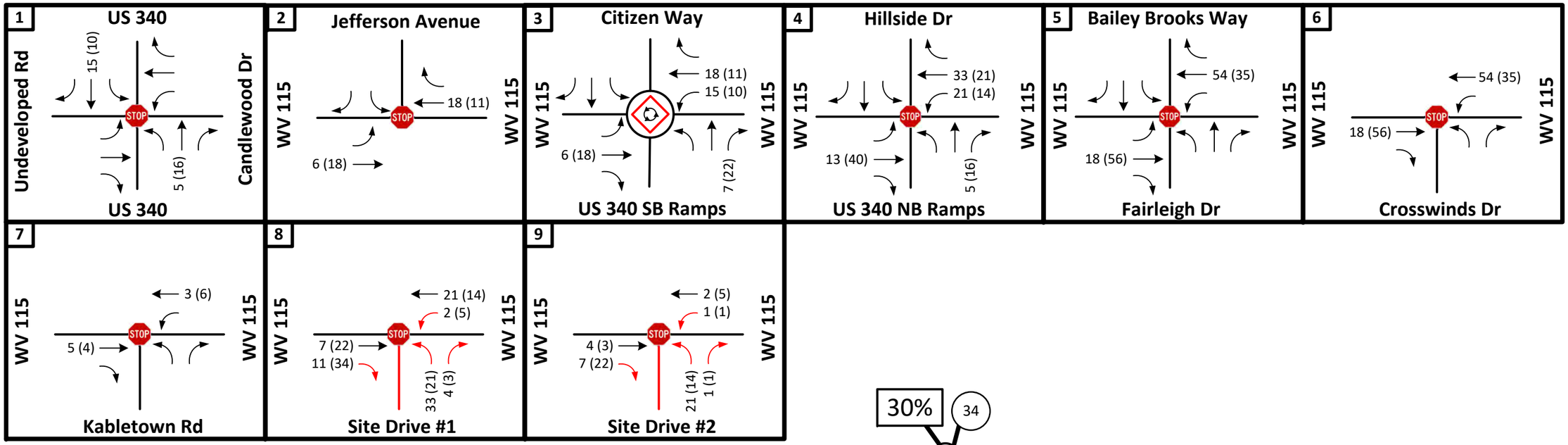
Kings Crossing Residential TIS

Phase 2 Site Trip Assignments

DATE: May 2022

FIGURE 8

AMT



LEGEND

- Proposed Traffic Control
- Existing Roadway
- Existing Lane Configuration
- Proposed Roadway
- Proposed Lane Configuration
- XX AM Peak Hour Trips
- (XX) PM Peak Hour Trips

N

NOT TO SCALE

Kings Crossing Residential TIS

Phase 3 Site Trip Assignments

DATE: May 2022

FIGURE 9

AMT

CONCLUSIONS/RECOMMENDATIONS

This report summarizes existing and future traffic analyses conducted in support of the proposed Kings Crossing Residential Development. The proposed residential development is to be located south of WV 115 (Charles Town Road) and east of US 340 (Berryville Pike) near Charles Town, Jefferson County, West Virginia. The proposed site plan includes 177 single-family homes and 227 townhomes and is expected to be built and completed by the year 2025. The development will be constructed in three phases. Phase 1 will include 43 single-family homes and 72 townhomes and is planned to be completed in 2022. Phase 2 includes an additional 81 single-family homes and 83 townhomes and is planned to be completed in 2024. Phase 3 includes an additional 53 single-family homes and 72 townhomes and is planned to be completed in 2025.

The proposed residential development is anticipated to be served by two site driveways intersecting directly with WV 115. Site Drive #1 and Site Drive #2 intersect with WV 115. Site Drive #1 (addressed as Road 1 on the site plan) is proposed to be located approximately 2,000 feet east of Crosswinds Drive approaching WV 115 from the south and will operate as a full movement approach utilizing two-way stop-control (TWSC). Site Drive #2 (addressed as Road 12 on the site plan) will approach WV 115 from the south approximately 2,600 feet east of Crosswinds Drive and will operate as a full movement approach utilizing TWSC.

Based on the findings of this study, the following infrastructure improvements are recommended to address existing capacity issues and maintain operation of the existing transportation network:

US 340 with Candlewood Drive

- Install pavement markings on the Candlewood Drive approach to US 340. Previous pavement markings are no longer visible and need to be reinstalled to delineate separate left and right turn lanes.

WV 115 with Jefferson Avenue

- As part of the Tate Manor TIS, it was recommended that a traffic signal be installed at the intersection of WV 115 and Jefferson Avenue. Intersection conditions previously met the MUTCD warranting criteria. Additionally, the 2021 Existing Conditions and 2022 No-Build analysis indicates that the intersection LOS will currently operates at LOS E during the PM peak hour under Two Way Stop Control. The previously completed signal warrant is located in **Appendix G**.

- In conjunction with installation of a traffic signal identified in previous studies, widening WV 115 to construct an exclusive left-turn lane on the eastbound approach is recommended. The left-turn lane should be constructed to provide a minimum of 125 feet of full-width storage with an appropriate taper.

WV 115 with Hillside Drive/ US 340 Northbound Ramps

- Proceed with the DOH planned conversion of the intersection to a single lane roundabout. The 2021 Existing Conditions analysis indicates that the northbound movement currently operates at LOS E during the PM peak hour. Under roundabout yield control, this intersection would operate at an overall LOS C during the PM peak hour for 2025 Full Build Conditions, with the northbound movement operating at LOS A.

Based on the finding of this study, the following improvements are recommended for Phase 1 of the Kings Crossing Residential Development:

WV 115 with Site Drive #1

- Construct Site Drive #1 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 2,000 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and two egress lanes to provide separate left and right turn lanes exiting the development. Site Drive #1 will operate under stop-control, while WV 115 operates as free-flow.

WV 115 with Site Drive #2

- Construct Site Drive #2 as a full movement approach intersecting with WV 115 creating a "T" type intersection approximately 2,600 feet east of Crosswinds Drive. The site driveway is recommended to include one ingress and two egress lanes to provide separate left and right turn lanes exiting the development. Site Drive #2 will operate under stop-control, while WV 115 operates as free-flow.

Based on the finding of this study, the following geometric improvements are recommended to mitigate the impacts of the Kings Crossing residential development and maintain acceptable traffic operations along the existing transportation network after the full build out of Kings Crossing Residential development in 2025:

WV 115 with Citizen Way/US 340 Southbound Ramps

- Construct a low angle right turn slip lane on for the US 340 northbound ramp approach to WV 115 eastbound. The 2025 Partial Build analysis indicates that the ramp approach will deteriorate to LOS C during the PM peak hour with the overall intersection operating LOS B. The 2025 Build analysis indicates that the US 340 southbound ramp approach will deteriorate to LOS E during the PM peak hour with the overall intersection operating at LOS C. The addition of the right turn slip lane improves the ramp to LOS B during the PM peak hour and the overall intersection to LOS B. This measure is needed at the conclusion of Phase 2 and prior to beginning Phase 3.

WV 115 with Site Drive #1

- Construct an exclusive left-turn lane on the WV 115 westbound approach to Site Drive #2. Peak hour volumes are projected to meet the AASHTO guidelines following 2025 Build Conditions PM peak hour. The left-turn should be constructed to provide a minimum of 125 feet of full-width storage with appropriate taper. This measure is needed at the conclusion of Phase 2 and prior to beginning Phase 3.

APPENDIX G: PROJECT CORRESPONDENCE

APPENDIX G-1: SCOPE OF WORK

Proposed TIS Scope of Work (SOW)

Fairview Farms Mixed-Use Development TIS

Charles Town, Jefferson County

Purpose

The purpose of this SOW document is to delineate the assumptions of the Traffic Impact Study (TIS) for the proposed development project. Confirming assumptions at the beginning of the project helps to assure that the TIS will be completed only once and in a timely matter. This memorandum aims to create a communicative line between the WVDOH, the client, and the traffic engineer to discuss all of the issues involved with completing the TIS. This document will cover the following topics:

- Client Information
- Study Methodology
- Intersections to be studied
- Existing Traffic Data Collection
- Trip Generation
- Trip Distribution
- Site Access
- Approved Developments
- Additional Data Needs
- Local Government Coordination

Client Information

AMT is preparing this study on behalf of *LGI Homes.* Our Point of Contact is *Jay Amin*.

1450 Lake Robins Drive, Suite 430
The Woodlands, TX 77380
Jay.amin@lgihomes.com

Study Methodology

The site is located on the north side of WV 115 (Charles Town Road) southeast of Downtown Charles Town, Jefferson County. Site access is proposed to WV 115 (Charles Town Road) via two (2) site driveways. Both the AM (7-9 AM) and PM (3-6 PM) peak hours will be studied.

The analysis will follow the TED 106-2 along with applicable ITE and Highway Capacity methodologies which include four milestones:

- 2022 Existing Conditions
- 2026 Future No-Build Conditions (without proposed development and with any approved adjacent development in place)
- 2026 Future Build Conditions (with the proposed development in place)
- 2026 Future Build Improved Conditions (with the proposed development and recommended improvements in place)

Traffic analysis will consider Future Build conditions at the build-out year. Based upon current information, the development is assumed to fully built by 2026. A growth rate has been requested from WVDOH Performance Management Division and will be utilized to determine future traffic volumes.

The analyses will be performed using the SYNCHRO 11.1 and SIDRA 9.0 (as applicable) software packages. The use of the software helps to ensure that the intersections will be analyzed in real life situations with intersections in coordination in all conditions.

Number of Intersections to be Studied

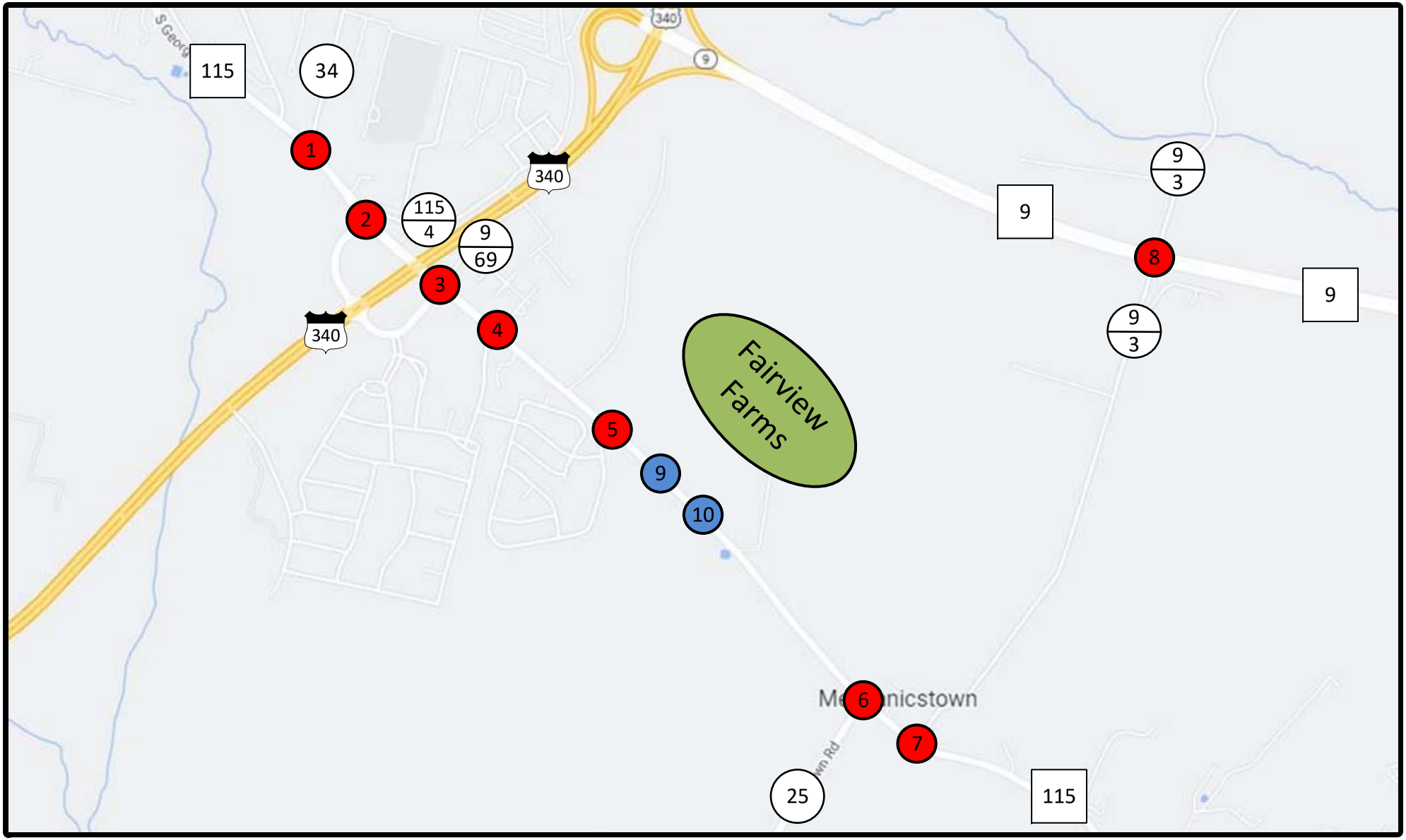
The following eight (8) existing intersections will be included in the study for capacity analysis:

1. WV 115 with Jefferson Avenue (CR 34)
    - Existing: Stop Controlled "T" Intersection
2. WV 115 with Citizens Way (CR 115/4)/US 340 SB Ramps
    - Existing: Roundabout Plus Intersection
3. WV 115 with Hillside Drive (CR 9/69)/US 340 NB Ramps
    - Existing: Stop Controlled Plus Intersection
4. WV 115 with Fairleigh Drive
    - Existing: Stop Controlled "T" Intersection
5. WV 115 with Crosswinds Drive
    - Existing: Stop Controlled "T" Intersection
6. WV 115 with Kabletown Road (CR 25)
    - Existing: Stop Controlled "T" Intersection
7. WV 115 with Cattail Run Road (CR 9/3)
    - Existing: Stop Controlled "T" Intersection
8. WV 9 with Cattail Run Road (CR 9/3)
    - Existing: Stop Controlled Plus Intersection

The following two (2) new intersections will be included in the study for capacity analysis:

9. WV 115 with Site Drive #1
    - Proposed: Stop Controlled "T" Intersection
10. WV 115 with Site Drive #2
    - Proposed: Stop Controlled "T" Intersection

Figure 1 shows the study area and key intersections. Figure 2 shows the current overall conceptual site plan with proposed access. Figure 3 shows the current conceptual site plan for the commercial section of the property with proposed access.



LEGEND

= Development

= Existing Intersection

= Proposed Intersection

AMT

N

NOT TO SCALE

Fairview Farms TIS

Site Location Map

DATE: August 2022

FIGURE 1

267 SINGLE FAMILY LOTS

200 TOWNHOUSE LOTS

Neighborhood Residential Land Use Mix Requirements				
	Requirement*		Provided	
Use	%	Acres	%	Acres
Residential	50	58.08	0.50	58.09
Commercial	10	11.62	0.10	11.62
Open Space*	10	7.75	0.13	10.17

*Per Ordinance, 10% of "usable land (Net Buildabal Land Area)" required for open space.

150 75 0 150 300 450

GRAPHICAL SCALE: 1" = 150'

NORTH

COMPREHENSIVE PLAN ROAD
LIMITED ACCESS
(80' RIGHT-OF-WAY)

SWM

SWM

SWM

CENTRAL
OPEN SPACE
(3.42 ACRES)

SWM

COMMERCIAL LOT #1
(3.76 ACRES)

COMMERCIAL LOT #2
(5.44 ACRES)

WATER PLANT DEDICATION
(2.42 ACRES)

SWM

15' WIDE ROAD RIGHT-OF-WAY
RESERVATION (ROUTE 115)

Intersection #5 – WV 115 & Crosswinds Dr (Full Access)

Intersection #9 – WV 115 & Site Drive #1 (Full Access)

Intersection #10 – WV 115 & Site Drive #2 (Full Access)

Intersection #6 – WV 115 & Kabletown Rd (Full Access)

SINGLE FAMILY LOT (110' DEPTH)

TOWNHOUSE LOT (100' DEPTH)

COMMON OPEN SPACE

STORMWATER MANAGEMENT

COMMERCIAL LOT

Fairview Farms TIS

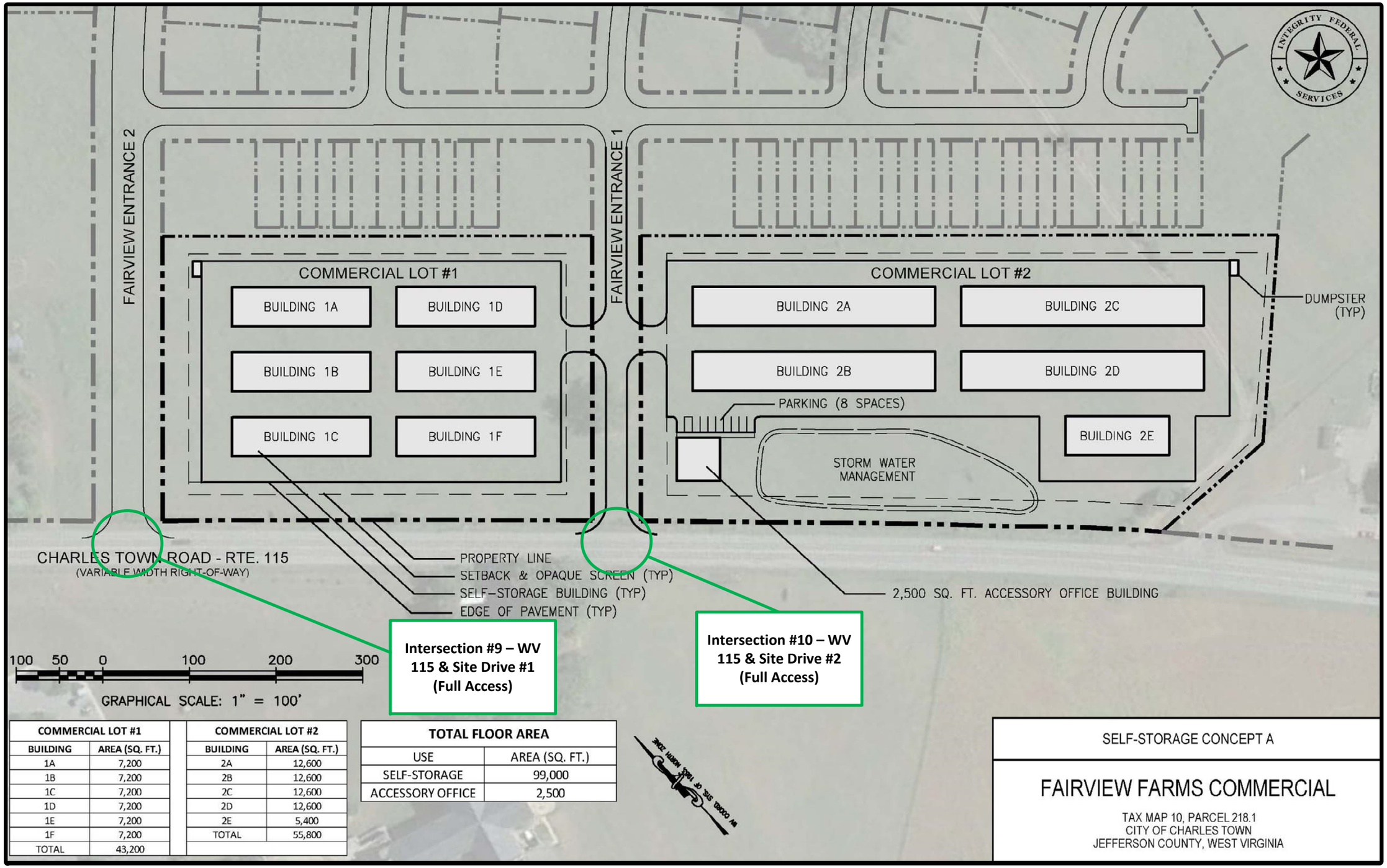
Overall Site Plan

DATE: August 2022

FIGURE 2

N

NOT TO SCALE



COMMERCIAL LOT #1	
BUILDING	AREA (SQ. FT.)
1A	7,200
1B	7,200
1C	7,200
1D	7,200
1E	7,200
1F	7,200
TOTAL	43,200

COMMERCIAL LOT #2	
BUILDING	AREA (SQ. FT.)
2A	12,600
2B	12,600
2C	12,600
2D	12,600
2E	5,400
TOTAL	55,800

TOTAL FLOOR AREA	
USE	AREA (SQ. FT.)
SELF-STORAGE	99,000
ACCESSORY OFFICE	2,500

SELF-STORAGE CONCEPT A

FAIRVIEW FARMS COMMERCIAL

TAX MAP 10, PARCEL 218.1
CITY OF CHARLES TOWN
JEFFERSON COUNTY, WEST VIRGINIA

Fairview Farms TIS

Site Plan – Commercial Property

DATE: August 2022

FIGURE 3

NOT TO SCALE

Existing Traffic Data Collection

Peak hour turning movement counts at each existing intersection will be collected on a typical Friday when Jefferson County Schools are in session between the hours of 7AM to 9AM and 3PM to 6PM. New Turning Movement counts will be collected at the following locations:

- WV 115 with Jefferson Avenue (CR 34)
- WV 115 with Citizens Way (CR 115/4)/US 340 SB Ramps
- WV 115 with Hillside Drive (CR 9/69)/US 340 NB Ramps
- WV 115 with Fairleigh Drive
- WV 115 with Crosswinds Drive
- WV 115 with Kabletown Road (CR 25)
- WV 115 with Cattail Run Road (CR 9/3)
- WV 9 with Cattail Run Road (CR 9/3)

Trip Generation

The proposed site will be a self-storage facility comprising 99,000 square feet of storage units, 267 single-family homes, and 200 townhomes (See Figure 2 and Figure 3). Peak hour trip generation will be determined using trip rate data from the latest version of the ITE Trip Generation Manual using Land Use Codes (LUC) 157 (Self Storage Facility), 210 (Single-Family Detached Housing), and 220 (Multi-Family Housing).

Trip Distribution

The site-generated trips to and from the proposed residential development will be distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area. Proposed trip distribution based upon current conditions is as follows:

- 25% to/from the north on US 340
- 25% to/from the south on US 340
- 15% to/from the east on WV 9
    - 10% to/from north via Cattail Run Road
    - 5% to/from north via US 340
- 30% to/from the west on WV 115
- 5% to/from the east on WV 115

This proposed distribution results in an 15/85 east/west split for traffic entering the site from WV 115. Trip distribution will be confirmed once turning movement data is collected and discussed with WVDOH prior to submission of the preliminary TIS document.

Site Access

Access to the site is proposed to be provided by two (2) site access points. Each of these are detailed below:

Site Drive #1 (Site Access 1)
Site Drive #1 is proposed as a full movement two-way approach to WV 115 near the western end of the parcel. Site Drive #1 is to be located approximately 630 feet east of Crosswinds Drive.

Site Drive #2 (Site Access 2)
Site Drive #2 is proposed as a full movement two-way approach to WV 115 near the eastern end of the parcel. Site Drive #2 is to be located approximately 1,270 feet east of Crosswinds Drive.

Approved Developments

The TIS will potentially include any applicable approved or pending TIS documents for projects in the vicinity of this proposed development, as determined by WVDOH. Preliminary adjacent pending developments will include the following:

- Magnolia Springs TIS (parcel north of WV 115 and east of US 340)
- Jefferson Heights South TIS (parcel east of CR 34 near Belvedere Farms Lane)
- Kings Crossing TIS (parcel opposite proposed development along WV 115)

Additional Data Needs

The following information is requested in order to complete the analysis for this project:

- Any potential DOH improvement projects planned in this area

Local Government Coordination

AMT will provide the preliminary and final TIS reports to local government in accordance with the pending Development Agreement with *LGI Homes*. The TIS will be provided to the following entities, plus any added through the development agreement process:

- City of Charles Town
- Jefferson County Commission
- Hagerstown Eastern Panhandle MPO (HEPMPO)

Glaser, Caleb

From: Meadows, Donald R <donald.r.meadows@wv.gov>
Sent: Monday, August 15, 2022 9:22 AM
To: Glaser, Caleb
Cc: Cramer, David E; Kenneth L Clohan; Luke I Miller; Trixie A Willis; Alanna J Keller; Kirk, Tim
Subject: Re: Proposed Fairview Farms TIS SOW - Jefferson County

Dave,
Appears the revised SOW submitted by AMT for the proposed Fairview Farms development has adequately addressed our previous comments and the consultant could proceed with the preparation of the study. Let me know if you have any questions or if you need any additional information. THANKS>DON

Donald R. Meadows
West Virginia Division of Highways
Traffic Engineering - Operations
1900 Kanawha Blvd. E.
Charleston, WV 25305
Office Ph: 304-414-7354
Cell Ph: 304-382-3160

On Wed, Aug 3, 2022 at 12:03 PM Glaser, Caleb <cglaser@amtengineering.com> wrote:

> Good Morning Dave,
>
> Attached is a revised Scope of Work for the proposed Fairview Farms Mixed-Use development along the north side of WV 115 in Charles Town, Jefferson County. The revised document details the commercial portion of the site and includes an additional site plan figure for that portion of the development.
>
> In regards to your first two comments below, the northern stub shown in the site plan will ultimately connect with WV 9 but that will not happen for some time and is within the City's Comp plan (would be part of a future unrelated development). For the purposes of this study, site generated traffic is proposed to access the development via WV 115 only. Also, there is currently a shared-use access agreement on the property line in place with the adjacent property owner (Oakland Church).
>
> Please let me know if you have any questions or concerns!
>
> Best Regards,

Caleb Glaser P.E., PTOE

Engineer

P 304-400-4952 **| D** 304-903-7010 **| C** 216-640-5970
W www.amtengineering.com

From: Cramer, David E <david.e.cramer@wv.gov>
Sent: Wednesday, April 27, 2022 4:12 PM
To: Glaser, Caleb <cglaser@amtengineering.com>
Cc: Donald R Meadows <donald.r.meadows@wv.gov>; Kenneth L Clohan <kenneth.l.clohan@wv.gov>; Luke I Miller <Luke.I.Miller@wv.gov>; Trixie A Willis <trixie.a.willis@wv.gov>; Alanna J Keller <Alanna.J.Keller@wv.gov>
Subject: Fwd: Proposed Fairview Farms TIS SOW - Jefferson County

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you verify that the attachment and content are safe.

The results of our review of the proposed scope and the preliminary site plan indicate we have a couple questions/comments. Please review/address each of the following:

- The "Comprehensive Plan Road" extends from this Development site into the adjacent property to the north.
    - This roadway stub is approximately 1600' from the existing stubbed access from WV 9; are there any known plans to ultimately connect to this existing access?
    - Does this Developer have in hand an agreement with the landowner of the property to the north allowing this stub to be constructed within that adjacent property?

- The site plan appears to indicate centerline of proposed westernmost WV 115 access is concurrent with property line. If so, does this Developer have in hand a shared-use access agreement with the adjacent landowner? If TIS analysis includes shared-use access that later is not feasible, Developer may need to submit to DOH new/updated/revised analysis or TIS.
- Some trips (assign 10 percent of the trips) would be anticipated to travel to/from WV 9 to/from the east. Based on proximity to Cattail Run Rd, TIS is to include Cattail Run Rd (CR 9/3) intersections with WV 9 and with WV 115.
- Site plan identifies commercial parcels along WV 115 as part of the Development, but the commercial lots are not included in the trip generation. Any potential development will need to be included within the study.

If additional info is needed, let us know.

Dave

---------- Forwarded message ---------
From: **Glaser, Caleb** <cglaser@amtengineering.com>
Date: Mon, Apr 25, 2022 at 11:13 AM
Subject: Proposed Fairview Farms TIS SOW - Jefferson County
To: Cramer, David E <David.E.Cramer@wv.gov>, Meadows, Donald R <Donald.R.Meadows@wv.gov>, Ken Clohan <kenneth.l.clohan@wv.gov>
Cc: Kirk, Tim <tkirk@amtengineering.com>

Good Morning Dave,

Attached is our proposed Scope of Work (SOW) for a residential project near Charles Town, Jefferson County. The site is proposed to have two site driveways to WV 115 between Crosswinds Drive and Kabletown Road. Please let us know if you have any questions or need additional information.

Best Regards,

Caleb Glaser P.E.

Engineer

P 304-400-4952| **D** 304-903-7010| **C** 216-640-5970
W www.amtengineering.com

--

David E. Cramer, PE

WV Department of Transportation

Commissioner's Office of Economic Development

Interim Director - Aeronautics Commission

1900 Kanawha Boulevard, East

APPENDIX G-2: GROWTH RATE

Glaser, Caleb

From: Skeen, Jeremy P <jeremy.p.skeen@wv.gov>
Sent: Tuesday, May 17, 2022 2:18 PM
To: Glaser, Caleb
Subject: Re: [External] WV 115 Growth Rate - Jefferson County

Caleb,

The same growth rate can be used from the previous year.

Thank you,
Jeremy

On Tue, May 17, 2022 at 9:47 AM Glaser, Caleb <cglaser@amtengineering.com> wrote:

> Good Morning Jeremy,
>
> We have a new TIS starting across from this previous project on WV 115. This is another residential development for a private client and was wondering if we would be able to utilize the same growth rate you provided about a year ago? The site driveways will intersect with WV 115 between Candlewood Drive & Kabletown Road intersections.
>
> Please let me know if this is possible or if the growth rate would've changed in the past year. As always I appreciate your assistance.
>
> Best Regards,
>
> **Caleb Glaser** P.E.
>
> Engineer
>
> **P** 304-400-4952 | **D** 304-903-7010 | **C** 216-640-5970
> **W** www.amtengineering.com
>
> **From:** Skeen, Jeremy P <Jeremy.P.Skeen@wv.gov>
> **Sent:** Wednesday, May 5, 2021 7:36 AM
> **To:** Glaser, Caleb <cglaser@amtengineering.com>

Cc: Johnson, Leland W <Leland.W.Johnson@wv.gov>
Subject: RE: [External] WV 115 Growth Rate - Jefferson County

Caleb,

According to the MPO Model of Jefferson County, the growth rate of WV 115 just East of the US 340 interchange is: 1.1978%

Thanks,

Jeremy

From: Johnson, Leland W <Leland.W.Johnson@wv.gov>
Sent: Friday, April 30, 2021 1:18 PM
To: Skeen, Jeremy P <Jeremy.P.Skeen@wv.gov>
Cc: cglaser@amtengineering.com
Subject: FW: [External] WV 115 Growth Rate - Jefferson County

Jeremy,

Please handle this request.

Leland

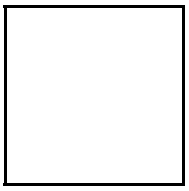
From: Glaser, Caleb <cglaser@amtengineering.com>
Sent: Friday, April 30, 2021 1:16 PM
To: Johnson, Leland W <Leland.W.Johnson@wv.gov>
Cc: Elsayed, Gehan M <Gehan.M.Elsayed@wv.gov>
Subject: [External] WV 115 Growth Rate - Jefferson County

CAUTION: External email. Do not click links or open attachments unless you verify sender.

Good Afternoon Leland,

Could you provide the anticipated annual traffic growth rate for WV 115 in Jefferson County at the US 340 interchange? We are preparing a TIS for a residential development just east of the interchange. In June 2019 you provided us with a growth rate in this area at 1.31% and was unsure if it would've changed.

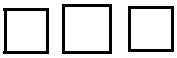
Thank you,



Caleb Glaser EIT

Engineer

P 304-400-4952 **| D** 304-903-7010 **| C** 216-640-5970
W www.amtengineering.com



APPENDIX G-3: COMMENT RESOLUTION

Glaser, Caleb

From: Keller, Perry J <perry.j.keller@wv.gov>
Sent: Tuesday, May 30, 2023 1:26 PM
To: Glaser, Caleb
Cc: Meadows, Donald R; Ken Clohan; Kirk, Tim
Subject: Re: 2023_03_28, Fairview Farms TIS, Preliminary

Follow Up Flag: Follow up
Flag Status: Flagged

1. The DOH already has a project programmed to construct a single lane roundabout at the intersection of WV 115 with Hillside Dr/US 340 NB Connector. This improvement is anticipated to be in place prior to the 2030 No Build Conditions (currently estimated for construction in 2025). TIS currently identifies this as a 2030 Build Improved Conditions project. It is recommended this project be included in the TIS beginning with the 2030 No Build Conditions so that it can be determined if this development is projected to negatively impact the intersection. Also, TIS appears to indicate this improvement to accommodate the Kings Crossing development, however, this improvement was initially discussed internally and ultimately recommended based on information within the Magnolia Springs development TIS.

2. Related to above, in both the Executive Summary and Conclusions sections of the TIS, while it indicates DOH should proceed with planned roundabout at Hillside Dr to address existing capacity issues, it then indicates that an exclusive right turn slip lane on WV 115 EB approaching US 340 NB Connector should be constructed to accommodate additional future volumes unrelated to the Fairview Farms development. It then states that the WV 115 EB approach is anticipated to operate at LOS E in the 2030 No-Build Conditions. Considering the roundabout currently is not included in the analyses (to our knowledge) until the 2030 Build Improved Conditions, this statement causes some level of confusion concerning this proposed improvement. This is further reasoning for the planned roundabout to be included in the TIS and all analyses beginning with the 2030 No-Build scenario.

3. It appears that the included site plan incorrectly refers to a proposed intersection of WV 115 with Kings Crossing as the intersection of WV 115 with Kabletown Rd.

4. Based on the proximity of the Fairview Farms and Kings Crossing developments and the turn lanes proposed along WV 115 for their approaches, its recommended the two developers engage in discussions to implement a section of TWLTL along WV 115 in lieu of multiple exclusive left turn lanes.

5. Although no direction has been provided to date, for the revised TIS and any future TIS, its preferred for any SIDRA analyses that the Site Layout, Intersection Summary, and Lane Summary reports be provided as part of the appendices.

6. Verify TIS has been provided to any appropriate local entity (City, County, MPO) and provide copies of any comments received and how they were addressed.

- Table 1 on page 14 lists US 340 as Williamsport Pike and it should be changed to Berryville Pike.
- Double-check the number of trips for the 200 townhomes since the numbers do not appear to be correct in Table 2 on page 20.

Consultant should address the above comments, as well as any provided by the District, and submit a revised TIS for further review/approval. Let me know if you have any comments or if you need any additional information.

On Tue, Mar 28, 2023 at 8:50 AM Glaser, Caleb <cglaser@amtengineering.com> wrote:

> Good Morning Perry,
>
> On behalf of LGI Homes, attached is the Preliminary Traffic Impact Study (TIS) for the Fairview Farms mixed-use development in Jefferson County. This study is prepared in accordance with the approved SOW document (attached) with WVDOH. In accordance with the SOW, a copy of the study is being provided to the Jefferson County Commission, City of Charles Town, and HEPMPO for comment. All relevant files have been uploaded to ProjectWise.
>
> Please let me know if you have any questions or need additional information.
>
> Best Regards,
>
> **Caleb Glaser** P.E., PTOE
>
> Project Engineer
>
> **P** 304-400-4952| **D** 304-903-7010| **C** 216-640-5970
> **W** www.amtengineering.com

--

Perry J. Keller

Chief Economic Development Officer

Commissioner's Office of Economic Development

Building 5, Room 110

1900 Kanawha Blvd., E.

Charleston, WV 25305

304.414.6925 (o)

August 04, 2023

Mr. Perry J. Keller
WV Department of Transportation
Commissioner's Office of Economic Development
1900 Kanawha Boulevard, East
Building 5, Room 164
Charleston, West Virginia 25305

Re: **Traffic Impact Study**
Fairview Farms
Charles Town, Jefferson County
AMT File No.: 22-0225.001

Dear Mr. Keller:

This letter is in reference to your email dated May 30, 2023 transmitting review comments regarding the Traffic Impact Study for the Fairview Farms development prepared by **A. Morton Thomas and Associates, Inc. (AMT)**. Following are responses and intended resolution to your comments:

1) *The DOH already has a project programmed to construct a single lane roundabout at the intersection of WV 115 with Hillside Dr/US 340 NB Connector. This improvement is anticipated to be in place prior to the 2030 No Build Conditions (currently estimated for construction in 2025). TIS currently identifies this as a 2030 Build Improved Conditions project. It is recommended this project be included in the TIS beginning with the 2030 No Build Conditions so that it can be determined if this development is projected to negatively impact the intersection. Also, TIS appears to indicate this improvement to accommodate the Kings Crossing development, however, this improvement was initially discussed internally and ultimately recommended based on information within the Magnolia Springs development TIS.*

   Acknowledged. This Revised TIS Report includes the proposed roundabout within No-Build conditions and onward. The Revised TIS Report has been modified to indicate the project is DOH planned and is expected to be constructed in 2025.

2) *Related to above, in both the Executive Summary and Conclusions sections of the TIS, while it indicates DOH should proceed with planned roundabout at Hillside Dr to address existing capacity issues, it then indicates that an exclusive right turn slip lane on WV 115 EB approaching US 340 NB Connector should be constructed to accommodate additional future volumes unrelated to the Fairview Farms development. It then states that the WV 115 EB approach is anticipated to operate at LOS E in the 2030 No-Build Conditions. Considering the roundabout currently is not included in the analyses (to our knowledge) until the 2030 Build Improved Conditions, this statement causes some level of confusion concerning this proposed improvement. This is further reasoning for the planned roundabout to be included in the TIS and all analyses beginning with the 2030 No-Build scenario.*

   Acknowledged. Revised analysis with the single-lane roundabout at Intersection 3 indicates an excessive queue length is expected on the WV 115 eastbound approach during 2030 No-Build conditions. The proposed improvement of an exclusive right-turn lane (shown in 2030 Build Improved conditions) on the approach would mitigate this issue.

3) *It appears that the included site plan incorrectly refers to a proposed intersection of WV 115 with Kings Crossing as the intersection of WV 115 with Kabletown Rd.*

Acknowledged. The figure has been modified within the Revised TIS Report.

4) *Based on the proximity of the Fairview Farms and Kings Crossing developments and the turn lanes proposed along WV 115 for their approaches, its recommended the two developers engage in discussions to implement a section of TWLTL along WV 115 in lieu of multiple exclusive left turn lanes.*

Acknowledged. The Kings Crossing TIS states that an exclusive left-turn lane be constructed on WV 115 westbound approach to Site Drive #2, which is approximately 1,300 feet east of Site Drive #2 for the Fairview Farms development. I do not believe it makes sense for the two developers to contribute to a TWLTL section between these two site driveways and should simply construct the exclusive left-turn lanes as described in their respective TIS reports.

5) *Although no direction has been provided to date, for the revised TIS and any future TIS, its preferred for any SIDRA analyses that the Site Layout, Intersection Summary, and Lane Summary reports be provided as part of the appendices.*

Acknowledged. All described reports are included in the Revised TIS Report and for all future TIS projects.

6) *Verify TIS has been provided to any appropriate local entity (City, County, MPO) and provide copies of any comments received and how they were addressed.*

The TIS was submitted to the City of Charles Town (James Newman), Jefferson County (Jennifer Brockman), and HEPMPO (Matt Mullenax) on March 28th. No comments were provided by any of the offices.

Please let us know if you have any additional questions or desire clarification of any information provided in this response to your comments regarding the Fairview Farms Revised TIS. We are available at your convenience to discuss this project.

Sincerely,
A. Morton Thomas and Associates, Inc.



Caleb Glaser, P.E., PTOE
Engineer
cglaser@amtengineering.com

cc: Mike Dropik (LGI)
Tom Evans (IGS)

City of Charles Town
101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 725-2311 ♦ Web: www.charlestownwv.us

Resolution to Repeal and Replace the Conditions of Annexation for Fairview Property

WHEREAS, Oakland United Methodist Church and the Estate of Margaret Z. Dailey, by Bank of Charles Town as executor, presented their petition to annex property into the City of Charles Town (City) at a regular council meeting on the 19th day of September 2005 that was subsequently referred to the Finance Committee (Committee) and the Planning Commission (Commission) for review, analysis, and recommendation; and

WHEREAS, the Committee and Commission recommended, and the Charles Town City Council (Council) received and approved acceptance via Resolution 2005-15 on 5th day of December 2005 for annexation of Oakland United Methodist Church and the Estate of Margaret Z. Dailey, by Bank of Charles, her Executor, to incorporate such land into the City with several conditions including certain parcels with a zoning designation of Neighborhood Residential and General Commercial; and

WHEREAS, the petitioners agree that any conditions of annexation imposed by Council at that time would bind the owners of the property, their successors, and assigns; and

WHEREAS, nearly eighteen years after that initial agreement was made, the subject property remains undeveloped and the current property owners, working with the developer, have requested Council consider amendments to the original agreement that reflect the City's current growth plans and existing economic conditions; and

WHEREAS, the Mayor appointed a Select Committee on the 22nd day of June 2023, including representatives from the City's Community Development Division, Planning Commission, and Council, to work with the current owners to determine if amendments should be recommended to the full Council for further consideration; and

WHEREAS, after several productive discussions with the current property owner and prospective developer of the Fairview Property that was annexed with conditions into the City pursuant to Resolution 2005-15 (Resolution), the special committee recommends repealing the conditions of annexation imposed by the Resolution and replacing with new terms and conditions.

NOW, THEREFORE BE IT RESOLVED Council agrees to the following new terms and conditions with respect to the development of the Fairview Property: See Attached Exhibit 1

NOW, THEREFORE BE IT FURTHER RESOLVED, the Planning Commission shall review the owner/developers' sketch plan dated March 2023 for development during the 24th day of April, 2023 Planning Commission for consistency with the Neighborhood Residential Zoning District standards and other conditions outlined in this resolution, make adjustments with the owner/developer as agreed, and perform all other routine duties as outlined in the City's Subdivision and Land Development Ordinance related to this project; and

NOW, THEREFORE BE IT FUTHER RESOLVED, Council and the property owner agree that the terms and conditions contained in this resolution shall bind the current owner, their successor, and assigns.

Adopted the 18th day of September 2023.

Robert M. Trainor
Mayor

John Nissel
City Manager/Clerk

Exhibit 1 of Resolution 2023-012: City of Charles Town - Conditions of Annexation offered by Jaguar IV, LC, and any future assigns and/or buyers, for the annexation of approximately 113.8 acres into the City of Charles Town.

"Jaguar IV, LC", herein also referred to as "Land Owner", and any future assigns and/or buyers, agrees to the following conditions of annexation for "The Property" identified as Parcel 218.1, Tax Map 10, Charles Town District, for annexation into the City of Charles Town, herein also referred to as "The City":

Economic Impact:

1. In lieu of paying capital improvement fees, and fee in-lieu requirements for Park Dedication under Section 1333.17 of the Subdivision and Land Development Ordinance, the Land Owner proffers to pay a flat fee of $3,494.00 per residential unit at the time of building permit issuance. The Land Owner shall be exempt from any future capital improvement fees implemented by The City.

2. In lieu of paying capital improvement fees, the Land Owner proffers to pay a flat fee of $2,958.00 per thousand square feet of commercial space at the time of building permit issuance. The Land Owner shall be exempt from any future capital improvement fees implemented by The City.

Urban Zoning:

3. The Property is to be zoned (NR) Neighborhood Residential District. At least 10% of the total land area of Parcel 218.1 shall be created as "for-profit" commercial uses. All proposed land uses shall be so designated on the Sketch Plan. The 2.42-acre Parcel 218.2, deeded to the City of Charles Town in 2013 for a water treatment facility, is to be included in the calculation of commercial use.

4. The City agrees to the following clarifications of the Zoning Ordinance:

    a. Townhomes may be constructed on individual lots and do not need to be located on a 5 acre cluster.
    b. For all residential structures, street front set backs shall be measured from the street curb.

5. The Land Owner agrees to provide landscaped buffers between commercial uses and adjoining residential uses. Such buffers shall be as prescribed in the City's Zoning Ordinance or may be landscaped parks or trails.

6. In accordance with the NR Zone regulations, at least 10% of Parcel 218.1 shall be open space. As a mixed-use community, Section 1333.20(O) of the Subdivision and Land Development Ordinance of the City of Charles Town, open space standards for townhouse developments shall be pro-rated at 20% based on the percentage of the property that is developed for townhomes.

Municipal Infrastructure and Services:

7. As part of the development, the Land Owner agrees to create recreation areas, walking paths and a small community park(s) (1 to 2 acres) to be built for use of the residents and users of the planned development. These areas shall be maintained by the HOA created for the development.

8. The following amenities shall be included in the community park(s):

    a. Outdoor community center consisting of a pavilion with electricity, picnic tables and BBQ grills.

b. Playground: Construct commercial grade playground equipment that serves the following age groups (6-23 months, 2-5 years, and 5-12 years). The playground should meet ADA compliance standards that features ramps and transfer stations with accessible access to the playground area. Playground surfacing should consist of ADA accessible engineered wood fiber, rubber mulch, or pour-in-place rubber surfacing with the goal of facilitating inclusive play opportunities.

c. Multi-purpose play field.

Affordable Housing:

9. 10% of the residential units in the development shall meet HUD's HOME Homeownership Value Limits for Jefferson County.

Transportation:

10. The Landowner shall co-ordinate with the Jefferson County Board of Education to provide an adequate number of bus stop shelters within the development to be used for school transportation, subject to acceptance by the Jefferson County Board of Education.

11. The Landowner shall co-ordinate with the Eastern Panhandle Transit Authority to provide an adequate number of bus stop shelters for public transportation subject to acceptance by EPTA.

12. The Land Owner shall include the construction of a major roadway and trail consistent with the transportation plan of the City's Comprehensive Plan. The trail shall be fully constructed by the Land Owner to Subdivision and Land Development Ordinance standards under Section 1333.18(A) and Standard Detail ST1. The trail is to be located within the proposed major road right of way, and it shall be accessible by the general public. The road shall be designed as a continuous limited access roadway designed to serve the traffic generated by the subdivision, but not limiting the use of traffic calming features such as roundabouts, narrow travel lanes and raised crosswalks to make the road more compatible for a residential area. The Land Owner shall build this road not more than 2 lanes wide (minor collector road design standards), excluding required turning lanes, and this road shall be located within an eighty-foot wide right of way. The road shall be located to serve the various parts of the subdivision. An eighty foot wide right of way will be reserved and platted to allow completion through the Property of the major road to the property line [adjoining the approximately 92 acre Langlet property (currently Tax District 3/Map 15/Parcel 7)] of the parcel.

13. The City agrees to work with the Land Owner and the WVDOT to create the best main entrances into the development.

14. The Land Owner shall conduct a traffic impact analysis (TIA) once the Sketch Plan for the Development has been developed and actual uses and transportation patterns have been delineated. This TIA will be done in accordance with the guidelines as set by the WVDOH. It will be submitted with the Preliminary Subdivision / Land Development Plat.

15. The Land Owner agrees that if it is determined by the traffic study that traffic lights are required at build out of the development at any of the intersections with Route 115 that it will be responsible for any portion of the light the State Department of Highways deems appropriate.

Other:

16. The Land Owner shall ensure that the above conditions of annexation are binding to the property and upon any assigns and/or buyers of any, or all, portions of the property, excluding land given to the City or WVDOT.

17. To incentivize and attract commercial development within the City, all commercial lots associated with the land shall be prepared in a way that includes grading and utility installation. All commercial lots shall have all pad sites graded with utility installation (stubbed to the property line) completed during the initial start-up of Project Phase 1. Specifically, if Phase 1 includes more than 100 residential units, to include both townhomes and single-family homes, all commercial pad site preparation shall run concurrently with the construction of the first (10) ten residential units. No more than (10) ten residential units shall be constructed until all commercial lots are completed with the above requirements.

City of Charles Town

Robert M. Trainor
Mayor

Attest:

John Nissel
City Clerk

STATE OF WEST VIRGINIA
COUNTY OF Jefferson, to wit:

The foregoing instrument was acknowledged before me this 11 day of October, 2023, by Robert M. Trainor, in his capacity as Mayor of the City of Charles Town, a West Virginia municipal corporation.

(Affix Notarial Seal)

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
Carolyn M. Vezzosi
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414
My Commission Expires June 12, 2025

Carolyn Vezzosi
NOTORY PUBLIC

My commission expires: 6/12/2025

Charles Cocke, Mgr.

Charles Locke

Charles Cocke, Manager

Jaguar IV LC

STATE OF Maryland

County of Montgomery

The foregoing instrument was acknowledged before me this 5TH day of October, 2023,

by Charles Cocke, Manager of Jaguar IV LC

(Affix Notarial Seal)

Michael Dropik
NOTARY PUBLIC
Montgomery County
MARYLAND
MY COMMISSION EXPIRES November 10, 2026

NOTORY PUBLIC

My commission expires: 11-10-26

City of Charles Town

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 725-2311 • Fax: (304) 725-1014 • Web: www.charlestownwv.us

MAYOR
Peggy A. Smith

CITY COUNCIL
Randy Breeden
Donald Chadwick
William Jordan
Sandra Slusher McDonald
Amy Schmitt
John Ward
Matthew Ward
Geraldine Willingham

CITY MANAGER
Jane E. Arnett

CITY CLERK
Joe Caccioni

Resolution 2005-15
An Acceptance of Conditions of Annexation

WHEREAS, Oakland United Methodist Church and the Estate of Margaret Z. Dailey, by Bank of Charles Town as executor, presented their petitions for annexation for their property to the Mayor and City Council at a regular council meeting on the 19th day of September, 2005, and

WHEREAS, the said Petitions for Annexation were received and approved for acceptance by the City Council at said meeting, and

WHEREAS, by action of the City Council taken at said meeting, the Petitions for Annexation were referred to the Finance Committee of the City for further review and analysis, and

WHEREAS, the Petitions for Annexation were next referred to the City of Charles Town Planning Commission for further review and analysis, and

WHEREAS, through direct negotiation, Oakland United Methodist Church, the Bank of Charles Town, the Planning Commission, the Finance Committee, the City Council of the City of Charles Town, and City Staff have compiled a list of conditions of annexation to be made by Oakland United Methodist Church as the owners of the property which is subject to the annexation for the use and benefit of the City of Charles Town (hereinafter attached to as Exhibit 1: Conditions of Annexation offered by Oakland United Methodist Church for the annexation of approximately 124 acres into the City of Charles Town),

WHEREAS, The parcels are located within the "Charles Town Growth Boundary" and are located off of WV Route 9 and across from the New St. James Church and Crosswinds Subdivision, both in the City and next to the Charles Town Water Treatment Plant parcel. The parcels to be annexed include the existing lands of the Oakland Methodist Church and the Dailey Farm minus a 7 acre parcel currently being subdivided out of the parcel for a family member under the Jefferson County Subdivision Regulations, and

WHEREAS, Increased municipal taxes and fees on residents and commercial entities will have a positive fiscal impact on the City, and

WHEREAS, The current zoning is rural, which is not compatible with the uses proposed or being built on the south Side of WV Route 9, nor the existing uses to the west, Oakland Heights (in the County) and Greenfields & Hillside subdivisions

(within the City). The proposed zoning categories will promote traditional neighborhood, mixed-use urban development, helping ensure orderly growth consistent with the established community. Zoning shall be Neighborhood Residential for the Dailey Parcel and General Commercial for the Oakland Methodist Church Parcel, and

WHEREAS, Affordable housing will be an important part of the proposed development. As a condition of annexation, Oakland Methodist Church agrees that in creating housing, it will make at least 10% of the housing created affordable. The church will, if it can find a partner to build an assisted housing complex to serve seniors requiring some assistance with activities of daily living, reserve land to create such a complex, and

WHEREAS, In developing its master plan for both of the parcels (containing 124 acres), Oakland Church agrees that major roadways will be designed so as to link up with any existing or proposed streets within Charles Town and also designed to link up with adjoining parcels in order to assure orderly growth of transportation facilities. Walkways and bicycle paths will be designed to connect all portions of the proposed development together, creating a walkable community, and

WHEREAS, A Phase 1 Study has been completed and will be made available to the City. No major environmental, historical or cultural resources or recreation areas are within the area to be annexed. However as part of the overall plan, recreational resources will be made available to the community including ball fields, walking trails and a community center, and

WHEREAS, The proposed annexations are not inconsistent with the existing comprehensive plan in that the plan recommends annexation of additional land and the creation of new recreational facilities, and

WHEREAS, The annexations are contiguous with the existing city in that both Crosswinds, and St. James Church are both within the City and directly on the other side of WV Route 9, and

WHEREAS, The properties are adjacent to the present Charles Town Water Treatment Plant,

NOW, THEREFORE, WITNESSETH: That Oakland United Methodist Church and the City of Charles Town agree as follows:

A. The City will, by ordinance, as provided in §8-6-4 of the West Virginia Code, annexing the corporate boundaries of Charles Town the territory known as Oakland United Methodist Church and the Dailey Farm.

B. The City will subject the territory so annexed to General Commercial zoning for the Oakland United Methodist Church parcel and Neighborhood Residential for the Dailey Farm parcel.

C. Oakland United Methodist Church will offer all terms set forth in Exhibit 1 hereof for the use and benefit of the City of Charles Town and/or the Jefferson County Board of Education as the Case may be upon the terms and conditions herein set forth.

D. Oakland United Methodist Church agree to execute further assurances or agreements as may be required by the City with such assurances and agreements to bind the owners of the property sought to be annexed, their successors and assigns to the terms of the conditions of annexation.

NOW, THEREFORE, BE IT RESOLVED; By the City Council of the City of Charles Town, to accept and approve the ordinance for annexation of Oakland United Methodist Church and the Estate of Margaret Z. Dailey, by Bank of Charles Town her Executor, to incorporate the same within the corporate boundaries of the City of Charles Town, pursuant to §8-6-4 of the West Virginia Code.

Dated: DECEMBER 5TH, 2005

CITY OF CHARLES TOWN:

Peggy A. Smith, Mayor

Attest:

City Clerk

Exhibit 1: **Conditions of Annexation offered by Oakland United Methodist Church, and any future assigns and/or buyers, for the annexation of approximately 124 acres into the City of Charles Town.**

***"Oakland United Methodist Church"*, herein also referred to as *"Oakland Church"*, *"The Church"* and *"Oakland"*, and any future assigns and/or buyers, agrees to the following conditions of annexation if the *"Subject Property"*, *herein also referred to as "The Property"*, *"The Land"*, *"The Parcels"*, *"approximately 124 acres"* or any similar language, and identified by parcels 6.1 and 8, Tax Map 18, Charles Town District, is annexed into the City of Charles Town, herein also referred to as *"The City" and "Charles Town"*:**

Economic Impact:

1. Oakland United Methodist Church or its assigns agrees to provide a fiscal impact study with the submission of a schematic plan for the property.

   This study will be done in accordance with the methodology already accepted by the City (and done by URS Consultants). If according to the study, negative impacts are found that cannot be mitigated by other acceptable means, then the church agrees to proffer to pay an amount to be determined jointly by the City and the church to mitigate the fiscal impact costs to the City.

2. Oakland Church agrees to pay the capital improvements costs incurred by the City on a per residential unit basis. The amount paid will be the dollar amount in effect (for planned capital improvements as determined by the City) at the time of building permit issuance. Such an amount may be mitigated as stated in #10 and #11 and #15, under the section Municipal Infrastructure and Services, described herein.

3. Oakland Church agrees to pay the capital improvement costs for non-residential development, if any are required at the time of building permit issuance. The amount paid will be the dollar amount in effect (for planned capital improvements as determined by the City) at the time of building permit issuance. Such an amount may be mitigated as stated in #10 and #11 and #15, under the section Municipal Infrastructure and Services, and Transportation, described herein.

4. The church agrees to pay the County's mandated impact fees for education.

Urban Zoning:

5. Parcel 6.1, of approximately 7 acres, is to be zoned GC (General Commercial District) and Parcel 8, of approximately 117 acres, is to be zoned (NR) Neighborhood Residential District. At least 10% of the total land area of Parcel 8 shall be created as "for-profit" commercial uses. If more than 10% of the land area of Parcel 8 is established for commercial purposes, any additional commercial land area over 10% may be used as "not-for-profit" uses. In addition, any additional commercial land over the 10% "for-profit" land use may be zoned GC (General Commercial) District (up to a maximum of 2 acres), which may be used for general commercial uses, such as, but not limited to, a restaurant and medical clinic. All proposed land uses shall be so designated on the schematic plan.

6. The church agrees to present to the Planning Commission a schematic plan for both parcels that may include an expansion to the church property, a multi-use non-profit office and community center. This plan will have attached to it a fiscal impact study and a traffic impact study. Phasing of all uses, including all commercial uses, shall be established on the schematic plan.

7. The City agrees to the following clarifications to the Zoning Ordinance:
   a. Town homes may be constructed on individual lots and do not need to be located on a 5 acre cluster.

b. Multifamily housing includes housing for elderly such as assisted or congregate housing that includes a central dining facility and kitchen.
c. For all residential structures, street front set backs shall be measured from the street curb.

8. The church agrees to provide landscaped buffers between commercial uses and adjoining residential uses, and between elderly assisted or congregate housing facilities and other residential uses, if any. Such buffers shall be as prescribed in the City's Zoning Ordinance or may be landscaped parks or trails.

Municipal Infrastructure and Services:

9. The church agrees to make available church owned playing fields and other church owned facilities available to the community at a minimal charge when these facilities are not being used by the Church.

10. Oakland agrees to provide to the City, free of charge, and as required by the WVDOH, a parcel of land to be taken from the Dailey parcel, not exceeding 2 acres to be located adjacent to the existing water plant at a location mutually agreed to by both parties for expansion of the water plant. Furthermore, the City agrees that if an entrance to the development is agreed to at the current entrance to the Water Treatment Plant, it will work with the church to make the land available for the entrance and the church will include in addition to the 2 acres a like amount of land to off set the land required for the entrance.
a. The land to be dedicated to the City as proffered above shall be appraised at its cash value at the time it is donated to the City.
b. The established cash value of this land will be used to offset cash contributions under #1, #2 and #3 above to be paid to the City.

11. As part of the development, the church agrees to create recreation areas, walking paths and a small community park (1 to 2 acres) to be built for use of the residents and users of the planned development. These areas may be maintained by a HOA created for the development or they may be dedicated to the City.
a. The land to be dedicated to the City as proffered above shall be appraised at its cash value by the church at the time it is donated to the City.
b. The established cash value of this land will be used to offset cash contributions under #1, #2 and #3 above to be paid to the City.

Affordable Housing:

12. The church shall require any developer of housing within the two parcels to make at least 10% of the residential units available as workforce housing in accordance with the guidelines to be developed by the Mayor's Committee on Work Force Housing and approved by City Council.

13. The church shall work with the WVHDF to identify resources to make 10% of any multifamily or elderly housing affordable to households with incomes between 50% and 80% of median income for the applicable household size (as published by the USDHUD on an annual basis).

Transportation:

14. The church shall provide at least one bus stop shelter within the complex to be used for public transportation and/or school transportation, subject to acceptance by either PanTran (public transportation) or its successor or by the Jefferson County Board of Education.

15. The church shall as part of its schematic plan include the construction of a major roadway and trail consistent with the transportation plan of the City's proposed Comprehensive Plan that is currently being prepared by the Planning Commission. The trail shall be fully constructed by

the church to standards acceptable to the City, be located within the proposed major road right of way, and it shall be accessible by the general public. The road shall be designed as a continuous limited access roadway designed to serve the traffic generated by the subdivision, but not limiting the use of traffic calming features such as roundabouts, narrow travel lanes and raised crosswalks to make the road more compatible for a residential area. The church shall build this road not more than 2 lanes wide (collector road design standards), excluding required turning lanes, and this road shall be located within an eighty-foot wide right of way. The road shall be located to serve the various parts of the subdivision at Schematic Plan Stage in consultation with the Planning Commission in order to implement the City's proposed Comprehensive Plan. An eighty foot wide right of way will be reserved and platted to allow completion through the property of the major road to the property line (adjoining Langlet) of the parcel. 30 feet of the 80-foot right of way shall be appraised at its cash value by the church at the time it is donated to the City. The established cash value of this land will be used to offset cash contributions under #1, #2 and #3 above to be paid to the City.

16. The City agrees to work with the church and the WVDOT to create the best main entrance into the development, possibly opposite the planned entrance for King's Crossing (a residential subdivision proposed in the County) whose entrance is currently planned to be directly opposite the existing Charles Town Water Plant entrance.

17. The church shall provide a traffic impact analysis once the concept plan for the Dailey parcel has been developed and actual uses and transportation patterns have been delineated. This plan will be done in accordance with the guidelines as set by the WVDOH. It will be submitted with the schematic plan submittal as required by the NR Zone, and proffered herein.

18. The church agrees that if it is determined by the traffic study that traffic lights are required at build out of the development at any of the intersections with WV Route 9 (Leesburg Pike) that it will pay up to one quarter of the cost of such improvements (not to exceed $35,000) unless otherwise required by the WVDOH.

Other:

19. The church shall ensure that the above conditions of annexation are binding to the property and upon any assigns and/or buyers of any, or all, portions of the property, excluding land given to the City or WVDOT.

Dated this 7 day of December, 2005.

For Oakland United Methodist Church

City of Charles Town, Mayor 12/8/05

ATTEST:

City Clerk

Gary W. Whittington
My Commission expires
4-2-2012

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
GARY W. WHITTINGTON
521 BURNS STREET
RANSON, WV 25438
My commission expires April 2, 2012.

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Public Hearing: ZMA2023-03: Vinton Hayes - Rezoning to Urban Reserve

ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3._Site.pdf
- 4._Original_Conditions_of_Annexation.pdf
- 5._Original_hayes_concept-drawing.pdf
- 6._COA_Revised.pdf

Rezoning Request

ZMA2023-03

Date: For the January 22, 2024 Planning Commission meeting

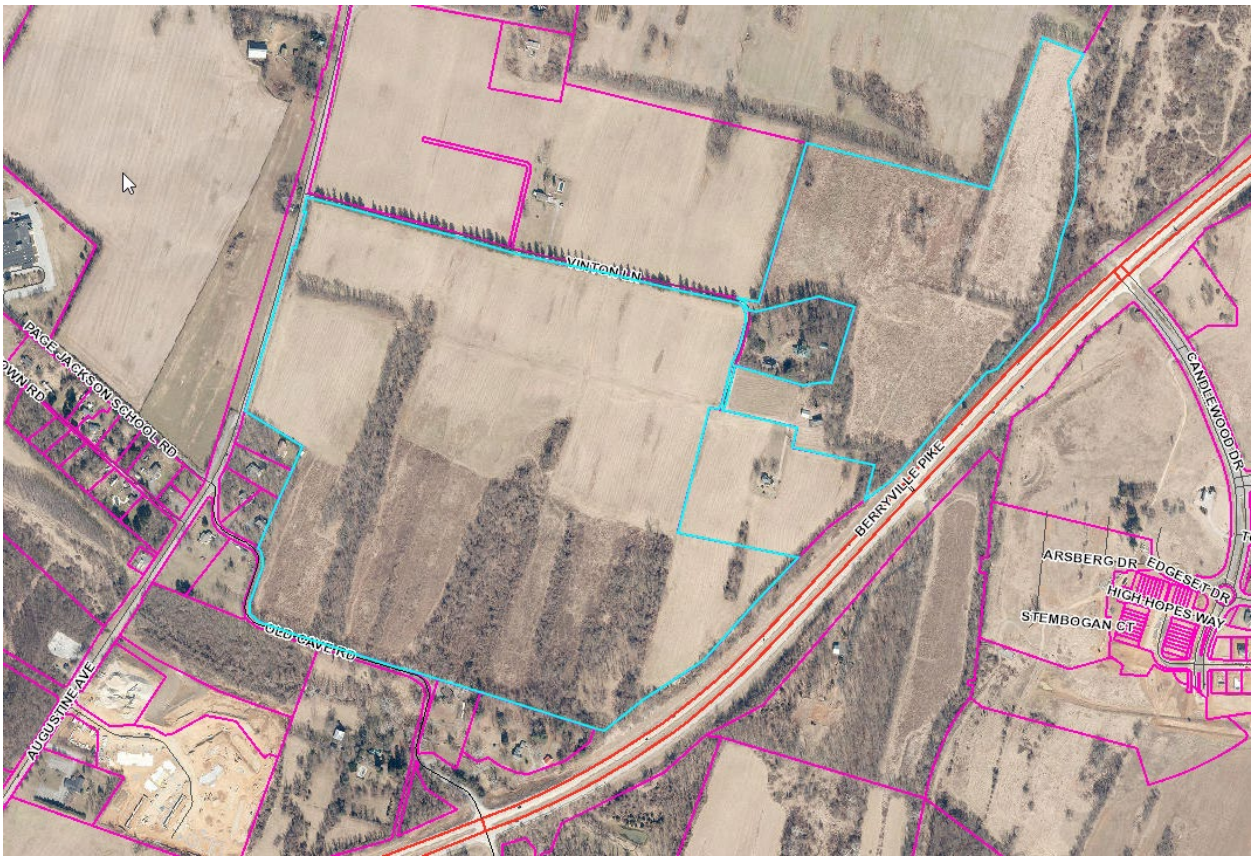
Applicant: Elm Street Communities LLC

Property Owner: HAYES ROSCOE A ET AL

Report by: James Newman, City Planner, Zoning/Subdivision Administrator.

Proposal: Rezoning to Urban Reserve.

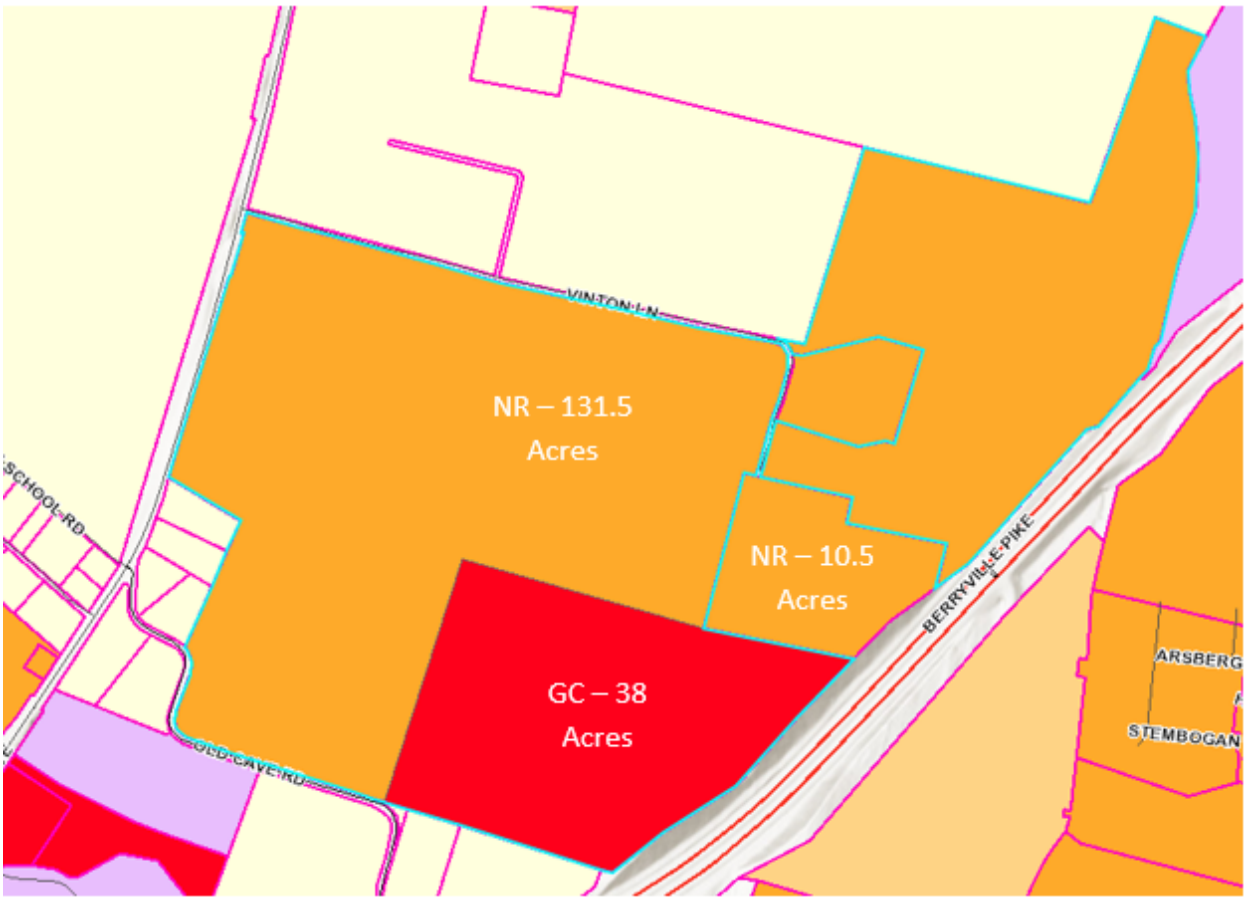
Property Location: TD 03 / Map: 12 / Pcls 217 & 218.



PROJECT OVERVIEW

Request by Elm Street Communities LLC to rezone approximately 180 acres of land on two parcels from Neighborhood Residential and General Commercial to Urban Reserve (UR).

CURRENT ZONING



The property is split into two zoning districts. The orange is Neighborhood Residential. And the red is General Commercial. The combined area of the two parcels is approximately 180 acres in size; General Commercial zoning covers approximately 38 acres of the site.

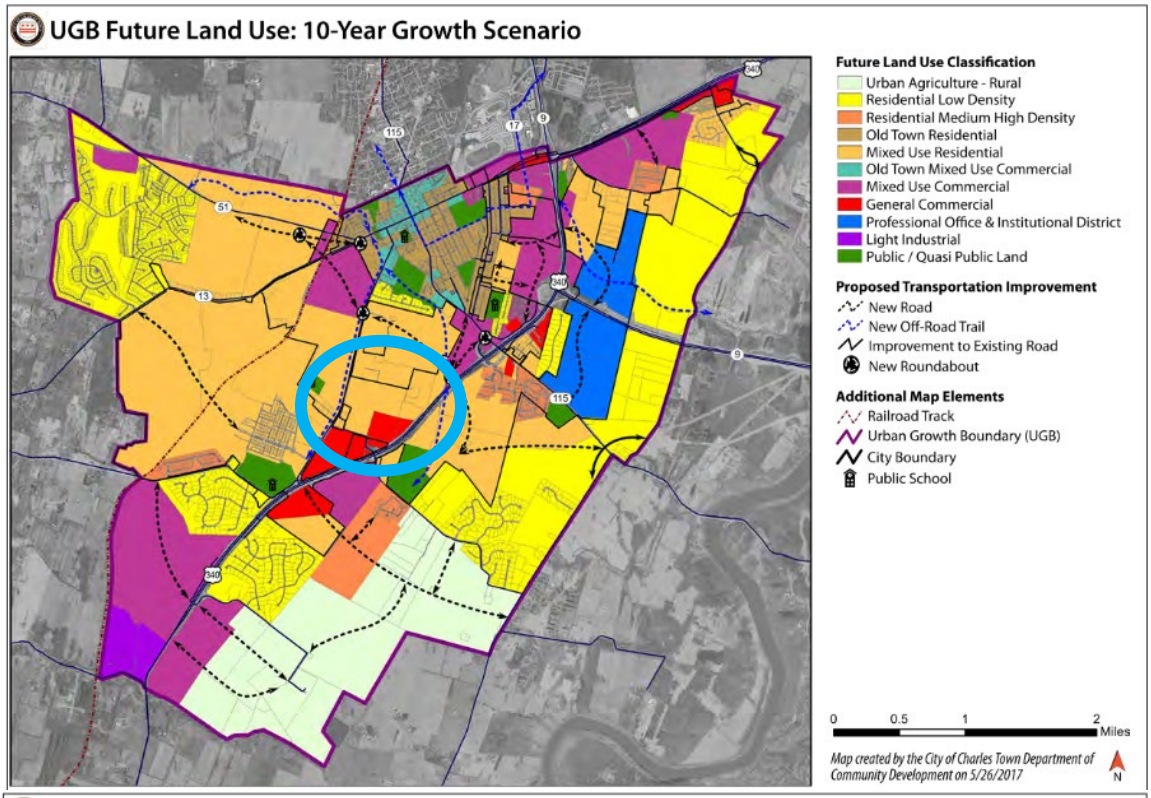
ZONING ORDINANCE SECTION 1322.05 URBAN RESERVE

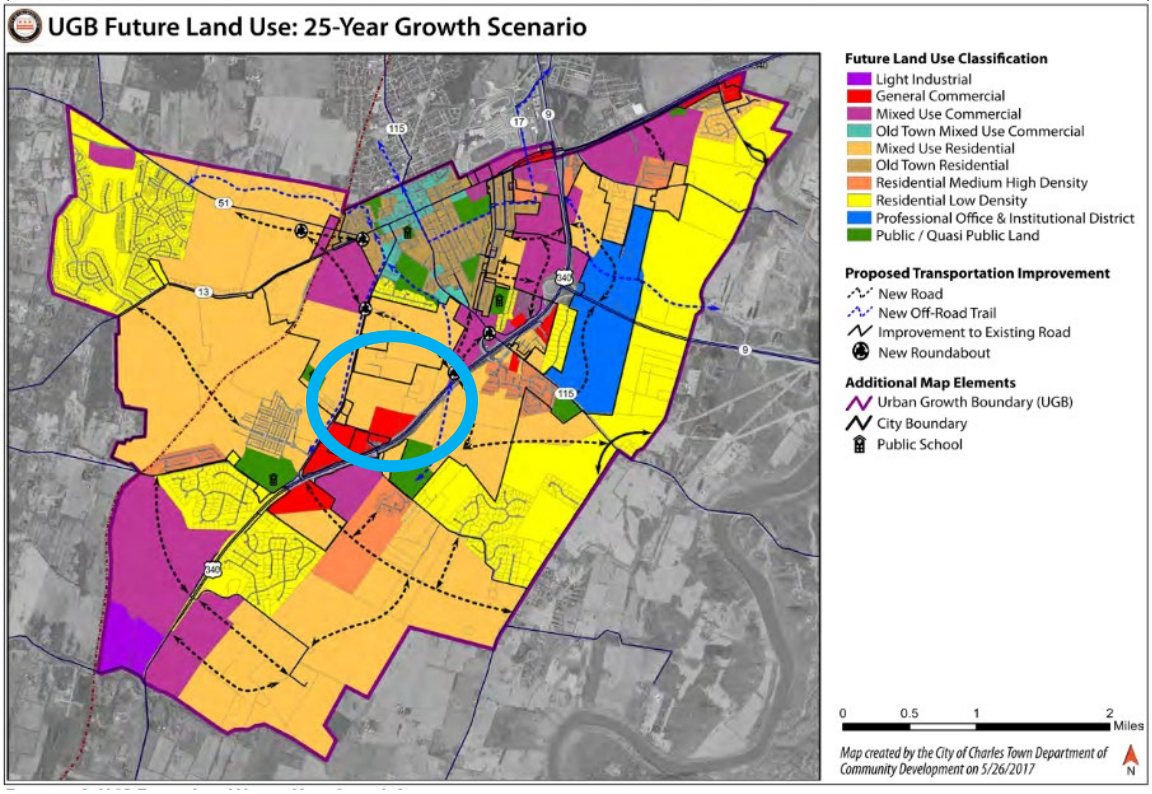
1. The Urban Reserve (UR) District is the zoning classification which is applied to annexed parcels upon approval and assignment into the City's jurisdiction. The UR District is a temporary holding district meant to accommodate existing Uses until the most appropriate zoning classification is enacted through the zoning amendment provisions specified under Section 1321.12 of this Ordinance; and

2. Parcels in the UR District may not be subdivided. An approved rezoning to any other Zoning District authorized by this Ordinance, or as amended, is necessary prior to subdivision or further development of such parcels or undertaking Uses other than the Uses existing thereon at the time of annexation. The rezoning request must be compatible with the goals and policies of the Charles Town Comprehensive Plan and must be accompanied by the Sketch Plan as specified under the Charles Town Subdivision and Land Development Ordinance

COMPREHENSIVE PLAN

The 2040 Comprehensive Plan designates this property as Mixed-Use Residential and General Commercial. The property is circled in blue below:





The Comprehensive Plan defines *Mixed-Use Residential* Future Land Use as:

> Categories are intended to **provide for a mix of housing types and sizes** (e.g. tiny houses), **as well as related services and uses**, **including** compatible and supporting **commercial** uses **and office** services. Regarding the mixing of uses, **residential uses are predominate and non-residential uses are secondary**, supporting the needs of the residential uses. Areas classified as Mixed Use Residential are a continuation of Charles Town's existing zoning category of Neighborhood Residential District and by extension, the non-residential uses would be similar to that of the Neighborhood Commercial zoning category. The Future Land Use Map envisions a higher intensity and density of uses oriented near Downtown to provide for greater walkability, accessibility, and mobility between Downtown commerce and surrounding neighborhoods.
>
> *-Comprehensive Plan page 72*

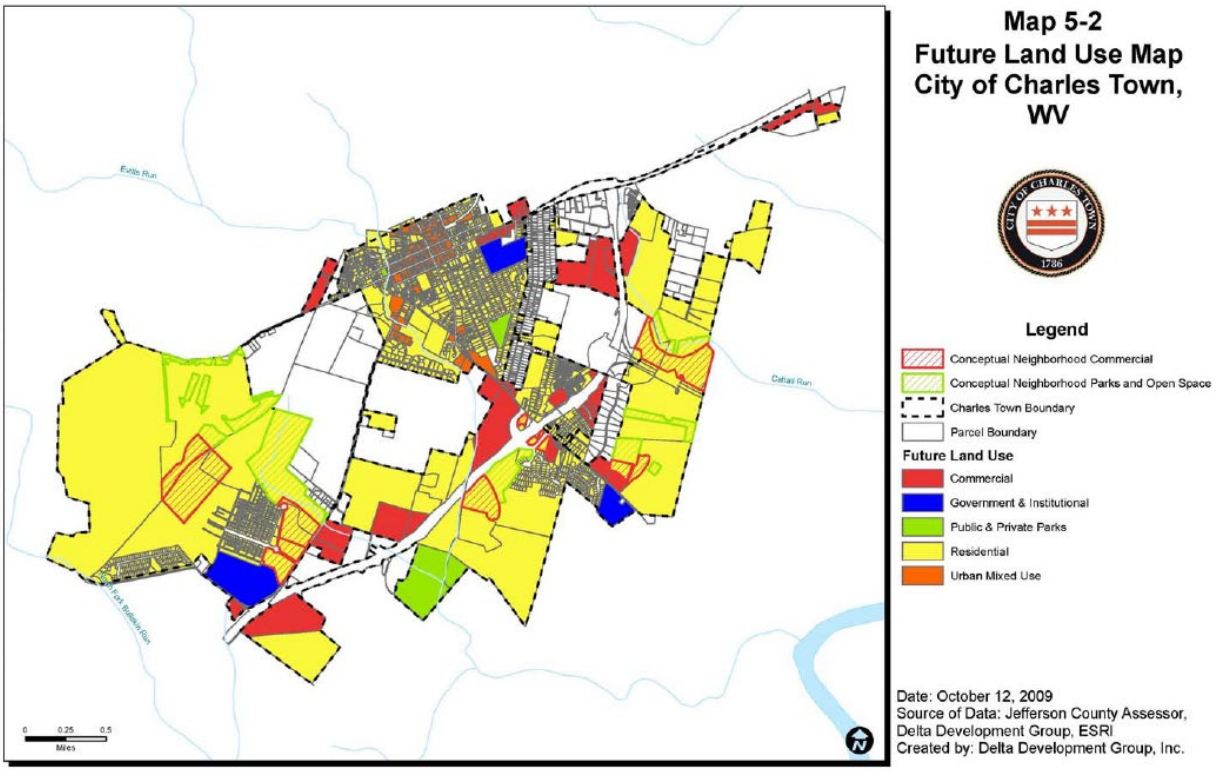
The Comprehensive Plan defines General Commercial as:

> The purpose of the General Commercial Future Land Use classification is to provide locations for **businesses of a more general nature** that may not be found in a neighborhood and can be served with adequate water, sewer, gas, and electric service. The businesses proposed in this Comprehensive Plan update include **retail, wholesale, and some light processing operations**. These uses tend to be very **auto centric**. It will be important for the Charles Town community (residents, visitors, and investors alike) to strongly consider the City's small town, historical significance of building and site design. New commercial development should strongly consider and be encouraged to deliver commercial products that uphold the City's small town and historical character and encourage walkable communities.
>
> *-Comprehensive Plan page 75*

The current Comprehensive Plan was adopted in 2018; the version prior to that was adopted in 2010. The 2010 future land use map for this area can be seen on the next page.

The 2010 Comprehensive Plan future land use map has the same general land use designations for these properties as the current Comprehensive Plan, which appear to be based on the 2007 Conditions of Annexation (COA) and its attendant land use sketch.

2010 Future Land Use Map



CONDITIONS OF ANNEXATION

The property was subject to COA that anticipated a mixed-use development centered around a hospital complex. The original COA was signed off by then Mayor Smith in January 2007. In early 2023 that COA was dissolved by mutual agreement of the City and the property owners. One of the conditions was that the property would be rezoned to Urban Reserve.

REZONING CRITERIA

Per Zoning Ordinance Section 1321.12, *Zoning Amendments*:

> *City Council, with the advice of the Planning Commission, finds either that the amendment is consistent with the City's Comprehensive Plan, or that the amendment is not consistent with the Comprehensive Plan but that there have been major changes of an economic, physical, or social nature within the area involved that were not anticipated when the Comprehensive Plan was adopted and that such major changes have substantially altered the basic characteristics of the area.*

1. *Is the zoning amendment consistent with the Comprehensive Plan?*

   The proposed rezoning is to Urban Reserve, which acts as a placeholder zoning district. However, the applicant will have to rezone the property again in order to develop it. Urban Reserve does not permit any uses other than what exists on site; the property is currently agricultural in nature

2. *Have been major changes of an economic, physical, or social nature within the area involved that were not anticipated when the Comprehensive Plan was adopted and that such major changes have substantially altered the basic characteristics of the area?*

   Yes. The development of this parcel as a residential periphery around a hospital/commercial subject to a set of specific conditions and development ideas was deemed unviable after 17 years of no development, and the COA was revised.

CONCLUSION

The applicant is proposing to rezone 180 acres of land to Urban Reserve. The Comprehensive Plan designates these parcels for residential and commercial use. The commercial use aspect was based on Conditions of Annexation which are no longer applicable to the properties. Urban Reserve acts as a placeholder while the applicant creates a development plan and a subsequent rezoning.

RECOMMENDATION

Approval.

Petition No._____

PETITION FOR ZONING AMENDMENT

Fee: $400

Zoning amendment petitions shall provide the following information:

1. Date 11/17/23
2. APPLICANT'S NAME* Elm Street Communities, Inc.
   Address: 1355 Beverly Road, Suite 240 McLean, VA 22101
   Telephone Number ( ) 703 734-9730
   Email Address jperry@elmstreetdev.com
3. PROPERTY OWNER'S NAME Hayes Roscoe A. et al
   Address: 245 Vinton Ln, Charles Town, WV 25415
   Telephone Number ( ) **304 671-1078**
   Email Address roscoeahayes@yahoo.com
4. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)
   Property Address: 245 Vinton Lane
   Tax Map # and Parcel(s): Map 12, Parcels 0217 and 0218
   Deed Book and Page: 1250/338
   Property Area in Square Feet or Acres: 180.11 Acres

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

5. PROVIDE SCALED MAP, TO BE ATTACHED, OF THE PROPERTY CLEARLY SHOWING THE PROPERTY'S LOCATION AND PROPERTY AREA IN SQUARE FEET AND/OR ACRES:

See Attached plan

6. DESCRIPTION OF APPLICANT'S INTEREST IN THE PROPERTY:

Rezoning of the property to the Urban Reserve zone.

7. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

The property is currently not zoned. It currently has one residence, farm outbuildings, fallow fields, and wooded areas.

Prior use is agricultural.

8. DESCRIPTION OF THE PROPOSED USE(S) OF THE PROPERTY AND REQUESTED ZONING DISTRICT:

The property will be rezoned to Urban Reserve as required, with the intent of subdividing in the future once the ultimate zoning is determined.

9. DESCRIBE HOW THE ZONING MAP AMENDMENT WILL BE CONSISTENT WITH THE OBJECTIVES AND POLICIES OF THE COMPREHENSIVE PLAN:

The Property is bordered on the East by Route 340 and adjacent Neighborhood Residential. It is bordered on the North, South and West by residential land and an Elementary school. The property is within the Urban Growth Boundary of the City as shown in the Comprehensive Plan.

10. TIME SCHEDULE FOR DEVELOPMENT: (AS APPLICABLE)

Rezoning to Urban Reserve is the first step.

11. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

Application No.	Project Name and Phase	Status	Approval Date
No pending applications			

NOTES

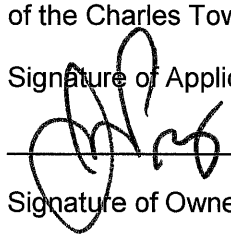
Additional exhibits may be required by the Zoning Administrator such as a lot location survey or site plan showing existing and if applicable, proposed structures, easements, watercourses, curb cuts and description of the uses of adjacent property that are necessary to describe existing or proposed conditions.

Any desire to amend or withdraw this petition must be submitted in writing to the Zoning Administrator. Also, if ownership of any part of or all of the real property subject to the petition shall change during the pendency of the petition, the Petitioner shall be required to immediately advise the Zoning Administrator in writing.

APPLICANT'S CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1321.12 and relevant provisions of the Charles Town Zoning Ordinance outlining the Zoning Amendment procedures.

Signature of Applicant



_____ Date 11/17/23

Signature of Owner(s) (If different than Applicant)

_____ Date _____

Please submit an original completed petition to the following:

Zoning Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Petition Received:_____

Fee: $_____ Check No._____ Receipt No._____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

APPLICANT'S CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1321.12 and relevant provisions of the Charles Town Zoning Ordinance outlining the Zoning Amendment procedures.

Signature of Applicant

Ronnie A. Hays Date 11/17/23

Signature of Owner(s) (If different than Applicant)

_____ Date _____

Please submit an original completed petition to the following:

Zoning Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Petition Received:_____

Fee: $_____ Check No._____ Receipt No._____

City Council Approval:_____ Date:_____

Comments:_____

#3 Property Owners Continued

NAME:	Alice M. Spickler and Donald Spickler Co-Trustees of the Alice M. Spickler Living Trust
Address:	4041 Fairway Drive, Medina, OH 44256
Email Address:	omnirph@zoominternet.net and im4wvu@zoominternet.net
Phone:	330-421-6476 and 330 421-6475
NAME:	Joseph R. Gallo
Address:	80 Ridgewood Road, Unit 205, Township of Washington, NJ 07676
Email Address:	joseph.r.gallo@gmail.com
Phone:	201 289-0387

APPLICANT'S CERTIFICATION Continued

Signature of Owners

Alice M. Spickler

Date 11/17/23

Donald Spickler

Date 11/17/23

Joseph R. Gallo

Date _____

APPLICANT'S CERTIFICATION Continued

Signature of Owners

Alice M. Spickler

Date _____

Donald Spickler

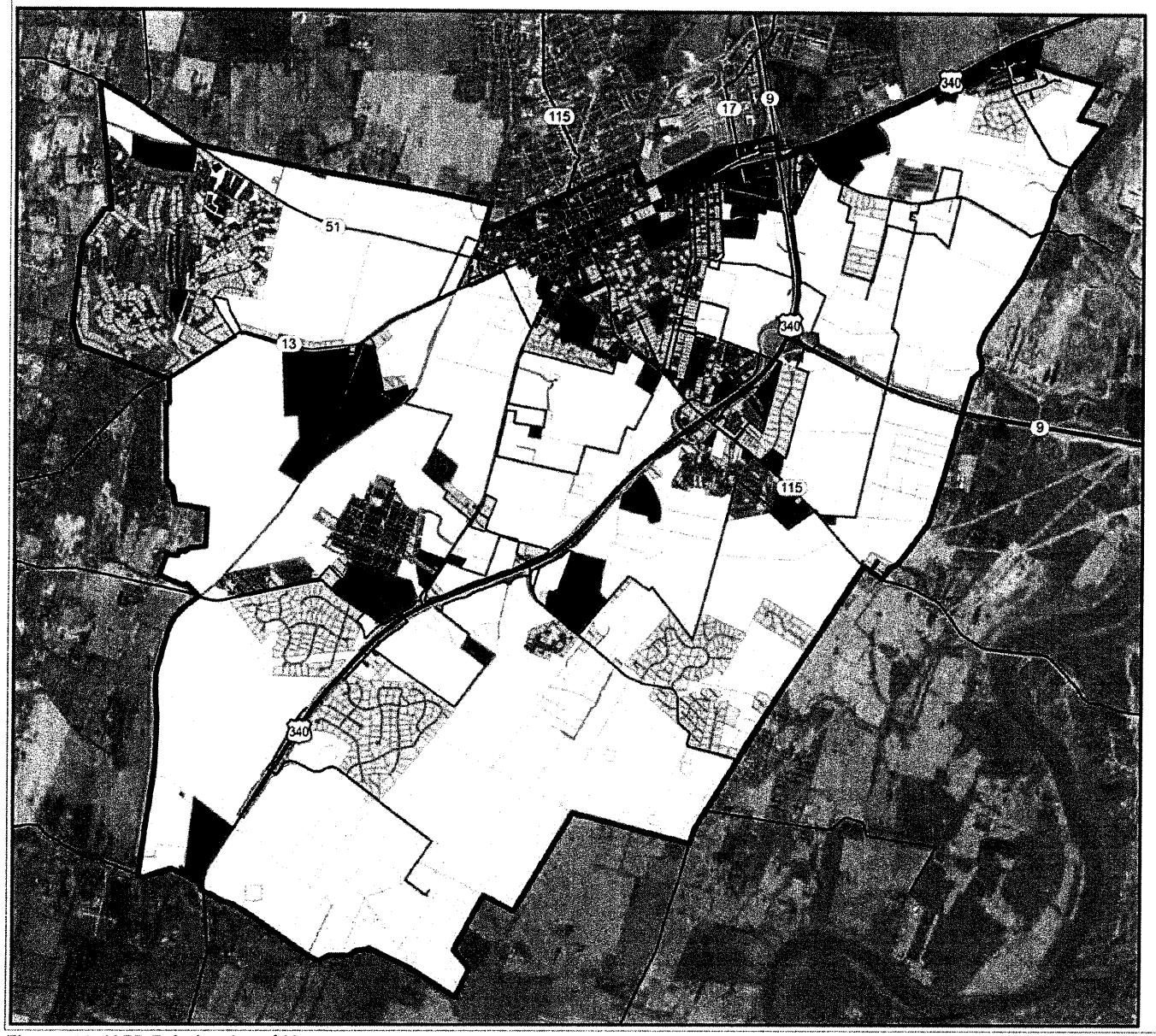
Date _____

Joseph R. Gallo 11/17/23

Date Nov. 17, 2023

Owner	Street	City State Zip	Owner Address	
PERRY ROGER J ET AL	1028 AUGUSTINE AVE	Charles Town WV 25414		
HAYES ROSCOE A & ROSEMARIE	245 VINTON LN	Charles Town WV 25414		
HAYES ROSCOE A ET AL	632 VINTON LN	Charles Town WV 25414		
SMITH RICHARD & ERIN	446 VINTON LN	Charles Town WV 25414		
PUSTER HARRY L ET AL	228 CASSILIS LN	Charles Town WV 25415		
ROMAN CATHOLIC DIOCESES OF WHEELING-CHARLESTON	BERRYVILLE PIKE	Charles Town WV 25416	1300 BYRON ST	WHEELING WV 26003
ARCADIA LAND INC	282 CANDLEWOOD DR.	Charles Town WV 25417		
BISHOP BRAD	BERRYVILLE PK	Charles Town WV 25418	55 FRASER CT	Charles Town WV 25414
CLINE ROBERT D JR & LISA E VIANDS-CLINE	1644 OLD CAVE RD	Charles Town WV 25419		
DAILEY ROGER H SR & EVELYN I	1854 OLD CAVE RD	Charles Town WV 25420		
FRAYSIER RICHARD H & CHARLENE A	1900 OLD CAVE RD	Charles Town WV 25421		
ATHEY GEORGE F & CATHERINE W	1865 OLD CAVE RD	Charles Town WV 25422		
WASHINGTON LANDING PARK LLC	OLD CAVE RD	Charles Town WV 25423	1821 AVON ST	CHARLOTTESVILLE VA 22902
KERNS ROBERT J JR & LISA D	2235 OLD CAVE RD	Charles Town WV 25424		
WYSONG KAREN L	2180 OLD CAVE RD	Charles Town WV 25425		
CRIM PATRICIA R & LOWELL KEITH	1445 AUGUSTINE AVE	Charles Town WV 25426		
BEAN VICTORIA & ETHAN SCHWARTZ	1441 AUGUSTINE AVE	Charles Town WV 25427		

UGB Existing Land Use



Existing Land Use Classifications

- Industrial
- Industrial Vacant
- Commercial
- Commercial Vacant
- Office Building
- Mixed Residential / Commercial
- High Density Residential
- High Density Residential Vacant
- Medium Density Residential
- Medium Density Residential Vacant
- Low Density Residential
- Low Density Residential Vacant
- Rural / Agriculture
- Golf Course
- Public / Quasi Public Land

Additional Map Elements

- Urban Growth Boundary (UGB)
- City Boundary
- Public School

0 0.5 1 2 Miles

Map created by the City of Charles Town Department of Community Development on 11/2/2016

N

Figure 18: UGB Existing Land Use
Sources: City of Charles Town, 2016 and Jefferson County GIS, 2016

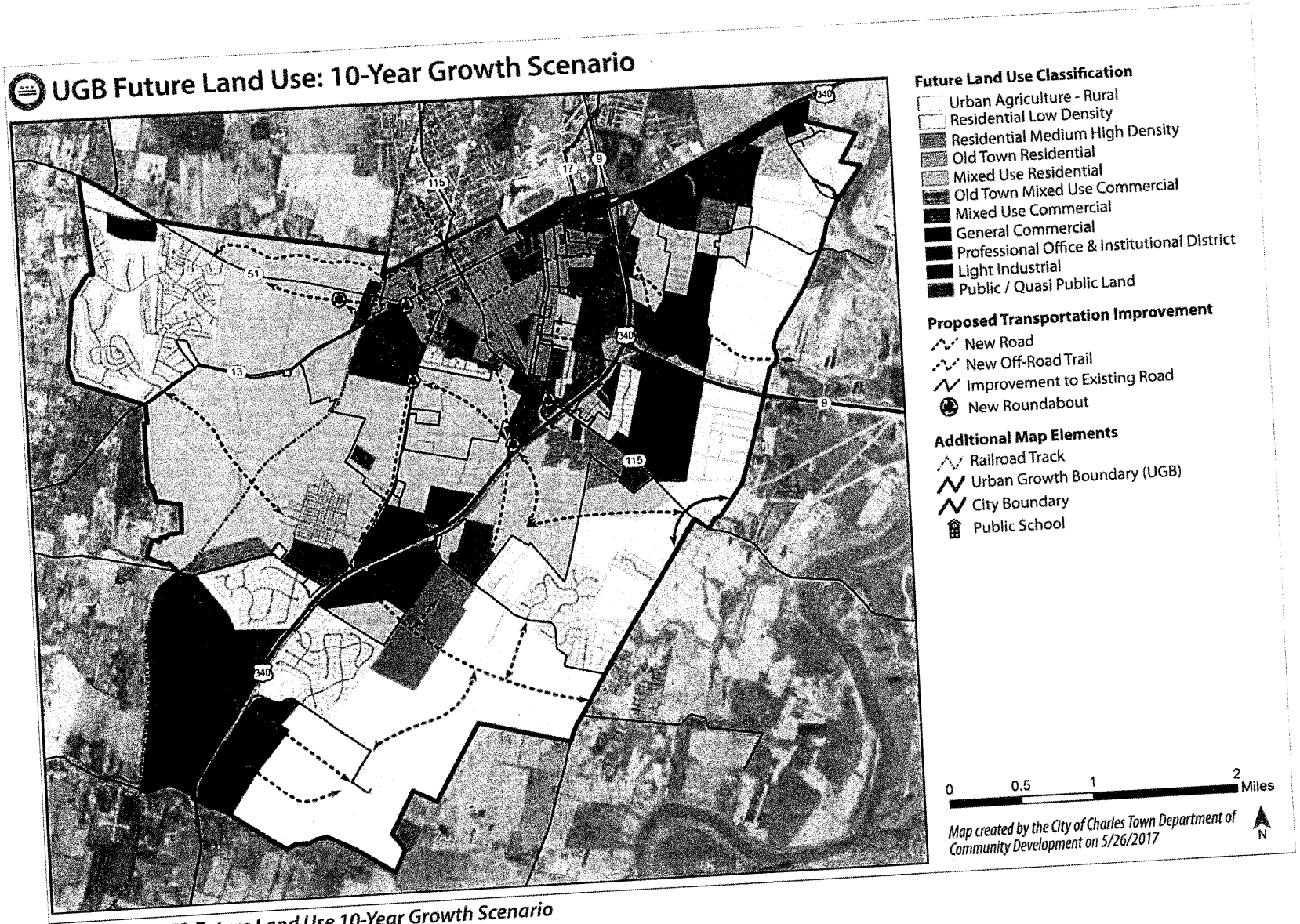
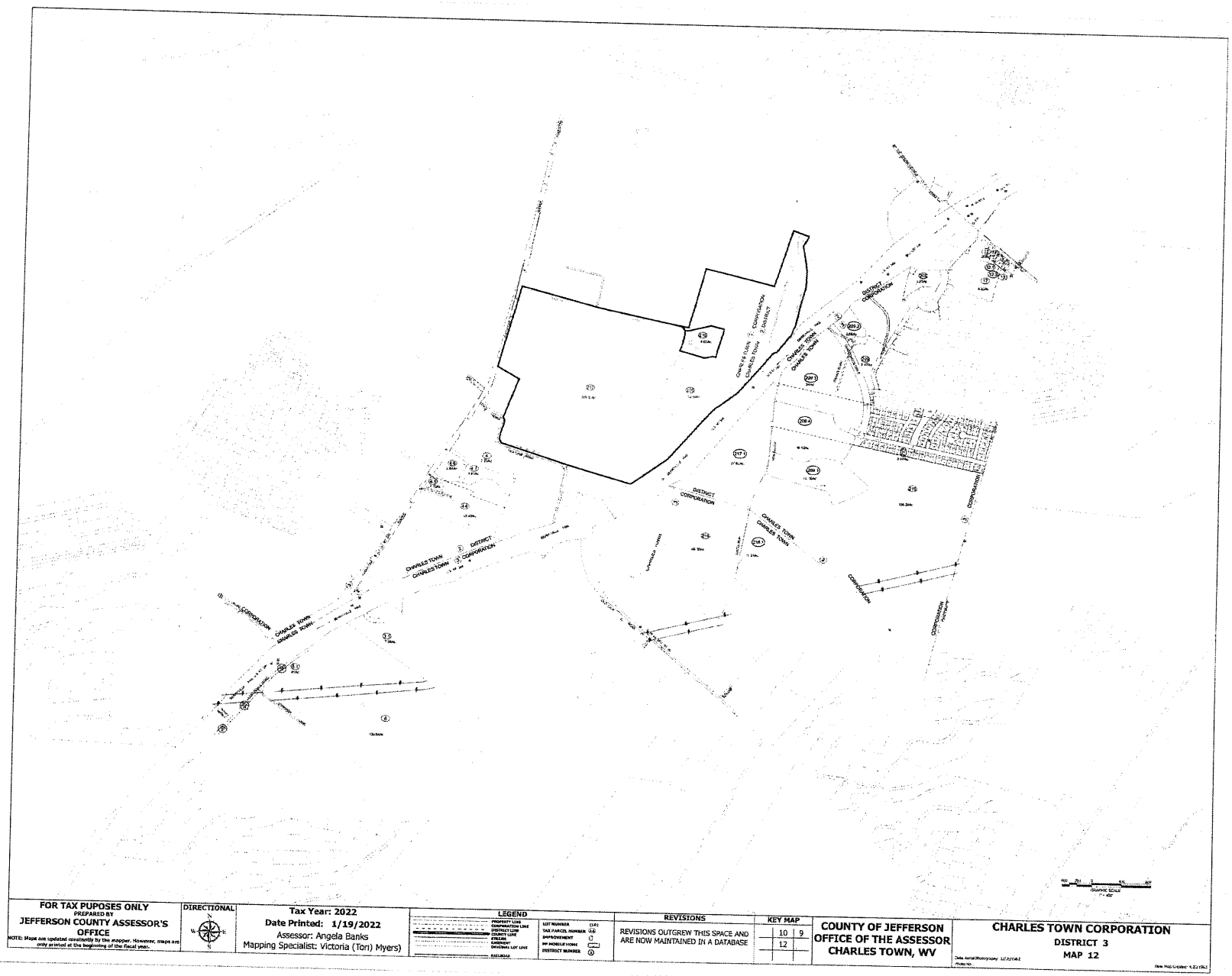


Figure 28A: UGB Future Land Use 10-Year Growth Scenario
Sources: City of Charles Town, 2016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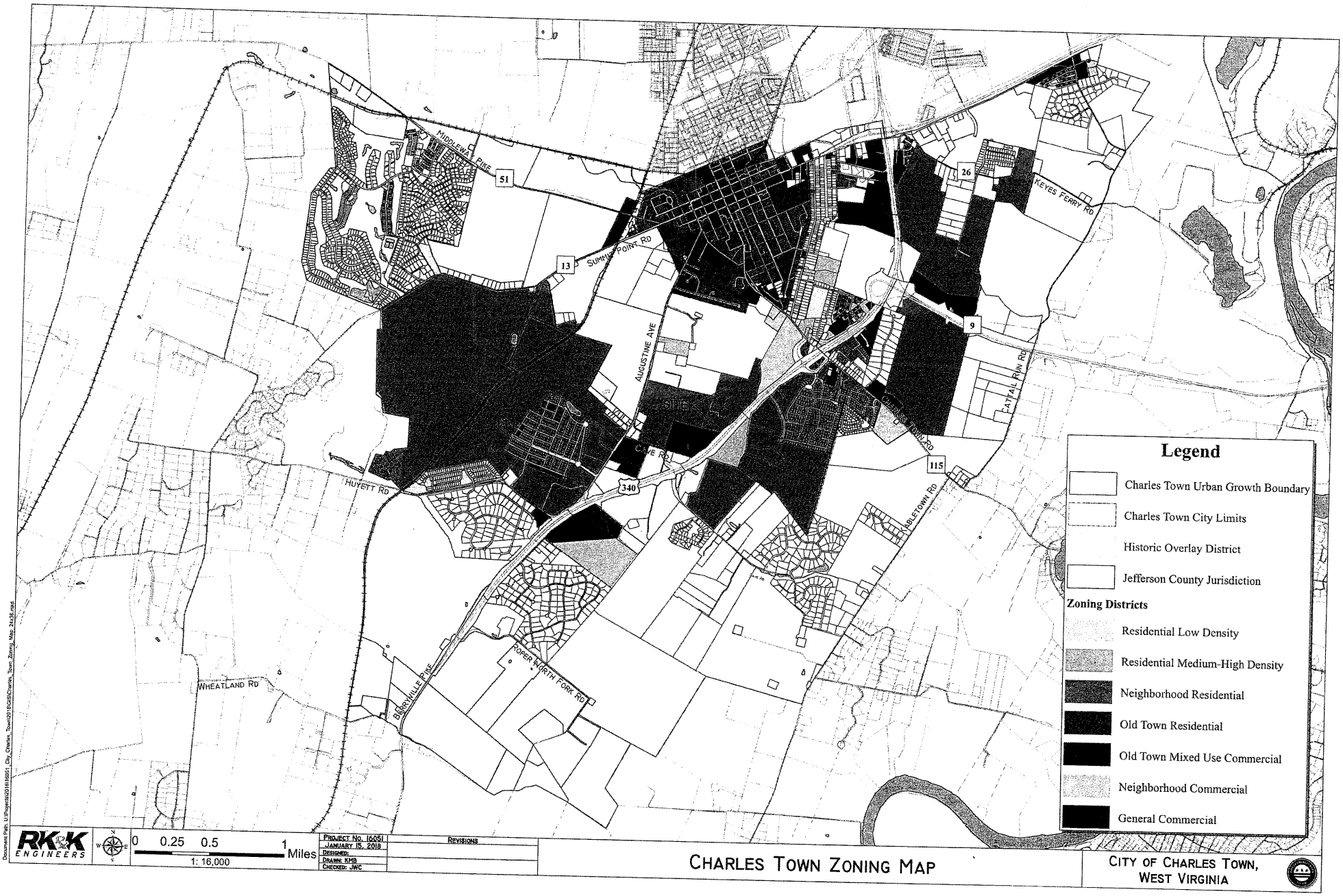


RK&K ENGINEERS

PROJECT NO. 16051
JANUARY 15, 2018
DESIGNED:
DRAWN: KMB
CHECKED: JWC

REVISIONS

CHARLES TOWN ZONING MAP

CITY OF CHARLES TOWN, WEST VIRGINIA

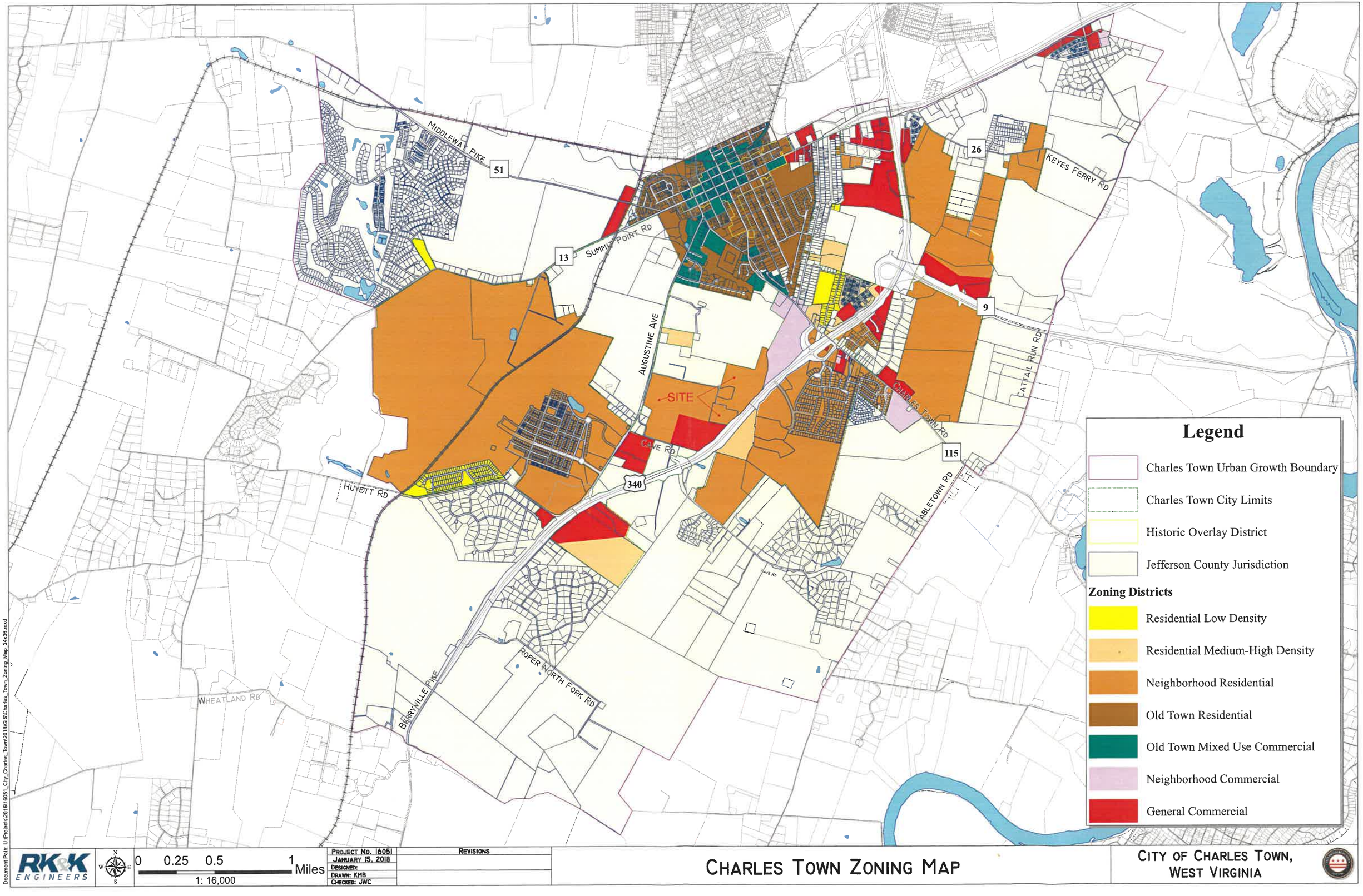
Document Path: U:\Projects\2016\16051_City_Charles_Town\GIS\Charles_Town_Zoning_Map_24x36.mxd

RECEIVED
AUG 1 2023
BY:



FOR TAX PUPOSES ONLY PREPARED BY **JEFFERSON COUNTY ASSESSOR'S OFFICE** NOTE: Maps are updated constantly by the mapper. However, maps are only printed at the beginning of the fiscal year.	DIRECTIONAL N W E S	**Tax Year: 2022** **Date Printed: 1/19/2022** Assessor: Angela Banks Mapping Specialist: Victoria (Tori) Myers)	**LEGEND** PROPERTY LINE CORPORATION LINE DISTRICT LINE COUNTY LINE STREAM EASEMENT ORIGINAL LOT LINE RAILROAD LOT NUMBER (16) TAX PARCEL NUMBER 09 IMPROVEMENT PP MOBILE HOME DISTRICT NUMBER 3	**REVISIONS** REVISIONS OUTGREW THIS SPACE AND ARE NOW MAINTAINED IN A DATABASE	**KEY MAP** 10 9 12	**COUNTY OF JEFFERSON** **OFFICE OF THE ASSESSOR** **CHARLES TOWN, WV**	**CHARLES TOWN CORPORATION** **DISTRICT 3** **MAP 12** Date Aerial Photography: 12/31/1962 Photo No.: Date Map Created: 4/23/1963

ecs\2023\100\0000\00481979\Rezoning Application\248 Vedon Lane_ANX_SCALE.prvg, dhenshaw, 8/8/2023 4:58:27 PM



RK&K ENGINEERS

0 0.25 0.5 1 Miles

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PROJECT No. 16051	REVISIONS
JANUARY 15, 2018	
DESIGNED:	
DRAWN: KMB	
CHECKED: JWC	

CHARLES TOWN ZONING MAP

CITY OF CHARLES TOWN, WEST VIRGINIA

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HAYES PROPERTY
CONDITIONS OF ANNEXATION

Rolfe G. Hayes and Ahmad H. Abdul-Baki (collectively the "Owners"), owners of the land identified on the tax map of Jefferson County, West Virginia as Parcels 6, 6.2 and 6.3 in the Charles Town District (the "Property") hereby agree to the following conditions of annexation, contingent upon approval by the City of Charles Town (the "City") of the annexation of the Property into the municipal boundaries of the City of Charles Town. These conditions of annexation are contingent upon and shall not be binding unless and until the Property is annexed into the municipal boundaries of the City of Charles Town and the City of Charles Town approves the zoning classifications with clarifications and additions specified in paragraph I.B below.

I. PLANNING & ZONING COMPLIANCE

A. Comprehensive Plan

The final development design shall be in general conformance with Exhibit 1 - Hayes Property Annexation Concept Plan dated August 15, 2006 and prepared by EDSA (the "Annexation Concept Plan").

B. Urban Zoning

Upon annexation, the City shall zone the Property Neighborhood Residential (NR), General Commercial (GC), and Residential Multi-Family (RM), as generally depicted on Exhibit 1, in accordance with the City of Charles Town Zoning Ordinance with the clarifications and additions specified below.

To permit construction of a hospital and related uses in the General Commercial (GC) District and innovative residential units in the Residential Multi-Family (RM) and Neighborhood Residential (NR) districts, the City shall approve the following clarifications and additions to the zoning regulations as they apply to the Property:

1. **General Commercial (GC) District –**

   a. Hospital and related medical uses and professional offices shall be a permitted use.

   b. One or more hospital buildings of up to eight stories and up to one hundred twenty feet in height shall be permitted. Height shall be measured from the mid point along the main roof plane between the ridge and the gutter line (eave) to the average grade measured at the four corners of the building footprint.

c. Medical and professional office buildings of up to four stories and up to fifty-five feet in height shall be permitted. Height shall be measured from the mid point along the main roof plane between the ridge and the gutter line (eave) to the average grade measured at the four corners of the building footprint.

2. **Neighborhood Residential (NR) District –**

a. Residential units of four stories and up to fifty-five feet in height and residential units of three stories and up to forty-five feet in height shall be permitted. Height shall be measured from the mid point along the main roof plane between the ridge and the gutter line (eave) to the average grade measured at the four corners of the building footprint.

b. The minimum lot width for townhomes shall be sixteen feet.

c. The minimum lot area for townhomes shall be 1,000 square feet for rear load integral garage townhomes, provided that for each such 1,000 square foot lot there shall be 1,000 square feet of community open space provided within walking distance in excess of the minimum open space required under the zoning ordinance.

d. No more than twenty-five percent of the dwelling units constructed on the Property shall be rear load integral garage townhomes.

d. The minimum lot area for townhomes other than rear load integral garage townhomes shall be 1,600 square feet.

e. There shall be no minimum lot area for townhome blocks.

f. The minimum front yard setback shall be twenty-five feet from edge of pavement.

g. The minimum rear yard setback shall be five feet for rear load integral garage townhomes.

h. Encroachment within the front yard setback shall be permitted up to 30%.

i. The maximum impermeable site coverage per lot shall be 100% for rear load integral garage townhomes.

j. The minimum street pavement width for two travel lanes, excluding on-street parking, shall be twenty-two feet.

k. Townhome portions of the development shall be permitted to have an area of less than five acres.

l. Townhome portions of the development shall be permitted at a maximum density of sixteen dwelling units per acre.

m. Alleys may provide lot access and satisfy road frontage requirements when lots served by those alleys front on open space.

3. **Residential Multi-Family (RM) District** –

a. Residential units of four stories and up to fifty-five feet in height shall be permitted. Height shall be measured from the mid point along the main roof plane between the ridge and the gutter line (eave) to the average grade measured at the four corners of the building footprint.

b. The minimum lot width per dwelling unit shall be sixteen feet.

c. There shall be no minimum lot area for residential multi-family blocks.

d. The maximum impermeable site coverage shall be 100% for individual condominium units.

e. The minimum street pavement width for two travel lanes, excluding on-street parking, shall be twenty-two feet.

f. Alleys may provide lot access and satisfy road frontage requirements when lots served by those alleys front on open space.

g. Gross density shall be permitted up to twenty dwelling units per acre.

Any other clarifications, additions or modifications to the zoning regulations that may be required to develop the Property in accordance with the Annexation Concept Plan and to yield 950 residential units shall be reviewed by the City of Charles Town.

C. Contiguous Location

The subject property is contiguous to existing corporate limits of the City of Charles Town by the following connections:

From the North – By Augustine Avenue and Route 340
From the South – By Route 340 and Norborne Glebe
From the East – By Route 340 and Norborne Glebe
From the West – By Augustine Avenue (Old Route 340) and Huntfield

D. Transportation Planning

For the purpose of providing transportation facilities, the following dedications of right-of-way and construction of transportation improvements, which are consistent with City standards and transportation plans, shall be provided at a time approved by the City Planning Commission:

1. **U.S. Route 340/Future Route 51 (New Vinton Lane) Intersection:**

   a. Design and construct a traffic signal;

   b. Dedicate required on-site right-of-way, design and construct a northbound left turn lane;

   c. Dedicate required on-site right-of-way, design and construct a southbound right turn lane;

   d. Dedicate required on-site right-of-way, design and construct a westbound right turn lane.

2. **Augustine Avenue/Future Route 51 (New Vinton Lane) Intersection:**

   a. Dedicate required on-site right-of-way, design and construct a southbound left turn lane;

   b. Dedicate required on-site right-of-way, design and construct a right turn lane from northbound Augustine Avenue onto eastbound Future Route 51 (New Vinton Lane).

3. **Future Route 51 (New Vinton Lane) - on site:**

   a. Dedicate required on-site right-of-way, design and construct a half section (two lanes) of a 4-lane divided roadway from Augustine Avenue to the intersection of Rte. 340;

   b. Dedicate required on-site right-of-way, design and construct an additional half section (two additional lanes) of a 4-lane divided roadway from the intersection of the North-South Commercial Boulevard to the intersection of Route 340.

4. **North-South Commercial Boulevard**:

   a. Dedicate required on-site right-of-way, design and construct a half section (two lanes) of a 4-lane divided roadway system running north-south within the site.

   b. Dedicate required on-site right-of-way, design and construct an additional half-section (two additional lanes) of a 4-lane divided roadway system running north-south within the site.

   c. Design and construct a left turn lane from the northbound North-South Commercial Boulevard onto westbound Future Route 51 (New Vinton Lane).

II. ECONOMIC GROWTH

To facilitate the construction of a new hospital and medical office facility on the Property, approximately thirty (30) acres of land shall be donated to the West Virginia University Hospitals - East ("WVUH-E") for construction of a hospital and related medical uses and professional offices. This donation shall be made on April 30, 2007 or upon approval by the City of the Schematic Plan for development of the Property, which ever is later.

In addition, approximately fourteen (14) acres of land will be developed for commercial and retail uses to support the hospital and medical offices. Together, these non-residential development areas within the Property are expected to provide significant economic development benefits to the Charles Town and Jefferson County areas.

III. WORKFORCE HOUSING

The proposed development of the Property as a mixed-use community will provide for a variety of dwelling types at modest market rate prices to serve the entire community. Seven percent (7%) of the units shall sell for no more than $220,446 (measured in 2006 dollars which shall be escalated annually in accordance with changes in the Consumer Price Index), based on the City's current calculation of Workforce Housing sales prices. These units shall be made available to the Charles Town Housing Opportunity Board (the "CTHOB") or to a designated agency authorized to offer housing for sale to qualified purchasers under the following conditions: (i) the location and type of units to be made available to the CTHOB shall be determined and designated by the Owners or assigns in their sole discretion, (ii) at least seven (7) units will be designated for every ninety (90) market rate units sold subject to the following conditions, (iii) at least seven (7) units to be made available to the CTHOB will be designated prior to the 90th, 180th, 270th, 360th, 550th, 640th, 730th, and 820th occupancy permits, and six (6) units will be designated prior to the 910th occupancy permit, (iv) the Owners may designate all units to be provided at any time at their sole discretion, (v) if more than seven (7) units are designated for any ninety (90) market rate units, then the minimum number of units to be designated for each succeeding group of ninety (90) market rate units will be reduced proportionately until the total number of units designated equals sixty-seven (67), at which time this condition of annexation will have been fully performed, (vi) a construction schedule estimating the completion date of each designated unit will be provided by the builder upon the start of construction of the unit, (vii) the CTHOB shall be responsible for satisfying all requirements of its program regarding the solicitation, qualification, and financing of its qualified purchasers and the placement of a qualified purchaser at settlement upon completion of any designated unit, (viii) any designated unit that is completed and ready for settlement for which a qualified purchaser is not present for settlement will be available for unrestricted sale by the Builder, and (ix) designated units made available for unrestricted sale due to lack of a qualified purchaser present for settlement shall continue to be counted toward the seven percent (7%) of units in satisfaction of this condition of annexation. The Owners or their assigns are currently working with City staff to further clarify the process by which workforce housing will be provided and administered.

IV. PROTECTION OF RESOURCES

A. **Floodplain**. No development, other than grading and the installation of storm water management and utilities, shall occur within floodplain limits on the portion of the Property located within the 100-year floodplain along Evitts Run.

B. **Existing Dwelling**. The existing structure commonly known as the "manor house" on the portion of the Property identified as tax map Parcel 6.3 shall be retained in some location upon the Property. The ultimate use of the manor house will be decided by the Owners or their assigns in their sole discretion. The uses may be, but are not limited to, a private residence, commercial or retail.

V. MUNICIPAL INFRASTRUCTURE AND SERVICES

The Property shall be served by the Charles Town Water & Sewer Departments and shall comply with the existing rules and regulations of the City of Charles Town Utility Board and any State regulatory agencies. The prevailing water and sewer capacity improvement fees, as approved by the Public Service Commission of West Virginia, will be paid as a condition of building permit issuance.

VI. FISCAL IMPACT

The following contributions shall be paid as a condition of building permit issuance:

A. **Capital Improvement Fee** of $948 per each residential unit, to be subject to review and adjustment once every three (3) years in accordance with changes in the Consumer Price Index from the base year 2006. Workforce Housing units shall be exempt from these fees.

B. **Non-Capital Fee** of $1,500 per each residential unit during the first five years of development following approval of the first record plat for residential units, $2,650 per each residential unit during the sixth through tenth years of development following approval of the first record plat for residential units, and $4,400 per each residential unit during the eleventh through twentieth years of development following approval of the first record plat for residential units. Workforce Housing units shall be exempt from these fees.

C. **School Impact Fees** - Any legally valid and applicable Jefferson County School Impact Fee in the amount established by the Jefferson County Commission.

The Owners agree that these conditions of annexation shall be binding on the Owners and their assigns and that a breach or default on the part of the Owners or their assigns may, at the option

of the City, result in enforcement by the City of Charles Town either through injunctive relief in the Circuit Court of Jefferson County or through the denial of schematic plan approvals, site plan approvals, record plat approvals, building permits or use and occupancy permits for the Property.

For purposes of these conditions of annexation, an assignee of the Owners shall mean any person or group of persons acting in concert who, as defined in Chapter 36B of the West Virginia Code: (i) as part of a common promotional plan, offers to dispose of his or its interest in a unit not previously disposed of; or (ii) reserves or succeeds to any special declarant right.

Further, the Owners agree that if the Annexation Concept Plan is amended so as to significantly increase the demand for governmental services generated by the development of the Property, the Owners or their assigns shall provide additional conditions of annexation or altered conditions of annexation to offset the impact generated by these changes on the demand for governmental services.

Dated this 30 day of January, 2007.

CITY OF CHARLES TOWN:

Mayor

ATTEST:

City Clerk

Ahmad H. Abdul-Baki

STATE OF:
COUNTY OF Jefferson, to wit:

I, the undersigned Notary Public, in and for the jurisdiction aforesaid, do hereby certify that Ahmad H. Abdul-Baki, whose name is signed to the writing above, has appeared before me and personally acknowledged the same before me in my jurisdiction aforesaid.

GIVEN under my hand and seal this 26 day of January, 2007.

Notary Public

My commission expires: April 25, 2012

OFFICIAL SEAL
NOTARY PUBLIC - STATE OF WV
EDNA M. KING
ROUTE 2, BOX 42K
CHARLES TOWN, WV 25414
My Commission Expires April 25, 2012

OWNERS:

Rolfe G. Hayes

STATE OF:
COUNTY OF Jefferson, to wit:

I, the undersigned Notary Public, in and for the jurisdiction aforesaid, do hereby certify that Rolfe G. Hayes, whose name is signed to the writing above, has appeared before me and personally acknowledged the same before me in my jurisdiction aforesaid.

GIVEN under my hand and seal this 21 day of November, 2006.

Notary Public

My commission expires: April 25th, 2012

OFFICIAL SEAL
NOTARY PUBLIC - STATE OF WV
EDNA M. KING
ROUTE 2, BOX 42K
CHARLES TOWN, WV 25414
My Commission Expires April 25, 2012



site legend

- residential development
- retail development
- medical development (hospital & professional office)
- programmed open space
- natural open space
- zoning line
- right-of-way / parcel line

0 100' 200' 400' 600' NORTH

August 15, 2006

Exhibit 1 — Annexation/Rezoning Petition

Hayes Property

Charles Town, West Virginia

CITY OF CHARLES TOWN
WEST VIRGINIA

AN ORDINANCE AUTHORIZING AND DIRECTING THE MAYOR TO EXECUTE AN AGREEMENT RESCINDING, CANCELING, AND NULLIFYING, AS BETWEEN THE PARTIES TO SUCH AGREEMENT, THOSE CERTAIN CONDITIONS OF ANNEXATION DATED THE 30th DAY OF JANUARY, 2007, ENTERED BY AND BETWEEN ROLFE G. HAYES AND AHMAD H. ABDUL-BAKI, AS OWNERS OF THE SUBJECT REAL PROPERTY, AND THE CITY OF CHARLES TOWN, AND RELEASING THE PARTIES TO SUCH AGREEMENT FROM ANY EXECUTORY OBLIGATIONS, COVENANTS, OR DUTIES UNDER THE CONDITIONS OF ANNEXATION.

WHEREAS, pursuant to (i) an Ordinance duly approved upon second reading and adopted by the Common Council of the City of Charles Town at a regular meeting held on October 16, 2006 (the "Annexation Ordinance"), and (ii) an Order entered by the County Commission of Jefferson County, West Virginia, on November 30, 2006 (the "Annexation Order"), the City of Charles Town annexed within its corporate limits four (4) parcels of land containing an aggregate of 268.8668 acres, more or less, being two parcels then owned by Rolfe G. Hayes ("Hayes") containing, respectively, 198.1519 acres, more or less, and 10.9440 acres, more or less, a parcel then owned by Ahmad H. Abdul-Baki ("Abdul-Baki") containing 4.6209 acres, more or less, and a portion of the Route 340 Bypass containing approximately 55.15 acres, more or less (collectively, the "Annexed Property");

WHEREAS, pursuant to a Resolution duly adopted by the Common Council of the City of Charles Town at the aforesaid meeting held on October 16, 2006, the City of Charles Town accepted and approved the annexation of the Annexed Property and thereby agreed with Hayes and Abdul-Baki to the provisions of those certain Conditions of Annexation thereafter executed by Hayes, Abdul-Baki, and the then Mayor, and dated the 30th day of January (the "Conditions of Annexation");

WHEREAS, the Conditions of Annexation contemplated a specific development project that required rezoning particular portions of the Annexed Property, respectively, to General Commercial, Neighborhood Residential, and Residential Multi-Family districts, and other modifications to the zoning regulations in order to permit construction of a hospital and related medical uses and professional uses in the General Commercial district and innovative residential units in the residential districts;

WHEREAS, the Conditions of Annexation required that the final development design of the development project be in general conformance with an Annexation Concept Plan attached to the Conditions of Annexation (the "Concept Plan");

WHEREAS, the Conditions of Annexation further contemplated that, in order to facilitate the construction of a new hospital and medical office facility on the Annexed Property, approximately thirty (30) acres of land would be donated to West Virginia University Hospitals –

East for construction of a hospital and related medical uses and professional offices;

WHEREAS, subsequent to execution of the Conditions of Annexation, the intended purchaser and developer of the parcels owned by Hayes and Abdul-Baki withdrew from the contemplated transaction and development;

WHEREAS, in 2012, Abdul-Baki conveyed to third parties his parcel of 4.6209 acres, more or less;

WHEREAS, Hayes died in 2014 and his parcels containing, respectively, 198.1519 acres, more or less, and 10.9440 acres, more or less, came to be held by Roscoe A. Hayes, Alice M. Spickler and Donald L. Spickler, Co-Trustees of the Alice M. Spickler Living Trust, and Joseph R. Gallo (collectively, the "Hayes Property Owners");

WHEREAS, in 2020, the Hayes Property Owners subdivided the parcel of 198.1519 acres, more or less, and conveyed therefrom a parcel of 27.8213 acres, more or less, to a third party;

WHEREAS, the Hayes Property Owners continue to hold the parcel of 10.9440 acres, more or less, and the remainder of the parcel that originally contained 198.1519 acres, more or less (collectively, the "Hayes Property Owners' Property"), which property has not been further developed;

WHEREAS, in recognition that the Conditions of Annexation contemplated a specific development project and that it now and in the future would and will be impractical, if not impossible, to develop the specific development project contemplated, particularly in general conformance with the Concept Plan as required by the Conditions of Annexation, due to changed circumstances and for various reasons including, without limitation, that portions of the Annexed Property intended to be included in the development project are now owned by third parties and that construction of a hospital on the Annexed Property is no longer contemplated, the Hayes Property Owners have requested that the City of Charles Town agree to rescind, cancel, and nullify the Conditions of Annexation as between the Hayes Property Owners and the City of Charles Town and that the Hayes Property Owners and the City of Charles Town mutually release the other from any and all executory covenants and obligations thereunder; *provided that*, it is the intent and desire of the Hayes Property Owners that Paragraph V of the Conditions of Annexation, pertaining to provision of water and sanitary sewer service to the Annexed Property by the Charles Town Utility Board, shall remain in full effect ("Paragraph V Provision");

WHEREAS, the Hayes Property Owners have expressed that the existence of the Conditions of Annexation and the uncertainty of their effect have frustrated the efforts of the Hayes Property Owners to market and sell the Hayes Property Owners' Property, which has prevented development of such real property; and

WHEREAS, West Virginia University Hospitals – East has expressed its objection to rescission,

cancellation, and nullification of the Conditions of Annexation on the basis of an alleged right to donation of thirty (30) acres of land or the value thereof;

NOW, THE COUNCIL OF THE CITY OF CHARLES TOWN FINDS AND DECLARES, that the Conditions of Annexation contemplated a specific development project;

FURTHER FINDS AND DECLARES, that it now and in the future would and will be impractical, if not impossible, to develop the specific development project contemplated, particularly in general conformance with the Concept Plan as required by the Conditions of Annexation;

FURTHER FINDS AND DECLARES, that certain covenants and obligations of each of the Hayes Property Owners and the City of Charles Town to the other under the Conditions of Annexation remain unperformed and executory and, accordingly, the Conditions of Annexation are unenforceable by either the Hayes Property Owners or the City of Charles Town;

FURTHER FINDS AND DECLARES, that the best interests of the City of Charles Town would not be served by the City of Charles Town performing and satisfying its unperformed and executory covenants and obligations to the Hayes Property Owners under the Conditions of Annexation for the sole purpose of positioning the City of Charles Town to enforce the Conditions of Annexation against the Hayes Property Owners;

FURTHER FINDS AND DECLARES, that leaving the Conditions of Annexation in effect between the Hayes Property Owners and the City of Charles Town serves no current or contemplated future purpose of the City of Charles Town;

FURTHER FINDS AND DECLARES, that it is in the best interests of the City of Charles Town to agree to rescind, cancel, and nullify the Conditions of Annexation as between the Hayes Property Owners and the City of Charles Town, with mutual releases of their respective executory covenants and obligations thereunder, excepting only the Paragraph V Provision; and

FURTHER FINDS AND DECLARES, that, in light of the continuing applicability of the Conditions of Annexation to the 4.6209 acre, more or less, parcel and the 27.8213 acre, more or less, parcel conveyed to third parties, as discussed above, each of the current owners of such parcels should be offered the opportunity to enter a separate agreement rescinding, canceling, and nullifying the Conditions of Annexation as between such owner and the City of Charles Town, with mutual releases of their respective executory covenants and obligations thereunder;

NOW, THEREFORE BE IT ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that the Mayor of the City of Charles Town be, and hereby is, authorized and directed to execute and enter on behalf of the City of Charles Town an agreement with the Hayes Property Owners in the form of that attached as EXHIBIT A that rescinds, cancels, and nullifies the Conditions of Annexation as between the Hayes Property Owners and the City of Charles Town, with mutual releases of their respective executory covenants and obligations thereunder, excepting only the Paragraph V Provision (the "Hayes Property Owners Nullification Agreement");

BE IT FURTHER ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that, in the event the current owner(s) of the 4.6209 acre, more or less, parcel and/or the current owner(s) of the 27.8213 acre, more or less, parcel conveyed to third parties, as discussed above, so elect, the Mayor of the City of Charles Town be, and hereby is, authorized and directed to execute and enter on behalf of the City of Charles Town an agreement with such persons in the form of that attached as EXHIBIT A, but with such persons substituted for the Hayes Property Owners therein and with Subsections 1(a), 2(a), and 3(b)(i) deleted therefrom (each, a "Third Party Nullification Agreement");

BE IT FURTHER ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that this Ordinance does not and shall not be deemed to, and neither the Hayes Property Owners Nullification Agreement nor any Third Party Nullification Agreement shall or shall be interpreted to, de-annex or otherwise affect the annexation of the Annexed Property, which Annexed Property shall remain annexed within the corporate limits of the City of Charles Town;

BE IT FURTHER ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that this Ordinance does not and shall not be deemed to, and neither the Hayes Property Owners Nullification Agreement nor any Third Party Nullification Agreement shall or shall be interpreted to, undo, reverse, change, or affect the current zoning of the Annexed Property as reflected on the Charles Town Zoning Map except that, pursuant to Section 3(b)(i) of the Hayes Property Owners Nullification Agreement, the Hayes Property Owners shall seek a change in the zoning classification of the Hayes Property Owners' Property to the Urban Reserve District by zoning amendment, for which purposes the prior rezoning of the Hayes Property Owners' Property pursuant to the Conditions of Annexation shall be considered revoked, annulled, void, and of no effect for all purposes;

BE IT FURTHER ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that this Ordinance does not and shall not be deemed to, and neither the Hayes Property Owners Nullification Agreement nor any Third Party Nullification Agreement shall or shall be interpreted to, undo, cancel, reverse, or otherwise make or render ineffective any other act heretofore performed by any party pursuant to the Conditions of Annexation;

BE IT FURTHER ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that this Ordinance and the Hayes Property Owners Nullification Agreement to be entered hereunder are intended to, and shall be deemed to, result in only the release of the executory covenants and obligations of the Hayes Property Owners and their successors and assigns to or in favor of the City of Charles Town under the Conditions of Annexation, and this Ordinance is not intended to and shall not be deemed to, and the Hayes Property Owners Nullification Agreement shall not purport to or be interpreted to, release or otherwise affect any right that West Virginia University Hospitals – East may assert or claim; and

BE IT FURTHER ORDAINED BY THE COUNCIL OF THE CITY OF CHARLES TOWN, that this Ordinance and any Third Party Nullification Agreement to be entered hereunder are intended

to, and shall be deemed to, result in only the release of the executory covenants and obligations of the subject third parties and their successors and assigns to or in favor of the City of Charles Town under the Conditions of Annexation, and this Ordinance is not intended to and shall not be deemed to, and no Third Party Nullification Agreement shall purport to or be interpreted to, release or otherwise affect any right that West Virginia University Hospitals – East may assert or claim.

This Ordinance shall take effect upon enactment.

First Reading: _____, 20___

Public Hearing: _____, 20___

Passed on Second Reading: _____, 20___

Enacted this _____ day of _____, 20___

CITY OF CHARLES TOWN

_____
Robert M. Trainor
Mayor

Attest:

_____
John C. Barkley
City Clerk

EXHIBIT A
NULLIFICATION AGREEMENT

NULLIFICATION AGREEMENT

This **NULLIFICATION AGREEMENT** (this "Agreement"), dated the ___th day of _____, 20__, is entered into by and between the CITY OF CHARLES TOWN, a West Virginia municipal corporation, party of the first part (the "City"), and ROSCOE A. HAYES, ALICE M. SPICKLER AND DONALD L. SPICKLER, CO-TRUSTEES OF THE ALICE M. SPICKLER LIVING TRUST, AND JOSEPH R. GALLO, parties of the second part. The party of the first part and the parties of the second part are sometimes referred to herein collectively as the "Parties," or individually as a "Party."

RECITALS

WHEREAS, in 2006, the City annexed within its corporate limits four (4) parcels of land (the "Annexed Property") including two parcels then owned by Rolfe G. Hayes ("Hayes") containing, respectively, 198.1519 acres, more or less, and 10.9440 acres, more or less, and a parcel then owned by Ahmad H. Abdul-Baki ("Abdul-Baki") containing 4.6209 acres, more or less;

WHEREAS, pursuant to a Resolution duly adopted by the City's Common Council, the City accepted and approved said annexation and thereby agreed with Hayes and Abdul-Baki to the provisions of those certain Conditions of Annexation thereafter executed by Hayes, Abdul-Baki, and the then Mayor of the City, and dated the 30th day of January (the "Conditions of Annexation");

WHEREAS, the Conditions of Annexation contemplated a specific development project and required that the final development design of the development project be in general conformance with an Annexation Concept Plan attached to the Conditions of Annexation;

WHEREAS, subsequent to execution of the Conditions of Annexation, the intended purchaser and developer of the parcels owned by Hayes and Abdul-Baki withdrew from the contemplated transaction and development;

WHEREAS, in 2012, Abdul-Baki conveyed to Richard Smith and Erin Smith his parcel of 4.6209 acres, more or less;

WHEREAS, Richard Smith and Erin Smith continue to hold said parcel of 4.6209 acres, more or less;

WHEREAS, Hayes died in 2014 and his parcels containing, respectively, 198.1519 acres, more or less, and 10.9440 acres, more or less, came to be held by Roscoe A. Hayes, Alice M. Spickler and Donald L. Spickler, Co-Trustees of the Alice M. Spickler Living Trust, and Joseph R. Gallo (collectively, the "Hayes Property Owners");

WHEREAS, in 2020, the Hayes Property Owners subdivided the parcel of 198.1519 acres, more or

less, and conveyed therefrom a parcel of 27.8213 acres, more or less, to Brad Bishop;

WHEREAS, Brad Bishop continues to hold said parcel of 27.8213 acres, more or less;

WHEREAS, the Hayes Property Owners continue to hold the parcel of 10.9440 acres, more or less, and the remainder of the parcel that originally contained 198.1519 acres, more or less;

WHEREAS, various provisions of the Conditions of Annexation currently remain unperformed and executory on the part of each of the Parties, the Parties accordingly agree that the Conditions of Annexation are unenforceable by either Party, and the Hayes Property Owners dispute the enforceability of the Conditions of Annexation in any event; and

WHEREAS, the Parties mutually desire to rescind, cancel, and nullify the Conditions of Annexation as between the Parties and that the Parties mutually release the other from any and all executory covenants and obligations under the Conditions of Annexation, except as expressly provided otherwise herein;

AGREEMENT

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

SECTION 1 -- NULLIFICATION

The Conditions of Annexation shall be, and hereby are, fully and completely rescinded, canceled, and nullified as between the Parties.

(a) Notwithstanding the foregoing Section 1, Paragraph V of the Conditions of Annexation, which pertains to water and sewer service to the subject property, shall remain in full force and effect such that the Hayes Property Owners' parcel of 10.9440 acres, more or less, and the remainder of the parcel that originally contained 198.1519 acres, more or less, shall be served by the Charles Town Utility Board and otherwise in accordance with said Paragraph V.

SECTION 2 -- MUTUAL RELEASE

Each of the Parties shall, and hereby does, for and on behalf of itself and its heirs, personal representatives, attorneys, successors, and assigns, fully, finally, and completely release, remise, acquit, and forever discharge the other Party, and all their respective trustees, officers, managers, employees, agents, representatives, insurers, heirs, devisees, personal representatives, successors, and assigns, if any, of and from any and all executory obligations, covenants, and duties under the provisions of the Conditions of Annexation.

(a) Notwithstanding the foregoing Section 2, the obligations of the Hayes Property Owners under Paragraph V of the Conditions of Annexation shall remain in full force and effect.

SECTION 3 -- LIMITED EFFECT OF AGREEMENT

This Agreement is not intended to, does not, and shall not be deemed or interpreted to:

(a) De-annex or otherwise affect the annexation of the Annexed Property, which Annexed Property shall remain annexed within the corporate limits of the City of Charles Town;

(b) Undo, reverse, change, or affect the current zoning of the Annexed Property as reflected on the Charles Town Zoning Map;

(i) Notwithstanding the foregoing Subsection 3(b), the Parties agree that the Hayes Property Owners shall, by petition, pursuant to the process and subject to all required actions provided in Section 1321.12 of the Charles Town Zoning Ordinance, seek a change in the zoning classification of the parcel of 10.9440 acres, more or less, and the remainder of the parcel that originally contained 198.1519 acres, more or less, now owned by the Hayes Property Owners from the Neighborhood Residential and General Commercial zoning districts to the Urban Reserve zoning district, in recognition that such land would be placed in the Urban Reserve zoning district upon annexation under the current Charles Town Zoning Ordinance;

(c) Undo, cancel, reverse, or otherwise make or render ineffective any other act heretofore performed by any Party pursuant to the Conditions of Annexation; or

(d) Release any executory covenants or obligations of the parties of the second part or their successors and assigns to any third party under the Conditions of Annexation that may subsequently be determined to be legally enforceable, if any, or release or otherwise affect rights of any such third party under the Conditions of Annexation that may subsequently be determined to be legally enforceable, if any, it being understood that this Agreement results in only the City's release of the executory covenants and obligations of the parties of the second part and their successors and assigns to or in favor of the City under the Conditions of Annexation.

SECTION 4 -- ENTIRE AGREEMENT

This Agreement contains the entire understanding of the Parties hereto in respect to the subject matter contained herein. There are no restrictions, promises, representations, warranties, covenants, or undertakings, other than those expressly set forth or referred to herein. This Agreement supersedes all prior agreements and understandings between the Parties with

respect to such subject matter.

SECTION 5 -- AMENDMENT

To the fullest extent provided by applicable Law, this Agreement may only be amended, modified, and supplemented by mutual consent of the Parties hereto with respect to any of the terms contained herein, in such manner as may be agreed upon in writing by such Parties.

SECTION 6 -- SEVERABILITY

If any provision of this Agreement is terminated or held by a court of competent jurisdiction to be invalid, illegal, or unenforceable, the remainder of this Agreement will remain in full force and effect.

SECTION 7 -- SUCCESSORS AND ASSIGNS

This Agreement shall inure to the benefit of and be binding on the Parties and their respective heirs, executors, administrators, successors, and assigns.

SECTION 8 -- COUNTERPARTS & FACSIMILES

This Agreement may be executed by the Parties hereto in any number of separate counterparts, each of which when so executed and delivered shall be an original, but all such counterparts together shall constitute but one and the same instrument. Signed counterparts of this Agreement may be delivered by facsimile or electronically transmitted image, and such facsimile or electronically transmitted image counterparts and signatures shall be deemed to be, and fully effective and enforceable as, originals for all purposes.

SECTION 9 -- CHOICE OF LAW

This Agreement shall be governed by and construed in accordance with the internal laws of the State of West Virginia, without giving effect to any choice or conflict of law provision or rule that would cause the application of laws of any jurisdiction other than those of the State of West Virginia.

[remainder of page intentionally blank – signature page follows]

IN WITNESS WHEREOF, the Parties hereto have executed this Nullification Agreement, intending it effective the day and year first above written.

CITY OF CHARLES TOWN

_____

Robert M. Trainor
Mayor

Attest:

_____

John C. Barkley
City Clerk

STATE OF WEST VIRGINIA;
COUNTY OF BERKELEY, to-wit:

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by Robert M. Trainor, in his capacity as Mayor of the City of Charles Town, a West Virginia municipal corporation.

(AFFIX NOTARIAL SEAL)

_____

NOTARY PUBLIC

My commission expires: _____.

_____
ROSCOE A. HAYES

STATE OF WEST VIRGINIA;
COUNTY OF BERKELEY, to-wit:

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by Roscoe A. Hayes.

(AFFIX NOTARIAL SEAL)

_____
NOTARY PUBLIC

My commission expires: _____.

_____
ALICE M. SPICKLER, Co-Trustee

_____
DONALD L. SPICKLER, Co-Trustee

STATE OF WEST VIRGINIA;
COUNTY OF BERKELEY, to-wit:

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by Alice M. Spickler and Donald L. Spickler, Co-Trustees of the Alice M. Spickler Living Trust.

(AFFIX NOTARIAL SEAL)

_____
NOTARY PUBLIC

My commission expires: _____.

_____
JOSEPH R. GALLO

STATE OF WEST VIRGINIA;
COUNTY OF BERKELEY, to-wit:

The foregoing instrument was acknowledged before me this _____ day of , 20___, by Joseph R. Gallo.

(AFFIX NOTARIAL SEAL)

_____
NOTARY PUBLIC

My commission expires: _____.

This document was prepared by Michael J. Funk, Esq., Steptoe & Johnson PLLC, 1250 Edwin Miller Blvd., Martinsburg, WV, 25404.

Planning Commission
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

AGENDA ITEM (ID #)

Public Hearing: WV 2023-08: Happy Retreat - Waiver from lighting standards

ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Lighting Plan and Details.pdf
- 4. Lighting Specs.pdf

Waiver Request

WV2023-08

Date: For the December 27, 2023 Planning Commission meeting

Applicant: Stromberg, Garrigan, and Associates Inc.

Property Owner: Parcel 3-5-6 is owned by Friends of Happy Retreat. Parcel 3-5-6.0001 is owned by the City of Charles Town Board of Parks and Recreation Commission.

Report by: James Newman, City Planner, Zoning/Subdivision Administrator.

Proposal: Construction of a parking lot.

Property Location: TD 3 / Map: 5 / Pcl: 6, 6.0001, located on Mordington Avenue.

Current Zoning: Old Town Residential.



PROJECT OVERVIEW

The property is 12.3 acres in size. The applicant has an existing cultural center on site, and is seeking to expand the parking lot. They are requesting a waiver from parking lot lighting standards. The property is outside of the Historic District.

PLANNING COMMISSION

The Planning Commission approved a sketch plan on July 24, 2023.

LIGHTING REQUIREMENTS

Section 1333.14 Lighting Standards

…

B) Parking Lot Lighting.

1. Parking lot lighting shall conform to the Underground Utility standards specified in Article 926 of the Charles Town Codified Ordinance.

2. Lights shall be mounted on flat black poles that match in detail and design the lights in the downtown of Charles Town with acorn style tops, unless otherwise specified by the Planning Commission.

3. The mounting height for luminaire fixtures shall not exceed 33 feet as measured to the top of the fixture from grade.

4. All fixtures shall be non-adjustable and shall have a cutoff that shields the light source at an angle of 90 degrees from vertical. Floodlights are not permitted.

5. The maximum average maintained footcandles for all parking lighting shall be three (3) footcandles and the minimum average maintained footcandles shall be one (1) footcandle. For the purposes of this Ordinance the average maintained footcandles shall be calculated at 0.8 of initial footcandles at the property line. A photometric plan shall be submitted as part of any Major S/LD.

6. Luminaire fixtures shall be arranged in order to provide uniform illumination throughout the parking lot of not more than a 6:1 ratio of average to minimum illumination and not more than 20:1 ratio of maximum to minimum illumination.

7. S/LD Application Requirements. A point by point calculation showing compliance with the lighting standards is required with all Preliminary S/LD Applications. The calculations shall be measured at grade for lighting levels within the parking lot. A cut sheet of the proposed fixtures, including a candlepower distribution curve, shall also be submitted. A vertical plan foot-candle calculation shall be submitted for property lines abutting residential properties. The maximum maintained vertical footcandle at an adjoining residential property line shall be 0.5 footcandles, measured at five (5) feet above grade.

REQUEST

Applicant is requesting a variance from standards 2 and 4 above, regarding style and mobility.

WAIVER CRITERIA

Section 1331.12, Appeals; Waivers; Amendments

1. Adjustments that may be made to the requirements of this Ordinance to unusual site conditions in order to achieve a better design. Waivers may not be used to circumvent the process requirements of this Ordinance. The Planning Commission shall have the authority to grant a waiver to allow a modification, change, or an alternative solution to a requirement of this Ordinance. Please note that economic hardship alone is not sufficient reason to grant an exception from the requirements.

2. Waivers from the minimum standards in this Ordinance may be granted by the Planning Commission only when the Planning Commission finds that granting a waiver will be consistent with all of the following criteria and the exception is the minimum necessary to afford relief:

a. **That the design of the project will provide public benefit such as a reduction in City maintenance cost, greater open space, parkland consistent with the City parks plan, or benefits of a similar nature;**

   The proposed lighting will be small-scale and non-intrusive, keeping the focus of the site on Happy Retreat, while discreetly providing lighting for access drives, the parking lot, and walkways.

b. **The waiver, if granted, will not adversely affect the public health, safety or welfare, or the rights of adjacent property owners or residents;**

   The proposed waiver affects only the aesthetics of the lighting and the ability of the lighting to be moveable; the modules can be moved up to 355° and are field-adjustable, while staying down-lit and shielded.

c. **That the waiver, if granted, will be in keeping with the intent and purpose of this Ordinance;**
   The Charles Town Subdivision and Land Development Ordinance is intended to guide future growth and development by regulating the Subdivision and physical Development of land within the jurisdiction of the City of Charles Town for the improvement of the health, safety, comfort, morals, and general public welfare of Charles Town citizens.

   The proposed waiver will not impact safety as it is only in regards to the aesthetics of the proposed lights, not the ability or intensity of the lighting itself.

d. That the waiver, if granted, will result in a project of better quality and/or Character.

The waiver will grant low -intensity, discreet lighting intended to blend into the background while keeping the focus on Happy Retreat.

RECOMMENDATION

Approval.

Waiver Application No._____

NOV 01 2023

BY:_____

WAIVER APPLICATION

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
SECTION 1331.12, (V) REQUIREMENTS

To assist staff in the review of a waiver application to the Planning Commission (PC), the applicant must supply all of the information contained in this application form. This application must be signed by all owners of the real estate which is the subject of the application. The owners may designate one or more professional agents to represent them in the application process using the spaces provided on this form.

Incomplete applications will be subject to scheduling delay. Applicants are encouraged to meet with staff prior to filing. A public hearing will be scheduled within 45 days of the receipt of a completed application.

Approval of a waiver by the Planning Commission does not relieve the applicant from other requirements including, but not limited to, signs(s), building, zoning and use permits or site plans.

As part of this application, the following must be provided:

1. $150.00 Application Fee.
2. A Completed Application.
3. As applicable, supporting documents included, but not limited to site plan or depiction of the requested Waiver.

It is the applicant's responsibility to make a good-faith effort to provide the Subdivision Administrator, as applicable, with a current list containing the accurate names and mailing addresses of all interested parties. For purposes of this provision, "interested parties" shall mean Landowners of Adjacent Property. The applicant shall provide the addresses in order to comply with Section 1331.12.B of the Subdivision Ordinance

Legal Notices

The following shall occur at least 15 days prior to the Public Hearing: notice of the hearing shall be advertised by the Planning Commission as a Class I legal advertisement in the local newspaper, posting of a sign upon the property, and letters to adjacent and confronting land owners within 100 feet of the subject property.

Definition of a Waiver

Adjustments that may be made to the requirements of this Ordinance to unusual site conditions in order to achieve a better design. Waivers may not be used to circumvent the process requirements of this Ordinance.

The Charles Town Subdivision Ordinance

To grant a Waiver as permitted in the Subdivision Ordinance, the Planning Commission makes findings as specified in Section 1331.12(B)(2).

In order to issue a Waiver, the Commission must make the following written findings regarding the Waiver sought and all of the following can be met:

A waiver request may be granted by the Planning Commission only when it shall be determined that:

1. That the design of the project will provide public benefit such as a reduction in City maintenance cost, greater open space, parkland consistent with the City parks plan, or benefits of a similar nature;
2. The waiver, if granted, will not adversely affect the public health, safety or welfare, or the rights of adjacent property owners or residents;
3. That the waiver, if granted, will be in keeping with the intent and purpose of this Ordinance; and
4. That the waiver, if granted, will result in a project of better quality and/or character.

Note:

Additional exhibits may be required by the Subdivision Administrator or Planning Commission such as a lot location survey or site plan showing existing and proposed Structures, easements, watercourses, curb cuts and description of the uses of adjacent property that are necessary to describe existing or proposed conditions.

1. DATE November 1, 2023

2. APPLICANT'S NAME* Stromberg / Garrigan & Associates, Inc.

Address: 121 Tazewell Avenue, Norfolk, VA 23510

Telephone Number (757)228-1962 Fax Number ( )

Email Address mstromberg@s-ga.com

3. PROPERTY OWNER'S NAME Friends of Happy Retreat, Inc.

Address: P.O. Box 1427, Charles Town, WV 25414

Telephone Number (304)724-7956 Fax Number ( )

Email Address swwash@comcast.net

4. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address: 600 Mordington Avenue, Charles Town, WV

Tax Map # and Parcel: Tax Map #5, Parcel 6 (FOHR); Tax Map #5, Parcel 6.1 (CTBPRC)

Deed Book and Page #: DB 1158, Page 721 (FOHR); DB 1158, Page 718 (CTBPRC)

Property Area in Square Feet or Acres: 12.313 acres total (2.313 acres FOHR, 10 acres CTBPRC)

5. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

Current zoning is Old Town Residential. The site is a historic site and the former home of Charles Washington dating back to the 18th century. It was used as a home by a series of other owners in the intervening years. It is now owned by non-profit Friends of Happy Retreat, Inc. (Parcel 6) and the Charles Town Board of Park and Recreation Commisioners (Parcel 6.1) after a 2015 subdivision and conveyance of the property. It is now being preserved as a cultural heritage site.

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

The Happy Retreat facility is a cultural heritage site and currently hosts occasional events on the property. The goal of this project is to create improved access and a permanent parking facility for the site so it is better equipped to hold events on a more frequent basis. No new building structures are proposed as a part of this project, only supporting infrastructure for vehicles and pedestrians, plus the associated earthwork and stormwater management needed for the improvements. The effort is led by Friends of Happy Retreat,which intends to secure funding to construct the project but will require final approval from the CTBPRC, who owns 10 acres of the 12.3 acre Happy Retreat facility.

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

7. DESCRIPTION OF ANY PROPOSED WORK TO BE DONE TO THE PROPERTY:

Work will include the construction of a new parking lot facility with associated access drives, pedestrian/ADA facilities, stormwater management, lighting, and landscape upgrades.

8. DESCRIPTION OF THE WAIVER REQUEST:

FOHR is requesting to use a simple low-profile light fixture within the new parking lot area to be constructed, rather than the typical acorn-style lighting found in downtown Charles Town.

9. LIST THE APPLICABLE SECTION(S) OF THE SUBDIVISION ORDINANCE FROM WHICH THE WAIVER IS REQUESTED:

Section 1333.14(B)3 - "Lights shall be mounted on flat black poles that match in detail and design the lights in the downtown of Charles Town with acorn style tops, unless otherwise specified by the Planning Commission"

10. JUSTIFICATION FOR THE REQUEST:

A) Explain how the design of the project will provide public benefit such as a reduction in City maintenance costs, greater open space, parkland consistent with the City Parks Plan or benefits of a similar nature;

Since a parking lot of this nature is inherently not of the era that the Happy Retreat residence was constructed, the intent of the design is to draw as little attention away from the main facility as possible. The low-profile lights being considered for the site are intended to blend into the buffer plantings as much as possible.

B) Explain how the waiver, if granted, will not adversely affect the public health, safety, welfare or the rights of adjacent property owners or residents;

This lighting waiver will is only related to aesthetic requirements under the ordinance and for that reason, should not result in any impacts to public health, safety, welfare, or rights of adjacent property owners.

C) Explain how the waiver, if granted, will be in keeping with the intent and purpose of this Ordinance; and;

The purpose of this section of the ordinance is to maintain an aesthetic which respects the historic character of Charles Town. The intent of this waiver is to limit the attention drawn by the parking lot away from a major historic landmark of the city which seems consistent with the goals of the ordinance.

D) Explain how the waiver, if granted, will result in a project of better quality and/or character.

As, indiated, the lights were selected to not attempt to replicate any sort of historic aesthetic, since a lighted parking lot is an inherently anachronistic feature in a historic facility. The low profile lights will help maintain emphasis on the main facility and natural beauty of the site.

11. INTERESTED PARTY ADDRESSES, FOR PUBLIC NOTICE (including across street) (Interested parties are defined as adjacent properties within 100 feet).

Owner	# and Street	City, State, Zip
Charles Town Board of Parks & Rec Comm		Charles Town, WV 25414
Board of Education	110 Mordington Avenue	Charles Town, WV 25414
Graves, Mark A & Amy E Collins Johns, Alice C	185 Mordington Avenue 187 Mordington Avenue	Charles Town, WV 25414
Glassford, David J Schottler, Robert J III & Sarah L Whitacre	144 Blakeley Place 145 Blakeley Place	Charles Town, WV 25414
Wilt, Angela L & David T Roll, Bethanny M	611 Mordington Avenue 621 Mordington Avenue	Charles Town, WV 25414
Kay, Marcella	620 Mordington Avenue	Charles Town, WV 25414
Thai Hung Viet	6602 Patrick Ct	Centreville, VA 20120
Murphy, Sean B & Candice D Obianwu, Anthony O	131 Springdale Drive 141 Springdale Drive	Charles Town, WV 25414
Solomon, Diana L Mayfield, Jennifer W & Mitchell D.	151 Springdale Drive 161 Springdale Drive	Charles Town, WV 25414

12. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

Application No.	Project Name and Phase	Status	Approval Date
SLD2023-07	Happy Retreat Parking Lot & Circulation	Sketch Plan Approved	7/24/2023

13. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

☐ Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

☑ No

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1331.12 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant

_____ Date 11/1/2023

Signature of Property Owner (If different than Applicant)

_____ Date 11/1/23

Please submit an original completed Application and specified number of Site Plan copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

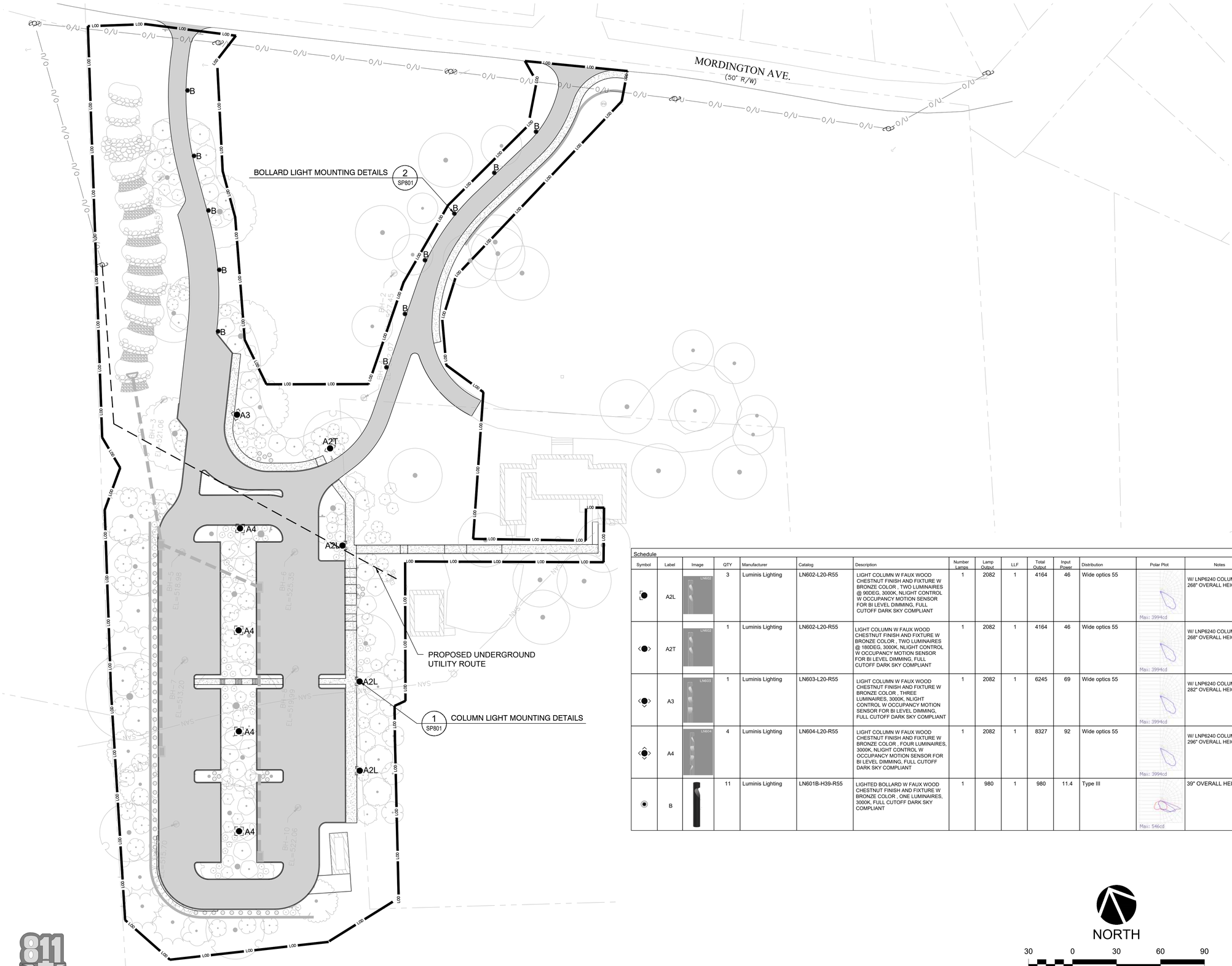
Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments/Conditions:_____



Schedule

Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Total Output	Input Power	Distribution	Polar Plot	Notes
	A2L	LN602	3	Luminis Lighting	LN602-L20-R55	LIGHT COLUMN W FAUX WOOD CHESTNUT FINISH AND FIXTURE W BRONZE COLOR , TWO LUMINAIRES @ 90DEG, 3000K, NLIGHT CONTROL W OCCUPANCY MOTION SENSOR FOR BI LEVEL DIMMING, FULL CUTOFF DARK SKY COMPLIANT	1	2082	1	4164	46	Wide optics 55	Max: 3994cd	W/ LNP6240 COLUMN POLE 268" OVERALL HEIGHT
	A2T	LN602	1	Luminis Lighting	LN602-L20-R55	LIGHT COLUMN W FAUX WOOD CHESTNUT FINISH AND FIXTURE W BRONZE COLOR , TWO LUMINAIRES @ 180DEG, 3000K, NLIGHT CONTROL W OCCUPANCY MOTION SENSOR FOR BI LEVEL DIMMING, FULL CUTOFF DARK SKY COMPLIANT	1	2082	1	4164	46	Wide optics 55	Max: 3994cd	W/ LNP6240 COLUMN POLE 268" OVERALL HEIGHT
	A3	LN603	1	Luminis Lighting	LN603-L20-R55	LIGHT COLUMN W FAUX WOOD CHESTNUT FINISH AND FIXTURE W BRONZE COLOR , THREE LUMINAIRES, 3000K, NLIGHT CONTROL W OCCUPANCY MOTION SENSOR FOR BI LEVEL DIMMING, FULL CUTOFF DARK SKY COMPLIANT	1	2082	1	6245	69	Wide optics 55	Max: 3994cd	W/ LNP6240 COLUMN POLE 282" OVERALL HEIGHT
	A4	LN604	4	Luminis Lighting	LN604-L20-R55	LIGHT COLUMN W FAUX WOOD CHESTNUT FINISH AND FIXTURE W BRONZE COLOR , FOUR LUMINAIRES, 3000K, NLIGHT CONTROL W OCCUPANCY MOTION SENSOR FOR BI LEVEL DIMMING, FULL CUTOFF DARK SKY COMPLIANT	1	2082	1	8327	92	Wide optics 55	Max: 3994cd	W/ LNP6240 COLUMN POLE 296" OVERALL HEIGHT
	B		11	Luminis Lighting	LN601B-H39-R55	LIGHTED BOLLARD W FAUX WOOD CHESTNUT FINISH AND FIXTURE W BRONZE COLOR , ONE LUMINAIRES, 3000K, FULL CUTOFF DARK SKY COMPLIANT	1	980	1	980	11.4	Type III	Max: 546cd	39" OVERALL HEIGHT

NORTH

30 0 30 60 90

SCALE: 1" = 30' - 0"

CALL BEFORE YOU DIG
IN WEST VIRGINIA
1-800-245-4848
SN: XXXXX

PRELIMINARY S/LD PERMIT SET (NOT FOR CONSTRUCTION)

NOTE: The base plan is derived from a survey generated by The Thrasher Group, Inc., Surveying dated 1/2023.

stromberg garrigan associates
LANDSCAPE ARCHITECTURE & URBAN DESIGN
553 GREENWOOD AVENUE, JENKINTOWN, PA. 19046
P. 215.357.1541 F. 814.444.0484 WWW.S-GA.COM

PROJECT TITLE:

HAPPY RETREAT PARKING LOT & CIRCULATION

PROJECT ADDRESS:

600 MORDINGTON AVE
CHARLES TOWN, WV 25414

OWNER:

Friends of Happy Retreat
P.O. Box 1427
Charles Town, WV 25414

STAMP:

REVISIONS:

NO.	DATE	REMARKS

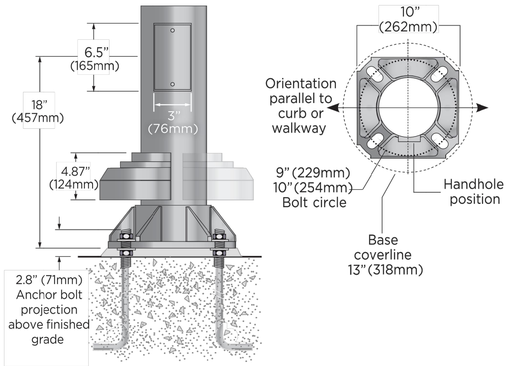
NOTE: DO NOT SCALE FROM DRAWINGS. VERIFY ALL DIMENSIONS ON SITE.

DRAWN BY: BE
CHECKED BY: TS
JOB #: 22012
DATE: 10/30/2023
SCALE: AS SHOWN

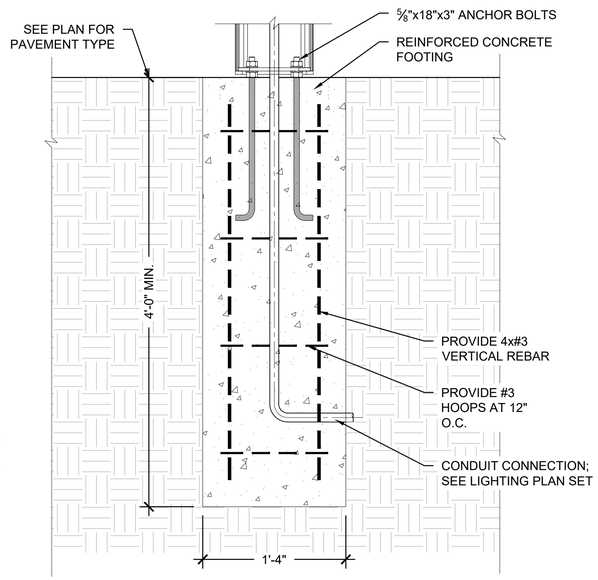
SHEET TITLE:

LIGHTING PLAN

SP800



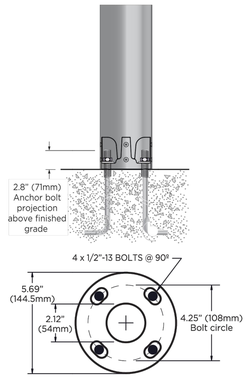
The cast aluminum base plate is secured with a set of (4) 3/4"-10 x 18" lg. galvanized anchor bolts.



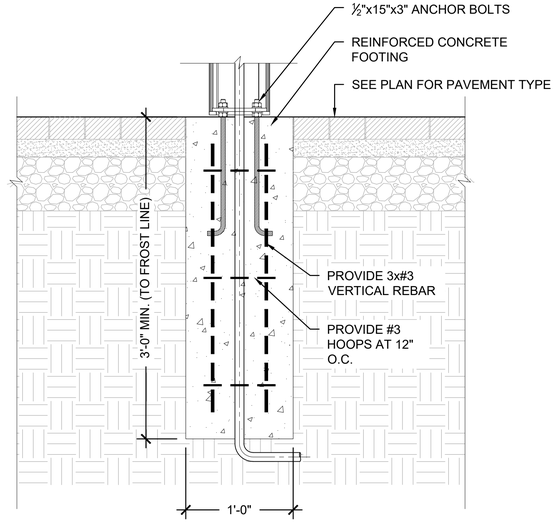
NOTES:
1. AVOID DISTURBING SOILS SURROUNDING FOUNDATION. IF SOILS ARE DISTURBED, PROPER COMPACTION OF SURROUNDING SOILS SHOULD OCCUR AFTER CONSTRUCTION. IF CLAYEY SOILS ARE ENCOUNTERED, NOTIFY ENGINEER BEFORE PROCEEDING.

2. CONSULT LUMINIS INSTALLATION GUIDE FOR ADDITIONAL INFORMATION.

1 COLUMN LIGHT MOUNTING DETAILS
NOT TO SCALE



Base is secured with a set of (4) 1/2"-13 x 18" lg. galvanized anchor bolts.



NOTES:
1. AVOID DISTURBING SOILS SURROUNDING FOUNDATION. IF SOILS ARE DISTURBED, PROPER COMPACTION OF SURROUNDING SOILS SHOULD OCCUR AFTER CONSTRUCTION. IF CLAYEY SOILS ARE ENCOUNTERED, NOTIFY ENGINEER BEFORE PROCEEDING.

2. CONSULT LUMINIS INSTALLATION GUIDE FOR ADDITIONAL INFORMATION.

2 BOLLARD LIGHT MOUNTING DETAILS
NOT TO SCALE

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Charles Town, WV 25414

STAMP:

REVISIONS:

NO.	DATE	REMARKS

NOTE: DO NOT SCALE FROM DRAWINGS. VERIFY ALL DIMENSIONS ON SITE.

DRAWN BY: FH
CHECKED BY: TS|MS
JOB #: 22012
DATE: 10/30/2023
SCALE: AS SHOWN

SHEET TITLE:

LIGHTING DETAILS

SP801

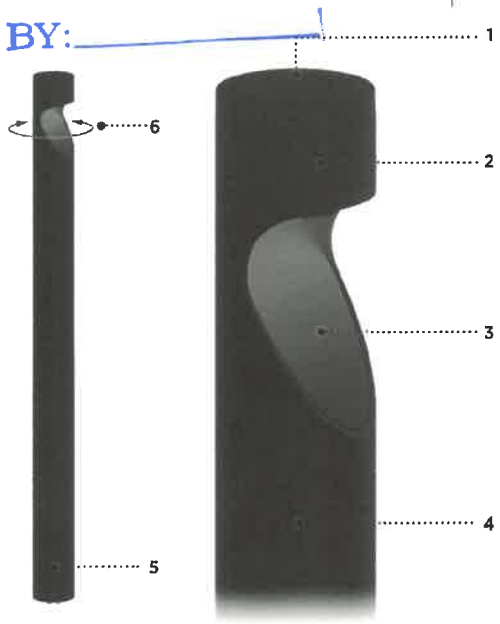
LUMINIS®

RECEIVED
NOV 06 2023
BY:

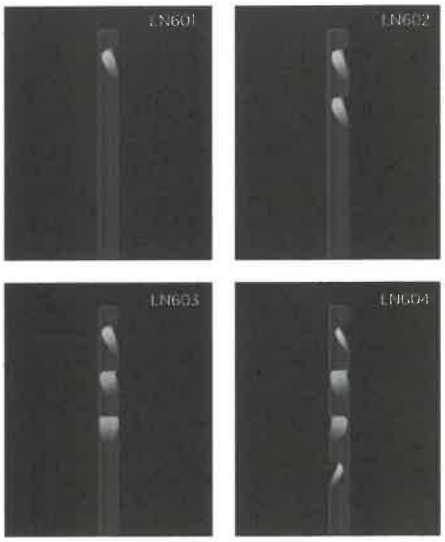
LN601/LN602/LN603/LN604 SERIES
INLINE
COLUMN

TYPE: _____ QUANTITY: _____ PROJECT: _____

CATALOG NUMBER:								
	MODEL	LED SELECTION	CCT	DISTRIBUTION	COLUMN POLE	VOLTAGE	FINISH	OPTION



1- Heavy cast aluminum top cover.
2- Optical system assembly.
3- Access door to rotation mechanism.
4- Ø6" (152mm) extruded aluminum body.
5- Cast aluminum mounting base or base cover.
6- Modules rotate 355º and are field-adjustable (shipped facing same direction).



MATERIALS
Inline is made of corrosion resistant 356 heavy duty cast aluminum alloy with a copper (CU) content of less than 0.1% with stainless steel hardware.

ELECTRICAL
DRIVER
Standard driver is 0-10V dimming-ready (dims to 10%) with: 120-277 multi-volt compatibility (50-60Hz), operating temperatures of -40ºC/-40ºF to 55ºC/131ºF, output over voltage protection, output over current protection, output short circuit protection with auto-recovery.

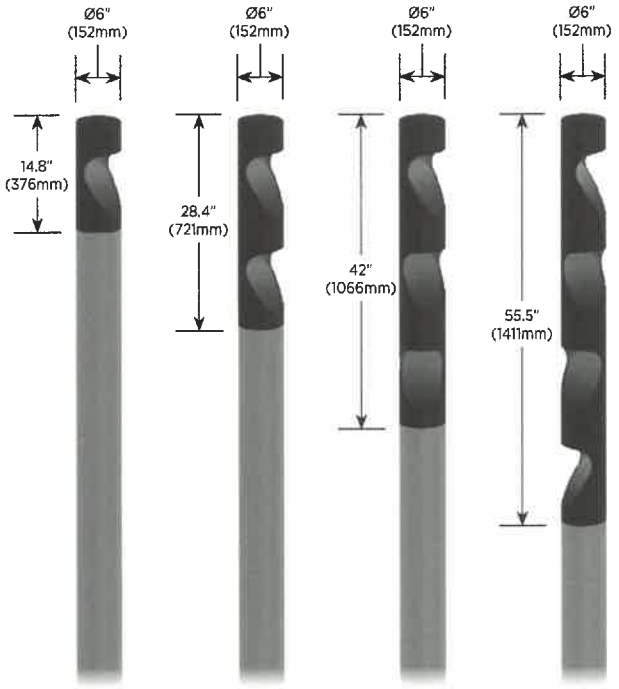
LED
2700K/3000K/3500K/4000K CCT with 80 CRI. Optional true amber LED for turtle sensitive areas. Wavelengths: 585nm to 597nm.

LIFE
60,000hrs $L_{70}B_{50}$ (based on IESNA TM-21 Test Method and LM-80 data).
Up to 70,000hrs $L_{70}B_{50}$ (calculated projection from LM-80 data).

FINISH
Five-stage preparation process including preheating of cast aluminum parts for air extraction, and an environmentally friendly alloy sealant. Polyester powder coating is applied through an electrostatic process and oven cured for long term finish.

MOUNTING
Mounts with a set of 4 x 1/2"-13 x 18" lg. or 3/4"-10 x 18" lg. galvanized anchor bolts. See page 4 for mounting details.

CERTIFICATION
Certified and approved as per CSA C22.2 No.: 250.0 standard and ANSI/UL 1598 standard, for wet location. Rated IP65. Photometric testing performed by an independent laboratory in accordance with IES LM-79-08 standards at 25ºC. Lumen depreciation in accordance with IESNA LM80 standards.



	LN601	LN602	LN603	LN604
EPA:	0.63	1.19	1.75	2.31
Light module weight*:	12 lb	22 lb	32 lb	42 lb

*Pole weights not included here. Refer to to page 6 and 7 for different pole weights and additional EPA information.

April 2023 Rev. 2

LN601/LN602/LN603/LN604 SERIES
INLINE

LUMINAIRE SELECTION

MODEL[1]

LED LIGHT SELECTION

	SUFFIX	DELIVERED LUMENS*	INPUT WATTS
☐ LN601	☐ L1L20	2143	23
	☐ L1L30	3156	36
	☐ L1L40	4191	53
	☐ L1L50	4809	64
	Amber LED:		
	☐ L1LK2A	229	11
☐ LN602	☐ L2L20	4286	46
	☐ L2L30	6312	72
	☐ L2L40	8382	106
	☐ L2L50	9618	128
	Amber LED		
	☐ L2LK2A	458	22
☐ LN603	☐ L3L20	6429	69
	☐ L3L30	9468	108
	☐ L3L40	12573	159
	☐ L3L50	14427	192
	Amber LED:		
	☐ L3LK2A	687	33
☐ LN604	☐ L4L20	8572	92
	☐ L4L30	12624	144
	☐ L4L40	16764	212
	☐ L4L50	19236	256
	Amber LED		
	☐ L4LK2A	916	44

*4000K / 80 CRI / R30

CCT/CRI

- ☐ **K27** 2700K CCT 80 CRI (LCF: 0.94)
- ☐ **K30** 3000K CCT 80 CRI (LCF: 0.97)
- ☐ **K35** 3500K CCT 80 CRI (LCF: 0.99)
- ☐ **K40** 4000K CCT 80 CRI

LCF Lumen conversion factor

DISTRIBUTION

- ☐ **R15** Narrow optics 15º (LCF: 0.94)
- ☐ **R30** Flood optics 30º
- ☐ **R55** Wide flood optics 55º (LCF: 0.97)
- ☐ **TYP3** TYPE III, Short (LCF: 0.76)

LCF. Lumen conversion factor

COLUMN POLE

- ☐ **LNP696**
- ☐ **LNP6120**
- ☐ **LNP6144**
- ☐ **LNP6168**
- ☐ **LNP6192**
- ☐ **LNP6216**
- ☐ **LNP6240**

See OAH by model below

OAH 20' +/-

VOLTAGE

- ☐ **120V**
- ☐ **208V**
- ☐ **240V**
- ☐ **277V**
- ☐ **347V**
- ☐ **480V**

FINISH[2]

STANDARD COLORS

- ☐ **WHT** Snow white
- ☐ **BKT** Jet black
- ☐ **BZT** Bronze
- ☐ **MST** Matte silver
- ☐ **GRT** Titanium gray
- ☐ **DGT** Gun metal
- ☐ **CHT** Champagne
- ☐ **SGT** Steel gray
- ☐ **BGT** English cream
- ☐ **BLT** Midnight blue

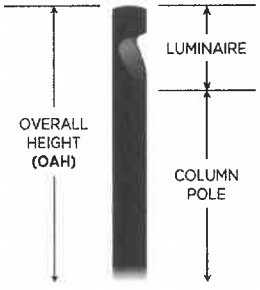
OPTIONAL COLORS

- ☐ **CS** Custom color
- ☐ **RAL** RAL# color

(Refer to color chart)

OVERALL HEIGHT (OAH)

	LN601	LN602	LN603	LN604
LNP696	110"	124"	138"	152"
LNP6120	134"	148"	162"	176"
LNP6144	158"	172"	186"	200"
LNP6168	182"	196"	210"	224"
LNP6192	206"	220"	234"	248"
LNP6216	230"	244"	258"	272"
LNP6240	254"	268"	282"	296"



For IDA certification compliance, luminaire must be ordered with 3000K or warmer.

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Luminaires may be altered for design improvement without prior notice

OPTIONS

ELECTRICAL

- ☐ **FS** Fuse
- ☐ **PH** NEMA C136.41 7-pin receptable with photocell sensor preinstalled
- ☐ **SP** Surge protector 10kV
- ☐ **MS** Motion sensor device (high/low 25%). 270° coverage. [4]

FAUX WOOD COLORS [2,6]

- ☐ **ADG** American douglas
- ☐ **BRC** Birch
- ☐ **CHN** Chestnut
- ☐ **CRY** Cherry
- ☐ **KNP** Knotty pine
- ☐ **MPL** Maple
- ☐ **OFL** Oak
- ☐ **RSW** Rosewood
- ☐ **TEK** Teak
- ☐ **WLN** Walnut

CONTROL

- ☐ **NLTAIR2** nLight AIR Control gen2, black antenna mounted on top [5]

ACCESSORIES

- ☐ **GFI** Ground fault circuit interruption flush receptacle [7]
- ☐ **CGF** Ground fault circuit interruption with clear in-us cover [7]

ENVIRONMENT

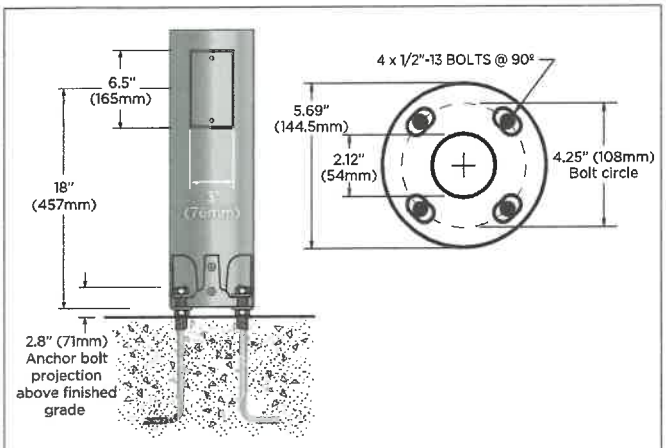
- ☐ **MG** Marine grade paint [3]

NOTES

1- For LN602/LN603/LN604, all light modules are factory-assembled in the same direction. They can be rotated in the field.
2- For any standard finish, access door will be black color to reduce glare and minimize uplight. Different access door color available on demand. For faux wood finish, access door will have same faux wood finish. (See page 4 for example.)
3- Marine grade paint for harsh, coastal environment and exposure to salt water. Additional delay required please contact factory for info.
4- Motion sensor option is not available with PH option, 347V and 480V.
5- NLTAIR2 not available with LxL50, PH, MS, 347V and 480V. Must link to external nLight Air network. Dims to 10%.
6- Faux wood finish not applied to fixture top cap, housing, hand-hole, base cover and accessories. Not compatible with marine grade finish.
7- GFI and CGF options are installed 26" (660mm) above grade on access door side. GFI cover protrudes by 1.75" (45mm). CGF cover protrudes by 3.75" (95mm). 120V required for GFI or CGF.

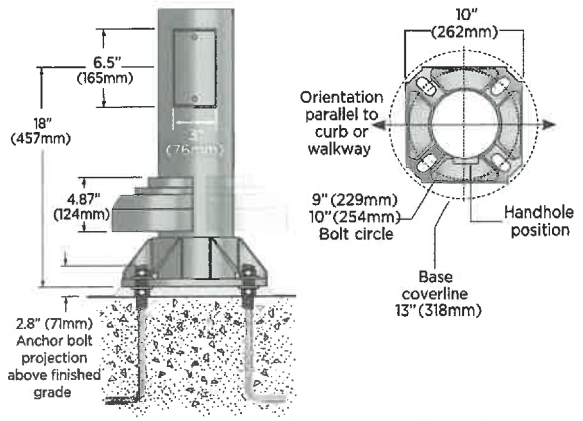
MOUNTING INFORMATION

FOR COLUMN POLES LNP696, LNP6120, LNP6144



Pole is secured with a set of (4) 1/2"-13 x 18" lg. galvanized anchor bolts.

FOR COLUMN POLES LNP6168, LNP6192, LNP6216, LNP6240



The cast aluminum base plate is secured with a set of (4) 3/4"-10 x 18" lg. galvanized anchor bolts.

ELECTRICAL DETAILS



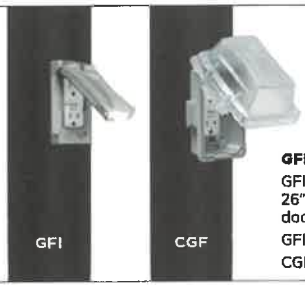
PH
7-PIN receptacle with photocell option mounted on top of the fixture as shown.



NLTAIR2
nLight AIR Control gen2.
Black antenna mounted on top as shown.



MS
Motion sensor module, mounted on pole as shown. 270° coverage. Motion sensor is black color.



GFI/CGF
GFI and CGF options are installed 26" (660mm) above grade on access door side.
GFI cover protrudes by 1.75" (45mm).
CGF cover protrudes by 3.75" (95mm).

FINISH DETAILS



STANDARD COLOR
For any standard finish, access door will be black color to reduce glare and minimize uplight. Different access door color available on demand.



FAUX WOOD
Access door will have same faux wood finish.
Faux wood finish not applied to rest of the fixture, hand-hole, base cover and accessories.
Not compatible with marine grade finish.

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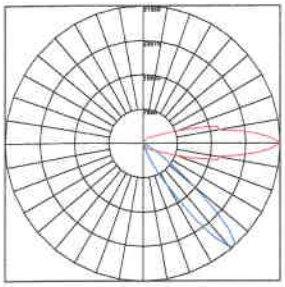
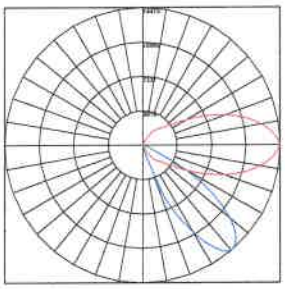
TYPICAL PHOTOMETRY SUMMARY



Descriptive information

LN601-L1L50-R15

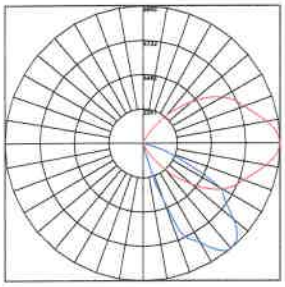
Total Lms: 4520 lumens
Total input watts: 64 W
Efficacy: 70 Lumens/Watt
CCT/CRI: 4000K/80CRI
Maximum candela: 31359 @ 0°H/42.5°V
BUG: B0-U1-G0



Descriptive information

LN601-L1L50-R30

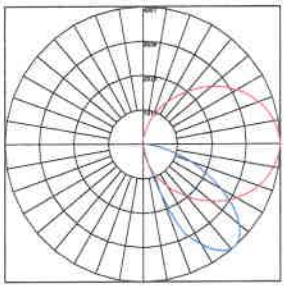
Total Lms: 4809 lumens
Total input watts: 64 W
Efficacy: 75 Lumens/Watt
CCT/CRI: 4000K/80CRI
Maximum candela: 14473 @ 0°H/40°V
BUG: B0-U1-G0



Descriptive information

LN601-L1L50-R55

Total Lms: 4664 lumens
Total input watts: 64 W
Efficacy: 72 Lumens/Watt
CCT/CRI: 4000K/80CRI
Maximum candela: 8963 @ 0°H/40°V
BUG: B0-U1-G0



Descriptive information

LN601-L1L50-TYP3

Total Lms: 3662 lumens
Total input watts: 64 W
Efficacy: 57 Lumens/Watt
CCT/CRI: 4000K/80CRI
Maximum candela: 4051 @ 0°H/42.5°V
BUG: B0-U1-G1

Please visit our web site www.luminis.com for complete I.E.S. formatted download data.

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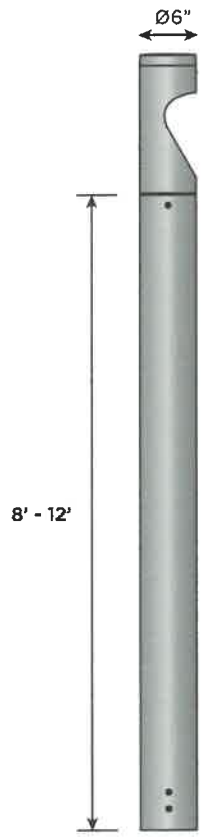
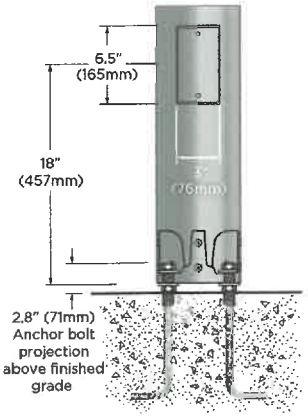
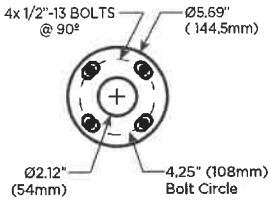
LUMINIS®

EPA SHEET
INLINE - Column

INTERNAL BASE
(LNP696, LNP6120, LNP6144)

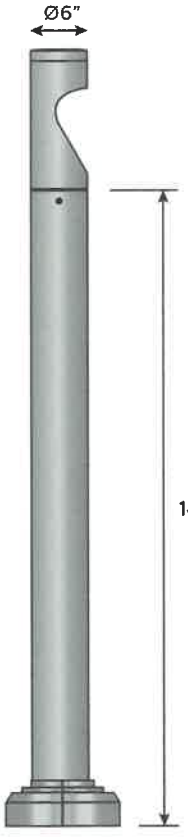


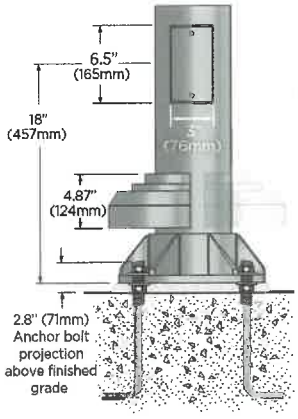


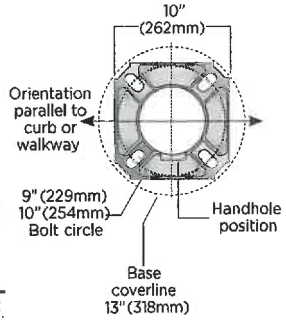


Pole is secured with a set of (4) 1/2"-13 x 18" lg. galvanized anchor bolts.

EXTERNAL BASE
(LNP6168, LNP6192, LNP6216, LNP6240)







The cast aluminum base plate is secured with a set of (4) 3/4"-10 x 18" lg. galvanized anchor bolts.

April 2023 Rev. 2

LUMINIS®

EPA SHEET
INLINE - Column

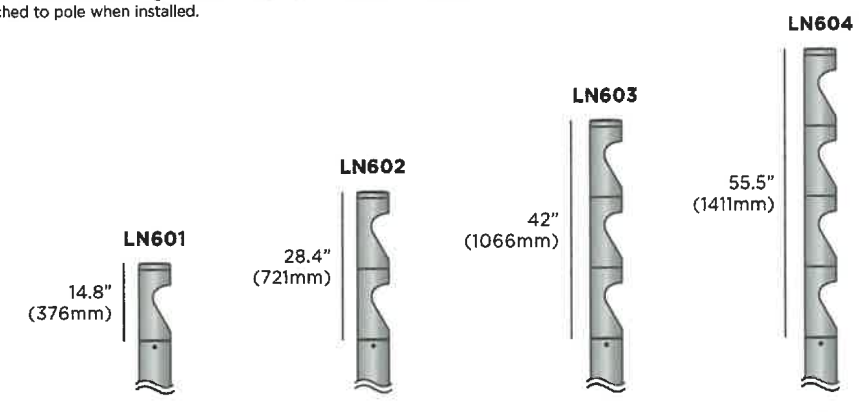
EPA
The EPA (Effective Projected Area) is a coefficient used to evaluate the loads induced by the wind on a luminaire.
It is calculated by multiplying the drag coefficient and the Frontal Projected Area of a luminaire (maximum achievable cross-sectional area in ft²).

The TOTAL EPA is the combination of the luminaire's EPA and pole's additional components' EPA.
It should not exceed the maximum allowable EPA at the selected geographic location and their corresponding wind map.

	Pole Height *ft*	Pole Weight *lb*	Wall Thk *in*	Base	AASHTO 2013 EPA RATING (ft²) 80	90	100	110	120	130 *mph*	140	150	160	170	180
LNP696	8	22.6	0.125	Internal	11.25	11.25	11.25	11.30	11.30	11.30	11.30	9.75	8.44	7.50	6.59
LNP6120	10	28.3	0.125	Internal	9.13	9.13	9.13	9.13	9.13	9.13	9.01	7.92	6.85	6.01	5.21
LNP6144	12	33.9	0.125	Internal	7.50	7.50	7.50	7.50	7.50	7.50	7.50	6.59	5.70	5.00	4.28
LNP6168	14	39.6	0.125	External	6.17	6.17	6.17	6.17	6.17	6.17	6.17	5.34	4.57	3.91	3.38
LNP6192	16	45.3	0.125	External	5.14	5.14	5.14	5.14	5.14	5.14	5.00	4.28	3.61	3.04	2.57
LNP6216	18	50.9	0.125	External	4.22	4.22	4.22	4.22	4.22	4.22	4.00	3.38	2.85	2.37	1.90
LNP6240	20	56.6	0.125	External	3.38	3.38	3.38	3.38	3.38	3.38	3.16	2.67	2.14	1.69	1.33

	Pole Height *ft*	Pole Weight *lb*	Wall Thk *in*	Base	CSA EPA RATING (ft²) 200	287	373	460	546	633 *q(Pa)*	719	806	892	979	1065
LNP696	8	22.6	0.125	Internal	20.45	13.82	10.22	8.08	6.47	5.46	4.78	4.15	3.69	3.36	3.03
LNP6120	10	28.3	0.125	Internal	16.60	10.92	7.88	5.91	4.60	3.83	3.36	2.87	2.52	2.27	2.02
LNP6144	12	33.9	0.125	Internal	13.45	8.51	6.06	4.25	3.19	2.52	2.12	1.79	1.59	1.34	1.19
LNP6168	14	39.6	0.125	External	12.12	7.56	4.92	3.36	2.27	1.70	1.41	1.13	-	-	-
LNP6192	16	45.3	0.125	External	10.09	5.67	3.40	2.02	1.06	-	-	-	-	-	-
LNP6216	18	50.9	0.125	External	8.08	4.25	2.12	-	-	-	-	-	-	-	-
LNP6240	20	56.6	0.125	External	6.38	2.83	-	-	-	-	-	-	-	-	-

NOTE: Do not erect pole without the intended loading attached to avoid wind-induced vibration.
Luminaires must be attached to pole when installed.



	LN601	LN602	LN603	LN604
EPA:	0.63	1.19	1.75	2.31
Light module weight:	12 lb	22 lb	32 lb	42 lb

April 2023 Rev. 2

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Public Hearing: WV2023-09: Mark Letenzi - Waiver from lighting standards

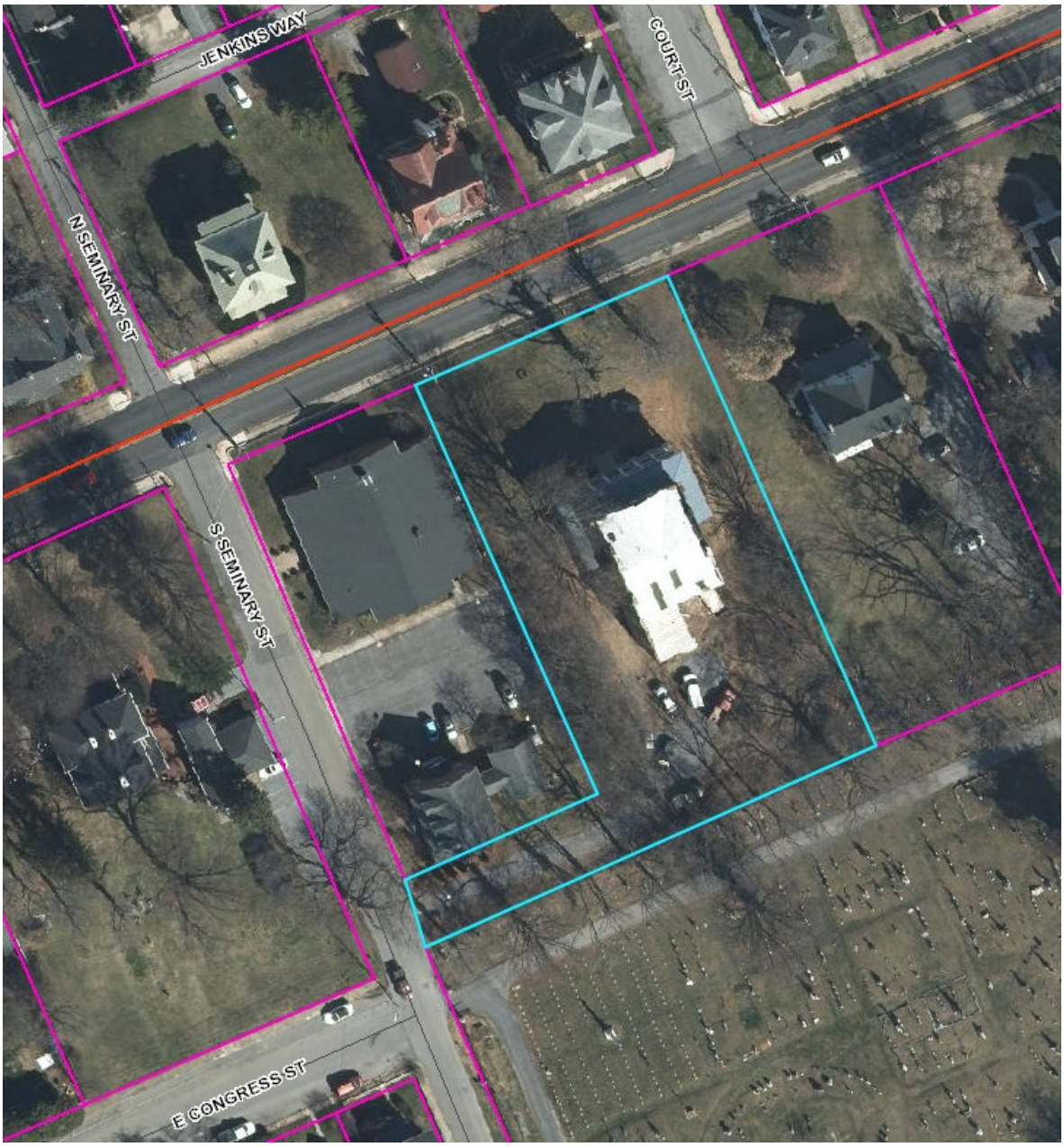
ATTACHMENTS:

- 1. Staff Report.pdf
- 2._Application.pdf
- 3._2024-01-12_Public_Comment.pdf
- 4._2024-01-08_Public_Comment.pdf
- 5. Public Comment.pdf
- 6._Installed_Lighting_Specifications.pdf
- 7._2024-01-17_Staff_Pictures.pdf
- 8._Approved_Plans.pdf

Waiver Request

WV2023-09

Date: For the January 22, 2024 Planning Commission meeting
Applicant: Mark Letenzi on behalf of 515 E. Washington LLC
Property Owner: 515 E. Washington LLC
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Waiver Request from lighting standards
Property Location: TD 3 / Map: 2 / Pcl: 256



PROJECT OVERVIEW

The property is 0.97 acres in size. The applicant has developed the property into apartments with a parking lot in the rear of the property that is reached via an access drive on South Seminary St. They are requesting a waiver from parking lot and street lighting standards, specifically the requirement for acorn style tops. The property is in the Historic District.

HISTORY

The applicant's development of the parking lot, access drive, dumpster pad, and lighting was treated as a minor subdivision and approved administratively on March 7, 2023. The proposed lighting on the plans conformed to the City's requirements with an acorn style top. The applicant installed lighting which does not conform to City Code requirements nor to the lighting shown on the approved plans.

LIGHTING REQUIREMENTS

Section 1333.14 Lighting Standards

…

B) Parking Lot Lighting.

1. Parking lot lighting shall conform to the Underground Utility standards specified in Article 926 of the Charles Town Codified Ordinance.

2. **Lights shall be mounted on flat black poles that match in detail and design the lights in the downtown of Charles Town with acorn style tops, unless otherwise specified by the Planning Commission.**

3. The mounting height for luminaire fixtures shall not exceed 33 feet as measured to the top of the fixture from grade.

4. All fixtures shall be non-adjustable and shall have a cutoff that shields the light source at an angle of 90 degrees from vertical. Floodlights are not permitted.

5. The maximum average maintained footcandles for all parking lighting shall be three (3) footcandles and the minimum average maintained footcandles shall be one (1) footcandle. For the purposes of this Ordinance the average maintained footcandles shall be calculated at 0.8 of initial footcandles at the property line. A photometric plan shall be submitted as part of any Major S/LD.

6. Luminaire fixtures shall be arranged in order to provide uniform illumination throughout the parking lot of not more than a 6:1 ratio of average to minimum illumination and not more than 20:1 ratio of maximum to minimum illumination.

7. S/LD Application Requirements. A point by point calculation showing compliance with the lighting standards is required with all Preliminary S/LD Applications. The calculations shall be measured at grade for lighting levels within the parking lot. A cut sheet of the

proposed fixtures, including a candlepower distribution curve, shall also be submitted. A vertical plan foot-candle calculation shall be submitted for property lines abutting residential properties. The maximum maintained vertical footcandle at an adjoining residential property line shall be 0.5 footcandles, measured at five (5) feet above grade.

Installed Light Pole



Installed Light – Close-up



Required Lighting Style



WAIVER CRITERIA

Section 1331.12, Appeals; Waivers; Amendments

1. Adjustments that may be made to the requirements of this Ordinance to unusual site conditions in order to achieve a better design. Waivers may not be used to circumvent the process requirements of this Ordinance. The Planning Commission shall have the authority to grant a waiver to allow a modification, change, or an alternative solution to a requirement of this Ordinance. Please note that economic hardship alone is not sufficient reason to grant an exception from the requirements.

2. Waivers from the minimum standards in this Ordinance may be granted by the Planning Commission only when the Planning Commission finds that granting a waiver will be consistent with all of the following criteria and the exception is the minimum necessary to afford relief:

a. That the design of the project will provide public benefit such as a reduction in City maintenance cost, greater open space, parkland consistent with the City parks plan, or benefits of a similar nature;

Parking lot lighting provides a public safety benefit. The parking lot was required to be lit, and the applicant has installed lighting. However, the installed lighting does meet the City's design criteria requirements nor those of the approved plan. A waiver from design does not affect City maintenance costs, open space, or parkland; the lights are maintained by the property owner.

Per the applicant, the waiver "*provides a more energy-efficient and parking-lot specific lighting solution to the buildings residents, with reduced light pollution for residents with windows facing the lot*."

b. The waiver, if granted, will not adversely affect the public health, safety or welfare, or the rights of adjacent property owners or residents;

The proposed waiver affects only the aesthetics of the lighting. The applicant has installed 75 wattage lighting, which has a color temperature of 3000 Kelvin. The image on the next page shows how color temperature visually appears:

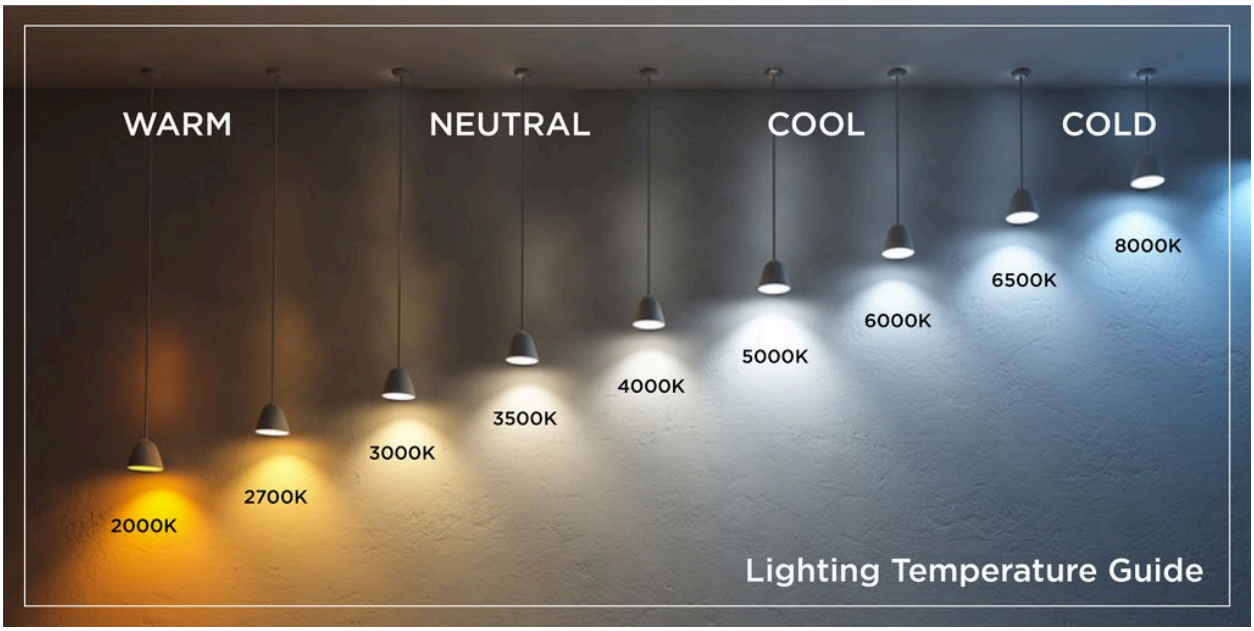


Image Source: https://www.casadiluce.ca/blogs/how-to/guide-to-light-color-temperature

Per the applicant: "*The exterior lighting in question is located in the rear of the private property, and largely hidden from public view. Conformity with neighboring parcels exterior lighting fixtures is not a concern as other also have lights of differing designs*."

The lighting is cutoff and shielded such that it is directed downwards.

c. That the waiver, if granted, will be in keeping with the intent and purpose of this Ordinance;

The Charles Town Subdivision and Land Development Ordinance is intended to guide future growth and development…for the improvement of the health, safety, comfort, morals, and general public welfare of Charles Town citizens. There is no mention of aesthetics.

The proposed waiver will not impact safety as it is only in regards to the aesthetics of the proposed lights, not the ability or intensity of the lighting itself.

Per the applicant: "*The exterior lighting in place meets all other requirements of the ordinance and provides adequate lighting where there was none present previously. A waiver would not compromise the building's historic designation either*."

The Subdivision and Land Development Ordinance specifically requires that lights be on a black pole with an acorn style top. The intent of this is to provide a uniform aesthetic lighting character throughout the City.

The adjacent parking lot at 111 S. Seminary contains lighting which also does not conform to current requirements. That lighting has been in place since at least 2014.

Required lighting style in place at Bank f Charles Town, adjacent to City Hall:



View of **installed lighting** at 515 E. Washington St:



d. That the waiver, if granted, will result in a project of better quality and/or Character.

Aesthetic character and quality are subjective. The Ordinance specifies a certain style of lighting.

Per the applicant: "*With the current lights being better suited for a small parking lot, a waiver would allow for reduced electricity costs being billed to the property's tenants. We do not believe it would compromise the building's historic nature in any way*."

HISTORIC DISTRICT

The property is located within the City's Historic District. Generally all new construction requires review by the Historic Landmarks Commission (HLC). The Design Review Standards used by the HLC do not specifically address street lighting. The HLC has reviewed the exterior changes to the structure and approved them, while review of the parking lot, dumpster, and lighting was handled administratively.

PUBLIC COMMENT

An adjacent property owner (525. E Washington St.) sent in two letters of public comment, both opposed to this waiver. The comments state that the lighting is extensive and overbearing, and that the required acorn top lights would also be a poor fit for lot as they are too strong (a picture of the required acorn top lighting is included in the attachment labelled *2024-01-17 Staff Pictures*).

An adjacent property owner (St. Thomas Church) sent in a letter of support. They state the lighting is attractive and helps improve security on their property. The installed lighting is downward facing whereas the City's acorn-top style lighting allows light to spread out.

CONCLUSION

In conclusion, the applicant is requesting a waiver from lighting standards for their parking lot, as the proposed lighting does not adhere to the City's lighting requirements for an acorn-style top. However, control of aesthetic is not within the intent of the Subdivision Ordinance. Since the installed lighting conforms to technical requirements for shielding and being downcast the waiver should be **approved**.

Waiver Application No._____

WAIVER APPLICATION

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
SECTION 1331.12, (V) REQUIREMENTS

To assist staff in the review of a waiver application to the Planning Commission (PC), the applicant must supply all of the information contained in this application form. This application must be signed by all owners of the real estate which is the subject of the application. The owners may designate one or more professional agents to represent them in the application process using the spaces provided on this form.

Incomplete applications will be subject to scheduling delay. Applicants are encouraged to meet with staff prior to filing. A public hearing will be scheduled within 45 days of the receipt of a completed application.

Approval of a waiver by the Planning Commission does not relieve the applicant from other requirements including, but not limited to, signs(s), building, zoning and use permits or site plans.

As part of this application, the following must be provided:

1. $150.00 Application Fee.
2. A Completed Application.
3. As applicable, supporting documents included, but not limited to site plan or depiction of the requested Waiver.

It is the applicant's responsibility to make a good-faith effort to provide the Subdivision Administrator, as applicable, with a current list containing the accurate names and mailing addresses of all interested parties. For purposes of this provision, "interested parties" shall mean Landowners of Adjacent Property. The applicant shall provide the addresses in order to comply with Section 1331.12.B of the Subdivision Ordinance

Legal Notices

The following shall occur at least 15 days prior to the Public Hearing: notice of the hearing shall be advertised by the Planning Commission as a Class I legal advertisement in the local newspaper, posting of a sign upon the property, and letters to adjacent and confronting land owners within 100 feet of the subject property.

Definition of a Waiver

Adjustments that may be made to the requirements of this Ordinance to unusual site conditions in order to achieve a better design. Waivers may not be used to circumvent the process requirements of this Ordinance.

The Charles Town Subdivision Ordinance

To grant a Waiver as permitted in the Subdivision Ordinance, the Planning Commission makes findings as specified in Section 1331.12(B)(2).

In order to issue a Waiver, the Commission must make the following written findings regarding the Waiver sought and all of the following can be met:

A waiver request may be granted by the Planning Commission only when it shall be determined that:

1. That the design of the project will provide public benefit such as a reduction in City maintenance cost, greater open space, parkland consistent with the City parks plan, or benefits of a similar nature;

2. The waiver, if granted, will not adversely affect the public health, safety or welfare, or the rights of adjacent property owners or residents;

3. That the waiver, if granted, will be in keeping with the intent and purpose of this Ordinance; and

4. That the waiver, if granted, will result in a project of better quality and/or character.

Note:

Additional exhibits may be required by the Subdivision Administrator or Planning Commission such as a lot location survey or site plan showing existing and proposed Structures, easements, watercourses, curb cuts and description of the uses of adjacent property that are necessary to describe existing or proposed conditions.

1. DATE December 8, 2023

2. APPLICANT'S NAME* 515 E Washington LLC

Address: 515 E Washington Street Charles Town, WV 25414

Telephone Number (908) 884-6062 Fax Number ( )

Email Address mletenzi@gmail.com

3. PROPERTY OWNER'S NAME 515 E Washington LLC

Address: 515 E Washington Street Charles Town, WV 25414

Telephone Number (908)884-6062 Fax Number ( )

Email Address mletenzi@gmail.com

4. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address: 515 E Washington Street Charles Town, WV 25414

Tax Map # and Parcel: 0002 0256

Deed Book and Page #: 1549 Page 46

Property Area in Square Feet or Acres: 0.97 acre

5. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

Multifamily residential R3

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

Multifamily residential (no change)

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

7. DESCRIPTION OF ANY PROPOSED WORK TO BE DONE TO THE PROPERTY:

Substantial rehab of interior apartments

8. DESCRIPTION OF THE WAIVER REQUEST:

The waiver request relates to exterior lighting that was spec'd for the rear of the property. Acorn-style lights as required by the City of Charles Town were on back order and so an alternative low-profile light fixture was purchased.

9. LIST THE APPLICABLE SECTION(S) OF THE SUBDIVISION ORDINANCE FROM WHICH THE WAIVER IS REQUESTED:

Section 1333.14 (B)

10. JUSTIFICATION FOR THE REQUEST:

A) Explain how the design of the project will provide public benefit such as a reduction in City maintenance costs, greater open space, parkland consistent with the City Parks Plan or benefits of a similar nature;

Approval of this waiver will allow the building to be safely occupied in a timely manner and provides a more energy-efficient and parking lot-specific lighting solution to the building's residents, with reduced light pollution for residents with bedroom windows facing the lot.

B) Explain how the waiver, if granted, will not adversely affect the public health, safety, welfare or the rights of adjacent property owners or residents;

We do not believe there to be an adverse impact - the exterior lighting in question is located in the rear of the private property, and largely hidden from public view. Conformity with neighboring parcels' exterior light fixtures is not a concern as others also have lights of differing design.

C) Explain how the waiver, if granted, will be in keeping with the intent and purpose of this Ordinance; and;

Despite being of a slightly different design, the exterior lighting in place meets all other requirements of the ordinance and provides adequate lighting where there was none present previously. A waiver would not compromise the building's historic designation either.

D) Explain how the waiver, if granted, will result in a project of better quality and/or character.

With the current lights being better suited for a small parking lot, a waiver would allow for reduced electricty costs being billed to the property's tenants. We do not believe it would compromise the building's historic nature in any way.

11. INTERESTED PARTY ADDRESSES, FOR PUBLIC NOTICE (including across street) (Interested parties are defined as adjacent properties within 100 feet).

Owner	# and Street	City, State, Zip
Todd Widmyer	525 E Washington Street	Charles Town, WV 25414
St Thomas Lutheran Church	119 S. Seminary Street	Charles Town, WV 25414
Todd Widmyer	500 E Washington Street	Charles Town, WV 25414
Marissa/Nick Tago	508 E Washington Street	Charles Town, WV 25414
Alfredo Diaz	524 E Washington Street	Charles Town, WV 25414

12. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

Application No.	Project Name and Phase	Status	Approval Date
	Stephenson Apartments	Approved	9/21/2022
HLC COA 2022-14	"	"	12/9/2022

13. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

☐ Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

_____

_____

_____

_____

_____

X No

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1331.12 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant

Mark Letenzi _____ Date 12/8/2023

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application and specified number of Site Plan copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments/Conditions:_____

_____

_____

_____

_____

_____

RECEIVED
JAN 12 2024
BY: VS

January 12, 2024

James Newman
City Planner, Zoning Subdivision
AICP
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Re: Public Notice Letter

Dear Mr. Newman,

This is a follow-up of my letter to you dated January 7, 2017. At the time I wrote the letter, I didn't realize the lights had already gone up at 515 E. Washington St. I went down there last night to see what the lights looked like.

I was appalled at the entire lighting situation. It invades my back yard. I have requested that the fence (approximately 50-60 feet) be extended so that we don't have to see the owner's A.C.Units, power transformer and tenants coming and going. The lights are too many, too bright and too high. This is overkill for a residential area. Two-thirds of the lights could be eliminated. Also, the column lights in the front should be put on a dimmer.

I strongly urge you go down there at night and take a look at it. Please look at it from our property at 525 Washington St. As I understand the globe lights you are recommending are also overkill. While they look great on the main street in Charles Town, they are just too big for this project.

We noticed on the way home this place is lit up 10 times brighter than the Charles Town Inn. He's trying to out due the Charles Town Casino! This project looks like a sore thumb driving into Charles Town. It's unfair what it has done to my property.

Sincerely,

Todd Widmyer

RECEIVED
JAN 08 2024
BY:

January 7, 2024

James Newman
City Planner, Zoning/Subdivision
Administrator
AICP
City of Charles Town
101 E. Washington St.
Charles Town, WV 25414

RE: Public Notice Letter

Dear Mr. Newman,

Regarding your letter concerning a waiver from City lighting standards for 515 E. Washington St, I would like you to know that I oppose it. This is a residential area. I have owned the place next door at 525 E. Washington St. for 37 years. I have four apartments in that building. We have one 100 watt light on the walk way in front and one out back and it is sufficient for the building.

I also own the house at 500 E. Washington St., across the street from 515 E Washington St., which has similar lighting. I have never had a complaint about insufficient light. I know my tenants would not want their private space invaded with light. They chose to live in a residential area.

This is not a commerical area. We want residential City lighting standards as it is an historic residential neighborhood. Commercial lighting would destroy the historic dignity of the cemetery and the neighborhood. The thought of having it lit up like a McDonalds is very disturbing. On another note, whatever happened to saving energy?

Sincerely,

Todd Widmyer
1316 Keyes Ferry Road
Charles Town, WV 25414

City

James Newman
City Planner, Zoning/Subdivision Administrator
AICP

City of Charles Town
101 E. Washington St.
Charles Town, WV 2541

December 28, 2023

RE: Public Notice Letter

Dear Property Owner,

In accordance with City and State Code notification requirements, notice is hereby given that a public hearing will be held on **January 22** at 7:00 p.m at Charles Town City Hall, 101 E. Washington Street, Charles Town, WV by the City of Charles Town **Planning Commission** on the following matter:

WV2023-09: *515 E. Washington LLC.* is requesting approval of a waiver from City lighting standards for the development of a parking lot and associated facilities at 515 E. Washington Street. The property is Tax District 3, Map 2, Parcel 256. The property is located 110 feet east of the intersection of E. Washington and S. Seminary Street. The property is zoned Old Town Mixed Use Commercial. The 2240 Comprehensive Plan designates this parcel as Old Town Mixed Use Commercial.

Notice is sent to all property owners within 100 ft of the subject property. To access additional information, please visit www.charlestownwv.us. Choose the "Government" tab, and hover over the drop-down menu to select "Agenda and Minutes." From this page, you can access upcoming events, including the Planning Commission information. This information will be accessible by the close of business on the Friday prior to the meeting.

Written comments can be mailed to City Staff at P.O. Box 14, or dropped off at City Hall at 101 E. Washington St., Charles Town, WV. Call 304-724-3251 for questions. Public comments are welcome at the scheduled public hearing.

Sincerely,

James Newman
City Planner, Zoning/Subdivision Administrator, AICP
City of Charles Town, WV

Saint Thomas Evangelical Lutheran Church
111 South Seminary Street, Charles Town, West Virginia 25414
304-725-5284 · stthomaswv@gmail.com

January 11, 2024

City of Charles Town
Planning Commission
101 East Washington Street
Charlestown, WV 25414

Dear Planning Commission:

The Saint Thomas Council supports the proposed lighting variance requested by our neighbor at 515 East Washington Street. The existing lights are attractive, and the lighting improves the security profile of our property. The design of the light is optimal in that it minimizes light pollution by not directing light upwards. We would not support the use of the acorn style lights specified in the code. This style of light would shine too brightly on the parsonage that is adjacent to the church and near where the lights are installed.

We look forward to having the neighboring property fully restored and occupied. The owner is proving to be a good neighbor and we welcome this addition to our neighborhood. We respectfully request that this variance be approved.

Sincerely,

Steven Sheard
Church Council, Property Committee Chair

LED SWIVEL POST TOP

QUICK SEARCH: SC11364

SUPERIOR LIGHTING
energy saving LED lights

FEATURES:

- Aluminum housing with dark bronze powder coat finish.
- 1-10vdc dimming drivers, which provide 10% continuous dimming
- Universal 120-277 AC voltage (50-60Hz) is standard.
- Power factor > 0.90
- Easy installation in new construction or retrofit applications.
- Available in two sizes: 21” and 18”
- Fits posts between 2 to 2-7/8 inches in diameter



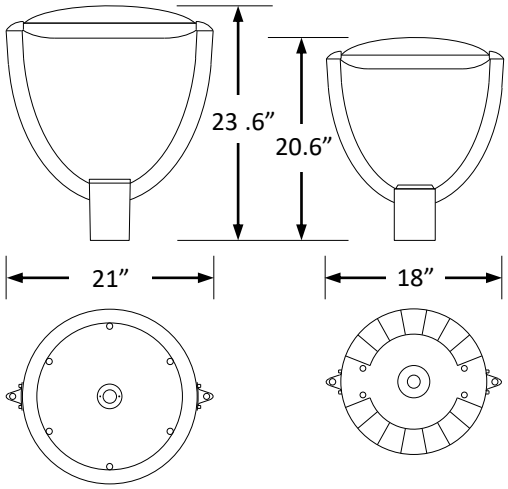
LIGHTING:

- 6,800 - 20,000 lumens
- Color temperature: Soft White, Cool White, and Daylight (depending on wattage selected)

APPLICATION:

- Great for parking lots or large walkways and parks. With a clean modern design, this powerful LED technology is designed for outdoor use as an efficient, yet inexpensive replacement for old fashioned metal halide post lights.

DIMENSIONS:



WARRANTY & LISTINGS:

- 5-year warranty
- cULus
- Wet Rated
- DLC
- 50,000 hour rated life
- RoHS

ELECTRICAL:

- Voltage: 120-277 AC Voltage
- Total harmonic distortion < 20%

MECHANICAL:

- Indoor or outdoor fixture: Outdoor
- Operating temp: -30°C to 45°C (-22°F to 113°F)

SPECIFICATION:

Product Code	Wattage	Lumens	Color Temperature	Dimensions	Voltage
7618CLB50-LLED-5000K	50W	6,887 LM	5000K	20.6” (H) x 18” (D)	120-277 AC voltage
7618CLB50-LLED-4000K	50W	6,785 LM	4000K	20.6” (H) x 18” (D)	120-277 AC voltage
7618CLB75-LLED-3000K	75W	9,713 LM	3000K	20.6” (H) x 18” (D)	120-277 AC voltage
7618CLB150-LLED-5000K	150W	20,259 LM	5000K	23.6” (H) x 21” (D)	120-277 AC voltage




STOP






PANHANDLE


PANHANDLE


PANHANDLE


BCT
BCT
EMPLOYEE
PARKI


BCT
Bank of Charles Town
DRIVE-THRU

DRAWING SCHEDULE

Cover	1
Parking Lot Rendering	2
Site Rendering	3
Site Plan	4
Landscaping	5
Dumpster	6
Stairway	7
Lighting	8
Stormwater	9

Property Zoned as R3

The Stephenson Building Historic Renovation

515 E. Washington Street, Charles Town, WV 25414

Property tax parcel number: 03 202560000000

Owner: Mark Letenzi

Contact: 908-884-6062

General Contractor: JC Smith LLC, WV License #WV047142

Contact: 304-596-0100

Owner Signature: Mark Letenzi Date: 1/25/2023

This plat was approved for recordation by the City of Charles Town, on the _____ day of _____, 20_____, subject to any conditions specified hereon. All expenses incurred with respect to improvements for all utility services, paving, grading, landscaping, curbs, gutters, sidewalks, road lighting, road signs, flood protection devices, drainage structures and all other improvements that may be required shall be the responsibility of the subdivider and not the City. _____ _____

Date Secretary of the Planning Commission

JC Smith LLC
PREFERRED CONSTRUCTION EXPERTS

210 West Burke Street,
Martinsburg WV, 25401

Contact: (304)596-0100;
Admin@JCSmithLLC.com

Mark Letenzi
Stephenson Project
515 E. Washington Street
Charles Town
WV, 25414
9088846062
mletenzi@gmail.com

Site

REVISION SCHEDULE

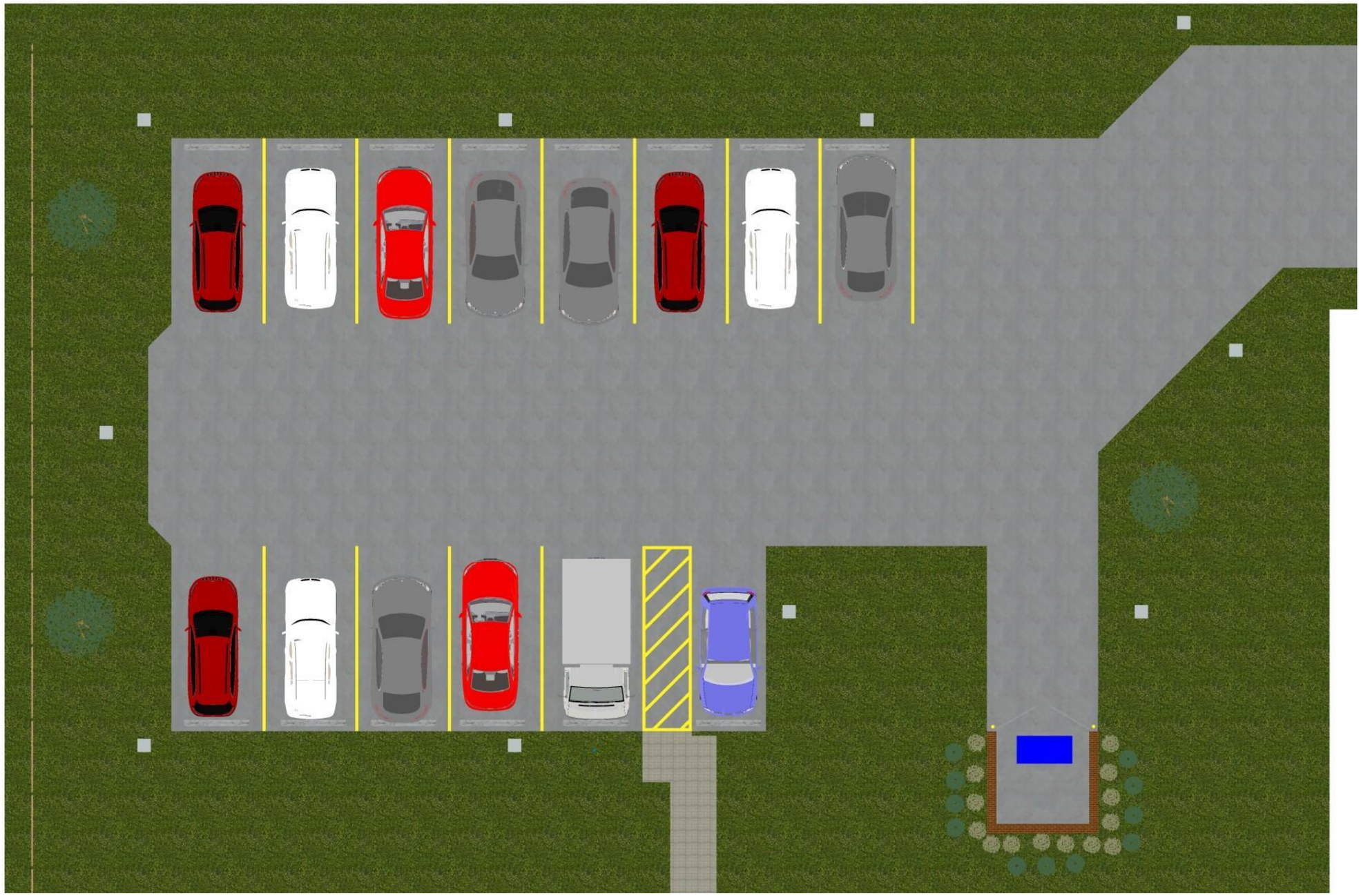
NUMBER	DATE

SECTION LETTER: A
PAGE NUMBERS: 1 1

DRAWN BY:	Bryan Wiercioch
SCALE:	As Noted
DATE:	2/28/2023

PAGE: 1/ 9

Cover



Driveway Continues to Road

Existing Structure not Rendered

PROPOSED SITE PLAN -REVISED(IIB)

SCALE: 1/8" = 1'-0"

JC Smith LLC
PREFERRED CONSTRUCTION EXPERTS

210 West Burke Street,
Martinsburg WV, 25401

Contact: (304)596-0100;
Admin@JCSmithLLC.com

Mark Letenzi
Stephenson Project
515 E. Washington Street
Charles Town
WV, 25414
9088846062
mletenzi@gmail.com

Site

REVISION SCHEDULE	
NUMBER	DATE

SECTION LETTER
A
1 1
PAGE NUMBERS

DRAWN BY:	Bryan Wiercioch
SCALE:	1/8" = 1'-0"
DATE:	2/28/2023

PAGE: 2/9

Parking Lot Rendering



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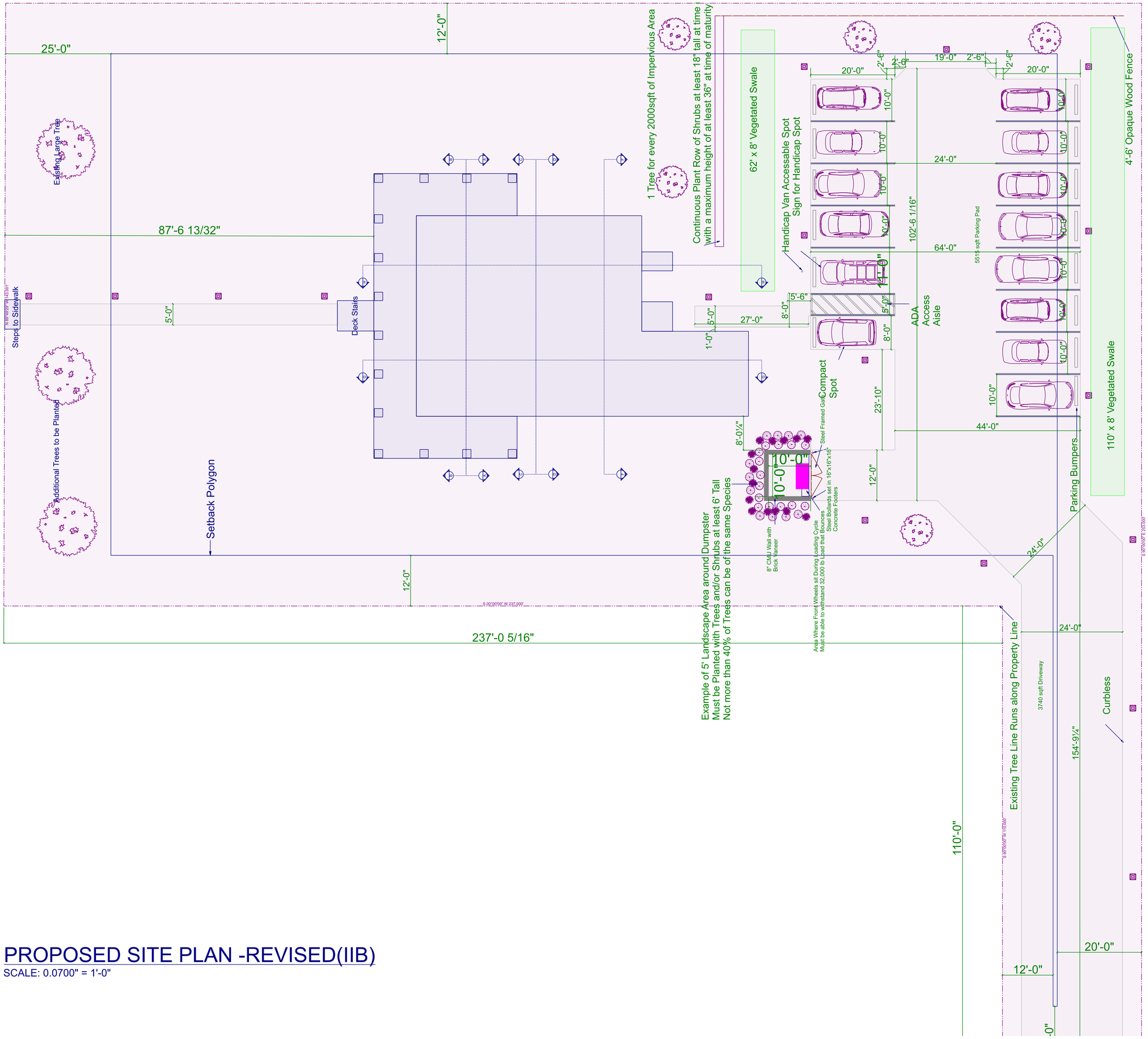
Site Rendering



PROPOSED SITE PLAN -REVISED(IIB)

SCALE: 0.0700" = 1'-0"

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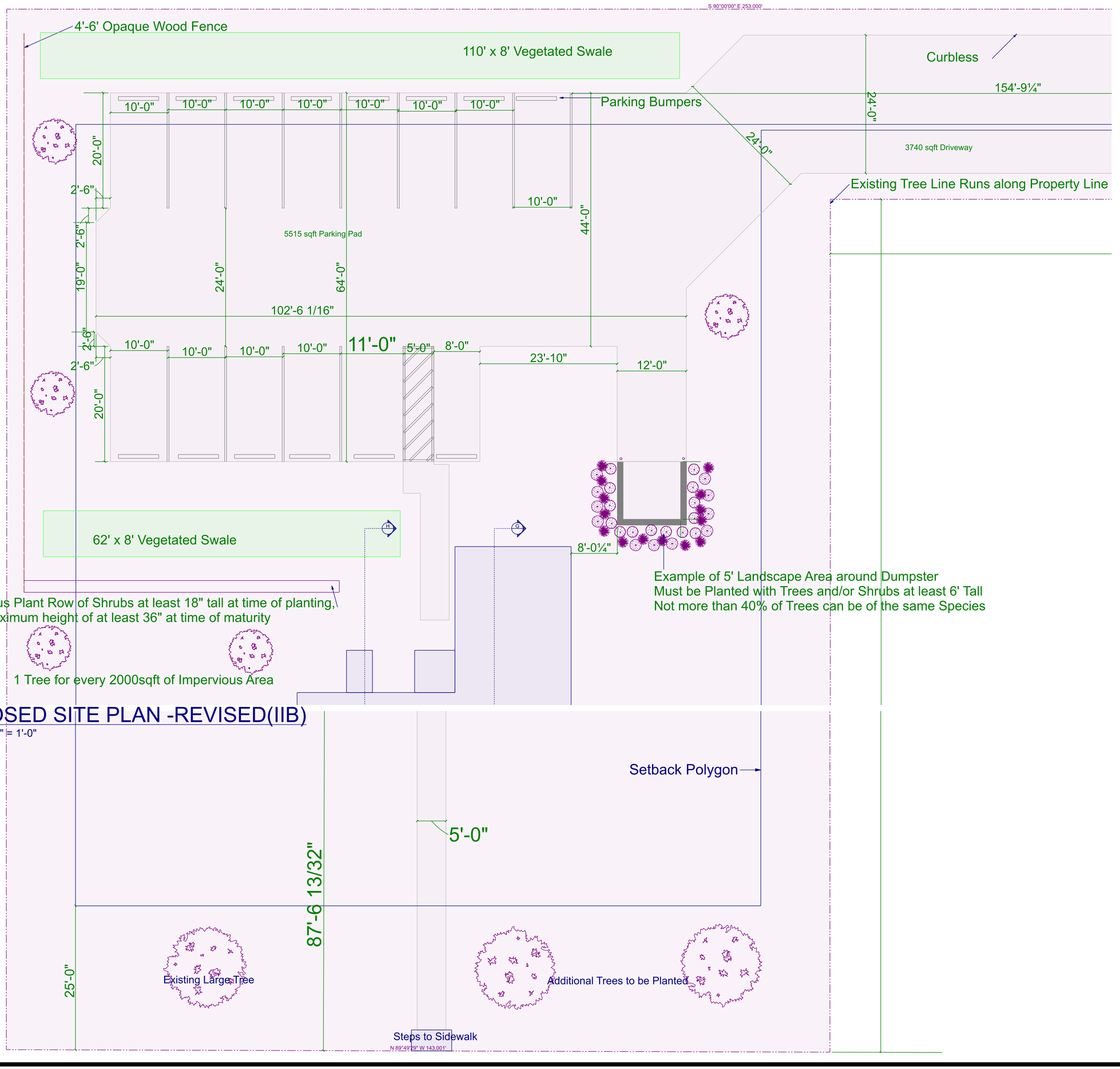
Site Plan



PROPOSED SITE PLAN -REVISED(IIB)

SCALE: 0.0938" = 1'-0"

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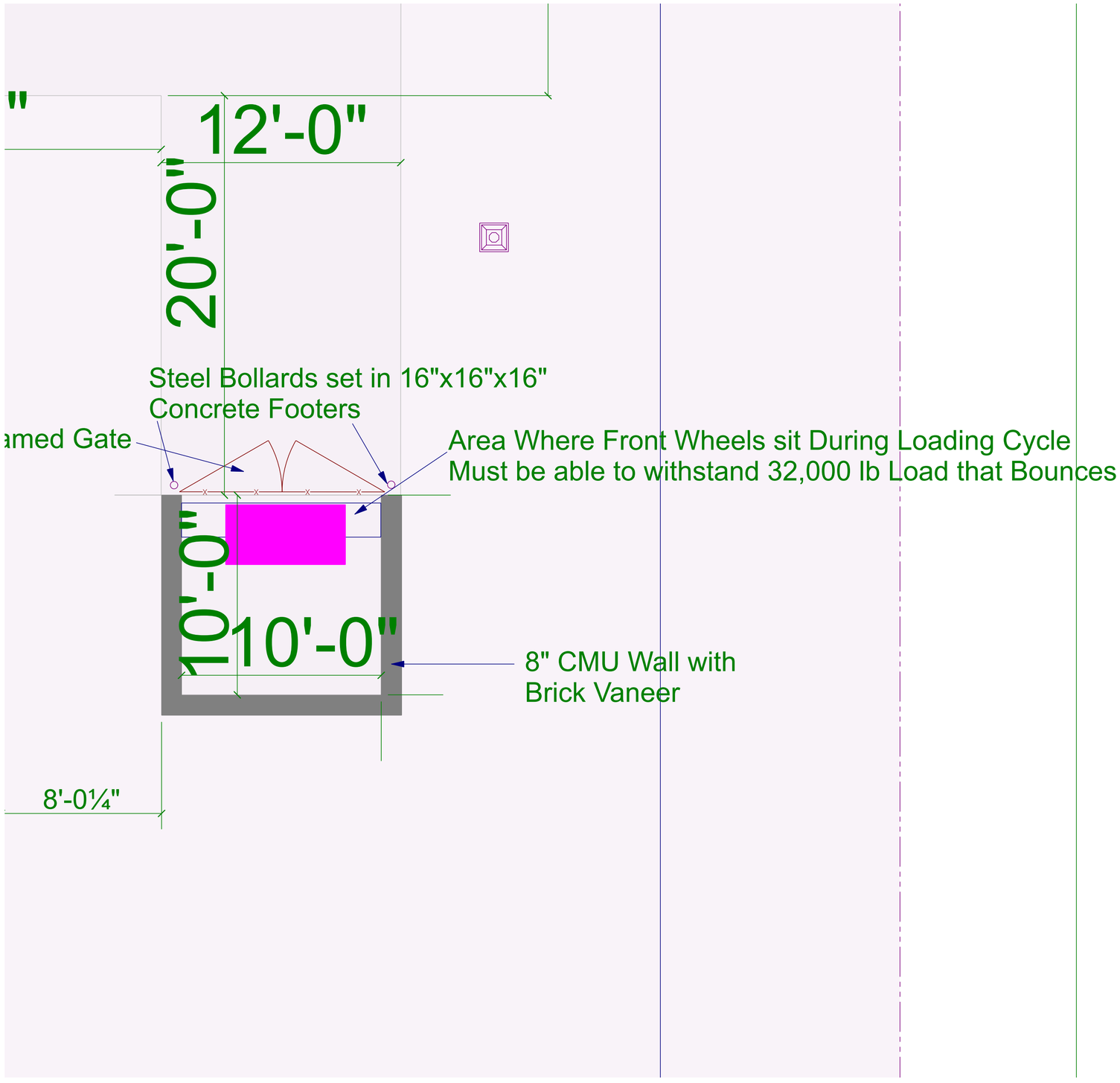

PROPOSED SITE PLAN -REVISED(II)

SCALE: 1/4" = 1'-0"

JC Smith LLC
PREFERRED CONSTRUCTION EXPERTS

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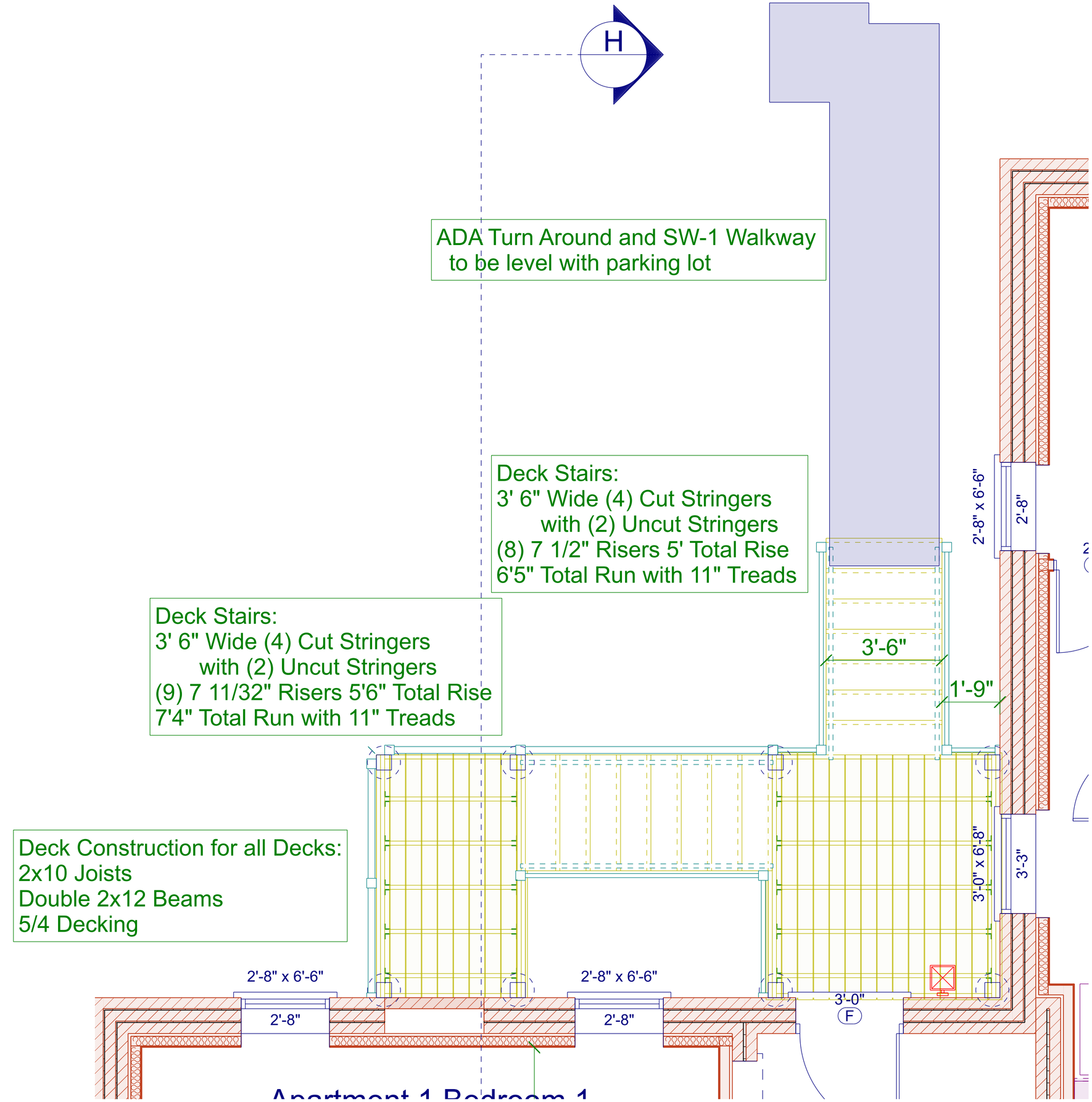

FIRST FLOORCON4

SCALE: 1/2" = 1'-0"

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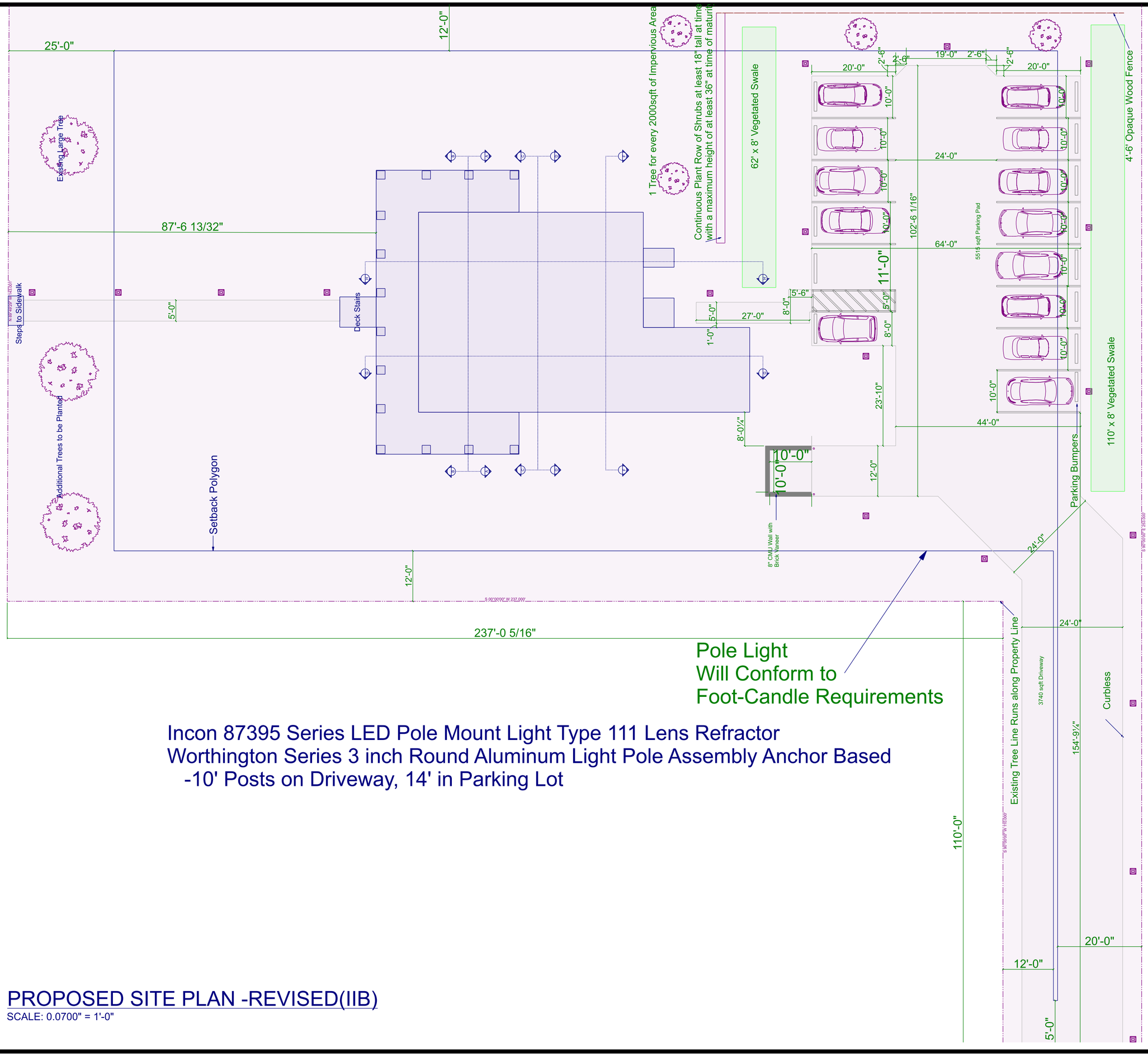
PAGE: 7/ 9

Stairway



Incon 87395 Series LED Pole Mount Light Type 111 Lens Refractor
Worthington Series 3 inch Round Aluminum Light Pole Assembly Anchor Based
-10' Posts on Driveway, 14' in Parking Lot

PROPOSED SITE PLAN -REVISED(IIB)

SCALE: 0.0700" = 1'-0"

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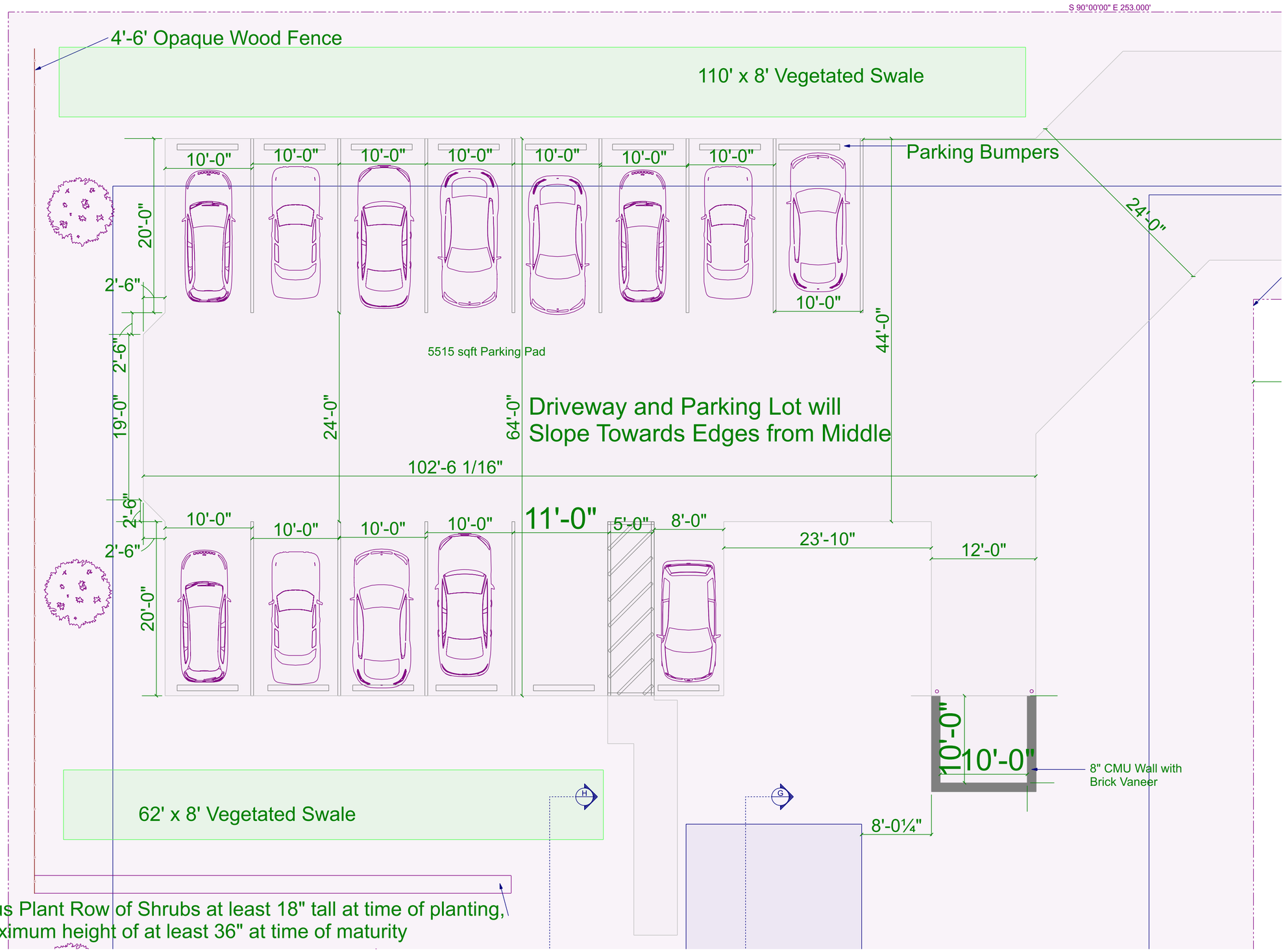
PAGE: 8/ 9

Lighting



PROPOSED SITE PLAN -REVISED(IIB)

SCALE: 1/8" = 1'-0"

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DATE:	2/28/2023

PAGE: 9/9

Stormwater

Features

- Black Die Cast Aluminum Housing
- Clear Lexalite® 425 Series Side Type III Refraction
- Clear Textured Polycarbonate Top
- Fits Standard 3" OD Poles
- UL Listed Wet Location
- Universal Voltage 120/277V 50/60Hz
- Buy American Act Compliant
- CCT - 3000K, 4000K & 5000K Available

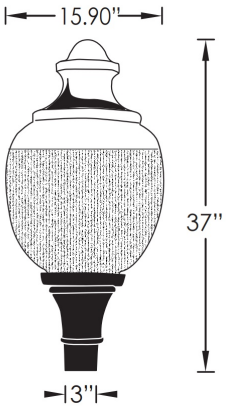


Wattage

Wattage/Lumens

- Mogul E39 Base (Bulb Sold Separately)
- 36W - E39 5,400lm (150W MH Equiv.)
- 45W - E39 6,750lm (175W MH Equiv.)
- 54W - E39 8,100lm (250W MH Equiv.)
- 54W Dark Sky (4000K) - E39 5,900lm (175W MH Equiv.)

Dimensions



Warranty

LED - 5 Year
E26/E39 - 3 Year

Options

- Smart Port Photocell** (www.inconlighting.com/smart-port)
- Black Finial
- 180° House Shield

Ordering Guide

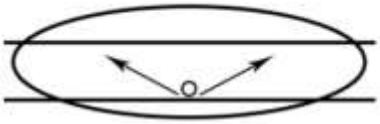
Example: 87495-54LED-50K

Family	Lens Color	Base Color	Wattage	CCT	Options
873	**9 -** Clear	**5 -** Black	**E39 -** Mogul Base		**All Options Purchased Separately** All Wattages • Black Finial • 180° House Shield 36LED, 45LED & 54LED Only • Photocell**
			36LED - 36W E39 **45LED** - 45W E39 **54LED** - 54W E39	**30K -** 3000K **40K -** 4000K **50K -** 5000K	
			54DS - 54W Dark Sky E39	**40K -** 4000K	

Specifications subject to change without notice

***Smart Port Devices only available with 36LED, 45LED & 54LED Wattages*

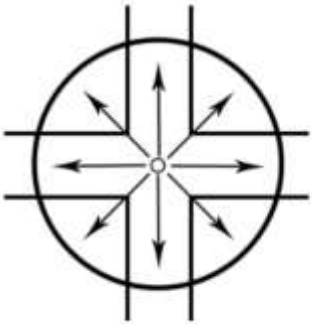
Type III



The type III distribution is meant for roadway lighting, general parking areas and other areas where a larger area of lighting is required. Type III lighting needs to be placed to the side of the area, allowing the light to project outward and fill the area. This produces a filling light flow.

Type III light distributions have a preferred lateral width of 40 degrees. This distribution is intended for luminaires mounted at or near the side of medium width roadways or areas, where the width of the roadway or area does not exceed 2.75 times the mounting height.

Type V



Type V produces a circular distribution that has the same intensity at all angles. This distribution has a circular symmetry of candlepower that is essentially the same at all lateral angles. It is intended for luminaire mounting at or near center of roadways, center islands of parkway, and intersections. It is also meant for large, commercial parking lot lighting as well as areas where sufficient, evenly distributed light is necessary

82083AB

Worthington Series, 3 inch Round Aluminum Light Pole Assembly Anchor Based

Energy Light, Inc.

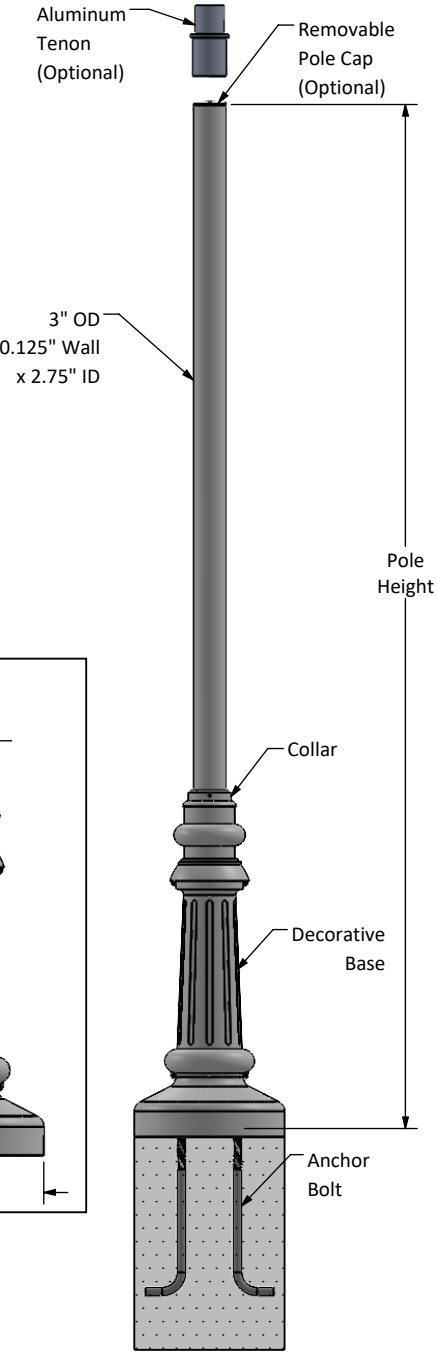
Job: _____

Job Site: _____ State: _____ Client Name: _____

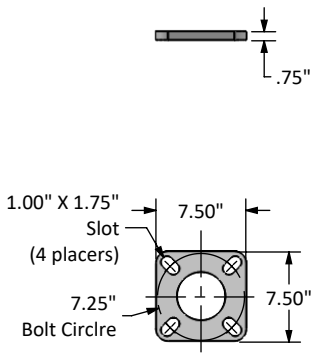
Notes: _____ Approvals: _____ Date: _____

Pole Top Options: Open top is standard. Removable top cap or tenon is available as an option. 2-3/8" O.D. aluminum tenon is 4" high and is attached to the pole with 3 set screws.
Pole Shaft: 3 inch round straight aluminum with 0.125" wall thickness. Seamlessly extruded from 6063-T6 alloy.
Pole Height: Standard pole height is 14 ft. Optional heights are 12, 10 and 8 ft. Custom heights are also available.
Decorative Base: 2-piece, clamshell style cast aluminum material.
Cast aluminum collar is included for proper fitment of 3" OD pole into the base. 4 stainless steel, tamper-resistant screws are included for attachment.
Weight: 17.5 lbs
Handhole: 2" X 4" size handhole is located at 18 inches from the base. An aluminum handhole cover with 2 screws is provided. A ground lug with set screw is located near the handhole opening for proper grounding of the pole.
Color: Black powder coat.
Anchor Bolts: A set of 4 galvanized steel anchor bolts is provided with each pole assembly. Each anchor bolt includes 2 nuts and 2 washers. Top portion of the anchor bolt is threaded for securing and leveling the pole with the provided nuts and washers. An actual size paper anchor bolt template is provided.
Maximum Load: Designed to support single light with a maximum weight of 25 lbs.
Warranty: 10 Years.
Use: To be used only as a light pole with single light fixture on top.
Foundation design: Foundation should be designed by an engineer familiar with local soil and wind conditions as well as local code where the pole(s) will be installed.

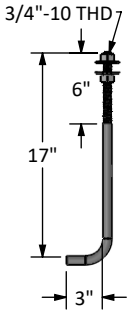
POLE WIND RATING (EPA) with 1.3 Gust Factor					Pole Weight (lbs)
Pole Height (ft)	70 mph	80 mph	90 mpH	100 mph	
8	6.3	4.5	3.0	2.0	14
10	5.0	3.6	2.4	1.6	16
12	4.2	3.0	2.0	1.3	19
14	3.4	2.4	1.6	1.0	21



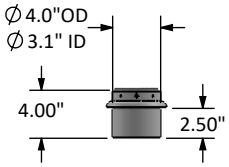
Base Plate



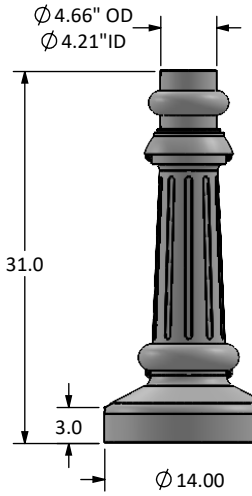
Anchor Bolt



Collar



Decorative Base



Disclaimer: All dimensions and specifications are subject to change without any notice. Energy Light, Inc. is not responsible for any claims arising from improper loading (what is attached to the light pole), improper use, incorrect foundation design and/or installation.

Copyright © 2020 Energy Light, Inc. All Rights Reserved | 1881 Rose Road, Lake Zurich, IL 60047

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Public Hearing: BR2023-10 - Norborne Glebe Phase Candlewood Drive Extension - Bond Release

ATTACHMENTS:

- 1. Staff Report.pdf
- 2._Application.pdf
- 3._KH_Review.pdf
- 4._Applicant_Consultant_Review.pdf
- 5._As-Built_Diagrams.pdf

Bond Release Request
BR2023-11

Date: For the January 22, 2024 Planning Commission meeting
Applicant: Gary Endler on behalf of Arcadia Land Inc.
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Bond release for performance and land disturbance bond

Norborne-Glebe Candlewood Drive Extension



BACKGROUND
The applicant has submitted a bond reduction request for the performance and land disturbance bond for Norborne-Glebe subdivision Phase Candlewood Drive Extension.

Upon review of the request the City Engineer, Kimley-Horn, has determined that the bond amount is a reasonable assessment of the work completed thus far.

Existing Bond Amount: $171,237.28

BOND COMMITTEE
The Bond Committee reviewed this item at their December 14, 2023 meeting. The Committee recommended approval of the bond reduction request.

STAFF RECOMMENDATION
The City Engineer and City Staff have reviewed the bond reduction request and recommends the bond release request be **approved.**

Bond Request No._____

RECEIVED
NOV 06 2023
BY:

BOND REQUEST AND REDUCTION

To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.

1. DATE NOVEMBER 3, 2023

2. APPLICATION TYPE ☐ Bond | Initiation ☐ Bond | Reduction

☐ Bond | Reallocation ☒ Bond | Release**

3. PROJECT NAME NORBORNE GLEBE PUBLIC IMPROVEMENTS PLAN CANDLEWOOD DRIVE EXT.

Address _____

4. APPLICANT'S NAME* ARCADIA LAND, INC.

Address 108 N. GEORGE STREET, 2ND FLOOR, CHARLES TOWN, WV 25414

Telephone Number (571) 220 3412 Fax Number ( ) N/A

Email Address mmflynn@h2land.com

5. PROPERTY OWNER'S NAME ARCADIA LAND, INC.

Address 108 N. GEORGE STREET, 2nd FLOOR, CHARLES TOWN, WV. 25414

Telephone Number (571) 220 3412 Fax Number ( ) N/A

Email Address mmflynn@h2land.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

Bond Request No._____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

NORBORNE GLEBE PUBLIC IMPROVEMENTS PLAN CANDLEWOOD DRIVE EXT.

7. A) CURRENT BOND AMOUNT $171,237.28

B) PROPOSED BOND AMOUNT Ø

8. PARCEL INVENTORY: (List all parcels that are part of this application):

Tax Map No.	Parcel No.	Deed Book	Page No.	Zoning District
		NA		

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

Application No.	Project Name and Phase	Status	Approval Date
	NA.		

Bond Request No._____

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements.

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts 11-30-21 Prepared By JON K. ERICKSON

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH.

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section.

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance.

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

Bond Request No._____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant

* _____ Date 11/1/2023

Signature of Property Owner (If different than Applicant)

* _____ Date _____

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

Kimley»Horn

Memorandum

To: Mr. Mark Flynn,
Arcadia Land Inc
108 N George St, 2nd Floor
Charles Town, WV 25414

From: Mark Phillips, P.E.

Through: Mr. James Newman, AICP
City Planner, Zoning/Subdivision Administrator
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: December 11, 2023

Subject: Norborne Glebe Public Improvement Plan Candlewood Drive Extension Bond Release Request Review

This memorandum summarizes our review of the Bond Release Application for the Norborne Glebe Public Improvement Plan Candlewood Drive Extension (dated November 3, 2023, by Morris & Ritchie Associates, Inc.) for a bond reduction and release of $171,237.28. Using the As-builts dated January 4, 2022, and the Final Site Work Certification from GeoLogic Consultants LLC dated August 30, 2023, it is our opinion that the bond release application is a reasonable representation of the work completed in the field.

Thank you for the opportunity to review this Bond Release Application. In the meantime, please feel free to contact us at 703-870-3631 should you have any questions.

KIMLEY-HORN & ASSOCIATES, INC.

Mark Phillips, P.E.
Project Manager
Associate

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I
Chantilly, VA 20151

November 1, 2023

Arcadia Land, Inc.
108 North George Street
2nd Floor
Charles Town, WV 25414

Attn: Mr. Mark Flynn

Project Name: Norborne Glebe (Arcadia Chase) Candlewood Drive Extension
Location: Charles Town, West Virginia

Dear Mr. Flynn:

Subject: Final Site Work Certification

The following completion letter relates to work performed under the observation of GeoLogic Consultants, LLC and by the undersigned at the referenced project site. These services were performed on an as requested basis beginning June 1, 2021 to July 12, 2023 with respect to site work for utilities, concrete and roadways.

GeoLogic Consultants, LLC observed the installation of sanitary sewer pipes & structures, stormwater pipes and structures, and waterlines pipes to include placement of bedding material for the referenced utilities, stone base, and asphalt with ASTM standard test methods.

The field density tests performed at selected locations and elevations should be indicative of the density of the fill within the limits of sampling and statistical accuracy. The test results indicate that the subject compacted fill and asphalt is in compliance with accepted geotechnical engineering practices at the location of the individual tests.

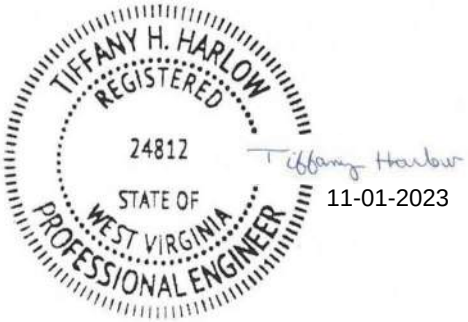
The locations of the individual tests are in reference to a field stakeout (horizontal and vertical) performed by others and a grading plan prepared by others. GeoLogic assumes no responsibility for any revisions to the location or alignment of structures that impacts the shape, size and general location of the structures and compacted fill. Subgrade elevations are referenced based on the site grading plans provided to us by others.

According to the field and laboratory test reports, the tests were performed in accordance with ASTM, appropriate industry standards. All construction to date met density requirements; all material depths were verified for compliance; and road and parking areas have been constructed in strict accordance with the approved plans and specifications. Where discrepancies were observed, if any, corrections or modifications were made.

Should you have any questions or comments regarding the content of this letter contact me at (571) 356-3176.

Respectfully Submitted,

GeoLogic Consultants, LLC



11-01-2023

Tiffany Harlow, P.E.
Principal Engineer

Attachments: Field Density Report Summary
Field Density Tests for Asphalt
Concrete Test Results and Break Results

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I
Chantilly, VA 20151

COMPACTION SUMMARY
FINAL REPORT

SITEWORK

Project: NORBORNE GLEBE CWD EXTENSION
Client: ARCADIA LAND
Contractor: GANTT EXCAVATING

Project No.: 10300
Report Date: 11/1/23

Date	Test #	Sta. No.	Test Location	Structure From	Structure To	Elev -SG	Lab #	% Comp. Req'd	Density Wet	Density Dry	M%	% Comp	Pass?
06/07/21	1	N/A	Storm Water (CWD)	801	802	SG	1	95.0	125.6	106.2	18.3	98.0	Y
06/18/21	1	N/A	Storm Water (CWD)	804	813	-4.0	1	95.0	128.9	108.2	19.1	99.8	Y
	2	N/A	Storm Water (CWD)	804	813	-3.0	1	95.0	124.3	106.1	17.1	97.9	Y
06/24/21	1	N/A	Storm Water (CWD)	813	400	-5.0	1	95.0	125.7	106.9	17.6	98.6	Y
06/25/21	1		Candlewood Drive	804	400	-4.0	1	95.0	128.4	108.1	18.8	99.7	Y
	2		Candlewood Drive	804	400	-4.0	1	95.0	123.6	104.7	18.1	96.5	Y
06/28/21	1		Candlewood Drive	804	400	-4.0	1	95.0	126.5	107.6	17.6	99.2	Y
	2		Candlewood Drive	804	400	-4.0	1	95.0	126.6	105.8	19.7	97.6	Y
07/08/21	1	N/A	Manhole ZL1	N/A	N/A	-12.0	1	95.0	125.9	105.6	19.2	97.4	Y
	2	N/A	Manhole ZL1	N/A	N/A	-11.0	1	95.0	127.1	106.4	19.4	98.1	Y
	3	N/A	Manhole ZL1	N/A	N/A	-10.0	1	95.0	127.6	107.3	18.9	99.0	Y
	4	N/A	Manhole ZL1	N/A	N/A	-9.0	1	95.0	122.6	105.8	15.9	97.6	Y
	5	N/A	Manhole ZL1	N/A	N/A	-8.0	1	95.0	122.8	105.4	16.4	97.3	Y
	6	N/A	Manhole ZL1	N/A	N/A	-7.0	1	95.0	129.5	108.2	19.6	99.9	Y
	7	N/A	Manhole ZL1	N/A	N/A	-6.0	1	95.0	124.2	104.6	18.7	96.5	Y
	8	N/A	Manhole ZL1	N/A	N/A	-5.0	1	95.0	125.2	106.9	17.1	98.6	Y
	9	N/A	Manhole ZL1	N/A	N/A	-4.0	1	95.0	121.5	104.7	16.0	96.6	Y
	10	N/A	Manhole ZL1	N/A	N/A	-3.0	1	95.0	122.4	103.5	18.3	95.5	Y
07/20/21	1	30+50	Candlewood Dr	N/A	N/A	SG	1	95.0	124.5	104.0	19.8	95.9	Y
	2	31+50	Candlewood Dr	N/A	N/A	-1.0	1	95.0	121.0	103.7	16.7	95.6	Y
	3	32+50	Candlewood Dr	N/A	N/A	-2.0	1	95.0	125.3	106.9	17.2	98.6	Y
	4	33+50	Candlewood Dr	N/A	N/A	-3.0	1	95.0	124.1	104.4	18.8	96.4	Y
	5	31+50	Candlewood Dr	N/A	N/A	SG	1	95.0	123.0	103.6	18.7	95.6	Y
	6	32+50	Candlewood Dr	N/A	N/A	-1.0	1	95.0	127.1	106.6	19.1	98.4	Y
07/23/21	1	32+50	Candlewood Dr	N/A	N/A	SG	1	95.0	127.7	107.0	18.8	98.7	Y
	2	33+50	Candlewood Dr	N/A	N/A	-1.0	1	95.0	125.6	106.8	17.6	98.5	Y
	3	33+50	Candlewood Dr	N/A	N/A	SG	1	95.0	126.9	106.1	19.6	97.9	Y
07/29/21	1	30+00	Conduit Crossing	N/A	N/A	-2.0	1	95.0	125.8	107.1	17.4	98.8	Y
	2	30+00	Conduit Crossing	N/A	N/A	-1.0	1	95.0	122.0	103.0	18.4	95.0	Y
	3	30+00	Conduit Crossing	N/A	N/A	SG	1	95.0	123.7	103.7	19.3	95.7	Y
07/30/21	1	31+00	Conduit Crossing	N/A	N/A	-2.0	1	95.0	122.3	104.0	17.6	96.0	Y

	2	31+00	Conduit Crossing	N/A	N/A	-1.0	1	95.0	122.5	104.1	17.6	96.1	Y
	3	31+00	Conduit Crossing	N/A	N/A	SG	1	95.0	124.0	104.1	19.2	96.0	Y
08/02/21	1	32+00	Conduit Crossing	N/A	N/A	-3.0	1	95.0	125.8	107.0	17.6	98.7	Y
	2	32+00	Conduit Crossing	N/A	N/A	-2.0	1	95.0	127.2	106.3	19.7	98.0	Y
08/03/21	1	32+00	Conduit Crossing	N/A	N/A	-1.0	1	95.0	122.4	104.4	17.2	96.3	Y
	2	32+00	Conduit Crossing	N/A	N/A	SG	1	95.0	125.3	105.2	19.1	97.0	Y
08/27/21	1	30+50	Waterline	N/A	N/A	-1.0	1	95.0	129.2	108.2	19.4	99.8	Y
	2	31+50	Waterline	N/A	N/A	-1.0	1	95.0	126.1	106.6	18.3	98.3	Y
	3	30+50	Waterline	N/A	N/A	SG	1	95.0	123.0	104.3	17.9	96.2	Y
	4	31+50	Waterline	N/A	N/A	SG	1	95.0	123.1	103.4	19.1	95.4	Y
09/03/21	1	30+00	Waterline CWD Crossing	N/A	N/A	-1.0	1	95.0	126.9	107.1	18.5	98.8	Y
	2	30+00	Waterline CWD Crossing	N/A	N/A	SG	1	95.0	125.1	106.3	17.7	98.1	Y
	3	N/A	Waterline	27+00	26+00	-1.0	1	95.0	123.3	103.1	19.5	95.1	Y
	4	N/A	Waterline	27+00	26+00	SG	1	95.0	127.3	108.3	17.6	99.9	Y
09/07/21	1	N/A	Waterline CWD Crossing	27+00	26+00	-1.0	1	95.0	126.9	107.1	18.5	98.8	Y
	2	N/A	Waterline CWD Crossing	27+00	26+00	SG	1	95.0	125.1	106.3	17.7	98.1	Y
09/17/21	1	N/A	2in Waterline Crossing	N/A	N/A	-2.0	1	95.0	123.3	104.0	18.5	96.0	Y
	2	N/A	2in Waterline Crossing	N/A	N/A	-1.0	1	95.0	122.5	104.3	17.5	96.2	Y
	3	N/A	2in Waterline Crossing	N/A	N/A	SG	1	95.0	128.1	107.3	19.4	99.0	Y
10/25/21	1	30+00	Candlewood Dr	N/A	N/A	SG	5	95.0	140.2	136.4	2.8	104.2	Y
	2	31+00	Candlewood Dr	N/A	N/A	SG	5	95.0	134.1	131.0	2.4	100.1	Y
	3	32+00	Candlewood Dr	N/A	N/A	SG	5	95.0	127.5	125.6	1.5	96.0	Y
	4	33+00	Candlewood Dr	N/A	N/A	SG	5	95.0	139.5	136.4	2.2	104.2	Y
11/15/21	1	N/A	Sidewalk	N/A	N/A	SG	1	95.0	120.9	103.2	17.2	95.2	Y
	2	N/A	Sidewalk	N/A	N/A	SG	1	95.0	126.8	106.1	19.5	97.9	Y
	3	N/A	Sidewalk	N/A	N/A	SG	1	95.0	126.0	106.7	18.1	98.4	Y
	4	N/A	Sidewalk	N/A	N/A	SG	1	95.0	122.2	104.2	17.3	96.1	Y

NORBORNE GLEBE
CANDLEWOOD DRIVE EXTENSION

ASPHALT REPORTS

GeoLogic Consultants, LLC
1012 Stringtown Road, Berryville, VA 22611

DAILY FIELD REPORT

Report #: 95

Project Name: Norborne Glebe CWD Contractor: Jefferson Asphalt Date: 10/27/2021

Project No.: 10300 Client: Arcadia LLC Weather: Sunny 62°F

Work Performed: Candlewood Dr Asphalt Placement and Compaction

Description of Work:

1- The undersigned arrived on-site, as requested, to observe the placement and compaction of 3 inches of Private Base 1 mix along Candlewood Dr Westbound lane.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Problems / Failing Tests:

Inspector: Zach Noakes
Inspector Time: 9.0 hrs.
Project Manager: Mark Hood, P.E.

Phone: (703) 282-2714

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 10/27/2021
Project Norborne Glebe CWD **Street** Candlewood Dr
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base 1 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Candlewood Dr Westbound

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	30+00	WB		148.7
2	31+00	C/L		148.9
3	31+50	WB		149.4
4	32+00	C/L		142.0
5	32+50	WB		141.6
6	33+00	WB		144.8
			AVERAGE	145.9

REMARKS
Target Density from Jefferson Asphalt = 131.5
Target Density from Field Marshall Value = 143.7

TARGET DENSITY 143.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 101.5 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Observed by _____ (Co. Inspector)

Zachary Noakes
Signature

10/27/21
Date

GeoLogic Consultants, LLC
1012 Stringtown Road, Berryville, VA 22611

DAILY FIELD REPORT

Report #: 96

Project Name: Norborne Glebe CWD Contractor: Jefferson Asphalt Date: 10/28/2021

Project No.: 10300 Client: Arcadia LLC Weather: Sunny 64°F

Work Performed: Candlewood Dr Asphalt Placement and Compaction

Description of Work:

1- The undersigned arrived on-site, as requested, to observe the placement and compaction of 3 inches of Private Base 1 mix along Candlewood Dr Eastbound lane and 1.5 inches of Private Base 2 along Candlewood Dr East and Westbound lanes.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Problems / Failing Tests:

Inspector: Zach Noakes
Inspector Time: 9.0 hrs.
Project Manager: Mark Hood, P.E.

Phone: (703) 282-2714

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 10/28/2021
Project Norborne Glebe CWD **Street** Candlewood Dr
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base 1 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Candlewood Dr Eastbound

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** BS

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	30+00	EB		146.7
2	31+00	C/L		143.2
3	31+50	EB		150.4
4	32+00	EB		141.6
5	32+50	EB		145.5
6	33+00	EB		143.9
			AVERAGE	145.2

REMARKS
Target Density from Jefferson Asphalt:
Private Base 1 = 132.9 Private Base 2 = 131.5
Target Density from Field Marshall Value:
Private Base 1 = 143.7 Private Base 2 = 146.3

TARGET DENSITY 143.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 101.1 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
10/28/21 — *Date*

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 10/28/2021
Project Norborne Glebe CWD **Street** Candlewood Dr
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Candlewood Dr Eastbound

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** BS

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	30+00	WB		142.8
2	31+00	C/L		147.5
3	31+50	EB		143.5
4	32+00	C/L		140.7
5	32+50	WB		149.9
6	33+00	EB		143.7
			AVERAGE	144.7

REMARKS
Target Density from Jefferson Asphalt:
Private Base 1 = 132.9 Private Base 2 = 131.5
Target Density from Field Marshall Value:
Private Base 1 = 143.7 Private Base 2 = 146.3

TARGET DENSITY 146.3 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 98.9 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
10/28/21 — *Date*

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I, Chantilly, VA 20151

DAILY FIELD REPORT

Project:	Norborne Glebe CWD	Report #:	194
Client:	Arcadia Land, Inc.	Date:	04/28/22
Contractor	Jefferson Asphalt	Weather:	62 P. Cloudy F
Project #:	10300		

Work Performed: Compaction of Surface Mix Asphalt for Candlewood Dr

Work Performed:

1- The undersigned arrived on-site, as requested, to observe the placement and compaction of 1.5 inches of Surface Mix mix along above locations.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Remarks:

Inspector:	Zachary Noakes
Total Time:	10 hrs.
Project Engineer:	Mark Hood, P.E.

(703) 282-2714

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 4/28/2022
Project Norborne Glebe CWD **Street** Candlewood Dr
From Station 30+00 **To Station** 33+50 **Lane** _____ **Width** _____
Mix Type Surface Mix **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Candlewood Dr

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	33+00	NB		151.4
2	32+50	C/L		150.9
3	32+00	SB		152.2
4	31+50	C/L		149.4
5	31+00	NB		143.7
6	30+50	SB		150.3
			AVERAGE	149.7

REMARKS
Target Density from Jefferson Asphalt = 131.5
Target Density from Field Marshall Value = 153.3

TARGET DENSITY 155.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 96.1 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
04/28/22 — *Date*

NORBORNE GLEBE
CANDLEWOOD DRIVE EXTENSION

CONCRETE REPORTS

OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe CWD DATE: 10/13/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 74˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Candlewood Dr Median Curb and Gutter

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
336	**530151**	**9.25**	**Yes**	**3.5**	**0.0**	**n/a**	**n/a**	**68.0**	**5.0**	**A**
325	530164	9.25	Yes							
336	530174	9.25	Yes							

TOTAL C.Y. **27.75** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Candlewood Dr Median Curb and Gutter

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

GeoLogic Consultants, LLC

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

Project No: 2410.1900076.0000
ReportNo.: 2412889-1 CT 101321
WorkorderNo.: 2412889
Lab No.: 21B498-C

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element: **Sample Location:** - Sampled at

Set#1 of 1	**Sample From:**	**Sample By:** Client On 10/13/2021	**At Lab On or Before:** 10/19/2021

General Information		Specified Strength / Sampling Times		Placement Information	
General Contractor:		**Specified Strength:**	3000 psi @ 28 days	**Truck Load:**	N/A
Subcontractor:		**Mix Design Strength:**	3000 psi @ 28 days	**Cumulative Quantity:**	N/A
Supplier:		**Water Added at Site:**	N/A	**Total Placement for the Day:**	N/A
Truck No.:	Unknown	**Time Batched:**			
Ticket No.:	Unknown	**Time Sampled:**			
Mix Design:	Unknown **Admixture:** N/A	**Weather Condition:**	Unknown		

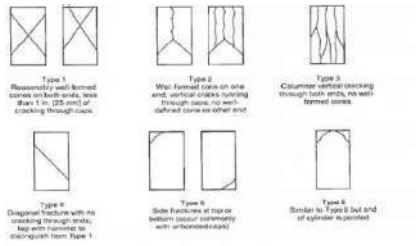
Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	10/20/2021	7	2	4.00	4.00	4.00	12.57	44,747	3,561	-	HZ
2*G*	10/20/2021	7	2	4.00	4.00	4.00	12.57	46,921	3,734	-	HZ
3*G*	10/20/2021	7	2	4.00	4.00	4.00	12.57	51,070	4,064	3,790	HZ
4*G*	11/10/2021	28	2	4.00	4.00	4.00	12.57	57,965	4,613	-	HZ
5*G*	11/10/2021	28	2	4.00	4.00	4.00	12.57	61,719	4,911	-	HZ
6*G*	11/10/2021	28	2	4.00	4.00	4.00	12.57	59,281	4,717	4,750	HZ

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with ASTM C39.**



Reviewed By

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Revised March 2019

OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe CWD DATE: 10/14/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 74˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Candlewood Dr Curb and Gutter

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
400	**530233**	**9.5**	**Yes**	**3.0**	**0.0**	**n/a**	**n/a**	**71.0**	**5.5**	**A**
343	530241	9.25	Yes							
337	530251	9.25	Yes							
		9.25	**Yes**							
337	**530267**	**9.25**	**Yes**							
325	**530273**	**9**	**Yes**							

TOTAL C.Y. **55.5** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Candlewood Dr Curb and Gutter

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Project No: 2410.1900076.0000
ReportNo.: 2412890-1 CT 101421
WorkorderNo.: 2412890
Lab No.: 21B499-C

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA 20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA 20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 10/14/2021 | **At Lab On or Before:** 10/19/2021

General Information		Specified Strength / Sampling Times		Placement Information
General Contractor:		**Specified Strength:**	3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:		**Mix Design Strength:**	3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:		**Water Added at Site:**	N/A	**Total Placement for the Day:** N/A
Truck No.:	Unknown	**Time Batched:**		
Ticket No.:	Unknown	**Time Sampled:**		
Mix Design:	Unknown **Admixture:** N/A	**Weather Condition:**	Unknown	

Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

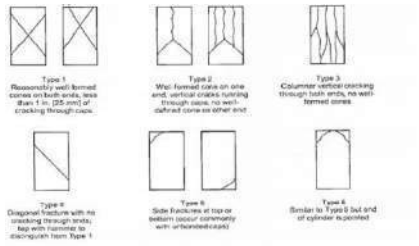
Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	10/21/2021	7	2	4.00	4.00	4.00	12.57	51,292	4,082	-	HZ
2*G*	10/21/2021	7	2	4.00	4.00	4.00	12.57	51,381	4,089	-	HZ
3*G*	10/21/2021	7	2	4.00	4.00	4.00	12.57	53,186	4,232	4,130	HZ
4*G*	11/11/2021	28	2	4.00	4.00	4.00	12.57	63,145	5,025	-	HZ
5*G*	11/11/2021	28	2	4.00	4.00	4.00	12.57	66,691	5,307	-	HZ
6*G*	11/11/2021	28	2	4.00	4.00	4.00	12.57	63,203	5,030	5,120	HZ

Remarks Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.

Remarks All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.

Note - *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition

Note **Test in compliance with ASTM C39.**



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Revised March 2019

OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe CWD DATE: 12/13/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 50˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Candlewood Dr Sidewalk

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
336	**530151**	**9.25**	**Yes**	**5.0**	**0.0**	**n/a**	**n/a**	**78.0**	**5.5**	**A**
325	530164	9.25	Yes							
336	530174	9.25	Yes							
		9.25	**Yes**							

TOTAL C.Y. **38** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Candlewood Dr Sidewalk

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

GeoLogic Consultants, LLC

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Project No: 2410.1900076.0000
ReportNo.: 2414330-1 CT 121321
WorkorderNo.: 2414330
Lab No.: 21B769-C

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 12/13/2021 | **At Lab On or Before:** 12/20/2021

General Information		Specified Strength / Sampling Times		Placement Information
General Contractor:		**Specified Strength:**	3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:		**Mix Design Strength:**	3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:		**Water Added at Site:**	N/A	**Total Placement for the Day:** N/A
Truck No.:	Unknown	**Time Batched:**		
Ticket No.:	Unknown	**Time Sampled:**		
Mix Design:	Unknown **Admixture:** N/A	**Weather Condition:**	Unknown	

Field Test Results

Air Content: N/A	Slump: N/S	Ambient Temp: N/S	Concrete Temp: N/S	Unit Weight: N/A

Results of Laboratory Testing

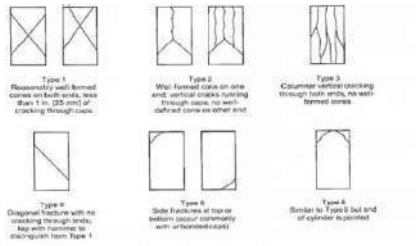
Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	12/20/2021	7	2	4.00	4.00	4.00	12.57	37,864	3,013	-	HZ
2*G*	12/20/2021	7	3	4.00	4.00	4.00	12.57	36,593	2,912	-	HZ
3*G*	12/20/2021	7	3	4.00	4.00	4.00	12.57	41,015	3,264	3,060	HZ
4*G*	01/10/2022	28	2	4.00	4.00	4.00	12.57	66,607	5,300	-	HZ
5*G*	01/10/2022	28	3	4.00	4.00	4.00	12.57	68,833	5,478	-	HZ
6*G*	01/10/2022	28	3	4.00	4.00	4.00	12.57	63,263	5,034	5,270	HZ

Remarks Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.

Remarks All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.

Note - *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition

Note **Test in compliance with approved plans and specifications**



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OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe CWD DATE: 12/14/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 52˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Candlewood Dr Sidewalk

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
400	**530233**	**9.5**	**Yes**	**4.0**	**0.0**	**n/a**	**n/a**	**74.0**	**5.0**	**A**
343	530241	9.25	Yes							
337	530251	9.25	Yes							
337	**530267**	**9.25**	**Yes**							
325	**530273**	**9**	**Yes**							

TOTAL C.Y. **55.5** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Candlewood Dr Sidewalk

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

GeoLogic Consultants, LLC

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

Project No: 2410.1900076.0000
ReportNo.: 2414329-1 CT 121521
WorkorderNo.: 2414329
Lab No.: 21B770-C

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 12/15/2021 | **At Lab On or Before:** 12/20/2021

General Information	Specified Strength / Sampling Times	Placement Information
General Contractor:	**Specified Strength:** 3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:	**Mix Design Strength:** 3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:	**Water Added at Site:** N/A	**Total Placement for the Day:** N/A
Truck No.: Unknown	**Time Batched:**	
Ticket No.: Unknown	**Time Sampled:**	
Mix Design: Unknown **Admixture:** N/A	**Weather Condition:** Unknown	

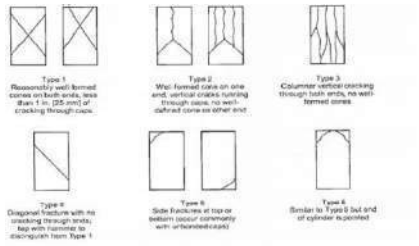
Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	12/22/2021	7	2	4.00	4.00	4.00	12.57	45,445	3,616	-	HZ
2*G*	12/22/2021	7	2	4.00	4.00	4.00	12.57	46,992	3,739	-	HZ
3*G*	12/22/2021	7	2	4.00	4.00	4.00	12.57	45,837	3,648	3,670	HZ
4*G*	01/12/2022	28	2	4.00	4.00	4.00	12.57	67,275	5,354	-	HZ
5*G*	01/12/2022	28	2	4.00	4.00	4.00	12.57	65,597	5,220	-	HZ
6*G*	01/12/2022	28	2	4.00	4.00	4.00	12.57	65,617	5,222	5,270	HZ

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with approved plans and specifications**



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OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe CWD DATE: 12/15/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 42˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Candlewood Dr Sidewalk

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
339	**533883**	**9.25**	**Yes**	**4.0**	**0.0**	**n/a**	**n/a**	**65.0**	**5.0**	**A**
400	533894	9.25	Yes							
308	533902	9.25	Yes							

TOTAL C.Y. **27.75** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Candlewood Dr Sidewalk

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Project No: 2410.1900076.0000
ReportNo.: 2414329-1 CT 121521
WorkorderNo.: 2414329
Lab No.: 21B770-C

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 12/15/2021 | **At Lab On or Before:** 12/20/2021

General Information	Specified Strength / Sampling Times	Placement Information
General Contractor:	**Specified Strength:** 3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:	**Mix Design Strength:** 3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:	**Water Added at Site:** N/A	**Total Placement for the Day:** N/A
Truck No.: Unknown	**Time Batched:**	
Ticket No.: Unknown	**Time Sampled:**	
Mix Design: Unknown **Admixture:** N/A	**Weather Condition:** Unknown	

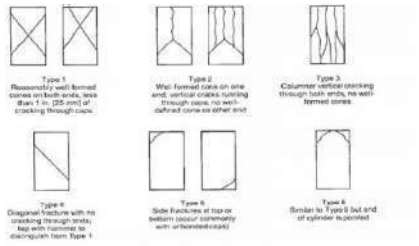
Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	12/22/2021	7	2	4.00	4.00	4.00	12.57	45,445	3,616	-	HZ
2*G*	12/22/2021	7	2	4.00	4.00	4.00	12.57	46,992	3,739	-	HZ
3*G*	12/22/2021	7	2	4.00	4.00	4.00	12.57	45,837	3,648	3,670	HZ
4*G*	01/12/2022	28	2	4.00	4.00	4.00	12.57	69,275	5,513	-	HZ
5*G*	01/12/2022	28	2	4.00	4.00	4.00	12.57	65,597	5,220	-	HZ
6*G*	01/12/2022	28	2	4.00	4.00	4.00	12.57	65,617	5,222	5,320	HZ

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with approved plans and specifications**



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OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe CWD DATE: 7/12/2023

CONTRACTOR: Foland Inc CONCRETE SUPPLIER: TBH Inc

WEATHER: Sunny AIR TEMP: 85˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Candlewood Drive Roundabout Apron

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
423	**564213**	**8.25**	**Yes**	**3.0**	**0.0**	**n/a**	**n/a**	**70.0**	**5.0**	**A**
		9.75								
		9.75								
		8.25								

TOTAL C.Y. **35.5** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Candlewood Drive Roundabout Apron West Side

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

GeoLogic Consultants, LLC

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111

Project No: 9164.L0010
ReportNo.: 2427479-1 CT 071223
WorkorderNo.: 2427479
Lab No.: 23C541-C

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA 20151

Project Norborne Glebe (#10300)
UES DC Metro Lab, , fairfax County, VA 20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 07/12/2023 | **At Lab On or Before:** 07/24/2023

General Information	Specified Strength / Sampling Times	Placement Information
General Contractor:	**Specified Strength:** 3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:	**Mix Design Strength:** 3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:	**Water Added at Site:** N/A	**Total Placement for the Day:** N/A
Truck No.: Unknown	**Time Batched:**	
Ticket No.: Unknown	**Time Sampled:**	
Mix Design: Unknown **Admixture:** N/A	**Weather Condition:** Unknown	

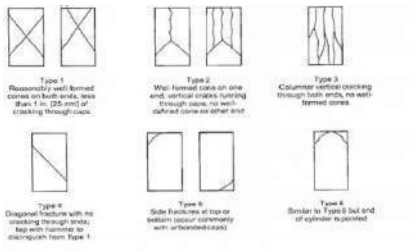
Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	08/09/2023	28	3	4.00	4.00	4.00	12.57	65,726	5,230	-	RKR
2*G*	08/09/2023	28	2	4.00	4.00	4.00	12.57	62,703	4,990	-	RKR
3*G*	08/09/2023	28	3	4.00	4.00	4.00	12.57	70,885	5,641	5,290	RKR

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with approved plans and specifications**



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Universal Engineering Sciences, LLC

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NORBORNE GLEBE PUBLIC IMPROVEMENTS PLAN

CANDLEWOOD DRIVE EXTENSION

PRELIMINARY SUBDIVISION / LAND DEVELOPMENT PLAT

MAJOR SLD 2017-07

CITY OF CHARLES TOWN

JEFFERSON COUNTY, WEST VIRGINIA

ZONED NEIGHBORHOOD RESIDENTIAL (NR)

Plan Revisions

Date	Comment
09/14/2017	Revised Per C.T.U.B. Comments
09/28/2017	Revised Per J.C.P.S.D. Comments
01/25/2018	Revised Per City of Charles Town Comments
02/16/2018	Revised Per Portion of the "Client Review" Comments
08/06/2018	Revised Per Client Bid Clarification
08/09/2018	Revised Per Client Bid Clarification
10/01/2008	Revised Per City of Charles Town Comments
11/09/2018	Revised Per Agency Comments



VICINITY MAP

SCALE: 1" = 600'

Sheet List Table

Sheet #	Sheet Title	
1	Cover Sheet	
2	~~General Notes and Legend~~	
3	~~Erosion & Sediment Control Plan~~	
4	~~Erosion & Sediment Control Plan Narrative~~	
5	~~Erosion & Sediment Control Plan Details~~	
6	Road Geometry & Utility Plan and Road Grading Plan	
7	~~Preliminary Plat~~	
8	~~Candlewood Drive Profile~~	
9	Water Line & Sanitary & Storm Sewer Profiles & Computations	
10	~~Storm Details~~	
11	~~Storm Details~~	
12	~~Storm Details~~	
13	~~Road Details~~	
14	~~JCPSD Details~~	
15	~~JCPSD Details~~	
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18	~~Landscape Plan~~	

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	ROAD GEOMETRY & UTILITY PLAN AND ROAD GRADING PLAN 6
3	WATER LINE & SANITARY & STORM SEWER PROFILES & COMPUTATIONS 9

Charles Town – Complete List of Waivers/Variances

Ordinance	Section of Ordinance	Description of Waiver or Variance	Date Granted

"This property is not in an area designated as a special flood area, as shown on Community Map/panel Number 540066/0138, Effective date 12/18/2009."

"This Preliminary Plan and Plat was approved by the City of Charles Town, on the _____ day of _____, 20_____ , subject to any conditions specified hereon.

All expenses incurred with respect to improvements for all utility services, paving, grading, landscaping, curbs, gutters, sidewalks, road lighting, road signs, flood protection devices, drainage structures and all other improvements that may be required shall be the responsibility of the subdivider and not the City.

_____ _____
Secretary of the Planning Commision Date

"The developer, in signing this plat/plan, agrees to abide by all conditions, terms and specifications provided heron; and to complete all the improvements required by the Preliminary Plat and Plan or site plan."

Carla J. Hoffman 11/29/2018
ARCADIA LAND, INC. Date
1602 VILLAGE MARKET BLVD., STE. 235
LEESBURG, VA 20176

"The Engineer and/or Surveyor, in signing this plat/plan, attests to the best of his or her knowledge, is plan is complete and accurate."

28-NOV-2018
RANDY L. KEPLER, P.E. Date
GREENWAY ENGINEERING INC.

CALL "MISS UTILITY"

WEST VIRGINIA UTILITY PROTECTION SERVICE AT 811 OR 1-800-245-4848. 48 HOURS PRIOR TO THE START OF WORK. EXCAVATORS MUST NOTIFY ALL PUBLIC UTILITY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION. THE EXCAVATOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL COUNTY REQUIREMENTS, WEST VIRGINIA CODE AND REGULATIONS.

UTILITY NOTICE REQUIRED

Contractors shall notify all public utility operators who maintain underground utility lines in the area of proposed excavating or blasting at least two (2) working days, but not more than ten (10) working days, prior to commencement of excavation or demolition. Names and telephone numbers of the operators of underground utility lines appear below. These numbers shall also be used to serve in an emergency condition

Water:	Charles Town Utility Board 832 S. George Street Charles Town, WV 25414 (304) 725-2316
Sewer:	Jefferson County Public Service District 340 Edmond Road Kearneysville, WV 25430 (304) 725-4647
Power:	Potomac Edison P.O.Box 3615 Akron, OH 44309 (800) 686-0011
Phone:	Frontier Communications 1108 N. Mildred Street Ranson, WV 25438 (304) 728-8500

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
PHONE: (703) 994-4047
MRAGTA.COM

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AS-BUILT CERTIFICATION

THE PHYSICAL SURVEY HAS BEEN REVIEWED AND, IN MY PROFESSIONAL OPINION, BASED UPON MY KNOWLEDGE, INFORMATION, AND BELIEF, THE DESIGN ELEMENTS MEASURED BY THE PHYSICAL SURVEY COMPLY WITH THE APPROVED PLANS. THIS REVIEW DOES NOT IMPLY IN ANY WAY THAT (I) INSPECTIONS WERE MADE DURING THE CONSTRUCTION, (II) TO THE QUALITY OF THE WORK, OR (III) TO ANY ELEMENT OR STRUCTURE NOT VISIBLE OR DEPICTED ON THE PHYSICAL SURVEY.

JON K. ERICKSON VLS#2451 NOVEMBER 30, 2021

JON K. ERICKSON No. 2302 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR 01/04/22

APPROVALS

_____ _____
PRELIMINARY PLAT APPROVAL DATE

_____ _____
PRESIDENT OF PLANNING COMMISSION DATE

_____ _____
ZONING ADMINISTRATOR DATE

THESE PLANS ARE IN CONFORMANCE WITH CITY OF CHARLES TOWN STANDARDS AND ORDINANCES. ANY DEVIATION OR CHANGE IN THESE PLANS SHALL BE APPROVED BY THE ZONING ADMINISTRATOR PRIOR TO CONSTRUCTION

RECORD DRAWING

GREENWAY ENGINEERING INC.
151 HANDY HILL LANE
WINCHESTER, VIRGINIA 22602
(540) 662-4185
www.Greenway[illegible].com
GREENWAY ENGINEERING

COVER SHEET
NORBORNE GLEBE PUBLIC IMPROVEMENTS PLAN
CANDLEWOOD DRIVE EXTENSION
CITY OF CHARLES TOWN / JEFFERSON COUNTY, WEST VIRGINIA

Rev. No.	Date
2	11/09/2018

RANDY L. KEPLER REGISTERED STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE: 06/09/2017
SCALE: AS NOTED
DESIGNED BY: EJG
FILE NO. 4542A
SHEET 1 OF 18
17-03

SHEET 1 OF 3

ROAD CENTERLINE CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
RC6	400.00'	50.00'	49.97'	N 16°30'28" E	7°09'43"

LEGEND

T.E.C. - 5' TELEPHONE, ELECTRIC AND CABLE COMMON SHARED UTILITY EASEMENT

SAN - SANITARY
W/M - WATER METER
LAT - LATERAL
MOD. - MODIFIED
ESMT. - EASEMENT
STREET LIGHT
TRAFFIC SIGN
STREET SIGN
TYP. - TYPICAL
S/W - SIDEWALK
D/W - DRIVEWAY

NOTES:

-WATERLINE IS MINIMUM 42" BURY

-ALL WATER MAINS SHALL BE AWWA C900 CL235 PVC.

-ALL SANITARY SEWER LINES SHALL BE SDR-35, UNLESS OTHERWISE NOTED

-SEE "JCPSD DETAILS" SHEETS FOR JEFFERSON COUNTY PUBLIC SERVICE DISTRICT SEWER DETAILS

-SEE "CITY OF CHARLES TOWN WATER DETAILS" SHEET FOR CITY OF CHARLES TOWN WATER DETAILS

-STREET LIGHT DESIGN DETAILS SHALL CONFORM TO COMMUNITY DESIGN STANDARDS AND SHALL BE INSTALLED PER CITY REQUIREMENTS.

-SEE "LIGHTING DETAILS" SHEET FOR LIGHTING DETAILS

- LANDSCAPED / GRASS MEDIANS ARE CONSIDERED OPEN SPACE. MEDIAN OPEN SPACE IS CONSIDERED COMMON SPACE OF THE HOME OWNERS ASSOCIATION AND IS THE RESPONSIBILITY OF THE HOA.

-IN ACCORDANCE W/ SECT. 13333.02 SUBSECTION V CONTRACTOR TO PLACE SIGN READING "STREET TO BE EXTENDED BY AUTHORITY OF THE CITY OF CHARLES TOWN" SIZE TO MATCH SPEED LIMIT SIGN.

-MEDIA OPEN SPACE MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE NORBORNE GLEBE HOA.

JON K. ERICSON — LICENSED — No. 2302 — STATE OF WEST VIRGINIA — PROFESSIONAL SURVEYOR

GREENWAY ENGINEERING INC.
154 INDY HILL LANE
WINCHESTER, VIRGINIA 22602
(540) 662-4185
www.GreenwayEng.com
GREENWAY ENGINEERING

ROAD UTILITY & GEOMETRY PLAN

SCALE: 1" = 30'

ROAD GRADING PLAN

SCALE: 1" = 30'

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
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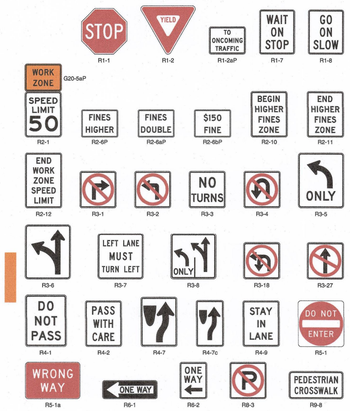
Page 584 — 2009 Edition

Figure 6F-3. Regulatory Signs and Plaques in Temporary Traffic Control Zones
(Sheet 1 of 2)



PAVEMENT MARKING LEGEND

- A — LANE LINES (BROKEN) - WHITE, TYPE B, CLASS I MARKINGS, 4" WIDE x 10' LONG, SPACED 30'
- B — EDGE LANE LINES (SOLID) - YELLOW, TYPE B, CLASS I MARKINGS, 4" WIDE LENGTH AS SHOWN ON PLAN. (OPTIONAL)
- C — CHANNELIZING LANE LINES (SOLID) - WHITE, TYPE B, CLASS I MARKINGS, 4" WIDE, LENGTH AS SHOWN ON PLAN
- D — EXTENDED LANE LINES (DOTTED) - COLOR AS SHOWN. TYPE B, CLASS I MARKINGS, 4" WIDE x 2' LONG, SPACED 6'. (OPTIONAL) 8" WIDTH TO BE USED FOR EMPHASIS AT ROUNDABOUT. (OPTIONAL)
- E — STOP BAR (SOLID) - WHITE, TYPE B, CLASS I MARKINGS, 24" WIDE
- F — CROSSWALK LINES - WHITE, TYPE B, CLASS I MARKINGS, 12" WIDE x 6' LONG, SPACED 18". SOLID WHITE TRANSVERSE LINES PLACED PARALLEL TO ONCOMING TRAFFIC.
- G — TYPE B, CLASS I WHITE PAVEMENT MARKING, 6" WIDE PARALLEL LINES SPACED 6 FEET APART.
- H — TYPE B, CLASS I PAINTED YELLOW DOUBLE LINE PAVEMENT MARKING, 4" WIDTH, SEPARATED BY A 4" SPACE, LENGTH AS SHOWN ON PLAN
- I — TYPE B WHITE PAVEMENT MARKING, 24" WIDTH. LENGTH AS SHOWN, SPACED 6' . PLACED TO POINT TOWARDS ONCOMING TRAFFIC.
- J — TRIANGLE YIELD STRIPE (OPTIONAL)
- K — TYPE 3 BARRICADES - RETROREFLECTIVE RAIL FACES WITH R11-2 "ROAD CLOSED" SIGN.

TYPE B, CLASS I WHITE PAVEMENT MARKING, ELONGATED TURN LANE ARROW.

TYPE B, CLASS I WHITE PAVEMENT MARKING, ELONGATED TURN LANE ARROW.

RECORD DRAWING

SHEET 2 OF 3

ROAD GEOMETRY & UTILITY PLAN AND ROAD GRADING PLAN
NORBORNE GLEBE PUBLIC IMPROVEMENTS PLAN
CANDLEWOOD DRIVE EXTENSION
CITY OF CHARLES TOWN / JEFFERSON COUNTY, WEST VIRGINIA

Rev. No.	Date
8	11/09/2018

CINDY L. KEPLEY — LICENSED — No. 21668 — STATE OF WEST VIRGINIA — PROFESSIONAL ENGINEER

DATE: 06/09/2017
SCALE: 1" = 30'
DESIGNED BY: EJG
FILE NO. 4542A
SHEET 6 OF 18

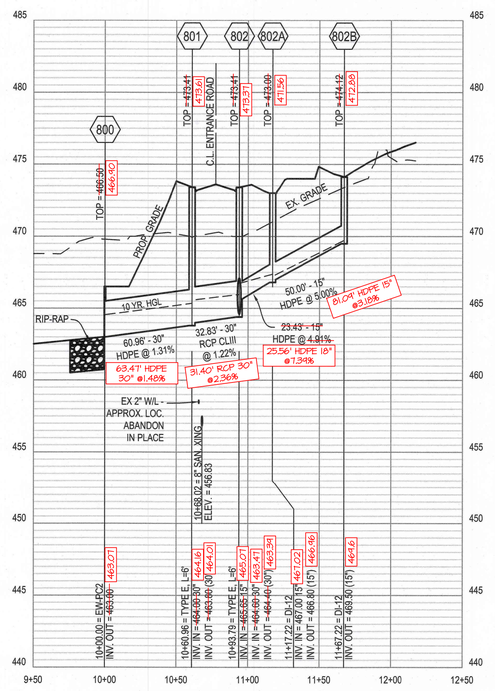
17-03

NORBORNE GLEBE CANDLEWOOD DRIVE EXTENSION SEWER COMPUTATIONS

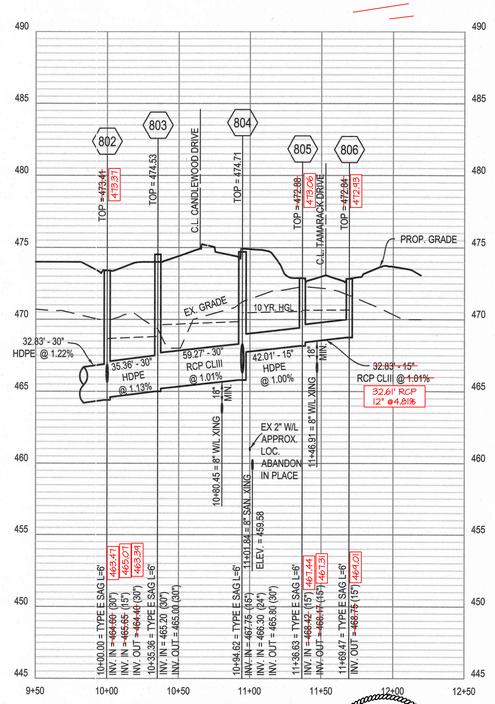
From Point	To Point	Drainage Area (Acres)	Runoff Coef.	CA (Increm.)	CA (Accum.)	Tc (min)	Compound Tc (min)	Rainfall Intensity (in/hr)	Runoff (cfs)	Pipe Material	Diameter (in)	Manning's n	Upstream Pipe Invert (ft)	Downstream Pipe Invert(ft)	Pipe Length (ft)	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Full Flow Velocity (fps)	Flow Travel Time (min)	Upstream Flow Depth (in)	Downstream Flow Depth (in)	Upstream Velocity (fps)	Downstream Velocity (fps)	Average Velocity (fps)	Total Q (cfs)	Upstream Rim Elev (ft)	Upstream HGL (ft)	Upstream Rim Minus HGL (ft)	Downstream Rim Elev (ft)	Downstream HGL (ft)	Downstream Rim Minus HGL (ft)
815	814	0.40	0.45	0.18	0.18	5.00	5.00	6.54	1.18	HDPE	15.00	0.012	472.76	471.96	40.00	2.00	9.92	10.67	8.09	0.31	5.14	11.89	3.17	1.13	2.15	1.18	477.16	473.19	3.97	476.00	472.95	3.05
814	813	0.38	0.45	0.17	0.35	5.00	5.31	6.43	1.12	HDPE	15.00	0.012	471.71	470.65	69.82	1.52	8.65	9.30	7.05	0.63	14.36	15.00	1.87	1.84	1.85	2.26	476.00	472.91	3.09	476.95	472.84	4.11
EX 400	813	0.00	0.50	0.00	0.00	5.00	5.00	6.54	0.00	Aluminum	24.00	0.012	472.44	468.00	107.77	4.12	49.88	53.66	15.88	0.24	20.17	24.00	7.87	7.06	7.46	22.17	480.50	474.12	6.38	476.95	473.13	3.82
813	804	0.14	0.65	0.09	0.44	5.00	5.94	6.20	0.60	HDPE	24.00	0.012	467.80	466.30	91.60	1.64	31.44	33.82	10.01	0.19	24.00	24.00	7.93	7.93	7.93	24.91	476.95	471.76	5.19	474.71	470.82	3.89
806	805	0.35	0.65	0.23	0.23	5.00	5.00	6.54	1.49	Concrete	15.00	0.013	468.75	468.42	32.83	1.01	6.49	6.99	5.29	0.45	15.00	15.00	1.21	1.21	1.21	1.49	472.84	470.67	2.17	472.88	470.65	2.23
805	804	0.42	0.65	0.27	0.50	5.00	5.45	6.38	1.79	Concrete	15.00	0.013	468.17	467.75	42.01	1.00	6.48	6.97	5.28	0.27	15.00	15.00	2.60	2.60	2.60	3.19	472.88	470.57	2.31	474.71	470.47	4.24
804	803	0.12	0.65	0.08	1.02	5.00	6.13	6.13	0.51	HDPE	30.00	0.012	465.80	465.20	59.27	1.01	44.83	48.22	9.13	0.17	30.00	30.00	5.79	5.79	5.79	28.43	474.71	469.86	4.85	474.53	469.62	4.90
803	802	0.22	0.65	0.14	1.16	5.00	6.30	6.07	0.94	HDPE	30.00	0.012	465.00	464.60	35.36	1.13	47.39	50.98	9.65	0.10	30.00	30.00	5.96	5.96	5.96	29.23	474.53	468.82	5.70	473.41	468.67	4.74
802B	802A	0.28	0.65	0.18	0.18	5.00	5.00	6.54	1.19	HDPE	15.00	0.012	469.50	467.00	50.00	5.00	15.69	16.88	12.79	0.40	5.16	15.00	3.18	0.97	2.08	1.19	474.12	469.93	4.19	473.00	468.52	4.48
802A	802	0.21	0.65	0.14	0.32	5.00	5.40	6.39	0.89	HDPE	15.00	0.012	466.80	465.65	23.43	4.91	15.55	16.72	12.67	0.24	15.00	15.00	1.66	1.66	1.66	2.04	473.00	468.49	4.51	473.41	468.47	4.94
802	801	0.19	0.80	0.15	1.63	5.00	6.40	6.04	0.99	HDPE	30.00	0.012	464.40	464.00	32.83	1.22	49.18	52.90	10.02	0.08	30.00	30.00	6.53	6.53	6.53	32.04	473.41	467.73	5.67	473.41	467.57	5.85
801	800	0.15	0.85	0.13	1.76	5.00	6.48	6.01	0.83	HDPE	30.00	0.012	463.80	463.00	60.96	1.31	51.04	54.90	10.40	0.09	17.48	17.48	11.03	11.03	11.03	32.76	473.41	465.26	8.16	463.17	464.46	-1.28

NORBORNE GLEBECANDLEWOOD DRIVE EXTENSION STORM SEWER INLET COMPUTATIONS

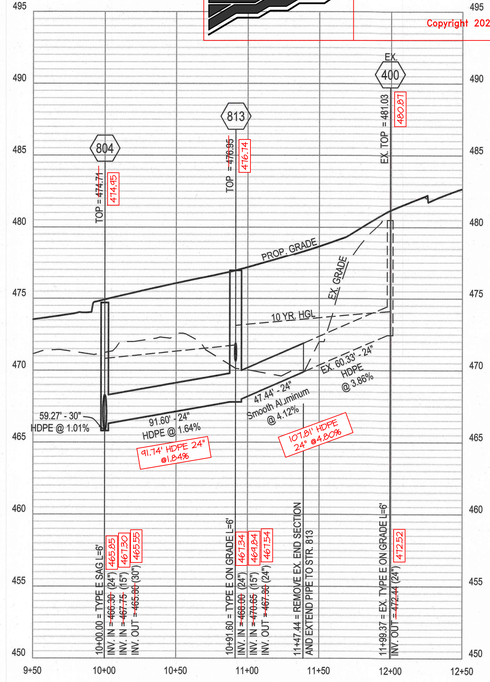
Number	Type	L Spec Length (ft)	Pavement Long Slope (%)	Pavement Cross Slope (%)	Gutter Width (ft)	Gutter Cross Slope (%)	W/T	Local Depression (in)	DA (ac)	C	CA	Time to Inlet (min)	I (in/hr)	Discharge For Gutter Calc (cfs)	Qi, Intercepted (cfs)	Bypass Flow For Gutter Calc (cfs)	Efficiency (%)	Lt, Comp Length (ft)	T Spread (ft)	Ponding Depth (in)	Gutter Velocity (fps)
815	DI-12 SAG TYPE II	N/A	3.00	2.50	4.00	2.00	0.76	0.00	0.40	0.45	0.18	5.00	6.54	0.86	0.86	0.00	100.00	N/A	5.28	1.59	0.00
814	TYPE G SAG 18"-24" PIPE TYPE I GRATE	N/A	3.00	8.00	0.67	2.00	0.21	0.00	0.38	0.45	0.17	5.00	6.43	0.81	0.81	0.00	100.00	N/A	3.20	3.07	0.00
EX 400	TYPE E ON GRADE	6.00	0.01	0.01	1.75	8.33	0.00	2.00	0.00	0.50	0.00	5.00	6.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
813	TYPE E ON GRADE	6.00	2.37	3.00	1.75	8.33	1.03	2.00	0.14	0.65	0.09	5.00	6.20	0.43	0.43	0.00	100.00	5.99	1.70	1.73	3.84
806	TYPE E SAG	6.00	0.30	3.13	1.75	8.33	1.16	2.00	0.35	0.65	0.23	5.00	6.54	1.08	1.08	0.00	100.00	6.00	1.51	1.66	0.00
805	TYPE E SAG	6.00	2.25	3.13	1.75	8.33	0.84	2.00	0.42	0.65	0.27	5.00	6.38	1.30	1.30	0.00	100.00	6.00	2.08	1.87	0.00
804	TYPE E SAG	6.00	2.01	3.00	1.75	8.33	0.00	2.00	0.12	0.65	0.08	5.00	6.13	0.37	0.37	0.00	100.00	6.00	0.00	0.81	0.00
803	TYPE E SAG	6.00	2.01	3.00	1.75	8.33	6.48	2.00	0.22	0.65	0.14	5.00	6.07	0.68	0.68	0.00	100.00	6.00	0.27	1.22	0.00
802B	DI-12 SAG TYPE II	N/A	2.00	2.00	4.00	2.00	0.63	0.00	0.28	0.65	0.18	5.00	6.54	0.86	0.86	0.00	100.00	N/A	6.36	1.53	0.00
802A	DI-12 SAG TYPE II	N/A	2.00	2.00	4.00	2.00	0.73	0.00	0.21	0.65	0.14	5.00	6.39	0.65	0.65	0.00	100.00	N/A	5.45	1.31	0.00
802	TYPE E SAG	6.00	0.30	3.13	1.75	8.33	3.76	2.00	0.19	0.80	0.15	5.00	6.04	0.72	0.72	0.00	100.00	6.00	0.47	1.27	0.00
801	TYPE E SAG	6.00	3.00	3.13	1.75	8.33	18.84	2.00	0.15	0.85	0.13	5.00	6.01	0.61	0.61	0.00	100.00	6.00	0.09	1.13	0.00



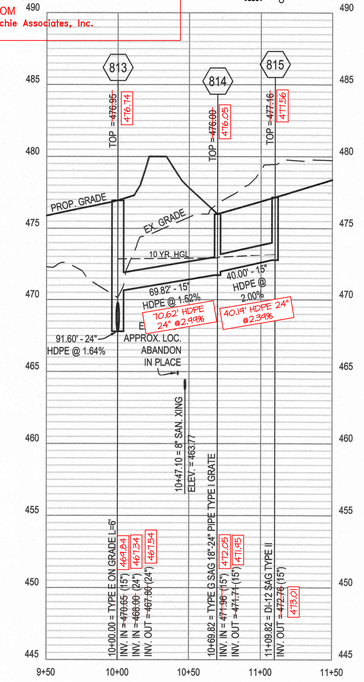
STORM SEWER 800 - 802B



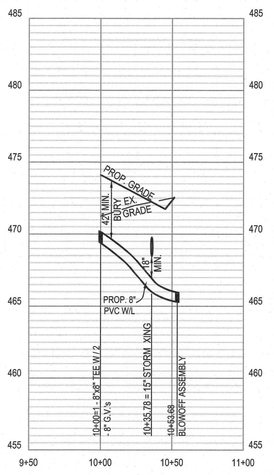
STORM SEWER 802 - 806



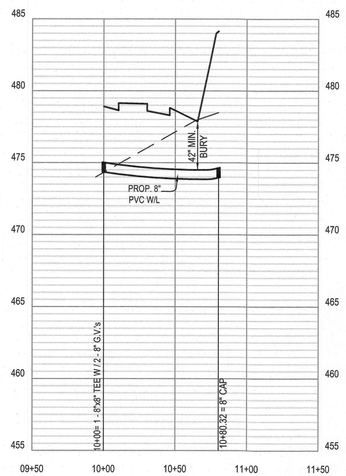
STORM SEWER 804 - EX. 400



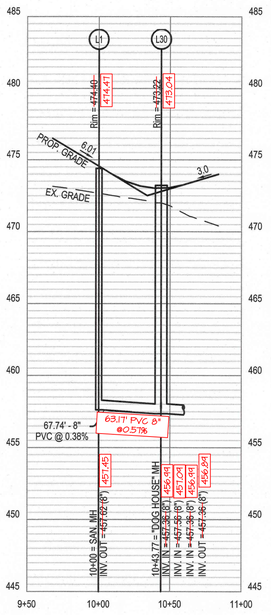
STORM SEWER 813-815



TAMARACK DR. WATERLINE



WATERLINE "D"



STORM SEWER L30 - L1

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
PHONE: (703) 994-4047
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SCALE: 1" = 50'

RECORD DRAWING

SHEET 3 OF 3

GREENWAY ENGINEERING INC.
151 LAWYER HILL LANE
WINCHESTER, VIRGINIA 22602
(540) 662-4185
www.Greenway-Eng.com

WATER LINE & SANITARY & STORM SEWER PROFILES & COMPUTATIONS
NORBORNE GLEBE PUBLIC IMPROVEMENTS PLAN
CANDLEWOOD DRIVE EXTENSION
CITY OF CHARLES TOWN / JEFFERSON COUNTY, WEST VIRGINIA

Rev. No.	Date
3	11/09/2018

DATE: 06/09/2017
SCALE: H: 1" = 50' V: 1" = 5'
DESIGNED BY: EJG
FILE NO. 4542A
SHEET 9 OF 18
17-03

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Public Hearing: BR2023-11: Norborn Glebe Phase 14A- Bond Release

ATTACHMENTS:

- 1. Staff Report.pdf
- 2._Application.pdf
- 3._KH_Review.pdf
- 4._Applicant_Consultant_Review.pdf
- 5._As-Built_Diagrams.pdf

Bond Release Request
BR2023-11

Date: For the January 22, 2024 Planning Commission meeting
Applicant: Gary Endler on behalf of Arcadia Land Inc.
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Bond release for performance and land disturbance bond

Norborne-Glebe Phase 14A



BACKGROUND
The applicant has submitted a bond reduction request for the performance and land disturbance bond for Norborne-Glebe subdivision Phase 14A.

Upon review of the request the City Engineer, Kimley-Horn, has determined that the bond amount is a reasonable assessment of the work completed thus far.

Existing Bond Amount: $329,306.20

BOND COMMITTEE
The Bond Committee reviewed this item at their December 14, 2023 meeting. The Committee recommended approval of the bond reduction request.

STAFF RECOMMENDATION
The City Engineer and City Staff have reviewed the bond reduction request and recommends the bond release request be **approved.**

Bond Request No._____

RECEIVED
NOV 06 2023
BY:_____

BOND REQUEST AND REDUCTION

To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.

1. DATE NOVEMBER 3, 2023

2. APPLICATION TYPE ☐ Bond | Initiation ☐ Bond | Reduction ☐ Bond | Reallocation ☒ Bond | Release**

3. PROJECT NAME NORBORNE GLEBE PHASE 14A
   Address

4. APPLICANT'S NAME* ARCADIA LAND, INC (OWNER)
   Address 108 N. GEORGE ST., 2ND FLOOR, CHARLES TOWN, WV 25414
   Telephone Number (571) 220-3412 Fax Number ( ) NA
   Email Address mmflynn@h2land.com

5. PROPERTY OWNER'S NAME ARCADIA LAND, INC
   Address 108 N GEORGE ST., 2ND FLOOR, CHARLES TOWN, WV 25414
   Telephone Number (571) 220-3412 Fax Number ( ) NA
   Email Address mmflynn@h2land.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

Bond Request No._____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

NORBORNE GLEBE PHASE 14A

7. A) CURRENT BOND AMOUNT $ 329,306.02

B) PROPOSED BOND AMOUNT Ø

8. PARCEL INVENTORY: (List all parcels that are part of this application):

Tax Map No.	Parcel No.	Deed Book	Page No.	Zoning District
		NA		

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

Application No.	Project Name and Phase	Status	Approval Date
		NA	

Bond Request No._____

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.
* FINAL GEOTECHNICAL CERTIFICATION REPORT PHASE 14A

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements. PHASE 14A ASBUILT PLANS

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts 9/8/22 Prepared By MORRIS & RICHE ASSOCIATES, INC

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.
* PROPERTY CORNER LETTER FROM GREENWAY ENGINEERING

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH. NA

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section. NA

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance. NA

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

Bond Request No._____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant

X _____ Date 11/1/2023

Signature of Property Owner (If different than Applicant)

X _____ Date _____

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

Kimley»Horn

Memorandum

To: Mr. Mark Flynn,
Arcadia Land Inc
108 N George St, 2nd Floor
Charles Town, WV 25414

From: Mark Phillips, P.E.

Through: Mr. James Newman, AICP
City Planner, Zoning/Subdivision Administrator
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: December 7, 2023

Subject: Norborne Glebe Subdivision Phase 14A Bond Release Request Review

This memorandum summarizes our review of the Bond Release Application for the Norborne Glebe Subdivision Phase 14A (dated November 3, 2023, by Morris & Ritchie Associates, Inc.) for a bond reduction of $329,306.02. Using the As-builts dated September 8, 2022, a site visit conducted by Kimley-Horn, and the Final Site Work Certification from GeoLogic Consultants LLC dated August 30, 2023, it is our opinion that the bond release application is a reasonable representation of the work completed in the field.

Thank you for the opportunity to review this Bond Release Application. In the meantime, please feel free to contact us at 703-870-3631 should you have any questions.

KIMLEY-HORN & ASSOCIATES, INC.

Mark Phillips, P.E.
Project Manager
Associate

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I
Chantilly, VA 20151

August 30, 2023

Arcadia Land, Inc.
108 North George Street
2nd Floor
Charles Town, WV 25414

Attn: Mr. Mark Flynn

Project Name: Norborne Glebe (Arcadia Chase) Phase 14-A
Location: Charles Town, West Virginia

Dear Mr. Flynn:

Subject: Final Site Work Certification

The following completion letter relates to work performed under the observation of GeoLogic Consultants, LLC and by the undersigned at the referenced project site. These services were performed on an as requested basis beginning November 11, 2021 to August 10, 2023 with respect to site work for utilities and roadways.

GeoLogic Consultants, LLC observed the installation of sanitary sewer pipes & structures, stormwater pipes and structures, and waterlines pipes to include placement of bedding material for the referenced utilities, stone base, and asphalt with ASTM standard test methods.

The field density tests performed at selected locations and elevations should be indicative of the density of the fill within the limits of sampling and statistical accuracy. The test results indicate that the subject compacted fill and asphalt is in compliance with accepted geotechnical engineering practices at the location of the individual tests.

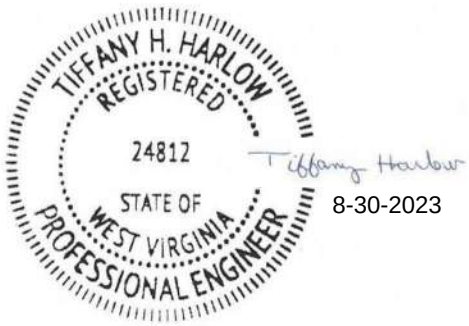
The locations of the individual tests are in reference to a field stakeout (horizontal and vertical) performed by others and a grading plan prepared by others. GeoLogic assumes no responsibility for any revisions to the location or alignment of structures that impacts the shape, size and general location of the structures and compacted fill. Subgrade elevations are referenced based on the site grading plans provided to us by others.

According to the field and laboratory test reports, the tests were performed in accordance with ASTM, appropriate industry standards. All construction to date met density requirements; all material depths were verified for compliance; and road and parking areas have been constructed in strict accordance with the approved plans and specifications. Where discrepancies were observed, if any, corrections or modifications were made.

Should you have any questions or comments regarding the content of this letter contact me at (571) 356-3176.

Respectfully Submitted,

GeoLogic Consultants, LLC



Tiffany Harlow, P.E.
Principal Engineer

Attachments: Field Density Report Summary
Field Density Tests for Asphalt
Concrete Test Results and Break Results

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I
Chantilly, VA 20151

COMPACTION SUMMARY
FINAL REPORT

SITEWORK

Project: NORBORNE GLEBE PH 14-A
Client: ARCADIA LAND
Contractor: GANTT EXCAVATING

Project No.: 10300
Report Date: 8/30/23

Date	Test #	Sta. No.	Test Location	Structure		Elev	Lab #	% Comp. Req'd	Density		M%	% Comp	Pass?
				From	To	-SG			Wet	Dry			
10/06/21	1	10+50	Stratton Dr	N/A	N/A	-6.0	3	95.0	132.5	114.1	16.1	97.1	Y
	2	11+50	Stratton Dr	N/A	N/A	-6.0	3	95.0	133.4	116.1	14.9	98.8	Y
11/11/21	1	10+50	Stratton Dr	N/A	N/A	-6.0	4	95.0	141.2	126.0	12.0	98.4	Y
	2	11+50	Stratton Dr	N/A	N/A	-6.0	4	95.0	138.2	124.6	10.9	97.3	Y
11/15/21	1	10+50	Stratton Dr	N/A	N/A	-5.0	1	95.0	123.9	104.2	18.9	96.1	Y
	2	11+50	Stratton Dr	N/A	N/A	-5.0	1	95.0	121.3	104.5	16.1	96.4	Y
11/16/21	1	13+00	Waterline Stratton Dr	N/A	N/A	-2.0	1	95.0	124.1	105.4	177.0	97.3	Y
	2	13+00	Waterline Stratton Dr	N/A	N/A	-1.0	1	95.0	122.5	103.9	17.9	95.9	Y
	3	12+00	Waterline Stratton Dr	N/A	N/A	-2.0	1	95.0	124.8	104.9	18.9	96.8	Y
	4	12+00	Waterline Stratton Dr	N/A	N/A	-1.0	1	95.0	121.8	104.0	17.0	96.0	Y
	5	11+00	Waterline Stratton Dr	N/A	N/A	-2.0	1	95.0	128.4	108.1	18.8	99.7	Y
11/17/21	1	13+00	Waterline Stratton Dr	N/A	N/A	EG	1	95.0	121.4	104.4	16.4	96.3	Y
	2	12+00	Waterline Stratton Dr	N/A	N/A	EG	1	95.0	124.0	105.3	17.8	97.2	Y
	3	11+00	Waterline Stratton Dr	N/A	N/A	-1.0	1	95.0	122.4	103.4	18.4	95.4	Y
	4	11+00	Waterline Stratton Dr	N/A	N/A	EG	1	95.0	127.5	107.9	18.2	99.5	Y
11/18/21	1	13+50	Stratton Dr	N/A	N/A	-3.0	2	95.0	124.6	102.3	21.9	99.9	Y
	2	12+50	Stratton Dr	N/A	N/A	-2.0	2	95.0	120.3	101.4	18.6	99.0	Y
	3	10+50	Waterline Stratton Dr	N/A	N/A	-1.0	1	95.0	122.9	105.1	17.0	97.0	Y
	4	11+50	Waterline Stratton Dr	N/A	N/A	-1.0	1	95.0	126.2	107.9	16.9	99.6	Y
	5	10+50	Waterline Stratton Dr	N/A	N/A	EG	1	95.0	120.5	103.4	16.5	95.4	Y
	6	11+50	Waterline Stratton Dr	N/A	N/A	EG	1	95.0	124.9	104.3	19.8	96.2	Y
11/19/21	1	11+50	Stratton Dr/Renamed Jack Rabbit	N/A	N/A	-1.0	2	95.0	117.7	98.4	19.6	96.0	Y
	2	10+50	Stratton Dr/Renamed Jack Rabbit	N/A	N/A	-1.0	2	95.0	121.1	100.2	20.9	97.7	Y
	3	10+50	Stratton Dr	N/A	N/A	-2.0	2	95.0	124.8	106.7	16.9	98.5	Y
	4	11+50	Stratton Dr	N/A	N/A	-1.0	2	95.0	127.3	108.1	17.7	99.7	Y
	5	10+50	Stratton Dr	N/A	N/A	-1.0	1	95.0	125.6	105.1	19.5	96.9	Y
11/22/21	1	11+50	Stratton Dr Waterline	N/A	N/A	EG	1	95.0	127.0	107.8	17.8	99.4	Y
	2	10+50	Stratton Dr Waterline	N/A	N/A	EG	1	95.0	128.5	107.5	19.5	99.2	Y
	3	10+50	Stratton Dr	N/A	N/A	-2.0	2	95.0	119.8	101.8	17.7	99.3	Y
	4	11+50	Stratton Dr	N/A	N/A	-3.0	2	95.0	120.4	99.9	20.6	97.4	Y
	5	10+50	Stratton Dr	N/A	N/A	-4.0	2	95.0	116.0	98.5	17.7	96.1	Y
	6	11+50	Stratton Dr	N/A	N/A	-2.0	2	95.0	119.4	100.3	19.0	97.9	Y
	7	10+50	Stratton Dr	N/A	N/A	-4.0	2	95.0	122.3	101.9	20.0	99.4	Y

	8	11+50	Stratton Dr	N/A	N/A	-1.0	2	95.0	117.1	98.8	18.6	96.4	Y
	9	10+50	Stratton Dr	N/A	N/A	-2.0	2	95.0	120.0	100.6	19.7	98.2	Y
	10	11+50	Stratton Dr	N/A	N/A	-1.0	2	95.0	115.6	97.9	18.0	95.5	Y
	11	10+50	Stratton Dr	N/A	N/A	SG	2	95.0	120.2	101.3	18.7	98.8	Y
	12	11+50	Stratton Dr	N/A	N/A	SG	2	95.0	119.3	99.9	19.4	97.5	Y
11/23/21	1	12+50	Stratton Dr/High Hopes Way Waterline	N/A	N/A	-1.0	1	95.0	122.1	103.2	18.3	95.2	Y
	2	12+50	Stratton Dr/High Hopes Way Waterline	N/A	N/A	EG	1	95.0	124.9	105.6	18.3	97.4	Y
	3	11+50	Stratton Dr	N/A	N/A	-5.0	2	95.0	123.0	102.3	20.2	99.8	Y
	4	11+50	Stratton Dr	N/A	N/A	-4.0	2	95.0	123.0	101.3	18.7	98.8	Y
	5	11+50	Stratton Dr	N/A	N/A	-3.0	2	95.0	115.5	97.9	18.0	95.5	Y
11/24/21	1	13+50	Stratton Dr/High Hopes Way Waterline	N/A	N/A	-1.0	1	95.0	128.8	108.5	18.7	100.1	Y
	2	14+25	Stratton Dr/High Hopes Way Waterline	N/A	N/A	EG	1	95.0	123.9	104.8	18.2	96.7	Y
	3	13+50	Stratton Dr/High Hopes Way Waterline	N/A	N/A	-1.0	1	95.0	128.2	107.5	19.2	99.2	Y
	4	14+25	Stratton Dr/High Hopes Way Waterline	N/A	N/A	EG	1	95.0	129.0	109.9	17.4	101.4	Y
12/01/21	1	N/A	Manhole 1405	N/A	N/A	EG	2	95.0	115.2	98.0	18.2	95.6	Y
	2	N/A	Manhole 1406	N/A	N/A	EG	2	95.0	117.3	98.3	19.3	95.9	Y
	3	N/A	Manhole 1407	N/A	N/A	EG	2	95.0	112.8	98.0	15.1	95.6	Y
	4	N/A	Manhole 1408	N/A	N/A	EG	2	95.0	118.5	100.5	17.9	98.0	Y
	5	N/A	Manhole 1410	N/A	N/A	EG	2	95.0	119.8	102.8	16.5	100.3	Y
12/02/21	1	N/A	Stratton Dr	N/A	N/A	EG	4	95.0	131.6	118.9	10.7	97.0	Y
	2	N/A	Stratton Dr	N/A	N/A	EG	4	95.0	139.3	121.8	14.4	99.4	Y
	3	N/A	Stratton Dr	N/A	N/A	EG	4	95.0	139.8	123.7	13.0	100.9	Y
	4	N/A	High Hopes Way	N/A	N/A	EG	4	95.0	136.4	122.0	11.8	99.5	Y
12/06/21	1	N/A	Water Service 1	N/A	N/A	EG	3	95.0	127.1	112.8	12.6	98.0	Y
	2	N/A	Water Service 2	N/A	N/A	EG	1	95.0	121.1	104.0	16.5	95.9	Y
	3	N/A	Water Service 3	N/A	N/A	EG	2	95.0	119.5	100.6	18.8	98.1	Y
12/07/21	1	N/A	Manhole ZM01	N/A	N/A	-7.0	4	95.0	136.0	121.5	11.9	99.1	Y
	2	N/A	Manhole ZM01	N/A	N/A	-6.0	3	95.0	131.9	114.8	14.9	99.7	Y
	3	N/A	Manhole ZM01	N/A	N/A	-5.0	3	95.0	133.0	115.6	15.0	100.5	Y
	4	N/A	Manhole ZM01	N/A	N/A	-4.0	4	95.0	137.5	122.7	12.1	100.1	Y
	5	N/A	Manhole ZM01	N/A	N/A	-3.0	5	95.0	146.6	130.1	12.7	101.5	Y
	6	N/A	Manhole ZM01	N/A	N/A	-2.0	5	95.0	142.8	130.3	9.6	101.7	Y
	7	N/A	Manhole ZM01	N/A	N/A	-1.0	3	95.0	126.2	114.6	10.0	99.6	Y
	8	N/A	Manhole ZM01	N/A	N/A	SG	4	95.0	135.0	121.9	10.8	99.4	Y
	9	N/A	Water Service 4	N/A	N/A	SG	3	95.0	127.2	110.6	15.0	96.1	Y
	10	N/A	Water Service 5	N/A	N/A	SG	3	95.0	129.7	110.9	16.9	96.4	Y
	11	N/A	Water Service 6	N/A	N/A	SG	3	95.0	129.2	112.8	14.5	98.0	Y
	12	N/A	Water Service 7	N/A	N/A	SG	3	95.0	124.5	109.8	13.4	95.4	Y
12/08/21	1	N/A	Fire Hydrant	N/A	N/A	-3.0	3	95.0	130.6	117.3	11.4	101.9	Y
	2	N/A	Fire Hydrant	N/A	N/A	-2.0	1	95.0	124.5	107.1	16.2	98.8	Y
	3	N/A	Fire Hydrant	N/A	N/A	-1.0	3	95.0	127.3	114.7	11.0	99.6	Y
	4	N/A	Manhole ZM01 Stub Out	N/A	N/A	-4.0	4	95.0	133.9	121.0	10.7	98.7	Y

	5	N/A	Manhole ZM01 Stub Out	N/A	N/A	-3.0	4	95.0	135.3	121.9	11.0	99.4	Y
	6	N/A	Manhole ZM01 Stub Out	N/A	N/A	-2.0	3	95.0	133.2	114.8	16.1	99.7	Y
	7	N/A	Manhole ZM01 Stub Out	N/A	N/A	-1.0	4	95.0	138.1	121.7	13.5	99.3	Y
	8	N/A	Manhole ZM01 Stub Out	N/A	N/A	SG	4	95.0	139.2	122.3	13.8	99.8	Y
12/09/21	1	10+50	Stratton Dr	N/A	N/A	-1.0	1	95.0	119.8	103.5	15.8	95.5	Y
	2	11+50	Stratton Dr	N/A	N/A	-1.0	1	95.0	121.3	104.4	16.2	96.3	Y
	3	10+50	Stratton Dr	N/A	N/A	SG	2	95.0	130.3	110.2	18.2	101.7	Y
	4	11+50	Stratton Dr	N/A	N/A	SG	2	95.0	129.6	110.0	17.8	101.5	Y
	5	12+50	Stratton Dr	N/A	N/A	SG	2	95.0	125.4	107.5	16.6	99.2	Y
	6	13+50	Stratton Dr	N/A	N/A	SG	2	95.0	128.9	110.4	16.8	101.8	Y
	7	10+50	High Hopes Way	N/A	N/A	SG	1	95.0	129.5	108.1	19.8	99.7	Y
	8	11+50	High Hopes Way	N/A	N/A	SG	1	95.0	127.0	108.7	16.8	100.3	Y
12/13/21	1	N/A	Manhole 1412	N/A	N/A	-1.0	1	95.0	123.1	105.4	16.8	97.3	Y
	2	N/A	Manhole 1412	N/A	N/A	SG	2	95.0	120.3	100.0	20.3	97.5	Y
	3	N/A	Electrical Crossing 1	N/A	N/A	-1.0	1	95.0	120.8	105.1	14.9	96.9	Y
	4	N/A	Electrical Crossing 1	N/A	N/A	SG	3	95.0	130.7	114.0	14.6	99.1	Y
	5	N/A	Electrical Crossing 2	N/A	N/A	-1.0	1	95.0	125.8	103.9	21.1	95.9	Y
	6	N/A	Electrical Crossing 2	N/A	N/A	SG	3	95.0	131.5	114.1	15.2	99.2	Y
12/14/21	17		Storm Water	1412	1416	-2.0	2	95.0	121.3	101.1	19.9	98.7	Y
	18		Storm Water	1412	1413	-2.0	1	95.0	129.7	110.3	17.6	101.6	Y
	19		Storm Water	1413	1414	-2.0	3	95.0	124.3	109.7	13.3	95.3	Y
	20		Storm Water	1413	1414	-1.0	3	95.0	131.5	112.2	17.3	97.4	Y
12/15/21	1	N/A	Storm Water	1413	1414	-1.0	3	95.0	130.1	111.3	16.9	96.7	Y
	2	N/A	Storm Water	1413	1414	SG	3	95.0	131.9	111.2	18.6	96.6	Y
	3	N/A	Water Service 9	N/A	N/A	-1.0	1	95.0	119.0	106.8	11.4	98.5	Y
	4	N/A	Water Service 9	N/A	N/A	SG	3	95.0	130.2	111.7	16.6	97.8	Y
	5	N/A	Water Service 10	N/A	N/A	-1.0	3	95.0	126.4	111.5	13.4	96.9	Y
	6	N/A	Water Service 10	N/A	N/A	SG	1	95.0	124.6	107.8	15.5	99.5	Y
	7	N/A	Water Service 11	N/A	N/A	-1.0	1	95.0	125.1	107.1	16.8	98.8	Y
	8	N/A	Water Service 11	N/A	N/A	SG	3	95.0	133.6	115.7	15.5	100.5	Y
	9	N/A	Water Service 12	N/A	N/A	-1.0	3	95.0	127.2	109.4	16.3	95.0	Y
	10	N/A	Water Service 12	N/A	N/A	SG	3	95.0	130.4	113.1	15.3	98.3	Y
12/16/21	23	N/A	Electrical Crossing 1	N/A	N/A	SG	3	95.0	128.0	113.6	12.6	98.7	Y
	24	N/A	Electrical Crossing 2	N/A	N/A	SG	3	95.0	125.6	109.7	14.6	95.3	Y
12/22/21	1	N/A	Water Service 23	1413	1414	SG	3	95.0	129.6	114.1	13.6	99.1	Y
	2	N/A	Water Service 24	1413	1414	SG	3	95.0	130.4	115.2	13.2	100.1	Y
	3	N/A	Water Service 25	N/A	N/A	SG	3	95.0	127.7	109.6	16.5	95.2	Y
	4	N/A	Water Service 26	N/A	N/A	SG	1	95.0	124.9	108.2	15.4	99.8	Y
	5	10+50	Stratton Dr	N/A	N/A	SG	1	95.0	134.4	132.3	1.6	101.0	Y
	6	11+50	Stratton Dr	N/A	N/A	SG	1	95.0	132.0	128.1	3.1	97.9	Y
	7	12+50	Stratton Dr	N/A	N/A	SG	1	95.0	132.5	128.9	2.8	98.4	Y

	8	13+50	Stratton Dr	N/A	N/A	SG	1	95.0	127.7	124.7	2.4	95.3	Y
	9	12+80	Stratton Dr Parking Area	N/A	N/A	SG	5	95.0	131.5	128.3	2.5	98.0	Y
	10	13+00	Stratton Dr Parking Area	N/A	N/A	SG	5	95.0	130.7	128.3	1.9	98.0	Y
	11	13+20	Stratton Dr Parking Area	N/A	N/A	SG	5	95.0	130.0	126.7	2.6	96.8	Y
	12	13+40	Stratton Dr Parking Area	N/A	N/A	SG	5	95.0	128.0	124.8	2.6	95.3	Y
	13	13+62	Jack Rabbit Run Hammerhead	N/A	N/A	SG	5	95.0	130.6	126.7	3.1	96.8	Y
	14	13+00	Jack Rabbit Run	N/A	N/A	SG	5	95.0	134.4	131.1	2.6	100.1	Y
	15	12+50	Jack Rabbit Run	N/A	N/A	SG	5	95.0	134.5	130.5	3.1	99.7	Y
	16	11+50	High Hopes Way Parking Area	N/A	N/A	SG	5	95.0	135.3	131.5	2.9	100.1	Y
	17	11+00	High Hopes Way Parking Area	N/A	N/A	SG	5	95.0	135.6	131.5	3.1	100.5	Y
	18	10+50	High Hopes Way Parking Area	N/A	N/A	SG	5	95.0	129.7	125.9	3.0	96.2	Y
1/5/22	1	N/A	Storm Water	1413A	1414	-1.0	3	95.0	121.2	111.6	8.5	97.0	Y
	2	N/A	Storm Water	1414	1415	-1.0	3	95.0	124.3	113.1	10.0	98.2	Y
1/6/22	1	N/A	Storm Water	1413A	1414	SG	5	95.0	133.5	128.8	3.6	98.4	Y
	2	N/A	Storm Water	1414	1415	SG	5	95.0	137.5	132.1	4.0	101.0	Y
02/10/22	1	N/A	Water Service 15	N/A	N/A	-3.0	5	95.0	134.7	130.8	3.0	99.9	Y
	2	N/A	Water Service 15	N/A	N/A	-1.0	5	95.0	128.9	124.5	3.5	95.1	Y
	3	N/A	Water Service 15	N/A	N/A	SG	5	95.0	133.8	129.8	3.1	99.2	Y
	4	N/A	Water Service 16	N/A	N/A	-2.0	5	95.0	135.9	130.7	4.0	99.9	Y
	5	N/A	Water Service 16	N/A	N/A	-1.0	5	95.0	136.3	130.6	4.3	99.8	Y
	6	N/A	Water Service 16	N/A	N/A	SG	5	95.0	129.7	126.4	2.7	96.5	Y
	7	N/A	Water Service 17	N/A	N/A	-2.0	5	95.0	132.5	128.3	3.3	98.0	Y
	8	N/A	Water Service 17	N/A	N/A	-1.0	5	95.0	128.2	124.9	2.6	95.4	Y
	9	N/A	Water Service 17	N/A	N/A	SG	5	95.0	134.0	129.4	3.6	98.8	Y
	10	N/A	Water Service 18	N/A	N/A	-3.0	5	95.0	132.7	128.0	3.7	97.8	Y
	11	N/A	Water Service 18	N/A	N/A	-2.0	5	95.0	134.9	129.6	4.1	99.0	Y
	12	N/A	Water Service 18	N/A	N/A	-1.0	5	95.0	130.8	125.2	4.5	95.6	Y
	13	N/A	Water Service 18	N/A	N/A	SG	5	95.0	134.6	129.1	4.3	98.6	Y
	14	N/A	Water Service 19	N/A	N/A	-2.0	5	95.0	131.2	126.8	3.4	96.9	Y
	15	N/A	Water Service 19	N/A	N/A	-1.0	5	95.0	130.2	124.7	4.4	95.2	Y
	16	N/A	Water Service 19	N/A	N/A	SG	5	95.0	129.5	125.6	3.1	95.9	Y
04/21/22	1	10+00	Stratton Dr (Jack Rabbit Run)	N/A	N/A	SG	5	95	136.2	128.2	6.3	97.9	Y
	2	11+00	Stratton Dr (Jack Rabbit Run)	N/A	N/A	SG	5	95	133.5	125.9	6.0	96.2	Y
	3	12+00	Stratton Dr (Jack Rabbit Run)	N/A	N/A	SG	5	95	137.2	128.7	6.6	98.3	Y
	4	10+00	Stratton Dr (High Hopes Way)	N/A	N/A	SG	5	95	135.7	129.0	5.2	98.5	Y
	5	11+00	Stratton Dr (High Hopes Way)	N/A	N/A	SG	5	95	133.2	126.2	5.5	96.4	Y
	6	12+00	Stratton Dr (High Hopes Way)	N/A	N/A	SG	5	95	132.9	125.3	6.0	95.7	Y
07/13/22	1	N/A	Stone Base	N/A	N/A	SG	5	95	128.1	124.5	2.9	95.1	Y
	2	N/A	Stone Base	N/A	N/A	SG	5	95	130.1	124.4	4.6	95.0	Y
	3	N/A	Stone Base	N/A	N/A	SG	5	95	133.2	126.6	5.3	96.7	Y
09/28/22	1	N/A	Line Deletion	N/A	N/A	-2.0	5	95	132.5	125.3	5.7	95.7	Y
	2	N/A	Line Deletion	N/A	N/A	-1.0	5	95	136.7	128.4	6.5	98.1	Y
	3	N/A	Line Deletion	N/A	N/A	SG	5	95	131.2	125.5	4.6	95.9	Y

NORBORNE GLEBE PHASE 14-A

ASPHALT REPORTS

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I, Chantilly, VA 20151

DAILY FIELD REPORT

Project:	Norborne Glebe Ph14a	Report #:	137
Client:	Arcadia Land, Inc.	Date:	12/23/21
Contractor	Gantt's Excavating	Weather:	25 Cloudy F
Project #:	10300		

Work Performed: Backfill/Compaction of Tamarack Soft Spot at Manholes ZL3, 864, and 861

Compaction of Private Base 2 Aspahlt for Stratton Dr, Jack Rabbit Run, and High Hopes Way

Work Performed:

1- The undersigned GeoLogic inspector arrived on-site, as requested to monitor placement & compaction of structural fill at the above locations.

Utilizing the Nuclear Gauge Test Method (ASTM D6938) to check the compaction, test results indicated that the materials, at the areas and elevations tested, met the project requirements of 95 percent of the corrected maximum dry density as determined in the laboratory. Materials observed on this date also appeared to be placed in accordance with project plans and specifications with regard to lift thickness and moisture content.

2- The undersigned arrived on-site, as requested, to observe the placement and compaction of 3 inches of Private Base 2 mix along above locations. Please see the attached sketch.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Remarks:

Inspector:	Zachary Noakes
Total Time:	8 hrs.
Project Engineer:	Mark Hood, P.E.

(703) 282-2714

COMPACTION TEST REPORT

Report #: 137
Date: 12/23/21

Project:	Norborne Glebe Ph8	Inspector:	Zachary Noakes
Contractor:	Gantt Excavating	Gauge Serial #:	27001
Compaction Method:	Smoothdrum vibratory roller	DS:	1952
Project #:	10300	MS:	657

#	Sta	Test Location	Structure		Elev	Lab #	% Compaction Required	Density		M%	% Comp	Pass?
			From	To	SG			Wet	Dry			
1	N/A	Manhole ZL3	N/A	N/A	-3.5	5	95.0	132.0	127.5	3.6	97.4	Y
2	N/A	Manhole ZL3	N/A	N/A	-3.0	5	95.0	133.8	129.5	3.3	99.0	Y
3	N/A	Manhole ZL3	N/A	N/A	-2.5	5	95.0	130.7	126.1	3.6	96.4	Y
4	N/A	Manhole ZL3	N/A	N/A	-2.0	5	95.0	132.1	127.7	3.4	97.5	Y
5	N/A	Manhole ZL3	N/A	N/A	-1.5	5	95.0	134.0	129.9	3.1	99.3	Y
6	N/A	Manhole ZL3	N/A	N/A	-1.0	5	95.0	134.0	130.1	2.9	99.4	Y
7	N/A	Manhole ZL3	N/A	N/A	-0.5	5	95.0	132.0	127.3	3.7	97.3	Y
8	N/A	Manhole ZL3	N/A	N/A	SG	5	95.0	132.5	128.1	3.4	97.8	Y
9	N/A	Manhole 861	N/A	N/A	-2.0	5	95.0	132.5	127.7	3.8	97.5	Y
10	N/A	Manhole 861	N/A	N/A	-1.0	5	95.0	132.7	127.5	4.1	97.4	Y
11	N/A	Manhole 861	N/A	N/A	SG	5	95.0	133.5	128.8	3.6	98.4	Y
12	N/A	Manhole 864	N/A	N/A	-1.0	5	95.0	132.7	128.5	3.3	98.1	Y
13	N/A	Manhole 864	N/A	N/A	SG	5	95.0	138.1	134.3	2.9	102.6	Y
14												
15												
16												
17												
18												
19												
20												
21												

PROCTOR INFORMATION

#	Detailed Soil Description	Dry Density	M%	+4%	Corrected	
					Density	M%
1	Red Lean Clay with Sand	104.5	19.6	10.0	108.4	17.8
2	Yellow Tan Lean Clay with Sand	102.5	20.7	0.0	102.5	20.7
3	Red Lean Clay with Sand	104.5	19.6	25.0	115.1	15.2
4	Red Lean Clay with Sand and Gravel	104.5	19.6	40.0	122.6	12.6
5	Yellowish Gray, Well-graded Gravel with Sand	127.1	10.4	12.3	130.9	9.3

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 12/23/2021
Project Norborne Glebe Ph14a **Street** High Hopes Way Parking Area
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** High Hopes Way

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** BS

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	12+00	L		131.7
2	11+50	C/L		136.3
3	11+25	R		139.0
4	11+00	C/L		140.2
5	10+50	L		136.0
6	10+00	R		144.7
			AVERAGE	138.0

REMARKS
Target Density from Jefferson Asphalt:
Private Base 2 = 131.5
Target Density from Field Marshall Value:
Private Base 2 = 146.3

TARGET DENSITY 146.3 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 94.3 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
12/23/21 — *Date*

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 12/23/2021

Project Norborne Glebe Ph14a **Street** Jack Rabbit Run

From Station _____ **To Station** _____ **Lane** _____ **Width** _____

Mix Type Private Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum

Mix Producer Jefferson Asphalt **Location** Jack Rabbit Run

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** BS

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	11+30	L		149
2	11+20	C/L		147.7
3	11+00	R		152.4
4	10+80	C/L		149.6
5	10+30	L		151.2
6	10+00	R		144.1
			AVERAGE	149.0

REMARKS

Target Density from Jefferson Asphalt:
Private Base 2 = 131.5
Target Density from Field Marshall Value:
Private Base 2 = 146.3

TARGET DENSITY 146.3 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 101.8 (Average/Target x 100)

(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____

(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*

12/23/21 — *Date*

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 12/23/2021
Project Norborne Glebe Ph14a **Street** Stratton Dr Main
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Stratton Dr

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** BS

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	12+00	L		148.5
2	11+50	C/L		145.3
3	11+25	R		149.5
4	11+00	C/L		153.0
5	10+50	L		145.6
6	10+00	R		147.5
			AVERAGE	148.2

REMARKS
Target Density from Jefferson Asphalt:
Private Base 2 = 131.5
Target Density from Field Marshall Value:
Private Base 2 = 146.3

TARGET DENSITY 146.3 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 101.3 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
12/23/21 — *Date*

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 12/23/2021
Project Norborne Glebe Ph14a **Street** Stratton Dr Parking Area
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Stratton Dr

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** BS

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	14+25	L		157.4
2	14+00	C/L		145.4
3	13+75	R		147.5
4	13+50	C/L		150.9
5	13+25	L		152.1
6	13+00	R		150.3
			AVERAGE	150.6

REMARKS
Target Density from Jefferson Asphalt:
Private Base 2 = 131.5
Target Density from Field Marshall Value:
Private Base 2 = 146.3

TARGET DENSITY 146.3 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 102.9 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
12/23/21 — *Date*

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I, Chantilly, VA 20151

DAILY FIELD REPORT

Project:	Norborne Glebe Ph7	Report #:	192
Client:	Arcadia Land, Inc.	Date:	04/27/22
Contractor	Jefferson Asphalt	Weather:	64 P. Cloudy F
Project #:	10300		

Work Performed: Compaction of Private Base 2 Asphalt for Stratton (Jack Rabbit Run) Dr and Stratton Dr (High Hopes Way)

Work Performed:

1- The undersigned arrived on-site, as requested, to observe the placement and compaction of 3 inches of Private Base 2 mix along above locations.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Remarks:

Inspector:	Zachary Noakes
Total Time:	10 hrs.
Project Engineer:	Mark Hood, P.E.

(703) 282-2714

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 4/27/2022
Project Norborne Glebe Ph14a **Street** Stratton (High Hopes Way) Dr
From Station 10+00 **To Station** 12+00 **Lane** _____ **Width** _____
Mix Type Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Jack Rabbit Run

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	10+00	NB		158.2
2	10+50	C/L		156.8
3	11+00	SB		154.2
4	11+50	C/L		155.2
5	12+00	NB		153.0
6	10+00	SB		150.3
			AVERAGE	154.6

REMARKS
Target Density from Jefferson Asphalt = 131.5
Target Density from Field Marshall Value = 155.7

TARGET DENSITY 155.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 99.3 (Average/Target x 100)

(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
04/27/22 — *Date*

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 4/27/2022
Project Norborne Glebe Ph14a **Street** Stratton (Jack Rabbit Run) Dr
From Station 10+00 **To Station** 12+50 **Lane** _____ **Width** _____
Mix Type Base 2 **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Jack Rabbit Run

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1	10+00	WB		156.6
2	10+50	C/L		154.8
3	11+00	EB		151.1
4	11+50	C/L		156.5
5	12+00	WB		159.9
6	12+50	EB		154.8
			AVERAGE	155.6

REMARKS
Target Density from Jefferson Asphalt = 131.5
Target Density from Field Marshall Value = 155.7

TARGET DENSITY 155.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 99.9 (Average/Target x 100)

(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*

04/27/22 — *Date*

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I, Chantilly, VA 20151

DAILY FIELD REPORT

Project:	Norborne Glebe Ph14a	Report #:	236
Client:	Arcadia Land, Inc.	Date:	07/13/22
Contractor	Gantt's Excavating	Weather:	Sunny 88 F
Project #:	10300		

Work Performed: Backfill/Compaction of Stone Base for Ph14a Asphalt Trail

Placement/Compaction of Private Base Asphalt for Ph14a Asphalt Trail

Work Performed:

The undersigned GeoLogic inspector arrived on-site, as requested to monitor placement & compaction of structural fill at the above locations.

1-Utilizing the Nuclear Gauge Test Method (ASTM D6938) to check the compaction, test results indicated that the materials, at the areas and elevations tested, met the project requirements of 95 percent of the corrected maximum dry density as determined in the laboratory. Materials observed on this date also appeared to be placed in accordance with project plans and specifications with regard to lift thickness and moisture content.

2- The undersigned arrived on-site, as requested, to observe the placement and compaction of 3 inches of Private Base mix along above locations.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 92% of the maximum wet density as obtained by using the Marshal Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Remarks:

Inspector:	Zachary Noakes
Total Time:	8 hrs.
Project Engineer:	Mark Hood, P.E.

(703) 282-2714

COMPACTION TEST REPORT

Report #: 236
Date: 07/13/22

Project:	Norborne Glebe Ph14a	Inspector:	Zachary Noakes
Contractor:	Gantt Excavating	Gauge Serial #:	23496
Compaction Method:	Sheepsfoot vibratory roller	DS:	1584
Project #:	10300	MS:	575

#	Sta	Test Location	Structure		Elev	Lab #	% Compaction Required	Density		M%	% Comp	Pass?
			From	To	SG			Wet	Dry			
1	N/A	Stone Base	N/A	N/A	SG	5	95	128.1	124.5	2.9	95.1	Y
2	N/A	Stone Base	N/A	N/A	SG	5	95	130.1	124.4	4.6	95.0	Y
3	N/A	Stone Base	N/A	N/A	SG	5	95	133.2	126.6	5.3	96.7	Y
4												
5												
6												
7												
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10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

PROCTOR INFORMATION

#	Detailed Soil Description	Dry Density	M%	+4%	Corrected	
					Density	M%
1	Red Lean Clay with Sand	104.5	19.6	10.0	108.4	17.8
2	Yellow Tan Lean Clay with Sand	102.5	20.7	0.0	102.5	20.7
3	Red Lean Clay with Sand	104.5	19.6	25.0	115.1	15.2
4	Red Lean Clay with Sand and Gravel	104.5	19.6	65.0	134.4	8.2
5	Yellowish Gray, Well-graded Gravel with Sand	127.1	10.4	12.3	130.9	9.3

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 7/13/2022
Project Norborne Glebe Ph14a **Street** Ph14a Asphalt Trail
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Ph14a Asphalt Trail

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1				143.7
2				148.8
3				144.6
4				142.7
5				140.5
6				150.7
			AVERAGE	145.2

REMARKS
Target Density from Jefferson Asphalt = 131.5
Target Density from Field Marshall Value = 155.7

TARGET DENSITY 155.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 93.2 (Average/Target x 100)

(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
07/13/22 — *Date*

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I, Chantilly, VA 20151

DAILY FIELD REPORT

Project:	Norborne Glebe Ph14a	Report #:	292
Client:	Arcadia Land, Inc.	Date:	10/07/22
Contractor	Gantt's Excavating	Weather:	Sunny 82 F
Project #:	10300		

Work Performed: Placement/Compaction of Private Base Asphalt for Ph14A Patches

Work Performed:

The undersigned GeoLogic inspector arrived on-site, as requested to monitor placement & compaction of structural fill at the above locations.

2- The undersigned arrived on-site, as requested, to observe the placement and compaction of 3 inches of Private Base mix along above locations.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Remarks:

Inspector:	Zachary Noakes
Total Time:	8 hrs.
Project Engineer:	Mark Hood, P.E.

(703) 282-2714

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 10/7/2022
Project Norborne Glebe Ph14A **Street** Stratton Dr
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Private Base **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Jefferson Asphalt **Location** Stratton Dr Patches

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1		N/A		156.4
2		N/A		155.4
3		N/A		150.8
4		N/A		152.5
5		N/A		151.9
6		N/A		153.3
			AVERAGE	153.4

REMARKS
Target Density from Jefferson Asphalt = 131.5
Target Density from Field Marshall Value = 155.7

TARGET DENSITY 155.7 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 98.5 (Average/Target x 100)

(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes — *Signature*
10/07/22 — *Date*

GeoLogic Consultants, LLC
14301 Sullyfield Circle, Suite I, Chantilly, VA 20151

DAILY FIELD REPORT

Project:	Norborne Glebe Ph14A	Report #:	434
Client:	Arcadia Land, Inc.	Date:	08/10/23
Contractor	Stuart&Perry	Weather:	P Cloudy 80 F
Project #:	10516		

Work Performed: Placement/Compaction of Surface Mix of Stratton Dr

Work Performed:

1- The undersigned arrived on-site, as requested, to observe the placement and compaction of 1 to 3in inches of Surface mix along above locations.

Utilizing the Nuclear Method (ASTM D 2950) to check the compaction of the asphalt; test results indicated that the compacted material, at the areas and elevations tested, did meet or exceed the project requirements of 98% to 102% of the maximum wet density as obtained by using the Control Strip Method. The asphalt observed on this date appeared to be placed in compliance with project specifications with regard to lift thickness and lay down temperature.

Remarks:

Inspector:	Zachary Noakes
Total Time:	10 hrs.
Project Engineer:	Mark Hood, P.E.

(703) 282-2714

GeoLogic Consultants, LLC

WORKSHEET

Control Strip _____ **Date:** 8/10/2023
Project Norborne Glebe Ph14A **Street** Extrovert Dr
From Station _____ **To Station** _____ **Lane** _____ **Width** _____
Mix Type Surface **Mix No.** _____ **Rate** _____ **Roller Type** Smooth Drum
Mix Producer Stuart&Perry **Location** Stratton Dr

Nuc. Gauge Model No. _____ **Serial No.** _____ **Depth Setting** _____

NUCLEAR DENSITY TEST SECTION

SUB-LOT	STATION	REF C/L	DRY LBS	DENSITY CU. FT.
1		L		150.2
2		CL		147.7
3		R		148.9
4		L		149.4
5		CL		148.5
6		R		148.3
			AVERAGE	148.8

REMARKS
Target Density from Asphalt Plant = 146.1

TARGET DENSITY 146.1 (Lbs. Cu. Ft.)

PERCENT DENSITY ACHIEVED 101.9 (Average/Target x 100)
(Must be greater than 91.5%)

SEAL

Technician Zachary Noakes **Certification No.** _____
(please print)

Oberserved by _____ (Co. Inspector)

I CERTIFY THAT THE FOLLOWING REFERENCED TESTS WERE CONDUCTED IN CONFORMANCE WITH THE CURRENT VIRGINIA TEST METHODS (VTM) STANDARDS AND PROCEDURES AND WITH THE PRIOR APPROVAL OF THE APPROPRIATE INSPECTION DIVISION.

Zachary Noakes
Signature

08/10/23
Date

NORBORNE GLEBE PHASE 14-A

CONCRETE REPORTS

OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe Ph14a DATE: 10/17/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 50˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Stratton Dr Curb and Gutter

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
370	**534068**	**9.5**	**Yes**	**3.5**	**0.0**	**n/a**	**n/a**	**70.0**	**5.5**	**A**
330	534075	9.25	Yes							
370	534084	9.5	Yes							
330	**534090**	**9.25**	**Yes**							
308	**534097**	**9.25**	**Yes**							

TOTAL C.Y. **55** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Stratton Dr Curb and Gutter 10+00

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Project No: 2410.1900076.0000
ReportNo.: 2414386-1 CT 121721
WorkorderNo.: 2414386
Lab No.: 21B786-C

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 12/17/2021 | **At Lab On or Before:** 12/27/2021

General Information		Specified Strength / Sampling Times		Placement Information
General Contractor:		**Specified Strength:**	3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:		**Mix Design Strength:**	3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:		**Water Added at Site:**	N/A	**Total Placement for the Day:** N/A
Truck No.:	Unknown	**Time Batched:**		
Ticket No.:	Unknown	**Time Sampled:**		
Mix Design:	Unknown **Admixture:** N/A	**Weather Condition:**	Unknown	

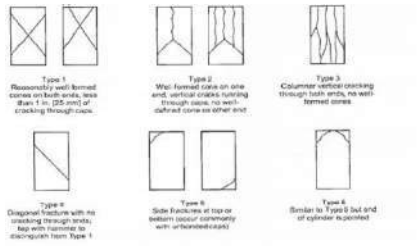
Field Test Results

Air Content: N/A	Slump: N/S	Ambient Temp: N/S	Concrete Temp: N/S	Unit Weight: N/A

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	12/24/2021	7	2	4.00	4.00	4.00	12.57	52,676	4,192	-	HZ
2*G*	12/24/2021	7	2	4.00	4.00	4.00	12.57	60,369	4,804	-	HZ
3*G*	12/24/2021	7	3	4.00	4.00	4.00	12.57	57,178	4,550	4,520	HZ
4*G*	01/14/2022	28	3	4.00	4.00	4.00	12.57	66,529	5,294	-	HZ
5*G*	01/14/2022	28	3	4.00	4.00	4.00	12.57	65,683	5,227	-	HZ
6*G*	01/14/2022	28	3	4.00	4.00	4.00	12.57	68,733	5,470	5,330	HZ

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with approved plans and specifications**



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OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe Ph14a DATE: 10/20/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 50˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Jack Rabbit Run Curb and Gutter

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
409	**534147**	**9.5**	**Yes**	**4.0**	**0.0**	**n/a**	**n/a**	**54.0**	**5.0**	**A**
336	534152	9.25	Yes							
409	534182	9.5	Yes							

TOTAL C.Y. **28** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Jack Rabbit Run Curb and gutter 12+50

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

Project No: 2410.1900076.0000
ReportNo.: 2414423-1 CT 122021
WorkorderNo.: 2414423
Lab No.: 21B801-C

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 12/20/2021 | **At Lab On or Before:** 12/27/2021

General Information	Specified Strength / Sampling Times	Placement Information
General Contractor:	**Specified Strength:** 3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:	**Mix Design Strength:** 3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:	**Water Added at Site:** N/A	**Total Placement for the Day:** N/A
Truck No.: Unknown	**Time Batched:**	
Ticket No.: Unknown	**Time Sampled:**	
Mix Design: Unknown **Admixture:** N/A	**Weather Condition:** Unknown	

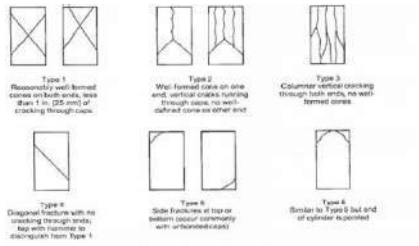
Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	12/27/2021	7	2	4.00	4.00	4.00	12.57	48,549	3,863	-	HZ
2*G*	12/27/2021	7	2	4.00	4.00	4.00	12.57	48,439	3,855	-	HZ
3*G*	12/27/2021	7	5	4.00	4.00	4.00	12.57	47,715	3,797	3,840	HZ
4*G*	01/17/2022	28	2	4.00	4.00	4.00	12.57	59,334	4,722	-	HZ
5*G*	01/17/2022	28	2	4.00	4.00	4.00	12.57	59,345	4,723	-	HZ
6*G*	01/17/2022	28	2	4.00	4.00	4.00	12.57	62,193	4,949	4,800	HZ

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with approved plans and specifications**



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OBSERVATION OF CONCRETE PLACEMENT REPORT

PROJECT: Norborne Glebe Ph14a DATE: 12/21/2021

CONTRACTOR: Gull Corp CONCRETE SUPPLIER: TBH Inc

WEATHER: Cloudy AIR TEMP: 40˚F FORM TEMP: n/a CURING BOX? No

PLACEMENT LOCATION: Jack Rabbit Run Curb and Gutter

Stratton Dr Parking Area Radi

TRUCK NO.	TICKET NO.	CUBIC YARDS	BATCH TO PLACEMENT TIME < 90 MIN.	1ST SLUMP (IN.)	WATER ADDED (GAL)	2ND SLUMP (IN.)	DISCH. SLUMP (IN.)	CONC TEMP	AIR (%)	TEST SERIES NO.
347	**534214**	**9.25**	**Yes**	**3.0**	**0.0**	**n/a**	**n/a**	**61.0**	**5.0**	**A**
417	534232	3	Yes							
336	534243	3	Yes							

TOTAL C.Y. **15.25** **Approved By:** Mark Hood P.E.

CONCRETE MIX PROPORTION/CUBIC YARD

NO.: 3223A CEMENT: ADMIXTURE:

FINE AGG: WATER ICE: ADMIXTURE:

COARSE AGG: NEWCEM: ADMIXTURE:

THE LOCATION THAT TEST SPECIMENS REPRESENT: Jack Rabbit Run Curb and gutter 13+00

METHOD: PRESSURE METER (X) OR VOLUMETRIC ( )

Inspector: Zach Noakes

GeoLogic Consultants, LLC

Project No: 2410.1900076.0000
ReportNo.: 2414424-1 CT 122121
WorkorderNo.: 2414424
Lab No.: 21B802-C

UNIVERSAL ENGINEERING SCIENCES
Geotechnical Engineering | Construction Materials Testing and Inspection
Building Code Compliance | Environmental Services | Facilities Consulting

14221-B Willard Road, Chantilly, VA 20151 - P: 703-652-5111 - F:

Compressive Strength of 4" x 8" Cylinder Test Specimens (ASTM C-39)

Client GeoLogic Consultants, LLC
14301 Sullyfield Circle Suite I, Chantilly, VA20151

Project Norborne Glebe
UES DC Metro Lab, , fairfax County, VA20151

Structural Element:

Sample Location: - Sampled at

Set#1 of 1 | **Sample From:** | **Sample By:** Client On 12/21/2021 | **At Lab On or Before:** 12/27/2021

General Information	Specified Strength / Sampling Times	Placement Information
General Contractor:	**Specified Strength:** 3000 psi @ 28 days	**Truck Load:** N/A
Subcontractor:	**Mix Design Strength:** 3000 psi @ 28 days	**Cumulative Quantity:** N/A
Supplier:	**Water Added at Site:** N/A	**Total Placement for the Day:** N/A
Truck No.: Unknown	**Time Batched:**	
Ticket No.: Unknown	**Time Sampled:**	
Mix Design: Unknown **Admixture:** N/A	**Weather Condition:** Unknown	

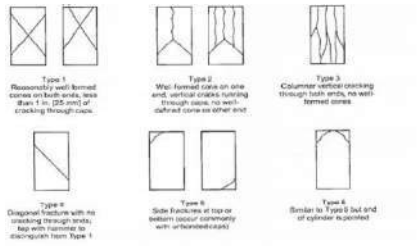
Field Test Results

Air Content: N/A	**Slump:** N/S	**Ambient Temp:** N/S	**Concrete Temp:** N/S	**Unit Weight: N/A**

Results of Laboratory Testing

Test Results	Date Tested	Age Days	Type Of Fracture	Actual Dimen.1 (in)	Actual Dimen.2 (in)	Avg. Dimen. (in)	Test X-Sect. Area (in²)	Max Compressive Load (lbs)	Test Compressive Strength(psi)	Average (psi)	Lab Tech ***
1*G*	12/28/2021	7	2	4.00	4.00	4.00	12.57	60,046	4,778	-	HZ
2*G*	12/28/2021	7	5	4.00	4.00	4.00	12.57	44,054	3,506	-	HZ
3*G*	12/28/2021	7	2	4.00	4.00	4.00	12.57	63,723	5,071	4,450	HZ
4*G*	01/18/2022	28	5	4.00	4.00	4.00	12.57	87,532	6,966	-	HZ
5*G*	01/18/2022	28	2	4.00	4.00	4.00	12.57	85,406	6,796	-	HZ
6*G*	01/18/2022	28	2	4.00	4.00	4.00	12.57	88,704	7,059	6,940	HZ

Remarks	Cylinders are tested at seven (7) days to get an early indication of the potential strength of the concrete, but the seven (7) day results are not to be used for concrete acceptance. When the compressive strength of the concrete has reached 70% of the specified strength, it is a reasonable practice to use this as an indication that 100% of the specified strength will be attained by twenty-eight (28) days.
Remarks	All information pertinent to concrete placement, slump, water, class, etc., along with casting the test specimens, was prepared by the client or contractor. Universal Engineering Sciences is only responsible for the compressive strength testing.
Note	- *H*- Hold Cylinder -*D*- Defective Cylinder, Un-testable -*E*- Excluded From Average -*G*- Good Condition
Note	**Test in compliance with approved plans and specifications**



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NORBORNE GLEBE

PHASE 14-A

PRELIMINARY SUBDIVISION / LAND DEVELOPMENT PLAT

MAJOR SLD 2017-04

CITY OF CHARLES TOWN

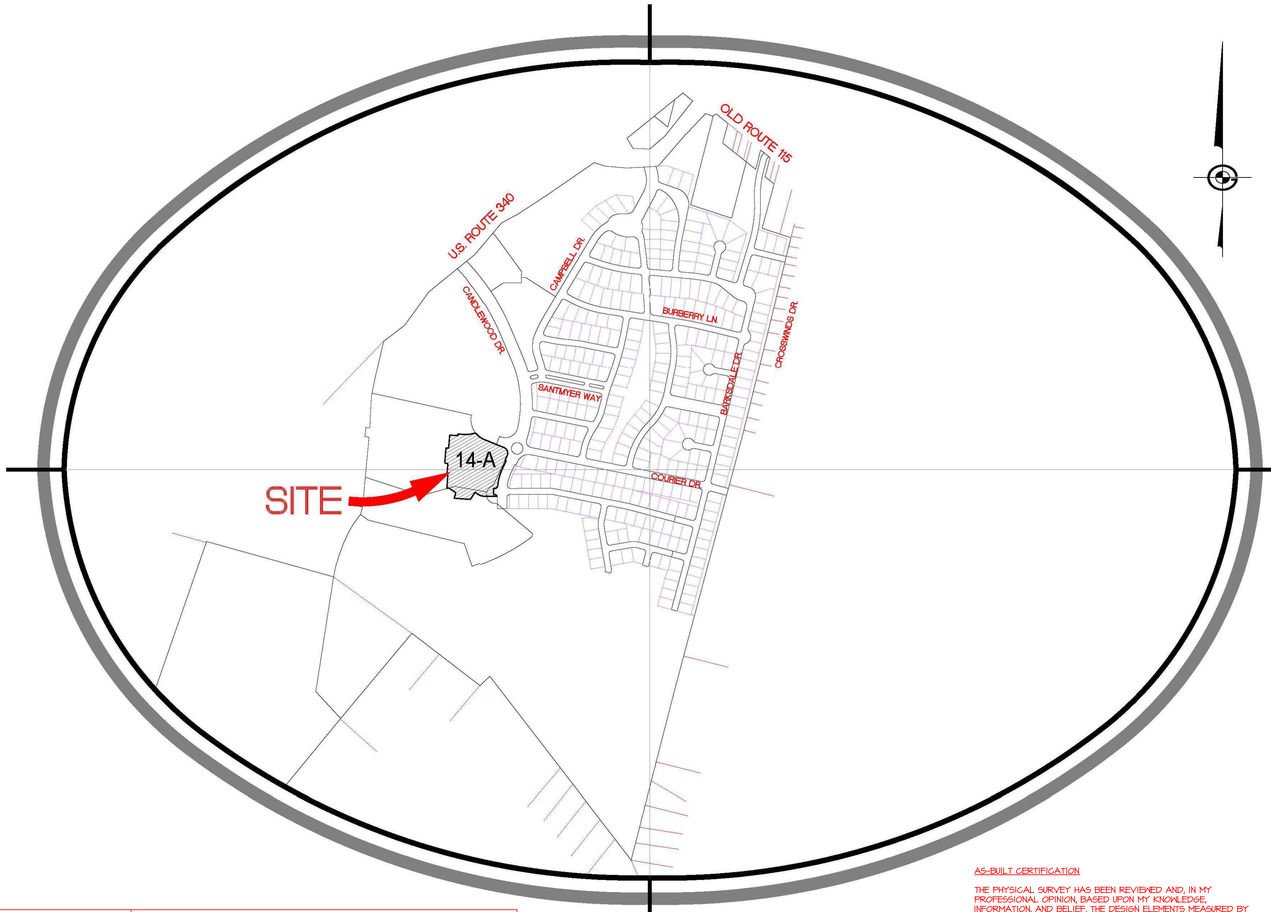
JEFFERSON COUNTY, WEST VIRGINIA

ZONED NEIGHBORHOOD RESIDENTIAL (NR)

Plan Revisions

Date	Comment
09/14/2017	Revised Per C.T.U.B. Comments
09/28/2017	Revised Per J.C.P.S.D. Comments
01/25/2018	Revised Per City of Charles Town Comments
02/16/2018	Revised Per Portion of the "Client Review" Comments
08/06/2018	Revised Per Client Bid Clarification
08/09/2018	Revised Per Client Bid Clarification
10/01/2018	Revised Per City of Charles Town Comments
11/09/2018	Revised Per Agency Comments
11/26/2018	Waiver Approvals
01/20/2019	**Zoning Administrator Approval Issued**
02/09/2021	Revised Lot Geometry, Grading and Utility Alignments

SITE AS-BUILT



VICINITY MAP

SCALE: 1" = 600'

Sheet List Table

Sheet Number	Sheet Title
1	Cover Sheet
2	General Notes & Site Computations
3	Adjoining Owner Information and Phasing Key
4	Erosion & Sediment Control Plan
5	Erosion & Sediment Control Narrative
6	Erosion & Sediment Control Details
7	Road & Utility Plan
8	Grading Plan
9	Preliminary Plat
10	Waterline Profiles
11	Sanitary Sewer Profiles
12	Storm Sewer Profiles
13	Storm & Sanitary Sewer Computaions
14	Storm Details
15	Storm Details
16	Storm Details
17	Site Details
18	JCPSD Details
19	JCPSD Details
20	Charles Town Utility Board Water Details
21	Lighting Details
22	Landscape Plan

Charles Town - Complete List of Waivers/Variances

Ordinance	Section of Ordinance	Description of Waiver or Variance	Date Granted
SLDO-CTWV	1333.07	10' Driveways	11/26/2018
SLDO-CTWV	Appendix A	Typical Road Section	11/26/2018
SLDO-CTWV	1333.09	Sidewalk Width & Separation	11/26/2018

"This property is not (is) in an area designated as a special flood area, as shown on Community Map/panel Number 540066/0138, Effective date 12/18/2009."

CALL "MISS UTILITY"

WEST VIRGINIA UTILITY PROTECTION SERVICE AT 811 OR 1-800-245-4848, 48 HOURS PRIOR TO THE START OF WORK. EXCAVATORS MUST NOTIFY ALL PUBLIC UTILITY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION. THE EXCAVATOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL COUNTY REQUIREMENTS, WEST VIRGINIA CODE AND REGULATIONS.

UTILITY NOTICE REQUIRED

Contractors shall notify all public utility operators who maintain underground utility lines in the area of proposed excavating or blasting at least two (2) working days, but not more than ten (10) working days, prior to commencement of excavation or demolition. Names and telephone numbers of the operators of underground utility lines appear below. These numbers shall also be used to serve in an emergency condition

Water:	Charles Town Utility Board 832 S. George Street Charles Town, WV 25414 (304) 725-2316
Sewer:	Jefferson County Public Service District 340 Edmond Road Kearneysville, WV 25430 (304) 725-4647
Power:	Potomac Edison P.O.Box 3615 Akron, OH 44309 (800) 686-0011
Phone:	Frontier Communications 1108 N. Mildred Street Ranson, WV 25438 (304) 728-8500

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ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
PHONE: (703) 994-4047
MRAGTA.COM

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DEVELOPER
ARCADIA LAND, INC.
108 NORTH GEORGE STREET, 2ND FLOOR
CHARLES TOWN, WEST VIRGINIA 25414
(703) 840-4585

OWNER
ARCADIA LAND, INC.
108 NORTH GEORGE STREET, 2ND FLOOR
CHARLES TOWN, WEST VIRGINIA 25414
(703) 840-4585

AS-BUILT CERTIFICATION

THE PHYSICAL SURVEY HAS BEEN REVIEWED AND, IN MY PROFESSIONAL OPINION, BASED UPON MY KNOWLEDGE, INFORMATION, AND BELIEF, THE DESIGN ELEMENTS MEASURED BY THE PHYSICAL SURVEY COMPLY WITH THE APPROVED PLANS. THIS REVIEW DOES NOT IMPLY IN ANY WAY THAT (I) INSPECTIONS WERE MADE DURING THE CONSTRUCTION, (II) TO THE QUALITY OF THE WORK, OR (III) TO ANY ELEMENT OR STRUCTURE NOT VISIBLE OR DEPICTED ON THE PHYSICAL SURVEY.

JON K. ERICKSON VLS#2402 SEPTEMBER 08, 2022

"This Preliminary Plan and Plat was approved by the City of Charles Town, on the _____ day of _____, 20_____, subject to any conditions specified hereon.

All expenses incurred with respect to improvements for all utility services, paving, grading, landscaping, curbs, gutters, sidewalks, road lighting, road signs, flood protection devices, drainage structures and all other improvements that may be required shall be the responsibility of the subdivider and not the City.

_____ _____
Secretary of the Planning Commision Date

"The developer, in signing this plat/plan, agrees to abide by all conditions, terms and specifications provided heron; and to complete all the improvements required by the Preliminary Plat and Plan or site plan."

_____ _____
ARCADIA LAND, INC. Date
1602 VILLAGE MARKET BLVD., STE. 235
LEESBURG, VA 20176

"The Engineer and/or Surveyor, in signing this plat/plan, attests to the best of his or her knowledge, is plan is complete and accurate."

_____ _____
RANDY L. KEPLER, P.E. Date
GREENWAY ENGINEERING INC.

APPROVALS

_____ _____
PRELIMINARY PLAT APPROVAL DATE

_____ _____
PLANNING COMMISSION DATE

_____ _____
ZONING ADMINISTRATOR DATE

THESE PLANS ARE IN CONFORMANCE WITH CITY OF CHARLES TOWN STANDARDS AND ORDINANCES. ANY DEVIATION OR CHANGE IN THESE PLANS SHALL BE APPROVED BY THE ZONING ADMINISTRATOR PRIOR TO CONSTRUCTION

704 Foxcroft Avenue
Martinsburg, West Virginia 25401
Telephone: (304) 820-3111
Fax: (540) 338-5831
www.greenwayeng.com
GREENWAY ENGINEERING
PROUDLY SERVING VIRGINIA & WEST VIRGINIA
OFFICES IN: WINCHESTER, VA & MARTINSBURG, WV

COVER SHEET

Norborne Glebe
Phase 14-A
City of Charles Town - Jefferson County, West Virginia

RANDY L. KEPLER — REGISTERED — 877 — OF — WEST VIRGINIA — PROFESSIONAL ENGINEER

Date: 06/09/2017	
Scale:	As Noted
Designed By:	EJG/RLK
File No.	4542L
Sheet	1 Of 22
File #:	

SITE AS-BUILT

CANDLEWOOD DRIVE

JACK RABBIT LANE

HIGH HOPES WAY

STRAWBERRY AVE.

PHASE 8 BOUNDARY

PHASE 14A BOUNDARY

Pre-Blast 25' For Future Santary Sewer

Lot 9 Slab = 489 Garage = 489
Lot 10 Slab = 489.9 Garage = 489.9
Lot 13 Slab = 490.6 Garage = 490.6
Lot 14 Slab = 491.1 Garage = 490.6
Lot 15 Slab = 491.1
Lot 16 Slab = 491.8 Garage = 491.3
Lot 17 Slab = 492.5 Garage = 491.03
Lot 18 Slab = 492.5 Garage = 492.0
Lot 19 Slab = 493.2 Garage = 492.7
Lot 20 Slab = 493.9 Garage = 493.6
Lot 21 Slab = 494.6 Garage = 492.49
Lot 22 Slab = 494.6 Garage = 494.1

Lot 8 Slab = 488.8 Garage = 488.3
Lot 7 Slab = 487.5 Garage = 487.0
Lot 6 Slab = 486.8 Garage = 486.3
Lot 5 Slab = 486.1 Garage = 485.6
Lot 4 Slab = 485.4 Garage = 484.9
Lot 3 Slab = 484.7 Garage = 484.2
Lot 2 Slab = 484.0 Garage = 483.5
Lot 1 Slab = 483.3 Garage = 482.8

Lot 23 Slab = 490.6 Garage = 490.1
Lot 24 Slab = 489.3 Garage = 488.8
Lot 25 Slab = 488.6 Garage = 488.1
Lot 26 Slab = 487.9 Garage = 487.4
Lot 27 Slab = 487.2 Garage = 486.7
Lot 28 Slab = 486.5 Garage = 486.0
Lot 29 Slab = 485.8 Garage = 485.3
Lot 30 Slab = 485.1 Garage = 484.6
Lot 31 Slab = 484.4 Garage = 483.9

4:1 Slope

100 YEAR W.S.E. = 471.09
10 YEAR W.S.E. = 469.77
2 YEAR W.S.E. = 468.91

SCALE: 1" = 30'

704 Forest Avenue
Martinsburg, West Virginia 25401
Phone: (304) 263-5111
Fax: (540) 722-9628
www.greenwayeng.com

GREENWAY ENGINEERING

PROUDLY SERVING VIRGINIA & WEST VIRGINIA
OFFICES IN: WINCHESTER, VA & MARTINSBURG, WV

Grading Plan
Norborne Glebe
Phase 14-A
City of Charles Town - Jefferson County, West Virginia

Rev. No.	Date
1	10/1/2018
2	11/09/2018
3	2/9/2021

LINDY L KEPLEY — LICENSED PROFESSIONAL ENGINEER — STATE OF WEST VIRGINIA — REGIONAL ENGINEER

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
PHONE: (703) 994-4047
MRAGTA.COM

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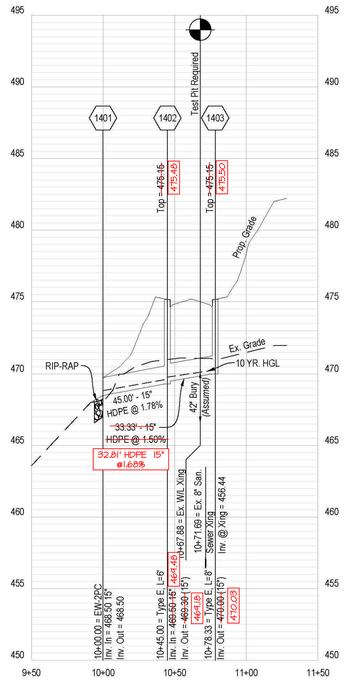
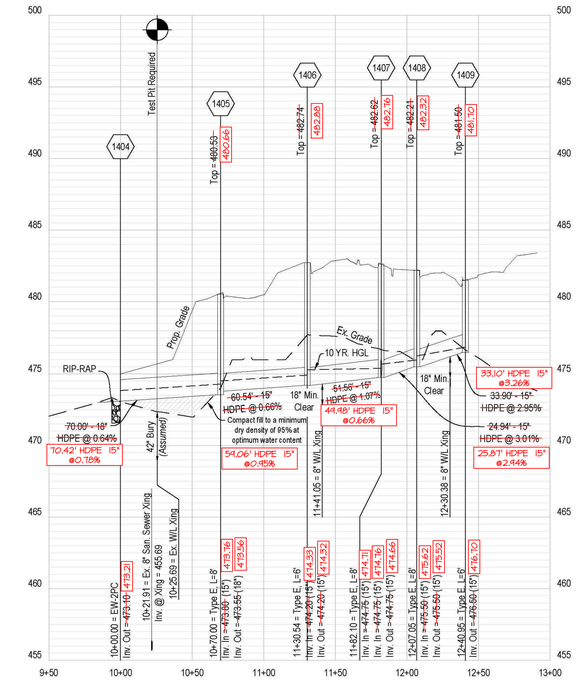
Date:	06/09/2017
Scale:	1" = 30'
Designed By:	EJG/RLK
File No.	4542L
Sheet	8 Of 22
File #:	



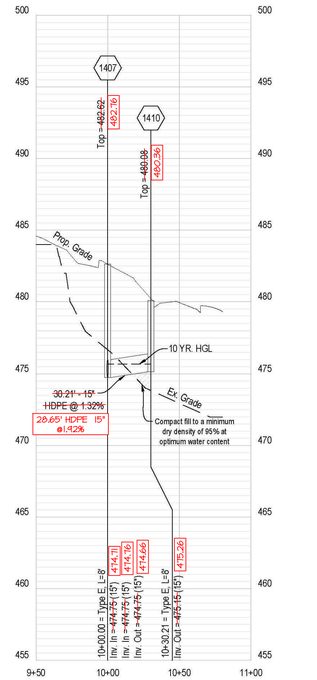
Storm Sewer Structures 1401 - 1403

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'



Storm Sewer Structures 1404 - 1409

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'



Storm Sewer Structures 1407 - 1410

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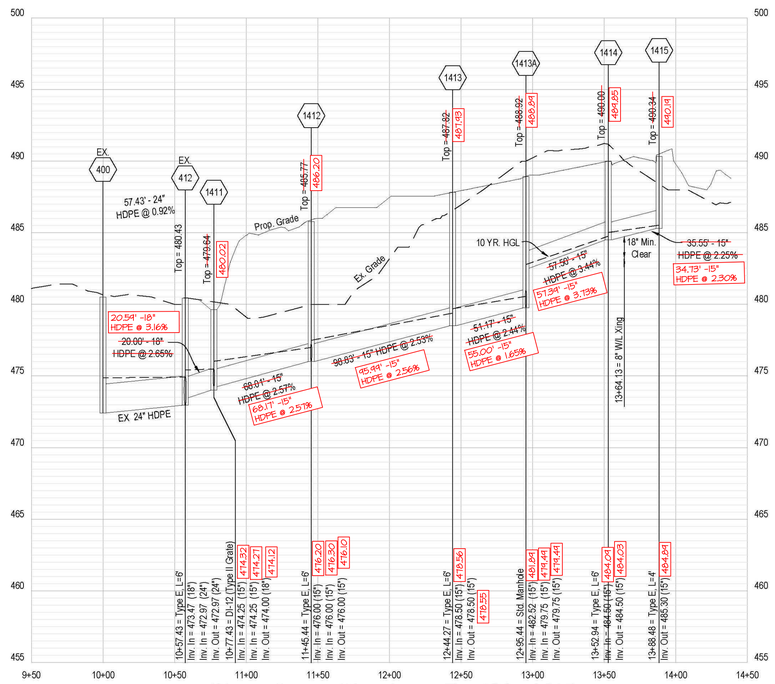
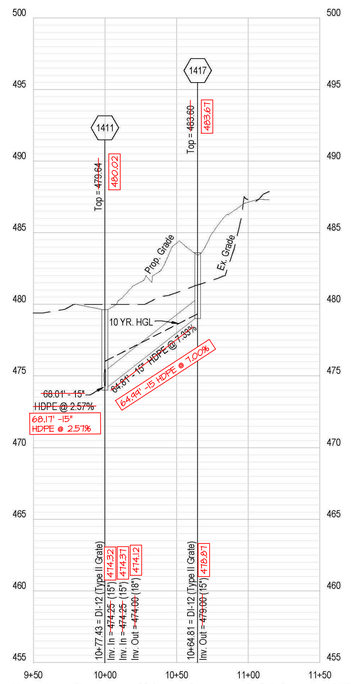


Storm Sewer Structures Ex. 400 - 1415

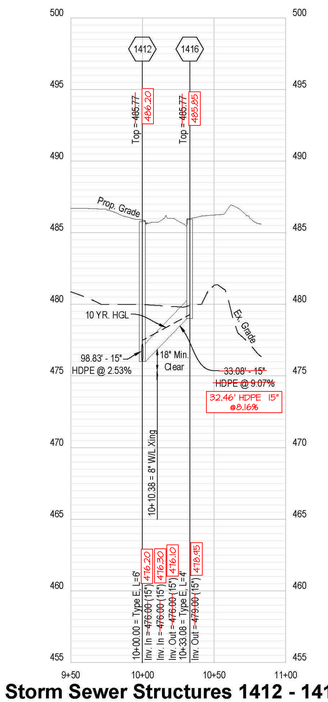
Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'

SITE AS-BUILT



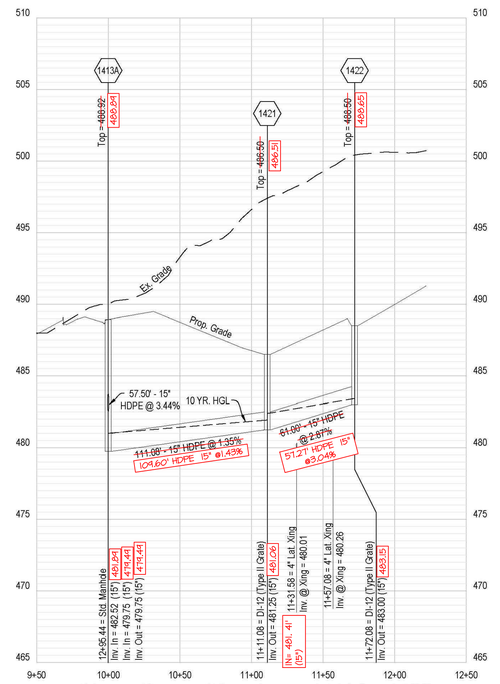
Storm Sewer Structures 1411 - 1417

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'



Storm Sewer Structures 1412 - 1416

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'



Storm Sewer Structures 1413A - 1422

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'

50 25 0 50
SCALE: 1" = 50'

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
PHONE: (703) 994-4047
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Storm Sewer Profiles
Norborne Glebe
Phase 14-A
City of Charles Town - Jefferson County, West Virginia

Rev. No.	Date
1	10/01/2018
2	11/09/2018
3	02/09/2021
4	05/03/2021

ANDY L. KERNS — REGISTERED — STATE OF — WEST VIRGINIA — PROFESSIONAL ENGINEER

Date: 06/09/2017

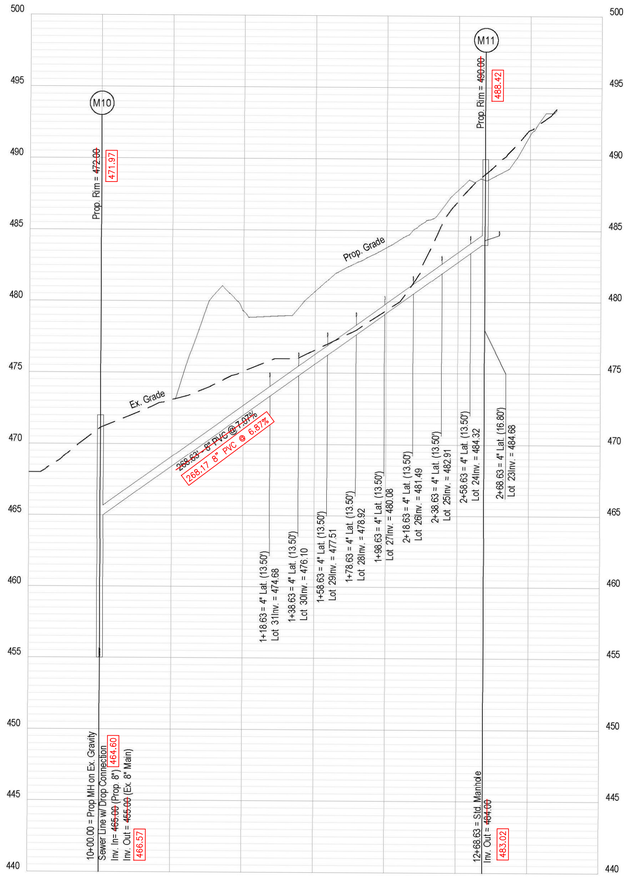
Scale: H: 1" = 50' & V: 1" = 5'

Designed By: EJG/RLK

File No. 4542L

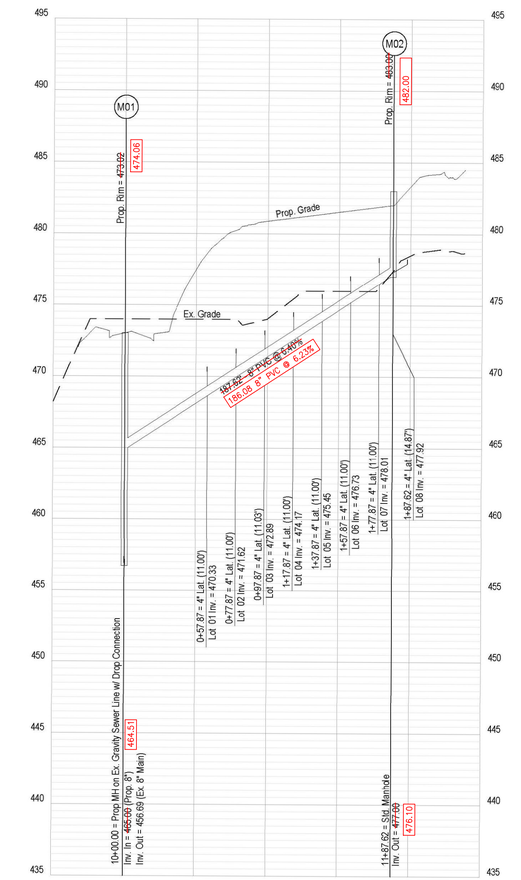
Sheet 12 Of 22

File #:



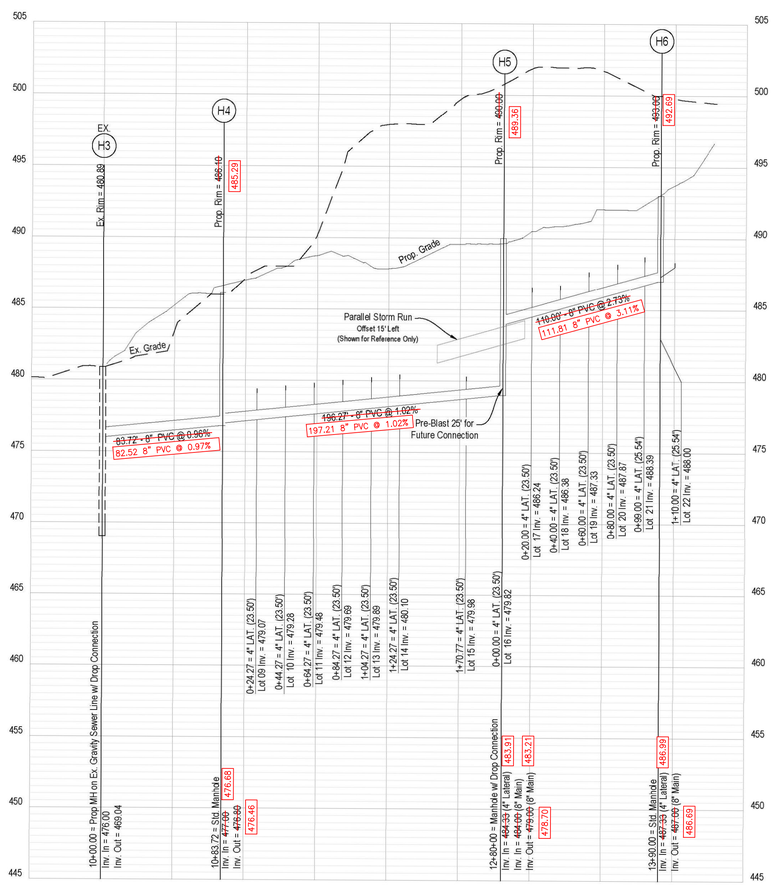
Sanitary Sewer Structures M10 - M11

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'



Sanitary Sewer Structures M01 - M02

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'



Sanitary Sewer Structures Ex. H3 - Prop. H6

Horizontal Scale: 1" = 50' & Vertical Scale: 1" = 5'

704 Fox Run Avenue
Martinsburg, West Virginia 25401
Telephone: (304) 620-5111
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GREENWAY ENGINEERING

PROUDLY SERVING VIRGINIA & WEST VIRGINIA
OFFICES IN: WINCHESTER, VA & MARTINSBURG, WV

Sanitary Sewer Profiles
Norborne Glebe
Phase 14-A

City of Charles Town - Jefferson County, West Virginia

Rev. No.	Date
5	08/09/2018
6	11/09/2018
7	02/09/2021

RANDY L KEELER
REGISTERED
No. 022720
STATE OF
W. VIRGINIA
PROFESSIONAL ENGINEER

Date: 06/09/2017

Scale: H: 1" = 50' & V: 1" = 5'

Designed By: EJG/RLK

File No. 4542L

Sheet 11 Of 22

File #:

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
604 SOUTH KING STREET
LEESBURG VA 20175
PHONE: (703) 994-4047
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50 25 0 50
SCALE: 1" = 50'

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Commission Review: SLD2023-02: Westover Dental - Preliminary Plan

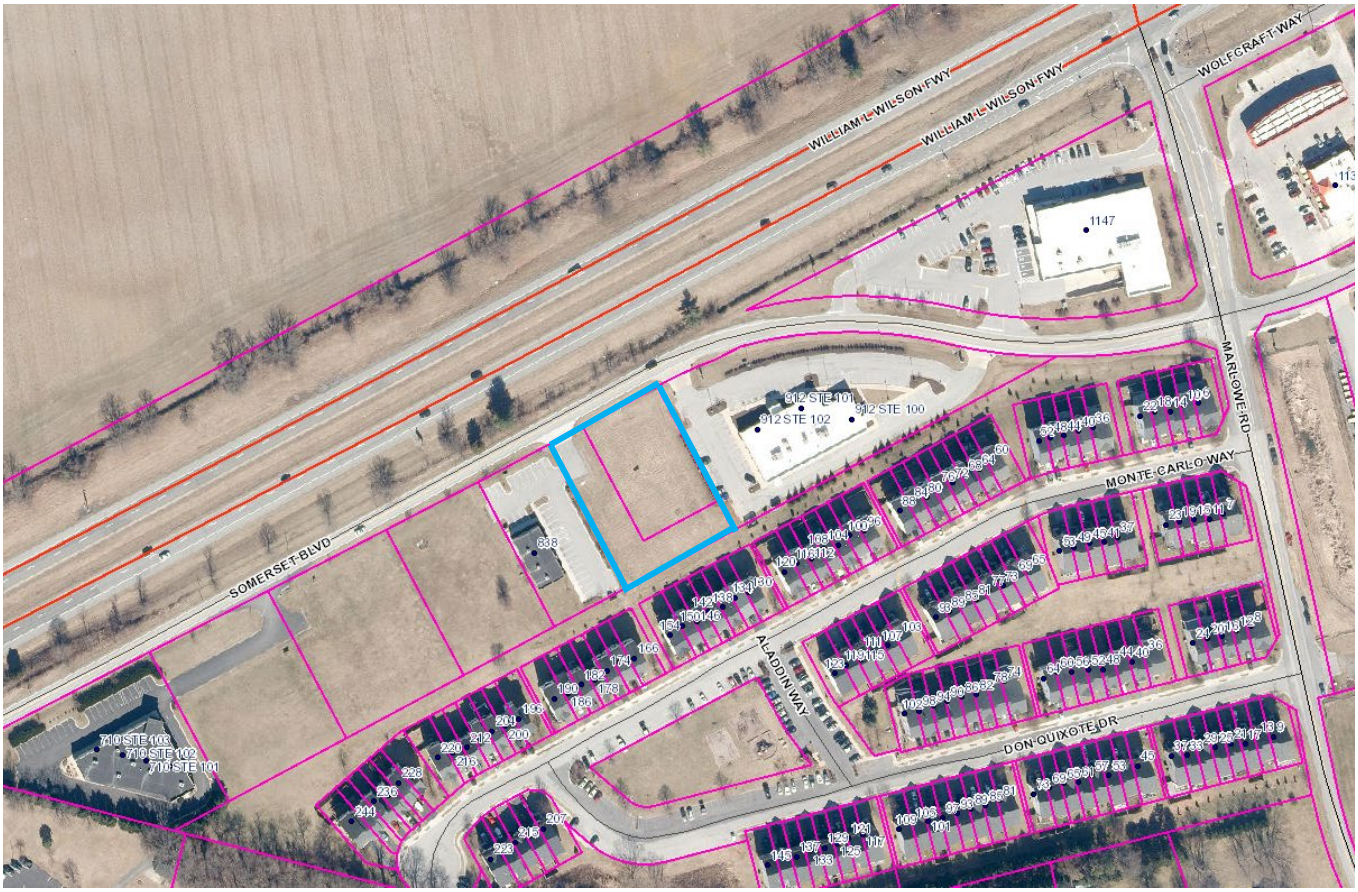
ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Revised Plans.pdf
- 4. KH Review.pdf
- 5. 2024-01-18 Comment response.pdf
- 6. CTUB.pdf

Preliminary Plan Review

SLD2023-02

Date: For the January 22, 2024 Planning Commission Special Meeting
Applicant: Westover Holdings LLC
Property Owner: Grasso and Sons Development Corp. (Lot 6); Somerset LLC (Lot 5.0001)
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Major land development
Property Location: TD: 03 / Map: 16A / Pcl: 0005.0001 & TD: 03 / Map: 16A / Pcl: 0006.0000, located on Somerset Blvd. Parcel is outlined in **blue** below.
Current Zoning: General Commercial (GC).



PROJECT OVERVIEW

The development of the property as a dental lab.

The parcels in question are TD 3 Map 16A Parcel 6, and TD 3 Map 16A Parcel 5.0001. the merger of these parcels was approved by the City Planner on November 28, 2011, but the owners at the time failed to finish the process. The property was merged on March 15, 2023 but has yet to appear on Jefferson County Geographic Information Systems (GIS) as merged.

HISTORY

The Planning Commission approved the sketch plan on October 23, 2023.

ZONING REVIEW

The property is zoned General Commercial.

Table 1322.10, GC District Bulk and Area Regulations

Maximum Density	No Requirement
Minimum Lot Size	No Requirement
Minimum Lot Width	No Requirement
Minimum Front Yard Setback	40 feet
Minimum Side Yard Setback	10 feet (25 feet where adjoining a residential district)
Minimum Rear Yard Setback	30 feet
Maximum Lot Coverage	90 percent
Minimum Required Open Space	No Requirement
Maximum Building Height	55 feet[1]
Maximum Stories	5 stories[1]

[1] Hotels shall have a maximum height of 78 feet and maximum number of six (6) stories.

Site Development/Open Space.

Up to 70% of the site may be developed with impervious surface. The proposed development will cover 67% of the site (22,866 sq. ft. of developed area on a 36,203 sq. ft. site). There is no open space requirement.

Parking

Required parking for a dental lab is 3.53 spaces per 1,000 sq. ft. Based on a 5,401 sq. ft. structure, the required parking is 20 spaces. 37 spaces are being provided, of which three are handicap spaces. There will be 12 employees.

Setbacks

All required setbacks have been met.
Front: 40 ft.
Sides: 10 ft.
Rear: 30 ft.

Landscaping/Buffering

There must be a minimum 6ft. tall opaque buffer between the structure and adjacent residential properties, which are located beyond the rear yard of this site. This requirement is met via a 5 ft. tall privacy wall.

Dumpster Pad

The applicant is proposing a 6 ft. tall fence around the dumpster pad, which fulfills part of the Code requirements. Generally landscaping is required around the rear and sides of the dumpster, however, such plantings would break up the sidewalk necessary to access a side door, and so have been removed. The lack of landscaping is reasonable given the need for safe pedestrian access. The dumpster location has shifted from the proposed location on the sketch plan at the rear of the property facing residential uses, to now being located at the front of the property adjacent to parking.

Lighting

Six lights are proposed: two over-head lights (one in the front parking area, one in the rear parking area), and four bollard lights for pathways. The lighting at the rear property line does not exceed .5 footcandles, which is the maximum allowed when adjacent to residential land uses (there are townhomes behind this property). Lighting at the front of the property reaches 1 footcandle just adjacent to the light fixture, which will provide additional illumination along the entrance road.

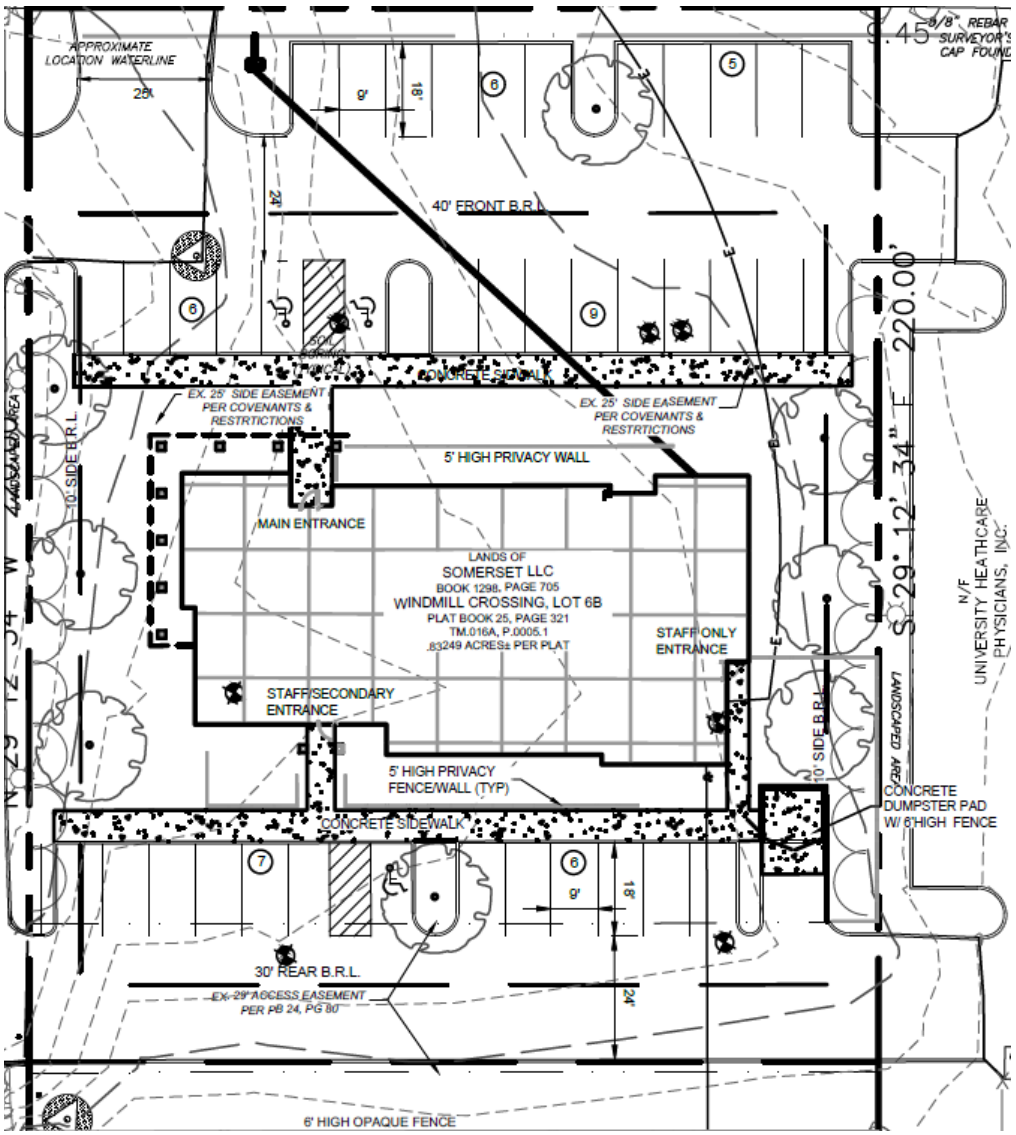
Sidewalks

The applicant has shown a sidewalk as access from parking to the structure. This satisfies the requirements of the ordinance. There are no adjacent sidewalks or pedestrian paths for the proposed sidewalk to connect to. The sidewalks are designed to meet access requirements of the Americans with Disability Act.

Stormwater

Kinley-Horn has reviewed the preliminary plan and found it satisfactory. The applicant addressed Kimely-Horn's previous comments.

SKETCH PLAN



CONCLUSION

This a request for approval of a preliminary plan for a dental office. The plan generally conforms to the requirements of the Ordinance. The site plan been reviewed by Kimley-Horn and they approve of the revised plans.

RECOMMENDATION

Approval.

S/LD Application No._____

SUBDIVISION AND LAND DEVELOPMENT APPLICATION

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
ARTICLE 1332, SUBDIVISION AND LAND DEVELOPMENT APPLICATION & APPROVAL REQUIREMENTS

To assist the Subdivision Administrator in the review of a Subdivision and Land Development (S/LD) Application, the Applicant must utilize this form to supply the City with the information prescribed under Section 1332.03 of the Charles Town Subdivision Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's S/LD Application as required by Ordinance Section 1332.03.

1. DATE _____November 1, 20 23____

2. APPLICATION TYPE

Minor Subdivision | Final S/LD Plan

Major Subdivision Development*
Preliminary S/LD Plan and Final Plat

X Major Land Development**
Preliminary S/LD Plan

Major Subdivision and Land Development***
Preliminary S/LD Plan and Final Plat

*Conventional Subdivision – A Preliminary Plan and Plat Approval and a Final Plan and Plat Approval is required.

**No Division/Merger of Land – A Preliminary Plan and Plat Approval is required for the submission of a building or multiple buildings on one lot where there is no subdivision of land (commonly referred to as a site plan).

***A Preliminary Plan and Plat Approval and a Final Plan and Plat Approval is required for the submission of a building or multiple buildings that will require the merger, adjustment or subdivision of land.

3. APPLICANT'S NAME* Westover Holdings, LLC

Address: 11 Meadow Branch Avenue, Winchester, Va. 22601

Telephone Number (804) 405-9873 Fax Number (___) _____

Email Address austinwestover@gmail.com

4. PROPERTY OWNER'S NAME same as applicant

Address: _____

Telephone Number (___) _____ Fax Number (___) _____

Email Address _____

5. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address: Somerset Boulevard, Charlestown, Wv.

Tax Map # and Parcel: Tax Map 016A, Parcel 0005.0001 & 0006.0000

Deed Book and Page #: Book 1309, pg. 109

Property Area in Square Feet or Acres: 36,263 sf / 0.83 Ac.

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

The purpose of the plan is the construction of a dental office.

Proposed usage is a Dental Office , which is a permitted usage in the General Commercial District.

7. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

Existing usage is vacant property. The current zoning is General Commercial District

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

8. ARE THERE ANY ANTICIPATED WAIVERS OR VARIANCES? IF YES, PROVIDE DETAILS.

No

9. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

Application No.	Project Name and Phase	Status	Approval Date
Jeff. Co Project	Windmill Crossing	Mixed Use Subdivision	

10. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

X No

11. PLAN/PLAT SUBMISSION TO OTHER AGENCIES (Documentation of all required approvals must be attached to this Application or submitted prior to Preliminary S/LD Application approval)

Agency (Specify others as applicable)	Submittal Date	Approval/Permit Issued	Date of Approval/Issuance
City of Charles Town	11-1-23		
City of Charles Town Utility Board	11-1-23		
Jefferson County Planning and Zoning Department	n/a		
Jefferson County Addressing Office			
Jefferson County Board of Education	n/a		
WV Department of Environmental Protection	n/a		
WV Department of Transportation, Division of Highways	n/a		
WV State Historic Preservation Office	n/a		
WV Office of Environmental Health Services	n/a		
U.S. Army Corps of Engineers	n/a		

12. FEE CALCULATION (Per Fee Schedule) _____

_____

_____

_____

AMOUNT PAID $ to be determined _____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1332.03 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant



_____ Date 10/31/23

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application and specified number of Plan/Plat (Three (3) copies at 24" x 36", Adobe PDF format, and Five (5) copies at 11" x 17") copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments/Conditions:_____

_____

_____

_____

_____

_____

PRELIMINARY LAND DEVELOPMET PLAN
WESTOVER DENTAL

I, DAVID L. GRAHAM A DULY LICENSED LAND SURVEYOR IN THE STATE OF WEST VIRGINIA, DO HEREBY CERTIFY THAT THIS PLAT REPRESENTS A SURVEY MADE BY TRIAD ENGINEERING, INC.; ALL MONUMENTS AND IMPROVEMENTS INDICATED THEREON ACTUALLY EXIST, AND THAT THEIR LOCATION, SIZE AND MATERIAL ARE CORRECTLY SHOWN. I, DAVID L. GRAHAM AM FAMILIAR WITH ALL REQUIREMENTS OF THE ORDINANCE TO THE BEST KNOWLEDGE AND BELIEF, ALL REQUIREMENTS OF THIS ORDINANCE HAVE BEEN FULLY COMPLIED HEREWITH.

DAVID L. GRAHAM LICENSED No. 2117 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

DAVID L. GRAHAM, P.S. #2117
TRIAD ENGINEERING, INC.

10-30-2023
DATE

"THE ENGINEER AND/ OR SURVEYOR, IN SIGNING THIS PLAT/PLAN, ATTESTS TO THE BEST OF HIS OR HER KNOWLEDGE, THIS PLAN IS COMPLETE AND ACCURATE."

ERIC ISER
TRIAD ENGINEERING, INC.

10-30-2023
DATE

ACCEPTANCE STATEMENT:
"THE DEVELOPER, IN SIGNING THIS PLAT/PLAN, AGREES TO ABIDE BY ALL CONDITIONS, TERMS AND SPECIFICATIONS PROVIDED HEREON; AND TO COMPLETE ALL THE IMPROVEMENTS REQUIRED BY THE PRELIMINARY PLAT AND PLAN OR SITE PLAN."

OWNER

10/27/23
DATE

STATE & LOCAL PERMITS

AGENCY	ITEM	PERMIT #	APPROVAL DATE
WV DEPT HIGHWAY	ENTRANCE PERMIT		
WV DEP	NPDES	N/A	N/A
JEFFERSON UTILITY	PUBLIC WATER		
WV BUREAU OF HEALTH	WELL AND SEPTIC	N/A	N/A
CHARLES TOWN UTILITY	SEWER		
WVPSC	WATER AND SEWER SYSTEMS		

CITY OF CHARLES TOWN, LIST OF WAIVERS

ORDINANCE	SECTION OF ORDINANCE	DESCRIPTION OF WAIVER OR VARIANCE	DATE GRANTED
NONE REQUESTED			



VICINITY MAP:
SCALE: 1"=400'

ENGINEERING/SURVEYING:
TRIAD ENGINEERING, INC
1075 SHERMAN AVE
HAGERSTOWN, MD 21790
c/o ERIC ISER, PE
eiser@triadeng.com
(301)797-6400

OWNER/DEVELOPER:
WESTOVER HOLDINGS, LLC
11 MEADOW BRANCH AVE
WINCHESTER, VA 22601
c/o Austin Westover
austinwestover@gmail.com
(804)405-9873

SHEET INDEX:

SHEET DESCRIPTION

1. COVER SHEET....C-1.0
2. EXISTING CONDITIONS....C-1.1
3. SITE PLAN....C-2.0
4. SITE NOTES AND DETAILS....C-2.1
5. EROSION SEDIMENT CONTROL PLAN AND GRADING PLAN....C-3.0
6. EROSION SEDIMENT CONTROL NOTES AND DETAILS....C-3.1
7. UTILITY PLAN....C-4.0
8. UTILITY DETAILS AND NOTES....C-4.1
9. LANDSCAPE PLAN....C-5.0
10. PHOTOMETRIC PLAN....C-6.0

NOTES:

1. THE PROPERTY BOUNDARIES SHOWN HEREON ARE BASED ON A FIELD SURVEY PERFORMED BY TRIAD ENGINEERING, INC., DATE OF LAST FIELD WORK BEING JANUARY 11, 2023.
2. HORIZONTAL DATUM IS NAD83 WEST VIRGINIA NORTH STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD 88, BOTH DERIVED FROM GPS RTK OBSERVATIONS.
3. THE SUBJECT PROPERTY IS NOT IN AN AREA DESIGNATED AS A SPECIAL FLOOD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL NO. 54037C0137E WHICH BEARS AN EFFECTIVE DATE OF DECEMBER 18, 2009. NO FIELD SURVEYING WAS PERFORMED TO DETERMINE THIS ZONE.
4. THE SUBJECT PROPERTY IS ZONED GC - GENERAL COMMERCIAL PER THE CITY OF CHARLES TOWN, WEST VIRGINIA, SUBDIVISION ORDINANCE, EFFECTIVE SEPTEMBER 1, 2009, ARTICLE 5 - DESIGN STANDARDS, SECTION 1322.10, ACCORDING TO TABLE 1322.10 GC DISTRICT BUILD AND AREA REGULATIONS, MINIMUM YARD SET BACKS ARE AS FOLLOWS:
   FRONT: 40 FEET
   SIDE: 10 FEET
   REAR: 30 FEET
5. THIS CHANGE TO THE LOT LINES DOES NOT CREATE A SETBACK VIOLATION OR INCREASE THE NON-CONFORMITY OF ANY EXISTING SETBACK VIOLATION.

AREA TABLE:

EXISTING PARCEL - LOT 6B	36,203 S.F.± OR 0.83249 ACRES±
OPEN SPACE	N/A
CONSERVATION EASEMENTS	N/A
REMAINING ACREAGE	N/A
LOT AREAS	N/A
GROSS AND NET DENSITY	N/A
RIGHTS-OF-WAY AND EASEMENTS	N/A
LIMITS OF DISTURBANCE	35,568 S.F. OR 0.82 ACRES

THIS PRELIMINARY PLAN AND PLAT WAS APPROVED BY THE CITY OF CHARLES TOWN, ON THE DAY OF ,2023, SUBJECT TO ANY CONDITIONS SPECIFIED HEREON.

ALL EXPENSES INCURRED WITH RESPECT TO IMPROVEMENTS FOR ALL UTILITY SERVICES, PAVING, GRADING, LANDSCAPING, CURBS, GUTTERS, SIDEWALKS, ROAD LIGHTING, ROAD SIGNS, FLOOD PROTECTION DEVICES, DRAINAGE STRUCTURES AND ALL OTHER IMPROVEMENTS THAT MAY BE REQUIRED SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER AND NOT THE CITY.

SECRETARY OF THE PLANNING COMMISSION

DATE

REF NO. #TBD

TRIAD ENGINEERING, INC.
1075-D SHERMAN AVENUE
HAGERSTOWN, MD 21740
PH:301.797.6400 FAX: 301.797.6400
OFFICE LOCATIONS
MARYLAND ◦ PENNSYLVANIA ◦ VIRGINIA ◦ WEST VIRGINIA

REV.#	DATE	DESCRIPTION	BY
3	01-17-24	PLANNING COMMENTS	
2	01-08-24	PLANNING COMMENTS	
1	12-11-23	PLANNING COMMENTS	

CADD FILE: 03-22-0423/ PRELIMINARY
DRAWN BY: STAFF
CHECKED BY: EHI
DATE: 10-24-2023
SCALE: AS SHOWN

I hereby certify that these sealed plans reasonably meet or exceed minimum acceptable engineering standards and those State and County provisions applicable on said date.
STATE OF WEST VIRGINIA
LICENSE NO. 15067
EXPIRATION DATE: 12/31/24

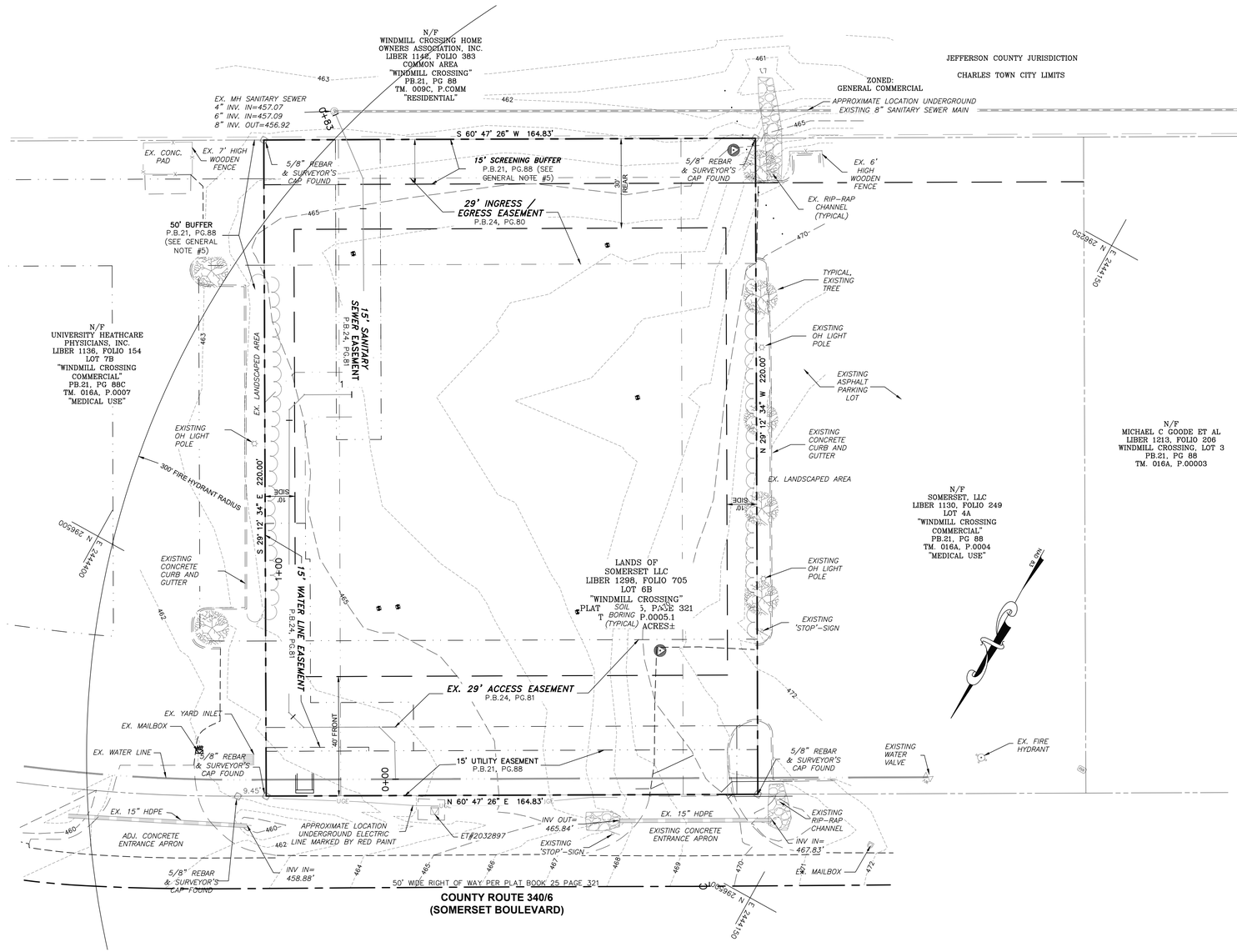
ERIC ISER REGISTERED 15067 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER 03/15/23

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 850' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD AND WILLIAM L WILSON FWY, IN THE TOWN CITY LIMITS
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3; TM. 0164; P. 0005.0001 & 0006.0000
ZONED "GC" GENERAL COMMERCIAL

COVER SHEET

TRIAD ENGINEERING, INC.
www.triadeng.com

SHEET NUMBER:
SHEET 1 OF 10
C-1.0
JOB NO.: 03-22-0965



GRAPHIC SCALE

20' 0 10' 20' 40' 80'

(IN FEET)
1 inch = 20' ft.

SYMBOLS LEGEND	
	ELECTRIC TRANSFORMER
	LIGHT POST
	REBAR & SURVEYOR'S CAP FOUND (AS NOTED)
S	SANITARY SEWER MANHOLE
	SIGN (AS NOTED)
	SOIL BORING

LINETYPE LEGEND	
	SUBJECT PROPERTY LINE
	ADJOINING PROPERTY LINE
	MINIMUM BUILDING RESTRICTION LINE
	EDGE OF CONCRETE
	CONTOUR, MAJOR 5'
	CONTOUR, MINOR 1'
	CURB
X X	FENCE, AS NOTED
	LANDSCAPED AREAS
	ROAD, CENTER LINE
	ROAD, EDGE OF PAVEMENT
	UNDERGROUND SANITARY SEWER
	UNDERGROUND STORM DRAIN
UGE	UNDERGROUND ELECTRIC LINE

SITE INFORMATION NOTES:

1. NO EXISTING STRUCTURES LOCATED ON PROJECT SITE.
2. NO KNOWN POWER TRANSMISSION TOWERS OR POWER LINES, CABLE AND TELEPHONE LINES ON PROJECT SITE.
3. NO KNOWN HISTORIC AREAS OR FEATURES ON PROJECT SITE.
4. EXCEPT AS SHOWN IN PLAN VIEW, NO EXISTING RESTRICTIVE EASEMENTS, OTHER EASEMENTS, AND RIGHTS-OF-WAYS AND USE KNOWN WITHIN SITE PROJECT.
5. NO PARKS AND OR PUBLIC SPACE WITHIN PROJECT SITE.
6. NO FORESTED AREAS AND OR TREE GROVES LOCATED WITHIN PROJECT SITE.
7. THERE ARE NO STREAMS WITHIN THE PROPERTY.
8. THERE ARE NO WETLANDS WITHIN THE PROJECT LIMITS PER MAPPING BY THE U.S. FISH AND WILDLIFE SERVICE NATIONAL WETLANDS INVENTORY PRODUCED BY THE NWI MAPPER.
9. UNLESS OTHER WISE SHOWN, NO WATER FEATURES AND SWAMPS WITHIN PROJECT SITE.
10. THE PROPERTY IS NOT WITHIN THE LIMITS OF THE 100 YEAR FLOODPLAIN AS SHOWN ON FEMA FIRM COMMUNITY PANEL NO. 54037C0137E, WITH AN EFFECTIVE DATE OF 12-18-2009.
11. NO KNOWN ROCK OUTCROPS, SINKHOLES OR DEPRESSIONS LOCATED ON PROJECT SITE.

REF NO. #TBD

TRIAD ENGINEERING, INC.
1075-D SHERMAN AVENUE
HAGERSTOWN, MD 21740
PH:301.797.6400 FAX: 301.797.6400
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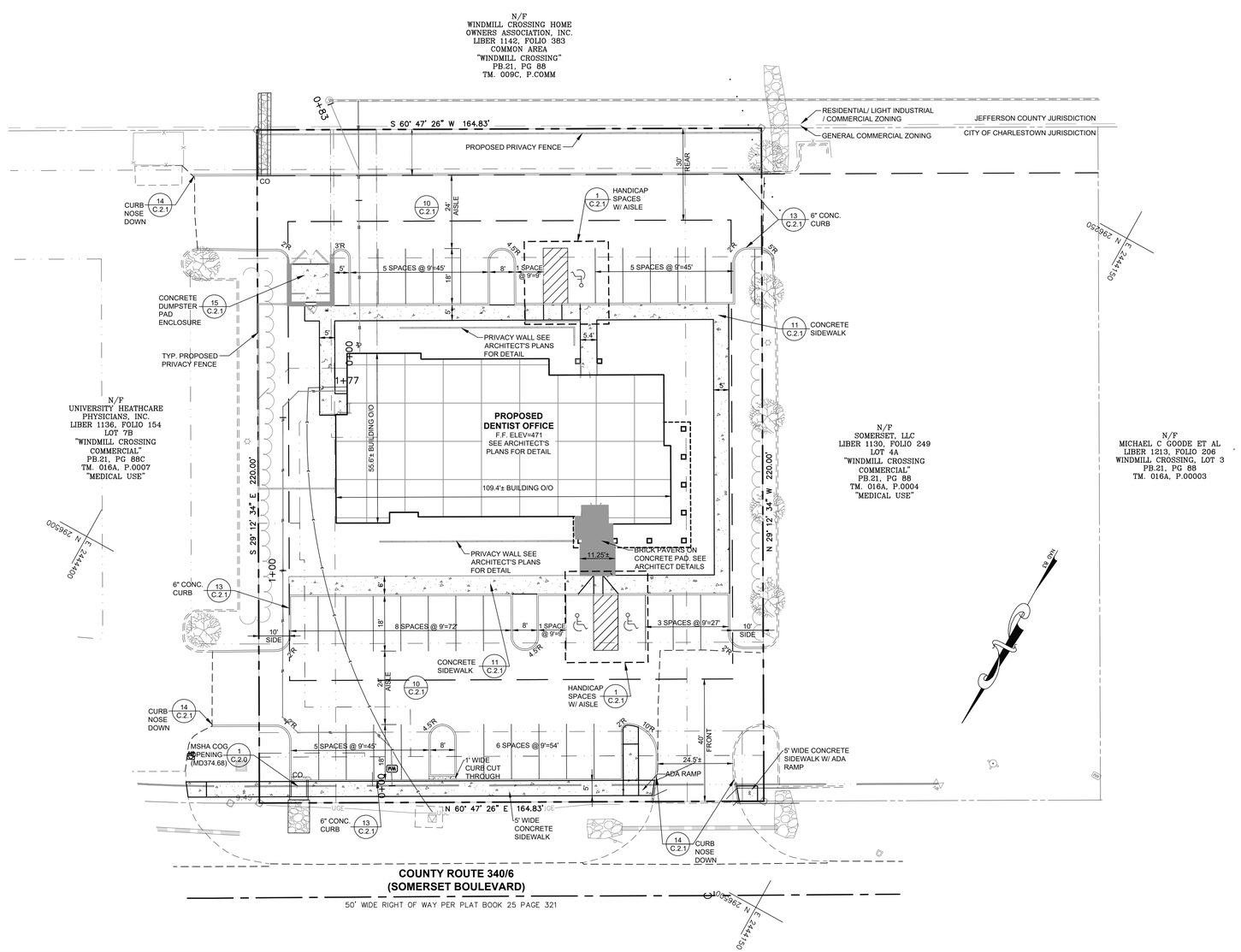
ERIC I. SER REGISTERED 15067 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER 03/15/24

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 850' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD (WV ROUTE 340) AND WINDMILL CROSSING
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3; TM. 016A; P. 0005.0001 & 0006.0000
ZONED: GC - GENERAL COMMERCIAL

EXISTING CONDITIONS

TRIAD ENGINEERING, INC.
www.triadeng.com

SHEET NUMBER:
SHEET 2 OF 10
C-1.1
JOB NO.: 03-22-0965



GENERAL NOTES:

1. TAX MAP 016A, PARCEL 0005.1
2. ELECTION DISTRICT: 3
3. THE PROPERTY IS CURRENTLY OWNED BY : WESTOVER HOLDINGS, LLC , DEED BOOK 1309, PAGE 109, DATED SEPTEMBER 15,2023 PLAT REF. BOOK 25 PAGE 321.
4. SITE AREA PER PLAT = 36,203± S.F. OR 0.83249 AC.±
5. THE PROPERTY BOUNDARIES SHOWN HEREON ARE BASED ON A FIELD SURVEY PERFORMED BY TRIAD ENGINEERING, INC., DATE OF LAST FIELD WORK BEING JANUARY 11, 2023.
6. HORIZONTAL DATUM IS NAD83 WEST VIRGINIA NORTH STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD 88, BOTH DERIVED FROM GPS RTK OBSERVATIONS.
7. SITE IS ZONED "GC" - GENERAL COMMERCIAL DISTRICT
8. EXISTING USAGE IS A VACANT PROPERTY. PROPOSED USAGE IS A DENTAL OFFICE, WHICH IS A PRINCIPAL PERMITTED USAGE IN THE GENERAL COMMERCIAL DISTRICT.
9. THE PURPOSE OF THIS SITE PLAN IS FOR A DENTAL OFFICE.
10. MINIMUM LOT REQUIREMENTS PER SECTION 1322.10, TABLE 1322.10 OF THE CITY OF CHARLES TOWN, WV. ZONING ORDINANCE:

	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO REQUIREMENT	N/A
MINIMUM LOT SIZE	NO REQUIREMENT	0.83249 AC.±
MINIMUM LOT WIDTH	NO REQUIREMENT	164.83 FEET
MINIMUM FRONT YARD SETBACK	40 FEET	40 FEET
MINIMUM SIDE YARD SETBACK	10 FEET (25 FEET WHERE ADJOINING A RESIDENTIAL DISTRICT)	10 FEET
MINIMUM REAR YARD SETBACK	30 FEET	30 FEET
MAXIMUM LOT COVERAGE	90 PERCENT	71 PERCENT
MINIMUM REQUIRED OPEN SPACE	NO REQUIREMENT	N/A
MAXIMUM BUILDING HEIGHT	55 FEET[1]	24.14'
MAXIMUM STORIES	5 STORIES [1]	1 STORY

11. SITE IS SERVED BY A PUBLIC SANITARY SEWER SYSTEM PROVIDED BY CITY OF CHARLES TOWN UTILITY BOARD.
11. SITE IS SERVED BY PUBLIC WATER SYSTEM PROVIDED BY JEFFERSON UTILITIES, INC.
12. HORIZONTAL DATUM IS NAD83 WEST VIRGINIA NORTH STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD 88, BOTH DERIVED FROM GPS RTK OBSERVATIONS.
13. HOURS OF OPERATION: MONDAY-THURSDAY 7:00AM-6:00PM / FRIDAY 7:00AM-1:00PM
14. NUMBER OF EMPLOYEES: 12
15. PARKING REQUIREMENTS PER SECTION 1333.23 (TABLE 1333.23(J)) OF THE CHARLES TOWN SUBDIVISION AND LAND DEVELOPMENT ORDINANCE:
    5401 S.F. x 3.53 SPACES REQUIRED PER 1000 SQ. FT. OF GFA:/1000= 19.1 SPACES=20 SPACES REQUIRED. 34 REGULAR SPACES + 3 ADA SPACES PROVIDED.
16. ON-SITE IMPERVIOUS AREA:

    PRE-DEVELOPMENT

BUILDINGS	0 SQ. FT.
ASPHALT PAVING	1,491SQ. FT.
TOTAL	1,491 SQ. FT.

    POST-DEVELOPMENT

BUILDING	5,401 SQ. FT.
PARKING, DRIVE AREAS, ETC.	17,485 SQ. FT.
TOTAL	22,886 SQ. FT.
% IMPERVIOUS	= 67%

    24,377 s.f/ 36,203± S.F.=0.67
17. PROPOSED SIGNAGE: ALL SIGNAGE SHALL COMPLY WITH ARTICLE 1324, SECTION 1324.03 OF THE CITY OF CHARLESTOWN, WV. ZONING ORDINANCE. SEE SITE PLAN FOR LOCATION.
18. TRASH AND RECYCLABLES SHALL BE COLLECTED AT THE DUMPSTER LOCATION SHOWN, REMOVED FROM SITE BY A LICENSED COMMERCIAL HAULER AND TAKEN TO AN APPROVED DISPOSAL FACILITY.
19. PROPOSED SITE LIGHTING: ALL PROPOSED LIGHTING WILL BE BUILDING MOUNTED AND SHALL BE INSTALLED AS DOWN SHIELDED IN SUCH A MANNER SO AS TO ELIMINATE GLARE ONTO ADJOINING PROPERTIES AND ROADWAYS.
20. PROPOSED BUILDING AREA = 5,401 S.F.
21. PROPOSED BUILDING HEIGHT = 24.14 FT.
22. STORMWATER MANAGEMENT QUALITY AND QUANTITY VALUES ARE CONTROLLED BY THE REGIONAL SWM STRUCTURE LOCATED NORTH OF THE PROJECT. THE SITE IS LESS THAN THE ALLOWABLE 70% IMPERVIOUS.

PROJECT NOTES:

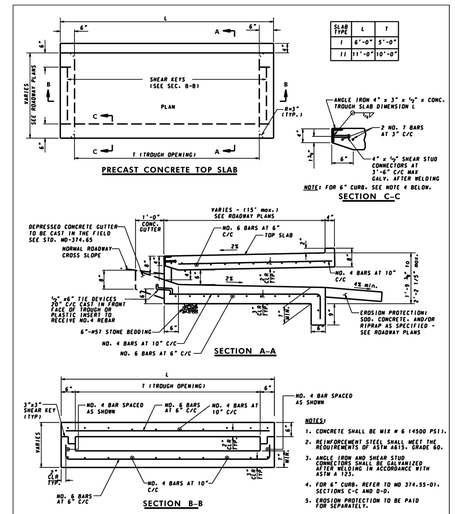
1. A GEOTECHNICAL EXPLORATION REPORT HAS NOT BEEN PERFORMED BY TRIAD ENGINEERING, INC. FOR THE PROJECT.
2. EXISTING UTILITY INFORMATION SHOWN HEREON IS FROM NUMEROUS SOURCES INCLUDING, BUT NOT LIMITED TO PROPERTY OWNER, UTILITY OWNER, PAST SITE PLANS AND DRAWINGS AND LOCATION OF SURFACE FEATURES. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD BEFORE BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY MISS UTILITY OF WEST VIRGINIA AND ANY OTHER UTILITY AND SUBSURFACE INVESTIGATIVE SERVICES AT 811 OR (1-800-245-4848) A MINIMUM OF 48 HOURS BEFORE BEGINNING ANY WORK SHOWN ON THESE DRAWINGS.ANY DAMAGE TO UTILITIES BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE AND TO THE SATISFACTION OF THE UTILITY OWNER. HAND PIT EXCAVATION SHALL BE PROVIDED AS NEEDED BY CONTRACTOR TO LOCATE EXISTING UNDERGROUND UTILITIES.
3. THE CONTRACTOR SHALL NOTIFY THE APPLICABLE MUNICIPAL, COUNTY AND/OR STATE AUTHORITIES AT LEAST 48 HOURS BEFORE BEGINNING ANY WORK WITHIN PUBLIC RIGHT (S) OF WAY.
4. THE CONTRACTOR SHALL VERIFY ALL SURFACE AND SUBSURFACE CONDITIONS (LOCATIONS AND ELEVATIONS) PRIOR TO BIDDING AND START OF CONSTRUCTION. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER AND/OR ENGINEER BEFORE PROCEEDING IF THEY AFFECT THE DESIGN FEASIBILITY OF THIS PROJECT. ANY DAMAGE TO FACILITIES, STRUCTURES, PAVEMENT OR OTHER MAN-MADE ITEMS ON OR ADJACENT TO THE SITE OR NOT SPECIFICALLY INDICATED FOR DEMOLITION SHALL BE REPAIRED OR REPLACED AT CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE OWNER.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR COMPLYING WITH ALL APPLICABLE LEGAL AND REGULATORY REQUIREMENTS. CONTRACTOR SHALL OBTAIN ANY BONDS REQUIRED BY COUNTY/ STATE FOR WORK WITHIN COUNTY/ STATE RIGHT-OF-WAYS.
6. TEMPORARY EROSION CONTROL MEASURES WILL BE USED TO CORRECT CONDITIONS THAT DEVELOP DURING CONSTRUCTION THAT ARE UNFORESEEN DURING THE DESIGN STAGE OR THAT ARE NEEDED TO TEMPORARILY CONTROL EROSION THAT DEVELOPS DURING NORMAL CONSTRUCTION PRACTICES.
7. TRIAD ENGINEERING, INC. WILL NOT BE RESPONSIBLE FOR ANYTHING TO DO WITH CONSTRUCTION UNLESS CONTRACTED BY THE OWNER OR CONTRACTOR TO PERFORM A SPECIFIC SERVICE.
8. JOB SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
9. NO TITLE REPORT HAS BEEN PROVIDED TO TRIAD ENGINEERING FOR THE PROJECT.
10. IT SHALL BE THE SOLE RESPONSIBILITY OF THE OWNER AND/OR DEVELOPER TO OBTAIN ALL NECESSARY EASEMENTS AND/OR RIGHT OF WAYS NECESSARY IN ORDER TO COMPLETE THE PROJECT SHOWN ON THESE PLANS. TRIAD ENGINEERING, INC. WILL ASSUME NO RESPONSIBILITY OR LIABILITY ASSOCIATED WITH THE ACQUIRING OF OFFSITE EASEMENTS AND RIGHT OF WAYS.
11. IF A STORM WATER MANAGEMENT STRUCTURE IS PRESENT ON THIS SITE, CONSTRUCTION INSPECTION AND ASBUILT CERTIFICATION OF THIS STRUCTURE OR STRUCTURES BY A REGISTERED PROFESSIONAL ENGINEER WILL BE REQUIRED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE INSPECTING ENGINEER PRIOR TO THE START OF CONSTRUCTION IN ORDER TO DETERMINE WHEN INSPECTIONS WILL BE REQUIRED. IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER WHEN THE STRUCTURE HAS BEEN COMPLETED AND STABILIZED IN ORDER THAT THE ASBUILT SURVEY MAY BE PERFORMED. STABILIZATION IS DEFINED AS HAVING A STAND OF GRASS OR OTHER SUITABLE VEGETATIVE COVER AS SPECIFIED ON THESE PLANS.
12. FINAL APPROVAL OF A STORMWATER MANAGEMENT STRUCTURE MUST BE GRANTED BY THE APPROPRIATE GOVERNMENT AGENCY/AGENCIES. APPROVAL BY THE INSPECTING ENGINEER DOES NOT GUARANTEE THAT ADDITIONAL WORK WILL NOT HAVE TO BE PERFORMED ON A STORMWATER MANAGEMENT STRUCTURE IN ORDER FOR IT TO COMPLY WITH THE STANDARDS OF THE GOVERNMENT AGENCY OR AGENCIES THAT ARE RESPONSIBLE FOR APPROVING THE STRUCTURE. TRIAD ENGINEERING, INC., ITS PERSONNEL AND ITS SUBCONTRACTORS WILL NOT BE LIABLE FOR ANY ADDITIONAL WORK ASSOCIATED WITH A STORMWATER MANAGEMENT STRUCTURE IN ORDER TO HAVE IT CONFORM TO NECESSARY STANDARDS.
13. ALL SPECIFICATIONS SHOWN HEREIN SHALL BE USED AND LOCAL, STATE AND FEDERAL SPECIFICATIONS SHALL BE MINIMUM STANDARD.
14. IF SITE THIRD PARTY CONSTRUCTION INSPECTIONS ARE REQUIRED BY CITY OF CHARLES TOWN, WV. THEN THE INSPECTION/CERTIFYING ENGINEER SHOULD BE CONTACTED ONE (1) WEEK IN ADVANCE TO START OF WORK.

GRAPHIC SCALE

20' 0 10' 20' 40' 80'

(IN FEET)

1 inch = 20' ft.



SPECIFICATION	CATEGORY CODE ITEMS
305	

APPROVED _____ DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 12-19-01	APPROVAL 7-16-02
REVISED 1-9-08	REVISED 11-26-07
REVISED	REVISED
REVISED	REVISED

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

PRECAST OR CAST-IN-PLACE COG / COS OPENING FOR 8" CURB 5' OR 10' ONLY

STANDARD NO. MD 374.68

REF NO. #TBD

TRIAD ENGINEERING, INC.
1075-D SHERMAN AVENUE
HAGERSTOWN, MD 21740
PH:301.797.6400 FAX: 301.797.6400
OFFICE LOCATIONS
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LICENSE NO. 15067
EXPIRATION DATE: 12/31/24

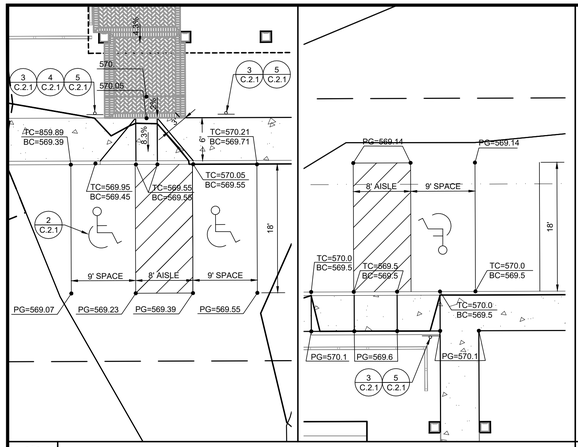
ERIC J. ISER REGISTERED 15067 STATE OF WEST VIRGINIA 03/15/23 PROFESSIONAL ENGINEER

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 800' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD (WV RTE. 340/6) AND WINDMILL CROSSING DRIVE IN THE TOWN CITY LIMITS OF
JEFFERSON COUNTY, WEST VIRGINIA
ED. 2, TM. 016A- P. 0005.001 & 0006.0000
ZONED "GC" GENERAL COMMERCIAL

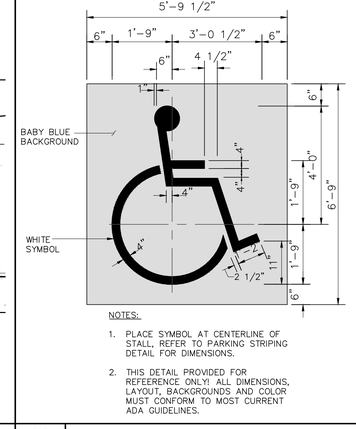
SITE PLAN

TRIAD ENGINEERING, INC.
www.triadeng.com

SHEET NUMBER:
SHEET 3 OF 10
C-2.0
JOB NO.: 03-22-0965



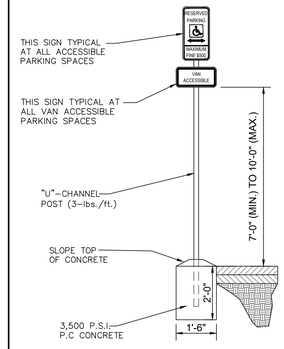
1 ADA PARKING AREA
SCALE: 1"=10'



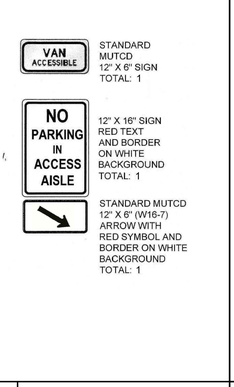
NOTES:

1. PLACE SYMBOL AT CENTERLINE OF STALL, REFER TO PARKING STRIPING DETAIL FOR DIMENSIONS.
2. THIS DETAIL PROVIDED FOR REFEERENCE ONLY! ALL DIMENSIONS, LAYOUT, BACKGROUNDS AND COLOR MUST CONFORM TO MOST CURRENT ADA GUIDELINES.

2 HANDICAP SYMBOL DETAIL
NOT TO SCALE



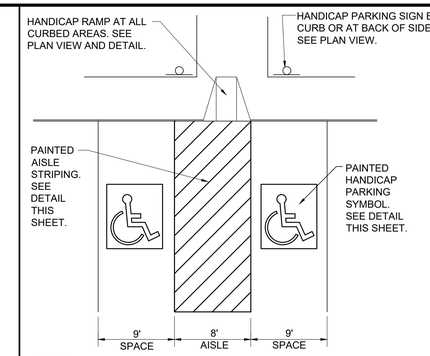
3 HANDICAP ACCESSIBLE SIGNPOST DETAIL
NOT TO SCALE



4 RESTRICTED PARKING SIGNS
NOT TO SCALE



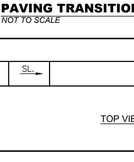
5 RESTRICTED PARKING SIGN
NOT TO SCALE



NOTES:

1. ALL HANDICAP PARKING SPACES SHALL BE DESIGNED, RAMPED,AND SIGNED TO COMPLY WITH ALL STATE AND LOCAL ORDINANCES AS WELL AS SECTION 4.6 OF APPENDIX A OF THE ADA ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES.
2. HANDICAP SPACE(S) AND AISLE SHALL BE GRADED AT 2.0% MAXIMUM SLOPE IN ALL DIRECTIONS.

6 HANDICAP ACCESSIBLE PARKING DETAIL
NOT TO SCALE



WARNING SURFACE SYSTEM
PLAN VIEW

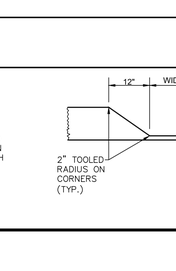
TRUNCATED DOME
SECTION VIEW

WARNING SURFACE SYSTEM
ELEVATION VIEW

GENERAL NOTES

1. THE PEDESTRIAN WARNING SURFACE SYSTEM SHALL CONFORM TO THE LATEST AMERICANS WITH DISABILITIES ACT (ADA) GUIDELINES FOR OUTDOOR FACILITIES. THE CONTRACTOR SHALL SELECT A SURFACE FROM THE CURRENT "PRE-APPROVED LIST" MAINTAINED BY MARYLAND STATE HIGHWAY ADMINISTRATION - OFFICE OF HIGHWAY DEVELOPMENT. THE CONTRACTOR SHALL SUBMIT THE SOURCE OF THE PROPOSED SYSTEM TO THE ENGINEER FOR APPROVAL.
2. THE DETECTABLE WARNING SURFACE SHALL BE 24" WIDE WITH LENGTH AND ORIENTATION AS SHOWN ON EACH PEDESTRIAN RAMP STANDARD DETAIL. THE SYSTEM SHALL CONSIST OF A SURFACE OF TRUNCATED DOMES ALIGNED IN A SQUARE GRID PATTERN AS SHOWN. THE COLOR OF THE SURFACE SHALL MATCH FEDERAL COLOR NUMBER YELLOW 33538. THE SURFACES SHALL HAVE A MINIMUM COEFFICIENT OF FRICTION OF 0.8 WHEN TESTED IN ACCORDANCE WITH ASTM C1028.
3. THE COLOR OF THE SYSTEM SHALL BE SURFACE APPLIED OR INLAID. THE CONTRACTOR SHALL INSTALL THE SYSTEM IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THESE RECOMMENDATIONS SHALL ADDRESS THE CONDITIONS OF THE CONCRETE SURFACE ON WHICH THE SYSTEM WILL BE APPLIED, SURFACE FINISH, PRESENCE OF CURING COMPOUND, LENGTH OF CURE, ETC. THE RECOMMENDATIONS SHALL ALSO ADDRESS AMBIENT TEMPERATURE, MOISTURE CONDITIONS, ADHESIVE POT LIFE, SET TIME, TOOLS REQUIRED, AND OTHER DETAILS ABOUT THE TECHNIQUE OF SYSTEM INSTALLATION.
4. THE VERTICAL EDGE OF THE INSTALLED SYSTEM SHALL BE NO HIGHER THAN 0.25" AND NO LOWER THAN FLUSH WITH THE ADJACENT SURFACE. WHERE A GRADATION THAN 0.25" THE CONTRACTOR SHALL BEVEL THE EDGES WITH A SLOPE NO STEEPER THAN 2 TO 1.
5. THE COST OF THE DETECTABLE WARNING SURFACE SYSTEM INSTALLATION INCLUDING MATERIALS, LABOR, AND ALL APPURTENANCES SHALL BE INCIDENTAL TO THE COST OF THE INSTALLATION OF THE PEDESTRIAN RAMP.

7 DETECTABLE WARNING SURFACE DETAILS FOR PEDESTRIAN RAMP
NOT TO SCALE

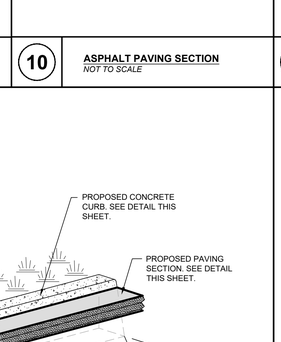


8 HANDICAP AISLE STRIPING DETAIL
NOT TO SCALE

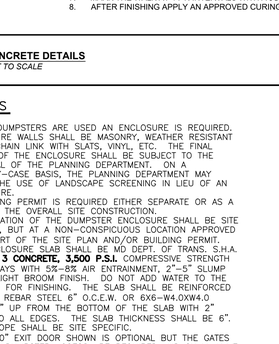
NOTES:

1) REFER TO WEST VIRGINIA DEPARTMENT OF HIGHWAYS SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2) ALL ACCESSIBLE RAMPS SHALL COMPLY WITH SECTION 4.7 OF THE AMERICANS WITH DISABILITIES ACT (A.D.A.) ACCESSIBILTY GUIDLINES FOR BUILDINGS AND FACILITIES (A.D.A. STANDARDS). REFER TO APPENDIX A, PART 1191 OF THE A.D.A. STANDARDS FOR CURRENT REVISIONS.
3) SIDEWALK RAMPS SHALL BE LOCATED AS SHOWN ON DRAWINGS, HOWEVER EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. MAY AFFECT PLACEMENT.
4) NO SLOPE SHALL EXCEED 12:1 ON THE RAMP.
5) RAMPS AND CURB RAMPS SHALL HAVE A MINIMUM CLEAR WIDTH OF 3'-0" EXCLUSIVE OF EDGE PROTECTION OR FLARED SIDES. (SECTIONS 4.7.3 AND 4.8.3 A.D.A. STANDARDS)
6) A ½" EXPANSION JOINT WILL BE REQUIRED WHERE THE CONCRETE RAMP JOINS ANY RIGID PAVEMENT OR STRUCTURE. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED, AND SEALED WITH NON-STAINING, TWO COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING WITH FEDERAL SPECIFICATION TT-S-00227.
7) TRANSVERSE JOINTS ARE REQUIRED AS SHOWN. SCORE THE CONCRETE AT TRANSVERSE JOINTS TO ⅓ DEPTH OF SLAB.
8) CROSS SLOPE OF RAMP SURFACES SHALL NOT EXCEED 1:50. RAMP SURFACES SHALL COMPLY SECTION 4.5 OF THE A.D.A. STANDARDS. ALL CONCRETE RAMPS SHALL RECEIVE A COARSE BROOM FINISH TO PROVIDE A NON-SKID SURFACE.
9) DETECTABLE WARNING SURFACES ARE REQUIRED AT ALL LOCATIONS WHERE THE SIDEWALK CROSSES VEHICULAR WAYS. DETECTABLE WARNING SURFACES SHALL BE INSTALLED PER MD. S.H.A. STANDARD No. 655.40. WARNING SURFACES SHALL COMPLY WITH SECTION 4.29 A.D.A. STANDARDS.

9 A.D.A. ACCESSIBLE RAMP NOTES
NOT TO SCALE



10 ASPHALT PAVING SECTION
NOT TO SCALE



CONCRETE SIDEWALK NOTES:

1. INITIAL SITE CLEARING SHALL CONSIST OF COMPLETE REMOVAL OF TOPSOIL AND ORGANIC MATERIAL TO DEPTHS OF APPROVED AND STABLE SOILS.
2. CONCRETE MIX FOR SIDEWALK TO BE 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS AND MEETING SHA STD. MIX NO. 3. ALL CONCRETE PLACEMENT SHALL BE DESIGNED IN ACCORDANCE WITH A.C.I. SPECIFICATIONS.
3. PROVIDE CONTROL JOINTS EVERY 4'-0" MINIMUM. PROVIDE 1/2" EXPANSION JOINT EVERY 20' O/C MAX.
4. PROVIDE 1/2" EXPANSION JOINT FILLER WHERE SIDEWALK ABUTS CURB OR OTHER RIGID STRUCTURE(S)
5. BROOM THE SURFACE WITH A FINE-HAIR BROOM AT RIGHT ANGLES TO THE CENTERLINE, TOOL ALL EDGES, JOINTS AND MARKINGS.
6. EXPANSION JOINTS OF 1/2" (MIN.) RIGID BITUMINOUS MATERIAL SHALL BE PLACED AT 24' SPACING.
7. MARK THE WALK AT 4 FT. INTERVALS WITH A JOINTING TOOL OR AS NOTED ON DRAWINGS.
8. AFTER FINISHING APPLY AN APPROVED CURING COMPOUND. PROTECT SIDEWALK FOR 7 DAYS.

11 CONCRETE DETAILS
NOT TO SCALE

12 PAVING TRANSITION DETAIL
NOT TO SCALE

13 6" CONCRETE CURB DETAIL
NOT TO SCALE

14 CURB NOSE DOWN DETAIL
NOT TO SCALE

NOTES

1. WHERE DUMPSTERS ARE USED AN ENCLOSURE IS REQUIRED.
2. ENCLOSURE WALLS SHALL BE MASONRY, WEATHER RESISTANT WOOD, CHAIN LINK WITH SLATS, VINYL, ETC. THE FINAL DESIGN OF THE ENCLOSURE SHALL BE SUBJECT TO THE APPROVAL OF THE PLANNING DEPARTMENT. ON A CASE-BY-CASE BASIS, THE PLANNING DEPARTMENT MAY ALLOW THE USE OF LANDSCAPE SCREENING IN LIEU OF AN ENCLOSURE.
3. A BUILDING PERMIT IS REQUIRED EITHER SEPARATE OR AS A PART OF THE OVERALL SITE CONSTRUCTION.
4. THE LOCATION OF THE DUMPSTER ENCLOSURE SHALL BE SITE SPECIFIC, BUT AT A NON-CONSPICUOUS LOCATION APPROVED AS A PART OF THE SITE PLAN AND/OR BUILDING PERMIT.
5. THE ENCLOSURE SLAB SHALL BE MD DEPT. OF TRANS. S.H.A. **MIX NO. 3 CONCRETE, 3,500 P.S.I.** COMPRESSIVE STRENGTH AT 28 DAYS WITH 5%-8% AIR ENTRAINMENT, 2"-5" SLUMP AND A LIGHT BROOM FINISH. DO NOT ADD WATER TO THE SURFACE FOR FINISHING. THE SLAB SHALL BE REINFORCED WITH #3 REBAR STEEL 6" O.C.E.W. OR 6X6-W4.0XW4.0 W.W.F. 2" UP FROM THE BOTTOM OF THE SLAB WITH 2" CLEAR TO ALL EDGES. THE SLAB THICKNESS SHALL BE 6". SLAB SLOPE SHALL BE SITE SPECIFIC.
6. THE 3'-0" EXIT DOOR SHOWN IS OPTIONAL BUT THE GATES FOR THE DUMPSTER ACCESS ARE REQUIRED AND SHALL HAVE LATCHES.
7. THE REQUIREMENTS SHOWN HERE ARE MINIMAL. CONTACT YOUR WASTE HAULER FOR ALL OTHER REQUIREMENTS.
8. **STEEL BOLLARDS SET IN 16 INCH x 16 INCH x16 INCH CONCRETE FOOTERS SHALL BE PROVIDED TO GUIDE DUMPSTER PLACEMENT. BOLLARD PLACEMENT SHALL ALSO BE ACCORDING TO INDUSTRY STANDARDS FOR THE DUMPSTER SIZE UTILIZED. WHERE FRONT WHEELS SIT DURING THE DUMPING CYCLE, CONCRETE MUST BE ABLE TO WITHSTAND UP TO A 32,000 POUND LOAD THAT BOUNCES.**

15 DUMPSTER ENCLOSURE DETAIL
NOT TO SCALE

16 CURB OPENING DETAIL
NOT TO SCALE

REF NO. #TBD

TRIAD ENGINEERING, INC.
1075-D SHERMAN AVENUE
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OFFICE LOCATIONS
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CADD FILE: 03-22-0423 PRELIMINARY
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SCALE: AS SHOWN
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I hereby certify that these sealed plans reasonably meet or exceed minimum acceptable engineering standards and those State and County provisions applicable on said date.
STATE OF WEST VIRGINIA
LICENSE NO. 15067
EXPIRATION DATE: 12/31/24

ERIC J. SER REGISTERED 15067 STATE OF WEST VIRGINIA 03/15/23 PROFESSIONAL ENGINEER

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 800' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD AND HARPERS FERRY ROAD IN DONA CITY LIMITS
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3, TM. 0160A P. 0000,0001 & 0006,0000
ZONED: GC/ GENERAL COMMERCIAL

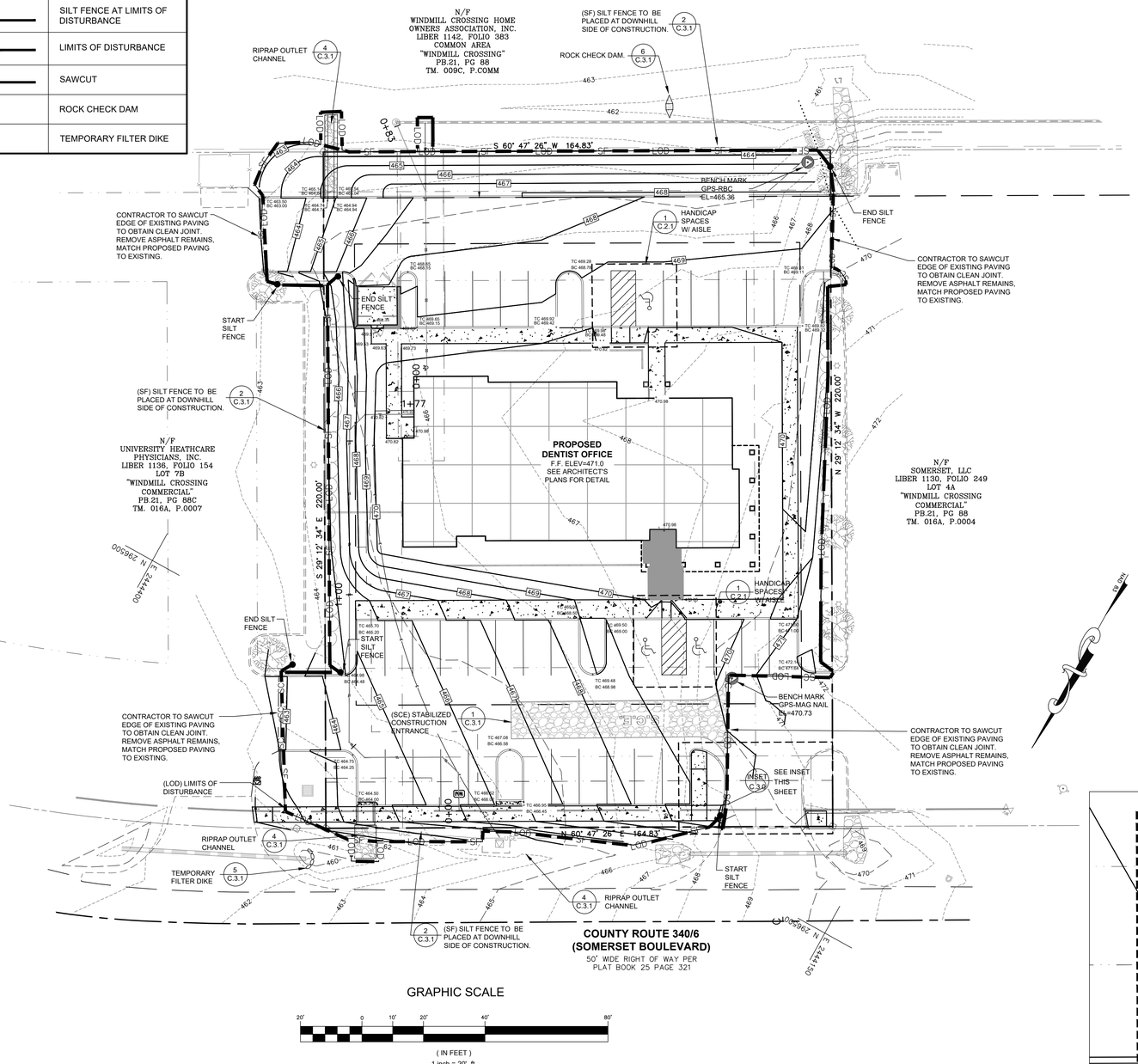
SITE PLAN DETAILS & NOTES

TRIAD TRIAD ENGINEERING, INC.
www.triadeng.com

SHEET NUMBER:
SHEET 4 OF 10
C-2.1
JOB NO.: 03-22-0965

SYMBOL KEY

SCE	STABILIZED CONSTRUCTION ENTRANCE
SF — SF	SILT FENCE AT LIMITS OF DISTURBANCE
LOD — SF	SILT FENCE AT LIMITS OF DISTURBANCE
LOD	LIMITS OF DISTURBANCE
SC — SC	SAWCUT
	ROCK CHECK DAM
	TEMPORARY FILTER DIKE



SEQUENCE OF CONSTRUCTION:

NOTIFICATION

A. CONTACT WV MISS UTILITY @ 811 OR 1-800-245-4848 AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
B. CONTACT THE CITY OF CHARLES TOWN PLANNING DEPARTMENT AT 1-304-724-3251, AT LEAST 48 HOURS PRIOR TO START OF SITE WORK.
C. CONTACT THE TRIAD ENGINEERING, INC. OF PRE-CONSTRUCTION MEETING TIME AND DATE AT 1-301-797-6400 AT LEAST 48 HOURS PRIOR TO START OF CONSTRUCTION. IT IS MANDATORY THAT THE ENGINEER OF RECORD BE IN ATTENDANCE AT THE MEETING.
D. OBTAIN GRADING PERMIT.

INITIAL STABILIZATION:

1. INSTALL STONE CONSTRUCTION ENTRANCE, PERIMETER SILT FENCE (SF), ROCK CHECK DAM AND TEMPORARY FILTER DIKE AS SHOWN ON PLAN, INITIALLY CLEARING AREAS ONLY NECESSARY FOR THE INSTALLATION OF PERIMETER EROSION CONTROL MEASURES.
2. CONTRACTOR TO PROVIDE ADDITIONAL SILT FENCE (SF) IN AREAS WHERE NOTICEABLE EROSION IS OCCURRING DURING THE CONSTRUCTION ACTIVITIES.

GRADING AND CONSTRUCTION:

1. ONCE ALL CONTROLS ARE IN PLACE, STRIP TOPSOIL FROM WITHIN LIMITS OF DISTURBANCE AREA AND REMOVE FROM SITE TO AN APPROVED LOCATION TEMPORARILY. SPREAD TEMPORARY SEEDING AND MULCHING (TS) TO ALL DISTURBED AREAS OF THE SITE TO ACHIEVE A UNIFORM 70% VEGETATIVE COVER THAT WILL SLOW ACCELERATED EROSION. (NOTE: ALL SPOIL MATERIAL SHALL BE DISPOSED OF AT A LOCATION WITH AN ACTIVE NPDES/SWPPP PERMIT FROM WVDEP. ALL FILL MATERIAL SHALL BE OBTAINED FROM A LOCATION WITH AN ACTIVE NPDES/SWPPP PERMIT FROM WVDEP).
2. COMMENCE ROUGH GRADING OF THE SITE. PERFORM BULK EARTHWORK OPERATIONS INCLUDING CUTS AND FILLS TO CREATE THE BUILDING PAD AND PARKING FACILITY. PROPERLY COMPACT ALL FILL SLOPES TO PREVENT EROSION. (SEE NOTE 1 BELOW).
3. SPREAD TOPSOIL AND PERMANENT SEEDING AND MULCHING (PS) TO DISTURBED AREAS IMMEDIATELY UPON REACHING FINAL GRADES.
4. PERFORM SITE PREPARATION ACTIVITIES FOR THE CONSTRUCTION OF PERMANENT FEATURES INCLUDING THE BUILDING, AND PARKING AND DRIVE AREAS. ESTABLISH FINISHED SUB-GRADE ELEVATIONS OF BUILDING PAD AND PARKING LOT/DRIVE AISLES.
5. BEGIN CONSTRUCTING OF BUILDING.
6. INSTALL THE UTILITIES WHERE SHOWN ON THE UTILITY PLAN SHEET C.4.0. BACKFILL AND COMPACT THE EARTH OVERTOP OF THE UTILITY TRENCHES TO STABILIZE THE DISTURBED AREAS.
7. ONCE ALL UTILITIES ARE IN PLACE, FINE GRADE SUBGRADE AND PLACE BASE STONE. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN 7 DAYS OF FINISHED GRADE OR SITE BEING IDLE.
8. FINE GRADE THE SIDEWALK AREAS AND THE DRIVE AISLES AND INSTALL PARKING STONE BASE.
9. INSTALL CONCRETE CURB, SIDEWALKS, ETC.
10. INSTALL RIP RAP OUTLET PROTECTION AT CURB OPENINGS AS SHOWN PER PLAN.
11. INSTALL ANY REMAINING BUILDING APPURTENANCES.
12. FINAL GRADE ANY REMAINING WORK AREAS, REPLACE TOPSOIL AND STABILIZE ALL DISTURBED AREA WITH FINAL SEEDING AND MULCH PER STABILIZATION SPECIFICATIONS WITHIN 3 CALENDAR DAYS. ANY SLOPES 3 TO 1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING.
13. PAVE PARKING LOT WITH BASE COURSE.
14. INSTALL ANY REMAINING SITE APPURTENANCES.
15. PAVE PARKING LOT WITH FINAL COURSE AND PAVEMENT MARKINGS.

SITE CLOSEOUT

1. WITH ENTIRE SITE FINAL GRADED AND STABILIZED WITH VEGETATIVE COVER IN PLACE, CONTACT WVDEP FOR FINAL INSPECTION TO RECEIVE NOTICE OF TERMINATION FOR THE REMOVAL OF PERIMETER CONTROLS.
2. WITH NOTICE OF TERMINATION FROM WVDEP, REMOVE PERIMETER CONTROLS. STABILIZE ANY DISTURBED AREAS WITH SEED & MULCH AS PER STABILIZATION SPECIFICATIONS.

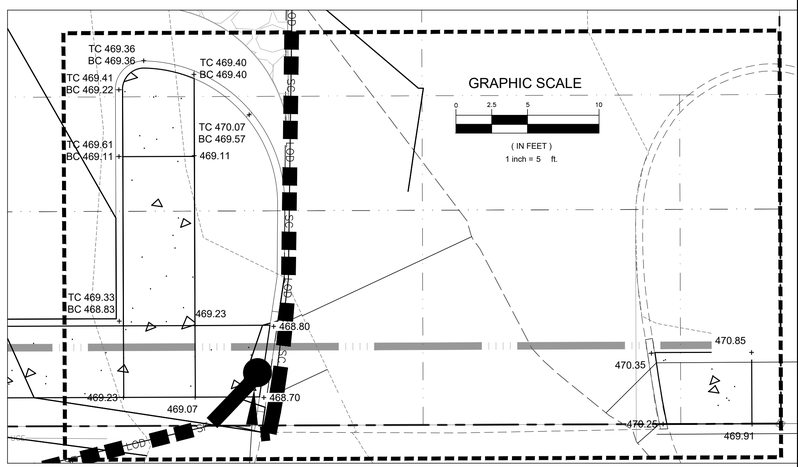
PROPOSED START - FINISH CONSTRUCTION
2023 - 2024

NOTE:
1. SITE HAS APPROXIMATELY 14 CY OF CUT AND 2865 CY OF FILL. 2851 CY OF FILL MATERIAL WILL NEED TO BE BROUGHT ON SITE FROM AN APPROVED BORROW SOURCE.
2. LIMITS OF DISTURBANCE= 35,794 S.F. / 0.82 ACRES.

GRADING NOTES:

TC - DENOTES TOP OF CURB SPOT
BC - DENOTES BOTTOM OF CURB SPOT
HP - DENOTES HIGH POINT

1. THE CONTRACTOR SHALL MAINTAIN A SMOOTH TRANSITION WHEN TYING PROPOSED ENTRANCE GRADES INTO EXISTING ROADWAY, CURBS AND SIDEWALKS.
2. A SMOOTHING GRADE SHALL BE MAINTAINED ALONG PAVEMENT AND PAVEMENT/CONCRETE TRANSITIONS, TO PRECLUDE THE FORMING OF FALSE GUTTERS AND/OR PONDING OF ANY WATER ON THE PAVED AREAS.
3. AREAS LOCATED OUTSIDE OF PAVEMENT AND/OR CONCRETE SHALL BE LANDSCAPED OPEN SPACE.
4. CONTRACTOR TO ADJUST GRADES AROUND AND OR RAISE ALL UTILITY VAULTS AS NEEDED TO ALLOW FOR POSITIVE DRAINAGE AWAY FROM STRUCTURES AND INTO PROPOSED STORM DRAINAGE STRUCTURES WITH CONFIRMATION FROM TRIAD ENGINEERING.
5. CONTRACTOR TO MAINTAIN LOD AND ENSURE CONSTRUCTION MATERIALS AND DEBRIS ARE CONFINED WITHIN THE LIMITS AS SHOWN TO PRECLUDE ANY OFFSITE DISTURBANCE TO EXISTING VEGETATION AND/OR SLOPES ADJACENT TO THE SITE.
6. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR SIDEWALK TREATMENT AT BUILDING ENTRY POINTS.
7. CONCRETE CONTROL JOINT AND EXPANSION JOINT LOCATIONS TO BE COORDINATED WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
8. ALL SLOPES SHALL BE 2:1 (HORIZONTAL:VERTICAL) MAXIMUM UNLESS NOTED OTHERWISE.
9. ALL SIDE SLOPES ARE TO BE 3:1 (HORIZONTAL:VERTICAL) MAXIMUM WITHIN PUBLIC RIGHT-OF-WAY.
10. CONTRACTOR SHALL TEST PIT PRIOR TO CONSTRUCTION TO VERIFY ELEVATIONS AND REPORT ANY DISCREPANCIES TO ENGINEER OF RECORD.
11. ALL AREAS NOT PAVED SHALL BE TOPSOILED, SEEDED, MULCHED OR LANDSCAPED UNLESS OTHERWISE NOTED IN THE CONSTRUCTION DRAWINGS, SITE SPECIFICATIONS OR INSTRUCTED BY THE OWNER.
12. ALL EXISTING TREES, VEGETATION, PAVEMENTS, CONCRETE FOUNDATIONS, STRUCTURES AND ORGANIC TOPSOIL SHALL BE STRIPPED AND REMOVED FROM NEW CONSTRUCTION AREAS UNLESS NOTED OTHERWISE.
13. REFER TO SWM REPORT FOR PRE AND POST DRAINAGE AREA MAPPING.
14. CONTRACTOR TO UTILIZE A MAX SLOPE OF 2:1 ON STOCKPILE AREA.
15. ALL SPOIL OR FILL MATERIAL SHALL BE DISPOSED OF OR EXCAVATED FROM A SITE THAT HAS AN ACTIVE OPEN NPDES PERMIT FOR THAT ACTIVITY.



SOIL TYPE ON SITE			
SYMBOL	DESCRIPTION	K FACTOR (WHOLE)	HYDROLOGIC SOILS GROUP
HbB	HAGERSTOWN SILT LOAM, 3 TO 8 PERCENT SLOPES	0.37	B
PmB	POPLIMENTO SILT LOAM, 3 TO 8 PERCENT SLOPES	0.43	B

REF NO. #TBD

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HAGERSTOWN, MD 21740
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OFFICE LOCATIONS
MARYLAND ○ PENNSYLVANIA ○ VIRGINIA ○ WEST VIRGINIA

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CADD FILE: 03-22-0423/ PRELIMINARY
DRAWN BY: STAFF
CHECKED BY: EHI
SCALE: 1"=20'
DATE: 10-24-2023

I hereby certify that these sealed plans reasonably meet or exceed minimum acceptable engineering standards and those State and County provisions applicable on said date.
STATE OF WEST VIRGINIA
LICENSE NO. 15067
EXPIRATION DATE: 12/31/24

ERIC I. SEIB
REGISTERED
15067
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
03/15/23

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 950' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD (WV RTE. 340/6) AND WINDMILL CROSSING COMMERCIAL DRIVE
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3, TM. 016A P. 0005.0001 & 0006.0000
ZONED: GC - GENERAL COMMERCIAL

EROSION/SEDIMENT CONTROL PLAN AND GRADING PLAN

TRIAD ENGINEERING, INC.
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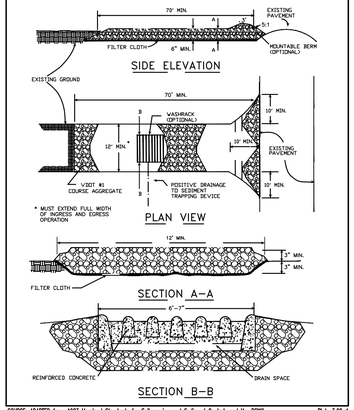
SHEET NUMBER:
SHEET 5 OF 10
C-3.0
JOB NO.: 03-22-0965

STONE CONSTRUCTION ENTRANCE

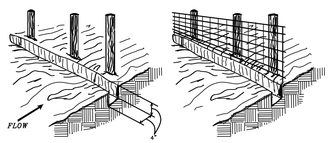


SOURCE: ADAPTED from 1983 Maryland Standards for Soil erosion and Sediment Control, and Va. DSWC — Plate 3.02-1

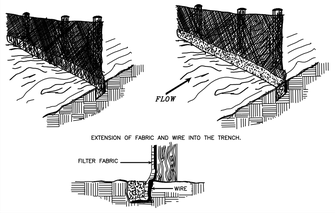
1 STONE CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE

CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

1. SET POSTS AND EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.
2. STAPLE WIRE FENCING TO THE POSTS.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SOURCE: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Revised 3 Yard — PLATE 3.05-1

2 SILT FENCE DETAIL
NOT TO SCALE

TEMPORARY SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): 6-b
SEED MIXTURE (FROM TABLE B.1):

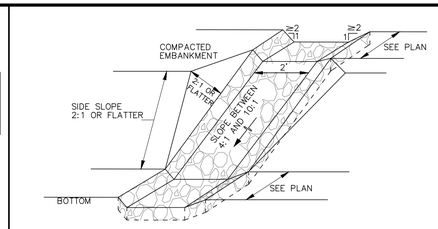
No.	SPECIES	APPLICATION RATE (LB. / AC.)	SEEDING DATES	SEEDING DEPTHS (inches)	FERTILIZER RATE (10-20-20)	LIME RATE
	BARLEY (HORDEUM VULGARE)	96 lb/ac. 2.2 lb/1000 s.f.	MAR. 15 - MAY 31 AUG. 1 - SEPT. 30	1.0	436 lb./ac. (10 lb./1,000 sq.ft.)	2 tons/ac. (90 lb./1,000 sq.ft.)

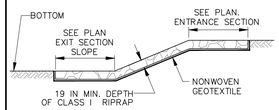
PERMANENT SEEDING SUMMARY

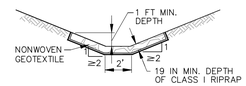
HARDINESS ZONE (FROM FIGURE B.3): 6-b
SEED MIXTURE (FROM TABLE B.3):

No.	SPECIES	APPLICATION RATE (LB. / AC.)	SEEDING DATES	SEEDING DEPTHS	FERTILIZER RATE (10-20-20) N	P205	K20	LIME RATE
	TALL FESCUE (100%)	40	MAR. 1-MAY 15 AUG. 1-OCT. 15	2"-3"	45 lb./ac. (1.0 lb./ 1,000 sq.ft.)	90 lb./ac. (2 lb./1,000 sq.ft.)	90 lb./ac. (2 lb./1,000 sq.ft.)	2 tons/ac. (90 lb./1,000 sq.ft.)
	PERENNIAL RYEGRASS (10%)	25	MAR. 1-MAY 15 AUG. 1-OCT. 15	2"-3"				
	WHITE CLOVER (10%)	5	MAR. 1-MAY 15 AUG. 1-OCT. 15	2"-3"				

3 TEMPORARY AND PERMANENT SEEDING SUMMARY
NOT TO SCALE



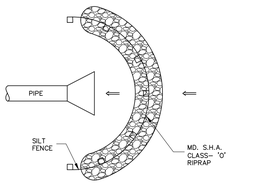




CONSTRUCTION SPECIFICATIONS

1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
2. CONSTRUCT INFLOW CHANNEL WITH CLASS I RIPRAP OR EQUIVALENT RECYCLED CONCRETE LINING TO A MINIMUM DEPTH OF 19 INCHES (2 x D_{50}) AND A 1 FOOT DEEP FLOW CHANNEL. INFLOW RIPRAP PROTECTION CHANNEL MUST HAVE A TRAPEZOIDAL CROSS SECTION WITH 2:1 OR FLATTER SIDE SLOPES AND A 2 FOOT MINIMUM BOTTOM WIDTH.
3. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
4. BLEND RIPRAP INTO EXISTING GROUND.
5. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION.

4 STONE RIPRAP OUTLET CHANNEL
NOT TO SCALE



SEE M.D.E. – W.M.A. STANDARD DETAILS E-15-3 AND B-8-5

5 TEMPORARY FILTER DIKE DETAIL
NOT TO SCALE

6 ROCK CHECK DAM DETAIL
NOT TO SCALE

REF NO. #TBD

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ERIC I. ISER — REGISTERED — 15067 — STATE OF WEST VIRGINIA — 03/15/23 — PROFESSIONAL ENGINEER

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 850' WEST OF THE INTERSECTION OF HARPERS FERRY ROAD (WV ROUTE 230) AND SOMERSET BOULEVARD (WV ROUTE 51) WITHIN THE TOWN CITY LIMITS OF JEFFERSON COUNTY, WEST VIRGINIA
ED. 3; TM. 016A; P. 0005.0001 & 0008.0000
ZONED "GC" GENERAL COMMERCIAL

E&S CONTROL DETAILS & NOTES

TRIAD ENGINEERING, INC.
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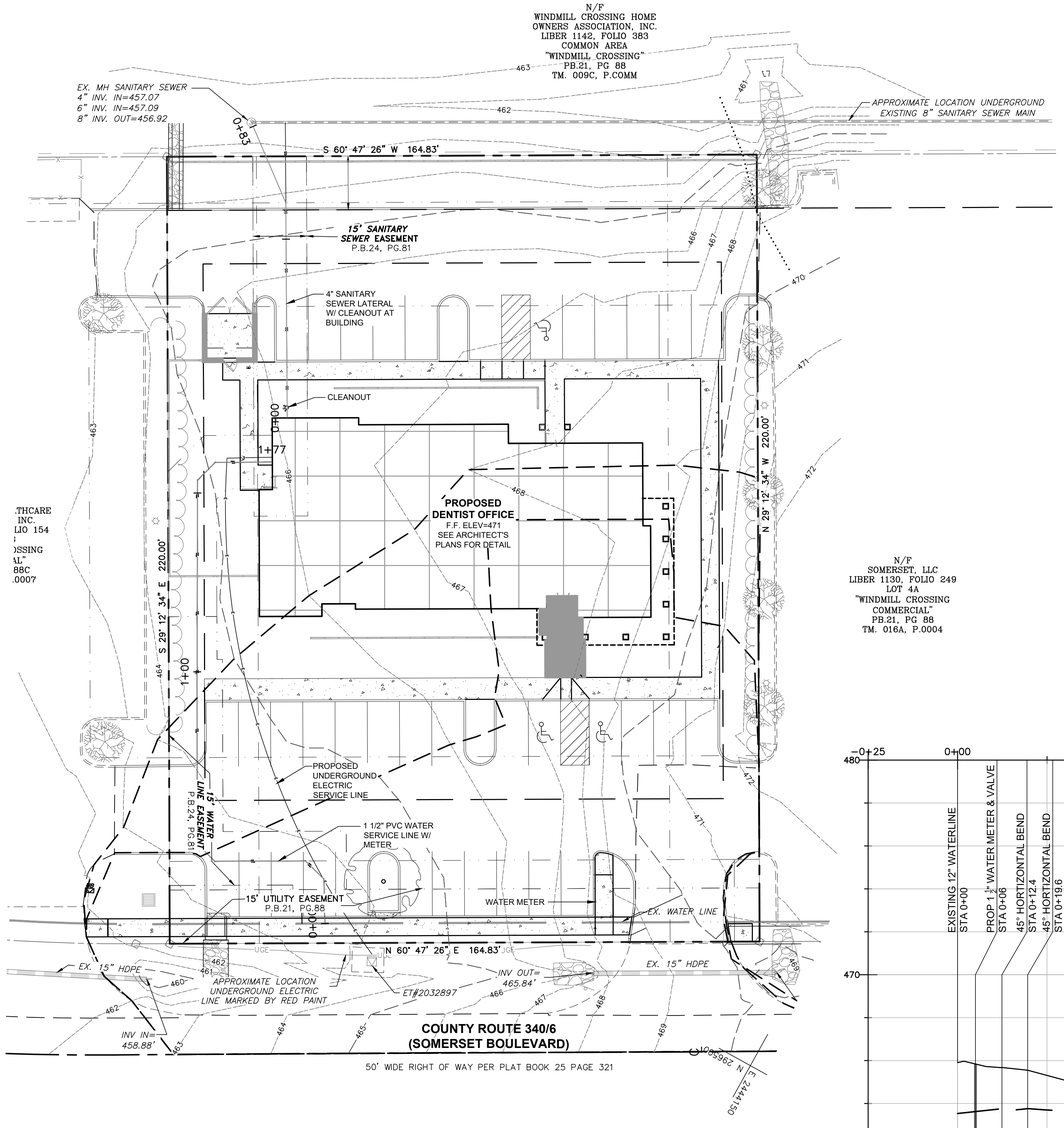
SHEET NUMBER:
SHEET 6 OF 10
C-3.1
JOB NO.: 03-22-0965



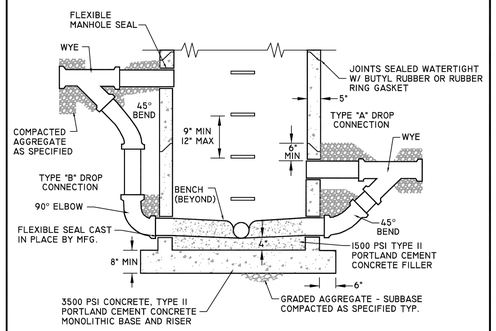
GRAPHIC SCALE

20' 0 10' 20' 40' 80'

(IN FEET)
1 inch = 20' ft.

DROP CONNECTIONS			
SIZE OF SEWER	TYPE A MAX DROP	TYPE A MIN DROP	TYPE B MIN DROP
8"	3'-9"	1'-9"	3'-9"
10"	4'-0"	2'-0"	4'-0"
12"	6'-0"	2'-6"	6'-0"
15"	6'-0"	2'-6"	6'-0"

NOTES:
1. PRECAST MANHOLE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C 478 UTILIZING TYPE II PORTLAND CEMENT.

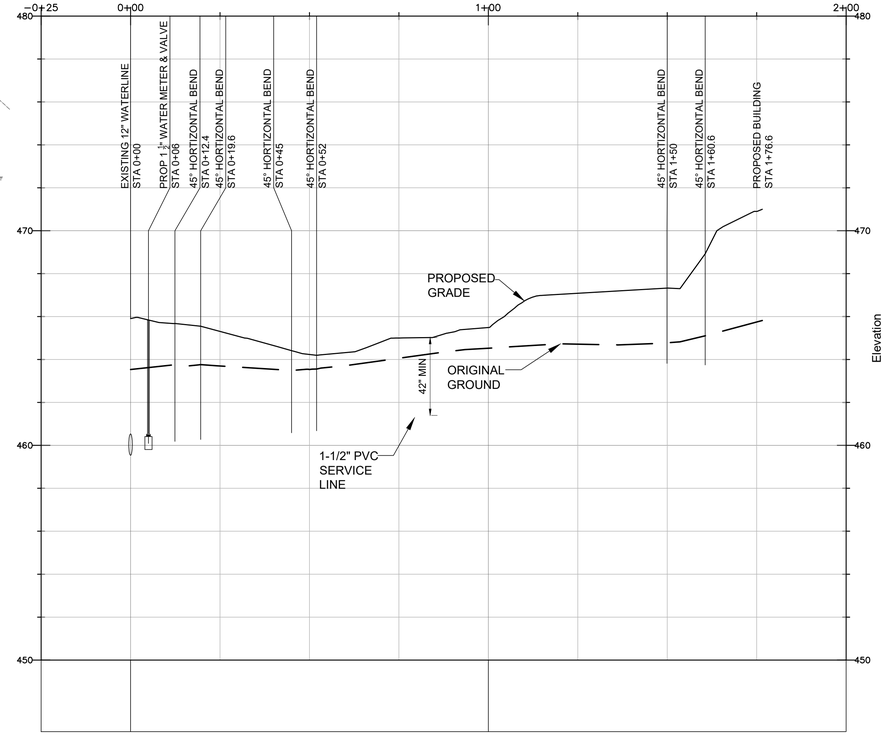


Charles Town Utility Board 832 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2316 •Fax: (304) 725-4313	**DROP MANHOLE DETAIL**	Standard Detail No. **S-8** NOT TO SCALE SEPTEMBER 2015

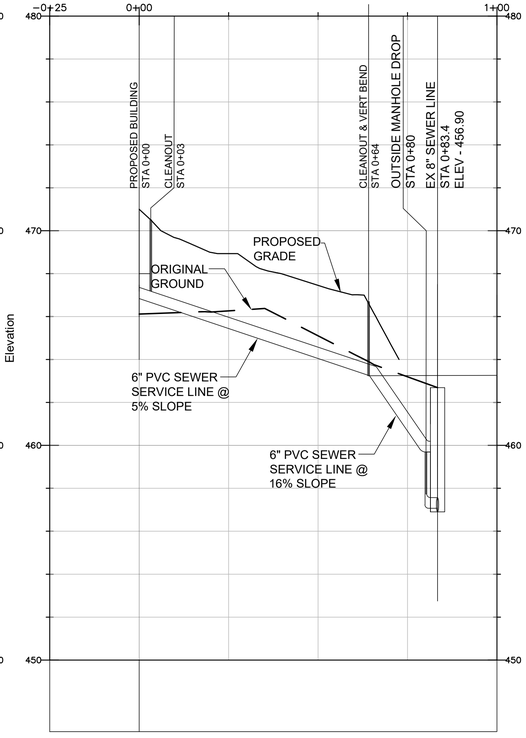
NOTE: "ALL PROPOSED UTILITIES SHALL BE LOCATED UNDERGROUND."

UTILITY CONTACTS

ELECTRIC CO:	POTOMAC EDISON
ADDRESS-	18444 NORTHWESTERN TURNPIKE AUGUSTA, WV 26704
PHONE NUMBER-	800.686.0011
OTHER:	MISS UTILITY
ADDRESS-	5608 MACCORKLE AVE, SW SOUTH CHARLESTON, WV 25309
PHONE NUMBER-	800.245.4848 OR 811
WATER PROVIDER:	JEFFERSON UTILITIES, INC.
ADDRESS-	270 INDUSTRIAL BOULEVARD KEARNEYSVILLE, WV 25430
PHONE NUMBER-	304.728.2077
SEWER PROVIDER:	CITY OF CHARLES TOWN UTILITY BOARD
ADDRESS-	108 W. CONGRESS STREET CHARLES TOWN, WV 25414
PHONE NUMBER-	304.725.2316
PHONE COMPANY:	FRONTIER COMMUNICATIONS
ADDRESS-	1108 N. MILDRED STREET RANSON, WV 25438
PHONE NUMBER-	304.728.8500



PROFILE OF WATERLINE
SCALE: HORZ: 1"=20'
VERT: 1"=3'



PROFILE OF SEWER LINE
SCALE: HORZ: 1"=20'
VERT: 1"=3'

REF NO. #TBD

TRIAD ENGINEERING, INC.
1075-D SHERMAN AVENUE
HAGERSTOWN, MD 21740
PH:301.797.6400 FAX: 301.797.6400
OFFICE LOCATIONS
MARYLAND ○ PENNSYLVANIA ○ VIRGINIA ○ WEST VIRGINIA

REV. #	DATE	DESCRIPTION	BY
3	01-17-24	PLANNING COMMENTS	
2	01-08-24	PLANNING COMMENTS	
1	12-11-23	PLANNING COMMENTS	

CADD FILE: 03-22-0423/ PRELIMINARY
DRAWN BY: STAFF
CHECKED BY: EHI
SCALE: 1"=20'
DATE: 10-24-2023

I hereby certify that these sealed plans reasonably meet or exceed minimum acceptable engineering standards and those State and County provisions applicable on said date.
STATE OF WEST VIRGINIA
LICENSE NO. 15067
EXPIRATION DATE: 12/31/24

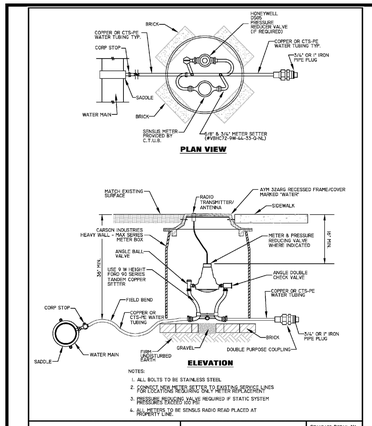
ERIC L. ISER
REGISTERED
15067
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
10/15/23

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 880' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD (WV ROUTE 340/6) AND CHARLES TOWN CITY LIMITS
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3; TM. 016A; P. 0005.0001 & 0006.0000
ZONED "GC" GENERAL COMMERCIAL

UTILITY PLAN

TRIAD ENGINEERING, INC.
www.triadeng.com

SHEET NUMBER:
SHEET 7 OF 10
C-4.0
JOB NO.: 03-22-0965



Charles Town Utility Board
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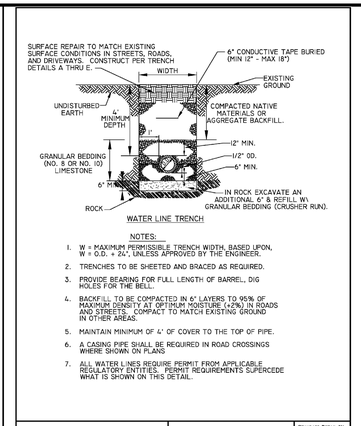
Phone: (304) 725-2316 • Fax: (304) 725-4313

METERED CONNECTION DETAIL

STANDARD DETAIL NO. **W-1**
NOT TO SCALE
APRIL 2015

1 **METERED CONNECTION DETAIL- W-1**
NOT TO SCALE



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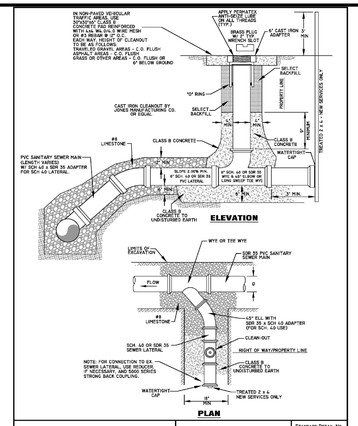
WATER LINE TRENCH DETAIL

STANDARD DETAIL NO. **W-9**
NOT TO SCALE
APRIL 2015

2 **WATER LINE TRENCH DETAIL - W-9**
NOT TO SCALE



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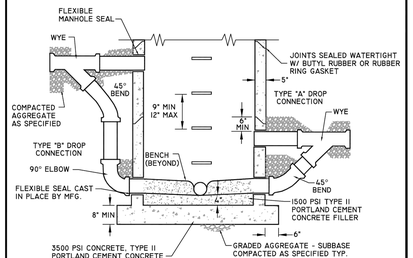
NEW LATERAL CONNECTION DETAIL

STANDARD DETAIL NO. **S-13**
NOT TO SCALE
SEPTEMBER 2015

3 **NEW LATERAL CONNECTION DETAIL - S-13**
NOT TO SCALE

DROP CONNECTIONS			
SIZE OF SEWER	TYPE A MAX DROP	TYPE A MIN DROP	TYPE B MIN. DROP
8"	5'-0"	1'-0"	3'-0"
10"	4'-0"	2'-0"	4'-0"
12"	6'-0"	2'-6"	6'-0"
15"	6'-0"	2'-6"	6'-0"

NOTES:
1. PRECAST MANHOLE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C 478 UTILIZING TYPE II PORTLAND CEMENT.



Charles Town Utility Board
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DROP MANHOLE DETAIL

STANDARD DETAIL NO. **S-8**
NOT TO SCALE
SEPTEMBER 2015

4 **DROP MANHOLE DETAIL - S-8**
NOT TO SCALE

TRIAD ENGINEERING, INC.
1075-D SHERMAN AVENUE
HAGERSTOWN, MD 21740
PH:301.797.6400 FAX: 301.797.6400
OFFICE LOCATIONS
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LICENSE NO. 15067
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ERIC L. ISER — REGISTERED — 15067 — STATE OF WEST VIRGINIA — 03/15/23 — PROFESSIONAL ENGINEER

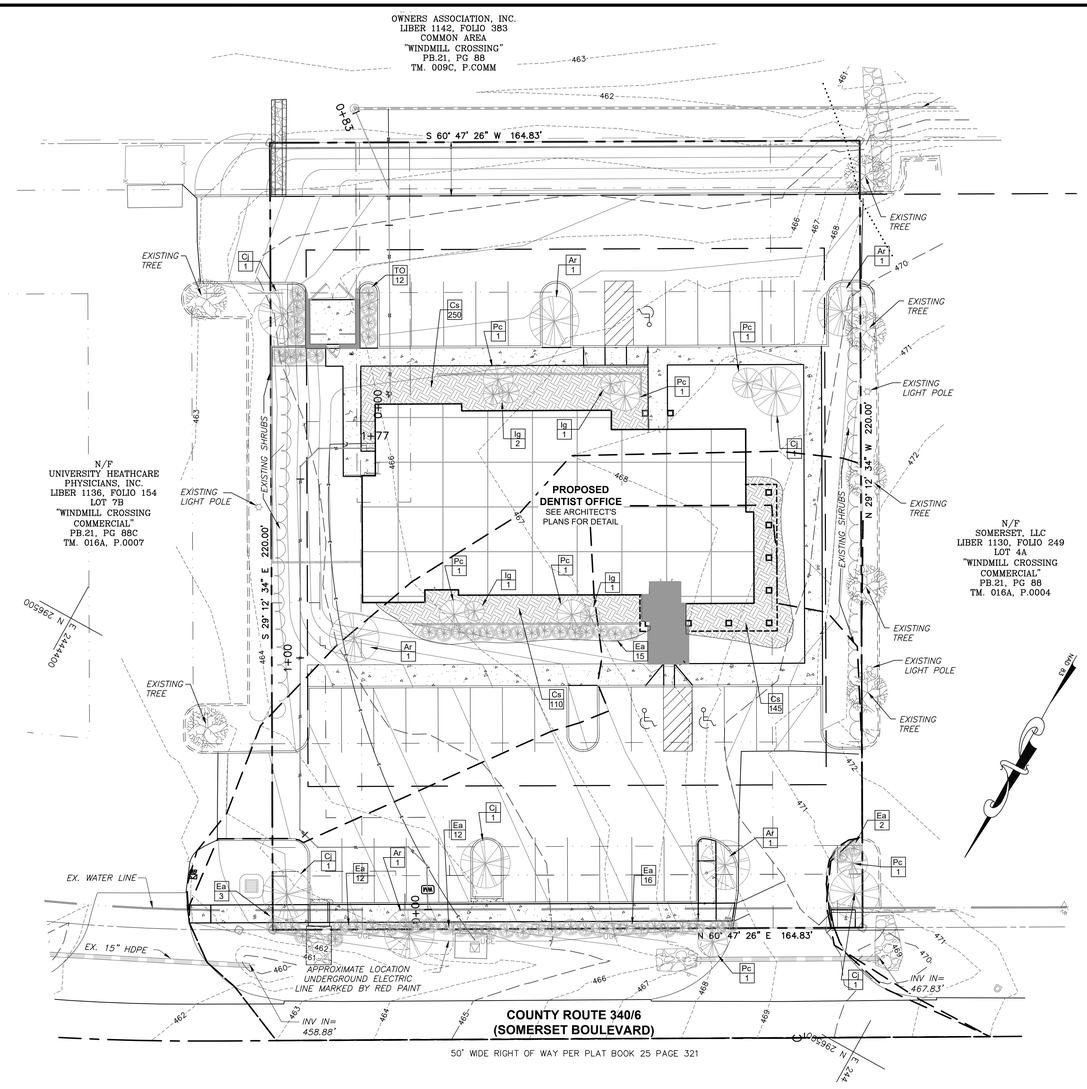
SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 850' WEST OF THE INTERSECTION OF HARPER ROAD AND SOMERSET BOULEVARD (WV RT. 51) AND WITHIN THE TOWN CITY LIMITS
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3; TM. 016A; P. 0005.0001 & 0008.0000
ZONED "GC" GENERAL COMMERCIAL

UTILITY DETAILS AND NOTES

TRIAD ENGINEERING, INC.
www.triadeng.com

SHEET NUMBER:
SHEET 8 OF 10
C-4.1
JOB NO.: 03-22-0965

REF NO. #TBD



GRAPHIC SCALE

20' 0 10' 20' 40' 80'

(IN FEET)
1 inch = 20' ft.

NOTES:

I. SCOPE

A. THE LANDSCAPE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT TO COMPLETE ALL LANDSCAPE WORK AS SHOWN ON THE PLANS AND SPECIFICATIONS.
B. TOTAL NUMBER OF PLANTS SHALL BE AS DRAWN ON THE LANDSCAPE PLAN. IF THIS TOTAL DIFFERS FROM THE PLANT KEY, THE LANDSCAPE CONTRACTOR IS TO NOTIFY THE LANDSCAPE ARCHITECT.

II. STANDARDS

A. ALL PLANT MATERIAL WILL CONFORM TO THE CURRENT ISSUE OF THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
B. PLANT MATERIAL MUST BE SELECTED FROM NURSERIES THAT HAVE BEEN INSPECTED BY STATE OR FEDERAL AGENCIES.

III. SUBSTITUTIONS

A. IF A PLANT IS FOUND NOT TO BE SUITABLE OR AVAILABLE, THE LANDSCAPE CONTRACTOR IS TO NOTIFY THE LANDSCAPE ARCHITECT.
B. THE LANDSCAPE ARCHITECT SHALL THEN PROVIDE THE LANDSCAPE CONTRACTOR A REASONABLE ALTERNATIVE.
C. ALL SUBSTITUTES MUST BE OF THE SAME SIZE, VALUE AND QUALITY AS THE ORIGINAL PLANT.

IV. UTILITIES

A. THE LANDSCAPE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AHEAD OF CONSTRUCTION TO LOCATE MAIN UTILITIES.
B. STREET LIGHTING AND OTHER UTILITIES THAT ARE PUT IN BY THE GENERAL CONTRACTOR ARE TO BE LOCATED BY THE OWNER OR GENERAL CONTRACTOR.
C. IF THERE IS A CONFLICT WITH THE UTILITIES AND THE PLANTING, THE LANDSCAPE ARCHITECT IS TO BE RESPONSIBLE FOR RELOCATING PLANTS PRIOR TO THE PLANTING PROCESS.

V. DRAINAGE

NO PLANTS SHALL BE PLANTED IN SITUATIONS THAT SHOW OBVIOUS POOR DRAINAGE. SUCH SITUATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER, AND IF THEY DEEM NECESSARY, THE PLANTS SHALL BE RELOCATED OR THE CONTRACT SHALL BE ADJUSTED TO ALLOW FOR DRAINAGE CORRECTION AT A NEGOTIATED COST.

VI. MAINTENANCE AND WARRANTY

A. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL PLANT MATERIALS PRIOR TO PLANTING AND AFTER PLANTING UNTIL ALL WORK IS COMPLETE AND THE WORK HAS BEEN ACCEPTED BY THE OWNER.

B. FOLLOWING ACCEPTANCE BY THE OWNER THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF ONE YEAR. ANY PLANTS THAT HAVE DIED OR ARE IN FAILING CONDITION SHALL BE REPLACED. THE OWNER MAY NOTIFY THE LANDSCAPE ARCHITECT TO DETERMINE THE NEED FOR REPLACEMENT.

VII. WORKMANSHIP

A. DURING PLANTING, ALL AREAS SHALL BE KEPT NEAT AND CLEAN, AND ALL REASONABLE PRECAUTIONS SHALL BE TAKEN TO AVOID DAMAGE TO EXISTING PLANTS, TURF AND STRUCTURES.
B. UPON COMPLETION, ALL DEBRIS AND WASTE MATERIAL RESULTING FROM PLANTING OPERATIONS SHALL BE REMOVED FROM THE PROJECT AND THE AREA CLEANED UP.

C. ANY DAMAGED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.

VIII. WATER

IF AVAILABLE ON SITE, THE OWNER SHALL SUPPLY WATER AT NO COST. IT WILL BE THE LANDSCAPE CONTRACTOR'S RESPONSIBILITY TO SUPPLY WATER IF THERE IS NONE ON THE SITE.

PLANTING PROCEDURES FOR TREES

I. PREPARING TREE PIT

A. WALLS OF TREE PIT SHALL BE DUG SO THAT THEY ARE VERTICAL AND SCARIFIED.
B. THE TREE PIT MUST BE A MINIMUM OF 9" LARGER ON EVERY SIDE THAN THE BALL OF THE TREE.

C. THE TREE PIT SHALL BE DEEP ENOUGH TO ALLOW 1/8 OF THE BALL TO BE ABOVE THE EXISTING GRADE. ANY LOOSE SOIL AT THE BOTTOM OF THE PIT SHALL BE TAMPED BY HAND OR WITH THE BUCKET OF THE BACKHOE.

II. PLACING TREE IN PIT

A. PLACE THE TREE IN THE PIT EITHER BY LIFTING AND CARRYING THE TREE IN ITS BALL (NEVER LIFT BY BRANCHES OR TRUNK) AND THEN LOWERING IT INTO THE PIT.
B. SET THE TREE STRAIGHT AND IN THE CENTER OF THE PIT WITH THE MOST DESIRABLE SIDE OF THE TREE FACING TOWARD THE PROMINENT VIEW (SIDEWALK, BUILDING, STREET, ETC.).

III. BACKFILLING TREE PIT

A. BACKFILL TREE PIT WITH A SOIL MIXTURE STATED IN THE DETAIL.
B. MIX SOIL AMENDMENTS IN MIXTURE EITHER PRIOR TO FILLING PIT OR AS PIT IS BEING FILLED.
C. MAKE SURE PLANT REMAINS STRAIGHT DURING BACKFILLING PROCEDURE.
D. BACKFILL SIDES OF TREE PIT HALFWAY WITH SOIL MIXTURE AND TAMP AS PIT IS BEING FILLED.
E. CUT ROPE OR WIRE ON BALL OF TREE AND PULL BURLAP BACK TO THE EDGE OF THE TREE BALL. REMOVE ALL PLASTIC WRAPS AND TWINE.
F. FINISH BACKFILLING SIDES OF TREE PIT AND TAMP FIRMLY.
G. NEVER COVER TOP OF TREE BALL WITH SOIL.
H. FORM A SAUCER ABOVE EXISTING GRADE AND AROUND THE OUTER RIM OF THE TREE PIT.
I. MULCH TOP OF ROOT BALL AND SAUCER WITHIN 48 HOURS TO A MINIMUM DEPTH OF 2" AND TO A DEPTH NOT TO EXCEED 3".
J. WATER THOROUGHLY ON THE INTERIOR OF THE TREE SAUCER UNTIL IT IS FILLED EVEN IF IT IS RAINING. A SECOND WATERING MAY BE NECESSARY TO INSURE SATURATION OF THE ROOT BALL.
K. PRUNE OUT ANY DEAD OR BROKEN BRANCHES.
L. IN EXTREMELY HOT WEATHER, REDUCE FOLIAGE SURFACE BY PRUNING OR STRIPPING.
M. REMOVE ALL TAGS, LABELS, STRINGS, ETC. FROM THE TREE.

PLANTING PROCEDURES FOR SHRUBS

I. PREPARING SHRUB PIT

A. FOR A SINGLE SHRUB, THE PIT SHALL BE DUG LARGE ENOUGH FOR THE PROPER SETTING OF THE ROOT BALL (1 FOOT WIDER THAN ROOT BALL) AND DEEP ENOUGH TO ALLOW 1/8 OF THE ROOT BALL TO SET ABOVE EXISTING GRADE.
B. FOR A SHRUB MASS PLANTING, THE ENTIRE BED AREA SHALL BE ROTOTILLED 3 TO 4 INCHES DEEP. EACH SHRUB PIT SHALL BE EXCAVATED FOR THE PROPER SETTING OF THE ROOT BALL.
C. FOR A HEDGE, A TRENCH SHALL BE DUG LARGE ENOUGH FOR THE PROPER SETTING OF ALL THE PLANTS' ROOT BALLS (THE TRENCH SHALL BE 1 FOOT WIDER THAN THE ROOT BALLS).

II. PLANTING SINGLE SHRUBS AND BACKFILLING POT

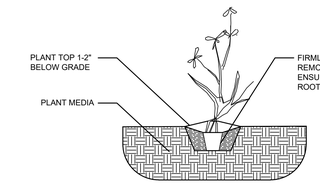
A. PLACE THE PLANT IN THE PIT BY LIFTING AND CARRYING IT BY THE ROOT BALL.
B. SET THE PLANT STRAIGHT AND IN THE CENTER OF THE PIT WITH THE MOST DESIRABLE SIDE FACING TOWARD THE PROMINENT VIEW.
C. USE A SOIL MIXTURE AS STATED IN THE DETAIL.
D. MAKE SURE THE PLANT REMAINS STRAIGHT DURING BACKFILLING PROCEDURE.
E. BACKFILL SIDES OF THE PIT HALFWAY UP WITH SOIL MIXTURE AND TAMP AS THE PIT IS BEING FILLED.
F. CUT THE ROPE ON THE BALL OF THE SHRUB AND PULL THE BURLAP BACK TO THE EDGE OF THE PLANT BALL. ALL PLASTIC WRAPS AND TWINE SHALL BE REMOVED. CONTAINERS ARE TO BE REMOVED FROM CONTAINERIZED MATERIALS.
G. FINISH BACKFILLING THE SIDES OF THE SHRUB PIT AND TAMP FIRMLY.
H. FORM A SAUCER ABOVE THE EXISTING GRADE AND AROUND THE PLANTING PIT.
I. MULCH TOP OF ROOT BALL AND SAUCER A MINIMUM OF 2" OF DEPTH, NOT TO EXCEED 3" OF DEPTH.
J. WATER THOROUGHLY ON THE INTERIOR OF THE SHRUB SAUCER UNTIL IT IS FILLED EVEN IF IT IS RAINING.
K. PRUNE OUT ANY DEAD OR BROKEN BRANCHES.
L. REMOVE ALL TAGS, LABELS, STRINGS, ETC. FROM THE PLANT.

III. PLANTING A SHRUB MASS

A. FOLLOW THE SAME PROCEDURE AS FOR A SINGLE SHRUB.
B. EDGE AND RAKE THE ENTIRE PLANTING BED.
C. MULCH THE ENTIRE PLANTING BED A MINIMUM OF 2" OF DEPTH, NOT TO EXCEED 3" OF DEPTH.
D. WATER THE ENTIRE PLANTING BED THOROUGHLY EVEN IF IT IS RAINING.
E. PRUNE OUT ANY DEAD OR BROKEN BRANCHES.
F. REMOVE ALL TAGS, LABELS, STRINGS, ETC. FROM THE PLANT.

PLANT SCHEDULE

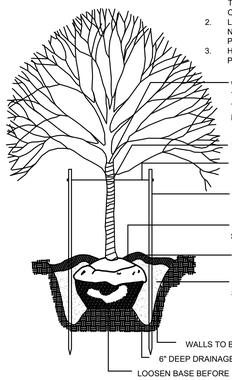
SYMB.	KEY	QUANT.	BOTANICAL NAME	COMMON NAME	SIZE	MATURE HEIGHT	MATURE SPREAD	NATIVE STATUS	DROUGHT TOL. RATING	SPACING	REMARKS
	LARGE DECIDUOUS TREES										
	Ar	5	Acer rubrum 'October Glory'	Red Maple	2" cal.	40' - 50'	30' - 40'	Y	GOOD	N/A	B & B
	Cj	5	Cercidiphyllum japonicum	Katsura Tree	2" cal.	40' - 60'	25' - 60'	N	GOOD	N/A	B & B
	MEDIUM DECIDUOUS TREES										
	Pc	7	Prunus cerasifera 'Thundercloud Cherry Plum	Thundercloud Cherry Plum	2.5" cal.	15' - 25'	15' - 20'	N	MEDIUM	N/A	B & B
	EVERGREEN TREES										
	To	12	Thuja occidentalis 'Nigra'	Dark American Arborvitae	6' ht.	20' - 30'	5' - 10'	Y	GOOD	N/A	B & B
	BUSHES										
	Ea	48	Euonymus alatus 'Rudy Haag'	Burning Bush	3 Gal	3'-5'	3'-5'	Y	GOOD	SEE PLAN	CONTAINER
	Ig	5	Ilex glabra	Inkberry	3 Gal	5'	5'	Y	GOOD	SEE PLAN	CONTAINER
	Cs	505	Carex stricta	Tussock Sedge	3" Pot	2' - 2.5'	2' - 2.5'	Y	GOOD	24"	POT



HERBACEOUS PLANTING DETAIL
NOT TO SCALE

NOTES:

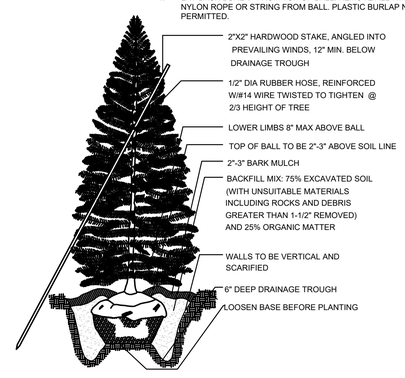
1. REMOVE ENOUGH WHOLE BRANCHES (NOT JUST END TIPS) TO REDUCE FOLIAGE BY 1/3. NEVER LEAVE "Y" CROTCHES OR DOUBLE LEADERS. RETAIN NORMAL PLANT SHAPE.
2. LAY BACK BURLAP FROM TOP OF BALL. REMOVE ALL WIRES, NYLON ROPE OR STRING FROM BALL. PLASTIC BURLAP NOT PERMITTED.
3. HOLE SHALL BE 2x DIA. OF THE BALL WHEN CONDITIONS PERMIT.



TYPICAL DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE

NOTES:

1. LAY BACK BURLAP FROM TOP OF BALL. REMOVE ALL WIRES, NYLON ROPE OR STRING FROM BALL. PLASTIC BURLAP NOT PERMITTED.



TYPICAL CONIFEROUS SHRUB PLANTING DETAIL
NOT TO SCALE

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SCALE: 1"=20'
DATE: 10-24-2023

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LICENSE NO. 15067
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REGISTERED
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STATE OF
WEST VIRGINIA
03/15/23
PROFESSIONAL ENGINEER

SITE PLAN
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SITUATED APPROXIMATELY 480' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD (MD 340) AND WINDMILL CROSSING
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3, TM. 016A, P. 0005,0001 & 0006,0000
ZONED: GC - GENERAL COMMERCIAL

LANDSCAPE PLAN

TRIAD ENGINEERING, INC.
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SHEET NUMBER:
SHEET 9 OF 10
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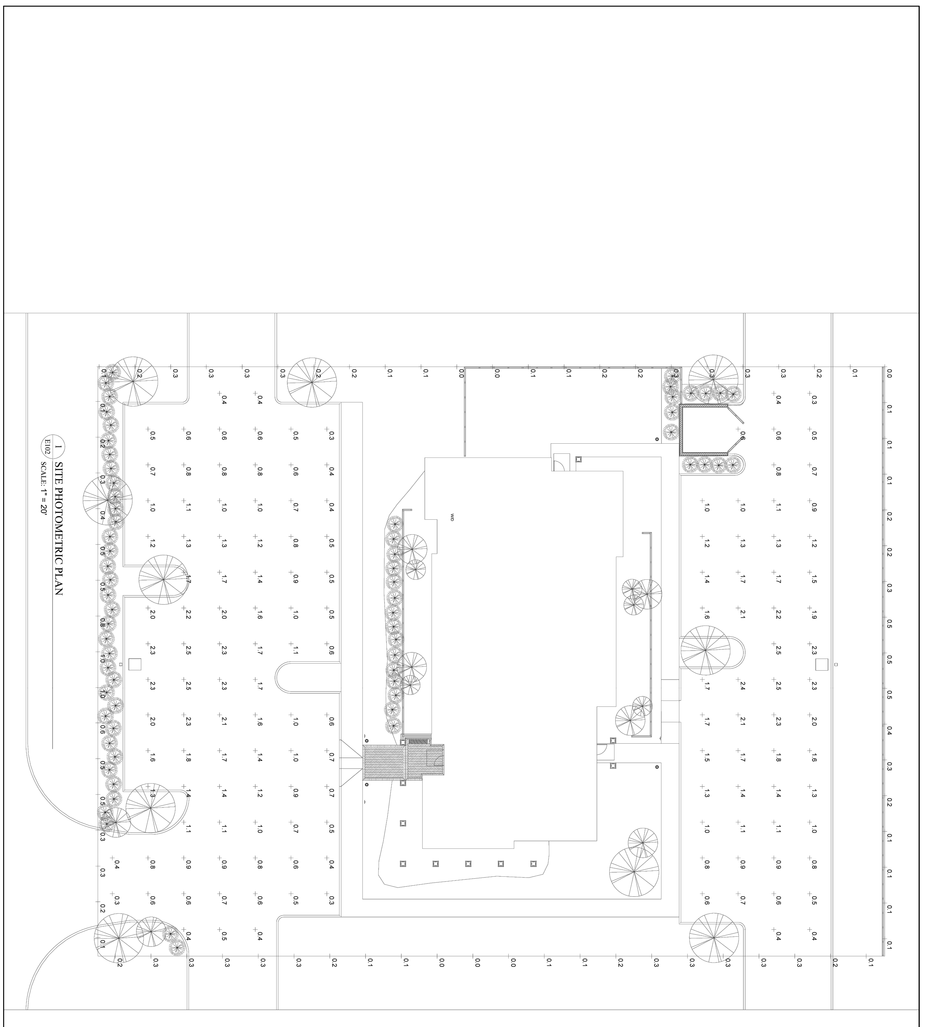

PHOTOMETRIC SITE PLAN
SCALE: As indicated

SHEET
E102

ISSUE	DATE
Planning Set	10/24/2023

# REVISION	DATE

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CHARLES TOWN
FAMILY DENTISTRY
LOT 6B "WINDMILL CROSSING"
SOMERSET BLVD. CHARLES TOWN, WV 25414

SEAN K. SIVIS

FAZIO
architects
3410 Far West Blvd. | Suite 330 | Austin, Texas 78731
512.454.0643 | www.fazioarchitects.com

REF NO. #TBD

JOB NO.: 03-22-0965

SHEET NUMBER:
C-6.0

TRIAD ENGINEERING, INC.
www.triadeng.com

SITE PLAN
WESTOVER DENTAL
SITUATED APPROXIMATELY 880' WEST OF THE INTERSECTION OF SOMERSET BOULEVARD AND MARLOW ROAD IN CHARLES TOWN CITY LIMITS
JEFFERSON COUNTY, WEST VIRGINIA
ED. 3; TM. 0168; P. 0005.0001 & 0006.0000
ZONED "GC" GENERAL COMMERCIAL

PHOTOMETRIC PLAN

ERIC H. ISAACSON
REGISTERED PROFESSIONAL ENGINEER
STATE OF WEST VIRGINIA

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of West Virginia, license number 15067, expiration date 12/31/24. I certify that these documents reasonably meet or exceed minimum requirements and standards as adopted by those State and County jurisdictions and applicable on said date.
STATE OF WEST VIRGINIA
LICENSE NO. 15067
EXPIRATION DATE: 12/31/24

CADD FILE:	03-22-0423/ PRELIMINARY
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OFFICE LOCATIONS
MARYLAND ○ PENNSYLVANIA ○ VIRGINIA ○ WEST VIRGINIA

From: Phillips, Mark
To: James Newman
Subject: RE: Westover Dental Office Revised plans
Date: Thursday, January 18, 2024 8:34:16 AM

Thanks James,

Based on my meeting with the Applicant yesterday and the revised plan set we have no further comments. No cost on this one.

Thanks!

Mark R Phillips, P.E. (VA,WV)
Kimley-Horn | 19775 Belmont Executive Plaza, Suite 250, Ashburn, VA 20147
Direct: 703-870-3631 | Mobile: 540-454-6294
Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

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From: James Newman <JNewman@charlestownwv.us>
Sent: Thursday, January 18, 2024 8:28 AM
To: Phillips, Mark <Mark.Phillips@kimley-horn.com>
Subject: FW: Westover Dental Office Revised plans

For your review

From: Eric Iser <eiser@triadeng.com>
Sent: Wednesday, January 17, 2024 7:09 PM
To: James Newman <JNewman@charlestownwv.us>
Cc: Keith Gregg <keith@fazioarchitects.com>; Greg Hayslett <greg@fazioarchitects.com>
Subject: Westover Dental Office Revised plans

James,
Attached is the Westover Dental Office Plans and point by point response.

Eric H. Iser, PE
Senior Engineer

Triad Engineering, Inc.
301-578-2708 (Direct)
301-797-6400 (Office)

LinkedIn | Facebook | www.triadeng.com

Triad has grown! Keep up with office expansions and announcements: *Follow our blog here!*

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Date: **January 17, 2024**

To: **Mr. James Newman, AICP**
City of Charles Town Planning

From: **Eric Iser, PE**

Re: **Westover Dental Office**
Preliminary Site Plan

Point by Point Response to Comments dated January 17, 2024, by Mark Phillips, Kimley-Horn & Associates.

Comment 1: On Sheet C-2.0 and C-2.1, please review the proposed curb ramp near the ADA parking area in front of the building adjacent to the brick pavers. We recommend that a Type B curb ramp create a smooth and consistent surface for pedestrian movements

Response: **As discussed on the phone, a Type B curb did not work in this area because it causes the walkway to the building to be a 5.7% slope which would then require handrails to be used. The current layout has a walkway slope of 4.3%.**

Comment 2: We request the Applicant provide curb ramp details for the new curb ramps proposed near the entrance of the property to ensure that they are ADA Compliant

Response: **Added inset on Sheet C-3.0 of this area showing elevations.**

Charles Town
Utility Board

661 S. George Street, Suite 101 Charles Town, WV 25414
Phone: (304) 725-2316 ♦ Fax: (304) 725-7150 ♦ Web: www.ctubwv.com

UTILITY BOARD

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Ashley Stottlemyer

Board Member
Jefferson Whitten

UTILITY MANAGER
Kristen Stolipher

Date: December 6, 2022

Re: Lot 6B Sommerset Boulevard – Windmill Crossing
Water/Sewer Availability

Dear Mr Iser:

The Charles Town Utility Board (CTUB) has received your request for water and sewer availability for the subject property located in Lot 6B of Windmill Crossing and offer the following:

Water Service:

(CTUB) has available water service capacity to serve your project to construct a dental office at this time. Please note that CTUB's Water Tariff does not allow for reservation of capacity. Therefore, water system capacity is provided on a first come, first serve basis. A Water Capacity Improvement Fee (CIF) at the time of building permit will apply. The current water CIF is $4,399.00 per equivalent dwelling unit (EDU). CTUB utilizes the WVPSC Residential Usage Equivalents chart to calculate the Sewer CIF. CTUB will need to be aware of the number of daily employees there will be in this office to calculate the Water CIF; it is unknown at this time, and therefore will be calculated at a later date. A copy of the CTUB Rates, Rules and Regulations as well as the Public Service Commission A copy of the CTUB Rates, Rules and Regulations as well as the Public Service Commission of West Virginia Water Rules and Regulations can be found at: www.ctubwv.com.

Sewer Service:

(CTUB) has available sewer service capacity to serve your project to construct a dental office at this time. Please note that CTUB's Sewer Tariff does not allow for reservation of capacity. Therefore, sewer system capacity is provided on a first come, first serve basis. A Sewer Capacity Improvement Fee (CIF) at the time of building permit will apply. The current sewer CIF is $2,930.00 per equivalent dwelling unit (EDU). CTUB utilizes the WVPSC Residential Usage Equivalents chart to calculate the Sewer CIF. CTUB will need to be aware of the number of daily employees there will be in this office to calculate the Sewer CIF; it is unknown at this time, and therefore will be calculated at a later date. A copy of the CTUB Rates, Rules and Regulations as well as the Public Service Commission of West Virginia Water Rules and Regulations can be found at: www.ctubwv.com.

If you have any questions, please contact me at (304) 725-2316.

Sincerely,

Travis Markley
Engineering Technician

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

***Commission Review:*SLD2023-04: Hillside - Preliminary Plan**
POSTPONED TO FEBRUARY 26 MEETING

ATTACHMENTS:

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Commission Review: **SLD2023-07 : Happy Retreat - Preliminary Plan**
POSTPONED TO FEBRUARY 26 MEETING

ATTACHMENTS:

Planning Commission
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

Meeting: 01/22/24
Department: Planning Commission
Category: Report
Initiator:

AGENDA ITEM (ID #)

Commission Review: 2024 Meeting Calendar

ATTACHMENTS:

- 2024-Planning-Commission DRAFT.docx

CITY OF CHARLES TOWN

Department of Community Development
Division of Planning & Zoning

101 East Washington Street, P.O. Box 14, Charles Town, WV 25414
Phone: (304) 724-3248 ♦ Fax: (304) 725-1014 ♦ Web: www.charlestownwv.us

2024 MEETING SCHEDULE OF THE CITY OF CHARLES TOWN PLANNING COMMISSION

Meetings are held in the Council Chambers at City Hall, at 101 East Washington Street, at 7pm, on the 4th Monday of every month unless otherwise specified.

Scheduled Meetings	**Submission Deadline**
Monday, January 22, 2024	Friday, December 1, 2023
Monday, February 26, 2024	Monday, January 1, 2024
Monday, March 25, 2024	Thursday, February 1, 2024
Monday, April 22, 2024	Friday, March 1, 2024
Monday, May 27, 2024	Monday, April 1, 2024
Monday, June 24, 2024	Wednesday, May 1, 2024
Monday, July 22, 2024	Monday, June 3, 2024
Monday, August 26, 2024	Monday, July 1, 2024
Monday, September 23, 2024	Thursday, August 1, 2024
Monday, October 28, 2024	Monday, September 2, 2024
Monday, November 25, 2024	Tuesday, October 1, 2024
Wednesday December 23, 2024	Friday, November 1, 2024
Monday, January 27, 2025	Monday, December 2, 2024

Bold dates - Per Code Sec. 135.03.A. these are the PC's minimum quarterly meeting dates. If additionalbusiness is required to be conducted, the other dates are available.

Italicized date - Indicates this meeting is not on the regularly scheduled meeting date.

Applications are due one week before legal ads are submitted to the paper.